

DECEMBER 1973

BM/E

BROADCAST MANAGEMENT/ENGINEERING

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The entire AKAI CVT-150 system is truly portable... only 22 lbs.! AC or battery operated.

At this price, you can't afford to be without a portable color VTR. Get the colorful AKAI CVT-150 specs and see for yourself. Just send in the coupon below.

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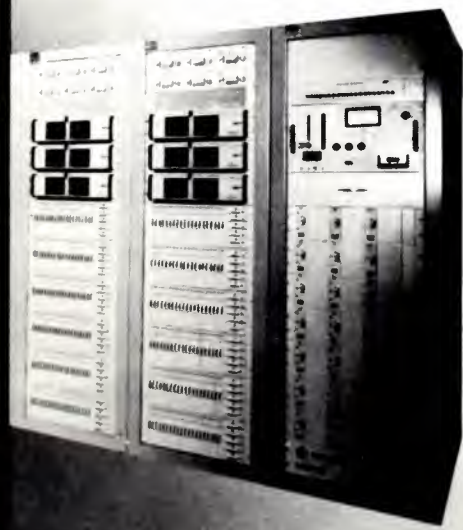
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Large DYN AIR video switchers, some with bandwidths to 50 MHz, are being used to route information from orbiting satellites, Mars and Moon probes and a variety of other aerospace functions. Our standard video and audio switchers have been used for years in commercial, industrial and educational television. And most of our installations are based upon off-the-shelf equipment.

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DYN AIR switching equipment is also based upon a building-block philosophy, with the various types of switch, amplifier and power supply circuit cards all being stocked items which can easily be assembled in standard mounting frames. Practically any input-output configuration or capacity is possible with this planned approach and, with the numerous crosspoints required in many systems, the economics of using standard modules can offer substantial savings.

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DYN AIR

BM/E

BROADCAST MANAGEMENT/ENGINEERING

DECEMBER 1973/VOLUME 9/NUMBER 12

BM/E



A big idea, a good idea to improve the exchange of engineering idea. Turn to pages 38-39

BROADBAND INFORMATION SERVICES, INC.
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6 Broadcast Industry News
High-speed Super 8 processor coming.

16 Interpreting the FCC Rules and Regulations
Payola and Plugola

A LOOK AT NEW IDEAS, FACILITIES, AND EQUIPMENT

24 Remodeling a Studio for Comfort and Convenience
Redesign accommodates "talk and disc"

28 WHA Radio and Television—Envy of Many
Impressive studios and equipment at University of Wisconsin center

34 Gutsy "VOX" of New York's Westchester County Gets a Proper Home
Strong community service leads to success

38 BM/E's Great Idea Contest
Win a cruise by sharing your engineering solutions with others

40 Enter the Segmented Scan Helical VTR for Broadcast Use
IVC's 9000 takes on quadruplex

42 KYW—A Reserved Contemporary Facility
New home is conservative in design but innovations abound

44 KYW Miniature 12-Channel Cable TV System Feeds Monitors
A neat way of distributing signals

48 WSNL-TV—5,000,000 Watts of Local Accent
New UHF station expects success

51 Broadcast Equipment
New and significant products for broadcasters

59 New Literature
Useful reading materials

**CM/E: A supplement for those with cable interests:
following page 50.**



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THE TEN DAY TAPE

This digital cassette provides 10,000 event storage capacity for the GVG APC 2000 television automation system. Television automation from The Grass Valley Group basically means computer controlled operation of master control switching equipment, video tape recorders, and telecine projectors. Automated control of on-air operations results in smooth presentation of program material and a marked reduction in the switching errors which inevitably occur with manual operation during periods of high activity. The broadcaster benefits by an improved on-air image, as a result of the smooth presentation, and by a significant reduction in make-goods.

However, control of technical operations is but

one aspect of television automation. APC-2000 systems can be supplied to include the following additional features: ● Off-line systems for storage and manipulation of booking information, contracts, availabilities, and adjacency warnings, as well as preparation of operating schedules and specialized listings. ● Printout or display of management statistics. ● Communication to accounting departments for billing information based on as-broadcast logs. ● Communication with other computer systems for coordination with centralized business activities.

THE GRASS VALLEY GROUP, INC. 

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BROADCAST INDUSTRY NEWS

Pay Cable: For and Against

The main adversaries in the stiffening argument over relaxation of some of the restrictions on pay-television (including pay cable) all had their say before the FCC in a series of hearings on November 5 to 8, and most tended to dig furiously into already plowed ground.

The broadcasters, through President Vincent T. Wasilewski, again

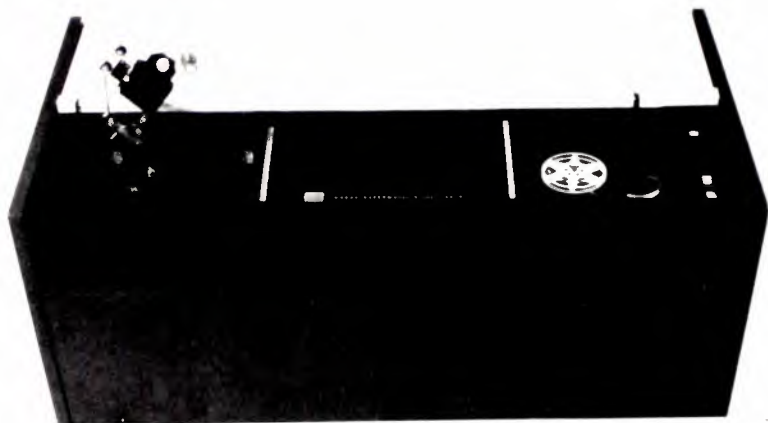
charged that the pay cable industry would take over programs now available "free" to TV watchers and force the public to pay for them.

David Foster, president of NCTA, charged that the real issue was the public's right to have the choice of a new communications and entertainment service. He said the cable industry is not, and does not, wish to be a threat to adver-

tiser-supported television, but would offer alternative fare, not now available. He said that, without viable pay programming, big-city cable would be unable to make it, thus depriving the public of a valuable service.

Jack Valenti, president of the Motion Picture Association of America, said Hollywood needed
continued on page 8

New Super 8 Sound Camera and Ultra-Fast Processor Announced by Eastman



New Kodak Supermatic 8 processor for Ektachrome film.



Super 8 camera with 200-foot cartridge attached

At a New York press conference on November 1, Eastman Kodak Company showed for the first time two new products aimed at advances in an important sector of the image recording battle—a new Super 8 single-system sound camera (above right) loadable with both 50- and 200-foot cartridges; and a new ultra-fast processor for the new Kodak Ektachrome SM 7244 film (above left). The processor, called the Supermatic 8, takes in film in the 50- and 200-foot cartridges and also in 400-foot darkroom loaded cartridges, and has a dry-to-dry time of about 8½ minutes.

Kodak underscored the relevance of the new units to operations requiring fast retrieval of recorded images by recording an interview with one of the guests shortly before the conference, playing it back from the finished film in mid-conference. The demonstration emphasized the automation of operation in both the camera and the processor. The camera has automatic gain control in the sound system, automatic exposure control (if wanted), has

230-degree shutter opening for available light work, viewfinder coupled with the zoom lens (an Ektar f/1.2-f/36); the viewfinder also has a corner marker for safe television action.

The processor requires only loading with a cartridge of exposed film, attachment of processing chemicals in containers with matching and non-interchangeable connectors, loading in a take-up reel, and pushing the start button.

The quality of the color recording shown at the conference seemed in the top bracket of what might be expected for 8mm Ektachrome, and if this proves to be the long-range benchmark for the system, it could win a lot of territory in education, industry, and perhaps cable television, all of which the system is avowedly intended for. Acceptability for news gathering in television broadcasting will remain an open question until substantial try-out has been completed.

Eastman said that the new products would be commercially available by about June 1974.

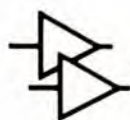
MagLink[®] SYNCHRONIZER

An indispensable tool in multi-track audio production, video mixing, editing and "sweetening," film sound track production, and foreign language overdubbing.



MagLink is a completely new approach to fast, efficient tape synchronizing, position logging and editing. Videotape, multi-track audio, and magnetic film machines may now be locked in synchronism, offset, or stopped and started at preset positions with an

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NEWS

the additional box office that cable offered. The theatre owners, however, said theatres would close. Sports owners supported free TV, but would like to sell rights to games not televised. Importation, however, worries home clubs.

Alfred R. Stern, chairman of Warner Cable Corp., pointed out that the non-availability of enough variety in movie fare was the overriding reason for cancellation of pay subscriptions on the Warner sys-

tems, with pay penetration dropping from an initial 30% to about 20%. He concluded that the "two- and ten-year rule" on movies seriously damaged the chances of success with pay cable, and called relief essential. He ridiculed the broadcasters' claims that pay cable would hurt them, reporting polls that show only 25% of cable subscribers overall are now interested in pay cable.

The bickering between NAB and NCTA on pay cable was condemned by W. Bowman Cutter, executive director of the Cable TV In-

formation Center, saying it had not "advanced one step our ability to make policy which is in the public interest." He said that, in his personal opinion, the development of pay television would be in the public interest and was necessary to advance the FCC's policies on cable.

There were suggestions for various trial rules to see how pay cable would work out. However, there was a consensus that experience with pay cable would not be significant until many more subscribers, in more cities, signed up: estimated national total right now is about 40,000. The FCC is expected to rule on the pay cable questions in a few months.

U.S. Research Ahead Says NAE Report

The National Academy of Engineering has released a study of telecommunications research in the United States and in selected foreign countries, prepared by a special panel headed by Henri Busignies, chief scientist of ITT, which finds U.S. research in general ahead of that in the other countries studied. However, the report holds that research should move faster into products, to help the U.S. balance of trade escape the "red ink" of recent years. The full two-volume report costs \$10 from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. (order number PB 222 080).

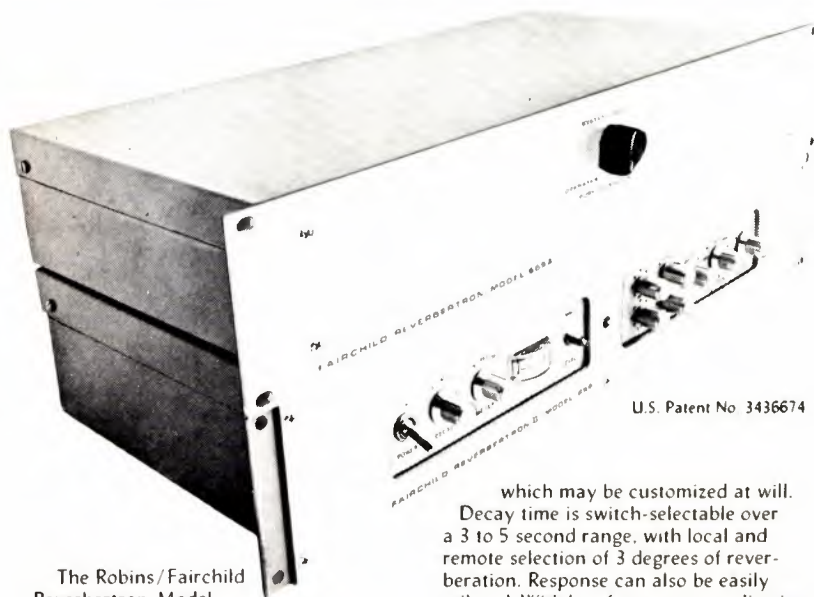
Radio Spot Sales In Crisis, Gallagher Holds

The widely-read fierce critic and Dutch Uncle of the media, Bernard Gallagher, reports in a recent issue of his newsletter that radio spot sales are in a squeeze that is catastrophic for many smaller stations and stations in smaller markets. He calls the national rep industry "inadequate" to handle present rising costs and fragmented markets, with many rep firms dropping smaller stations they can no longer afford to service. Gallagher's solution (he always has one): alteration of anti-trust rulings so a rep firm could handle more than one station in a market (but with different salesmen), and with stations grouped along audience and format lines for efficient group selling.

New Quad Encoder, Decoder Chip, From Sansui

The Sansui Electric Co. is continuing very active development of their quad matrixing system, announcing a new
continued on page 10

THE SOUND REPEATS ON YOU. NOT THE PRICE.



The Robins/Fairchild Reverbertron, Model 659A, is another example of how we engineer more performance into less space, at lower cost. Requiring just 7" of rack space (two 3 1/2"-high remotable units), Reverbertron is a full-featured reverberation system priced at only \$979.

The price is harder to believe when you consider the system's many features. Using six differently-tuned electro-mechanical delay lines, Reverbertron produces a natural "echo" effect,

which may be customized at will. Decay time is switch-selectable over a 3 to 5 second range, with local and remote selection of 3 degrees of reverberation. Response can also be easily tailored. With low-frequency equalization, high-frequency boost and peak selector, plus a high-frequency droop control. Accepting signals as low as -30 dbm, the unit's maximum output is continuously adjustable to +18 dbm. All signals in the system may be easily read via a built-in edgewise VU meter.

Specifications are likewise impressive, in terms of noise, response and distortion. For more information, contact Sales Manager Rick Belmont.

ROBINS FAIRCHILD

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Electronic editing so precise you might kiss tape splicing goodbye!



The new Tape-Athon 1001 Recorder/Reproducer has everything the professional studio demands in a precision instrument, plus some exciting innovations we've added to make the 1001 a must-see-it-before-you-invest. Here are the basics: dual capstan, closed loop tape drive for clean, even tape travel with minimum wow and flutter; tach-controlled motion sensing to eliminate tape breakage, stretching or spillage; newly designed tape head section for easy threading, fast lifting; illuminated push button controls, flush mounted.

Now for the innovations, take a look at this control panel.



With the Tape-Athon 1001 you can initiate a "balanced torque mode" on the tape drive by activating the PLAY (or FAST FORWARD) controls simultaneously with the REWIND control. Both drive motors are balancing against one another, allowing the user to manually move the reels in either direction without drag, skipping or tape stretching. You can actually move the tape so precisely for editing purposes that splicing is virtually eliminated.

Call for complete details and specifications on the professional's professional 1001 Recorder/Reproducer (also now available in Reproduce-Only, 14 Inch Reel, and Logger versions for the broadcast industry) or write to:

Tape-Athon Corp.

502 S. Isis, Inglewood, CA 90301 • Tel: (213) 776-6933

Circle 105 on Reader Service Card

encoder designed specifically for FM broadcasting, and an IC chip for an improved decoding system, both scheduled to be ready in quantity in January 1974.

The new encoder, QSE-5B, will sell for about \$800 and will allow FM stations to broadcast matrixed quad from discrete four-channel recordings or from four-channel live pickups.

Sansui says the new decoding system has improved separation and moreover will decode either the Sansui QS or the Columbia SQ, at the throw of a switch.

Sansui moved closer to CBS, too, by taking out an SQ license: Sansui receivers will carry the SQ as well as the QS designation. In a demonstration for *BM/E*, the new decoder did appear to produce exceptionally clear and definite separation among the four channels, although direct comparison with other systems was lacking.

Auto FM Jingles Ready At NAFBM

"Driving with FM," a series of recorded jingles aimed at increasing au-

toists' use of FM radio, has been prepared by the National Association of FM Broadcasters. The tape holds several versions of the jingle, designed to fit into various program formats, and in both mono and stereo. It is free to NAFMB members, \$7.50 to others, from NAFMB at 420 Madison Avenue, New York 10017.

Ampex Has New Long-Life Coating for Magnetic Disks

A new coating for plated magnetic disks has greatly enhanced the life, performance, and reliability of such disks, according to an announcement from Ampex Corp., the developer. The critical head-to-disk interface in digital recording had created a serious wear and reliability problem, said Ampex, which has now been solved by the new coating.

Burch Asks for Program Quotas

In a talk to the International Radio and Television Newsmakers Society in New York in September, Chairman Dean Burch of the FCC came out as personally in favor of percentage requirements applied to broad program categories, to put broadcast license re-

newal on a fair basis. He contended that the renewal process was in serious disarray, with too much depending on Commission decisions on quality, which he held to be impossible—and wrong. "I'm seeking a go/no-go system of broadcast license renewals," he said. "Let the FCC establish well defined guidelines—and then let the FCC get out of the way."

Kodak Gets Esquire Ad Award

Eastman Kodak Company was one of 20 firms named winners in the first annual Corporate Social Responsibility Advertising Awards Program, instituted by *Esquire Magazine*. The Kodak ad that won an award was captioned "Pictures talk. Some little boys don't." and it told how a camera project had helped inner-city youngsters, "turned off" by their environment, to gain interest and self-respect, so they could begin to learn. Arnold Gingrich, publisher of *Esquire*, said that the winning entries effectively work "to improve our environment—both physical and social—as well as the quality of life in America." How about some prizes for socially-responsible broadcast ads?

continued on page 12

rapid VTR editing



at low cost

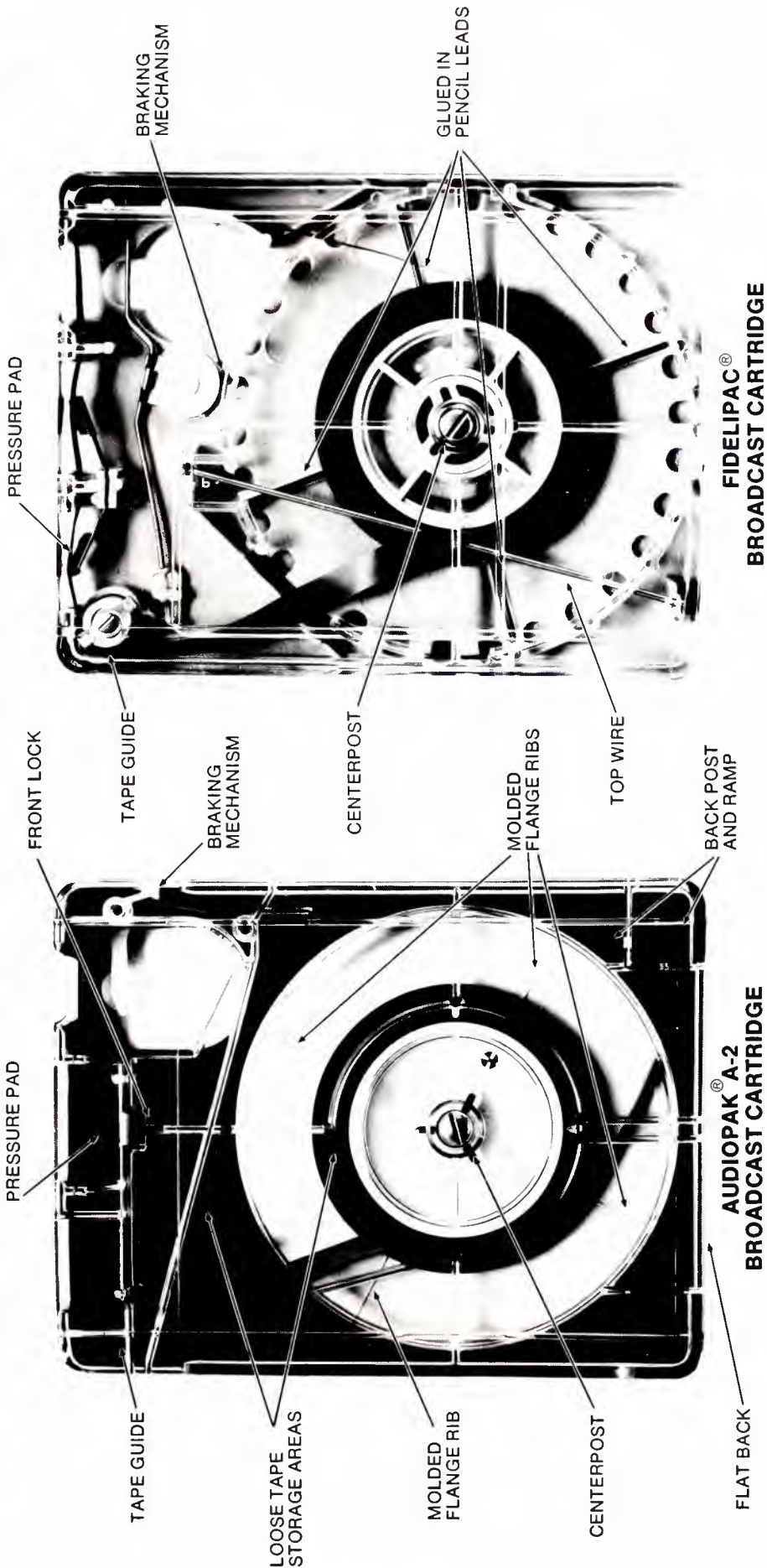
The EDS - 200 uses SMPTE precoded tapes to ensure excellent edit accuracy • Controls two VTRs plus external source • Programmed micro-computer control • No-overshoot high speed search • For quad or helical VTRs • Units may be linked for multi-machine control.



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YOU BE THE JUDGE!



Circle 107 on Reader Service Card

www.americanradiohistory.com

Jampro Asks FCC for FM Antenna Rules Change

Redefinition of radiated power for antennas with beam tilt, to eliminate the present ERP penalty on stations using tilt, and eight other changes in the FM antenna rules, have been requested in a petition filed with the FCC by the Jampro Antenna Co. Peter Onnigian, president of Jampro, says that the changes are aimed in general at bringing the FM antenna rules into

line with current engineering art. Some of the other changes asked: reduction of two ERP values to one on licenses when tilt is used; circularity specs of ± 4 dB (there are none at present); maximum of 15 dB for directional antennas; make circular polarization the standard, rather than horizontal.

People

Richard Schoch, a senior vice president of Compton Advertising, Inc., New York, and resident of Princetown, N.J., was appointed to a five-year term on the board of the New

Jersey Public Broadcasting Authority ... **Paul Lancaster** became chief engineer of Delta-Benco-Cascade ... **Bud Cole** has rejoined Trans-World Communications as director of programming.

Andrew R. McMaster was named director of engineering for KETC-TV, educational station in St. Louis, Mo. ... New director of marketing for Continental Cablevision is **Thomas P. Willett** ... **Jac Holzman**, founder and for 23 years president of Elektra Records, became chairman of the planning committee and senior vice president of Warner Communications, Inc.

Fred La Cosse, news director for KNTV, San Jose, Calif., won a "personality of the month" designation from TV Picture Life Magazine ... **Ward McCarthy** will direct promotion and public relations for WSNL-TV, only commercial TV station on Long Island.

Charles M. Powell became vice president of operations and finance for Tocom, Inc. ... New engineering manager of Ameco, Inc. is **Robert H. Wilson** ... **Warren Burtis** is field engineer for AEL Broadcast Division.

John S. Scanlan joined TelePromp-ter Corp. as director of corporate marketing ... **John H. Martin** won promotion to the position of manager, product administration, for Jerrold Electronics Corp. ... **Phil D. Cook** was promoted to supervisor, CATV products sales and service, for Anaconda Electronics.

E.C. Oldfield Jr. was named treasurer of Telecable Corporation ... **Justo Caffi** is the new manager of American Cable Television's system in Napa Valley, Calif. ... **Daniel Denham** is vice president of the 3M Company, in charge of a newly-formed division, the Recording Materials Group.

Ivan D. Barton became Southwest regional sales manager for Philips Broadcast Equipment Corp. with headquarters in Houston ... **Alain Onesto** was appointed program director of Empire State Cable TV Co. in Binghamton, N.Y. ... **Phyllis Thompson** joined the sales staff of Anaconda's Systems Wire and Cable facility in Phoenix.

Richard C. Gall is the new technical director of development laboratories for Oak Industries ... **Fletcher R. Smith** won promotion to the position of director of engineering for Triangle Broadcasting Corp. to supervise both the radio and cable operations of that company.

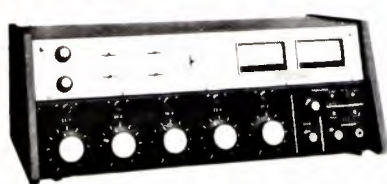
Briefs

Magnavox is supplying cable distribution equipment worth over \$3 million to CATV of Rockford, Inc. ...

continued on page 14



CONSOLE YOURSELF!



Model 5S11
Stereo



Model 5M11
Mono

SPOTMASTER IS HERE ...

*with outstanding new audio consoles
from \$825*

Here are the audio consoles for stations whose standards are higher than their budgets. Look what you get:

- Model 5M11 Mono—11 HI/LO inputs into 5 mixers
- Model 8M20 Mono—20 HI/LO inputs into 8 mixers
- Model 5S11 Stereo—11 pairs of HI/LO inputs into 5 mixers
- Model 8S14 Stereo—14 pairs of HI/LO inputs into 8 mixers

- Electronic switching of input channels via FET's
- Low and high level preamps for each channel
- Top quality ladder attenuators (Daven or equiv.); carbon pots optional at lower cost in mono models
- Identical program and audition output channels for dual console capability
- Individual program, audition, monitor, cue and headphone amplifiers, plus mono mixdown amps in stereo models
- Solid state construction throughout; modular, plug-in circuitry; superb specs; complete with self-contained power supply
- Beautiful as well as functional; wood grain side panels

Write or call for details about the budget-pleasing prices:

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A Filmways Company

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Circle 108 on Reader Service Card

Canon offers the perfect zoom lens for the camera of your choice



More and more people are discovering how significantly superior Canon Zoom Lenses are for TV broadcasting purposes. Their outstanding color characteristics, even in dim light, is one of the many reasons why Canon was chosen for telecasting the Munich Olympics. Canon's wide range of excellent zoom lenses encompass three types of operation control— all-servorized, via flexible cables and by effortless push-pull rod control. And it can be attached to

fit and operate with any make of TV camera. Shown on this page are only a few examples of the quality lenses Canon has available to more than meet your particular demands. Specify Canon to stay ahead.

The following are Canon TV Zoom Lenses for the Plumbicon® color cameras currently available on the market:

Size of image tube	Lens	Image format covered
1 1/2" Plumbicon® color camera	P10 x 20B4	17.1 x 12.8mm (21.4mmφ)
	P17 x 30B1	
	P17 x 30B2	
1" Plumbicon® color camera	PV10 x 16B1	12.8 x 9.6mm (16mmφ)
	PV10 x 15B2	
	PV17 x 24B1	
	PV 6 x 18B1	

® Reg. TM N.V. Philips of Netherlands.

The Canon TV Lenses Naming System



Applications	Image Format	Pick-up Tubes
P	21.4mmφ	1" Plumbicon
PV	16mmφ	1" Plumbicon

Apart from the above, Canon has available TV zoom lenses for 3" or 4-1/2" image orthicon cameras and can also build special lenses to fit your requirements.

Canon

● CANON INC.: 9-9, Ginza 5-chome, Chuo-ku, Tokyo 104, Japan ● CANON U.S.A., INC.: 10 Nevada Drive, Lake Success, Long Island, New York 11040, U.S.A. (Phone) 516-488-6700 ● CANON U.S.A., INC.: 457 Fullerton Ave., Elmhurst, Illinois 60126, U.S.A. (Phone) 312-833-3070 ● CANON OPTICS & BUSINESS MACHINES CO., INC.: 3113 Wilshire Blvd., Los Angeles, California 90005, U.S.A. ● CANON AMSTERDAM N.V.: Gebouw 70, Schiphol Oost, Holland ● CANON LATIN AMERICA, INC.: Apartado 7022, Panama 5, Panama

Circle 109 on Reader Service Card

NEWS

CBS Radio will begin in January a nightly hour-long mystery drama; series will be produced by "Hi" Brown, who put on many of the best-known radio dramas of the 1940s and 1950s . . . **RCA** will install in the newest class of large U.S. naval vessels, Landing Helicopter Assault Ships, interior voice communications systems which have dual stored program processor control units, either of which can take over if the other is knocked out.

JVC Industries, Inc. opened a new midwestern sales office at 3012 Malmo Drive, Arlington Heights, Ill. . . . **Television Bureau of Advertising** reports local TV ad sales up 24% in the first half of 1973, to \$349 million . . . **Panelgraphic Corp.** of West Caldwell, N.J., has agreed with Thorn Electrical Components, of Enfield, England, to form a joint company for European production and marketing of electronic display products.

Texas State Network, in a recent massive audience study by ARB, emerged as the largest radio influence in that state, by a wide margin . . . **Avantek** microwave relay equipment will be sold throughout Canada by **Northern Electric** of Montreal . . . **Marconi Electronics** reports the sale of

more than 100 of their i.f. modulated TV transmitters, or about one a week since introduction of the units two years ago.

WHOO Radio, Orlando, Fla., won a Golden Award for specialty advertising in 1972 from Specialty Advertising Association International . . . **Telemedia, Inc.** of San Diego, video program producer, formed an educational division to produce teaching programs . . . **Collins Radio Co.** announced the purchase of Spectrum Analysis and Frequency Planning, Inc., recognized for microwave frequency planning, from its parent, **MCI-Communications Corp.**

Thomas C. Seger Associates is a new firm in Pittsburgh which will supply consultation on any phase or form of video programming, particularly corporate sales, training, and information programs . . . **Quad/Eight Electronics** became West Coast distributor for tape recorders and recording consoles of **MCI** . . . **Scientific-Atlanta, Inc.** will supply amplifiers and headend equipment worth over \$1 million to **Hawkeye Cablevision**, franchisee in Des Moines, Iowa.

General Cable Corp. will build a new \$14 million plant in central Kentucky for manufacture of plastic insulated telephone cable . . . **American Technical Ceramics** announced appointment of **Technical Sales, Inc.** of Chi-

cago as sales agent in Illinois, Indiana, and Iowa for their capacitors.

Mobile Color Productions, Inc. has installed a complete production and post-production videotape facility in Dallas, to supplement their facility already operating in Houston . . . **Ampex Corp.** has sold to the Korean Broadcasting System video and audio production facilities totalling \$2.1 million, including VTRs, audio recorders, video cassette equipment.

Hewlett-Packard will supply about 130 cesium beam frequency standards to the U.S. Navy Electronics Systems Command, for about \$2.8 million . . . **Ceramic Magnetics** has appointed **Underwood Sales Corp.** to sell the full line of ferrite components in New England . . . **AKAI** color video cameras are used for live cable pickup and for recording at the new World Championship of Tennis arena near Austin, Texas.

Kalart Victor Co., veteran supplier of 8mm and 16mm editing equipment and other motion picture and television specialties, celebrated in October its 50th year under its founder, **Morris Schwartz** . . . **Century Strand Inc.** reported a realignment of corporate relations with their parent, the Rank Organization, for full access by Century to Rank research and development resources. BM/E

THE BEST



And because that's the way things are, the EMT-930st is also the most expensive turntable you can buy.

In the short run.

In the long run, you'll own precision-made equipment that really slashes maintenance costs, because it's virtually trouble-free. For years. Ask anyone.

Other features? Low rumble; $\pm 0.035\%$ rms ANSI flutter; and you can cue to any beat or syllable with a wow-free start from the world's only remote-controlled turntable.

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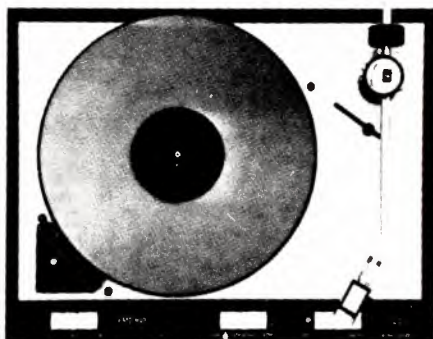
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We won't kid you.

The EMT-928 doesn't have all the ruggedness of our friend across the way.

On the other hand, the EMT-928 costs 40% less.

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A proven concept augmented for professional use, the EMT-928 stands second to none in construction, durability, and performance. Except for you know who.

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Circle 110 on Reader Service Card

QS 4-Channel News

OVATION/SANSUI EMBARK ON MAJOR PROMOTION CAMPAIGN

View, Ill. — Dick Schory, President of Ovation Records, and Hoshi Tada, Executive Vice President and General Manager of Sansui Electronics Corporation, have announced plans for a major national multi-media promotion and advertising campaign to get underway this fall.

Across the country thousands of dealers will be involved in an intensive educational program, telling the public what is special about Sansui's QS. They will explain that only records encoded in QS have the capacity to give you sound sources from any area within a 360° sound field and that receivers with vario matrix offer the most realistic 4-channel than any other decoding system.

The exciting campaign will feature a cooperative effort on the part of Ovation Records and Sansui

in terms of national advertising with Ovation artists and Sansui 4-channel receivers and amplifiers. The entire Ovation and Black Jazz catalog which includes such artists as Bonnie Koloc, Heaven & Earth, and Willie Dixon, is recorded with the QS encoder. Ovation is the only record manufacturer exclusively producing 4-channel discs.

Other aspects of the campaign will feature dealer 4-channel clinics and seminars, promotions with banners and demonstrations of 4-channel showing 2-channel and mono compatibility. In-store demonstrations will be supported by attractive posters both of the Ovation artists and new posters created especially for Sansui's 4-channel campaign. Buttons will also form an integral part of this ambitious marketing concept.

International acclaim has also been accorded the QS vario matrix. Britain's famed *Hi-Fi News* described its impression this way in its May, 1972, issue:

"Undoubtedly the most convincing and interesting demonstration was the Sansui, who had arranged comparison between QS Mark II [vario matrix] and QS using special recording... The QS II [vario matrix] system seemed effective, unanomalous discrete rear images, somewhat spreadened but definitely behind, were consistently detected."

Julian Hirsch, director of the famed Hirsch-Houck labs, in his September, 1973 *Popular Electronics* article on QS vario matrix, said:

"Having listened to a demonstration of the system in operation both at the Audio Engineering Society, N.Y. convention and elsewhere, we can testify that the Sansui QS Vario Matrix appears to provide a fully 'discrete' sound character, with no evidence of the side effects sometimes experienced with gain-controlled matrices."

And *Billboard* magazine's Claude Hall was quoted in June, 1973's *BM/E* as saying:

"QS with logic is 500 times better than stereo and the QS with vario matrix is 700 times better than stereo."

It is likely to be the Complete Tchaikovsky Symphonies. Vox has joined over 30 other companies around the world, including 18 in the United States, who utilize Sansui's QS matrix to produce records with the greatest creative freedom for the artist and recording engineer and that can be enjoyed by more home listeners than any other 4-channel system.

Other manufacturers producing QS encoded discs include ABC/Dunhill, A&M, Audio Lab, Audio Treasury, Barclay, BASF, Black Jazz, Bluesway, Blue Thumb, Canyon, Command/ABC, Crown, French Decca, Impulse/ABC, Jockey, Kilmarnock, King, Longines Symphonette Society, Minoruphone, Ode, Ovation, Project 3, Pye, Quad Spectrum, RTV/ERA, Teichiku, Telecast Marketing, Toho, Tokuma-Onko, Tumbleweed, and Toshiba-EMI.

QS Regular Matrix (RM) First in Hardware First in Software

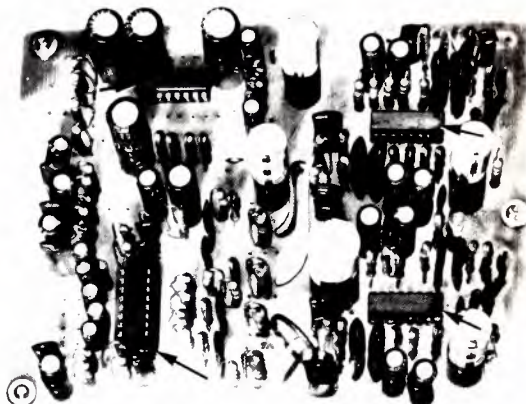
New York, N.Y. — The QS/RM 4-channel matrix can be found on more pieces of high fidelity equipment than any other 4-channel system. Over 58 manufacturers are now making more than 242 models with QS or RM decoding positions.

To match the hardware story QS has surpassed all other 4-channel systems in record production as well. Over 30 companies around the world have produced over 496 albums in QS. That includes over 166 records manufactured by 18 companies in the United States. U.S. artists represented by these companies include such names as Carol King, Joan Baez, B. B. King, Bonnie Koloc, Sun Ra, Willie Dixon, Beverly Sills, Gato Barbieri, Enoch Light, Dick Hyman, Pharoah Sanders, John Coltrane, Count Basie, Tony Mottola and 101 Strings. More and more manufacturers are using the QS matrix because of its unique engineering freedom and the fact that more consumers can buy more equipment capable of decoding QS Regular Matrix.

SANSUI INTRODUCES IC CHIP QS VARIO MATRIX 4-CHANNEL DECODER

Woodside, N.Y. — Sansui Electronics Corporation has announced a major breakthrough in 4-channel audio technology. After years of experimentation and development, the Sansui QS vario matrix decoder has been reduced

not been one decoder that could adequately handle more than one system. The new IC chip QS vario matrix can and does it. It provides a full 20dB separation in the QS mode and excellent separation on all SQ records.



MAJOR AUDIO CRITICS PRAISE QS VARIO MATRIX

New York, N.Y. — Comments from the audio press have been enthusiastic about Sansui's vario matrix circuitry. Noted critic Bert Blyden describes his auditioning of the QS system in the August, 1972, issue of *Audio Magazine* this way:

"A discrete quadraphonic tape was played for us, and then A/B with a disc cut with the Sansui decoder and decoded through a new type decoder. The results were startling. With both pop and classical selections, there was a little apparent difference between the tape and the disc. Localization and separation were very accurate and stable. Ambient material was as effectively reproduced as 'surround stereo.' There seemed to be little of the diffuse 'amorphous' feeling typical of such matrixed quad sound... it must be reckoned as a matrix system with great potential."

VOX BOXES ON QS MATRIX

New York, N.Y. — Vox Productions has joined the growing list of record manufacturers producing discs encoded in QS. The company is set to release a famous 'Box of The Complete Chopin Music for Piano and Orchestra' performed by the Utah Symphony under Maurice Abravanel; the set will carry Vox catalog number 7B 5126.

According to a company spokesman, several dozen other new albums in QS are scheduled for release over the next six months. One of the most anticipated

KLOS GOES QUAD

Los Angeles, Calif. — KLOS-FM, ABC's top rated station in Southern California and a national leader in the 18-34 market, has just completed its first series of regularly scheduled 4-channel broadcasts.

The 13 week series sponsored jointly by Pacific Stereo and Sansui Electronics Corporation has impact far beyond the high expectations of the sponsors or the producers. The impact was so great that a second 13 week series is planned starting in the next few weeks.

KLOS used a QS encoder and ran all their programming for the quadraphonic segment through the encoder. This included all types of tapes and discs. The listener at home with a mono set received the FM signal with no change and no dilution of quality, while the FM stereo listener actually got a program with an enhanced stereo effect and the listener with a QS or other decoder had FM 4-channel sound with all its nuances and subtleties brought into his listening room.

Response to the series was enthusiastic. KLOS reported phone calls and letters requesting information on 4-channel and 4-channel broadcast, while local audio dealers reported a noticeable increase in traffic through their stores and specific increase in interest in 4-channel products by

to three different IC chips. Two of the three chips are currently in production and available while the final chip will be available in quantity by early February, 1974. The IC chips will be manufactured in Tokyo by Hitachi.

Sansui is aggressively pursuing a two-stage licensing policy of the chips and vario matrix decoder. Step one is giving chips information and technical assistance to any audio manufacturer requesting them. This is intended to aid the industry in experimentation with what Sansui believes to be the greatest single advance in 4-channel technology since the introduction of the QS matrix itself in 1970. Step two is licensing of commercial production of QS vario matrix decoders.

The IC chip version of the vario matrix decoder is a huge stride for a number of reasons. The concept of IC's provides tremendous economy in terms of simple component costs, but also in adjustment and "tuning" costs. Conventional discrete component decoders had to be adjusted for maximum performance; the current IC chip QS vario matrix is set to operate at peak performance from the time of manufacture.

Economy is one major aspect of the new IC units. Universality is the second major area of importance. With the proliferation of several matrix systems, there has

Another exciting aspect of the new vario matrix technology is the synthesizer. Previously so called synthesizers added ambient sound available on most conventional stereo records to the rear channels and created a 4-channel effect. With the new IC chip vario matrix decoder, a 2 channel signal is fed through its own encoding process and then decoded. The resulting signal is a "surround" effect with real directionality on three sides. Music is no longer just enhanced instruments are spread around a panorama, but appear to be fixed and have position and direction. Since a majority of record collections are still primarily stereo, and since many 2-channel discs will never be released in 4-channel, the new development adds a new dimension to 4 channel rather than being just a large technical leap.

With the new IC chips plus associated discrete components, a manufacturer can build a Universal decoder and synthesizer for less than \$12 which means that a decoder could be available to the consumer at a price anyone interested in 4-channel can certainly afford.

Since Sansui incorporated the vario matrix in its QRX receiver line in January, 1973, sales have risen dramatically and consumer response has been overwhelming.

all manufacturers

WSHE in Miami, Florida, the leading rock station in the Miami-Ft. Lauderdale area, has just purchased a QS encoder and plans to go 24-hour Quad by mid-November. "We believe 4-channel

is the most exciting broadcast development in many years and the wave of the future," commented WSHE's owner, Gene Milner. "We're looking forward to being the first in our market with it."

INTERPRETING THE **FCC** RULES & REGULATIONS

Payola and Plugola

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

The specter of payola and plugola scandals has again risen on the horizon of the broadcast industry. Federal officials are investigating allegations of substantial cash pay-offs to radio stations in exchange for over-the-air record exposure. Some record industry executives have resigned or been fired. Investigations continue and indictments are possible. No one is yet certain just how pervasive this latest wave of payola and plugola activity has been.

The Communications Act and the Commission's Rules and Regulations contain explicit sections defining payola and plugola, and specifying when and how sponsorship announcements are to be made. A review of the relevant Rules follows. To facilitate the broadcaster's understanding of whether or not broadcast matter is "sponsored," hypothetical illustrations are also included.

Announcement of Sponsored Programs

All matter broadcast by any radio station for which any money, service, or other valuable consideration is directly or indirectly paid, or promised to or charged or accepted by, the station so broadcasting, from any person, shall, at the time the same is so broadcast, be announced as paid for or furnished, as the case may be, by such person . . .

The general rule emanates from the rule-making proceeding which followed on the heels of the payola scandals of the late 1950s. This rule requires licensees to exercise reasonable internal procedures to assure that they announce that they have received money, gifts, consideration, etc., which influences their choice of programming. This rule applies to standard broadcast (AM), FM, and television licensees. The purpose of the rule is simple. The public interest dictates that the broadcast audience has the right to know when and what programming is being presented by a sponsor in order to avoid being unconsciously influenced to the benefit of the sponsor (i.e., to enhance the sponsor's product or service). For example, XYZ Records, Inc. pays a radio station \$500 to play one of XYZ's records a certain number of times. The radio station plays the record, as

agreed, and, in addition, the disc jockey says prior to each play, "This is my favorite record and it is sure to become a hit." If no sponsorship announcement is made, the broadcast station is clearly guilty of receiving *payola* (receiving payment in consideration for playing a record without a sponsorship announcement) and *plugola* (promoting a record to influence record sales without announcing that the broadcaster is promoting the record in consideration of a cash payment).

The prior rule applies to payment by *sponsors to licensees*. The Communications Act was amended subsequent to the payola and plugola scandals of the late 1950s to include payments, gifts, etc., 1. by a *sponsor to any station employee* and 2. by a *sponsor to any person connected with the production or preparation of any program matter*.

Thus, if Airline A pays a television producer \$5000 to include shots of A's airplane prominently featuring the corporate logos, the station licensee must make a sponsorship announcement before or after broadcast of the program. However, this poses a problem. How can the licensee reasonably be expected to know whether or not a member of the program production staff or one of the licensee's employees received payment in consideration for plugging a sponsor's product or service? To alleviate this dilemma, the Commission has promulgated a rule requiring 1. an employee receiving payment in consideration of plugging a sponsor's product or service to report same to the licensee, and 2. a member of a program production staff receiving a similar payment to report such payment to either the payee's employer or the program producer. In either case, the licensee is then obligated to make an announcement of sponsorship.

Exception to the General Rule

Service or other valuable consideration shall not include any service or property furnished *without charge or at a nominal charge* for use on, or in connection with, a broadcast *unless* it is so furnished in consideration for an identification in a

continued on page 18

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Every time a heavy dropout burst from your VTR causes lost sync, your viewers might as well be watching

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It replaces the lost video information in full color within the video signal itself. Luminance and color are processed through separate delay lines, with the color phase-inverted to achieve color interlace with the stored signal. When dropouts are

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The 3M DOC comes with an adjustable dropout replacement threshold, with rf agc to maintain the level set; a chroma auto-phase corrector; and a built-in dropout simulator for alignment without a test tape. All standard features, not expensive options.

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For the name of your nearest dealer, contact: Video Products, Mincom Division, 3M Company, 300 South Lewis Road, Camarillo, California 93010. Telephone: (805) 482-1911. TWX: 910-336-1676.



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FCC Rules & Regs

broadcast of any person, product, service, trademark, or brand name *beyond an identification which is reasonably related to the use of such service or property on the broadcast.*² (Emphases supplied.)

The sponsorship announcement requirement does *not* apply if the service or property is furnished without charge or at a nominal charge for use on a broadcast. Thus, a licensee need not announce that a record company has supplied it with several copies of a newly released record prior to each airing. Moreover, the licensee may broadcast the record's title and the artist's name because such announcement is *not beyond an identification which is reasonably related to the use of such property on the broadcast.*

On the other hand, were a record supplier to furnish 100 or 200 copies of the same release, with an *agreement* by the station, express or implied, that the record would be used on a broadcast, an announcement would be required because consideration beyond the matter used on the broadcast was received.

There are two further exceptions to the general rule that the licensee must announce both the identity of the sponsor and the fact that program matter is paid for. Such required announcements are *waived* with respect to the broadcast of 1. “want ad” or classified advertisements sponsored by individuals, and 2. any other cases in which the Commission determines that the public interest, convenience or necessity does *not* require the broadcast of such announcement.

Examples of the former are quite familiar and need no further illustration. A recent example of the latter waiver of sponsorship identification requirement involved announcements advertising and promoting an independent organization supported by the federal government and industry designed to provide job training for disadvantaged youth. A major oil company bore production expenses of the announcement but was *not* identified in the finished announcement. Having determined that the public interest did not require a sponsorship announcement waiver, the Commission granted a waiver.³ Although sponsorship announcements may be omitted, the licensee is required to maintain a list showing the name, address, and telephone number of each sponsor. This list is to be attached to the daily program log and must be made available to any public citizen having a legitimate interest in obtaining information contained in the list.

Political or Controversial Issue Programs

An announcement that program matter is furnished without charge or at a nominal charge as an inducement to the broadcast of the program is required for *all* political and controversial issue discussion programs. As such, this is an “exception to the exception to the general rule,” i.e., political programming provided even free of charge must include a sponsorship announcement. The purpose of this rule is to insure that the listening or viewing public is kept aware of who or what organization or interest group is promoting the particular political or controversial issue viewpoint being espoused in the broadcast. The public is thus assured that they will not be subtly or unconsciously influenced by the sponsoring organization's or interest group's position on a particular issue.

Sanctions

For violating these Commission Rules, a broad range of sanctions may be imposed, including 1. Commission

continued on page 21

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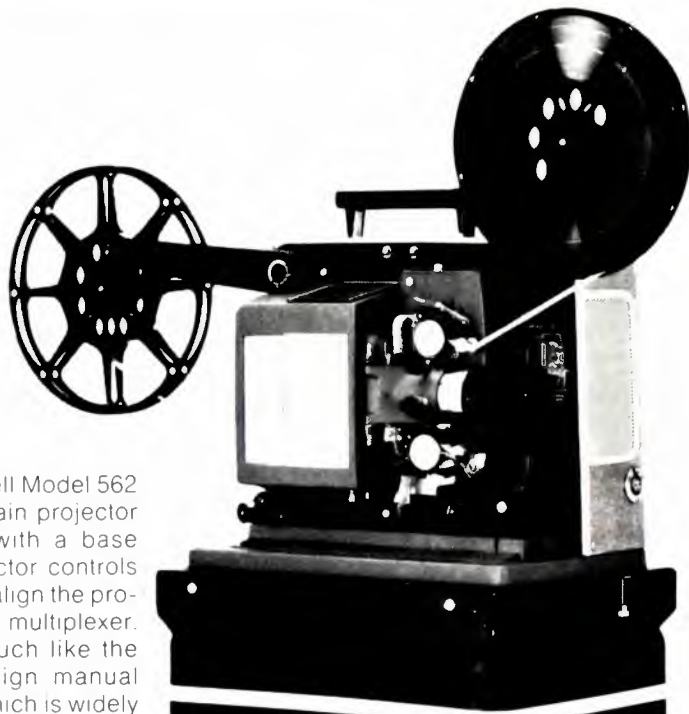
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Filmchain Projection Simplified



The new Bell & Howell Model 562 Optical/Magnetic Filmchain projector is delivered complete with a base which contains the projector controls and height adjustment to align the projector with TV camera or multiplexer. The projector is very much like the reliable 500 series design manual thread 16mm projector which is widely used in industry and education.

The Model 562 utilizes a synchronous motor, chain-driven film transport system including an automatic loop restorer to assist in providing picture and sound into the camera for transmission over closed circuit or antenna-signal distribution. The pedestal includes facility for easily installing remote operation from a control panel.

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Optical or magnetic sound play back. Choose from a wide variety of standard lamps and Bell & Howell lenses to obtain the optimum lumen input to the camera. A special torque release lever is provided when using reels with small hubs.

Other Important Details

Projector reel arms are gear driven, which provides quiet, reliable operation and constant take-up torque. The "Stellite," 3-tooth shuttle and ground and polished aperture plate, provides careful film handling in the projector transport system.

Self-lubricated bearings and other fine engineering details provide long life. The 500 series product design is well known to the hundreds of Bell & Howell service stations across the country, providing a ready facility to service any projector when maintenance or repair is required.

A Final Thought

The instruction books and service manuals provide the details necessary for installation, both electrical and mechanical, as well as remote control. Contact Bell & Howell, Chicago, for technical literature and the name of the local sources who will help you select the best combination of lens, lamp and equipment to project 16mm films for TV program distribution or local display.

AUDIO VISUAL PRODUCTS DIVISION
7100 McCormick Road, Chicago, Illinois 60645



BELL & HOWELL

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demand for letter of explanation, 2. license revocation proceedings, 3. fines, and/or imprisonment.

The Communications Act provides that a station employee or program production employee's failure to disclose payments of the type described above, is subject to a fine of not more than \$10,000 or imprisonment of not more than one year, or both, for each violation. Numerous fines have been imposed by the Commission.

Conclusion

Commission attention has again been drawn to the issue of payola and plugola violations by broadcasters. Commission rules regarding announcement of sponsored programs, announcement requirements of political or controversial issue programs, and exceptions to the announcement rule have been reviewed and accompanied by illustrative examples.

In summary, the broadcaster must exercise *reasonable diligence* to conform to the Commission's sponsorship announcement rules. Reasonable diligence includes affirmative licensee efforts to determine whether or not program production personnel or station employees have accepted payments for inclusion of material in programming.

Broadcasters should exercise a high degree of care in avoiding payola and plugola violations and should not hesitate to consult with their communications counsel should questions arise.

BM/E

¹ The Communications Act of 1934, 47 U.S.C. § 317 (a)(1).

² Regulations, § 73.119(a).

³ National Broadcasting Co., Inc. 24 RR2d 130 (1972).



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9. It can record simple commercials directly from studio.
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12. You can dub film spots onto cartridges.
13. How do you make a movie review more useful? Dub it to cartridge.
14. With the Cart, when you need a news "filler", you've got it.
15. The Cart Machine makes it easy to "localize" national commercials.
16. Directly record weather reports for later use.
17. It records and plays station editorials.
18. Use it to integrate live, film and slide material with audio for spots or programs.
19. Use it to make multiple dubs to reel machines.
20. Dealer tags. Make them once and dub onto carts where needed.
21. Some stations use it to dub tapes in quantity for clients.
22. Alfecon II headwheels last as much as 3 times longer than previous materials.
23. TCR-100 design is based on a study of actual station program logs.
24. Cartridges are easy to handle and store.
25. Ready access allows cart changes up to within 30 sec. of air time.
26. Carts available preloaded or reloadable.
27. Tapes recorded on highband VTRs can be loaded into carts and played on the TCR-100.
28. Consistent cart quality makes your station look better on the air.
29. All cartridges in the magazine are always visible.
30. Carts are factory loaded and cue coded.
31. Preloaded carts come in 1- and 3-min. lengths.
32. Tape in the cart is always in a rewind state, ready for replay.
33. Change carts in 3 sec.
34. Some carts have been played over 3,000 times.
35. Consistent color quality from cart to cart.
36. Cartridge doors protect tape while cart is out of machine.
37. Cart shelf area is only 2½ by 3½ in.
38. Carts are labeled so they can be identified in storage as well as in the machine.
39. Carts are keyed to prevent incorrect insertion.
40. Six carts can be stored in the same space required by two 6-in. tape reels.
41. Cartridges are respoolable.
42. The tape in preloaded carts is the best available.
43. The TCR-100 is designed for simplicity, not complexity.
44. Power consumption is low.
45. One to 21 dubs in one load.
46. Can do the work of 3 or more reel-to-reel machines at the break.
47. It eliminates the need for spot reels.
48. It programs 1 to 9 sequences with 1 to 8 events in each.
49. It's easily interfaced with a computer.
50. Operating controls are divided into 3 convenient functional groups.
51. To correct a premature start, just press the "Play Recue" button.
52. The TCR-100 has automatic A-to-B dub.
53. The Cart Machine follows the program log. No need for a bin log or sequence log.
54. Cue tones are audible.
55. "Last Event" warning on remote-control panel tells operator when final cart is playing.
56. Can be teamed up with our newly announced TCP-1624 Cartridge Film Projector.
57. The entire break is pretimed via cues, so cuts are clean and consistent.
58. To record, there are only 7 steps. Competition requires more.
59. Setup is easy with RCA Color Reference Cart.
60. Once reference is set, all tapes are recorded and played to the same standard.
61. Automatic threading, cueing, rewinding.
62. It can time-share the electronics of reel-to-reel TR-60s and TR-70Cs.
63. Traffic departments like it because it simplifies scheduling as well as logging and verification.
64. Machine can preview cart sequence to make sure they're in correct order.
65. Preview the entire cart sequence at the touch of a button.
66. After preview, one button recues the break.
67. It interfaces with and cues other VTRs and film equipment.
68. The TCR-100 switches video automatically.
69. To dub a cart, push only 4 buttons. No shuffling or cueing.
70. Makes possible all-tape station break.
71. Tape is protected from crimping and tearing.
72. You get dependable tape handling. No vacuum used.
73. There's no need for repeated color-bar checks throughout the broadcast day.
74. You use less tape because color-bar leaders, clapboards are unnecessary.
75. To program, just place carts in magazine, dial the number onto sequence register.
76. Smooth cartridge operation minimizes dead air time.
77. Tapes stay untouched by human hands.
78. With the Cart Machine, stations are able to get into more local production.
79. Machine setup takes only 10 to 15 minutes at start of broadcast day.
80. One man can control the entire station break.
81. It's easy to substitute a paying spot for a nonpaying one at the last minute.
82. Drastically cut headwheel cleaning time. Do it once at the beginning of the day.
83. If you receive just one film spot to run on a heavy schedule, the Cart solves the problem.
84. The Cart simplifies adding several different dealer tags to the same commercial.
85. Headwheels are interchangeable with those of TR-60s, TR-61s and TR-70Cs.
86. When time-shared with a TR-60, TR-61 or TR-70C, the reel-to-reel machine has separate video output for loading and cueing.
87. Cart dubs can be edited during dubbing.
88. The TCR-100 can be slaved to RCA TR-60s or TR-70Cs you already own.
89. An automatic actor's tally operates during recording.
90. It's the lowest-priced 2" quad cartridge VTR.
91. It frees up reel machines for production.
92. Its Signal Processing Unit contains picture and waveform monitors, monitor switching systems.
93. External Source Preroll Control for dubbing and recording.
94. There's a more relaxed atmosphere in the tape room at station-break time.
95. The TCR-100 includes its own processing amplifier.
96. There are only 35 control panel buttons compared to a competitor's 60.
97. Lighted status displays on TCR-100 indicate function being performed.
98. Optional remote-control panel also has status lamps for operator assistance.
99. Reference tape is supplied with machine.
100. Time sharing with TR-60, TR-61 or TR-70C provides cue-actuated preroll and audio-follow with TCR-100.
101. Rear-side video erase protects tape.
102. Available in 525/60 or 625/50 standards.
103. Rear-side handling during threading and playing prevents scratching.
104. Requires less floor space than the competition.
105. The signal processor includes a color dropout compensator (CDOC).
106. And a chroma amplitude and velocity error corrector (CAVEC).
107. Record-lockout control prevents loss of recorded material.
108. Only 2 tape contacts—one video, one audio head—means less tape wear.
109. All controls are at eye level.
110. Stations tell us that the TCR-100 frees manpower for other duties.
111. Make-goods are drastically reduced.
112. Optional remote-control panel fits into only 7 inches of rack or console space.
113. Optional Electronic Programming Identification System (EPIS) displays an identification of the cart being played.
114. There's a splicer-editor option for quickly adding last-minute information to carts.
115. Editor performs both video-only and audio-only edits.
116. Record Current Optimizer is standard.
117. Control track phase can be optimized automatically with an accessory.
118. Recording on both decks is available optionally. Most stations don't need it.
119. More than 4 million commercial plays to date.
120. It's the most experienced machine of its kind.
121. One of the best things about it is figuring out what to do with the money you save.
122. The service backup available is second to none.
123. And according to one user, "It makes such nice noises."

123 reassuring reasons for owning the RCA Cart Machine.

1. One TCR-100 delivered to WBAY-TV, Green Bay, Wisc.
2. One TCR-100 delivered to WUTV, Buffalo, N.Y.
3. One TCR-100 delivered to KSLA-TV, Shreveport, La.
4. One TCR-100 delivered to WWL-TV, New Orleans, La.
5. One TCR-100 delivered to WBAL-TV, Baltimore, Md.
6. One TCR-100 delivered to WJAR-TV, Providence, R. I.
7. One TCR-100 delivered to WBRE-TV, Wilkes-Barre, Pa.
8. One TCR-100 delivered to WAFB-TV, Baton Rouge, La.
9. Five TCR-100s delivered to NBC Network, N.Y.C.
10. One TCR-100 delivered to WDCA-TV, Washington, D. C.
11. One TCR-100 delivered to KIRO-TV, Seattle, Wash.
12. One TCR-100 delivered to WSAV-TV, Savannah, Ga.
13. One TCR-100 delivered to KNTV, San Jose, Cal.
14. One TCR-100 delivered to KPLR-TV, St. Louis, Mo.
15. One TCR-100 delivered to KHQ-TV, Spokane, Wash.
16. One TCR-100 delivered to KTSM-TV, El Paso, Tex.
17. One TCR-100 delivered to WAPA-TV, San Juan, P. R.
18. One TCR-100 delivered to WISN-TV, Milwaukee, Wisc.
19. One TCR-100 delivered to WFMY-TV, Greensboro, N.C.
20. One TCR-100 delivered to WTVC, Chattanooga, Tenn.
21. One TCR-100 delivered to WSB-TV, Atlanta, Ga.
22. One TCR-100 delivered to WTAF-TV, Philadelphia, Pa.
23. One TCR-100 delivered to WTAE-TV, Pittsburgh, Pa.
24. One TCR-100 delivered to WPTV, W. Palm Beach, Fla.
25. One TCR-100 delivered to WGR-TV, Buffalo, N.Y.
26. Two TCR-100s delivered to WBNS-TV, Columbus, Ohio
27. Two TCR-100s delivered to WECT-TV, Wilmington, N. C.
28. One TCR-100 delivered to WKBW-TV, Buffalo, N.Y.
29. One TCR-100 delivered to WGN-TV, Chicago, Ill.
30. One TCR-100 delivered to CHAN-TV, Vancouver, B. C., Can.
31. One TCR-100 delivered to WDAY-TV, Fargo, N. D.
32. Three TCR-100s delivered to NBC Network, Burbank, Cal.
33. One TCR-100 delivered to WRAL-TV, Raleigh, N. C.
34. One TCR-100 delivered to WNCT-TV, Greenville, N. C.
35. One TCR-100 delivered to WKRC-TV, Cincinnati, Ohio
36. One TCR-100 delivered to WTVN, Columbus, Ohio
37. One TCR-100 delivered to WBRC-TV, Birmingham, Ala.
38. One TCR-100 delivered to WDAF-TV, Kansas City, Mo.
39. One TCR-100 delivered to KVRL-TV, Houston, Tex.
40. Two TCR-100s delivered to WRC-TV, Washington, D. C.
41. One TCR-100 delivered to KSD-TV, St. Louis, Mo.
42. Two TCR-100s delivered to WKYC-TV, Cleveland, Ohio
43. One TCR-100 delivered to KWTU, Oklahoma City, Okla.
44. Two TCR-100s delivered to KPRC-TV, Houston, Tex.
45. One TCR-100 delivered to KTBS-TV, Shreveport, La.
46. One TCR-100 delivered to KARD-TV, Wichita, Kan.
47. One TCR-100 delivered to WMAL-TV, Washington, D. C.
48. Two TCR-100s delivered to KSTP-TV, St. Paul, Minn.
49. One TCR-100 delivered to WEAT-TV, W. Palm Beach, Fla.
50. One TCR-100 delivered to KPTV, Portland, Ore.
51. One TCR-100 delivered to WKRG-TV, Mobile, Ala.
52. One TCR-100 delivered to WSPA-TV, Spartanburg, S. C.
53. One TCR-100 delivered to KWGN-TV, Denver, Colo.
54. One TCR-100 delivered to KCEN-TV, Temple, Tex.
55. Two TCR-100s delivered to KRON-TV, San Francisco, Cal.
56. One TCR-100 delivered to WSOC-TV, Charlotte, N. C.
57. Two TCR-100s delivered to KOB-TV, Albuquerque, N. M.
58. One TCR-100 delivered to WBTV, Charlotte, N. C.
59. One TCR-100 delivered to KOMO-TV, Seattle, Wash.
60. One TCR-100 delivered to KATU-TV, Portland, Ore.
61. Two TCR-100s delivered to WBAP-TV, Fort Worth, Tex.
62. One TCR-100 delivered to KTRK-TV, Houston, Tex.
63. One TCR-100 delivered to KBTU, Denver, Colo.
64. One TCR-100 delivered to KOCO-TV, Oklahoma City, Okla.
65. One TCR-100 delivered to WUAB-TV, Cleveland, Ohio
66. One TCR-100 delivered to KTVW, Tacoma, Wash.
67. One TCR-100 delivered to WTOP-TV, Washington, D. C.
68. One TCR-100 delivered to KNOE-TV, Monroe, La.
69. One TCR-100 delivered to WTNH-TV, New Haven, Conn.
70. One TCR-100 delivered to CFTO-TV, Toronto, Ontario, Can.
71. One TCR-100 delivered to KFSN-TV, Fresno, Cal.
72. One TCR-100 delivered to WATE-TV, Knoxville, Tenn.
73. One TCR-100 delivered to KMGH-TV, Denver, Colo.
74. Two TCR-100s delivered to WMAQ-TV, Chicago, Ill.
75. One TCR-100 delivered to KOVR-TV, Stockton, Cal.
76. One TCR-100 delivered to KYTV, Springfield, Mo.
77. One TCR-100 delivered to CFRN-TV, Edmonton, Alberta, Can.
78. One TCR-100 delivered to WVUE-TV, New Orleans, La.
79. One TCR-100 delivered to WTVD, Durham, N. C.
80. One TCR-100 delivered to KCAU-TV, Sioux City, Iowa
81. One TCR-100 delivered to WRTV, Indianapolis, Ind.
82. One TCR-100 delivered to WTMJ-TV, Milwaukee, Wisc.
83. One TCR-100 delivered to WDBJ-TV, Roanoke, Va.
84. One TCR-100 delivered to WMC-TV, Memphis, Tenn.
85. One TCR-100 delivered to WCPO-TV, Cincinnati, Ohio
86. One TCR-100 delivered to WXYZ-TV, Detroit, Mich.
87. Two TCR-100s delivered to WABC-TV, N. Y. C.
88. One TCR-100 delivered to WEWS-TV, Cleveland, Ohio
89. One TCR-100 delivered to WBOC-TV, Salisbury, Md.
90. One TCR-100 delivered to KVUE-TV, Austin, Tex.
91. One TCR-100 delivered to KRIS-TV, Corpus Christi, Tex.
92. One TCR-100 delivered to WLS-TV, Chicago, Ill.
93. One TCR-100 delivered to WJAC-TV, Johnstown, Pa.
94. One TCR-100 delivered to KOAA-TV, Pueblo, Colo.
95. One TCR-100 delivered to KTEN-TV, Ada, Okla.
96. One TCR-100 delivered to WTEV-TV, New Bedford, Mass.
97. One TCR-100 delivered to WZZM-TV, Grand Rapids, Mich.
98. One TCR-100 delivered to WJRT-TV, Flint, Mich.
99. One TCR-100 delivered to WMAR-TV, Baltimore, Md.
100. Two TCR-100s delivered to WTOG-TV, St. Petersburg, Fla.
101. One TCR-100 delivered to KATC-TV, Lafayette, La.
102. One TCR-100 delivered to WTLV-TV, Jacksonville, Fla.
103. One TCR-100 delivered to WYAH-TV, Portsmouth, Va.
104. One TCR-100 delivered to WMTV, Madison, Wisc.
105. One TCR-100 delivered to WAVY-TV, Portsmouth, Va.
106. One TCR-100 delivered to WAPI-TV, Birmingham, Ala.
107. One TCR-100 delivered to WFMJ-TV, Youngstown, Ohio
108. One TCR-100 delivered to WCSH-TV, Portland, Me.
109. One TCR-100 delivered to ATV-O, Melbourne, Australia
110. One TCR-100 delivered to TV-Q, Brisbane, Australia
111. One TCR-100 delivered to BTW, Bunbury, Australia
112. One TCR-100 delivered to YTV, Yorkshire, England
113. One TCR-100 delivered to LWT, London, England
114. One TCR-100 delivered to Venevision, Caracas, Venezuela
115. One TCR-100 delivered to TIMSA, Mexico City, Mexico
116. Two TCR-100s delivered to WKAQ-TV, San Juan, P. R.
117. One TCR-100 delivered to WCYB-TV, Bristol, Va.
118. One TCR-100 delivered to Global Communications, Toronto, Can.
119. One TCR-100 delivered to WSBT-TV, South Bend, Ind.
120. One TCR-100 delivered to KOTA-TV, Rapid City, S. D.
121. One TCR-100 delivered to KELO-TV, Sioux Falls, S. D.
122. One TCR-100 delivered to WBBH-TV, Ft. Myers, Fla.
123. One TCR-100 delivered to WPVI-TV, Philadelphia, Pa.

For further information, see your RCA representative. Or write RCA Broadcast Systems, Bldg. 2-5, Camden, N.J. 08102.

Circle 160 on Reader Service Card

Remodeling a Studio For Comfort and Convenience

By Arthur A. Avery

WGN rebuilt a "talk and disc" studio for top operating efficiency, as well as comfort for guests and operators.

Are you remodeling a studio or building a new one to serve your audience? We at WGN have lately completed a comprehensive remodeling project. The highly rated telephone talk show, "Extension 720," a daily noontime farm program, many taped radio shows and radio commercials were scheduled to originate in the remodeled studio. This article will describe how we went about it.

"Dedicated to serve" was the theme for design and construction of the remodeled studio. All facilities were aimed at the most convenient service to talent, engineering, building maintenance and guests. Constructed in this way, it was believed the studio could best serve WGN's audience.

We were remodeling a studio which had served for ten years, therefore our limitations of space were known and fixed. All arrangements and construction were designed to best utilize this available space. Our first step in the remodeling program was the drawing of plans to achieve our goals. We believed that the pre-planning phase of such a project would be the most influential factor in its success, therefore, representatives of all departments who would be involved in the studio's use were called upon to present their requirements and ideas. Personal representatives of engineering, production, building maintenance, management, and interior design met in the studio area to develop an agreed-upon set of pre-plan decisions.

The station management and production department set goals and described intended uses for the studio. Engineering presented methods to apply state-of-the-art equipment to accomplish the goals set. Building maintenance presented the problems of physical maintenance as they related to the facilities proposed. Management weighed costs of each idea and evaluated their productive worth.

Our interior designer, Robert Stebbins, then drew up a preliminary sketch of the agreed-upon arrangements of the studio. This plan recognized that all anticipated alterations would comply with two basic criteria. The original studio had been constructed as a dual-suspended room-within-a-room to minimize entrance of external sound and vibration. Our remodeling had to carefully maintain this valuable feature. The second requirement was to establish an acoustical criterion to complement and utilize today's state-of-the-art pickup equipment which could and would be enhanced when necessary by

varied electronic means.

When the plan had reached its final form, a bill of materials for construction was placed on order.

Our studio was designed basically as a circle in which personnel could communicate visually with one another. You will note from the floor plan, opposite, that every person involved in the operation can conveniently view all others. Operating positions consist of three separate announcing positions, four guest-performer positions, two production positions, a transcription playback position, and an engineering operation position.

In addition, there is seating for six non-performing guests. The studio area is furnished as a comfortable living room, providing a warm, friendly atmosphere for



View over engineer's shoulder in control room includes disc-playing position, at right, and interview table, with gooseneck mikes for each position, in left background.

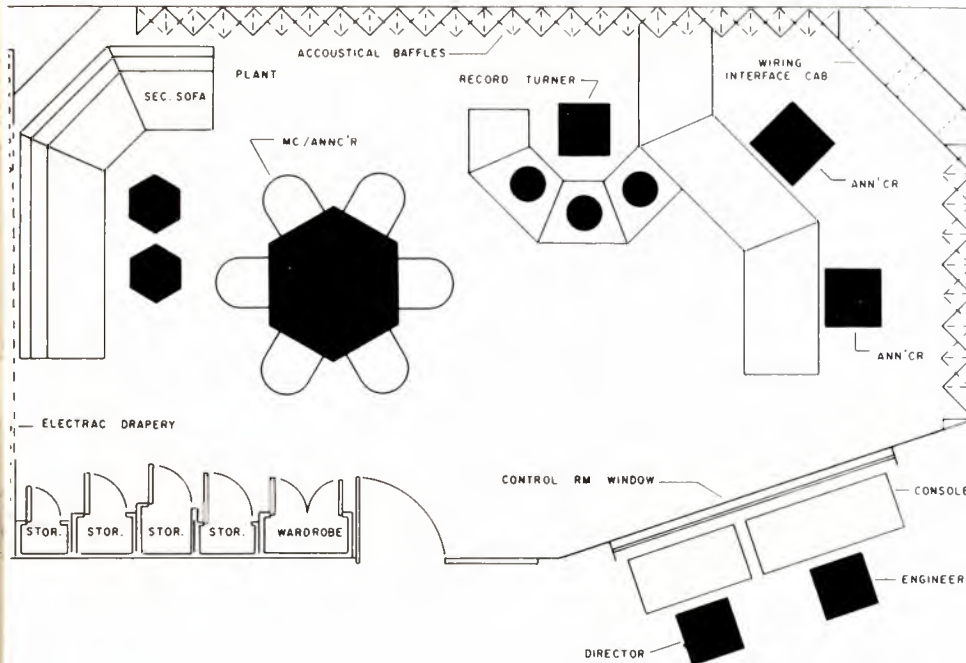
Random-select control panel, at engineer's right in control room, allows him to inject into the program recorded material from any cart on a three-part machine holding up to 165 carts.



Mr. Avery is engineer-in-charge, WGN, Chicago.



Interior view in studio shows announcer position, foreground, disc position, right mid-distance, and table with mikes for talk shows, left background.



Floor plan of new WGN studio for talk shows and disc programs shows relation of facilities for the various shows, with comfortable seating for guests and observers beyond "talk table."

announcers, talent, and guests. The decor includes carpeted floors, living green plants, and adjustable lighting to suit the needs of the operation in progress.

As previously mentioned, the primary uses of this studio were to serve announcers, the air playing of disc transcriptions, a daily telephone talk show including our performing guests and, at times, small live musical groups. With this considerable number of persons in the studio at one time, it was anticipated that sounds which should not be reproduced would be created by talent and guests.

To help in keeping these sounds off the air, cardioid microphones are used for all positions. You will note that mikes are placed so that each user works six to eight inches from his assigned microphone. Each operating position and each microphone is placed so as to take advantage of the cardioid pattern, thus assisting in the control of unwanted noise and reducing the effect of room acoustics. The circle arrangement lends itself admirably to this placement of personnel and microphones.

The studio walls are constructed to provide a slight

liveliness, which enhances good communication within the studio. But, since we work close to the microphones, the acoustics of the studio have a minimum effect on our end-product. Our walls, ceiling, and floor treatment provide comfort and appeal, more than acoustic control.

However, we can liven the studio, if desired, by opening the drapes which extend over one end. This is rarely required. The strength of external building sounds and vibrations which enter the studio are successfully controlled by the dual wall construction and other insulating techniques. For example, the studio entrance to the corridor is by way of a double set of doors and a sound lock. Altogether, our new studio provides a comfortable, pleasing environment for all to work in. The floor plan locates all furniture, equipment, and operating positions.

Electronic facilities used in the studio will now be described. In the control room are two manually operated cartridge machines, which may be utilized by the audio operation engineer for news cartridges and as a backup for the remote-controlled cartridge playback system. A cartridge-delay machine, used as a backup for the reel delay required for telephone participation

shows, is also in the studio control room. A reel tape machine used to record the studio output or play a tape through the studio's facilities is located near the studio operator.

The audio control console shown is a custom unit which was modified by the station engineering staff to accept the additional input studio facilities; it provides two channels. One channel is used for on-air, and the other for tape-delay programming, or auditioning of selected facilities.

As will be noted in the studio floor plan, there are seven microphone positions in the studio. Each appears on a separate mixer in the audio console. A 12-key selector is available to permit the mixing of remote facilities into studio programming. Three record playback turntables may be mixed through two console mixers. A telephone system is available which gives production personnel the ability to pre-screen telephone calls before use on telephone-participation shows. The output of this system is fed to a console mixer. Talk-back services for the audio engineer and control room producer provide communication to the studio, supplementing the local battery telephone services.

A random-select cartridge machine, located in our

master control room and remotely controlled from the studio control room, has three parts. Each part may be loaded with 55 cartridges, and any unit of the three may be run, one following another in random order. Thus, a total of 165 cartridges can be loaded and played without reloading. At WGN, most commercial and public-service announcements are aired through this machine to guarantee a consistent high quality of presentation on the air.

As we turn to the studio, we find there are three announce positions, each equipped with a control panel, a microphone, a local battery telephone, telco phone instruments and headsets. Each control panel permits the announcer, through the use of push-button switches and gain controls, to control volume to his headset, actuate buzzer in the control room, originate talkback to the control room, edit a tape delay show to eliminate undesired comments from the air and select turntable output for cue purposes. Indicator lamps on the unit show studio on air, desire of control room to gain announcer's attention, and warning to announcer to give station identification call letters. Each announcer's position is served by a convenient-to-view clock controlled by the station's master clock system.

You will note that the studio floor plan provides a position for a transcription operator with three record playback turntables. This operator is provided headphones for cueing and a desk area for paper work. A local battery phone provides communication to the control room from the transcription operator.

Our hexagon table serves a telephone talk show host and up to five guests. The host is equipped with an announcer's control panel and a telephone switching panel. All performers at this table are provided with headphones to hear outside telephone callers. Our talk shows are often of two hours' duration. Guests and moderator require space for texts, fact sheets, and reference documents, and these needs are served through the use of the hexagon table. Microphones, one for each guest, are adjusted before each show. Persons performing on a typical two-hour show respond to the many questions from the telephone caller on the "Extension 720" program. You may note that participants are provided with comfortable chairs, which are a must for the success of a continuous two-hour performance.

Often performers bring other guests to our studio. These guests are accommodated in the seating area partially circling the hexagon table. Headphones are provided so that they may hear the outside telephone callers.

Cabinets and closets are available for cable storage and the other sundry items which are occasionally used in the studio.

Practically all wiring is concealed. To facilitate fast emergency replacement of defective equipment, a wiring interface cabinet is located in the studio. This wiring cabinet is the interface between electronic equipment in the studio and the control room.

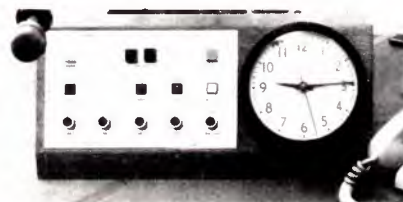
Our new studio is effectively serving WGN's audience. We believe the key to its success is its convenience for all who work within its pleasant environment. This was the assignment our management gave us in the remodeling of the studio, and it was carried out by station personnel and the outside contractors who worked together on the job. We at WGN wish you well as you proceed to build and use your new radio studio.

BM/E



Studio in use, with announcer in front, disc jockey in middle ground, interview group at table in background.

Control panel in front of each announcer allows him to set volume in headset, actuate buzzer in control room, institute talkback to control room, edit the tape delay "safety," select turntables for cue.



Closeup of announce position, showing local battery phones, as well as regular phone and plug-in cueing headset.



One of the world's most popular microphones

The E-V 635 A



WARRANTY

Electro-Voice Professional Broadcast, Recording, and Sound Reinforcement Microphones are guaranteed unconditionally against malfunction from any cause for a period of two years from date of original purchase. Also, every Electro-Voice microphone is guaranteed for the life of the microphone against malfunction due to defects in workmanship and materials. If such malfunction occurs, microphone will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not cover finish, appearance items, cables, cable connectors, or switches and lifetime warranty does not cover malfunction due to abuse or operation at other than specified conditions. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

Our warranty is pretty popular, too.

It's a singular microphone, the E-V 635A. Used by engineers around the world. On TV, film, radio, in recording studios, and on stage. Chosen because it unfailingly delivers great sound with no fuss. If often seems that the tougher the problem, the better the 635A performs... and outperforms the competition. In fact, for many it is the standard by which all others are judged.

But even when things go wrong (as they sometimes do) E-V has the advantage. For instance, for the first 2 years we'll put your 635A (or any other E-V Professional microphone) back in operation fast, for only the cost of one-way postage. Even if you dropped it, or dunked it, or ran over the microphone with your remote truck!

It's a remarkable warranty because we build remarkable products. Designed to serve, and to solve your sound problems day after day. Your E-V sound headquarters is ready to help you select the E-V Professional microphones that exactly fit your needs. Or write us for the latest information on E-V professional sound products. Today.

Electro-Voice®

a **Gulton**
COMPANY

WHA Radio and Television Envy of Many

The impressive studios and equipment of WHA Radio and WHA-TV—part of the University of Wisconsin Extension Telecommunications Center—are helping the electronic media serve both students and the public at large, on and off campus.



Ground floor entrance to Vilas Communication Hall, home of WHA Radio and TV.



Set used in Studio A.

WHA traces its beginnings to a University of Wisconsin physic lab workbench. That was in the pioneer days of 1917. In 1919 it began scheduled broadcasts licensed as an experimental station 9XM. These dates permit WHA (call letters acquired in 1922) to lay claim to being the "oldest station in the nation." Today WHA Radio, with its eight studios, is located in the Vilas Communication Hall, as modern a telecommunications facility as one can find anywhere. Only two of these studios serve a campus radio station. WHA is really a University Radio Center.

This center produces programs for broadcast over University stations and other educational and commercial stations within the state and, through nationwide interconnected networks, serves other educational radio stations. It is a major central production facility for all types of educational audio for use by the University, by other educational institutions in the state and across the country, and by special professional groups, adult education projects, and families in their homes.

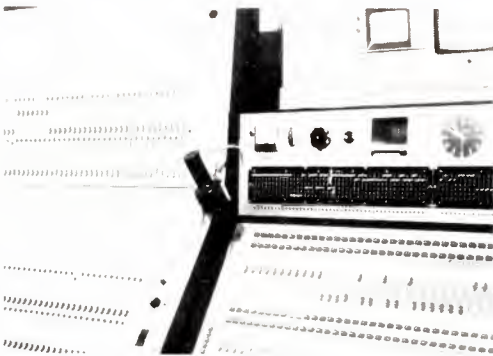
WHA-TV, Channel 21, became the fourth non-commercial TV station in the U.S. when it went on the air in 1954. Back then it put out 11,900 watts (ERP) from a transmitter and was called the University of Wisconsin Television Laboratory. Today it has an effective radiated power of 754kW emanating from a 1250 foot tower. Service area ranges from 40 to 60 miles. Like WHA Radio, the TV counterpart is part of a state network (Wisconsin Educational Television Network) and its programs reach now (or soon will) the entire state. Its equipment and studios dominate three floors of Vilas Communication Hall. Its administrative offices are located on the seventh floor, which also contains the offices and studios of WHA Radio. The master control complex on the third floor is as impressive a nerve center as you can find anywhere. So is Studio A, with its floor area of 6000 square feet, and ceiling height of 24 feet.

Many a commercial station would be very envious of the WHA Radio and WHA-TV facilities, but, lest the reader surmise from a quick look at the floor plans on these pages that *all* area is devoted to over-the-air broadcasting, we hasten to add that Vilas Communication Hall serves others too. It is the home of the Madison Campus Department of Communications Arts and School of Journalism and Mass Communications. Actually, WHA Radio and WHA-TV are a part of the University of Wisconsin Extension Telecommunications Center Facilities and therefore are used for teaching, research, and public service as well as broadcasting.

Two of the four TV studios, for example, are operated by the Department of Communications Art for teaching television production.



Production switcher in Studio A.



Lighting control in Studio A.



Audio control console in Studio A.

General view of Studio A audio-video control room. Audio console is to the right. Through the window is the lighting control room.



The building also includes a thrust theater, an open-stage theater, and a Parliamentary Room, all having broadcast capabilities. A pedestrian bridge across University Avenue, which connects the Vilas Communication Hall with the Humanities Building, includes audio/video cables which add the Humanities Building performance halls and the Elvehjem Art Center as additional broadcast-capable locations.

Radio production facilities

WHA Radio production facilities include eight custom designed studios. These range from mini talk studios to the nearly 2000 square feet of Studio One.

Master Control, which feeds the state FM network and operations of an AM transmitter when it is in simulcast, incorporates a 16-input, six-output McCurdy Custom Audio Console, SS-5200 Series. Master controls include six Ampex AG-440 recorders, three ITC cartridge play-back-only tape recorders, and two EMT turntables. The monitor system is made up of two Crown D-150 stereo power amplifiers feeding four Sentry I speakers. There are two channels for programming and two channels for auditioning. Three studios are available to Master Control, two of which are talk studios and a third is large enough for panel discussions.

The talk studios have AKG C12 condenser mikes. Their pattern can be changed from the control room. There is also a back-up second mike line. The large studio has a six-mike capability from the control room, and a second mike line is available.

The production control center for Studio One is called Control One and includes a 24-input and eight-output audio console custom-built by Audio Designs. Control One also contains one MM-1000 Ampex eight-track recorder, two AG-440B record/play two-track, and two mono recorders, plus one G-440B four-track Ampex. Two stereo AKG-BZ20E reverb units are included.

Another McCurdy SS-5200 audio production console with 12 inputs and four outputs is found in the recording service production area. This studio includes one



Camera control units and video processing section in master control.



Master control console for WHA-TV



View of the videotape room.



Master control console controlling Educational Communications Board programs.

Fairchild reverbatron, two EMT turntables, and three Ampex AG-440 record/play tape recorders as well as a monitoring system.

The recording service console has access to two studios, one equipped with eight microphones and the other with four. The recording line feed area consists of the audio console, which is an Altec 250-T3, with 12 input channels and three output channels. There are stations for five tape recorders. In the duplicating area there is a Pentagon C-1400 reel-to-reel cassette recorder and a cassette-to-cassette duplicator capable of duplicating four at a time is found in the duplicating area. There is also an Ampex AD-15, reel-to-reel, duplicator capable of three at a time, and an Ampex CD-2000 cassette-to-cassette high-speed duplicator.

WHA also boasts an unusual electrosonic studio for

experimentation and special effects. It contains an Audio Designers console, one MM-1100 Ampex 16-track recorder, a Scully reel-to-reel two-track and a Scully reel-to-reel mono recorder. Key to this room is a Moog Synthesizer.

When not simulcasting, WHA has a separate AM control room. It uses a McCurdy SS-4396 dual channel audio console with 12 inputs and two outputs. Input devices include three Ampex recorders, two ITC cartridge recorders, and two EMT turntables. The WHA Radio operation includes some portable equipment which is used in-house.

Television production facilities

WHA-TV began its life in the basement of Chemical Engineering. It still has two studios at its command in a

campus building, but most of the action takes place at Vilas Communication Hall. Studio A offers 6000 square feet of usable space, and Studio C, 1850 square feet.

WHA-TV has six RCA TK-44Bs and two TK-630s. It also has access to four TK-630s and three TK-60s which are part of the UW Department of Communication Arts complement. WHA-TV's TK-630s are standard cameras, and the TK-44B chains include four 10X1 lenses and two 15X1 lenses. The latter also include chroma comp for tech matching. Six cameras may operate in Studio A and four in Studio C.

Telecine islands include two RCA TK-28s and one TK-27. (UW Department of Communication Arts has a TK-610A and one TK-22 for black-and-white.) The videotape recording complement includes: three RCA TR-70Cs, one TR-70A, one TR-60, and one RCA TR-4HB quad machine. The Wisconsin Educational Communications Board, which shares Master Control space for its network transmission, has two RCA TR-70Cs. All except two are capable of electronic edit-

ing. There are two Ampex 5800 one-inch helical machines, two Panasonic 3130 one-half inch units, and 12 Sony-Wollensak three-quarter inch cassette VTRs.

Master Control switches consist of two CDL Model 830s, one of which has a 17-event pre-set (PTS120). A CDL film and VTR delegations system assigns film islands, tape machines, pulses, and machine control to all studios and two master control positions. All audio mixers are McCurdy, with the major unit being a custom-built model 6200. Audio inputs include three ITC cartridge machines and one RCA reel tape player.

Studio A Control is equipped with a CDL type VSP-870 which is the major production switcher and includes assignable dual effects, chroma key, dual background generators, auto-transition, and quad split. There is a Vidifont titling system and a McCurdy mixer. Within the studios two Fisher Booms are available—Model 2-100 with 3-100 perambulator.

The major portion of WHA-TV's lighting equipment was purchased from Mole-Richardson. This equipment package includes 5Ks, 2Ks, nook lights, century stands, floor stands, inkies, 3-circuit 12 light and 2 light floor cyc lights. Top lighting for the cyc is done with Century and scoops, three color. The lighting control systems were designed by Kliegl Brothers. Studio A has 90 dimmers and a 5-scene preset board. Studio C has 36 dimmers and a 3-scene preset board. Dimmers are either 7kW or 12kW. In addition, Kliegl provided 2K pattern projectors and cabling 20 amps and 50 amps in various 10-2550 foot; there are also 2 fers and 3 fers.

The scene shop is fully equipped. All sets and background flats are designed and built in the WHA-TV shop.

Mobile capabilities

WHA Radio has no specific mobile unit as yet, but it does have equipment used for remote recording. There are two Ampex AM-10 stereo mixers and three Shure M-67 monaural mixers. Three tape recorders are available: a Sony TC-770, an Ampex 602, and a Uhuer stereo recorder.

WHA-TV's mobile unit is used primarily for on-campus courses and instruction. The unit is a redesigned version of a 22-foot motor home housing two RCA TK-630 cameras with an additional camera control unit which will permit the use of a third camera. In addition to normal technical equipment there is an RCA TS-51 production switcher, Dipole audio mixer, quad and helical VTRs and a Telestrator unit.

The cost

Expenditures for radio and television equipment in Vilas Communication Hall totalled nearly \$3 million. An additional \$700,000 was allocated for upgrading of the TV transmitter and tower facilities. The combined operation of the UW-Extension Telecommunication Center cost the UW \$1,200,000 for fiscal year 1972-73. As part of Extension, both radio and television have the responsibility for partial self-support which totalled \$300,000. This is achieved through "chargebacks" for services on a cost reimbursement basis. Grant funds in television production and activities generally match state appropriations and radio matches about 60% of its UW support. In 1969-71, these grants totalled \$343,000 for radio and \$1.2 million for television; in 1971-73, the figures reached just about a half-million for radio and a million dollars for television.

BM/E



WHA Radio control room.



Audio console in WHA Radio studio.

You can see it, you can hear it, and you get it in every piece of equipment we build.

Quality, performance and reliability.

Collins traditionally has been in a class by itself as a supplier of high quality, high performance, high reliability broadcast equipment.

You probably know that.

But if you think you can't afford Collins equipment, here's something else you should know: Collins is competitively priced. We'll

match our prices with competition anytime. On transmitters. On consoles. On antenna systems. On programming equipment. On any equipment you use.

And we haven't sacrificed anything in the way of quality, performance or reliability. We back everything we make with a two-year warranty. Plus 24-hour, on-call service — which means you get help if you need it.

AM. FM. Stereo. Broadcast equipment from Collins. Competitively priced to give you the best sound on the air.

Contact Collins Radio Company, Broadcast Division, Dallas, Tex. 75207 or call 214/235-9511.



Collins Broadcast Equipment



Gutsy "VOX" of New York's Westchester County Gets a Proper Home

WVOX, nationally admired for its blend of forthrightness and community service, leaves cellar and office building stands behind for good.

Some radio stations are born into new, properly-designed plants. Many adapt or enlarge their plants to match enlarging or shifting objectives and needs.

WVOX, in New Rochelle, N.Y., serving the mighty New York suburban county of Westchester, was a successful, highly individual, nationally-known radio voice before it had anything approaching a plant designed from the ground up. The station grew up in a small block building at the transmitter site, in an office building in downtown New Rochelle, and over a restaurant in the town.

Late last summer WVOX got its own plant, one that houses its activities to perfection and makes the station a county showcase. The new transmitter-studio-office building is the result of a long and careful search by the management for the facilities design that did the most for the station—technically, administratively, and in its fervent relation with its community.

That relationship is, by intent of the management, the central fact of the WVOX operation. The 100-horsepower drive of President William O'Shaughnessy, since he took over the station some eight years ago, has been to make it the voice of the community in literal truth and in as many ways as possible. As it has worked out, O'Shaughnessy's determination took the station into a multitude of local involvement and community service activities, into strong editorial stands on controversial issues, into stance as a "soap box" for the most diverse viewpoints—and into an astounding variety of general-interest programs:

- Local and regional news, with stringers in every part of the country;
- Arlene Francis in comment;
- Regular comment from Washington by Senator James Buckley;
- A live Wall Street report;
- A regular high school quiz program;
- Gardening tips;
- Albany reports;
- Irish (and Italian, German, Polish) music;
- U.N. reports;
- Rap sessions (and rock music) for teenagers;
- Classical music;
- The 40-Plus Club (for senior citizens);
- Movie reviews;
- Ski reports;
- Soccer scores from Italy and Ireland;
- Weekly reports from the County Administrator;
- Larchmont Race Week (a yachting classic);
- Golf tournaments;

- A Westchester Arts program;
- . . . and scores more.

The narrow "format" idea was smashed to bits at WVOX, and a literally-followed "vox-populi" idea erected in its place.

The station's willingness to take on unpopular causes testifies most clearly to the breadth of O'Shaughnessy's concept. Westchester is a Republican stronghold that furnishes bedrooms and well-manicured lawns for hundreds of executives of national corporations and for very highly-paid professionals in advertising, etc., but it has its pockets of poverty, its racial ghettos, and, from time to time, its corruption in government. WVOX has mounted attack after attack on discrimination, malfeasance in office, and other ills of the county.

The program "Open Line" taps community feelings directly by putting telephoned comments on the air. The station campaigned strongly for CBS's right to free speech when the program "The Selling of the Pentagon" ran into trouble with the Administration in Washington. And the station proved its really straight view of free speech by defending a local college under heavy attack because of a scheduled lecture by Eldridge Cleaver, the black activist.

All this, and much, much more, reflects the special energy of O'Shaughnessy, who was called by John O'Connor, in the *New York Times*, "part cool sophisticate, part gutsy street fighter." O'Shaughnessy has gathered a high-energy news staff who see eye to eye with him, headed by news director Steve Osborne. Senator Jacob Javits of New York said: "The attractive and dedicated young men at WVOX are real pros. I've never heard another station quite as concerned about the interests of the people they serve."

O'Shaughnessy himself writes and delivers most of the editorials, with a rich and vigorous style both in the writing and the delivery.

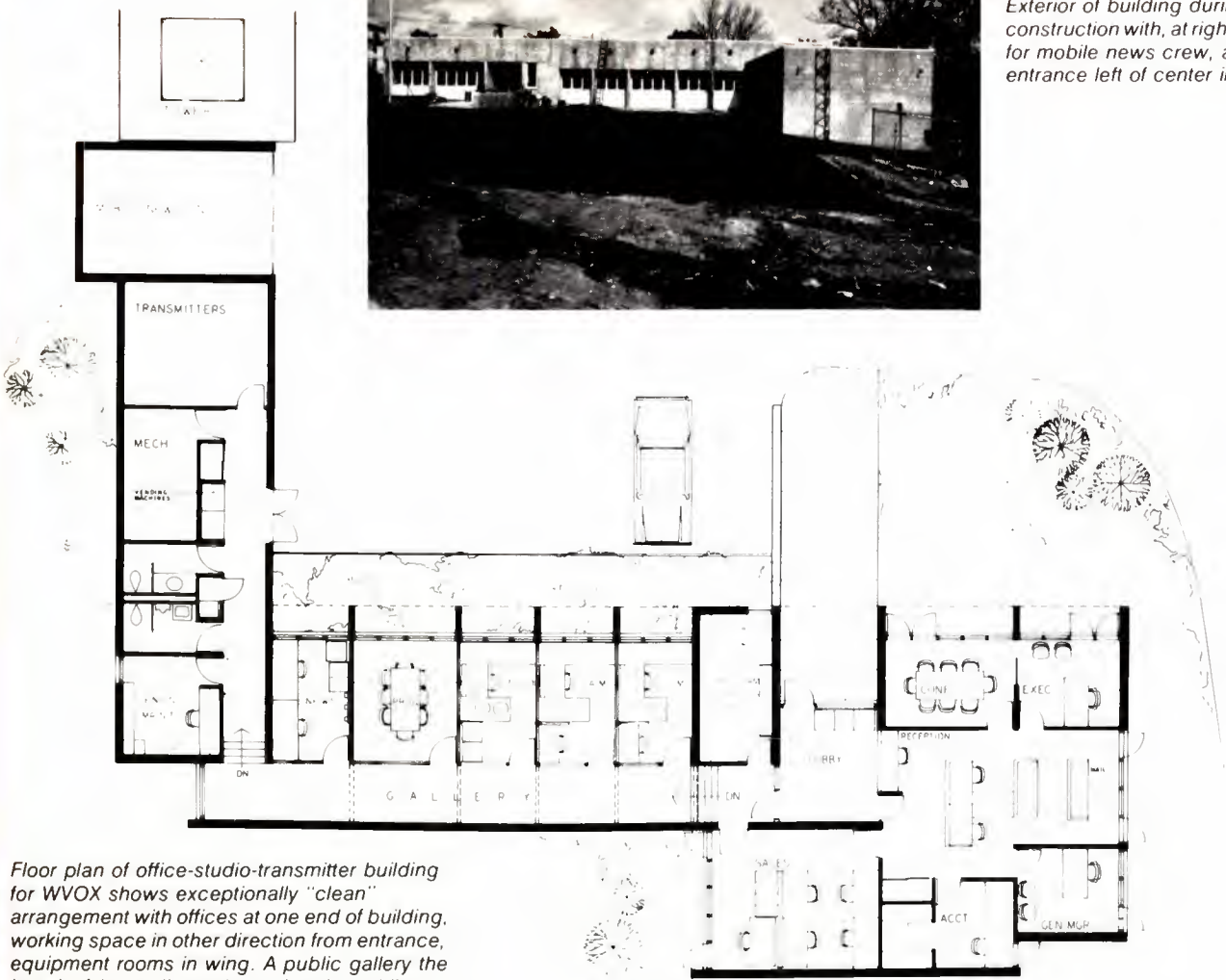
How is this working out at the box office? WVOX is strongly in the black; it is one of the favored advertising outlets in the county. Billings are well above the \$500,000 line, a profit area for a station of this size. WVOX has, in fact, become the national prototype of the suburban station that succeeds by integrating with local "gut" issues.

On the technical side, WVOX is a combined AM/FM station: 500 watts AM by day, and 3 kW FM, day and night. Its signals cover the county and adjacent sections of New York City.

The new building, as the illustrations show, is arranged for efficient operation of a news-talk-recordings station.



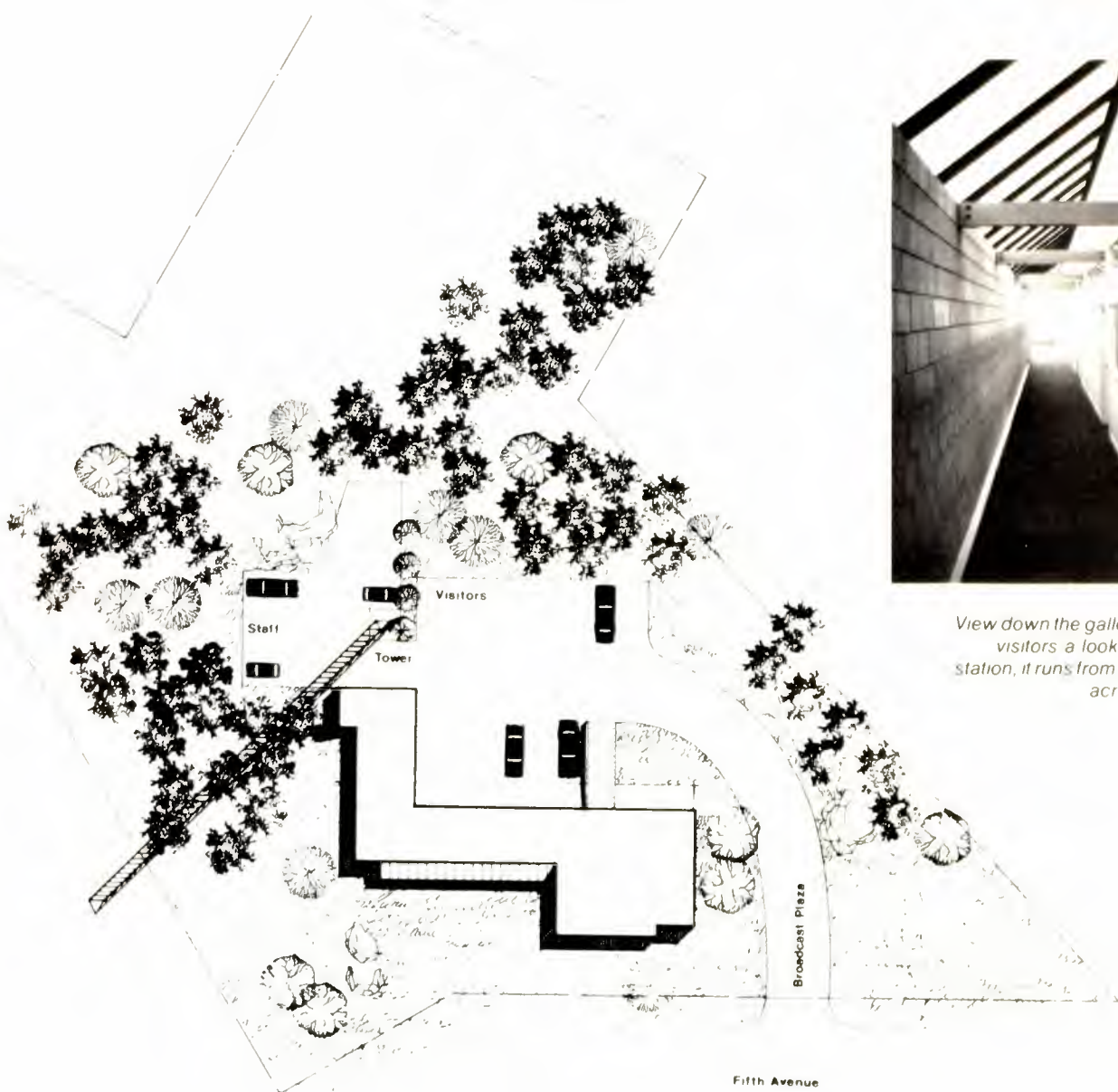
Exterior of building during construction with, at right, housing for mobile news crew, and main entrance left of center in facade.



Floor plan of office-studio-transmitter building for WVOX shows exceptionally "clean" arrangement with offices at one end of building, working space in other direction from entrance, equipment rooms in wing. A public gallery the length of the studio-work area lets the public see the station at work. Antenna tower is at end of transmitter-storage wing.

Architect's drawings show, top, exterior of building which faces the main street with viewing gallery skylight along top (entrance driveway is to the right of trees). Lower drawing is elevation including main entrance (left center), studio windows (center to right end). Architect was David Glasser of the New York and San Francisco firm of Marquis and Stoller.





View down the gallery which gives visitors a look into studios of station, it runs from entrance lobby across work area

Site plan shows how architect Glasser made the most of difficult lot shape with handsome exterior facing street. Parking, entrance, are away from street side



Rocky site added to construction effort, but variations in level were turned to advantage by architect, to give building a commanding position

There is a control room, with disc playing equipment, for AM and a separate similar one for FM so the transmitters can be programmed separately most important programs go over both during the day. The FM transmitter is a Bauer and the AM transmitter is RCA.

The news room includes Collins cart recorders and playback equipment and a Gates console telephoned-in news is recorded on carts for use at convenient times. The two an rooms have RCA consoles and Gates turntables. The production room has two RCA 16 inch turntables, inputs for the recording equipment.

Micro-Trak tone arms are used throughout, with Stanton 500F pickups in the production room and Shure Hi Track in the an rooms. Microphones are AKG D120 and D19.

Chief engineer Cliff Mills likes especially the result coming in with the new UPI Extell impact printer for news printout.

The gallery that runs the length of the on-air working rooms, to give the public a close view of station operation, has become a popular excursion objective of the community. Its success fits splendidly into the "community voice" ideal that has made WVOX a stand out station.

BM/E

for consistent colorimetry



Why all the splash about this newest feature of COHU's Model 1500 Color Film Camera? Instant Black Paint is the broadcast engineer's indispensable assurance for consistent video excellence and that's a resource of quality worth recommending. When film or source colorimetry requires refinement, COHU Black Paint allows the option of fingertip accessibility to program temporary adjustments. Convenience is the key and preset color balance is restored for normal operation by only the touch of a button.

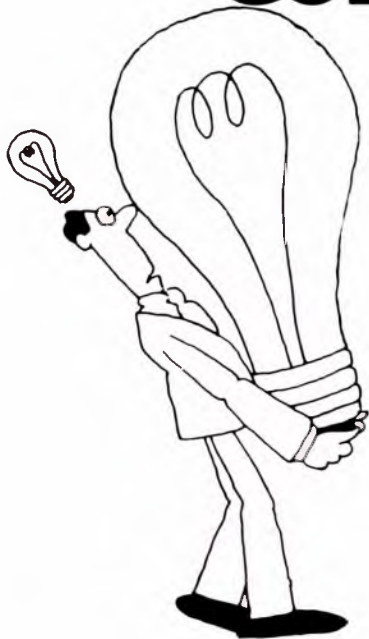
The Model 1500 is already recognized as a popular standard for reliability and color fidelity. The addition of Black Paint is COHU's way of delivering to you the best in broadcast performance at no increase in price. You expect more from COHU, and you get it.

For further information, contact your local COHU Sales Engineer or COHU, Inc., Electronics Division, P. O. Box 623, San Diego, Calif. 92112. Phone 714-277-6700. TWX 910-335-1244.



Circle 121 on Reader Service Card

ANNOUNCING THE GREAT IDEA CONTEST



Station Engineers!

Win a Caribbean cruise! Send us your solutions to day-to-day or long-range engineering problems. We will publish them and invite your colleagues throughout the industry to vote for the best. Four winners will each get a free Wind-jammer Cruise for two in the Caribbean! Top entries in nine categories will each be awarded a Certificate of Merit.

Station Managers!

Encourage your engineering personnel to enter our contest! It is a chance for them to get

professional recognition for work well done. It's a chance to show off your station as an innovative leader. All meritorious material sent in will be published.

Why we are doing it

The collective ingenuity of station engineering personnel is a massive technical resource of the industry which is to a harmful degree unused. The tremendous reservoir of techniques accumulated in solving day-to-day problems, in making needed changes or improvements in facilities, and in designing new facilities, gets poor distribution through the industry because there are few channels for disseminating it.

After years of being unhappy about this lack of circulation for front-line engineering experience, *BM/E* decided that one way to improve matters would be a contest which would stimulate engineers to send us their ideas for publication. In addition to the recognition, we'd give a significant prize for the idea that readers vote the best. *But our primary objective is not to winnow out a few "best" ideas.* We think publication of a substantial volume of good ideas is the important thing, both for the advancement of the industry and for the satisfaction of justified pride on the part of their creators.

Subjects can touch on just about every facet of station technical operation and design. The following list is *suggestive only*, to show the breadth of the acceptable field:

- A particularly efficient way of using telco lines for remotes;
- Preventive maintenance of tape recorders, etc.;
- Simplifying directional antenna measurements;
- Modifying existing equipment for higher quality, greater flexibility;
- Simplifying the monitoring operation;
- Giving news announcers the best technical backup;
- An ideal studio layout for . . . ;
- Getting top performance from . . . ;
- Automatic switching without a full-blown automation system;
- Assuring top quality throughout a stereo audio chain;
- Efficient control unit for remote news pickup crew;
- Solving the ground loop problem in audio equipment;
- Protective measures for antennas and transmission lines;
- Equipment and procedures for maximizing station security;
- Simplifying proof-of-performance measurements;

- Practical methods for improving studio lighting;
- Chasing an elusive noise source;
- Smart ways of meeting FCC requirements.

We repeat: This list is simply to start your thinking; it is *not* a specification. The actual range of possibilities could run into many scores of items.

How it works

Readers are invited to send us descriptions of their favorite engineering creations, technical solutions, or clever how-I-solved-it ideas right now. We will publish all accepted items, beginning with the January 1974 issue. Each month readers will rate the published items on a merit scale of 0 to 10. Highest ranking items will be republished in the issue of December 1974 for a final overall vote. Winners will be informed in February and announced in the March 1975 issue of *BM/E*.

Prizes and awards

There will be one winner in each of four categories: AM (5kW and below); AM (above 5kW); FM; and TV. The prize for each of the winners will be a six-day Windjammer Cruise in the Caribbean for two. (See rules for locations and dates.)

In addition, nine Certificate of Merit awards will be presented: **Audio** (four awards)—TV, FM, AM (Class I or II), AM (Class III or IV); **RF** (four awards)—same classes as audio; and **Video** (one award)—TV. Author of each entry accepted for publication will receive a \$10 honorarium.

Words to the wise: Enter early

Your brainstorm may be a winner, but only if you tell us promptly. We are sure that many good ideas have occurred to more than one engineer. Unfortunately, we will not be able to publish duplicative material.

Rules for *BM/E*'s Great Idea Contest

1. Eligibility: All station personnel are eligible. Consultants to the industry may enter if the entry indicates the specific station or stations using the idea or concept. Manufacturers of equipment or their representatives are not eligible.

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

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

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

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

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

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

Entry Form for *BM/E* Great Idea Contest—1974

Mail to: *Editors, BM/E*
274 Madison Avenue
New York, New York 10016

Name _____ Title _____

Station Call Letters _____

Address _____

City _____

State _____ Zip _____

Licensee _____

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

FM _____ AM (Class III or IV) _____

Title of Entry _____

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

Solution: (use separate sheet)

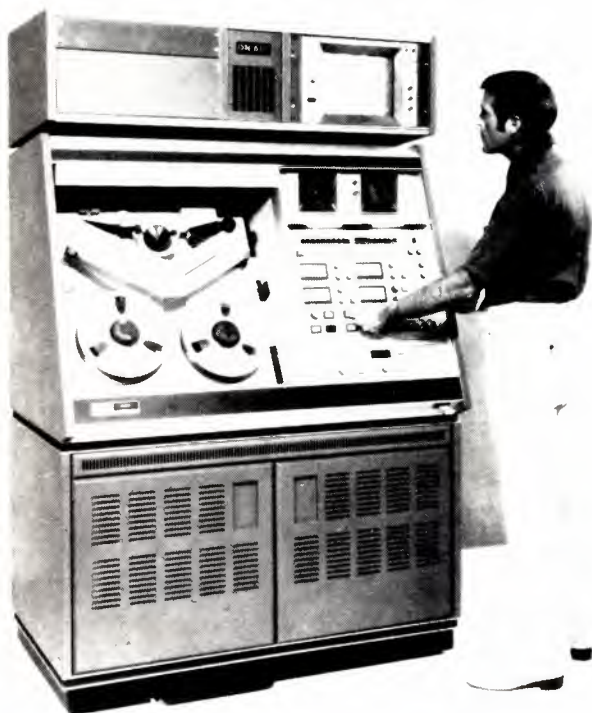
I assert that, to the best of my knowledge,* the idea submitted is original with this station; and I hereby give *BM/E* permission to publish the material.

Signed _____ Date _____

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

Enter the Segmented Scan Helical VTR for Broadcast Use

IVC calls it a major breakthrough since its IVC 9000 is claimed to outperform quadruplex systems in signal quality, price/performance ratio and cost factor. Will it become a standard?



It's been known for some time that IVC was perfecting a helical scan system as a viable alternative to the venerable quadruplex VTR which has served the industry well for the last 17 years. The new concept was described in London at the International Broadcasting Conference in the fall of 1972. This last spring IVC revealed more in a private seminar at the NAB Convention. In May it demonstrated its first units—both a PAL version and a SECAM version—at the Eighth International Broadcasting Symposium, Montreux, Switzerland.

At Montreux, it was very clear that IVC's totally-new concept was going to make an impact. Indeed, to head off what might have been an avalanche of order commitments, RCA announced it was developing Quad II, a modified quad machine that hopefully would do as much as that claimed for IVC 9000—and still play standard quad (with minor adaptations). Ampex, too, said it felt quad could be modified to use ferrite heads and run at much lower tape speed. (See *BM/E*, September 1973, page 39.)

Just how good the IVC 9000 is at handling NTSC was demonstrated in New York in October at the 114th SMPTE Technical Conference. Visitors were impressed. They saw a no-compromise system priced under \$100,000. Tape speed was 8 ips—a feature that cuts tape costs in half. The unit uses ferrite heads, another feature that promises lower operating costs—through reduced head replacement (at least 1500 hours is claimed). On top of this, IVC said that wear on the tape itself was less because of a gentler system. Another important feature—one most vital to Europeans—was two full quality and audio tracks.

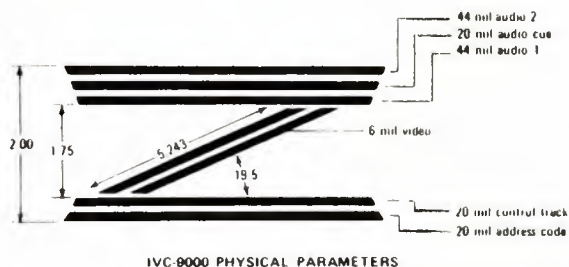
During the technical sessions at SMPTE, IVC engineers presented four papers describing in detail design objectives and performance characteristics of the IVC 9000.

Why segmented scan?

The new segmented scan system adopted by IVC represents a careful balancing of several facts according to the paper delivered by B.E. Guisinger. Ferrite heads were desirable since they were longer wearing. But they cannot be used readily in transverse scanning equipment because of their brittle nature and the high impact between tape and head encountered in that scanning method. Thus transverse scan was ruled out. Of the three choices for a helical scan format—360° wrap, one head, one field/pass; 180° wrap, two heads, one field/pass; 180° wrap, two head, segmented field—IVC chose the

continued on page 62

The IVC 9000 segmented-scan helical broadcast recorder offers equal or better performance than quadruplex recorders. Operating cost is less and price is about one-third less than similar quad.



Format of the two-inch tape used in the segmented-scan helical recorder.

WINDJAMMER

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STIMULATE YOUR
EROTIC PREOCCUPATION**

We have a book with color pictures. It's nothing pornographic. But somehow it tends to stimulate erotic thoughts. Especially if you're a free thinking, uninhibited person who wants to be turned on to an unusual vacation experience.

We sail adventurous schooners to several slightly uncivilized islands in the Caribbean. Places like Grenada, Saba, Monserrat, St. Maarten and Antigua. Fortunately these are the few islands that haven't been overrun by jaded tourists.

So you can find a deserted beach and stretch without being seen. Or you can strip down and play under a waterfall. Or you can get into the local color on each island.

And we haven't let our Windjammer cruises become a luxury. We keep things basic. Nice, clean cabins. Good hearty food. And an uninhibited crew that will entertain you until dawn with wild native music. The rest is up to you. There are no formalities, no social pressures, no restrictions. Fish, skin dive, soak up the sun and communicate with real people in an unhampered, natural setting.

A 10 day Windjammer cruise starts at \$245 per person. Write for our free book today. It will give you something good to think about.

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Yes, send me the book.

KYW—A Reserved But Contemporary Facility

KYW-Radio and KYW-TV (Westinghouse Group W stations) keep a low profile, but inside the handsome new home of these stations are found the latest innovations.

KYW Radio and KYW-TV moved into 5 Independence Mall in 1972. With a setting in Philadelphia, and with Independence Hall but a block-and-a-half away, one wouldn't expect to see something all glassy or flashily aluminum. But we do see authority and style in the three-story, dark red-brown brick structure (with wire-cut texture and complementary color mortar joint), with an interplay of line and recessed spaces. The deeply recessed fenestration with sloping sills and recessed headers and vertical pier also give spaciousness and height to the building, which cost something over \$4 million (floor area is 80,000 sq ft.).

Once past the lobby and into the administrative areas, the decor is efficiently white—all partitions, walls, etc. The white contrasting with the dark brick walls comes off as both reserved and contemporary. It might be sterile, except for flower decals and a little pop art here and there that secretaries have pasted up. There's nothing bizarre to be found, not even in the sets or scene design—with exception of the dressing room of Group W star Mike Douglas. It boasts a chambered nautilus fibre-glass shower.

And while KYW has some custom-designed consoles that look very contemporary, only tried and true components have gone into this equipment. Cautious designing is particularly apparent in KYW Radio quarters. KYW has three air studios designed for its all-news programming format. Each studio is nearly equally equipped with custom-designed audio consoles from Electrodyne. Flexibility and redundancy are the key words: Each studio and its associated control room are physically integrated capsules (acoustically slanted fibre-glass walls with double and triple glass windows), but any studio can be fully operated from any of the three consoles. Interconnections can be switched in through internal wiring or, if faults occur, they can be patched in. All consoles, distribution amplifiers, and terminal panels have such dual input/output features.

Upon entering the KYW Radio engineering area, one at first suspects something new in layout concept. Master control appears to be entirely in a passageway. In fact, it is. On the opposite wall are the three studio control rooms. Engineers and technicians are within only a few feet of everything. This layout is far from ideal, however, and more space would be desirable. The studio control rooms are also too small. There's a limit to equipment that can be included (such as reel-to-reel recorders), and access to the console for maintenance is difficult.

The individual studios themselves are not large but, from an engineering point of view, it would have been preferable to allocate a few more square feet to the control area. *BM/E* didn't talk to the news director, but



The striking KYW building faces Independence Mall. Architect was The Ballinger Co. of Philadelphia.
Photo courtesy Ballinger



Inside the lobby at KYW



Master control room at KYW-TV. CRT terminal input to automated switching equipment as at far right. Between it and switcher is video monitor displaying upcoming events.



Girl in Traffic entering the program schedule into automated switcher computer. This step will be eliminated shortly; central computer will feed data directly to switching computer.



Computer terminal in Sales Service is connected to central computer. Raw sales data goes in and program schedule comes back. High speed printer provides print-out.



View of studio control room which handles the Mike Douglas show.

we suspect the studios, while adequate for KYW's own newsmen, are uncomfortably small for visitors (most call for standing). On the other hand, KYW doesn't need to assemble newsmakers in a studio. Its capability for remotes via phone and mobile radio are outstanding and ever-expanding. We hope to present an article on these facilities in a future issue.

The KYW-TV engineering area, unlike Radio, doesn't suffer from lack of space. It has the entire mezzanine floor (half a floor) to accommodate master control, the VTR area, and the telecine area (four islands). The major distinguishing feature of the KYW master control room is the automation system. To the right of the master production switchers is the CRT Display Terminal and the Scheduled Events monitor which displays such real-time operations as starting machines, switching, and mixing that will be performed automatically.

The automation system uses the Central Dynamics APC-610 which gets its input directly from the Traffic Department. Technical operations are performed as indicated once proper machine assignments (VTR, telecine, or SC) are made. (And if a machine is not properly loaded and assigned, the event line blinks.)

As one looks about the technical area, a few other distinguished features come into sight: An Ampex ACR-25 video cassette machine, an Ampex RA-4000 editor, a machine delegation station in front of the telecine area. One also spots a digital display mechanism on top of machines. This is the digi-key unit which, when set as the traffic schedule indicates, tells the computer system it's ready to roll.

As one walks through the station, it's apparent that KYW is where the Mike Douglas Show is produced. One of the two large studios has the permanent Mike Douglas set in it. Both studios are equipped with theatre seats and both have semi-circular cycloramas.

Other eye-stoppers are the Traffic and Sales Service areas on the third floor. In the former, one sees two more CRT display terminals, which are part of the APC-610 system, and a hard copy printout unit. Here two girls enter data into the computer from the approved schedule. In Sales Service, two other CRT Display Terminals are used for communication with a large central computer located in Milford, Conn. There's also a high-speed printer nearby. Into these units goes sales data and back come rough schedules and variance reports. After adjustments are made, final schedule pages are spewed out. The day *BM/E* visited, Traffic took this schedule and re-entered it into the APC-610 keyboard. If we had been there about a week later, we would have seen data produced by the central computer feed directly into the APC-610 system. KYW should soon be the most fully automated station in the nation.

One other attention-commanding location is the office of Charles Blair, KYW's director of engineering. Facing Blair's desk are two 25-inch CRTs. One is a monitor reporting the next 14 upcoming events that will be automatically switched to the air. Blair has confirmation at all times that master control is ready and working smoothly. The other CRT is in the TV set which is connected to the RF distribution system described in the accompanying article.

BM/E

Distribution system of KYW Radio is literally in a hallway.



KYW Radio has three announcer's studios in a row. One can look from one into the other two. Control rooms are on right side.

Consoles in radio studios are custom designed to stress flexibility and redundancy.

Far right is view of announcer's studio looking in from the studio control room.



Miniature 12-Channel Cable TV System Feeds KYW Monitors

By Bert Wolf

How do you get 12 video channels (six off the air, one the station's own signal, and five internal CCTV signals), plus an FM channel, to video monitors throughout a large studio-office-transmitter complex? Any monitor must be able to choose any of the 12 at any time.

It might occur to you to use a "headend" and a fairly typical 12-channel CATV distribution system. That is what KYW-TV in Philadelphia did, using a dual system worked out with the Jerrold Electronics application engineering department. The assignment went to Christopher Payne of the KYW engineering department (he is

Mr. Wolf is manager, Jerrold Electronics, DSD Division.

chief engineer of KYW radio, but does TV jobs as well). KYW's TV chief, Robert Fields, also contributed: for example, it was his idea to put all the internal channels on odd numbers and the external ones on even numbers.

An A/B switch on the back of each monitor lets the user choose even or odd channels. The rundown of channels carried on the system looks like this:

Anyone interested in watching another station in town can set the A/B switch to the "B" position, while those interested in internal channels can set their switches to the "A" position. With the switch in the "A" position, the viewer can easily flip through the channels to see the Mike Douglas Show being rehearsed in Studio

A; a film being previewed; the network news from NBC; a computer readout of the automatic switcher showing a list of coming events; and the program being telecast to the viewers of KYW-TV—all might be on the system simultaneously

RF vs video

Because TV studio engineers are more familiar with video, they tend to avoid RF. However, it would not be economically feasible to distribute 12 channels of video to the hundreds of outlets at KYW. The station obtained 50 Sony Color Trinitron receivers via a trade-off deal. It would have been impossible to get 50 video monitors through tradeoffs.

Thanks to the Trinitrons and the RF distribution system, every salesman, engineer, and executive at KYW has a color TV receiver on which he can monitor all 12 channels.

This tends to reduce traffic in and out of the control rooms. Before the system was installed, salesmen brought customers to stand beside a VTR to watch their commercials. Now, the salesman simply calls the control room and the customer watches the commercial in any Sales Conference Room.

Budget

The decision to use a dual A-B cable distribution system was influenced by ease of operation, simplified maintenance, and low cost.

Other than two Kay modulators, which KYW already owned, all the headend equipment was to be purchased. Jerrold modulators, CCM-AB for internal programs and individual channel AGC amplifiers for external programs, were specified.

The original equipment budget approved for the RF distribution system at KYW was \$15,000. By doing the installation themselves and because of the careful design, they were actually able to bring the system in under budget. Chris Payne estimates that the extra cable, splitters, A/B switches, and tap-offs required by the dual cable system accounted for only about 10% or 15% of the job. This was more than compensated for by savings on headend equipment. Of course, installing two cables is no more difficult or time consuming than installing one cable.

Patch panel maintenance

One of the requirements of the distribution system was that it be very easy to maintain. Chris knew that in a busy studio the RF system would have low maintenance priority. Therefore, he felt that troubleshooting time should be kept to an absolute minimum.

To meet this requirement, he designed a unique patch panel system. Patterned after video patch panels the system uses Jerrold 75 ohm plug-in "G" fittings with short lengths of cable.

The patch panel system provides instant access to, and test points at, every critical part of the system. For example, patches can be used to test the signal into and out of every amplifier and every head end splitter. Thus, troubles can be isolated to a single component or branch in a few moments.

With the system in operation almost a year, only one trouble has developed so far—FM interference on Channel 6. Using the patch panels, the trouble was quickly isolated to the FM trap used ahead of the Channel 6

SWITCH POSITION A ODD (INTERNAL)

Channel 3	KYW-TV (Off Air)
Channel 5	Studio A
FM	FM (Off Air)
Channel 7	Studio B
Channel 9	NBC (KYW is NBC Affiliate)
Channel 11	Routing Switcher from Master Control
Channel 13	Routing Switcher from Videotape

SWITCH POSITION B EVEN (EXTERNAL)

Channel 2	UHF Channel 17
Channel 4	UHF Channel 29
Channel 6	VHF Channel 6
Channel 8	UHF Channel 48
Channel 10	VHF Channel 10
Channel 12	VHF Channel 12

amplifier. Tuning the trap cured the problem quickly.

The solid state equipment used should provide trouble free service for many years, with minimal maintenance.

How the system works

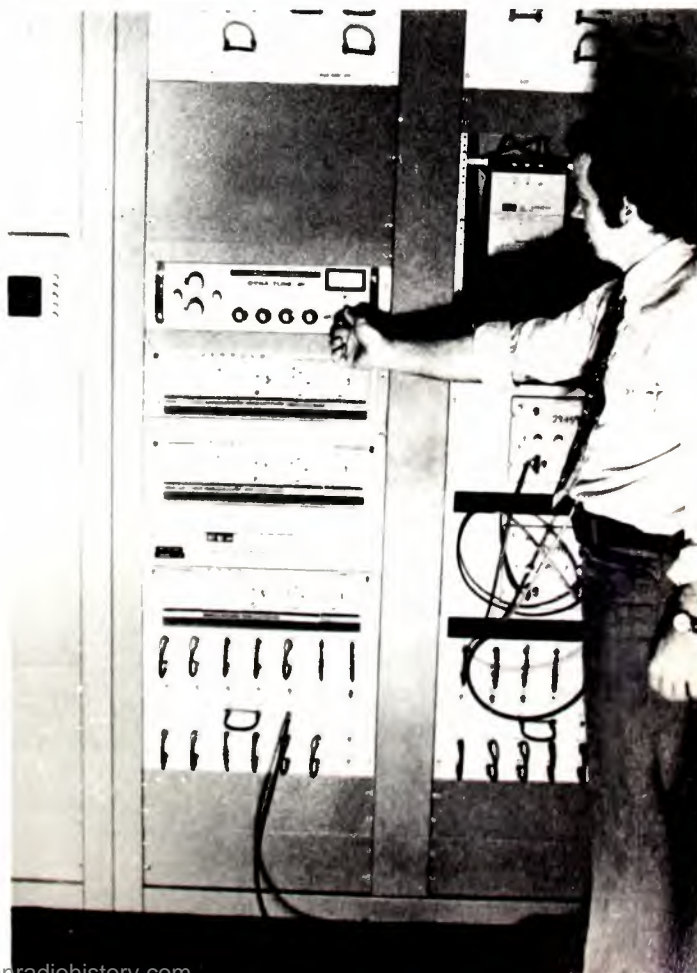
Figure 1 shows the headend of the KYW RF system. Five modulators accept audio and video to produce internally originated channels.

The routing switchers are wild cards, adding flexibility

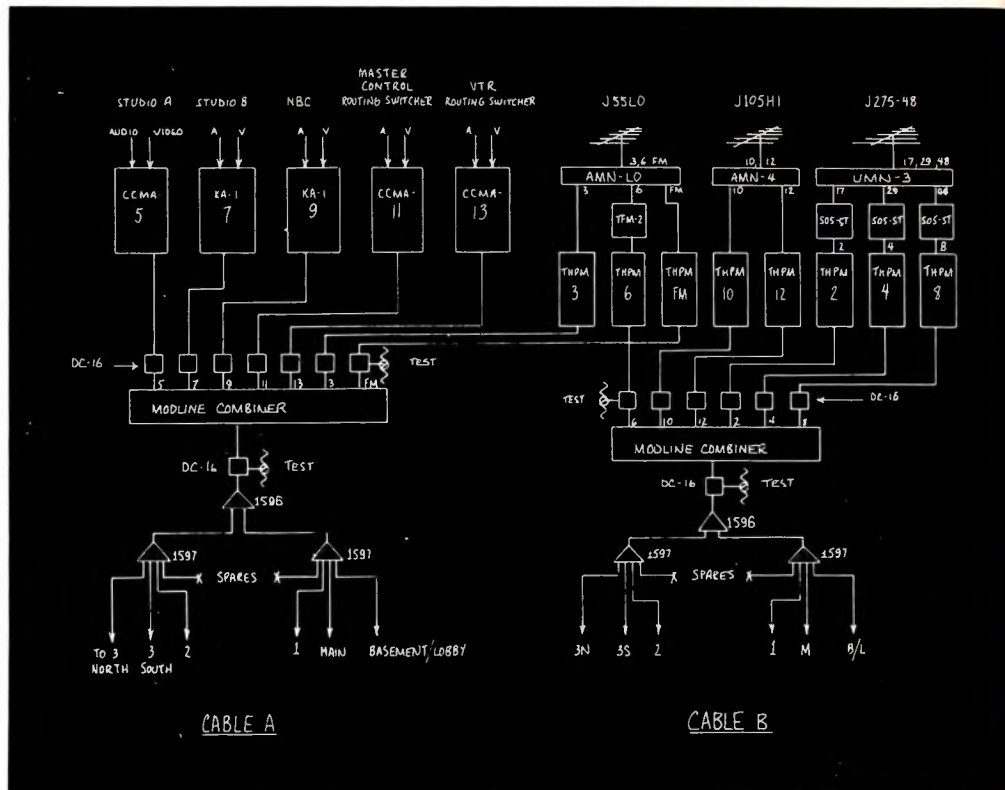


Left—A-B switch on TV set for selecting even or odd channels.

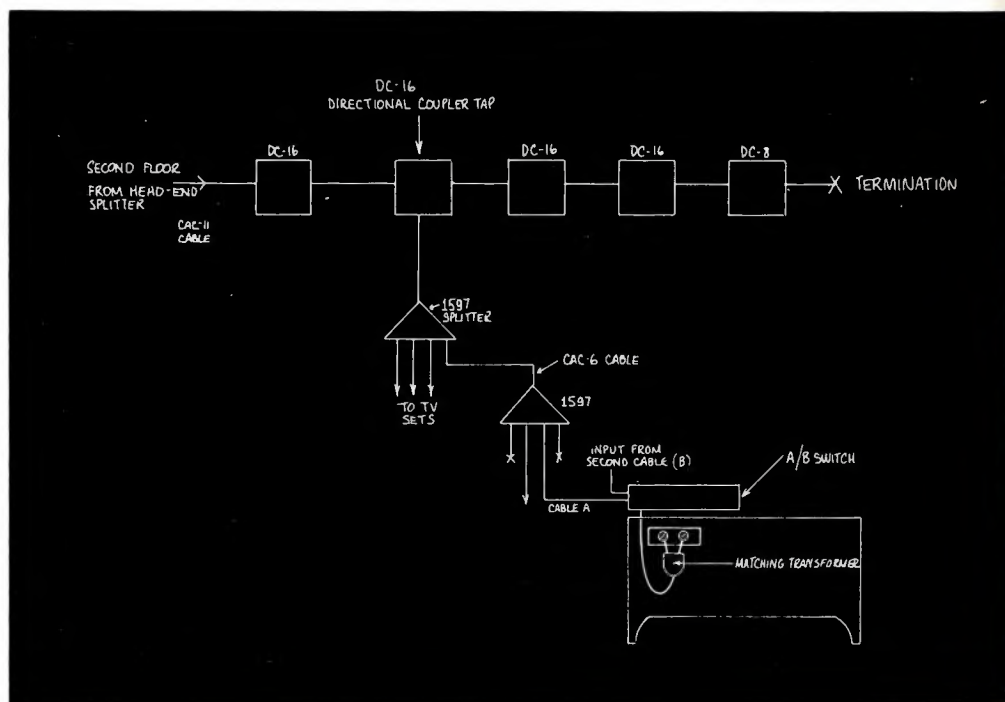
Below—View of the KYW headend.



Overall distribution system at KYW.



Typical leg of the distribution system.



to the system. For example, the master control routing switcher can accept the KYW line; network; color bars; sync; Studio A; Studio B; VTR 1, 2, 3, 4, 5, or 6; Film A, B, C, D, E, or F; remote 1, 2, or 3; the computer readout of the list of coming events; tests; space; or the output of the demodulator.

All the off-air channels are received on three antennas. The antenna signals are split and sent to Jerrold THPM high output single channel amplifiers. Built-in AGC enables all THPMs to put out the desired sound and picture carrier levels at all times, regardless of antenna signal fluctuations. The TFM-2 keeps FM signals out of Channel 6. Jerrold Model 505-ST crystal-controlled converters convert the UHF channels to unused VHF frequencies.

Once the signals are processed and amplified, they are combined for distribution by two Jerrold MFC Channel Modline combiners. Then, each Modline combiner output is split into 6 main trunk lines for distribution.

Figure 2 shows a typical leg of the distribution system. Signals are taken from Cables A and B by means of directional coupler taps. Each tap output is further split to serve up to 8 TV sets. Unused splitter outputs are terminated and reserved as spares.

A and B cables feed into the A/B switcher mounted on top of each TV set. The output of the switch connects through a matching transformer to the antenna input of the TV set.

A system of this type can be expanded to provide studio quality signals to hundreds of TV sets. **BM/E**

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WSNL-TV—5,000,000 Watts of Local Accent

Long Island, well covered by New York City stations, is getting its own first commercial TV station, Channel 67. It's located almost mid-center in the new Standard Metropolitan Statistical Area covering Nassau and Suffolk counties. Most programs will originate on Long Island in Channel 67's studios—or its OB van.

As this issue goes to press, WSNL-TV, Channel 67, will be going on the air as Long Island's first commercial TV station. It will be writing another page in the up-and-down history of independent UHF stations. Suburban Broadcast Corp., which holds the license, is sure it will be a story of success. It's starting with a number of things going for it. It has a clear vision of what its purpose is: to serve three million people in about 750,000 households in Nassau and Suffolk counties. Its programs will accent Long Island activities, now virtually ignored by New York stations. The market is rich; the area was recently designated as a distinct Standard Metropolitan Statistical Area, the ninth largest in the U.S. It is a market larger than Baltimore, Boston, Cleveland, Dallas, Houston, and Philadelphia, with \$6 billion in retail sales in 1972. Nassau County is the third richest county in the nation in terms of per capita income.



The OB (outside broadcasting) unit is used extensively. Here camera is being set up to shoot a scene for the soap opera, "The Fairchilds."



Local advertisers believe in the area and the station—125 had signed charter contracts by air time. Local investors believe in the area and the need for a station, as evidenced by the successful public stock sale. (See box, page 61.)

Suburban Broadcasting is also benefiting by past UHF history which teaches that high power is vital. It goes on the air with 3 million watts ERP; it will up that to 5 million as soon as the second 55 kW Gates transmitter is delivered in early spring. And, if that power doesn't provide parity with Vs, Channel 67 has another plus not always available to UHF in earlier days. It will be carried to over 100,000 homes by local cable TV systems.

And, perhaps more importantly than any of the foregoing, is an enthusiastic, youthful programming and engineering staff. They're out to make the very best use of their time, talent, and equipment.

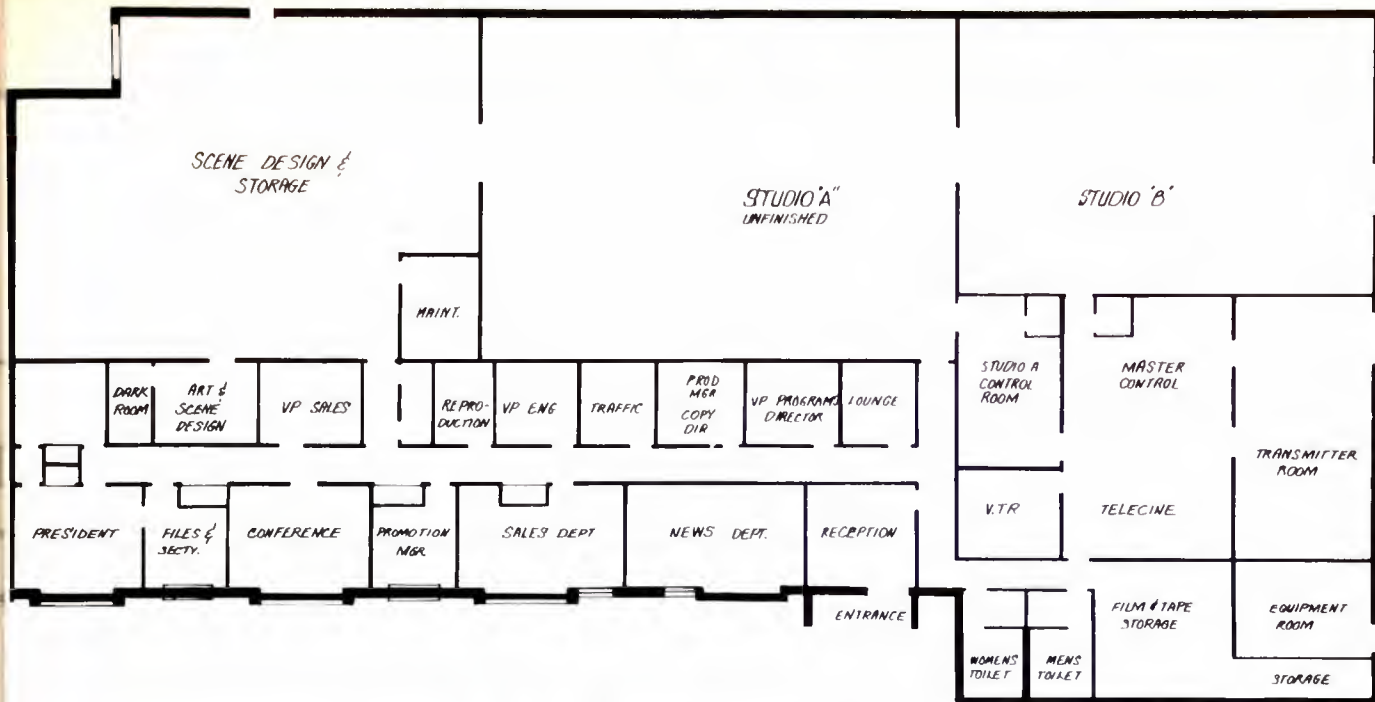
The local programming effort is impressive. Almost fifty percent of the programming schedule reflects local programs. Heavy emphasis, as might be expected, is placed on Long Island news—an hour-and-a-half a day. Its "least meritorious" program may be its own daily Long Island soap opera, "The Fairchilds," but in terms of counter programming strategy, it may be a brilliant tour de force. The setting is Long Island and local people, places, and problems will be dramatized in the story that will, as the promotion reads, "become part of you . . . part of your day . . . every day." Another major block of time focuses on Long Island women—one hour daily, from 12 noon to 1 p.m. Substantial segments are devoted to children's programs and sports, both syndicated and local.

Altogether, more than 50% of the initial 12-hour broadcast day is locally oriented and a lot of it live. *Variety* has implied that WSNL-TV would have had a rough time getting top flight syndicated material because of market exclusivity rights enjoyed by the nearby New York City stations. This is undoubtedly true, but it has not phased Suburban Broadcasting. It goes about its programming efforts as if local quiz, game, and variety shows were the only logical decision.

Facilities

The first component of the station to be completed was the mobile van, the "OB" as WSNL-TV refers to it. This made it possible to get out on location while the rest of the station was being built to shoot scenes for the soap opera, "The Fairchilds." It also helped put in the can tapes for the Sunday program "Blue Light Brigade" (featuring firemen).

The OB has also already covered some of the doings of
continued on page 60



Floor plan for WSNL-TV. Antenna tower is within a few feet of transmitter room.



Channel 67 will use the new AKAI portable camera to capture news. Recording will be done on IVC BCR 100s and 825 reel-to-reel units.



Most all locally produced programs will be played on IVC 960 helical recorders. Two quads are in the same room.



Master control room also serves as Studio A control. Remote switching panel (below Gates audio control) makes it possible to handle Studio A production and on-air signal. CCU, sync generator, DAs, etc., are directly behind switching console.



Studio B is major production studio. Control Room includes a new Grass Valley switcher model 1600 and a flexible audio console.

Why our time base correctors should be the apple of your eye

Proven Flexibility in Standalone Time Base Correctors

Regardless of your VTR—power line-locked, capstan servo'd/V-locked, or H-locked—our Delta Series Time Base Correctors and Hue Shift Correctors offer standalone processing of all color signals—either NTSC direct, "NTSC-type" or heterodyne "color under." And in monochrome—either RS-170 or RS-330 industrial sync.

Offering the best economy and flexibility, the Delta 44-328 HETROCOLOR™ TBC works with all types of monochrome and color VTRs. Particularly in cassette VTRs without our TBC, the color tape will be a long way from FCC acceptance. Aside from independently varying sync and sub-carrier frequencies, editing capabilities are marginal. The HETROCOLOR TBC is the only unit on the market that allows transfer of heterodyne record VTR signals to a broadcast VTR. Second generation playback of this tape through the TBC corrects the color signal for broadcast with clean electronic splices.

For the best cost/performance package in the business, select the standalone Delta 44-200 NTSC Direct Color TBC coupled with the Delta 7 VELCOR Hue Shift Corrector for the finest in broadcast color processing.

And if you're staying with monochrome somewhere in your system, our Delta 44-028 TBC combines broadcast specs with our lowest price.

For more flexibility, we've added the Delta 23/3.58MHz subcarrier generator as an accessory to the Delta 44-328 TBC for combined outputs that are the equivalent of a broadcast stable NTSC color sync generator.

Exclusive Features of Our Growing TBC Family

Optimized Design. Of the several ways to eliminate time base error generated by all VTRs, we primarily use binary related delay lines which are switched in or out of the signal path at line rate. This technique offers the highest output performance looking at all the critical specifications of signal to noise ratio, bandwidth, differential phase and differential gain. There is no tampering with the visual portion of the picture. There is no contouring and quantizing noise as in digital techniques, or differential phase/gain variation as in EVDL techniques.

Velocity Error Corrector. In NTSC direct playbacks from 1" helical and all quad VTRs, color streaking (velocity error) is another problem that must be solved when either interchanging tapes or dubbing through several generations. Adding our Delta 7 VELCOR™ Hue Shift Corrector in front of any broadcast quality TBC, you get faithful color reproduction as well as imperceptible time base jitter throughout the entire picture.

Universal Color Corrector. In "NTSC-type" and "color under" playbacks from 1/2", 3/4" and 1" VTRs, all you need is our exclusive HETROCOLOR TBC, despite the wide variety of color recording and recovery techniques.

Full Proc Amp. All Delta Series TBCs have a built-in Delta 21 proc amp with front panel controls for video gain, setup, chroma gain, and chroma phase. The plug-in Delta 28 with front panel controls for gen-lock tracking rate and H-phase timing is included in all Television Microtime models working with less sophisticated VTRs.



TMI's exclusive built-in Delta 21 proc amp and Delta 28 TBD.

Front Panel Switches. All our TBCs have illuminated front panel switches to provide easy selection of operating modes. These include separate monitor and program video outputs on separate in/out and operate/bypass switches. A failsafe program bypass exists to handle power loss.

Experience is Our Guide

We introduced the first of our Delta family at the Chicago NAB Show in April 1972 and delivered our first production unit to the University of North Carolina two months later. In March 1973 at the Washington NAB Show we introduced two additional TBC models, the Delta 7 Hue Shift Corrector and several accessories. We are now delivering this family of products that work with the whole spectrum of VTRs from 1/2" helical to 2" quad.

But our experience goes back even further. In addition to developing custom TBC products for the networks, we've been supplying delay lines to Ampex Corporation who builds them into the full line corrector in their AVR-1 Teleproduction Recorder.

Look at Who Has What in Time Base Correctors

Review the chart then call us for a demonstration. We're sure you'll be as pleased as our many customers are—in every segment of the television industry—broadcast, CATV, education, medicine, industry, research, government, and OEM. Contact us. Television Microtime.

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3/4" line lock				44-328 ●	*502
1" line lock				44-328 ● 7-001 ●	*502
1" V-lock				44-328 ● or 44-200 ● (with 14)	500
TBC				7-001 ●	
HSC					
1" H-lock				44-328 ● or 44-200 ●	500
TBC	790		4102	7-001 ●	
HSC	VELCOMP (Optional built-in)				
2" Quad				44-200 ● or 44-328 ●	500, if VTR has AMTEC or ATC
TBC	AMTEC COLORTEC PROC AMP	ATC CATC PROC AMP		7-001 ●	
HSC	VELCOMP	CAVEC			

*Announced last June (ask CVS about availability — and specs)

● How do you like them apples?



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BROADCAST EQUIPMENT

Loaders for audio or data processing tape can be controlled by cue tone or tachometer and digital switching. Series 235 loaders wind 8-track cartridge hubs with blank or prerecorded tape—\$1260 to \$1385. AUDIO/TEK INC.

300

Antennas for educational FM transmitters are circularly polarized, with 1½ turn helix. Series ECFM includes six models with power ratings from 0.2 to 0.5 kW, gain in dB from -3.66 to 4.76. PHELPS DODGE COMMUNICATIONS CO.

301

Temperature sensing kit samples air temperatures between 0 and 140 degrees F. Model TSK-3 provides linear indication on appropriate meter. MOSELEY ASSOCIATES.

306

Low-cost time code generator uses crystal oscillator with optional accuracy to 25 parts per million. Series M



has IRIG B Serial format, has a choice of pulse rates from 1 pph to 100 pps or 1 KHz. Digital display clock is included. \$690. THIEM INDUSTRIES.

307

Re-enterable urethane encapsulant is two-component, cures to a clear compound. Model 190RE meets all safety requirements, can be used in grease-filled or non-grease-filled cable. HEXCEL CORP., REZOLIN DIV.

308

AM modulation monitor works off-the-air or direct-connection. Model 732 is FCC type-approved, has peak-reading meter and two LED peak flashers, one for 100% negative modulation, the other settable for negative or positive from 50% to 129%. TIME & FREQUENCY TECHNOLOGY, INC.

309

EMI meter covers 10 KHz to 32 MHz. Model NM-17/27 is fully programmable for automatic and semi-automatic testing, has adjustable band-

width, 160 dB signal range, 0.016 microvolt sensitivity, electronic scan with X-Y output. \$9,800. SINGER INSTRUMENTATION.

310

Portable color monitor is for remote color videotaping or pickup. Model



CP5002 has 5 in. Trinitron tube, operates from 110 vac, car or boat battery, or its own rechargeable battery pack (supplied). WORLD VIDEO, INC.

317

Headset with microphone is for sports or DJ use. Astrolite Enunciator has two 200-ohm phones that can be wired separately (for cue and program) or together. Mike is on boom at one side. Ventilated cushions are available if hearing of ambient sound is wanted. \$75. TELEVISION EQUIPMENT ASSOCIATES.

311

Audio oscillator provides sine-wave signals, 10 Hz to 30 KHz. Model G231 has balanced output, 40 and 600 ohms, illuminated bandsread scales. Rechargeable battery kit is available. AMALGAMATED WIRELESS (AUSTRALIA): SYSTEMS MARKETING CORP., U.S.

312

Low-light level video cameras are for use with AKAI ¼-in. VTR. Models VC-200 and VC-115ST, used with ultra-sonic wave sensor, allow taping or monitoring at night in surveillance systems, with street lamps or auto headlights. VC-200 has automatic iris, works from starlight to full sunlight. VC-115ST is a C-mount camera. Both have built-in 1½-in. viewfinder-monitor. AKAI AMERICA.

314

Time announce control unit will control two single-play cart machines, two

open-reel machines, or a combination.



Model CD60T automates time announcements, has a fail-safe circuit preventing false announcements in a shut-down. CONTROL DESIGN CORP.

316

One-inch Vidicon tubes are specially designed for color film pickup service. Models 4809 and 4809/B are free from focus-related signal non-uniformities, have minimum black lift, freedom from burn-in. 4809/B is specially processed for blue-channel sensitivity requirement. \$350. RCA.

319

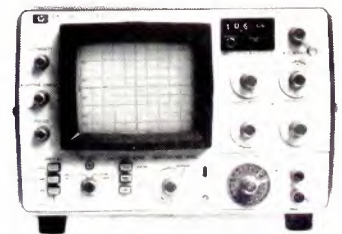
Large-screen color monitors have CRT with negative black matrix shadow mask for high resolution. Series 5000 in 19 in. and 25 in. sizes are for group viewing in auditoriums, classrooms etc., and have rigid mechanical construction. CONRAC CORP.

320

Monochrome monitor, 12-in. screen, has horizontal resolution of 640 lines, amplifier bandwidth over 8 MHz. Model 12M918 has plug-in circuit modules, 100% solid-state circuitry. \$229. SC ELECTRONICS, INC.

321

Low-frequency spectrum analyzer, 5 Hz to 50 KHz, uses digital storage techniques to keep trace refreshed. Model 3580A automatically updates



trace at correct rate; or trace can be stored in memory for later comparison with another trace. Sweep times are 0.1 to 2000 seconds. "Adaptive sweep time" allows fast sweep of signals below an adjustable baseline, to speed analysis. Amplitude range, 100 nanovolts to 20 volts full scale. \$3800. HEWLETT-PACKARD.

322

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coded, 2048-bit capacity, designed for high-speed main-frame memory or mass memory storage. Model MM5262 has silicon-gate circuit with bipolar compatibility, access time of 365 nsec (max) and cycle time of 475 nsec (short/read), or 635 nsec (read/write, or write). \$16.80 in 100-up quantities. NATIONAL SEMICONDUCTOR.

High-voltage power supply has up to 60 kW continuous DC output, with voltage adjustable 0 to 6 kv at 10 amps. Model HP6-10,000RX is servo regulated against +5% variation in line voltage, has reactors to limit short circuit output to 30 amps, and both instantaneous and delayed protection circuits. \$16,000. SPELLMAN HIGH-VOLTAGE ELECTRONICS CORP.

323

CATV cable connectors provide RF integrity in cable-to-cable, cable-to-housing joints. Intra-Shield connectors



have permanent integral radiation shield sleeve, are completely weather proof, need no grease or taping. JERROLD ELECTRONICS CORP. 324

Solder gun element accommodates interchangeable tips, is designed for circuit-board work without damage to components. Gunmaster Universal element fits most solder guns, can be used with "slug" for soldering, or with "dum-dum," which has center hole for removing solder. GUNMASTER UNIVERSAL INDUSTRIES. 325

Highly-directional microphone has line design, hyper-cardioid polar response. Model DL42 Cardiline has new shock



mount, dynamic element, EIA sensitivity rating of -144 dB. \$300. ELECTRO-VOICE, INC. 326

Function generator covers 0.1 Hz to 1 MHz, with 10 volt p-p output. Model 300A provides sine, square, and triangular waves and sync output. DC offset is ±2.5 volts. Model 310A has in addition variable pulse output, with rise and fall times better than 25 nano-

continued on page 54

PRODUCTION

Dave Daniels, program director at Heftel Broadcasting Corporation's WKTQ-13Q in Pittsburgh gave us his dream design for easy production... Pacific Recorders made it a reality... twice! First with a complete NEW SOUND at 13Q in Pittsburgh and then again at Heftel's WLQY-Y100 in Ft. Lauderdale... Pacific Recorders builds complete systems!... maybe it's time for your "new sound"...



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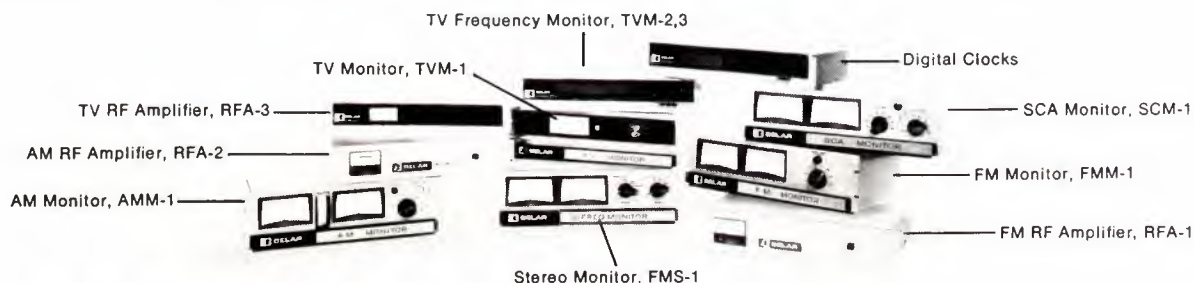
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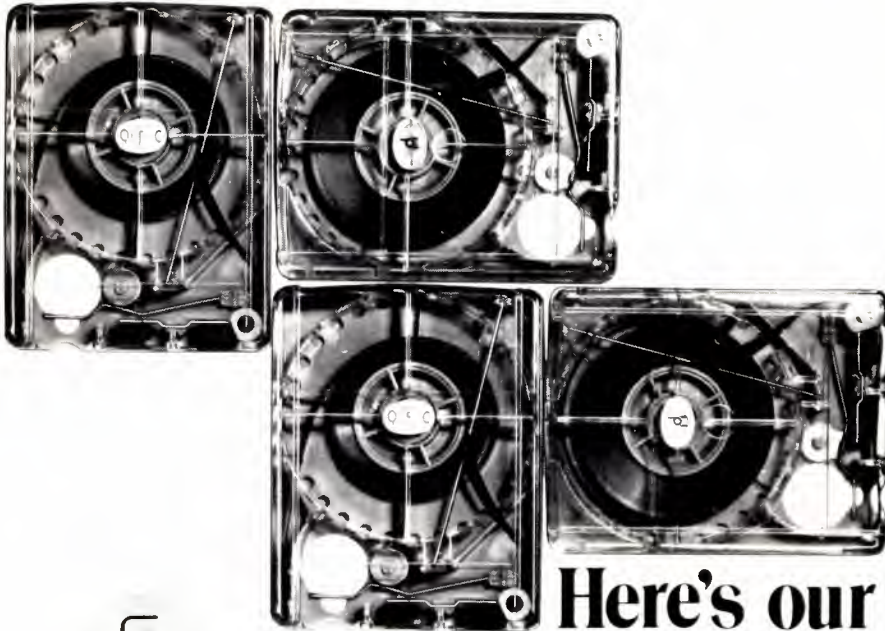
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seconds. 300A, \$225; 310A, \$295. (Also rentable.) TUCKER ELECTRONICS CO. 328

Joystick control is for use with Model V350PTV servo pan and tilt drive for



camera mounts. Model V121PTV joystick is vector-solving, gives camera pan and tilt in direct line at desired speed. VICON INDUSTRIES, INC. 318

Active cross-over networks for bi- and tri-amplification go ahead of power amplifier. Model 521L for two-way systems, Model 521H for three-way, are on plug-in cards for easy installation. Housings for various capacities are available. Available with or without internal power supply. UREI 333

Video cassettes with 3/4 in. blank tape come with 10, 20, 30, and 60 minute recording times. Series 187 are for Sony U-matics, come in vinyl dust proof boxes, \$17, \$20, \$25, and \$35 respectively. IRISH MAGNETIC TAPE COMPANY. 334

Swivel spot and flood light runs on 7.5 volt battery, provides 50,000 BCP in spot and 20,000 BCP in flood. Model MX-50 turns 360 degrees, can be hooked to edge of an aerial bucket. MULTIPLIER INDUSTRIES CORP. 335

Combination plow set has fixtures for trench, backfill, vibratory plowing, backhoe, and hydraulic boring. Ditch



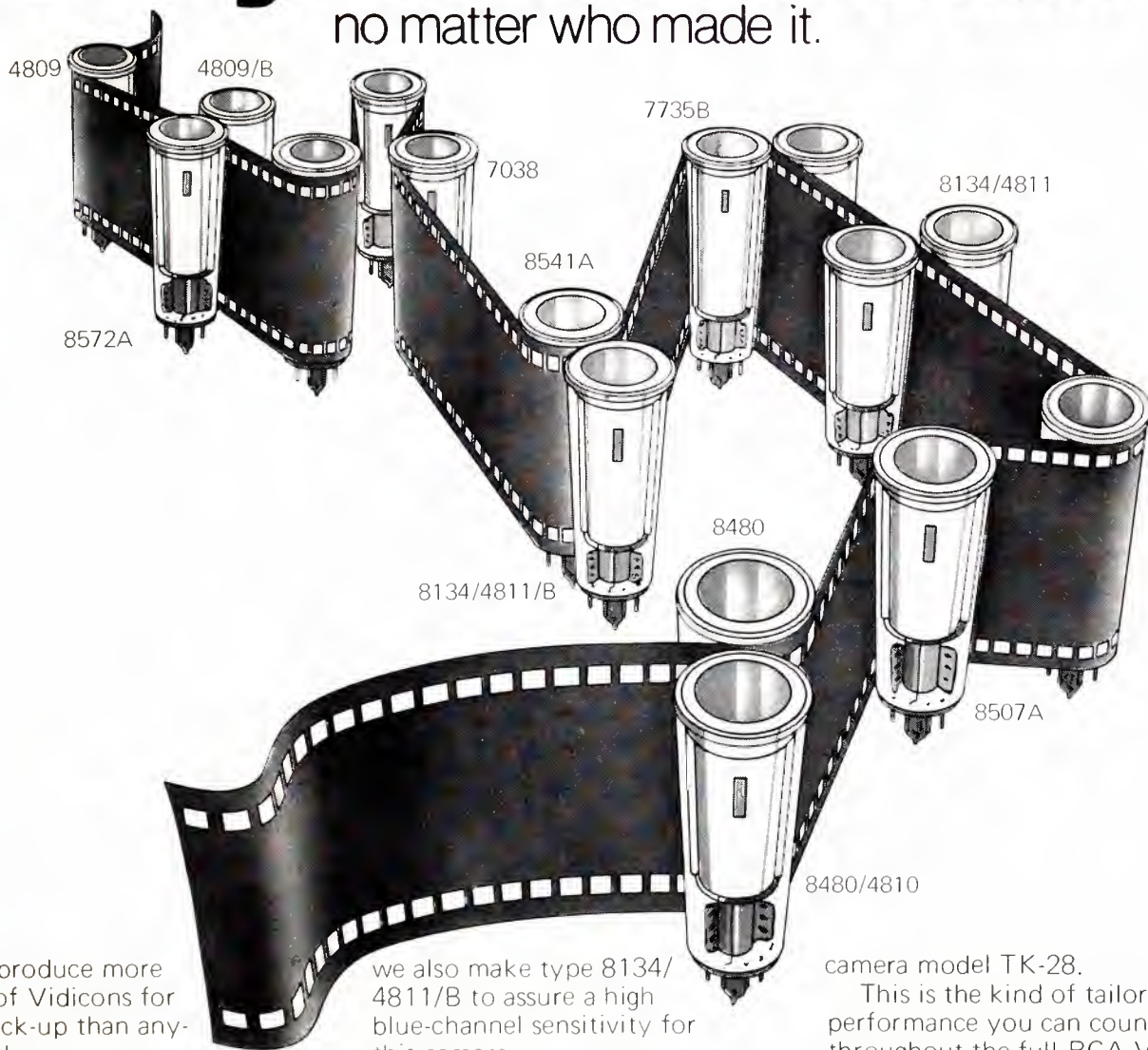
Witch Combo is available in 30, 37, and 65 horsepower models. DITCH WITCH-CHARLES MACHINE WORKS. 327

Zoom lens goes from 1000mm to 27.5mm in one second. Model 18x27.5F61, 1/2 lens is 1/6 at 1000mm, has electrically positioned

continued on page 56

Select RCA film pick-up vidicons for your camera...

no matter who made it.



We produce more types of Vidicons for film pick-up than anybody else.

We make so many because we've learned that top film camera performance requires tailoring Vidicons to camera requirements. And our applications engineers have studied them all.

Take our 8480/4810 and 8134/4811 film pick-up Vidicons, for example. The specifications defining their performance characteristics are controlled to provide exceptional service in the RCA camera model TK-27. And

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Or consider our 4809 and 4809/B Vidicons. They're recommended because they are specifically designed, manufactured and tested to produce best performance under conditions imposed by today's 3-tube color film pick-up requirements. The 4809/B is specifically processed and tested to meet blue-channel sensitivity requirements. Both of these tubes have been successfully applied in the RCA

camera model TK-28.

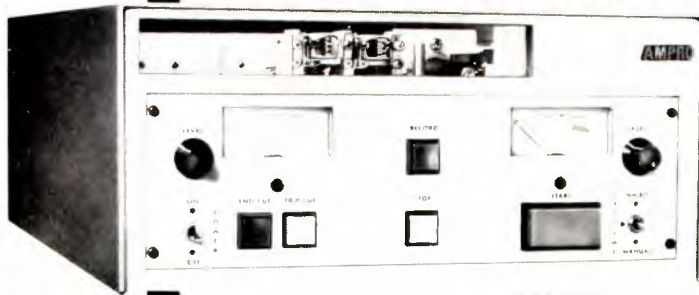
This is the kind of tailor-made performance you can count on throughout the full RCA Vidicon line. Take advantage of it now. Just call your RCA Camera Tube Distributor or RCA Representative for complete information. Or write Commercial Engineering, RCA, Harrison, N.J. 07029 for your copy of the new RCA Camera Tube Product Guide (CAM-703B).

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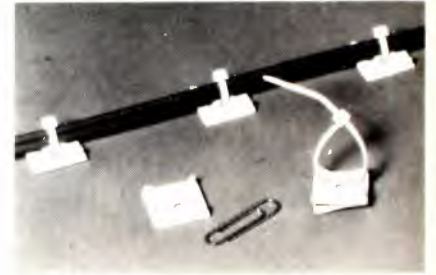
PRODUCTS

continued

range extenders and automatic iris for constant video level. **ANGENIEUX CORP.** 331

Hydrofluid tripod is for cameras weighing up to 20 pounds. Super-Mini tripod is 66 in. high fully extended, weighs 14½ pounds, has ball levelling, 360-degree pan, ±90 degree tilt, operates from -60 to 350 degrees F. \$479.95; head only, \$379.95. **HERVIC CORP./CINEMA BEAULIEU.** 332

Adhesive-backed mount holds cable bundles in restricted space. Model ABMM-A mount can be used with



various cable ties, measures ¼ in. x ¼ in., holds up to ¼ pound of cable. **PANDUIT CORP.** 338

Audio power amplifier is rated at 100 watts continuous output, is designed for 4-8 ohm loading or 25-volt output. Model M-250 claims ¼% harmonic distortion over the 20-15,000 Hz range. \$200. **PULSE DYNAMICS MFG. CO.** 339

Electrical outlet tester checks grounding and voltage at power outlets. Veri-Test measures resistance in ground line, determines which is the hot wire and measures voltage. **OMEGA SCIENTIFIC, INC.** 340

SCA receiver is an integrated unit with built-in audio amplifier and speaker. Purist Mark II has phase-locked loop detection, ceramic i.f. filters crystal frequency control, outlet for audio to other amplifiers. \$118.75. **PERMADYNE ELECTRONICS CORP.** 341

Portable precision voltage calibrator supplies 10, 1, and 0.1 volts with 0.05% accuracy. Model 450A also supplies 10 mV with 0.1% accuracy, is short-circuit proof, runs on two nine-volt alkaline batteries, or on an external 15 to 20 volt supply. **PIONEER/INSTRUMENTATION.** 342

Simultaneous sweep system for checking CATV systems produces no discernible effects in ongoing program. The "Sleep Saver" has 5-350 MHz bandwidth, long-persistence CRT, battery operation, with charger/converter supplied. **JERROLD/TEXSCAN.** 343

Solder-flux remover is available in aerosol spray form. CD-290 takes solder

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The new CLD-1100 Sync Pulse Generator from CBS Laboratories features digital-circuit design. Unique design enables maximum adaptability in pulse systems and achieves virtually perfect timing between dissimilar studios. Unit stability is derived from a timing circuit employing a single servoloop where the 3.58 MHz color frequency is generated from a 14 MHz crystal reference source. Contact us for quotes on your new sync systems. From CBS Laboratories, of course.

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fluxes from electronic circuits. \$2.85 per 16-oz. can. COLE-FLEX CORP.

344

Relative power monitor is a compact, passive device that has outputs for forward and backward voltages in a



50-ohm line. Model 5478 allows continuous observation of forward and reflected power in aural STLs, FM exciters, remote pickup antennas; and locates defective RF connectors. MOSELEY ASSOCIATES 345

Hi-pass filter for mike lines plugs to mike connectors at input and output. Model 513A filter has a sharp cut-off at 100 Hz to reduce wind and vibration noise. \$45. ELECTRO-VOICE, INC. 336

Digital line printer uses non-impact thermal process. Device is available in 6- or 12-column size, prints at 5 line/second. It is compatible with BCD 4-line TTL logic, is quiet because it has no moving printing parts. GULTON INDUSTRIES. 346

Commercial vehicle has 125 square feet of open interior space, 6 ft. 4 in. headroom. Model 307 is on Chevrolet



chassis, can be had with numerous optional items (air conditioning, water, generators, gas system, etc.) FRANK INDUSTRIES. 347

CATV test set is a single-package tracking sweep analyzer. Model 9600 provides simultaneous sweep and analyzer measurements, 1 to 350 MHz, with RF to IF conversion for high sensitivity and more than 100 dB of measuring range. JERROLD FLECTRONICS CORP. 348

FM/AM demodulator covers 47 to 860 MHz with four plug-in oscillators. Model FAB measures modulation fre-



quency response, center frequency error, frequency deviation, spurious AM. \$4100. ROHDE AND SCHWARZ. 349

continued on page 58

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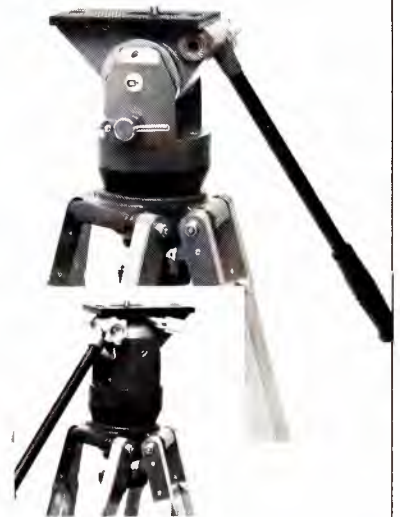
CPT-24 Fluid Head Tripod



CPT-24 shown with CP-16/A camera

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New high-power line-voltage regulator system operates in the 5 to 300 KVA range. "LZR" system has an average 11-millisecond response to line and load transients, goes from no-load to full load with 5% or less drop and full correction within 1/2 to 1 cycle. **SOLA ELECTRIC COMPANY.** 347

Multi-function counter reads frequency, period, multiple period averaging, ratio, and totals. Model 1950A has six-digit LED display, 50 MHz band width, 50 mV sensitivity. **JOHN FLUKE MANUFACTURING CO.** 348

Microphone line transformers step up from Lo-Z mikes to Hi-Z inputs. Models 502C and 502CP are small tubular units, the first with three-pin connector on Lo-Z end, MC-type connector at output; the second with standard phone plug on output. **ELECTRO-VOICE, INC.** 349

Automatic cartridge and cassette loaders include tape measuring, tone sense option, speeds of 30 ips and 60 ips. ACL-25 Series is for blank tape loading, have digital control panel to set length, at 30 ips; ACL-60 Series loads blank or uses tone detection at 60 ips. Torsion control uses TTL digital circuitry. \$150 to \$350. **RAMKO RESEARCH.** 350

Nine-inch video monitor has high-impedance bridging input with switchable 75 ohm termination. Model VM-4092 has horizontal AFC assuring compatibility with all helical videotape recorders, is aimed at student or employee education, surveillance or studio monitoring, time-lapse VTR applications. **SANYO ELECTRIC CO.** 351

Portable video pattern generator operates on batteries, provides all RCA-licensed patterns with pushbuttons. Model CG25 uses CMOS ICs for high stability, has adjustable RF output for low TV channels, color level control from 0 to 200%, adjustable dot size. \$99. **SENCORE, INC.** 352

Aluminum deep-flotation camera case holds an ACL camera, two 400-ft. magazines, lens, battery, battery charger. MAXAL case has a piano-hinge top, is dust-, water-, and shock-resistant, functions as carry-on luggage. \$200. **ECLAIR CORP.** 353

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Medium power (12 amp) silicon rectifiers, DO-4 series, get full technical description in new six-page brochure. International Rectifier Corp. 250

Entire line of attenuators and attenuation networks is covered in catalog A-16, including rotary and vertical



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slide units, pads, accessory equipment. Daven (McGraw-Edison Co). 251

FM Atlas and Station Directory in a new, up-dated edition with new general material is available at \$2.50 each from FM Atlas, Box 24, Adolph, Minn. 55701.

Twelve-page brochure describes fully new computer-controlled remote VTR editing system, PEC-102, which allows one non-technical person (creative director, for example) to perform automated editing. Central Dynamics. 252

Chart shows **rf power products** on a power-frequency scale for quick reference. Communications Transistor Corp. 253

Brochure covers **premium (pay) cable system**, with one-way and two-way capability. Magnavox CATV. 254

Digital programming instruments and controls, timers, clocks, measuring devices are subjects of six-page catalog covering the entire line. F.S. Enterprises, Inc. 255

Fast-switching PIN and NIP diodes for rf control applications are described in new four-page brochure. D-205. Raytheon Co. 256

Entire line of **Pathmaker cable equipment** is covered in 41-page catalog, including the 2000 series trunk amplifiers and associated equipment. GTE Sylvania. 257

New technical brochure describes the **50-watt swept power signal generator**, Model M473 AILTech. 258

Magnetic recorder heads for audio, video and data applications get full technical description in new Head Catalog, including custom design capabilities as well as all technical specifications. Brush Magnetic Heads. 259

Microwave capacitor kits consisting of assortments of capacitors for various applications, with values from 0.3pF to 91 pF in pellet or chip form, are covered in new technical brochure. American Technical Ceramics. 260

HF and VHF voltmeter that measures signal level in AM, FM, and TV bands, and frequency and modulation percentage in addition Model 2007 is fully described in new brochure. Bruel and Kjaer. 261

Tone signalling products, including audible and sub-audible tone encoders and decoders and related products, are subject of a 32-page catalog. Alpha Electronic Services. 262

Three new CCTV cameras for day-night operation, with automatic dynamic ranges of 20,000 to 1; 100,000 to 1; and 2,000,000 to 1; respectively, are covered in new data sheets (models CTS2, CTS3, and CTS4). Moxon, Inc. 263

Improved pedestal mounting tap for directional coupler applications is covered in new data sheet. Magnavox CATV Division. 264

Center tap rectifiers of 15 and 30 amp ratings and 100 to 960 reverse voltage ratings get listing and technical description in new data sheet. International Rectifier Corp. 265

Zip-on cable jacketing in a variety of materials and configurations is the topic of technical catalog. Zipper-tubing Corp. 266

Receiving tube manual covers 1400 types in over 700 pages, with traditional technical information and applications data. RCA. 267

Contactless meter relays and controllers are described in new 16-page catalog, with a variety of sizes, voltage options, etc. Simpson Electric Co. 268

Device for testing shield effectiveness of CATV drop cables, using the "SEED" technique, gets full explanation in new four-page data sheet. Bel-den Corp. 269

Twenty basic servicing tests on FM, AM and SSB radio, using the FM-10C Communications Service Monitor, are fully explained in booklet. Singer Instrumentation. 270

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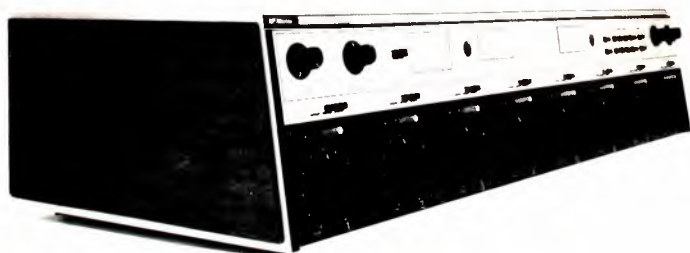
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latter. Although one-field/pass systems eliminate visible hue or saturation errors (banding) that could develop when more than one head is used, the track length is long. For good interchangeability (no tracking error or adjustment problems), the segmented format was the logical choice.

In deciding how many segments per field, IVC felt an odd line segmentation was desirable (heads do not play the same portion of each field), since hue error is then visually integrated at a 30Hz rate—the eye sees the average of the two colors. (On PAL systems, an even segmentation was necessary to avoid a 12.5 Hz saturation flicker.) In the NTSC units, the video image is segmented into 52 lines each (compared to 16 for quad). To minimize chroma saturation, a chroma match circuit matches the two heads.

Since writing speed is essentially a question of recorded wavelength (peak white carrier should be longer than 100 microinches), the writing speed was selected as 1500 ips. This produces a peak white wavelength of 125 microinches (12MHz).

The final format was determined only after extensive discussion with broadcasters throughout the world. The arrangement picked is shown. There are two high-quality audio tracks, a medium quality cue track, and a separate address cue track in addition to the control track. The cue track separates the audio track and the two saturating tracks are on opposite sides of the video pattern

eliminating crosstalk.

Guisinger said various computer studies were done analyzing the tolerance build-up of the various guides as well as the effect of environmental changes on interchangeability. These analyses showed an ability to maintain interchange with 6 mil video tracks and 3 mil guard bands. Maximum mistrack errors amount to 1 mil under worst case conditions. The track length is 5.24 inches.

A high carrier frequency is used to meet PAL requirements. PAL has a subcarrier frequency of 4.43 MHz and a base bandwidth of 6 MHz. Moiré is visible when standard FM modulation is used. To overcome this, carrier frequencies are raised so that the third order folded sideband does not demodulate within the base bandwidth. A blanking frequency of 9.9 MHz was chosen. The design produces a 75% saturated color bar pattern with the moiré down in excess of 40 dB. While this high frequency was not necessary for NTSC, the design is simplified by using it. In a practical sense, the recorder can be further misadjusted before visual defects are seen.

The IVC 9000 boasts a unique time-reference system. A wide variety of timing pulses are available which make automation systems feasible and make editing simple. Details are available in a paper by Bert Dann of IVC. The servo system was covered by Donald E. Morgan. The system includes an "edit tension memory" which assures that all edited material is recorded at the same tension as the prerecorded program on the tape. Tape time is displayed on the video monitor to aid editing decisions. Edit preview capability is built in. **BM/E**

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ADVERTISERS' INDEX

AKAI America Ltd.	Cover 2
Ampro Corp.	56
Astrionics Div. of Technicolor	66
Audio Devices, Inc.	11
Audiotronics Inc.	63
Automated Processes Inc.	7
Avantek Inc.	CM/E-10
Belar Electronics Laboratory Inc.	53
Bell & Howell, Audio Visual Products Div.	20
Broadcast Electronics Inc.	12, 58
CBS Laboratories, A Division of Columbia Broadcasting System Inc.	56
Canon Inc.	13
Central Dynamics Ltd.	10
Cerro Wire & Cable Co.	CM/E-4
Cetec Inc.	61
Cinema Products Corp.	19, 52, 57, 60
Cohu Electronics Inc.	37
Collins Radio Co.	33
Cosmic Optical Co., Ltd.	62
Datatek Corp.	61
Dynair Electronics	3
Eastman Kodak Co.	CM/E-9
Electro-Voice Inc.	27
Fidelipac	54
Fort Worth Tower Co., Inc.	59
Grass Valley Group, Inc., The	5
Gotham Audio Corp.	14
Heller-Oak Finance Corp.	CM/E-6
Hitachi Shibaden Corp. of America ...	Cover 4
International Video Corp.	Cover 3
Jampro Antenna Corp.	63
McMartin Industries Inc.	59, 60
3M Company, Mincom Div.	17
Pacific Recorders and Engineering Corp.	52
Philips Broadcast Equipment Corp.	CM/E-7
Potomac Instruments Inc.	58
RCA Broadcast Systems	22, 23
RCA Electro Optics	55
Richmond Hill Laboratories Inc.	21
Robins-Fairchild	8
Russco Electronics Inc.	57
Sansui Electronics Corp.	15
Sitco Antennas	CM/E-6
Systron-Donner	21
Tape-Athon Corp.	9
Tektronix Inc.	58
TeleMation	47
Television Microtime Inc.	50
Tracor Industrial Instruments	54
Wilkinson Electronics Corp.	18
Windjammer Cruises	41

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Money. We put the latest solid-state circuitry and some clever design techniques into the IVC-240 and the 4000A—not just to make them more reliable, but to give them the industry's finest price/performance ratio. Example: we use costly precision fixtures, like other manufacturers, to align the 240's dichroic mirrors. Unlike other manufacturers, however, we set the mirrors permanently in optical epoxy. The expensive fixtures stay here—but the precise optical alignment stays with the 240—permanently. Features like this hold the price of the 240/4000A combination to less than \$30,000.



A free-standing camera cabinet. Ordinarily, if you accidentally bumped into a film-chain camera, you'd disturb the picture. But when the IVC-240's cabinet is accidentally bumped or nudged, picture positional stability, as viewed on a picture monitor, is virtually unaffected. The reason: the optical system and Vidicon/yoke assemblies are mounted on a separate rigid backbone that is lagged directly into the floor through the sheet metal of the cabinet. The effect is the mechanical isolation of optics and cabinet



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It makes your studio look nicer.

But we can't tell you all about the 240 and the 4000A here—there isn't room to talk about their minimal maintenance requirements, their exceptional stability, their hands-off operation, their automatic features. We suggest you write to Camera Product Manager at the address below.

We'll be glad to give you all the reasons why choosing IVC is a good move.



Money again: Having a single neutral-density filter wheel inside the camera for automatic white level is a special cost-saving bonus from the IVC-240. This unique arrangement can save you up to \$4200 by eliminating the usual separate disc for each projector. The lightweight disc and high-torque motor, which are built into the camera enclosure, respond to light level changes up to 100 to 1 in 0.6 second (maximum). And typical changes are compensated for much faster.

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