

MAY 1976

BME

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REPORT INSIDE.**

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BROADCAST MANAGEMENT ENGINEERING

MAY 1976/VOLUME 12/NUMBER 5

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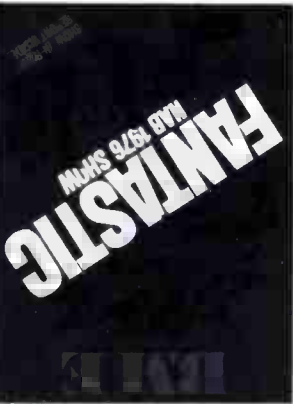
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BME, BROADCAST MANAGEMENT ENGINEERING, is published monthly by Broadcast Information Services, Inc. All notices pertaining to undeliverable mail or subscriptions should be addressed to 295 Madison Ave., New York, N.Y. 10017. BME is circulated without charge to those responsible for station operation and for specifying the purchase of equipment used in broadcast facilities. These facilities include AM, FM, and TV broadcast stations; CATV systems; ETV stations; networks and studios; audio and video recording studios; consultants, etc. Subscription prices to others: \$15.00 one year, \$25.00 two years. Foreign: \$20.00 one year, \$35.00 two years. Foreign Air Mail: additional \$24.00. Copyright © 1976 by Broadcast Information Services, Inc., New York City. Controlled circulation postage paid at East Stroudsburg, PA.



"Fantastic" is the word used by visitors to describe the new equipment on display at NAB '76. "Fantastic" is the word used by exhibitors to describe both traffic and interest in new equipment—in both Radio and TV. Read about what was on display beginning on page 33.

BROADCAST INFORMATION SERVICES, INC.
295 Madison Ave.
New York, N.Y. 10017
212-685-5320

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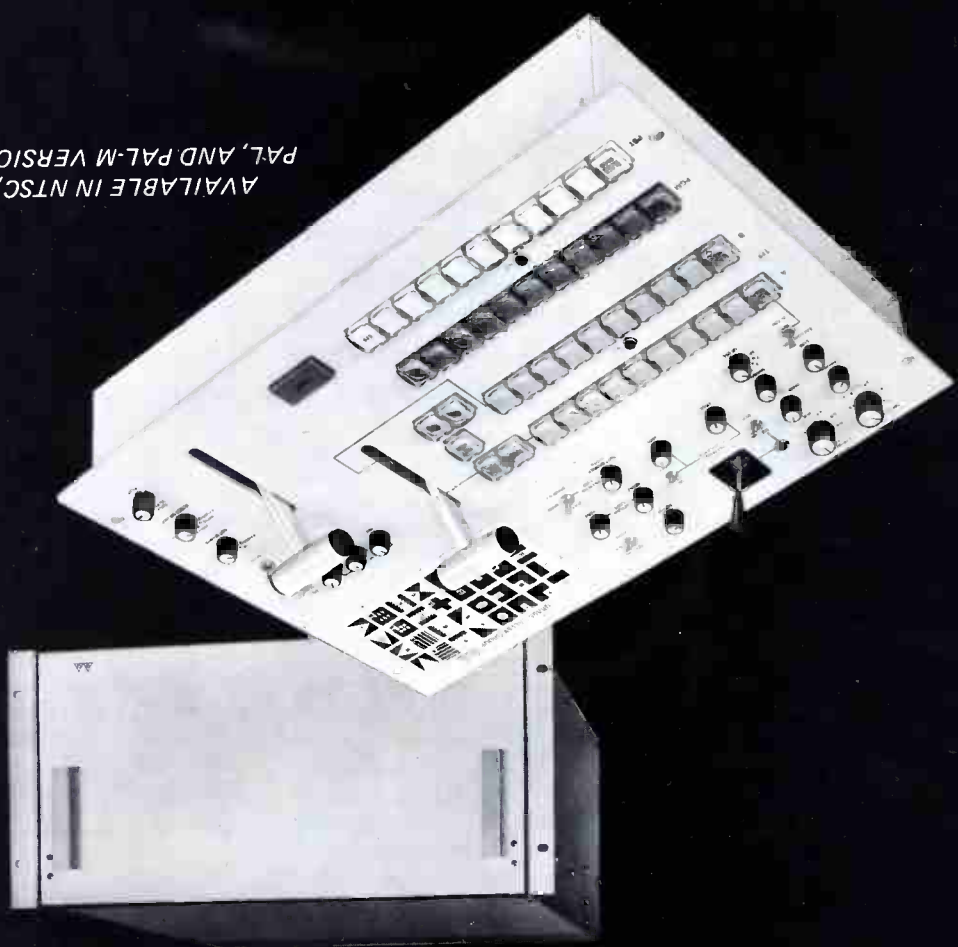
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A Door To The Future:

Auto Transmitter

Rules Proposed

In an action that could change the face of broadcasting over the next few years from what it has meant to engineering personnel for decades, the FCC issued on April 8th the proposed rules opening the way to use of automatic transmitters. From the timing of the comments requested (on or before June 12th) and the Commission's current spirit of do-it-now, evident in many recent actions (see next items), it seems likely that the auto transmitter rules will become official well before the end of the present year.

The FCC sees automatic transmission systems (ATS) as a *third option* for broadcasters, after direct and remote control; moreover, the proposal is for permission to use automation in any *parts* of the operation the broadcaster chooses; he can be partially automatic, partially "manual". Prior authority for ATS would not be required, except that AM stations with directional antennas would have to submit certain advanced showings. Others simply notify the FCC that they will do it.

The FCC proposes that stations adopting ATS for all specified functions will *not* be required to have a first-class radio-telephone operator in full time employment. Such an operator must be available for inspections, measurements and adjustments made at specified intervals, for all on-air adjustments, and for check-out at the end of maintenance work. However, since the law now specifically requires it (amendment is anticipated), the ATS station must have a continuous-duty operator with at least a restricted operator permit.

The FCC proposes that ATS can be adopted by adding a "black box" to an existing transmitter—completely new transmitters are not required, although eventually there will certainly be transmitters with the automation built in. As to the black box itself, it is clear that recent developments in micro-processor control systems have showed the way toward extremely compact, inexpensive and reliable quasi-computer systems that would have more than

FCC Realigns '77

Rebuild Cable Channel

And Access Rules

Enough memory for all the functions of a transmitter needing monitoring and automatic control. The FCC lists functions that would be controlled, a very comprehensive list starting with output modulation, loss of signal, etc., and specific conditions calling for automatic shut-off, with others merely activating an alarm.

Every broadcast station manager and engineer must study the ATS proposal; if copies are not on hand at station, the FCC should be asked for them. Certainly no drastic events will take place the day the rules are adopted, but over several years a major evolution in broadcast engineering practice seems

An important realignment of the cable channel capacity rules, under discussion for several years, was another item in the current big-decision splurge at the FCC. It makes a substantial attempt to meet the industry's criticisms of the earlier rules as impractical, economically. The old rules included: a requirement for 20-channels in "new" systems (starting after March 31, 1972); in major markets, one non-broadcast channel for every broadcast channel; facility for non-voice two-way service; four dedicated channels, one each for public, educational, local government and leased access; complete program facilities for local access. Systems in operation before March 31, 1972, were to be given until March 31, 1977 to come up to these standards. The new rules, effective May 1st, 1976, eliminate channel capacity and access rules for systems with fewer than 3500 subscribers; delete entirely the one-nonbroadcast-for-one-broad-cast rule, provide that for larger systems, the rules apply on a head-end, rather than a community basis. Further, the new rules delete the requirement that older systems reconstruct to provide four dedicated channels or that new ones install them before commencing; require that systems provide the four channels only if they have the activated capacity (but systems with more than 3500 subscribers must accommodate access ser-

New Alloy Extends Life

Of Magnetic Heads

The development of a new wear-resistant alloy by the Nortronics Co. makes it possible to significantly extend the life of magnetic heads. After two years of extensive testing by Nortronics of the alloy developed by Carpenter Technology of Reading Pa., long-wear properties of the high magnetic alloy named Hy Mu 800 were confirmed. Nortronics will be the first firmed. Magnetic head manufacturer to the new alloy in its products.

"Fairness" Reaffirmed:

No Change Will Be Made

In another of the "big" decisions pending out of the FCC in March and April, the Commission gave a flat "no" number of requests for elimination or changes in, the Fairness Doctrine under attack by a covey of critics. FCC restated the basic two-part "Fairness" duty of licensees as: devote a reasonable proportion of air time in the sense that there is opportunity for contrasting viewpoints to be heard. FCC rejected the proposal that "news" be evaluated only at renewal time, saying that this could allow broadcaster to get way "off base" jeopardizing renewal, and could let the issues get "stale". Also rejected the proposal that "public on any side of an issue of importance," not would oppose commercials provide any substantial continued on page

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FCC Briefs

balance). A third proposal rejected evidence that a station management deliberately ordered a slanting of news. The FCC said that the present system strives for a "delicate balance among the interests of all concerned" is "outlined with specific procedures requirements and with substantial guidelines upon which viewer and licensee may rely. The Commission tailored its actions so as not to become in effect, the broadcast journalist programmer."

The proceeding looking toward regulation of "hypoing" (Doc 20501) has been dropped by the FCC because of difficulties in defining "right" and "wrong" actions, possible unfairness in the application, First Amendment problems from including programs on content. No certified equipment can now be shown at Trade Shows, says the FCC, which carries clear notice that it is not for sale until certified. The FCC announced formation of a Consumer Assistance Office, at headquarters, 15 M St., NW, Washington, which members of the public, citizen groups and licensees will get information and assistance.

The FCC proposes to add to "equal time" a requirement that a station give time to a candidate within hours prior to an election day, immediately notify opposing candidates (comments by May 17). Request for VHF and FM translator power 10 watts in areas east of the Mississippi (now restricted to 1 watt) were turned down by the FCC as not warranted the facts; it promised to consider requests on a case-by-case basis.

Cox Pres., Researchers See Continued Upswing in Broadcasting & Economics

The rebound in radio and TV advertising sales indicates the nation is gradually coming out of the recession in a very healthy way, Clifford M. K. Land, Jr., President of Cox Broadcasting Corp., commented at the company's annual Shareholders Meeting. "We frequently state that broadcasting reflects the national economy," said. "The solid momentum which broadcasting finished 1975 continually is continuing. We see a lesser of inflationary pressures and a pickup Kirtland remarked on broadcast continued on page 8

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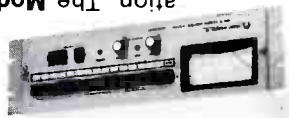


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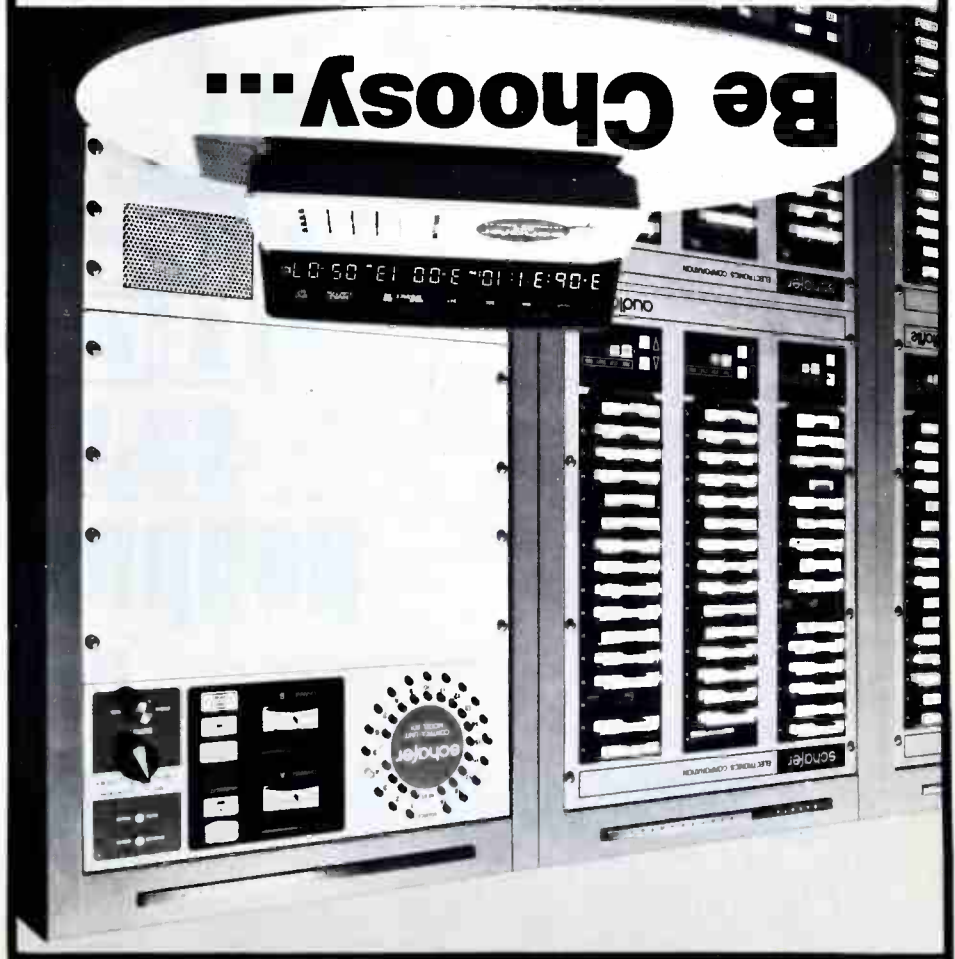
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NEWS

which accounts for the largest percentage of Cox's revenues and earnings. "With more Bicentennial programs, the summer Olympics and accelerating political campaigns be us, indications are that broadcast vertising time will be in demand throughout the year."

In agreement with Kirtland is B Eastman Dillon & Co., the New York City investment researchers. In a recent industry service report "Broadcasting-Television Entertainment (Volume 1, No. 2), the sees continued strength in broadcast billings that started in the latter part of 1975 and predicts that 1976 will increase between 10% and 14% for all broadcast categories—network, national and local. Looking at the total picture in 1976, the company says that due to a tight supply of available broadcast companies new to the medium, the rise in industry revenues should be about 1 1/2% with the gain at the level somewhat higher than national spot. In addition, advertising rates will increase due to the demand of political advertisers.

Taylor Buys Atlanta Common Carrier Comp

Edward L. Taylor recently announced the acquisition of 100% of the assets of Southern Satellite Systems I (S.S.S.), a common carrier company formerly owned by Turner Communications Corp. of Atlanta, Ga. Taylor, President of S.S.S., was formerly President of Marketing for Western Satellite Systems of Western Union. Taylor also announced an agreement in principle with R.C.A. Global Communications Inc. for lease of one hour transponder on the R.Satcom Domestic Satellite for the distribution of the signal of WTCC Channel 17, Atlanta, to CATV stations.

TPT Manhattan Plans Election Year Programs

Teleprompter Manhattan Cable TV announced plans for a series of political programs which they plan to produce for this election year. The company feels that since much national attention will be given to New York City year due to the upcoming Democratic National Convention, the company should give its viewers the most complete coverage possible. The first program in the series was on April 6 and was devoted exclusively to the

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York City results of the statewide P
identical primary.

CATV's Urged To Improve Campaign Communications

The President of the NCTA has urged the nation's CATV operators to join together in an industry-wide public service effort to help improve communications during the 1976 election year. In a special letter to the NCTA membership, President Robert Schmidt called upon the CATV industry to undertake a national demonstration of CATV's capability to assist in facilitating the flow of information about vital national and local issues. The public.

NRBA Board Actions

The National Radio Broadcasters Association made several important decisions at its meeting last March 22 in Chicago. The Board voted to oppose reducing the channel spacing of FM broadcast band from 200 KHz to 150 KHz or 100 KHz as had been proposed in a recent report by the Chief Engineer of the FCC and a fact-finding committee was designated to fund study that proposal. The special problems faced by daytime radio broadcasters were discussed and NRBA General Counsel Tom Scharent was instructed by the Board to discuss the Commission's support of pre-sunrise authorities for all time broadcasters who do not have them.

The Board also planned a series of regional sales seminars during the months of May and June. Radio broadcasters from across the country will be invited to attend one-day workshops in such cities as Chicago, Orleans, New York and Seattle. Seminars will follow NRBA's traditional panel discussion format. For their information call the NRBA at 212-869-8873.

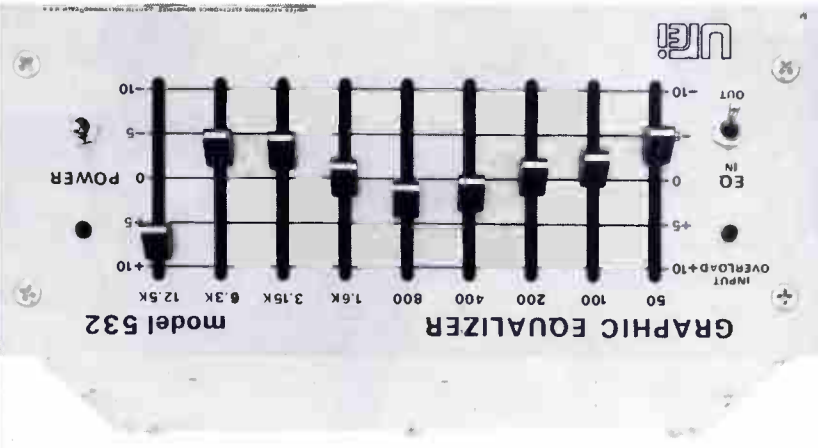
TV's Worldwide Popular Rivals Telephone & Cars

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Achiever Awards were presented last
continued on page 17



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categories, with approximately
million TV sets, 144 million tele-
s and 130 million motor ve-
size of the worldwide TV
is impressive since the indus-
commercial growth began only in
The telephone is 100 years old
car and the motor vehicle close to
its old.

Wants More Channels TV Remote Pickups

AB has asked the FCC to allocate
national channels to provide more
channels for remote TV pickups.
requested that the 6425-6525
band be shared by TV broad-
casters on a co-equal basis with the
common carriers. This band is cur-
rently allocated to the common carriers
for a specific purpose of providing
backup service for TV broadcast

S Introduces New Automation Equipment Line

(Broadcast Industry Automation
m), a division of Data Communi-
s Corp., has unveiled its new
S 202 Terminal System, which
become standard equipment for the
II system, the latest automation
n introduced for station oper-
ated. Developed to provide a wide
of efficient information access,
new station equipment includes a
Data General mini-computer, 2
CRT's (Cathode Ray Tubes) and
Electronics Printer.

Point Makers, Programmers Many Video Cassettes

ars of TV programs and com-
erals are making heavier and
er use of video cassettes, accord-
MPCS Video Industries, in New
which has large studio facilities
assette recording. Most of the larg-
d agencies, says MPCS, have
d to videocassettes for talent tests,
ommercials and TV "pilot" pro-

addition, the advent of the time
corrector has allowed a number of
program producers to do the whole
n cassettes, with stations going on
directly from cassette recording.
test commercials, for example,
th pass the audience trials, often go
rtly to broadcast without further
nsive processing.

LOAD/COMM 76

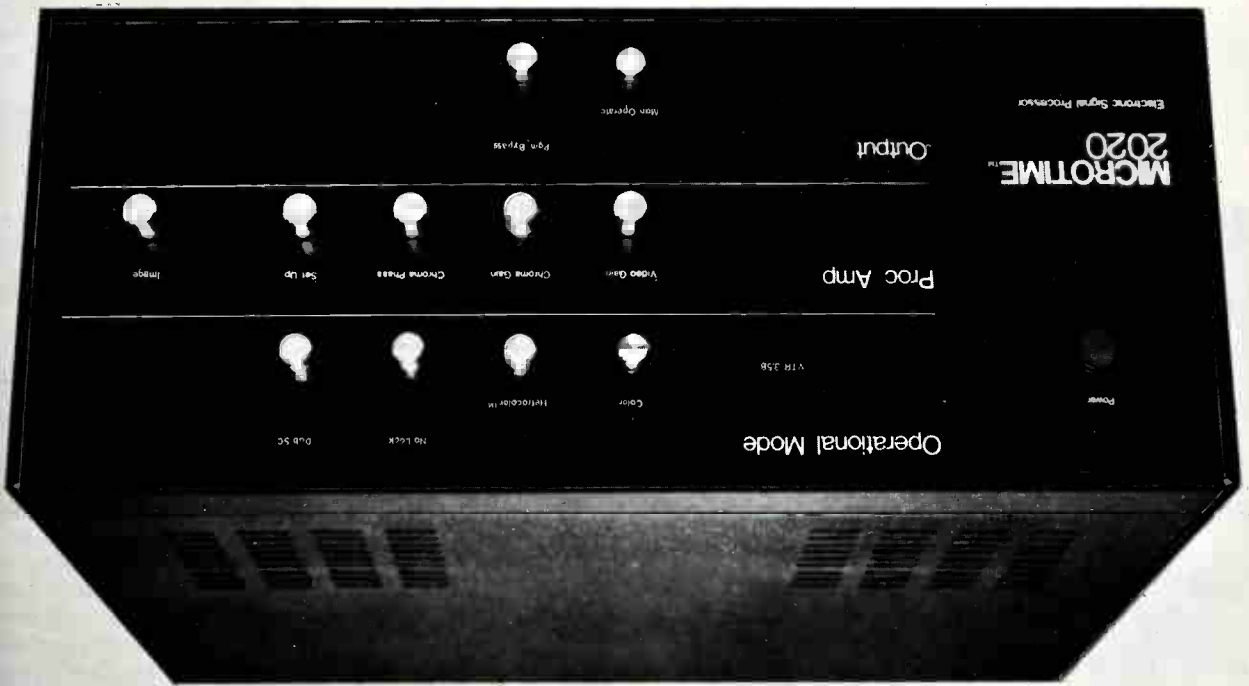
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tra Large Memory

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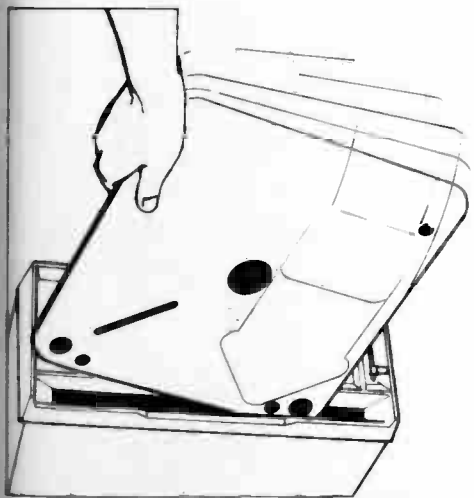
Every integrated circuit in the 2020 undergoes accelerated aging at 125°C for 96 hours and 100% tested before assembly into circuit cards. The P.C. cards are then tested and built into units to be the completed 2020's are vibration stressed for one hour at varying frequencies. The result—the most stringent reliability standards in the industry and the most reliable system of its kind! Microtime—the reliable one.

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Electronic coding system to combat legal duplication or "pirating" of films from videotape has been developed under a joint engineering venture by Byron Motion Pictures, Telecommunications International and Goldmark Communications Corp. Each organization provides major program transfer from tape and film to magnetic tape for TV viewing.

Although the system has undergone extensive laboratory testing, further development is needed to make the "Sp-Copy" system compatible with tapes of videocassette players used for most recording. An early design version for most recording devices will be made available for a licensing fee to be determined against film pirating.

Company Formed For Film Distribution

A film distribution company called Film Media has been formed by Ronald Kincheloe, formerly of Modern Picture Services. The company will distribute sponsored films for companies, associations and governmental agencies, as well as selected national films on a rental basis. Additionally, the company will provide specialized consulting and marketing services for sponsors, producers and distributors. For more information contact Karol Media, P.O. Box 2000, S. Hackensack, N.J. 07606; 652-7779.

Wometco To Join Pay TV, Role, Movie Operations

A fine display of "if you can't lick the join 'em," Wometco Enterprises announced it would buy the Blondere pay-TV operation in Newark, including station WBTB-TV, and Vision, the pay-TV systems developer. The move has special interest because of Wometco's earlier strong efforts against pay-TV and cable, as a owner of movie theaters.

Wometco's senior vice president Wolfson II, said that Wometco is currently in charge of broadcasting and the station could become profitable with a mix of specialty programs and pay-TV. In addition, he said, Wometco would be strong cooperation with systems, and also with movie continued on page 18

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New Supply "Hotline"

Comprehensive Service Corp. rec announced that the firm has installed nationwide toll-free "hotline" commercial film and video use locating supplies and sundries. company says that by dialing 223-5460 from anywhere in the country (except within New York State, the number is 212-586-6161), professionals can find over 2,000 frequently—and not-so-frequently—items, most of which can be shipped immediately from either their East Coast warehouses. In the that Comprehensive doesn't carry particular item, they will refer the to another source.

Westar Service Expands

Western Union recently announced the Westar domestic communication satellite system is now offering a broadcasting channels on 19 routes between seven Satellite Access Cities. First customer for the new Westar service is Robert World Co. of Los Angeles, a leading packager of broadcast arrangements for sports events. World Co. has reserved a number of Type II audio channels (50-7,500 for high-quality AM broadcast baseband games. Type I audio channels are provided in the 300-3,600 range, and will be used primarily inserts of news events, actualities. The new Westar service is offered by Westar in the cities of New York, Los Angeles, Chicago, Washington, San Francisco, Dallas and Atlanta.

Quinian Says Six Hours May Be TV Watch Limit

Commenting on the fact that television watching per family dropped from hours 14 minutes a day in 1974 to hours seven minutes a day in 1975, Sterling ("Red") Quinian, TV veteran and author of several books, says a new book that "there is a limit how much television Americans watch. Six hours a day may be the Quinian goes on. "We believe per should, and must, find time for pursuits. We do not want to be accused of stifling the ability of youngsters to (read and) write. We only work harder to make our programs as much as they presently do better for those who watch our The new book, titled "TV Turn The Viewers Revolt," is scheduled publication this month.

NEWS

theatres, along lines which he declines to elaborate.

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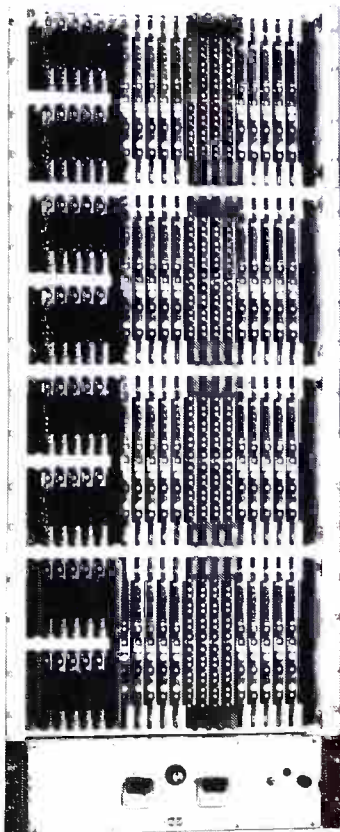
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continued on page 20



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Distortion Of Audience Ratings

By Frederick W. Ford and Lee G. Lovett of Pittman, Lovett, Ford and Hennessy, Washington, D.C.

For a number of years, the Commission has maintained a basic policy against distortion of audience ratings of broadcast stations by misuse of audience survey results. Such distortions are termed "hyping." Several Public Notices concerning "hyping" were issued in the early 1960's. Following a Federal Trade Commission de-termination that "hyping" activities constituted "unfair methods" of competition, or unfair or deceptive acts or practices in violation of the Federal Trade Commission Act, the FCC adopted its 1963 Public Notice. The Commission stated therein that it intended to refer "hyping" complaints to the Federal Trade Commission for action. However, the Commission declared that it would take into account any FTC findings regarding "hyping" when determining if a broadcast licensee is operating in the public interest (either at license renewal time or during the license period.)

The FCC issued another Public Notice in 1965 in response to a series of "guidelines" issued by the FCC concerning deceptive use of audience survey results. The FCC stated that it would consider a broadcaster's compliance with the 1965 FTC Statement guidelines when determining whether the licensee is operating in the public interest. The FTC's 1965 guidelines were, in abstract, as follows:

1. A person (or firm) making a claim concerning the size, composition or other important characteristics of a listening or viewing audience is responsible for seeing to it that the claim is truthful and not deceptive. If he bases his claims on the results of an audience survey, he assumes responsibility for interpreting the data accurately. Thus, he should not engage in activities calculated to distort or inflate such data—for example, by conducting a special contest, or instituting unusual advertising or other promotional efforts, designed to increase audiences only during the survey period. Such variation from normal practice is known as "hyping."
2. Audience data based on sample surveys not derived from complete measurements of the audience, as such, they are statistical estimates, and, at best, are of only limited reliability due to errors and distortions inherent in the statistical methods yielding such data. Claims as to audience coverage based on audience surveys, should therefore be qualified in recognition of the fact that survey data are inherently imperfect. Any such claim should be accompanied by a disclosure that any figures cited or quoted are estimates only or are based upon estimates, and are not accurate to any precise mathematical degree based upon a true probability sample. Audience surveys are not in practice based upon true probability samples.

3. Such claims should not be based upon data obtained in a survey that the person (or firm) making the claim knows or has reason to know was not designed, conducted, and analyzed in accordance with statistical principles and procedures, reasonably free from avoidable bias or based upon a properly selected sample of adequate size. Such claims should not be based upon survey reports or data that do not reliably reflect current audience coverage, either because the passage of time has made the data outdated, or because a later survey report encompassing essentially the same area has been published, or because of the entry or departure of a competitor or for any other reason.

Since 1965, the FCC has enforced the above-cited FTC guidelines on a case-by-case basis. The FCC had three basic methods of enforcement. First, it issued letters of admonition to broadcast stations gagging in distortion or misuse of audience ratings. Second, the FCC has designated license renewal hearings of ratings distortion in some cases. Third, the FCC has granted short-term renewals to those stations guilty of more serious audience ratings distortions. The FCC's enforcement of the FTC guidelines, in conjunction with the FTC's own investigation of broadcast licensees engaged in distortion practices, became a "double-edged" deterrent to audience ratings distortions.

In spite of the efforts of the FCC and the FTC, misand distortion of audience ratings continue. In response the FCC recently initiated a rulemaking proceeding to define distortion and misuse of ratings, prohibit such practices, and enable (the FCC) to apply the additional sanction of monetary forfeiture.

The proposed rule would prohibit the broadcast licensee from doing any of the following:

- (1) Undertaking, within four weeks before or during rating period unusual advertising, contest or promotional activities which are not conducted regularly throughout the year by the licensee.
- (2) Undertaking, within three months of a rating period any advertising, contest or promotional activity which rewards people for stating that they listen to the licensee's station.
- (3) Quoting from audience surveys in a misleading way, either by misrepresenting survey results or quoting accurately the results of an improper conducted survey.
- (4) Quoting survey results which are not the most recent available for the market.

The Commission received numerous comments nearly all of which opposed the proposed rule. Many of the comments raised questions concerning the constitutionality of such a rule which would dictate programming content (e.g., some programs used to be prohibited (high-value prize contests). Commenters asserted that the proposed rule would violate First Amendment freedom of speech guarantee of Communications Act.

Formulation of a concrete rule permitting some programming and prohibiting other programming to continued on p.

As enumerated in Report and Order in Docket No. 20501, FCC 76-226, at para. 3; adopted: March 17, 1976. Notice of Proposed Rulemaking in Docket No. 20501, FCC-643; adopted May 29, 1975. Section 326.

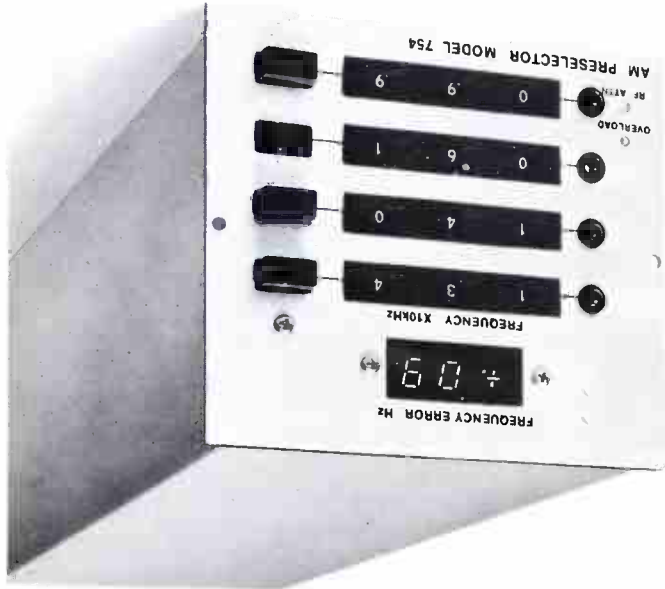
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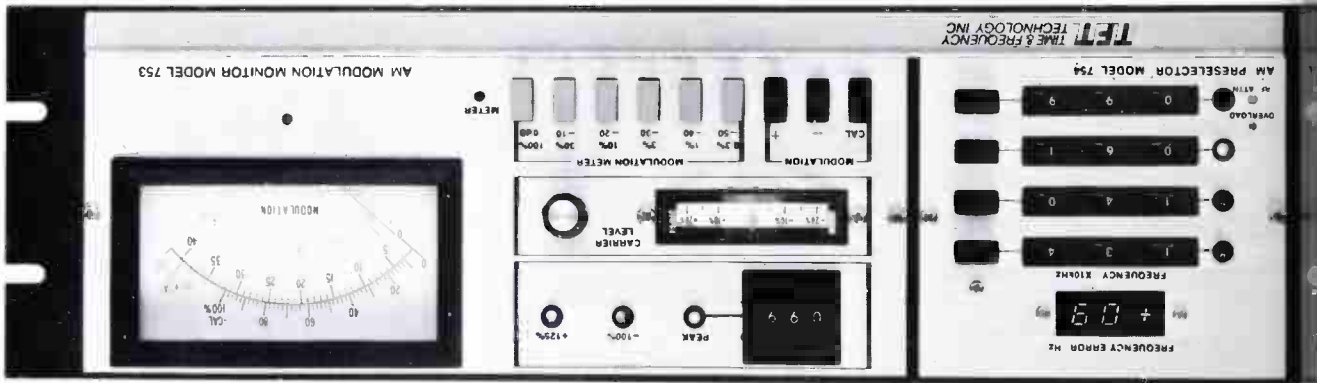
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FCC RULES & REGS

nate distortion of audience ratings would too closely tangle the Commission in the determination of program content. The Commission would effectively become an arbiter of the value of different types of promotional programming activity.

Rulemaking Denied

Although the Commission admitted that Amendment and programming discretion considerations entered into consideration of the proposed rulemaking shielded away from basing its decision to adopt or reject new rule upon those issues. Instead, the Commission said:

... it appears that there does not exist immediate impending dangers to the public interest that clearly outweigh possible First Amendment, Section 326 and [other] problems... that are inherent in any proposed Rule which would discriminate between forms of entertainment programming on the basis of program content.

The Commission concluded that in light of the above cited "balancing" test, that the audience rating based its decision, in part, upon the Supreme Court statement that "Calculated risks of abuse are taken order to preserve higher values." Clearly, said Commission, the value that might accrue from intrusion by the FCC into the sensitive area of programming creation would be outweighed by damage to the nation's policy of a free, uncensored complement of broadcast media programming. The Commission went on to say that the problems inherent in the distortion of audience ratings simply do not lend themselves to a case or mechanistic regulation.

Further, the Commission noted that the proposed assumptions that all variations in promotional patterns motivated solely by an intent to distort audience ratings, in fact, is not true. The Commission went on to a number of situations in which independent business considerations, and not an intent to distort audience ratings, underlie initiation and continuation of promotional activities by broadcast licensees. Put another way, the existence of certain outside competitive factors simply negates a broadcaster's intent to distort audience ratings. The Commission's examples of those situations which would not constitute true distortion of audience ratings follow:

- (1) Television stations normally increase advertising and promotional activity at the onset of (a) the new fall programming season (when new series are produced) and (b) the second programming season (mid-winter).
- (2) Contest, promotional and advertising activity often increases when "special event" programs (e.g., the Super Bowl, the Olympics) occur; such special events are obviously not scheduled to coincide with audience survey activity.
- (3) A licensee whose station increases power quite naturally desires to heavily promote the station's new potential listeners.
- (4) A station that changes its program format has legitimate interest in promoting the date that the change will occur in order to attract the largest possible audience.
- (5) A radio station has a legitimate interest in increasing its advertising, promotional and content.

*Olympia Broadcasting Company v. Democratic National Committee, U.S. 94, 125 (1973).



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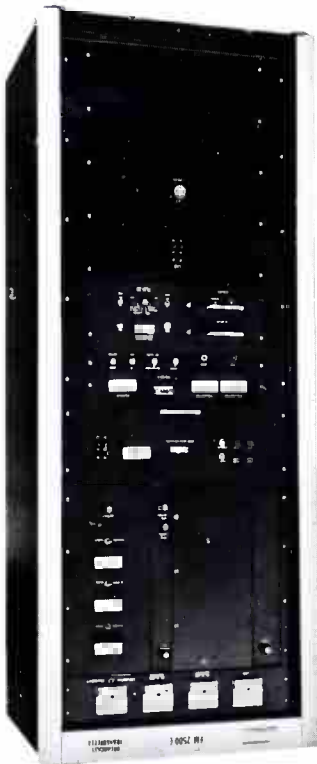


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- activity when another radio market competitor changes to the station's programming format.
- (6) A broadcast licensee has a legitimate interest promoting (a) its station anniversary, (b) the adoption of an air personality to the announcing station and (c) the sudden availability of a long-sought advertising opportunity (e.g., a uniquely attractive advertising position within a newspaper's television program listings).
 - (7) A broadcaster has a legitimate interest in initiating a concentrated advertising campaign to promote a particular aspect of its own coverage (e.g., a particular sport) to counteract an intensive advertising campaign by another media source such as newspaper.
 - (8) An independent TV station (especially a UHF) has an interest in maintaining concentrated advertising and promotion activities to counteract the strong new program offerings of the networks during the Fall season, the mid-winter second season and the summer re-run season. Especially in the third case UHF's have a special opportunity to increase their ratings, which they would not normally have during the initial run of network shows.

Commission Policy

Having declined to adopt the proposed Rule, the Commission concluded that the practice of intensifying promotional advertising, or contest activity "at times at which scheduling or program modifications are made" does constitute an unfair method of competition as defined by the FTC. The FCC views the goal of such activities "to persuade viewers to sample a station's program schedule." The FCC also concluded that such activities "reflect a healthy competition among licensees that is both economically important and in the public interest."

The Commission distilled from the Comments filed in response to the proposed rulemaking that "the seasonal promotion is not to exert short-term, temporary influence on any particular rating survey." Rather, promotional activities are aimed at the justifiable, perfectly legitimate goal of attracting new viewers to particular licensee's program fair.

Conclusion

The Commission declined to adopt a rule relating to the distortion of audience ratings because such a rule would be too mechanistic and pose extremely complex enforcement problems. The Commission will continue to enforce the FTC's 1965 Statement guidelines (as sent above) to detect and eliminate unfair trade practices by broadcasters who misuse survey results.

Further, the Commission explicitly stated that censures will henceforth be required to exercise "readable diligence" to determine what surveys are made in their markets. The Commission will here forward copies of complaints relating to distortion of audience ratings to the FTC for possible action. The Commission will continue to consider findings (or cease and desist orders) regarding distortion of audience ratings in determining whether a licensee discharged its public interest obligations.

Finally, the Commission issued a stern warning to the rating industry, itself, to take effective measures against ratings distortions might cause the Commission to recommend Congressional legislative action on the subject in the future.

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Ampex AVR-3. The

Super high band pilot
The Mouthful
That Becomes An Eyeful.
 How does a VTR compensate for signal irregularities introduced during the recording phase? In the past, those corrections were made on the basis of "average" information. In the new AVR-3, with Super High Band Pilot, signal corrections triggered on a continuous Color velocity errors and equalization variables are "seen" corrected before they can be displayed. The result? Perfect pictures. You can see the difference.



Two decades ago, Ampex introduced the first videotape recorder, and now Ampex opens a new generation of VTR capability with the all-new AVR-3, the machine that thinks for itself. You'll want an AVR-3 for a couple of basic reasons: for the "intelligent" way it does an outstanding job for you, and for the superb pictures it makes. In any broadcast band it delivers superior picture quality. With Super High Band Pilot you have the most foolproof record/playback technology available. "Intelligent." What does it mean? It's a lot of things, such as automatic sensing and switching of speeds and bands. It's an all-new optional Edit Controller for teleproduction capabilities that once seemed impossible. It's fast, efficient, gentle tape handling. And there isn't anything in the world like an AVR-3. It produces unequalled pictures; it protects you against errors in playback settings; it provides the easiest and best editing you've ever known; it's going to give you longer service life than any other VTR you've ever owned. AVR-3 is the best recording investment on the market.

First "Intelligent" VTR

program takes over again, producing a smooth deceleration curve to a precise, dead stop. You'll never damage a tape as you run it back and forth, time after time, on an AVR-3.

Editing

If You Can Imagine It, You Can Accomplish It.
The standard AVR-3 editor permits manual insert and assemble edits. If your needs are simple, you can stop right here. The optional Edit Controller takes you the rest of the way. Using either time code or tape timer information, it includes search capability. This feature gives you separate video and audio edit points, and the keyboard control allows you to move or enter edit points at will. There's more. An optional color framer eliminates all color ambiguities between edited segments. A time code generator and reader and a character generator are other handy options.

Housekeeping and computer control

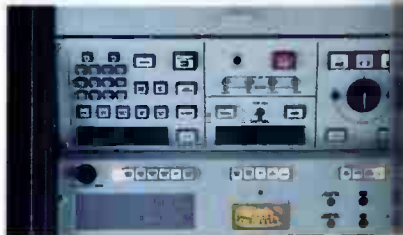
What else does the AVR-3 IQ do to make your life easier? Once the video and audio edit points are keyed in, Edit Controller takes over the house-keeping. It automatically computes and controls pre-roll addresses, acceleration/deceleration profiles, synchronizing information, and all switching

AMPPEX

Ampex Corporation
Audio-Video Systems Division
401 Broadway, Redwood City
California 94063, (415) 367-2011

Circle 125 on Reader Service Card

4 1976-BM/E



With Super High Band you'll get a picture at 7½ frames per second that's virtually as good as you've learned to expect from 15 ips High Band. The tape speed means half as much tape. It's a money saver.

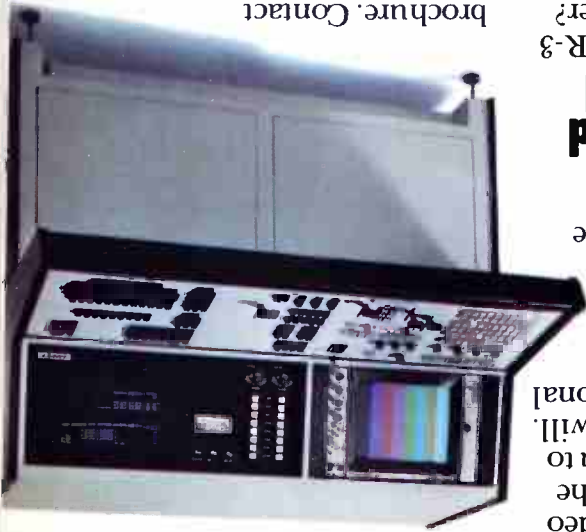
Recording options

When you order your AVR-3, you'll be able to choose from the following pairs of recording bands: Super High Band; Pilot/High Band; High Band; Low Band; Low Band Mono-Color/Low Band Color; Low Band Color; and no matter which of bands you specify, you'll get both 15 ips and 7½ ips capability.

"Intelligent"

ing the Brain to Work. The first thing you'll notice about your new AVR-3 is the way it "knows" how a given tape was recorded. If the auto-recording sense the recording and the band you used, it will switch to the right play configuration. Intermixing won't be a problem, because the AVR-3 always knows how to sort them out. The second feature you'll notice is the way your AVR-3 handles tape. Punch up a fast le, and AVR-3 programs the generation from a gradual to speeds up to a flying 375 ft-reel (or a cue point), the

brochure. Contact your Ampex Video Sales Engineer, or write us for your free copy.



are now available in our AVR-3 and performance specifications Complete technical data professional service.

Economics
Good at First, Better Every Year. Even the basic AVR-3 model will outperform most previous top-of-the-line VTRs. And no matter how you equip your AVR-3, it'll cost less than you'd expect and then pay for itself with many years of reliable, professional service.

IT'S DECADE TWO

...and the company whose innovations over the past 10 years revolutionized color television cameras in the U.S. and throughout the world, now puts its 3-Plumbicon picture and a beam-splitter prism into the most exciting new lightweight camera value on the market.

The PHILIPS LDK-11. Full broadcast quality for both ENG and commercial production!

With the LDK-11 no longer must broadcasters or production companies sacrifice picture quality or operational features for portability. Broadcasters started using the LDK-11 in January, 1976 and the reactions have been outstanding. A typical report from one of the first stations to get delivery... "the field pictures look as if they were shot in our studio!"

Battery or AC powered and with full production control either remotely or at the backpack, the LDK-11 has all the key Philips engineering features that make it like no other comparable camera in the world. These features include Philips famed 3-Plumbicon tube picture, beam-split prism with bias light and Philips linear matrix for superb colorimetry. Also included are H & V contours, auto iris, auto white balance, gen-lock sync generator, switchable gain and gamma, built-in color bars, remote VTR and zoom controls, and two audio channels. All this and more add up to the



PHILIPS

Send for more information. Or, better still, have your Philips representative set up a demo for you. But do it today before you get TKO'd into anything else. Broadcast Products, Philips Audio Video Systems Corp., 91 McKee Drive, Mahwah, New Jersey 07430. (201) 529-3800.

utmost flexibility and economy for ENG, local remote and studio production... without compromise. And the LDK-11 is available now!

TM, N.V. PHILIPS

Highlight of convention was celebrating video tapes 20th birthday. Ampex pioneers led (l. to r.) Chas. Ginsberg, Alex Maxey, Ray Dolby, Chuck Anderson.



were new standalone devices from Coming, TRI, and Yves Faroudja. Inc., all designed to sharpen the picture coming from cassette players. The Crisp-matic by Faroudja, not only did not hurt the S/N ratio it improved it. In the broader signal processing area, the standard product was the new Microtime 2020 Signal Processor. This unit was considerably more than a TBC; it also increased resolution, reduced visual noise, and improved color quality. (In getting it all together, Microtime adopted the crispener circuitry developed by Faroudja.) All of these items will be discussed in more detail later, after we establish the point that the NAB television show was more than an ENG and more than a helical VTR show. Continuing advancements in such areas as digital processing and disc recording added the third main ring to the show. The star performers had slightly different acts, but it all added up to new approaches to graphics production and new special effects: One group of performers were the character generator people. Leading in their ability to create new dynamic effects were Chyron, 3M and TeleMat. These companies showed assorted shapes and forms digitally and then set them in motion (performing in

• In the video enhancement area there time base corrector people and others. video specs were concerned) but the player models did not change as far as (indeed, Sony's new ENG recorder/omatic cassette devices. The stars here were not the VTR manufacturers on improving the signal quality of U-portant side show running and that was teleproduction jobs, there was an im-quad for on-the-air broadcastists and inch formats that could compete with cal VTRs were concerned was on one-While the main focus as far as heli-during slow motion or frame stepping. no noise bar crossing the monitor was so effective there was absolutely ing and interchange problems. AST system to completely eliminate track-an automatic scan tracking (AST) slow motion. The VPR-1 incorporates Sony unit provides still-frame and new unit, the VPR-1, which like the Ampex took the wraps off of a totally ago—this time in the helical area. nouncement of the AVR-2 two years Ampex—and one bigger than the an-• The springing of another coup by unique design feature. val pulses between fields—was a second head to pick up vertical inter-head scanning a full field followed by and a half" head design—one video played no tracking problems. A "one still-frame and slow motion and dis-

big push by Bosch-Fernseh to establish its BCN line, introduced last at Montreux, as the non-quad standard both internationally and in the U.S. re days immediately preceding convention, Bosch-Fernseh worked agreements with IVC, Philips and whereby these three giants would and sell the BCN segmented-system. (At the convention both and Philips announced they were ng up to produce the BCN line.) The new but compact, full-broadcast helical VTR, the I-1000. This unit was capable of

early signs pointed to the 1976 Convention as an ENG show—erating Thomson-CSF Microcam going to be unveiled representing through in size and weight (11 22 watts); NEC said it was bringing the MNC-61, also low in weight power drain by virtue of micro-ity. And Hitachi, Ikegami and also promised new, compact tra designs. Sony, for months, called about unveiling an entirely line of broadcast equipment, re items in the ENG class. All of events did happen but NAB 1976 (not an ENG show! To the surprise ost, it was a VTR show—more sely a helical VTR show. Three ar developments made it so: a big push by Bosch-Fernseh to establish its BCN line, introduced last at Montreux, as the non-quad standard both internationally and in the U.S. re days immediately preceding convention, Bosch-Fernseh worked agreements with IVC, Philips and whereby these three giants would and sell the BCN segmented-system. (At the convention both and Philips announced they were ng up to produce the BCN line.) The new but compact, full-broadcast helical VTR, the I-1000. This unit was capable of



SHOW-IN-PRINT—A Fantastic Affair, More Exhibits e Eager Buyers Than Ever Before. Radio It Was Go From The Start—See Page 78. TV It Was a Three Ring Event With Major Attractions.

the center ring, it was helical VTRs; in the flanking rings it was in one and digital processing in the other. There were dozens of shows, some of them major attractions.

Most camera manufacturers had their cameras trained on attractive female models. Thomson-CSF was different; it had female models handling the camera! We're referring, of course, to the new banham weight Microgram. And handle it they did! A favorite maneuver was to swing it high over one's head to demonstrate without a doubt the camera's light weight. At 8-lbs., the Microcam with lens and viewfinder is the lowest weight ENG camera around. The electronic hip pack adds another 3-lbs., but the total is still only 11-lbs.

Thomson-CSF made a strong point out of the fact that the Microcam is more flexible than most and that one can therefore increase the number of camera angles in getting an interesting story in sports or the upcoming political conventions. CBS Network reports that it will take most of the first 50 cameras (priced at \$30,000) that Thomson-CSF can turn out (for use at the political conventions) and that every other camera produced thereafter it has an option to purchase.

One of the important features of the Microcam is image enhancing. Specially-designed horizontal and vertical comb filter image enhancing techniques are built into the camera to monitor the color segments of the television picture as it is transmitted to every other camera produced.

Those ENG cameras were remarkable

There were many other new developments and new products either discussed in technical sessions or shown in the TV arena—new cameras, a new super intelligent quad recorder, electronic still store, new editors, new switchers, new accessories of many sorts. We'll start with the category of ENG cameras.

Getting into this act from yet another technology were the primarily time base corrector people. Video Systems Labs showed a few effects called 3-D—you could see an entire picture rotate about an axis parallel with the screen. Central Dynamics said they would be adding this feature to switchers. The power of the computer in several planes was shown by Computer Image.

Another entourage was from the floppy disc sector but those who were storing analog signals. Arvin Systems and Egen started here—partly as a new means of adding animation, or as an inexpensive method of storing still slides.

NAB SHOW-IN-PRINT

The TK-76 was the first camera of this latest generation to be announced (last year) and it certainly was in most prominent display at NAB since RCA had a roving ENG crew around McCormick Place. The camera helped enhance the RCA exhibit area by bringing in live fresh flower scenes every day—from the gigantic flower show going on simultaneously with NAB, one right up at McCormick Place. Engineers were heard to comment, "Fi-

While the Thomson-CSF Microcam is somewhat in a league by itself in virtue of its small sized head and separate hip pack (and extra connectors as critics point out), it was only one of six of the latest generation of full broadcast backpackless cameras. The complete line up at NAB included the RCA TK-76 weighing 19-lbs., the NEC MNC-61 weighing 13.5-lbs. with lens, the Ikegami HL 77 weighing 13.2-lbs., the Hitachi SK-80 weighing 16.7-lbs., and the Asaca 2000 weighing 14.3-lbs. (These aforementioned weights includes the viewfinder but not a lens except the NEC unit.)

Other features are stability over a wide temperature range (-20°C to +60°C) and a sensitivity of 5 ft. candles television set.

viewer with crispier pictures on the sharpen the image and provide the

The RCA TK-76 on convention floor.



The banham weight Thomson-CSF Microcam.



The Hitachi camera display was impressive in that it included cameras suitable for ENG. In the s contained category there were three—with the new SK-80 top

Not a great deal of information available on the new Ikegami HL-77 but it appears to be fully competitive with all of the other models. The head weighs only 13.2-lbs. weight was attractively dubbed the "Plo out lens and it uses three 2/3-in. Plu bicons along with prism optics. It l the same performance, stability, col imetry, and sensitivity of the HL-35 has both a +6 dB and a +12 dB g illumination could be as low as 6 candles at f.4.

Count lens. The unit uses a standard fair compensation, aperture control, etc. The unit uses a standard features auto white balance, has light features auto white balance. The u assumption is only 25 watts. The 1.5 hours of operation since the cc cam. A 5 1/2-lb. battery belt provide all the new entries save for the Micro unit incorporates microcircuits and the lightest, lowest power drain unit camera was called the BCC-4. TI system. At the Ampex exhibit EN Ampex as its own portable ENG exposure by virtue of being adopted.

The NEC camera got a little doubt the Japanese will have to respect, ally an American ENG camera in

The backpackless Ikegami HL77.



The compact NEC MNC-61 ENG camera.



high performance system using four heads in a transverse scanning mode. It's not standard quad, however, (tape is one-inch) and stations may be reluctant to try this recorder without having compatible playback units available (such as the Asaca AVS-3300 high-band VTR). Although the 3200 is a portable unit it does have master erase, fast forward, rewind and converter

Asaca's 1-in. quad portable VTR.



Sony's BVU-200, right.



wait for NAB for its ENG announcement. What it unveiled was, of course, its successor to the 2850/3800 models. The new units are designated the BVU-100 (studio) and the BVU-200 (portable). The units boast new features but prices went up to \$9000 and \$4500 respectively. Among the new features were the ability to record and playback SMPTE code on an auxiliary track, a framing servo, video age reference to sync amplitude, new audio level control, chroma level control, new video outputs, new connectors. No special sheets were available at the show but we understand video performance is rated the same as the VO 2850. It is not entirely correct to imply that Sony and JVC are the only source of ENG recorders. It is true as far as U-matics are concerned. The Bosch-Fernseh BCN at 44-lbs. can be used as a ENG unit. The Asaca AVS-3200 is another alternative. The latter is in use in Japan for news gathering. It's a very

The only cassette sources remain as anti-climatic. The show was almost moment. But as far as ENG recorders which we will cover in detail in a new one-inch helical format offered video tape recorders as a result of the There was plenty of big news in JVC. JVC has been promoting the CR-4400 U portable and CR-8300 U studio unit heavily since January (see BM/E Feb. and March). The CR 4400 is remarkable because of its low power drain. It was busy at NAB and got a boost in promotion since Ampex adopted JVC units as part of its ENG system. Sony, as everyone knows, has been advising the industry publicly since January (and privately before that) to

ENG recorders still only Sony and JVC?

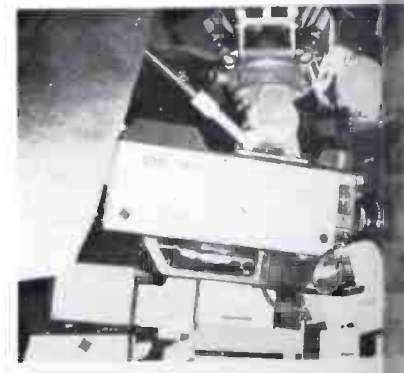
also Camera Accessories.) were power bells and power packs. (See Mart) and hot items at Cine 60's booth various braces, stands, etc. (Camera In the ENG accessory category were either for sale or lease. distributor, offered a number of brands Magnavox handhelid. Camera Mart, a Panasonic the WV-2000 feather was present and featured the VTS-150 system. JVC exhibited the 4800 and carrying the Harris name plated. Akai is actually the Asaca ACC-3000 unit the TC-3 portable live color camera. It cameras. Harris showed what it called other exhibitors showing ENG Incidentally, there were several includes a seven-inch viewfinder. special mounting configuration in- now available in a studio version. A The IVC 7000 P portable camera is operational controls. camera with automatic line up and pack, thus making it a portable studio camera, KCK, via an interface color the processor of the automatic color seh's KCN can now be connected to added to earlier cameras. Bosch Fern- Several innovations have been green for ease of registration, etc. the viewfinder for playback monitoring, prism optical system, negative noise-level switch, test scan points for were a -9 dB high-light-level/low- typical of its class. Additional features latter included all of the usual goodies Ikegami and the Sony BVP-100. The brand new units were the HL 37 from LDK-11 and the Ampex BCC-2. The KCN, the IVC 7000P, the Philips introduced earlier—were the Fernseh pack category. The familiar ones—all were fewer new cameras in the back- capable of doing a better job. There

least expensive was the FP 1600. In between was the FP 1600. of the latter are one-tube cameras the FP 1600 having a little edge in activity. (The fourth ENG camera is the SK-70—introduced last year— which has a backpack but unusual in adapts readily to studio use.) The SK-80 is a full feature camera including I and Q encoder, image enlargement (both H and V), bias light, bars, auto white balance, auto 66 dB gain switch, indicators in the finder. Standard lens is a Fujinon 10:1 zoom but the unit also takes about lenses. The SK-80 sells for less than \$20,000 and is ready for shipment in June. The FP 3030 is in the low \$5000 category. The Asaca 2000 was shown as a type and it too had a great many of studio cameras: S/N better -50 dB, over 550 lines of resolution, a sensitivity of f 2.8 at 2000 (186 ft. candles), enhancement, registration, etc. The camera is priced at \$22,000. M/E did not inspect the interior of the cameras. From reports from broadcasters some looked as if they might be hard to maintain because of the small size. On this score the larger RCA unit was judged as good in design. The self-contained units did appear to be the play away from those re- coming up with higher capabilities. may or may not be true. Certainly one-inch Plumbicon units should

Asaca ENG 2000 camera.



Sony's new SK-80 and other cameras.



SHOW-IN-PRINT

Manufacturer	Format	Monopoly name (pre NAB '76)
Ampex	helical	Mediterranean, Baltic
Various Japanese manufacturers	EIAJ, etc.	Oriental, Vermont, Connecticut
IVC	helical	Charles Place, State, Virginia
Sony	U-matic	St. James, Tennessee, New York Ave.
RCA	quad	Kentucky, Indiana, Illinois
Ampex	quad	Atlanta, Ventnor, Marvin Gardens
none	?	Pacific, North Carolina, Pennsylvania
IVC	segmented helical	Park Place, Boardwalk

continued on page

After NAB, 1976, the game looked like it was about to change. Up to that time, the game had been a struggle between quad (Go To Jail—Not Pass Go) and Park Place. Bose, Pennsylvania with its segmented-science system using the Echo Science transport. It looked like it might be able to sweep up North Carolina and Pacific since it had commitments from IVC and Philips to develop this property by cross licensing sales and manufacturing agreements. But at the show Sony was laying claim to Pacific Av Boardwalk with the ultimate machine, its segmented helical IVC 9000 but customers were, except for a few tele-

production houses, slipping by it. IVC was sitting on Park Place and AVR-2 ahead of the TR-600. Ampex recovered by holding the hotels first with the TCR-100. But it wasn't always so—RCA got some close. Ampex was raking in the most level in most cases. As 1975 drew to a close, Ampex was raking in the most level in most cases. As 1975 drew to a close, Ampex was raking in the most level in most cases. As 1975 drew to a close, Ampex was raking in the most level in most cases.

Before 1976, the situation could be fairly easily appraised. Ampex and RCA shared the quad side of the board from Kentucky through Marvin Gardens, both had developed these properties quite fully up to the hotel level in most cases. As 1975 drew to a close, Ampex was raking in the most level in most cases. As 1975 drew to a close, Ampex was raking in the most level in most cases.

A new game in VTRs: pick another standard

Up until the present, Ampex was the embarrassing position of having the least valuable helical property. Mediterranean and Baltic. IVC was in a good position in the helical world by holding St. Charles Place, Charles Place, etc. held by assorted Japanese manufacturers. But IVC was being passed up by competitors who favored the U-matic cassette. Sony was sitting pretty on the Ave. After NAB, 1976, the game looked like it was about to change. Up to that time, the game had been a struggle between quad (Go To Jail—Not Pass Go) and Park Place. Bose, Pennsylvania with its segmented-science system using the Echo Science transport. It looked like it might be able to sweep up North Carolina and Pacific since it had commitments from IVC and Philips to develop this property by cross licensing sales and manufacturing agreements. But at the show Sony was laying claim to Pacific Av Boardwalk with the ultimate machine, its segmented helical IVC 9000 but customers were, except for a few tele-

Let me assure you today that re-regulation will continue to be our number one priority in the year ahead. We have made considerable progress along the path I laid out two years ago. One very large task ahead is the development of a rational, coherent and pragmatic licensing and renewal policy. I support the enactment by Congress of a five year license for both radio and television stations. This action is right, it is in the public interest and it is long overdue. The problem which remains, however, is the comparative case—either among a group of qualified applicants for a "new" facility or between a challenger and an incumbent licensee. How do you compare an apple with an orange? You can't. Congress should meet the issue straight on and abolish the comparative process involving an incumbent licensee. The FCC, on its own motion and with the aid of citizen input, carefully scrutinizes licensee performance at renewal time and does not hesitate to take strong remedial action against the deficient performer. We would continue to undertake such oversight even in the absence of the comparative renewal process. Re new applications. . . . we can only speculate concerning which applicant, among a group of qualified newcomers, is likely to provide the "best" broadcast service. The selection process might be better based on some kind of an objective, non-discriminatory method of selection: for example, a lottery. —Richard E. Wiley, Chairman, FCC.

On Licensing, Renewal, Etc.



Bosch-Fernseh BCN 20 portable



To help you get information on NAB products, reader service numbers are given for selected products in the various categories. Circle the appropriate number.

For more ENG equipment information, Thomson-CSF 340; NEC MNC-61 (Ampex BCC-4) 341; Hitachi SK-80 342; Asaca 2000 343; Ikegami HL-77 339; Sony camera 344; Sony BVR-100/200 345; JVC recorders 346.

The APA 300 playback unit supplies color and provides time base correction for on-the-air broadcasting. Although we have talked about the ENG recorder as a separate device, we should point out that many exhibitors stressed ENG systems by which they meant a camera/recorder combo and perhaps also a TBC and editor. Asaca, for example, linked its ACC 2000 portable camera together with the AVS-3200 VTR and APA playback unit and called it a 9000 system. Sony, by virtue of now making its own TBC and editor, could boast of producing most components in an ENG system, but by not having a top grade backpackless camera of its own (its BVP-100 is a private label entry) it didn't quite have it all together. Ampex referred to its BCC-4 as a system. It coupled the JVC 4400 portable cassette unit and the JVC studio camera to make a system. JVC and Akai, of course, linked closely their own cameras with their own recorders to make systems.

NAB SHOW-IN-PRINT

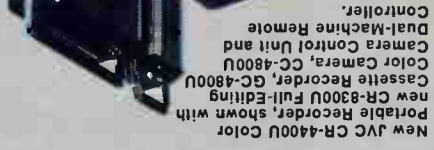
We've lightened your load. Here and here.



new portable video cassette recorder/player as eyewitnessing gives easier than ever before. has done two things to improve ENG capabilities. We've made a special lighter and we've lowered the cost.

Our brand-new CR-4400U Color portable Capstan-Servo 3/4" U-VCR has only 24.5 pounds, complete rechargeable battery and standard 20-minute videocassette tape. And it sits as lightly on your shoulder as it does on your shoulder. With the CR-4400U at your side, you're set to record top-quality color video. There's a full-function key-locked, including pause/still and audio. Other JVC features include audio and multi-purpose meter to measure audio, battery, video and servo function enables you to get accurate, glitch-free edits between recordings, and can be operated by a remote trigger or remote switch. With up-time to full speed at less than a second, you're always ready to shoot. And you can shoot 50% longer (since the CR-4400U requires 50% power than most other decks).

Circle 128 for demonstration literature



JVC's unique patented dubbing switch is provided to facilitate quality tape transfers. For playback through regular TV sets, an optional RF converter can be plugged right into the deck. The CR-4400U operates on AC as well with its companion

New JVC CR-4400U Color Portable Recorder, shown with new CR-8300U Full-Editing Cassette Recorder, GC-4800U Color Camera, CC-4800U Camera Control Unit and Dual-Machine Remote Controller.

JVC

JVC INDUSTRIES, INC.

Name _____ Title _____
 Organization/Company _____
 Address _____
 City _____ State _____ Zip _____
 Telephone _____

- Please send information on:
- CR-4400U Portable Color 3/4" Video Cassette Recorder/Player
 - GC-4800U Portable Color Camera
 - CR-8300U Full Editing 3/4" Video Cassette Recorder/Player
 - I'd like a demonstration

JVC Industries, Inc.
 58-75 Queens Midtown Expwy.
 Maspeth, N.Y. 11378

AA-P4U Power Adapter, which also functions as a battery charger. But the best way for you to find out how this light-weight, low cost portable video-cassette system can add to your newsgathering ability is to get yourself a hands-on demonstration. Call your JVC dealer, or send us the coupon below.



When we promised a commitment to the industry, we weren't kidding.

1. BVH-1000 High-Band Production Recorder

This is the most significant high-band recorder ever made by Sony, or anyone else, for that matter. It incorporates amazing signal capability with the economy of one-inch tape. Its transparent picture quality is so crisp and clean, you might even think its playback is E/E camera output.

The BVH-1000 is non-segmented. Which means its production capabilities are infinitely

versatile. And unlike ordinary broadcast recorders, Sony's unit combines optimum broadcast performance with compact size. It has fast, accurate edit and bi-directional search logic. So it's really suited for the studio as well as remote locations.

No other direct color high-band recorder surpasses the picture quality and production capabilities of Sony's BVH-1000.

2. BVT-1000 Digital Time Base Corrector

Sony has combined a wide window of $\pm 2H$ with a unique moving window concept. This means your picture can hold its lock, even though you may have wide error excursions. The BVT-1000 assures you transparent picture quality. It also comes with full NTSC advanced sync, built-in processor and velocity compensation.

When it comes to time base correction, there is no better value than Sony's BVT-1000.

3. BVU-100 Portable U-Matic® Recorder

This light-weight unit can vastly improve your picture quality. Thanks to Sony's unique SMPTE address track and special comb filtering, your ENG broadcasts can become high-quality broadcasts. Your picture is sharp and distinct. Sony's BVU-100 is compact, rugged and ready to go.

Sony Broadcast

Sony Corporation of America, 9 West 57 Street, New York, New York 10019

And this is just the beginning.

These new products are one cornerstone of Sony's commitment to your industry. A commitment that is backed by Sony's new approach to service, training and engineering.

Plus, other products shown: 7. Camera Base Station; 8. AC Power Supply; 9. Color Pack; 10. Camera Control Unit; 11. Remote Search Control; 12. Remote Control Unit for BVR-510.

This high-quality portable color camera can do double duty. It's ideal for ENG. And at the same time, it will give you excellent results in the studio. It features three 2/3" Plumbicon® tubes. So it's capable of handling just about any assignment with optimum quality.

6. BVP-100 3P Color Camera

What's more, this system features two separate counters and remote controls. All of which means fast, accurate editing — anywhere, anytime.

Designed for use with Sony's BVU-200, this new control unit lets you achieve insert and assemble editing too. It also lets you preview as well as review your edit, and trim frames at either end of the edit.

5. BVE-500 Editing Console

Why do so many broadcast engineers consider this unit to be the state-of-the-art U-Matic videocassette recorder? For one thing, it has frame servo editing as well as bi-directional search capability. It too lets you take advantage of Sony's new and unique SMPTE address track. But that's not all. Sony's BVU-200 comes with a stable DC servo system, too.

4. BVU-200 Editing Recorder

NAB SHOW-IN-PRINT

could vie for the whole tract of Pacific through Pennsylvania and it meant renewal of Mediterranean and Baltic. If IVC didn't do something else, Ampex might win the whole market for American helicals. Between Electric Com-pany and Free Parking sat Sony, but IVC was threatening to cut in.

Could broadcasters avoid landing on less than all four of these properties—helical, U-matic, quad and segmented helical? They might be forced to use at least three. Quad land was getting too rich. The BCN format, the Sony one-inch and the rejuvenated Ampex with AST, not to overlook the IVC 9000 at half speed, were all real alternatives offering accommodations at low daily (operating) rates. Whether any one of these new contenders could manipulate a monopoly was hard to figure. Dazzled by it all at NAB, broadcasters were reluctant to predict what they thought might happen.

Let's describe what's happening another way. NAB '76 demonstrated quad no longer need be the only video tape standard. You can do things with other formats sometimes better, sometimes cheaper and sometimes both benefits accrue. True, we said this in 1973 when the IVC 9000 was announced and the world has not changed all that much since. The IVC has proven valuable to teleproduction houses as a mastering machine but it couldn't totally compete in broadcasting—largely because the AVR-2 and the TR 600 gave quad a new lease on life.

However, since 1973, one new tape standard has definitely evolved and it has led broadcasters to realize quad is not sacred. We're referring, of course, to the Sony U-matic cassette format. The U-matic is no threat as a quad replacement but it did open eyes to the



The Sony BVH-1000 1-in. system.



The Ampex VPR-1.

fact that you can get a stable picture cheaply thanks to TBCs. Further, broadcasters have begun to realize that the helical format with its still frame and joggling capability simplifies production.

All of the three new formats offered for customer consideration at the NAB convention, the Bosch Fernseh BCN system, the Sony BVH-1000, and the Ampex VPR-1, offer some things quad cannot without compromising picture quality in any way. Bosch appears in a strong position with RCA, IVC and Philips behind it, and it has been in production for a year making it here and now system. But there is no compelling reason to believe it can beat out the other systems—not yet. In terms of the most 'elegant' design, the VPR-1 with its automatic scan tracking system would have to take the honors. It features guaranteed interchangeability, still frame, slow motion, a second head for monitoring, and fast forward and reverse.

Whether the Ampex AST scheme is easier or harder to make and maintain than the Sony approach of precision guides and sensitive servos, only time will tell. At the show the VPR-1 worked faultlessly, and AST eliminated noise bars on slow motion. Sony couldn't make that latter claim but, of course, slow motion isn't a normal mode for most programming.

A most telling Ampex point was its guarantee that an AST-equipped VPR-1 could play any Ampex helical format tape. This means one could use Video Memory's VM1000—with the VPR-1. But interchange (between Sony machines) is absolutely no problem for the BVH-1000 either according to Sony spokesmen and so the two may be at a standoff on this score. (At NAB Sony played sixth generation dubs intermixed with the master and you'd be hard pressed to know where the switches were made.)

New Competition for 35mm film. The big feature of both the Ampex and Sony units is that they offer a production alternative to 35mm film in pro-ducing TV shows. Already, videotape is proving popular for sitcoms. These



Details of VPR-1 AST system.

new recorders make it even easier put together TV shows. Because their low initial cost, low operating expense, and small size and ease of operation, users can simply assign VTR to each camera and record everything. This means one would not have to lose the ideal camera shot because of a mistake or error on the production board. You've captured every camera on tape and you simply put together the final show the way you would edit on film because both VPR-1 and the BVH-1000 have Moviola like capability—fast forward

Similarities and differences between Sony and Ampex. Both the VPR-1 and the BVH-1000 offer good tracking, still frame, slow motion and frame-by-frame editing. The Sony achieves good tracking by virtue of four servo systems—a drum servo, dual capstan servo system and re-take-up servos. The dual capstan feature meters tape onto and off the drum with even tension. So that the servo never lose control, a second system pulse head picks up where the video head leaves off. This is a unique feature of the Sony design.

The VPR-1's automatic scan tracking system employs a special head system that moves in two planes. This technique allows the head to be electronically deflected over the actual video path during playback to automatically follow any deviation from the 'ideal' path.

The sensitive AST system instantly adjusts to a tracking error or im-change problem during playback without causing any picture disturbance. The customary guard band 'no bar' which shows up as the head slows to a new track when the tape is slow down are entirely eliminated on Ampex unit. It is quite remarkable to see a perfect picture maintained on VPR-1 even during slow speed still-framing. (This feature means Ampex can also play back many tapes which may have been improperly recorded and would be otherwise unrecoverable because of severe tracking errors.)

continued on page 41

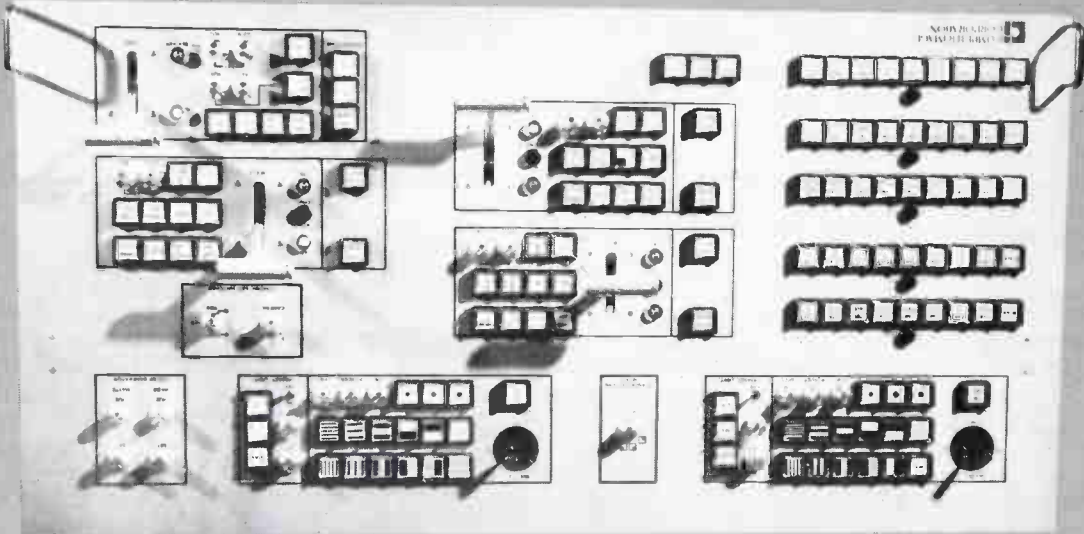
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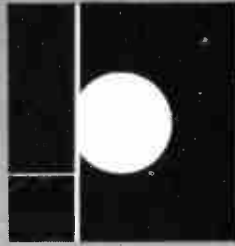
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continued on page

market for both helical and quad. VTR. Obviously Ampex sees a future called the world's first intelligent introduction of the AVR-3, which. The big news in quad was Ampex results from an IVC half track recording engineer gave a paper discussing good pictures at half speed and an IVC stated that the TR 600 could produce not quiet on other fronts. RCA demoted to the new one-inch machines, all while we've devoted a lot of space

Ampex offers super high band pilot; other alternatives, include disc

casters will look at closely. and replacement costs of heads bound to be a factor which operators two heads riding the tape. Operational cost and to tape wear since there. The Ampex does have a second replication head. Presumably this adds We don't have a figure from Amp Changing a head is a 20 minute job crystal ferrite head is only \$31 and that a replacement of its single it guarantees 500 hours from its head center comes out in seconds). Sony can be replaced in minutes (the 300 hours on headwheels which it secures for refurbishing. Bosch guarantees \$9 hours at which time one spends \$9 The average for quad is about 3 point of low head maintenance cost quad. All three machines made a very equal or better than that offered initial costs, lower tape costs and quality the new one-inch systems offer low In the way of a comparison, all 010-T, technical.

distributed, B 010, general, and demonstration of eleven general excellent pictures at NAB (including Bosch Fernseh demonstrated a control track for the servo system (e.g., time code, etc.), as well as system, another for cue recording with the Dolby "A" noise reduction tracks suitable for stereo recording tracks: two broadcast studio and The BCN format has four additional of hot-pressed ferrite), is expected. 300 hour life of the video heads (a better feature of the headwheel. A better

Calls For Broadcaster Militancy

The time has come for broadcasters to become militant and match the influence of others in our society. The day is over when a strong sales force, good engineering and imaginative programming is enough. Government has become another department at stations and broadcasters must spend more time and money to become effective in combating its inroads. Cable and pay cable are two massive reefs upon which our free television system may become shipwrecked. Broadcasters are no longer constrained by the 1971 consensus agreement with cable.

—Vincent T. Wasilewski, president, NAB

CATV—To Deregulate Or Not?

People used to worry that radio would be doomed by television. That has proved untrue, and so will commercial television's fears about growth of cable systems, but more needs to be done in the areas of signal carriage, syndication exclusivity rights and certification requirement. Cable television has in many cases increased revenues for local broadcasters by increasing the range of advertising markets.

—Jay Wagner, North Central Television, Sandusky, Ohio.

I can name at least 14 stations harmed financially by cable competition. Cable systems do not abide by regulations that now exist. Cable TV could destroy the small broadcaster. We need a slowdown on deregulation until stations go bankrupt, it will then be too late for rule changes.

—Bill Bengston, KOAM-TV, Pittsburg, Kansas.

The BCN design is fundamentally different. To circumvent the tracking problems heretofore encountered in helical machines, the BCN system uses two heads and a segmented scan approach. The length of any field is becomes available late this summer. The first customer is Sask-Media, Regina, Saskatchewan.

Sony is beginning to make some deliveries now. The first three go to CBS, Hollywood. Other customers are lucky ETV network, the Video Group, WXLT-TV, Sarasota, Fla., the Ken-

Both Sony and Ampex offer two full bandwidth audio tracks plus a cue channel. Both have built-in SMPTE time code generators and readers for easy editing. The Sony has the ability to always edit on the beginning of a frame (the edit always dumps at the end of an even field and begins on an odd field).

Sony's price is \$32,000 without the TBC, approximately \$45,000 with. A completely equipped VPR-1 is in the same order of magnitude although a unit without the AST feature starts at \$20,000.

The AST system includes a video head for conformity proof. This feature allows the user to see a simultaneous reproduction of a recording as it is being made.

NAB SHOW-IN-PRINT

75 Canon U.S.A. Inc.

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Wave length range for	400-700nm
Glass compensation	69 2mm (BK7)
Back focal distance	78.08mm (in air)
Tele-	5.3 x 4.0cm; 6.7cm diameter
distance Wide	103.2 x 77.4cm; 129.0cm diameter
minimum object	0.7m (27.6")
Object dimension at	0.7m (27.6")
from front vertex	dia
Minimum object distance	12.8 x 9.6mm; 16.0mm
Image format covered	18x
Zoom ratio	1.2 0 (f = 216mm)
aperture	1.2 1 (f = 16-230mm)
Maximum relative	1.2 7 (f = 288mm)
extender	32-576mm
with 2x range extender	24-432mm
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Focal length	12-216mm
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CANON ANNOUNCES THE ULTIMATE STUDIO LENS

The AVR-3 is a dualband VTR and is compatible with existing broadcast equipment. It features a new development called Super High Band Pilot (SHBP) which enables the AVR-3 to provide incomparable picture quality. SHBP virtually eliminates "banding" due to velocity and internal errors.

Equipped with an optional Edit Controller, the AVR-3 can be programmed to handle a wide range of editing functions currently possible only with computer-editing systems.

The AVR-3 also offers automatic switching between bands and tape speeds. It can be configured with one of several pairs of bands for NTSC, PAL and SECAM. SHBP/High Band; High Band/Low Band color; or Low Band color/Low Band monochrome and for 15 ips and 7.5 ips operation.

Standard on the AVR-3 are a digital time base corrector, editor, a new digital autotracking system, fully servoed reels, constant-tension tape servo, video head optimizer and vacuum capstan. Prices for the AVR-3 range from \$105,000 to \$137,000.

Since super high band and pilot has been a subject of some controversy in the past between RCA and Ampex, Ampex issued a position paper on the subject setting forth its strong views on the matter.

The half speed IVC machine is called the 9000-4. At 4 ips, a single reel runs four hours. S/N ratio is 47 dB (as good as most quads). Prime application is archival storage for big savings in tape. A standard 9000 can be converted to play at 4 ips in about 15 minutes.

Other alternatives were offered at NAB. Recorders talked about R Mod and Merlin Engineering showed how it upgrades torque motors and converts existing machines to high band work, etc. Merlin also showed how to test VTRs with its sweep generator.

Speaking of refurbishers, two independent head refurbishers were on hand—Vidcomax and Computer Magnetics. Vidcomax stressed that it could refurbish any Ampex or RCA

There were fresh developments in disc recorders at NAB—at two ends of the price spectrum. At the lower end, Systems and Eigen Video, Arvin for still storage and is described later

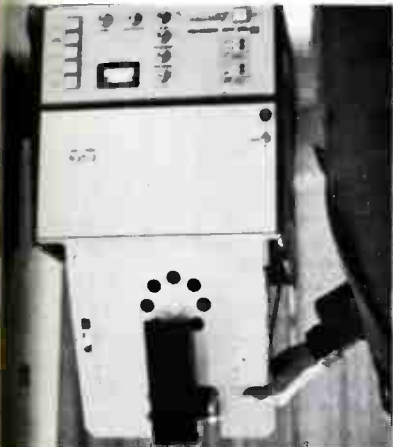
For more information on VTRs.
Bosch Fernseh BCN 347; Sony BVH-1000 348; Ampex VPR-1 349; Ampex AVH-3 350; IVC90004 351; Ampex HS 100C 352; Data Disc 353; Eigen 354.



Ampex intelligent quad, the AVR-3.



Data Disc compact disc recorder.



Eigen Video flexible disc.

NAB again, this time saying it's ready to go. The unit features continuous variable slow motion, both forward and reverse.

New patterns, graphics and effects done digitally—as well as better alpha-numerics

It was clear at NAB that new production tools, operating in the digital mode, were coming to the fore.

type is the graphics generator—instead of storing alphanumeric data as is done in character generators, you store graphics, patterns and the like and then set them in motion. Chyron prefers to call its unit of this sort the Dynam Montage Unit. You could animate graphics on the DMU without having to follow a computer program. Electronic memory captures the position of a large number of patterns making up the "frame" of each event. Any patterns so captured can be positioned anywhere on the screen, and assigned value of hue, saturation and intensity. They can be called out when desired.

The designer can work with a pen, a cursor control for ruling, scanning, and a composing easel camera (with zoom lens) to enter extra information on page

Last year Data Disc created a stir by showing a unit smaller in size than the HS-100, and lower in price. Data Disc claimed unusual reliability since it has had experience designing such units for NASA. No push was made to promote this product to broadcasters last year but the company was back at

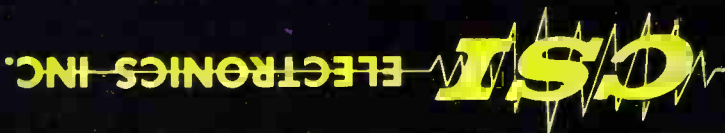
eliminating catastrophic head crashes. Ampex updated the HS-100 by introducing a new model, the HS-100C. The new unit includes a built-in TBC, an integral clean air system, and automatic circuitry. To avoid damage to the disc or heads, automatic head lifters lift heads free of the disc until rotation stops. To avoid damage during freeze frame, a flashing light alerts operator when it's time to move the head to the next location. Prices start at \$95,540.

These units record consecutive fields as alternate tracks in each direction to achieve continuous "loop" operation, vital to sports slow-motion work. Each track is erased before recording by dual-gap magnetic heads. A signal-to-noise performance of 46-50 dB is achieved. The flexible disc

last fall (\$12,500). It showed a 10-second unit announced (priced at \$40,000). Eigen also offered. New were the 20-second unit (priced at \$27,500) and a 30-second frame, animation). Three units were slow-motion (sports, editing, freeze

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ing patterns into the memory. The DMU uses a hierarchy of memories:

- a. Working Memory—a semiconductor memory capable of storing (in dot pattern) every element of a full television frame.
- b. Mosaic Memory—a semiconductor memory for storing the pattern outline and locations (together with their identification data) of up to 64 groups of areas identified by pattern number.
- c. Characteristic Memory—a semiconductor memory storing the digital control information which to make the various patterns and to display them under different hues, saturation, intensity, flashing priority, etc.
- d. Mosaic Store—a hard disc capable of storing approximately 40 mosaics with access to a new mosaic requiring less than one second.
- e. Event Control Store—flexible disc capable of storing all of the events and mosaic control information required for an entire program.
- f. Mosaic Library—magnetic tape cartridges each one capable of storing approximately 20 mosaics.

A program is created by selecting patterns and then picking a series of events to control the display and characteristics of the patterns. 3M was also showing a system (D-8000) that was capable of introducing patterns and certain preset effects and events (3M used such words as colorization, synthesis, movement, reposition, rotation) such as hue, saturation, etc.

Both Chyron and 3M said they were now ready to implement these concepts into specific hardware options that could be purchased.

It's difficult to distinguish clearly between titling generators and graphics generators and, indeed, TeleMaton unveiled Compositor I which it called a Titling/Graphics System. Graphics in this unit refers to graphic quality characters and the production of other graphics. The Compositor I showed unusual smoothness in its characters by using character elements smaller than the limiting resolution and provides horizontal elements of 29 nsec width as contrasted with the 45 and 50 nsec typical of many units.

For more information on Pattern Generators and Character Generators, Chyron 355; 3-M 356; TeleMaton 357; Thomson-CSF 358; RCA 359; Systems Concepts 360; Knox 361; Video Data 362.

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Vidfont Mark IV can use light pen to "edit" artwork.



TeleMaton's Compositor I intrigued visitors.



Panasonic's digital controller.



System Concepts Q-IV showed power.

The Compositor I uses a full mini-computer which offers numerous features and future program expansion. A RAM active font memory (32K x 12 bits) has capacity for from one to three 92-character working fonts. These can be mixed with others added by the keyboard or mixed with those stored on a disk (256K).

Among the features of the new unit are variable horizontal character width spacing, and inter-character spacing (0 to 31 spacing elements) permitting the letter 'A' to be closely spaced to 'V', etc. Vertical inter-row spacing can be made proportional to the character height which can be one of 8 sizes. An optional colorizer permits characters, rows, or pages to be colorized from a selection of 28 basic colors—consisting of seven hues, each available at four luminance levels. Selectable bordering and shadowing is possible, making it possible to create logos from the keyboard.

Single-button random access page sequencing is another feature. The disk memory is of the hard disk type. Custom graphics and logotype generation is expected as a future option. The input technique will use an X-Y grid system as opposed to a TV camera and an A/D converter.

Thomson-CSF introduced the Vidfont Mark IV at the show. It too was called an electronic-character-graphic display system. Although it did not go as far as Chyron and 3M in pattern generation capability, it did allow for fonts and limited graphics to be generated from artwork (or electronically synthesized) and recorded on flexible disks.

Among the features: two character fonts, 18 to 128 scan lines height, loadable into font memory three or more different font styles at sizes mixed on the same display for automatic character spacing allowed for overlapping characters such as AW; adjustable inter-row spacing on an individual basis, preview display (option) permitting simultaneous presentation of two different messages edge position controls; eight speeds roll and crawl (plus pause and move). The flexible disk storage of the unit provides random access time of approximately 0.3 seconds.

RCA showed a new version of the graphics system called the Video Compositor to the Video IV, it adds features such as two program channels which can be used on the air simultaneously. (The second channel can be used as an edit channel.) A larger font capacity makes possible the interim of three standard sizes of characters—64, 48, and lines high—in a single symbol for the system also now uses a small dot to compose characters smoother appearance and better appearance when a second color is used for edging. Keyboard operation have remote control operation have been simplified, reducing the number of strokes necessary (compared to earlier model) to compose a message. In the latter side of the business new character generator—the Concepts. Using a state of the art microcomputer from Intel (all with the 17 x 17 x 5/8 in. console), continued on page 47.


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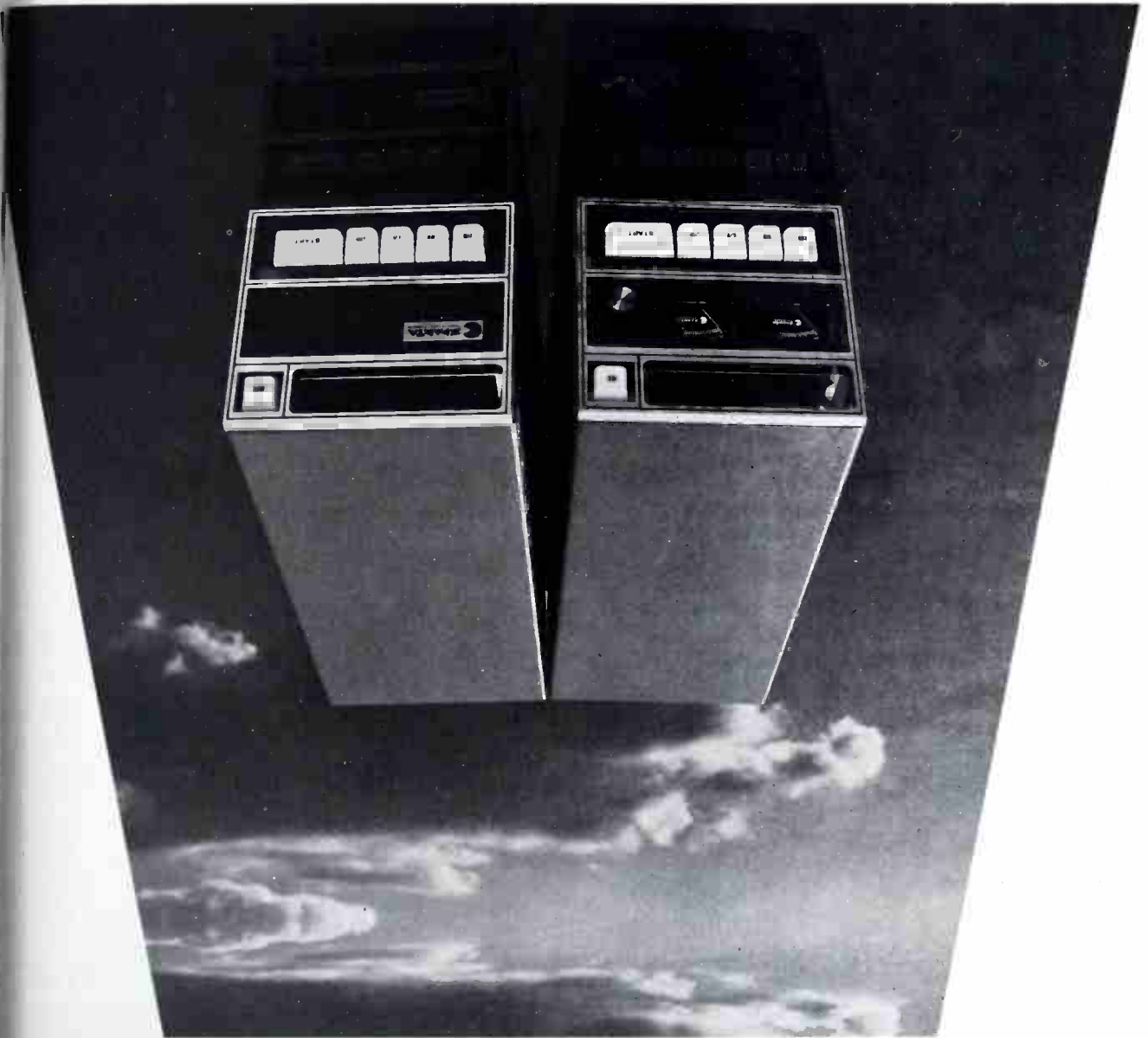
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provided a lot of features found in more expensive computer control units. It offered 12 character absolute centering, color graphics separators, 8-pages of random and sequential page speeds of crawl, roll and flash, special displays (such as keyboard rotation of three logos). Line graphics displays of boxes, graphics, Basic price of the unit is only \$50. An unusual accessory is the cassette console which was styled on top of the console. Each case contains one 8-page file which can be transferred to the RAM copy in less than six seconds. Although the font shown at NAB was not "graphics" quality, a high resolution font will be available for another 50.

Another new company in the tiling field at NAB was Knox Ltd. which had a high resolution generator of 4 pages for only \$3250. Its feature true lower case letters and four variations. A non additive video or added titles to the video with minimum phase and gain distortion. Unit was expandable.

Among the other character generator companies displaying their products were Laird Telemedia, State Network and Video Data Systems. The latter showed a new \$200 system, an economical (E55) system that featured two characters, two character sizes and 16 bits of memory.

Although we have stressed digital techniques in pattern generation in this generation there is an alternative: BJA Systems Inc. offers an analog system that can add moving color and color to B&W camera art. At NAB was the Teletestor overlays lines on a TV picture through a light pen input.

Switchers reveal new approaches

forming up with some alternative approaches to simplify the size and flexibility and operability of full-function switchers were Central Dynamics and American Data. A new line labeled the CD 480 (Sequential Effects System), its new device more than just a switcher—it's a smart switcher. CDL boasted that the new approach would be more significant than the introduction of the mix-effect after built in 1969. The other new approach came from American Data

"The Week That Was" Reported By FCC Technical Panel

In their annual appearance in public to field questions on technical matters from hot or bothered station operators, the panel of top staffers from the FCC were highly persuasive, with substantive answers to most of the questions shot at them.

On the panel were Wallace Johnson, chief of the Broadcast Bureau; Phil Horne, chief of the Field Operations Bureau; Neil McNaughten, assistant chief of the Broadcast Bureau; Ray W. Seddon, chief of the Emergency Broadcast Division; and Dennis Williams, chief, Existing Aural Facilities.

A good part of their success sprang from the fact that the FCC is officially supplying answers, a result of the spirit of do-it-now that has been in evidence at the FCC lately. In fact, Wallace Johnson, leading off the discussion, was able to describe more than half a dozen important FCC actions just in the week before the Convention, which certainly justified his calling it "The Week That Was."

Among those actions were: finally, the long-promised rule-making on automatic transmitters, issued March 19th, which asks for industry comment on a wide range of questions (see details in news story in this issue); the development of a "short-form renewal," a one-page form with questions on both sides that will be available for most renewal operations, to be ready in a few months, along with an instruction book modeled somewhat after the IRS instruction book—the user is led through the numbered questions one after the other; a rule-making on non-commercial FM broadcasting to settle whether or not many 10-watt licensees in the lower 20 channels are blocking higher-powered FM educational assignments (as many educators have alleged); with proposals such as putting the 10-watters on commercial channels, or arranging the sharing of channels by two or more stations. Broadcasters interested in any of these matters should be sure to get copies of the proposed rule-makings and make their comments to the FCC by the dates specified.

Promised very shortly (two weeks) was a rule-making on circularly-polarized TV antennas. Described as actively in discussion, with "early" resolution hoped for, were: the proposal for VHF frequencies for wireless microphones; the National Quadruphonic FM report (called an excellent report by FCC staffers—see BM/E, Feb.); and the "clear channel" proceeding, looking toward the possible authorization of powers in excess of 50 kW for Class 1-A stations.

Johnson made the point that using "super-power" to describe these proposals (which contemplate levels such as 100,000 to 200,000 watts) would be amusing in such a country as Costa Rica, for example, which is building a one megawatt AM station on 625 KHz.

In contrast to meetings of some earlier years, the questions from the floor were uniformly polite, non-accusatory, information-seeking. Among them: Should a graphic equalizer be taken out or disabled during proof of performance? (Yes); In a stereo station, which channel for EBS transmissions? (The "Main" channel, or effectively, mono); Does a station with an approved sampling system for antenna parameters still have to send an engineer every other day to read at the towers? (No—once the sampling system is approved).

Corp. Its 558 Production Switcher uses a four channel video mixer to achieve multiple functions on a single mix-effect amplifier.

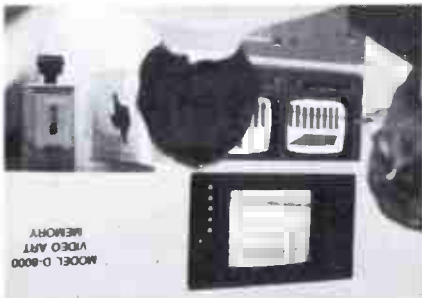
While CDL demonstrated what the smart switcher could do, it didn't say how it did it (for patent reasons). The descriptive brochure issued by CDL portrayed graphically the sequence that could be achieved with the Smart Switcher. Here's a verbal description: A single CD 480 SFX Amplifier gives complete control over four signal levels. Each level may be controlled independently or in conjunction with any or all of the other signal levels. Levels 1 and 2 are used for Keying, with full transition control (Cuts, Dissolves and Wipes) to and from the processed signals.

Levels 3 and 4 are used for the Background video signals with the ability to Cut, Dissolve or Wipe between them.

This unique arrangement makes it



Chyron's Dynamic Montage Unit created interacting graphics.



3M's D8000 demonstrated the power of a graphics generator.

possible to perform effects sequences such as:

- Wipe from a title over one background to another title over another background.
- Wipe to a new background behind a title.
- Wipe over a chroma key and a title over a chroma key.
- Wipe to a new background behind the chroma key and title.
- Wipe from a title keyed over a chroma key over a third source to a fourth source.

Transitions other than wipe could, of course, be used—cut, dissolve, soft wipe, color bordered wipe, etc.

A single SD 480 SFX Amplifier can easily perform complex sequences with no pre-planning. The CD 480 keeps one step ahead of you, showing automatic preview system always the composite result of your next transition.

The American Data Model 558 Production Switching System (shown last year in a non-working state) turns out to be a remarkably versatile, state-of-the-art package able to do things normally calling for a board with triple re-entry. The matrix is organized in a 20 input format with 10 available output buses.

Each crosspoint module contains a high input impedance amplifier with an adjustable delay of the input to effectively provide a matrix system with little or no path length variations. Output amplifiers incorporate fast acting dc restorers to eliminate "bounce" when switching between sources with APL changes. The heart of the Model 558 is the all new "Quad EVA" control element, or, four channel video mixer. This new approach in video processing provides the tremendous flexibility. Each mix/effects system receives input signals to be processed from the following four sources: the A and B switching buses, the output of the particular M/E amplifier, and the video from the "Chroma Key fill" video buss. The outputs of the four channels are combined, as in a video mixer, according to the logic commands or control signals provided by the logic system. The logic system is addressed by the control panel operator as to the mode of operation, i.e. wipe, mix, key, chroma key, etc. Since the logic system is not interrupted, multiple functions may be accomplished simultaneously on a single mix effects amplifier. An example of these single mix/effects, simultaneous, multiple modes of operation would include mix or dissolve to

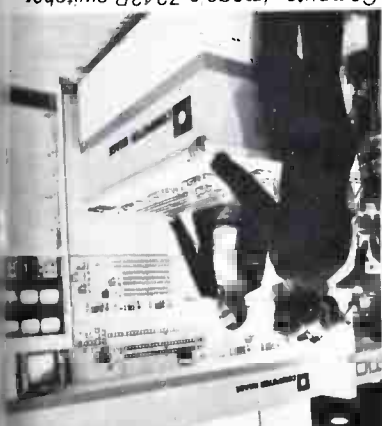
or from a preset wipe behind a chroma key or to or from an electronic spot-light behind a chroma key, etc. The ADC one-bus-quad-split feature allows functions to be done over a quad split on either mix/effects system. Each mix effects system, the primary matrix, the quad split, and the optional downstream keyer incorporate independent color background generators, allowing different grounds, mattes and edges throughout the system. Conventional cascaded recinries are used in the 558 system along with program output switching to place the output of M/E-1, M/E-1 or the M/E-2 "A" bus directly on line. The 558 switching matrix uses the well known and compact ADC 900 cross point switching system which, incidentally, now uses monolithic ICs instead of proprietary hybrid circuits. These ICs are available from several sources. The Vital exhibit, one of the highlights at the show, was centered around last year's VIX-114 but it included several new things. To get around the almost super human effort that it takes to fully utilize a large switcher, Vital used a computer. The computer is used not just to handle preset switching but to achieve dynamic results by con-



The Grass Valley APC-2000 system.



Vital's VIX-114 Switchers.



Central Dynamics' CD480 switcher.



Computer Image's 7243B switcher.

New digital special effects. New digital special effects was an attraction of the Vital booth. These included a heart, key hole, and others. By programming the computer such thing as a rotary wipe, changing shapes colors could be achieved. Another exhibit, incidentally, stressed digital effects was Marconi Part of the Marconi booth covered construction. Grass Valley's large exhibit shared by the APC-2000 series, a demonstration system at one end and a 1600 71 series. Grass Valley also produced the 1600-TRK switcher system designed for master control application. The system includes face connections for adding on 2000 series automation system. The video section accommodates 23 audio follow sources and 10 audio only sources. Computer Image demonstrated switcher; the 7243B product switcher and the 2241 MC A Control switcher. The 7243B includes four mix/effects amplifiers and effects generators plus pattern continued on p2

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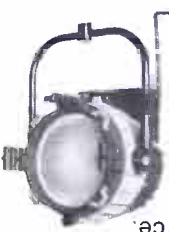
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In the small switcher category all of the bigger and medium sized companies plus others including SI

Also in the medium size-economy range was the 3M Model 11. It's loaded with features usual for its price according to 3 The preview channel allows accurate set up of effects before use, including preset wipes and modulation. 7 dimension to special effects.

Ross has several models. It includes 24 wipe functions including a soft wipe, soft key operation power than many four-button switcher boasted more production "compact cost-effective video production switcher" Ross Broadcast Products. Ross (its 7960 expandable switcher) a large customized units), Telemet (which does but) sited switchers category were under editors. In the medium sized switchers category were popular this year's NAB but we'll describe them under editors. In the medium sized switchers category were popular this year's NAB but we'll describe them under editors. In the medium sized switchers category were popular this year's NAB but we'll describe them under editors.

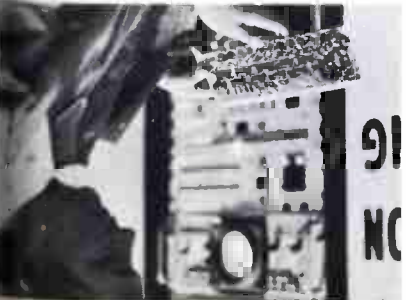
Editing switchers were popular this year's NAB but we'll describe them under editors. In the medium sized switchers category were popular this year's NAB but we'll describe them under editors. In the medium sized switchers category were popular this year's NAB but we'll describe them under editors.

Across the street at McCormick another new switcher was shown. The VPM 3000 has a number of technical features built in as standard and prices are in the \$11,000 to \$33,000 range. The company put a lot of emphasis on its automated A/V switcher. The system provides full transition capability. Unique features claimed are the ease in which even can be changed (via a keyboard), data error indicator, look ahead for possible malfunctions.

The TRI portable PC-1.



American Data's switch-module with second sourced ICs.



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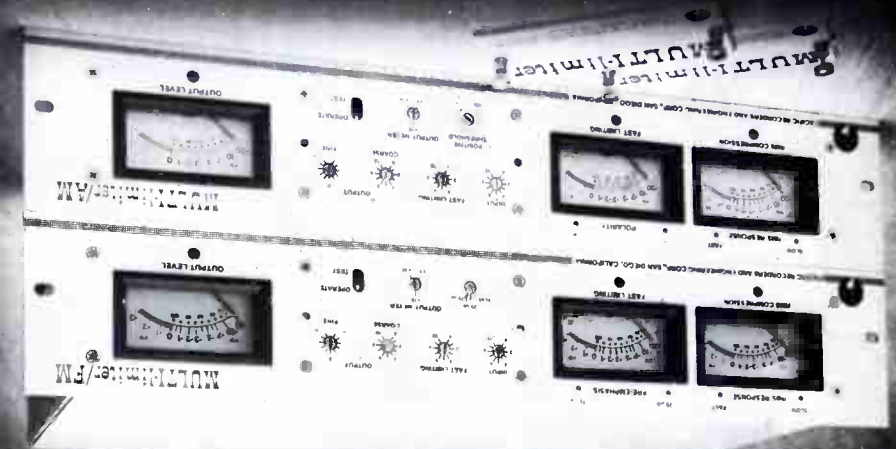


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selected pattern to create unlimited special effects. The modulated pattern may remain fixed, or can then be modulated at variable rates to produce artistic, moving patterns. New mid-stream keying, an optional feature on the 7243B, and other models, is comparable to having two switchers in one unit and permits operations heretofore possible only by using an auxiliary switcher. Richmond Hill was back as a production switcher exhibitor. It showed the VPM 3000 series, a full-capability board with a new RHL linear key circuit.

ulators and a mid-stream chroma key. Computer Image boasts 85 basic special effects patterns available through push button selection. In addition, an optional special pattern generator multiplies the number of basic patterns... creating literally hundreds of effects. A unique third and related option, the pattern modulator, provides electronic modulation of the patterns. The operator may continuously vary the

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Data Model 558, 363; CDLS
EX 480, 364; Computer Image,
35; Duca Richardson's 4000, 366;
3's 1114, 367; E&O's DME406,
3; Comtech, 369; Grass Valley
Systems, 370; Vital Systems, 371.

There was a lot happening on sev-
erations in editing equipment. In the
us counting ENG area Sony an-
nounced a new editor to work with its
BVU-100 recorder. Convergence
limited several add-ons—a program
editor and a separate joy stick con-
troller for individual video cassettes. TRI
announced an audio accessory, the BAA 1
(balance lines). CMX announced a
lower cost ENG editor, the
34X; Datron, the Tempo '76.
Something new in the computer
area was the appearance of
mixing-switchers. Such units, such as
mpex EDM-1, permit the ad-
vanced the microprocessor as an
individual interface (thus freeing the
processor for other tasks). Both
and Datron stressed ex-
tensible systems. Datron extended
concept of expandability to en-
compass both pulse counting system
SMPTe time code editor system.
time code generator and reader
where were a number of new de-
velopments including a small battery
powered generator to add to full usa-

new developments in equal areas

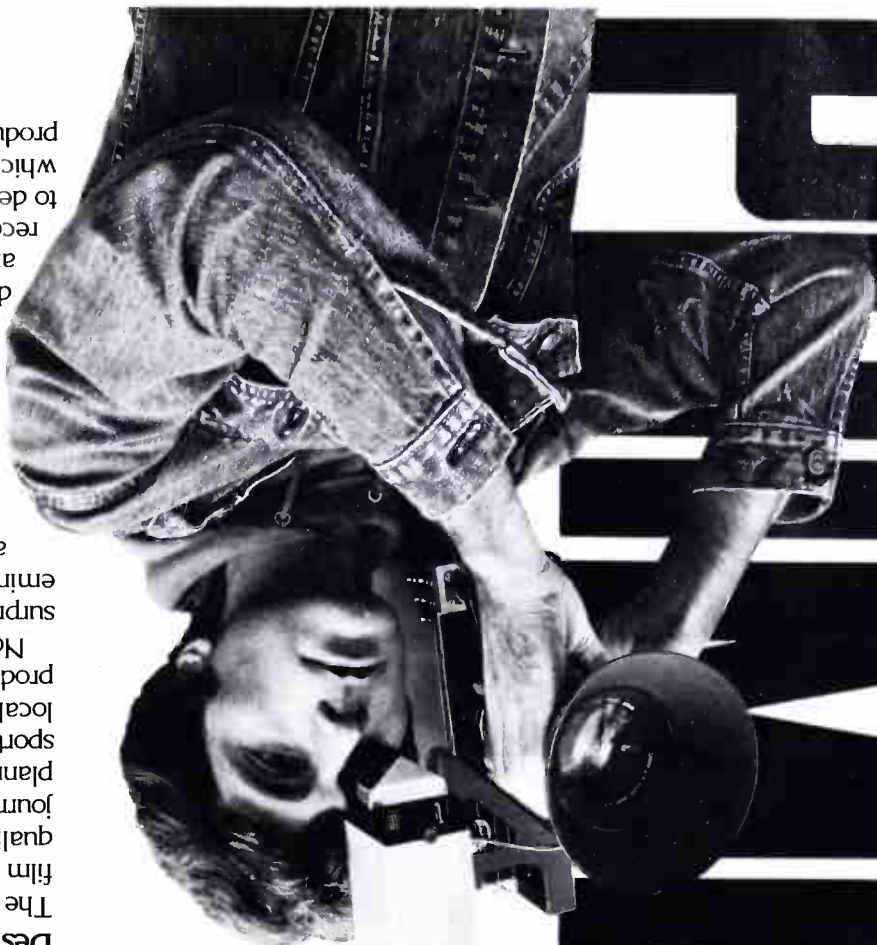
ing a small switcher.
Comtech was another company
to cassette machines. It starts at
designed to work with helical
keying with 3-way insert selec-
includes five effects modes, six
is a compact low-cost unit
E&O Systems DME-406
\$2,500.
tion amplifiers, etc. It's priced
nary intercom amplifiers, pulse
in mixer, sync generator and all
interval switcher, a five-input
control, a high quality six-input
Trinitron monitor for program
PPC-1 System includes a 5-in.
Production Console, the PPC-1.
TRI showed the suitcase Port-
included a SMPTe Edit Code
ter, the 367 for ENG application.
Shinton showed a small
TRI and E&O Systems (of

Datron's new Tempo '76 editor.



The total price is considerably below
units.
The key unit of this new approach is
the Editing Programmer which in-
corporates "Time Sync." The Editor
can function equally well using stand-
ard SMPTe Edit Code or the standard
control track pulses. When using the
standard SMPTe Edit Code, the code
is recorded on one audio channel of the
program material source tape and the
master tape. Since each recorded event
coincides with a specific time value to
continued on page 56

STEEL MILL



Now, its performance has surprised even its designers. It is eminently suited to its proposed application, yet it's also a surprisingly good studio camera—as its own demo tape clearly shows. Among the studio sequences are scenes of a girl's face that show the excellent closeups and detailing the TK-76 can achieve and a slow panning across recognizable commercial product to demonstrate the clarity with which the TK-76 can show a product.

flower shop—even transmitting faces illuminated only by low light. Designers surprised. The TK-76 was created to bring film camera freedom and high quality pictures to electronic journalism. This new camera was planned for secondary uses in sportscasting, documentary and local on-location commercial production.



contrast of brilliant molten metal and the mill's shadowy surroundings, the TK-76's automatic features held color balance while the camera produced excellent color resolution and consistent picture quality. Good operating characteristics came through in overcast weather, in the bright artificial lighting of a



Steel mill to supermarket. Your RCA Representative has an unusual TV camera tape to show you: the TK-76 portable camera demonstrating its capabilities. In available light situations as varied as a steel mill and the interior of a supermarket, the TK-76 proved its unusual adaptability. Even when taping the

TK-76 PROVES ITS PICTURE QUALITY—AND MORE—WITH ITS OWN DEMO TAPE.

...you have been planning to enter the electronic journalism or improve the reliability of your teleproduction activities, you have probably weighed the cost-versus-quality of portable cameras quite carefully. The prime purpose of EJ is to all station ratings and reputation of exciting, where-it's-happening footage. An inflexible, limited-cost EJ camera cannot achieve this, thus even its reasonable cost is a good return on investment. Performance can be equalled by a medium-priced camera. That medium-priced high former is here: the TK-76. It is

Consider the logistics.

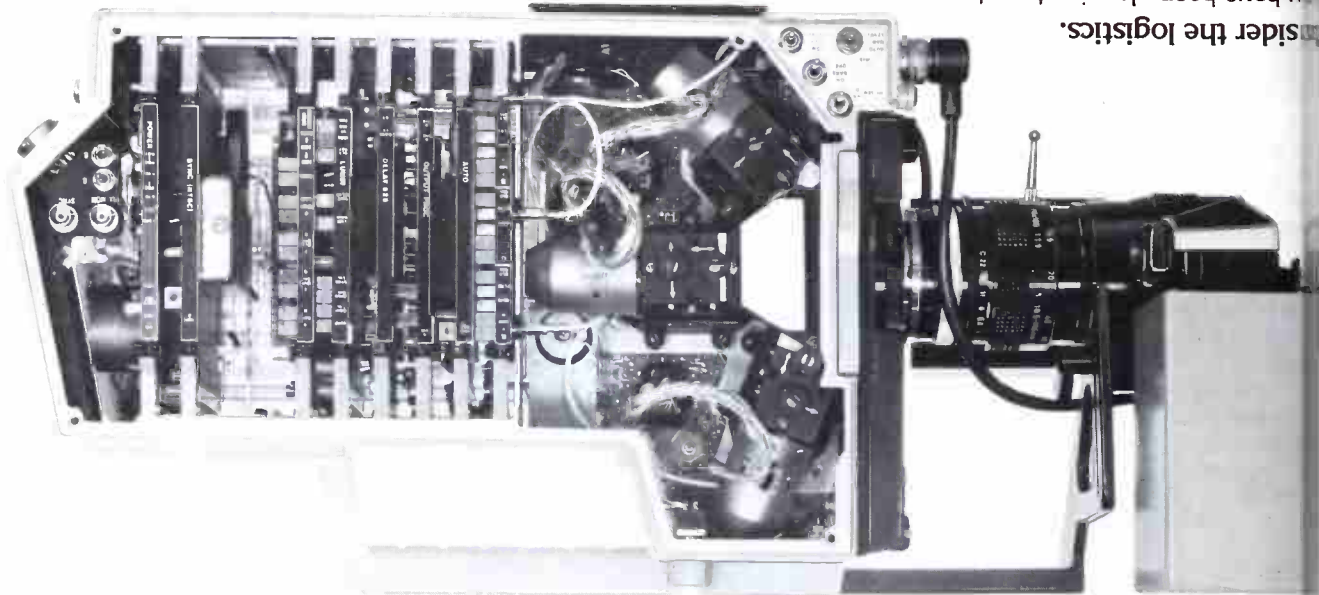
New camera generation. The TK-76 is the first camera to pack big-camera electronics into a round package without a backpack, all at a most attractive price: under \$35,000. Among the desirable features of new-generation TK-76 are: self-contained—no backpack or separate CCU. Exclusive shock-mounted optical system from optics— $f/1.4$; freedom from reflections. Picture quality equal to or better than that produced with commonly used news film. Less light—less lag in low light. See $2/3$ -inch PBO's



The first camera to combine the picture quality of expensive EJ cameras with the handling ease of a limited-capability portable. As bonuses, the TK-76 offers a high degree of studio capability, plus film camera freedom of movement and picture quality. The logistics favor the TK-76!



See the TK-76 tape. Your RCA Representative will gladly screen the TK-76 demonstration tape. We think you'll find it a most rewarding twenty minutes. Contact him today—and join the scores of TV stations and teleproducers who have already ordered new TK-76 cameras.



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- Vertical and horizontal contour enhancement—with comb filter and coring
- Rugged cast aluminum case
- T-bone construction—holds optical alignment
- Sealed camera case
- $1\frac{1}{2}$ " (38 mm) diagonal viewfinder
- Fully adjustable viewfinder
- Interchangeable pentaprism viewfinders
- Automatic iris control with manual override
- Automatic white balance control
- Video level indicator in VF senses peak white or flesh level
- +9dB video gain switch—for extremely low light levels
- +12 volt DC power source
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- Optional AC power adaptor
- Flat mounting base
- Convenient carrying handle
- Shoulder-balanced—minimizes fatigue
- Light weight—only 20 lb.
- Instant "on" from standby
- Fast warmup—5 to 7 seconds from cold start
- High sensitivity—450 LUX @ $f/1.6$
- Full bandwidth encoder
- Operates from -10°F. to $+120^{\circ}\text{F.}$
- Built-in filter wheel
- Flare correction

CMX also—the X in the 340X and the Expandability was the theme of minutes, seconds and frames. Hours are indicated in addition to field of black for easy readability. alphanumeric, gas-paneled display conveniently displayed in amber on an systems. All editing parameters are for either off-line or on-line editing top case-of-operation and flexibility The Tempo '76 Editor offers desk-

also possible. The Tempo Series 7650) is and teletype (Tempo Series 7650) and special effects switcher control three-deck system with all of the above capability (Tempo Series 7640). A edit decisions and automatic assembly with memory for storage of up to 50 Series 7630) or a three-deck system three decks and three readers (Tempo additional expansion is possible, such as SMPTTE Time Code readers (Tempo Series 7620) are added. Once the tran-

SMPTTE has been made, add- sition to SMPTTE is possible, such as (Tempo Series 7610). To expand, two with a two deck Control Track Editor ing capabilities gradually. You start processor. The CMX can inter-mary, a system without burdening the central almost any machine could be added to microprocessor interfaces so that it introduced the concept of separate ing only to offer the SMPTTE units. But systems and SMPTTE time code, choos-

bridge the gap between pulse counting 34X is for X-pandable. CMX did not processor. The CMX can inter-mary, a system without burdening the central almost any machine could be added to microprocessor interfaces so that it introduced the concept of separate ing only to offer the SMPTTE units. But systems and SMPTTE time code, choos-

bridge the gap between pulse counting 34X is for X-pandable. CMX did not processor. The CMX can inter-mary, a system without burdening the central almost any machine could be added to microprocessor interfaces so that it introduced the concept of separate ing only to offer the SMPTTE units. But systems and SMPTTE time code, choos-

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A feature of the 340X program is time compression. This is a look-ahead cue and pre-roll function which for the next function. This can save hours, CMX says. The 34X ENG unit is basically a computer assisted video tape editing system. The basic 34X is a cuts only editor which links two VTRs to a com-

At the heart of the system is an interactive keyboard display and com- puter unit that generates signals, ques- tions and responds to the operator's commands and replies. The com- puter's memory logs all edit decisions, made during the course of an edit ses- sion. This decision list can be out- putted to a punched tape or other command medium for future auto as- sembly. The Editor works from a management list that appears on the CRT. He can restructure this list easily.

Applying concepts used in editors for automatic play purposes was I correct. The key to these devices again the microprocessor. The Edmatic 100 is one of th SMPTTE code by counting control tr performs frame accurate edits with devices. This editing control syst The Edmatic 100 is one of th SMPTTE code by counting control tr performs frame accurate edits with devices. This editing control syst

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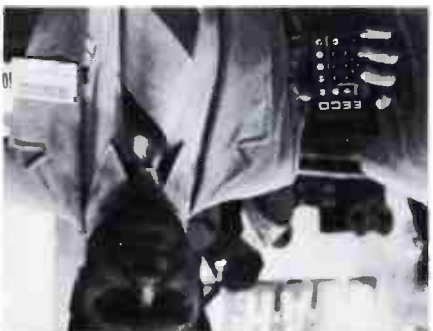
CMX 340-X with microprocessor interface.



Ampex EDM-1 computer editor.



ECCO's submin TCG.



Cooke time code generator.



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A surprise exhibitor was Teletim with its TEM-V video tape editing system. This is the system used by Don Stern Productions to edit off-line such TV network shows as "All In The Family," "Big Eddie," and some 48 others. The system uses five Sony 8650 reel-to-reel decks controlled by ESE. Among its collection was a new ES-230 Time Calculator/Timer capable of adding and subtracting minutes and seconds. It was priced at \$275.

A new source of time code readers (and video character generators) showed up at the show. Beta Tech Corp. Another source is Time Tech timer. Another source is Time Tech timer. Another source is Time Tech timer. Another source is Time Tech timer.

Another similar device is the Tape Search Unit which stores up to ten cue points for random record and auto-matic search. Central Dynamics exhibit included demonstrations of its well-known editing systems, the PEC 102 Computer Editing System—a macro system built on a modular design philosophy so that it could handle almost any job—and the EDS-200 microcomputer editing system. TRI showed its familiar EA-5 editing system.

In this Recotec family of related products is the Video Spot Assembly. The VSA is a microprocessor-based system designed to do what a cartridge system does at a fraction of its cost. The VSA uses the same two VTR's used for A-B rolls for spot/spot sequences. It provides random access for up to 100 spots, access to slides and film chains; no restrictions on spot length (even 2 second spots); playing of 10 second spots back-to-back; plays up to 100 breaks without reprogram-ming; programming of up to eight events per break; and, last minute spot changes up to the last break time. It costs \$8,950.

Quad VTR editing is provided through Recotec's Reel-Servo Mod-ification (R-MOD). This unit also provides electronic tape timing with frame accurate time display. It works directly with other buffered tape handlers such as the Ampex AVR-1, IVC-9000 and the Video Memory helical VTR, the VM-1000.

The Edimatic-100 at \$7500, unlike many other low cost editors, is equally capable of editing tapes on quad and helical video tape recorders. On-line or off-line edits and edits from camera to VTR may be performed simply and easily.

With which edit points may be selected and the ability of the Edimatic-100 to perform assembly of up to ten memorized edit points.

A new source of time code readers (and video character generators) showed up at the show. Beta Tech Corp. Another source is Time Tech timer. Another source is Time Tech timer. Another source is Time Tech timer.

A line of time code systems was shown by Cooke Engineering. These included the TCG-5000, and the TCR-6000 time code reader and character generator. An ancillary device was the DTT-4000 digital tape timer. Another source is Time Tech timer. Another source is Time Tech timer.

Recotec had a time lock system chip. Recotec had a time lock system chip. Recotec had a time lock system chip. Recotec had a time lock system chip.

The 2020 also eliminates automatic characteristic, that of shifting of chroma relative to hue. U-matic characteristic, that of shifting of chroma relative to hue. U-matic characteristic, that of shifting of chroma relative to hue. U-matic characteristic, that of shifting of chroma relative to hue.

In the time code reader, generator and programmer category there were a number of devices on the floor. Data-tron showed, as we mentioned, a battery operated time code generator that would fit in the RF modulator slot of the Sony VO 3800 recorder. Unit is designated the 510P. It also offered a Varascan viewing system designed to work with the new Sony BVU-200 VTR and other U-matic machines.

Several interesting cueing aids were shown: K&M Electronics demonstrated an edit/auto cue system to facilitate cueing video cassettes. Count down times are inserted and the device parks the cassette at the appropriate pre-roll time. Microprobe Inc. showed an ATS edit controller which stores edit points "on the fly." A feature was quick adjustments to the edit point made by operating trim panel buttons. System doesn't require use of control track pulses or SMPTE time code.

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You could work on a monthly lease plan starting at \$1,039 a month.



The correction range of the 2020 is ± 2 H lines, approximately 30% greater than prior units. To eliminate picture breakup caused by a moving deck, Auto-Trac feature is incorporated. A new digital "universal" signal processor capable of producing broadcast-quality signals from all sources is incorporated.

The 2020 also eliminates automatic characteristic, that of shifting of chroma relative to hue. U-matic characteristic, that of shifting of chroma relative to hue. U-matic characteristic, that of shifting of chroma relative to hue. U-matic characteristic, that of shifting of chroma relative to hue.

Video noise off-tape is reduced by Electronic Signal Processor. Electronic Signal Processor. Electronic Signal Processor. Electronic Signal Processor.

Microtime showed a device that dramatically improved the signal of a U-matic cassette. Not only did correct timing deviation but it increased the signal to noise level. Further, picture softness. Further, picture softness. Further, picture softness. Further, picture softness.

Time base correctors, as everyone knows, have made it possible to picture inexpensive helical machines on the air meeting FCC sync and frequency requirements. Since the signal from the VTR has to pass through the FB requirements. Since the signal from the VTR has to pass through the FB requirements. Since the signal from the VTR has to pass through the FB requirements.

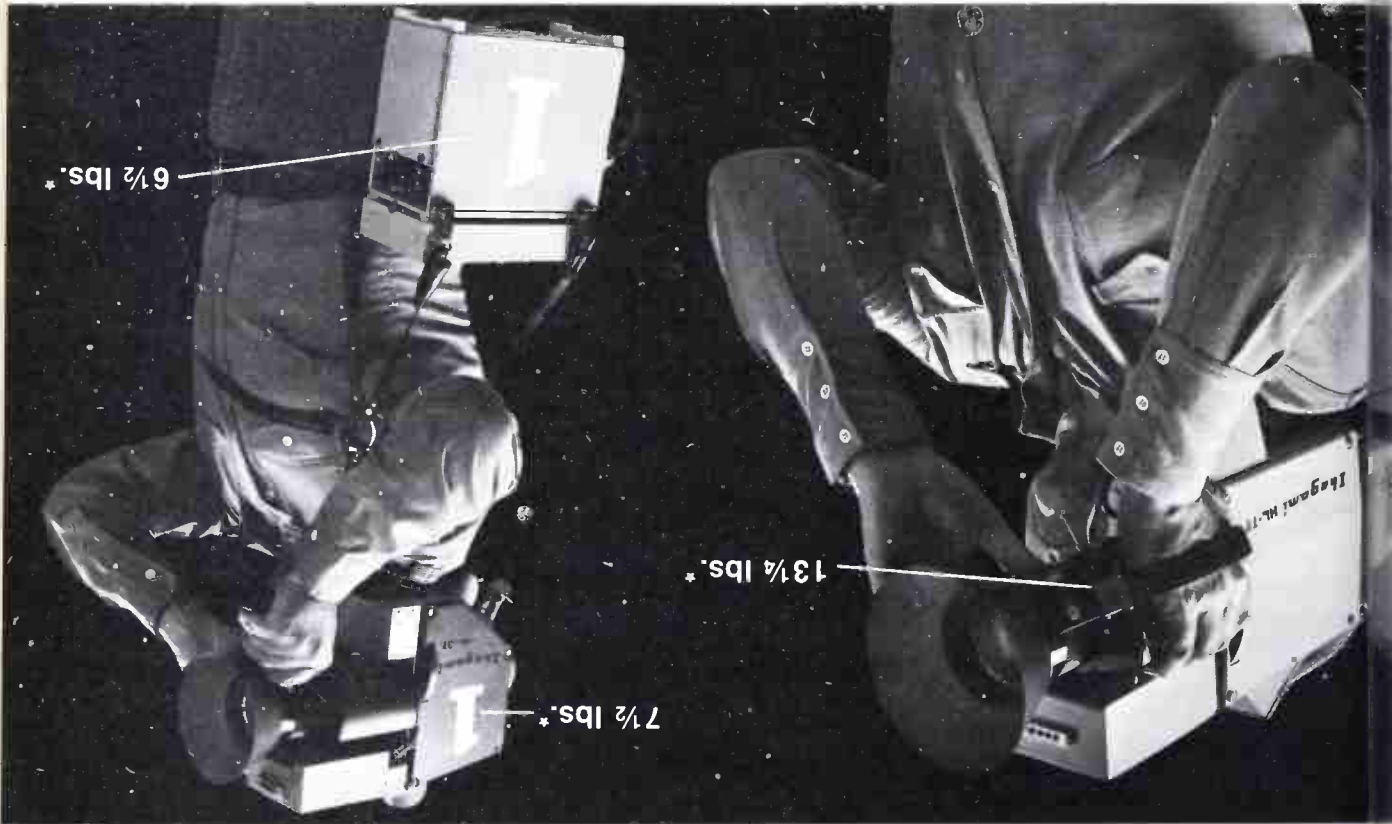
Time base correctors, as everyone knows, have made it possible to picture inexpensive helical machines on the air meeting FCC sync and frequency requirements.

NAB SHOW-IN-PRINT

IKEGAMI

ING Dependables

duced to 13 1/4 lbs.*



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Ikgami has dramatically cut the and power consumption of ast-quality ENG. But we didn't e one ounce of the proved reliability, colorimetry, stability! w generation in lightweight offered in two configurations. ve you film camera freedom. n have the HL-77 as a single shoulder unit at only 13 1/4 lbs.* HL-37 at 7 1/2 lbs.* with a process pack of 6 1/2 lbs.* sling from a shoulder or

rest on the floor. Only Ikgami gives you a choice.

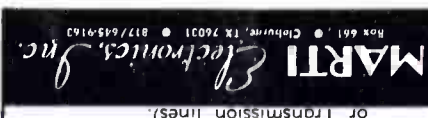
Outstanding Performance Features
 Both configurations give you F/1.4 prism optics; auto white and auto black balance; concentric color temperature compensation and neutral density filter wheel; two-line detail correction; quick start via a four-second preheat circuit; 18Q encoder; RS-170 sync (optional gen lock); +6dB and +12dB gain; picture capability at 6ft-candles.

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Circle 140 on Reader Service Card



- (Does not include cost of Antennas or Transmission Lines)
- Dual Channel System (Stereo) \$4160.00
 - Single Channel System (Mono) \$2290.00
- "Built-in Backup,"**
The Stereo STL with
1. Channel Separation more than 65 db.
 2. Channel Response matched to 0.25 db.
 3. Distortion less than 0.5%.
 4. All Solid State.
 5. A Simple, True Direct FM Plug-in Modulator.
 6. Complete accessibility to Modules without removal from rack.
 7. The Marti System Delivers Top Performance with Transmitter Manufacturer's Stereo Generator.
 8. Marti STL Systems Log over TWO MILLION (2,000,000) Broadcast Hours each Year.
 9. AVAILABLE FROM STOCK.

Why MARTI?

1. A Dual-Channel costs less than a Composite.
2. Better Reliability than a Composite. "Built in Backup."
3. Greater Channel Separation than a Composite.
4. Less Signal Drive Required to Receive means additional system receivers.
5. Fade Margin.
6. Less Test Equipment Necessary and more Positive System Diagnosis.
7. Stereo Generator is away from Studio and Unauthorized Tampering.
8. Having a Dual-Channel STL is like having a Spare Link.
9. Two Remote Control and Two Sub-Carrier Capability.

Why Dual Channel?

1. No "lost air" time due to cut, wet or electrically changed telephone lines.
2. Better Sound Quality than a Class AAA telephone line.
3. EVENTUAL COST REDUCTION in operating expense.
4. Complete control of entire broadcast system.

Why STL?

for outstanding and meritorious ability and intelligence demonstrated in the decision to install Aural Studio-Transmitter Link equipment and the high degree of knowledge exercised in making the equipment selection."



CVS also introduced a \$5500 TBC, and PROC AMP. The unit includes a built-in EIA sync generator plus a PROC AMP, DOC and color interface.

The window is 1.5 times. With a capstan-servoed VTR, the lock up time is in milliseconds. The unit includes a built-in DOC, VELCOMP, and PROC AMP.

The window is 1.5 times. With a capstan-servoed VTR, the lock up time is in milliseconds. The unit includes a built-in DOC, VELCOMP, and PROC AMP.

By locking the output signal from the 520 with other sources through a special effects generator, fades, wipes, etc., are possible from inexpensive VTRs.

In "Line Lock," the internal sync generator can also supply drives to auxiliary equipment, allowing inexpensive VTR's to be used for live production sources. By engaging the color interface switch, time base corrected tapes can be dubbed to any master recorder, including quads. When played back, these tapes will contain color interlaced signals.

CVS surprised broadcasters by introducing a 9-bit, four times subcarrier sampling technique in its new CVS Model 520. The higher sampling rate means improved bandwidth capability, K-factor specs, and signal to noise ratio (60 dB p-p signal to rms noise).

The 520 is designed to handle U-matic machines. It will stabilize non-capstan servo (line-locked) VTRs (although maybe not to broadcast standards).

When used in conjunction with an ENG system the TBC-2200 accepts non-standard synchronization some-times inherent in hand-held cameras and produces a standard output.

A "look-ahead" velocity compensator measures errors line-by-line and corrects on that basis. A dropout compensator reinserts correctly timed luminance and chrominance of the proper hue and saturation as long as the dropout lasts.

The TBC-2200 has a three and three-quarter line-correction window and a five-line store. This wide correction range permits correction of extremely difficult-to-handle color signals.

NAB SHOW-IN-PRINT

Digital Video drew particular attention to its booth by playing a 3-D. The picture can be made to volve around various axes to give such effect as that best described by showing new digital effects.

The 2002-01 is priced at \$13,500. The motor drive microprocessor board provides frequency reference for the vertical lock of non-capstan VTRs and costs \$950.00.

The 2002-01 is priced at \$13,500. The motor drive microprocessor board provides frequency reference for the vertical lock of non-capstan VTRs and costs \$950.00.

Standard with the DVL 2002 is a digital sync generator and a digital processing amplifier that adds reference color burst blanking prior to digital to analog conversion, and color phasing to correct for wrong field VTR lock-up or wrong field edits.

Digital Video Systems (formerly DVLabs) showed the DVL-2002 which has a six-line correct window (± 3 lines). DVS uses 4x carrier having pioneered that concept. The company claims improved signal response, wider and flatter frequency response, improved differential phase and differential phase. The dynamic line correction window makes it possible to use a motor drive amplifier provide vertical lock for non-capstan servo VTRs.

One of Sony's new broadcast products was a TBC. Among its features was a large window ($\pm 2H$), for price range (\$12,000), a "superior S/N ratio, extremely fast lock up time, and EIA composite advantage sync. Technical literature was not available.



Microtime calling attention to the initial error correction features of the 2020.



CVS 20 TBC has 9 bit sampler at 4X subcarrier.

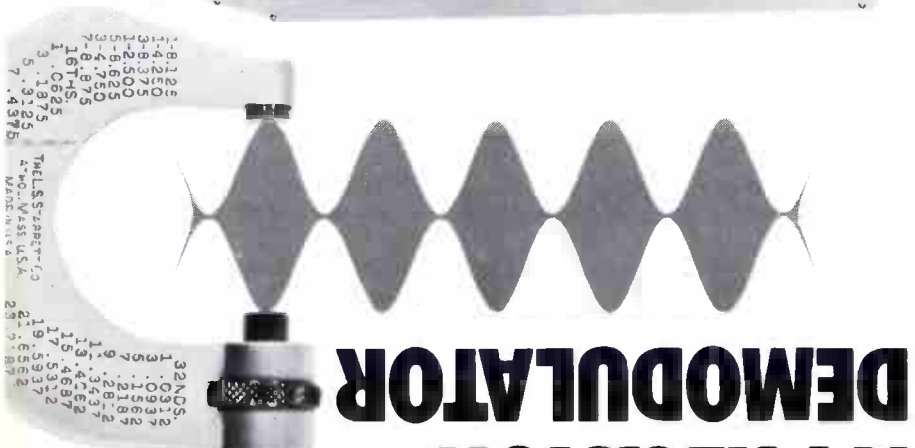
For more information on TBCs
 Microtime 2020, 382; IVC-2200;
 VS 520, 383; CV520, 384; Digital
 Video Systems, 385; MCI-Quantel,
 386; RCA synchronizer, 387;
 Panasonic AV-7000, 388.

on of depth.
 ons to watch was that created by
 Digital Video Processing System,
 AV-7000 by Panasonic. This unit
 compress and squeeze pictures
 then process them through a 16-
 production switcher.
 AV-7000, through the use of a
 processor, can create remarkable
 ts. This system can take an in-
 uring, non-synchronized video
 id, such as a microwave trans-
 on and reference it to studio sync.
 us shifts in the subcarrier phase of
 oncoming signal caused by remote
 ramission. The picture can be re-
 ed to any size in real time and post-
 d anywhere on the screen. Quad
 ps (four way split screens) can be
 ormed with ease. The digital wipe
 orator produces rotating wipe pat-
 for truly spectacular effects.

oystick position permits desired
 tment of a compressed picture
 here on the screen. No price or
 very schedule was set for the unit
 with so much interest shown at
 it, it seems likely Panasonic will
 the U.S. market.
 Panasonic AV-7000 was by no
 the only new frame syn-
 izer present. As reported in
 E in March, one new source
 ld be the Micro Consultant/
 el device. MCI was at NAB with
 DFS-3000 which is remarkable be-
 of its small size—unit takes up
 8 3/4-in. of rack space and stores
 complete fields. Another new
 e was RCA which unveiled its
 -121 system. But first a little more
 at the DFS-3000, priced at
 965.

because the DFS-3000 is small and
 umes little power (250VA), it is
 portable. The DFS-3000 is also
 first digital synchronizer to offer
 time base correction capability.
 cause the TBC function can be in-
 orated into the existing package,
 eaders can, for the first time,
 ide both synchronization and time
 correction for any VTR, at
 te locations.
 number of options for the DFS-
 were demonstrated at NAB, all
 hich can be "plugged-in" to the
 system. In addition to the Infinite
 ow Time Base Corrector options
 a Video Compressor that reduces
 s it in any one of four quadrants on
 screen, a Joystick Control that
 res the compressed image; Frame

A PRECISION DEMODULATOR



The AMM-2 AM Modulation Monitor

- RF frequency range — 200 KHz to 160 MHz
- 100% negative peak modulation light — independent of input carrier level
- 125% positive peak modulation light — independent of input carrier level
- Peak modulation light adjustable from 40 to 130%, calibrated in 1% increments — independent of input carrier level
- True peak reading modulation meter — responds to shortest duration program peaks
- Carrier level meter — indicates true carrier shift
- Phase-linear filter — no overshoots from clipped modulation peaks
- Remote outputs — outputs for both meters and peak lights
- Built-in modulation calibration
- Built-in carrier-off alarm
- Outputs for listening as well as test functions
- 115/230 volts, 50/60 Hz operation
- FCC Type Approved

The AMM-2 Modulation Monitor sets new standards in accurate AM monitoring — the first AM monitor to incorporate true ratio-type peak indicators. The AMM-2 contains a unique modulation cancellation scheme to recover unmodulated carrier to reference the modulation peaks to. Thus the instantaneous program peaks are referenced to the instantaneous carrier without the need of time-constants, as with AGC devices. True carrier is indicated even with the asymmetrical modulation encountered in today's high positive peak modulation, and the peaks are automatically referenced to this true carrier to give the most accurate indication of program peaks.

The AMM-2 incorporates a phase-linear filter that does not produce overshoots when a negative peak clipper is used in the transmitter. The true modulation peak is measured instead of a false, higher peak introduced by the non-linear phase filters found in other monitors.

With the AMM-2, you can turn up your level to where it belongs for maximum loudness.

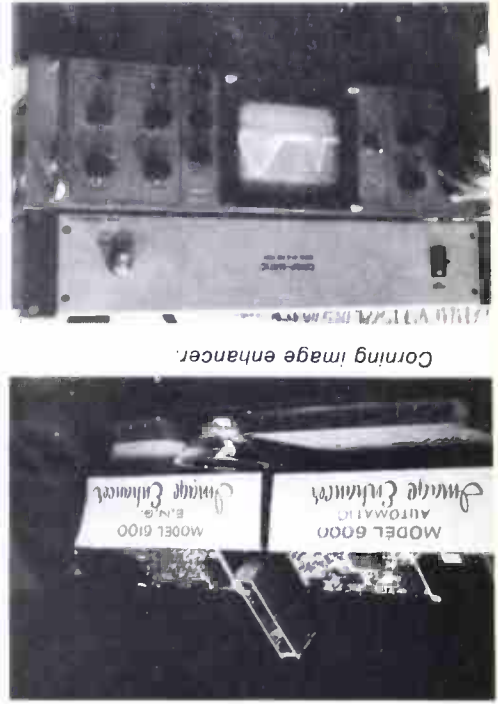
There are well over 3000 Belar AM, FM and TV monitors currently in use worldwide.

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Circle 142 on Reader Service Card



Corning image enhancer.

We made a point earlier that NAB '76 had a number of devices devoted to improving the video signal of U-matic VTRs particularly. What follows is a run down of some of these devices—for ENG and other applications.

Corning Glass Works showed a new line of image enhancers headed up by the 6100 ENG unit. The Series 6100 ENG unit is well-suited for use when minimal picture information content is

Details on those video enhancers, chroma correctors

The RCA unit stores a full frame and it uses a 14.3 MHz (4x subcarrier) sampling rate. In addition, since only the active picture information (120 IRE units) is coded, amplitude of the original analog signal, and quantizing errors are less significant, RCA said.

Still picture, joystick positioning and picture compression capabilities will be available as optional accessories. The still picture mode of operation allows a single picture to be retained as long as desired.

The RCA unit will not be available for delivery until later in the year.

Others displaying TBCs at NAB were Ampex and Kansas State Network. Other frame synchronizer sources were CVS and NEC. All of these manufacturers have been regular sources.

NAB SHOW-IN-PRINT

There were other corrective devices at NAB such as the Mathley Chroma Corrector which compensates for luminance and chrominance amplitude and delay inequalities. This year Mathley came up with a new device (Television Equipment Associates booth) called the automatic video equalization device. The unit works

Details were not available because of a pending patent but apparently the rise time of signals is improved. The Crisp-Matic does use a special horizontal enhancement process which depends upon the generation of new frequencies in the luminance path which are above 2 MHz and give the subjective impression of a full bandwidth. The residual subcarrier and other interfering modulation products are combined out of the composite signal and noise gating is used to improve the S/N ratio. Price of the unit is \$2,500.

Another device aimed at crispening the picture and reducing the noise inherent in the picture was the Step 1 from TRI. It is specifically designed to interface with various "color-under" type helical VTR's to subjectively improve the image of the picture. No specifications were available but the price was right—\$1,495.00. The Model Step-1 comes in a 19-in. rack mount configuration, 1 3/4-in. high.

The unit that claimed to improve S/N ratio rather than worsen it was a Crisp-Matic shown by Yves C. Faroudja, Inc. It reduced noise and chroma/luminance crosstalk. Improvement was stated to be 3 dB for an input S/N of 40 dB or better.

Corning also showed a new Series 7000 unit for CCTV work priced at \$1750.

Another device aimed at crispening the picture and reducing the noise inherent in the picture was the Step 1 from TRI. It is specifically designed to interface with various "color-under" type helical VTR's to subjectively improve the image of the picture. No specifications were available but the price was right—\$1,495.00. The Model Step-1 comes in a 19-in. rack mount configuration, 1 3/4-in. high.

available at sub-carrier frequency, a common circumstance at remote locations, Corning said. Unlike most available enhancers it does not adversely affect the picture noise. Key specifications for Corning's Series 6100 ENG image enhancers are: signal/noise—65 dB (rms noise referred to 1-volt peak-to-peak); bandwidth, flat ± 0.25 dB to 6 MHz; tilt 0.5%; differential gain 0.5%; differential phase 0.5%; K factor (2T) 1%. The vertical detail range is adjustable 0 to 100%. A correction signal is automatically generated for sharp line-to-line black-to-white transitions. The Series 6100 ENG image enhancer is available for immediate delivery off-the-shelf and is priced at \$3800.

Other Corning enhancers included the Series 6200 RGB unit ideal for film chain cameras. It generates a contour signal from the green channel and adds it to all three channels. The unit can be used with any camera lacking a built-in enhancer. Again the S/N ratio is -65 dB. Price is \$3650.

Corning also showed a new Series 7000 unit for CCTV work priced at

Arvin frame store device.



At the Winter SMPTE Meeting Detroit CBS revealed its plans for electronic still storage (ESS) system designed to eventually replace telecine. The ESS system described CBS (see BM/E, March) was

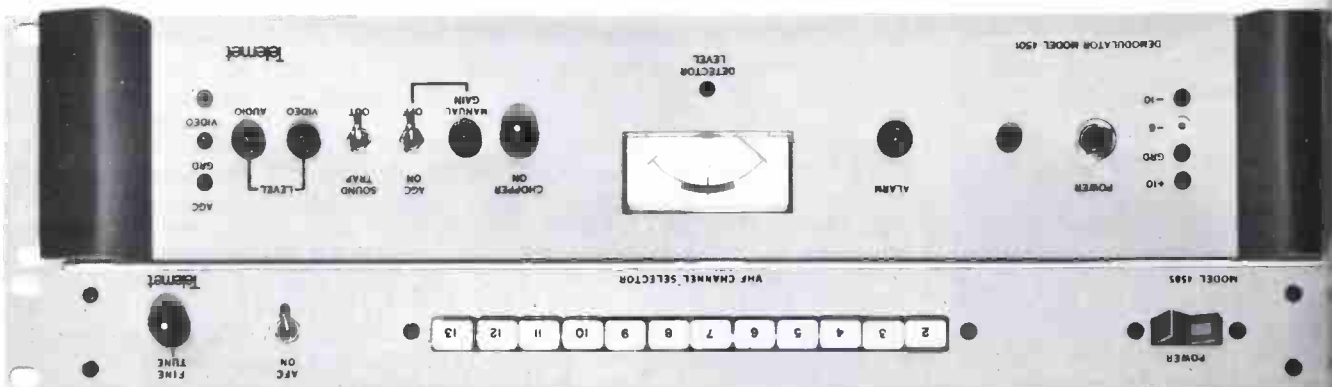
New electronic still store approaches

from ITS or a VIR signal and correct the following: video gain—maintains peak white signal; tilt—reshapes the bar correcting if distortion; sync level—maintains sync level; gain—alter it to 714 μ s (no loss of detail); chroma gain—achieves correct color saturation; burst gain—maintains burst level; step up—adjusts video pedestal; delays—stabilizes 2 chroma and burst delay.

For information on Video Enhancers, Corning Glass 389-Faroudja 390; TRI 391; Mathley (TEA) 392.

Chyron showed how it would approach still storage in an electronic still storage in a nominal way (the Ampex ESS unit a \$150,000 plus system). Using Dynamic Montage Unit (semiconductor memory, low-cost random access and disk storage), Chyron showed how still frame storage color was possible. Basically, frames are stored in the semiconductor memory. This memory is supplied with digital data from megabyte disk memory which is held of holding approximately 120 frames. In turn the main file is continued on page

Different Demodulators for Broadcast and Cable



Telemet has the right demodulator for every broadcast and cable application.

Tunable VHF • Fixed Channel VHF • Fixed Channel UHF • Chopper
Low Input Sensitivity

Characteristics and quality that VHF stations get through the use of Telemet's improved downconverter which minimizes RF interference. This unit is only available as a fixed channel demod. Model 4501A2.

Cable installations can now have a single tunable demodulator Model 4502B1 for standby operation, that provides all the quality, performance and dependability that broadcasters have come to expect from any demodulator bearing the Telemet name. A fixed channel demodulator, Model 4500B1 is available for all VHF channels; Model 4500B2 is the industry's best fixed channel UHF demodulator.

Select the right demodulator for your application from the following chart.

Model No.	Frequency Range	Application	Standby	Response	Differential Gain	Differential Phase	Input Sensitivity
4501A1	VHF	Broadcast	Yes	±0.5 db	±0.5 db	±1°	\$3800
4501A2	VHF	Broadcast	Yes	±0.5 db	±0.5 db	±1°	\$3975
4501A3	VHF	Broadcast	Yes	±0.5 db	±0.5 db	±1°	\$3975
4501A1/4505A1	VHF	Broadcast	Yes	±0.5 db	±0.5 db	±1°	\$4775
4500B1	VHF	CATV	No	±0.75 db	±0.5 db	±3°	\$1700
4500B2	VHF	CATV	No	±0.75 db	±0.5 db	±3°	\$1750
4502B1	VHF	CATV	Variable	±0.75 db	±0.5 db	±2°	\$2475

SPECIFICATIONS

NEW! SYNCHRONOUS DETECTOR \$1,050

The New Telemet Model 4504A1 Synchronous Detector, enables measurement of Transmitter Quadrature Distortion, when used with Model 4501 Precision Demodulator. Both the Synchronous Detector and Demodulator's envelope detector utilize the identical RF, IF and band-shaping networks. Comparison of the differential phase between the two detection circuits enables the broadcaster to determine the amount of incidental phase caused by quadrature distortion. For detailed information, write or call today.

For immediate product information, Call Ken Schwenk, Director of Marketing, Telemet, 185 Dixon Avenue, Amityville, NY 11701 (516) 842-2300. TW-510-227-9850

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Telemet

NAB SHOW-IN-PRINT

tained in magnetic tape cartridges each of 20 megabyte capacity and thus capable of holding approximately 45 frames.

By proper system organization the contents of the 50 megabyte active file (the disk memory) are readily updated on a daily basis using either manual or automatic means.

In the manual mode a keyboard surfaces to direct all of the requisite activities:

- Conversion of the original artwork (slides or graphics) to the digitized form to store.
- Store and located the active frames on the disc memory.
- Purge undesired frames from the disc memory.
- Control the "take" to air of a desired frame.

Arvin Systems showed that you could save still more dollars in still store if you used its new EFS-1 Broadcast Color Discassette Frame-Store. Its \$12,500 system (analog) was one of the "smash hits" at the show and orders for over 60 were taken. ABC plans to use the unit in spring baseball coverage. In practice, the EFS-1 will probably not be used as a direct replacement for a slide projector but rather as a storage device to work in conjunction with a character generator. Once a frame of in-

A Look At TV's Future

TV programming is like a pendulum—it swings back to something else. As the audience tires of that type and then it turns to program sources not used before. The creative sources in Hollywood are structured, those in London are not. New York is in the middle. Television is now tapping the New York market where there are theater, book and emerging writers not found in Hollywood. [However,] this is a great risk because the writers do not know television.

—Oscar Katz, CBS TV Network.

Audiences are becoming more sophisticated and want something different—not just the series programming. . . . Proof? The enormous success, and high ratings, for such shows as "Rich Man, Poor Man," the Olympics, "60 Minutes" and the recent PBS program "The Incredible Machine."

—David Gerber, David Gerber Productions, Hollywood, Calif.

Television will be going more for the long form of programs and that the creative people are gravitating toward feature films because there is more time to make them and more money spent on production. . . . Unlike the medium's early days, television audiences want more realism.

—Phil D'Antoni, producer/director of "French Connection."

Television stations, like radio, will become individualized in order to survive and it will not be in the too distant future that there will be all-news television stations. . . . Anchormen on news shows will not be as we now know them. Their primary function will be to question reporters—who will be specialists in their fields—and their knowledge will be derived from their many sources. . . . Anchormen will act as surrogates for the viewer.

—Richard Wald, President, NBC News

The future already is here in bits and pieces. . . . The prime time access rule is stimulating new productions. . . . This Fall nine new series have been produced, and local stations are producing more programs at that level.

—Marvin Shapiro, Group W Station Group, New York, N.Y.

formation is prepared it can be stored on the EFS for easy recall. The medium is a flexible magnetic disc record in a "cassette." Each record stores 400 stills (200 per side). The record is virtually crash proof, reusable, malleable, storable and interchangeable with any EFS-1 system anywhere.

The EFS-1 is compact, weighing only 38 lbs. Bandwidth is 4.2 MHz (at the 3 dB point) and S/N is 42 dB (on the innermost track). Step rates are freezable (single step), and automatic rates of 1, 3, 6, 10 and 15 tracks per second. The head is warranted for 500 hours. Yet another approach to still store was shown by RCA. It showed how lasers could be used for high density video recording. As many as 10,000 TV pictures on a single 12-in. disc are possible, said RCA.

At the convention, RCA used laboratory-built equipment under mini-computer control to show how the stored TV pictures can be randomly accessed and displayed in a fraction of a second. The demonstration recordings used only a 1-in. band on the disc. The developmental system can store one frame of TV information in only three-thousandths of a square inch (tracks for 30 TV pictures occupy space only as wide as a human hair).

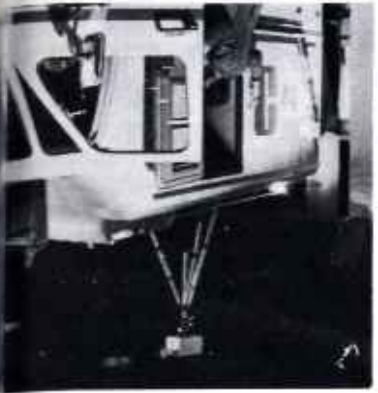
While the demonstration covered only still pictures, RCA said the technology also was capable of recording motion, from film, video tape or

Studio cameras galore

In the studio camera class there were some new developments at NAB. Harris came out with what it calls the first American built Triax camera, TC-80. Its remote range extends to a mile. At McCormick Place, Harris strung some 3000-ft. of cable to get the roof and showed scenes of

For more information on Still Store, Chyron 393; Arvin Systems 394. Circle Reader Service No. 394.

Movement along the disc radius is accomplished by using a mechanism actuator, permitting rapid access to approximate location of the desired corded track. Precise location is made possible by using an electronic system to deflect the laser beam. The pictures in storage and controls the pictures in storage and controls preparation of picture sequences broadcasting.



The new Harris TC-80.



RCA TKP-45 on new Ford van.

STRAIGHT TALK FROM YOUR DITCH WITCH MAN

"Let's talk about the reasons the Modularmatic concept can save you a lot of money!"

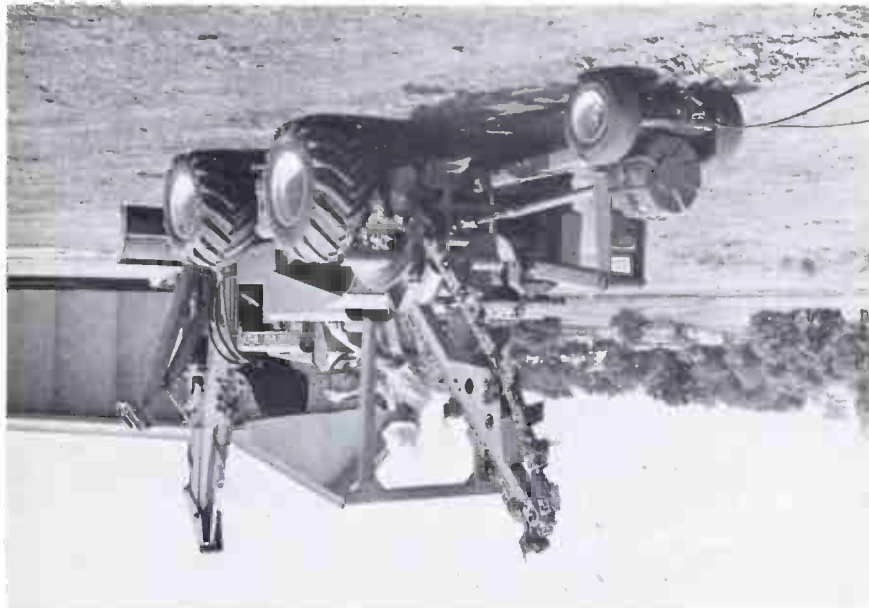


"A Ditch Witch Modularmatic can do more different underground jobs than any other machine!

One vehicle using interchangeable work modules — that's what our Modularmatic concept is all about. An example of what this can mean to you: Let's say you have a big trenching job now — buy the right Modularmatic vehicle with a trenching module. When that job is finished, a vibratory plow contract comes up. Your major investment — the Modularmatic vehicle — is already bought and paid for. All you need is a vibratory plow module and you're ready to go. Modularmatics get the job done, give you greater job flexibility and help spread equipment costs.

We'd like the chance to tell you more. We'd like to give you a free demonstration to show you what a Modularmatic can do. Remember, at Ditch Witch, we tell it to you straight!"

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This Ditch Witch Modularmatic is equipped with the Combo module for both trenching and vibratory plowing; a backhoe module is mounted on the front.

Ditch Witch... equipment from 7- to 195-HP.

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Circle 144 on Reader Service Card



10 7000 camera



Chicago skyline, Meigs Field, etc. All and operational controls were located at the CCU. Camera is heavily automatic—digital black and white balance, H and V centering, a three and automatic iris, etc. The sealed film optical system included integral light for minimum lag at low light levels. A unitized optical bed-plate assembly is used; ACT Plumbicons can be used.

The convention served to introduce the new studio TV camera, the 46, an updated and improved version of its widely-used predecessors of which more than 1,000 are in regular service in this country and abroad. The TK-46 is described as a deluxe camera and incorporates new preamps improved S/N performance, yield-pictures that are sharp and low in level. A new tiltable viewfinder results into the camera profile for slow and improved transport.

The BCC-4. EI introduced a 52-lb. 287 studio level to complement its model 280 camera and 290 portable projection camera. It features a 7-in. tilt-viewfinder, a low lab optical S/N ratio. EI on a price-performance basis the EI also introduced a small medical beam 300 camera offering broadcast quality. Displaying this unit was various for CEI since the Chicago continued on page 66

with the RCA TK-76 camera, system permits a cameraman to weave or jog and still come up with a stable picture. The full designation of the unit is the CP/TK-76 Stabilized Video Camera System incorporating the Brown Stabilizer.

The system consists of a body and support arm connected to a camera through a free-floating gimbal. It includes a high-intensity 3-in. motion picture tube. The system is designed so that the picture can be seen without an eye glued to an eyepiece. The system complete with the TK-76 camera is priced at about \$45,000 and is available from Cinema Products.

In the traditional pedestal, dolly stands area, were Listec, as Quick-Set, Innovative Television Equipment and a new exhibit, Orion Engineering.

Quick-Set was featuring the newly acquired Houston Fearless products as well as ENG stands. ITE had a continued on page 67.

New Camera Accessories—Something

Normally, this topic is not terribly exciting. True the Listec (Vinten) low angle dollies and cranes are attention getters but you don't marvel over them. This year there was a show stopper—the Cinema Products ENG camera stabilizer. Designed to work

For more information on Studio Cameras, Harris TC-80 395; RCA TK-46 396; Ampex BCC1 397; Ampex BCC2 398; Ampex BCC3 399; CEI 287 250; Leddicon tube 251; Vistacon Tube 252.

For more information on Lenses, Canon P18 series 253; Schneider 30X 254; Schneider 15X 255; Fujinon ENG 256; Angenieux 42 X 257.

For more information on the Cinema Products, TK-76 Brown Stabilizer 258; Dynasciences lens stabilizer 259.

Fujinon also had a large array of lenses including a high power zoom for 1/2-in. ENG cameras. The A22X12.5RW has a zoom of 22X, a focal length of 12.5 mm to 275 mm and a f.6 rating. Angenieux took the prize for the largest zoom with its new 42X16E11/f.2 studio lens. It also showed a new 15X12.5 f.2.5 2-1/2-lb. lightweight 24-in. close focussing lens for ENG. Comquip showed fixed lens adapters. Dynasciences showed a lens stabilizer system.

Canon showed a wide number of lenses but the PV25X16B-D2 stood out as one of the largest low-cost lenses designed for 3/4-in. tubes. TeleCine also showed a huge array, to numerous attention. Among them was a 30X Schneider field lens with a focal length of 34+1020 mm rated at f2.1/f5.3 (weight 35-lbs.). Another was a new wide angle close work 15X lens with a focal length of 12.5 to 190 mm. It's a f.6 lens with a close working distance of 15 inches.

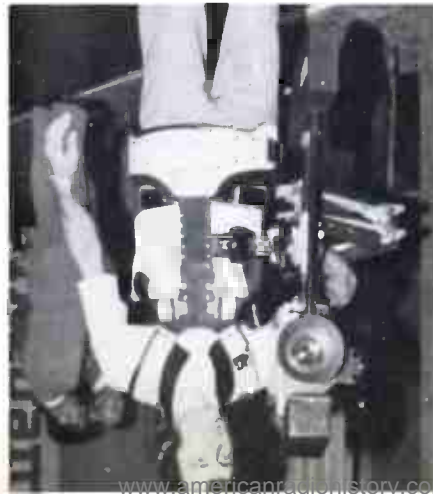
As might be expected, lenses continue to proliferate to keep pace with camera developments. Canon introduced the PV 18X12B2 as a new ultimate lens for 3/4-in. Plumbicons and the P18X16B2 for 1-in. tubes. This series is a 16-288 mm zoom. With its f2.1 maximum relative aperture, 18X zoom and 0.7 meter minimum object distance, Canon says it offers the best relative aperture in its range plus superior wide angle and short MOD.

Camera Lenses

In the tubes-for-cameras category, English Electric Valve announced a one-inch Leddicon replacement for the X1070 Plumbicon. Tubes feature short lag, high sensitivity and low dark current. RCA Electro Optics also showed substitution tubes. Three series of one-inch Vistacons were shown including an extended red series.

Among the other traditional camera manufacturers showing "standard" disciplines outside of the broadcast area, show tended to draw visitors from disciplines outside of the broadcast area. Marconi and IVC, Thomson-CSF which made its debut last year was back this time stressing the ENG Microcam as well as the TTV-1515 Triax and TTV-1515P portable. As last year, Ikegami stressed a high quality studio camera, the HK-312, a unit which features a push button microprocessor for fast set up. Hitachi and Panasonic showed quality lower-priced cameras. Top of Panasonic's line was the AK-900, a three Plumbicon camera for less than \$30,000.

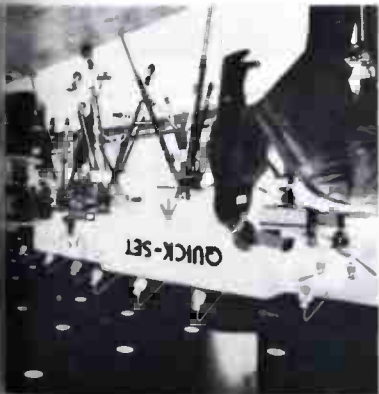
NAB SHOW-IN-PRINT



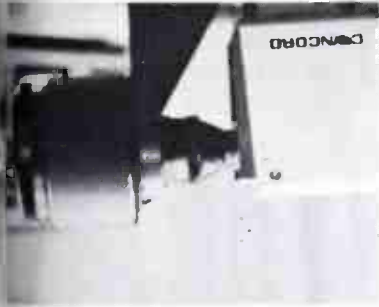
The CP/TK-76 Camera Stabilizer.



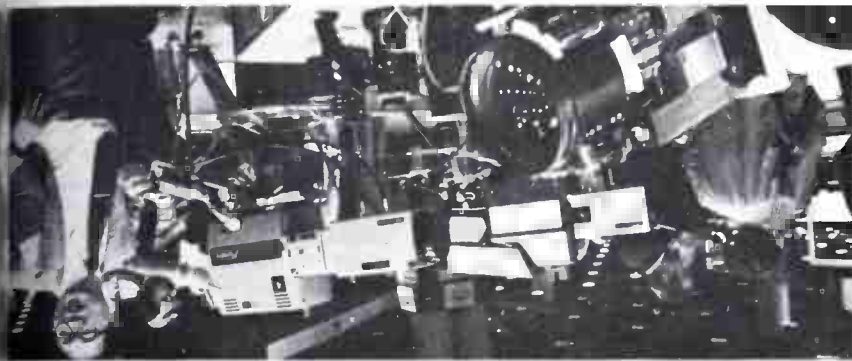
Listec (Vinten) crane.



Quick Set TV stands.

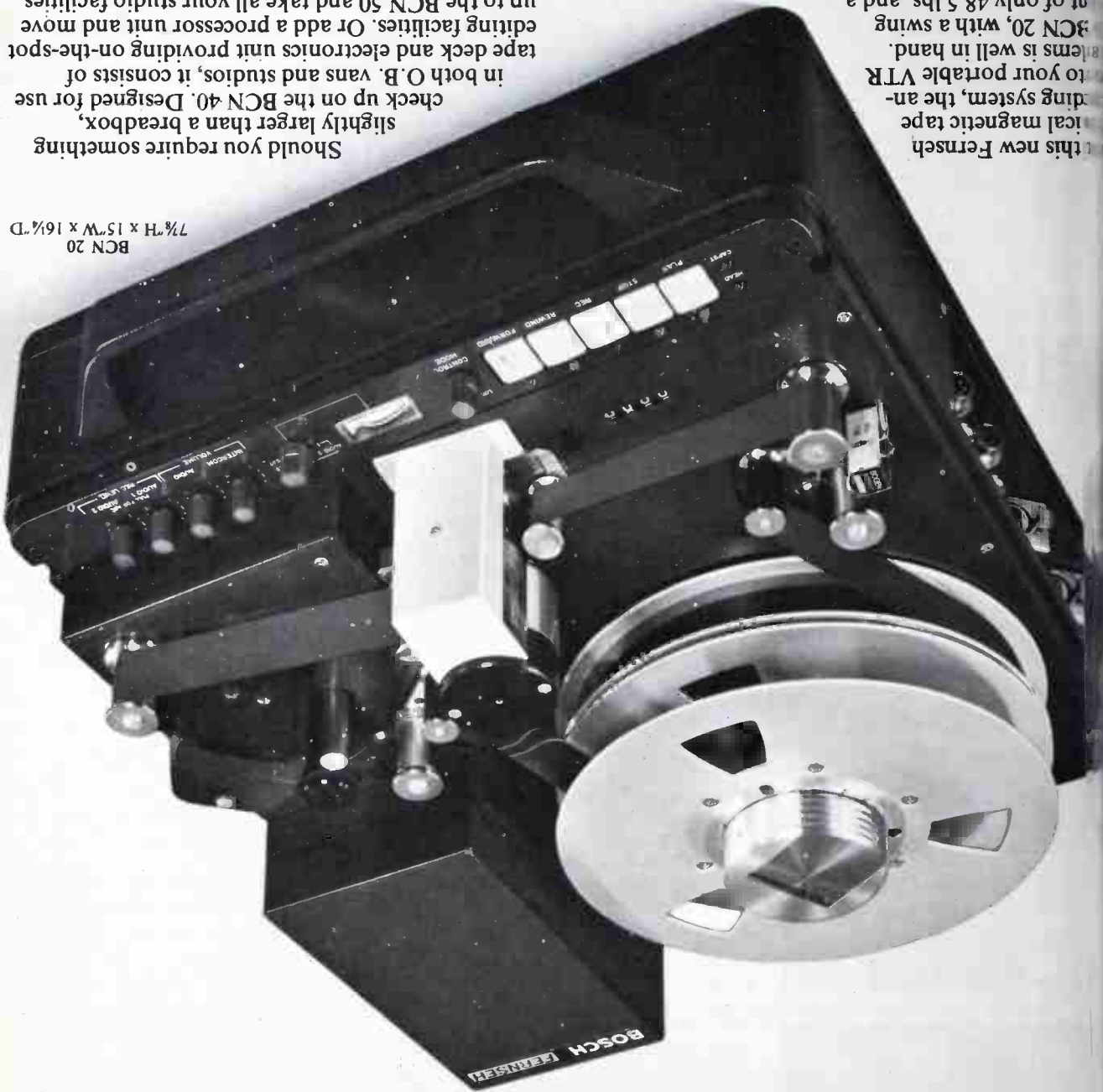


Dynasciences lens stabilizer.



Fujinon lenses.

Full broadcast quality color VTR no bigger than a breadbox.



BCN 20
7 7/8" H x 15 7/8" W x 16 1/4" D

Should you require something slightly larger than a breadbox, check up on the BCN 40. Designed for use in both O.B. vans and studios, it consists of tape deck and electronics unit providing on-the-spot editing facilities. Or add a processor unit and move up to the BCN 50 and take all your studio facilities into the field.

Fernseh BCN systems. Setting new standards of recording efficiency in studio and field production equipment.

For detailed information concerning the new Fernseh BCN, VTR system contact Fernseh, Robert Bosch Corporation, at one of the offices listed below. Saddle Brook N.J., Headquarters (201) 797-7400/ Chicago (312) 865-5200/Houston (713) 688-9171/ Los Angeles (213) 649-4330.

FERNSEH means television.

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This new Fernseh VTR system, the analog magnetic tape to your portable VTR, is well in hand. BCN 20, with a swing out of only 48.5 lbs. and a recording time of 52 minutes, offers full broadcast quality VTR in a completely portable, battery-powered package. Equipped with an automatic production of "on-air" tape from recorded takes. Used in conjunction with the portable KCN reporter camera, the BCN 20 can open up new perspectives in field production, while lowering your operating costs.



BCN 50

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R-MOD AUTOMATES YOUR OLD VTR

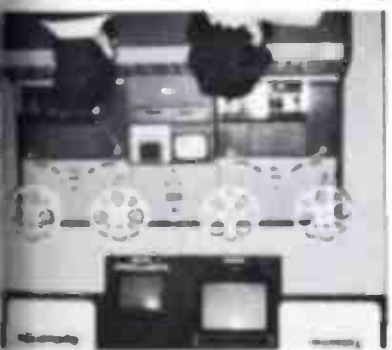
LAST YEAR we said R-MOD is for all quads except AVR-1.

THIS YEAR they even R-MOD'D AVR-1 into AVR-3.

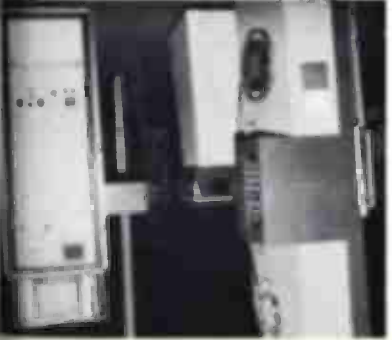
NOW we can safely say R-MOD is good for all quads.

R-MOD upgrades the transport portion of your old VTR giving it many more years of operation at the same performance level as new VTRS. It's not a new VTR but it is the best investment for your VTR. Every R-MOD owner is a good reference. Call us toll free for details, (800) 538-1586.

It was videotape's 20th anniversary and several new products were announced to celebrate the occasion. 3M unveiled Scotch High Audio 82. This new tape retains the high signal to noise loss that results in continued on page



The Marconi automatic telecine.



The new Harris TF-100 telecine.

For more information Telecines, Harris TF100 260; Marconi B340A 261; Rank Precision 262; Ikegami 263; Thomson-CSF 264; Philips 265. For more information Videotape, 3-M 8250 266; Ampex 195 267; Taniel gauge 268.

Eastman Kodak built its exhibit around film—the basic medium—and stressed film for quality news. Extacrome Video News Film 7240 (Tungsten) was introduced which allows shooting as low as five foot candles—with extended processing. As usual E-K's literature rack was filled with excellent educational material.

Film and videotape

The B340A. This basic unit has been shown before, but never with such a degree of automatic operation. RCA showed the automated TCP-1624 film cart. Showing a super quiet telecine was Rank Precision Industries. Also on the floor was a TKC-950 film chain from Ikegami, a flying spot telecine from Thomson-CSF, the TTV 2520. Philips showed the LDH-16 integrated color telecine. L-W Athena showed the 400TSM film chain including an image rotating device.

The big news in telecines this year was the fact that Harris introduced a new telecine unit, the TF-100, featuring true-film gamma corrector and flexibility. A number of marketing shifts have taken place: the Cohn 1550 telecine is now marketed by Thomson-CSF. Telecine is no longer selling the TCF-3000 to broadcasters—its requests in that area have been turned over to Harris. Cohn continues to market directly the lower cost telecine the CAT (Cohn Automated Telecine) and Telecine offers the TCF-3000 but only to closed circuit or instructional TV customers. In the category of automated telecines, Marconi stressed the features of

Telecines

Lisec had new models for ENG applications. O'Connor showed a line of fluid camera heads and hydro pedestals. Power Optics showed remote control camera pedestals. In the connector area, Boston Insulated Wire stressed field repairable connectors. Mithawk and Kings Electronics showed connectors, the latter specializing in Triaxial types.

NAB SHOW-IN-PRINT

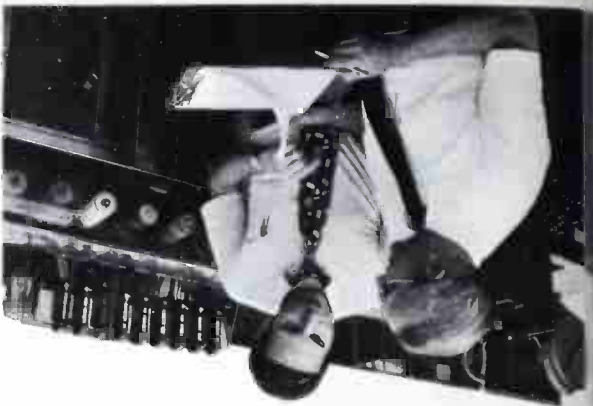
WHO-TV Eyewitness News is all over town, doubling news on film.

"There isn't a single piece of newscast equipment in this studio that hasn't paid for itself, one way or another," claims Lisle Shires, proudly. And that's only one aspect of their film production facility that has doubled the amount of film coverage for half-hour shows on one year.



Lisle Shires, Newscast director of WHO-TV in Des Moines, Iowa.

Jack Cafferty, WHO's Television News director, recalls: "WHO-TV used to average about six film reports per show. Then, management made some drastic changes in news programming. We jumped from six to twelve film stories per news show, as a result, and we now have a dozen reporter-photographers. WHO-TV has always had a high percentage of film footage winding up on the air. Now we're shooting two to two-and-a-half times as



Here's Lisle with Robert Kress in the smooth-running, surgically clean environs of WHO's elite processing lab.

much film and one-third of it is still being broadcast.

"Our field reporters have some of the finest film equipment available today. And although some of our film is still shot with silent cameras, we have a continuing program to upgrade our sound equipment.

"Presently, we're shooting all prestripped Kodak Ektachrome EF film 7242 (tungsten). You never can tell when we may want to add voice-over later or use silent footage as a B roll with sound effects. We're in the process of converting to the new Eastman Ektachrome video news film 7240 (tungsten) and while 7242 looks good on the air, we're looking forward to the finer grain and low-light capability of 7240."



One of the most popular film features is "Cafferty is—," in which Jack takes on different jobs. Like driving a semi or in this case, working in a hospital where he first gives—and then gets—a cardiogram.

Cafferty anticipates continued heavy use of film. "With film, I can send a man out with a 16-pound camera and he'll come back with pictures that are simple to edit—and to store, too.

"One more thing—our news is getting a lot of attention. We've been getting very good response from our viewers. And that's what it's all about, isn't it?"

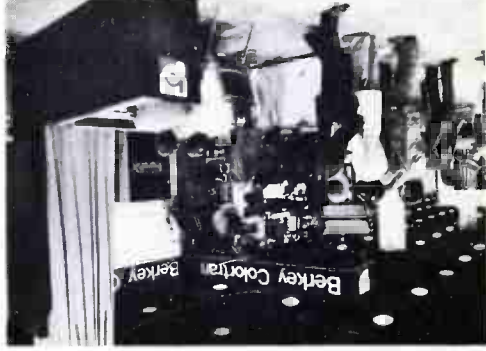
Film is good



Electronics Diversified's lighting system.



Lighting control at Berkeley-Colortran.



Lighting control was the dominant theme of exhibitors in the category of lighting—a category that included a company making NAB for the first time, Electronics Diversified Inc. This company showed a range of studio lighting control equipment. Kliegl hammered it up a bit by presenting a "Pettis of Pauline" drama (involving a model railroad). Idea was to demonstrate how complex situations could be

Lighting—for all occasions

controlled by Q Level 2000, "an advanced lighting memory control system." The Q Level system controlled the model train.

Berkeley Colortran emphasized memory assisted lighting but also showed a multi-purpose Mark III grid system—and custom dimming systems. Skirpan stressed how its lighting control systems have been key to the success of professional theatres and studios. Strand Century showed a modular memory system.

Lighting fixtures, kits, etc., were the products most stressed by Mole Richardson. Rosco Labs showed filters for shooting under fluorescents and a 200-watt portable daylight source. Sylvania exhibited lamps, as usual.

NAB SHOW-IN-PRINT

splitting the audio track into stereo. Ampex introduced series 195 premium grade video tape. Tape is said to surpass industry specs for drop out (particularly high frequency), chroma noise, S/N, and picture performance. Each roll is 100% tested, said Ampex.

For more information on Electronics Diversified Lighting 269.
For more information on Picture Monitors, Contac series 270; World Video 271; Rohde and Schwarz (Barco) 272.

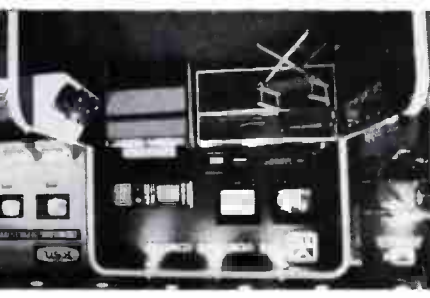
Four new broadcast monitors were introduced at NAB by Contac, the Model 6000 is a completely new precision and compact (19-in.) color television monitor designed for NTSC, PAL, or SECAM operation. The 6000 has been designed for the utmost stability and incorporates a new Contac development, beam current feedback (BCF), which automatically stabilizes CRT color temperature reference. Color temperature stability in television monitors has been limited by the stability of the cathode-ray tube itself. This system samples the beam

Picture monitors

Richardson, Rosco Labs showed filters for shooting under fluorescents and a 200-watt portable daylight source. Sylvania exhibited lamps, as usual.

Lighting fixtures, kits, etc., were the products most stressed by Mole Richardson. Rosco Labs showed filters for shooting under fluorescents and a 200-watt portable daylight source. Sylvania exhibited lamps, as usual.

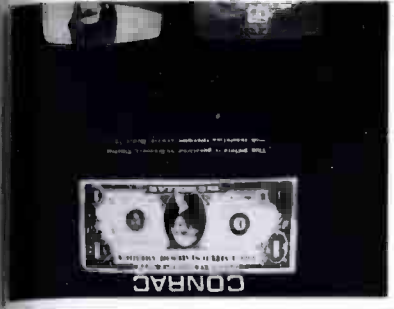
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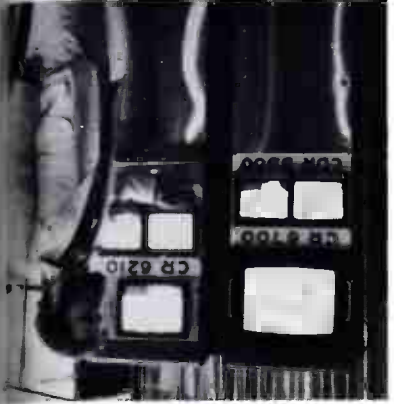
Characteristics of 3M 8250 demonstrated.



Contrac demo'd high resolution monitor



World Video's CDR 990 twins.



continued on page

and teleproduction. The Model DZE limited applications in broadcast for specifically designed for budget in. tape bridge mounting. Model 53 monitor for VTR over-console 10 resolution, shadow-mask, 13V co

The Model 5700 is a compact high up only 15 3/4-in. of vertical rack space monitor from the rack. The 6000 takes from the front without removing reference. Circuit modules are accessible for any deviation from a set current from each CRT gun and a



The Tentelometer tape tension gauge.



Video Tape Co. stressed VTC-1000.

Video Tape Co. stressed VTC-1000.

Your best buy in small screen monitors



Everyone makes

large monitors-but we're

the leader in small screen units.

Setchell Carlson gives you a definite advantage in small screen video monitors with 9 different models to choose from, in 5", 6" and 10" screens. One else offers such a wide selection.

Angles, duals and triples combine compact size with Setchell Carlson's well-known features. Like UNIT-IZED® 100% solid state circuitry, up front controls, regulated power supply, front panel screwdriver adjustments for critical linearity, height and focus. And more secure with Setchell Carlson.

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Suggested
user net
Triple Six
Monitor \$690

Suggested
user net
Dual Ten
Monitor \$485

NAB SHOW-IN-PRINT

monitors as did Ball Brothers. The latter showed a 23-in. unit for data display. Tektronix was of course another exhibitor of monitors. The famous Belgium Barco line of monitors was featured this year in the Rohde and Schwarz exhibit area. R & S is now the U.S. distributor. We saw a new monitor in the Sony exhibit area but no detailed information on it was available.

Microwave gets a big play at NAB

Microwave Associates was not

a newly styled 15V professional monochrome broadcast monitor for VTR 12½-in. tape bridge mounting. Deliveries for these new monitors are scheduled for the last quarter of 1976. Compact CDR 9000 color rack monitors were a feature attraction at World Video. The 9000 will directly replace console-mounted monochrome monitors using 8¾ inches of vertical rack space.

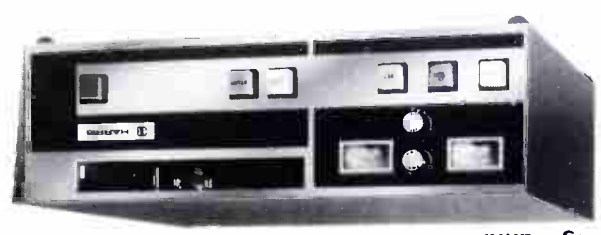
Electrohome stressed a full line of

We've packaged our compact Criterion three different ways.



Criterion I... only 8-1/2" wide. Direct capstan drive comparable to the finest reel-to-reel machines. Speed accuracy of 0.2%, 1, 2 or 3 cue signals available for automatic equipment. Handles A & B cartridges. Mount two units side by side in a standard 19" rack.

Criterion II... offers both record and playback in a single unit. Handles A, B and C cartridges. Fits in 7 inches of standard rack space.



Criterion III... combines three playback decks in a single compact unit. One, two, or three decks may be operated at the same time, each feeding a different program input. Handles A & B cartridges. Mount twin playback units side by side in 12-1/4" rack space.

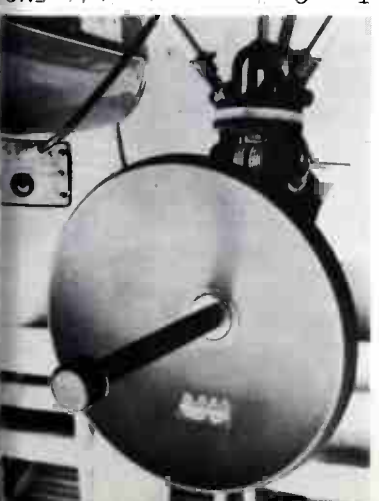


For more information, write Harris Corporation, Broadcast Products Division, Quincy, Illinois 62301.



Harris...originators of the tape cartridge machine.

Circle 149 on Reader Service Card



Terra Com's compact portable ENG transmitter.

alone. Competing on a number of fronts with them were Farinon, TerraCom and a newcomer, Tepco. Farinon stressed the FV P system which it called "Frequency (finger tip tuning) herodyne system" designed for the high quality transmission. The all state system is available in the 2 and 13 GHz bands. Convenience and reliability in using the system in temporary situations was stressed. The could be optimized for ENG through special low-pass filtering, aural carrier, video equalization and rowband filtering.

TerraCom made its first appearance at NAB showing their ENG portable microwave systems, featuring a TCM-5 Series transmitter and receiver. Available in the 2, 7, 0 GHz bands, the TCM-5 is designed for portable or remote pickup. The weights only 23 lbs. and is 3½-in. x 15¼-in. W x 12½-in. deep. It operates on either 24 volt battery power or 120 VAC.

The TCM-5 Series is patterned after the widely used TCM-6 Series able units and incorporates the test and alignment features. The features total flexibility in mounting and operation, and can be used with a wide choice of antennas.

With all solid-state, modular constructed and removable printed circuit boards, the TCM-5 offers an optimum program subcarrier and the printing quality essential to good news gathering. Completely compatible with TCM-6 Series the TCM-5 offers a small, light weight package for overflown vehicle or helicopter. TerraCom also offers a TCM-5 manpack operation. (The TCM-5 tripod or rack-mounted unit.)

Although Tepco may be not known to many broadcasters it has been around 15 years. It showed NAB with an all solid-state receiver REM-4A, and a solid-state transmitter for-the-klystron transmitter, TEM-4A (I wait through 13 C). The company claims high

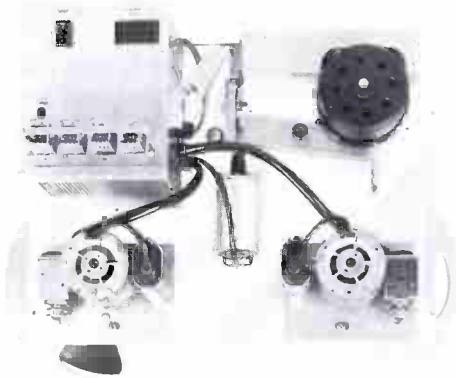
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Form No.: 112-0005

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Check with any leading automation company for more information or call ITC collect (309-828-1381).



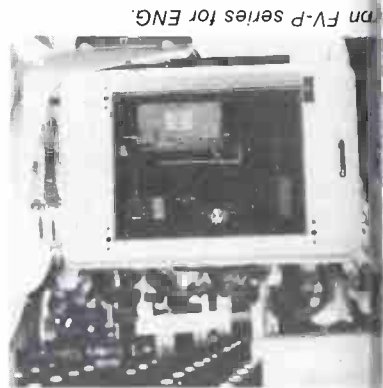
1/2 Track Stereo \$1150

ITC's 750 Series Reproducer

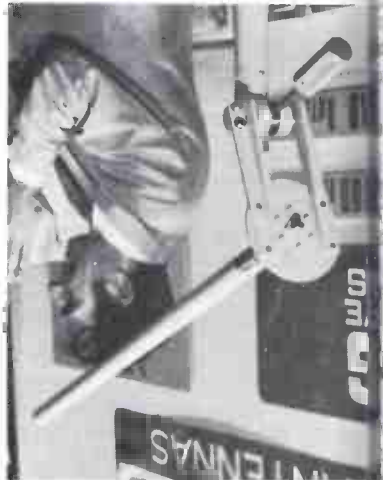


Built for Professionals

For Television Auxiliary Broad- Stations, the TEM-7 and TEM-13 and other products. In the ENG antenna area, Nurad showed a dual-band quad polarized antenna and a low-windload 2 GHz Goldenrod antenna for vehicles. The new dual quad polarized antenna is capable of both simultaneous and independent operation in the 2 GHz and 7 GHz bands. The antenna is the key element in the unique 20/70 QPI Receive Antenna System. The system embodies four of the dual-band antennas. Each antenna covers its own



on FV-P series for ENG.



's golden rod transmitting antenna.



transmit and receive antenna tower.

MCI shows how transmitter polarization overcomes obstacle.



pack for the 13 CP, a video clamper and other products. In the ENG antenna area, Nurad showed a dual-band quad polarized antenna and a low-windload 2 GHz Goldenrod antenna for vehicles. The new dual quad polarized antenna is capable of both simultaneous and independent operation in the 2 GHz and 7 GHz bands. The antenna is the key element in the unique 20/70 QPI Receive Antenna System. The system embodies four of the dual-band antennas. Each antenna covers its own

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TABERASER



Change
Sound to
Silence
with a

As we scan over what we've reported so far and look over what notes have left, we find we haven't put perspective several observations. Routing switches for example. This year we had a lot on the contribution of American Data, Comtech, DynaTeleMatron and Dataek. These companies again stressed routing switches but the products were the same those shown last year. Lenco had an overwhelming amount of video accessories on hand as part of its 300 series universal system—generators, test signal generators, pulse and video distribution processors, encoders, switchers, etc. This line is growing, you aren't up to date, check them. Television Equipment Association had a couple of unclassified goodies—an ENG portable test signal generator (puts out an NTC-7 positive signal) and a video cassette cleaner and evaluator. Power Optics showed (in addition to the remote camera control system which it is well known), an electronic color analyzer. This unit (made continued on page 75)

Miscellaneous video devices

As we scan over what we've reported so far and look over what notes have left, we find we haven't put perspective several observations. Routing switches for example. This year we had a lot on the contribution of American Data, Comtech, DynaTeleMatron and Dataek. These companies again stressed routing switches but the products were the same those shown last year. Lenco had an overwhelming amount of video accessories on hand as part of its 300 series universal system—generators, test signal generators, pulse and video distribution processors, encoders, switchers, etc. This line is growing, you aren't up to date, check them. Television Equipment Association had a couple of unclassified goodies—an ENG portable test signal generator (puts out an NTC-7 positive signal) and a video cassette cleaner and evaluator. Power Optics showed (in addition to the remote camera control system which it is well known), an electronic color analyzer. This unit (made continued on page 75)

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Specifications are available from:

Used in recording studios; disc mastering studios; sound reinforcement systems; TV, AM, FM broadcast stations to maintain a sustained average signal at a level significantly higher than that possible in conventional limiters, and with performance that is seldom attained by most linear amplifiers. Rack mounted, solid state, functional styling, the Model 610 is in stock for immediate shipment.

MODEL 610



COMPLIMETER™

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5 Easy/Fast Operation.

4 Costs Less.

3 1,000 Page Random Access Memory. (Optional D-4000 Unit)

2 "Most Asked For" Features.

1 Smooth, True Characters.



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D-3000 Character Generator produces video-type excellent clarity (1120-element character height). Each letter is smooth and precise. You know you have a greater selection of type fonts including Upper and Lower Case, selected math and accented foreign language characters. You can store up to 1,000 pages on each floppy diskette. With our new Animation Mode (optional), you can play out full frames at a rate of 6 or 12 frames per second from the D-4000 Memory, creating "motion pictures".

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Phone: (301) 948-0460.

Good Reasons to See the

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The Studio Compact Shown With Optional Accessory Shelf



Micro-Trak's "Studio Compact" is the newest, of a group of four, fully equipped audio control centers.... Designed for the professional, the Studio Compact offers top line Micro-Trak components throughout. 740 Turntables, 303 Tone Arms, 500-AL Cartridges, a high quality dynamic mike, and your choice of one of three different four channel audio consoles.... For broadcast the 6444 stereo or the 6454 mono, for disco the 6440 stereo.... Best of all a "Studio Compact" with the 6454 console is only \$1745.00. With other console choices slightly higher.... See your Dealer or contact our Marketing Office....

THE STUDIO COMPACT



There were fewer TV transmitters on the floor than in previous years, but there were still more than plenty of broadcast stations looking to upgrade their plants. Harris and RCA, of course, long-standard suppliers of TV transmitters, included their TV lines in their elaborate show stands. Harris was emphasizing the 10 level IF modulation of visual and audio carriers, as the source of very high quality. continued on page 76

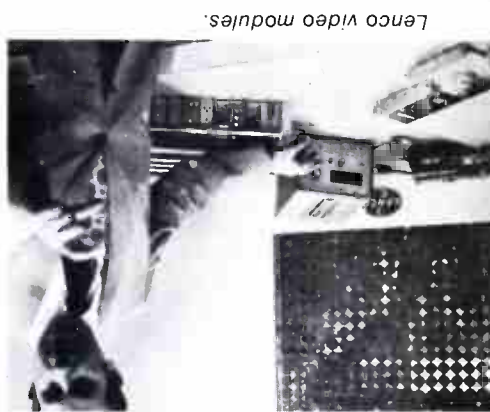
TV transmitters—plentiful, too

val editing etc. lock—for correct speed, vertical motion grade line-locked VTRs to true vertical. Oregon Magnetics showed a multi-purpose servo to control video cassettes. Oregon Magnetics showed a multi-purpose servo to control 2, a device for controlling unusual units. Microtime showed D. In the VTR related area were a 20-in. diameter sphere the inside which is painted with E-K white reflective coating 6080. Mathey automatic video equalizer. AUTOMATIC VIDEO EQUALIZER

For more information on Video Accessories Lenco 274; Dynair Keyer 275; Dynasciences Keyer 276; Video Aids Of Colo. line isolator 277; Telecommunications Illuminator 278.

Richmond Hill offered a chroma keyer to be used with an SEC having a 360° potentiometer to get the desired keying color. Video Aids of Colorado got a big play on its general purpose video line isolator—apparently there are a lot of stray current problems in the field. These units using an electro-optic isolator provide 80 dB power line isolation. Prices are \$250 each. Another popular item was the burst phase meter (introduced last year) which is a \$437 substitute for a Vectorscope. A radically different transparency illuminator which eliminates cleaning problems was shown by Telecommunications Industries. The unit provides even illumination over the entire area of an 8 x 10 in. transparency. It's

Dynair soft key chroma keyer.



Lenco video modules.

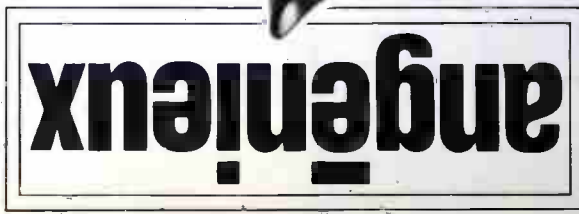
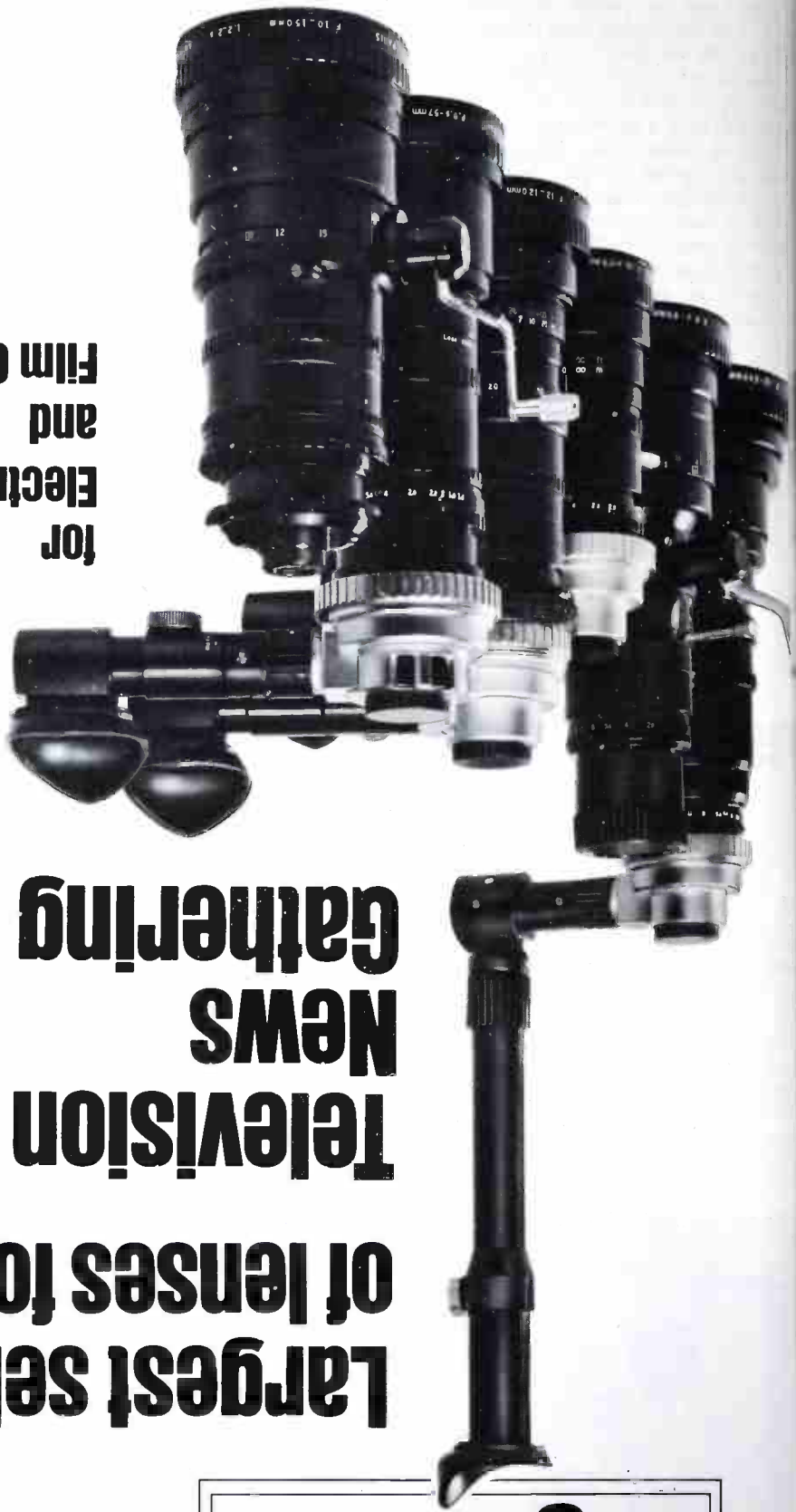
Graphicron is designed for fast, accurate and objective color balancing of TV monitors. We could have mentioned them under production aids but we didn't—we're referring to the new RGB linear chroma keyer from Dynair and the Downstream Chroma Keyer from Dynasciences (also new). The Dynair SE-361A unit (formerly made by Chromatech) offers proportional soft keying in a stand-alone unit. It combines two sources of signals into one composite picture without ragged or tearing edge effects. The unit will key from red, green or blue foreground scenes. The Dynasciences 7200 chroma keyer is capable of keying on any color in the NTSC spectrum. A comb filter is provided for minimum noise and chroma crawl. The output is delayed exactly 280 nanoseconds relative to the inputs. Since this is exactly one cycle of 3.58 MHz subcarrier, the output signal appears as if it had zero color phase shift.

NAB SHOW-IN-PRINT

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continued on page 77

developments follow below.

on these and other similar into cart recorders and players. Collins, into radio automation; Philips, moving into audio components added to old ones scale. Other firms with new enough new radio transmitters coverage greatly was McMartin. An example of a firm expanding for broadcasters (details below).

heavy emphasis on several products and Matsushita, (Panasonic) Sony, with a whole line of moving strongly into broadcasting.

Among the long-established efficiency, to stay in the game offer better performance, new that radio hardware makers The intensifying competition pushing bowls of cream toward radio station owner is a cat with full-line coverage was strong. eny of specialty firms to move new firms than ever before. The were more products from both hardware from related fields, and

More of everything from nearly everybody

If one word could cover the radio show it would be "more"—there were more firms moving into radio

show at McCormick Place. happy at NAB conventions. Now, here is our show-in-print report on the radio broadcasters and hardware producers radio gets a fair shake, to make radio and care on the part of the NAB that good business, an accessible location, So maybe it takes a combination of did the year before.

agers and engineers made the trip than much higher proportion of radio man- more accessible than Las Vegas. A was a general feeling that Chicago is "Panel of 100" survey discovered, tributing to the show's success, as our tractive and cost effective. Also con- grading, replacing, process seem at- new, better products to make this up- year even better. There were plenty of grade, expand, hoping to make next

owners were ready to replace, up-casting had had a good year and station ware sold well because radio broad- report on the TV show). Radio hard-trends like ENG (see the preceding the far-out new devices, the big new had the pretty girls under bright lights, glamour and excitement. Television pace by competing with television in Radio did not set this high selling complaint on the floor.

Mc McCormick Place, a very common tress from his battle with the unions at last year's show at Las Vegas, or dis- more than wipe out any distress from enough sales and promises of sales to four days on the exhibit floor, with of radio hardware had a wonderful handle in four days. And the exhibitor knew the score, than he could possibly toward him, from people who really relevant, useful information directed years. The radio broadcaster had more the radio show was the best in recent On the two most important counts, McCormick Place in Chicago?

What kind of radio show did the NAB put on during its four-day stand at McCormick Place in Chicago?

broadcaster interest.

From transmitters to cart players to turntables, through tape recorders and audio consoles, and especially in automation and audio processing, the spirit of radio at the 54th Convention was strongly upbeat, with plenty of new products, high

The NAB's Radio Show: It Was Go From The Start

several firms have developed circularly-polarized (CP) antennas for

TV Antennas—CP in many models

As described in the March issue, several firms have developed circularly-polarized (CP) antennas for

bands.

along with their established line of low-power TV transmitters for all 5 watt backpack transmitter for VHF, transmitters for ITFS and MDS, a new EMCEE showed new S-band TV transmitters for ITFS and MDS, a new VHF.

state T-210V for 10 Watts output on with a new model, the totally solid translators, powers from 1 W to 1 kW, Acrodyne showed their line of TV (55 kW units).

UHF klystron amplifiers (30 kW and (1200 W to 35 kW) transmitters and hand describing a new series of VHF UHF, the TN-2EU. It had literature on Its current product was an exciter for reappeared—Townsend Associates.

Another name of the past 100 kW on UHF.

announced a whole line of TV transmitters, 1 to 12.5 kW on VHF, 15 to CCA, as part of its "comeback", efficiency.

showed a model of a twin-Z design by stations outside the U.S. Alford had its designs in use for several years and Alford Mfg. Co. MCI, in fact, has designs—Micro Communications Inc. involvement with CP antenna

Two other firms emphasized their antenna.

ditional member, becomes a CP an- antenna (developed by Bogner): a antenna movement with an interesting Another firm, CCA, joined the CP stood to be nearly ready for issue.

rule-making on CP antennas, under-FCC to encourage and guide the plete Jampro report has gone to the of indoor receiving antenna. The com- of the S/N with practically every kind duction of ghosting and improvement prehensive on-air tests, including a re- findings of a two-year test program of the Jampro antenna at station KLOC (Channel 19), Modesto, CA. All the expected benefits were found in com- UHF, the TN-2EU. It had literature on Its current product was an exciter for reappeared—Townsend Associates.

Another name of the past 100 kW on UHF.

announced a whole line of TV transmitters, 1 to 12.5 kW on VHF, 15 to CCA, as part of its "comeback", efficiency.

TV, anticipating a change in the FCC rules that will make such antennas legal. Harris, Jampro, and RCA have been the pioneers, and all three were showing their CP designs at the show. Jampro president Peter Onnigian, in a talk at the convention, summarized the findings of a two-year test program of the Jampro antenna at station KLOC (Channel 19), Modesto, CA. All the expected benefits were found in comprehensive on-air tests, including a reduction of ghosting and improvement of the S/N with practically every kind of indoor receiving antenna. The complete Jampro report has gone to the FCC to encourage and guide the rule-making on CP antennas, understood to be nearly ready for issue.

For more information on Transmitters, Antennas, Emcee 5-watt backpack unit 279; Emcee S-band 280; CCA TV transmitter line 281 Acrodyne, 10-2 transistor 282; CCA CP antenna 283; Townsend 284 MCI CP ant. 285; Alford CP ant. 286.

mediate applications.

horizontal-polarized types for

All of the developers of CP TV either FM or TV CP use.

that was promoted as suitable



Harris' BT-25L1 VHF transmitter.

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8C-25K shown

FM TRANSMITTERS
1000W • 2500W
NEW



8A-25K shown

AM TRANSMITTERS
1000W • 2500W
NEW

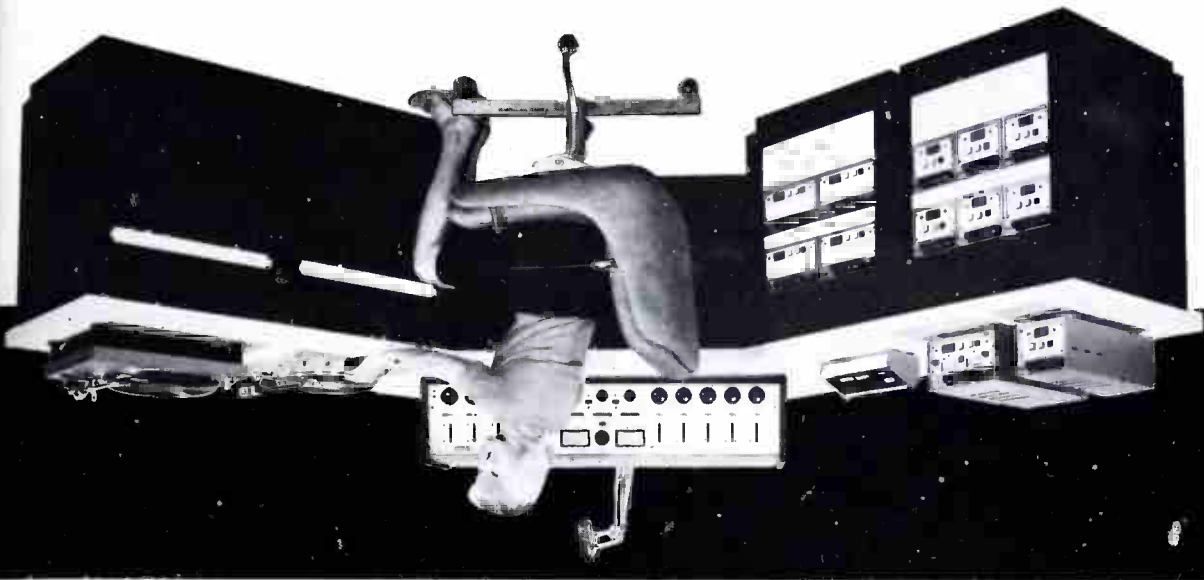
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Transmitters were not on everyone's shopping list but for some NAB visitors they were a high priority item. Awareness has been growing that

The transmitters march in strong

There was a movement toward automation in testing and measurement, with several new systems that put measurement operation onto pushbuttons, guaranteeing very high accuracy automatically. micro-explosion in wireless micro-phones. There was a major refinements over last year but no greatest abundance, with many radio list, were on the floor in the and two on this year's "most wanted" and audio consoles, which were one more options. Open reel tape recorders of new systems giving broadcasters information was very strong, with a number future (more below). Radio auto-strength and clear promise of a big splash at Houston and Las Vegas, was The all-solid state transmitter, a big

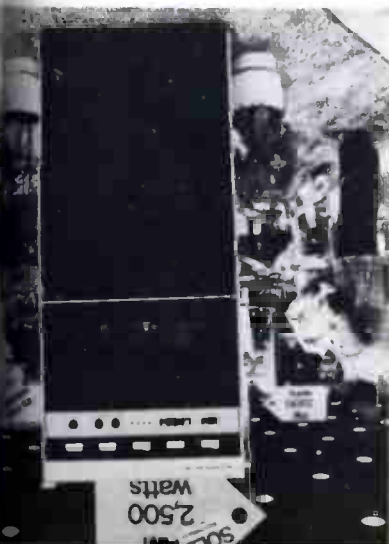
Some General Comments

NAB SHOW-IN-PRINT

today's transmitter is superior to yesterday's. Transmitter makers were prepared to cash in on this renewed interest. The "breakthrough" in radio transmitters is, of course, the all-solid-state design, with all that means in higher reliability, higher efficiency, and ultimately, better performance. At last year's show in Las Vegas, Harris and Westinghouse stood out as the pioneers, Harris with its ready-to-go 1 KW AM, Westinghouse with its prototype 5 KW AM. This year, Harris' MW-1 is a widely-used broadcast transmitter, on the air in many stations and proving out all the expectations for the superiority of the solid-state design. Westinghouse was not on the floor, but the influence of its design was felt in another way: just before the show, RCA announced that a series of all-solid-state AM transmitters were "on the way," including a 5 KW and 10 KW model, with higher powers to be readily available by paralleling. It is understood that RCA has taken up the Westinghouse design, and will put it through extensive further development to produce a series of transmitters realizing all the potential advantages of all solid-state. RCA spokesmen would not furnish a date for appearance of ready models, but trade

rumors said the aim is for late this year or early next. In any case, the logic of the solid-state transmitter is so strong that it is clearly a sure thing: an additional push for it comes from the relevance, its reliability and simplicity to automatic transmitter, which is all surely coming (see news story, issue). There were other all-solid-state transmitters on the way, too. Spaced out a strong position in solid state with the new SS AM series, which continued on page

McMartin's 2.5 KW AM transmitter, part full line.



EXCITING NEWS!

NEC Presents Two Super Products for ENG Systems.



First, meet our new NEC Super Synchronizer

It's half the price of competitive units, yet you can mix, fade, wipe and alter from U-Matic VTRs as well as from all other remote sources. Without genlocking. How's it possible? Our FS-12 Frame Synchronizer is now augmented by our new Base Corrector adaptor to provide for infinity correction window. The combined unit allows operation with a non-



Now, meet our new NEC MNC-61.

phased input video signal, so no control timing pulse is necessary for the VTR. Our Super Synchronizer lets you operate with a single connecting cable. Now, all pictures from your remote ENG unit can be integrated as smoothly as if they originated in your studio. And we can help you get better pictures, too.

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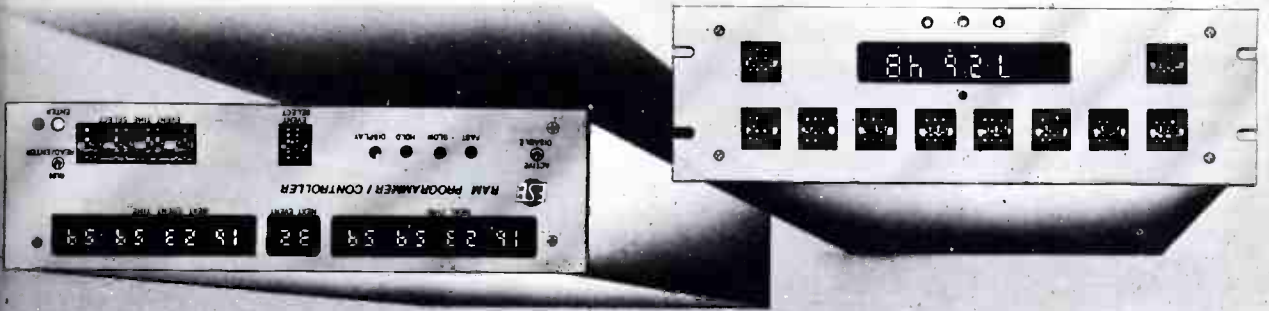
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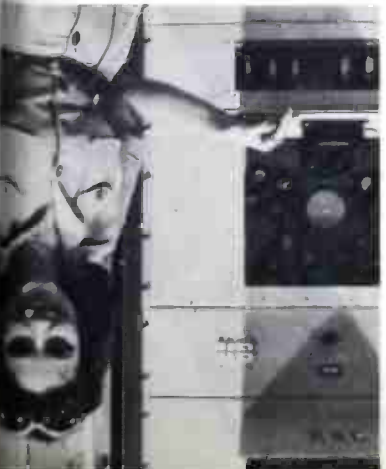
Programmer/Comparators and Controllers



PERFECT TIMING

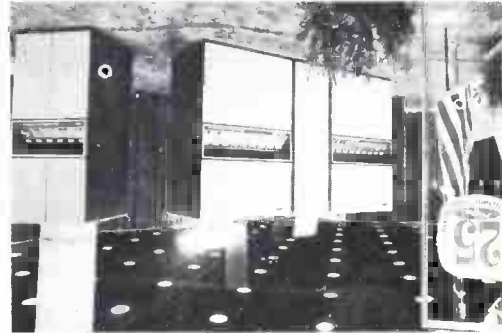
Continental Electronics, known primarily for super-power AM transmitters (up to 1 megawatt and above in other countries), showed that 5, 10, and 50 kW AM designs that aimed at the American market. The radio transmitter section of the show gave the lie to the ideal transmitter design is on a no-advantage plateau. The competition is fierce, like that in the audio console field forcing design ahead, besides giving the broadcaster far more choices than he can easily sort out. Moreover, FM quadruphonics is not the horizon and AM stereo is not far beyond. RCA was demonstrated on page

Sparta introduced a totally solid-state KW AM.



"super-hit" amplifier to drive the transmitter. Sparta also added the new SS500F, a 500 watt all-solid-state FM, to their SS250F, 250-watt FM, available for a couple of years. Further, a new all-solid-state FM transmitter, at 250 watts, was brought in by Wilkinson Electronics, a standard source for broadcast transmitters for a couple of decades. Wilkinson's addition to the solid-state trend should be ready before this sees print. But solid-state was not the whole story. There was a spare of new transmitters with at least one vacuum-tube apiece. They came from nearly every established manufacturer. McMartin, as already noted, added several models, both AM and FM design, so that their line now runs from 500 to 27,500 watts in FM, up to 3 kW in AM. CCA, with every show of vigor after the recent change in management, came in with a large line of AM, FM, transmitters and a new 40 watt stereo exciter with precision characteristics. AEL had a new 5 kW FM; CSI showed total AM and FM lines, from 25 W to 13 kW. Collins emphasized their "Generation Four" line of FM transmitters, and their "Phase 4" stereo exciter, in this country and abroad. Sintonics had FM designs from 10 watts to 25

American Electronic Labs had new 5 kW FM and AM series



CSI showed line of AM, FM transmitters.



1 kW, 2.5 kW and 5 kW models produced; the 1 kW is promised for early this summer. The design includes a high-level modulator with a 650 watt

NAB SHOW-IN-PRINT

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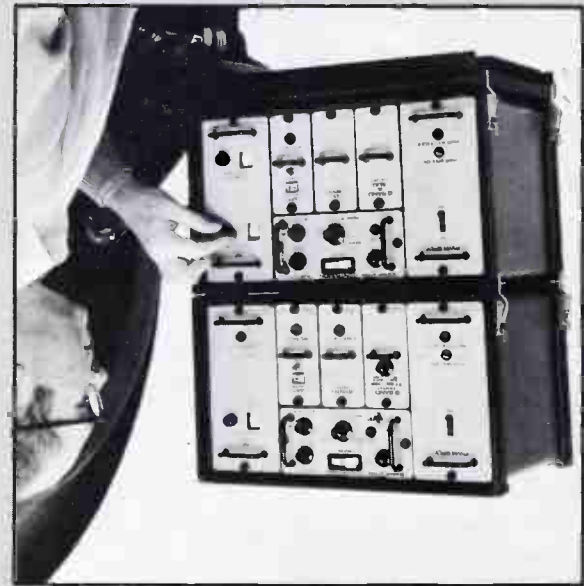
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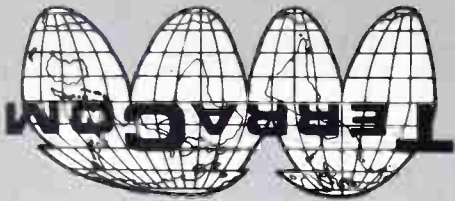
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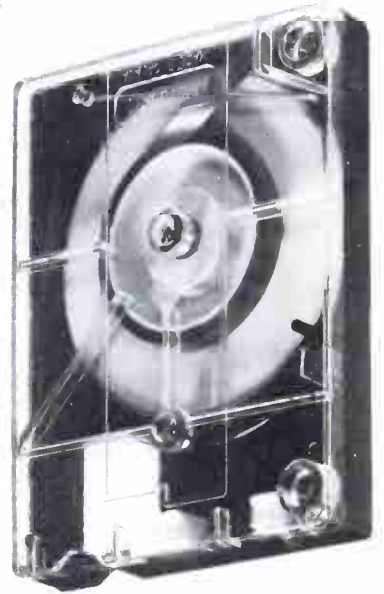
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 with full internal guidance

FIRST CARTRIDGE

All the established makers of cart equipment were on hand, and there were some new ones. Sparta had a new Century II series, with optional fast forward, in all configurations of one to

Cart recorder/players

Others were Telex, with their "1400 Series" introduced two years ago; and U.S. Pioneer, which is making a very strong impression with their expanding series of open-reel machines. Nagra was on hand with the small battery portables, in three sizes, that are used everywhere. And Electro-Sound showed their very popular ES-Series, to round out a tape-recorder display of extreme richness and variety.

United Recording's Auto-Tec line, among the best available for a number of years, was on display. So were the machines of MCI (in the Pacific Recorders and Engineering booth). The JH series by this Florida maker are extremely interesting, as noted in BM/E's coverage in the February, 1975 issue, with plenty of automation in controls, a "joy stick" that lets you move the tape forward or back any distance at any speed, and specs on the frontiers of the art.

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The broadcasters who put these units at the top of their shopping lists could swim in top-grade machines. Apex demonstrated their new MM1200 studio machine, which handles up to 2-in. tape, introduced just a few months before the show—all-outry for the total studio recorder. Scully/Metrotech had new options for the 280 series—a DC capstan servo drive, a variable-speed accessory to go with it. There was also a new Scully model, the 285B, a play-only machine.

Tape recorder/players

EIA already has three proposals before its, as reported in BM/E in February.

NAB SHOW-IN-PRINT

Both Fidelity and Capitol emphasize on cart quality. the operation of more and more stations, we can expect more and more the standard cart becoming cent details, but not great leaps ahead. advances over earlier designs in ability. Most of the new carts show serviceability, operating ease, midsummer, with emphasis line of new cart machines by Bloomington, Illinois, promises Audi-Cord, a new firm on motors and called "Beaucart", completely new set of cart made built around the Beau inside. Two newcomers were UMC, as did Telex.

Ampro showed their widely-used QRK the Citadel line, Rapid-Q the top of the line. Harris had their the 1000 (economy), 2000 and 3000 Broadcast Electronics had three sets showed their heavy-duty set, meter, peak reading meters, three units, with cue tones, and



ITC had new Series 750 open-reel recorders.



Scully/Metrotech. Multi-channel tape recorders shown

President of the RAB, Miles David, presented five radio consultants, with their expectations and predictions for the future of the radio industry.

Dwight Case, RKO Radio president, spoke on the rise of the computer and the decline of the typical salesman. Predicting the use of computers for buying, selling and evaluating radio space, he indicated that one of the real advances in this area would be the ability to determine almost immediately what the sales on a given product are following the airing of their advertisement. Instead of the traditional salesman, Case sees the development of a well-educated marketing man, making contact with the client at the highest levels, rather than at the advertising agency.

Clint Fornby, president of Fornby Stations, Texas, discussed the future of the small market radio. Interpreting changes in America as prime movers for changes in the small market radio industry, Fornby predicts that 1/3 of the small market radio stations will be located in depressed areas in the next 5-7 years. As city populations decline, the economic environment will affect the market. He sees computers as helping cut costs and providing more capabilities. Additionally, he predicts that program automation will be a part of every small market within the next 5 years; AM Stereo seems likely. As challenges to the success of the small market radio stations, cable penetration will be higher and will therefore present continued and substantial competition. Mr. Fornby made two other observations: He foresees an absence of qualified engineers in the future and he expressed his disdain at the lack of industry support for field internships.

Richard Harris, president of the Group W Westinghouse Broadcasting Radio Stations discussed the most serious challenges facing radio as a continuing viable medium. He advocated continuous evaluation of the listener, the advertiser and the position of the owner as a profit-maker. With the expansion of news commentary and investigative reporting, costs will jump—and to be responsible to the needs of the community these costs must be evaluated in light of the coverage required. In other words, the cost of news is rising, but news is a necessary function of programming. The radio industry must adopt a competitive attitude and programming direction must be kept relevant and responsive to sustain radio as a viable, profit-making business.

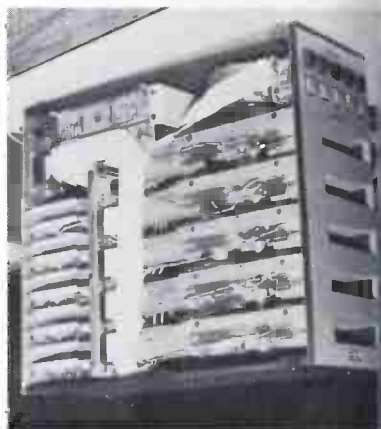
Donald G. Jones, president of PSB Radio Group, addressed himself to the question of finance—the sees continued expansion for the radio industry, with qualifications. He advised that every owner, investor, or manager must now also be a business man. He suggested evaluating the profit margins of radio in relationship to the Gross National Product. And he advised the audience that salaries are now going to constitute 50% of radio's costs.

George Wilson, President of Bartell Broadcasters, attacked radio automation and expressed his feeling that automation (machines) would not be necessary if more attention was paid to the listener and his programming needs. Also attacked by Wilson, was the amount of money spent on content tests—money he feels would be better spent for research in the local community as to the real listening preferences.

The Third Radio Conference at the NAB, Chicago

For more information on:
transmitters: Sparta, SS AM
 eries, SS-F series 200; Wilkinson,
 50-w FM 201; McMartin, new FM
 eries, 202; CCA, 40-watt stereo
 xcieter, new AM, FM models, 203;
 EL, 5 kW FM, 204; CSI, new AM,
 M models, 205.
ape recorders: Ampex MM 1200,
 06.
art recorders/players, carts:
 Sparta Century II, 207; UMC Beau-
 art, 208; Audi-Cord, 209; Fidelipac
 Master Cart, 210.

roadcast Electronics had heavy-duty machines.



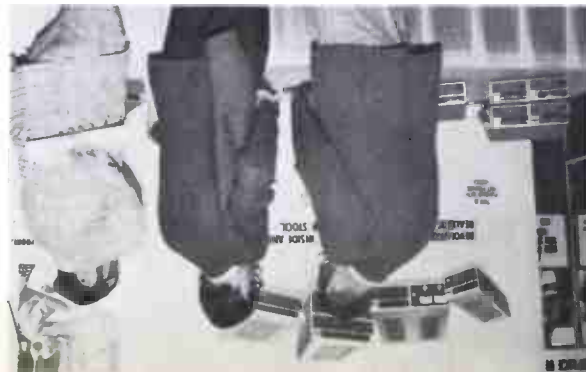
any broadcaster who has lost his
 idence in the heads on his open-
 tape machine, or the audio heads
 his VTR, can get new heads, or
 ill heads, or have his old ones
 e new, at any of several firms
 izing in this service (new heads
 also come from the makers of the
 rder, of course). On the exhibit
 were the following:
 Minnesota Magnetics offers to
 ily audio heads for virtually any
 ume with "new head" guarantees.
 r provides roughly the same kind
 service: total reconditioning of
 machine heads, or audio heads
 VTR's, at considerably less than
 cost of brand new heads.
 aber also showed their com-
 ensive line of accessories for tape
 rding, especially their well-known
 -erasers.
 ortronics had data on their very
 plete line of replacement heads for
 ically any tape machine on the

io heads: new, refurbished.

line of audio carts.
 International Audio also showed
 nance.
 Audiopak aimed at precision per-
 es showed the internal features of
 e performance of any of 400 carts,
 by performance of the observer. Capitol Mag-
 with equipment for reading
 new Master Cart on active dis-
 minimum phase error. Fidelipac had
 to handle stereo material with



Garner's conveyor eraser
 for carts was shown by
 McMartin.



UMC introduced new line of cart
 machines called "Beaucart."

For more info on NAB
 products circle bold face
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 service card.

The under-12-channel, knob front class was represented by Ampco, Broadcast Electronics, McMartin, Ruscso, Sparta, Co. Big hatsops came from Audionics, Neve, Automated essses, Ward-Beck, Dipol; some continued on pa

Trust only credible promoters (those who tell you which of their records are not good for your market). Trust your own ear. We play the top 40 per week plus three to seven more depending on what is released. During peak time we play 20 minutes of commercials. They have to be produced right to keep listeners. During drive time, use just the most popular—two short records are better than a five minute one. With a slight adjustment of our play list, we have not lost to ethnic stations.

At KEEL (Shreveport) we have been contemporary radio and not rock-and-roll for 14 years. We go for the 18 to 49 age group. Because of strong ethnic station competition, because the largest single age group is 34-49 and because it is the teenager that buys records, we do not stick to the top 100 lists. We do survey local outlets (which vary according to the section of the city). After 10-14 weeks we move a hit to the old gold—and still play it. We censor sex-oriented music. Announcers can make a difference in keeping the older audience. Commercials must not tune listeners out.

—Marie Gifford, Manager, KEEL.

At WFIL (Philadelphia) we are "home town radio." We try to select the music preferences of our listeners in our playlist. Rock-and-roll is a stigma to be

erased entirely.

—Jay Cooke, Manager, WFIL.

Charts at best are accurate for only three to five records. The hot hundred have become a reflection of ego trips—the record company, the artist, the artist's manager. It is virtually impossible to use the top 100 as a reflection of

what is happening in your market. Surveys and chart analysis have been overworked. The classical research designs are contaminated with variables

... We should be following CapCities slogan "We talk to the people." Do we live with our audience, understand them, set up responses for them, and do we

talk to them? I suggest that we got out of the record business and back into the music radio business.

—Mardi Nehrbass, Music Director, RKO General, Los Angeles.

Most important—do more music research but don't trust the charts.

—Rick Sklar, Moderator, ABC, N.Y.

What The Experts Said—Contemporary Music Panel (All Amers)

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vertical or both, so that either audio/helical VTR, or quad VTR, can be efficiently degaussed. Claimed degaussing levels are -90 dB for audio and digital recordings, -70 dB for quad video tape.

Audio consoles

If tape machines were plentiful, more than 20 firms showed consoles, many with extensive lines. Some new lines were imported from England: Philips brought Pye consoles, Rank brought Audix, both long established in the Old Country. Sinder brought a new series. Roughly, there were three classes of console (with some in between): portables, often battery operated (and there were some good ones); boards of five to ten channels, in the older box-with-knobs-on-front style, appropriate both in cost (up and down from \$5000) and in capability for the smaller radio stations; the bigger "flat-tops," (\$10,000—\$50,000) now practically always with each of the 12 to 30 channels in a thin modular case, together with adjustable equalization, cue controls, elaborate in

The field pattern can be horizontal or whole cycle takes about 45 seconds. when the reel is fully removed. The reel is automatically moved slowly out slowly. At the end of the rotation the hub, and on the push of the "operate" button moves the whole reel horizontally into the field, while rotating it slowly. Their Model 7400 takes a reel of tape (up to 16-in. diameter) on the tape degausser with some useful new ideas. Optek showed a new automatic bulk across the tape at the right angle.

ing block, guides the razor blade *splicer* is a slide that fits over the splice paper is \$50. A new *semi-automatic* of the block and an initial supply of only three microns dimension; cost with the finest grade having roughness grades of replaceable lapping paper, surface on audio heads uses three for hand-polishing down to an even action accessories. A new *lapping block* recorder maintenance items and operation accessories. A new *lapping block* items in their extensive line of tape tronic also introduced some new designs for particular purposes. Nor-

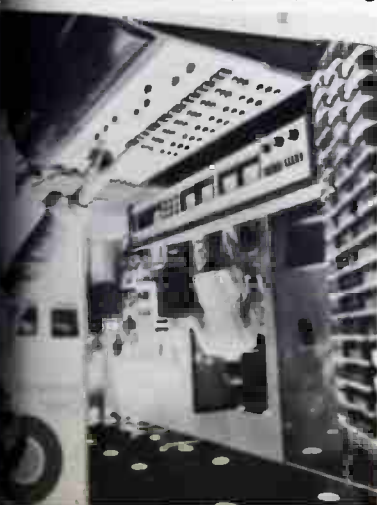
market, plus specialty heads of various

NAB SHOW-IN-PRINT

Micro-Trak had operating studio assembly.



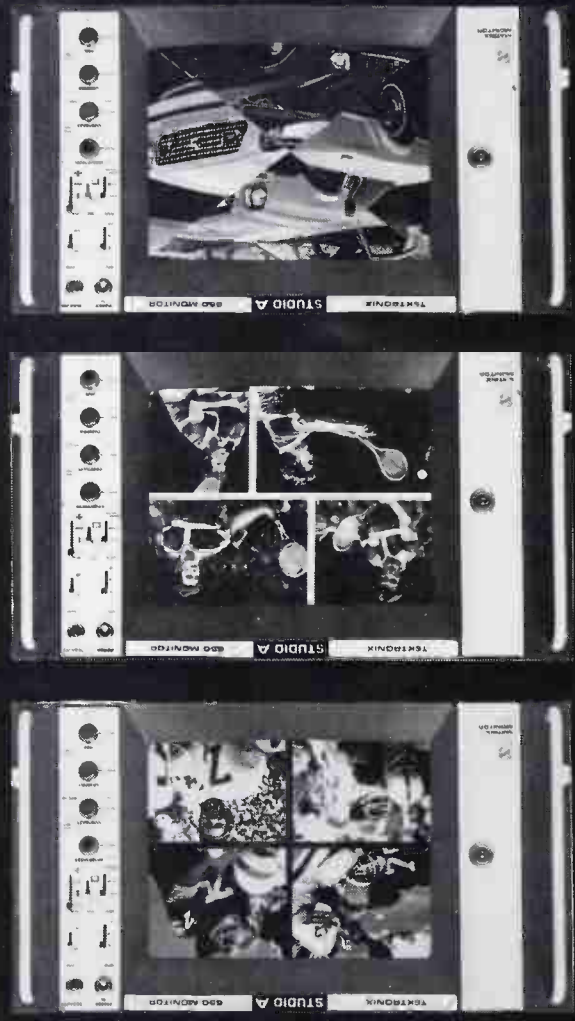
Cetec showed new console.



THE ADC 1290-B

Two years ago we introduced the 1290 OBQS (One Bus Quad Split). It afforded you with new versatility in both studio and remote applications.

Today we bring you a new and more versatile package which offers an optional Quad Pattern Selector. Now standard splits and split vertical displays are available — along with a new diagonal split. Each display provides adjustable positioning and adjustable width borders on standard and split vertical displays. Also available is an internal border colorizer and full relay tally. As the 1290, the 1290B can be used with any switcher or used as a stand alone device.



Television Pictures Simulated

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 3250 WILSHIRE BL. STE900 LOS ANGELES, CA 90010 213 387 7756
 2908 MULBERRY PASADENA, TX 77502 713 941 7772
 233 W. HILL AVE GLENN ELLI, IL 60137 312 469 6200
 Circle 162 on Reader Service Card

For more information on:
Audio consoles: Ramko DC Control, 211; Phillips (Pye), 212; Rank (Audix), 213; Cetec, 214; Robins, 215; Ward-Beck, 216.
Audio processors: Broadcast Electronics CLE-FM, 217; Orange County audio control system, 218; Urban Optimod, 219; MicMix Series C reverb units, 220; Sine Systems peak AM limiter, 221;
 Thomson-CSF FM Volumax, 222.

intermediate would be Robins, Audix (Rank), Pye (Phillips), Revox, McCurdy. Good portables came from Studer, Revox, CCA, Pye. Nearly all the consoles showed design innovations of one kind or another, mostly in the area of making operation easier, more fool-proof. For example: Automated Processes brought a new multichannel board designed specifically for broadcasters (WBEN has bought several), with pushbuttons for nearly all functions (mono, stereo, quad, air, cancel, preset, etc). To expand from stereo to quad takes only a few new plug-in cards—controls are already set up.

Each mike input is gated to eliminate noise when there is no acoustic input, and has a limiter to hold peaks. Screw-driver controls set balancing levels. The objective, said Automating Processes, was to take all engineering adjustments off the controls, let the engineers do them, make it simple for

There was a little excitement here, with the introduction of Urban's radically new Optimod, FM generator-limiter-compressor, (described in detail in BM/E's October, 1975 issue), and the new FM Volumax by Thomson-CSF. Urban reported excellent sales right on the floor.

The new FM Volumax, Model 4101 (mono-\$1065) and 4111 (stereo-\$1860) is being delivered from stock, according to Thomson-CSF. The design is aimed at very low distortion control of FM signals, at high modulation levels. It splits the signal into low, middle, and high-frequency bands and controls each independently. As in the earlier Volumax, the control is with dynamic frequency compensation, which eliminates the need for steady-state clipping, often a source of harmonic distortion. Along with the Optimod, the new Volumax reflects and enhances the trend to higher audio quality in FM signals, a trend noted in BM/E over several years and still gathering force.

Sine Systems, a new firm, showed

Audio processing equipment

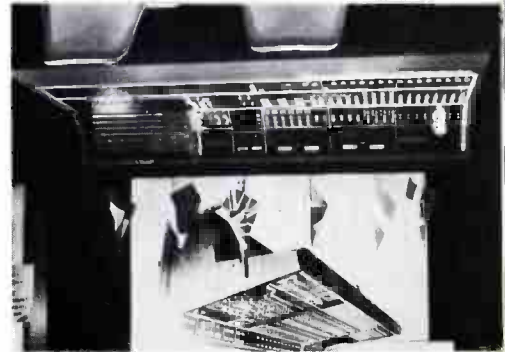
the DJ or other programmer to run the board. Similar design philosophy was in evidence on boards from Cetec, Ward-Beck, Auditorics, Neve, and others.

Other audio processing equipment was on the floor from Pacific Reverb units, 220; Sine Systems peak AM limiter, 221; Orange County showed a two "audio shaping" system with new ideas. The sweep equalization covers the complete audio spectrum can be emphasized with 40 dB range. Selected parts of the spectrum can be emphasized with a flexible system adaptable to AM or FM with appropriate plug-in controls. Orange County, Mic

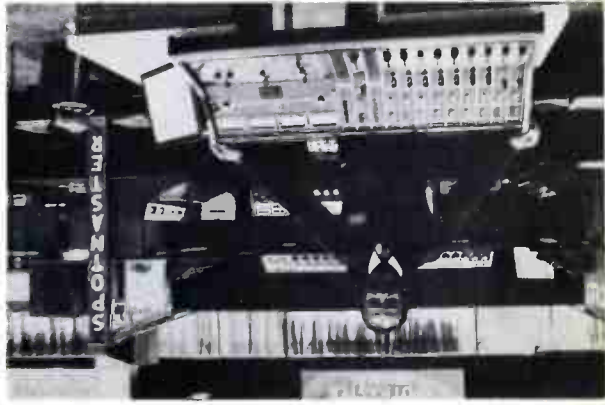
Several units by the California positive modulation (continuous 1 to 130%).

the only adjustments are for input level, and the desired amount of automatic circuitry, based on age modulation with very low level of a high level of a PL-1. The new peak limiter designed for AM

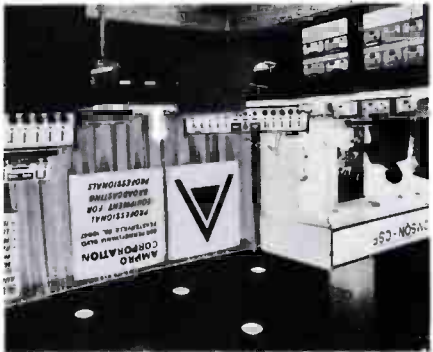
Automated Processes radio console.



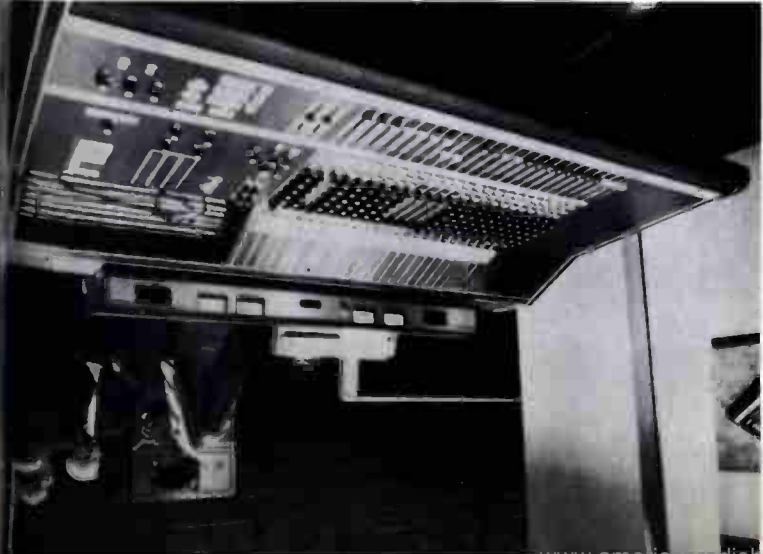
Broadcast Electronics' new "Spotmaster" console.



Console series shown by Ampro.



Custom console by Audio Designs and Mfg.

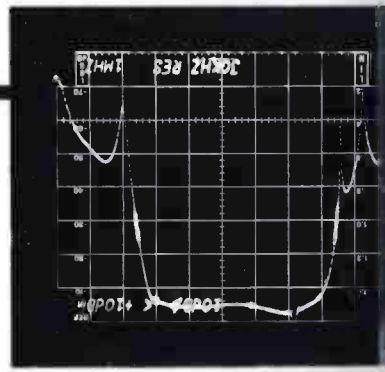
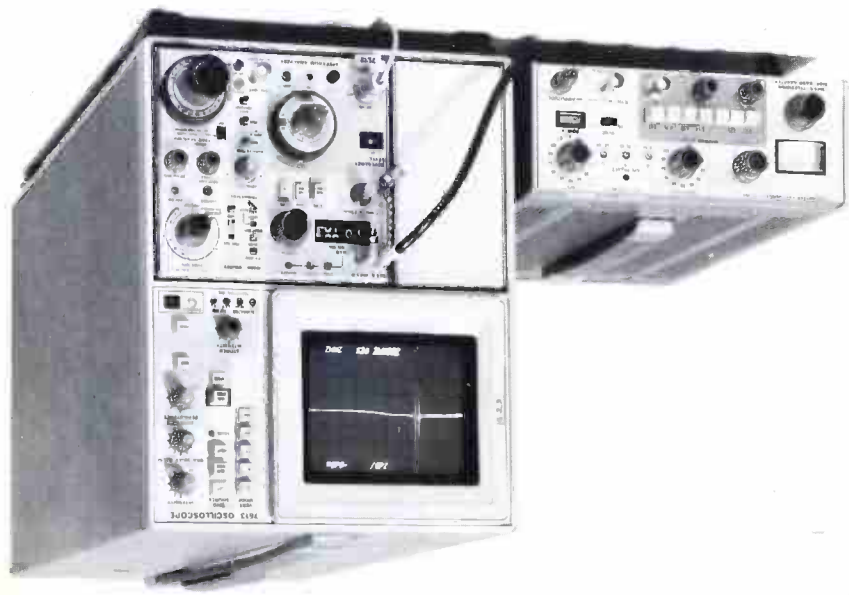


Ward-Beck audio board for TV production.



Now you can have

sideband and analysis, plus...



and lower sideband response at 10 dB/div. intensity markers.

sw capability by combining a performance spectrum ana-lyzer with a sideband analyzer.

your regular sideband test

ow a log amplitude display of band response.

form in-service testing and spectrum analysis of the trans-

asure aural transmitter devi-

asure swept differential gain. assure antenna VSWR (with di-

ational coupler). assure baseband response and

form complete loop testing, New 1405 TV Sideband Ana-

is an adapter to be used with 7L12 or 13 to analyze the re-

sponse of a TV transmitter. The 1405 generates a composite video

signal, the picture portion of which is a constant amplitude sine wave

signal that sweeps from 15-0-15 MHz. When this signal is used to

modulate the TV transmitter, the sideband response of the trans-

mitter will be displayed on the spectrum analyzer. The 1405/

spectrum analyzer combination can be used to display the fre-

quency response characteristics of rt and if stages of any vhf or uhf

transmitter used today in the world. Video circuits from 0 to 15 MHz can

also be analyzed.

Want a demonstration or more in-

formation? Ask your Tektronix TV Field Engi-

neer or representative, or write: Tektronix, Inc., Box 500A, Beaver-

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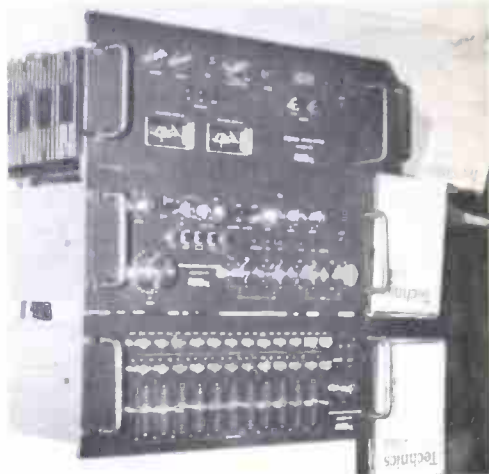
Peter Port, Guernsey, Channel Islands.

Circle 163 on Reader Service Card

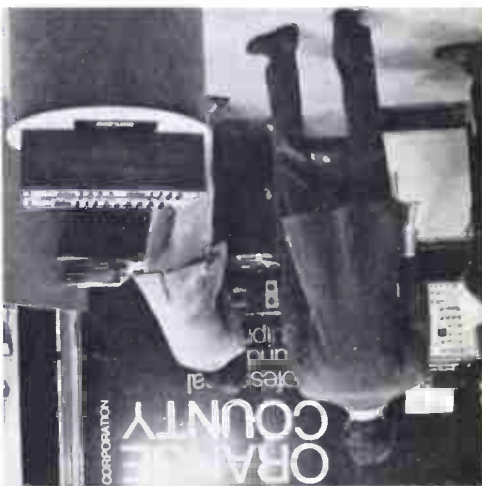


- 1405 TV Sideband Adapter (NTSC Markers) \$2700
 - 1405 Option 1 TV Sideband Adapter (International) ... to be announced
 - 7L12 Spectrum Analyzer ... \$5200
 - 7613 Variable Persistence Mainframe \$2950
- U.S. Sales Prices, F.O.B. Beaver-ton, Oregon

Graphic equalizer, control unit, amplifier by Panasonic.



New audio processing system from Orange County.



affecting other parts, for example, 30 to 40 Hz can be boosted up to 20 dB with no "muddiness." This unit looks especially attractive for broadcast stations or recording studios looking for strong musical "effects." The second unit is a compressor/limiter, with variable threshold, and an expander/gate to cut noise at low levels. The peak limiter uses FET circuits to reduce transient distortion; flat response or FM preemphasis are switch selectable. Broadcast Electronics introduced the CLE-FM Sound Britener, a compressor/limiter/expander for FM which further contributes to the higher-quality-in-FM movement. It provides a maximum of 30 dB compression before clipping, 20 dB of expansion; it has controls for average/peak ratio, expansion rate, for normal or limiter use only, for flat, 75, or 25 microsecond preemphasis. The maker says it is fully compatible with the Dolby B encoder, and can be used ahead of the encoder for compression, or behind it for limiting only.

NAB SHOW-IN-PRINT

line of reverb units, brought their new "C" series, packaged for mono or stereo, with electronics built in with variable decay controls, mixing amplifiers, built in delay, etc. A stereo system starts at \$1795, mono at \$950. The new series further extends the MicMix reverb philosophy of creating the timing, amplitudes, etc., of actual room reverberation.

AM and FM monitoring units

New AM and FM monitors at the

Recap: NAB Engineering News Highlights

John D. Silva, winner of NAB's Engineering award last year, urged TV broadcast engineers to learn all they can about digital techniques—as soon as they can. Predicting that the whole videotape process will be mostly, if not entirely, digital in 5 to 10 years, he warned that time is running out in the near future for digital TV. Dr. Silva sees the following: automatic film cartridges and special effects equipment; video switchers; frame synchronizers; and electronic slide apparatus that may eliminate the need for multiple standard TV slide projectors.

A third-dimensional "time" element improves high fidelity music. This element is the reverberation that comes milliseconds after direct reception and echoes from the stage. William Hall, vp of engineering for MicMix Audio Products, advocated use of what he calls "auditorium ambience." Such an effect can be synthesized through echoes from recording studio patterns or artificial chambers having good reverb characteristics. To achieve this, addition of a good delay-type reverberation chamber to the rear channels is needed.

Operating on ultra high frequencies, a wireless microphone system with a range of up to 1/2 mile, was described by Vincent E. Rocco of the CBS TV Network, New York. The new device overcomes crosstalk and other problems related to simultaneous operation, by the use of a high dynamic range into the receiver front-end, and by a signal processing technique designed to improve receiver selectivity. The transmitter design achieves proper stability at the 950 MHz band. Power is supplied by two 9-volt transistor-type radio batteries and one 1.5-volt AA cell.

Do as the FCC does when making checks for overmodulation. This was the advice given radio engineers for monitoring their stations. Use of a tunable receiver with a good IF strip and an oscilloscope of good quality was recommended. Overmodulation is generally caused by variations in power line voltages, due to severe cold or extreme heat. Care in setting the limiters and their proper levels will not insure protection from voltage variations. The safest and most effective way is to follow the same procedures used by the FCC.

Christopher Payne, chief engineer of KYW Radio, Philadelphia, a 24-hour-a-day, 7 day-a-week, all news-operation, described how his station established its own 2-way communications system for on-air or taped broadcast from almost anywhere in its community. This remote pickup system features UHF base stations arranged for automatic repeater and full duplex operation. The multiple receiver installations incorporate a "voicing" system whereby one of the receivers of a multiple series set out around the city, locks onto the signal from a portable transmitter. The receiver receiving the strongest signal activates, the other, receiving weaker signals, passes. Each "voicing" receiver is connected to the main studio by 5 kHz telephone lines resulting in program quality voice connection. Also described was a hand-held portable unit called the "lunchbox." It is used with a broadcast microphone with tape input as well as full duplex capabilities that enables cues and talkback while on the air.

John B. Bullock of RCA's Missile & Surface Radar Div., described an anode pulser that regulates the output of a station's power amplifier—resulting in power savings that can amount to \$14,000 annually in UHF transmissions. He predicted that anode pulsing will become both an effective energy saver and a worthwhile investment.

A circularly polarized antenna system capable of reducing ghosting was described by R.E. Fisk and J.A. Donovan of Gates Broadcast Equip. Div. This method can overcome most aberrations, caused by multi-path signals. Two major features of the design are the exceptional pattern and impedance bandwidth capability, and the excellent on and off axial ratio.

show continued the advance in mon for design that has been evident in several years. Belar showed their M-3, an FM modulation and frequency monitor with digitally tuned RF amplifier, which reads the carrier frequency, the pilot frequency, and in addition an indicator display which shows instantaneous modulation with a row of LEDs; overmodulation peaks light indicators at the end of the row. Time and Frequency Technology brought in their new Model 753 A continued on page 97.

Shopping for a Distribution Switcher?

SAVE SPACE.

One of our competitors describes their 40 x 60 AFV switcher as occupying only two equipment racks. An equivalent TVS/TAS-1000 switcher takes about 2/3 of a single rack — without compromising performance specs. Audio hum and noise measures -80 dbm on the TVS/TAS-1000 vs. -57 dbm on the competitive unit) and without use of single-source custom hybrid components.

SPEND LESS.

Another competitor boasts of video switching at less than \$30 per crosspoint. The TVS-1000 sells for as little as \$23 a crosspoint, and this price includes professional quality vertical interval switching, on-board electronic latching, and 100% computerized testing of all parameters through all crosspoints.

SPECIFY THE SWITCHER WITH PROVEN RELIABILITY.

The TVS/TAS-1000 is more reliable because its simple design requires fewer active components in the signal path. This reliability has been proven at installations throughout the world in configurations ranging from 10 x 10 to 80 x 50. To find out more about the one switcher offering compact, cost-effective signal distribution with true broadcast quality and reliability, contact the nearest TeleMation sales office.

TeleMation  **the discovery people**



**TVS/TAS-1000
Video/Audio
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40 x 50 AFV Switcher



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Every important maker of broadcast-quality microphones was on the floor with a comprehensive microphone play. Shure had two new microphones, for hands-free use; one assembly includes a headset. Shure also had a new miniature lavaliere microphone with a clip for attaching the cable to a belt.

Revox showed, as in earlier years, the Beyer mikes, a very complete line of new models is the M320, a ribbon microphone with the up-to-the-minute design features that are helping this class of microphones. Philips had the AECM-50P, a new small clip-on condenser microphone, finished in black to avoid reflections in the ENG pickup. Sony also had the C-37P, a new, improved version of the C-37; and the new condenser shotgun mikes, M16 and 17, to be ready later this year.

The five brands of wireless mikes on the floor gave the broadcaster in the area. Vega showed its well-known line, with the addition of a new diversity system: two receiver paths, automatic selection of the best Electro-Voice, in addition to its established line, came in with the Model 221, a wireless system with versatility capability, on the 150-MHz band. Switek, an English manufacturer, got a U.S. outlet via Gordon Enterprises of Hollywood. Comrex showed its line, also on

Microphones, turntables, studio equipment

son, QEI. Rhode and Schwarz, Sparta, Wisconsin, were familiar units for other high-quality AM and FM and noise level are also covered. with 10 KHz resolution. Carrier-volt sensitivity, thumbwheel tuning, Model 754, adds 100 microamps built-in calibration. The optional positive modulation meter and 125% active and 100% separate digital flashers for modulation meter and peak flasher phase filter to cut transient overshoot. Forward monitor trend with line modulation monitor, which shows

For more information on:
 AM/FM Monitoring: Belar, Model M-3, 223; T&F, Model 753, 224; QEI, 225.
 Microphones: Beyer (Revox), M320, 226; Shure head-band mikes, 227; Sony ECM-50P, C37P and MCX, 228; Vega diversity system 229; Electro-voice M221 system 230; Switek line, 231; Comrex, 232; Thomson-CSF diversity system, 233.

Self-discipline By Radio

Exert self-discipline to avoid strangulation by government regulation. . . . The corner cutters in our profession are few, but that's all it takes to justify the regulators. It would not take more than one rape of our Representative Republic to get us all gilded. . . . Equal time is a nuisance, until you think of it this way: Many Americans believe that the news media has proved itself capable of overthrowing the United States government.

—Paul Harvey, veteran newsmen.

Harvey Observations

People feel bedeviled with so many little problems these days mainly because they have no big ones.

These are challenging days for newsmen. We're having to try to make something out of an FDA suspicion concerning the red dye in jello. TV newsmen, with nothing to cry about, try laughing.

We cover a one-state political primary with more manpower than we used to commit to a world war.

People have the impression things are worse than ever today. . . . It isn't that the world is worse, however. It is just that the coverage of news has gotten better.

—Paul Harvey, veteran newsmen.



To help you get information on NAB products, reader service numbers are given for selected products in the various categories. Circle the appropriate number.

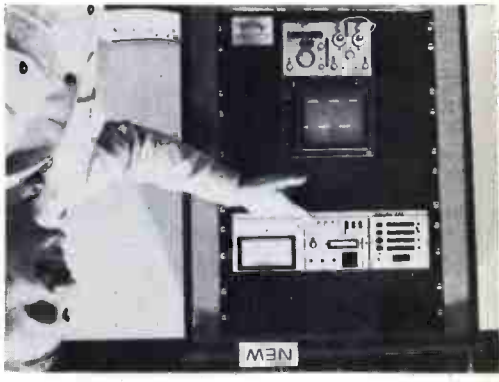
McMartin had AM, FM and FM monitors. QEI showed line of AM monitors, EBS units.



FM monitor from Belar with LED peak indicators.



BELAR



TFT had new precision AM monitor.

NAB SHOW-IN-PRINT

CVS Introduces the First Digital Family of Time Base Correctors.



The proven standard
CVS 504B



High Performance
CVS 520
"Super" TBC



"Low Cost" digital TBC
CVS 510

CVS 520 satisfies capabilities desired by broadcasters. IVC (interlaced video correction) and non-segmented (quad, U-matic, etc.) video signals are base corrected utilizing a 4 times subcarrier, PCM sampling technique. Applications include: equal-to-noise greater than 60 db differential phase less than 2° differential gain less than 2% and Features include: by-line velocity correction all color modes automatic Direct/Heterodyne for switching drop out compensator in adjustable Proc-amp level meter. Equal outputs on rear panel for future expansion capability. Small size, low power requirements. CVS 520 provides full flexibility in any studio facility.

The CVS 504B NTSC and CVS 503 Pal/Secam digital TBC's have become the standard of the television industry worldwide. The proven dependability and capability of these TBC's have and will continue to contribute substantially to the advancement of this industry.



CVS
Consolidated Video Systems
3300 Edward Avenue
Santa Clara, California 95050
(408) 247-2050 Telex: 35-2028

Circle 165 on Reader Service Card for more information
Circle 166 on Reader Service Card for a demonstration

The CVS 510 is designed to satisfy the requirements of the non-broadcast facility where the technical needs are great but the budget small. Standard heterodyne color and B/W video signals are time base corrected utilizing a 6 bit, 4 times subcarrier digital sampling technique. Specifications include: 1 h window of correction Signal-to-noise 48 db Differential phase 3° Differential gain 3% Standard Features include: Built-in Drop out Compensator Built-in Proc-amp Operation with V-lock, line lock and non-standard sync VTR's Dub-up to quad capability Front panel video level controls Small size, low power requirements. The CVS 510 can do much to add dependability and quality in Pay TV or Closed Circuit TV facility.

NAB SHOW-IN-PRINT

play last year in Las Vegas, designed specifically to free mikes of cable runs in ENG including a new diversity system.

Thomson-CSF announced a brand-new variety, developed by R.F. Technology and operating in the 950 MHz band, with the objective of getting more bandwidth than on the 26 MHz or 450 MHz bands. It also has diversity capability and the maker claims very high stability, freedom from drop-outs, a useful range of one-half mile. Very low intermodulation makes it possible, says Thomson-CSF, to use up to 15 channels in a single studio.

Turntables continued to show forward movement.

Panasonic, in their Technics line, came in with an improved direct-drive SP-10 (the machine now in use in many broadcast stations), called the SP10 Mk. 2, which reaches full speed in 25 degrees of revolution from a dead start. A combination of mechanical and reverse electrical braking provides a 0.3 second stop. The table also has a new speed control system: a crystal-controlled oscillator provides a

Session on Automated Programming, NAB, Chicago



The benefits and future of automated programming were discussed by a panel of four. Andy McClure, of Schafter Electronics spoke to the time efficiency and personnel productivity that can be achieved through automation. He views automation as a tool that will cut costs without sacrificing quality. Lee Bayley of Drake Chenuit, believes that automation, as a function of modernization, works. He feels that the listener does not know or care if the station he is listening to is automated—provided he likes what he hears. Martin Taylor, Bonneville Broadcasting Consultants, discussed the consistency and control that automation permits. He sees its function as more than a cost-saver—as a contribution to quality radio, provided that programming is kept relevant to the listener.

Chris Dante, WTSV-WECM-FM, Claremont, New Hampshire, included advertising as an element of radio requiring audience appeal. Through automation, Dante feels, the creative talents of the staff are freed-up to devote more time to improving the quality of advertising and the quality of the overall program format. All panelists were in agreement that radio automation is not a panacea, but that as a tool it can improve the existing product, that it can save money, and, that it is here to stay.

reference for the turntable speed, and the servo, says Panasonic, then keeps speed within $\pm 0.02\%$, or ± 0.036 second on a 30-minute side. Suggested retail price is about \$700.00. Russco showed a completely new turntable, using a synchronous motor and electronic speed control, with belt drive to the outer rim. Because of requests from radio operators, Russco has included an optional 48 rpm speed (along with the standard 33 1/3 and 45) for "speedy rock," evidently a spreading practice allowing the DJ to pile more tunes in per hour. QRK showed their familiar and widely used tables as did CCA, Harris and RCA. In phono pickups, Stanton showed a new series of extra-rugged units, 680 EL and 680 EE, designed primarily for crystal-controlled oscillator provides a

Russco showed new turntable, consoles.



Microtrak also showed studio units assembled into complete systems. Introduced was the new System D compact audio control center, turntables with control console between in a unit with folding legs transportable in a station wagon and set up in minutes. Also new was Model D1 production control unit which remotely controls two turntable and two tape machines. It provides time-delayed sequenced starts making spots directly.

Radio antennas—some new designs

There was no shortage of radio antennas, all power levels, all shapes CCA showed a new series of FM continued on page

For more information on:
Turntables, etc.: Panasonics, SP10 mk2, 234; Russco, new belt drive table, 235; Stanton, 680EE and 680EE, 236; Ampco, studio turntable, 237; McCurdy, reel-tape switcher, 238; Microtrak System D Antennas: CCA, high-power FM antenna, 240; Harris Corp., high power FM antenna, 241; Delle AAM-1 antenna monitor, 242.

Introducing a Color Corrector for Electronic News Gathering.

Electronic News Gathering makes tough demands upon the broadcaster. Color imbalance and colorimetry problems are frequently encountered. Matching remote camera shots to indoor studio programs or assembling tapes from different locations or cameras is "chancy" at best. Often that fast-breaking story doesn't allow for camera rebalancing! Thomson-CSF Laboratories now provides a solution to such difficult encoded signal color problems. With the Model 5500A Color Corrector, you'll be able to rebalance and match video signals *after* encoding. It can be used either after the play-back tape machine or following the micro-wave receiver during live coverage. In most cases, a noticeably improved color picture will result. For ease of operation, a Remote Control unit is included as standard equipment.

As an added feature, an optional automatic Sensor unit is also available to control the Color Corrector for telecine use.

Whether for Electronic News Gathering, tape production or telecine use, the Thomson-CSF Laboratories Color Corrector System should be working for you. Interested? Give us a call.



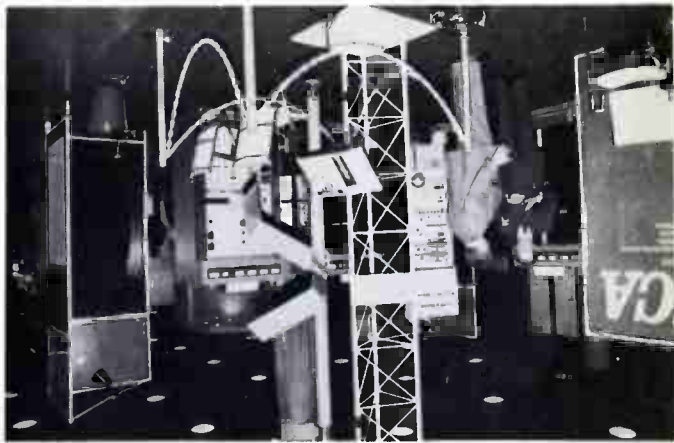
THOMSON-CSF LABORATORIES, INC.

37 Brownhouse Road, Stamford, Connecticut 06902
(203) 327-7700 / TWX (710) 474-3346

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NAB SHOW-IN-PRINT



CCA had hi-power FM antenna with "strap" elements.



Aford showed "twin-Z" FM antenna.

tennas, with a high-power unit handling 50 kW in one bay; low-power, 10 kW. The large gap form factor eliminates the need for feed point straps and insulators. The design has phase center for horizontal and vertical components.

Other firms showing lines of antennas were: Phelps Dodge, with their comprehensive FM series; Harris, with a new 40 kW endfire antenna, the energy all contained in the large tubular members until radiated. Aford Manufacturing described their long-known line of high-power antennas for FM, including circularly-polarized types. RCA showed their established line of AM and FM antennas.

Antenna monitoring

Potomac Instruments showed its line of digital and analog antenna monitors. Delta, as noted below, introduced a new antenna/transmitter remote control system which can be interfaced with their antenna monitors. There was also a new monitor, the AAM-1 digital system for AM direct-arrays; it can handle up to eight inputs without external switching, and reads both the relative phase and the current ratio simultaneously, on two front-panel meters. The unit has FCC type approval.

Transmission line and cable

Several firms were on the floor with complete lines of coaxial cable and high-power transmission line for broadcast applications. Cablewave Systems showed their many cables, including a 50 kW, 3 1/2-in. "Wellhex" cable with polyethylene helix dielectric. Andrew Corp. showed Helia-

Remote control, pickup

The established suppliers of remote pickup, remote control and STL equipment were on hand, in most cases with improved equipment. Delta brought a new combined antenna-transmitter monitoring and remote control system, the TMC-2, with up to 30 channels of monitoring, complete transmitter control, interface to regular antenna monitors.

Moseley had an innovation: a color CRT data display for remote control systems, allowing groups of data to be segmented by color for quick, accurate reading. Moseley also showed a new STL transmitter, Model 505, with RF amplification at the carrier frequency of 960 MHz, with a claimed reduction in noise. McMartin showed their complete line of remote pickup equipment. Marti also showed their long-established remote control and STL systems, with a new system, RMC-20, providing digital remote control, telemetry, and status-limit alarm. It is available with 5, 10, 15 or 20 channels, has single button channel select, can use radio or wire connect; accuracy of telemetry is 0.1%, based on digital transmission with a system crystal clock.

Comrex showed their "radio ENG" system, high quality remote pickup on the high VHF band, for remote triggering of car-borne mobile transmitters. A new firm, Teledata Systems, introduced a digital remote control system, Digital X32, with interesting features. Digital control data are sent twice, on two separate channels, and

With that April 15th deadline closing in on them, broadcasters who had not yet bought their new EBS two-ton signal equipment were naturally looking hard at what the show offered.

EBS Signal Equipment

control relays are activated only if parallel words match, reducing error greatly. The system also provides status indication of relays, switches, plus analog telemetry; interconnect is 2-wire telephone, voice grade, or radio equivalent. Another production by the firm is a unit, Digital X-10, for pushbutton remote control receiving antennas in live journalists



Teledata introduced digital remote control system.



Marti had line of remote control, STL systems.



Moseley had aural STL, sub-carrier equipment.

DFS-3000 Digital Framestore Synchronizer

would take a wall full of equipment to handle the job that DFS-3000 does in just 8.75 inches of rack space. In fact, every synchronous treatment needed for the full spectrum of NTSC compatible broadcast activities is literally at your fingertips in this light, rugged, fully portable system that goes anywhere.

Just check this list of available features:

- Two complete fields of store for full broadcast versatility.
- Infinite window TBC corrects time base errors on any VTR including ENG.
- Look Ahead Velocity Compensator cleans up color vectors on direct color VTR's for truer color presentation across entire picture.
- Video Compressor enables producer to insert second live image in any quadrant of screen.
- Joystick Control allows compressed picture to be positioned *anywhere* on screen.
- Broadcast Quality SPG permits synchronizer to be used as station reference.
- Memory Analyzer ensures system integrity.

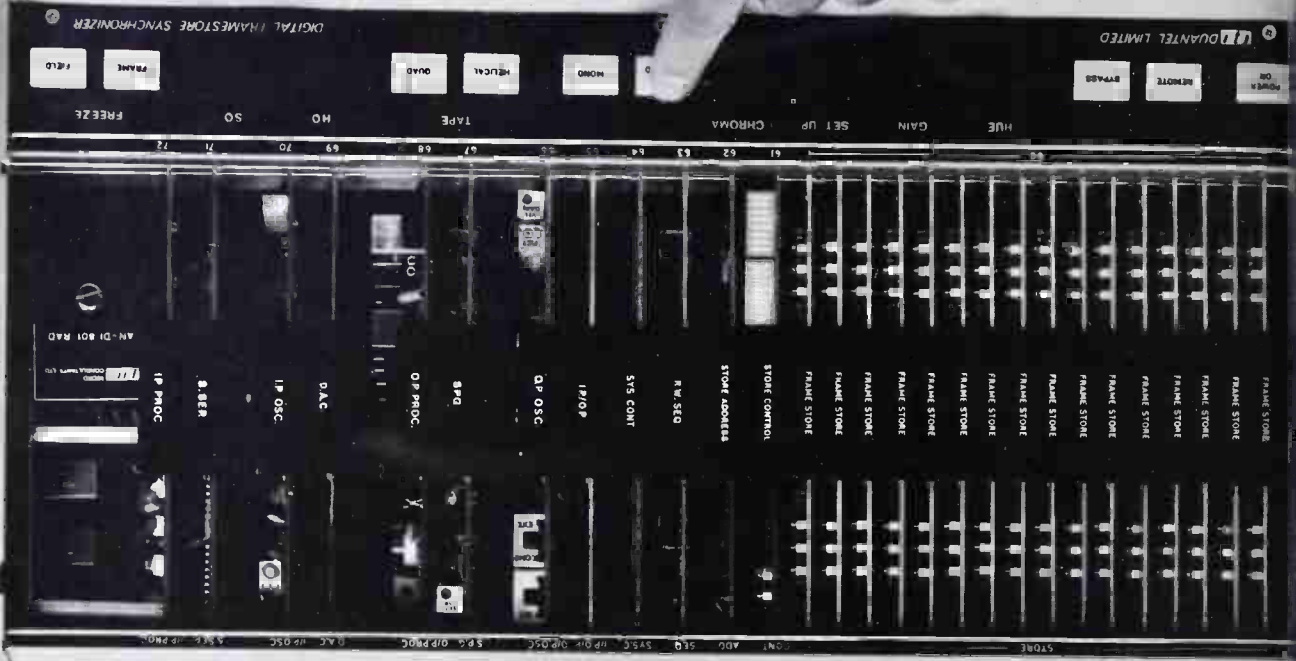
- Frame or Field Freeze for special effects.
- Remote Control Panel for production flexibility.
- Synchronous clean-up of non-synchronous switches eliminates picture tearing and rolling.

All these features, and broadcast quality too, are packaged complete with power supply and analog circuitry in this fully modular system that weighs less than 60 lbs. Even more significant, power consumption is a mere 250 VA, keeping heat problems to a minimum. For information on our demonstration program, call or write George Grasso, MCI, P.O. Box 10057, Palo Alto, CA. 94303. Phone: (415) 321-0832.



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so you do less out there

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NAB SHOW-IN-PRINT

Only two firms, Time and Frequency Technology, and McMartin, actually had EBS units on the floor, and both reported excellent sales. ESE announced an encoder-decoder for put on the market too late for inclusion in BM/E's December and January summaries. It has a crystal oscillator with solid-state division down to the 853 and 960 Hz tones, phase-locked loop frequency selectors in the decoder, a switch to connect generator to decoder for test, decoder operable on receiver output from 100mV to 5V,

Radio automation looked even more vigorous than in prior years. There was plenty of new, more cost-effective, more versatile equipment; radio broadcasters signed up for automation in larger numbers than at any previous show. One major trend is the use of the micro-processor or mini-computer to enable full-scale automation systems to do more than ever, in very compact space and at reasonable cost. In another direction was continuation of the

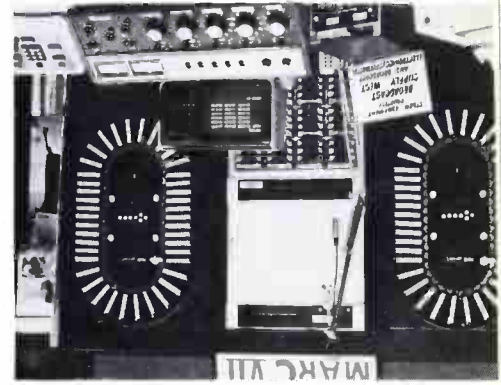
Automation

and FCC approvals.

Microprobe had new 100-A auto programmer.



Marc VII was new automation system from IGM.



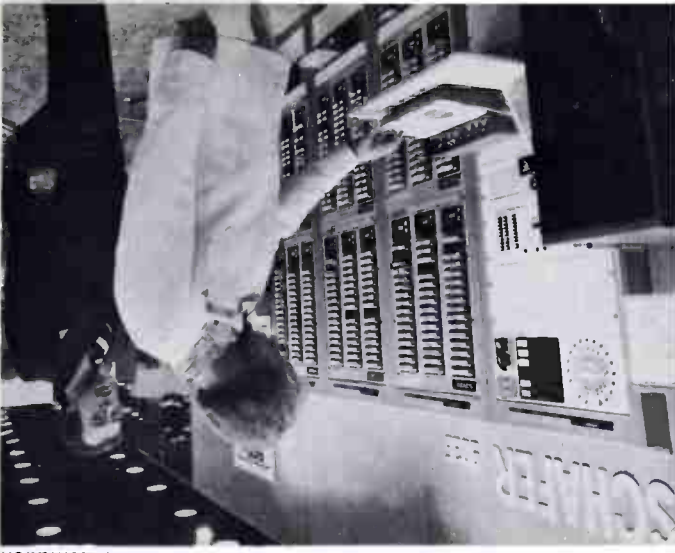
TFT piled up new EBS two-tone units.



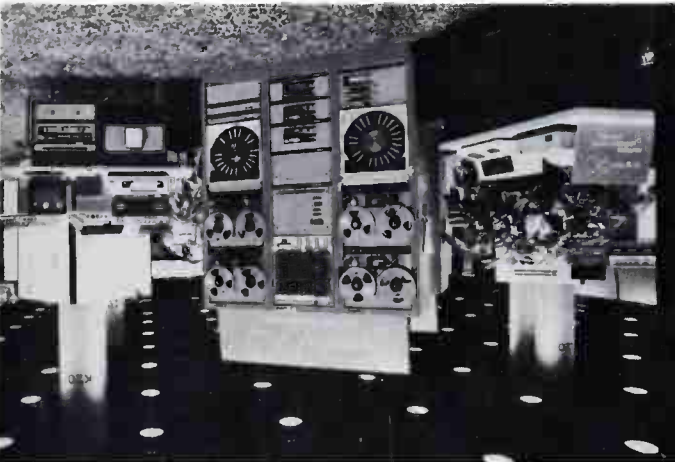
Collins introduced A-7600 automation system.



SMC showed new "RAS-PA automation system. Schafers new 903E automation has "three day" memory.



Harris showed improved System 90 automation.



continued on page 100

Examples of the newer systems: RCA's new PAC versatile systems; control of 15 sources, readily expandable to 10,000 events, using a mini-computer, with storage for 3000 events, control of 19 sources, and 100 sources, with CRT display, show present and future event status, the new Schafers 903E, 8,000 event memory, control of 19 sources; using a new SMC DP-2, using a micro-processor for 2,000 to 8000 event status

movement, noticeable at the two various shows, toward somewhat costly systems that give the DJ flexibility, extended sequential call play, easy.

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1 SOUND TECHNOLOGY

REDUCED OPERATOR ERROR
 There's something you'll like — Sound's new distortion measuring instrument for use in balanced work. The new 1710A is much more than a distortion analyzer. It's a system that contains its own ultra-low-distortion generator tracked with the analyzer. It's a system that greatly simplifies measuring — gives you fast measuring operation that reduces operator error.

For example, push the frequency button and you set both generator and "Distortion" and you have reading. Automatically. No slow, manual null-searching. Features in the new 1710A include: a balanced, floating output (600/150 ohms) a balanced (bridging) input a high-level + 26 dbm signal

- + 26 to - 90 dbm attenuator
 - distortion measurements to .002% fast 5-second measuring speed
 - automatic nulling, optional automatic set level.
 - both harmonic and optional inter-modulation distortion measurements.
- SPECIAL OUTPUT CIRCUIT**
 In the 1710A you get a transformer-less audio generator output that's balanced and floating. No transformer means no transformer distortion. Floating and balanced means you can connect to virtually any audio circuit regardless of configuration. And you can set the output from + 26 to - 90 dbm in 0.1 dB steps.
- FAST, SIMPLE MEASURING**
 Automatic nulling and the automatic set level option (ASL) give you ex-

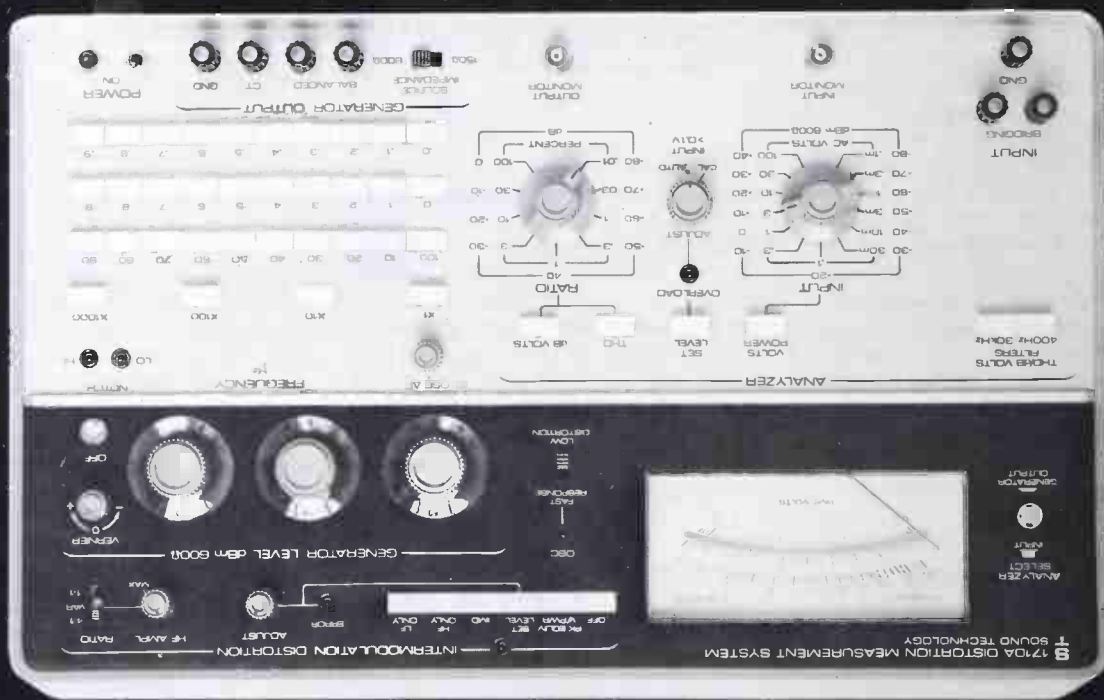
An additional optional bonus is that the 1710A also measures intermodulation distortion. After you've made a harmonic measurement, just push the "IMD" button. In 3 seconds you'll have the IM reading. With this option you'll be ready for future IM requirements.

CALL/SEND NOW FOR LITERATURE
 It's worth while getting the information on this major new distortion measuring system. Call Larry Maguire or Bob Andersen now and get our new product brochure. It's ready and waiting.

IM OPTION
 An additional optional bonus is that the 1710A also measures intermodulation distortion. After you've made a harmonic measurement, just push the "IMD" button. In 3 seconds you'll have the IM reading. With this option you'll be ready for future IM requirements.

LITERATURE
 It's worth while getting the information on this major new distortion measuring system. Call Larry Maguire or Bob Andersen now and get our new product brochure. It's ready and waiting.

Your new automatic distortion measuring system for balanced measurements



For more information on:
 Remote control, etc.: Dell
 TMC-2, 243; Moseley Model 505
 244; Marti RMC-20, 245; Comre
 X32 and Digitel X-10, 247.
 Automation: RCA, PAC-1, 248;
 Schafner 903E, 249; SMC DP-2
 287; Collins automation, 288; SM
 "RAS-PRO," 289; IGM Marc
 290; Microprobe 100-A, 291.

ESE showed ES 230, time calculator timer.



Several firms showed products having to do with time. ESE, which specializes in this area, showed remote impulse display. Pacific Recorders showed a tape locality indicator, the TV1, digital variable speed drive for the MCIH series tape recorders. They also showed DT-2, "digitimer family," a series of digital clocks with real and elapsed time on pushbutton selection. Another unit has digital readout in the center, around the edge to seconds sweep.

Chronotron Systems, of Mineola, NY, had a digital timing system based on a WV receiver-synchronous master clock, a power driver for others did turn up in hotel suites, and they mostly liked the results. But ev- deny, as might be expected, those on the floor were much better placed to sell their product.

The floor exhibitors were: Broadcast Programming International, of Bellingham, Wash., a 16-year old firm now serving roughly 250 radio stations; Drake-Chenault of Los Angeles, another long-established syndicator with something like the same number of stations; Radio Programs, Inc., a new firm, with headquarters in Las Vegas, and a full complement of varied "formats" that parallels more or less the offerings of the others; Camex International, of Los Angeles, which supplies automation systems and the programs to go on them; and HG Productions of Scottsdale, AZ, with a variety of formats.

Each of the syndicators has a corps of "personalities"—announcers, interviewers, DJs—who can be "bought" along with the programs, and integrated into the station's own programs so thoroughly that they become, in effect, part of the station's staff. But the station's own staff, and cannot be totally replaced by syn- dicated programming. As Drake- Chenault's Art Astor said in a pub-

licated program. As Drake- Chenault's Art Astor said in a pub- lished interview (see BM/E Aug. 1975, for a full story on this automation doesn't replace local gramers: the good programming vice makes room for local creat-

time: counted, measured, added, etc.

Time: counted, measured, added, etc.

Syndicated programmers—an excellent first year on the exhibit floor

Control Design, another major source of "full scale" automation, was also on the floor with its series of systems familiar from earlier years. These include the Control Design rotary multiscart machine with the removable drum, handy for storage of carts and for quick change of the total cart assignment.

Collins Radio introduced some full-scale automation systems based on Control Design components. A major effort is toward specializing the design for the customer's need. Response, as to all the suppliers of "large" systems, was strong.

In the direction of "easy DJ control and sequencing" for somewhat less money, there were two important new systems: the SMC "RAS-PRO" and the IGM Marc VII. The RAS-PRO has a basic 1000-event random access memory into which format is entered directly, controlling up to 20 audio sources. The system will random-access up to six multiscart machines, each of which can have its own memory for sequencing play. A small keyboard allows entry of all programming instructions, and controls playing the digital switcher allows for overlapping, fading, logging, as well as start and stop.

The Mark VII is somewhat similar in results: it also has a very compact keyboard for entry of cart identification into the memory, a CRT screen on which playing and upcoming sequence are shown through their digital designations.

A new unit for an even simpler—and less costly—kind of automation, somewhat like a number of others introduced in recent years, was the Model 100-A Programmer introduced by Microprobe Electronics. This will play, from up to six tape machines, up to 24 "events" in any chosen se-

quence, automatically. By adding two multi-cart machines in place of two of the open-reel machines, says Microprobe, the system becomes a mini-automation system, playing commercials within a five minute window at each break time, and providing about three hours of walk-away time, before the four open reel machines would need reloading.

A system with similar performance was shown by ESE, their ES780 series of RAM programmer-controllers. These will hold up to 32 events in memory, with entry by thumbwheel and pushbutton. Time for each event is entered. LED readouts show real time and next event time. When the start button is pushed the controller will automatically play each event at the specified time. Internal crystal oscillator, with battery back-up, supplies the time base. Prices are \$1200 to \$1500.

NAB SHOW-IN-PRINT

age; the Harris System 90, introduced last year but available in an improved version, with similar large event storage; the IGM/NTI 700 series, computer controlled, available for several years. All these systems will run the programming of a radio station just about totally for extended periods, (up to a week) handling the most complicated programming assignments, but allow "live" intervention at any time for announcements, DJ chatter, or changes in the program set up, right up to air time for any segment. They will do everything but answer the front door, and that could undoubtedly be programmed in with the addition of a few external relays, and an automatic telephone answering device. It would be a far simpler operation than many the systems do.

clocks, and an extensive line of these clocks from 5-in. to 16-in. in diameter, a number with self-illumination from circular fluorescent light. The master-clock-receiver in-cludes an internal crystal-controlled phase oscillator phase locked to a signal derived from WWV recep-tor. Outputs are: 1 pps on time, TTL pulse; 100 KHz, locked to WWV; serial time code. Sproke Engineering showed their MOS circuits. Included are day, month, and calendar clocks (showing day, month, hours, minutes, seconds). Crystal-controlled 1 MHz oscillator, or line frequency, is the reference. Standard output is computer compatible BCD-1248, serial by meter.

Audio miscellany

An interesting exhibit not classified in any preceding group: Key-Note Engineering Corp. showed their "In-ternet" system for automatic tele-voice polling and recording of the voters. A recorded message is de-coded to any phone dialed; the management automatically records the responses, which can be tabulated at use. The system has been used not only by broadcast stations, for audi-ence surveys, but also for political

Flash Technology's latest strobe antenna system for antenna towers was directed into the structure-filled top of the hall. Called the FTB-100, it puts out 200,000 or 100,000 pulses during the day, automatically at 20,000 at twilight and 4000 at night. A "hot tower" version is available. Installation and maintenance are simplified by having two low voltage towers, and no others, from controller to antenna.

Three firms had exhibits specially adapted to high-power electron tubes. One, an extremely alive old veteran on display their X2159 tetrode, 1.25 megawatt plate dissipation, megawatt output, and the X2170, a natural design with exactly half the ratings. They are naturally used in other countries, but furnish an impressive "top" for a rated Eimac line.

Tomson-CSF had a special booth to show the high-power tubes of the plus Klystrons that are heavily used in HF TV applications.

Radio Communications entered the scene as a distributor for professional iron tubes of all makers.

continued on page 102

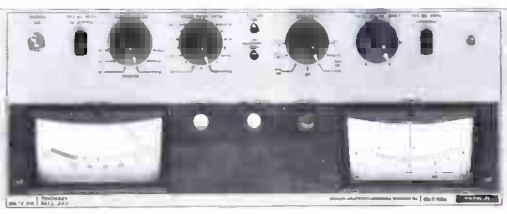
MC MARTIN announces LOW FM MONITOR PRICES

FM MODULATION TBM-3500B



with STEREO or SCA (TBM-2200A or TBM-2000B)\$2,625.00
with STEREO and SCA (TBM-2200A & TBM-2000B) 3,950.00
for "OFF-AIR" drive, add the LL-35B 180.00

FM MODULATION and FREQUENCY TBM-3700



with STEREO or SCA (TBM-2200A or TBM-2000B)\$2,810.00
with STEREO and SCA (TBM-2200A & TBM-2000B) 4,135.00
for "OFF-AIR" drive, add the TBM-2500C 533.50

McMartin

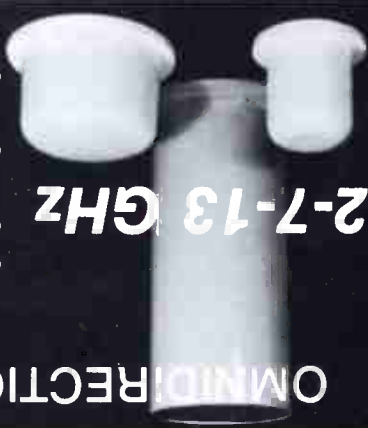
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OMNIDIRECTIONAL ANTENNAS

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- Usable for Transmitting or Receiving Applications

2-7-13 GHz



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These circularly polarized omnidirectional antennas are designed to be employed in either transmit or receive operations. Their gain is 6.0 dB referenced to a like polarized isotrope. Coverage is a full 360° in azimuth and 19° in elevation at the half-power level.

Now through the use of Nurad's circularly polarized antennas, multipath signals that cause "ghosting" or "smearing" are greatly reduced or eliminated entirely.

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NAB SHOW-IN-PRINT Testing—By Push-Button

Accuracy and versatility of broadcast test equipment have been rising year by year and so has the availability of automated and full-system testing. Marconi introduced a new one, the "television automatic monitoring equipment." It samples in rapid succession all the wanted parameters of a TV system while it is in operation, and not only reports "findings" at any remote location, but can be set for tolerance limits and will give warning if any tolerance is exceeded. The search for a faulty section of the transmitter is by push-button, with each section called "on the carpet" in turn. It can be interfaced with a computer for complete automation of testing and adjustment sequences.

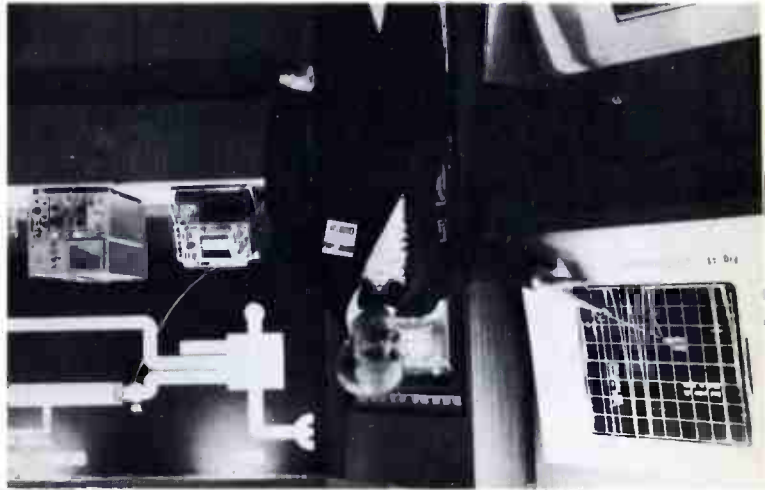
Tektronix showed a whole sweep of equipment for AM, FM, TV and audio testing, including their spectrum analyzers, wave form analyzers, vectorscopes, generators. A new item was the Model 1450 demodulator, aimed at the higher accuracy of the best current TV testing systems. It has a synchronous video detector, for no quadrature distortion of the video signal, zero carrier reference pulse, digital signal strength readout, audio monitoring, other advanced modes. Also new were the 1410 sync pulse and test generator, and the 1470 CCTV color sync and test generator.

Further, the Tektronix "Measurement Theatre," on a seven-show-a-day schedule, had Tektronix personnel demonstrating, successively, TV, RF, AM and FM proof of performance and maintenance measurements, with complete systems simulating broadcast stations set up. The "show" was SRO over and over, and the lively questions left no doubt that the subject matter had strong appeal.

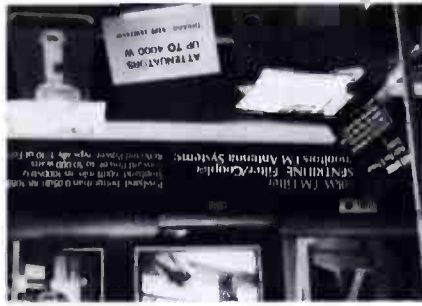
Several other firms brought new TV demodulators to make it a whole gen-



Dielectric had series of RF wattmeters, dummy loads.



"Instructor" discusses test in Tektronix "measurement theater."

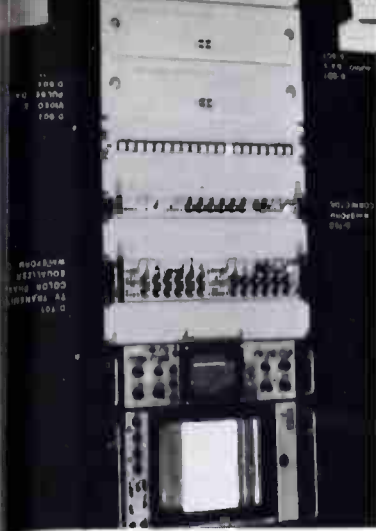


Bird showed FM filter couplers, RF wattmeters.

Datatek had video test, waveform correctors, color equalizer.



Sound Technology showed automated audio distortion test



Test equipment: Marconi, auto TV test, 292; Tektronix 1450 demodulator, 1410 generator, 293; Telemeter demodulators, syn detector, 294; Scientific Atlanta, 6250 demodulator, 295; Sound Technology 1710 audio test, 297; W.&G. ROR audio analyser, 298; R.&S. RF power meters, 299; Telcomex program-mable oscillator, 334; Tenti H12LS gauge, 335; Potomac FM71 field-strength meter, 336; Bird high-power RF wattmeters, water boots-ter, 337; Electro-impulse hi power loads, 338.

For more information on:

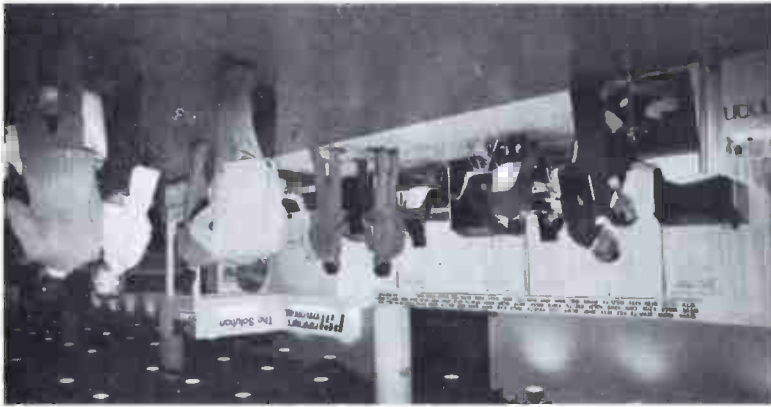
location computers, are sold outright. Base price for the Bar 1750 is about \$57,000. PSL also announced installation of a Bar 1500 system at WBEN, in Buffalo, which will interface with that station's AM and FM automation. So "total automation" is here in radio as well as in television.

Cox Data showed their new completely in-house system, which handles either radio or TV. They also demonstrated their interface to automated switching in the Grass Valley booth near theirs. Like the other automation suppliers, they were delighted with the response of broadcasters on the floor, and considered it the opening of another excellent year for the business.

TV simultaneously. Jefferson Data, which has specialized in automation systems tied by line to their large computers at headquarters in Charlotte, NC, is readying a new optional system with an "on location" mini-computer that does the whole job on the customer's premises. Called System 80, it has a 65 K processor, has CRT readout as well as printout, supports up to 8 input. Jefferson is also about ready with an interface system for connecting to either radio or tv automated switching.

Paperwork Systems brought a new-top-of-the-line system, Bar 1750, that roughly the same space that earlier systems took. PSI systems use on-

Paperwork Systems showed compact, on-location automation.



Potomac's new FM71 field-strength meter, like most of the new test units of its section of the art, and the same firm's SD21 frequency synthesizer, for bridge measurements of antenna impedance; Bird's new high-power RF wattmeters, continuing the long tradition of innovation by that company in RF power measurement.

A new unit in that firm's termination equipment is the Water Booster, which allows equipment to be operated safely on weak or intermittent water supplies. A very complete line of RF directional wattmeters was introduced by DiElectric of Sola Basic, along with RF loads for every power level, both dry and water cooled. Series 1000 wattmeters, for example, are portable instruments measuring forward and reflected RF power, with plug-in elements that provide ranges from 5 watts to 10 kW.

A third firm showing comprehensive equipment for RF power testing, with directional wattmeters and dummy loads, was Electro Impulse. Coaxial watercooled loads go to 80 kW; air-cooled AM loads are available to 400 kW, TV-FM to 75 kW.

Some other test units brought to the show: the Telcomex (distributed by McCurdy) programmable oscillator, with a sequence programmed and controlled by internal clock; Tentel's new tape-tension gauge, the Model H12L5, for Sony 2600 and 2800 series; Datarek had their series of TV test instruments, including units for measuring differential phase and gain, en-Barco U.S. of Los Angeles. Distribution will in the future be by R&S.

A great array of test units and systems, including automated TV test systems, introduced in earlier years. Among the new items this year: in-line RF power meters for the 1 GHz to 4 GHz band; new video noise meter; new video demodulators for waveform analyzers and other TV test systems. Added to their test line this year were the Barco picture monitors, made in Belgium and introduced in the U.S. last year by Barco U.S. of Los Angeles. Distributed in the future be by R&S.

Rohde and Schwarz, as always, had a great array of test units and systems, including automated TV test systems, introduced in earlier years. Among the new items this year: in-line RF power meters for the 1 GHz to 4 GHz band; new video noise meter; new video demodulators for waveform analyzers and other TV test systems. Added to their test line this year were the Barco picture monitors, made in Belgium and introduced in the U.S. last year by Barco U.S. of Los Angeles. Distributed in the future be by R&S.

the principal suppliers of broadcast automation for radio and TV stations were on the floor, and all reported the best industry response of recent years—Paperwork Systems, for example, said they sold all their "de-automated" off the floor and accumulated further orders as well.

Now, the advantages of automated data processing in the handling of sales, traffic, accounting etc, are generally known; the fresh trend is toward "total" automation, based on interface between the business and automated switching. This has been gathering force for several years as reported in BM/E and elsewhere, but has reached something like "total acceptance" on the evidence of 54th NAB, with every important player either doing it or preparing to. Data Communications Corporation demonstrated on the floor the interface of its BAS system with Vital, Central and TV switchers. Kaman Sciences teamed with their new BCS 1100 system, which can handle AM/FM and

Business Automation—Outstanding

at the detector output to provide a built-in ultra-low distortion generator; automatic nulling of the generator; stereo phase and level difference; return loss and impedance; and with optional accessories, many more.

automated audio distortion measuring instrument, Model 1710A. It has automatic tracking of the signal from built-in ultra-low distortion generator; automatic nulling of the generator; stereo phase and level difference; return loss and impedance; and with optional accessories, many more.

the measurement are about: all these operations are automatic; automatic calibration of button, and the measurement of accuracy of .002% of error, with no "twinking" of scope. A new option adds push-button intermodulation testing to the art. It would be hard to imagine a better approach to audio distortion measurement, in this case, to accuracy—the limits of the art.

of American Instruments (American Instrument of Wandel and Goltermann) designed another automated audio test system. Their ROR 300 Audio Analyzer system uses a special plug-in Tektronix Model 5103-D11 oscilloscope (no modifications), which sets with switches and pushbuttons for more than a dozen important tests that them: frequency response, with 16 resolution; transmission meas-

How to Measure Short Term Time-Base Error, Simply, Inexpensively

By Robert W. McAll

Timing errors that occur between sync pulses in a video signal have been largely ignored, both in measurement and in correction. With a reliable, inexpensive measurement technique apparently worked out, we can't avoid the second problem: How are we going to correct the error?

A 1971 NAB Subcommittee report mentions that in typical network remotes as many as six proc amps can be in the circuit on a remote feed. It also states that, "It is evident that four processing amplifiers are used on a typical network feed by the time the signal reaches the station transmitter. . . . The report goes on to indicate that proc amps add jitter (time base error) to the sync of an incoming signal only, to the detriment of recording and subsequent playback.

The point is that in a modern TV plant quite often the sync/luminance/chrominance/burst are separated from each other, either separately or in groups, processed for some legitimate reason, and subsequently put back together again. It is immediately obvious that if time base error (jitter) is added to just a portion of the signal and then the signal is recombined, a "burned in distortion" is created that is very difficult to correct.

An example is the VTR, in which the playback is error-corrected on the assumption that sync edges represent the true time base error of the picture. They do not necessarily do so. They do represent the error introduced by the recorder, however. The time-base-corrected picture with the VTR's error added to incoming error now enters the output proc amp of the VTR. Here new, stable, plant pulses are added, more or less successfully. Thus, with one pass we have burned in time base error of a kind which up to now has been almost impossible, or very expensive, to measure. Moreover, with these processing techniques in use, time base error of this kind is additive.

There are numerous other examples. A technique is needed that will measure the time base error of sync/luminance/chrominance/burst separately without reference to each other. Such a technique should take advantage of equipment already found in a broadcast facility, be accurate, repeatable, and easy to make on a routine basis.

A faintly remembered fact about the color bar signal

Have you ever wondered what the "Bow Tie" shaped trace is at the center of the color bar on the vector display? Actually, there are several "Bow Ties". One is caused by the harmonic of the edges of sync which lie at

Mr. McCall is Northeastern Regional Manager for Vital Industries, Inc. He is also chairman of EIA Sub-committee TR4.4.1, which is revising the RS170 standard for color.

3.58 MHz. (See Fig. 1.) The vectorscope unblanks after

the leading edge of sync has passed, so only the trailing-edge "Bow Tie" is seen. It occurs just prior to burst so that burst tends to "modify" it and make it less visible. The timing angle of burst with respect to that edge of sync determines the angular position of the "Bow Tie".

The second "Bow Tie" occurs later in time than burst and is caused by the leading edge of the first (grey) bar. In other words, it is caused by picture related luminance. (See Fig. 1.)*

The last elements or sections of the signal can be broken into two parts; namely burst and chrominance. These are represented on the vectorscope by the burst vector and the various six-bar vectors. Thus, the vector display presents, at one time, all four parts of the television signal, sync/luminance/chrominance/burst.

The next thing we realize is that any short-term angular rotation of the vector display, or any portion of it, represents jitter (time base error) over the period of time you are viewing it, provided that the subcarrier you are using to demodulate the encoded signal is stable and itself has no jitter!

The action of the vectorscope is to demodulate the TV signal on a radial time display somewhat like a revolving weather radar. The vectorscope display is a radial time base in that it displays the electrical signal behavior of 360° of modulation information in 279 ns. In other words, 279 ns/360° = 0.77 ns/deg. Or, rounded off, 0.8 ns/deg. There is a one-to-one relationship between jitter on sync/luminance and jitter on their harmonics.

Since that is the case, then any angular rotation of the "Bow Ties", or burst, or the vectors, represents jitter (time base error) of the affected part with respect to the external subcarrier supplied to the vectorscope. Thus the accuracy of the vectorscope is not a consideration here. We are only making a relative measurement.

A word is in order to explain further the behavior of "Bow Ties". The amplitude of the "Bow Ties" is a direct function of the sync/luminance amplitude. The larger the sync/amplitude the larger the peak-to-peak amplitude on the vector display. The "breadthness" (the side-to-side width in degrees) is an inverse function of the risetime. That is, the faster the risetime the smaller the "breadthness" of the "Bow Tie". The "Bow Tie" is

*To see the Bow Tie from the leading edge of sync it is necessary to delay the video in to the vectorscope (externally synced). This will overcome the inherent unblanking delay. Be careful, however; too much delay will allow the vectorscope clamps to clamp on the front porch rather than the sync tip. continued on page 10

WHAT IS DUCA- RICHARDSON

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independently controlled MIXES OR WIPES, in the background. INLINE KEYS added to the buses give you a tilting capability BEHIND the chroma key so that title keys can be wiped or mixed as transitions are made from bus to bus. Bilevel techniques eliminate the halos and edge noise and allows you to chroma key on very thin shadows. You can do INSERT KEYING from any source (PW Bus, B Bus, or External) and these can be bordered in the DOWNSTREAM KEYS. You can adjust borderline luminance from black to white, and outlines can be COLORED in the outline mode. SOFT COLORED BORDERS are also possible. You can independently adjust width, softness and color of pattern borders, to give you colored borders which can vary from wide to narrow and soft to sharp in any combination. With features like these it's easy to understand why Duca-Richardson is the most advanced company of its kind in the industry today. They produce the kind of extraordinary switching systems, custom and standard, that professionals search for... and at prices that make sense. For specifications, quotations and delivery dates, call Duca-Richardson Corp. today at (303) 697-9202 or write: P.O. Box 2469, Evergreen, Colo. 80439.



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You may not know all the problems common-mode ground loop can cause - especially when using your video equipment in an unfamiliar remote location. With your video equipment connected to one AC power source and your camera connected to another, you can get common-mode ground loop hum that tears up video signals. Dangerous voltage potentials due to faulty AC power distribution can damage equipment and be hazardous to personnel.
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TIME ERRORS



Fig. 1 Expanded center of color bar showing "Bow Tie" leading edge of grey bar (No. 1) and modified "Bow Tie" sync (No. 2). Note absence of jitter both with respect to other and also over the two-field period of the exposure.



Fig. 2 Expanded center of color bar. One (1) line of 521 half of "Bow Tie" from Grey Bar (luminance) and half of B half of "Bow Tie" from Grey Bar (luminance) and half of B line integrated 15 times. Note stability is excellent of all components (burst, sync, luminance).

a symmetrical figure 8 because the NTSC subcarrier phase alternates every line. Although the harmonic sync/luminance is always in the same direction, vector display inverts this harmonic's apparent every line, thereby creating the figure 8. (See Fig. 8. We should mention the period of time over which measurement is made. The vector scope normally blanks for two fields and therefore presents the positive addition of all 525 lines. However, it is possible to use the line strobe output from a waveform monitor to control the unblanking of the vector scope (be sure consult the vector scope manual for the unblanking mod.). In this manner, it is possible to look at the behavior of 1, 2 or 15 lines of video. The last (15) should be of help when looking at waveform performance. It is apparent that by measuring the peak-to-peak angular deviation of the various elements of a color

MAY, 1976

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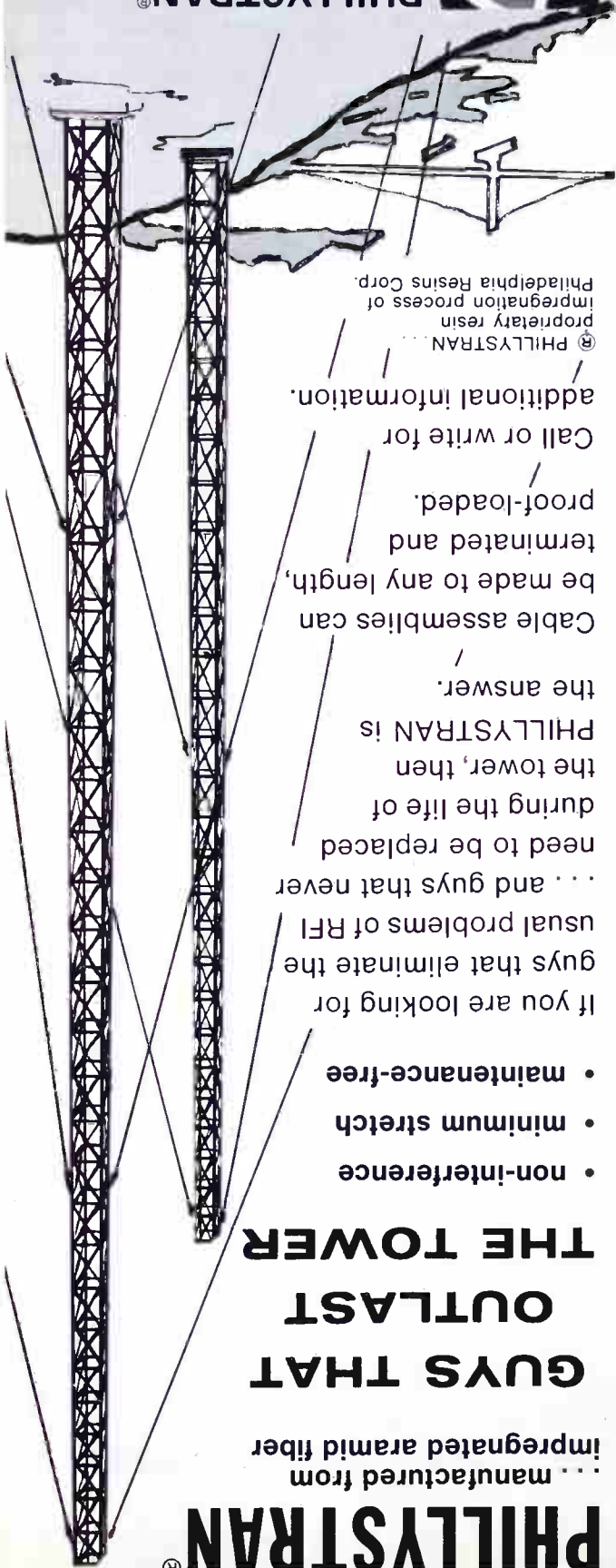
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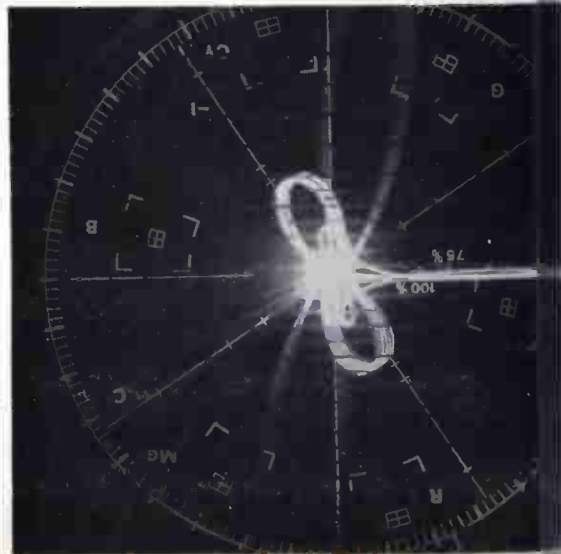
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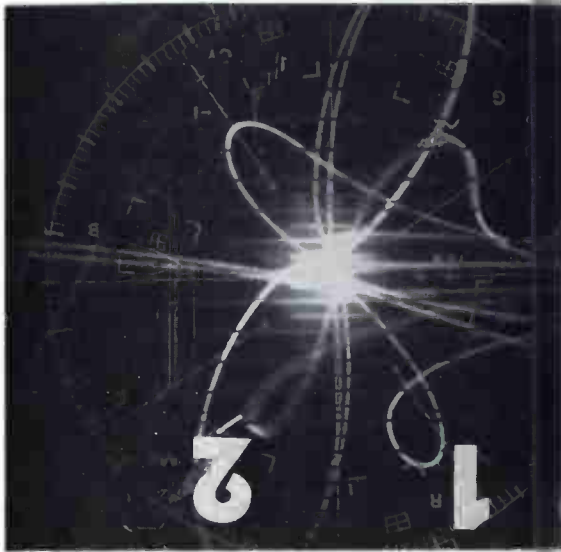


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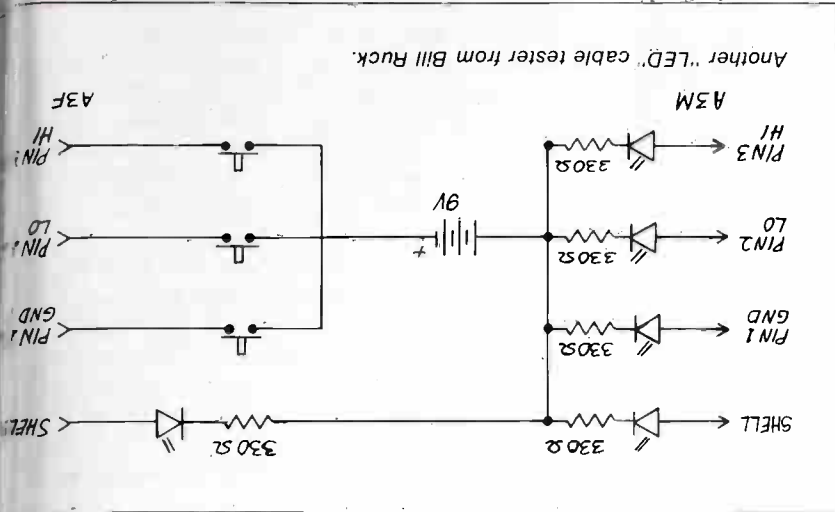


The color lock of test signal generator (pulse and bar). First lock is jitter free while approximately 3 degrees of present on the luminance harmonic. There is negligible sync "Bow Tie." 3 degrees of jitter is approximately



Multiple exposure of a color bar signal before and after though a proc amp. Note: No. 1 is sync incoming 2.4 is sync outgoing—3 degrees or approximately 2.4 Subsequent recording and playback results in jitter added to the picture with jitter free sync added

When demodulated against external, stable, sub- that it is possible to draw accurate repeatable ions about the short-term time base stability of ous parts of the TV signal with respect to each The measurement may be stated in so many of subcarrier or converted directly to ns by ying by 0.8 (an approximation obtained by round- 0.774 ns/deg. at subcarrier). Therefore, the sensitivity of the technique is more equate. When using several fields for unblanking. technique holds up well in severe signal to noise ements. Previous techniques utilized (using the on voltage of a T.B.C.) were limited to 4 ns on and were expensive. This technique takes ad- of equipment normally found in a broadcast BM/E



Problem: To devise a cable checker that will show continuity or shorts between the three pins of a mike connector, and the shell as well.

Solution: With the circuit as shown you can tell whether or not the shell is connected to any of the three pins, and if so, which pin is connected to which shell in addition to the usual continuity checks.

You will have to make sure that both connectors are insulated from the chassis, or use cable connectors and four conductor cable. Switchcraft A3F

Bill Ruck, CE, KUSF Radio, San Francisco, Calif.

6. Cable Short And Open Identifier.

Problem: To provide ready access to common-point current and phase formation.

Solution: For the last several years have been recommending that distant A.M. stations replacing their antenna monitors order their new antenna monitors with one extra R.F. input beyond number of towers in their system with which to sample and monitor common point. A simple but effective loop, such as a toroid loop, may be located at the common point at short length of RG-58 cable from it to the extra monitor input. provides continuous sampling of common point current that is conveniently and smoothly integrated into remote control metering system remote common point current requirement. The common point simply considered to be an antenna. It is also useful as a "tower". Observing the phase angle of common point current as well as magnitude, troubles with any tower may be located quickly. The common point loop may be used to temporarily replace the remote tower input to the monitor when the ratios and phase of all towers may be read with respect to the common point. The greatest departure from normal ratio and/or phase angle shows up, but the corresponding LED will light up, and if any wrong LED will light up, the corresponding shell LED will light up, and if any pin is shorted to the shell, the corresponding shell LED will light up, identifying both the pin that is shorted and which end of the cable has the short to the shell.

The entire circuit can be contained within a small hand held box, and a standard 9 volt transistor radio battery provides power.

If the cable is wired so that the shells are not connected to any of the pins, the two shell LEDs will not light up, but the corresponding LED will. If the cable is not wired properly, the wrong LED will light up, and if any pin is shorted to the shell, the corresponding shell LED will light up, identifying both the pin that is shorted and which end of the cable has the short to the shell.

You asked for it! The 1976 Great Idea Contest is underway. Vote for the idea that impresses you most on the Reader Service Card. Enter your own Great Ideas. (See April, p. 58 for rules.)

GREAT IDEA CONTEST

7. Reading Antenna Common-point Data.

Frank S. Colligan, A.D. Ring Assocs., Washington, D.C.

RCA



RCA power tubes are at work now in new-generation color transmitters. Proving their value with an excellent combination of high gain, high linearity, plus long operating life. Documented long life. In the table, you can see actual operating

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Up to 17.5 kW Type 8807 Visual service	16,600 hrs. 29,800 hrs. 30,100 hrs.
Up to 27.5 kW Type 8916 Visual service	9,778 hrs. 7,875 hrs. 10,799 hrs.
21,329 hrs. 19,200 hrs. 14,000 hrs.	18,300 hrs. 21,200 hrs. 20,400 hrs.
9,776 hrs. 13,183 hrs.	

* Serial numbers and tube type data available on request

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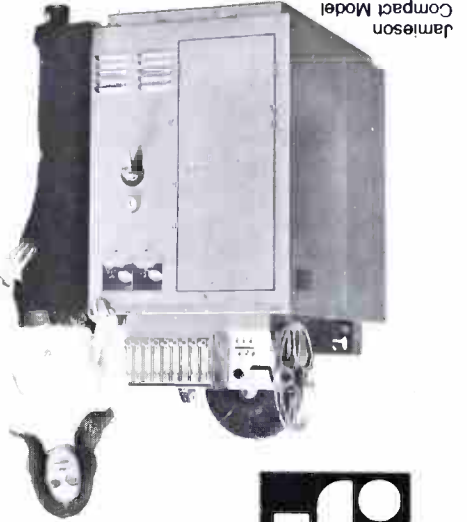
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Jamieson No. 1 in TV!



Problem: To utilize the TV station identification segment as a service to the public, as well as to satisfy FCC requirements.

Solution: The TV station normally consists of from two to four programming segments, one of which is the identification of the station. After pondering what might be done

WIN A CALCULATOR, ENTER YOUR GREAT IDEA NOW.

The play VTR should be stopped first. Push stop and manually reduce the take up tension until the arms activate the stop circuit.
In addition to the delay, many unusual effects can be created by mixing the playback machine with the record input.

Problem: To provide a videotape delay for live programming.

Solution: The AVR-2 provided the solution with it's excellent tape tension throughout a 64-minute reel with the set-up shown in the drawing. If any tracking problems occur, the TBC maintains perfect sync. The Ampex 1200 was also tried but often caused tracking errors due to uneven tape path tension.

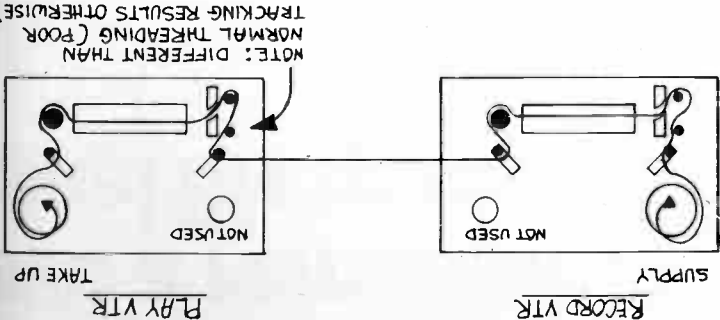
The first playback roller should be bypassed. A common start such as that used in dubbing should also be used.

9. Public Info Added to

George Grubbs, Production Manager, KNOE-TV, Monroe, Louisiana

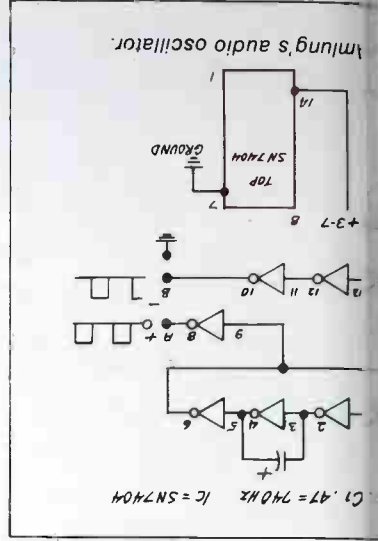
8. Videotape Delay.

"sour tower" on arrays with mysteriously drifting parameters, one case being that of an electrically broken Johnny ball insulator at the tower and another where the FM coax isolation hardware had broken loose to an unstable condition due to weather's wear and tear over a period of time.
Specifying an extra input on a newly ordered antenna monitor is well worth the investment.



Szabak's videotape delay system.

GREAT IDEAS



Problem: To design an extremely inexpensive audio oscillator.

Very Inexpensive ID Oscillator.

the ID more effective and functional. I came up with the idea of providing a public service to the viewing audience by incorporating the correct temperature, and a special event for the station identification. E-TV began this practice in January, 1971, and as far as can be determined, we were the first station to use of this technique.

The set-up includes a digital readout, a digital readout temperature unit, and hot press supers of special units are fitted into a plywood enclosure, with appropriate openings, and a slot for sliding in the speaker, and a slot for sliding in the speaker. The entire unit is faced with a black mask for keying. The message is lighted by an external fixture. A single black and white camera is used to key the set-up over the ID slide.

Specialty edited and produced three, and 10 second, and one minute cartridge tapes supply the audio portion of the ID instead of the usual tapes were produced and are recorded monthly.

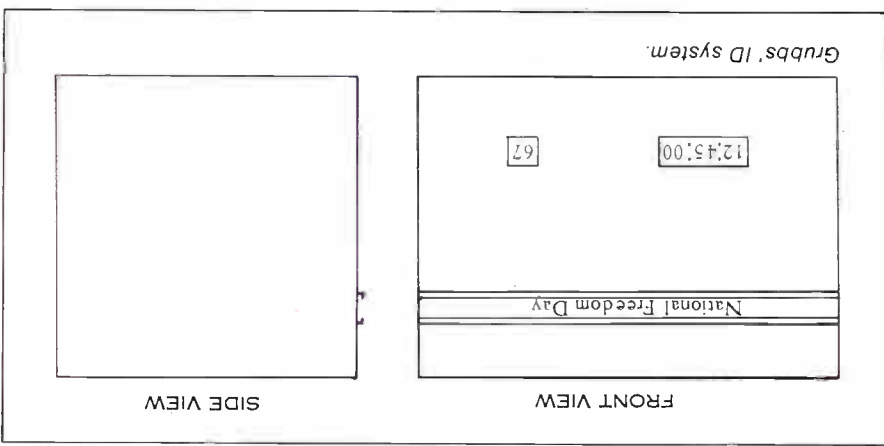
The station ID concept has had tremendous audience response over the years. We have also been flat-tapping us about our station ID. Local and regional stations adopted a similar ID. In the last few years, we have noticed that electronic companies have developed a similar to ours, which can be used by TV stations.

Solution: Here is my answer. It has a wide range, about 1 Hz—15 Hz—15 MHz. It's the ideal super-compact oscillator with only three parts including the battery. Output is between A and ground (positive) or B and ground (negative). Voltage for power is 3—7 volts dc at 10 Ma.

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Objective or Problem: (in few words; use separate sheet for details) _____
Solution: (Use separate sheet—500 words max) _____
I assert that, to the best of my knowledge, the idea submitted is original with this station; and I hereby give BM/E permission to publish the material.
Signed _____ Date _____

1976
Entry Form



Example of KNOE-TV public service ID.



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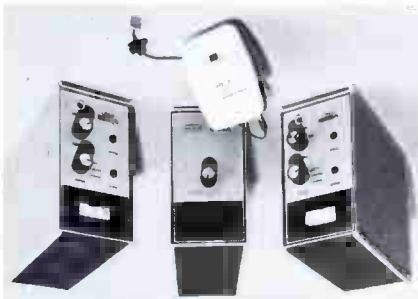
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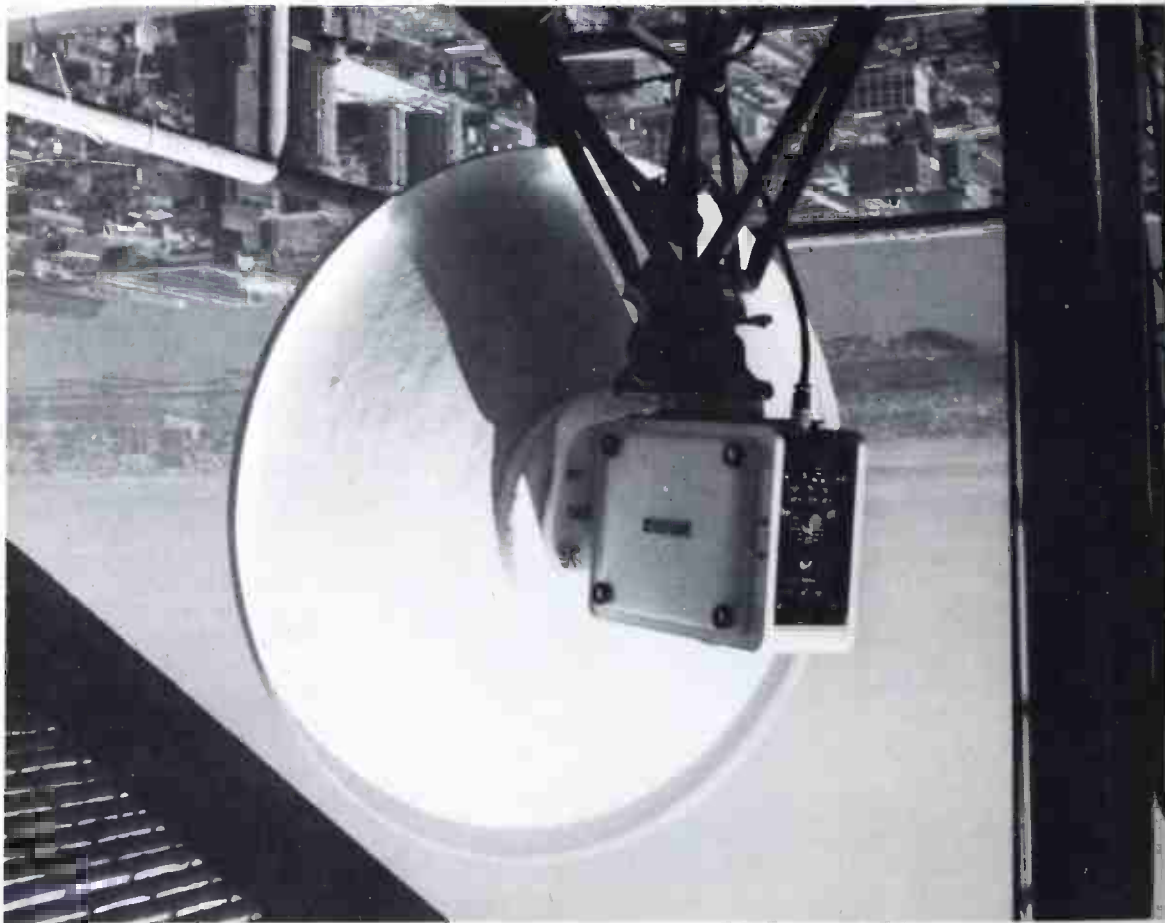
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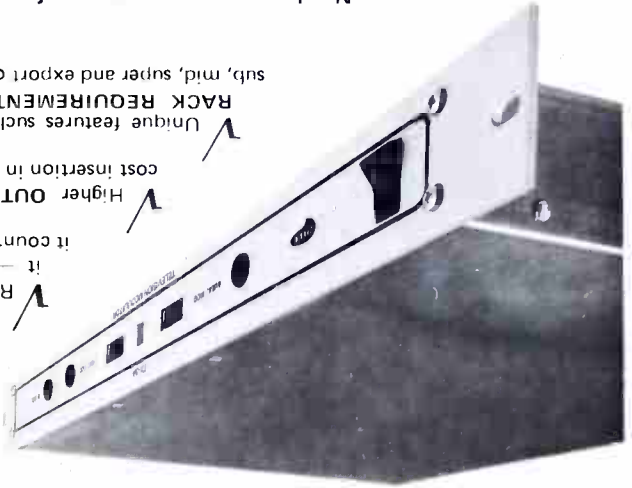
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- ✓ Higher OUTPUT LEVELS — +48 dBmV — enough to permit minimum cost insertion in many broadband systems.
- ✓ Unique features such as TWO LEVEL METERS — REMOTE KEYING — MINIMUM RACK REQUIREMENTS (1 1/2 inches) — ALL CHANNEL AVAILABILITY include sub, mid, super and export channels — plus DYNAIR RELIABILITY.
- ✓ It's video modulator is a QUADRANT MULTIPLIER which makes for better stability — better unit to unit consistency — better linearity at high modulation levels for superior color performance.
- ✓ Real AUDIO STABILITY keeps the sound where you want it — undistorted — all day — all night at the TV receiver where it counts — not just on the specification sheet.
- ✓ Higher OUTPUT LEVELS — +48 dBmV — enough to permit minimum cost insertion in many broadband systems.
- ✓ Unique features such as TWO LEVEL METERS — REMOTE KEYING — MINIMUM RACK REQUIREMENTS (1 1/2 inches) — ALL CHANNEL AVAILABILITY include sub, mid, super and export channels — plus DYNAIR RELIABILITY.



What makes the DYNAIR TX-3A the OUTSTANDING MATV modulator?

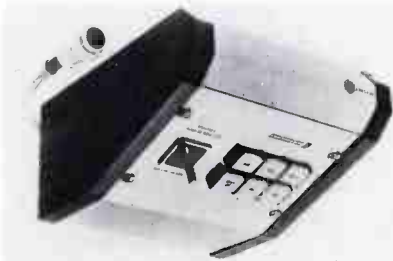
with automated mixdown equipment and electronic music synthesizers. Available in 8, 12, 16, 20, and 24 input channel formats, expandable as desired. RICHMOND SOUND DESIGN, LTD.

10-Meter Polar-Mounted video earth terminal is designed to receive video transmissions from any domestic satellite. The terminal features 50 dB gain, all-aluminum construction, plus the ability to change rapidly from one satellite to another. The antenna is available either alone or as part of a complete system. RF SYSTEMS, INC. 304

Modular broadcast color television camera, the BCC-1, was introduced last May at Montreux, Switzerland and was shown for the first time in the U.S. at this year's NAB convention. The head housing of the BCC-1 provides assembly, disassembly, and transport of the camera for use on location. The optical assembly is suspended on a single front casting, uses a hook-on lens mount with one-point suspension to permit quick lens change. A five-position filter wheel is sealed in the light-proof assembly. The tiltable viewfinder can be detached or rotated to either side during maintenance.

capability is up to five times normal speed. The SM-2 also provides cue capability programmable from 1 to 10 seconds, and full transport controls, including fast forward, rewind, stop and play. \$1,600. CONVERGENCE CORP. 306

Tone encoder, Model 501-A, measures 1 1/2-in. x 1-in. wide x 1/2-in. high. The frequency range is 20 Hz to 3,000 Hz; stability is $\pm 0.5\%$ over a temperature range of -40°C to 100°C . Output is adjustable to 2.5 V rms.



enance. A return viewfinder feed enables the operator to view the same picture as that of the director. Prices for the BCC-1 range from \$70,000 to \$107,000 depending on accessories. AMPLEX CORP. 305

VTR editing module, the Model SM-2, is designed for use with VTR's such as the Sony VO-2850, VO-2800, BVU-200 and the JVC 8300. Search

ALPHA ELECTRONIC SERVICES, INC.

Oil vapor removal filter for the rarification of compressed air removes smoke, oil aerosol, particles (as small as 0.01μ , nominal) and condensation. Free air flow is 45 cfm at 100 psi and working pressure is 100. Designed for a remote mount on tubing or hose, and it has a 1/4-in. inlet and outlet. Overall size is 5 (dia.) x 6-in. high. MOTOR GU CORP.

Film processors, one for the Model process and the other for the VNF process, are designated the Model (ME-4/VNF process) and model (ME-4/VNF process only). Each requires less than 20 sq. ft. of space. Film speed is 17 ft./min HOUSTON PHOTO PRODUCTS, INC.

Zoom lens for 1-in. and 1/2 C-mount vidicon cameras. Model V6x18-f.6, has a speed of f throughout the zoom range, a length of 18 mm at wide angle, 108 mm at telephoto. The lens has proper exit pupil for use with the Trinicon series models DXC-11, DXC-1200 and SXC-1600. manual version is \$775; a cable version is \$1,375. CANON, U. INC.

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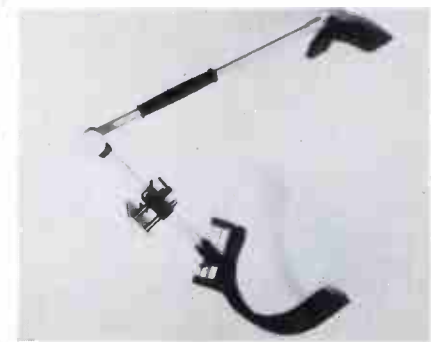
Model 375, \$690.

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PRODUCTS

cameras, the Model MSP-75, weighs three pounds. Three adjustments suit it



to the cameraman's body, plus two other adjustments align it to his eye. \$180. VIDEO COMPONENTS, INC. 312

Conductive heat-shrinkable polyolefin tubing and molded shapes are alternatives to metal braid and connector backshell braid adapters. They provide lightweight, flexible EMI/RFI shielding and strain relief for cables.



connector terminations and coax splices. Called Cho-Shrink, the materials are coated with a silver-based resin which contacts the polyolefin without cracking. Typical shielding: 50 dB @ 100 MHz. Tubing is available in diameters of 1/4-in. to 4-in. It shrinks to half its original diameter.

Digital time base corrector, the CVS 520, is designed to handle segmented VTR's and signals from non-



segmented machines. Specifications include: signal-to-noise greater than 60 dB; differential phase less than 2%; differential gain less than 2%. The active video portion of the last 8 lines of vertical blanking may be individually selected to pass vit, vit, and other test signals. CONSOLIDATED VIDEO continued on page 116



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2002	BH 2003	2052	BH 2003
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Northronics		Northronics	
Bean		Bean	
P/N		P/N	
2051		5701	
2057		5703	
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3003		5001	
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rope having a minimum breaking strength of 6,000 lbs. Lifeline is threaded onto the rope and, once attached to the worker's safety belt, allows free vertical movement during normal working conditions. It travels up and down freely without manual adjustment and meets OSHA require-



Automatic lifeline safety system, Model 6006, consists of a safety lifeline and 1/2-in. dia. three-strand nylon

SYSTEMS, INC. 313

PRODUCTS

Telephone line equalizer, the Model 133, uses a 25 dB gain-regulating amplifier to compensate for flat line loss. The basic frequency response is from 10 Hz to 70 kHz. Impedance is 135 ohms. Balance and impulse noise is specified at 20 hits in a 10 minute period with a threshold of 54 dBRN from 40 Hz to 50 kHz bandwidth. TM

316
Film-sound console, the AVEX-1, is a self-contained, 4-ft., film/sound production facility. Some of the con-

naughyde. Available in two versions: Model IL255 is for CP-16R cameras, Model IL134 is for CP-16. Both versions permit access to camera controls. \$74 each. CINEMA PRODUCTS CORP. 315



Rain covers for CP-16 reflex and non-reflex cameras are made of

ments. RESEARCH & TRADING CORP. 314

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On the Air

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RF peak wattmeters, the Model 4314, a directional peak & cw instrument, costs \$395, down from \$475. Frequency and power ranges 0.45 to 2.3 GHz from 1 watt to 101 depending on the plug-in element selected. BIRD ELECTRONIC CORP. 315

Standard models are available with 3-, and 4-track master recorder. 135 mm. MULTI-TRACK MAGNET INC.

sole capabilities are direct tape or 35 mm, work track preparation, fingertip control pick-up record

Standard models are available with 3-, and 4-track master recorder. 135 mm. MULTI-TRACK MAGNET INC.

ENTER GREAT IDEAS CONTEST, PAGE 111

entatives for certain Setchell
on Video products. Town-
Associates, a Massachusetts
manufacturer of TV transmitting
equipment, has announced a licensing
agreement with NERA A/S, a Norwe-
gian company which has been produc-
ing transmission equipment for the
international market since 1960.
agreement has been reached be-
tween RCA Corp. and GTE Sylvania,
for the sale of machinery, parts,
materials, work in process and
technical data related to the manu-
facture of Nuvistors and certain other
vacuum tubes that were produced at
the CA plant in Harrison, N.J. As a
result of this understanding, the plant
will be closed last April 30. An
agreement to acquire Corotek Corp. of
San Grove, Calif. for cash of an
undisclosed amount was announced by
Basic Industries.

A firm that produces mus-
ic and TV advertising, and film
production has been acquired by R.
Lawrence, founder of Can-
niple Productions.

The N.Y. CATV system has been
acquired by Silver
Broadcast Electronics, Inc., Silver
Spring, Md. as its representative
of Neff Communications of

ment nationally System Concepts,
a group of manufacturers
including in program automation
es. Bird Electronic Corp.
announced the establishment of a
national sales office for the Eastern
at 800 Olde Hickory Road, Lan-
Pa. 17601; 717-569-0467.

S Radio announced that on
the 1st WITH Radio, Baltimore,
and WKHM Radio, Jackson,
became Network affiliates.

Video Group, Inc. of Detroit has
changed its name to Videogroup.
less Music of Arkansas, Inc.,
now offers MUZAK EMER-
CY WARNING SYSTEM
(WS) as part of its 24-hour service
President Vincent T. Wasilewski
led to the Radio Board of Direc-
of the National Association of
casters recently a multifaceted
am designed to provide additional
es for its radio members. One
aid to radio is the promotion of
les T. Jones Jr., to the newly
ed post of Vice President for
o Affairs. Two IVC 9000

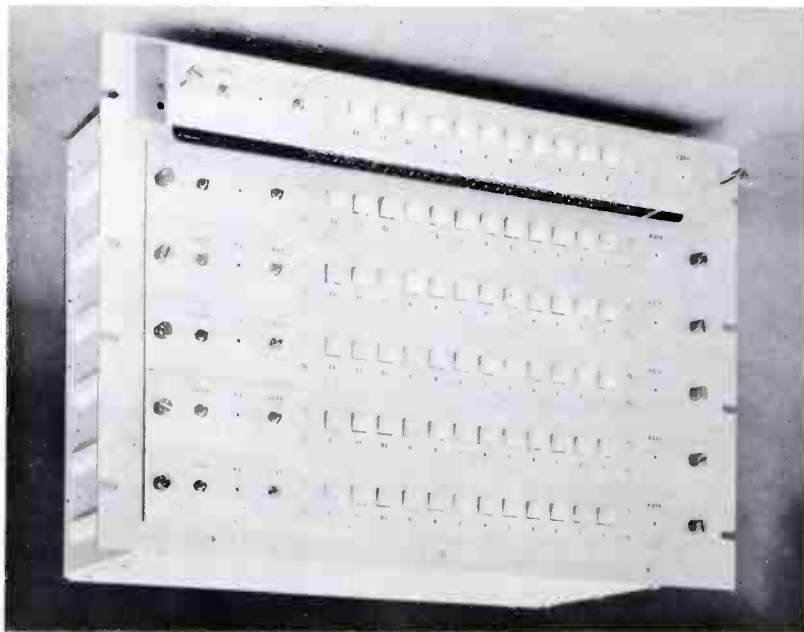
ed to MCA Disco-Vision Inc.,
continued on page 118

Routing Switcher

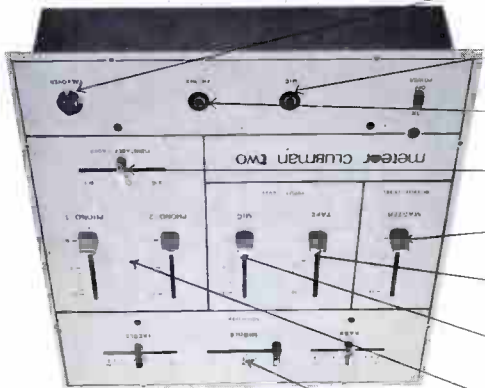
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NEWS

Torrance, CA and will be used to transfer videotape copies of movie films to Disco-Vision discs. With the delivery of the MCA recorders, IVC has produced over 100 9000 recorders. . . . Station KNTV, San Jose, Calif., has acquired two ACR 25 video cassette recorders. . . . New York State Assemblyman Jose E. Serrano has sponsored legislative action resulting in the appropriation of \$50,000 to the New York State Commission on Cable Television for the development of the South Bronx Media Access Center. . . . Construction has commenced on a new CATV system on Saipan in the Mariana Islands, which is soon to become a U.S. Commonwealth. Continental Electronics Mfg. Co., of Dallas has been awarded a \$3,305,551 contract from General Electric Co. for the design and manufacture of radar transmitters and related equipment for use in an Over-The-Horizon Prototype Radar System (PRS). A \$1.6 million contract has been awarded CCA Electronics by the U.S. Army Corps of Engineers for the installation and one year maintenance of a multichannel radio network in Saudi Arabia. . . . Magnetic Components Ltd. has received world-wide orders for over \$600,000 for cassette-

Meetings

A new company, EAGLE Com-Tronics, has been formed to supply electronic products to the CATV industry. For more information contact A.F. Tressness, EAGLE Com-Tronics, 8016 Chatham Dr., Manlius, NY 13101; 315-682-2650. . . . Television Technology Corp. has moved to 5970 W. 60th Ave., Arvada, CO 80003; 303-423-1652 from Maryland. . . . The definitive agreement to merge Rixson-Firemark, Inc. into a subsidiary of Contrac Corp. has been authorized by the boards of directors of both companies and will be submitted to their shareholders. . . . Dropped digit correction: 44 Fernseh KCU cameras were used at Winter Olympics, not 4 as stated in caption on pg 38, April BM/E. Dr. Robert P. Fina, Kutztown State College, Kutztown, Pa. 19530 details. Imroto Fiorentino Associates has announced that its television lighting & staging seminar/workshop will be held June 7-9 at the Univ. of Wisconsin's new Telcommunication Center, Madison, Wisconsin. For further information contact the Education Div. of the company at 212-787-3050. . . . An intensive, full-time, five-week Film Production Workshop will be offered at New York University's School of Continuing Education starting Monday, June 28. All materials, laboratory services and instructions are included. The 19th Annual Motion Picture Laboratories Seminar will be held July 1 and 24 at Memphis State University and Memphis Tenn. For further information write MPL Seminar, B. 1758, Memphis, Tenn. 38101. . . . IFSA, the International Scientific Film Assoc., will hold its 30th annual congress and festival from August through 14 in conjunction with SCOM '76 in Philadelphia. For further information contact SCI/COM, University City Science Center, 36 Market St., Philadelphia, Pa. 19101. The fourth annual Midwest Seminar on Videotape and Film will be held October 8 and 9 in Chicago.

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1975 Annual Report, Cox casting reports revenues of \$46,028, a 10% increase over its income before taxes was \$28,902, a 8% increase over 1974. The company's net income was \$14,490, a 12% increase over the six month period that ended November 30, 1975 with net earnings of \$1,195,000 or \$2 per share on total sales of \$12,000 for the fourth quarter of 1975. **Fairchild Industries** has reported that its financial results for the third quarter and the year ended October 31, 1975 showed fourth quarter earnings were \$1,195,000 or \$2 per share on sales of \$56,570,000. **B/CECO Industries** has reported both increased revenues and earnings for the six month period that ended November 30, 1975 with net earnings of \$3,198,000 or \$1.70 per share on sales of \$218,538,000. This compares with earnings of \$6,022,000 or \$2 per share on total sales of \$92,000 in 1974. **Western Industries** has reported the highest net earnings for any six months in its history for the second quarter ended January 31, 1975. Net earnings for the six months ended by 45% to \$92.8 million from \$32.7 million in fiscal 1976 advanced by 43% to \$47.2 million recorded last year. **Standard** has announced audited financial results of 1975. Sales for the nine months ended October 31 were \$25,923,124 compared to \$24,760,250 in 1974, net earnings of \$808,000 compared to \$1,000 the previous year, dividends declared were \$.15 compared to \$.135 in 1974. **prompter Corp.** has reported 1975 revenues increased to \$848,000 from \$86,809,000 in an improvement of 39,000 or 17%; the corporation's sales declined to \$4,387,000 in 1975

Financial Briefs

Wometco Enterprises reports that from \$7,335,000 in 1974, to \$180,677,000 compared to \$160,871,000 in 1974 an increase of 12.4%, and net income was \$11,615,000 compared to \$9,007,000 in 1974 an increase of 28.9%. The Zenith Radio Corp. Annual Report 1975 shows net sales of \$901 million compared to \$911 in 1974, income before taxes of \$45 million compared to \$15 million in 1974, income taxes of \$19 million compared to \$5 million in 1974, and a net income of \$31 million compared to \$11 million in 1974.

People

The Board of Directors of Multionics Inc. has announced the election of **John F. Watter** to the office of President. **Neal P. Monda** has been elected Vice-President and General Manager of Q.E.I. Inc. **Nat C. Myers, Jr.**, has joined Goldmark Communications Corp. as Vice President. **Thomas J. Brady** has been named Vice-President, Finance for RCA Global Communications. **John M. Seavey** has been named Vice-President of Engineering for RF Systems Inc. **Brian Madley** has joined Micro Consultants, Inc. as Vice-President of Engineering and Chief Technical Officer and **George Grasso**, formerly Marketing Vice President of CEI, has joined the company as Vice-President of Marketing. **Louis A. Arpino** has been appointed Vice-President and General Manager of the Rhode Island Div. of Ampetex Electronic Corp. **GTE** of Pennsylvania has announced that **J. Clayton Stephens** has been appointed Western Regional Vice President-Marketing and that **James A. Roden** has been appointed Marketing Manager-Zenith Radio Corp. has promoted **James A. Stark** to Executive Director, Purchasing. **Bill Mansfield**, a Datatron founder, has resigned as a full time employee to join Electro Units, Inc., a San Jose based start-up company. **Mansfield** will remain a Datatron Director and Consultant. **David L. "Les" Werschker** has been named to head Image Trans-form's new United Kingdom-Europe operation. **Scientific Atlanta** has appointed **Joseph O'Connor** as Manager of its Optima Division and has appointed **John Edwards** to the newly-created post of Director of Administration and Operations. **John H. McGuire** has been promoted to Director of Minicomputer Services (continued on page 120)

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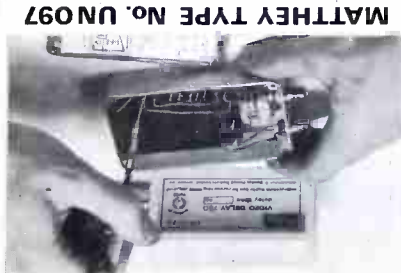
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Tidy Up Your SWITCHERS

continued on p. 52

Hauenstein, Vice President and General Manager of Radio Station KDMesa, Ariz., has been named Program Chairperson for NRBA's National Broadcasters Conference & position.

Former Senator **Sam J. Ervin**, of North Carolina was the first recipient of the NAB's annual Cobb Memorial Award at this year's convention for his work in improving broadcasting's relationship with the federal government. **Sam Da** for a CBS Radio Mystery The script, and **Norman Morris** and **Minor**, for "The American heritage," have been named winners in the 1975 Writers Guild of America Annual Script Awards competition. The NCTA has presented **V. Schneider** with the Robert H. Vissinger Memorial Award for total involvement and commitment in the CATV industry and **Richard Hickman** of Cox Cable Communications, and **Archer S. Taylor**, an engineering consultant, have been named recipients of the Technical Achievement Awards. The American Society of Lighting Directors received presented Gold Honor Awards honorary memberships to GTE vania Inc. and three of its executives. **Melvin H. Moehrting**, **Thomas Holland** and **Dr. Robert E. Levy** **Kenneth V. Jaeggi** has been moved to the position of Director of Manufacturing/Material Financial Control, at Zenith Radio Corp. **Dr. Wesley H. Weisenberger** joined Communications Trans Corp. as Manager of Research and development. **Sola Basic Industries** has announced that **Glenn E. R** will head the Electronics and Communications Group consisting of **Don Webster** has appointed Marketing Manager, Marketing Associates, for GTE Lenkurt Inc. **Douglas C. Johnson** has been appointed Marketing Manager of **Ronald B. W** Laboratories. **John I** has been named Manager of Communications Corp.'s System Programming Dept. **John I** has been appointed Manager of Trials for Theta-Com.

Frank J. Morris, West Coast agent of the NAB's Code Authority, died of a heart attack January 26 age of 56. **Ernest E. Free** Jr., President of General Instrument subsidiaries Chicago Lamp Works and Drake Manufacturing Co., died January 26 at the age of 52.

CATV Div., Oak Industries Inc., and **Joseph W. Spells, Jr.** has been appointed Manager of Engineering. **Gerald J. Sperry** has been named General Sales Manager of "video-group" in Detroit.

John J. Schroder has been appointed Eastern Regional Sales Manager for Nikko Electric Corp. **RCA Broadcast Systems** has announced that **Paul Bergquist** has become Manager, Midwestern Area Sales and **Ray Harding** has been appointed Western Area Sales Manager.

Frank Maynard has been appointed Chief Engineer of stations **WILS** and **WILS-FM**, Lansing, Mich. **KEVN-TV/KIIV-TV** has announced that **Don Stafford** has joined its staff as Chief Engineer and **Jim Kozora** has joined its staff as Assistant Chief Engineer. **Robert W. McDermott** has been named General Manager of Radio Station **WKKE**, Asheville, North Carolina. **KYTV**, Springfield, Mo. has announced the appointment of **Raymond A. Gilvard** as Program Director. **WJCT**, Jacksonville, Fla. has announced the appointment of **Richard V. Brown** to the new position of Vice President for Programming and **Eric Sass** has been promoted to Vice President of Development. **WCBS-FM**, N.Y. has promoted disc jockey **Jack Miller** to the position of Music Director.

The appointment of **Rita Sands** as a CBS Radio News Reporter has been announced. The National Association of Broadcasters has announced the appointment of the following radio station executives to the Small Market Radio Committee: **David Brown**, president and general manager, **WTVA** AM & FM, Water-ville, Me.; **Glodean Kent**, vice president and general manager, **KKZZ & KOTE** FM, Lancaster, Ca. and **Ernest Sparkman**, owner and manager, **WKIC-WSGS**, Hazard, Ky. The National Cable Television Association has announced the following personnel changes: **Thomas E. Wheeler** has been named Executive Vice President, Director of Government Relations; **Don Shuler**, Carl Gainer and **Patrick J. Nugent** have been elected to the Board of Directors; and **James H. Doolittle** has been elected District Five Director (North Carolina, South Carolina, Georgia, Alabama, Florida and Mississippi). **Douglas I. Sheer**, Advertising and Sales Promotion Manager of **JVC Industries**, has been elected to the Board of Directors of the National Audio Video Assoc. **Eric**

for Cox Data Services. **John Bridal** has been named Manager of Special Accounts at Ditch Witch, a Division of Charles Machine Works. **United Systems Corp.** has appointed **Richard Pinner** to the position of Product Manager for digital printers, thermometers and data acquisition systems and components. **Mrs. Bonnie Kraig** has been elected Corporate Secretary for Goldmark Communications Corp.

William R. Brock has been appointed Manager, Dealer Sales for **Audionics, Inc.** **E.D. (Don) De Cesare** has joined the Telepromter Corp. as Director of Marketing. **William Adikes** has been appointed Marketing Manager of the Thomson-CSF Electron Tubes Div. of DuMont. **Fredrick W. Feuerhake** has been appointed Director of Export Sales and Licensing for the Entertainment Products Div. of **GTE International**. **James M. Hollen** has been appointed Sales Supervisor, professional recording & broadcast markets, Magnetic Audio/Video Products Div., **3M Co.** **Donald V. Pascarella** has been appointed Vice President, Sales of the

NEWS

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