JUNE 1976

BM/E

BROADCAST MANAGEMENT/ENGINEERING

Just add four walls and you're on the air

Presenting Collins' full line of broadcast equipment

Whether you have 10 watts or 100,000 watts behind your signal, Collins has everything you need. From towers and transmission line to transmitters and test gear to turntables and tone arms . . . and all the other items in between.

Including the modular, flexible AutoPro program automation line. And featuring the Generation 4™ series of transmitters — with the exciter that has set new standards for FM broadcasting. Plus AM transmitters that our customers say sound like FM . . . and consoles with plug-in flexibility to meet your changing format requirements.

But there's much more to Collins than just breadth of line. Every item we make is the result of an uncompromising dedication to technical superiority. The result is a difference that some customers say they can "feel". They call this difference "the Collins presence". Your listeners will notice the difference, too.

And Collins believes in after-sale support to keep you on the air. Our Product Support Staff is at your service 24 hours a day, 365 days a year. And our Service Parts Department is just a phone call away, even on weekends and holidays at 214/690-5000. Support is not just lip service at Collins, either. Our transmitters are backed up with a full *two-year* warranty, twice as long as the other majors.

Our quality line of broadcast products and prompt service add up to still another benefit to Collins customers — longer operating life and lower cost of ownership. We're ready to demonstrate this with action, too.

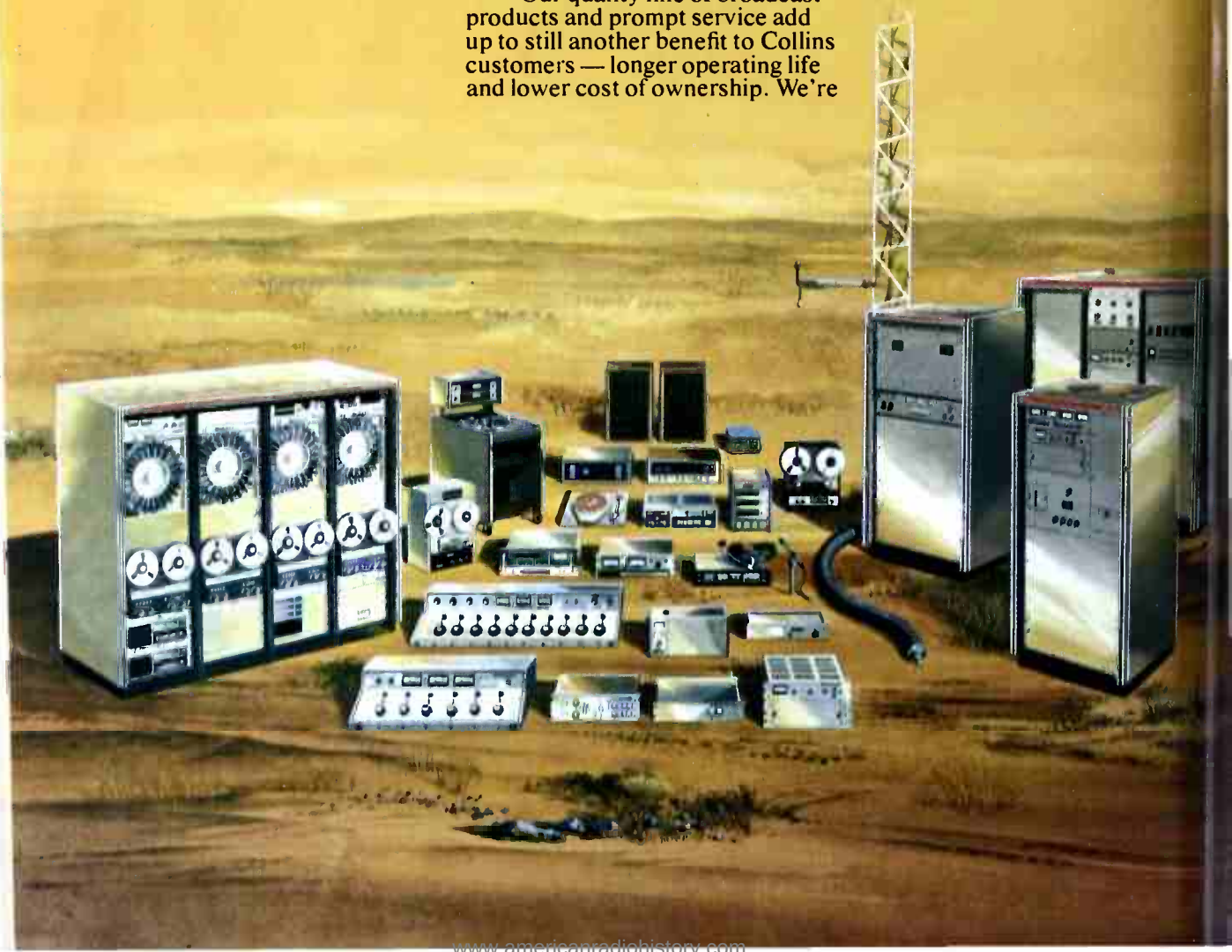
For those four walls, see a general contractor.

For everything else, see Collins, the *radio specialists*. Contact your local Collins salesman, or Broadcast Marketing, M.S. 406-240, Collins Radio Group, Rockwell International, Dallas, Texas 75207. Phone 214/690-5574 or -5424.

Rockwell International

...where science gets down to business

Circle 163 on Reader Service Card



This Is National Be Kind To Tape Supervisors Week

- Let him know the VTR is broken *at least* 5 minutes before air time.
- Please overlook his roars and grumbles.
- Agree with him that he is overworked and underpaid.
- Let him know there was only 27 minutes on that 30 minute reel.
- Don't hide his schedule board.
- Look the other way when you see him miss the audio stack.
- Do not start taping until his necktie is clear of all moving parts.

...

lax, it's a econd free iveaway oster. wonder who they'll bast' next?"

e can r write eir

omax now refurbishes ypes of quad heads ny other company in the See Videomax for heads than new" with the best and performance tages in the industry.

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Circle 101 on Reader Service Card

BM/E
BROADCAST MANAGEMENT/ENGINEERING

We gave Bill Etra, a Video Systems Designer and Artist, simple white on black letters. He processed these images through his videolab colorizer/switcher, and manipulated them using a Rutt/Etra Synthesizer, Electronic Music Synthesizer, and controlled the process using three mini-computers, programmed by Bill and Lou Katz of Columbia University. The striking results are an example of what Etra can achieve with this prototype for a new computer controlled production system which he hopes to introduce soon as The Intelligent Video System.

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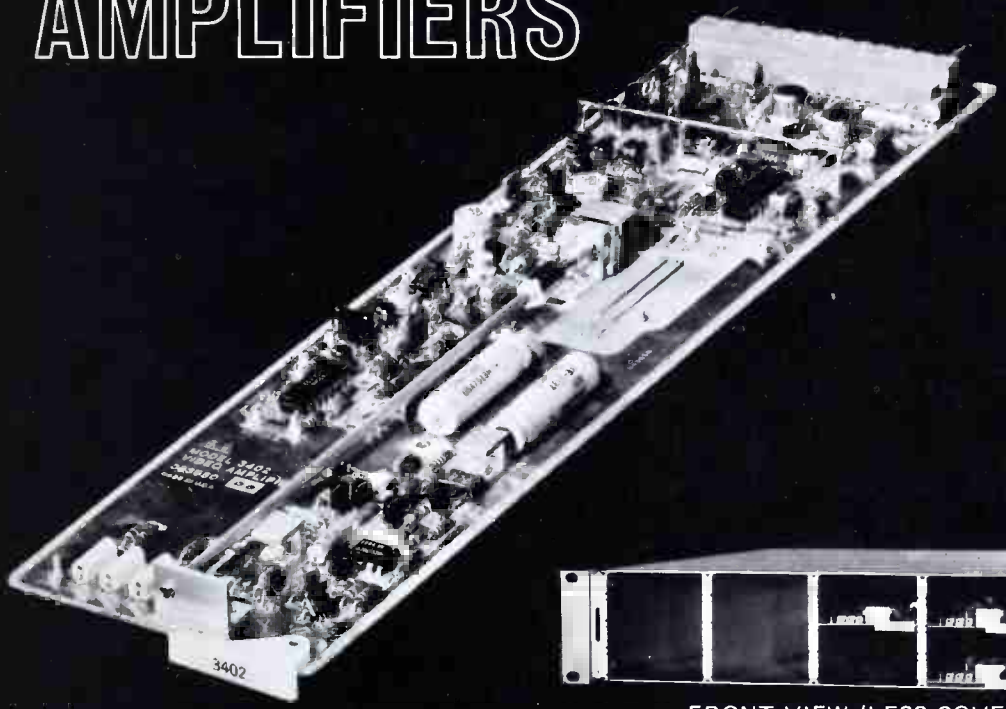
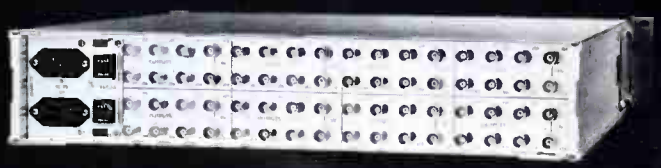
GRASS VALLEY GROUP

3400 SERIES AMPLIFIERS



FRONT VIEW (LESS COVER)



REAR VIEW

Model 3402 distribution amplifier is the first product in a new series of video terminal equipment. Six outputs are provided in this versatile, high-performance, compact unit which represents the latest in the state of the art.

The 3402 gives exceptional performance in the areas of stability, distortion, and noise. Power consumption is only two watts per amplifier. It is an all-purpose video amplifier, featuring switchable DC restorer, differential input, controlled time delay, selectable gain adjustment up to +11 dB, and provision for cable equalization.

A two-rack unit mounting tray, illustrated above, accommodates eight 3402 amplifiers and a 3200A power supply, with provision for a second optional supply for emergency protection. A one-rack unit, four-amplifier mounting tray is also available.

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BROADCAST INDUSTRY NEWS

Kansas City TV Station To Beam GOP Convention News

With what is believed to be the first transmit-receive earth station ever set up by a TV station, KBMA-TV will transmit GOP convention news, via satellite, this summer.

KBMA-TV, a UHF station in Kansas City, MO, expects to have the earth station operational in time for the Republican National Convention. In cooperation with the Independent Television News Association, KBMA-TV will beam nightly convention news to other independent stations around the country.

The earth station is the result of a joint venture between KBMA-TV and Transcommunication Corp., of Greenwich, CT, which purchased the earth station and will lease it back to KBMA-TV.

Europe Gets First Quad Broadcast

For the first time in Europe, a quadraphonic broadcast was done using a single transmission facility. Radio Picadilly in Manchester, England, tested the technique as part of its second anniversary commemoration activities, April 2nd, and 3rd.

Listeners of Radio Picadilly, one of the commercial stations that make up the Independent Local Radio network, received programs of discrete 4-channel tapes and QS 4-channel records broadcast through a system using the Sansui QSE-5B broadcasting encoder. The versatility of the system was demonstrated by synthesizing some stereo programming into 4-channel using the QS synthesizer function.

Throughout England, it is estimated, that only a ½ million homes have some 4-channel capability. To properly receive quad broadcast a system should have the Hafler speaker matix system which is compatible with QS encoding and a 2-channel receiver or amplifier plus a simple resistive matrix network.

Radio Picadilly's stereo listeners, however, did report enhanced stereo reception.

FM Station Rates Number 1, in L.A.

For the first time in Los Angeles radio history, an FM station is number one in the ratings.

K-BIG FM 104, the Los Angeles "beautiful music" station, owned and operated by Bonneville Internati Corporation, achieved the mar highest ratings in the winter su (Jan/Feb '76) conducted by Arbit The station got a 6.5 share of all r listening in the metro area.

Satellite Video Conferen 'Saves Millions'

The technique of "video c ferencing," via satellite can s "American industry millions of do a year in reduced travel expenses," cording to an RCA executive.

Philip Schneider, President of F American Communications, Inc., s satellites such as the RCA Satcc provide wideband service at a frac of the cost of terrestrial landlines can reach every place in the cou simultaneously. Any company or ganization using this video confer call technique can do so "much expensively than moving a whole f and taking important managers f their offices, losing valuable tim travel, and running up enormous h and transportation expenses," Schneider.

Harris Corporation Expa Broadcast Operation

Harris Corporation announced in April, a $3.25 million dollar expan of its Broadcast Products divis Quincy, Illinois. The expansio needed, according to Harris, to commodate the division's gro sales of radio and television tr mitters and related products."

Gene T. Whicker, vice presi general manager of the division, the expansion would add appr imately 85,000 square feet of sp reunite downtown administrative marketing offices with the m facturing and engineering opera and aid in the gradual build-up of ployment in the Quincy area.

NY Commission Re-Asserts Rights Over 'Pay Cable' Rates

The New York State Commissic Cable Television reiterated its juri tion over rates charged by cable t

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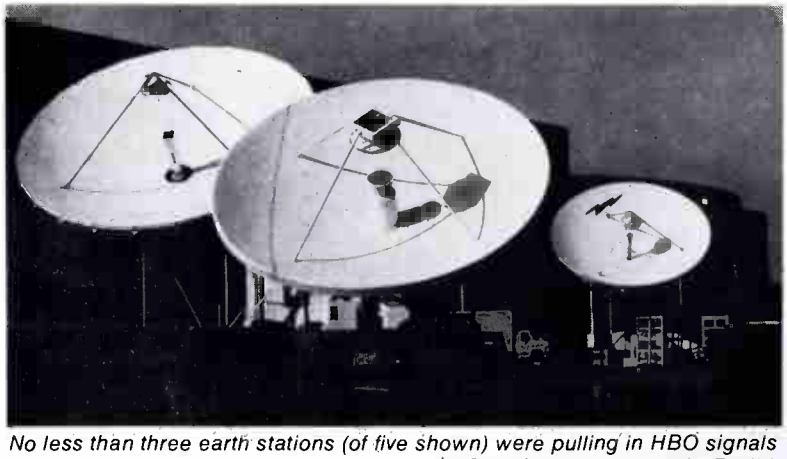
Satellites and Pay Cable Dominated NCTA Convention



No less than three earth stations (of five shown) were pulling in HBO signals at the 25th anniversary NCTA Convention at Dallas the other month. Exhibit floor was filled with converters, addressable taps, and filter traps to deliver pay signals to TV sets. New program packagers showed up and Optical Systems announced it would offer 15 hours daily on two program channels via Westar satellite this Stptember.

smart switcher

CDL has just raised the standard for video production switchers. Again.

The CD-480 is the first totally new full scale production switcher from CDL in 7 years. It offers every wanted feature, from superb Chroma Keying to Rotating Wipes with Colored Borders and Soft Edges.

We applied unique technology to create an operator's "dream". A *single* CD-480 Effects Amplifier can perform production sequences that are not possible even on a conventional *triple* M/E switcher.

The CD-480 is not just a new switcher, but a completely modular production system.

Call us!

CD-480 gives you the competitive advantage!

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Circle 102 on Reader Service Card

sion companies for "pay cable" services.

According to the Commission, this reiteration was prompted by "recent problems in this area." Many municipalities have requested help, claims the Commission because some cable television companies have raised their "pay cable" rates after being denied increases for their "basic" services.

CATV companies have argued that FCC regulations pre-empt municipal or state regulation of "pay cable" services.

NAB Wants FCC To Review 'Specialty' Station Decision

The NAB petitioned the FCC, in late April, to reconsider its decision to permit cable systems to carry the complete broadcast schedules of so-called "specialty" stations.

NAB's petition claimed that the Commission "glossed over the basic impact issue," and failed to appreciat how program practices of independen vary from those of network affiliates

According to the petition, the FC decision, "rests on unsound premises and fails to consider the fact th "fringe time" rather than "prim time" is the crucial period when indi pendents must attract audiences an advertising revenue.

ABC Sports Uses Frame-Stor

The under $15,000 Arvin Echo floppy di frame slide storage device, Frame-Stor a new production tool for ABC Sports such events as Monday Night Baseb and the Kentucky Derby. Photo he shows composite picture of a live came (left), a still frame (right) run through video compressor and mixed with character generator display. Each p recorded still frame (200 per disc side coded for instant call up. Device fr slow-motion recorder for exclusive sh action shots. As we go to press, A plans to use device in Oregon and Ca primaries and at the "Indy 500."

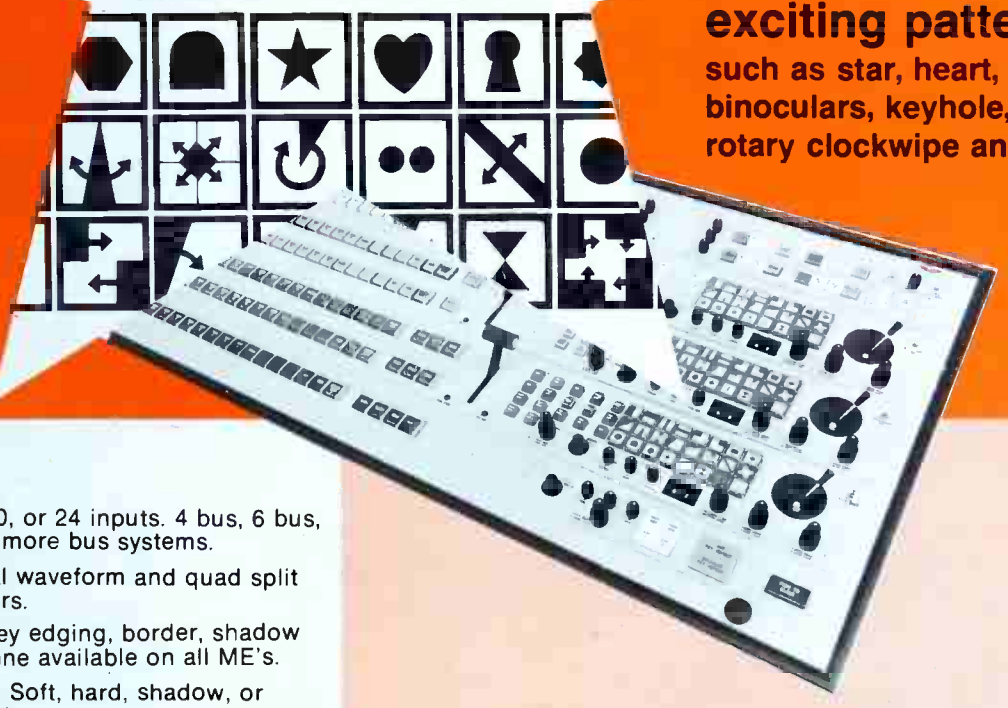
Christian Broadcasting T Build School

The Christian Broadcasting Netw has announced plans to construct a million dollar international he quarters and communications schoo teach broadcasting to students fr around the world. Dr. M.G. "P Robertson, President of CBN, v started the network ten years ago wi three dollar contribution plans to bu the complex on recently purchased l in Virginia Beach, Virginia.

The complex will contain two la television studios, a satellite-tra mitting facility, an office complex 2,400 seat conference center, and International Institute of Broadcasti including a School of Theology. W the complex is completed, over the several years, Dr. Robertson inter "to train Christians from around world in all phases of the broadcas industry. . ." so, "When they re to their home countries, they will h

continued on pag

VIX-114 production switcher with STAR studded features



Choice of over 80 exciting patterns
such as star, heart, binoculars, keyhole, rotary clockwipe and more

- 12, 16, 20, or 24 inputs. 4 bus, 6 bus, 8 bus or more bus systems.
- All digital waveform and quad split generators.
- Digital key edging, border, shadow and outline available on all ME's.
- Vari-key. Soft, hard, shadow, or see-thru key.
- Digital quad split. Wipe or dissolve in each quadrant.
- Electronic vignette. Adjustable soft pattern edges.
- Superb linear chroma keyer. RGB or encoded.
- New digital, drift and jitter-free proc. amp on output.
- Ready to interface for computer aided operation.
- Many more state of the art and operational features described fully in series 114 brochure.

The VIX-114 series video switching systems are conceived and designed by the largest specialized independent video switching company in the USA. Vital Industries, Inc. is holder of US patents on digital effects and analog rotary effects. Vital VIX-114 series switchers open new vistas in production of television commercials and programs to yield maximum pleasant visual impact.

o not fear to discover a supe- or product in the VIX-114 eries switchers. Ask to see the emo tape for a sample of what e can do for users of switching quipment.

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

BVH-1000 High-Band roduction Recorder

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

The BVH-1000 is non-segmented. Which eans its production capabilities are infinitely rsatile. And unlike ordinary broadcast recorders, ony's unit combines optimum broadcast perform- ce with compact size. It has fast, accurate edit and -directional search logic. So it's really suited for e studio as well as remote locations.

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

BVT-1000 Digital Time Base Corrector

ony has combined a wide window of ±2H with a nique moving window concept. This means your cture can hold its lock, even though you may ve wide error excursions. The BVT-1000 assures u transparent picture quality. It also comes with ll NTSC advanced sync, built-in processor and locity compensation.

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

BVU-100 Portable U-Matic® Recorder

his light-weight unit can vastly improve your cture quality. Thanks to Sony's unique SMPTE dress track and special comb filtering, your ENG oadcasts can become high-quality broadcasts.

Your picture is sharp and distinct. Sony's /U-100 is compact, rugged and ready to go.

4. BVU-200 Editing Recorder

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

5. BVE-500 Editing Console

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

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

6. BVP-100 3P Color Camera

This high-quality portable color camera can do double duty. It's ideal for ENG. And at the same time, it will give you excellent results in the studio.

It features three 2/3" Plumbicon* tubes. So it's capable of handling just about any assignment with optimum quality.

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

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

And this is just the beginning.

Sony Broadcast

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

both the technical know-how and the Christian commitment to use broadcast for the betterment of mankind."

NCTA Urges FCC To Act on Pole Attachment Dispute

NCTA, at its annual membership meeting in Dallas, adopted a resolution that urged "Congress and the FCC to take immediate action" to settle the issue of pole attachment rates charged by utility companies.

The resolution charged that "The policies and practices of utility companies providing pole attachment services have demonstrated a consistent pattern of abuse and delay in such areas as makeready, inspections and other procedures."

The provision of pole attachment and conduit space service to the nation's cable TV operators is completely unregulated at the Federal level and virtually unregulated at the non-Federal level, according to the resolution.

MPAA, NCTA Agree On Copyrights, Ask Congress To Act

After lengthy negotiations, MPAA a NCTA reached agreement last mo on CATV copyright liability and joi in urging the House Judiciary Co mittee's copyright subcommittee consider this agreement during mark-up of H.R. 2223.

NAB responded quickly by reco mending to the Subcommittee tha adopt NAB's proposal to permit " marketplace to determine" fees for tant signals.

The MPAA and NCTA deal calls CATV systems to incur copyright ability only for the retransmission non-network programming from tant TV stations. The copyright fee these "imported equivalent signal (IES) will be expressed as a percent of the cable system's basic subscri revenues. Systems would pay .6% basic subscriber revenue for the f IES, .425% for the second thro fourth IES and .2% of basic subscri revenues for each equivalent signal excess of four. National network noncommercial educational sign would each count as one quarter IES determining the number of impor equivalent signals.

The agreement retains the Sn System Revenue Adjustment appro by the Senate in its final action on S (Hathaway amendment). The justment affects systems with ann revenues of $160,000, reducing revenue base on which copyright ability is determined. The flat paym of $30 annually for systems with un $80,000 on annual revenue is also tained.

Should the Subcommittee not ad the NAB recommendation, NAB ommends that action on Sec. 111 deferred, or that the MPAA-NC deal be modified by the Subcommi in a number of areas. According to NAB analysis of the agreement favors large non-grandfathered syst over smaller grandfathered system

CATA said it was "distressed" this "secret" agreement and "rural CATV systems will end paying more money per CATV cha of service than metropolitan areas.

Super 8 Film Used For Documentaries

KVIE 6, in Sacramento, CA, will eight 30 minute documentaries this all produced on super 8 double-sys sound film equipment.

The documentary series, prod with a $40,000 grant from the Corp tion for Public Broadcasting and tional Endowment for the Arts, is a

n and was produced by Emiko
, resident filmmaker at KVIE.
ries, called "Equal Time," was
ed on a super 8 equipment pack-
t together by Richard Leacock,
ssachusetts Institute of Technol-
d Hampton Engineering.
biggest technical hurdle, said
Engineer Gorman Brown, was
rring the super 8 film to quad
r playback. "The film projector
re given didn't do the job satis-
y on our film chain." said

n solved the problem by using a
Supermatic film videoplayer
"we locked . . . into our film
and used it to compile our
mixing the super 8 footage with
ipe, slides and 16mm film." Ac-
to Brown, "It is nearly impos-
tell that the original was super 8

ets Topped Two Billion 975; Profits Down

t broadcast revenues of the three
on networks (ABC, CBS and
and of their 15 owned and oper-
ations totalled $2.1 billion in
up 7.7 per cent from 1974, ac-
to figures released by the FCC
April. But profits before Federal
taxes, at $314 million, were
bout 5 per cent from 1974. The
ned stations, considered sepa-
maintained profits even with
t $106 million before Federal
taxes, but they had to take in
re in sales to do it. The nets
d spending about $160 million
s and public affairs in 1975, up
150 million in 1974.

ons of the FCC

's do-it-now FCC is turning out
ant decisions at such a rate that
is hard pressed for space to
them all. To cover the maximum
r of FCC actions, we are present-
lumber here in abbreviated form,
he Docket or release number so
der can get a more detailed story
y from the FCC—if he wants it.

sed season, again, on AM and pplications. Last year the FCC wn the bars a little on new AM ations, and got a flood of new The 600% increase in AM ap- ons, says the FCC, has clogged rks for both AM and FM actions ame personnel work on both). dingly, new or major-change nd FM applications are *banned* en June 30, 1976 and December 976. (FCC Release #76-395.)

tions allowed more time for po- spot commercials. The "ad- " policy on commercials, 18 es in each hour, with 20 minutes in no more than 10% of the weekly total, and 22 minutes if the excess is political advertising, is changed to allow four "extra" minutes, rather than two, for political spot ads. (FCC Release #76-360.)

Better usage of non-commercial channels. A notice of proposed rulemaking, Docket 20735, asks for comment on a wide range of questions relating to non-commercial FM (Channels 201-220): standards governing classes of educational stations; protection to be afforded; interference on TV channel 6; requirement that non-commercial stations have a minimum on-air time, and concentrate on educational and cultural material; change in 10-watt assignments, if they are blocking higher-powered, more useful stations; and many others.

Ascertainment for non-commercial stations. Beginning with non-commercial stations whose licenses expire August 1, 1977 (who must file for renewal April 1, 1977) non-commercial stations must file a list of 10 important community problems and indicate how they addressed those

continued on page 14

NEWS

problems during the year; non-commercial radio stations must ascertain continuously throughout their license term by any reasonable method, and keep a narrative of it on public file; non-commercial TV stations must document leadership interviews throughout the license term. (Docket 19816)

Inquiry into entertainment formats upheld. The FCC has reaffirmed its inquiry (Docket 20682) seeking guidelines for FCC action relating to stations proposing to change entertainment formats. A group called the Citizens Communications Center had attacked the inquiry as an abuse of FCC discretion and on other grounds. The FCC pointed out that the US Court of Appeals, in the WEFM case, ruled that the FCC must consider the possible "rights" of an audience to an established format; this court ruling effectively requires FCC inquiry into the matter.

Changes in cable technical standards. The FCC proposes to change the rules to make the measurement requirements apply to a single physical plant, rather than in each community served; to relax frequency standards for signals picked up from a translator so they don't exceed the translator standards; to substitute a converter frequency stability standard (±250 KHz) for the present frequency accuracy standard. (Docket 20765.)

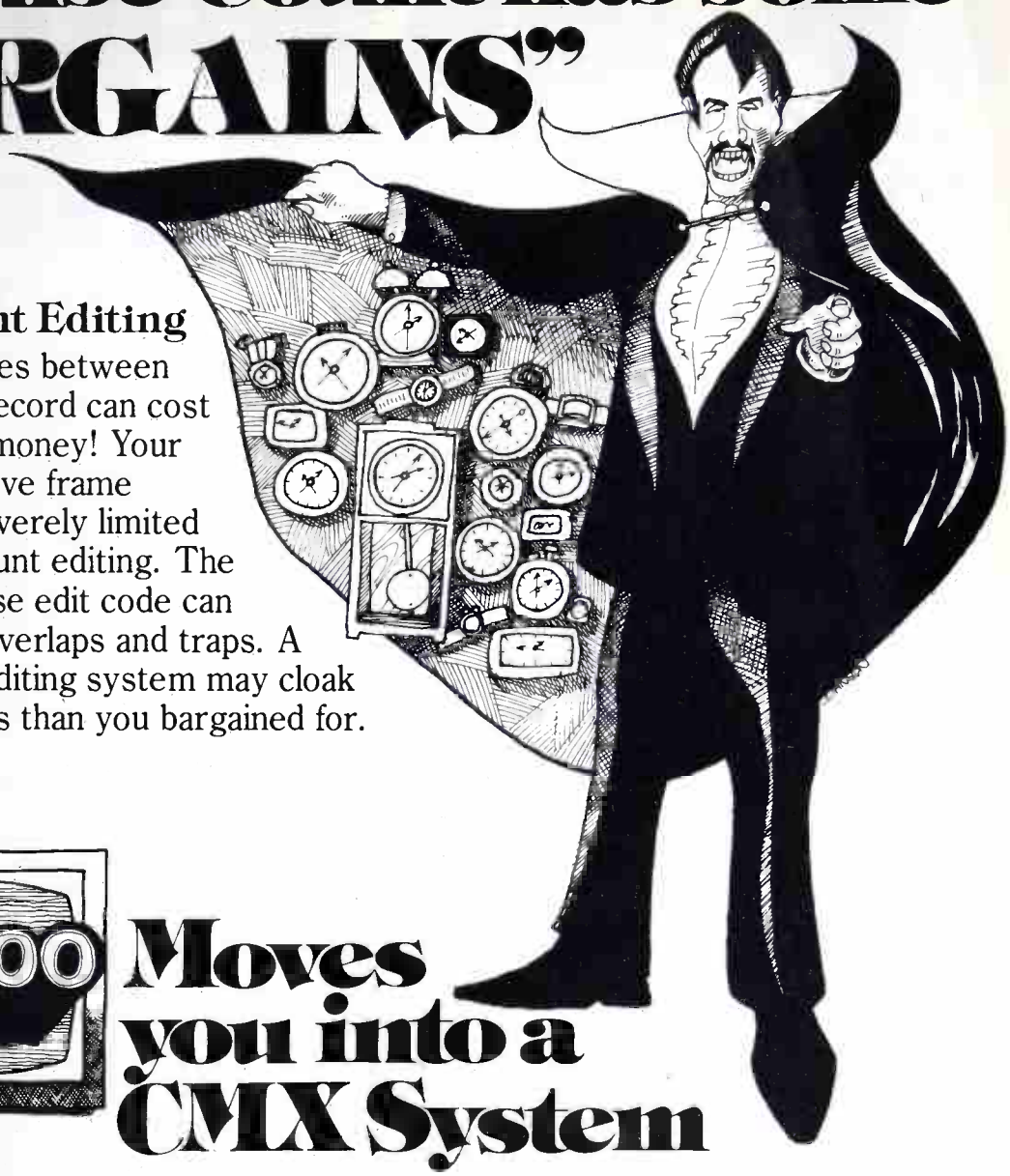
New Jersey does need local TV service, but how to get it? A long-standing "gripe" on the part of New Jersey residents, that they have no decent local TV service because New York and Philadelphia stations pre-empt the air space, received the explicit assent of the FCC in Docket 20350. The Docket asks for comments on a long list of proposals for remedying the lack, including a New Jersey "presence" for one or perhaps all of the VHF stations whose signals cover the state. Dropping in a New Jersey station on Channel 7, often proposed, is rejected as technically not feasible. Comments by May 3, replies May 24th. (Likely to be extended.)

FCC Briefs

Addressing what must certainly have been the oldest unresolved matter before it, the FCC settled a controversy going back to 1941 over **clear-channel operation on 770 KHz**: WABC, New York, got day and night Class 1-A use of the channel; KOB, Albuquerque, must file for a nighttime directional pattern for Class II-A operation . . . . The FCC has received a report **"Determin-**

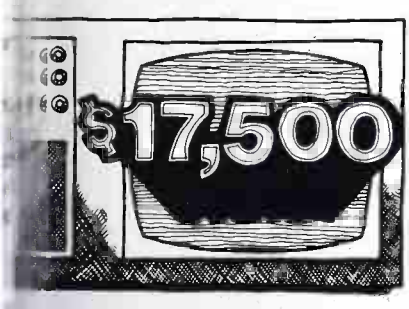
continued on page 17

The Pulse Count has some BARGAINS"



Pulse Count Editing

Differences between preview and record can cost you time and money! Your ability to achieve frame accuracy is severely limited with Pulse Count editing. The lack of a precise edit code can create gaps, overlaps and traps. A Pulse Count editing system may cloak more problems than you bargained for.



Moves you into a CMX System

CMX SMPTE/EBU Time Code Editing

With CMX, there are no differences between preview and record. CMX Systems are fast and accurate (± 0 frame). In editing and re-editing, you can quickly search and cue to the exact frame you are seeking. You can synchronize and maintain absolute frame and syllable accuracy through both editing and automatic assembly modes. With CMX, you can start for $17,500. Add list management, look ahead, reel summary, sync roll, multiple record, 7 machine simultaneous operation with 32 machine (any mix of capstan servoed VTRs and ATRs) access and other features as you need them. Now that's a real bargain!

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ENG SYSTEMS

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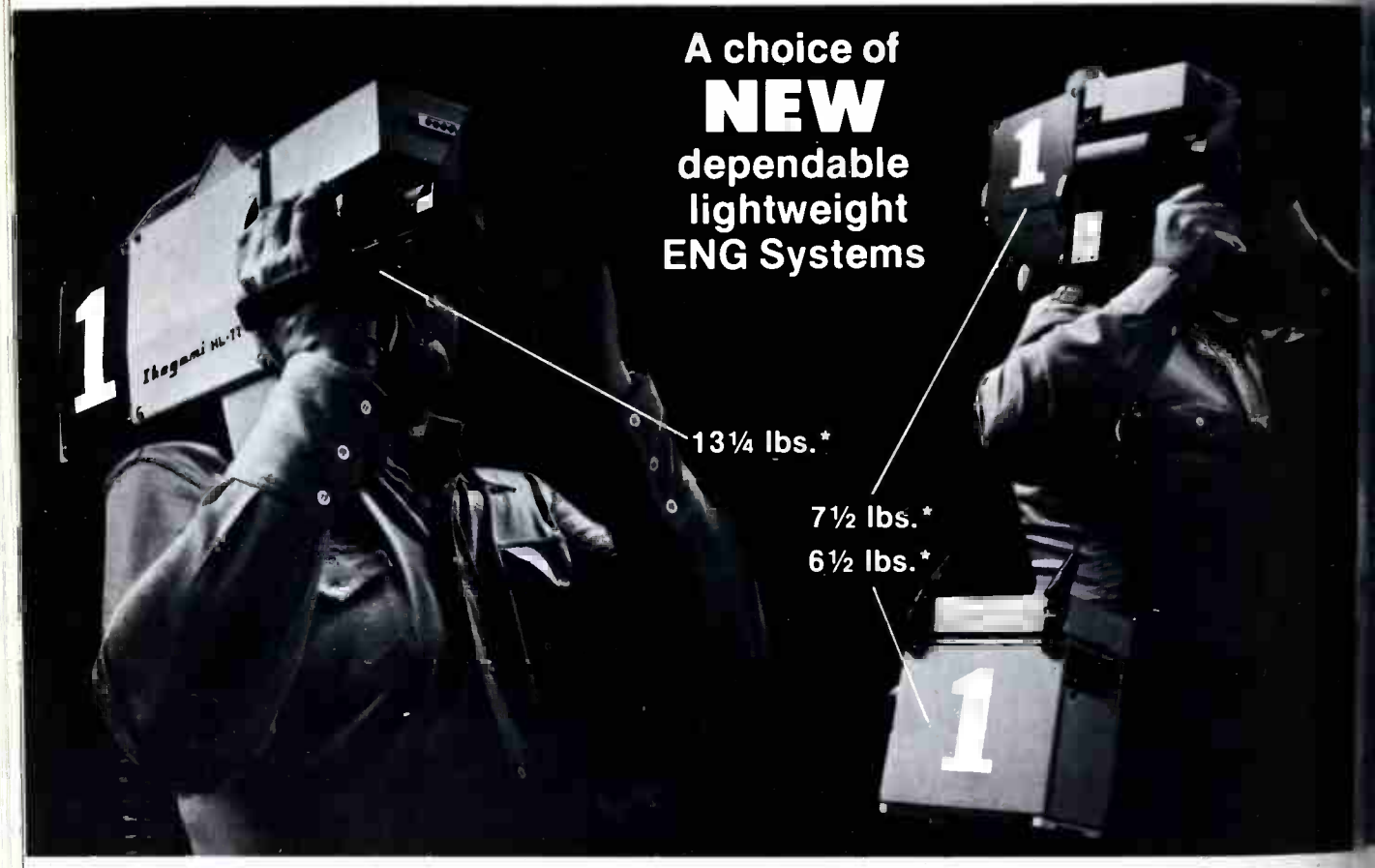
. . . more broadcast-quality IKEGAMI Systems in the field than all other manufacturers combined.



ALL-IN-ONE "IKE"

Ikegami ENG Systems dominate the industry because one user tells another they're the "dependables". They're debugged, ruggedized, get instant service nationwide.

Now we've dramatically cut the weight and power consumption of the "dependables". With no sacrifice of broadcast-quality colorimetry, stability or sensitivity. Result: you get film-camera freedom of movement.

You can have the HL-77 as a single on-the-shoulder unit at only 13¼ lbs.* Or the HL-37 at 7½ lbs.* with a separate process pack of 6½ lbs.* you can sling from a shoulder or rest on the floor. Only Ikegami gives you a choice.

Outstanding Performance Features

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

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* Weights do not include lens or 3 lb. battery pack.

NEWS

ing Coverage by FM Stations," describing how FM coverage area maps were developed for the entire US; both report and maps are available in the Public Reference Room of the FCC, 1919 M St., NW, Washington.

The **rules for applying terrain roughness** in predicting FM and TV field strength contours have been suspended until May 1, 1977, while further studies are made to eliminate "anomalies" . . . . A broadcaster is not responsible for **"indecent" language picked up in live on-the-spot news broadcasts,** says the FCC; this contrasts with the censure of WBAI for language ruled "indecent" in a recorded comedy program . . . . **All FCC forms should be requested** from the FCC Forms Distribution Center, Room B-10, Washington, D.C. 20554; copies of the FCC Rules and Regulations come from the Superintendent of Documents, US Government Printing Office, Washington, D.C. 20402.

News Briefs

Hughes Television Network and **Western Union's Westar** satellite system helped to make hometown fans happy on May 1st, by telecasting the away games of Boston, California Angels, Pittsburgh, Houston, and the Chicago Cubs back to local fans in those cities . . . . **RCA's Satcom II,** which was launched by NASA on March 26, aboard the most powerful Thor/Delta rocket ever built, is scheduled to become operational this month, doubling the capacity of the nation's domestic satellite system . . . . **Western Union** announced that it has put 11 more American cities "on line" with its Westar satellite system. The new cities are, Boston, Buffalo, Philadelphia, Baltimore, Cleveland, Cincinnati, Detroit, St. Louis, Kansas City, Milwaukee, and Wilmington . . . .

CSI Electronics, Inc. 2607 River Road, Cinnaminson, N.J., announced that the FCC has issued type acceptance on new CSI FM transmitters . . . . **International Video Corporation** announced the first installation of its IVC-9000 broadcast videotape recorders in Canada. The machines were installed at **CKWS-TV,** Channel 11, in Kingston, Ontario and **CHEX-TV,** Channel 12, Peterborough, Ontario.

Bruce Merrill, president of **American Cable Television, Inc.,** and a recognized national leader in the CATV industry, has formed a new corporation, **Tele-Features, Inc.** which introduced a new Super Channel ser-

continued on page 18

NEWS

vice to CATV viewers in the Pho area. Super Channel will prese double feature each day and a t feature each Saturday and Sunday

NCTA's Board of Directors their meeting in Dallas, unanimo approved a resolution reaffir NCTA's committment to equal ployment and ownership opportuni the CATV industry. An industry c mittee is planned to meet EEO jectives . . . . **Kal Raasch, presi** of the **International Industrial T vision Association,** announced formation of a Government U Committee as an ITVA Special Pro **Lieutenant Commander John S ton,** USN, is chairman.

People

Robert D. Pabst has been named p ident of Electro-Voice, Inc. . Dielectric Communications, a divi of Sola Basic Industries has named, **Charles D. Brown** Chairman, **John L. Hutson,** President.

Harold L. Green, has been pointed manager, operations and e neering for Kaiser Broadcasting C pany . . . . **Martin Gittleman** joined the staff of Quad Eight Elec ics as vicepresident and director o gineering.

Raymond Yorke has been pointed general manager of WL FM . . . . WNOE AM/FM annou the appointments of **J. Fred Ril** Chief Engineer and **Bill Massey** a rector of Engineering.

Albert H. Chismark was appo manager of technical services **Steven Smith** was named direc television engineering by Mer Broadcasting, which also annou that **Thomas J. Durney** has bee pointed general manager of W Radio, Syracuse.

Teleprompter Corp., announce appointments of **James H. Miller** as associate director of gramming and **Stanley J. Sols** Director, Management Informati

John S. Auld has joined W Cable Corp., as vice president **Stanley J. Rejniak** has been n vice president of marketing **Stephen A. Merrill** was app General Manager of Tele-Fea Inc.

continued on pa

The NCTA headquarter's tele number has been changed to 457-6700. The new number with a modern Centrex phone that will give each person his own direct dial, four digit numb

The Audio Travel Lab

ktronix TM 500

reare the four basic instruments you cto check out your electronics. The cion. The versatility. The convenic. They plug in, side by side, in a **TM 5 Traveler Mainframe** that supplies power and includes storage space jobes and cables.

eudio Travel Lab features an **SG 502 o Oscillator** as a 600-Ω source of low rtion sine and square waves from 5 500 kHz (0.035%, 20 Hz to 50 kHz). e**DC 504 5-digit Counter/Timer** pro- precise display of frequency or nd for cue and control tone measure- es, alignment of filters, and readout hes from test tapes and records. The **502 Digital Multimeter** provides full- ion ac, dc, current, temperature, and stance readings in addition to dB surements. The **SC 502 15 MHz Dual- Oscilloscope** features Enhanced matic Triggering, making it one of easiest to use oscilloscopes on the ket today. It readily reveals clipping crossover distortion, transients and levels, rf interference, and high-fre- ncy oscillations. Reverberation and y measurements can be made via the triggered capability with a tone-burst signal. A rear interface circuit board in the TM 515 Mainframe lets you interconnect the plug-in instruments for applications such as gain, loss, or response measurements—at the touch of a push-button.

The TM 515 Traveler Mainframe looks like carry-on flight luggage, but it's really an electronic instrument mainframe and power supply that operates from 48 to 60 Hz, 100 to 240 V ac with a quick-change line voltage selector. **It's designed to put lab-quality modular instruments conveniently on the road,** to make them easily movable from room to room, useable on a small surface or on end on the floor, or to be easily stashed in the corner out of the way.

Should you have special needs requiring different instrumentation, you can select from the more than 35 plug-in modular instruments of the continually growing TM 500 Product Line. For example, the AF 501 Tunable Bandpass Filter selects a narrow band of frequencies for oscilloscope observation and frequency or level measurement. The AM 502 Differential Amplifier adds balanced input capability, and its high gain extends noise measurement floors. The sophisticated new FG 504 40 MHz Function Generator features log sweep over the 20 Hz to 20 kHz spectrum and full tone burst capability for delay measurement and transient analysis. The Product Line also includes calibration instruments, power supplies, a logic analyzer, and two sizes of blank plug-in that you may use to build in your own custom circuits. **Just pull one or more of the Audio Travel Lab plug-ins from your TM 515 and insert the appropriate instrument.**

To get full specifications, applications recommendations, and prices, send for the TM 500 Catalog. Circle the reader response number or write or call: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97077, (503) 644-0161 ext. 5283. In Europe write: Tektronix Limited, P.O. Box 36, St. Peter Port, Guernsey, Channel Islands.

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INTERPRETING THE FCC RULES & REGULATIONS

Commission Reconsiders Fairness Doctrine

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

The Commission took another look at the Fairness Doctrine and reaffirmed it on all counts.[1] The Commission denied petitions by the Media Access Project and The Committee For Open Media for reconsideration of the 1974 Fairness Report.

The Commission also declined to follow the suggestion of Chairman Wiley that the Fairness Doctrine be experimentally suspended in major markets which characteristically contain a plethora of media voices.

The general provisions of the 1974 Fairness Report, as modified by subsequent cases, is discussed below.

The Doctrine's Underpinnings

The Commission is prohibited from censoring broadcast programming in any manner.[2] At the same time, the Commission is charged with overseeing the allocation and operation of the electromagnetic spectrum in the public interest. One of the Commission's goals is to promote, to the greatest degree possible, an uninhibited, robust, and wideopen debate on public issues.[3] While free speech and open debate on public issues is best fostered by a "hands off" policy by government toward the print media, the scarcity of the airwaves dictates otherwise for broadcast media. The government must, to some limited extent, "interfere" with broadcasting to promote discussion on the important issues of the day by broadcasters. This limited interference with broadcasters' programming discretion is embodied in the Fairness Doctrine. The right of the public to hear contrasting viewpoints concerning important public issues outweighs the broadcasters First Amendment right to freedom of speech (e.g., freedom from government interference in programming decisions).

[1] *Memorandum Opinion and Order on Reconsideration of Fairness Doctrine*, 36 RR 2d 1021 (1976).
[2] *U.S. Const. amend. 1; Communications Act of 1934, as amended*, Section 326.
[3] *New York Times* v. *Sullivan*, 376 U.S. 254, 270 (1964).

The Doctrine

A "cut and dried" definition of the Fairness Doc is impossible to formulate. The Commission has dev a workable definition by breaking the Doctrine into duties:

(1) The broadcaster must devote a reasonable pe centage of [its] broadcast time to the coverage public issues; and
(2) [Its] coverage of these issues must be fair in th sense that it provides an opportunity for the pre entation of contrasting points of view.

The first Fairness Doctrine duty does *not* require b broadcaster provide *equal time* for discussion of trasting views. Rather, the broadcaster must pro *adequate time* for discussion of same. Further, Commission eschews the task of determining just wh "adequate time." This is a duty for the broadcaster, must make a "good faith, reasonable judgment" what constitutes adequate time.

A broadcaster does not meet the requirements o Fairness Doctrine by "passively" complying (e.g *not refusing* to permit spokesmen offering contra points of view of respond to controversial issues arise fortuitously). Rather, a broadcaster has an *affi tive* responsibility to provide a reasonable amou time for presentation of programming devoted to cussion of public issues.

When reviewing the adequacy of a broadca public issue programming, the Commission will not stitute its judgment for that of the broadcaster. Commission will only address the *reasonableness* broadcaster's public issue programming choices.

The second Fairness Doctrine duty requires b casters to provide reasonable opportunity for opp viewpoints. Most Fairness Doctrine complaints violation of this duty. When confronted with a requ

continued on pa

I had the budget to build any kind of FM station I wanted..."

KBWD's Jim Laird explains what Precision Monitoring can add to broadcast capability

TFT was a must, right from the start."

It's a rare event when a Chief Engineer gets to design his dream station from the ground up. Management's confidence in Jim Laird was handsomely rewarded, however, with what is as the most modern, efficient FM station in southwest Texas. The TFT Frequency and Modulation, Modulation Only and Stereo Monitors were key ingredients of the new facility. Here are a few of Jim's reasons why:

Selecting TFT

"When you've got an opportunity to get the best, why not go for it. I've been reading the broadcast books for a long time, and it seems that TFT gear stands above the rest. You get what you pay for, and they (TFT) just put more into the system."

Coverage

"TFT gives us the extra edge we need so we can use our transmitter to its maximum ability without worrying."

On Accuracy

"... very darn good when it comes to proof of performance. If I have an error, I look at the transmitter, not the TFT monitor ... I have the utmost confidence my TFT is telling the truth."

On Design

"... they seem to be more easily operated as far as the way you set the thing up. And the fact that they can be located right here at the studio is one thing we really like.

On The Frequency and Modulation Monitor

"... FM was a new adventure for us, and I needed good readout of our pilot. The TFT 723 was right on the money then and we're using it all the time now."

On The FM Stereo Monitor

"... It does have the extra human engineering to make it easier to operate. I feel the thing is considerably more stable than others too."

On Confidence

"... well, we got our FM gear based on our experience with the TFT AM monitor. Now, after checking out the FM, I envision having TFT at all the stations we own."

On Price

"... sure it costs more, but even if I'd been on a tight budget, I wouldn't have scrimped on the TFT monitors ... it's the only way I can keep my transmitter honest ... do everything I want it to do and get a little bit more out of it."

On Engineering

"... TFT is No. 1 ... there's no doubt about it."

Jim Laird, and many knowledgeable engineers like him can speak from experience on the reliability of TFT systems. And, when it comes to quality engineering, our specs will speak for themselves. Call or write for a set today.

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make a Fairness Doctrine response, a broadcaster should ask two questions.

Question 1: Is the matter a *controversial* issue of *public importance?*

There are several factors which must be considered in answering this question. Mere broadcast or newspaper coverage is not enough, itself, to make an issue a matter of significant public importance. The degree of media coverage can be considered as one factor in determining a particular issue's importance. The primary factor is whether a broadcaster *subjectively evaluates* that the issue will have a *significant impact* on the community as a whole.

In determining whether an issue is controversial, the degree of media coverage is a much more important factor to be considered. Additionally, the attention paid to an issue by community leaders and elected officials must be factored into this determination.

As a general rule, private controversies among individuals do not invoke the Fairness Doctrine. Public controversies often do (e.g., a local school bond issue).

Question 2: What *specific* issue has been raised?

It is sometimes extremely difficult to pinpoint the issue raised. An often-cited Commission example of this problem involves a controversial bond issue to fund teachers' raises and facility improvements. The bond issue, itself, might be controversial in the community; teacher raises and facilities improvements may not be. Broadcast of a discussion of the need for new school construction would not raise Fairness Doctrine duties.

The Fairness Doctrine refers to local, regional and national controversial issues. Of course, an issue may be controversial in one community, but not controversial in another community.

Broadcasters need not present *all* sides of a controversial issue either (1) when first airing the controversial issue of public importance or (2) when permitting presentation of opposing viewpoints. As with other aspects of the Fairness Doctrine, the Commission defers to the discretion of the licensee. The Commission's policy is to refrain from even a semblence of control over program content. The broadcaster is expected to "make good faith, reasonable judgments" in presenting the major viewpoints in the spectrum of opinions concerning a particular controversial issue. The Commission has declared that it will not review a broadcaster's "reasonableness" based upon the handling of one particular issue in one particular program. The broadcaster's "overall performance" will be considered. A broadcaster can rebut a Fairness Doctrine complaint with a listing of programs that have presented opposing viewpoints and have been aired either *before* or *after* the complaint was filed. For this reason, it is recommended that licensees retain detailed listings of all programs presenting particular views of controversial public issues. When a complaint is received, the licensee can simply draft a list of all the opposing viewpoints presented over the station to rebut the complaint.

The choice of spokesmen for opposing viewpoints has not been strictly defined by the Commission. On the one hand, it is clear that a licensee cannot have a neutral party (e.g., one of its own employees) attempt to present all sides of controversial public issues. On the other hand, broadcasters are certainly not expected to pe any "crackpot" who walks in off the street to pre opposing views. Broadcasters should permit "res sible party spokesmen" to present opposing viewpo

Once a broadcaster has met its affirmative dut providing adequate air time for discussion of pu issues, it has several means of assuring that oppo viewpoints will be aired. Before or after the broadca controversial issues; many broadcasters insert nouncements soliciting opposing viewpoints from e sponsible spokesmen. Many controversial issues clear cut (e.g., in the 1960's, the Viet Nam War) a broadcaster will have no trouble in simply contac organizations known to have opposing viewpoints.

A broadcaster may at times fail to locate a respon le spokesmen for opposing points of view in spite of od faith efforts to do so. In such an event, a license is excused from presenting an opposing point of v However, the Commission requires that broadca rs make diligent searches for persons espousing oppo views, including *specific offers* of air time to indivi known to the spokespersons for those opposing v points.

When a spokesman for an opposing viewpoint ps forward, a broadcaster may not refuse air time sim ly because the spokesman lacks the ability to pay. he broadcaster can certainly negotiate for full or pa al payment; but if the spokesman is financially unable he must be provided air time free—unless another re affluent spokesman for the *same* viewpoint can b o cated.

Standard Product Commercials

The Commission reaffirmed its position that the ir ness Doctrine will not be applied to standard pro ct commercials. One public interest organization a petitioned the Commission to apply the Fairness oc trine to product efficacy advertising. The Commi o rejected this suggestion, reiterating that its inclusi o cigarette advertising within the parameters of the ir ness Doctrine was injudicious at best. Also rejected as mandatory allocation of broadcast time for free sp ch messages by spokesmen for opposing points of vie

Editorial advertising continues to come within he constraints of the Fairness Doctrine. Thus, if a pro o tion group buys time to broadcast an editorial, the ir ness Doctrine comes into play for the broadcaster on cerning competing viewpoints. As in other areas of ir ness Doctrine regulation, the Commission will no review a broadcaster's actions in terms of wha h Commission would have done; rather, the Commi o will simply determine whether or not the broadcaste exercised reasonable, common sense judgment in r viding for opposing viewpoints.

The periphery of editorial advertising causes b ad casters untold problems. For instance, during the ener shortage, many of the larger oil companies aired m mercials discussing the opening of the Alaskan oil ld and construction of the controversial trans-Alaskan p line. The question arose as to whether this constitu d discussion of a controversial issue of public import ce or was simply an advertisement aimed at enhancir th company's public image as a leader in developme o energy sources. The Commission has declared th th Fairness Doctrine does not apply in such a situatio

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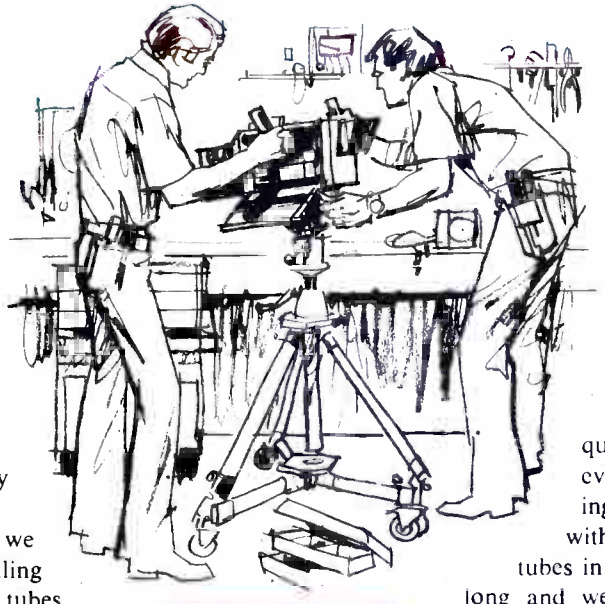
Your Amperex distributor has the replacement tube that will restore your Plumbicon* TV camera to its original performance...

...or even better!



Let's face it—even Plumbicon TV camera tubes wear out and eventually have to be replaced to restore your camera's original picture quality. If we learned anything on the way to selling over 50,000 Plumbicon TV camera tubes, we learned how important Service is to the Telecaster. Especially when it's related to parts availability! No Telecaster can afford to shut down his operation while "waiting for parts." Plumbicon replacement tubes are instantly available, at all times, through local distributors and through Amperex factory sales representatives. And Plumbicon tube distributors (your own local businessmen) are carefully selected for their ability to support Plumbicon TV camera systems with on-the-spot customer support and on-the-spot customer service.

No doubt it was picture quality that motivated you to select a Plumbicon TV camera originally. You can restore that original picture quality—and chances are you can even upgrade it, simply by replacing your old Plumbicon tubes with new ones, especially if the tubes in your camera have served you long and well. Today's Plumbicon tubes improve upon our original Plumbicon, the tube that revolutionized color TV broadcasting and won an Emmy award from the Broadcast Industry. Contemporary Plumbicon tubes outperform the original Plumbicon by a wide margin with such important improvements as Higher Resolution and Modulation Depth, Extended-Red Response and Minimum Lag.

Genuine Amperex Plumbicon tubes are available through selected Amperex Distributors. For the name of the Plumbicon Distributors nearest you, write: Electro-Optical Devices Division, Amperex Electronic Corporation, Slatersville, Rhode Island 02876. Telephone: 401-762-3800.

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the ad bears only a tenuous relationship'' to debate concerning the controversial issue.

In this situation, too, the Commission will limit its review of a broadcaster's decision not to treat the issue as a controversial issue of public importance to whether the licensee made a good faith judgment.

In sum, the Commission will apply the Fairness Doctrine to those commercial advertisements which discuss public issues in an *obvious* and *meaningful* way.

Fairness Complaints

Licensees should be cognizant of the specific information that must be included in any Fairness Doctrine complaint made to the Commission:

1. The station or network involved;
2. The specific issue of a controversial nature broadcast (complainant should include an accurate summary of the views broadcast by the station or network);
3. The date and time when the issue was broadcast;
4. The basis for the claim that the issue was controversial and of public importance;
5. Reasonable grounds for the claim that the station or network broadcast only one side of the issue in its overall programming;
6. Copies of correspondence between the complainant and the station and/or network, and
7. Whether the station and/or network has afforded, or expressed an intention to afford, reasonable opportunity for the presentation of contrasting viewpoints on the issue.

The bigguest shortcoming of all Fairness Complai is the failure to make a specific enough identification the controversial issue broadcast. The Commission h indicated that it will not assume the task of defining t specific issue involved based upon material submitted the complainant. It is the complainant's responsibility specify the issue. The complainant also bears the burd of demonstrating a ''prima facie evidence of violatio of the Fairness Doctrine. If the complainant does so, t Commission will solicit the broadcaster for a justificati of its actions. The licensee need only show that it act reasonably and in good faith. The Commission will substitute its judgment for that of the broadcaster.

Conclusion

As might seem apparent, the complainant norma labors under a heavy burden of proof in demonstratin prima facie case of violation of Fairness Doctrine o ligations. Broadcasters who *1* study the 1974 Fairn Report, *2* maintain a complete list of all discussions controversial issues (including day and time of broadc as well as the particular viewpoint voiced) and *3* foll some of the procedures noted above, insulate the selves, to a significant extent, from adverse Commiss action on Fairness Doctrine complaints.

The entire scope of the Fairness Doctrine is frau with difficulties and underdefined gray areas. This arti has not attempted to thoroughly cover every facet Fairness Doctrine application. Communications coun should be consulted frequently to assure compliance w Fairness Doctrine obligations. **BM**

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Sharp panel debate—

Can A Radio Station Afford A High-Quality Signal?

Some stations can, and do put out a good signal. But if the competition is hot and heavy, especially with pop music, the level has to be kept very high, and dynamic range and cleanness are likely to suffer. Broadcasters tell audio men at AES Convention those are the facts of life.

A group of broadcast engineers exchanged barrages with a roomful of audio professionals at a panel session of the Audio Engineering Society Convention in New York in November, on the topic of the audio quality of broadcast signals: why it is low (if it is) and what if anything can be done about it.

The broadcasters told it straight out, what they were doing and why, and the audience responded with a flood of comments, disagreements, questions, right up to the closing bell. The overall result was probably a clearing of the air; a number of comments from the floor indicated that the audio men appreciated the bind the broadcasters described. The session ended with some tentative guidelines for a better future.

Moderator of the session was this magazine's own James A. Lippke, Editor. On the panel were: William McCarren, assistant director of AM transmitter engineering. CBS Radio Network; Ted Ronneburger, chief engineer of WXLO-FM, New York rock station, affiliate of WOR; George Endres, chief engineer of WRVR-FM, New York jazz station; Bob Deitch, assistant chief engineer of WABC-WPLJ-FM, more New York rock stations; and Dick Sequerra, audio consultant, designer of super-quality FM tuners, general gad-fly. Bill McCarren started things off by noting that the antenna and transmitter must be carefully adjusted for even loading through both sidebands or the signal quality will be hopelessly compromised. He said there was no question that heavy use of processing would make the signal "loud"; but if such processing is to be used, proper side-band adjustment of transmitter and antenna was needed more than ever to avoid signal degradation.

Bob Deitch said that he felt the WABC signal, noted for being one of the "loudest" in the city, was pretty clean. He said the "garbling" Jim Lippke complained about was actually very fast speech delivery of the station's disc jockeys. He said there are no "black boxes" at WABC, the processing is all with commonly used equipment, in standard application, including a UREI Model LA3A limiter set for 7 to 10 dB of levelling, then a Gates limiter at the transmitter, set lower than that. An AGC amp is also there for errors: it doesn't react to normal ups and downs.

Deitch made an interesting point on reverb: he believes a major part of the station's "loudness" comes from the use of an EMT reverb unit *after* all limiting. Reverb ahead of the limiting, he said, will change with level and that is annoying to the listener. With the reverb at the end, it tends to keep the level "even," filling "holes" so the apparent loudness stays up.

He said he felt the use of carts was a disadvantag o signal quality: "This might, indeed, worsen the signa noise ratio." He said it was necessary, when runnir a very high level of average modulation, to have plent reserve in the power supply: WABC uses a supply t for a 100 kW transmitter on its Harris 50 kW transmit

Ted Ronneburger laid on the line the difficulties the engineer of a station in hot competition. His to rock-and-roll sound must be competitive with tha Bob Deitch's WABC, a tough assignment. His p essing equipment is similar to that at WABC—a L limiter, then a Gates FM limiter at the transmitter. le said the program department was constantly pushing ½ dB more of level to beat the "other fellow." resulted in a signal he was not necessarily happy w but he saw no way of changing things.

George Endres put himself right beside the ot when Jim Lippke asked if his reportedly very "cle signal was therefore not very loud. Endres counte "No, we are a little dirty and pretty loud." He sai used much the same approach as Ronneburger at W (Endres was formerly chief engineer there). WR however, uses AGC which goes to about 10 dB and quits (much less than some stations). He said one difficulty was that his combo operators often set the l above or below zero on peaks; if they are low, the si is weak; if high, it is too compressed.

Endres praised the use of a graphic equalizer t everything in the audio line "flat" before processi applied: the line is set up at 27 points across the trum, using broadband noise and the Belar mor Tests are made at a very low level, 30-35 dB b peaks, so all compression and limiting are out. "Thi been very helpful to us in improving our signal," Endres.

He expressed even greater unhappiness than D with the quality of cart equipment. "Something ha solutely got to be done about stereo cart machines," Endres, calling them the worst "sin" in present da station equipment. He asked for some form of casse other equipment that can handle tape more precisel mono mixdown is poor at many stations. "The se biggest problem," he went on, "is that every tim slam the peak limiter you lose highs."

Dick Sequerra, moving away from the specifi broadcast practice, said the industry must get ba basics to solve the contradictions evident. That m

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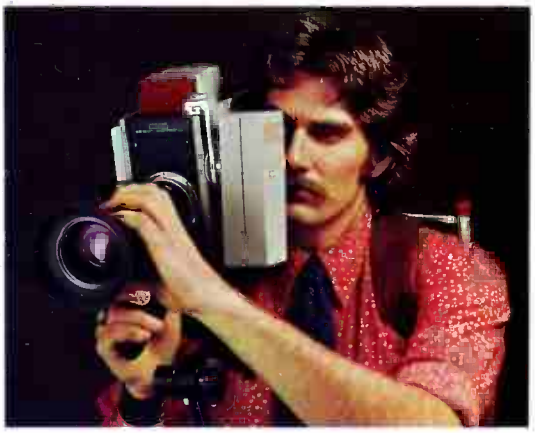

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The addition of the new Hitachi SK-80 camera to our existing line, now gives you three top performance Hitachi ENG cameras to choose from. Each camera also has the versatility to be applied to other non-ENG operations.

Hitachi FP3030 A low cost and lightweight (17 lbs.) completely self-contained portable color camera with built-in battery that is ideal for broadcast capability in ENG, as well as a variety of industrial applications. The FP3030 also features excellent colorimetry and sensitivity with registration-free tri-electrode single tube.

Hitachi SK-70 A modular system camera that can be converted easily from studio to portable use with superior broadcast performance in either mode. Digital command control unit is also available. The SK-70 is many cameras in one!

Hitachi SK-80 Totally self-contained ENG camera whose exceptional design and features are sure to be appreciated by broadcasters. Features three 2/3" Saticon tubes. Optional Gen-Lock available, as well as many other fine built-in features.

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To get the complete scoop on ENG cameras, contact your Hitachi dealer today. And find out how much **more camera** Hitachi gives you for the price!

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said Sequerra, defining what a radio station is supposed to be, what the program material is. He said the AES could do a big thing by setting guidelines for technical excellence in broadcast signals; for example, defining in descending order of excellence various grades of signal. Then we would know what a "transparent" station is. Station audio processing should not enter the equation. A main problem is that we don't know what we want. What is it our processors are trying to "fix up"? Are our statements about broadcasting really true? We must define desirable bandwidth, dynamic range, S/N of a complete system, including the receiving system.

Endres responded that this makes theoretical sense, but in real life what we have is a highly differentiated audience, characterized, for example, by the 1-inch car radio speaker at one end of the spectrum, and the fine hi fi speaker at the other. Why not set our sights on a "target" audience that we actually have, try to satisfy them?

Sequerra said, yes, define the market, but this doesn't define the system nor the characteristics of the audio processing—that must be done from technical points of view.

Several questions from the floor made it clear that the audience had got the message of (a) the problem of the differentiated radio audience, with many levels of receiver quality, and (b) the difficulty imposed by the loudness problem in competitive markets. Two speakers on the floor, both associated with college stations, told similar stories of greatly improved audience response, not only on campus but throughout the community, with sharp improvement in dynamic range, lower distortion, etc.

Bill McCarren said yes, many stations have done it when there was no one else to take the audience away from them. He cited the case of the CBS station in St. Louis, a 50 kW clear channel with no community competition, where the engineering department is under no pressure to "hype" the modulation, sets signal quality by other considerations. Boston is entirely different, with five 50 kW stations within reach. And New York is perhaps worst of all: New York cannot tolerate dynamic range. "Its a fact of life we have to recognize," said McCarren, "given two stations with the same format, maybe playing the same records, and with equal signal strength, then the station with the least dynamic range is always going to come out with the highest ratings."

A couple of speakers from the floor again made the point that stations with a hi fi audience, or in some cases with progressive rock, have been under pressure from listeners to "clean up" the signal (earlier stories in BM/E have described several such situations). The point was clear that, yes, there are a number of situations in which a station, not competing for the mass top-40 audience with other stations, has served its economic interests with "better" rather than "louder" sound. The growth of "hi fi" consciousness in the listening public has had a definite effect. But most or all such stations use *some* limiting to make sure of reaching the community fully.

Victor Campos of KLH, familiar as a gad-fly at earlier AES meetings, expressed from the floor in forceful terms the unhappiness of audio professionals with much of the

The Audio Engineering Society panel on audio in broadcasting fields questions from the floor. From left: J Lippke; Bill McCarren; Dick Sequerra; George Endres; T Ronneburger; Bob Deitch. Photo courtesy AES.

signal quality on radio. He cited his experiments to sh that even with "very modest" receiving equipment, was capable of "very, very good sound." But he knowledged that many FM broadcasters are in a bind commercials have to be heard as widely as possible

From the floor, too, came a statement with an ir twist from Mark Xenakis, chief engineer of New Yo (again) classical station, WNCN. When the statio turned to classical music after its fling with roc WQIV, Xenakis was told by the management, he sai eliminate all audio processing, feed the turntables tape directly to the transmitter: the station's liste said management, would not put up with any kin AGC, limiting, etc. (This must be the *only* case in w a station *management* demanded that the engineerin partment cut out processing totally.) Xenakis said h exactly that—and listener complaints started to po from White Plains, Poughkeepsie, etc., where they getting a poor signal. The management got highly turbed. Xenakis said he made the listeners, and s management, happy by slipping back in about 15 t dB of compression!

Xenakis got considerable flack from the floor, George Endres on the panel backed him up by poi out that two classical stations, WGMS in Washin and WFMT in Chicago, were both getting good re with "very carefully applied AGC." He said "beyond argument" that on FM radio the clas format—or any other kind—needs some amount of processing.

Dick Sequerra then made a statement that provid useful and suggestive finish. He said the way to d the kind of audio processing needed was not in ter how many listeners complain. He agreed that every station needs audio processing. But he suggested th processing does not need to garbage up the signal does in too many cases. "The way to define (the essing) is in terms of the capability of the program rial under average receiving conditions . . . do yo the processing by accident or by design?"

This thought will be explored further in an upco issue of BM/E, which will survey the available processing equipment, including such new units Optimod and the new Volumax which are aimed at lower distortion than was common in the past.

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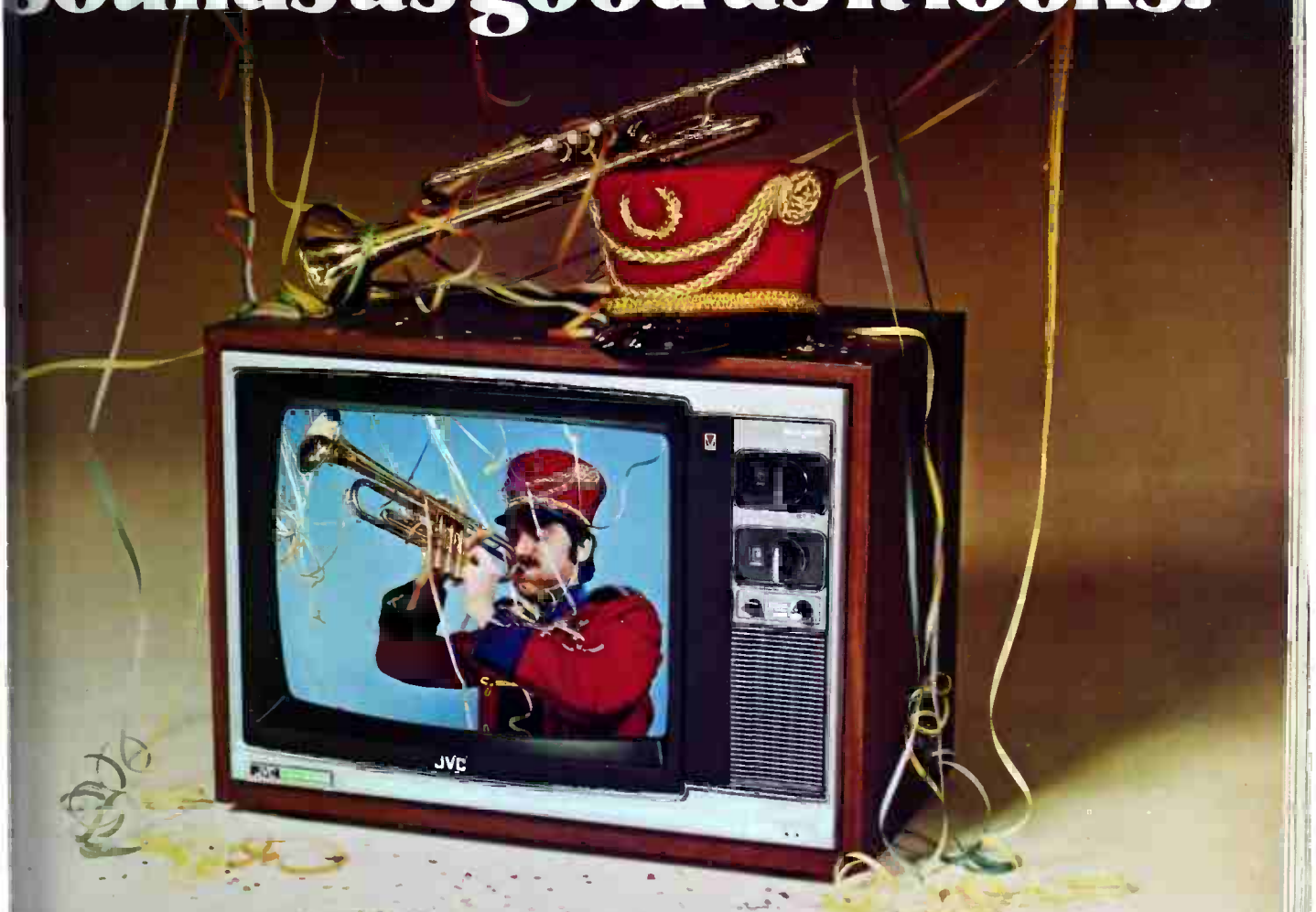

Too often, the sound portion of video production is overlooked. Not on purpose, but because it wasn't being heard very well in the first place. Because most monitors offer only tiny speakers and under-powered electronics.

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Microphone Technique: It's Alive And Well On The CBS Radio Hit Series, "Mystery Theater"

e "old fashioned" microphone techniques used on the CBS radio ama revival could enliven and enhance many current radio grams, live or recorded—and often save time and money to boot. re is how a highly expert team puts together the radio series that s grabbed an army of addicts right out of the television generation.

ne: Two actors are standing in a radio production lio facing each other, speaking a very romantic dia- e into a single microphone that is between them, but on a level with their heads. As the emotion grows, man moves a trifle closer to the woman and the mike turns more directly toward it. He reaches with his , non-script-holding hand over to the woman's ulder in a direct expression of "affection." She es in a trifle closer too, and her voice registers rly a response to the man's gesture. In the control m that looks down on the studio, two men smile a : everything is up to standard in the production of mpteenth radio drama for the CBS hit series, "Mys- Theater."

ne of the men, of course, is Hi Brown, producer of a k of the most famous radio dramas of the 1930's and 0's, who refused to stop plugging for a revival of the orm he helped create. Three years ago, CBS agreed amble on a revival series produced and directed by wn, and the result is radio history. Mystery Theater nning for an hour every day of the week on more 200 stations, and has a fanatic following of some 2 ion listeners.

lystery Theater fans agree: Brown has won hand- ely on his contention that well produced radio drama stimulate the imagination in a way television cannot. listener himself creates a more fearsome fear, a e glorious joy, than can ever be "shown" to the eye.

he other man in the control room is Fred Himes, nical director, artist with microphones, responsible he technical end of getting each show on the tape sound that works effectively for the atmosphere and tion of the story. The romantic scene described e illustrates clearly his basic method.

s can be seen there, (it actually happened), he does use today's predominant technique of close-miking, a mike for each actor, recorded on a separate track with the show "assembled" in post-production down. That would mean, says Himes, that the rs would be tied to the mikes and isolated from each r, whether sitting at a table or standing in the room e distance apart. Brown and Himes want the actors to move, to express emotion with their bodies as as their voices, and especially to interact directly each other, as the two "lovers" did in the scene described.

Technical director Fred Himes adjusts "cast" microphone for taping of Mystery Theater drama. Much of dialogue is recorded with this single mike, with actors in the two lobes of figure-8 pattern. Higher mike gets more reflections, can put "room" around actors.

"Separate" miking would break down, too, when the actors shout, which they obviously must do from time to time. There would be heavy leakage from one track to another. It is far better to have everybody on one track, able to shout, move, interact.

That motion and interaction give the show its life. Another example: in a recent show there are three murders in rapid succession. The actor "murderer" actually lunged toward each "victim." That lunge helped him express hate and violence with an intensity he could never have achieved sitting at a table, tied tightly to a mike pattern.

Moreover, the listener hears real bodies falling onto a real floor. The effect could be simulated in a mix-down with various kinds of audio processing, but at much greater cost in man-power and time (more on that presently). And further, the motions of the various participants with respect to the mike help give the listener a sense of the motions in the story. With careful handling,

continued on page 32

In control room producer-director Hi Brown signals actors to start scene. Himes rides gain; frequent adjustment of level is needed. Brown can stop tape to correct a scene, then re-do it, but no changes can be made in a "mixdown" because there is none; all recording is in full-track mono.

motion in and out of the mike can be used to reinforce aurally the story motions.

A considerable part of many shows is done with the single mike used in the opening scene—it is a Neumann U67, with a figure-eight pattern. An omni mike would get too much room sound. Thus, in most face-to-face dialogues, there will be one or more actors in each "lobe" of the mike.

The Neumann hangs near the center of the studio, away from the walls, so that the ratio of direct to reflected sound is high, and the listener does not get a strong sense of a room around the actors. Then the sound effects and dialogue can create a "setting" out of doors, in a street, etc.

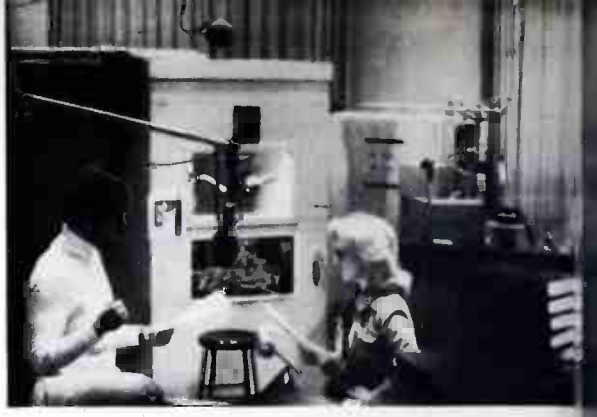
Himes sometimes puts a second omni mike right next to the Neumann, or "cast mike," at 90° to it. With filter/reverb added, this can be used for "ghost" voices, without serious leakage of the "ghost" into the cast mike.

There is another mike several feet higher and looking down at the cast mike, which gets a much higher proportion of reflected sound. To put a "room" around the actors, Himes can mix this mike in—or use it for the full pickup. Other mikes are used from time to time in the corners of the studio, even occasionally in the corridor outside, for various special effects.

But no matter how many mikes are used, they are all mixed in *before the program goes on the tape*—recording is in full-track mono. Also mixed in to the single track are the sound effects and the background music (of which more in a moment).

Himes does use audio processing for certain effects. He has used a "flanger" on a voice channel to get a fluttery, science-fiction strangeness in the voice. He has two channels of reverb he can add to voices to make them overfull, grandiose. For telephone quality, he uses, literally, a telephone, in a sound-proofed booth at the rear of the studio; it is open so actors can duck in and out with no door sound.

A Pultec can be switched in to help, for example, in indicating that an actor has moved from indoors to out: at



In studio, two actors do a scene from opposite sides of s. mike. Note beginning of man's punchy gesture. Beyon actors is "telephone booth," into which actors can duc make call on a real telephone. Sound effects man Pete Prescott, right rear, works right in studio with actors.

Prescott, about to close his "door," gives timing cue to in foreground. Bottles on sound effects stand were use pouring drinks in front of mike, for convincing party sou Crumpled newspaper was left over from scene in whic murderer ransacks a living room, looking for hidden rec

the right moment the Pultec takes out a carefully termined amount of bass, leaving that flat, non-refle bass-weak quality characteristic of out-of-doors sou

But a considerable part of the "naturalness" punch come from expert use of the microphones example, a nurse is frantically looking for a child w turns out, has climbed a tree and can't get down.

The nurse's calls to the child are "on mike," up close with the gain down so she seems right next t listener; the child's voice is made to seem far awa having her about eight feet from the mike, but spe directly into it to minimize the reflections that wou unnatural in the "setting."

A somewhat similar mike technique made the seem "natural" when an actor was supposed to be ing across a small lake.

Here are a few more examples of the ingenuity H must come up with for one script after another. A has been transformed into a spider and is speaking inside a bottle. Some experimentation led to a p film can over the mike, with the actor speaking di into the bottom of the can from a few inches away some filtering in the mike channel.

For an actor speaking on the far side of a closed Himes made a device of several painter's masks together, with felt between each "layer." The holds this over his nose and mouth while he is supp to be beyond the door, drops it when he "comes in room."

Himes agrees that for many kinds of program pr

continued on pa

ANTENNAS AND TRANSMITTERS

PRIME TIME

V RCA ANTENNAS D TRANSMITTERS GHTEN THE TURE FOR TWO Y DIFFERENT STATIONS

-TV, Tucson, Arizona, and -TV, Hartford, Connecticut are as different as two TV stations t. The first is a highband ercial station; the second, a ublic TV outlet.

thing they had in common e need to improve their ission facilities in a way that assure stability, low mainte- and improved picture quality. helped both stations attain ojectives. Here's how:

RCA TT-25FH TRANSMITTER "AN ALL AROUND PERFORMANCE WINNER," SAYS GLEN HILLS, KGUN-TV.

"Our 25 kW RCA transmitter has been operating for well over a year now, from the top of 8500-foot high Mount Bigelow," reports Glen Hills, Chief Engineer, KGUN-TV. "The

"...improved our picture quality substantially."

transmitter has been reliable, very stable, and has improved our picture quality substantially.

"With only two broadband stages, the TT-25FH is easy to tune, but that's rarely necessary. Ours goes three or four months without more than a touch-up. The automatic controls minimize the need for constant tweaking.

"Sometimes in the summer, lightning storms turn Mt. Bigelow blue, but we've had no lightning problems. It doesn't affect the transmitters' solid state circuits. Our picture even looks good when we're

"...just sits up there and runs!"

transmitting with our emergency diesel generator—and the transmitter seems immune from generator effects.

"The TT-25FH just sits up there and runs. It's a winner!"

"TOP-RATED TRANSMISSION ON A BUDGET," SAYS JACK KEAN, VP/ENGINEERING, WEDH-TV.

"Public television needs a quality picture as well as worthwhile programming to get and hold audiences," says Mr. Kean.

"Our RCA Antenna/Transmitter system was installed in 1973. It has given us excellent coverage and signal strength—to the point where WEDH is currently the top-rated Public Television UHF station, and #5, among all Public TV outlets.

"Our new TFU-20J omnidirectional antenna resulted in a phenomenal

"...phenomenal improvement in signal clarity."

improvement in signal clarity, in null areas and giving us excellent reception to all of Hartford, minimizing the need for roof-top antennas."

The new transmitter for WEDH was an RCA TTU-60BX with an economical standby power option. It is a single-ended 60kW transmitter with a klystron switching arrangement that permits one of the visual klystons to function as an aural amplifier in the event of an aural klystron failure.

"The TTU-60BX transmitter is remote-controlled from the studio, and its redundancy features are

"...support as outstanding as the equipment."

excellent. The spare exciter with automatic switchover gives us full protection—and we no longer have to man the transmitter site.

"RCA support has been as outstanding as the equipment."

RCA

tion today—large-group music, rock and roll, material with very many far-out sound effects or synthesized music—multi-track recording and mixdown are advantageous and are here to stay. But for his kind of show, and at least as a supplement on many other kinds, he believes that the old "pure" mike techniques can do things better, more effectively, and faster (see below).

The sound effects, naturally a vital part of each show, are a story in themselves. In charge of sound effects is Peter Prescott, another veteran of the "old" days in radio. He has a sound effects stand on the opposite side of the studio from the control room.

Prescott has all the traditional sound "tricks" that have been described scores of times—the gravel bag, the horse-hoof cloppers, etc., etc., and two microphones to pick them up. He has an actual door (four feet high) to slam, or open, or shut stealthily, with a microphone to get the bass "wump" of the door and another for the high pitched sounds of latch and lock. He has a large repertory of sound effects on carts, and records, plus six cart players and two turntables.

To put it all together, he has a small subsidiary mixer panel right in his sound effects box. He sends his sound effects by cable over to the main console, where they are mixed into the program before it goes on the tape, as already noted.

That means Prescott has to do his work in real time, right along with the actors. As Fred Himes points out, again there is genuine interaction, in this case between Prescott and the actors, and it puts a lot of life into the show. Prescott can time his door, for example, to exactly the right moment in the dialogue as it is spoken. The actor, for his part, can respond directly to any sound that Prescott sends over.

Having the sound-effects operation right in the studio at some distance from the actors and the cast mike only allows the actors to hear the sound effects aco cally, for direct timing, but also, says Himes, impr the naturalness and "punch" of the sounds as recor The combination of main pickup with a mike right o sound-effect stand, plus a low leakage of sound ef into the cast mike about 20 feet away creates an hanced naturalness far superior to that of pre-reco sounds.

Himes has some advice for anyone who wants a sharp pistol shot, recorded with a real pistol: turn of but one mike. If several mikes are used, the shock from the shot will reflect to one mike after another multiple-shot recording that has a blobby, blunted ef By the same token, if you want a fusillade effect, multi-shot device in a long corridor, with two or t mikes spaced very far apart. Then the reflections the end of the corridor will multiply six or eight into a volley from a full battalion.

Many sound effects come from doing the itself—when an actor says, "Put those groceries o kitchen table," Prescott is ready with a heavily lo paper bag he puts down in front of his mike; whe actor says, "How about another drink?" Prescott p water from a bottle into a glass; the gurgling and sp ing are totally convincing.

But when they needed the sound of a car falling bridge into a river, large objects into a large tub of didn't do it: it took water poured into the water!

The last element, background music, comes fr library of about 500 carts that are stacked up just be the console operator's position. These have beer tensively classified and labelled so that Brown Himes, can put his hand quickly on the kind of needed for any part of a show. If music of the w kind is not already on hand, CBS is asked for it ahe time. The console operator is handed the carts for show with a cue sheet.

Himes points to another area in which his tech

Ampex Introduces Radically New Audio Machine

A new audio tape machine by Ampex with radica vances in tape handling and electronic design was sh to radio and recording professionals for the first tir the Audio Engineering Society's 1976 Conventic Los Angeles, May 4 to 7. Called the ATR-100, the machine, said Ampex, is ready for immediate deli at prices that begin under $5000.

Tape handling on the ATR-100 does not depen pinch rollers in pulling tape, but uses a closed-loop tronic servo system that controls capstan and both together to put exactly even tape tension on both sid the capstan. The servo is driven by digital com logic that senses the motion of the capstan, the dire of motion, the size of the heads and width of tape the amount of tape on each reel. The logic puts th together so that the motor drive on the reels can co the tape at all times, maintaining constant tension heads and capstan. This provides, says Ampex, "e tape motion that, along with the improvements in tronics, "permits the most accurate reproduction of inal and recorded sound ever achieved on tape."

The totally new signal electronics, says Ampex, performance specs that are as much as 10 dB, or an of magnitude, better than any audio recorder now market. Signal to noise ratio is rated at better than

thods are vital to the show: economics. Brown pro-ces about 195 shows a year, four every week. Stations n four new shows and three repeats a week. Unless the ows were made swiftly and efficiently, the project uld be impossible.

And they *are* made efficiently: Himes reports that the ing of a show rarely runs to the full three hours of the all" for the actors. The actual drama runs about 45 nutes with introduction and postscript; five com-rcials for CBS, and five for the station (the com-rcials do not come in the middle of the drama), bring it to 53. A seven-minute newscast completes the hour.

The usual procedure is for the actors to have a single n-through with the script and the sound effects, and n the actual taping starts. This superspeed production ossible because the actors Brown uses are generally hly experienced radio "voices" who need only one to get at the guts of a drama. And they are micro-one-wise: they know that up close to the mike and low is intimate"; if they are going to shout they have to pull k a little, etc. A very similar situation prevails in pop sic recording: veteran jazz "sidemen" can come into cording studio, pick up a piece of music they never w before, and play the heart out of it after one or two n-throughs.

The taping of Mystery Theater usually ends with a nber of segments of tape, as many as a hundred, ch represent the stopping and restarting of the show eliminate some "clinker" or other. Himes and his v assemble these into a finished show after the actors e; it usually takes no more than a couple of hours.

Himes concludes: "If we had to put the show to-ger, get the 'sound' with fancy processing in a mix-n, it would take three times as long as what we do, cost three times as much. And the show wouldn't be better—it wouldn't be nearly as good! All of us who k on Mystery Theater feel we are doing something thwhile and artistically satisfying—and it is a success there." **BM/E**

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track at 30 ips), combined record and reproduce onse is ±¾ dB, 100 Hz, to 15 KHz at 15 ips (com-d with the generally claimed ±2 dB of most top-e audio machines).

The control panel is a matrix type with all buttons in rea about the size of a pocket calculator. It can be on ight or left side of the machine, or separate from the hine in a remote-control version. Other standard fea-s are PURC (Pick Up Recording Capability), an elec-ic tape timer, an editing knob that allows the oper-to move the tape exactly to a wanted edit point, and te heads with a one-year guarantee. The machine can ad with any two of the four standard speeds (not ssarily adjacent), 3¾, 7½, 15, and 30 ips. It can le 14-inch reels for six hours of playing time at 3¾ suitable for radio automation systems, says Ampex.

Arthur H. Hausman, president and chief executive er of Ampex, said: "The ATR-100 is a milestone in tical sound recording that spans nearly 30 years of eering leadership in audio engineering and in-orates modern computer technology." He pointed that, along with a number of other Ampex audio and o innovations this year, it results from research and lopment investments of more than $70 million since 9. **BM/E**

Two Production Techniques Give New Versatility to Videotape Recording

With a few modifications, Teletronics has achieved the long sought after goal of "The Film Look," and changed the video engineer to "video colorist." Windsor Total Video uses standard production techniques to "animate" Ad agency storyboards. Both techniques can increase the productivity of television studios.

Despite the technological advances in videotape there are still two areas in which film is considered, commonly, to have domain: Animation. And that unarticulated notion called, "The Film Look."

Two New York companies, however, have gone a long way toward dispelling even these vestiges of film superiority. Windsor Total Video, using a simple process it has dubbed Videomatics®, has produced more than 300 test commercials using ordinary studio equipment, to achieve highly animate test commercials on videocassette for New York City's top advertising agencies.

Teletronics International, Inc., although using some fairly sophisticated editing equipment, has done wonders with slightly modified production equipment in achieving the "film look." According to Dan Rosen, vice president of Sales for Teletronics, there are basically four major elements required to achieve the "film look."

At Teletronics, said Rosen, "our thrust was always toward people of film orientation. The idea was to get our single camera units and shoot film style." The first necessary step, then, was to modify a Norelco PCP-70 to take 35mm film camera type lenses.

Although there were initial problems, Teletronics was eventually able to locate a lens mounting adapter that allows them to use a variety of lenses such as a 25-250 Angenieux, 16mm wide angle, a 155mm macro a battery of five or six fixed Nikors. With the adapter some modification to the PCP-70, Teletronics was to permit the film director to work with lenses o choice, without having to relate his objectives to v lenses.

One of the keyboard edit systems at the new Teletronics Video Center. Living room atmosphere supports optimum creativity.

The second and third elements for achieving the " look" are perhaps, the most important: Lighting what Teletronics calls their video "colorist."

Lighting for video was always considered as, "s how different," then lighting for film, accordin Rosen. "Part of that," said Rosen, "was because was thought of as a television broadcast medium most of the people who were in it were technician

Videotape was alright for the six o'clock news, Rosen, or for doing the "Beachcomber Bill sho some of the kiddy shows, but there, they always h very flat look." Rosen attributed this to the necessi lighting for multiple cameras and the lack of produ time available to the average broadcast station.

"Whereas," said Rosen, "when you're into commercial area," like Teletronics, which proc hundreds of commercials a year, "you are into very production values."

In commercials, "you're dealing with people wh relying upon film and very fine, subtle lighting, v each frame you shoot is very important," said R "So what we try to do," he added, "is eliminat technician mentality; to get our whole way of oper to build up a rapport with film people and to stay from rigid lighting requirements."

Rosen said, "Our big sales idea was to be able t to a film director or cinematographer, just light the you normally light for film."

It is at this juncture that the video engineer's becomes critical. One of the things Teletronics d take creative advantage of their engineers was to si change his title to "video colorist."

We take the term, "colorist, very seriously." Rosen. "Traditionally, the person who controlle camera with regard to color and density was refer as the video engineer, or more commonly, the man," according to Rosen.

"The way we presented ourselves," said R

continued on pa

"was to get away from that 'Technician/Engineering' mentality, so our phrase for that person is video colorist, which is what he is." Teletronics presents the "colorist" as, "a very key creative advantage, for which there is no analogy in film production."

What appeals to a lot of people, said Rosen, is that you are able to mix your color, and "control your density while working with the person doing the lighting, so as to achieve the aesthetic goal." Rosen pointed out, that one of the key advantages for the director is that he can see exactly what effects he is achieving while on the set or location. A director, cinematographer, and a colorist, working together, "can really paint the hell out of a picture," said Rosen.

Though the use of the colorist at Teletronics has been described as "taking the color lab with you," Rosen explains that, "On a higher plane he (the colorist) is more than a lab timer. He is part of the production advantage of that shooting pool. He can be, and I think in our case, he is, a very creative part of the job."

The "video colorist" at Teletronics works with the production team from the very beginning and for that reason, according to Rosen, there is very rarely a need for post-production color correction. When the need does arise, however, the "colorist" works very closely with the post-production people and can perform extensive color correction, "after the fact."

The fourth element in obtaining the "film look," is the use of optical effects. "Optics," said Rosen, "are the same," for tape as they are for film. "Whatever a director would want to use on the lens, whether it be vaseline, silkstockings, diffusion filters, fog filters, you get the same result with tape as you do with film, except that you see the results immediately."

In addition to the four basic elements: The use of 35mm film lenses, film lighting techniques, the use of various filters, and the redefining of the role played by the video engineer, Teletronics also attributes much of its success at obtaining the "film look," to creative use of its sophisticated editing systems.

Teletronics uses three types of CMX Editing systems,

Teletronics has separated VTR equipment from the editing rooms so that the latter are quiet and distraction free.

Engineers at Teletronics are creative video colorists.

all computer assisted. Each system, whether it i light pen system, the keyboard system, or cassette ing system is capable of providing frame by frame ing

Moreover, the editing rooms are separate fro VTRs and computer hardware, so that the edito director are free to turn all of their attention t process of achieving their desired goals. Because speed of these editors, and the creative environ Rosen pointed out that the director is more like pursue ever more refined editing effects.

Though Teletronics has gone a long way t "achieving the film look," most commercials ar shot in film.

"One of the things that technicians reinforced videotape," said Rosen, "was that you were into extensive limitations with regard to lighting and th have to have 'x' amount of footcandles, but that true." According to Rosen, videotape, "is a medium than film, but to this day, the myths, in c quarters, persist."

Regarding contrast ratio, Rosen pointed out, t though film does have an almost unlimited co range, if it is intended that the final product is to b for broadcast, the film will still have to be shot or essed to conform, "to the TV system."

Everything Teletronics does to achieve the "film conforms to broadcast standards," said Rosen, broadcast standards provide considerable latitu creativity."

Videomatics bring life to static artwork

Animation, which has traditionally been the pr of film, is also yielding to pressures from vid technology. Though computer assisted animatio synthesized video have been around for some tim is still the medium of choice for most types of anim because it has been cheaper and simpler.

One type of animation, however, as practi Windsor Total Video, uses video for what it do permit instant viewing of results.

In the high pressure world of Madison Aven vertising, many agencies wish to present a conce client in a more animate form than the traditional board. They also want to get that idea to the cl quickly as possible.

continued on p

olby Noise Reduction

he First
uccessful Decade 1966-1976

by noise reduction has staying power.
as been around for ten years.*
ou have read our technical papers and otherwise
owed our progress, you are probably familiar
n the reasons for this success. Here are ten quick reminders.

e Dolby system works like a
stant-gain amplifier in two critical
mic regions—low levels and
levels. Error-free signal handling
us ensured at the dynamic
e extremes. Compression and
nsion occur only at easy to
le mid-levels, between —20 dB
—40 dB.

e system employs a simple
ng and subtracting scheme which
matically results in mathemati-
exact complementary compres-
and expansion. There are no
oximations, so the signal must
out the same as it went
st check the Dolby Level now
hen).

mpressor overshoots with high-
transient signals are suppressed
ut audible distortion, because
e basic system layout (dual signal
s). Since there are no overshoots
clipped by the recorder, there is
pairment of even the most
me transient signals.

4 The freedom from overshoot is a result of system philosophy, not an ultra-short attack time. Relatively gradual gain changes are used, yielding a compressor output which is remarkably free from modulation distortion. There is no need to depend upon cancellation of modulation products by the expander (thereby relaxing recorder performance requirements).

5 The reproduced dynamics of low-level signals are essentially immune to rumble in the input signal and head bumps and other frequency response errors in the recorder—the system has a solid low-level 'gain floor' below —40 dB.

6 The system gives a pre-determined amount of noise reduction which is realistically useful.

7 The noise that remains has a subjectively constant level. Noise modulation effects are almost non-existent.

8 The principles and parameters used in the Dolby system result in a high margin of safety. The system works well with all types of audio signals —speech, music, effects—and with practically all types of noises. High noise levels (from multi-generation copies, for example) do not impair performance.

9 The system functions reliably on a day in, day out basis, with real workaday recorders and other equipment.

10 All of the above have been proved in ten years of dependable service to the industry—25,000 professional channels in use by well over a thousand studios in more than 50 countries around the world.

irst five A301 units were delivered to the Decca Record Company, London, on April 14, 1966.

---

by noise reduction now looks forward to

he Second
uccessful Decade 1976-1986

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Telex 919109
Cable Dolbylabs London

The solution worked out by Windsor, is a process they have dubbed Videomatics®. Videomatics is a method of "converting artwork to a moving image," recorded by standard studio gear, according to Ken Lorber, vice president of production for Windsor Total Video.

Windsor asks a prospective client, usually an ad agency, to provide two things: artwork completed on 9" × 12" board, and a ¼" audio tape of the voice and/or music track.

The artwork can be on almost anything though they prefer the 9" × 12" size. It can even be on slides and they have shot from artwork as small as 2" square. Though the audio track is usually completed outside by the agency, Lorber points out that Windsor is equipped to record that stage as well.

Once the artwork and audio tape arrives, the audio is transferred to one inch videotape. Then, using the storyboard, and sometimes a shooting script, the visuals are assembled.

The most common set up involves the use of two cameras, the switcher, lights, and Windsor's one VTR.

The artwork is set up on easels and illuminated cameras are focused on the artwork and the camera ators follow directions for pans, tilts, zooms, and provided by the director.

The method of recording, said Lorber, "pretty parallels normal live action shooting."

The artwork is changed according to the scri storyboard and each "frame" is assembled ont video tape so that it corresponds with the audio tr

In addition to the camera moves, Lorber adde they also use, "keying, supers, wipes, split scre any of the special effects needed to add to the an quality of the spot."

"Although we coined the phrase 'Videomat Lorber said, "the process actually started out agencies. They would use b&w videotape to recor

continued on pa

Creating Video Graphics With A Light Pen

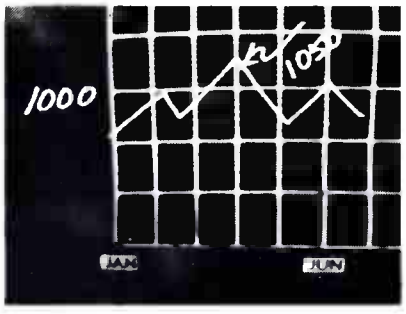
INTERAND's Telestrator provides an unusually simple and versatile way to write graphics directly into the video image. The electronic pen and tablet are used like a pencil and paper. When one writes on the transparent tablet, the added marks, strokes, or drawings are superimposed on the background image and the combination is seen on the monitor directly beneath the tablet. Thus, the impression of writing directly into the video image is created. The pen can be turned into an "eraser" (a recent development), by merely pushing a selective erase control button and placing the pen on the spot to be erased. Thus, errors or changes may be selectively erased without erasing the entire screen.

Pre-programmed symbols of any size or orientation may be instantly placed at any point on the screen by selecting the symbol and touching the pen to the desired location. A complete screen of graphics can be built up quickly using symbols. Telestrators also have the capability of putting circles or any symbol into a cursor mode, so that the viewer's attention can be brought to particular points on the video image.

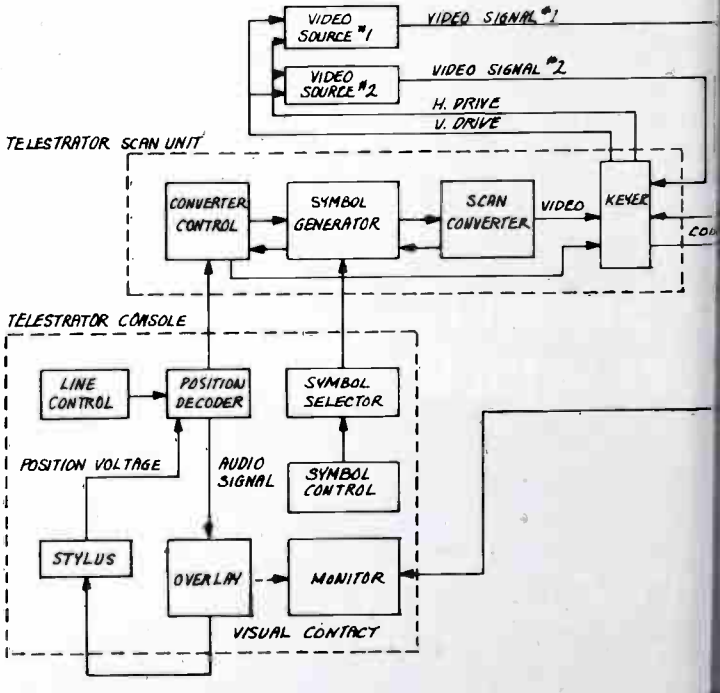
The Telestrator is now utilized in many broadcasting applications. In its latest form one can write and store at the same time. Some of the standard broadcast users are illustrating news, sports, and weather productions. The Telestrator has also been used to animate studio card material, add "life" to still photos, make station announcements such as weather warnings, station logos, announce audio failures, and elaborately edit video productions. This method of graphical presentation can increase the viewer's interest in the broadcast, but it is not without pitfalls. If too much graphical information is presented at one time, the video image becomes cluttered. The personnel using the Telestrator can, however, judge for themselves the amount of graphics that will enhance the production, because they can directly see the effects created as the graphics are added to the video background.

One example of how the Telestrator can assist in

continued on page 42



Typical graphics written with a light pen on Telestrator.



Block diagram of Telestrator.

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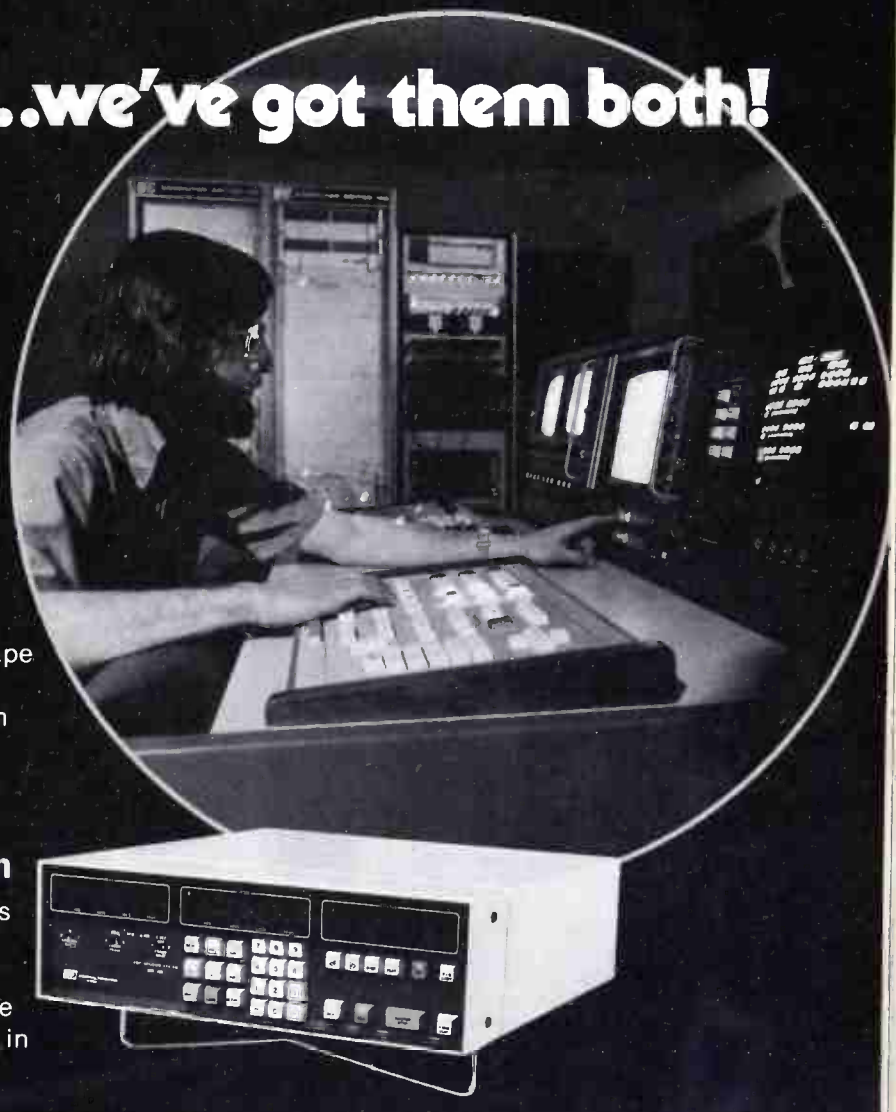

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Circle 127 on Reader Service Card

frame of their storyboard and use a professional voice/over for presenting concepts to clients."

"All we did," Lorber continued, "was take the idea a couple of steps further and add the host of special effects and quality appearance that agencies were not equipped to provide."

The results of the Videomatic process have been so good, that although Windsor does not normally shoot these spots for broadcast, a couple of them have been used as regular on-air commercials.

Lorber points out, that when shooting low budget commercials, set design and talent quality often suffer. But, Videomatics can offer, especially to retailers where turnaround time for sales and such is important, an effective and superior low budget approach.

The real key to doing Videomatics is working closely with the agency. Frequently, the art director or illustrator needs consultation on how to prepare the artwork to achieve certain effects.

"Sometimes," said Lorber, "if the client wan glass to fill or a car to appear as if it's moving dov road, we might have to explain to the illustrator ho prepare a piece of artwork for keying or suggest ho piece of clear acetate might be used to permit us to some colored paper behind the glass to make it appe fill."

All and all, the process is "amazingly simple productive." In just the 18 months that Windsor been engaged in Videomatics, it has completed r than 300 individual spots for at least "eighteen out o top twenty ad agencies in New York," accordin Lorber.

The most remarkable thing about both of these t niques, "the film look," and "Videomatics," seen be that neither technique has required any space technology or electronic wizardry. Instead, each t nique has resulted from careful experimentation existing technology and ardent pursuit of solution common problems. B

Creating Video Graphics

continued from page 40

making a clear and concise presentation is in graphically showing the stock market reports. The charts that are used are simple studio cards and do not have motion or animation. Most newscasters simply show the chart and deliver the narrative. Their viewers have the feeling that they are looking at a still slide and the presentation can be dull. One alternate approach is to use a rear screen or "reveal" which is time-consuming and can tie up an extra camera. A second method is to use a Telestrator. The same charts are broadcast. But now the newscaster can write or draw on the charts: highlighting, pointing out specific points, writing the numbers on the screen, and creating eye-catching special effects as he desires. The feeling of looking at a still slide is gone since the broadcast picture is continually changing. The presentation becomes more interesting and informative to the viewer. The accompanying photo of a TV receiver illustrates this. The newscaster has just finished the last short feature and is ready to begin the market report. The stock market performance chart is broadcast and the newscaster begins the narrative.

"The Dow Jones Industrials closed down 3 points today at 944."

As he talks to his audience, he writes in the number 1000 on the graph and finishes the last segment of the graph.

"The performance of the market is down from a high of over 1050 in early April, but some indicators are pointing to a recovery period within three months."

As the number 1050 is spoken, the newsman writes in 1050 and then draws an arrow showing the time period of early April.

A cursor arrow could be also selected and the newscaster points at the somewhat cyclic dips in the past performance. The figure below shows the arrow pointing to one of the dips.

The key features of the Telestrator are the ease of use and the capability to generate complex animated graphics for many types of productions. Alternative methods usually involve far more time, trouble and practice and also tie up both studio facilities and crews for far longer times to achieve the equivalent effects. The system costs $12,000 in its base form. Expanded symbol generators or special effects can add up to another $6000.

How it works

The Telestrator consists of two units, the Scan Unit and the Console Unit. The components of the console unit, usually housed in close proximity, are the monitor, transparent overlay, stylus, console controls and position decoder. The scan unit includes the scan converter, symbol generator, converter control and keyer.

The operation of the Telestrator can be traced as follows:

A signal from one or more video sources is fed into the keyer and the resulting composite picture is displayed on the monitor.

At the same time, an audio frequency signal is generated by the position decoder and applied to the position-sensitive overlay. A set of diodes alternately directs the current to the X and then Y directions of the overlay.

The overlay is coated with a transparent, conductive coating. When current flows in the X direction, the X position can be determined by the proportion of the measured voltage at a point in the X direction to the total voltage drop across the total X length. The Y position is measured with the same procedure. The position decoder also decodes the combined X and Y position information into separate X position and Y position signals.

These signals are fed through the converter control, which contains the circuitry for varying the line widths. A sine-cosine generator varies the X and Y voltages in a circular pattern around the X and Y position defined with the stylus to create a wide line. The line control generates the control signals for the converter control.

The X and Y signals are passed to the symbol generator. The symbol generator has symbols stored on ROM's. The information in the ROM's control current integrators used to create straight-line segments which are stored in the scan converter. The symbol generator passes the X and Y signals directly to the scan converter when a symbol is not selected. The size and orientation of the symbols are determined by the symbol control and the symbol selector addresses the appropriate ROM.

After the desired changes are made to the original X and Y position, the X and Y signals are written and stored on a scan converter where they can be retained until completely erased or selectively erased. This image is converted to a standard television image in synchronization with a background video signal. The scan converter output can be used to key in a white or dark level or another camera.

For more information, circle 398 on Reader Service Card

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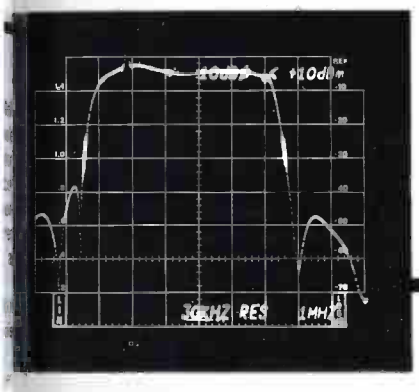
ideband analysis, plus...



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.new capability by combining a h performance spectrum ana- yer with a sideband anlyzer:

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The New 1405 TV Sideband Ana- yer is an adapter to be used with the 7L12 or 13 to analyze the response of a TV transmitter. The 1405 generates a composite video signal, the picture portion of which is a constant amplitude sine wave signal that sweeps from 15-0-15 MHz. When this signal is used to modulate the TV transmitter, the sideband response of the transmitter will be displayed on the spectrum analyzer. The 1405/ spectrum analyzer combination can be used to display the frequency response characteristics of rf and if stages of any vhf or uhf transmitter used today in the world. Video circuits from 0 to 15 MHz can also be analyzed.

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April 23, 1976

Mr. Paul Warnock
President
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Dear Paul:

The new TeleMation TCG3000 Character Generator has proven to be a very delightful surprise. It seems to measure up to just about all of our expectations and then some. I thought you would like to know that it has generated more genuine excitement and enthusiasm on the part of our employees than any other piece of equipment that I have purchased for the station in the last seven years.

May I extend our thanks to you and to those members of your staff who have contributed so much in the preparation, design and provision of this forward looking equipment and especially to Dennis Fraser, Tom Meyer and Leo Lewis. It was great having those people work with us on this project and we hope that they will continue to support us as we come to be more knowledgeable and familiar with the equipment.

I just thought you might appreciate our words of thanks.

Sincerely,

R. C. Smith
Chief Engineer

RCS:rg

Introduced at the '76 NAB, the first ***Compositor I*** Titling/Graphics System was delivered to Time-Life station WOTV, Grand Rapids, Michigan, on April 17.

The results?

WOTV Chief Engineer R.C. Smith writes that the ***Compositor I*** "has generated more genuine excitement and enthusiasm on the part of our employees than any other piece of equipment that I have purchased for the station in the last seven years."

We wish to thank Mr. Smith for his appraisal, and extend an invitation to all Broadcast Managers and Engineers to compare these ***Compositor I*** features with any other multifont character generator:

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- Automated Election Reporting. With the addition of the TED (Television Event Display) software package, the ***Compositor I*** automatically compiles, formats, totals, and displays election returns. No additional hardware is required.

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For more information about the Compositor I, send us the coupon below or call TeleMation Broadcast Sales collect at (801) 487-5399.

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Buying A Switcher For That Best-In-The-Market On-Air Look

A production switcher is a more critical component than the camera, the VTR or studio staging in determining your on-air look. You've got the right switcher when a creative production director and a conservative chief engineer agree on the same unit.

You don't lay out $50,000 or more for a new production switcher just to make your creative production department happy. Such an investment may be well worth it, however, to improve the presentation of news shows, to dramatize the coverage of sports or to sharpen your ability to produce commercials. Your real reason for buying a new switcher, therefore, is to make your sales manager happy. You get a production aid tool* and a sales tool at the same time.

But in buying a new switcher, you may be giving your engineering department a headache. On the one hand, the chief engineer has to make sure the production manager will be satisfied but on the other, he has to be sure the switcher he selects will be reliable. There have been plenty of miracle devices ordered in the past that simply have not measured up—or didn't get delivered in the first place. Notwithstanding the checkered past of some suppliers, now is not the time to be timorous. There are excellent proven switchers already on the market that can help you and there are exciting fourth generation** devices now appearing. If your present switcher is over five years old, you need a new one to get that contemporary look.

Be prepared to pay the price of a Grass Valley 24-input, 8-output 1600 7J with options. Indeed, don't be surprised if this switcher is the one recommended to you by your staff—it has been the first choice of most productions out to buy the best. But make your guys put it—in terms of "Yes, it's exactly what I want to do creative things (production manager);" "It's the switch to buy (chief engineer);" "It's the best value for dollars spent (production manager and chief engineer)."

We are not trying to suggest the GV 1600J7 (or similar model) won't meet these tests. We are suggesting that there is some keen competition out there in switchers from American Data, Central Dynamics and Vital to mention GV's chief rivals. There's a second tier of competitors too: Computer Image, Richmond Hill, Telemet, and more recent newcomers Ross and D

continued on page

Production switchers were a big drawing card at the NAB Convention as this photo of the Vital booth shows.

Grass Valley put its 1600 J7 through the paces at NAB demonstrate how to put together a super news show.

Teleproduction Aids—Curtain is Rising on Future Theatre

The subject of teleproduction is vast. We could have reviewed the subject of editing and particularly the likely impact of expandable editing systems. The new Datatran Tempo '76, for example, permits the user to start with a pulse counting approach and to expand to a SMPTE time code system capable of working with an intermix of cassette-, helical-, and quad-VTRs. We could have explored the likely impact of the new one-inch helical VTRs, discussed last issue, that offer quad performance plus such features as slow-motion or freeze frame. We might have dug into the future role of graphic arts generators. We could have revealed how the computer is now being used and what is likely to happen in the near future as a result of the avalanche of minicomputers descending upon us.

As a matter of fact, we did start to prepare articles on some of these subjects, but we couldn't achieve "closure." There just isn't enough field experience around to do more than speculate. Not that we're against speculation. Indeed, some mind expansion is a prerequisite to the new theatre. For this issue, however, we're concentrating on here and now hardware that you can get delivery on and a few concepts that have been working. Stand by for future episodes.

*Bob McCall, Vital Industries' Northeast regional manager, likens switcher to the film man's scissors: to get the Hollywood look on TV yo rely on a $5 pair of shears—$50,000 is the more likely figure.

**First generation switchers were simple additive mixers handlin buses. Next came a special effects generator with output re-entered input on one bus. Second generation devices saw combined mix-effec plifiers designed. Third generation introduced proportional control fo key etc. Fourth generation is four-level amplifiers reducing the nee triple (8-bus) M/E amplifiers.

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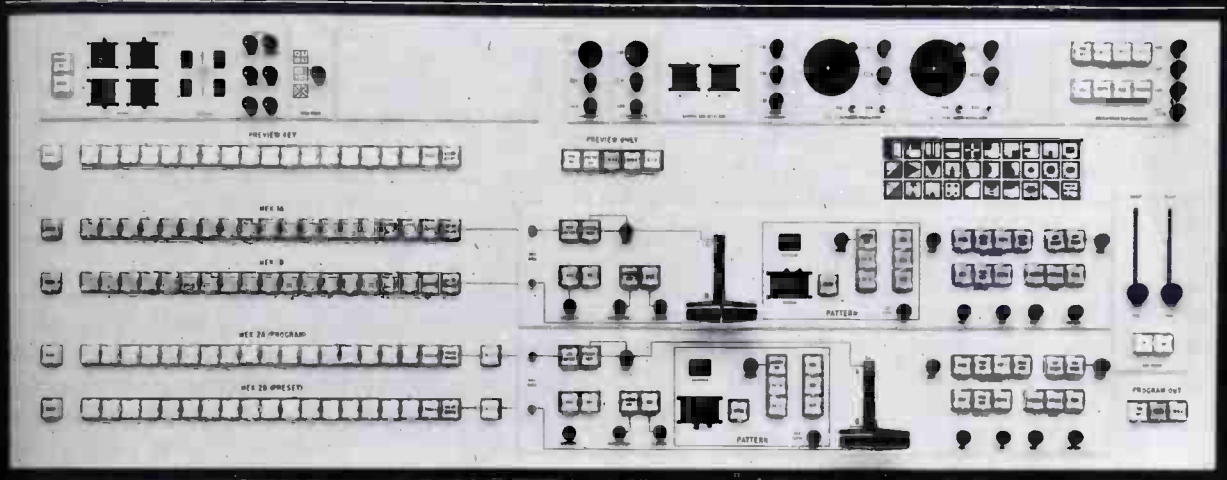

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- Mix or Dissolve to a Key
- Wipe to a Key or Wipe Key
- Mix to a Bordered Key
- A-B Mix Behind a Chroma Key
- A-B Wipe Behind a Chroma Key
- A-B Wipe with Borders Behind a Chroma Key
- Mix-Wipe or Bordered Wipe to a Preset Wipe Behind a Chroma Key
- Mix or Dissolve to a Luminance Key Over a Chroma Key
- Wipe to a Luminance Key over a Chroma Key
- Mix, Wipe or Dissolve to an Electronic Spotlight Behind a Chroma Key
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- And More —

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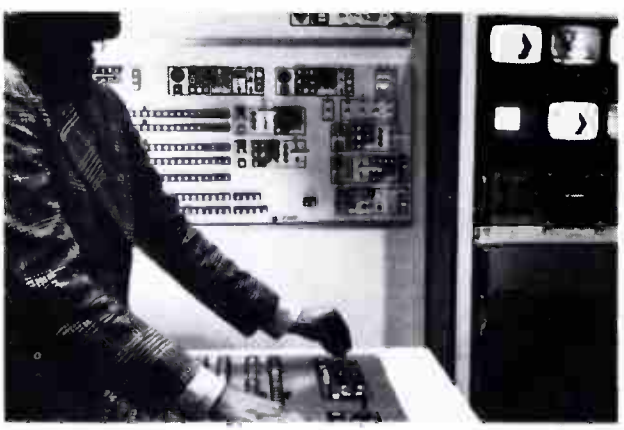
"BEST" SWITCHER

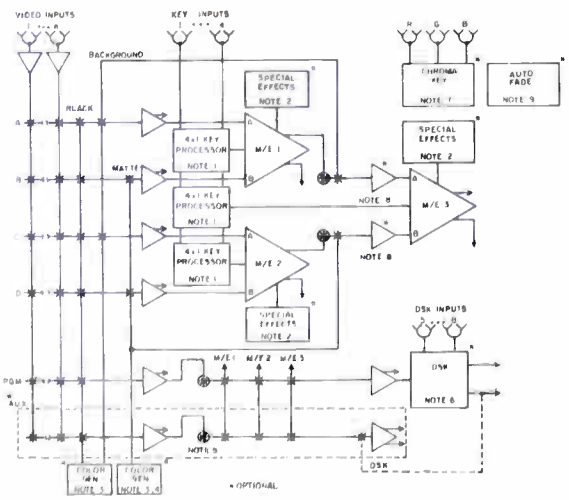
Richardson, to mention only those who make big full-production boards.

Recent developments make the right choice somewhat difficult. The big news at the NAB 1976 Convention was the introduction of some new concepts in switchers; either in internal organization or how the board is arranged—or both. The standard approach has been two buses feeding a mix-effect amplifier. To get top versatility, big boards have been using three mix-effect systems. Thus, eight buses are needed—six to feed the three M/Es and two others—one for program and one for preset. At NAB, American Data demonstrated the 558 which uses a four-channel parallel video processor. Multiple functions can be accomplished simultaneously in a single M/E without requiring extra buses. Central Dynamics introduced at the show what it called the sequential effects amplifier. One such amplifier can do production sequences that can't be done on a triple effects conventional switcher.

In working with four signal levels simultaneously, two can be used for keying (cut dissolves, wipes) to and from processed signals. Levels three and four are used for background video signals with the ability to cut dissolve or wipe between them. How the CD 480 system is organized and how it achieves some of the effects [illegible] contained in a separate accompanying section, page[illegible]



Computer Image showed how to get special effects easily at the NAB Convention.



Computer Image pyramids M/E amplifiers to control a number of video signals with only four buses.

There was another new switcher from a new com[illegible] in the wings of the NAB convention. Duca Richard[illegible] showed in a private suite at McCormick Inn wh[illegible] called a state-of-the-art switcher. By being able to[illegible] over with either the A or B bus, it in essence, offere[illegible] capability of a third bus. This switcher was desi[illegible] with the requirement of a Live Action camera news s[illegible] in mind. Inline keyers to buses give a titling capab[illegible] behind the chroma key so that title keys can be wipe[illegible] mixed as transitions are made from bus to bus. The[illegible] grams, page 52, show what effects are possible.

All operating controls in the D-R switcher are loc[illegible] in a subpanel that controls a function module. [illegible] experienced operators can learn the board quic[illegible] We include a separate section on the new switcher [illegible] ing on page 50.

What Duca Richardson offers is an extension of c[illegible] bility pioneered by Computer Image—use of logi[illegible] achieve many effects easily. In a general sense, swit[illegible] manufacturers are somewhat characterized by their[illegible] phasis in the past. Thus Duca Richardson and Com[illegible] Image are known for their computer oriented think[illegible] Grass Valley and Central Dynamics have been kn[illegible] for their solid engineering approach. Vital has ma[illegible] name for itself by stressing creative production c[illegible] bility, particularly digital effects. But these lines[illegible] blurring as each manufacturer borrows a bit from[illegible] other.

Because of these past propensities, certain switc[illegible] tended to be somewhat higher priced. Central Dynam[illegible] for example, was always considered a high-p[illegible] switcher manufacturer. Now, as emphasis shift[illegible] newer techniques to accomplish special effects, [illegible] generalizations don't necessarily hold. That is to [illegible] one shouldn't now compare switchers by how m[illegible] buses they have or how many fader levers but rathe[illegible] what they can do.

In the past, switchers have often been specifie[illegible] reflect the personality or ego of the buyer. Inputs [illegible] stations are, of course, essential and, indeed, the ne[illegible] switchers have been designed to offer the custo[illegible] what they want. But one can go overboard in getti[illegible] custom designed switcher. Custom features do add [illegible] and could lengthen delivery. With the flexibilit[illegible] today's switchers, a standard model may be quite [illegible] quate.**

The capability of today's switcher is quite fantas[illegible]

The top of the line of "third generation" devices[illegible] the initial offerings of fourth generation offer a lo[illegible] capability. More changes are coming. But, you [illegible] afford to sit by and see what will happen—not u[illegible] your competitors have the same attitude. This is[illegible] likely to happen. Thus one must buy now and prob[illegible] buy more capability than one knows how to use—sim[illegible] as a hedge against the future.

continued on pag[illegible]

*Formed by former Computer Image employees.

**In making this statement, we recognize that it could be interpre[illegible] being unfavorable to those suppliers who have geared their compa[illegible] especially cater to clients wanting custom features. We don't wish [illegible] minish the value of either custom service or customer service. Vi[illegible] prided itself on meeting the needs of its customers and this is an ex[illegible] reason for picking a supplier. Computer Image got into the marketpl[illegible] offering an expandable system. You buy what you can afford but y[illegible] pre-wired in accommodations for what you may want to buy tom[illegible] Such an approach is certainly valid.

IT'S TIME YOU CHANGED THE WAY YOU LOOK AT THINGS.

Broadcast people, you've changed. Over the last few years, you've effectively turned the industry on its ear with determination to provide your public with more, and *more effective* coverage. Your remarkable has brought about vast changes in camera technology—in size, weight, mobility and versatility.

PV10 x 15B. Lowest-priced 10:1 for major broadcast cameras.

We've been changing, too. While quietly supplying the broadcast industry with high-quality optics for the last two decades, we've been hard at work, developing a family of lenses to expand the capabilities of broadcast TV equipment...while keeping the economics under control.

You are our requirements. More than any other factor, Canon products are the result of user inputs. So it's no coincidence that we offer the widest, most customized range of optical products for the broadcast field—in terms of function *and* price. From the lightest-weight, most compact (and by the way, most popular) 12-120mm on the market to an enormously-versatile 32-1070mm with *continuous* zoom and 1.8 meter minimum object distance. Your requirements also inspired our new budget-stretching Versatility Packages—a family of two-lens systems that give one camera the versatility of two at substantial savings. (And we're always listening for new ideas.)

PV25 x 16B-DZ. Longest low-cost lens for 1" plumbicons*

We've invested in you. Because major optical advances don't happen without a lot of expensive thinking and heavy experimentation. While the dividends are visible in every Canon product (for example, for some years now, we've been pioneers in super spectral coating), they've also won us acclaim in the process. Like a special award from the Motion Picture Academy of Arts and Sciences. No less important, our sizeable investment in manufacture and quality control insures that the advances in our labs aren't diminished on the production line.

You make us look good. Service isn't just a matter of goodwill—it's good business. So we support what we sell with an extensive staff of factory-trained technicians, headquartered in New York, Chicago and Costa Mesa, California. Equipped with the finest, latest test equipment—much of it of our own design. To help insure the consistency of our standards...and facilitate the fastest possible turn-around time.

PV34 x 24B-DZ. Widest range double-zoom lens.

One demo is worth a thousand claims. We could spend a lot of time on awe-inspiring technical specs and case-histories. But we'd rather let our lenses do their own talking. More information, or a demonstration are yours for the asking.

PV10 x 12B. Most popular lens for portable, hand-held professional TV cameras.

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Industrial Products Division
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* ® N.V. Philips of Holland

Circle 131 on Reader Service Card

"BEST" SWITCHER

There is, of course, the danger of buying so much capability you won't know how to handle it. Not everybody can handle a big board. Vital, for example, openly acknowledges this fact and has been offering computer assisted production as one way of coping with the problem. You work out your sequences by previewing them. When satisfied, you store them in memory. Upon command, the computer will then execute them regardless of their complexity, with precision. Grass Valley says it also will be offering this kind of capability this fall. This computer-assisted production should not be confused with master control operations automation. CAP is achieving special effects and involved transitions within an event—not switching between program log events.

The alternative, of course, to computer assisted production as a means of getting the most you can without losing control is to opt for the new three-and-four-channel mix/effect amplifiers systems. If you have the pioneer spirit, you will take this route. If you want to play it safe, you will stay with the tried and true.

As you evaluate the options, you do not have to concern yourself as to whether or not new switchers are coming. They are. It is just a matter of whether the first of the new crop offer you what you want. Neither Grass Valley or Vital, for example, are panicking because of the new competition. As a spokesman for G-V s "We're perfectly happy to Monday-morning qua back the game as it is being played this year. The swi ers that will be delivered in 1977 are likely to differ f those shown at NAB, '76."

Whether you opt to the familiar or the new, there some guidelines that you can follow. The accompany box "Hints to Production Switcher Buyers" raises important questions for testing both existing and systems.

Each individual switcher manufacturer will be gla add other suggestions to our list. These will incl points in which they will score better than their c petitors. Our advice: don't ignore them—check t out.

Hints to Production Switcher Buyers

- Think through what you want to do in terms of putting on your news show, covering sports or producing commercials. Tell prospective switcher suppliers what you want to achieve. Let them suggest how you can accomplish your ends the least expensive way.
- Buy the most capability you can afford—or have the option to buy more capability later. If you can do something your competitor can't, you've got an edge.
- Through the use of particular digital logic control, some switchers may be easier to operate than others. But technically they may be more complicated. Study the design to make sure you know what you are buying.
- Check cross fade linearity—not all switchers may measure up to your standards.
- What is the total delay of the switcher? This spec is not usually given, but the smaller the delay the less likelihood of any timing problems and the less chance for signal degradation.
- Analyze carefully the board's layout—can non experts run it?
- Through how many crosspoints (mixing junctions) must the signal pass to end up with the desired effect? Can another switcher do the job with fewer crosspoints? Remember the more crosspoints the greater the opportunity for signal degradation.
- Check out those special features offered by various suppliers. If they eliminate or minimize the chance for error or on-air mistakes they have real value.
- Investigate how features are accomplished technically. For instance, not all quad splits are generated the same way.
- Check out signal stability carefully. Does it vary with time and temperature?
- Selling switchers is a price competitive business. Try to determine what compromises might have been made in components, circuitry, or construction quality to offer so many goodies at a competitive price.
- Check the reputation of the supplier. Best bet is to talk to both recent and long-time customers.

Duca-Richardson Processes A Keyin Mode And Two Buses Simultaneousl

The new Duca-Richardson 4000 Series of video/a switching systems was designed to realize three jectives—greatly expanded performance capabi simplified operation, and provision for field installa of all optional components.

The first of these goals has been achieved throu completely new and innovative approach to the effects system. In the 4000 Series, each system is signed to process a keying mode and two switc buses simultaneously. However, inline bus keyers, border capability, interposed between the backgr videos and the transition control make possible the dition of bordered captions or chroma keys to eith both backgrounds prior to a transition. Each backgro therefore, may represent composite information fro to three video sources.

Any of nine key sources, including insert video, be selected for the keying modes and mix, wipe, no ditive mix, wipe key, mix key, and mix to preset li are available for A/B transitions. Keys can be outli filled with key video or matte, and bordered with s metrical or dropshadow borders—hard or soft, blac white. This increases the capacity of a single M/E plifier to the extent that such switchers with 2 buses the equivalent of conventional switchers with 5 or r buses.

Fig. 1 shows a mix/effects system and a sequenc typical effects. Backgrounds are selected from v sources feeding the A and B buses. Captions, graphic chroma keys may be inserted over the backgrounds inline keyers ahead of the transition control. Follo the transition control, a third keyer permits keying either background, or over transitions from one to other. Thus, captioned backgrounds may be mixe wiped behind any key source selected for the third ke including chroma keys.

In DRC systems, switcher operation has been plified by grouping all controls on a single unified panel, or function module, and arranging them for g est ease of manipulation. The most important featu the function module, shown in Fig. 2, is the keyb With only fifteen buttons, the keyboard provides ac to 99 patterns for the pattern generator, 99 auton

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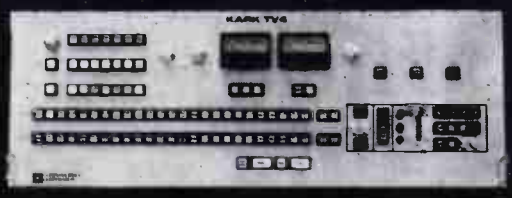
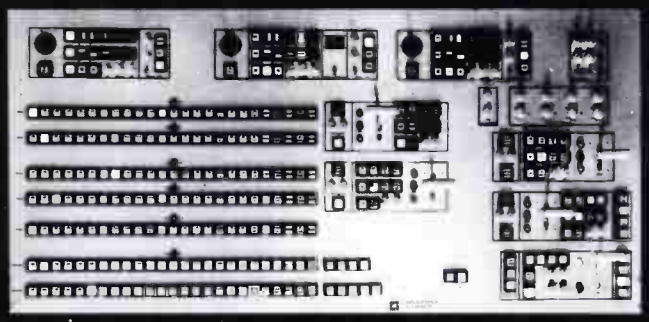
e Video Controller family...

...at home almost everywhere!

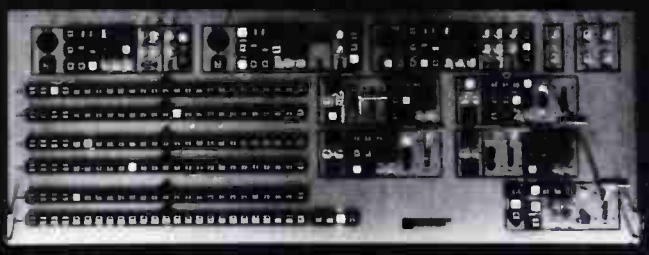


MASTER CONTROL MODEL
at home at
KARK TV. Little Rock. Ark.

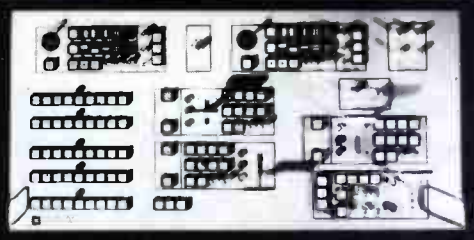
COMPUTER EDITING MODEL
at home at
ORROX/CMX. SantaAna. Calif.



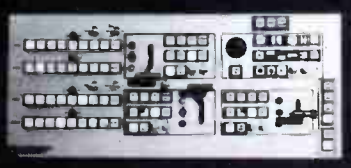
BROADCAST PRODUCTION MODEL
at home at
KHTV. Houston. Tex.



BROADCAST PRODUCTION MODEL
at home at
KTVK. Phoenix. Ariz.



POST PRODUCTION MODEL
at home at
ROMBEX PRODUCTIONS.
N.Y.. N.Y.



MOBILE VAN MODEL
at home at
WESTERN VIDEO
San Diego. Calif.

rther information write or call
resident of Marketing. Video Controller Div.

COMPUTER IMAGE CORPORATION
2475 West 2nd Avenue. Denver. Colorado 80223 – (303) 934-5801

transition durations from 0.1 sec to 9.9 sec, and nine key sources.

To enter a command on the keyboard, a function button is first pressed, followed by selection of a one- or two-digit designator for the particular effect desired. For example, pattern 26 is entered by pressing PATT, 2, and 6. The selection appears in the REGISTER for visual check and may be corrected if an error has been made. Depressing XFR shifts the designator from REGISTER to function storage and enables the switcher to respond to a command to execute the function. In the example, the register clears to 00 and 26 appears in PATTERN storage; when the fader lever is moved, pattern 26 will be produced if the switcher is in the wipe mode. In a similar way, key sources and transition rates may be preselected and transferred to storage for future use. Selections may be changed at any time up to actual use and auton... transitions even can be changed during use, i.e., a tr... tion can start with one rate and finish with another.

Keyboard control also has been applied to two o... options: the downstream keyer and the quad ... generator. In the case of the former, pushbutton selec... of key sources and of separate automatic transition ... for fade key and fade to black increase considerably ... versatility of this useful option. Equipped with comp... border control, downstream keyers also may be spec... with program bus genlock and pulse and subca... outputs. This feature is important when it becomes ... essary to key over nonsynchronous sources. For ... situation, the downstream keyer genlocks the switch ... the incoming nonsync video, and provides a sour... timing signals for character generators or other pe... eral equipment.

The keyboard for the quad split quadrant sel... permits a choice of nine sources to be preassigned ... trarily to any of the four quadrants and stored ... needed. A second arrangement of the same sources, ... set of different sources, then may be selected and ... tained in a preset condition until a new program dis... is required. Two formats and complete border contro... standard.

In addition to the keyboard-controlled downstr... keyer and quad split generator, the usual compleme... conventional options is available. All are supplie... standard drop-in subpanels which fit designated slo...

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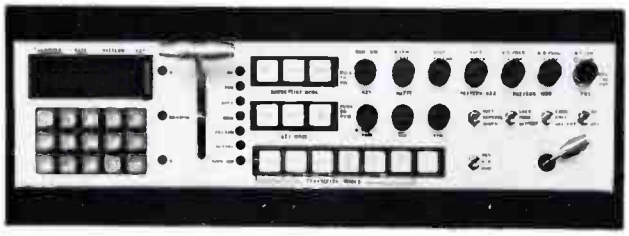


Fig. 2. Duca Richardson function module features only 15 buttons to create 99 patterns.

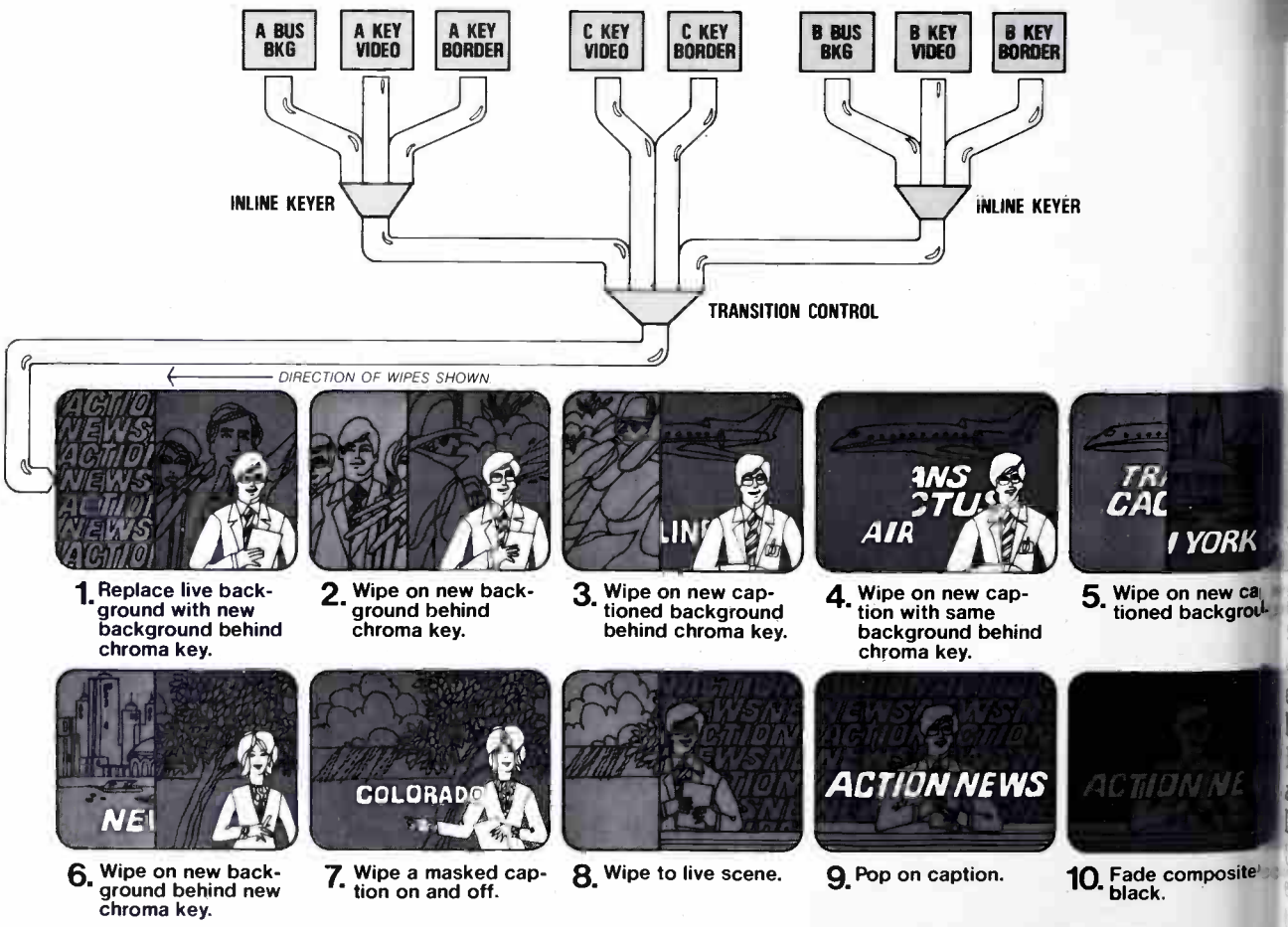


Fig. 1. Sequence of effects with one function module on Duca Richardson switcher. For simplicity, the transitions shown here are wipes only. However, they also could be mixes or wipes with hard, soft, hard-colored, or soft-colored borders.

Here's how WXYZ-TV uses film to keep on top of the news and the ratings.

In the Detroit market WXYZ-TV's early and late news shows are number one.* A lot of credit goes to film teams headed by Joe Doneth of the News Film Department. Says Doneth: "We film

Joe Doneth, head of the Newsfilm Department, shown with one of the teams that originates up to 24 stories a day.

practically everything in single system sound. Most times we use a cameraman, soundman and reporter with CP-16 cameras and wireless mikes; we get a lot of flexibility and mobility this way when covering a story.

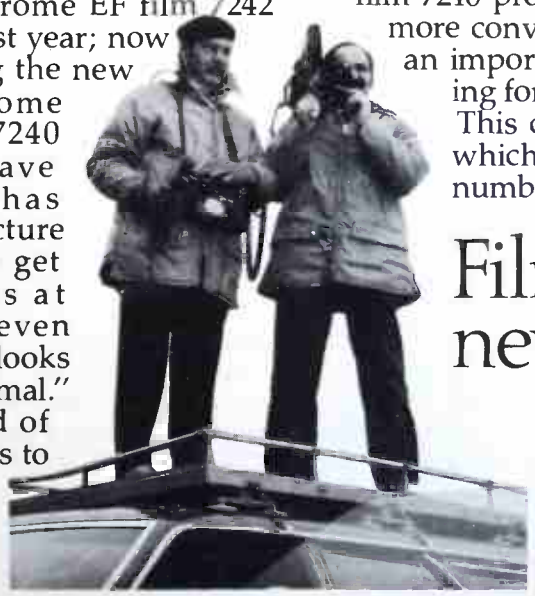
"We had been getting excellent results with Kodak Ektachrome EF film 7242 (tungsten) for the last year; now we have been using the new Eastman Ektachrome video news film 7240 (tungsten). We have found that 7240 has superior grain structure and definition. We get excellent results at E.I.250, 500, and even 1,000. At 250, 7240 looks as good as 7242 normal." Dean Erskine, head of the film editing, edits to eliminate lip flutter and other major editing problems. We are death on talking heads, so we use B rolls on most every story to show what the conversation is all about.

Mike Kalush, another member of the WXYZ-TV team, feels that his staff has been in the forefront of developing 7240.

"I've shot with 7240 when I literally could not see through the viewfinder and the picture showed up just great. Like the time we were doing a five-part documentary on industrial thefts for our Action News Show. We spent the night on top of a switch tower overlooking a railroad car. We had a CP-16 camera and no illumination but a red flare. We 'captured' the gang of car thieves on film. Then we force-processed the film one stop, and had a great story for our Channel 7 Action News audience." Joe Doneth and Mike Kalush agree that as their work with Eastman film 7240 progresses they are more and more convinced that film will remain an important factor in news reporting for years to come.

Dean Erskine, head of the Film Editing Department.

This could be one of the factors which makes WXYZ-TV's News number one.



Film is good news.

Kodak

*Source NSI Detroit market Jan. 76—DNA ratings, Hones subject to qualifications available on request.

Circle 133 on Reader Service Card

the main switcher control panel. Since electronic frames are prewired for all options, they may be ordered at any time and are easily installed in the field.

The American Data Model 558 Features Parallel Processing

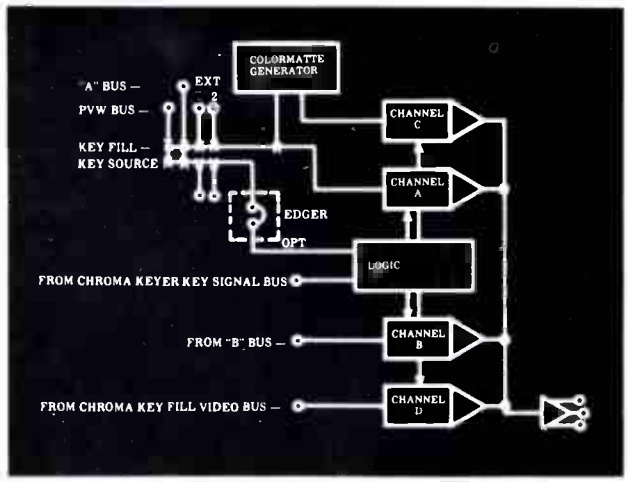
The heart of the American Data approach is the new "Quad EVA" control element which is actually a four-channel video mixer. The four signals into a mix-effect amplifier include the A and B switching buses, the output of the colorizer associated with the particular M/E amplifiers and the video from the "chroma key fill video bus." The outputs are combined depending on the logic commands received, as entered by the operator—mix, wipe, key, chroma key, etc. Since the logic system is not interacting, multiple functions can be achieved on a single M/E amplifier. Thus it is possible to do:

A-B wipe with border
A-B wipe through 100% border
Mix or dissolve or wipe to a preset wipe
Mix or dissolve or wipe to a key
A-B mix behind a chroma key
A-B wipe behind a chroma key
A-B wipe with borders behind a chroma key
Mix, dissolve, or wipe to luminance key over a chroma key
Mix, wipe, or dissolve to an electronic spotlight behind a chroma key
Mix or wipe to a quad split, with or without borders, behind a chroma key
Luminance key over a quad split behind a chroma key. Etc.

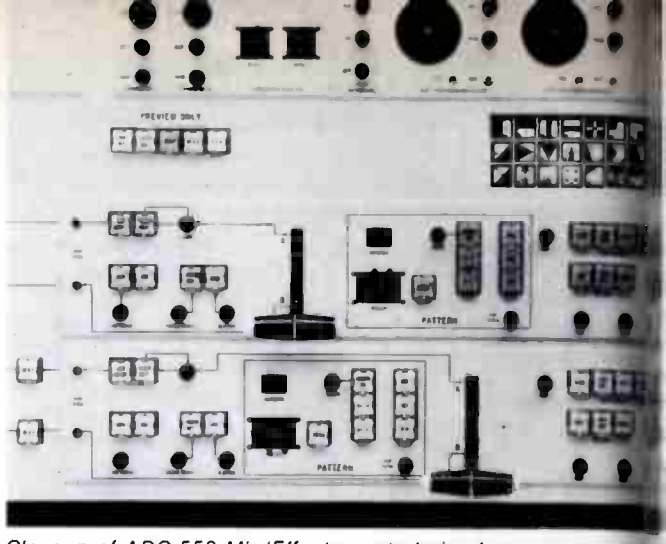
The American Data one-bus-quad split feature enters the matrix as a primary input and allows the above function to be done over a quad-split on either mix/effects systems.

Each M/E system, the quad split and optional downstream keyers incorporate independent color background generators allowing different colors to be used as borders, backgrounds, mattes and edges.

Conventional cascaded re-entries are used too in the 558 along with program output switching to replace the output of M/E-1, M/E-2, or M/E-2 "A" bus directly on line. To fully understand the capability of this switcher, ask ADC for a copy of "Fourth Generation Switching."



Block diagram of the ADC four channel parallel video processor. Several customers are now using the 558.



Closeup of ADC 558 Mix/Effects control panel.

The CD480 "Smart" Switcher

Totally new operational concepts are employed in the new CD480 8 video production switcher. As a result, the Model 8 can do some things that other large production switchers can't. A single CD480 Sequential Effects (SFX) amplifier permits production sequences that cannot be performed even on a complete triple mix-effects switcher of conventional design.

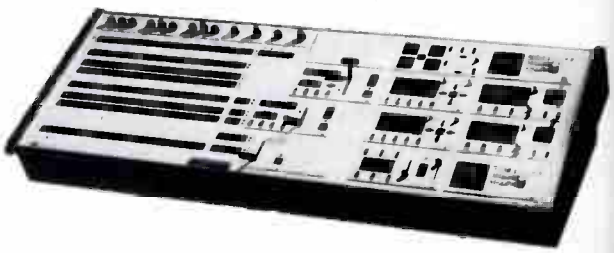


Fig. 1. Full view of CD 480 8 switcher. Note complete functional modular construction. First has been sold to KSD, St. Louis.

Current video production switchers have severe limitations when called upon to do complex production sequences. Frequently the whole sequence must be planned in advance to ascertain the correct point of entry into the sequence. The conventional arrangement of cascading mix/effects groups necessitates the use of one bus for each reentry. The CD480 can duplicate today's production practice with fewer buses. It represents a definite advance to the state-of-the-art.

For patent reasons, we can't reveal just how the SFX amplifier works in handling four inputs. You will be able to appreciate what it can do, however, by visualizing how the board is arranged and how sequences are effected.

The CD480 Model 8 consists of an 8-bus primary matrix with a ninth reentry bus, feeding into two SFX amplifiers and a master mix amplifier. The buses (Fig. 1) are designated:

ility (key, preview)
X-1 Foreground
X-1 Background program
X-1 Background preset
X-2 Foreground
6. SFX-2 Background program
7. SFX-2 Background preset
8. Master Mix B
9. Master Mix A
(reentries and black only)

single SFX amplifier gives complete control over signal levels. In a simple situation this means a ground, background program, and background t bus plus a utility bus (e.g., character generator) all be controlled independently or in conjunction all others.

ng can be done from the preview bus and the fore- nd bus with full transition control (cuts, dissolves or s) to or from the processed signal. As a matter of two chroma keys can be controlled by one SFX ifier simultaneously while on the air.

ke a look at the diagram of the board's functional , Fig. 2. Opposite the three buses is the SFX MODE ifier control module. To the left of the fader arm veen the three buses and the arm) are the three S(fer) MODE switches labeled BKG, KEY 1, KEY 2. ose a background scene (Cam 1) is on the air and want to wipe to a composite comprising a title keyed a newscaster (Cam 3) keyed over a new background 1 2). You simply press the three transfer mode ns. The composite picture of sources selected ars on the preview monitor. If you like what you then select the effects mode, such as mix or wipe, move the fader arm to the opposite position.

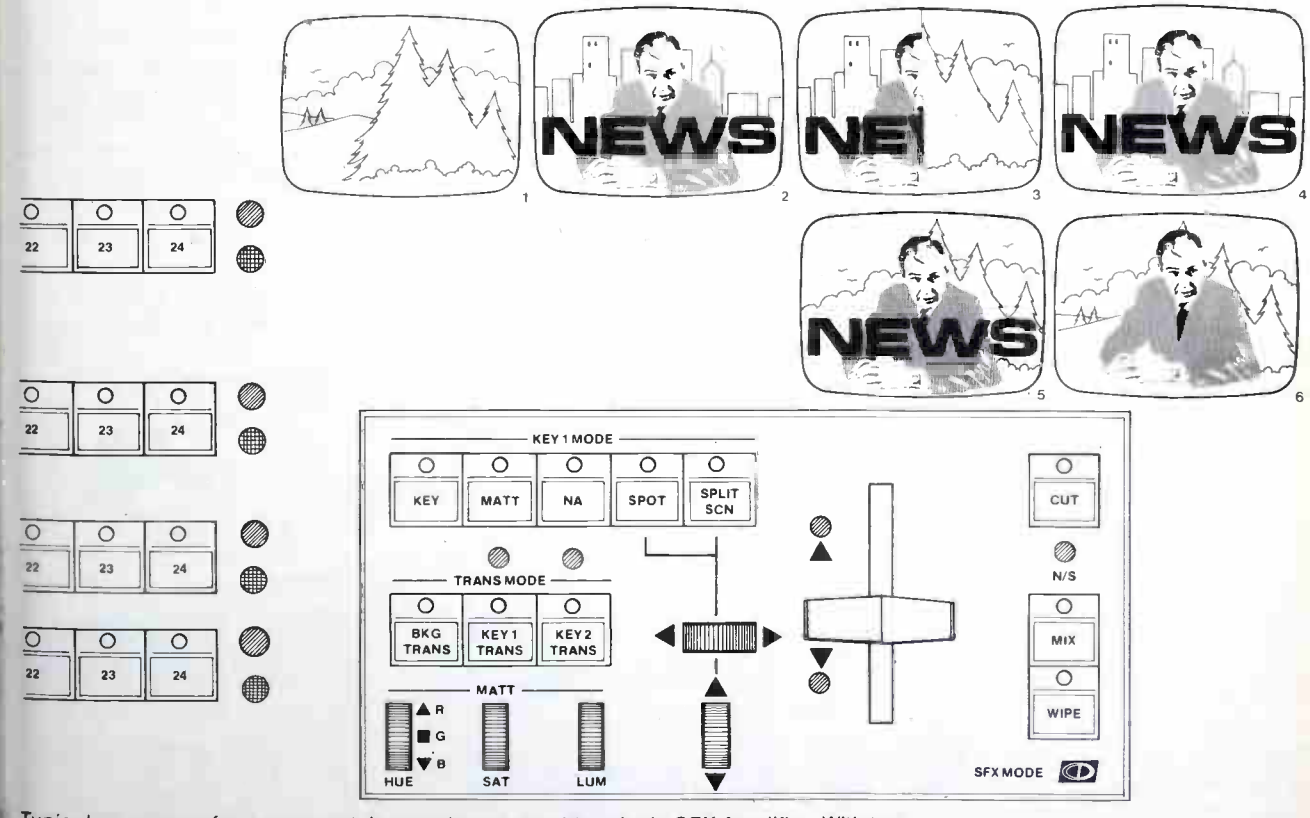
the wrong title was up on the preview monitor, you d correct it by selecting a new title source on the y key bus—it would appear automatically on the ew monitor. You have positive assurance that the ition will be to the correct source.

. 2 shows monitor shots of a typical newscast along a partial drawing of the CD 480 switcher console.

Monitor 1 represents the scene presently on air. To put the scene in Monitor 4 on the air, the following operation sequence is used. Select BKG TRANS on the SFX MODE control panel and the new background source on B 1 PST bus. Select KEY 1 TRANS (for chroma keying) and the appropriate newscaster source on F 1 (foreground bus). Select KEY 2 TRANS and then the title source on the UTILITY KEY bus. All three sources are now automatically on the preview monitor (No. 2). We then select the effect transition, WIPE, and move the fader arm to the opposite position (this movement, incidentally, clears the three TRANS MODE selector buttons). The transitional effects stage is shown on Monitor 3.

To continue with the program sequence, suppose we want to change the background behind the announcer. Simply select BKG TRANS, then the new background source on B 1 PST bus, the appropriate effect transition (mix or wipe) and move the fader arm to the opposite position. Result is shown on Monitor 5. The next sequence is to remove the title. Select KEY 2 TRANS, the effects transition, and move the fader arm, Monitor 6. Such sequences could be continued ad infinitum. To the right of the SFX MODE control panel is the KEY MODE panel for setting up the two keyers plus border keys. The WIPE MODE panel, next over, contains pattern selection buttons, positioner and modulator controls. (See Fig. 1.)

To accomplish the above sequence on a triple M/E switcher, the chroma key would have to be set up on M/E 1, the title on M/E 2 and the wipe transition performed on M/E 3. The complete switcher is now locked-up as shown in Fig. 3 and cannot perform another complicated sequence without going to black and quickly setting up the next shot. Fig. 4 shows the set-up required to change the background behind the chroma key and title. Note the buses used for Bkg 2, Chroma



Typical sequences for a newscast that can be set up with a single *SFX Amplifier. With two fiers, even more involved sequences can be achieved.*

"BEST" SWITCHER

Key and Title all had to be rearranged.

Quadraplex. An optional quadraplexer includes 4 × 4 input selector which receives its signals from primary buses 1, 2 and 3 and the output of SFX-1. The output of the quadraplexer reenters the inputs of SFX-2 and the Master Mix amplifier. The Master Mix amplifier feeds the system output via an optional downstream keyer.

Wipe Patterns. Each CD480 SFX Amplifier is equipped with a group of standard wipe patterns including circle, square and diamond. The basic patterns may be multiplied in both horizontal and vertical directions, by operating the appropriate pushbuttons, to provide a large variety of specialized patterns. Still further patterns are available by using the integral pattern modulator. The modulator may be phase locked to station sync to provide absolutely stable edge modulation. The modulator function generator may be switched between sinewave, square wave or triangular wave edging. The optional CD480 multi-pattern generator provides a la variety of rotary wipes such as fan and windshield wi patterns.

All patterns may have soft and/or colored bo edging. The degree of softness is adjustable over a w range and the border edges are adjustable for both w and color.

3D Effects. A new and entirely unique CD480 op is the 3D Effects system. The 3D Effects system u digital video and microprocessor techniques to create illusion of the picture rotating about an axis. Pic compression and perspective correction while the vi is in a digital format combine to create the illusion rotation. Many different rotating effects may be p formed such as the picture seeming to open like a se barn doors to another picture. Rotation about a cen axis to another picture is a common effect used by film industry—now available for the first time for electronic video medium. In addition to the rotat (video compression) effects, the CD480 3D eff system can slide one picture off the screen while slid a second picture on (so called "slide-change" effec

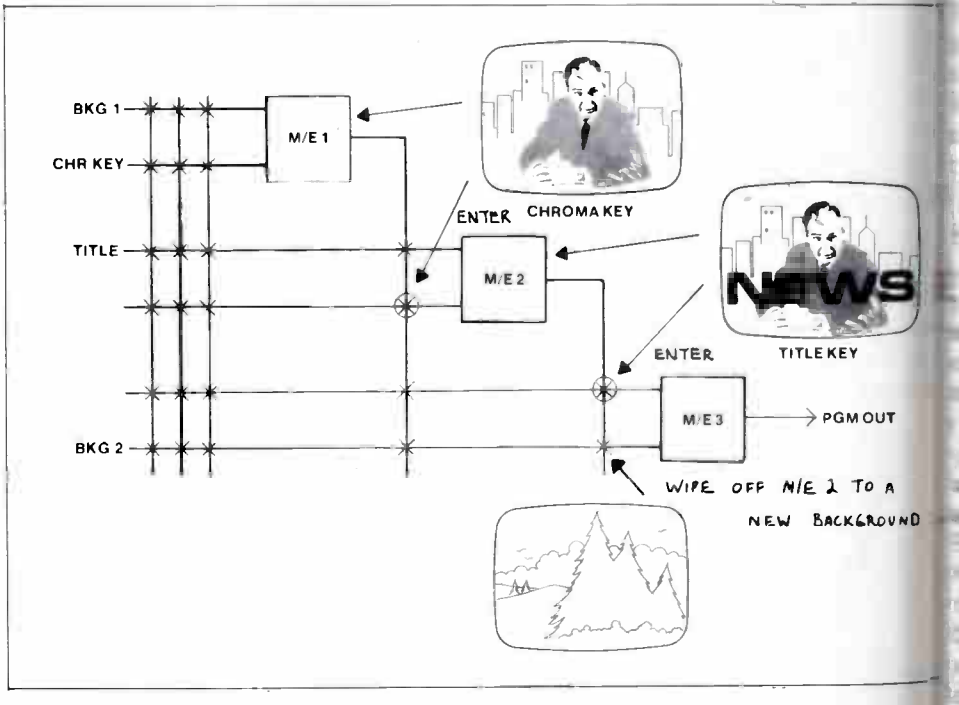


Fig. 3. All three M/E amplifiers would be required on a conventional switcher to accomplish the initial transition (monitor 4) shown in Fig. 2, then wiping to a new background.

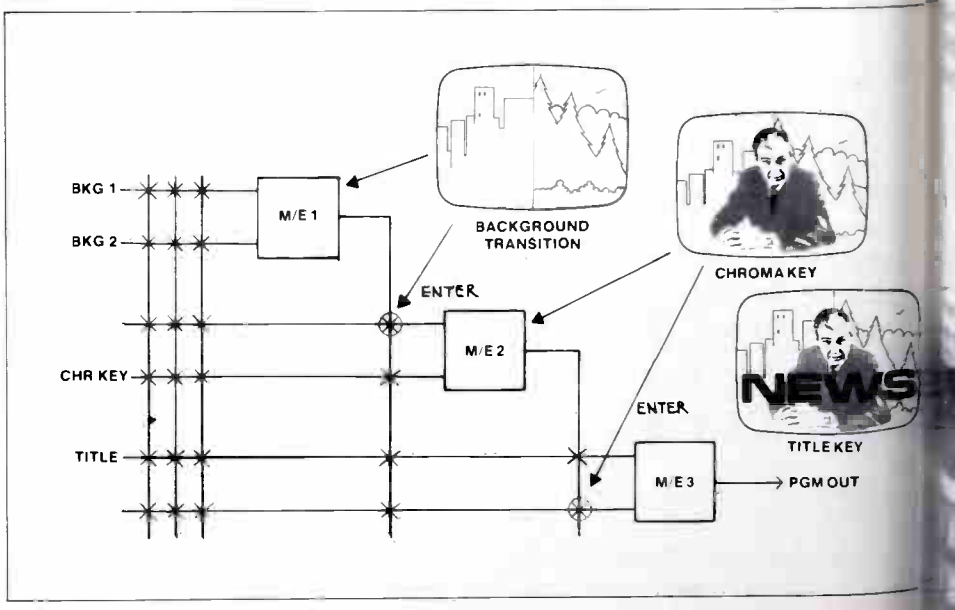


Fig. 4. To continue the sequence shown Fig. 2, (change the background behind a chroma key with title keyed over chroma key) a triple effects switcher would have to go through a complete re-setup.

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*SHOWN HERE IS THE FUNCTION MODULE

Circle 134 on Reader Service Card

Producing A Syndicated News Feed With ENG Mini Equipment

By Barry Rebo

Time Life Television's MONEY NEWS INSERTS is now in over 45 markets and growing. Production of the series is a fascinating proving ground for new mini equipment.

Time Life Television entered into the syndicated news service field at a time when the success of such operations were dubious. Television News Service had ceased operation after an unsuccessful effort to provide local TV news departments with a selection of national and international news feeds on a wide variety of hard news topics. Notwithstanding, T-L decided to move, electing to pursue the one specialized area that affects every individual American: personal economics. How to best maximize the efficiency of one's own dollars would be the theme. David Burke, formerly a producer with Metromedia's WNEW in New York was brought in to formulate the new series, which operates under the working title of "Money News Inserts."

Burke designed a news feed to provide each station with five 90- to 120-second "economics" stories per week for inclusion in the stations' evening news program. The station has a choice of taking the reel with a pre-recorded narration, or of personalizing it by taking a version with wild sound only over which the local consumer or "action" reporter can re-record his own sound track (from a T-L provided script). The local news operation can thus either take credit in full or use the T-L narrator and give credit to Time, Inc., if they feel latter course would lend additional credence to report.

Equipment can be rolled down the sidewalk. Here David Burke, Money News producer, does an on-the-street interview at St. Petersburg, Fla.

Portable equipment can be easily carried in a station wag for on-location shots. Author is operating camera.

Original budget considerations were based on us the existing standard of TV news production, 16m film. Burke's desire to produce a high quality visu product dictated a documentary approach utilizing hi quality, double system sound and extensive p production effort to incorporate super's, ID's, d graphics. A-B dissolves, split-screens and a 'news' lik quality were desired since the product would have to well within the context of a local station's own n operation.

During the formulation period of the news seri ENG was the glamour topic of the trade. Live cover with a "Mini-Cam" was being promoted to the view public and the opportunity was ripe to capitalize on new look in TV news around the country. Since distribution plans already called for playback for week's stories on quad, why not investigate if this newest syndicated feed could not also be the first to totally ENG-produced? (Indeed, T-L sales perso later reported stepped-up interest from news direc when they learned this was to be a tape-produced p uct.)

Burke then contacted Barry Rebo, of Rebo Associ

continued on pag

Mr. Rebo is head of Rebo Associates 148 East 28th New York City 10016.

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Tube Operating Hours Reported by 20 TV Stations*		
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Types 8890 & 8806	12,263 hrs.	19,200 hrs.
Aural service	16,200 hrs.	14,000 hrs.
Up to 12.5 kW	10,096 hrs.	10,525 hrs.
Type 8891	9,402 hrs.	
Visual service		
Up to 17.5 kW	16,600 hrs.	18,300 hrs.
Type 8807	29,800 hrs.	21,200 hrs.
Visual service	30,100 hrs.	20,400 hrs.
Up to 27.5 kW	9,778 hrs.	9,776 hrs.
Type 8916	7,875 hrs.	13,183 hrs.
Visual service	10,799 hrs.	

*Serial numbers and tube type data available on request

RCA power tubes are at work now in new-generation color transmitters. Proving their value with an excellent combination of high gain, high linearity, plus long operating life.

Documented long life. In the table, you can see actual operating hours reported by 20 TV stations. That reliability comes from RCA's sturdy, coaxial CERMALOX® construction and thoriated-tungsten mesh filament, which minimize inductances and feed-thru capacitances. So you can use simple, economical broadband circuitry.

In fact, RCA can supply you with the right circuit and cavity to go with the tube you select.

For high performance and proven long life in a wide range of power tubes, there's one thing to do. Contact your RCA Representative. Or, RCA Power Tube Marketing, Lancaster, PA 17604. Telephone 717/397-7661.

RCA

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to discuss the feasibility of such an involved series. Rebo along with Chuck Edwards, now working exclusively with the new generation of ¾-in tape equipment, were intrigued with the project and met with Burke to develop a production design for a pilot in order to demonstrate the "look" for Time Life executives.

The following serves as an up-to-date review of their findings since the project was commissioned in November '75.

Production, post-production and evaluation of pilot

The pilot program was shown on Rebo Associates' existing field production unit consisting of a Sony VO-3800 VTR and a Sony DXC-1600 camera outfitted with a Canon F1.6 18-108mm lens. Support equipment used included Cine 60 power packs, F&B/Ceco fluid head tripod, Lisand shoulder pod, and a selection of Sony and Shure microphones, both hand and lavalier types. Also, a 5" Sony battery-operated color receiver modified for line video feeds was used in stationary setups, i.e., interviews, checking lighting, color rendition, and exposure values. Lighting equipment was either Lowell 'D' Heads or Lowell Tota-Lights, both with Umbrellas, and a selection of 500, 750, and 1000 watts lamps.

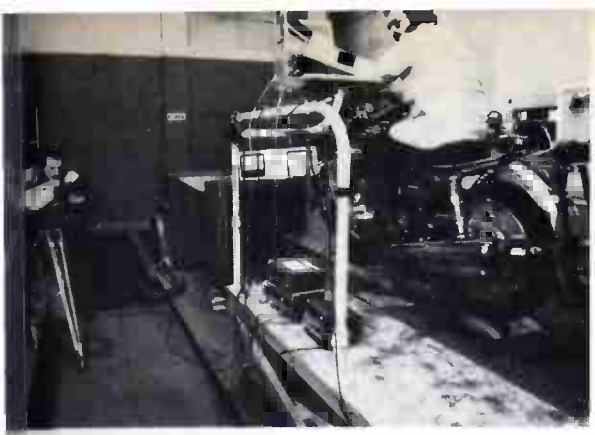
Since the project is national in scope, extensive air travel would be required, consequently, shipping cases were acquired that allowed all of the above equipment to be packed into five containers all of which are manageable. None exceeds the domestic carriers' seven five pound limitation. In practice, the case which co tains the camera head, lens and the color line monito hand carried since it contains the most critically aligi items. This case is designed to fit under a passenger se Test equipment is limited to a ¾-in standard test tape routine checks of the VTRs speed and servo system to set up the monitor with color bars since the cam control unit had no such provision.

The first field trip was a five day jaunt to south Florida, returning north to Boston, Mass. and back New York. Everything functioned as designed and tapes were prepared for editing.

Teletronics International handled the editing of pilot after its subsidiary, S/T Duplicating performed step-up to quad (utilizing a Sony VO-2850 modified direct color playback through a CVS-504 TBC). F gram audio had been recorded on track one and ti code was recorded on the second cassette audio tr simultaneously as the transfer was being made. Editol decisions were made viewing the cassette masters on CMX-50 systems. The quad masters with time c were then conformed on line with the CMX-300. T tronics' editor Ruth Neuwald cut the programs to a recorded narration.

Evaluation of these initial programs led to the deci to proceed with tape but it was decided that the S camera with its inherent vidicon problem of retention "lag" would have to be replaced.

The project required a broadcast quality three-t camera of high reliability, great sensitivity and l weight. A comparison of the readily available camera



or Rebo sets up ASACA camera at EPA Test Center in Arbor, Mich.

at this time presented the choice of Ikegami, seh, and the Asaca ACC-3000. Familiarity with the er Asaca 5000 and its low lag Chalnicon tubes mpted a trip to Chicago to examine the 3000 first l. This camera was then accepted as the new produc- camera. A critique based on the past month usage be offered later.

ducing the real thing

ory assignments for money news insets are dis- ned from Burke's office at T-L Television in New to the crew which consists of Rebo, Edwards and a producer. Depending on the geographical area of ation that is being worked that week, the crew will r fly to location or use Rebo's already set-up van. s are either held for the duration of the trip or can be ed back to New York for preparation for editing—stepped up to quad, and scripting. Teletronics main studio is now setup to dub to quad using an Ampex TBC-800 and a Sony VO-2850A.

When the two-inch quad tape is recorded, time code is added. The original cassette tape is sent back to the T-L office where the narration script is written. T-L also decided rough edit points and what graphics should be added. All this then goes back to Teletronics editor (Ruth Neuwald) who has the narration recorded on another piece of two inch tape. The editor then picks the best footage to match the narration. The story is then assembled on line using the CMX-300 system. The five pieces for the week are then dubbed for shipment to the subscribing stations. Along with the deck goes artwork, slides for chroma-key insert, the written transcript of the narration for those wanting to add their own local narration (four out of five subscribers). Included also is specific information on certain stories that are germaine to individual markets.

Evaluation of the field hardware

Six months and approximately fifty-five thousand miles after, the following observations can be made on the status of the hardware used on the Money News Project.

Asaca 3000. The decision to upgrade the field unit to incorporate the 3000 was an excellent choice. The Chalnicon tubes have eliminated all problems of lag and the general sensitivity is remarkable. The majority of footage is shot with available light and whatever supplementary light that is added is done without destroying the

continued on page 62

ambience of the room. Normal footcandle rating for an interview situation is approximately 60-80 footcandles. The 3000 uses a Canon F-2.2 12-120mm power zoom. lens. The ability to manually control the iris from the CCU has also been highly advantageous as it allows Edwards' the combination audio/video recordist, to monitor the levels while viewing the color line monitor. The reliability of the camera has also been outstanding*. The crew operating is responsible for the set-up and routine maintenance of the camera on a daily basis during their travels. This basically entails adjusting color-balance, fixed pedestal level, auto white set and registration. These procedures are checked and adjus as needed with conclusion of the days shoot usin lightweight Philips PM3226 dual trace scope, vari PortaPattern charts, and a Panasonic B/W unders monitor.

The power supply for battery operation of the can is a Chiles belt but the AC unit is used when there series of interviews to be shot in the same day. single belt will drive the unit for up to ninety minutes it must be used judiciously since it can take up to f teen hours to fully recharge. Obviously a series of qu charge belts is needed but this seems to be a problen the higher powered ENG cameras in general. It was necessary to modify the Lisand shoulder brace in orde get the camera seated further back on the shoulder better weight distribution and subsequent balance du the weight of the Canon lens. Nonetheless, the 3

*Rebo Associates does not have an engineer on staff. When passing through Chicago, Asaca shows up at the airport and gives the camera a once over. All problems so far have been trouble-shoot via telephone.

Stabilized Mobile Video Camera System for Jitter-Free Shots

The CP/TK-76 is a Cinema Products modification of RCA's lightweight TK-76 color video camera incorporating the radically new Brown Stabilizer.

In hand-held operation, the system permits the recording of extremely steady images of studio-quality smoothness. It is ideal for taping "on-the-spot" television commercials, documentaries, and other special coverage as well as sports events, news interviews, etc.

The stabilized camera system permits the camera to move freely in all directions—up, down, and all around, in any number of angles, as if suspended freely in mid-air, yet completely balanced at all times. For example, a cameraman can run very fast (even up and down staircases) while shooting, or sit in a helicopter . . . or on the back of a flat-bed truck and shoot in any kind of rough terrain, and still deliver completely jitter-free shots of "dolly/track quality."

The CP/TK-76 is primarily intended for use in its stabilized mode. It is, however, readily convertible to either tripod or "on-the-shoulder" modes of operation.

Bright 3-in. monitor can be viewed while on the run.

The CP/TK-76 Stabilized Video Camera System produces jitter free pictures.

The complete system consists of a body brace, with a support arm attached to the body brace at one end, and (through a free-floating gimbal) to the camera system at the other end. A special 3" high-intensity monitor is attached to the camera for convenient two-eyed viewing in all ambient light situations. At the bottom of the video camera, in a T-bar type of arrangement, is the monitor power supply module and battery pack powering the camera. (The CP/TK-76 battery pack is a 6 ampere-hour nickel cadmium unit rated at 12 volts. Two battery packs and one charger are supplied with each system.)

The special 3" monitor, designed and manufactured exclusively for the CP/TK-76 features a high-intensity kinescope tube, with a special filter with multiple layer anti-reflective coatings on its surface, that permits the operator to perceive a bright, high resolution picture even with direct sunlight impinging on the face of the tube. Before filtering, the CP 3" monitor delivers in excess of 4000 footlamberts on the screen of the tube—at least ten times (10X) the brightness one would get from a standard monitor. The video camera and the CP 3" monitor are easily detached from the rest of the system for tripod or "on-the-shoulder" operation.

The body brace and support arm weigh approximately 13½ lbs. The CP/TK-76 video camera (including Canon 10.5-105mm video zoom lens, CP 3" monitor and power supply) weighs approximately 30 lbs., all comfortably supported at the operator's hips due to the human engineering and special configuration of the body brace and support arm.

The Brown Stabilizer, invented by Garret Brown, was developed and is manufactured by Cinema Products under exclusive world-wide license.

The CP/TK-76 stabilized video camera system, available as a complete package exclusively from Cinema Products, is priced at approximately $45,000. Other video cameras may also be modified for use with the Brown Stabilizer.

For further information, write to Cinema Products Corporation, 2037 Granville Ave., Los Angeles, CA 90025, or Circle 399 on the reader service card.

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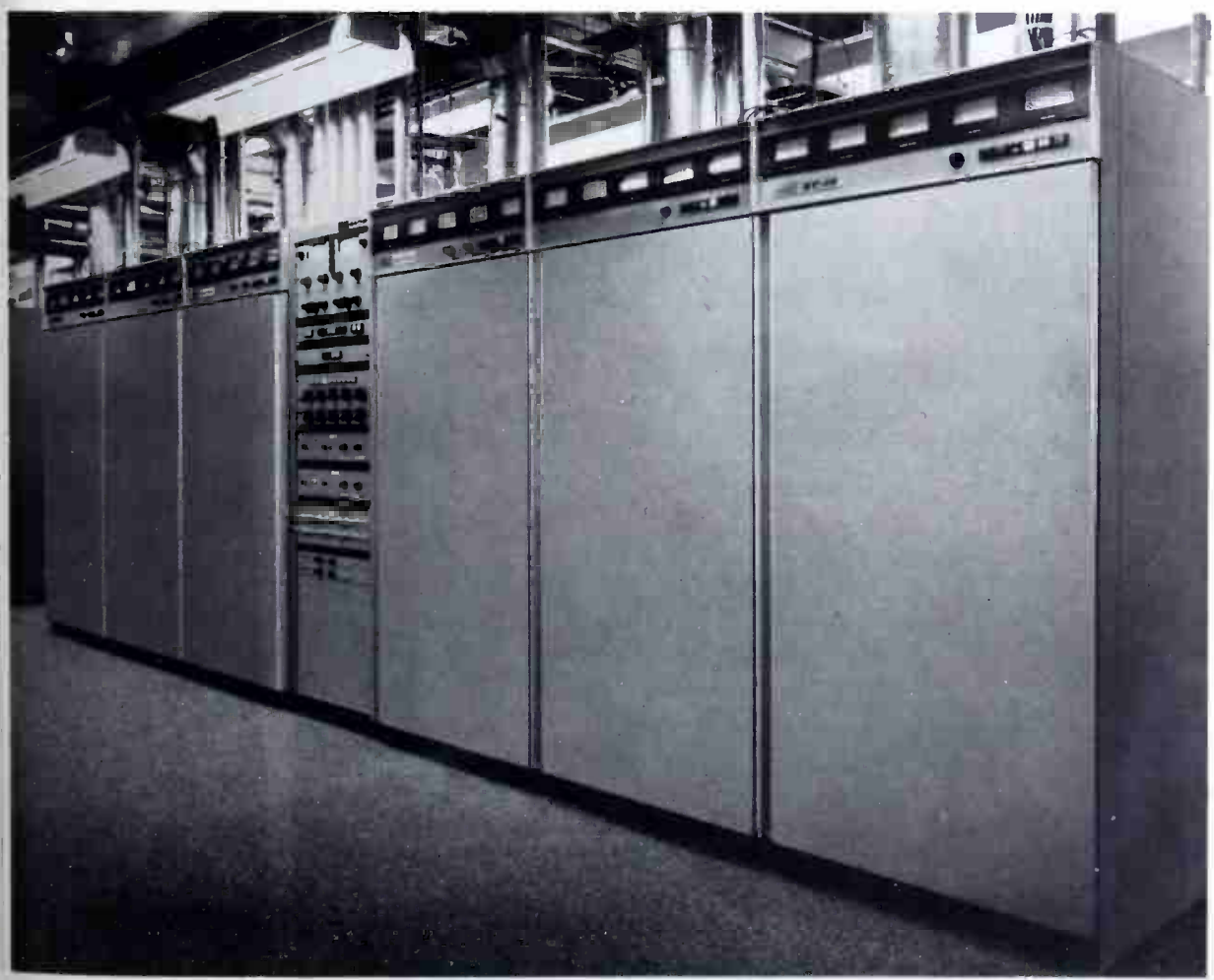

Circle 138 on Reader Service Card

underweighs both Ikegami models (33s and 35s), as well as the Fernseh and is close to half the price of either. It has been a highly satisfactory choice for our purposes.

Sony VO-3800. Here the choices were obviously limited. Fortunately the VTR has been totally dependable to date. The deck has never failed to record properly and has never failed to produce tapes that could not be time base corrected to quad. There is a need for color playback in the field at times and a higher signal to noise recording would be advantageous due to the number of dubs involved in post-production before distribution copies are struck. We hope to add the Sony Broadcast BVU-100 VTR when it becomes available to meet these needs. Power supplies used are Cine60 packs with t internal Sony BP-20A battery held in reserve. The co bination is good for over six tapes during the course the day and has not presented any real problems. Als performance of the deck is continually monitored by t use of the aforementioned standard tape. An RF pla back module is used by the field producer to screen t days work each evening over the in-room TV receiver order to better prepare scripts and the following da schedule.

Money News went to Choctaw Indian Reserve in Mississippi.

Support Equipment. The guideline here has been keep everything as simple and compact as possible. M audio is recorded with the Sony ECM-50 lavalier n and wild wound with a Shure hand mic. The Tota-Li is now primarily used due to its compact size and weig The addition of the Asaca camera has required an a ditional case or so to transport the test equipment but i still quite a mobile operation and easily manageable ev on the longer flying trips. The accompanying pho show how the system goes together. The carts used mount the CCU and VTR on are the heaviest duty airp luggage carts available since the industrial hand tru that many TV stations use could not be boarded on p senger planes.

In summing up the performance of the hardware date, the field unit utilizes many of the basic ENG e ments with some of the perhaps more overlooked pie and comes up with a very workable ensemble. It course draws on some extremely dedicated people in areas of involvement with the program who realize t this is a whole new process in which everyone is b teacher and student. BM

HE END OF HALF YOUR NEWS AND DOCUMENTARY PROBLEMS.

co think of any phase of motion pictures that
s much upon its equipment as
television. With
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a Mart, we under-
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its you halfway home. The other half is people—
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ice. Rent or lease, and you'll be taking out equipment that's fanatically maintained—inspected and tested to factory standards before and after each use. Buy from us, and don't be surprised to find your carton open. Unless you instruct us otherwise, we'll fully inspect it and test it ourselves, to be sure you're getting the performance you deserve.

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GREAT IDEA CONTEST

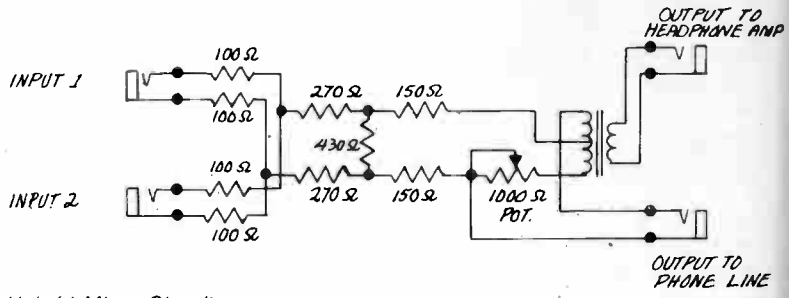
If you haven't done so already, send in your ideas for BM/E's most popular feature. Remember, there is no limit on the number of ideas that one contestant can submit. And don't forget to vote on all published ideas.

11. Easy Communication With Remote Operator.

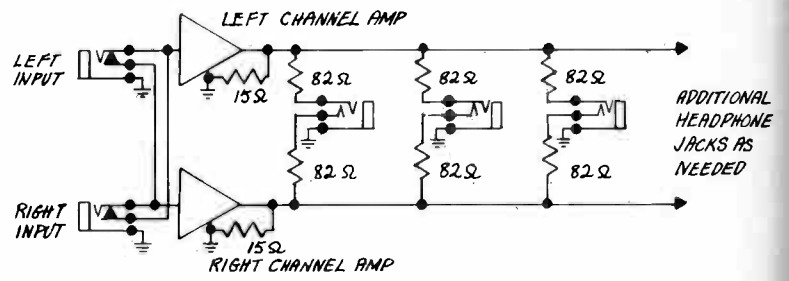
Emeric S. Bennet, CE, WPVL, Painesville, Ohio.

Problem: To be able to talk t remote broadcast operator du commercial breaks without a sec phone line, or a lot of fumb around.

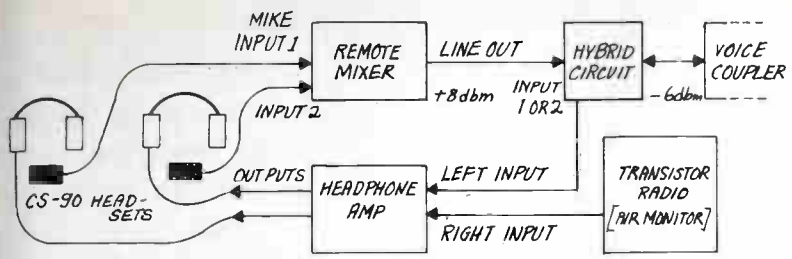
Solution: We solve the problen using Telex model CS-90 head



Hybrid Mixer Circuit



Headphone Amp Modification



Bennet's overall system connection

bi-directional, allowing the signal on the phone line to come out the coupler's input jack. I suspect the entire system, except for the radio, can be built into a remote mixer providing sufficient room is available for the additional jacks and parts.

continued on page 68

WIN A CALCULATOR, ENTER YOUR GREAT IDEA NOW.

built in boom mikes instead of held mikes and separate headnes. These headsets have a low-Z and two separately connected hones. The mike is connected to remote mixer as usual: one earhe gets a signal from a portable , the other earphone gets a signal the phone line. Obtaining the al off of the phone line is the main in this set-up. By using the hybrid r circuit shown in Fig. 1, the s of the mixer output and the ator in the studio, can be adjusted e equal. This way, during the mercial breaks, the people at the te site can talk to each other and he studio, without having to ve their headsets. If the remote is location where radio reception is , simply unplug the radio's input e amplifier. This will switch the e line monitor circuit to both ears he headset. The studio operator now give a "go" over the phone before opening the console pot at nd of a commercial.

e headphone amp used is a small o phono amp modified as shown ig. 2. The 82 ohm resistors in s with the output jacks will apmately balance the level in any of headphones used, regardless of mpedance. Up to 10 headphone can be connected in this manner, ut overloading the amp.

e hybrid circuit shown in Fig. 1 wo input jacks for mixing the +8 output from two separate mixers, necessary. The output level is oximately −6 dbm, about correct voice coupler feeding a business hone line. There is essentially no ge in it's operation when only one r is used. The pot is used to adjust lative send and receive levels of hone line. The pot is first set to ut the mixer output in the heades, and then turned slightly to one until the levels are equal. To pre- a poor null and bad headphone quality resulting from frequency nse errors, use a good quality former in the hybrid circuit.

. 3 shows the overall system ection. The 30A Voice Coupler is

GREAT IDEAS

12. Simple Humidifier Eliminates Static Paper Jams on Teletype, Paper-Dust Buildup

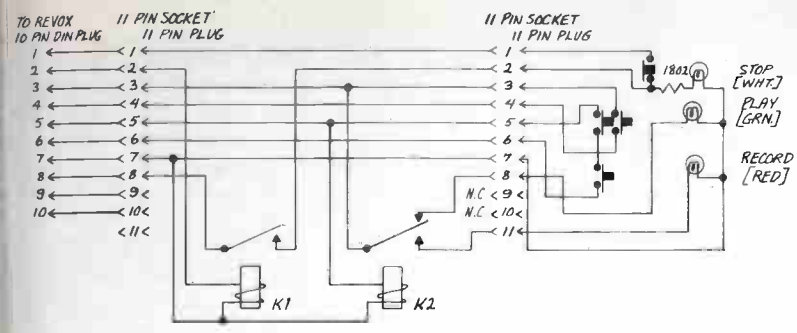
John C. Morgan, general manag tech director, WFVA-WFVA-FM, I dericksburg, VA

Problem: We bought and install Model 28 teletype for the E Weather wire, and having no m tinsel immediately available, we forthwith plagued with paper j caused by static buildup.

Solution: We cut the top off a p tic bottle, quart-size (such as bleac copier-fluid, etc. come in—size li are approximately 3½ inches diam and up to 9 inches high). Then made a wick out of cotton rag, abo inches wide and 12 long. We fold length-wise about four times and pled with 3 or 4 staples to kee folded. This was then placed in bottle and stapled to it, with abo inches hanging outside. The bottle filled with water to about an inch t top and placed on rear of printer b

This kept the inside of pr cabinet well-humidified and preve static build up, even in driest weat The bottle has to be refilled every or three days, of course. Many found that the metal tinsel used to charge static is not 100% reliabl will fail occasionally—usually after the last person has left for night. The bottle worked without alone, for several weeks. Howe we then obtained some metal ti and put it in place as a hedge ag the possibility of forgetting to refil bottle for several days.

The foregoing also solved an problem we'd always accepte normal: the buildup over a perio several weeks of a coating of p dust ("goofer feathers"), over all faces of printer and inside of cab This eventually mixes with oil ribbon ink to form a viscous g which can cause divers glitches. noticed this in our News printe along, but since AP provided ma nance we let them worry about it. so the Model 28. That's OUR p lem; but though its been clac along, 24 hours a day for 15 mo there's never been any sign of g feathers. The only maintenance w done has been to keep the felt l cating discs oiled, and about or month, clean the type font, and ole man river it has jest kep' ro along.



Ruck's Revox A-77 remote control adapter

and still have remote control of the three functions, except that the green "play" light will remain on whenever the machine is turned on and the other two lights will not light up.

I used Arrow/Hart 83500 series switch parts. All three switches use an A/H 83500-30 contact block while the "play" switch uses two contact blocks. The "stop" switch uses an A/H 83500-80 white square lens, the "play" switch uses an A/H 83500-82 green square lens and the "record" switch uses an 83500-81 red square

continued on page 70

bout a month ago, the AP service performed a routine maintenance he Model 15 news printer, and he left I decided to try putting it he bottle. Not a sign of goofer ers yet! This unit has an irradiated over the paper where it feeds into platen, and we'd never had any lem with static; however, I under- 15s do not have this feature, and nd on the tinsel for static control.

3 Status Lights For Revox note Control.

Ruck, CE, KUSF Radio, San ecisco, Calif.

oblem: While many people have ed out how to add a remote con- o a Revox A-77 tape recorder, g status lights is a bit more dif- due to the unusual relay logic his machine has.

lution: By adding two relays, one have full status indication of chine ready," "play," and ord" without modifying the tape der, with the circuit shown. The "stop" light will come on ever the machine is turned on and is threaded in the machine. The "play" light will come on ever the machine is in the play , and the red "record" light will on whenever the machine is in record" mode.

lay K1 is a "helper" relay for the shutoff photocell amplifier and is red due to the extra current drawn e status lights. Relay K2 is an f" gate which turns the "record" on when both the "record" and " relays in the tape recorder are ized. Without K2 the "record" would also come on in the ind" mode.

e circuit as shown has a record ock in that both the play and d buttons must be depressed taneously to put the machine into rd." If you wire the circuit with 1 pin octal plugs and sockets as you can bypass the adapter box

GREAT IDEAS

lens. These switches also come round and PP2 rectangular shapes.

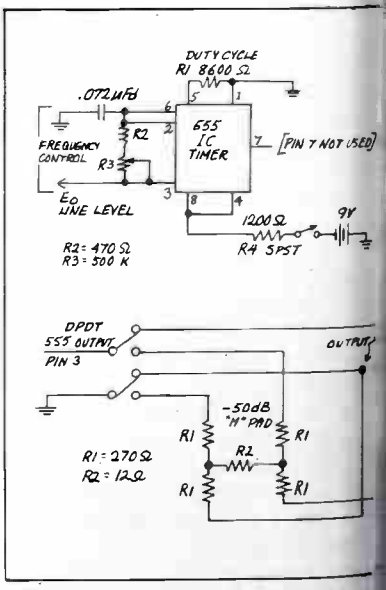
All three lamps are #334 bulbs used "crystal can" relays since I ha bunch on hand, but almost any sm 24 volt relay would work in this c cuit. Finally, the 180 ohm resistor series with the "stop" light redu the brightness of the white lens match the red and green lenses.

Vote On Great Ideas Nov Turn To Reader Service Card. Send In Your Grea Ideas.

14. Very Inexpensive Square-Wave Oscillator, Hz-20KHz, Needs No Switching

John F. Moser, chief student er neer, WKHS, Kent Co. High Sch Worton, MD

Problem: To build a very low c square wave audio generator wh covers the entire 20 to 20000 Hz b with no range switching and the abi to switch from line to microph level output.



Solution: A 555 IC timer ma adapted to make an audio gene whose frequency band (20 Hz-20 is controlled by R_3, a 500 K taper pot. R_2 sets the high frequen 20,000 Hz. R_1 controls the duty c 8.6K here provides a duty cycle o

pximately 50%.
A DPDT switch may be added along h an "H" pad to provide a mike el output for added versatility.
This generator is portable and very dy for wire and signal tracing, and er audio applications. It fits in a all (4" × 2" × 2") metal cabinet, and cost is approximately $6.

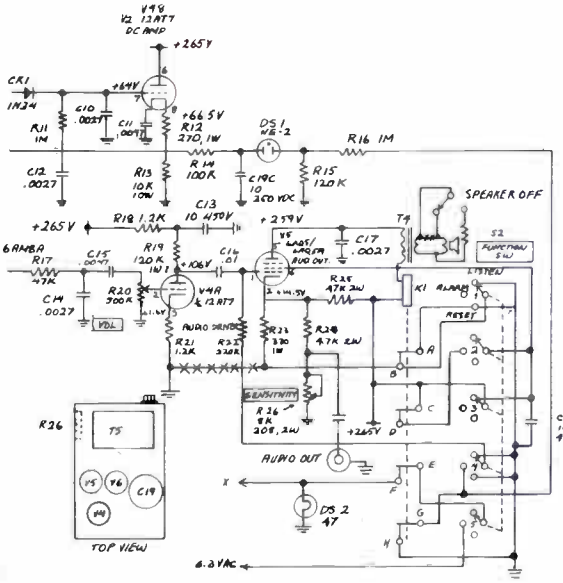
Using Old EBS ceiver To Feed Audio To w Two-Tone Monitor

glas Booth, Jr., chief engineer, YU, New Orleans, LA

roblem: To find a way to use the EBS receiver for audio feed to the 2-tone monitor, while retaining its ier alarm function.

olution: When we got our new ne EBS monitor (decoder) we did buy a new receiver, intending to audio from the old receiver, a Ball hers Miratel Air Alert I unit. We wanted it to give us a constant audio feed, but also to alarm when the station to which it was tuned went off the air. Originally the receiver had no audio output when in the alarm condition, and was incapable of alarming at a carrier break when in the "listen" condition. The following changes were made to permit both functions at the same time (see schematic). 1. The lower end of R21 was removed from R23 and grounded. This enabled the audio driver to operate normally at all times. 2. An audio output jack was installed on the chassis, between the fuseholder and line cord strain reliever and connected to the junction of R24 and R26 by a dc-blocking capacitor. 3. A SPDT toggle switch with a 6 ohm resistor was installed on the left side of the speaker to mute the speaker and provide a dummy load to the amplifier while the speaker is off. 4. The volume control knob was removed and discarded, and a control locking nut assembly installed in place of the regular nut.

continued on page 78



oth using old BS receiver to ed audio to new o-tone monitor.

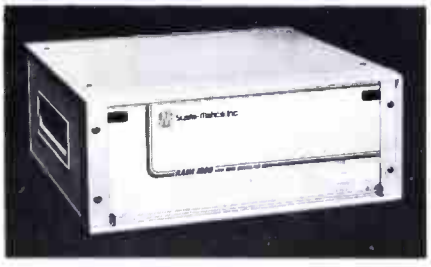
BROADCAST EQUIPMENT

For more information circle bold face numbers on reader service card.

Film/sound console, the AVEX-1, is a self-contained, 4 ft. film/sound production facility for TV and film producers. Some of the capabilities are direct tape to magnetic film strip transferring on 16 or 35 mm, work track preparation, fingertip control, pick-up recording, premixing with picture and synchronous 24 fps and high shuttle speed

in forward and reverse. Standard models are available with 1-, 3-, and 4-track master recorder, 16 and 35 mm, and can be interfaced with standard interlock systems, SMPTE time lock, TV and video servo systems. MULTI-TRACK MAGNETICS, INC. **300**

Time base corrector, the RAIM (Random Access Incremental Memory) 1000, is intended for the closed circuit and CATV television



systems. It features only two operating controls, an "On-Off" switch, and a "Correct-Bypass" switch. Also included are, instant lock-up of no more than .250 seconds, full picture above and below the head switch and several other features. $2995.00 SYSTA-MATICS, INC. **301**

Stereo compressor/limiter Model 162 with strapping for multi-tracking, is similar to the Model 160 single channel compressor/limiter and offers true RMS level detection with the threshold variable from 10 millivolts to 3 volts. LED indicators show above and below threshold operation. The Model 162 is a fully professional, rack mounted

compressor/limiter with barrier terminal strip connectors and is ground loop compensated and protected against power turn-on, turn-off transients. DBX, Inc. **302**

Color monitor receiver, Model JU-970W, is a 100% solid state TV specially designed for numerous studio applications, including direct off-air and general purpose monitoring. RCA **303**

New color television film chain, The Producer 32, is a 2 × 2 slide projector capable of creating multispeed dissolves and numerous special effects on a single film chain. It is described as the first to incorporate in one unit, separate dissolve and special effects systems, a memory and audio tape programmer and full random access. A micro processor and most of the electronics are contained in a 19" rack mount controller wired through ribbon connectors for remote operation of the projector unit. SPINDLER & SAUPPE. **304**

Digital stopwatches, the STT II and STT III are new liquid crystal display (LCD) watches that feature 1500 hours use on a replaceable 9 volt battery, easy to read LCD, solid state electronics, readout in hundredths of a second to 59 minutes and 59.99 seconds, and split

functions of Taylor action (interv and standard (cumulative). STT III $99.50 and STT II, with memory $149.50. FELDMAR WATCH CO INC. 3

Video Delay Units, UN097, whi will give accurate delay time of up 665 ns, have been introduced. Us may connect or change delay time connections inside the box according instructions supplied. Seven versio are available according to the del time required. Minimum delay pr vided is in unit UN097A (15 ns 165ns) and maximum is in u UN097G (515 ns to 665 ns). TELE SION EQUIPMENT ASSOCIATES. 3

Power Belt supplies 30 volts dc at 4 from nickel-cadmium batteries for to 30 minutes to a maximum 250 w load. Model F-30, now in use by three major USA TV networks power Hitachi, Ikegami, RCA, a Thomson ENG hand-held cameras well as portable camera lights such Sun Gun and others. F-30 with trick charger for 120 volts ac, 50/60 H $485.00 and Model F-30EXFA w external 30 minute rapid charger 120 volts ac, 50/60 Hz, $650.0 FREZZOLINI ELECTRONICS, INC. 3

Nickel cadmium battery, alternati for Sony Lead Acid BP-20A, fits t recorders model no. Sony VO-38 and Sony camera, DXC-1600. It can modified to fit Akai, as well. Nic cadmium construction performs w higher discharge rates, longer d cycles and longer total life. Free placement guaranteed for six mont ALEXANDER MANUFACTURING CO. 3

Lens for 2/3 in., ENG cameras. 15×9.5 zoom lens offers very w angle at the minimum focal length

9.5 mm with a 15x zoom range to vide a maximum focal length of mm. Lens has the ability to focus d to 24 in., while still retaining z capability. The new lens will be a able with both iris and zoom serv The zoom control is incorporated in

grip and a retrozoom attachment lable which attaches to the front lens without altering the ap- ANGENIEUX CORP. OF AMER- **309**

Sync Generator CSG-2 with Burst is an EIA RS-170 sync tor that features oven controlled oscillator, front panel test 19 in., rack mount or table top ion, 3 subcarrier outputs (one 2 adjustable), front panel 360 hase adjustment, and front panel g. burst phase adjustment. VIDEO PTS, INC. **310**

ut quad console, the QM-12A us eight track monitor section enables the engineer to monitor akes'' without disturbing the

ing chain. The four monitor also perform normal buss moni- A talkback mic and talkback control allows communication he studio as well as providing nication of tracks from the control $3295.00 QUANTUM AUDIO INC. **311**

peed audio tape copier, Model can turn out five professional duplicates in four minutes. It single capstan drive and spe- designed heads to provide uni- frequency response (±.5 dB of from 50 Hz to 15 KHz). GARNER TRIES, INC. **312**

beration System recreates the ambience of a live per-

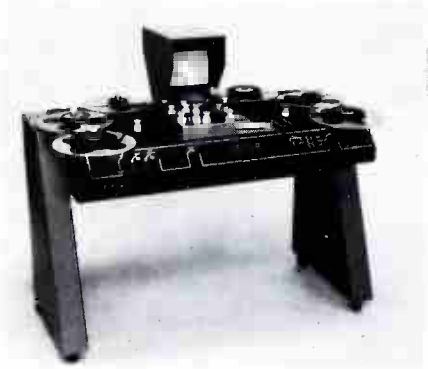
ice. The Model 4400's two inde- t channels have a four band equalizer that allows the oper- tailor the reverb sound to simu- qualities of a room. The input each channel is set by AutoPad control circuitry and constantly red by VU meters. Each channel own four band graphic equal- $389.00 TAPCO. **313**

continued on page 74

PRODUCTS

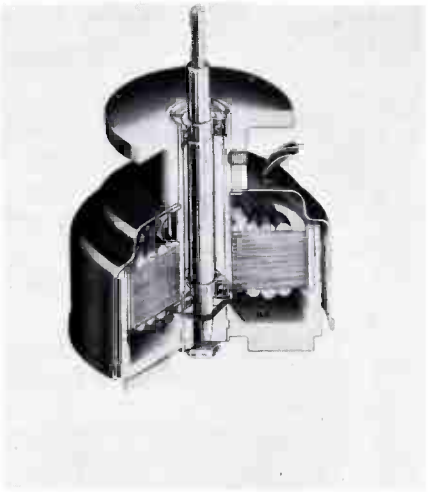
Modular professional recording/remixing/on-air audio control console, the Model 110, is designed to accomodate multi-track recording/remixing. The free standing unit is expandable to 18 mixing positions, 36 inputs in 38 in., width. It offers complete metering, two echo send/receive channels, talkback communications, separate control room and studio monitoring, test oscillator, and a full line of matching accessories. AUDIOTRONICS, INC. **314**

Six Plate Console Editor, C-16, features a seven motor drive system, 12



sided prism, rear screen projection, interlock switching and all metal construction. It accepts an add-on picture module and MT-3 Mix Transfer module. Super 8 and 16 mm modules are available for quick change from gauge to gauge. $3995.00 S.E.R.A. **315**

Motor for magnetic recording and instrumentation applications differs from a conventional motor since its stator



core and windings are the internal members, while the rotor is the external member. This diminishes the magnetizing current and results in about half the magnetizing losses in iron. UMC ELECTRONICS CO. **316**

Ektachrome video news film, 7239 (daylight), like Ektachr video news film type 7240 (tungst is pre hardened during manufac This allows the new film to be p essed in process VNF-1, thus el nating the prehardener and neutra solutions of process ME-4. The maining steps in VNF-1 are the s as those of ME-4. The film is rat EI 160. EASTMAN KODAK CO.

Multi-coated, six element 2X extender is available in the follo lens mounts: Arriflex standard, E CM3 and Arriflex bayonet, which be used with any Arriflex bay mounted zoom lens and certain fo able prime lenses. ALAN GORDON TERPRISES, INC.

Digital frequency meter can be as a flow meter, tachometer, pro tion rate monitor or dividing cou Meter uses a programmable cr time base and pre-scaler (input vider). Parallel binary coded dec (BCD) data outputs can be conne to automatic controllers, small p ers, computers or microproces The meter measures 3½-in. × 4½ × ⅝-in. Priced from $300; deliv to 6 weeks ARO. NATIONWIDE E TRONIC SYSTEMS, INC.

NS continued from page 18

ane D. Osborne has been named
Group Manager of Rust Craft
dcasting . . . . McGraw-Hill
dcasting announced that **Robert**
lart will act as chief operating
r for KMGH-TV.
is Gredell has been named Gen-
Manager of WBBM-FM, by CBS
. . . . Universal Broadcasting
., has named **Richard V. Marsh,**
president of marketing.
ASA announced that **Dr. Robert**
oper will become its new director
e Goddard Space Flight Center,
lst.
ny Bolletino has joined Di-Tech,
as director of marketing . . . .
nond Beier has been named gen-
ine distributor sales manager by
hcraft, Inc. . . . . **Thomas R.**
ng has joined BSR (USA) Ltd., as
vest regional sales manager.
S. Larkworthy has been named
dent and chief executive officer of
vision Microtime, Inc., a sub-
ry of Anderson Laboratories, Inc.

siness Briefs

has announced a long-term deal
Poland to install a $71 million
ty to produce 300,000 precision
ne color television picture tubes.
pany also has a $1 million contract
Nationwide Communications,
to purchase RCA broadcast
ment for its group stations to
d their ENG and videotape car-
systems . . . . **Dynair Electron-**
nc., of San Diego, CA, recently
leted work on "the world's larg-
deo switcher" with its 360 inputs
00 outputs; the switcher is at Cal
's Jet Propulsion Lab near
lena and will be used for NASA's
g Spacecraft when it lands on
this July 4th . . . .
rris Corp. has taken a $97,000
from WHAS Inc., of Louisville,
for its new TF-100 film island and
der for three Harris TC-50 color
sion cameras from the Blackhawk
st Church, Ft. Wayne, IN . . . .
s has also started a new division,
is Satellite Communications, in
ourne, FL, to serve the com-
al market for satellite communi-
s equipment . . . .
E International received a $3.5
n contract to provide the Repub-
Ireland with microwave commu-
ons systems for its national televi-
network, and a contract in excess
50,000 to provide New Zealand's
sion broadcasting network with a
pervisory control system. . . . .
e RAPID-Q line of tape cartridge equipment and the STE-100 Stereo Phase Enhancer have joined the EDCO Group of products manufactured by **Engineered Devices Company,** 680 Bizzell Dr. Lexington, KY 40504 . . . . **Eric Small & Associates,** Broadcast Audio Consultants, and Marketing Representatives for Orban/Broadcast have moved from 271 Columbus Avenue, San Francisco, to, 680 Beach Street, Suite 315, San Francisco, CA, 94109 . . . .

Data Communications Corp., Memphis, TN, announced that its BIAS (Broadcast Industry Automation System) division has signed six more TV stations for its services bringing its total client list to 147 stations in the U.S. and Canada. The six new stations are, WZZM-TV, Grand Rapids, MI, KMOL-TV, San Antonio, TX, KTUV-TV, Salt Lake City, UT, CKVU-TV, Vancouver, B.C., WBAL-TV, Baltimore, and WTAW-TV, Pittsburgh . . . .

Dale G. Moore, Chairman and Earl E. Morgenroth, President of Western Broadcasting Company announced the sale of radio station KIDO-AM, Boise, ID, to **MESABI Western Corporation,** the sale is contingent upon FCC approval . . . . **MICMIX Audio Products, Inc.,** has announced the appointment of Irving Rose Associates to represent their products in the Chicago area; while the eastern representatives, **Sphere Associates,** Washington, D.C., has installed a New York City telephone line, (212) 246-0176, to better serve the area . . . .

TelePrompTer Corp. announced that the number of its basic cable subscribers has now passed the 1,100,000 mark, and that Signals & Video, Inc., Bronx, NY, has been added to the list of production companies using TelePrompTer's Manhattan CATV color TV studio at 219th Street and Broadway . . . .

Trans-World Communications, Inc., was scheduled to open the largest facility on the West Coast devoted exclusively to the mastering and duplication of video tapes; International Video Corporation completely equipped the facility . . . . Glenn R. Jones, Chief Executive Officer of **Jones Intercable, Inc.,** announced the acquisition of a CATV system in Mountain Home, ID, which currently serves more than 1,000 subscribers, ...

Warren G-V Communications, Livingston, NJ, has named three Sales Representatives. Electro Rep Associates of Charlotte, will handle North and South Carolina; CSS Telecommunication Specialists of Mountain View, CA, will cover Alaska, Oregon, Hawaii, and Washington; Leonard Electric, Ltd., will be responsible for Canada with the exception of BC.

NEW LIT

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

The second edition of **The Theory of Electronic Lighting Control for Stage and Studio,** covers both theory and practical use of electronic lighting controls. The 16-page booklet is available from Skirpan Lighting Control Corp. **250**

Reprints of a 12-page article entitled **FCC Tests Due: March 31, 1976,** which discusses the new FCC proof-of performance standards and describes how to test for each parameter, are now available from Jerrold Electronics. **251**

A pocket size chart that relates focal length to camera format to horizontal viewing angle is now available. The conversions are made simply and accurately with a new "See Key" which is explained in the chart from Achro Video Ltd. **252**

Cable Television: Strategy for Penetrating Key Urban Markets, is a new book by James D. Scott. Professor Scott is the Sebastian S. Kresge Professor of Marketing at the Graduate School of Business Administration, University of Michigan, where he conducted the research for this book. The book provides an analysis of, and suggests plans for, the marketing necessary to help CATV realize its potential. The book is available for $5.50. Michigan Business Reports No. 58. The University of Michigan, Ann Arbor, 48104.

Troubleshooting in the Data Domain is Simplified by Logic Analyzers (Application Note 167-5), is designed as an introduction to the operation of logic analyzers and is available from Hewlett Packard. **253**

"An authoritative, practical guide to microprocessor construction, operation, programming and applications," entitled **Microprocessor/Microprogramming Handbook** (TAB Book No. 785) is available for $9.95, hardbound or $6.95 paperback, Tab Books, Blue Ridge Summit, PA, 17214.

A descriptive 4-page **brochure on the new Philips LDK-11 Portable Color Camera** is available. The camera is battery or ac operated and features a 3-Plumbicon tube picture with bias light, beam-split prism, linear mat for colorimetry, H and V contou auto iris, auto white balance, genlo sync generator and built in color ba Full details of the camera, backpa remote control unit, power source a electronic viewfinder are contained the brochure, from Broadcast Equ ment Div., Philips Audio Vid Systems Corp.

SEED: Establishing an Indus Standard, and Duobond™: T Callback CostCutter, are two n color/sound films from Belden. T first film treats the development a operation of Belden's patented SE test fixture. SEED is an acronym f Shield Effectiveness Evaluat Device. The second film uses SE based research to compare the shie ing effectiveness of conventio dual—foil wrap-on laminate shie with new bonded-foil shield c structions such as Belden's Duobo Both 12-minute films are availble fr Belden.

MobCat 76 is a new 12-page cata of Mobile Communications Supp Test EquiPment. The catalog conc trates on the 35 instruments most u for Mobile Communications ser and is available from Bird Electro Corp.

continued on pag

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ior or Senior Engineer to work in R&D.
perience in Color Video and Switching
ems preferred.
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Gainesville, FLA. 32601
Phone: (904) 378-1581

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unity for the right person.
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Phone: (904) 378-1581

VISION TECHNICIANS. Excellent career op-ity in public broadcast station operated by West ia University located 70 miles south of rgh, PA in scenic mountainous area. Experi- color studio operations and maintenance. First FCC license required. Forward resume and requirement to: Mr. E.J. Podeszwa, Personnel , West Virginia University, Morgantown, WV An Equal Opportunity/Affirmative Action Em- M/F.

dent Video Production Center seeks Chief En- Will assist in design and installation of new facility. Will also maintain remote unit. Omaha, ska. Send resume, salary requirements to: roup, 3716 "D" St. Omaha, Nebraska 68107.

VISION ENGINEER. Excellent opportunity dio transmitter technician with heavy mainte- experience, good salary, top benefits, estab- UHF network, affiliates in ideal community. eply to Chief Engineer, KJ TV, P.O. Box 226, field, CA 93301.

POSITIONS WANTED

man, 21, needs a "break" into the field of educa- ommercial Television broadcasting. Will relo- ywhere in the U.S.A. Experienced in camera dio operations. Have produced/directed many ms for closed circuit television and educational nication departments. Hard worker, willing to t bottom. Resume upon request: (518) 371-6629 rew R. Landor, Jr. R.F.D. #1, Route 236, ord, New York, 12188.

EQUIPMENT FOR SALE

VER YOUR EQUIPMENT NEEDS—new or heck us first. We specialize in broadcast equip- Send $1.00 for our complete listings. Broadcast lent and Supply Co., Box 3141, Bristol, TN 37620.

st mixer for remote out of studio programming. sed as inexpensive second console for college and dio stations. DJ's can now originate program- home. Simultaneous mixing of two stereo phono- tape machine and a microphone. Precue for all with built-in monitor headphone amplifier. Send ature. $325. Professional discount, use letterhead. ox 2076, DEPT BM/E, Brooklyn, N.Y. 11201 (212) 875-4992.

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FOR SALE

2 Sony VPP-2000 Projectors—$2600 ea., 1 Sony 8650 editing recorder $1960.00, 2 AKAI VT-150 color system/includes camera, editing recorder, CCU and case $4798.00 ea., 1 TRI EA-5 Editing console w/AKAI-Sony interface $3640.00, 1 AKAI VT-150EP editing player $2635.00, 1 AKAI CCU 150P camera control $695.00, 1 Panasonic W-3020 ½" recorder $695.00. All equipment like new. All items cash with order. Contact Cloyd Taylor, 6327 So. Orange Ave. Orlando, Florida 32809, (305) 851-2780.

FOR SALE: AMPEX, AMTEC, TIME ELEMENT COMPENSATORS (1605078-04) WITH MANUAL. **$1,200.00**

DYNAIR. **26 EACH** DA-1060C, VIDEO DA 4 OUTPUTS. 9 EACH PD-1041C. PULS D DA × 4 OUTPUTS. 9 EACH PS-1006A POWER SUPPLY, 8 EACH FR-1000A MODULE MOUNT FRAME. 19-INCH RACK AMOUNT. 3 EACH CE—0001 MODULE EXTENDERS. 1 EACH SPARE POWER SUPPLY. LIKE NEW, ALL FOR $1,400.00 T&A CO. PO BOX, 9444 GLENDALE, CALIF. 91208 Tel: 213-247-2753.

CLOSE OUT SALE. IVC Color Editing Package with interfaced TRI Editor/Controller and CVS Time Base Corrector. All gear completely checked out for solid operation. List, $32,000.00, SALE PRICE, $21,775.00; Larid Telemedia 5300 Film Chain Package with dual drum 75mm slide projector, super 8mm magnetic projector, Norelco LDH-1 Plumbicon (approx. 200 hrs.) Color Camera with CCU, 50' camera cable and CBS 526 Image Enhancer, List, $34,700.00, SALE PRICE $23,890.00. We also have some great buys on Colortran dimming equipment, Panasonic Video equipment and Dynair 12 × 12 Audio/Video Routing System. Call or write: Intermountain Video Systems, 2635 South Santa Fe Drive, Denver, Colorado (303) 744-2724.

BROADCAST AND RECORDING EQUIPMENT: Scully, V.I.F. International, Metrotech, Langevin, Electrodyne, Q.R.K., Micro-Trak, MRL, Nortronics, McMartin, U.R.E.I., E.V., A.K.G., Stevenson, Gately, D.B.X., Advent, Altec, Fairchild, Audio Designs, 3M, Magnecord, Telex, Inovonics, Nagra, Uher, Tape-Athon, Package Deals, Installations, Service, Request Flyer. Weigand Audio, Middleburg, PA. 17842. (717) 837-1444.

SPOTMASTER PARTS—24 hour service—repairs and rebuilding of your equipment. Franchised SPOTMASTER repair service. COMMUNICATION MEDIAS/BROADCAST COMPONENT DISTRIBUTORS, P.O. Box 54, Allentown, PA. 18105. (215) 437-0607.

Gates BC500T, 500 watt AM transmitter, 1961, excellent condition, passes proof, 125% + modulation, solid-state rectifiers, spare tubes, manual, on-line (1480 khz) as aux, past 5 years. $2,000.00. WKND, Box 1480, Windsor, Conn. 06095 (203) 688/6221.

FOR SALE, TR22 Hyband Color Video Tape machine. Also 1 CEI 280 Plumbicon broadcast camera. Write WXON, Box 2020, Southfield, Mi. 48075 Or Call 313-355-2901.

AMPEX, SCULLY, TASCAM, all major professional audio lines. Top dollar trade-ins. 15 minutes George Washington Bridge. PROFESSIONAL AUDIO VIDEO CORPORATION, 342 Main Street, Paterson, N.J. 07505. (201) 523-3333.

EQUIPMENT FOR SALE (Cont'd)

GE PE-250 Color camera, GE TY-106B helical antenna ch. 22, Collins stereo console 212S-1, more items on list. S.R. Cathrall, WEZF-TV, Box 22, Burlington, Vermont 05401, (802) 655-3663.

MICA AND VACUUM transmitting capacitors. Large stock; immediate delivery. Price lists on request. SURCOM ASSOCIATES, 305 Wisconsin Ave. Oceanside, Calif. 92054 (714) 722-6162.

4–650 ft. towers $6500.00 each. Many more. Ground wire 85cper xx. lb. Bill Angle, Box 55, Greenville, N.C. 27834. Tel. 919-752-3040.

Federal 193A 10KW FM Transmitter working when removed from service $2000—best offer. Ernie Hoppseker, KFLY 503-753-6633.

EQUIPMENT WANTED

Educational FM applicant needs tax-deductible studio and transmitter equipment donations. Box 2784, Phoenix, Arizona 85002.

INSTRUCTIONS

First phone through tape recorded lessons at home plus one week personal instruction in Washington, D.C., Atlanta, Boston, Detroit, New Orleans, Minneapolis, Seattle, Denver, Portland, Los Angeles. Proven results. Our 17th year teaching FCC license courses. Bob Johnson Broadcast License Training, 1060D Duncan, Manhattan Beach, Calif. 90266. 213-379-4461.

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GREAT IDEAS cont. from pg. 71

To set up, we tune in our EBS station, reset the receiver to its "alarm" condition, adjust the volume control for the proper output level of audio to our new 2-tone monitor, and secure it with the locking nut assembly. At this point there is audio from the speaker at a low level, which can be eliminated by the new speaker "off" switch. We relabeled the old EBS ALARM light "EBS RECEIVER FAULT," and when it lights up, the duty operator just retunes the receiver to our alternate EBS station and resets it. Now, we don't have to wonder if our EBS receiver is actually receiving a signal—it tells us when it's not.

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- ☐ Station(s)
- ☐ Station(s)
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- ☐ Telephone Company
- ☐ Program Sources
- ☐ Recording Studios
- ☐ Government
- ☐ Consultant
- ☐ Lawyer
- ☐ Distributor/Manufacturer dealer
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Are you responsible for more than one station or facility?

☐ Yes ☐ No

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- ☐ Station, Production or Program Management
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Your signature .....

..... Date .....

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