AUGUST 1973

BM/E

BROADCAST MANAGEMENT ENGINEERING

CM/E

INCLUDING: CABLE MANAGEMENT ENGINEERING

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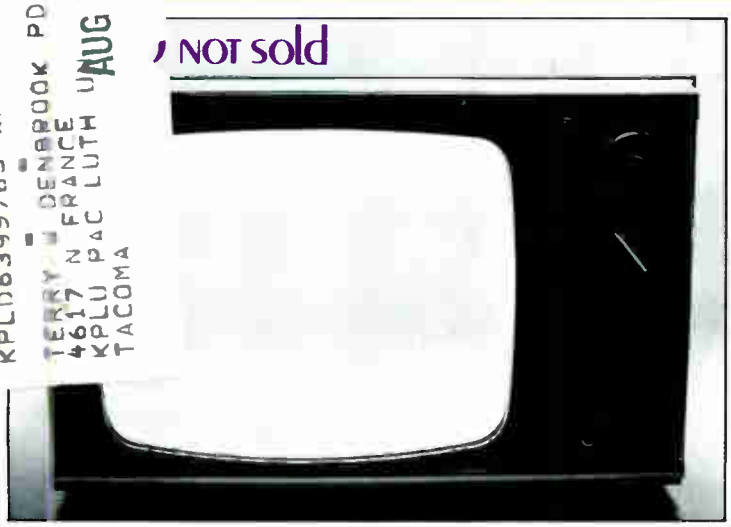
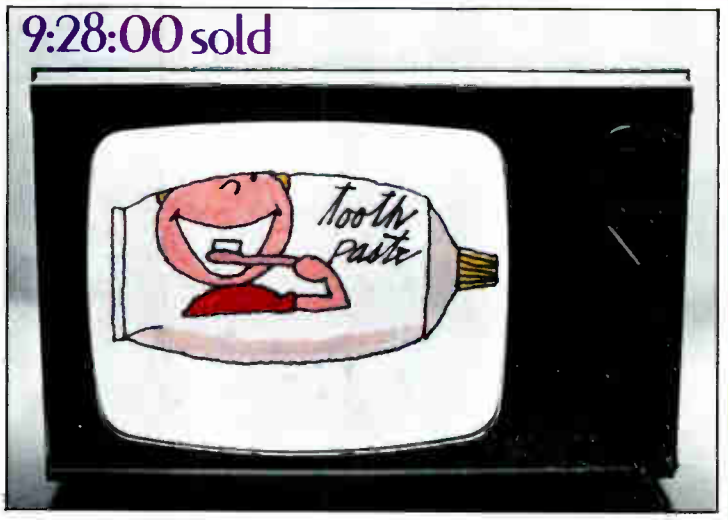
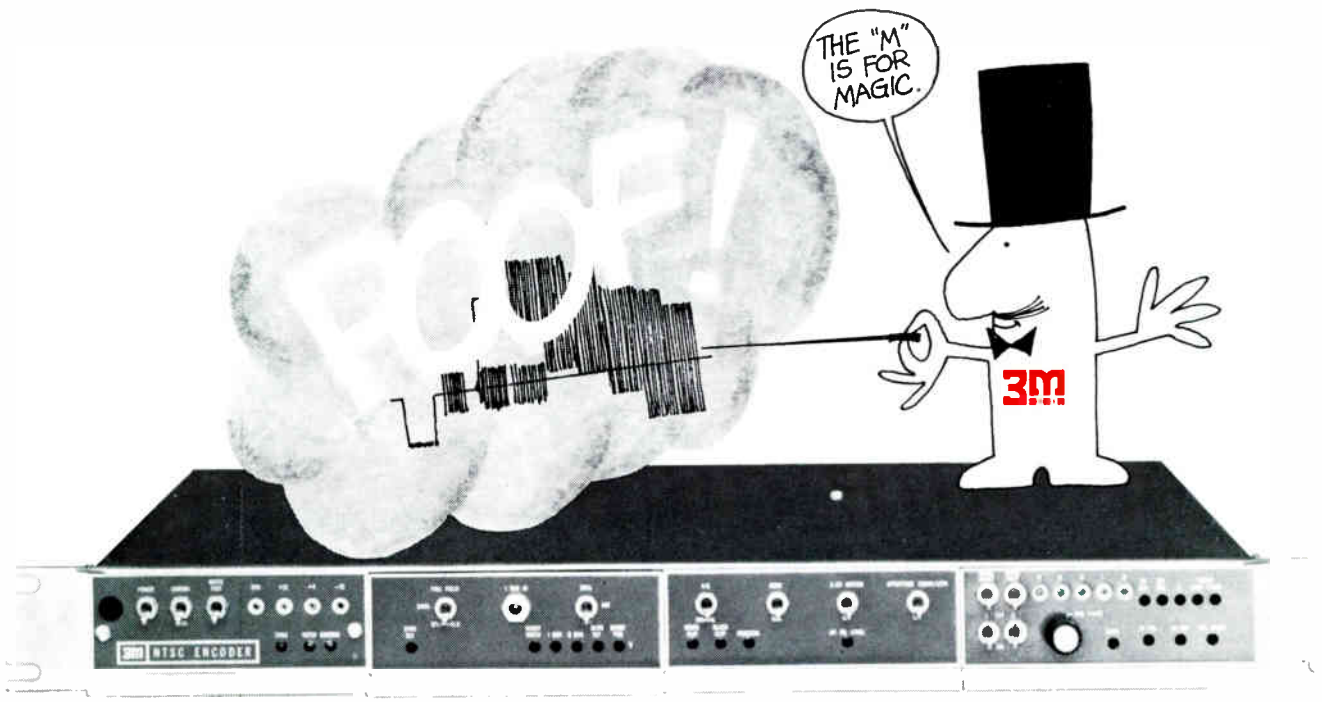




TV AUTOMATION:

TRACK AVAILABILITIES WITH A COMPUTER.

World Radio History



Presto! Change-o!

Before your very eyes, the flick of a switch converts the output of any 3- or 4-channel camera, no matter what its price, into an encoded signal that meets all applicable EIA and NTSC specs!

The switch is on the 3M color video encoder, and it's loaded with features and performance like nothing you've ever seen before.

Its all-digital color bar generator, accurate to within ±½%, requires no adjustments and has already earned a reputation for being rock solid with temperature variations.

Its video input clamping circuits eliminate low frequency hum and noise, and prevent APL changes and ground loops from causing color errors.

Its amplitude-dependent aperture equalizer provides noise-free picture crispening.

Its luminance-enhancement circuits increase the resolution of 3-channel cameras, improve the color fidelity of 4-channel cameras, and provide automatic green channel luminance when switching to monochrome.

And maybe best of all, its price is lower than you'd expect.

As we said, like nothing you've ever seen before, so why not let us show you? Ask for a demonstration. There'll be no hocus-pocus, no mumbo jumbo — we let the 3M color video encoder speak for itself.

We've made more believers that way.

Mincom Division, 3M Company, 300 South Lewis Road, Camarillo, California 93010. Telephone (805) 482-1911.

VIDEO PRODUCTS

Mincom Division 3M COMPANY

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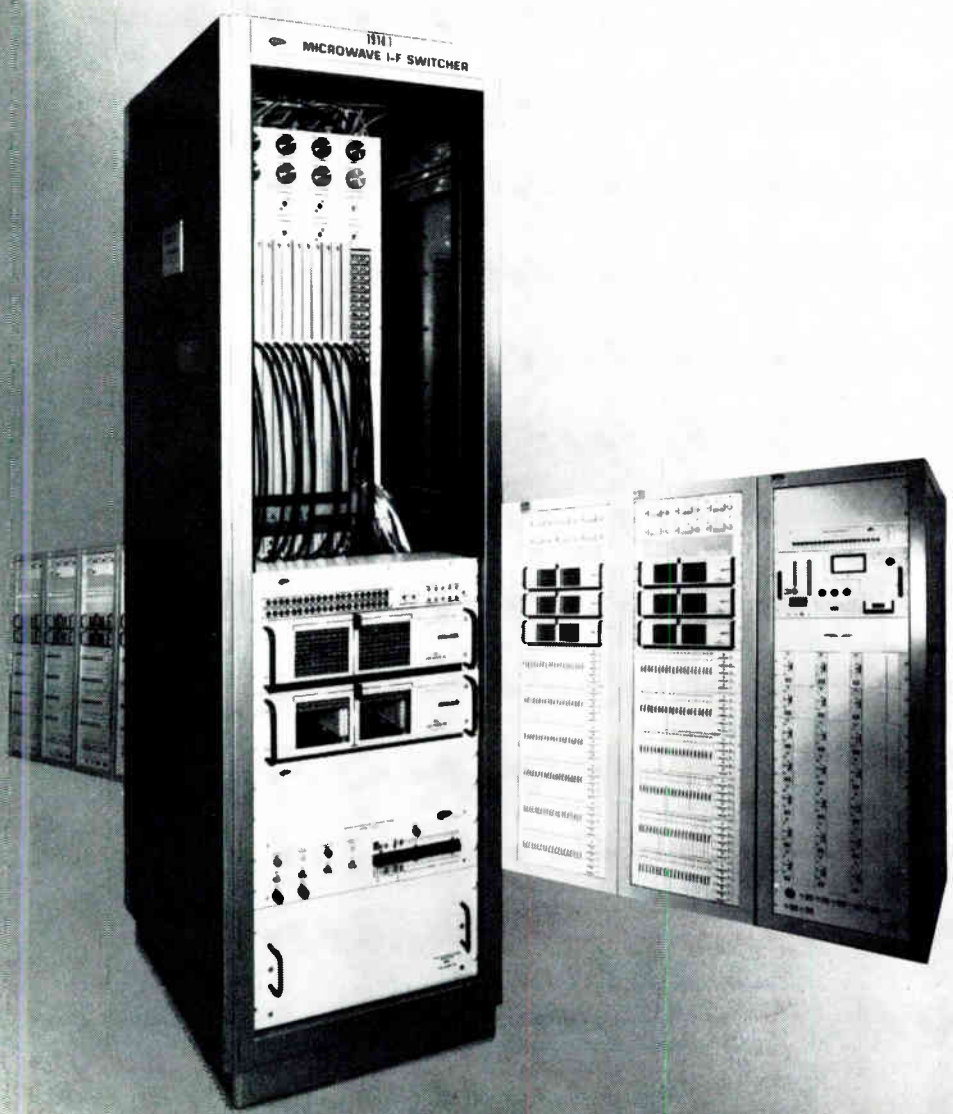
If you are planning a broadband communications switching and distribution system you should talk to DYNAIR.



That's right. DYNAIR specializes in the switching and distribution of broadband signals to 100 MHz. Our 70-MHz computer-controlled microwave IF switching system distributes television and other information to all major universities in Indiana . . . and several other installations are now being completed with similar equipment.

Large DYNAIR 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.

Standard logic cards are available from stock for ease of assembling most computer-interface and machine-control subsystems. These cards mount in a universal frame which utilizes wire-wrap connections to establish the required interface functions. Numerous manual control options are also available.

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Shouldn't you talk to DYNAIR? Give us a call today. Or if you prefer, drop us a note and we'll send literature.

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PHONE: (714) 582-9211

DYNAIR

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World Radio History

BM/E
BROADCAST MANAGEMENT/ENGINEERING

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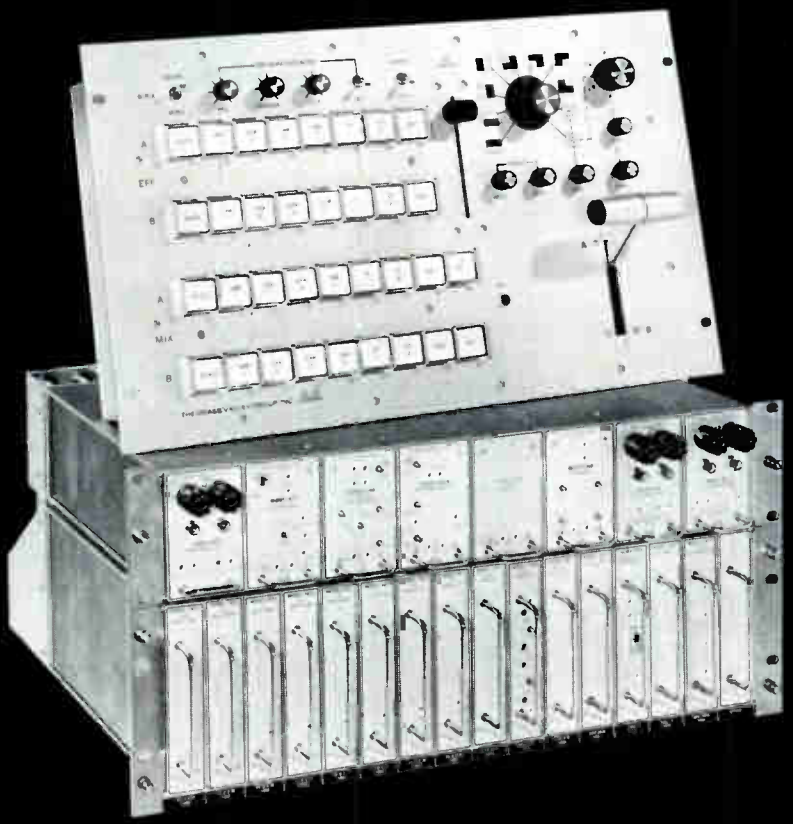

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● 8 inputs - composite (loop through) ● 4 buses - Mix A and B, EFF A and B ● True re-entry system - allows dissolves to wipes and inserts ● Complete color special effects system - 8 wipe patterns, internal keying, external keying, and matte ● Bordered wipe patterns ● 3 input mixer - allows split fades to black ● Vertical interval switching ● 2 program outputs ● Effects monitor output ● Meets NTSC color specifications ● Compact - Control panel 10½" x 19" (rack mount), electronics 8¾" x 19" (rack mount) ● OPTIONS: Color black/color matte generator ● Automatic sync-add crosspoints for non-composite inputs ● Chroma key ● Non-synchronous inhibit for MIX buses ● Video processing system ● AFV system

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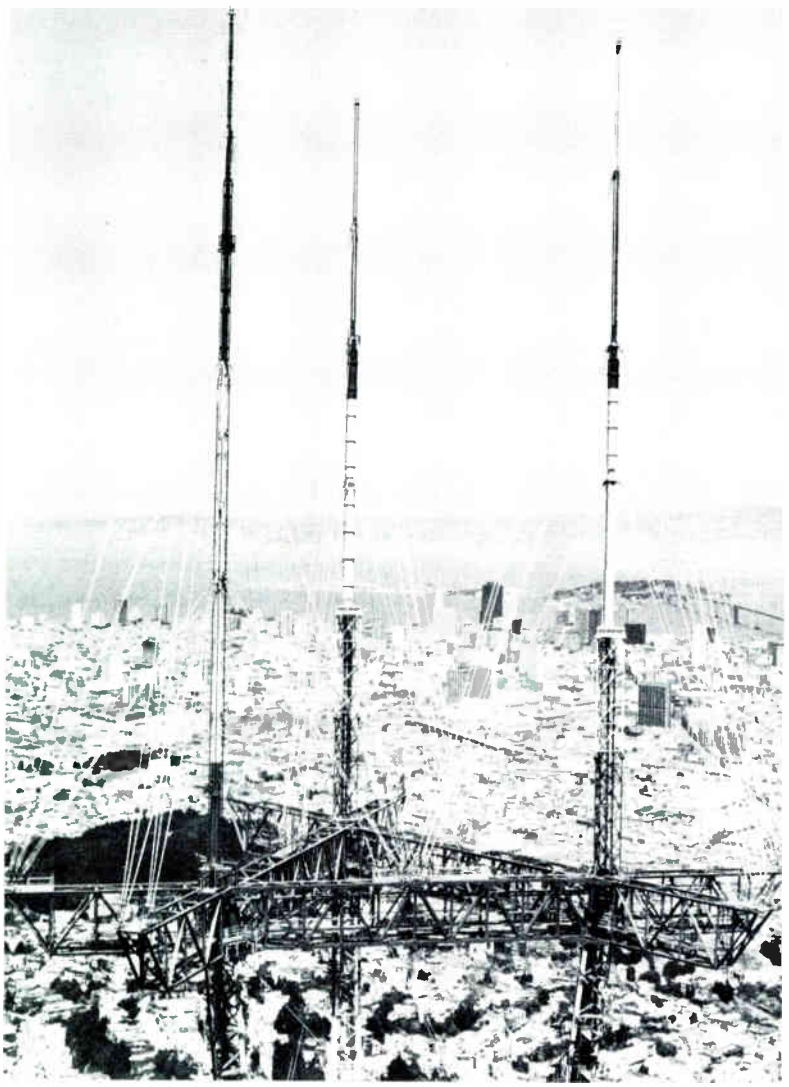
BROADCAST INDUSTRY NEWS



San Francisco's new eight-station TV broadcasting tower, as viewed from a helicopter, is 977 feet high and rises 1811 feet above sea level on its Mt. Sutro site. The antenna system, which was designed by RCA, is configured in three 210-foot stacks rising above the triangular platform. The tower and its antennas, electronic equipment, and transmitter buildings, cost more than $12 million.

NAB Asks Anti-Siphon Rule For All Non-Broadcasters

The National Association of Broadcasters has urged the Federal Communications Commission to apply a single anti-siphoning rule against all non-broadcast systems that deliver programs to the home for a fee. The objective, said the NAB, is to prevent the charging of home subscribers for programs they now see free on broadcast TV, not only through cable systems (already covered by an anti-siphoning rule), but also by other delivery methods now in development: microwave, telephone line, etc. NAB did not ask restriction on pay-programs for hotels and other "transient" areas.

Supreme Court Will Rule On FCC Cable Fee Authority

In response to a plea by the National Cable Television Association, the U.S. Supreme Court has agreed to rule on the authority of the FCC to impose annual fees on cable television operators. The decision will come in a review of a Court of Appeals ruling that the FCC could impose an annual fee of $.30 per subscriber on all cable systems, as a means of recovering FCC operating costs.

TheatreVisioN Pay Cable Will Expand To Six States

Chairman Joseph Freidman, of Chromalloy American, said that the affiliate TheatreVisioN, pay-cable system, had signed with cable operators in six states—Florida, Michigan, Missouri, New Mexico, Pennsylvania and Texas—with a total of 170,000 subscribers. Dore Schary, president of TheatreVisioN, opens marketing efforts in the six states in August, and first installations are expected in November.

continued on page 8

World Radio History

Now...you can convert your TK42/43 camera to use Plumbicons* in the chroma channels!

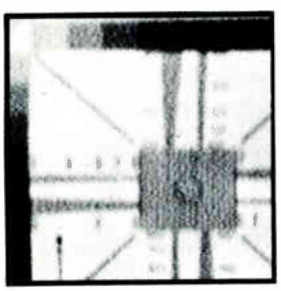
Eight years ago, the Plumbicon TV color camera revolutionized the broadcast industry with its clean, sharp, noise-free images, and its color rendition so obviously superior to that of the TK42/43 cameras it superseded.

But not all of the TK42/43's in use in 1965 have been replaced. There are still many studios where TK42/43's are the workhorses of color TV.

If yours is one of those studios, and you're not considering a new camera, we offer you the opportunity to convert your TK42/43 to use Plumbicon tubes in its chroma channels instead of vidicons and enjoy performance at wholly new levels, including:

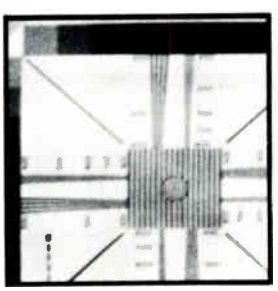
- **9 to 12 dB noise reduction in chroma channels**
- **Easier, more accurate, registration**
- **No more chroma channel lag**
- **Clean color keying**
- **Shorter black-balance time**
- **Faster, easier, gamma tracking**
- **No more need for faceplate temperature control**

Before



Unretouched photo taken through the viewfinder of a a TK42 camera. With vidicons still installed in the blue channel, the operator has difficulty registering the color and B/W images because vidicon signals are inherently noisy.

After



Unretouched photo taken through the viewfinder after conversion to Plumbicon camera tubes. With conversion completed, accurate stable registration is easy since chroma channel noise is reduced by 9 to 12 db.

*Registered trademark of N. V. Philips of Holland

But the big difference will be the difference you see on your monitor screens...a difference immediately obvious to your viewers and to your advertisers.

We make the conversion with a kit developed for us by the Electro-Optical Devices Division of Amperex Electronic Corporation, manufacturer of the Plumbicon color TV camera pickup tubes. We remove the three chroma channel vidicons from your camera and replace them with three new Amperex Plumbicon tubes and yoke assemblies; we add a new Amperex interconnect board and we modify the deflection modules and the preamplifier to match the characteristics of the Plumbicons.

The conversion takes about one working day...at your studio. The complete cost, in continental U.S.A., is only $7,860.

For further details, write: Rank Precision Industries, Inc., 260 N. Route 303, West Nyack, New York 10994. Attention: Nick Glade, Service Manager. Telephone: 914-358-4450.

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NEWS

marketing efforts in the six states in August, and first installations are expected in November.

American Satellite Signs For Channels on Canadian "Bird"

The American Satellite Corporation announced agreement with Telesat Canada for use of up to three full-time and one part-time transponder circuits on the Canadian Anik-2 satellite, for ASC's commercial communications channels. Voice, TV and data service to American customers is slated to begin in fall, with earth stations ready in New York, Chicago, Dallas and Los Angeles, and additional earth stations projected.

Public Radio Operators Form National Association

Representatives of the nation's public radio stations voted at a May meeting to form a national body, the first all-radio organization in public broadcasting. A nine-member interim board, with Hugh Cordier of National Educational Radio as chairman, will develop the organization's structure and name.

Xtrra-Vision Pay TV Starts on Carrolltown, Penna., Cable

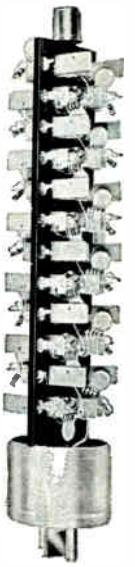
Another pay-cable system, Xtrra-Vision, was slated at press time for a July 9 turn-on date on the Cambria TV Distribution Co. cable system in Carrolltown, Penna. The multi-channel service will be available to the 5100 subscribers of Cambria,, with both movies and regularly scheduled non-movie entertainment.

Hughes TV Network Has $12 Million Sales, Last Half '73

The Hughes Television Network, enlarging its programming to include prime-time entertainment and documentaries as well as sports, announced sales in excess of $12 million for the last half of 1973, a record. Hughes, which operates by "borrowing" stations for specific broadcasts, has benefitted from the FCC prime-time access rule and also by release of a number of documentaries and specials. Strong

continued on page 10

Replace Mercury Vapor Tubes Directly with WILKINSON Silicon Rectifier Stacks!



Because...

- ☐ Only non-encapsulated WILKINSON Silicon Rectifiers can be repaired in seconds with low-cost replacement diodes!
- ☐ Exclusive "GO, NO GO" indicator automatically warns when the reverse leakage of any diode is in excess of 50 microamps.
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- ☐ WILKINSON Silicon Rectifiers function in ambient temperatures of from – 85 F to +158 F.
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- ☐ No warm up time is necessary . . . instantaneous operation!
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Our rigorous system test routine is one of the reasons you should talk to Farinon before you buy Microwave.

The equipment shown here in system test is part of a microwave network which extends CPB programming from Sprague, Washington to ETV stations in Pullman, Washington and Moscow, Idaho.

Every Farinon Microwave System goes through a complete operational test before our Vice President in charge of Quality and Customer Service will let it ship. Everything possible is done at the factory to assure that each system will work as intended when the user turns it on.

Farinon has learned how to test solid-state microwave by repeating the process on thousands of terminals since the first solid-state equipment was produced in 1965. You'll find Farinon equipment furnishing reliable video, voice and data circuits throughout the United States and Canada, and in more than 50 other countries. Any user will tell you about the inherent reliability of Farinon equipment, and about our fast response when help is needed to keep a system operating.

You can use Farinon Type SS12000 Microwave for video in the 12.7 to 13.25 GHz CARS, STL and intercity relay bands. This system is similar to those used for video by common carriers in the 4 GHz, 6 GHz and 11 GHz bands.

If you need microwave for importing distant signals, for studio to head-end links, or for any other purpose, you should see what Farinon can do for you before you buy. Call John Bartelme at (415) 593-8491 to get equipment details or engineering help.

Farinon Electric,
935 Washington St.,
San Carlos, California 94070
(415) 593-8491

Farinon

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emphasis on production of national sports telecasts continues.

FCC Emphasizes Rule On Source of Material

The Federal Communications Commission has issued a strong reminder to broadcast stations that prerecorded material furnished to a station by government agencies or officials, candidates, businesses, trade associations, non-profit groups, etc., must be identified as to source when it is put on the air. Stating or implying that such material originated with the station's own news staff, or any other misrepresentation as to source, will raise questions as to the qualifications of the licensee, said the FCC statement.

Anixter To Distribute Sony Cassettes To CATV

Anixter Brothers, Inc. has a nationwide franchise to sell Sony videocassette equipment for use by CATV systems. Sales will be through Anixter-Pruzan, affiliate giving national service to the cable industry.

FCC Sees Problems With Profits Tax, Other Proposals

The FCC has expressed strong doubts as to the desirability, even the legality, of proposals advanced in Congress for a tax on broadcast profits, for the auctioning of licenses to the highest bidder, and for the abolishment of the Fairness Doctrine. Chairman Burch, in a letter to Senator William Proxmire, said that fixing a profits baseline would be difficult or impossible, and that any tax was a Congressional and not an FCC responsibility. He pointed out that auctioning licenses to the highest bidder would, in effect, take spectrum management away from the FCC, ending "reasoned decision making by an expert body accountable for its actions to Congress. Commissioner Wiley said that the Fairness Doctrine carried out an express mandate of Congress, and that broadcasting could not be on the same first amendment basis as print media as long as there is a scarcity of channels which restricts access to the public.

Three Station Groups To Produce Children's Programs

A consortium including Capital Cities Communications, Inc., Metromedia Television, and Storer Broadcasting Company, all multistation operators, will create, finance and produce a series of television programs for children, initially aimed at the 6-11 year-old viewer. The programs will be available to stations both inside and outside the three groups, according to the announcement from WXIX, Metromedia station in Cincinnati.

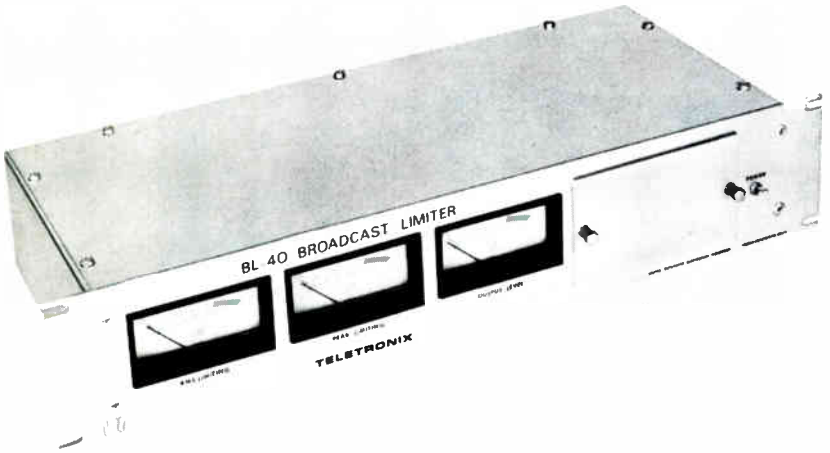
Hotel Pay-Movies No Drain on Theatres, Says Wometco

Wometco Enterprises, which has joined with TransWorld Communications in a Miami trial of hotel pay-movies, and also operates more than 100 movie theatres, has concluded that the hotel service is not stealing people from the theatres. Mitchell Wolfson, president of Wometco, said: "If these early results are a valid barometer, we will be adding an entire new market for motion pictures rather than draining the

continued on page 12

MODUlimiter....

you can hear the difference!



The Urei Model BL-40 Broadcast Limiter is more than a compression limiter...*Modulimiter* provides independent adjustment of RMS gain *and* peak limiting, *without clipping*! The result allows continuously variable, asymmetrical limiting to maximize effective power for your particular program format.

***Modulimiter* features low noise, low distortion integrated circuitry and has full function metering. Output meter can be calibrated to match any transmitter input. All critical adjustments are located behind a security panel and a test switch for proof-of-performance is provided.**

Modulimiter* is another product for the Broadcast Industry, distributed by *Pacific Recorders...the Total Equipment Supplier.

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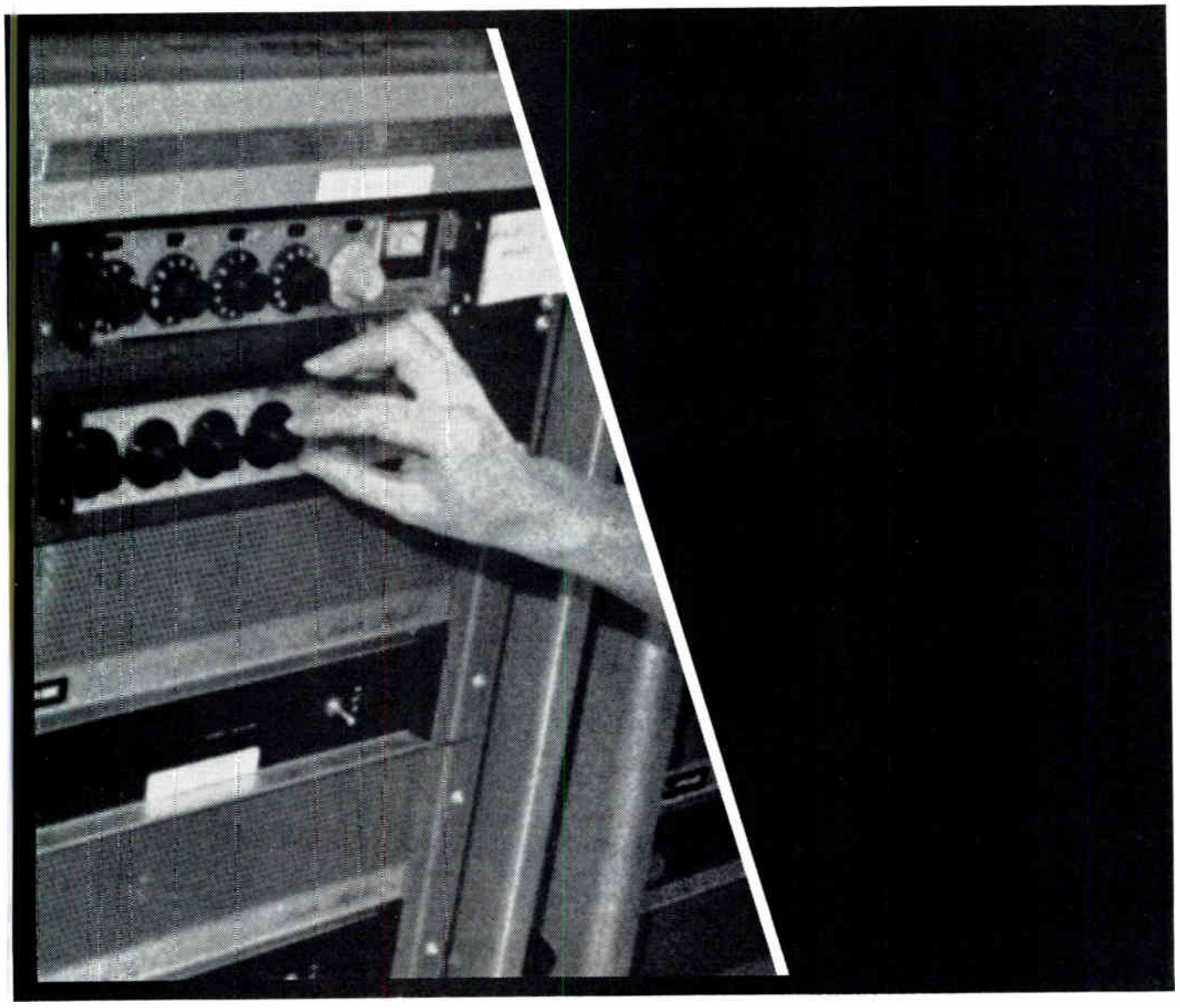
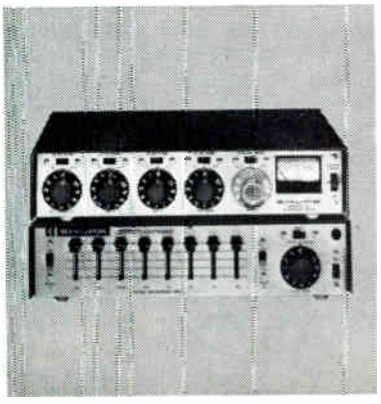


Modular sound control center 3.*

Coordinate sound reinforcement & live TV for $455.40



Problem: An in-studio musical event with input signals from various sources — and you have to make sure that the combined output meets *both* the special requirements of the house sound reinforcement system and a live TV station feed. Sounds tough, but Shure cuts it down to size with a pair of M67 Mixers, stacked with our new M610 Feedback Controller. The M67's provide up to eight microphone inputs, each individually balanced, adjusted for signal level, and ready to run "flat" into the broadcast line. The combined output also runs into the M610 Feedback Controller *before* it reaches the PA system, where the M610's eight slide-switch filters plus high and low frequency roll-off controls provide the house system with a "room-tailored" signal, shaped for optimum feedback control and maximum system gain! Result: good sound in the room . . . and on the air.

* More to come . . . other ingenious sound control centers will be discussed in future issues.

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

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World Radio History

current one." He pointed out that the typical hotel guest is around 42 years old and has upper-middle income, a class conspicuously missing from present movie theatre audiences.

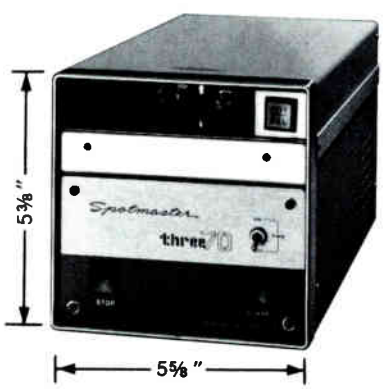
Code For Children's Ads Is Adopted by NAB Board

The Television Code Review Board of the NAB adopted in June a statement of principles covering advertisements directed to children. Among the principles are: material to be non-exploitative in manner, style and tone; information on the characteristics and functional aspects of a product/service to be disclosed; edibles to be presented in accord with commonly accepted principles of good eating; promised benefits in strength, growth, prowess must reflect documented evidence; no appeals that state or imply a child will fail with peers without a product, or succeed with it; no frightening material; no appeals to violent or dangerous behavior.

Spotmaster®

Space Setter

$469



Three/70™ Cartridge Playback Deck

Meet our midget. And don't be fooled by its modest exterior. The new Spotmaster® Three/70 packs the performance of its big brother—the incomparable Ten/70—into a pint-sized package at a pint-sized price.

Standard features include the Ten/70's direct drive synchronous motor, all silicon solid state circuitry, high output (+8 dbm) and plug-in modular construction. Deck operation is pushbutton-quick, with instantaneous response.

Now look what happens when you put a trio of Three/70s together. They fit side by side in a single rack mount. The whole thing takes up just 7" of rack space.

Three/70s accept all Type A cartridges, playing up to 10½ minutes at 7½ ips. Options include 3¾ ips operation, as well as 150 Hz and 8 kHz secondary and tertiary cue tones (to augment the 1,000 Hz primary stop/re-cue tone).

Good things do come in small packages. Learn more about the Three/70—contact us today.

BROADCAST ELECTRONICS, INC.

A Filmways Company

8810 Brookville Road, Silver Spring, Maryland 20910 • (301) 588-4983
TWX 710-825-0432

KPMC Joins CBS Radio Network

Sherril W. Taylor, vice president of CBS Radio Division for Affiliate Relations, announced that KPMC, Bakersfield, California, has joined the CBS radio network. KPMC is the eighth station to sign on as an affiliate in the past two months, raising the number of network stations to 250. Other new affiliates are WEMP, Milwaukee; WWSW, Pittsburgh; WSIX, Nashville; KIXI, Seattle; WEST, Easton, Pa.; KGNC, Amarillo, Tex., and WMEL, Melbourne, Fla.

RCA Supplies Transmitting Systems for Canadian Network

Broadcast transmitting systems for the first phase of Canada's new Global Television network will be supplied by RCA. Three VHF transmitters and six antenna systems valued at $780,000 are included in the order received by RCA Limited, Canada.

Global Television is establishing a grid of TV transmitter facilities strategically located for overlapping coverage of most major Southern Ontario urban centers, as well as broadcast service to less dense areas. The transmitters and Global's new studio complex in Toronto will be interconnected by two-way microwave. The transmitters will be automated and remotely controlled. Testing of the transmission system is scheduled for the end of November, with January 1, 1974 planned as the on-air date.

WDHO-TV First to Install New ABTO Color TV System

The first broadcast quality projector equipped with the optical components of the ABTO System has been installed at WDHO-TV, Toledo, Ohio, an affiliate of the ABC Television Network.

The ABTO System is based on the principle of Abtography which codes color information onto conventional 16mm black-and-white film through use of a glass microfilter in the taking cameras. The information is optically decoded by ABTO-converted projectors. The result is color projection.

WDHO-TV has completed over four months of daily news operation using prototype equipment. Arthur M. Dorfner, president of WDHO-TV, expects significant cost savings to allow broader color coverage of local news.

continued on page 17

World Radio History

RCA

PRIME TIME

The automatic TK-45 Color Camera. Why we made the best even better.

Probably the question we're asked most often about our new TK-45 Color Camera in relation to the TK-44 is "Why tamper with a good thing?"

This usually comes from people who have worked with one or more of the approximately 700 44's over the years and have come to rely on their proven performance and stability.

Our answer is "To make it better." Since the TK-44A was introduced in 1969, it has undergone a continuing evolution, with new features and design improvements incorporated each year.

So, in coming up with the TK-45, we had our work cut out for us:

Add more automatic features without compromising the well-known stability and performance capability of the TK-44.

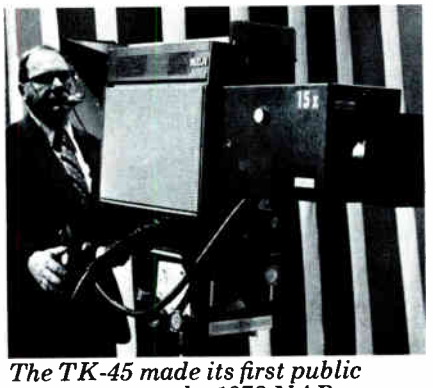
What happened is that the new features actually contribute to the operational simplicity of the camera while enhancing the quality of the pictures produced.

In effect, we designed *in* the new features, while designing *out* complexity—by utilizing new techniques, more solid state devices, improved modular packaging concepts.

Take a look inside the TK-45's camera control unit and you'll see a big difference: fewer interconnecting cables; far fewer set-up controls, and not nearly as many modules. But, in this case, much less adds up to *much more*... in convenience, operational simplicity, and performance.

In essence, the TK-45's stability results from basic design simplicity, like our use of the RGB system. Simple to understand, operate and maintain.

As an example of what this new configuration can do, imagine a ball



The TK-45 made its first public appearance at the 1973 NAB Convention.

game that runs from the afternoon into the evening. And the wide variety of lighting conditions and color temperatures encountered.

Now suppose the sun is setting and the lights come on. Instantly, the color temperature of the scene is radically changed.

And instantly is how the TK-45 responds. The cameraman zeroes in on any white portion of the scene, presses a button, and white balance is automatically restored. Picture quality remains excellent. And true to life.

Black balance is set even more easily—just cap the lens.

All the while, the automatic iris is responding to the changing light levels—such as when a cloud obscures the sun or in panning from the field to the dugout.

And, thanks to automatic centering, the picture comes into precise registration at the touch of a button. So you're ready for instant action, even during the normal camera warm-up time, when the pickup tubes are varying.

And of course, the 45 has all the advanced features the TK-44 has, including Scene Contrast Compression to bring out shadow details in high-contrast scenes (another natural for baseball, by the way). And all of the 44's low-light capability.

In sports *or* commercial *or* program production, both camera stability and operational simplicity can now almost be taken for granted, so production people can pay attention to the more creative aspects of their work: shooting angles, precise focus, composition, intercutting, etc.

And when less time has to be devoted to the camera, more time can be devoted to turning out a quality product.

It's that simple. To see for yourself, see your RCA representative.

World Radio History

Broadcasters discover extra values with a TCR-100/TR-60 package.

When purchasing a TCR-100 Cart Machine, many broadcasters take advantage of our extra-value package. Instead of the separate, self-contained Signal Processing Unit, they order a TR-60 reel-to-reel recorder. With the TR-60 as "master" and the Cart Machine as "slave", they get a combination that can do a lot more than the two machines can do separately.

The TCR-100 can time-share the signal processing circuitry of the TR-60, and the station gets an additional reel-to-reel VTR for its work force.

In addition to a "station-break machine", stations are using the Combo as a side-by-side, miniature tape-processing center for production and delayed broadcast purposes.

Automatic cueing and switching are possible between the two machines without adding switching equipment, resulting in a clean vertical interval switch from one machine to the other. Separate, individual operation is possible too, of course.

So for a station that programs a lot of syndicated material, automatic on-air playback is easy. Properly cued program material goes on the TR-60, commercials on the Cart. From then on, everything happens automatically.

The TR-60 is placed in the "Auto Start" mode, and the machines are then able to cue one another for playback. For example, ten seconds before the end of the last event of a cart sequence, a warning signal is sent to the TR-60, which puts it in the "Play" mode. It automatically goes on air at the end of the cart sequence, provided it has been cued up at ten seconds prior to the switch and placed in "Standby".

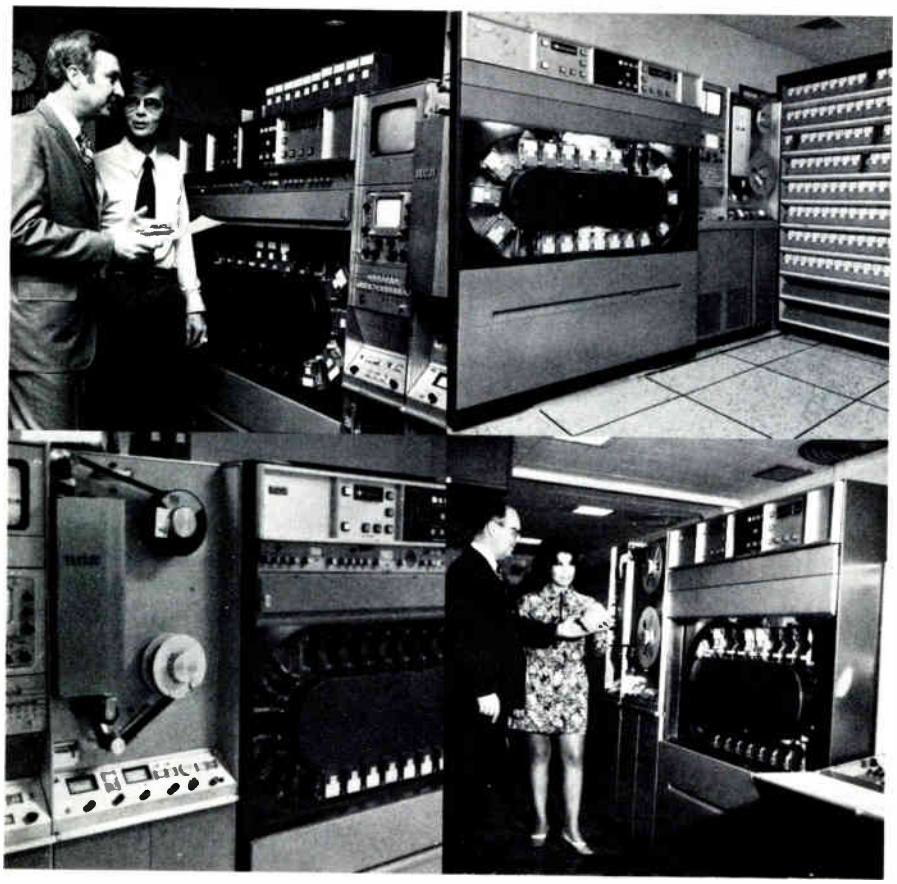
The master TR-60 cues the Cart Machine in a similar manner. A cue mark prerecorded at two seconds before the end of play on the reel machine cues the Cart to go on air two seconds later. The master recorder may then stop or continue to play, at the option of the user.

The Combo also permits A-to-B dubs on the Cart Machine with external editing of the signal. Start and end timing of the dubbed tape are the same as the cartridge being copied.

The Cart Machine has built a reputation on releasing reel-to-reel recorders for production work, but in combination with the TR-60, it really hits new heights.

In delayed broadcast, production, or news segment dubbing—from network, from the studio, from film, from reel-to-reel to Cart or vice versa—the "Combo" is totally flexible.

Ask your RCA representative to explain the details of this extra-flexible, extra-value package... the TCR-100 and the TR-60.



A gallery of TCR-100/TR-60 owners.

Making events flow smoothly at the station break and during dubbing sessions are TCR-100/TR-60 VTR systems at these stations (clockwise from upper left): KIRO-TV, Seattle, Wash.; KVRL-TV, Houston, Tex.; KTSM-TV, El Paso, Tex.; and WUTV, Buffalo, N. Y.

World Radio History

TCR-100 Box Score

Number delivered	121
Number of commercials broadcast	3,749,000*
Present rate (commercials/day)	15,750*
Man hours saved	155,167*

*Estimate

Recent Deliveries

ABC, Network, New York, N.Y.
KATC-TV, Lafayette, La.
KOAA-TV, Pueblo, Colo.
WBOC-TV, Salisbury, Md.
NBC, Network, Burbank, Calif.
NBC, Network, New York, N.Y.
WECT-TV, Wilmington, N. C.
WJAC-TV, Johnstown, Pa.
WKYC-TV, Cleveland, O.
WLS-TV, Chicago, Ill.
WMAR-TV, Baltimore, Md.
WTEV-TV, New Bedford, Mass.
WTOG-TV, St. Petersburg, Fla. (2)

Our Pressurized Traveling Wave Antenna. The pollution/corrosion solution.

If you're in an area where natural or industrial corrosion is a problem and you're considering a new antenna, you might like to know about one station's experience.

San Diego's salty air and nightly fogs gave KFMB-TV's Superturnstile Antenna a daily corrosive bath for 18 years. The antenna performed well, but the hostile environment took its toll. The moist salt air had an electrolytic effect on the antenna's bronze and aluminum fittings.

To make preventive maintenance easier, the antenna was split so that six of its twelve bays would be operational at all times. And to fight off corrosion, KFMB-TV engineers had settled on a pliable vinyl plastic compound and taping.

But after 18 years of continuous operation, antenna components were deteriorating and a new antenna was needed.

The antenna choice was narrowed to either a radome-covered antenna, or the new RCA Pressurized Traveling Wave Antenna.

A radome antenna with increased windloading would have required a new tower. So KFMB Manager of Engineering Charlie Abel took a closer look at the Traveling Wave. In addition to a proven, high performance antenna, he saw some obvious design and construction advantages to solve his environmental problems:

A corrosion-resistant hot-dip galvanized outer tube surrounding a copper inner conductor with irridited aluminum coupling probes and stainless steel hardware.

The antenna is fitted with eight "slot covers", four on the upper half and four on the lower half, that extend over the radiating slots of the antenna. The slot covers are fabricated from a heavy-duty polyethylene material that is resistant to the ultraviolet rays of the sun. The antenna is kept internally pressurized with dehydrated air at 3-4 PSI. So there's no moisture to promote electrolytic action.

Along with the pressurized TW Antenna, KFMB updated their entire transmitting facility, adding a TT-50FH parallel 50 kW Transmitter and an Opto-Switcher. With system optimization, a lower VSWR is achieved and with it, better color transmission.

Mr. Abel notes that although no specific measurements have been made, the new transmitter/antenna plant has resulted in a noticeably improved signal, with outlying areas reporting a stronger, sharper picture.

KFMB-TV has the first pressurized Traveling Wave antenna in the U.S. Since this antenna is well prepared to resist the attack of both natural and industrial corrodents, we expect that other broadcasters will be utilizing pressurized antennas soon.

If you have a similar problem, your RCA representative will be happy to consult with you.

World Radio History

Sprucing up for a date with Emmy. *Technicians help ready Pacific Video Industries' new van for duty at the Academy of Television Arts and Sciences' Emmy Awards telecast—one of the many assignments being handled by this fully equipped mobile unit.*

The 40-foot van carries three RCA TK-44B color cameras, two TR-70C highband video tape recorders, a complete video tape editing system, and a 16-track mastering quad mixdown audio system.

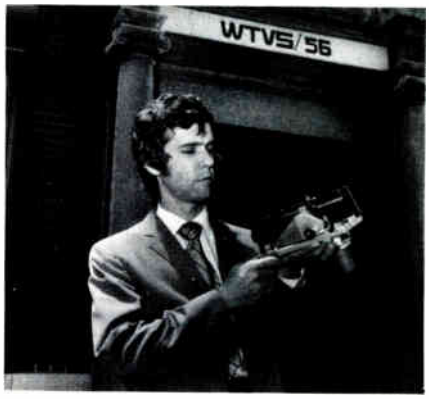
It is designed and equipped for electronic production of feature films. A major advantage of this technique is the ability to play back a scene immediately so it can be re-shot if necessary. This results in a significant saving in time and expense over conventional film-making methods. Still in its early stages, electronic moviemaking is expected to mushroom in the next few years.

When not in use for producing video/film features, the Pacific Video van keeps busy with on-location taping of sports events, commercials and broadcast programming.

WTVS Mark X Headwheel joins RCA 1000 hour club.

After registering 1,150 hours, an RCA reworked Ampex Mark X headwheel panel at WTVS, Detroit has recently joined the 1,000 hour club. It was installed June, 1972.

Director of Engineering Ed Hendry notes that two of his three Ampex VTR's are now equipped with RCA rebuilt headwheel panels with Alfecon II material. The second headwheel is also approaching the 1,000 hour mark and will be joining the "club" soon. Ch. 56 also operates two TR-70C tape machines and has previously qualified for the 1,000 hour club with an RCA headwheel panel.



Products in the news.

RCA space research has resulted in the new **Type TPR-10 Portable Video Recorder.** It records color, studio-quality two-inch quad video tapes using two units—transport and electronics—which together fit into a space only about 11″ high by 24″ wide by 13″ deep. This and the recorder's ruggedness make it ideal for almost any location assignment.

The TPR-10 can play back its 20-minute tapes in monochrome for immediate verification. Retakes are possible because full erase facilities are included. Tapes are also playable in full NTSC color on any quad recorder/reproducer meeting SMPTE standards.

Announcing the **TG-6 Color Sync Generator.** This self-contained, modular unit is designed primarily as a signal source sync generator, but also has the stability to operate as the primary timing standard for complex video installations.

The generator produces sync, blanking, H&V drive, burst flag and color subcarrier. Options include a line amplifier that duplicates each of these functions; a grating dot generator module; and a black burst module.

Control track phasing is the process of moving the relative position of the tape with respect to the video head to assure the passage of the head precisely over the prerecorded track.

This function has now been automated by the **Automatic Control Track Phasing Accessory** (MI-591713) which can be added to any TR-70C. The key feature of this accessory is the incorporation of a memory which stores the correct playback phase for the particular tape loaded on the machine.

The "cued" tape memory provides for complete lockup within the normal time specified, and additionally permits a "Time Lapse" check/reset capability which eliminates the degradation in system performance which would occur in a continuously operating mode.

For complete specifications and product details, check your RCA representative.

World Radio History

NEWS

CCBA Plans Annual Convention

The Central Canada Broadcasters Association will hold its annual convention from October 21-23 at the Skyline Hotel, Toronto, Ontario. For information, write to: Bert Verwey, CCBA Engineering Section, c/o CKVR-TV, P.O. Box 519, Barrie, Ontario.

TelePrompTer Listed On New York Stock Exchange

TelePrompTer Corporation, the nation's largest cable television company, was recently listed on the New York Stock Exchange. The stock was assigned "TP" as its ticker symbol.

TPT President William J. Bresnan purchased the first 100 shares —the first trade of the day on the stock ticker tape. TelePrompTer has more than 14,000 shareholders owning 16,800,000 shares. The company operates 140 systems in 33 states and two Canadian provinces serving more than 818,000 subscribers.

Time-Life Films Available On Norelco VCR Video Cassettes

All titles in the Time-Life Films Inc. library are being made available in the Norelco VCR video cassette format.

Selections cover a vast range of topics such as "Time-Life Video Speed Reading System," narrated by Dick Cavett; the five-part "Effective Executive" series by Peter Drucker; an extensive list of sports titles on nearly every major individual and team sport; "Bernstein on Beethoven;" and a number of widely-acclaimed BBC productions including Alistair Cook's "America" TV series and "Civilisation" narrated by Lord Kenneth Clark.

New productions will be continually added to the list. Titles and price information may be obtained from Anthony J. Palms, Time-Life Multimedia, Time & Life Building, New York 10020.

Briefs

RCA has sold a TCR-100 videotape cartridge system to Westward Television, independent program producer in England . . . **Canon U.S.A. Inc.** appointed Eclair Corporation exclusive U.S. distributor of Canon 16mm lenses in the Eclair CA-1 mount . . . **Marconi** sold three Mark VIII automatic color video cameras to the government of Qatar.

International Video Corporation has completed three new buildings for headquarters, engineering, and systems facilities, totalling 90,000 square feet, in Sunnyvale, California . . . **Poly-Tek Enterprises,** publicity firm, moved to larger quarters at 16661 Ventura Ave., Encino, Cal. . . . **Microband Corporation of America** has received FCC authorization for MDS private TV service in New York City.

Goldmark Communications Corp. has given a non-exclusive license to Avtel Corp. of Glen Head, N.Y., to manufacture and market the Goldmark "Star-Pak" cable programming system, which uses video cassette players, plus a skew corrector developed by GCC . . . **Ampex Corp.** announced a five-year leasing agreement for about $900,000 for supplying the Pennsylvania Public Television Network with ten VR-1200C VTRs and other items.

Oak Cable Communications, Ltd. is a new subsidiary formed by

continued from page 18

versatile and compact
easy-to-use,
consider the reverberating
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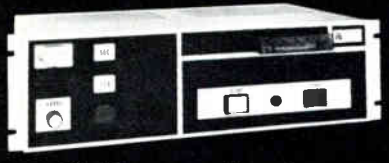
A two week test in your own broadcast facilities is the only fair way for you to evaluate the performance of ITC's premium line cartridge equipment. Advertising statements are no longer simply claims, but become actual facts proven first hand. Find out for yourself how ITC has built in all the features demanded by broadcasters since tape cartridge equipment was invented. If ITC equipment fails to measure up, you're under no obligation. You'll find that ITC dependability is something on which you can rely completely.

RP SERIES RECORDER/REPRODUCER



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INTERNATIONAL TAPETRONICS CORPORATION

2425 South Main Street, Bloomington, Illinois 61701

Circle 109 on Reader Service Card

NEWS

Oak Industries to market Oak cable products in Canada . . . **FCC data** showed more than **six million cable subscribers** as of January 1, 1972 . . . "In Search of The Sun," 28½-minute travel film, is available free from the **Tucson, Arizona, Chamber of Commerce.**

Sony won an "Emmy" from the National Association of TV Arts and Sciences for the Trinitron tube. . . . **Certron Corp.** has an agreement with **Autotape** of Rome, European tape product distributor, for marketing of Certron cassettes in most of Europe . . . **CBS Radio Network's** all-night news has brought in more than 40,000 letters of approval in a five-week span, a network announcement says.

C-Cor Electronics will supply **Cypress Valley Cable TV** with equipment, and the necessary services, to build about 117 miles of a cable system in Marshall, Texas . . . "The Stuntmen" is an Australian-produced documentary on movie stuntmen, showing how stunts are prepared and carried out: info from the Australian Overseas Trade Dept., 636 Fifth Avenue, New York City.

Warner Cable Corp. won the cable franchise for St. Louis Park, Minn., a suburb of the Twin Cities. . . . **Corning International** has reached a tentative agreement with Samsung Electronics Co., Ltd. for manufacture of TV picture tube bulbs in Korea . . . **VidExpo 73,** Billboard-sponsored video equipment convention, has invited producers of industrial educational video programs to submit them for showing: address VidExpo, Billboard, 1 Astor Plaza, New York City.

Rupert Neve, Inc. will build a custom control console, with 40 inputs and quad, stereo, and mono output capability, for the new "Opry House" in Nashville . . . **Gates** has sold about $1 million worth of broadcast transmitting equipment to the Wisconsin Educational Television and Educational Radio networks . . . **Motion Picture Laboratories** of Memphis has opened a new laboratory at 2517 South Blvd., Charlotte, N.C.

TelePrompTer of San Bernardino began tests in June of the pay-cable system developed by **Magnavox** . . . **The Practicing Law Institute** will run a Workshop at La Costa Hotel, Rancho La Costa, California, Au-

continued on page 59

Authorized AKAI video dealers sales & service

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FOR IMMEDIATE DEMONSTRATION CALL:

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- 240 line resolution
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World Radio History

It's only a broadcast quality, portable COLOR camera that's priced under $4000 and weighs less than 6 lbs.!

AKAI'S new CCS-150S Portable Color Camera weighs only 5.8 lbs. yet offers professional studio quality costing thousands more in any other camera.

The specifications tell the story:

- Completely compatible with any U.S. TV system.
- Two vidicon system with separate Luminance and Chrominance channels.
- S/N ratio: Luminance—Better than 40dB
  Chrominance—Better than 30dB
- 525 line scanning, 2 to 1 interlaced, locked chroma.
- Better than 300 line resolution.
- Built-in 6 to 1 zoom lens.
- Viewfinder—1.5" picture tube.
- Built-in directional microphone.
- Servo controlled iris.
- Sensitivity control: 60 to 2,000 ft. candles (without filters)
- AC or battery operated.
- Dimensions: 5½"(W) x 10"(H) x 12"(D) including lens and grip.

The performance of AKAI's new CCS-150S color camera will amaze you! Whether you use it as the perfect tool for on-location shooting or as an alternate studio camera . . . But see for yourself . . . it's really no big thing!

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World Radio History

INTERPRETING THE FCC RULES & REGULATIONS

New Call Sign Rules

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

A broadcaster's call sign is his basic source of identification to the public. Often it is the key to his promotional efforts, exactly as a trademark or brand name is to other businessmen. Since the Federal Communications Commission has recently adopted new rules relating to the assignment of call letters (Section 1.550 of the Commission's Rules), it is appropriate to go over the call sign Rules in some detail.

The new Rules, adopted June 21, 1973, stem from a Notice of Proposed Rulemaking issued in 1967. The new Rules formalize and clarify previously existing Commission policies on call signs, while adding a major change in procedure to deal with the abuse of "trafficking" in call signs.

Call signs are intended to provide identification of the source of a signal. Their assignment arises from international agreements dividing the alphabet among nations, whence the familiar "W" and "K" of American broadcasting. The FCC has jurisdiction over call letter assignments to United States stations under the Communications Act.

Call signs are required by many types of stations and transmitters other than broadcast. The Commission allocated signs among a variety of users, assigning combinations of letters and numerals in varying order. These combinations generally identify the type of station, sometimes its geographic location as well. Non-broadcast signs usually include numerals, while broadcasters use only letters.

Originally both three- and four-letter calls were assigned to broadcasting, but the possible number of three-letter calls, being much smaller, could not accommodate the growing industry. Three-letter calls are therefore no longer available, although existing calls have not been revoked. One instance in which calls have had to be changed was in compliance with the Commission's former policy limiting identical calls of commonly-owned stations to the *same* community.

The regulatory history of call letters has centered around clever attempts to exploit other broadcasters' calls, attempts which the Commission has tried to discourage. Two forms of this practice have existed: requests for identical signs recently relinquished by another broadcaster in the service area, and requests for confusingly similar signs. For example (hypothetically), powerful station WGDG is sold and changes its call; another station in the same area immediately requests the WGDG call. Or, while WGDG is in operation, a nearby station requests WGGD.

The Commission has had to deal with such proposals one-by-one as they arose, usually expressing its disapproval. Thus call letter policies have developed through the regulatory process in reaction to new abuses as they were recognized.

Many long-standing policies achieved the formal status of Rules only this June.

Available signs

For broadcasters, currently available signs are four-letter combinations beginning with "K" and

continued on page 22

World Radio History

Manual video correction is no longer necessary...

...so why do it?

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

The quality of your program signal will be stubbornly maintained by the TEKTRONIX 1440 Automatic Video Corrector. And, since signal distortions are automatically corrected, your engineering people will be freed from the task of continuously readjusting controls.

Attempting to keep up with continuously varying conditions with manual correction is no longer necessary . . . so why do it? The assurance of signal quality that comes from using the 1440 is something that can't be priced, but the 1440 costs just $2450.

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

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

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

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Box 500-A, Beaverton, Oregon
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Circle 112 on Reader Service Card;
For demonstration, Circle 113.

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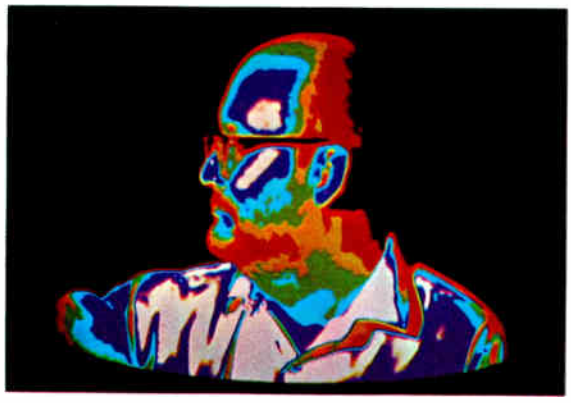

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(303) 444-3972

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"W"—a theoretical 35,152 possible call signs. But several restrictions come into play.

First, Commission policy has long assigned "W" calls only east of the Mississippi River, "K" calls west of the Mississippi. This policy is written into the new Rules. *Second,* signs whose last three letters correspond with the initials of the President, a living former President, the United States or any of its departments or agencies, may not be used unless "suitable clearance" is obtained. *Third,* call signs which would not be in good taste may not be used. *Fourth,* and this is the requirement most likely to cause problems, possible confusion with other stations must be avoided.

The most obvious source of possible confusion is identity of call signs, which is forbidden except for certain stations under common control as noted below. Four-letter signs may already be in use by other broadcasters, by vessels in documentation, and by other nonbroadcast radio stations. A common source of woe is the checking of other broadcasters' signs only. Since no complete, up-to-date listing of all signs is readily available to the broadcaster, you should have your Washington counsel check with the Commission for an immediate ascertainment of the availability of a specific call sign.

Further problems of possible confusion arise with call signs which, while not identical, are substantially similar to those in use by another station in the service area. (Often, of course, the similarity may be deliberate.) Such signs are most likely to be objected to by other licensees in the area. The Commission considers both phonetic and rhythmic similarities unacceptable. It decides the permissibility of proposed signs on the basis of "significant likelihood of public confusion" between stations.

Thus, numerous constraints limit the choice of a call sign for a new station, a station changing hands, or a station which merely wishes to change its "name."

Obtaining a call sign

Once the proposed new call sign is chosen, Commission procedures are straightforward and reasonable. The same procedures apply to new permittees (who *must* request or be assigned call letters by the Commission on its own motion), to transfer applicants, and to those simply wishing to change. Application is made by letter to the Secretary of the Commission. As many as five proposed calls may be listed in order of preference. Notice must be given to all licensees or holders of construction permits for AM, FM, or TV stations whose communities are wholly or partially within a 35-mile radius of the main post office of the applicant's community of license. (These are the most likely sources of objections.) A public notice of receipt of the application is given by the Commission. Thirty days are allowed for filing objections. The validity of objections received is weighed, and the application is granted or denied. The Rules caution, rightly so, against reliance (particularly in the form of promotional expenditure) on securing a desired sign before notification that the request has been granted.

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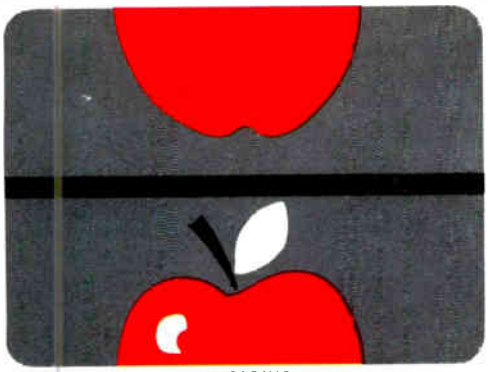

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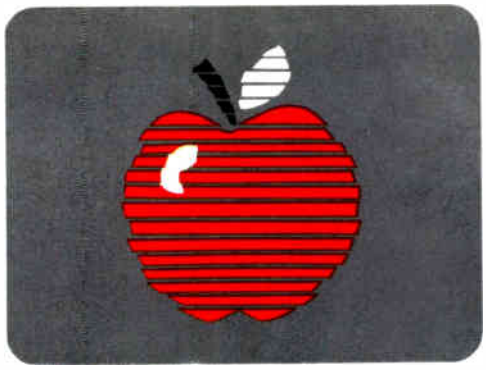

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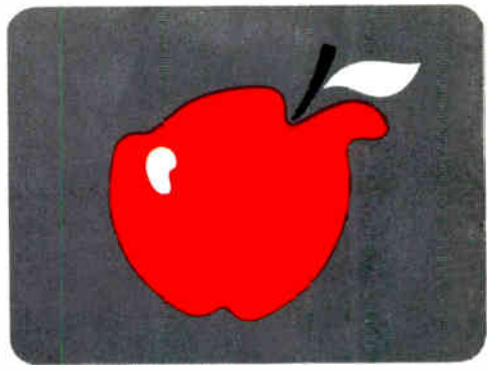
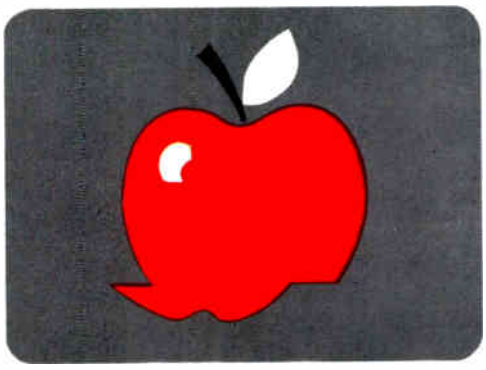


FLAGWAVING

HUE SHIFT



SKEW ERROR

COLOR STREAKING

How do you like them apples?

Like 'em or not, them apples show composite errors in video signals which accumulate every time you use VTR equipment. Errors caused by changing tape geometries, varying tape speeds, fluctuating head velocities.

But how do you get rid of the bad apples?

With a standalone Delta Series TBC from Television Microtime.

Delta TBCs give you broadcast quality from every VTR — 2-inch "quads," 1-inch helicals, ¾-inch cassettes, ½-inch EIAJ — in monochrome, or direct or heterodyne NTSC color. And you can get them with standalone or built-in velocity error correction.

Delta accessories convert V-lock VTRs to H-lock operation and add automatic skew tension correction to low cost cassette and EIAJ VTRs. Our new full line brochure, *Meet The Compatibles*, describes over 20 different models . . . covers time base errors, the causes and the solutions. Use the coupon to send for your free copy. Or send for our special tape demonstration. We're available anytime to tell you how we can help solve time base problems.

Dear Sir,
I want to know more about time base error correction and Delta Series TBCs.

- ☐ Please send me your new brochure: *Meet The Compatibles.*
- ☐ I would like to see your tape demonstration.
- ☐ I want to talk with one of your representatives. My application is:

_____

Name _____

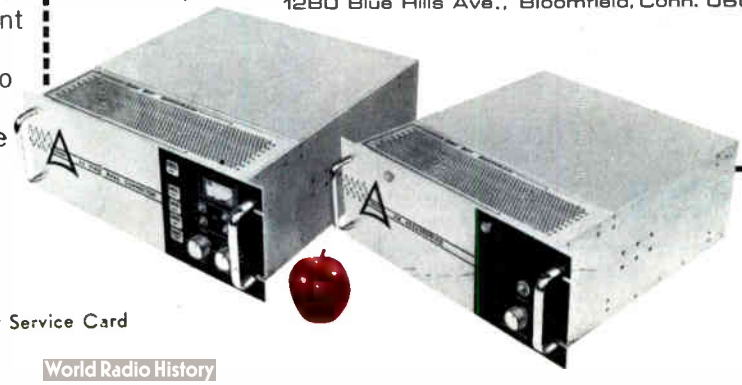
Title _____

Company _____

Address _____

City, State, Zip _____

TELEVISION MICROTIME, INC.
1280 Blue Hills Ave., Bloomfield, Conn. 06002



Circle 115 on Reader Service Card

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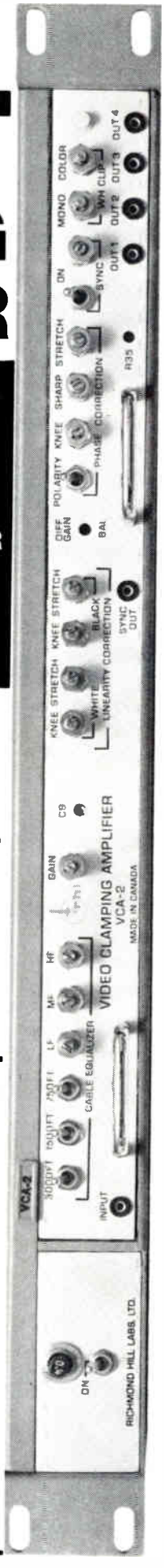

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FCC Rules & Regs

Normally, receipt by the Commission of the first application for particular call letters blocks all later ones. (A modification of this basic "first-come-first-served" rule to deal with relinquished calls is described below). Call letters may *not* be reserved. New stations may not request calls until a construction permit is granted. Applicants for transfer or assignment may file for new calls concurrently with their transfer or assignment applications, although the new call will not become effective until completion of the transaction unless the transferor's written consent is obtained.

Addition or deletion of "-FM" or "-TV" suffixes to calls requires only a letter to the Secretary; no notice to other licensees is necessary to effect changes in the basic call.

These are the basic provisions; however, a number of special situations must also be discussed.

Commonly-controlled stations

An exception to the prohibition against identical calls is made for stations in different services under common control and licensed to the same or adjoining communities. In these cases, identical calls may be applied for and granted, as: WXXX, WXXX-FM, and WXXX-TV. Newly-acquired stations may be conformed to the calls of "sister" stations, while stations with conforming calls which are sold *must* give up the conforming call or be assigned new calls by the Commission on its own motion.

The common control requirement is *prima facie* met by 50% or greater common ownership. The requirement of location in the same or adjoining communities is meant literally. The Commission has considered and rejected suggestions to broaden the Rule's scope to embody an urbanized area or Standard Metropolitan Statistical Area concept.

The situation of common control also provides exceptions to two other Rules. Three-letter call signs are still available only to conform with those already held by "sister" stations. Similarly, "K" and "W" may cross the Mississippi for conforming purposes only.

Identical calls with other stations are available *only* when the conditions of geographic and ownership identity stated above are met.

Relinquishment and deletion of call signs

The principal change embodied in the new call sign Rules is the modification of the "first-come-first-served" rule in the case of relinquished or deleted call signs. The practice of "trafficking" in call signs was common because private arrangements with stations relinquishing their calls were the logical way for stations desiring the calls to be first in line. Often, the Commission notes, both the relinquishment and the new application were filed by the same attorney.

To prevent "trafficking," the Commission has instituted a new procedure for relinquishing or deleted calls, modifying the "first-come-first-served" rule. Now, when a call is relinquished or deleted, the Commission will issue a public notice. If two or

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When you take Cohu's Model 1500 Color Film Camera and combine it with Eastman Kodak's CT-500, it's quite a system, especially when these two units together are priced nearly the same as the base price of other color film cameras alone. It's like getting two for one.

In addition to its moderate price, the 1500 gives you a proven and superior method of correcting for film base and dye transfer errors utilizing instant black and white paint, auto sensitivity and black level control. For gross film errors, continuously variable gamma correction is available in all three channels.

The Model 1500 was designed with a simple and efficient optical system which transmits better than 65 percent in any one channel through the sealed dichroic beamsplitter.

This permits the camera's vidicons to be operated at relatively low target voltages and very low dark current resulting in low lag, long life, and better black level stability. This sensitivity precludes the need for expensive lead-oxide tubes.

Featuring a rear-loading parallel yoke system that can be retubed in seconds, the Model 1500 is virtually free of registration problems encountered in other color film cameras and can be totally retubed and set up from scratch in 20 minutes by an experienced operator. Cohu's yoke system is not removed during tube changes and you are not subjected to alignment problems inherent in systems requiring yoke removal.

A passive remote control station is included and does not contain video circuitry which would be subjected to interference and signal degradation. Throughout, this film camera features simple circuitry, unencumbered by the requirement for 'extras' such as complex test equipment for sophisticated circuitry.

It all adds up to the reason why broadcasters are turning to Cohu's Model 1500 Color Film Camera — it's the choice, not an alternative.

COHU INC
ELECTRONICS DIVISION
SAN DIEGO CALIFORNIA

You expect more from Cohu, and you get it.

Contact your local COHU Sales Engineer or COHU, Inc., P. O. Box 623, San Diego, Ca. 92112. Phone 714-277-6700, TWX 910-335-1244.

Cohu's 1500 Color Film Camera & The Kodak CT-500 Perform Rings Around Other Combinations

World Radio History

From the June 16th issue of Business Week:*

"Helical scan promises the same results as quadruplex but at a lot less cost."

To which the attendees at the recent NCTA convention might reasonably add..."Amen."

*page 68

What happened was... we demonstrated our newest "funny little box," the CVS 502 digital video signal corrector.

What this means to you is that, regardless of the helical VTR you're using, you can now produce fully corrected and stabilized color.

That's a fact.

At the NCTA we corrected color signals from a Sony ¾" cassette, an IVC 870 and at various times managed to sneak in the new AKAI ¼" low-cost VTR. The results were not to be believed—unless you were there and witnessed the demonstration.

Let's face it! For many years the only VTRs that met FCC specs for broadcastable color were quads. That limitation no longer exists.

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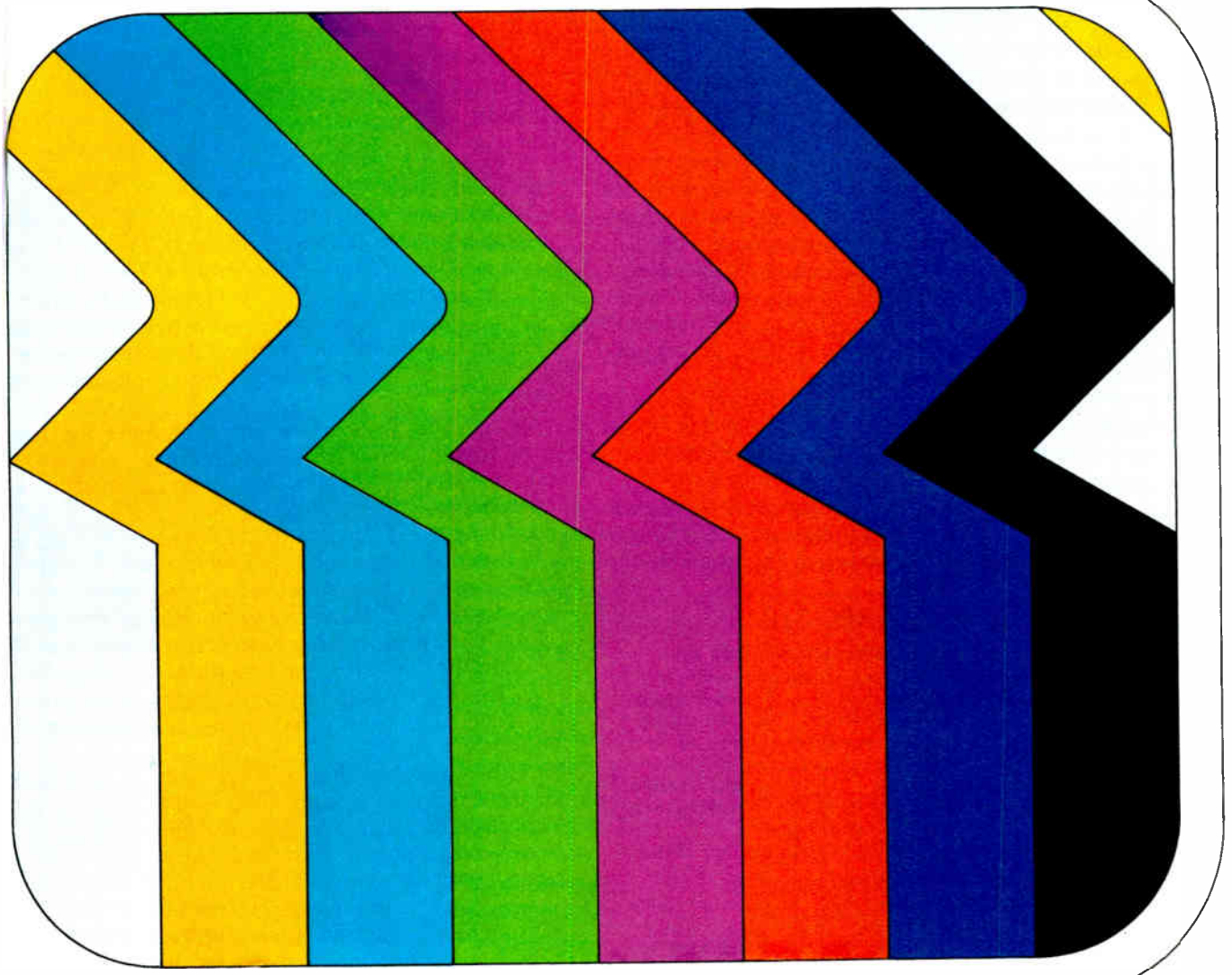

Today, at least twelve helical VTRs from five different manufacturers (that we know of) meet these same specifications with the help of our digital video signal correctors.

All this is made possible by CVS's digitized processing of helical VTR signals. Where all these new found advances will ultimately lead is anybody's guess—but you may be certain we are hard at work perfecting new products to broaden the scope of benefits from digital video.

Meanwhile, we're shipping production CVS 500s. We'll soon be shipping production CVS 502s. And we'll soon announce our newest funny little box.

Consolidated Video Systems

CVS

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3300 Edward Avenue
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In TV Automation, Most Of The Action Right Now Is At The "Business" End

Automated program switching is moving in, but much more slowly. With business-end computer systems automatically assembling and storing complete program instructions, the goal of TV automation is clearer than ever —total integration, with the computer-assembled program instructions fed directly to the switching equipment.

FOR QUITE A WHILE, the broadcast industry has been watching television automation come in from two directions: from the data-processing, financial-report, traffic-handling end, and, independently, from the automatic program-switching end. Putting the two together has been an obvious long-range goal, but so far very few installations to do that have been made.

What is happening right now is a rapid spread of business-end computer use, plus solid but much slower progress by the handful of firms making automatic program switching equipment.

The growing popularity with broadcasters of computer handling of business, traffic, etc., rests in general on maturity and flexibility of the available systems, with emphasis on two services that broadcasters find most valuable: the supplying of instant availability data, in any form desired, as an almost essential sales and scheduling tool for busy stations; and the service already noted, the automatic assembly and storage of complete, error-free program instructions, with the instructions amendable in any detail, at any instant, usually by a simple keyboard entry.

A number of stories in this issue (and the July issue which stressed radio automation) cover in detail the services supplied by various specific computer systems for broadcasting. Suppliers in this field note the current thinking of broadcasters is to dig in for a period of consolidation with a new business-end computer service before moving on to automated switching. However, the increasing availability of electronically-stored program instructions is building up the long-range pressure on integration. The logic of feeding those instructions to automatic switching equipment is too strong to be ignored indefinitely.

Two completely integrated systems that have been in development for some time, and have been described before, are the Sarkes Tarzian "Starcom," with Sarkes Tarzian's automatic switching equipment added; and the General Electric total automation system, now in the hands of Gates. Manufacturers of automated switching equipment for video who are now most active in supplying the field include, in addition to Sarkes Tarzian and Gates, Grass Valley, Central Dynamics, and Vital Industries.

The Sarkes Tarzian total system has been in use in the maker's own station, WTTV in Indianapolis, for a two-year shakedown with the APT-2000 switcher attached. Biagio Presti, general manager, told *BM/E* that operation is now smooth and effective and that active marketing of the system should start in "a couple of months."

An early model of the General Electric system (now Gates) similarly underwent refinement and trial at Taft station WNEP, in Scranton, Pennsylvania, in a collaboration between GE and the station's engineers. Chief engineer Chester Sawicki says it is doing an excellent job. Gates had made no an-

Introduction to the APC-610

The APC-610 performs real-time tasks, such as:

- The operation of on-air, video and audio production equipment, including selection of sources, operation transitions and effects, and remote operation of reproduction equipment such as film islands.
- Capture and storage of significant events (whether automatically or manually initiated) and their times for logging and analysis.
- Updating displays to the current system status.

Several on-line tasks include:

- Building, maintenance, and retrieval of daily program schedules and log files.
- Generation of variance reports to account for deviation from the schedule and to highlight problem areas.
- Maintaining reference files of information such as repetitive program formats and other operational aids.
- Printing of schedules, summaries, VTR and Film/Slide run sheets and other data systems.
- Communications with larger data processing units.

Other interesting programs that will be used at WNEW are:

- Calculating FCC percentages for such things as commercials, PSAs, local news, etc.
- Automatic calculation and insertion of true times for each event as derived from event duration time.
- Event duration time summing to make sure that all the individual pieces are equal to the whole.

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nouncement of marketing plans at press time, but it seems likely that this system will also eventually play an important role on the automation scene.

Central Dynamics has been offering for some time not only automated switching but a modular approach to integrated automation, with a number of units designed to interface with large data processing systems. *BM/E* reported, in the September 1972 story on television automation, several stations that were using, or planning to use, Central Dynamics' switchers—as well as those of the other makers discussed here.

Since then, KYW in Philadelphia (a Group W Westinghouse station) has gone on line with a completely integrated system involving the Central Dynamics switcher, a company-owned computer, and other elements. *BM/E* was unable to do a story on this operation because of an IATSE strike underway during June. Hopefully, we can provide details at a later date. (Parenthetically, we might mention KYW has functioned smoothly throughout the strike with more people on the sidewalks than in the studio.)

Metromedia planning integrated system

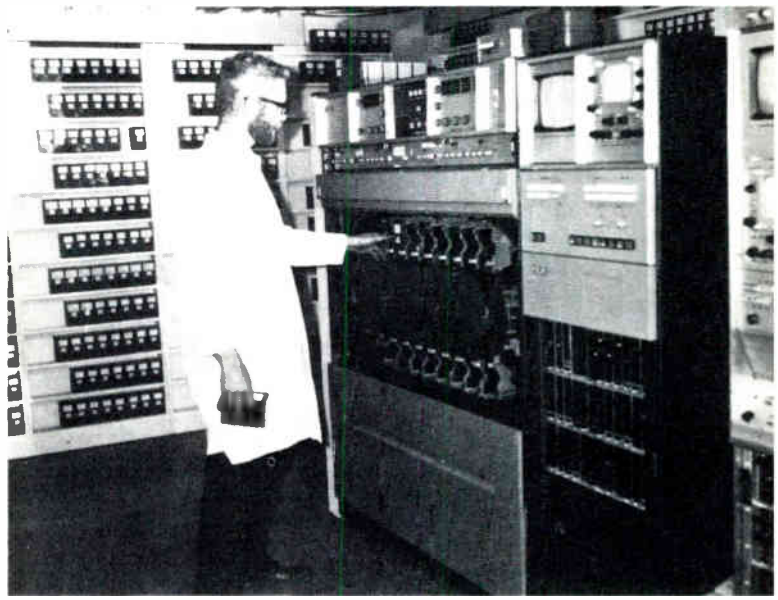
Central Dynamics' switching equipment with mini-computer control is a key element in another current story that illustrates well the step-by-step approach to automation. Metromedia, with TV stations in New York, Los Angeles, Washington, Cincinnati and Minneapolis, is working toward integrated automation of each station with the chain tied together, with completion a couple of years off. There is an IBM computer at KTTV, the Los Angeles station, slated to do large volume data processing for the chain—financial, sales, and demographic—and is already doing much of this work.

WNEW, the New York station, was one of the first stations to use automatic switching in any form: for about a decade, an early system using punched cards, Nixie tube indicators, a Visual Electronics' video switcher and Grass Valley audio switcher, has been in use there. According to Bill Kelly, chief engineer, within the next several months a Central Dynamics' switcher with mini-computer control (Digital Electronics PAP 11/15) will go in. For a while the punched-card system will still be used for entry of data, since production of the cards is all set up.

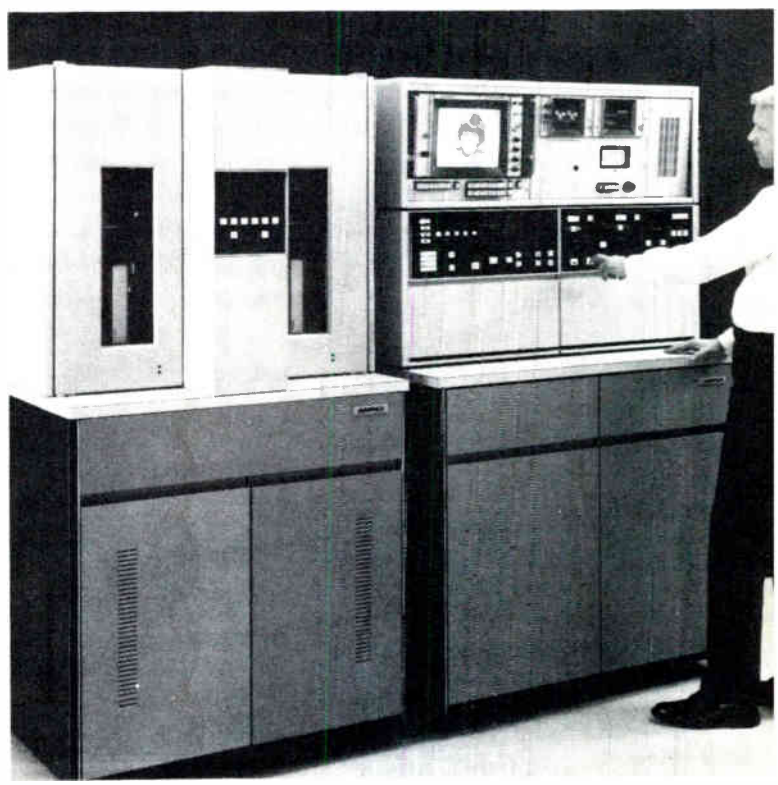
The mini-computer will share the automation load with the IBM unit in Los Angeles; just how this will be divided will be decided later, based on operating experience. But the mini-computer will, of course, handle program switching (it can store up to 15 days of programs), and the large computer will do the larger data processing jobs that are beyond the capacity of the mini.

Another key element in the plan is the Ampex ACR-25 cassette player, which will be used for airing of spots, IDs, and other short segments. Bill Kelly reports excellent cooperation from both Central Dynamics and Ampex in modifications to help him interface the systems, with the station's special needs in mind. The interface problem can be a serious hang-up for integrated automation; more on that in a moment. Some of the capabilities of the Central Dynamics APC-610 are described in the accompanying box.

Two of the most recent Grass Valley installations paint a quite similar picture of step-by-step progress toward total automation. WHC in Pittsburgh has had the Grass Valley 1400-24 switcher in use for about a year, with manual push-button operation. However, the station is now well advanced toward service



Inserting a "cart" into the TCR-100 for making a dub at KOB-TV.



Ampex's simulated "on-air" newscast during the last NAB Convention demonstrated how news, sports, commercials, and promos can be incorporated into a fast-moving news show using the ACR-25 and AVR-1. The ACR-25 provides random access to up to 24 programs ranging in length from ten seconds to six minutes.

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from a completely computerized traffic and billing system, as part of the Cox chain (see box). The switcher will eventually be connected in for automated operation—this shows movement in the opposite "direction" from some stations, which, as already noted, have moved from traffic control to switching. The switcher at WIIC was designed with relatively small capacity (230 events) because close support from the traffic-system computer will supply frequent data updating.

Master—Minicomputer Combo for Flexible Automation

Kaman Science Corporation's Broadcast Computer Services (BCS) made its first installations at KVOR Radio, Colorado Springs, in 1968, and at KOOL-TV, Phoenix, in 1969. "We are continuing to develop increasingly sophisticated software and to broaden the capabilities of available hardware to meet stations' growing needs," says Jack Finlayson, manager of BCS.

BCS was the first system to adopt the ultra-high-speed mini-master concept with brief daily connection between in-station minicomputers around the country and large master memory banks located at Kaman Science's Computer Center in Colorado Springs. Although the in-station mini units provide about 99% of the data needed for several days' operations, all stations in the BCS system have the option of connecting with the central computer whenever they so choose. To date, no stations have found it necessary to use that option.

Wide flexibility results from the on-line real time access, speed, large system economy and in-house minicomputer. The mini-master concept provides built-in insurance against breakdown through the dual location of data. Even if the in-house mini goes down, an alternate-site feed can be arranged and, should the master go down, the essential data for several days' operations is available in the mini.

Experience at stations in the BCS system shows that, depending on the scope of the operation, four to six persons are required for smooth functioning.

Searching the availability file on the in-station minicomputer disc used by BCS. Information for a vertical/horizontal rotation is retrieved in less than a second and displayed at the rate of 300 characters per second.

Because the BCS system dialogues in broadcaster language, stations find that, after a brief training period, the existing staff can man the operation and it's not necessary to add personnel with data-processing expertise.

The in-station minicomputer is a Digital Equipment Corporation PDP 8/E, which has a disc-stored memory of 3.2 million characters. Up to three entry-display terminals, functioning at 300 characters per second, may be used throughout the station to handle all availability and demographic searching and manipulation of logs and data entry. Any portion of the logs and/or avails can be found and displayed within one second.

All data entry is made via a simple question-and-answer technique with the mini continuously editing incoming data for errors. In case of an error, the entry-display terminal immediately questions the information and forces the operator to make a correction before proceeding.

Avails can be displayed in two forms. They can be shown with just the total time remaining to be sold or with the total time as well as a complete listing of all sponsors in a time period (with spot length, rate section, last air date, and product code) to provide station personnel with needed information if preemptions become necessary. Each new contract entered throughout the day is processed by the mini and avails are immediately updated with the new information.

One of the system's special features is a selective search mask which allows the mini to seek out specific items on the log for display and editing. A late film change on one commercial flight, for instance, can be entered in the mini and, one by one, all spots involved in that flight can be altered as required—at the touch of one key.

Printouts at 400 lines per minute, are produced on an in-station CDC printer. Any portion of the logs or avails can be printed at any time and as often as needed. A 24-hour log, for instance, is turned out in four minutes.

The high-speed, high-volume capability and round-the-clock availability at the stations provide managements with many advantages. The versatility of the mini permits a broad range of uses from film inventory maintenance to engineering programming. *Of major interest to station operators is the ease with which the PDP 8/E can be expanded economically and used for automatic control room operation*, as it is now used by several automated control room equipment companies. Research into interfaces currently is underway at BCS.

In evaluating the versatility and economy of this system, monthly costs are an important factor. Average fixed costs for a television station range from $3300 to $3800 per month. Each month, more and more station managements agree that it is a bargain.

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Bias Service To Stations Booming

A comparative Johnny-come-lately in the broadcast automation field, the BIAS (Broadcast Industry Automation System) Division of Data Communications Corp., a Memphis-based company, has emerged as the largest station communications service firm in the broadcast industry.

Launched a short three-and-a-half years ago by Norfleet Turner, who is president of the firm, BIAS has out-distanced competitors in the sale of its service to TV stations. As of June 1973, the young, aggressive, and creative staff of BIAS had a contract list of 42 stations.

The success of the BIAS service (see KSTP's use elsewhere in this report) has come largely through word-of-mouth recommendations, with client stations pointing out the cost savings they've enjoyed—particularly in the area of elimination of "make-goods" and in the streamlining and increased efficiency of their traffic and sales departments—to other station operators. The client list includes stations from the major markets (San Francisco, New York, Seattle), to medium-size markets (Oklahoma City, Tampa-St. Pete), and small markets such as Albuquerque.

A typical example of station management approval of the BIAS operation was made by Herb Mayes, comptroller for WOR-TV, New York, one of the largest and busiest independents in the country. "The BIAS operation," he said, "has increased our revenues about 10% without an additional increase in our business." The business manager for KPIX-TV, San Francisco, stated, "We can sell substantially more time due to the lack of make-goods, and also more time is available due to the lack of over-runs on a contract."

The primary reasons for BIAS' success, according to Norfleet Turner, were 1) the decision not to market its service until the system was completely free of bugs (based on pilot operation at WMC-TV, Memphis, Tenn.), 2) its claim that it is the only communications service which offers "On-Line, Real-Time" availability of central computers, and 3) the intensive conversion program it conducts for its new clients prior to the "on-air" date. The conversion is effected in an eight-week indoctrination and preparation period spearheaded by a team of BIAS conversion specialists and includes a visit to the Memphis headquarters for on-the-scene orientation for station staffers.

Just recently BIAS signed a contract with a British TV firm for a joint venture project. Jim McKee, BIAS vice president, feels that BIAS' impact on the broadcast industry communications field is only the beginning of what may be the most comprehensive media communications network in history. "We have plans for the future which we hope will embrace every facet of the communications industry," said McKee. "They are in the works and about the only clue we can give as to the scope is that we have ordered a Burroughs 6700 computer (the largest model) to supplement the 3700 and 4700 computers we now have on hand." A special system for radio stations is in the works now.

Terry Bate (left), Beaverbrook Newspapers Ltd., London, was one of a group of British broadcasters in the United States recently for a tour of broadcast operations and facilities' development, such as BIAS's station automation communications systems. To right is Norfleet Turner of BIAS.

Cox Data Promotes Marketing Service

A pioneer in efforts to properly exploit the computer, particularly as a marketing tool, is the Cox Broadcasting Corp. Cox now has on stream a sophisticated system serving three of its own stations (in Atlanta, Pittsburgh, and Dayton) and three others: *KSD-TV* in St. Louis, *WTVT* in Tampa, and shortly *WSOC* in Charlotte. Operations are handled by a separate group, Cox Data Systems. The system is on-line using a central Honeywell Computer at Atlanta and mini-computer at each station. Objective is to give a salesman current timely information on availability—and cost based on latest ratings and demographics. Inventory control is central to the system—pricing can be extremely timely depending on the latest ratings which get cranked in immediately.

The system provides a host of other management reports and ties into a billing system. System is relatively costly—more than that of BIAS—and, as such, is probably of most interest only to stations in the top-50 markets. Cox expects to use it for all five of its own stations but, to help underwrite costs, will accommodate seven or eight outside stations.

TV station CHCH, Hamilton, Ontario, has also been using a Grass Valley 1400-24 switcher for about a year, with plans to integrate it with a computerized traffic system. Here the switcher has greater capacity (1000 events) because the management wanted full-day stand-alone capability in the switching system itself. A small disc unit supplies the additional memory for the CHCH switcher.

For both installations, data entry on an interim basis is from a typewriter-style keyboard; eventually both will take data directly from the traffic system, and the keyboards will be used only for day-of-air changes. Computer hardware will be the Digital Equipment Corp. PDP8/E mainframe.

Vital Industries' automatic switcher, described in detail in last September's automation round-up, is in use at a number of stations. The story at WTVJ in Miami illustrates, again, the process of moving into automation step by step, with shakedown over an extended period of use. The Vital Industries switcher was expected there at about press time for this issue. It will be used for some time standing alone,

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with manual or magnetic tape input, for program control.

But WTVJ is also "breaking in" an IBM 370 computer for data processing. At some future date, according to Joe Klein, chief engineer, the two will be hooked together. However, that integration is not going to be hurried; the management wants to get fully on top of the operation of the large computer before taking on the interface job. (Nubar Donoyan, president of Vital, points out that his switching system is fully adaptable to the interface with the computer system: it is designed to be so.) The large computer is just about to produce the complete program log and program instructions.

WTVJ also has an Ampex ACR-25 for airing of short material, which for some time will also operate standing alone. Over the long haul it, too, will become part of the total system. By the end of this year the station plans to have a second ACR-25: this allows for convenient transfer of spot material to cassettes, on one machine, while the other is on the air—and is also good insurance against down time.

The WTVJ story reinforces the picture of the current status of television automation emerging from the other stories here. Hardware for all segments of the job is ready. But many stations need a considerable period for shakedown and interfacing, getting integrated software that meets specific needs. As WNEW (above), for example, WTVJ is learning how to divide the load between the large computer and a minicomputer for the program switching. Putting the big one "on line" is not economical, points out Joe Klein, because the computer is too lightly loaded by "real time" operations.

Mention of the interface problem in the foregoing leads to a tentative general observation: the progress of automation probably would be a great deal more rapid if the automation industry had a greater degree of intra-industry integration. Interface hangups are obviously most likely when a station has long-existing equipment to which new equipment is to be added. Cooperation from hardware manufacturers in helping solve such problems can certainly be expected in most cases; nevertheless, the fact that the problems are there is an impediment to automation progress.

How much intra-industry integration is practical is clearly a matter of contention. Steven Smith, chief engineer of KCMO, Kansas City, has held in speeches and papers that the industry badly needs a much higher degree of integration than it now has. In an accompanying box we summarize very briefly a few of his main ideas.

Aiding and abetting the automation movement, as well as supplying an initial semi-automated operation that can precede automation and later be integrated with it, is the rapid spread of video cart systems.

The RCA TCR-100, with two years of use, is now playing a key role in automation. At KOB-TV, Albuquerque, front-office automation provided by a time-shared computer is helping to streamline the operation of on-air equipment. When a salesman brings in an order for a commercial, it is entered in the computer. A printout, identifying the order, its scheduling, billing and so on, goes to all station activities involved.

The printouts serve as guides in setting up the day's schedule on the RCA TCR-100 videotape cartridge machine. Any new spots needed in the cartridge format can be quickly identified and dubs made by the production crew after its 6 a.m arrival.

The machine holds up to 22 cartridges and is loaded manually in quick order. The machine's magazine is readily accessible to the operator so that carts can be removed and replaced to accommodate last-minute changes in scheduling or a newly-arrived spot.

The Ampex ACR-25, already mentioned in a couple of the station stories, came on the market later, but during the past year went out to more than 40 stations. Like the TCR-100, the popularity of the ACR-25 is based on the ease it brings to handling the short video segments: the spread of the ten-second spot, for example, would be greatly impeded without automatic cart handling, which allows such spots to run smoothly back-to-back.

A final general observation: TV automation is inevitable because 1) station operators badly need it; 2) the basic technology is fully available to do it at a feasible cost. Adapting automation to the specific needs of broadcasters has taken longer than most observers expected five or more years ago, but the main hurdles seem to have been passed. **BM/E**

Prelude To Automated Systems: Automated Equipment

Automated performance of individual studio equipments—cameras, tape machines, film systems, and other apparatus—is the forerunner of automated stations of the future, in the view of RCA Broadcast Systems officials.

Neil Vander Dussen, division vice president, says his company's TCR-100 "is hastening the trend toward automatic devices in the TV studio and their future integration into fully-automated systems."

He noted that the TCR-100 has removed virtually all of the uncertainty, confusion, and costly errors that have plagued multi-machine station breaks since TV broadcasting began. The extensive on-air experience gained from more than 100 operating TCR-100 systems proves that the station break now can be delegated to a single machine.

Recently RCA introduced a new color studio camera, the TK-45A, which has been designed for a high degree of automated performance. White level is accomplished automatically for instant correction of variations in scene-to-scene colorimetry. Black level is automatic too, as is iris operation. The iris responds to changes in subject lighting faster than any human could.

Centering also has been automated. The operator presses a button and he has automatically compensated for the centering limitations of the camera's pickup tubes. Previously it was a tedious procedure.

These and other automatic features of the newest studio apparatus suggest that a first practical step toward automation has been made, Mr. Vander Dussen says. Full studio automation will not come overnight, he adds, but on an incremental basis through integrating such devices into larger and finally all-inclusive systems.

World Radio History

Step By Step To Full Automation

Hubbard Group uses both an in-house computer and on-line computer service to carry a five-station load, while working toward integration of all accounting and programming.

THE HUBBARD BROADCASTING COMPANY, which operates stations KOB/TV/AM, Albuquerque, New Mexico; WTOG-TV, Tampa-St. Pete, Fla.; WGTO-AM, Silver Springs, Fla.; and KSTP-TV-AM, the Twin Cities, is moving towards an all-automated station status which it hopes to achieve within "the next few years" according to Stanley S. Hubbard, president of the Hubbard Group.

"We installed our own IBM System 3, Model 10," said Mr. Hubbard, "as the nucleus of our automation concept. Each step we take from here will be toward the end result of a fully-automated operation covering every aspect from production through administration and accounting."

Gerry Deene, comptroller for the KSTP-TV stations, is highly enthusiastic about the eventual automation of the Hubbard Group's operation. He points out that with the System 3 doing all the billing, payrolls, general ledger, etc., for the radio stations, including availabilities and logs, it is heavily loaded. The company, therefore, also subscribes to the BIAS on-line computer service, which supplies availabilities, logs for the three TV stations, and works on each TV station's own marketing and sales administration too.

However, all information on each TV station's financial status is forwarded to the headquarters station, KSTP-TV, for correlation into reports for the Hubbard management. This includes payrolls, financial reports, and other pertinent financial material. Information from the radio station is similarly correlated at the headquarters station into management reports.

Between the two systems," he says, "we have already made great strides in the consolidation of our accounting operations. As we get further into automated production gear, we foresee that this also will be tied into our central computer set-up and we'll be as well on the way to complete automation as one can get within the activities of a group operation."

The combination of individual utilization of on-line automation for the local TV outlets of the Hubbard Broadcasting Company and the IBM System 3 computer located at the KSTP-TV group headquarters has provided the Hubbard management with a complete, centralized system of all accounting procedures.

continued on page 34

Jerry Deene, KSTP-TV comptroller, checks out a confirmation contract from the BIAS "on line real time" computer terminal.

Jan Murphy, KSTP-TV, programs the station's spot information via a BIAS terminal. All Hubbard Broadcasting Group stations use BIAS and information from this service is forwarded and stored in KSTP-TV's IBM computer for consolidation purposes.

World Radio History

Mary Leibfried, KSTP-TV programmer, inserts a new tape into the station's IBM computer . . .

. . . and sets the System 3, Model 5, for printout operation.

According to Mr. Deene, the tremendous increase in efficiency has been accomplished with no increase in personnel. "Thanks to the computer, and the BIAS systems used at all our stations," said Deene, "we have been able to centralize all of our accounting efforts. The instant communications that have been established via the computerized "on-line, real time" service of BIAS keeps us posted with an on-going, up-dated, and extremely accurate series of reports of all kinds. For overall planning, for future considerations of projects, costs analyses, and other important financial aspects of a group operation, the combination of our computer and the BIAS computerized service has given us the most effective operating tools for broadcast evaluation we've seen to date."

Mr. Deene envisions a whole new era of broadcast accounting concepts as computerized equipment becomes more sophisticated in the future. "Automation is really the key to competitive growth," said Deene. "In the not too distant future, many of the activities we now perform will be handled by a computerized service. With a simple tie-in with a bank, for instance," said Deene, "we should be able to make all payments directly without drawing a single check at KSTP-TV. The range of possibilities for automated activities in future operations is virtually unlimited."

Mr. Deene also pointed out the potential for tieing in production operations with the automated systems currently in operation at KSTP-TV. "Already there is automated production equipment which can be interfaced with some of the computerized systems we now have. There is a present capability of automating the transmitter and, when all of the various segments of present automated operations are interfaced—when the right equipment is placed in the right sequence—we will have a fully-automated broadcast operation completely embracing every aspect of station performance from sales and traffic through engineering and production."

He emphasized that Hubbard's plans for the interfacing of accounting and program control were still in the "search and study" stage, and said that a far greater degree of compatibility among automation and control systems would greatly advance the feasibility of the project. In other words, some integration of broadcast automation systems, as pointed out in other stories in this issue, is building up as a tremendous need.

For those operators who have been slow in adjusting to the mercurial changes developing in the broadcast industry, both administratively and in engineering, the time is getting short, according to Mr. Deene's forecast. "The growing intricacies of broadcast advertising and the increasing deluge of paper work, reports, and informational needs professed particularly by the local, state and federal governments, make automation an urgent necessity at this time," said Deene.

It's getting to the point where the station operators, particularly the group operators, must 'automate or disintegrate.' " **BM/E**

World Radio History

A SALES MANAGER'S TOOL

STARCOM

STARCOM is a sales-oriented system rather than accounting-oriented . . . it allows you complete flexibility in developing sales plans, with overlapping time blocks, combos, lap plans, you name it . . . and it still gives you a very compact daily avails summary, covering Monday-to-Sunday for four weeks. Sales are broken down into four levels, or categories, and time available is computed. Status of prime time, MON-SUN, for four weeks, can be shown on *two* pages. A master sales/avails report is also provided which may also be used in the traffic department. Examination of this report will give you contract details for every spot on order. You can evaluate sales by sales class; estimate degree of fluidity; see spots sold for "special" programs separate from those sold for normal programming; see sales booked for months into the future; and, when programs have changed, see advertisers who weren't moved with the program, pointing up the potential need for order modifications. Circle 160 on Reader Service Card

SARKES TARZIAN INC.

Data Processing System

AN ENGINEER'S NECESSITY

APT SYSTEMS

The APT MC control systems are mini-computer controlled designed to interface to STARCOM. Master control automation gives automatic pre-roll/take control over FILM and VTR islands, audio and video sources, and provides long term, fail safe, memory for storing log data one week or more into the future with immediate access to modify, insert, or delete events—even the immediate next event.

Circle 162 on Reader Service Card

SARKES TARZIAN INC.

MC Automation

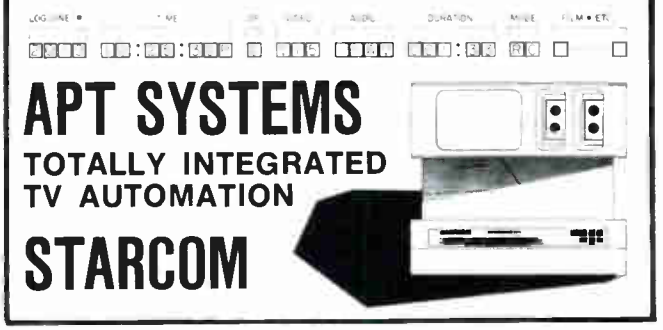
STARCOM

A GENERAL MANAGER'S DREAM

STARCOM gives you finger-tip control over the daily operation of your station, e.g., a log revenue analysis report. On *one* page you can see at a glance total revenue by program or program adjacency, and revenue by day-part and day, all subdivided into four sales categories and totals. Closer inspection will show, for example, the number, total time and revenue of "fixed" category spots in a given program. This report will help you optimize sales strategy by pinpointing sales of sellout at low rates or areas of undersell at high rates. Circle 161 on Reader Service Card

SARKES TARZIAN INC.

Data Processing System



APT SYSTEMS

TOTALLY INTEGRATED TV AUTOMATION

STARCOM

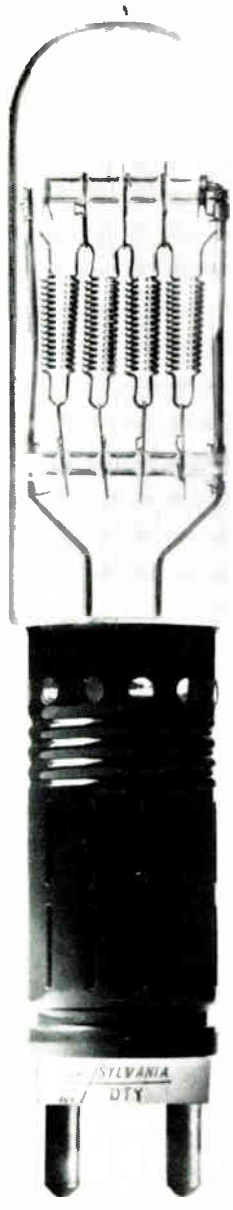
The STARCOM system provides the station with a printout of all their contracts, rough logs, final logs, daily avails, weekly avails, sales backlogs, invoices, billing summaries, discrepancy reports, reports of expired contracts, missing commercial instructions, log conflict reports, billing discrepancies, FCC reports, pre-emption summaries, name and address information, and a complete range of options which include revenue summaries, and accounts receivable package. All of the reports may be printed at the TV station.

STARCOM will interface to the APT system so that on-air control is automatic—providing FCC log report and providing full last minute override for last minute changes. Circle 163 on Reader Service Card

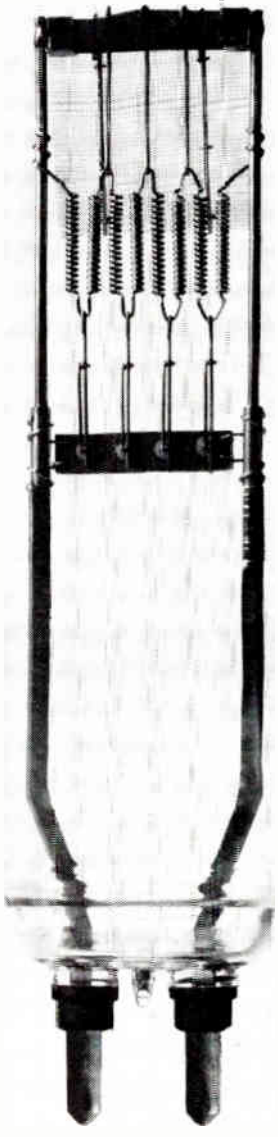
SARKES TARZIAN INC.

Broadcast Equipment Division
East Hillside Drive
Bloomington, Indiana 47401

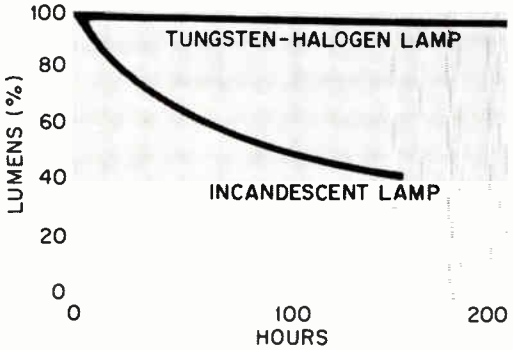
World Radio History



10 KW TUNGSTEN-HALOGEN LAMP.



10 KW INCANDESCENT LAMP.



WE'VE CONQUERED THE DROOP.

If you've ever watched those big, fat incandescents deteriorate, you know what a big, fat pain-in-the-neck that is. Their lumen output sinks and their color temperature drops, as the graph shows.

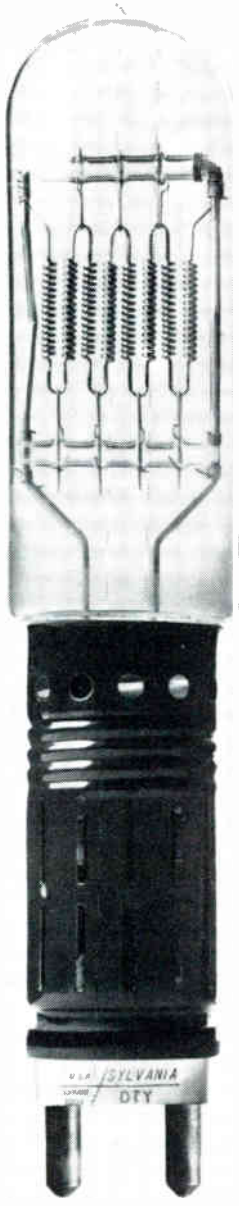
Now Sylvania tungsten-halogen lamps have come to the rescue.

They don't blacken with age, so light output and color temperature don't go into a slump.

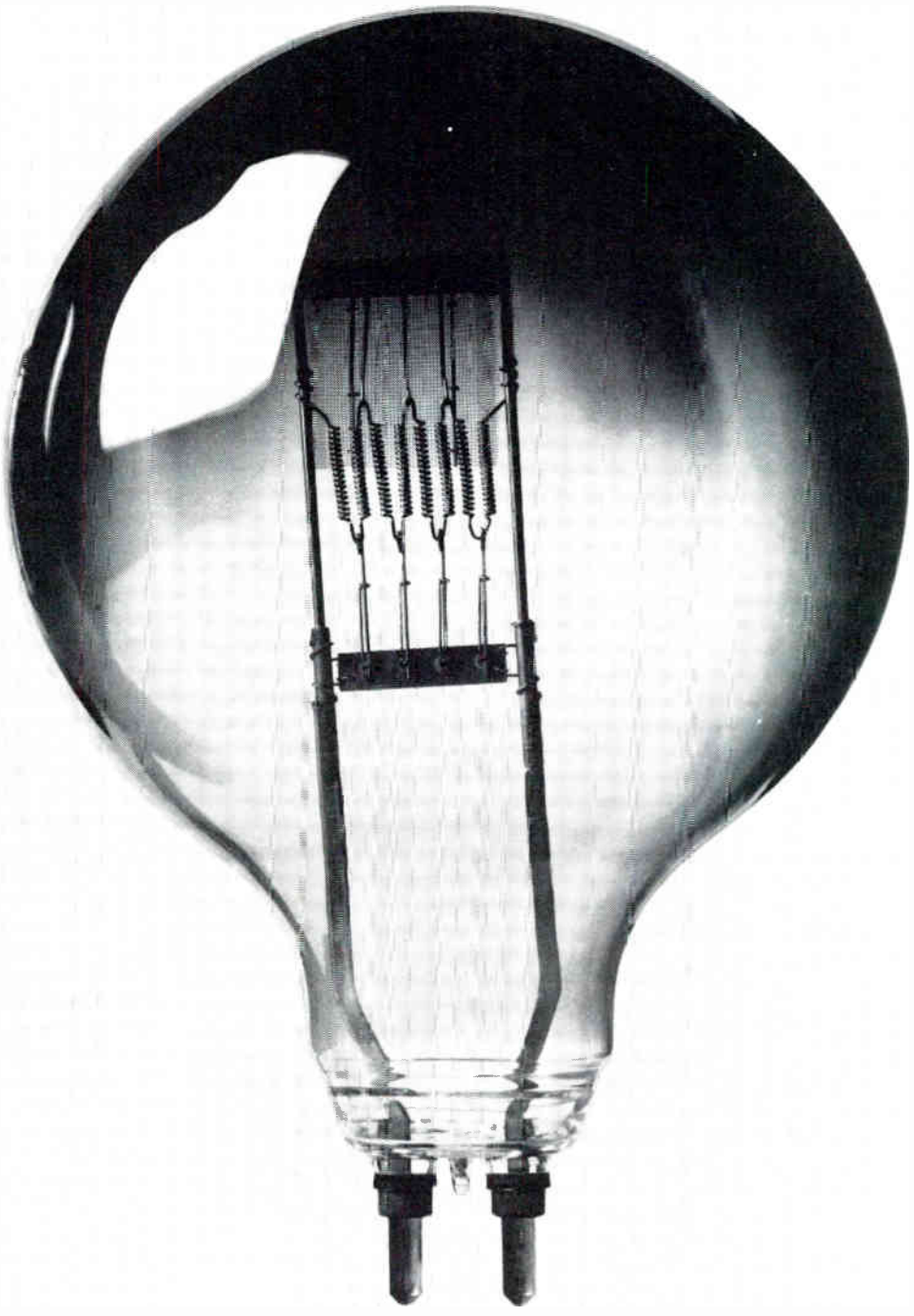
That means you don't have to keep

World Radio History

70 HOURS LATER.



10 KW TUNGSTEN-HALOGEN LAMP.



10 KW INCANDESCENT LAMP.

fiddling with the studio lights or camera settings. You get constant color rendition on color film and save money on print correction.

Tungsten-halogen lamps outlast the incandescents 2-to-1. (Or even 3-to-1, since you may have to throw away the blackened lamps before they conk out.)

Then there's size. Why should anyone want big, heavy glass balloons when he can have nice, slim little lamps that are easy to handle and store?

We've developed two complete lines of Sylvania tungsten-halogen lamps.

The first is a line of direct replacements. These lamps fit into the big, old sockets vacated by the big, fat incandescents.

The second is a line of even smaller tungsten-halogen lamps that you can use to replace our replacements once you've gotten rid of the old sockets and fixtures. They fit into entirely new, smaller. more efficient fixtures.

Ask us about both our lines. Right away.

Before another 70 hours go by.

We'll be glad to send you an illustrated brochure on each line. For your copies, write: Sylvania Lighting Center, Danvers, Mass. 01923

GTE SYLVANIA

Circle 120 on Reader Service Card

Camera Remote Control—Is It For You?

TV stations that use it love it. It saves time, money, personnel and tempers—but for some, it hasn't all been gravy.

IN A LITTLE TOWN IN PENNSYLVANIA, sophisticated camera remote control equipment is assembled in an incredible profusion of types, models, sizes and designs for just about every kind of TV camera there is. Units and systems available from the Power Optics Fairview Village plant control pedestal height, pan, tilt, zoom, focus, and iris. The controls can be programmed from a computer—there are several memory core storage options—and the whole thing seems to be ideal from the automation standpoint. Yet, field tests by broadcasters have yielded a mixed bag of sentiments about camera remote control. Some stations love the systems and wouldn't do without them; a couple have relegated the remote equipment to the storage room.

Very high on the whole idea is Charles King, manager of operations for General Electric's WRGB in Schenectady, N.Y. He had a chance to watch the systems in operation at WNYS and WHEN in Syracuse, liked what he saw, and installed two systems in his own station.

Other stations, especially those that purchased equipment five to six years ago, complained about poor repeatability and the fact that they could use the equipment only on non-critical shots. Two stations surveyed indicated that the remote equipment was gathering dust in the storeroom because of their unhappy experiences with it. One common denominator has emerged from *BM/E's* survey: systems dating back to 1967-8 are the ones that caused trouble and disenchantment; stations with more recently installed remote equipment are delighted with performance and utility.

One of the happy users is KCMO's director of engineering, Steve Smith. He told *BM/E* that the station's two remote systems are in almost constant use. Using Power Optics' automation on two of the station's three cameras, one of the automated cameras is ordinarily used manually while the other is always used in the automatic mode for calls, supers, and trick shots. KCMO uses the automated cameras for all its news shows and for production. Important to the operation is the use of one camera in a fixed shot so studio personnel are free to perform maintenance.

The controls are at the audio console, so the audio man controls focus, zoom, and tilt. The station likes the control systems, but initially had some repeatability problems. "The company told us to put 90 pounds of dead weight on top of our cameras," Smith said. "Well, one of our sister stations tried it and it didn't do a bit of good. Besides, how do I get 90 pounds of dead weight specifically made and in such a size that I can put it on a GE camera? And where do I attach it so it won't fall off and break somebody's foot?"

Controllability is okay for most shots, but Smith says it does not have the accuracy or repeatability for closeup zoom shots. Reports Smith, "We can't use it exclusively for dynamic shots. It's great to set it in an area and use it within a limited range, but we can't use it to do an entire news show."

Even within the range of these shortcomings, KCMO has plans to extend the use of the automated cameras. They are building a platform to elevate the camera for wide shots. During news shows, they often turn the automated camera around to show the operator-manned cameras to lend an element of realism and urgency to the newscast.

Stations like KCMO have come to depend on the remote camera system so totally that they wouldn't sell their second unit under any circumstances. They use the second unit mainly as a backup. If the first one goes on the fritz, the camera is used manually and the other remote camera takes over. The station definitely feels that use of this equipment has saved it considerable money—mainly the salary of an extra camera operator.

At Cincinnati's WKRC, the single remote camera unit is used for virtually every one-camera operation in the studio. It's used for the news show and on all programs that originate there. Chief engineer Ray Owen feels that the camera control system was definitely worth the investment, but that it hasn't really saved the station the cost of a camera operator's salary. "What it did do for us," said Owen, "was to save an operator during actual production." The time-saving is not so apparent during setup, he pointed out, but the remote feature has definitely paid for itself.

In production of commercials, Owen feels that the remote system is far better than using a manually-operated camera. "When we've had some extreme zooms and fast zooms on preset shots, a man just can't do it that well," Owen pointed out. Commenting on the repeatability of presets, "I understand that the new ones have been modified so they come right back to the same spot. Ours does not, but it's workable. If you're concerned about really tight framing with a closeup and want to come back to the precise framing, then the camera will be off a little bit." The station has one show that does not use the remote camera, mainly because its production people have a thing about live operators.

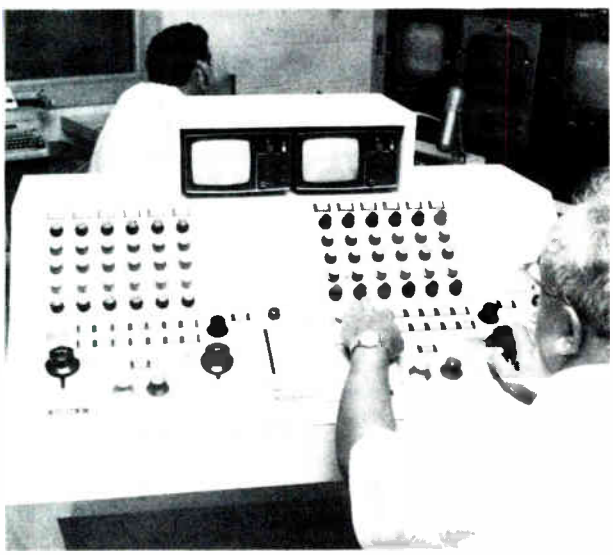
World Radio History

One station that's not so happy about the remote camera control is Buffalo's WGR. According to engineering supervisor Ed Gordon, the station stopped using the system because "It's too slow. Generally, we found the unit to be more of an inconvenience than having a man actually on the camera. Its operation has been jerky—never smooth. It's never really worked properly. We haven't used it for over a year now." The unit is one of the oldest ones sold by Power Optics, and was installed in 1968.

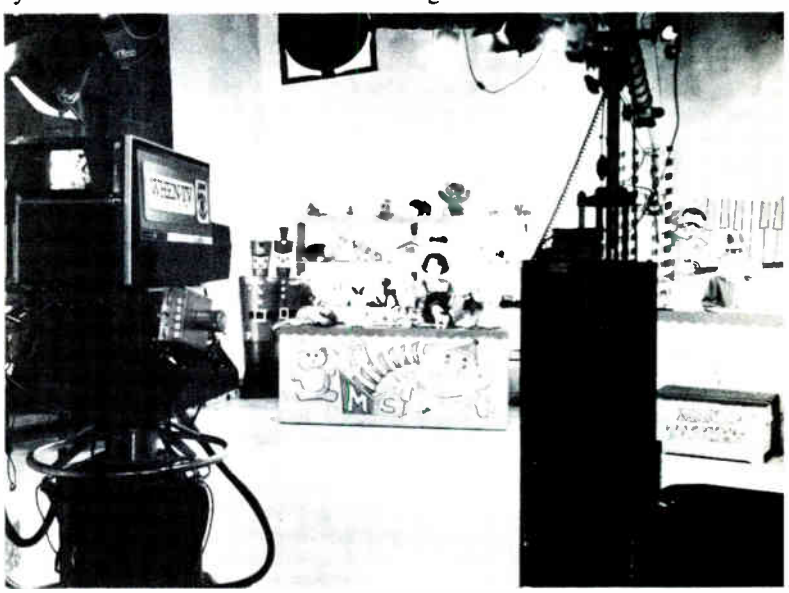
Another oldie that's not in use is the one at WTVN in Columbus, Ohio. According to studio supervisor Glade Grable, the station has taken a different approach to its broadcasting in the last six months. The remote camera unit was taken out of operation to make it more flexible in production. Grable pointed out, "If you needed that camera moved to another spot in the studio for something else, it took three men and a boy to move it. It was unwieldy and quite heavy. In fact the tilt-pan automatic section probably weighed one-and-a-half times as much as the camera itself. If we had three cameras in our studio instead of just two, I'm sure the remote unit would still be in use here."

Later models overcome earlier problems

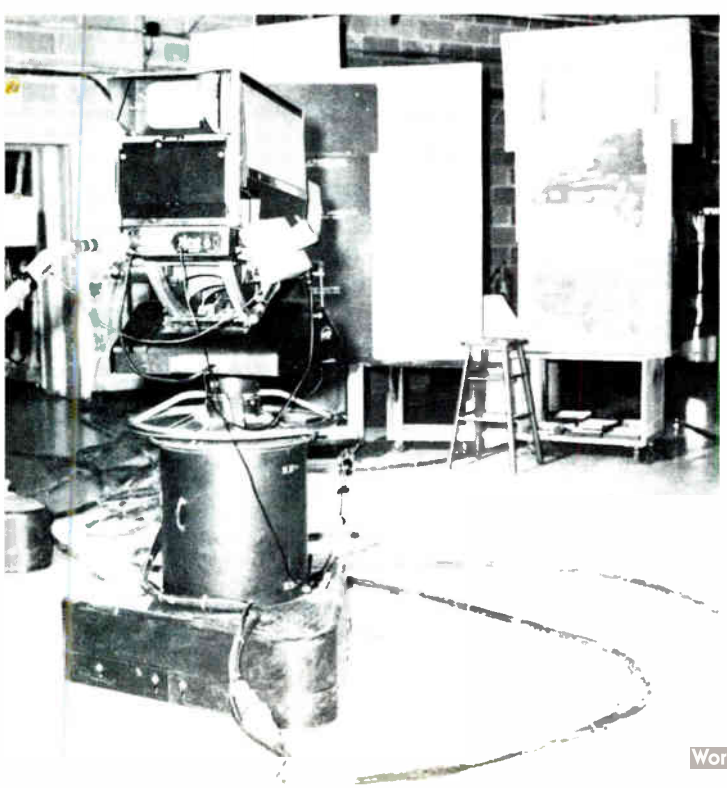
The older units were also found wanting by Albert Chismark, director of engineering for WHEN, Syracuse. He had installed a pair of systems in 1967, and then replaced them with new ones in 1970. "The 1967 units didn't have a satisfactory memory for accuracy of pan and returning back to a particular spot. The newer, more sophisticated systems are much more to our liking." WHEN uses

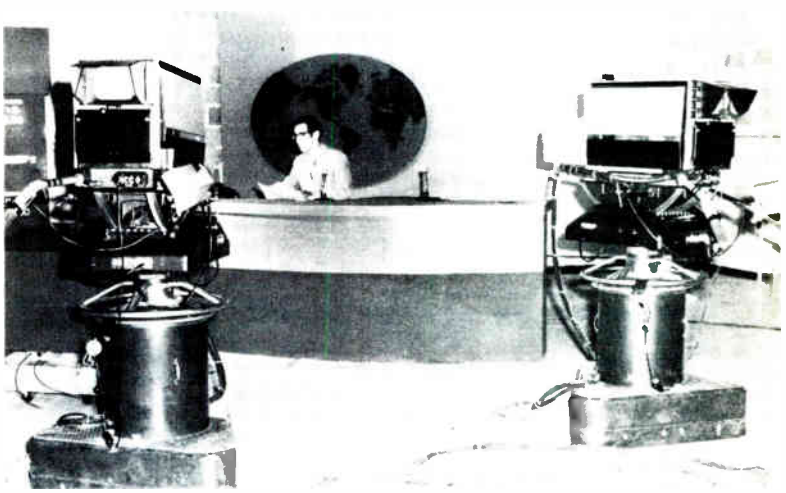


Control panel and console for two-camera remote control system at WHEN-TV, Syracuse, New York. The console is portable and movable between two Control Rooms. Each camera features six "shots" complete with manual hand controls.



WHEN uses remote control system for children's program.





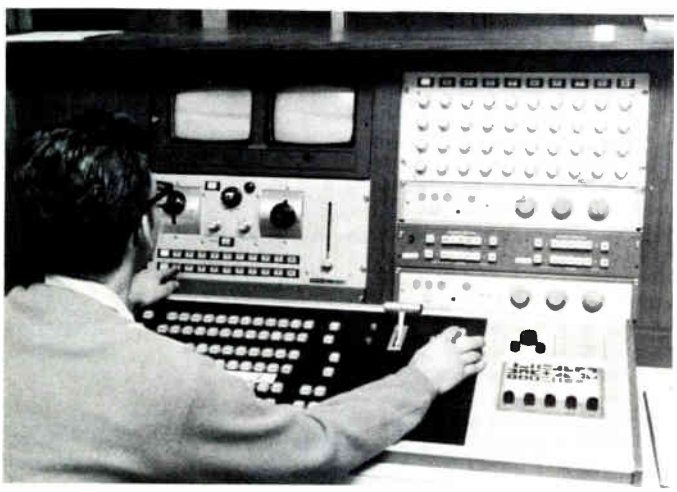
General Electric PE 350 cameras are used in WHEN's news and weather studio (shown at left), and also in the news studio (above).

World Radio History

the new units for all types of programs, for both live and taped shows. Typically, two cameras are remotely controlled in a three-camera studio setup. Chismark feels that the systems have definitely paid for themselves.

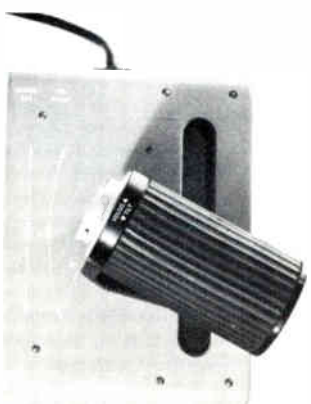
"I think that for normal everyday use, these units are quite adequate," Chismark told *BM/E*. "I don't think you could do an extravaganza with them, but they're just fine for our applications." WHEN feels that even without the third camera, the two remote-controlled cameras can work well without anyone being able to tell that the entire show is remote controlled. The station is "married' to the remote cameras and Chismark feels that they just couldn't get along without them.

General Electric PE 250 color camera with remote control system at WUTR in Utica.



Power-Optics' remote control panels installed on WUTR's main control console (facing camera bottom left and top right).

Power-Optics' Portable Manual Controller. With this unit six functions of a television camera's movements for pan, tilt, zoom, focus, and iris, plus pedestal height, may be controlled.



At Syracuse's WNYS, two recent-vintage Power Optics' systems are in daily use. Chief engineer John A. Carroll told *BM/E* that the systems are excellent not only for day-in, day-out live programming, but do yeoman service in production as well. He feels that the systems have excellent repeatability. "There are limits, though," he pointed out. "You can't get halfway across the studio and expect repeatability, but by moving the camera in close for tight shots, you can get excellent repeatability."

The units are operated by computer control, but not from a large-scale memory. Carroll, like everyone else surveyed, felt that the Power Optics factory reps bent over backwards to be helpful in making the installation, setups, callbacks for service and for helping out with problems. While reliability was a problem during the initial installation period, the station would do it all over again without hesitation.

In Utica, N.Y., WUTR's chief engineer Gerald Devine uses the camera remote for everything. He feels that the equipment has good repeatability—well within the tolerance indicated by the manufacturer (to 1/5 of one degree in pan.). Reliability is also excellent, although the equipment required an initial debugging period. The station has just two cameras, and one of them has the remote system, used with drop cards and for studio and production work. Devine is very happy with the equipment, and would buy it again if need be. As with most of the other stations surveyed, WUTR's equipment cost has already been amortized and more than repaid by salary savings.

As far as salary savings are concerned, having one remote camera doesn't necessarily mean saving a full camera operator's salary. After all, *someone* has to operate the remote controls, but this is often an audio man working the pushbuttons from his sound console position in the control room. Some stations don't operate remotely at all, but have an operator at the camera location itself. The rationale here is that the powered control equipment works zooms, pans, and tilts more smoothly than manual control does and can zoom and reset much faster than mechanical controls can.

In almost all cases, the equipment has managed to pay for itself within a two-year period or less. In stations with two remoted cameras, it has meant not having to call in a separate night camera crew for the late news programs—a night crew that would draw a full day's pay for a couple of hours actual work. In production work, the remote cameras can operate from preprogrammed settings, making all operations smoother and more efficient.

Looking forward, Power Optics has in development an automation system for control of all camera motion which could be operated by potentiometers, or by a digital system or MOS memory. Among the functions to be brought into the system would be the trucking path on the floor, height relative to the base, and others. **BM/E**

World Radio History

If you want to lay down
a 113 dB signal*
flat from 28 to 18,000 Hz,
radiating through an angle of 120°
the SENTRY™ III is it.

On the other hand,
if you need 4 dB more level
on axis, and are willing to
give up just 22 Hz of bass, consider
the SENTRY™ IV A.

*4' on axis with just 50 watts, with optional SEQ Active Equalizer. Response without equalizer, 40-18,000 Hz.

Both monitor systems share the same mid-range and high frequency speaker components. Both have tweeter protector circuits built in to save the systems from inadvertent damage. The Sentry IVA uses a dual-speaker, horn-loaded bass end for efficiency. The Sentry III uses a single speaker in a vented enclosure for extended range.

Sentry III. Sentry IVA. The two best ways to recreate the actual sound pressure sensations and response range of live music... in the studio or in demanding sound reinforcement installations. From the innovators at E-V.

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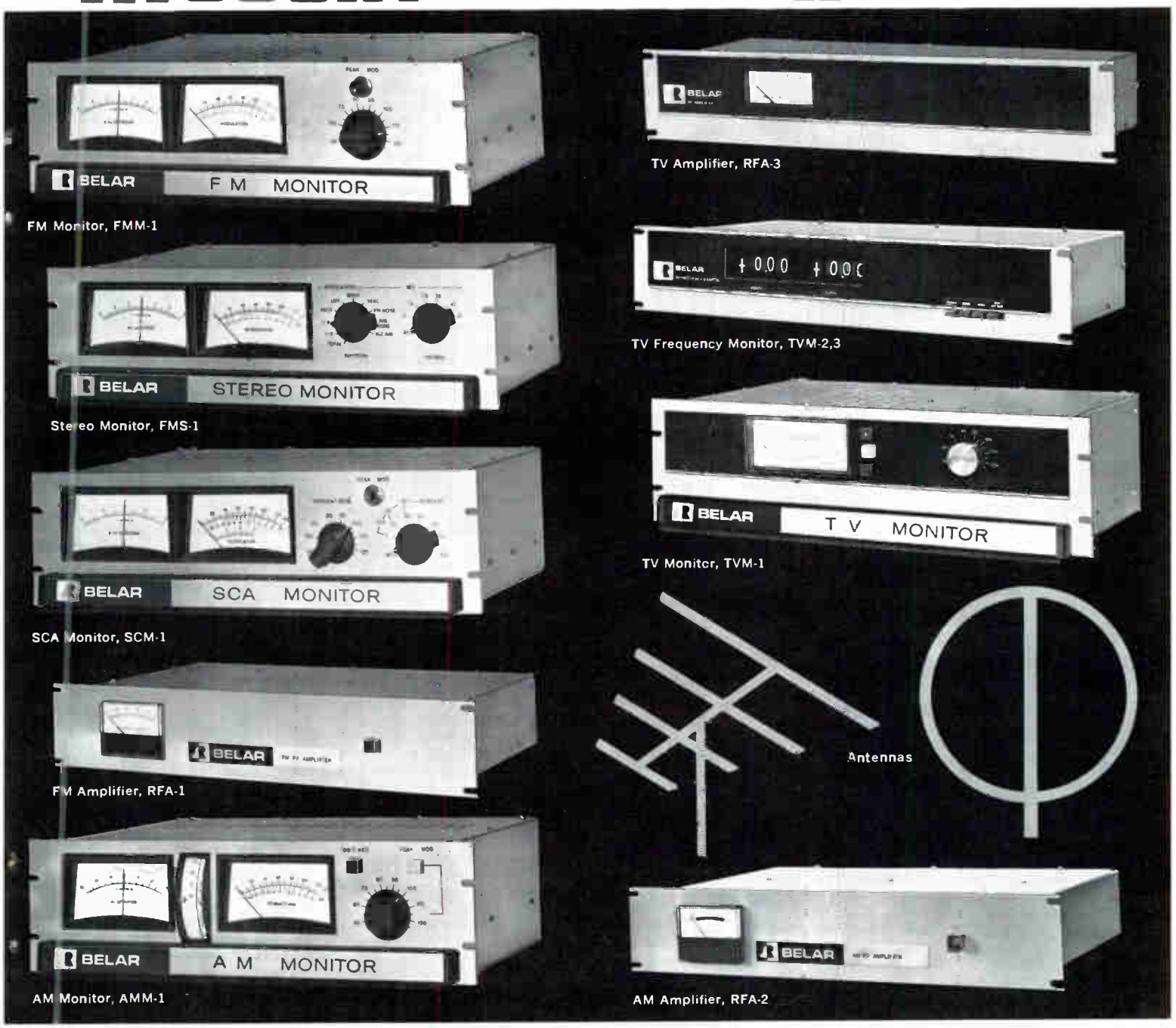

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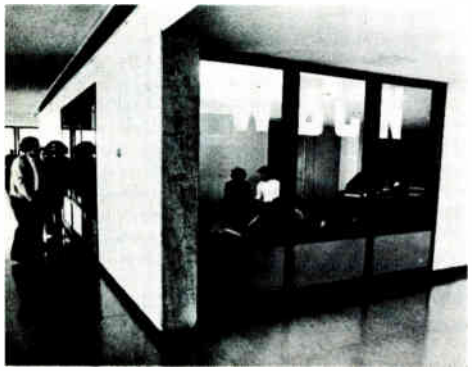
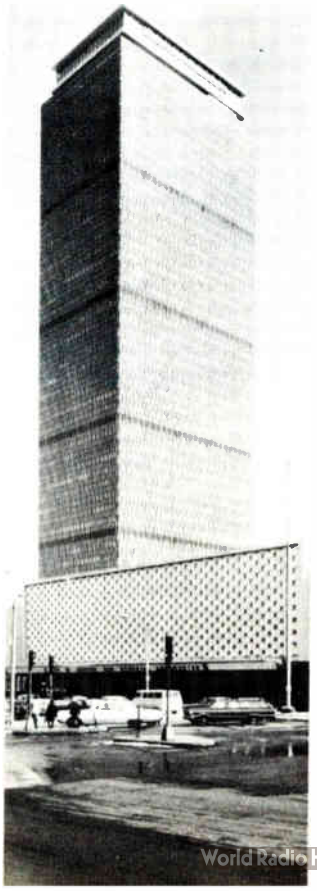
Free-Form Music: Bucking The Trend and Making Money Out Of It

Two big things have happened at Boston's veteran FM station, WBCN—a move to a spectacular, see-through tower-top home, and success with an individualized rock-to-classics format hung on announcers' musical care and expertise.

WITHIN THE PAST COUPLE OF YEARS, the Concert Network flag-station in Boston, WBCN, has nailed two big trophies to the wall. One is very recent—a remarkable new home at the top of the 50-story Prudential Tower that puts the station in full view of the public in a spectacular setting. The other is the culmination and solid success of a program format experiment that began in 1968, a "free-form" approach to a wide range of musical styles, from rock to classics, proving that you don't necessarily have to concentrate on one narrow style of music to hold a recognizable, "salable" audience. This counter-trend success suggests that FM operators, at least in larger markets, have more options than the current high-popularity formats provide.





The 50th floor "skywalk" of the Prudential Tower in Boston is the new home of WBCN. Station operations may be observed by those visiting the skywalk through specially designed soundproof windows.

Not every FM operator can find a 50th-floor home, but the public can be given a good look almost anywhere—and a number of other stations are doing that.

WBCN completed a year and a half of construction in June, to take it to the new Prudential Skywalk studios. T. Mitchell Hastings, chairman of the board of Concert Network, Inc., WBCN's corporate parent, said: "We'll have spent $150,000 on this move before we're all through, but it's not out of proportion to its value."

At the top of its tower, the WBCN offices, studios, and transmitter are located in one area inside and contiguous to the Skywalk, the observation "corridor" that circles the top of the tower. The antenna is located directly above the transmitter and projects 75 feet into the sky from the Prudential Tower roof.

Every part of the operation can be seen through windows opening on the Skywalk, which is visited by about 500,000 people a year.

There are three production studios, a news room, and a conference room which also serves as a public affairs (PA) studio. Programs can either be broadcast live or recorded in the PA studio. There are stereo speakers and headsets on the Skywalk side of the studio windows, so visitors can hear and see programs in production.

Adjoining the main studio is the library, where over 15,000 records will be stored.

With windows to the Skywalk from the reception area and from the largest of four executive offices, the public will be able to see all aspects of WBCN in operation. The studio windows have three to five panes of different thicknesses separated by air spaces for sound isolation.

The programs produced in the studios for broadcast are carried through mixers, amplifiers, filters, compressors, stereo generators and into one of the two 20-kilowatt transmitters and then to one of the two vertically and horizontally polarized antennas, which propagates the WBCN 104.1 MHz signal into the air from atop the Prudential Tower. Every piece of equipment is duplicated and electronically switched into use when needed. Within the studios, no extraneous sound or vibration is permitted to mix with the broadcast signal. Each studio is completely

World Radio History

lined with sound-absorbent materials on ceilings, walls and floors. The total facilities take about 3500 square feet.

WBCN has done considerable pioneering in both FM programming and engineering since its 1958 inception. It was the first commercial FM station to use vertical polarization (in addition to its horizontally polarized signal). This was an outgrowth of Hastings' development in 1952 of a successful FM car radio, a receiver which was bedevilled by "picket fence" effect when mobile until the vertically polarized signal was added.

In its first year, WBCN pioneered FM stereo by carrying the left-hand side of the Boston Symphony broadcasts while WGBH carried the right. All a listener needed for full FM stereo reception was two FM receivers.

WBCN was also very active in the formation of the National Association of FM Broadcasters (NAFMB); the management strongly aided and abetted the persuasion of the FCC to open up FM stereo.

Another crusade backed by WBCN was the opening of the 150%-maximum power limit for stations in Zones I and IA of the U.S.

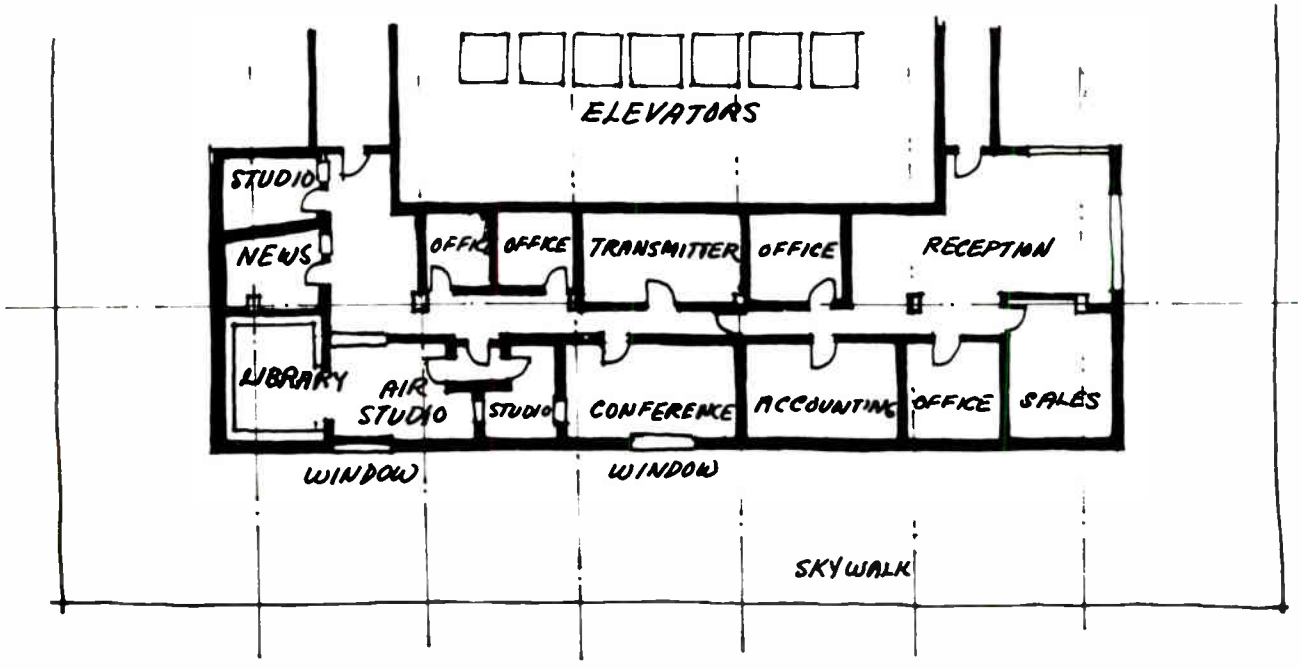
The new music format represents quite a change from the station's original orientation. WBCN, like its three Concert Network sister stations in Providence, Hartford, and New York City, began as a full-time classical music station. The station presented many innovative programs, such as "the Basic Repertoire," wherein a variety of recordings of the same masterpiece were played, discussed, and compared.

In the mid-sixties, audience research done by the NAFMB revealed a shift in preference to popular and Broadway melodies. The station followed the trend. By 1966, the programming was largely middle-of-the-road except for an evening symphony concert. By 1968, enough listeners had been won over to FM to assure its success, but a new generation had arrived which was not being reached in substantial numbers by the medium. To reach them, an experiment with a new late night sound was attempted, starting on a part-time basis on March 15, 1968, when from 10 p.m. to 5 a.m. "free-form broadcasting" ruled 104.1 on the Boston FM dial. Favorable listener response, coupled with an increase in advertising, resulted in the station's switching full time to its current format two months later.

Call it progressive, free-form, prog-rock, whatever, it can range during a typical three-or-four-hour WBCN program from David Bowie, the Velvet Underground, and the Mothers of Invention, to Glenn Gould and Eugene Ormandy with the Philadelphia Orchestra. Liberally interspersed might be British and American blues, folk, hard rock, jazz, gospel, country . . . in short, practically anything on record or tape that would enhance the listener's enjoyment and awareness of music.

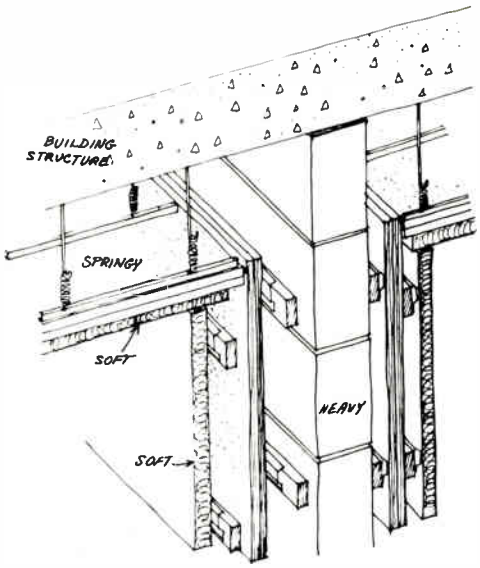
What ties it all together? WBCN has on its staff a group of "announcers," each of whom is really a "programmer," highly competent in some field of music and adept at interesting choices and introductions. Together with Manager Al Perry, the music staff chooses records and tapes from the station library, following their own special knowledge and likes, or acting on the large volume of requests that come in. Their enthusiasm for the music has proven highly communicable to the audience, which has developed a strong tendency to come back for more and more.

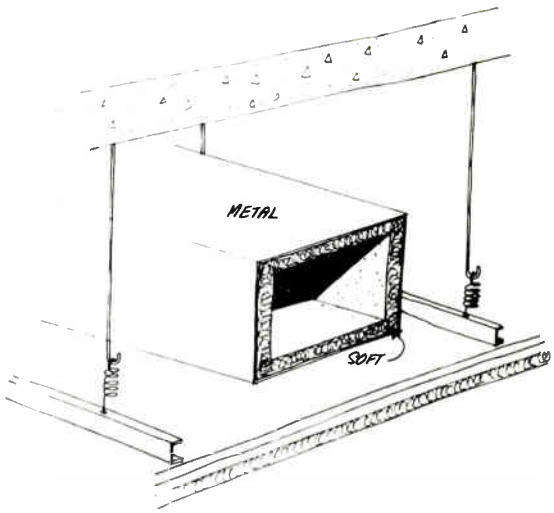
As Perry said of the staff, "Everyone approaches the music from his or her own orientation and manages to pull a sense of coherency out of it all." These young announcers try to lead rather than

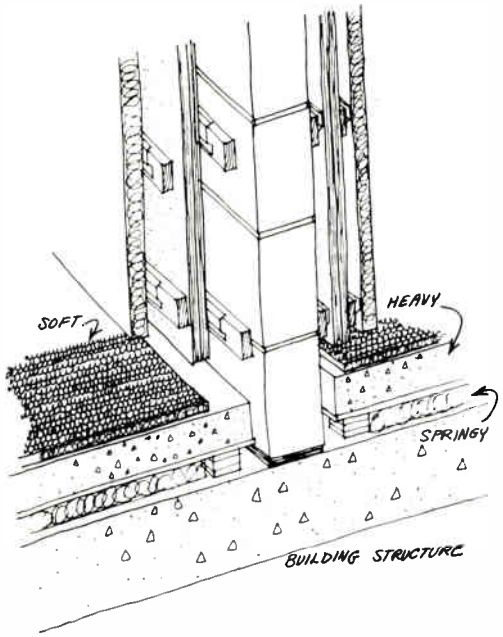


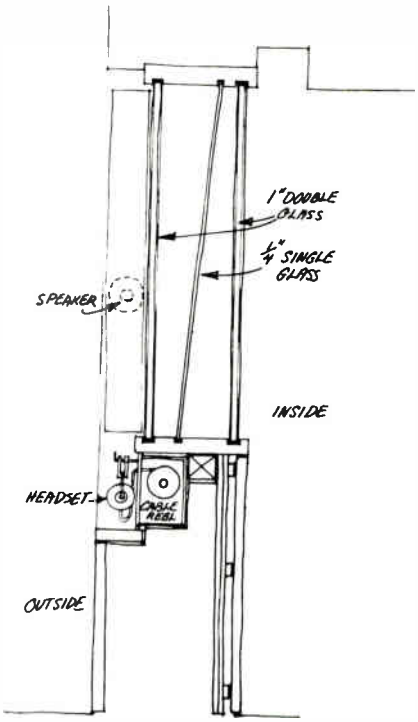
Floor plan shows layout of WBCN's tower-top studio.

World Radio History

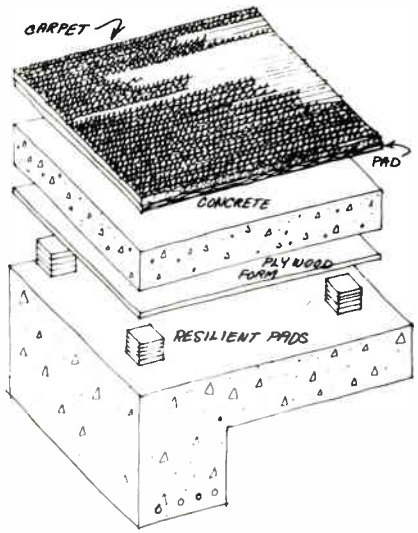


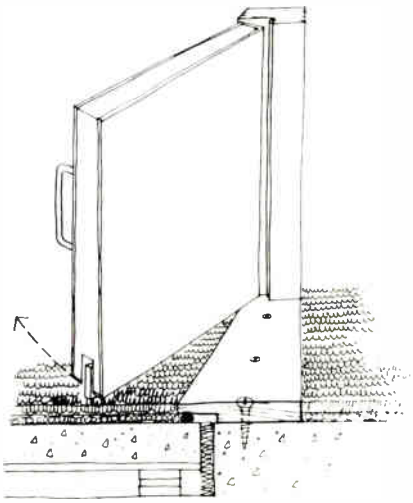






Studios at WBCN are "floated" inside the existing building to keep out noise of elevator movement, large fans, pumps and compressors, and even of people walking on hard surfaces. The ceilings (first drawing) are hung from spring supports and move up and down free of the main structure. Floors (second and third drawings) supply a combination of heavy and soft isolation from building. Air conditioning ducts (fourth drawing) are lined with sound-absorbing material. Observation windows (fifth drawing) have three panes of glass, with center pane at an angle to others. Doors (sixth drawing) are heavy steel with tight fitting rubber gaskets to eliminate all sound leaks.





World Radio History

simply react, the collective aim being to ascertain where music will be in the coming months and years.

The audience maintains a strong attachment to the station. In addition to the continuous phone calls for requests, each day's mail produces favorable reactions, such as, "Dear BCN . . . If it weren't for you, I'd leave home . . . Love Gail" (quoted in its entirety); ". . . Thank you for giving me Tom Rush, Richie Havens, James Taylor, Tim Hardin, and Buffalo Springfield in the morning when nothing seems promising . . ."

It is equally heartening for the announcers to receive a letter such as Daniel R. Gustin's. Gustin, education affairs director of the Boston Symphony Orchestra, wrote, in part, ". . . I have been impressed with the way you are able to juxtapose music of widely divergent styles on the program. I have found this particularly impressive because, contrary to the usually accepted 'rules' of radio programming, hearing B.B. King sing the blues right after the adagio from a Schubert symphony really seems to me to be aesthetically pleasing . . . i.e., it 'works'."

It's not only recordings—the special excitement of "live" music helps cement the audience. Currently a weekly jazz concert is broadcast live from Boston's famous Jazz Workshop, live blues is presented from Joe's Place in Cambridge, and leading performers in the rock and folk fields are broadcast regularly from Paul's Mall. Concerts such as a sold-out Grateful Dead performance have also been aired, as were some outstanding productions from Boston's 16-track Intermedia Studios. Moving to the Prudential expands the possibilities for live studio broadcasts of concerts by major name performers.

WBCN has met the challenge of rising costs by steadily expanding its audience and increasing spot rates proportionately. In this manner, a program policy of no more than eight commercial minutes per hour remains strictly enforced. WBCN reached a breakeven point at the end of its first summer with the new format. The first profit was earned in 1971.

Hastings said that, "A handful of FM licensees, which included WBCN, were willing to risk considerable amounts of money because of their belief in the future of FM radio. As an engineer, I had faith in the entertainment and inspirational value of great sound faithfully reproduced. And now, at the Prudential, we'll broadcast in quadraphonic sound 24 hours a day, giving the listener the experience of being totally surrounded by music as in the concert hall."

WBCN is also very active in public services. Every morning at 11 a.m., a ten-minute program of recorded music or comment is presented on "Feedback," consisting entirely of tapes submitted by listeners. The HUB-FELT (482-3358) Listener Line will do practically anything the hundreds of daily listeners' calls request, from helping in the search for stray animals to coordinating drivers and riders to travel destinations. All services are without charge and greatly encourage intercommunity and interpersonal communication.

In addition to the various news and public affairs specials and documentaries, the weekly program, "Lock Up," on Sunday evenings, focuses on prisoners' news events in Massachusetts penal institutions. The music consists of inmates' requests exclusively.

In the WBCN news department, under the direction of Danny Schechter, "Your News Dissector," a strong policy has evolved to keep the listeners abreast of subjects in which they are interested while entertaining them with delightful touches of whimsy and humor. So . . . the WBCN news staff not only presents facts, but also stimulates a good-natured response to the news.

News features may occur informally during the day or evening (such as recent interviews with Mohammud Ali, Ramsey Clark and Jane Fonda). As a half-hour public affairs program, significant local events are presented weekly on "Community Reports," Sunday at 6 p.m. (repeated Tuesday at 1 a.m.). Educational needs of the community are served by "School Days," a 15-minute program Monday at 7 p.m.; Tuesday at 7 p.m. another 15-minute public affairs program known as "Third World Report" is designed to meet the needs of minority groups.

February 12, 1973, was memorable for WBCN, for on that date the station was notified it had "won First Place in the News Category, commercial division, of the Ninth Annual Major Armstrong Awards" for "Excellence in News Programming" in 1972. The bronze plaque for this highest national award in FM newscasting was presented to Schechter on March 24, 1973, at the NAFMB Convention. The winning program, a group effort by seven staff members, was WBCN's post-election broadcast to Massachusetts citizens, entitled "The Election: Nixon 49, America 1."

That helps paint a picture of extreme liveliness for this 15-year-old, and augurs an open future. **BM/E**

Genuine Interest in Music Wins the Young Adults

The effectiveness of the WBCN "personalized" approach to free-form music programming is sharply drawn in the Pulse audience survey for the last quarter of 1972 and the first quarter of 1973, covering the radio stations in the Boston area. One of the stars of the WBCN program operation is staff announcer Charles Laquidara, who, according to manager Al Perry, has outstanding ability to communicate his knowledge of and love for classical music. Around the first of the year Laquidara was put in the morning slot, 6 to 10 a.m. WBCN's average quarter-hour audience in the crucial 18-34 age group went from 11,200 in the final 1972 quarter to 37,200 in the 1973 first quarter, putting WBCN among the top three stations. With the program format crystallizing all down the line, similar increases were picked up throughout the day: from 12,400 to 33,500, 10 a.m. to 3 p.m.; from 15,800 to 40,700; 3 p.m. to 10 p.m. (putting WBCN first in this time slot in the 18-34 age group). At night, 7 p.m. to midnight, WBCN was *far and away* first in the 18-34 group in the January-March 1973 period, with 38,100 against the nearest competitor's 16,300.

World Radio History

Computer Keeps Management In Control Of The Data Flow

By Richard H. Chapin

OPERATING DYNAMICS in a TV or radio station involve a steady flow of information—from sales, confirmations, and advertiser instructions, through preparations for broadcast, daily lots, to invoicing accounting and management reporting.

This flow goes on every day, every minute that the station is on the air. Broadcasting is a business in which many factors have to be brought together for a payoff measured in seconds.

Time, the most perishable commodity in the world, is the station's "product." If a spot isn't sold, it's lost forever; and if advertiser instructions are not followed, there's often no "second chance." Everything becomes critical, because the many different things that need doing must all be done *now*.

In this light, recent trends have multiplied the broadcaster's problems. The move from the 60-second to the 30-second—and even shorter—commercial serves to illustrate the point. It automatically created more spots, with a resulting impact on operations and a greatly increased need for accurate, easily-available information. These spots represent more film, tape, slides or copy that must be made ready and available to the engineer or announcer at the right time. Often the spots have to be scheduled for rotation within certain time flights. They raise the danger of clutter, which can lead to less effective commercials, thus watering down the broadcaster's product. They increase the work necessary to assure that one advertiser's message is not too near that of a competitor. And the increased volume has a real impact in accounting, where it creates far more paperwork and figure work.

Inevitably, some lost revenue results as spots fail to be broadcast because, sadly, they were not scheduled, or the wrong message was broadcast, or separation was not adequate and the advertiser refused to pay, and so forth. Lost revenue from these causes is particularly painful because it represents business that was in the house; all that was needed to produce revenue was proper execution.

TV and radio profits today are under pressure for other reasons as well. Collections of accounts receivable, always a problem in this business, impact cash flow and put yet another element of pressure on profits. And, while the standard invoice is intended to help TV, it, in itself, tends to add to operating costs.

An interesting aspect of this situation is that while broadcasters are very well aware of what's going on, very few have the same "hot button." Talk to a station manager in the Midwest, and he will com-

continued on page 61

Mr. Chapin is senior program administrator-Broadcasting, Data Processing Division, IBM Corporation.

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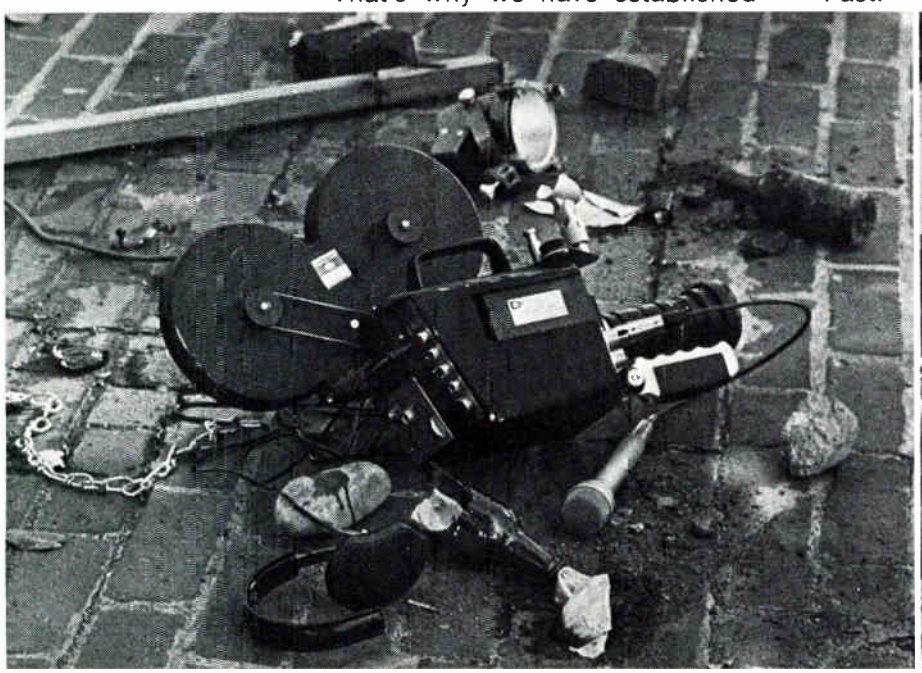

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CM/E
CABLE MANAGEMENT / ENGINEERING

AUGUST 1973

NCTA Show-In-Print

Make Film Work For You: Simplify Operations With Interfones

World Radio History

NCTA '73 Show-In-Print

Live satellite transmission made history
Pay-TV systems garnered most attention

THE 1973 NCTA CONVENTION was a large affair that undoubtedly produced as many as 6240 different impressions as to what really transpired. Varying accounts of specific events which took place at the convention could be expected because of the widely divergent frame of reference of attendees. An NCTA Convention draws a broad lot: not only operators (large and small) and manufacturers, but churchmen and bankers, blacks and chicanos, Justice Department observers, and Rural Electrification Association officials, regulators from every level of officialdom, video freaks, and staid insurance investors.

Some of the more interesting facts to which all might agree were these:

• Domestic satellites are real: Monday's attendees watched House of Representatives Speaker Carl Albert send greetings from Washington via satellite. Later that night, a heavyweight fight taking place in New York was viewed via satellite. On Tuesday, a portion of a Canadian French broadcast was seen. How the cable industry can use satellites was discussed extensively that day.

• Pay TV is foremost in operator minds. But just how an operator should approach the subject is not all clear.

• Interest in cablecasting is on the upswing, at least in the larger markets. A whole new crop of program suppliers has sprung forth, hoping to find a market for their wares on cable.

• Distribution equipment manufacturers placed emphasis on reliability. Designs appear to be converging toward a few basic variations.

• The industry and the FCC are working closely together to configure the nature of regulations and standards that will bind the industry for years to come—views of state and city regulators are being outvoted.

• Nothing is tied down permanently regarding copyright, nonduplication or anti-siphoning rules. Cable TV will get no favors, but heretofore-protected markets may lose some of theirs, according to Whitehead and Burch.

• Public-access disciples are growing in number and anti-industry in attitude. Although these practitioners seek and need cable for distribution, they strongly oppose industry ownership and control.

History will remember the 1973 NCTA Convention as the time and place of the first public use in the U.S. of a domestic satellite. On Monday, June 18, the Honorable Carl Albert, Speaker of the House of Representatives, addressed the convention live via a link that went from a transportable earth station outside the offices of American Satellite Corp. in Germantown, Md., to the Canadian Telesat Anik I (in stationary orbit over the equator) and thence to a portable receiving station built by Scientific-Atlanta for TelePrompTer. Signals were piped into the Convention Center and projected on a screen larger-than-life by an Ediphone color projector. Later, the same satellite link was used to transmit the heavyweight bout of Ellis and Shavers from the East Coast to the West. The opening ceremony and fight were distributed via cable to home subscribers in Newport Beach and Huntington Beach. On Tuesday, symbolizing the special uses to which satellites can be put, a French-language CBC broadcast was picked up and shown to the audience.

The uplink station used a 36-foot parabolic antenna. The transmitter, operating in the 4 to 6 GHz band, had a 3 kW capability. At the receiving end, a 25-foot dish picked up the signal from Anik. Some of the overall performance specs of the receiving station are tabulated in the box on page CM/E-3.

Satellites will surely play a major role in cable networking, according to the panel who addressed themselves to the subject, although no one was ready to predict exactly when and how satellites would be used.

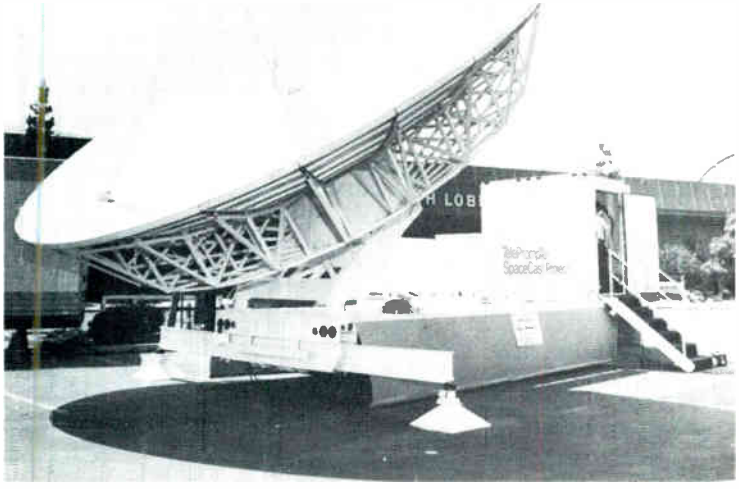
Moderator of the panel, FCC Commissioner Richard E. Wiley, asked a number of questions of panelists regarding programming issues, the nature of the interconnection, and technical standards, all of which went unanswered. It was not that the panelists were unresponsive, but simply that such answers will come later.

Robert Button of TelePrompTer said regular satellite service will be readily available in late 1974 or early 1975 and he urged the cable industry get involved, noting that, "The fundamentals of satellite technology require that the maximum number of cable systems participate." In order to form an effective satellite-CATV network, he explained that all the elements of a regular broadcasting network have to be created, including programming sources, sales, station relations, operations and technical functions. For that reason, he called for both the personal and economic participation of every operating cable system to make networking a success.

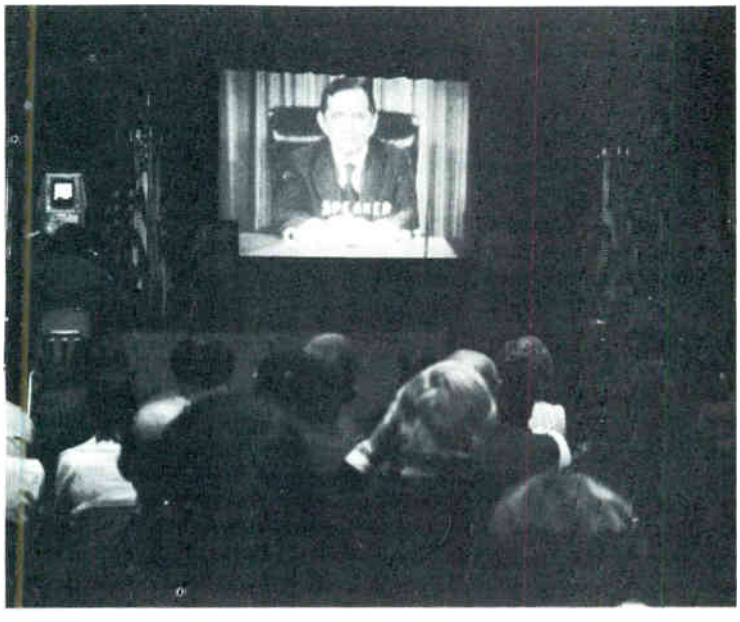
Button's concept of cable industry cooperation was supported by John D. Matthews, communications attorney, who saw the already-formed industry consortium led by John Gwin, Cox Cable, as a way to participate. Later, at the NCTA Board of Directors meeting, it was made clear that satellite plans for the industry should aid small as well as large operators.

Some of the satellite possibilities that will have to be considered were discussed by Paul Vischer. He used a number of charts to indicate trade offs in terms of: 1) satellite power versus receiving antenna size, and 2) home terminal cost vs. years of life vs. monthly subscriber fees necessary. With the present power of proposed satellites—6 watts—operating in the 6.4 GHz range, a 24-foot receiving dish costing $75,000 is necessary. Should 12.6 GHz birds with twice the power be available, 15-foot antenna stations costing $30,000 would work. Should

World Radio History



Earth station used in demonstration by TelePrompTer of satellite-to-cable link-up at convention. Station was built by Scientific-Atlanta. Canadian Anik I was the "bird."



The Honorable Carl Albert, Speaker of the House of Representatives, addresses the convention via the TelePrompTer/Scientific-Atlanta satellite demonstration link.

General view of exhibits by firms offering programming to cable operators, a much larger group than at earlier conventions.

2.5 GHz frequencies be authorized, where power of 60 watts can be generated, inexpensive, 10-foot antennas could be used with low-cost $5000 receivers.

Vischer's charts pointed to the desirability of simple home terminals (one way no impulse buy) which might have a lifetime of at least four years. With this minimum investment only about $2 worth of cable services need be sold per month. If a full two-way terminal is needed, costing over $150, monthly revenues would have to be at least $6 and maybe over $12 or more assuming the equipment were to become obsolete in two to three years' time. Systems in between the simple and the complex would have to generate between $3 and $6 a month and have a lifetime of at least three years. Vischer intimated simple equipment with lifetime of ten years was the safest route. On

System Performance Specifications For A Cable TV Satellite Earth Station

Characteristic	Specification
Antenna Size	25-foot diameter
Operating Frequency	3.7 to 4.2 GHz
Antenna Gain (4.0 GHz)	48 dB
G/T (4.0 GHz)	27 dB
Video Signal/Noise (clear sky)	
Canadian Satellite	50 dB nominal at Anaheim
U. S. Satellite	54 dB nominal throughout U.S.
Video Response	10 Hz - 4.25 MHz (±0.5 dB)
Differential Gain	0.5 dB maximum, 10-90% APL
Differential Phase	1° maximum, 10-90% APL
Video Outputs	1 per receiver, 1V peak-to-peak, 75 ohms
Audio Outputs	1 program, 1 cue, 1 broadcast (Telesat) at 0 dBm, 600 ohms
Operating Temperatures	20°F to 100°F (indoors) −20°F to 160°F (outside)
Power	115V, 50/60 Hz, 12 amps

—From an NCTA paper by Tom Smith and Peter Pifer, Scientific-Atlanta

World Radio History

such equipment he could offer ten or more different types of programs: pay TV, sports net, various cultural nets, and a variety of "how-to" type programs.

Only live box-office type attractions were considered viable by Barry Zorthian of Time-Life. Zorthian suspected video cassettes might turn out to be a better delivery system for "how-to" type programming. Zorthian also expected regional nets using microwave to be the first networking to evolve—the kind now being used by Home Box Office to pipe pay TV to Pennsylvania towns. John Malone of TCI (which operates the large microwave net, Western Comm) said the same thing. Malone, apparently envisioning the need for the more complex equipment described by Vischer, said per-subscriber investment would double for such networking and that there wasn't enough capital available. Neither is there the programming, he said, and he predicted a long, slow learning curve.

On the assumption that multiple channels on satellites will be inexpensive, Peter Goldmark said the industry should insist on a channel bandwidth in excess of 6MHz so that color quality could be improved. He declared present U.S. color quality the worst in the world.

Although the panel appeared divided on how fast satellites are coming, it was apparent that the FCC expects the possibility is soon. That was the reason for Wiley's questions. Chairman Burch, in a luncheon speech that same day, foresaw up to 20 million cable subscribers by the end of the decade interconnected via satellite. At this point, Burch said, the program producers get into the act and the question is who outbids whom for which product.

Notwithstanding FCC protective rules that serve ingrained audience expectations, political pressures, and FCC regulatory trade-offs (such as requiring news and public affairs programs from broadcasters for protected sports rights), Burch saw a new ballgame: "Up to now, the market in broadcast program distribution has been mostly a tripartite oligopoly, and it is perfectly natural that it has been cornered by more or less interchangeable products of probable mass appeal. Much of the public in all likelihood wants about what it gets. But is all this *all* it wants?

"What I am suggesting is that, before this decade is over, oligopoly may sustain a competitive challenge the likes of which it has never really had to contemplate.

"And that, to my way of thinking, is a good thing. . . . I say it's a good thing, with the further understanding that the outcome is unclear and the success of anyone in particular is *not* guaranteed."

Pay TV—rising star

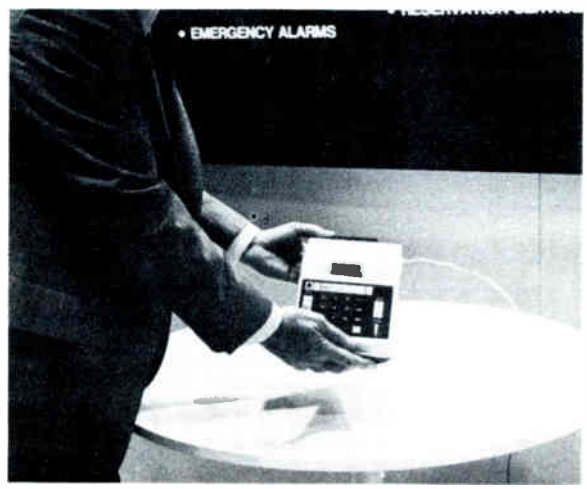
If it still seemed hard for the NCTA audience to fathom the reality of satellites, even though satellite networking was a sure way of solving pay-cable distribution problems, pay-cable as a here-and-now service was accepted by everyone. Indeed, it is considered mandatory for big-city markets. At the panel session on subscription TV, every panelist (TheatreVisioN, Optical Systems, Home Box Office) announced enormous success to date and expansion to other cities as fast as possible.

The only remaining question for the operator is how to get into it. "How?" is a deceptively simple question, though, since the answers are many and none looks like the final one.

First, there is the question of deciding on a per-program system or settling on a per-channel system as sufficient. The success of flat-fee systems to date raises the question of whether or not a per-program billing system is really necessary. Jeff Nathanson of Optical Systems said "yes," even though subscription tickets are selling better than per-program tickets. Special events and some sporting events call for a per-program capability. Perhaps movies will, too, in the future, should the heretofore movie-starved customer get his fill—or when prices go up (which nobody mentions). On the other hand, experts from Home Box Office and Warner Communications argue that subscription TV can and should be sold like cable TV—on a monthly fee.

While there was SRO during panel sessions on subscription TV, attendees were getting some "hands-on" experience out on the exhibit floor.

Oak, as a respected tuner supplier, drew very heavy booth traffic by announcing a modularized approach to systems which would permit a customer to start out with only a converter at first, then a scrambled



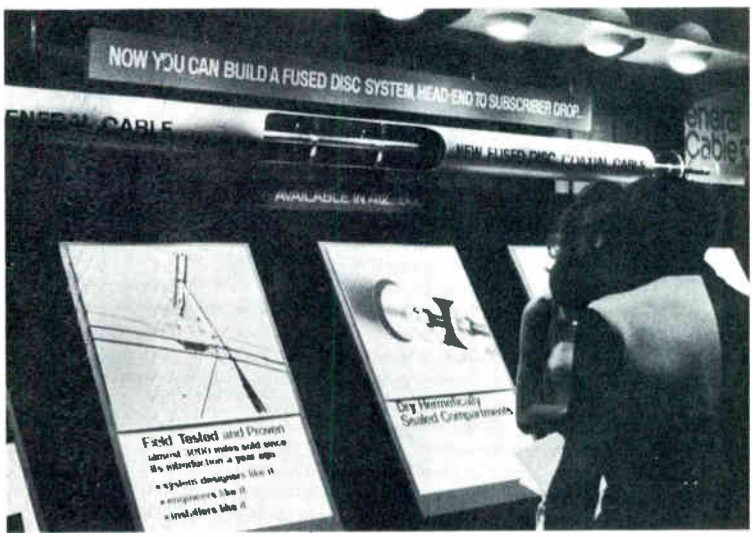
The Theta-Com home-control unit for pay-TV and special services.

Oak ESP converter and control units in their "step-by-step" two-way and pay-TV system.

World Radio History

Panel on use of satellites with cable had FCC Commissioner Richard E. Wiley as moderator. Panelists agreed that regular cable use of satellites would probably come in 1974 or 1975.

K'Son showed two-way and pay-TV terminal.



General Cable had blow-up of interior of "fused disc" cable.

one-way system and, finally, a two-way system. Any one module could be returned to the factory for retrofitting to accommodate expanded service. Another exhibitor showing yet another hardware approach was Digital Communication Inc. (St. Petersburg, Fla.)–the company that produced systems for Computer Television Inc.'s hotel pay TV system.

K'Son, which has been building equipment for the rapidly growing TransWorld hotel TV systems (now in 40,000 rooms) showed equipment designed specifically for cable TV.

Providing a total systems service (software and hardware) were TheatreVisioN, Optical Systems, and Home Box Office. The first two were among the largest exhibitors in terms of booth space.

A large segment of the Magnavox booth was given over to show off its pay TV system which handles per-program requests now through its Interactive Data Exchange Modules. Jerrold displayed pay TV equipment in its booth as part of a futuristic Communicom system, but also showed a stand-alone scramble-decode system to vie for this fast-developing interim market.

Similarly, Theta-Com also showed one of many services possible with its SRS system, but the company had no stand-alone pay cable equipment. Pay cable was also an integral part of the Tocom computerized system.

The operator trying to make up his mind on pay cable thus has many things to sort out. Should he *lease a channel* to one of the entrepreneurs who have their own hardware and software and be content with a percentage of the gross, or should he *lease a system* which offers an opportunity for greater profits but possible losses? If the latter sounds appealing, should be invest in equipment with a per-program billing capability, or should he select the simplest equipment which could pass the premium signals on midband channels? Did one even need invest in scrambling–decoding equipment if a converter could be purchased that could be field modified to pass the premium channels? Is such a low-security approach too risky—would too many people buy a set from Allied or Radio Shack and steal the signal?

If one is making an investment, just how important is it that the equipment be able to be upgraded to two-way (for simple billing and control) or upgraded to handle information transactions other than premium TV? How many channels are desirable? How many buttons are a minimal requirement? How maintainable is the equipment? Is the cost reasonable for the revenue to be derived?

World Radio History

Obviously, some of the choices can be narrowed down for certain markets, but for operators planning for big-city areas, the weighing and sorting stands out as a formidable task, one that is indeed perplexing.

There was advice offered, to be sure. K'Son said operators planning pay-per-program one-way systems could solve the basic order-entry problem through the use of its new Subscriber Order Concentrator (SOC). With the SOC, a subscriber orders via standard telephone by simply dialing an assigned number and following basic instructions printed on a 3x5 card. The K'Son SOC, in turn, accepts the individual subscriber's message and converts it to digital form for use by the computer. This simple ten-line electronic system will accommodate calls at a rate of one every two seconds, with one SOC serving 10,000 pay TV subscribers. It can be expanded to handle additional lines as the system grows.

Digital Communications unveiled what it calls Key Cinema, a system including a converter, a scrambler located on poles (no decoder is needed in the home), and a cartridge VTR player system. The company will also arrange for software. (The word 'Key' is derived from the company's simple hotel system. The guest buys a key at the front desk to turn on the room converter. A key is used on the cable TV converter for parental control.)

Biggest news at the convention in this area was Oak's ESP system (ESP standing for Expandable Scrambled Programming).

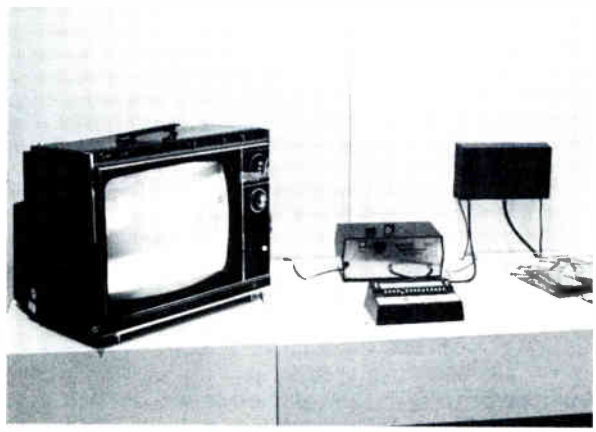
This system is expandable in three steps: 1) a mid-band converter; 2) scrambled programming at the headend with unscrambling controlled by the individual's subscriber decoder; 3) transmission of digital signals from the subscriber's home back to the headend.

Scrambling is accomplished by periodically switching the program material back and forth between channels K and L at the headend. To unscramble this transmission, the subscriber decoder must switch the converter between channels K and L at exactly the same time. The switching occurs during the vertical blanking interval of the desired programming.

The operator can buy the system in stages. The converter can be returned to the factory for one-way decoder circuitry, and again later for the addition of the interrogatable response system. Retrofitting will cost $60 to $70 for decoding circuitry and another $50 for the two-way mode.

The stand-alone equipment displayed by Jerrold was shown in two forms: 1) a single-channel pay-TV system without converter, and 2) a converter (non-AFC) with up to four premium channels added. Jerrold labelled its equipment "prototype." Final designs, which will incorporate an optimum single channel video-audio scrambler, should be set soon.

The Magnavox system was described in the March issue of *CM/E*.



Jerrold's pay-TV and two-way system uses converter and separate remote-control unit.

Magnavox exhibit emphasized its trunk line and distribution units.

Distribution equipment for the major markets

Just as one could best determine what was happening in premium TV by taking in both sessions and exhibits, one could see a correlation between what was talked about in such sessions as "developments in urban markets" and what was shown on the floor in the way of distribution equipment.

Douglas Dittrick, ATC, matter-of-factly declared that cable operators should be more concerned about installing durable equipment and lowering maintenance costs than in promising increased bandwidths. In a later session, Moses Shapiro, Jerrold, said major changes in reliability are necessary, such as building in redundancy, if special services are to materialize. Redundancy in both amplifiers and power supplies is needed. Shapiro also said equipment should have built-in automatic monitoring so that failures can be spotted. Furthermore, equipment should be designed so all malfunctioning portions can be disconnected from the system. That is, if a terminal failure in a two-way system jams up a whole communications path, that section should be immediately disconnected from the headend. Shapiro also noted that upgraded connectors are necessary to prevent ingress of unwanted RF signals.

As for capacity, Shapiro said present equipment allows 35 down channels and 4 return channels, or

continued on page CM/E-10

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Stop the bull. Everyone ships a bad reel occasionally.

Including us:

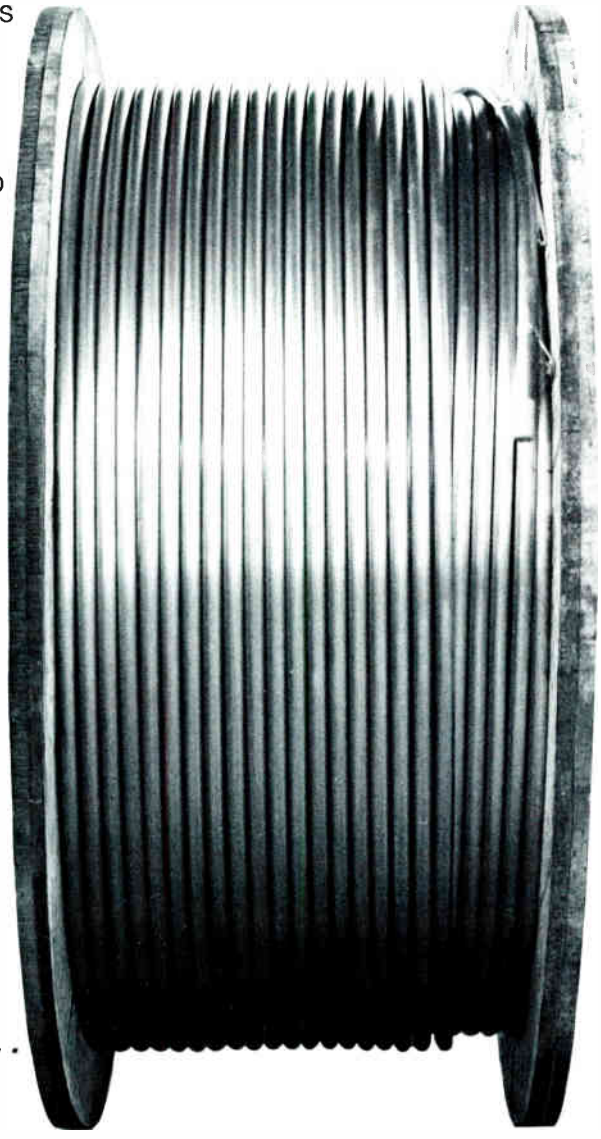
Very infrequently, to be sure. But cable-making is *not* quite an exact science yet. So absolute guarantees are worth about as much as the paper they're written on.

Now let's get on to the important thing: what do we do if you *do* get a bad reel? Talk it over at length? Painstakingly re-check the cable? Start negotiations on complicated adjustments?

Yes, all that.

But *later*. What we do right away is re-ship. That's right away.

When cable perfection can be absolutely guaranteed, we'll be the first to do it. Meantime, we simply promise not to leave you hanging. Ever. And that *is* an absolute guarantee.



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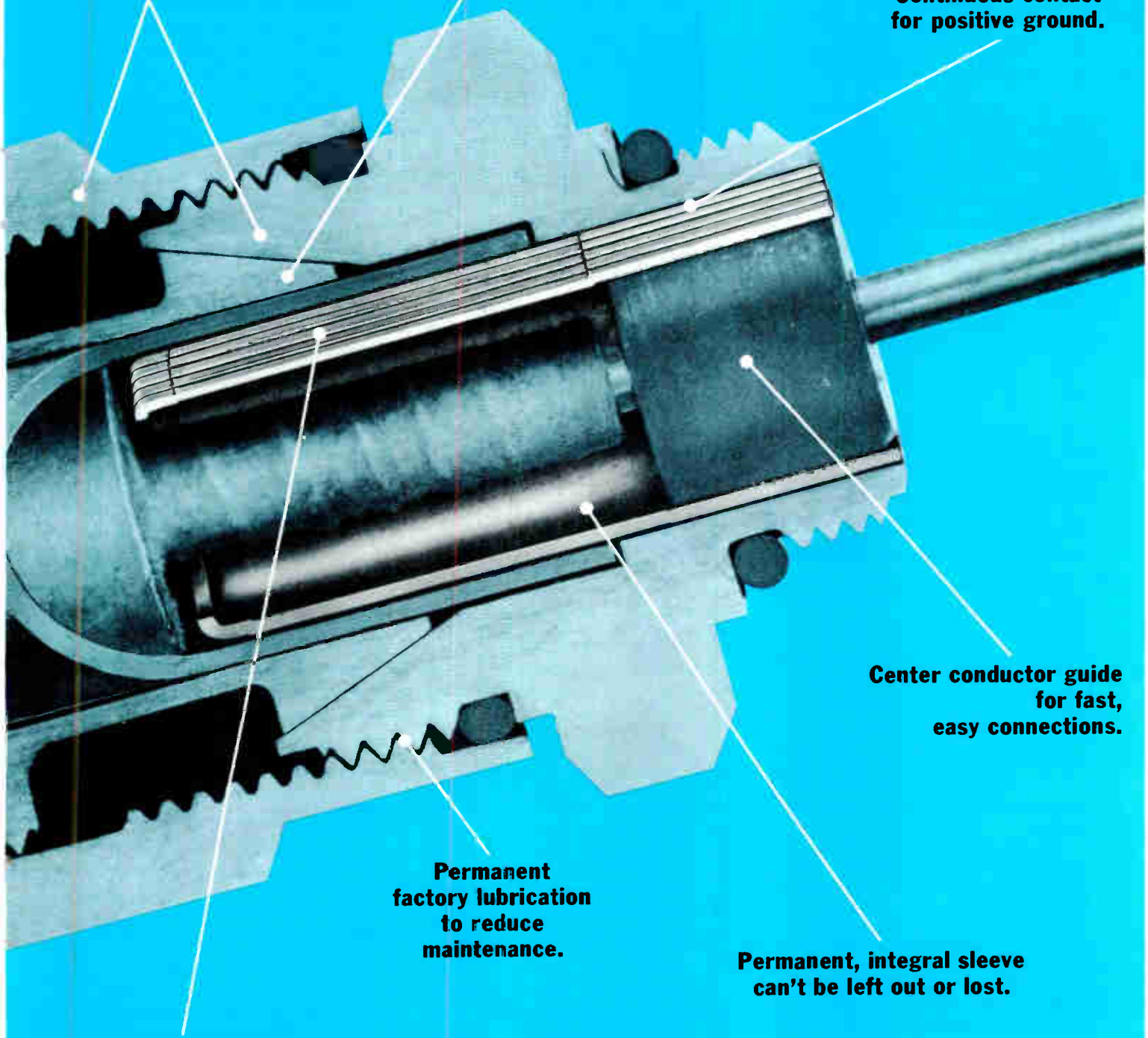

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DB 12-2

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At Anaconda's booth, trunk and distribution amplifiers were connected to cable for demonstration.

Sylvania had in operation its "Pathmaker" bi-directional system with a total of 40 amplifiers on line.

double this amount if dual trunks and dual feeders are used. This is adequate for the foreseeable future, he said.

An improvement in reliability was also stressed by Bob Behringer of Theta-Com. It's necessary as the industry begins to provide essential services (as opposed to entertainment). Reliability costs more money; i.e., a ten-time improvement in reliability may increase costs two times.

What equipment manufacturers predicted will be necessary was, not surprisingly, seen in the exhibit area. Just about everyone was stressing reliability–along with the ability to handle two-way communication.

One piece of equipment that epitomizes most of what was said is the Starline 300 introduced by Jerrold (which it immodestly referred to as the *ultimate* distribution system for *all* CATV markets).

The Starline 300 was designed to accommodate growth of basic one-way single-trunk single-feeder systems (to two-way) as well as growth of more advanced systems, including dual-trunk single-feeder systems to two-way round robin; dual-trunk single-feeder, to two-way midband split.

More important than these expandable signal distribution path options are its extra features of redundant amplifier-, power supply-, and status-monitor modules—there is room for a redundant module for every function.

To achieve status monitoring, transceivers are located at headend and at trunk stations.

The headend transceiver transmits control signals to each trunk station monitoring module, which then samples the various parameters and transmits the information back to the transceiver. There, each parameter status is compared with a predetermined level and presented as a read-out on a meter dial or other device.

A dozen or more different parameters can be measured. This station monitor system can also be used to shut off parts of the return system.

Although we described the Starline 300 as epitomizing what was said to be needed, it was more than that–it was the only totally-new piece of distribution equipment shown.

To be sure, other exhibitors talked reliability and redundancy, and everyone had a modular approach so that one-way systems can be converted to two-way. Some of these equipments were new for a particular company. In large part, though, the configuration of all of these equipments, whatever their features, was vintage 1971-72.

Thus, although new equipment was shown by several manufacturers, the products were by and large back-and-fill, rounding out a line or catching up. Manufacturers in this latter category did of course include some advances not available in 1971-72.

AEL Communications, for example, introduced the Mark IV as a single-cable two-way amplifier to complement its Mark V dual-cable equipment. The system could be installed initially as a single-cable forward system and later converted to two-way. (It uses the same push-pull hybrid IC modular amplifier as the Mark V.)

Several companies that had been somewhat unique in their approach to distribution equipment showed gear this year pretty much in conformance to what is emerging as the industry standard.

Thus both EIE and C-Cor announced systems that allocated one trunk for forward transmission, 50 to 300 MHz (with diplex filters for 5 to 30 MHz return) and another trunk with a midband split (reverse in the band of 5 to 108 MHz and forward in the 174 to 300 MHz band). EIE equipment with this capability was designated Model Group 170, part of the company's new Series 100. C-Cor called its unit the two-way A-B system.

Altogether, in EIE's new line, there were four different groups (Models 140, 150, 160 and 170). All are contained in new housings less than ten inches in height.

One of the features of the new C-Cor A-B system is the incorporation of a higher performance bridger amplifier. This unit reduces the number of amplifier stations and filters necessary, according to the company.

The Tocom "Blue Chip" series amplifier was designed to accommodate the two-trunk concept also. Circuitry incorporates push-pull ICs. In Tocom's Blue Chip series, line extenders have the provision for upstream amplifiers being turned off until a signal is detected. This squelch circuit limits noise from distribution lines carrying upstream information.

GTE-Sylvania announced additions to the Series 2000 two-way Trunk Amplifier. New options in-

continued on page CM/E-12

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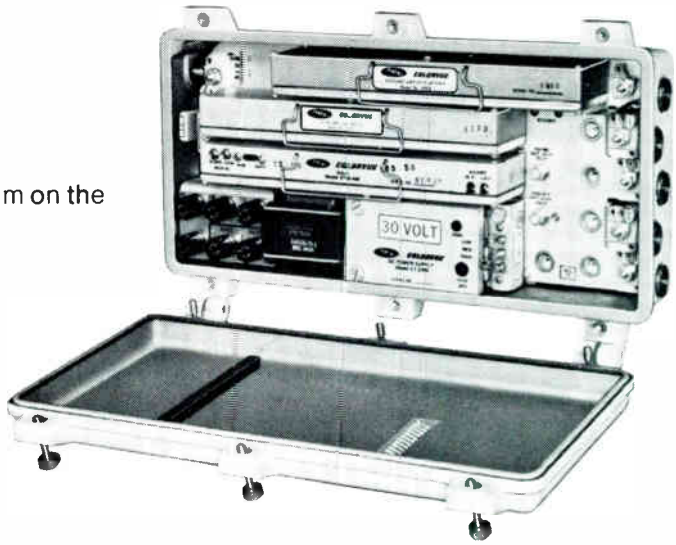

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clude automatic control, bridging with one to four output and "super trunk" operating between hubs. New variations provide for mid-band split and other dual-cable configurations.

Anaconda showed additions to its Century line. New line amplifier was designated the 2109. Incidentally, Anaconda's wall chart of bidirectional cable systems handed out at the convention describes the trunk systems which have become the industry's standard approach.

Stressing the reliability concept hard was Coral with its 2300 series. This series includes redundant amplifiers and power supplies.

Although Theta-Com did not show new equipment, reliability was its theme. It said the hundreds of systems using the XR extended range and XR-2 stations were ample evidence of its reliability.

Magnavox came across at the convention as a major distribution system manufacturer—it took up some 360-degrees of its giant exhibit area showing the MX-404 system, which includes some six options, in operation.

As proof that it's into two-way systems with a full-line capability, Scientific-Atlanta stressed the 800-mile system it is building in Schenectady.

Ameco showed this year, as before, the MetroCom system, including the Nova 5-300 MHz trunk system for two-way. It stressed the value of the Nova "Blockbuster" module for certain applications. Idea is that in high-density areas (city blocks, apartments, etc.), one amplifier with eight modules can provide eight outputs of +50 dBmV each.

A very interesting development was the announcement by the Oak CATV Division and Teleng that the former would be the U.S. and Canadian distributor for the British-manufactured amplifier. Teleng's unit meets U.S. requirements (specs, ICs, modules, two-way, etc.). With Oak now in construction, converters, pay TV amplifiers, and financing, a new industry force may be in the making.

More evidence of the interest in reliability was the emergence of exhibitors stressing standby power systems. Gulton, Interstate Telephone and Electronics and Sola were companies emphasizing such units.

Other power supply manufacturers were Glentronics and Globe-Uniton.

Cable, construction, accessories

Coaxial cable doesn't normally make headlines. Last year it was different: General Cable announced the fused-disc approach. This year things were pretty well back to normal—the only news release put out by a cable manufacturer was again General Cable, who announced the availability of a .750-in. diameter fused-disc cable. Other cable manufacturers stressed quality foremost; some both quality and delivery.

System construction and connectors for cable was another story. Burnup & Sims, generally conceded as the No. 1 CATV construction firm, indicated it's going to be hard to bump from that position by announcing a Fast-Plant/System Design. By linking engineers with a computer, weeks and months of design time can be accomplished in a day, Burnup & Sims said. All the system operator needs to supply is pole distance information and a trunk route—trunk routing decisions are best made by man, B&S says. Actually, all the information B&S needs from the operator can be sent by the phone via standard teletype machine. The computer will take this data and look up as many as 500 solutions.

New competition for B&S and other construction companies was announced at this year's convention. L.E. Meyers Co., a leading electric utility construction company, and Oak Manufacturing, revealed a joint venture plan that would aggressively seek construction jobs. The new company is known as Meyers-Oak Communications Construction Corp. "Bigness" of construction business was shown by exhibits of Cablevision Construction Corp. and Jackson Communications.

Emphasis on construction and construction techniques was readily apparent at the convention. A demonstration by Burnup & Sims showed which of five different expansion loop approaches has the longest life (answer: the one with a longer loop and largest radii of bend). Comm/Scope also had a demo to stress the value of good loop construction. The cable manufacturer also showed a new reel package.

The 1973 Convention exhibits also hammered home the point that not just any connector will do. Several exhibits made a strong effort to show how proper design is necessary to prevent ingress of unwanted RF signals. Gilbert showed a connector that could be spliced into.

The Anixter-Pruzan exhibit was a place to catch it all—this year among new product lines were Raychem, a heat shrink tubing, Cambridge and EG&G connectors; Sola power supplies and safety equip-

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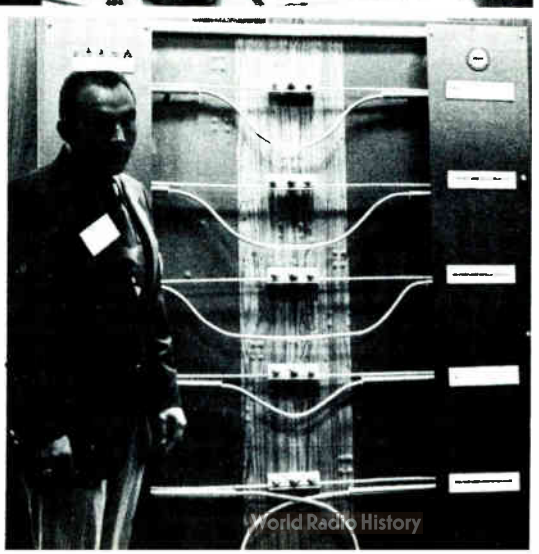
Attendees listen intently to explanation of C-Cor electronic units.



Burnup and Sims had a demo showing which loop construction was best.

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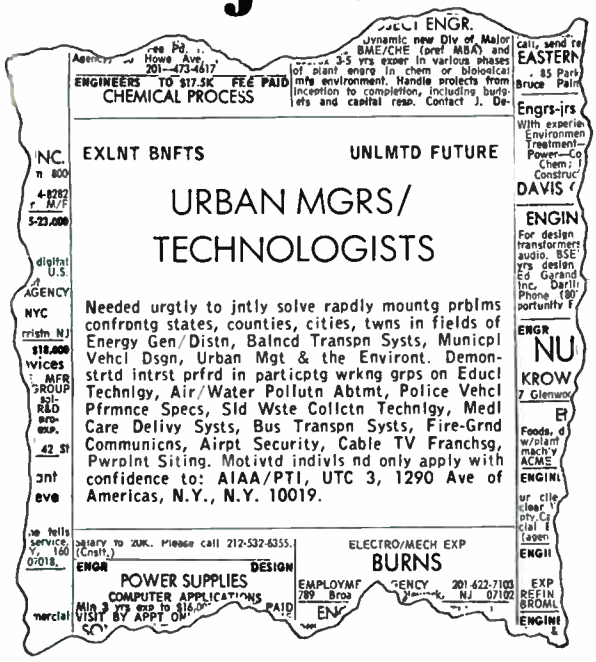
Are you up to the job?



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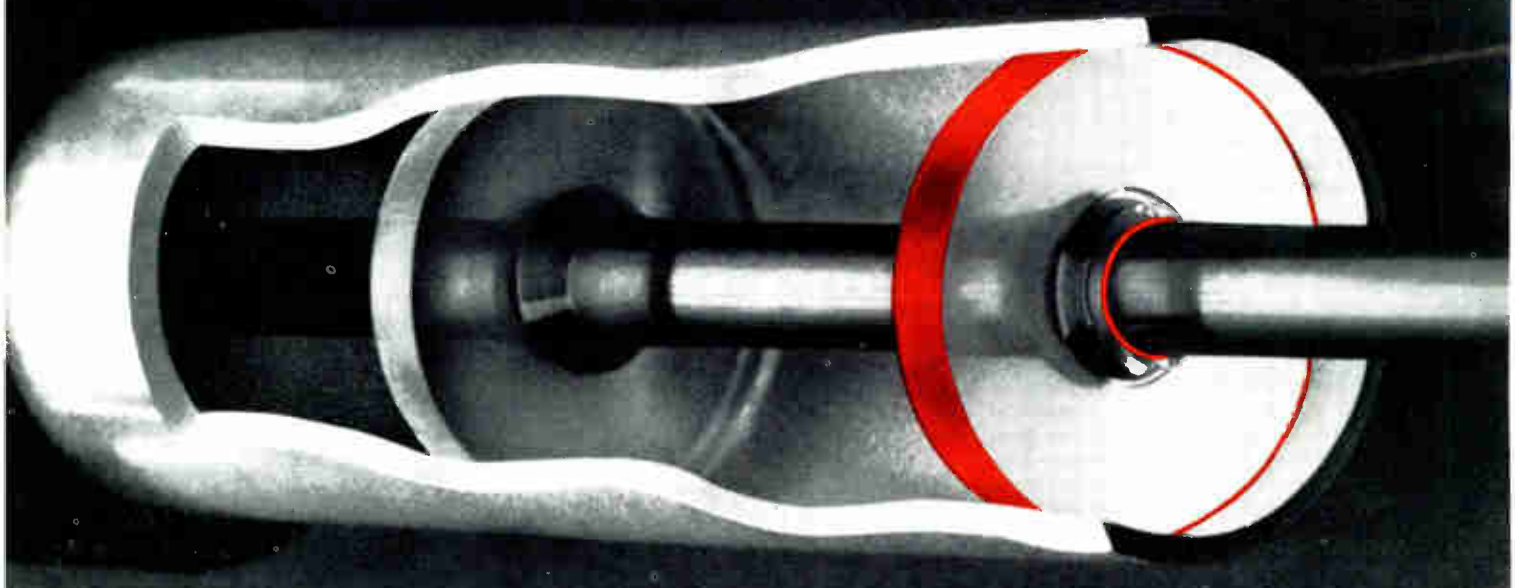
OK. You've decided you can save money with low loss cable, but you're worried about the performance of foam polystyrene cables.

FUSED DISC SOLVES YOUR PROBLEM



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Fused Disc cables give you the benefit of low attenuation plus all-around high quality levels no other cable type can approach.

FACT: The Fused Disc design ensures that the center conductor is held in absolute alignment by the precision formed polyethylene discs. Conductor movement in any direction due to vibration, temperature cycling or forming bends and loops just can't happen.

Not true of foam polystyrene coaxial cables.

FACT: In Fused Disc cable, hermetically sealed compartments prevent moisture migration.

Not true of foam polystyrene types.

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Not true of foam polystyrene cables. Foam does not provide good support. Special care is needed. Ask any contractor who has used it.

FACT: Fused Disc cable gives you remarkable electrical and mechanical uniformity that system designers can rely on.

Not true of any other coaxial cable.

AND MORE FACTS:

SPECIFICATION	FUSED DISC CABLES	FOAM POLY-STYRENE CABLES
Low attenuation for a given size	YES	YES
95% velocity of propagation	YES	NO
Guaranteed ± ½ ohm characteristic impedance tolerance	YES	NO
Guaranteed 35 dB SRL (worst case)	YES	NO
Less than 2% attenuation variation from reel to reel	YES	NO

And that's the story. Fused Disc gives you low loss plus all these other advantages. Available in .412", .500" and .750". Bare or jacketed for aerial. GP armored for direct earth burial.

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ment. (Anixter-Pruzan also showed a major broadening of its line—it is now distributor for Hamlin converters—and Sony video cassettes.)

In other exhibits, one could get a good education on ditchers and trenching equipment. Those not going underground found aerial lift equipment. Telsa was giving visitors a commanding view of the show by putting them in a basket and lifting them above the crowds.

Prosaic items like taps, splitters, etc., held their own. There were new versions about—all to facilitate construction ease. Locking plugs to prevent unauthorized taps were big. Switchboxes to facilitate distribution in apartment buildings were plentiful. Dolphin Communications was among those showing a new unit of this type.

Cable TV gets attention of test equipment manufacturers

The 1973 Convention included several new names. Singer and General Radio—both long-time instrument manufacturers—came to Anaheim indicating that cable TV is a market for test equipment.

The Biddle Company, who has a cable fault locator, was also new.

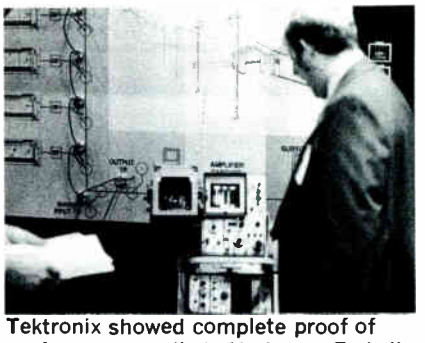
Singer highlighted a Communications Service Monitor, the Model FM-10C. The unit is capable of performing high-accuracy frequency measurement now required by the FCC. Both frequency and modulation measurements are possible and Singer distributed an application note indicating exactly how the equipment can be used.

A complete RF network analyzer (Model 1710) was the main attraction at the General Radio exhibit. This $7750 unit could measure group delay, cable attenuation, filter response, etc.

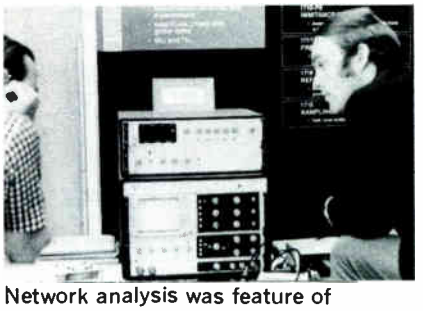
Mid-State Communications showed a new signal level meter which uses an up converter technique similar to that used in expensive spectrum analyzers. Result is good frequency range, accuracy, sensitivity, selectivity and adjacent channel rejection. Fast tuning is possible by pressing a predetermined channel button.

Blonder-Tongue showed a dual-band converter to convert subchannels 5 to 54 MHz and superband signals 216 to 310 MHz to the midbands, thus making it possible

Kay Elemetrics put its new line of cable test equipment on view.



Tektronix showed complete proof of performance, called "No Loose Ends."



Network analysis was feature of General Radio exhibit.

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to read the frequency on any signal strength meter. The user can measure cross-modulation products with the converter and an FSM.

An economical FSM (called a channel monitor) was shown by St. Petersburg Communications along with a calibrator and other accessories.

Kay Elemetrics Corp. displayed a full line of equipment. The 9000 series was designed for proof-of-performance tests. The system includes: a basic storage scope main frame with low cost plug-ins for summation sweep testing, spectrum analysis, loss and return loss measurement and bench alignment.

New equipment shown by Jerrold/Texscan included a new version of the Simultaneous Sweep System. Complete CATV test systems were also shown deluxes (Model 9600) and issue (Model 9700); both included a sweeper and a spectrum analyzer.

Non-interfering monitoring was the sales feature of the Avantek CR/CT-1000 Remote Automatic Sweep System. It offers two modes of operation—swept frequency response and spectrum analysis.

In a bold move which stole attention from other equipment at the Convention was the Tektronix complete proof-of-performance program called "No Loose Ends." Tektronix said the "No Loose Ends" program was just that: a complete way to do required FCC tests—with no loose ends. What caught everyone's attention was the low price. The Tektronix package costs $9700—a far cry from $25,000 proof-of-performance packages once thought necessary. The hardware Tektronix listed included a spectrum analyzer ($4850), pre-amp ($550), mainframe (Tektronix 7313, $2000); digital counter ($1010), and a sweeper (Wavetek) 1801-A, $1445). None of the hardware was new; but a 20-page booklet covering proof-of-performance from A to Z was new, and it was free.

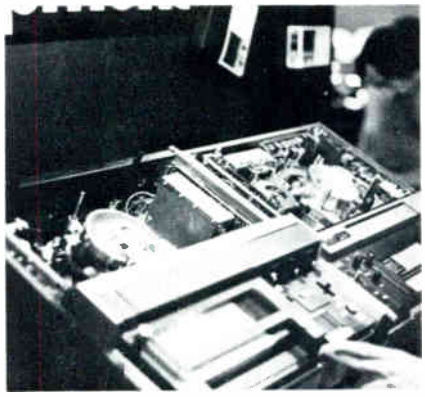
A new cross-mod generator and receiver was shown by Dix Hills Electronics, Inc.

It wasn't exactly a cablecasting convention

Although there probably has never been more cablecasting than there is now at this point in cable TV's history, and although interest in cablecasting is growing, the subject was rather low-key—both at sessions and on the exhibit floor.

Sessions on cablecasting drew in-

continued on page CM/E-18



TeleMation's new U-matic format VTRs opened up for inspection by cable engineers.

Consolidated Video's time base correctors showed their abilities with a variety of video sources.

Whatever your video display/ production requirements, you can rely on Datavision for the right character generator for your specific applications! And at prices that start below $2000! From our economical Model D-1032 right on up to our full capability Model D-2400, you'll find the one that's right for your particular needs—and at the most competitive prices, too. Typical features include:

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Whatever your requirements—Cable and Closed Circuit TV, Television Broadcast, Training/Education Programs, Information/Paging Networks, Industrial Display Systems, Point of Sale Promotion, or a wide range of other applications—Datavision has the maximum capability character generator to meet your every requirement, now and in the future. And—they're available for immediate delivery at affordable prices that start at only $1995!

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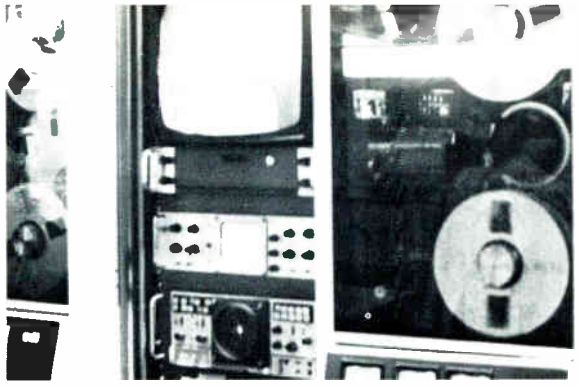
terested but small crowds; cablecasting equipment was lost in the large exhibit center which featured many, many products and services. Giant exhibits were given over to promoting distribution equipment and pay cable systems. Some CCTV exhibi-



Sony's new two-inch helical scan VTRs were put through their paces, along with line of U-matics and other video equipment.

Cinema products CP-16A camera unit is tried for weight and handling at Angenieux exhibit.

EIE promoted their interactive remote terminal which serves up to four subscribers.

Fiddle-free picture quality for your subscribers. Fewer service calls for you.

■ No need for a fine tuning knob on the Oak V-26. The automatic frequency control (AFC) ensures drift-free, stable reception on each channel. The varactor-tuned channel selector provides maximum reliability with little or no maintenance. Oak warranties the V-26 against factory defects for one year. And it's both UL and CSA listed.

The all solid-state V-26 is manufactured by Oak in the U.S. This assures constant and reliable quality control; quick reaction time on orders, repairs, and assistance; and —*very important*—stable pricing which will not be subject to later increase due to currency revaluations.

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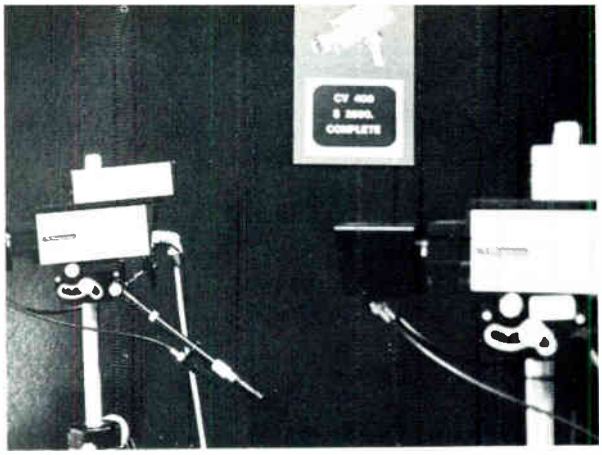
tors of former years decided not to show.

There was more emphasis on information systems, weather and data systems, albeit sophisticated ones, than on studio equipment. Such was the focal point of MSI Television, which had a flashy display, and TeleMation, although the latter did show studio cameras and other origination equipment.

TeleMation featured a new coordinated data display system which included a lower cost character generator system along with a weather station.

The data system could be expanded to a complete electronic display system. TeleMation also showed a new U-matic format VTR which the company expects will cut into Sony's business. The transport system looked rugged, reliable and jamproof.

Sony, in a compact exhibit, showed a full array of equipment—VTRs, cassettes, cameras—but stressed production by featuring a new high-quality helical-scan tape system using two-inch tape, the model MV-10000, along with a sophisticated editor system (Datatron's.) continued on page CM/E-20



Magnavox video cameras got a "live" demonstration in full-line exhibit.

Television Microtime's time-base correctors pulled many viewers.

International Video Corporation's one-inch video cassette system looked compact and rugged.

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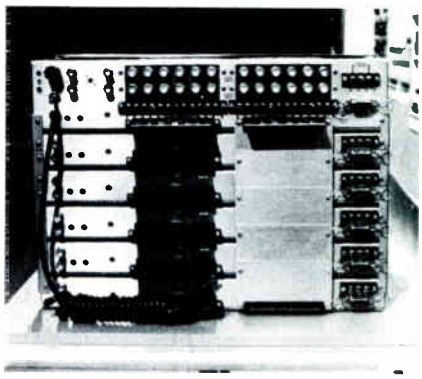
NCTA SHOW

continued from page CM/E-19



Dynair's new Series X audio/video switcher is a "patch cable eliminator" with modular design.

Both Ampex and IVC showed professional studio and tape equipment. IVC was promoting heavily the VCR-100 as a "better quality" cartridge system—high resolution and excellent color fidelity.

Higher quality cameras were stressed more than at previous conventions—not only at the Ampex and IVC booths but by Commercial Electronics, Philips, Gates and Shibaden. The latter offered 3-Plumbicon design at low prices. Stressing good color at low prices was Magnavox. Cohu showed in-between-priced equipment.

One of the more interesting cameras was the ASACA professional portable, the ACC-5000 on exhibit in the F&B/CECO/SOS booth. Its price in the above-$30,000 range seemed too steep for many cablemen.

The two exhibits that drew the biggest cablecasting crowds were those of Television Microtime Inc. and Consolidated Video Systems, who showed stand-alone time-base correctors. The video freaks were delighted–they could take over tapes shot on battery portables and display stable pictures.

There was considerable exhibitor emphasis on telecine and related equipment–Cohu, Laird TeleMedia, Avitel and Ziemark. The latter showed an interesting multiplexer system that would permit previewing as the same one was on the air. (For more details, see Oliver Berliner's article, page 24, this issue.)

Showing inexpensive waveform and picture monitors (in a CCTV system) was Ultra Audio Products.

A useful product for any cablecasting studio is the Dynair Series X-Video Audio switcher—basically a patch cable eliminator. The units are totally modular, eliminating the

World Radio History

need for custom fabrication. Off-the-shelf assembly of almost any configuration is possible. Video-only or audio-follow-video is possible. Key to this modular approach and the circuit design was development of a precise way of making connections. Flat ribbon cable is used between modules. Dynair also showed an inexpensive special-effects generator.

New this year was Arvin Systems Inc.'s magnetic disc recorder. Practical techniques for video animation were shown. Eastman Kodak caught attention with its new Super-8 mm player that would feed directly to a TV set. Supporting the increased use of film in CATV operations was a new exhibitor, Angenieux. The company showed a line of lenses and cameras including the easy-to-use Cinema Products CP-16/A.

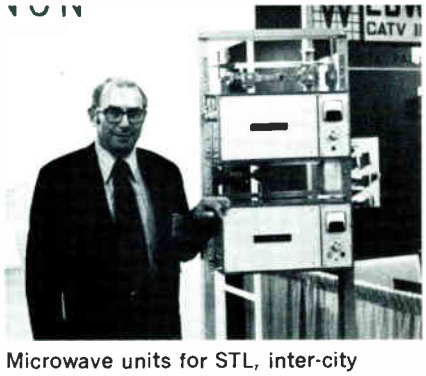
Systems for adding FM to cable were shown by Catel and Tape-Athon.

Accessories for mounting TV cameras were shown by Quick-Set Inc.

Assorted products

Among the more unusual new products at the convention was a programmed switch controller exhibited by Theta-Com (AML Dept.). This unit opens or closes up to 20 output switches at precise times for non-duplication switching, local program switching and deletion or substitution of commercials—any application which requires time-controlled switching.

Program control information in the form of coded tones is placed



Microwave units for STL, inter-city links were on display by Farinon.

on a magnetic tape cassette by operation of the keyboard. Memory capacity is more than 1700 separate switch instructions.

RCA exhibited the XL-100 cable TV receiver which had the built-in capacity to receive 24 cable channels as well as VHF-UHF reception.

continued on page CM/E-24

the strength of "Gibraltar," yet uniquely mobile and flexible.

The Quick-Set Gibraltar Balanced Pedestal offers everything you want for strength, quiet mobility and unlimited versatility.

- 125-pound camera capacity
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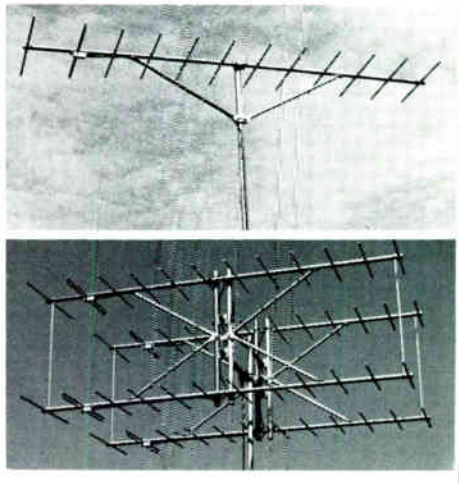

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World Radio History

Make Film Work For You: Simplify Operations With Interfones

By Oliver Berliner

Take advantage of the many fine films available (frequently at little or no cost) and rid yourself of sync and jitter problems associated with videotape. Use also an interfone system.

AS WAS "BROUGHT HOME" at a just-concluded NCTA Convention, there are often *better* ways for the cableman to cablecast than with videotapes he makes himself or obtains from outside sources. Do you have the staff, the studio, the equipment, and the production money to produce your own shows? Are you essentially limited to interviews and low-budget settings? Is your videotape recorder not reproducing broadcast-grade sync pulses? Is your live camera color quality disappointing? Do you *have* color? If the answers you give yourself bring tears to your eyes, consider one potent alternative . . . film!

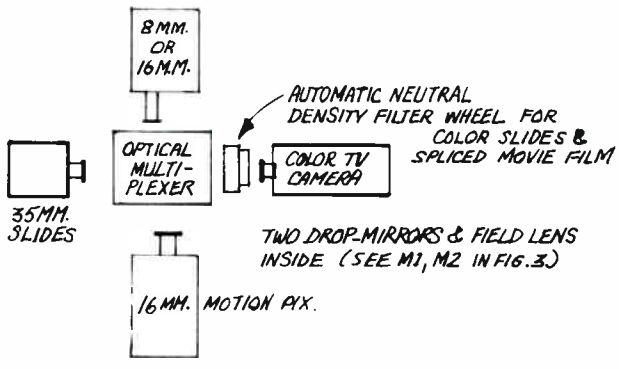
Recent, or even not-so-recent, feature films may have to be ruled out because the nearby commercial stations have long ago gobbled up rights to the libraries. And there are 16mm prints in distributors' hands not available for rent for telecasting until after theatrical showings. But do investigate this possibility. There are film buyers to serve you and there are innumerable lavishly-produced educational films, travelogues, governmental films (domestic and foreign), that are interesting, informative, and downright entertaining, available virtually free of charge . . . and begging for exhibition.

In lining up films, don't overlook the efforts of the college student film makers. Consider also appealing to the amateur photographers in your audience to bring you their best efforts. Why not schedule this as a regular feature—simultaneously improving your public relations and performing a public service. Invite amateurs to become "staff reporters" and shoot color slides of newsworthy events, while making an audio tape to run as a voice-over to these slides. With a *press card* from your CATV system in their pockets, they'll "break their necks" to do you justice . . . especially when you run a slide that gives them the all-important on-the-air credit. (Remember, photography is the nation's number one hobby.)

Yes, in spite of anything you may have heard or preconceived, film is often quicker, easier, and cheaper than videotape. What about the cost and delays in processing, you ask? Well, the news slides shoot 35mm *monochrome reversal* film, and the photographer can process it in minutes. For feature stories or news of less than immediate nature, shoot color and have it back from the lab in about 48 hours or less. Find a way to solve the problem instead of using it as an excuse not to proceed.

Technically, film (motion or still) usually avoids the problems encountered with inexpensive color television cameras or inexperienced crews. And it always avoids the dilemma of the abominable sync stability found in most of the helical VTRs—to say nothing of the lack of real interchangeability of videotapes (even *quad*!) and the inherent problems of noise, dropouts, stretch, "flagging," lockup time, color rendition and level changes . . . even with tapes played on the VTR that made them. Most of the series appearing week in and week out in network or network-affiliated television, and most of the features shot by the "nets" for television are

Mr. Berliner is president, Telaudio Centre, Burbank, California.



Equipment placement for complete three-source film "island."

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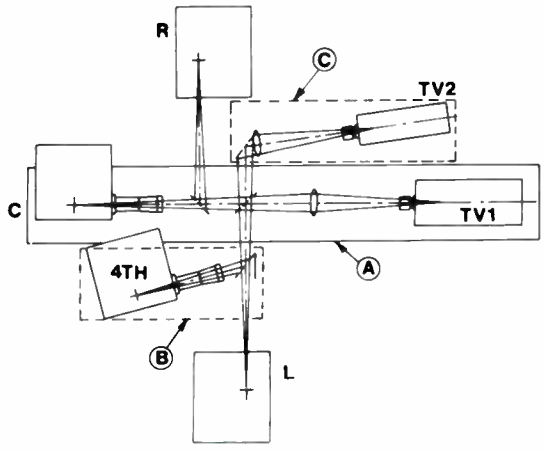


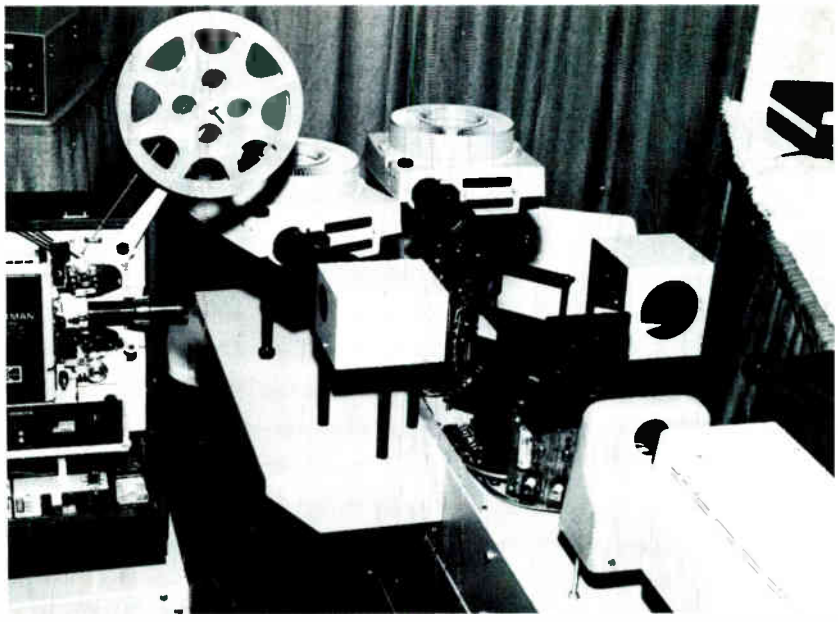


Fig. 2, right, shows four-in two-out film island (one of the movie projectors and the two slide projectors are visible). Island allows operator to preview one source while airing a second; and it allows rapid fill-in if one camera fails. Fig. 3, above, shows projection path. Indicated are: **A**, two drop mirrors on center for changeover; **B**, fourth input, slides, shares with left movie projector is dormant when movie is in use, with selection by swing mirrors; **C**, TV2 is "preview" camera; **R**, right-hand movie unit takes one or three mirrors, depending on camera fed. *(Photo: Don Lauritzen, courtesy Zei-Mark Corp.)*

shot on film—35mm motion picture film, at that. So let's not rush to rule out any form of film just because we've entered the magical world of electronic pictures. And don't overlook the possibility of using your film chain as a film and/or slides-to-videotape transfer service. There are businesses and educational enterprises who might be grateful for the availability of such a service.

Understand the film island

To get the most from our telecine operation we must consider the characteristics and limitations of our *film island*. First of all, recognize that motion picture film must be reversed, otherwise it will appear backwards on television. This is because the film is designed to be projected onto a screen and not into the viewer's (or camera's) eye. This reversal is accomplished via a mirror in the telecine optical system. Obviously, there must be an odd number of mirrors to project movie film; i.e., one, three, or (hopefully not as many as) five. Slides also require reversing. In this instance, just reverse them in the slideholder and project 'em straight into the TV camera. Fig. 1 shows the layout of a standard optical multiplexer.

The "curse" of all low-cost units is that there is no failure protection and there is no provision to preview any film while another is *on-the-air*. If your telecine (T/C) camera fails, you must have another complete film chain on hand. Also, the T/C-man may be unable to precheck his cine film status prior to airing (because the chain is in use) and the video operator has no way of seeing if the film is properly cued or if the correct slide is in proper position.

Commercial broadcasters solve these problems by having a number of film chains, and the networks often dispense with multiplexers and have each movie projector directly feeding its own camera (with optical image reversal added, of course). One manufacturer of fine but modestly priced film islands has just introduced a unique compromise for this problem by adding a number of mirrors to his basic telecine system. The result of this, Fig. 2, is a 4-in/2-out film island permitting the feeding of two slide projectors and two film projectors to either of two television cameras. It is immediately evident that one camera can preview anything while the other is showing something else. And should a camera fail, the same projectors are ready to feed the other camera instantly.

Compare how this is accomplished, Fig. 3, with the single-camera system of Fig. 1 Note that the 2-camera multiplexer permits all projectors to be "on" at any time (without interference) and, most importantly, that with this system it is not necessary to ever optically pass through an unwanted source to get to the desired one! True, this 2-camera system is expensive, but far less so, and less space-taking, than two independent film islands. It is also more versatile. If you plan to put film on the air, plan to expand to this system as soon as your volume warrants it.

Use an interfone system

You may wish to accompany your T/C operation with a paging system if T/C is located in a room separate from the control room. I heartily recommend putting all mechanical (noisy) apparatus in a separate room. This means T/C and VTR;

continued on page CM/E-24

World Radio History

FILM & INTERFONES

continued from page CM/E-24

High-intensity interfone can feed a PA system or accept program audio, or both.

but your space, budget and personnel limitations will make this decision for you. If T/C *is* isolated, be sure it includes an interfone station for the T/C man; and since he may not always have his headset on, many broadcasters have a loudspeaker system for paging Telecine.

The interfone system included on most low-cost cameras is woefully inadequate. We could overlook the poor quality if we could get enough intensity. The latter is particularly a problem on sports remotes, long camera cable runs or in talking to areas of high noise such as Telecine is liable to be. Fig 4 shows a separate interfone system which could be incorporated into your cameras' intercom provided you have wires available, one of which must be shielded. In this system, the audio is actually a dynamic microphone's output carried on the single-conductor shielded wire. Each headset has its own amplifier with one master station required per system of up to 30 stations. The unshielded wire carries power to each station.

You can loop from one station to the next. You can feed program to the stations. You can feed the intercom to a paging system. There's a call light to attract the operator's attention if he's away from his phone. High voice quality, rather than telephone quality, is provided and noise-cancelling microphones are used. The lightweight remote stations may be attached to the user's belt, and the earphones are infinitely more comfortable than the customary telephone operator's headset. These reasonably priced interfones are a worthy addition to your live and film intercommunication lash-up. **CM/E**

NCTA SHOW

continued from page CM/E-21

The importance of microwave was attested to by new exhibitors. In addition to Microwave Associates and Collins Radio—familiar names—were newer companies: Communication Carriers, Farinon, and Soladyne. Of interest in the LDS category: Laser Link did not exhibit.

Phaselock color modulators were the big thing at EIE. Phaselock was the word at Phasecom's exhibit also. Jerrold stressed pre-packaged headends. Blonder-Tongue showed improved versions of single channel VHF amplifiers. (IC switching laser replaced relays.) Ameco described the Mark II heterodyne as still the most advanced. Temco showed a UHF to VHF converter.

Programming

The minions of exhibitors at the 1973 NCTA Convention selling programming services tells something about the industry. There appeared to be more than in 1969-1970, when programmers first thought the millenium had arrived. By 1971, it was almost all over for suppliers, except for one new company, Videomation, which made an inaugural appearance at the Washington convention. It, and Cable Television Network (CNT)), were practically the sole exhibitors with entertainment programs in 1972 (aside from the premium-TV entrepreneurs). These companies were back again in 1973, thus having the distinction of being the choice few to link that first period of illusion to today.

There's been one other faithful, Thomas J. Valentino, music supplier, who expects some day to be rewarded as a source of music with copyright clearance rights—"some day" being the date when cable operators will have to be liable for copyright infringement. In the meantime, the music firm has had to be content selling sound effects and mood music albums.

The offerings of Videomation in 1971 compared to 1973 tell something. Freshly produced syndicated programs hosted by personalities are still a big part of the stable—Julia Meade, Henry Morgan, and various sports personalities—as is a rock show. Gone is the effort to sell how-to or instructional programs. Instead there's more entertainment. In addition, Videomation has moved into production of commercials and, in 1973, had a new concept—programming that could be used to back up, in a professional way, local talent and effort. In other words, tape and film segments were offered to meld into locally-produced children's shows and the like.

CNT's offering in 1973 was a lot of old syndicated material, plus a how-to-play-musical-instruments series prepared especially for cable.

A sign that programming for cable might be truly a viable business was the appearance of new companies with principals that had been through the mill. Rowland Productions was an example. It was offering programming somewhat similar to Videomation, since Jack Brooks was a former Videomation associate. Many of the first-time exhibitors were selling old programs—Trans America Film Corp., Tele-Video Systems, Inc. (very large inventory), and others.

A new exhibitor at Anaheim with a serious intent was the Red Eye Network. The company, in addition to offering its wares, handed out a report on origination showing that a cable operator could afford five hours in which to program if market penetration increases 2¾% (from a base of 5000). Red Eye was ready to produce five hours of programs geared especially for cable TV—none of it tired films.

News for cable was stressed by AP, UPI and Reuters. Your own Washington news bureau was the concept of L/G Productions (754 National Press Bldg., Washington, D.C.). This group is ready to do a weekly interview with a cable operator's local Congressman, for example.

Attempting to pull together a variety of local production groups to serve cable operators was Catalyst Cable Origination Network (211 South Winter St., Yellow Springs, Ohio 45387). This group displayed a tape, "Electronic Highway" (about America), and said it can arrange for production almost anywhere.

Next issue: Technical standards. **CM/E**

World Radio History

BROADCAST EQUIPMENT

Antenna monitor provides direct reading of phase angle and loop current ratio. Model AM-19 (204), FCC type approved under the new rules adopted January 1973, requires no operator adjustment except tower selection by front-panel push buttons. Input level range is 32 dB (.5V rms to 20V rms) without adjustable attenuators. $1660 and up. POTOMAC INSTRUMENTS. **275**

New line of cables for CCTV and VTR use includes camera extension, video-audio-power extension, remote control, remote-control-video, and coaxial types. Models 9254 through 9262, inclusive, cover nine different cables, with various combinations of control, audio, and coax conductors. BELDEN CORP. **276**

Portable quadruplex videotape recorder gives 20 minutes of on-location recording, in full NTSC color. Model TPR-10 is in two units, a transport weighing 45 lbs and an electronics package weighing 55 lbs. Tapes are fully compatible with any standard quad system. Monochrome playback is included for reviewing immediately after shooting on location. RCA. **277**

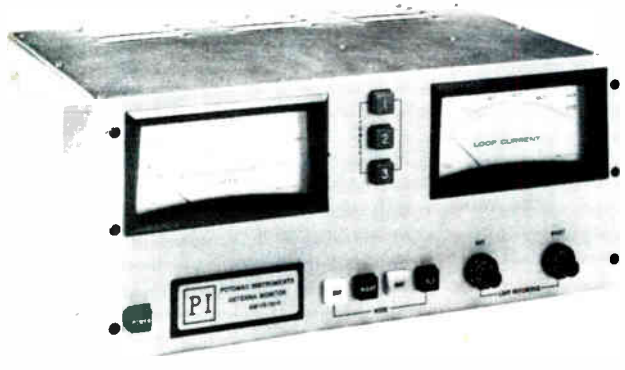
Video signal generator produces greyscale, grating, dot, window, multiburst and flat field signals. Model 615 has grating control for horizontal and vertical phase and frequency, and multiburst phase. Video output is 1 volt across 75 ohms. $1500. COLORADO VIDEO, INC. **278**

Active combining network has differential inputs for 600-ohm balanced circuitry. Model 6X1 mixes six audio sources with no loss, 60 dB source isolation. It has 10K ohm balanced bridging inputs, unity to 20 dB gain, set by potentiometer. $75. ROH CORP. **279**

Noise control devices for discotheques and factories have a sensor triggered at pre-set sound level. The "Electronic Orange" and "Electronic Lighthouse" light a warning signal when preset level is exceeded, then automatically turn off the musician's amplifiers, or the offending machine. CUSTOM ELECTRONIC ASSOCIATES, LTD. (American agent: R-Deck, Inc.) **282**

SCA FM tuner has a phase-locked loop second detector, ceramic IF filters. The Purist Mark I has average sensitivity of 1.5 microvolts, crosstalk main channel to SCA of −60 dB, stereo to SCA of −55 dB. $101.75. PERMADYNE

continued on page 52



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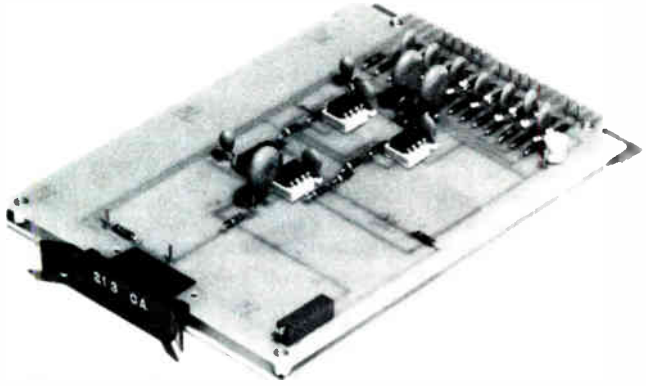
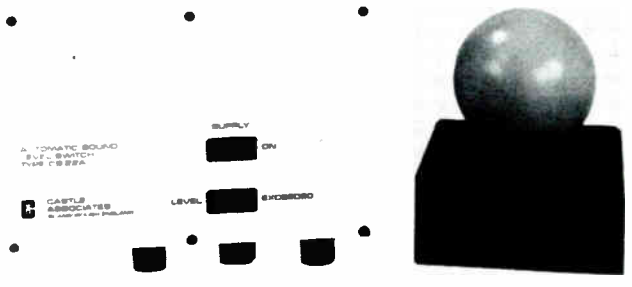
Potomac Instruments 275.

RCA 277.



Roh Corp. 279.



R-Deck, Inc. 282.

World Radio History

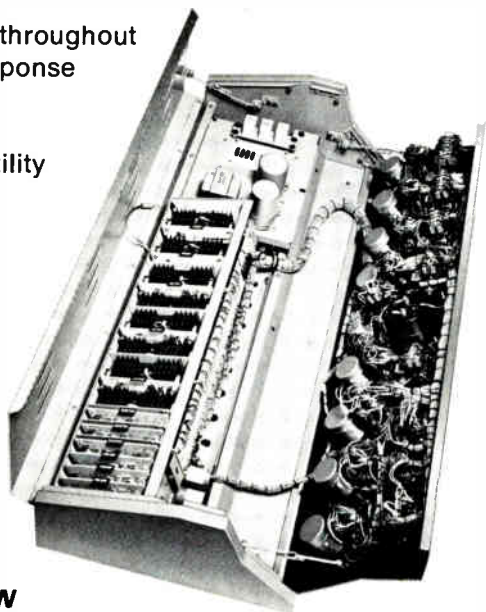
Before you buy an audio console... look inside the GATESWAY 80.

One look will convince you that the Gatesway 80 monaural 8-channel console is the best buy for your money. Here's why:

- Modular solid state plug-in amplifiers
- Program, cueing, and monitor amplifiers all interchangeable
- Step-type attenuators
- Leaf-type key switches throughout
- Excellent frequency response 20-20kHz ± 1dB
- 18 inputs into 8 mixing channels provide versatility

These are a few advantages.

For more information, write Gates Division, Harris-Intertype Corporation, Quincy, Illinois.



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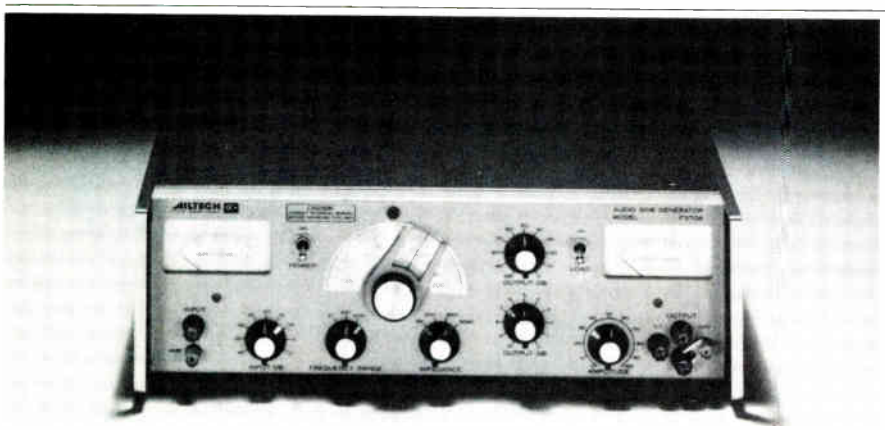

HIGH watts are a must for the effective testing of audio range devices. For such applications as measuring return loss, AILTECH's Model F370 Audio Sine Generator has all the specifications you'll ever need. Model F370 has a frequency range of 20 Hz to 20 KHz; a built-in voltmeter; 110 db control and impedances of 50 to 5000 ohms. If your requirements include input level metering and secondary metering, Model F370 has it all—for only $625. Write today for information on the finest high watt audio sine generator built — AILTECH's **Model F370.**

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PRODUCTS

ELECTRONICS CORP. **280**

Portable VTR system includes camera and recorder for EIAJ-1 standard. Model GS-4500 (camera) has automatic light control, electronic viewfinder, zoom lens, 5.5 lbs weight. PV-4500 (recorder) has automatic gain control, 3-way power capability —110 VAC, nicad battery, or car/boat battery. JVC INDUSTRIES. **281**

Automatic iris control for low-light-level CCTV cameras covers range from bright sunlight to almost total darkness. "Auto-Iris" is designed for cameras with silicon-diode array tube, comes in three models, with 25mm f/1.4 lens, 12mm f/1.4, and 50mm f/1.4. GBC CLOSED-CIRCUIT TV CORP. **283**

Digital printer for output of digital voltmeters, counters, and other devices operates at a speed of at least 2.5 lines per second. Model 2010A prints eight columns of data and two of function; or in a larger model 16 columns of data and two of function. Function symbol generation and decimal position circuits allow interface with digital instruments of most manufacturers. Ten-columns, $795; 18 columns, $875. JOHN FLUKE MFG. CO. **284**

Impulse generator is flat within ± 1 dB from 500 Hz to 35 MHz. Model 93453-1 has useful output DC to 400 MHz, output adjustable in ¼ dB steps up to 121 dB above 1 microvolt/MHz, pulse rate variable 2 to 100 pps. Single pulse is also available. $578. SINGER INSTRUMENTATION. **285**

High energy master tape for high-speed duplication produces low-noise copies. Fuji master tape is said to provide acceptable copies after 250 passes. FUJI (U.S. Distributor: Coltape.) **286**

Diode switch for 18 GHz has insertion loss of 1 dB. Model 33632A is two-diode model. 3364A is four diode model with loss of 1.8 dB at 18 GHz, 1.2 at 12 GHz. Carrier lifetime of both

World Radio History

is 200 ns, allowing 10%-90% switching in 100 ns or less. 3363A, $60; 3364A, $100. HEWLETT-PACKARD CO. **287**

Power supplies for Nixie tubes take input at 5, 6, 12, 24, or 28 volts (to be specified), and deliver 200 volts. Series T is 1 x 1 x ½ in., rated 3 ma. Series N is 1 x 1½ x ½ in., rated 12 ma. T, $15.95; N, $29.95. MIL ELECTRONICS, INC. **289**

Battery-powered video level meter connects into video line to indicate camera output level. Palm-sized unit is intended for CCTV and ETV operators. KALART VICTOR CORP. **290**

Digital monitors have 2-, 3-, or 4-digit readout, can be calibrated to read rates, events per unit time, machine or process time, counts, shaft or other motion ratios, etc. Models in "D" Series operate on 115 VAC, are available with overflow indication, BCD output, have input compatible with most digital sensors. $150-$225. SEQUENTIAL INFORMATION SYSTEMS, INC. **291**

Gated compressor provides "hands free" gain riding for audio inputs. Model SE30 has three-input mixer, with compressor that virtually rides

gain automatically. Memory circuit holds level when input drops out, to eliminate "pumping" or build-up of crowd noise when announcer stops talking. $310.20. SHURE BROTHERS, INC. **288**

Numeric readouts are available with number of digits desired, mounted with bezel and filter for panel output. Series 68000 has snap-in terminal board which can hold decoder-drivers, memory, or counting logic. Lamped readout, $5.90/digit; with decoder-drivers: $11.80/digit. INFO-LITE CORP. **292**

Encapsulated power supply puts out ±12 volts at 100 ma. Model 12100 is 3 x 2¾ x 1½ in., has internal short-circuit protection, operates from 115 VAC. $9.95. KENMARK DEVELOPMENT GROUP. **293**

Dual-station controls for CCTV and surveillance systems operate all scan-

$475 . . . buys LPB's S-9B, the best little high-quality 4 channel mono production board you've seen yet! Features include:

- 2 inputs on each channel
- Mic or hi-level on any channel, plug it up for your requirement
- Solid-State circuits of our big consoles
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- Internal cue and monitor amplifiers
- Cue speaker on front panel
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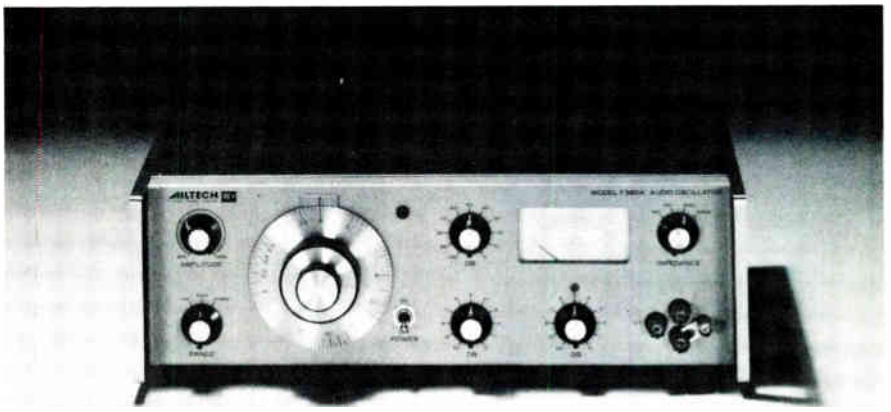

LOW distortion a requirement for the testing, monitoring, and maintenance of your broadcast instrumentation? AILTECH's Model F380A Audio Sine Generator has proof accuracy in one box. Total distortion is less than 0.1%; it has a built-in voltmeter, calibrated in volt and db; a balanced 150/600 ohm output; and a 20 Hz to 20 KHz frequency span. All that for only $925. If you're interested in only the finest in broadcast test instrumentation, AILTECH's Model F380A can guarantee **proof of performance.**

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CBS Laboratories new Video Processing Amplifier is an outstanding performer! For monochrome or composite color restructuring, CBS Laboratories CLD 1300 is *the* universal amplifier. High quality restoration is accomplished through individual controls of video, chroma, reference burst, sync and blanking.

In helical or quad tape use, the CLD 1300 actually improves quality dramatically. And the CLD 1300 can even be used simultaneously as a standby sync generator. From CBS Laboratories, of course.

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Matthey Video Delay Lines

Infinitely variable range of 10-165 ns. in 5 ns. steps, selectable by switches, with fine trim of ± 4 ns. by screw adjustment. Cascade with fixed delay boxes of 50, 200, 500 and 1,000 ns. 75 Ω—fully-equalized—insertion loss .1 dB. In service at all three networks, numerous stations.

Price $80.00—qty. 1-10. Try one at no obligation.

Complete literature and prices on video delays (boxed and PCB modules)—pulse delays —pulse cleaners for under- and over-shoot—low-pass video filters from

Bill Pegler **'phone (516) 628-8068**

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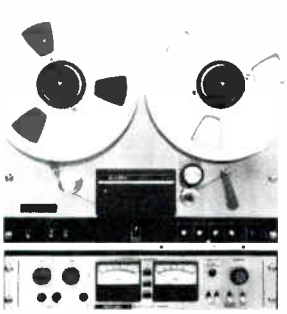
Loaded with Schafer value.



Schafer's new Model RP720-2 professional tape recorder and reproducer provides excellence in craftsmanship and performance at an unbelievably low price. Value-packed features include:

• 3 speeds • Ferrite heads • Positive reel locks • Hysteresis synchronous capstan motor • Plug-in head assembly • Tape index counter

For details on the remarkable performance-to-price ratio of this new tape recorder, contact Schafer Electronics Corp., 75 Castilian Dr., Goleta, Ca. 93017, (805) 968-0755. In Canada: Schafer Electronics Ltd., 5824 Burbank Rd. SE, Calgary, Alberta, Can. T2HIZ3, (403) 253-0351.

schafer Electronics Corporation

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PRODUCTS

ners, pan and tilt drives, autoscan pan and tilt and motorized zoom lenses. Model V160C allows operation from two remote locations. VICON INDUSTRIES, INC. **295**

FM signal generator covers all FM mobile communication frequency bands. Model 800A has output continuously variable from 0.1 microvolt to 0.1 volt, stabilized by temperature compensated bolometer. Dials and scales are direct reading; internal modulation is 1 KHz sine wave or 20 Hz sawtooth; meter reads peak deviation. MCGRAW-EDISON CO. **296**

Auxiliary mixer for 16mm cine sound allows use of microphones additional to those connected to regular camera sound unit, or recording operation by personnel other than cameramen. Model 6C Crystasound Auxiliary Mixer accommodates four low-impedance

microphones, one condenser mike and one line input. It plugs directly into the Crystasound system's built-in amplifier and is powered by same battery. $850. CINEMA PRODUCTS CORP. **294**

Display unit for spectrum analyzer systems has standard-persistence, flat-faced rectangular CRT with electrostatic deflection. Model 712 has variable illumination, 70 dB graticule calibration, linear amplitude calibration over a 40:1 range. Sweep is automatic, manual, or single. $1750. SYSTRON-DONNER CORP. **297**

Mono production console has eight inputs, two per channel. Model S-9B

weighs 12 pounds, has internal cue and monitor amplifiers, built-in speaker. $475. LPB, INC. **298**

World Radio History

NEW LIT

For copies of these literature offerings, circle number for appropriate items on Reader Service Card.

Catalog shows listings and technical data on **Foamflex and Spirafil II coaxial cables** for CATV. Phelps Dodge Communications Co. **209**

Snap-action switches are covered in catalog, with engineering drawings, specifications, and a switch selector-locator that shows in seconds the right switch for any application. Cherry Electrical Products Corp. **210**

Brochure MWD-311, details extensive line of **transferred-electron devices for microwave applications.** RCA. **211**

Multipoint Distribution Service Systems are described fully in brochure with general background on system application, technical details on available hardware. Varian. **212**

Digital incremental readout systems are subject of a technical data sheet with application data and specifications. Sequential Information Systems, Inc. **213**

"High Frequency Signal Sources" is a 20-page booklet describing in extensive detail **signal generators from DC to 2 GHz,** including 17 different units. General Radio. **214**

"Cable Television and Education: A Report from the Field" is a 52-page booklet detailing **actual uses of cable for education around the country.** National Cable Television Association. **215**

Narrow-band video applications are covered in eight-page brochure, including transmission line requirements, signal characteristics, etc. Colorado Video, Inc. **216**

"Silver Prospecting Today" is an illustrated booklet describing the various systems for **recovering silver from film-processing apparatus.** HF Photo Systems, Technology Incorporated. **217**

Cross-reference catalog shows comparable **Littelfuse and Bussmann numbers for hundreds of standard fuses, holders, clips, etc.** Littelfuse, Inc. **218**

All current test instruments and related products are covered in new short-form

continued on page 56

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Stanton's 681 Series is the Calibration Standard to recording engineers such as Robert Ludwig.

Whatever the requirements for recording and playback, Stanton's Series 681 cartridges are the Calibration Standard. And there is a 681 model engineered specifically for each of these critical applications. That's why Stanton is truly the Benchmark for the industry.

The Stanton 681A—For Cutting Head Calibration. With Stanton's Model 681A, cutting heads can be accurately calibrated with the cartridge, for it has been primarily designed as a calibration standard in recording system checkouts. Frequency response is factory calibrated to the most rigid tolerances and the flattest possible response is assured for precise alignment of recording channels.

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All Stanton Calibration Standard cartridges are guaranteed to meet the specifications with exacting limits. Their warranty comes packed with each unit – the calibration test results for that individual cartridge.

For complete information and specifications write Stanton Magnetics, Inc., Terminal Drive, Plainview, L.I., New York 11803.

All Stanton cartridges are designed for use with *all* two- and four-channel matrix derived compatible systems.

STANTON

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Front-Mounted VU Meter for CP-16/A Cameras

The new front-mounted auxiliary VU Meter provides the TV-news-film/documentary cameraman (working an assignment on his own) with an important added control. The auxiliary VU Meter is mounted in front of the CP-16/A camera, directly across from the lens eyepiece, permitting the cameraman to make swift periodic checks on the recording level by simply glancing sideways for a split second. The auxiliary front-mounted VU Meter's dial illumination light also serves as a pilot light to indicate that the Crystasound amplifier system is on. The standard VU Meter, located at the rear of the built-in Crystasound amplifier control panel, continues to operate even with the front-mounted auxiliary VU Meter in use. The auxiliary VU Meter is easily mounted and removed from the CP-16/A camera body.

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PROTECT your broadcast equipment against lightning surges with WILKINSON AC LINE SURGE PROTECTORS

Excessive voltage surges caused by lightning, transformer arcing and induced transients are everyday occurances that cause heavy damage to valuable broadcast equipment.

Now through the use of WILKINSON voltage sensitive Line Surge Protectors you can protect your equipment from line surges that may exceed even twenty times the normal line voltage.

A WILKINSON pulse compensated Line Surge Varister, is placed across a line of its rated voltage. Should a surge or increase of voltage occur, the resistance of the varister decreases at log scale as the voltage increases, thus acting as a momentary load or short circuit to the surge. WILKINSON Line Surge Protectors draw little or no current and are capacitor compensated for microsecond surges, thus damping all line disturbances as well as excessive voltage increase.

A small investment in WILKINSON Line Surge Protectors is your assurance that your valuable broadcast equipment will not be damaged due to line surges.

Model SIA-1	110 V.	Single phase	$150.00
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Model SIA-3	220 V.	Three phase	$350.00
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NEW LIT

catalog. Hickok Electrical Instrument Co. **219**

"Cinema Perspectives" is a quarterly publication with feature articles on new motion picture techniques and applications of motion picture photography around the world. Cinema Products, Inc. **220**

Push-pull broadband power amplifier is subject of application sheet describing design, construction and performance of a 100-watt, 225-400 MHz amplifier. Communications Transistor Corporation. **221**

"Mastering TV Distribution Systems" is a new **MATV design guide,** a 64-page book showing detailed specifications for 38 different systems, with sections in addition on basic MATV design theory. Jerrold Electronics Corp. **222**

New 12-page catalog shows full line of **microwave studio-transmitter links and intercity relays,** with general design background and full technical specifications. Marti Electronics Inc. **223**

Directory shows more than **5000 currently popular electron tubes** of all manufacturers, with quantity prices. Metropolitan Supply Company. **224**

Brochure covers full line of **trunk, distribution and extender amplifiers and accessories** for 50-220 MHz, with specifications and mechanical data. AEL Communications Corp. **225**

"A Selection of Application Ideas" shows in full technical detail more than 20 different ways of using **video switchers, modulators and related equipment** in videotaping, ETV, monitoring, switching, etc. Dynair Electronics. **226**

A 68-page technical booklet describes **how to choose the right digital voltmeter** with general background on DVM design, A/D conversion techniques, etc. Hewlett-Packard. **227**

"What Happens to Your Film At the Lab" **describes film processing techniques,** with a tour of a typical lab, and constitutes a basic introduction to laboratory procedures. Motion Picture Laboratories, Inc. **228**

Catalog covers **emergency lighting equipment,** and shows technology of life safety egress illumination, data on OSHA and the Fire Protection Code, and complete line of emergency light systems. Teledyne Big Beam. **229**

"a complete monitoring system"

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World Radio History

CROSS-TALK

Feedback On Video Production Switchers

Reader reaction to the special emphasis in June on video production techniques has been enthusiastic—particularly about Eric Somer's "Television Creative Palette." Our brief historical recap, page 30, stands corrected, however, by the following letter from Bob Hueffed of Central Dynamics Corp. Please note also the proper photo of KOOL-TV's Sarkes Tarzian switcher.

Dear BM/E:

"Video Production Switchers—A New Breed Is Available" was a timely feature in your June 1973 issue and certainly highlighted manufacturers' responses to many of the industry's real needs.

Your unique and enviable position to accurately evaluate the industry was manifest in your editorial content.

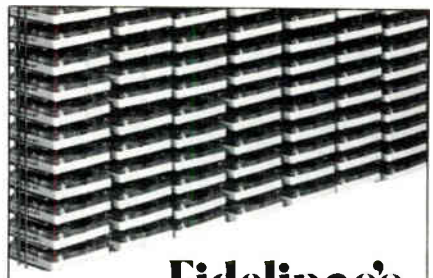
Your awareness also steered you to the current buzz words—"production and editing back into the studio control room," "human engineered," "simple operation yet extreme flexibility for creative talent," "production of locally-produced spots," "mix AND effects on each bus," and "cost-effectiveness."

However, I do take issue with the history and chronological order of the introduction of *some* of these "New Breed Switcher" features.

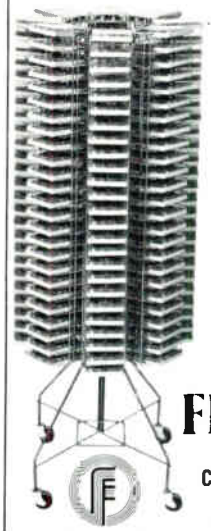
All solid state switching and systems were installed almost ten years ago. Meeting and maintaining exacting specifications has also been a reality for a long time. Operator-oriented switcher designs, "human engineered," are at least four years old. Mix *AND* effects amplifiers, simple operation, IC circuits, flexibility, production capabilities of locally-produced spots, and cost effectiveness also have a birth date of 1969.

To be specific, I'd like to submit the following brochures and infor-

continued on page 58



Fidelipac's Hot Convertible



The new Cart-A-round Storage Racks. Each WR-25 Modular Rack holds 25 Type A Cartridges . . . eight can be mounted on our Mobile Carousel Base to make up the MR-200. Convert to wall mount by using the brackets supplied.

Want more information on Cart-A-round Racks and the other new Fidelipac Professional Accessories? Contact your distributor or

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Spotmaster

Compressor-Limiter Amplifier

(The Great Leveler)

$465!

You can stop riding gain now, even when a shouter and whisperer are on the same talk show. The Model CLA 20/40 Compressor-Limiter Amplifier does it automatically . . . instantaneously . . . for both AM and FM. Switchable controls permit symmetrical (FM) or asymmetrical (AM) peak limiting; pre-emphasized or flat response; compress/limit, compress only, or compress/limit off. Automatic gain control range is 40 dB dynamic, and the compression ratio is better than 10:1. All solid state, plug-in modular construction assures trouble-free reliability. Write for details.

BROADCAST ELECTRONICS, INC.
A Filmways Company
8810 Brookville Rd., Silver Spring, Md. 20910
(301) 588-4983 • TWX 710-825-0432

SYSTEM CP-16 NEW from cinema products

Crystasound Pre-Amplifier for CP-16/A Cameras

The Crystasound Pre-Amplifier optional accessory provides the CP-16/A camera system with an additional condenser microphone capability—without requiring the use of the Crystasound Auxiliary Mixer. When the Model CM-1 Pre-Amplifier unit is plugged in, the CP-16/A Crystasound built-in Amplifier will still accept two low impedance microphones and one line input—as well as one Sennheiser 804/805—series condenser microphone, with all systems controlling the Crystasound built-in Amplifier remaining fully operational. All required power is supplied by the same NC-4 nicad battery pack powering the entire CP-16/A camera system.

For further information, please write to:

cinema products CORPORATION
Technology In The Service Of Creativity
2044 Colner Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 ■ Telex: 69-1339 ■ Cable: Cinedevco

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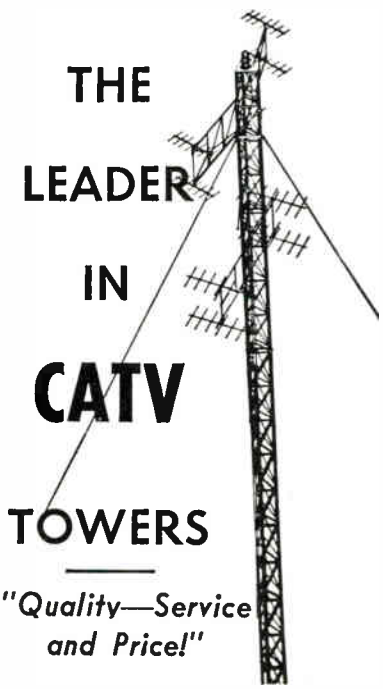

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"Quality—Service and Price!"

Yes, quality, service and price on CATV systems are the reasons for Fort Worth Tower's position as the industry's leading supplier. Experience gained as a pioneer supplier of CATV enables Fort Worth Tower to provide you with a quality product at a price that is reasonable and attractive.

Take advantage of our experience. For assistance in systems planning, engineering and complete systems quotations . . .

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CROSSTALK

mation for your "Who's Who" and "What-Where-When-Why and How" file:

1964: Central Dynamics introduced its VS-100 series all solid state, vertical interval, color video switcher.

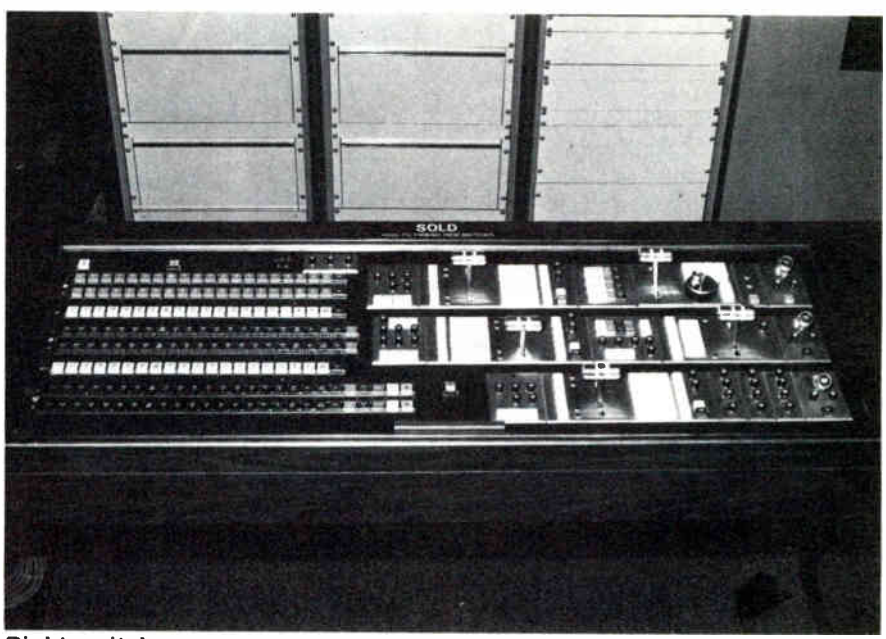
1969: Central Dynamics, at the NAB, introduced its series VS-800 Video Production Switcher—human engineered, oriented for production people and studio production work, and with a patented Mix AND Effects amplifier.

1973: Central Dynamics at the NAB, introduced its series VS-1200 Video Production Switchers with up to three CDL unique and patented Mix/Effects amplifiers, soft edge wipes and keys, vignettes, borderline keys, spotlight, and transparent matte picture framer.

Although Central Dynamics' equipment was not one of your feature articles, we take great pride in realizing that for years we have been anticipating and meeting the industry's needs and that the "New Breed of Switchers" are reflections of CDL's creativity and advancement.

Be assured that your readers can continue to look to CDL advancing the state-of-the-art—(and hopefully reading about it in *BM/E*).

Robert G. Hueffed
Vice President
Central Dynamics Ltd.

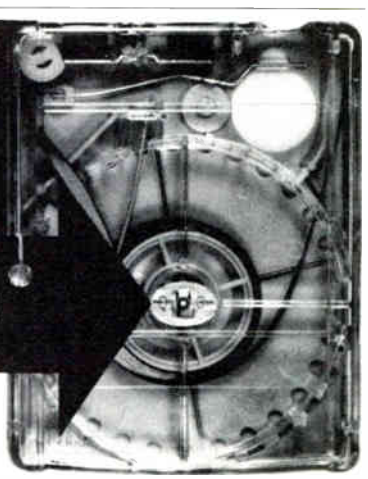


Right switcher

The production switcher pictured on page 31 of the June issue of *BM/E* was identified as being the one used by KOOL-TV, Phoenix, Arizona. That's not so. KOOL-TV's production switcher is shown above.

SPOTLIGHT

For a quality spot, SPOT QUALITY!



This gold seal assures you of the finest quality, fresh tape, factory loaded by Fidelipac® under strict quality controls. At a glance, know that you can trust the splice and tape tension and depend on accurate tape run-out. COMMUNICATION MEDIAS and FIDELIPAC® where quality is understood. Contact us for pricing information.

COMMUNICATION MEDIAS
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World Radio History

NEWS

continued from page 18

gust 27-29, on legal "packaging" of television and motion picture programs: info, PLI, 1133 Sixth Avenue, New York City.

Sola Electric has rescinded a selective 4.5% price raise, announced early in June, in response to the President's June 12 price freeze . . . **Memorex** has instituted a lifetime warranty on its Quantum/L computer tape and Mark X/L Disc Pack.

People

Lynd John Carter joined Lenco Electronics as sales manager . . . **James Gabbert,** president of KIOI-FM, received a Golden Mike award from the Institute of High Fidelity for innovations in hi-fi sound . . . **R. Brent Judd** became chief engineer of San Diego Video, Inc.

Sam Cook Digges, president of the CBS Radio Division, won a Missouri Medal of Honor from the University of Missouri for his "contributions to radio journalism" . . . **Don Herman** is the new coordinator of field activities in Delaware, Maryland, Virginia, West Virginia, and District of Columbia for Broadcast Electronics, Inc.

James R. McQuade won appointment as manager of WCBS-FM in New York . . . **Alan S. McDonald** has the new position of marketing analyst for TelePrompTer . . . **Lad F. Hlavaty** is the new vice president and director of engineering for RKO General's television division . . . **Charles P. Ginsburg,** vice president for advanced development of Ampex Corp., was elected to the National Academy of Engineering.

Garrity

Glade

Desmond A. Garrity became vice president and director of corporate planning for General Cable Corp. . . . **Tom Longfellow, Louise Seymore,** and **Larry Duke** were all named vice presidents of the Arkansas Radio Network . . . **Paul Glade** joined Anixter-Pruzan as CATV sales representative.

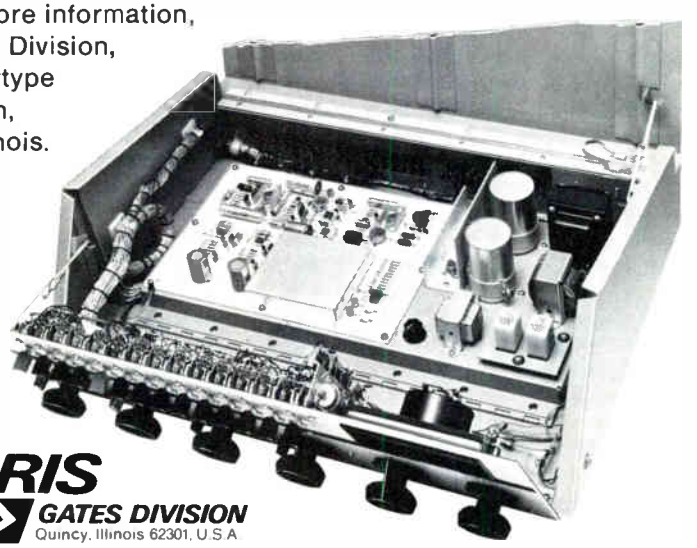
continued on page 60

Once you look inside the STUDIOETTE 80, you'll buy it.

You'll see why the new Studioette 80 is the quality buy of solid state, 4-channel audio consoles.

In the Studioette 80, 13 inputs into 4 mixing channels provide maximum flexibility. All inputs and outputs are protected by isolation transformers. Reliable, step-type attenuators, used in each of the 4 mixer channels, assure quiet and reliable audio operation.

For more information, write Gates Division, Harris-Intertype Corporation, Quincy, Illinois.



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GATES DIVISION
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SYSTEM CP-16 NEW from cinema products

Auxiliary Side Cover for CP-16/A Cameras

The Auxiliary Side Cover is ideal "insurance" for TV-newsfilm cameramen using CP-16/A cameras with Crystasound built-in Amplifiers. Under difficult news filming conditions where it is possible for the Crystasound Amplifier to be damaged (and where such field damage cannot be repaired at once), having a spare auxiliary side cover available permits the CP-16/A cameraman to instantly dismount the Crystasound built-in Amplifier, replace it with the Auxiliary Side Cover, and continue sound filming using an external Auricon-type amplifier.

Rear of Auxiliary Side Cover showing the 8-pin sound cable connector, compatible with all Auricon-type amplifiers.

For further information, please write to:

cinema products CORPORATION
Technology in The Service Of Creativity
2044 Colner Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 ■ Telex: 69-1339 ■ Cable: Cinedevco

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World Radio History

NEWS

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Robert W. Sarnoff, RCA chairman, got a special citation from the International Radio and Television Society for "twenty-five years of leadership in broadcasting and communications" . . . **John B. Chaney, Jr.** joined Jerrold Electronics as an MSO account executive.

Erwin Parthe is the new program director of WNEM-TV, Bay City, Michigan . . . **John N. Catlett** became manager of WBBM-FM, CBS Chicago station . . . **John W. Elsasser** joined Theta-Com as manager of cable sales.

Elsasser

Lambert

Wm. H. Lambert was named vice president and division manager of Jerrold Electronics' CATV system division . . . **Robert E. Buescher** is the new manager of eastern sales and **Robert S. Dickinson** is manager of western sales, RCA Film Recording Systems.

Eric King was named northeastern sales manager for Vital Industries . . . **Nick Morris** won appointment as national sales manager of Bozak, Inc. . . . **Robert E. McIlvane** became vice-president, sales, for Anixter Bros., Inc.

Margaret A. Richards became assistant to the manager, commercial products, of International Rectifier's semiconductor division . . . **A. Clinton Ober** was appointed national subscriber sales manager of Community Tele-Communications, Inc. . . . **John W. Overton** has the new position of market manager, consumer professional markets, 3M Mincom Division.

George F. Mooney was named account manager of Paradyne Corporation . . . **Jack Sumroy** joined WSNL-TV, Long Island, New York, station, as vice president for programming and promotion . . . **David Packard,** chairman of Hewlett-Packard and former Secretary of Defense, will receive the Medal of Honor of the Electronics Industries Association at the EIA Spring 1974 conference.

Paul D. Askos is manager, national product sales, Ameco, Inc. . . . **James A. Monroe** was named central Arizona district manager for Arizona Cable TV . . . **Remi Nadeau** joined Collins Radio Co. as director of advertising and public relations.

Askos

Wulliman

Richard D. Petit is vice president of engineering, and **Gene Parole** is vice president of manufacturing, both for K'Son Corporation . . . **James Wulliman,** manager of engineering at WTMJ, was elected president of the Society of Broadcast Engineers.

Darrell Wells has joined Anaconda Electronics' CATV Division as customer service rep at Anaheim . . . **Ronald H. Fried** and **Daniel J. Yomine** have been named senior vice presidents at International Video Corp. **BM/E**

the "performer" class A state-of-the-art

Class "A" and educational broadcasters can now enjoy the same quality and superior signal characteristics of major stations . . . at a budget price, with budget installation and maintenance costs.

Efficient design is the key. The "Performer" is elliptically polarized for a clearer signal, even in the fringes of your broadcast area. And its low VSWR guarantees you better stereo performance.

Built to last, the "Performer" features thick-wall copper tubing and marine brass. It's the best FM antenna bargain on the market today.

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JAMPRO

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World Radio History

COMPUTER

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plain about increasing administrative costs. Another, on the East Coast, worries about the foul-ups in traffic and engineering. Yet another points to collections as "the" problem.

In fact, "the" problem lies in the nature of the business—its fluidity and the immediacy of its needs. A solution must address the problem as a whole. The requirement is for operational efficiency and stability, and this can be attained only by applying a proper system and associated controls to the entire broadcast business cycle.

That, simply stated, is the philosophy behind the IBM System for Television and Radio. It is designed to provide the broadcaster with effective control over his entire business cycle—from "avails" and contract management through the daily log, aired log update with discrepancy reporting, accounting, sales analyses, and demographics. It follows the flow of broadcast dynamics, providing control at the critical points, and supporting management with the analyses and data needed to maximize profits and control the business.

The System for Television and Radio is written for the small-scale System/3, which was specifically designed to be used by companies with no prior experience in operating computers. It consists of a set of six interrelated programs that interact with a data base containing information such as advertiser contracts, airing instructions, program schedules, daily logs, billing and demographics data. This information is maintained in direct-access magnetic disk files, which are updated as operations proceed and from which information is retrieved quickly as needed.

The system is designed to minimize data preparation and improve communications. For example, contract data which has an effect on a number of departments represented in the data base is entered only once. The system automatically updates all related files, and the information thus becomes available to all areas concerned. Documents such as intermediate and final program logs, availability reports, and reports on contract status are generated quickly and efficiently on request.

With the station's key operating information in the computer, the system provides the support functions needed to control operations. It satisfies contract specifications by automatically scheduling the bulk of spots, performing horizontal and/or vertical spot rotation where requested, and by providing an easy method for the broadcaster to schedule those "difficult" and "special" spots. Then it produces the following operating documents:

1. An availability worksheet that describes the status of all scheduled spots and opens;
2. A summary highlighting degree of program success in terms of open spots, fixed and preemptible sales;
3. A contract listing to aid in planning and scheduling activities, providing information on spot

continued on page 62

PERFECT YOUR CCTV SYSTEM WITH COSMICAR® LENSES

TV-COSMICAR-EE 16mm F/1.6

The TV-COSMICAR-EE 16mm f/1.6 is a high-speed EE lens specially designed for 2/3" vidicon cameras. It maintains image luminance 100 lx against subject brightness between LV11.3 ~ 17 (350 ~ 18,000 cd/m²), about 1,800 ~ 96,000 lx.

The automatic electric-eye diaphragm close down completely provided that subject brightness exceeds approx. LV20 (144,000 cd/m²), 768,000 lx. In case the camera is switched off and not in operation, the automatic diaphragm closes down, completely shutting off the light for protection of the vidicon camera.

The "Change-over Switch" in front of the lens controls the operation of the diaphragm.

When the switch lever is turned on to "EE", the lens diaphragm operates as fully automatic electric-eye, and is brought on to "OPEN", the diaphragm stays fully opened condition.

Be sure to get the finest image recording results with quality Cosmicar lenses.

Also available are scores of other lenses, ranging from 8.5mm to 1,000mm telephoto, zoom and those motordriven among them, for immediate delivery, after being tailored to your specifications.

COSMICAR **COSMICAR OPTICAL CO., LTD.**

424, Higashi-Oizumi, Nerima-ku, Tokyo, Japan Cable Address: "MOVIEKINO TOKYO"

Representative & Service Office: Asahi Optical (America) Inc. 15 East 26th Street, New York, N.Y. 10010, U.S.A.

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World Radio History

airing schedules, makegoods, airing performance, invoicing and cash receipts;

4. A contract exception list, to help control contracts, improve customer service, and assist in sales and financial planning;

5. A confirmation, that identifies original orders and substitutions;

6. A list of scheduling conflicts that identifies those situations which need special attention; and

7. A list of airing instructions that allows the system to track customer specifications—thereby reducing errors, makegoods, and lost revenue.

The system goes on to produce preliminary logs for any date specified leading to the production of a final log. As the engineer airs broadcast events, he records his activity on the log, in effect filling agency/advertiser orders. He also notes on the log any deviations from the schedule, with explanations.

When aired data is entered into the computer, the system updates the log and contract information and produces a discrepancy report. This helps management pinpoint when and why a discrepancy occurred, and indicates where makegoods are required. It is a means of assuring that makegoods do indeed get scheduled.

The accounting portion of the system produces the standard invoice, or, if desired, a customized format. Also produced are a cash application list for internal cash/credit control, and an aged invoice status report showing the invoice date, amount, and amount paid to help control receivables.

Then, continuing to follow the logical information flow, sales reports are produced by agency/advertiser, by salesman, and by product. The latter highlights those products that are or are not advertised on the station, leading to sales strategies aimed at maintaining or increasing current business and going after new business. A revenue projection based on business in-house serves as the basis for understanding trends and for resource planning.

The system can also produce a demographics report showing cost-per-thousand for stations and programs in a given market.

Customarily, different departments in a station interact through direct contact, or by telephone. By their very nature, these contacts tie up a number of people. They are relatively inefficient, often requiring followups. As the time for a given broadcast approaches, the pressure to have all needed materials on hand increases, and adds to the already existing potential for error.

In contrast, the computer makes timely operating data available through regular reports and listings, and also permits inquiries into one common data base on a random basis, for up-to-date information, for checking and/or for modification.

Someone in traffic, for example, may want to make modifications to an upcoming log. He goes to the computer, where either he or a machine operator taps a few keys on the typewriter-like keyboard of the System/3's console. The computer finds the desired information in the data base, and immedi-

Spindler & Sauppé TV film chain 2x2 projectors

your widest
and wisest choice

Seven models in all—one of which will fit your needs *exactly*. Color or monochrome; uniplex or multiplex; forward or reverse actuation; sequential or random access; 16- to 96-slide capacity. These are thoroughly proved performers, built to the highest professional standards, and recently updated with advanced electronics.

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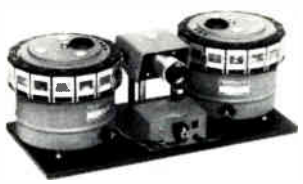
SPECTRUM 32B: The most advanced film chain slide projector available. For color or monochrome chains; 32-slide capacity. Many exclusives. Operates at 120V, 50/60 Hz. Spectrum 32F operates at 220V, 50/60 Hz.



MODEL 332: Newest version of the workhorse of the industry. For monochrome chains; 32-slide capacity. Model 322: single turret for 16 slides, monochrome or color.

MODEL SLX-TV: 96-slide capacity, random access. Model SLS-TV: 48-slide, random access. Model SLD-TV: 96-slide, sequential. Model SLR-TV: 48-slide, sequential, forward/reverse. All for monochrome or color chains.

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World Radio History

ately acts on the instructions provided, by either adding, deleting or moving the appropriate data. Or, someone in sales may want to check an availability. Again, the information is instantly retrieved.

Everyone works from a single source of information, and that source is likely to have far fewer errors than separately-maintained information sources in different departments. The information is more complete and up to date, and it is available on demand to the people who need it as part of the station's normal flow of work.

The System for TV and Radio is written in an English-like programming language, known as RPG II, that has been learned and used by thousands of people with no previous knowledge of the computer. The language includes forms on which operating information is recorded, to speed and simplify entry into the computer. The System/3 itself has "miniaturized" components and takes up little floor space.

With all these user-oriented characteristics the computer system becomes an in-house resource, tailored to meet the specific needs of a station and its management. For instance, the "tailoring" can include special reports and/or procedures desired by individual station managers, readily produced with minimal programming effort on the user's part.

With its own system thus geared to support its own particular operations, management is in position to adapt quickly and effectively to evolving needs, and to take maximum advantage of new opportunities. **BM/E**

FCC Rules & Regs

continued from page 24

more applications for the call are received within 15 days, the recipient will be the station with the longest continuous record of broadcasting operation under substantially unchanged ownership and control.

Thus a rule of *seniority* replaces the "first-come-first-served" rule in the special case of competition for relinquished or deleted signs. In other situations, "first-come-first-served" is still the rule.

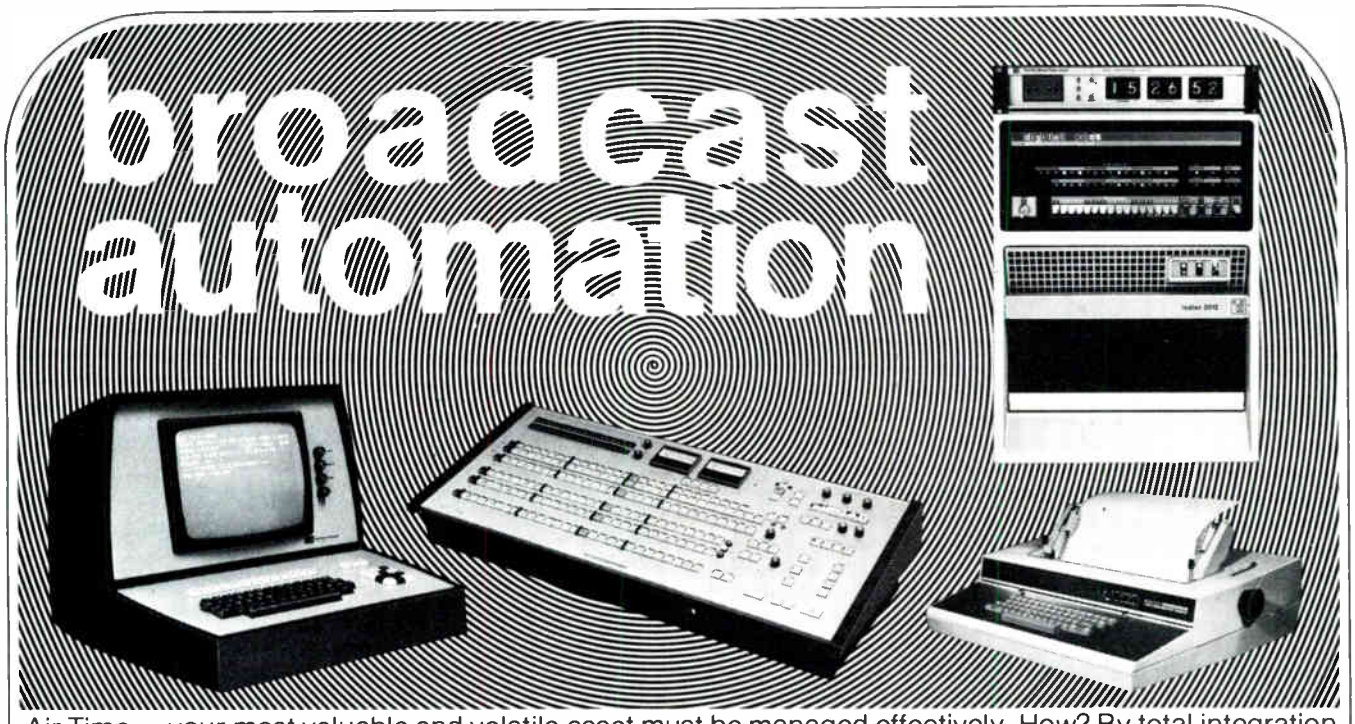
A refinement of the relinquishment provisions prevents the re-use of a relinquished call sign in the *same* community within 180 calendar days, except by the same licensee or its successor-in-interest.

Summary

The call sign Rules are principally directed against two problems. First, there is the need to prevent confusion among stations, particularly in the face of some licensees' apparent desire to capitalize on such confusion. Second, there is the problem of "trafficking." The present call sign Rules have grown out of the Commission's experience with these problems.

Broadcasters should always check with communications counsel as to availability of desired calls, timing of requests and objections, and required filing fees.

Finally, it should be noted that, while the new Rules do not deal with the problem, the Commission expressed its continuing concern over frivolous requests for call sign changes; a later pronouncement on this issue may be expected. **BM/E**



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World Radio History

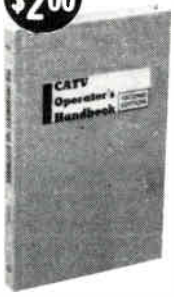
TWO NEW BOOKS FOR TV & CATV PERSONNEL!

CATV Operator's Handbook—2nd Edition—

By the Editors of BM/E Magazine

Here, through popular demand, is an updated 2nd Edition of this exhaustive collection of info designed to help you in Cable System Management, Operation, Program Origination, and Engineering!

SAVE $2.00



Here is the ALL-NEW, UPDATED Second Edition of the classic in the field. This HUGE 352-page volume is a complete guidebook for those involved in any aspect of CATV. It fully covers cable system planning, management, operation, program origination and engineering, two-way cable practices and potentials, and it offers timely solutions and up-to-the minute data for the everyday use of the present or would-be CATV operator. All the necessary knowledge to build or maintain a successful operation is included in this invaluable guide.

The real strength of this unique volume lies in the practical tips it provides, imparted in a readable, powerful fashion. The authors reveal the best way to go about starting a system, and consider everything from obtaining a franchise to installing the plant. Two chapters deal with antenna systems planning, including ideas on locating the best point for signal reception. Promotional ideas are discussed in some detail. This crucial area of CATV operation is clarified with invaluable hints on how to set up an effective, working promotional program. Program origination receives extensive coverage, as do ways to produce commercials on small budgets, adding FM to a cable system and two-way systems. 352 pps., hundreds of illustrations.

PARTIAL CONTENTS: CATV in 10 Proven Steps—Putting the Community in CATV—Obtaining a Franchise—Cable Poles: Lease or Install—Planning Cash Requirements—Appraising an Existing System—Updating Yesterday's System—Planning An Antenna System—Beyond-the-Horizon Reception—Promotion on a Profit Plan—Promoting and Selling Cable Service—Pre-Service Promo Blitz—Promotions that Build Customer Sales—Determining Viewer Station Preferences—Getting into Program Origination—Successful Programming Methods—Low Budget Cablecasting—Working With Civic & Public Health Organizations—Educational Programming—Reporting Community Emergency Situations—Mobile Reports—Automated Audio Commercials—Weather Radar System—FM Stereo for Cable Systems—AND MUCH, MUCH MORE.

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DON'T LOOK AT THE CAMERA—

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By Sam Ewing with R.W. (Ozzie) Abolin

A practical "how-to" guide based on years of on-the-job experience by the authors!

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This new volume is needed in every TV and CATV library. It will prove invaluable for photographers, producers and directors. The authors have produced literally thousands of TV commercials, plus numerous documentaries and news photo work. The easy-to-read, fully illustrated text explains the basic techniques of TV photography, including dozens of tried-and-proven shortcuts for getting pictures on the air quickly and economically. Emphasis is placed on low-cost production. Featured throughout are scores of case histories relating the experiences—both good and otherwise—of this two-man production team.

Fully covered are such subjects as developing ease and tact in dealing with touchy and difficult advertisers, fresh, exciting new techniques for filming low-cost commercials, continuity writing and production planning, the six important elements required in film production, the difficulties of filming on location, plus sure-fire techniques that overcome field problems, and a 7-point plan to help produce a better commercial film. Also included is a step-by-step chronicle of a sound-on-film assignment. The authors then tell how they put together a documentary, using fresh techniques on scriptwriting, staging, shooting, narration, etc. The use of a storyboard is explained, and there are discussions covering camera equipment, lighting, editing, simple animation, techniques for producing inexpensive commercials, and the use of special effects to dress up a film product. 224 pps., 46 illus.

CONTENTS: Part 1 Action in the Field—Part 2 Behind the Scenes—Part 3 Putting It All Together—Part 4 More Than Meets the Eye—Glossary Suggested Reading—Index.

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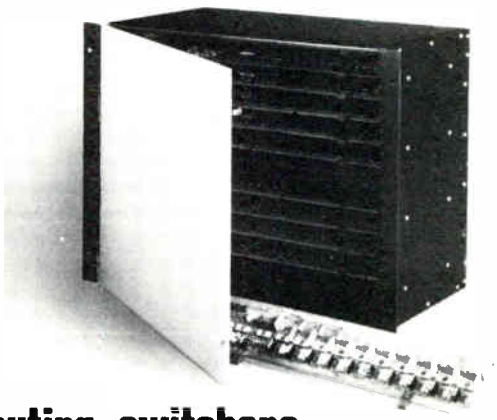

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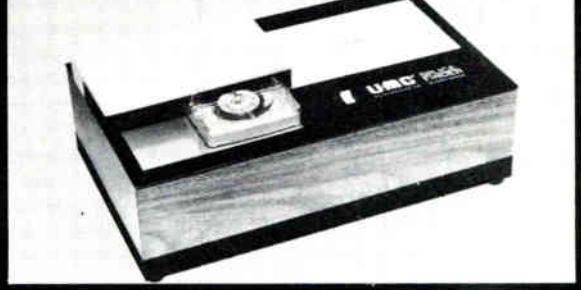

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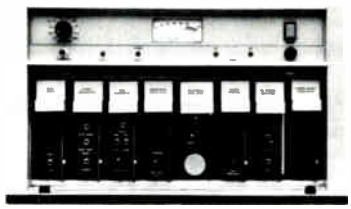

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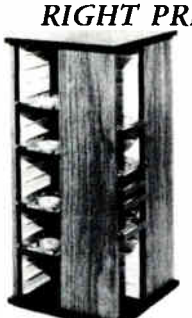

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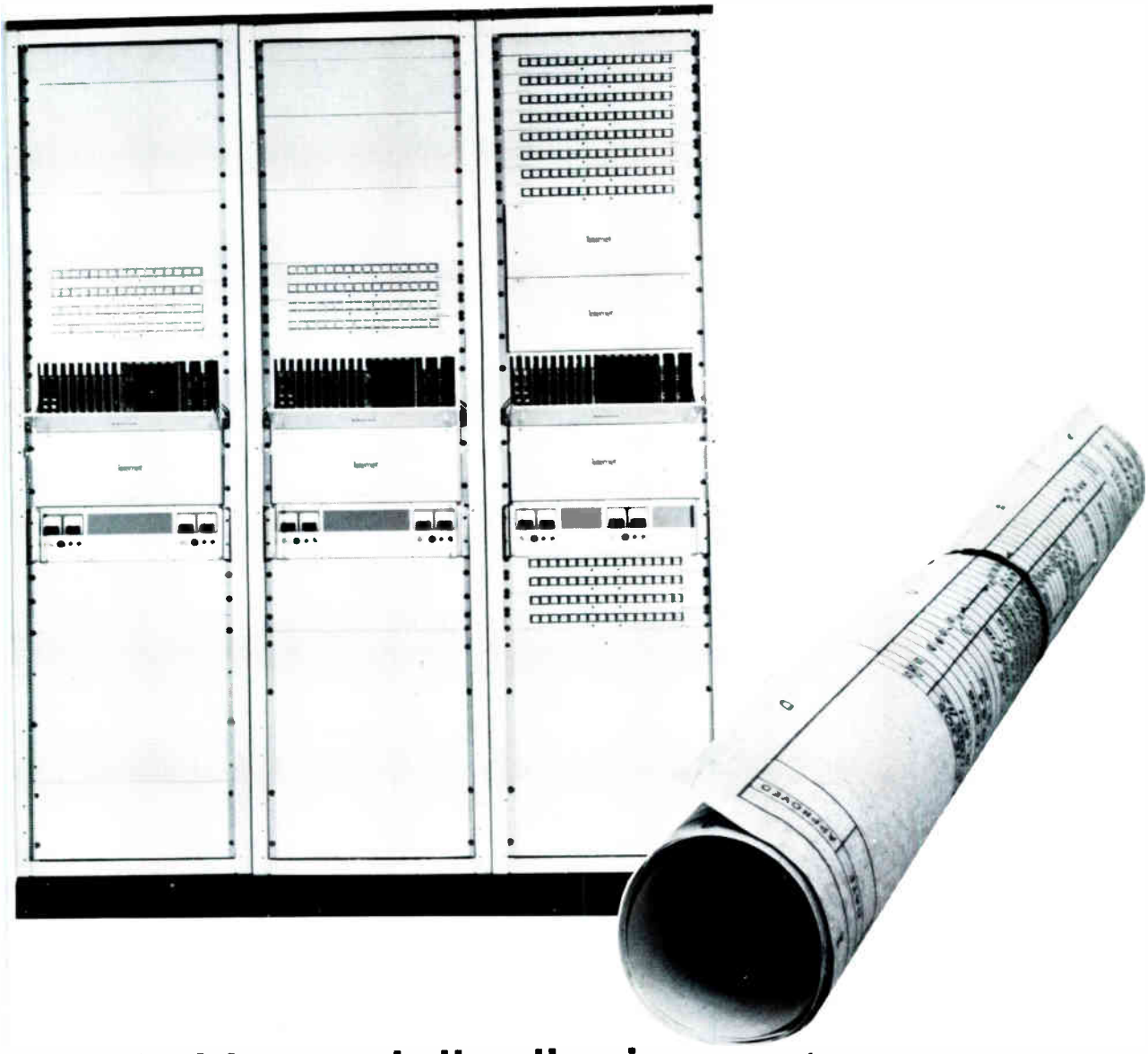

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