

CPR

November, 1977/75 cents

BROADCAST ENGINEERING

Radio Free Europe Automates



474010 015 770 0006 27
 116 078 01
 LIBRARY SERIALS DEPT
 &&

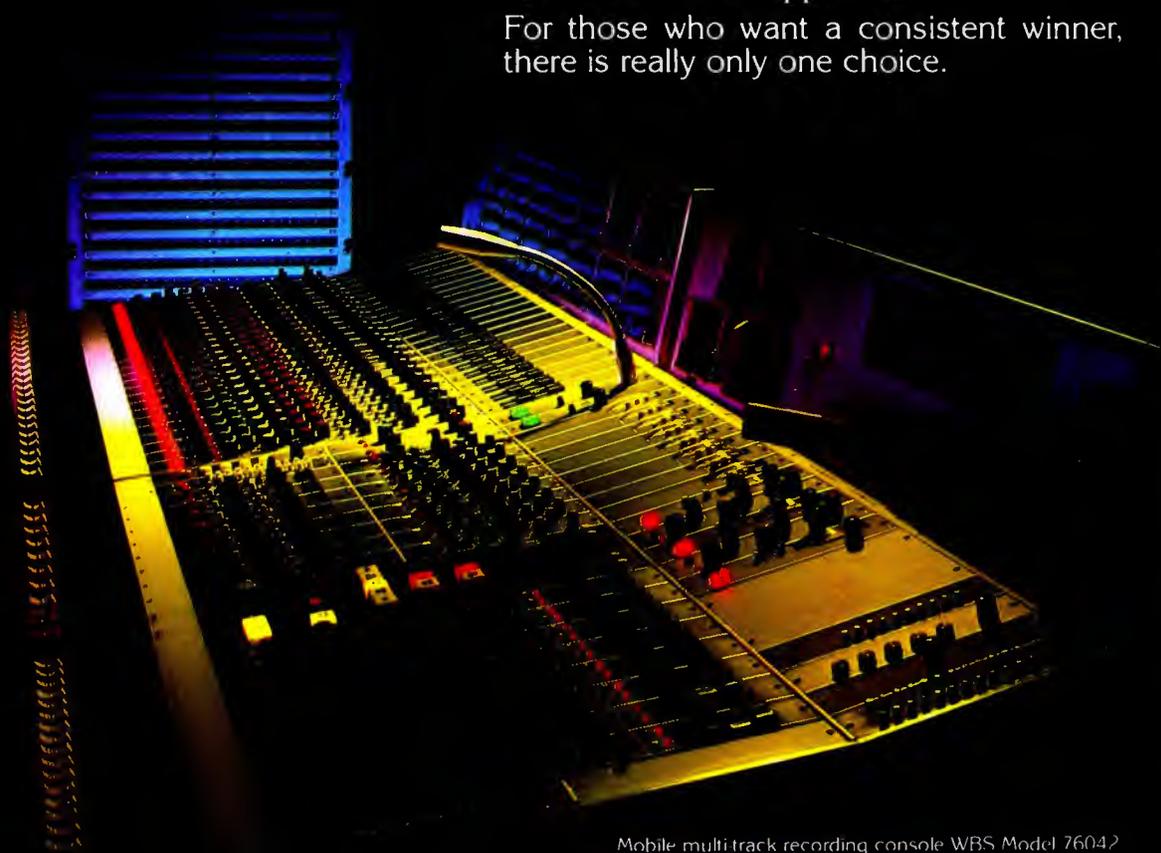
AUTOMATION SURVEY
 Television
 Lighting

At Home. Or Away.

At home in the studio, or away on location, Ward-Beck's flawless performance comes through for you.

The same engineering expertise, imaginative design concepts, and unparalleled craftsmanship, provide a depth of quality that is inherent in every Ward-Beck console, whatever its application.

For those who want a consistent winner, there is really only one choice.



Mobile multi-track recording console WBS Model 76042



Tomorrow's Technology Today.

Ward-Beck Systems Ltd., 841 Progress Avenue, Scarborough, Ontario, Canada M1H 2X4
Telephone (416) 438-6550. Telex 065-25399

Ward-Beck Systems Inc., 290 Larkin Street, Buffalo, N.Y. 14210

For More Details Circle (1) on Reply Card

Here's how useful a distortion analyzer can be

Indiana University
NOV 22 1977
Library

1710A DISTORTION MEASUREMENT SYSTEM
SOUND TECHNOLOGY

INTERMODULATION DISTORTION ANALYZER (OPTIONAL)

GENERATOR LEVEL dBm 5000

HF AMPL. RATIO

±1 dB Vernier adds fine level control.

Internal oscillator adjustable from +26 dBm to -89.9 dBm in 0.1 dB steps.

Turn off oscillator for quick S/N measurement.

Tuning indicators help measure distortion of an external source.

Simultaneously select oscillator and analyzer frequency with fast-to-use pushbuttons. 10 Hz to 110 kHz.

Balanced and floating 150Ω or 600Ω Generator output.

Measure distortion down to .002%, voltage or S/N ratios with 100 dB dynamic range.

View distortion products on a scope.

Automatic Set Level is optionally available.

Output signal on a

Balanced Input.

Measure voltage or power 10 Hz to 110 kHz.

Pushbutton operation: set level, measure power, then measure distortion.

Rejects 18 dB per octave hum and frequency noise.

Generator signal at 100 Hz with the push of a button.

Measure voltage, power, distortion, S/N ratio.

No manual nulling controls required (the 1710A is always in auto-null, reaches a null in less than 5 seconds).

Intermodulation Distortion Analyzer optionally available.

Oscillator distortion is typically .001%.

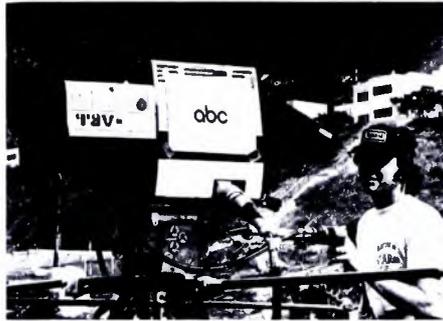
Some of the above features are so outstandingly valuable that we especially invite your attention to them. One is the fast, easy measuring you get with pushbutton-selected distortion-measuring circuits (signal source and measuring circuits are simultaneously selected with the same pushbuttons). Pushbuttons make it so simple to measure quickly and to repeat measurements. Secondly, you can drive virtually any type of load from the signal source output — whether

balanced, unbalanced, off-ground or whatever. That's because the signal source output circuit is fully **isolated and balanced**. There is **no output transformer** to introduce noise or distortion. Besides these outstanding conveniences, you can have the Sound Tech 1710A with an option that enables you to measure **intermodulation distortion**. Call Mike Hogue/Larry Maguire to get full information on an instrument recognized everywhere as the standard of the audio field.

ST® **SOUND TECHNOLOGY**
1400 DELL AVENUE
CAMPBELL, CALIFORNIA 95008
(408) 378-6540
For More Details Circle (5) on Reply Card

BROADCASTENGINEERING

The journal of the broadcast-communications industry



Page 52

Contents

- 20 New SBE Re-certification Procedures Proposed. *Jim Wulliman.*
- 22 Radio Free Europe Automates Their Newsroom. *Barry Griffiths.*
- 30 New Systems Put Automation On The Front Burner Again. *Ron Merrell.*
- 34 No Short Cuts—No Formulae—Lighting Is Painstaking Work. *E. Carlton Winckler.*
- 42 Microcomputer Controls Traffic For KEZK. *Noel Moss.*
- 52 Anatomy Of A TV Extravaganza. *Ron Whittaker.*
- 58 Radio Automation: Beast Or Beauty? *Peter Burk.*

About the cover

Our cover photo this month was taken in the newsroom Radio Free Europe's facility Munich. The article explains RFE's switch to automatic begins on page 22. [Photo courtesy of Megadata].

Departments

- Direct Current
- Industry News
- News Briefs
- Radio Workshop
- People in the News
- Zoom In
- Station-to-Station
- SBE Journal
- Blue Bananas
- New Products
- Ad Index
- Classified Ads

Editorial, advertising and circulation correspondence should be addressed to 9221 Quivira Road, P.O. Box 12901, Overland Park, Kansas 66212 (a suburb of Kansas City, Missouri) (913) 888-4664



Member, American Business Press



Member, Business Publications Audit of Circulation

EDITORIAL

- Ronald N. Merrell, *Editorial Director*
- Carl Babcoke, *Technical*
- Ron Whittaker, *Production Spotlight*
- Howard T. Head, *FCC Rules*
- Robert A. Jones, *Facilities*
- Michael Scheibach, *Associate Editor*
- Cindy Nelson, *Editorial Assistant*
- Dudley Rose, *Graphic Designer*
- Joe Roizen, *Video*
- Peter Burk, *Radio Workshop*
- Dennis Ciapura, *Audio Editor*

CIRCULATION

- Greg Garrison, *Director*
- Evelyn Rogers, *Manager*

ADMINISTRATION

- George H. Seferovich, *President*
- Mike Kreiter, *Publisher*

ADVERTISING SALES

- Gloria Parmenter, *Production*
- P.O. Box 12901
- Overland Park, KS 66212
- (913) 888-4664
- Regional advertising sales offices listed on ad index page.

BROADCAST ENGINEERING is published monthly by Intertec Publishing Corp., 9221 Quivira Road, Overland Park, Ks 66212

BROADCAST ENGINEERING is edited for corporate management, technicians/engineers, other station management personnel at commercial and Educational radio and TV stations, Teleproduction studios, recording studios, and CCTV facilities, and government agencies. Qualified persons also include consulting engineers, dealer/distributors of broadcast equipment.

SUBSCRIPTIONS: BROADCAST ENGINEERING is mailed free to qualified persons in occupations described above

Non-qualified subscriptions in the U.S. are one year, \$10.00 two years, \$13.00 three years. Outside the USA add \$1.00 per year to postage. Single copy rate 75 cents. Back issue rate \$1.00. Adjustments necessitated by subscription termination at single copy rate.

Allow 2-3 weeks for new subscriptions. Allow 4-6 weeks delivery for change of address.

Controlled circulation postage paid at Kansas City, Missouri.



INTERTEC PUBLISHING CORPORATION

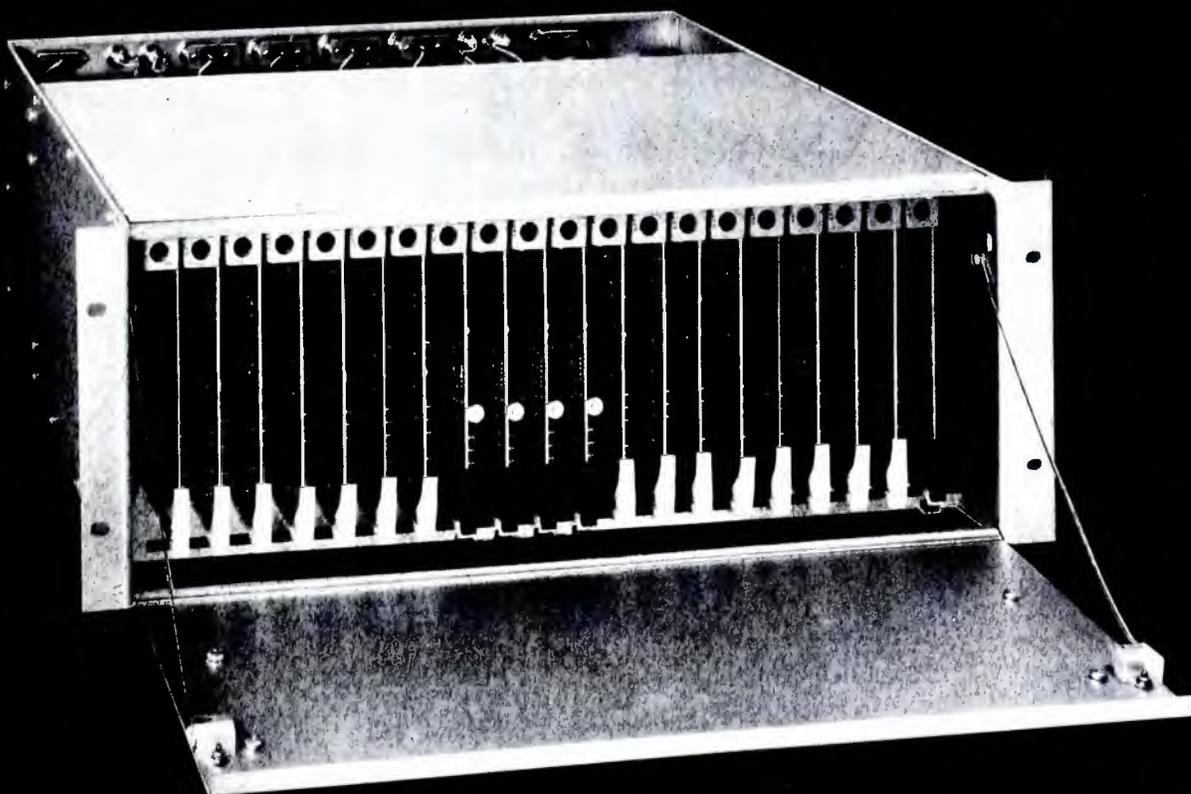
BROADCAST ENGINEERING

Copyright, 1977, Intertec Publishing Corp. All Rights Reserved. Material may not be reproduced or photocopied in any form without written permission of Publisher.

GRASS VALLEY GROUP ®

400 SERIES

A/V ROUTING SWITCHERS



FEATURES—

- High Performance
- Clamped Inputs
- Vertical Interval Switching
- Destination Oriented Matrices
- Expandable
- Economical

OPTIONS—

- Additional Audio Matrices
- Breakaway Audio Control Systems
- Tally Relay Systems
- Special Control Systems
- Dual Power Supplies
- XPT Memory Protection

THE GRASS VALLEY GROUP, INC.

A TEKTRONIX COMPANY

Station Plaza East
GREAT NECK, NY 11021
(516) 487-1311

4419 Van Nuys Blvd, Ste 307
SHERMAN OAKS, CA 91403
(213) 990-6172

1644 Tullie Cir, NE
ATLANTA, GA 30329
(404) 321-4318

P.O. Box 482
MABANK, TX 75147
(214) 887-1181

810 W Bristol Street
ELKHART, IN 46514
(219) 264-0931

DIRECT CURRENT FROM D.C.



November, 1977/By Howard T. Head and Harold L. Kasse

New FCC Chairman Has Engineering Background!

The new chairman of the FCC is Charles D. Ferris. Ferris is a Democrat and succeeds Richard E. Wiley whose term expired June 30. Wiley is entering private law practice.

Although the installation of a new FCC chairman is not a matter of especial interest to broadcast engineers, Chairman Ferris comes with an unusual background. He holds a degree in physics, has had practical experience as a research physicist, and has taught science and engineering at Harvard University. All of this is in addition to a law degree, experience in legal practice, and service as general counsel to the Speaker of the House of Representatives.

Chairman Ferris' appointment comes at a time when the Commission is faced not only with increasingly complex technical problems, but increasingly intricate judgments involving interrelationships between engineering and non-engineering matters. We extend the new chairman our best wishes and pledge every effort to do whatever we can to assure a successful tenure.

Commission Rules on AM Antenna Current Distribution

In a case involving a proposal for a new AM directional antenna in New England, the Commission has dealt with a challenge to the traditional assumption of sinusoidal current distribution in an AM transmitting antenna. This classical assumption is almost invariably employed, assuming wavelength along the radiator equal to wavelength in free space. It is known that this current distribution is only approximated in actual practice, but it is the exceptional instance where these assumptions do not yield satisfactory results.

One of the parties to the New England case had proposed the use of the current distribution given by Hallen's integral equation. The Commission pointed out that this method is also an approximation at

continued on page

Unmistakably Schafer.

Definitely Cetec.

Series 7000.



The all-new sequential 7000 Series system adds a microprocessor complement to the 900 Series Schafer 'time file' system line.

The computer grade CRT brings your station what other automation users have asked for ---

English Programming [PEP] for errorless understanding of all the programming information which is constantly displayed. And the display

is ahead for hours so station personnel can easily make changes, updates, and special event functions. Another exclusive 7000 Series feature is that the display provides PEP

alarm indication upon event or equipment failure. A 7000 Series built-in safeguard is

program error detection logic, which prevents error of back-to-back tray selection or other such mistakes. A part of the system's extreme reliability is

upgrading with expandable memory, addition of CRTs for remote locations, and computer link interfacing with coming computer devices.

The third generation microprocessor used in the 7000 Series assures up-to-the-minute design for utmost longevity. And the exclusive use of

multi-processing techniques for increased reliability and system throughput, with

separate program busses for music and voice track operational flexibility, are indicative of the design advantages of this new system. All told,

the 7000 Series brings sequential programming unique flexibility, through the most advanced design concepts and component devices available in a system today. Another

first for Cetec Schafer in its 20-year history of automation leadership. And another reason to talk to Cetec Broadcast Group; Jampro, Schafer, Sparta.



Cetec Broadcast Group

The Broadcast Divisions of Cetec Corporation
75 Castilian Drive Goleta California 93017
Telephone (805) 968-1561

For More Details Circle (6) on Reply Card

DIRECT CURRENT FROM D. C.

continued from page 4

that several other equally close approximations find occasional use. The Commission concluded by approving the use of the sinusoidal current distribution assumptions in this particular instance.

One of the more unusual features of the Commission's order is the fact that it dealt with the technical merits of a dispute of this type. The Commission rarely injects itself into the merits of such disagreements, relying instead on the judgments of engineering experts for opposing parties.

Commission Reaffirms Withdrawal of UHF TV Channels 70-83 For New Translator Service

The Commission has denied a petition by the Council for UHF Broadcasting (CUB) to restore UHF channels 70-83 for assignment to new television translators. These channels were withdrawn from translator service when the upper portion of the UHF television broadcast band was reassigned to the land mobile services although existing translators have been permitted to continue operation on the basis of non-interference to land mobile operation in this band.

CUB had asked for the restoration of channels 70-83 because of existing and expected future congestion not only on channels 55-69 which are preferred for new UHF television translators, but also on channels 14-54 where translator operation is permitted if higher channels are not available. However, the Commission concluded that most translator assignments could be made on channels 14-69 and expressed concern over possible future interference to land mobile operation in the frequencies above channel 69.

Short Circuits

The requirement for an AM modulation monitor type-approved for the maximum modulation to be encountered (up to 125% positive) has been extended to March 1, 1978...Your friendly RI will soon be carrying with him a paint chip to make sure the color of the paint on your tower is truly International Orange...Unattended operation of FM translators is now permitted, the same as TV...All commercial radiotelegraph operators certificates issued after January 1, 1978 must bear the photograph of the holder...Part 17 of the Commission's Rules governing painting, lighting and marking of radio and television towers has gone metric, with dimensions and requirements being stated in the metric system.

Why over 500 OEMs have decided to buy components from ADC.

The matter of trust.

OEMs have learned they can count on ADC for communication components. We've been in the components business over 35 years — designing and producing jacks, plugs, patch cords, terminal blocks, panels, transformers. Over 30,000 different products. OEMs know they never have to worry about ADC quality or reliability. Less than 1/2 of 1% of ADC products have been returned for replacement or repair over the last 10 years. All of our components are designed to meet or exceed mil-spec and Bell System requirements.

New product innovations.

ADC has been the first to engineer a number of significant new components for the communications industry, including:

- The first Bantam Jacks.
- The first Printed-Circuit-Board (PCB) Jacks.
- The first Wrapid Terminal Blocks.

All have saved our customers time, space, and money.

Full systems capability.

Many of the components which ADC manufactures are used in the assembly of ADC Systems: in our pre-wired and connectorized jackfields, our new Remote Access System, and our complete line of centralized test systems for private lines and message trunks.

The same quality components which we build into our own systems are the components we sell to you.

For our free 36-page "Components Catalog," write ADC Products, 4900 W. 78th Street, Minneapolis, MN 55435. Telephone (612) 835-6800. TWX 910-576-2832. Telex 29-0321.



ADC Products

A DIVISION OF MAGNETIC CONTROLS COMPANY



Bantam, Long-frame & Coax Jacks.



Plugs for every type of jack.



New Printed-Circuit-Board Jacks.



Bantam & Long-frame Patch Cords.



Hybrid Transformers.



Fly Bug Transformers.

Before you make a decision, talk to ADC.

Sales offices in:
 Fairfield, CT (203) 255-0644
 Washington, D.C. (202) 452-1043
 Melbourne, FL (305) 724-8874
 Atlanta, GA (404) 766-9595
 Minneapolis, MN (612) 835-6800
 Lafayette, IN (317) 474-0814
 Dallas, TX (214) 241-6783
 Menlo Park, CA (415) 323-1386
 Montreal, Quebec (514) 677-2869



Assembled Panels.

For More Details Circle (7) on Reply Card



The Sony BVE-500A. It's the best editing decision you'll ever make.

Announcing the professional automatic editing control unit professional editors have been waiting for. The Sony Broadcast BVE-500A.

Already, the earlier BVE-500 has been accepted as the state of the art in control track editing by broadcasters around the world. In the new BVE-500A, we've made substantial improvements that increase the speed, versatility, and convenience of the editing process.

Compare these editing advantages with existing equipment, and consider the added creative capabilities you get with the Sony Broadcast BVE-500A.

1. BIDIREX control. The big news in the BVE-500A is BIDIREX: two self-return search dials that take the place of ordinary pushbutton search controls. Many control instructions have been built into these BIDIREX dials to allow an operator to shuttle tape in forward and reverse direction at various speeds.

BIDIREX eliminates mode selection error. And it gives Sony U-matic editing a true "film" feeling ordinary editing systems can't match.

2. Decision Prompter. The new BVE-500A uses lamps to prompt the operator to the mode and progress of all editing decisions.

Function lamps blink until the edit commands are made, then go automatically to "steady on." Even in a busy newsroom, with many interruptions, an operator can tell at a

glance the status of his last instruction as the BVE-500A prompts him for the next command.

3. Automatic Entry. The BVE-500A saves valuable time with a feature that automatically enters the "IN" point when the preview button is engaged.

If the operator has already selected an "IN" point, this auto mode has no effect; the editor may preview without disturbing his pre-selected "IN" point.

4. New Full Time Counter. The BVE-500A counts control track pulses from -79 minutes through 0 to +79 minutes. An operator need not concern himself with the count when he initiates an editing sequence.

5. Short Pre-Roll. When used with external sync, pre-roll is reduced from five seconds to three seconds, a further time-saving advantage.

6. Cue Control. The BVE-500A features built-in cue record and erase. This 1kHz tone is recorded on Audio 1, and is useful for both auto control systems and pre-cueing the tape to air.

These are just a few of the new BVE-500A features.

Others include auto shut-off, external interface of control logic, manual edit capability, and more. You can see them all in action when you ask for a demonstration of this versatile new editing control unit. To do that, just contact your nearest Sony Broadcast office.

Sony Broadcast

Sony Corporation of America, 9 West 57 Street, New York, New York 10019
New York: (212) 371-5800 Chicago: (312) 792-3600 Los Angeles: (213) 537-4300 Canada: (416) 252-3581

Sony is a registered trademark of Sony Corporation of America

For Demonstration Only Circle (8) On Reply Card
For Literature Only Circle (9) On Reply Card

SMPTE working group agrees on Type C helical format

First drafts of the proposed One Inch Type C Helical format have been ratified by a SMPTE working group meeting recently in San Francisco.

The working group, including the major networks, commercial and institutional users, and a European Broadcasting Union representative, met September 7th and 8th to continue progress on the agreement in principle announced July 7th on One-Inch Non-segmented Helical Video Recording.

Following a full day of discussions between manufacturers' experts, who finalized details of format specifications, the SMPTE group reviewed and ratified those elements of the proposals that could be agreed upon. The new format will be identified as specifications for One Inch Type C Helical Video Tape Recordings for 525-line, 60-field NTSC Television Systems.

The Type C format

Specifications on a Type A format and Type B format, which will not interchange with Type C recordings, are presently being prepared by other SMPTE working groups.

The proposed Type C format for 525-60 provides for

recording exactly one field of video during scanner revolution. The recording of each field divided into two parts, the video track and the track. The video track contains all active picture and the interval starting with line 16 and ending line 5. Thus, VITS and VIRS are retained. The v track has a 10 line vertical-interval signal gap. sync track contains the 10 lines of the vertical-interval not recorded on the video track, plus an adequate overlap.

For those users not requiring the information contained in the sync track, the format allows omission of this track. However, no other information shall be recorded in the area allotted for the track when the sync track is not recorded.

Six head tip locations

The rotating scanner drum has six head locations. This scanner design provides for separate record and erase heads for both the video and sync tracks. In addition, it provides for optical features such as video and sync confidence heads and an automatic tracking head. When a particular head is used, a dummy head tip will be provided in its place to minimize velocity errors.

The linear tape speed is nominally 244 millimeters per second (9.61 ips).

continued on page

THE SYSTEMS APPROACH

...at last, AGC/Processing and Peak Control in the proper packages.

MULTIMAX—the AGC/Processor with exceptional input headroom, low noise, and low distortion. Multimax is the 3 band processor which employs unique energy based, open-loop compressors as the active gain control elements. A special gated release circuit insures smooth gain control and band tracking performance. Separate cross-over frequencies are designed for AM and FM bandwidths.

MULTILIMITER—the limiter that features an input "gain riding" compressor, a variable compression ratio fast limiter and an ultra fast peak control limiter which provides modulation protection without relying on clippers.

exclusive export agent:

Sierra Audio
Burbank, Calif.

Phone: (213) 843-8115
Telex: 691138



The Multimax, Multilimiter "package" concept puts your processor and limiter where they belong... in separate boxes. Multimax and Multilimiter are available for AM or FM application.



PACIFIC RECORDERS AND ENGINEERING CORPORATION
11100 ROSELLE ST., SAN DIEGO, CALIFORNIA 92121
TELEPHONE (714) 453-3255 TELEX 695008

For More Details Circle (59) on Reply Card

WE'LL WORK WITH YOU



Every supplier promises good service on their products. But what some have in mind is service *after* the sale. We do it a little differently. Our service starts *before* the sale and continues well after delivery.

You see, we *work with you* to make sure our consoles effectively do what you want them to do. However, if one of our standard consoles won't do it, we'll custom-engineer one that will.

As we've pointed out, we provide service after the sale too. But with our professional know-how based on more than ten years' experience, you won't be needing that much.

AUDIO DESIGNS AND MANUFACTURING, INC.
16005 Sturgeon, Roseville, Michigan 48066
Phone: (313) 778-8400, Cable: AUDEX TLX-23-1114

AMPEX

DISTRIBUTED OUTSIDE U.S.A.
BY AMPEX INTERNATIONAL OPERATIONS, INC.



Audio tracks

Three longitudinal audio tracks of equal width provide for three program quality audio channels. Two adjacent audio tracks can be used for stereo audio or for two separate audio signals. The third audio track can be used for time code, cueing purposes or an additional audio channel. In addition, a separate control track has been provided that identifies the odd and even fields and alternate frames. All longitudinal tracks are recorded at the same position perpendicular to the edge of the tape and downstream on the tape path.

The video signal is recorded using the high-band technique. The audio signals are recorded using conventional bias recording techniques. The control track is recorded using saturation recording techniques.

In addition to the 525-60 NTSC agreement, preliminary format for the 625-line, 50-field PAL and SECAM color systems was also prepared for ultimate consideration by the EBU.

The working group plans to complete various tests and measurements prior to the next meeting.

**PROTECTION
ASSURED
AGAINST
LIGHTNING**
**1259 Stations Use
The Wilkinson
Line Surge
Protector
IT REALLY WORKS!**

**WILKINSON
ELECTRONICS, INC.**

P.O. Box 738
Trainer, Pa. 19013
(215)497-5100

For More Details Circle (93) on Reply Card

Wilkinson Electronics Canada Ltd.
15 McCulloch Ave., Rexdale, Ontario
Canada M9W 4M5 (416) 247-9741

**Wilkinson
Self Testing
Silicon Rectifiers
Replace Directly
Mercury Vapor
Tubes**

- * Self Testing — A neon indicator for each diode warns of failure.
- * Direct replacements available for all diode rectifiers — no rewiring necessary.
- * Repairable — any component can be replaced easily.
- * 200% Safety Margin on Voltage — 300% on Current.
- * Fully Guaranteed.

**WILKINSON
ELECTRONICS, INC.**

P.O. Box 738
Trainer, Pa. 19013
(215)497-5100

For More Details Circle (94) on Reply Card

Roizen elected RTS Fellow

The Royal Television Society in England recently elected Joseph Roizen, president of Telegen, to the status of Fellow.

Roizen is only the third American to be so honored in the 50-year history of the world's oldest television society. The citation, read by John Ware, current chairman of the RTS, reviewed Roizen's technical developments in the field of videotape editing and color TV recording as well as his many contributions to the Society in the area of symposium lectures and journal articles.

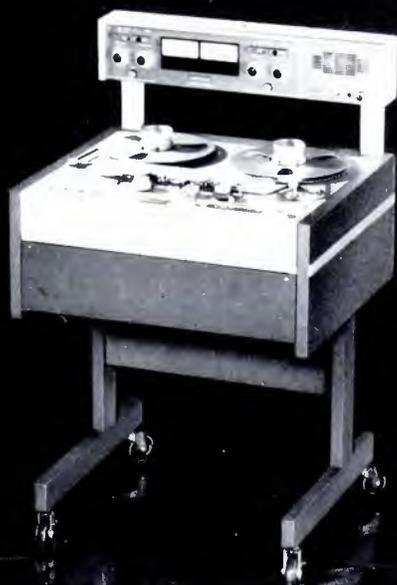
The award was presented at a Society's dinner on September 13 at the Arts Club on Dover Street, London.



Joe Roizen (center) receives the citation from John Ware, RTS council chairman, as Donna Foster Roizen watches.

continued on page

Studer introduces the A80/RC
the quality defies comparison...
the price invites it



From now on you don't have to pay more money to get Studer quality. The new Studer A80/RC two-channel recorder costs the same as or less than two of the other three popular names.

It sounds unbelievable. And it is the most perfect machine you can buy for any two-channel application you can think of.

Because nothing but a machine created by Willi Studer records, plays, handles, and lasts like a machine created by Willi Studer.

Now you have a choice: you can pay less for an A80/RC and get more tape recorder, or pay more for another brand and get less tape recorder.

Visit Studer for a hands-on experience with the A80/RC or for full information, call:

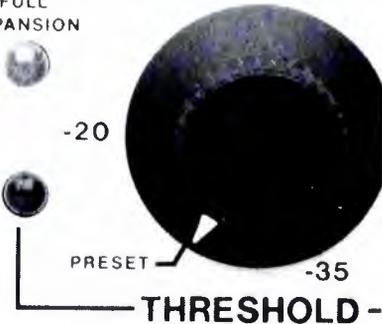
REVOX

Revox America, Inc., 1819 Broadway, Nashville, Tennessee 37203 / (615) 329-9576 • In Canada: Studer Revox Canada, Ltd. / (416) 423-2831

For More Details Circle (11) on Reply Card
www.americanradiohistory.com

Turn on a better idea

FULL
EXPANSION



Program-controlled filter suppresses residual background noise in audio reproduction systems. Selectable low frequency, high frequency, or wideband suppression modes.

Inovonics' DYNEX Noise Suppressor

Model 241 - \$280

Inovonics Inc.

503-B Vandell Way
Campbell, CA 95008
(408) 374-8300



industry news

continued from page 12

Court rules FCC regulations impose government censorship

A federal appellate court ruled September 15 that Section 399(b) of the Communications Act and the FCC's implementing rules impose government censorship and therefore are unconstitutional.

The section and accompanying rules required noncommercial educational broadcast stations receiving federal assistance to retain, and make available on request, recordings of all public affairs programs broadcast.

The U.S. Court of Appeals for the District of Columbia found the Act and the FCC regulations to be based on an objective of governmental review that is, in effect, government censorship.

The court also determined these provisions could not constitutionally be imposed on noncommercial stations when there was similar regulation for commercial stations.

Since implementation of the rules covering Section 399 several noncommercial educational stations had sought judicial review contending the Act and FCC regulations impinged on their freedom of expression in direct violation of First Amendment.

The FCC had argued that purpose of the statute was to "taxpayers, who provide the bulk of financial support for these stations as a means for reviewing the station performance."

At Last, a Cart Machine that Keeps its Cool



Telex/Magnecord broadcast cart machines run cool and steady. So cool no ventilation is required, so steady not even voltage or frequency fluctuations will alter their speed. Thanks to our dc servo flutter-filter drive.

The MC series offers broadcasters a host of options, including field convertability from mono to stereo or play to record and, of course, end of message, secondary/tertiary cue tones.

Designed for type A or B carts, the MC series meets all NAB specifications, offers full immunity to EMI and RFI, is remote controllable and automation compatible with CMOS digital logic. Audio muting, air damped low voltage

dc solenoid and fast forward are standard features on every MC unit.

Four broadcast cart machines to choose from in the Telex/Magnecord MC series. Running cool and steady. With a pleasant surprise—they're affordable.

For detailed information please write:

PRODUCTS OF SOUND RESEARCH
TELEX[®]
COMMUNICATIONS, INC.

9600 ALDRICH AVE. SO. • MINNEAPOLIS, MINN. 55420 U.S.A.
Europe: 22 rue de la Legion-d'honneur, 93200 St. Denis, France
Canada: Telex Electronics, Ltd., Scarborough, Ontario

Don't settle for ENG-Only!



LDK-11 is an ENG and EFP Camera.

The unique Philips camera that everyone thinking ENG and production. The one camera does both without compromising color or operational features. One camera many innovations that has earned Philips its reputation as "the INNOVISION company."*

Exclusive Philips design and performance, the LDK 11 outperforms "mini" and "micro" ENG-Only cameras. It is lightweight, battery powered, totally portable and operates for ENG; with full production control either remotely or at the backpack. Yet the LDK-11 operates the Philips picture-determining features that go into our most advanced studio cameras.

The LDK-11 includes many special unique features for difficult production and ENG applications. Here are just a few:

Outstanding low-light performance; 12 dB additional gain to match

specific requirements down to 8 ft candles.

- Bias-lit Plumbicon™ tubes for lowest lag.
- Lowest Delta T permits high ambient temperature operation
- Ultra stable gamma circuitry for true color rendition down to black
- Switchable gamma to 35 provides contrast compression
- Production gen lock capability up to 3000 feet
- New 1/4" Plumbicon tubes with studio camera resolution
- Up to 300' of 1/2" cable between camera head and backpack
- Carry head only. Ideal operator's weight (14 lbs with 10 l lens)
- Change head to backpack cable length without adjusting registration or set up
- True broadcast quality (27 MHz) 2 line contours with coring and

combing for maximum sharpness and minimum noise

- Magnetic shielding as in studio cameras
- Optional 5" viewfinder

The broad application of the LDK 11 in studios, documentaries, sports, local spots and ENG confirms that broadcasters need—and want—more than just an ENG camera. Prove it for yourself. For more information or a demonstration of the LDK 11 call your local Philips representative or contact Philips Broadcast Equipment Corp., 91 McKee Drive, Mahwah, N.J. 07430 (201) 529-3800

the
INNOVISION
COMPANY

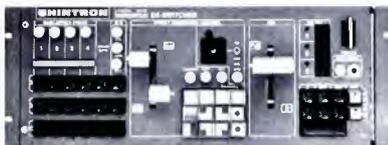
*Innovative Leader in World Television.

PHILIPS

TM & © 1988

For Demonstration Only Circle (115) On Reply Card
For Literature Only Circle (13) on Reply Card

The Only Solution for Sony Cameras



373 DX

Chromatic Production Switcher

Just Plug Them in and You Have the Most Advanced Studio

- Sony Camera Compatibility.
- Color Bar, Automatic Color Black and Color Background.
- 10 Wipes, Soft Wipe, Border Wipe, and Key.
- SYNC Generator.
- Front Panel Subcarrier Phase Shifter.
- Digital Tally Indicator, and Intercom.

SHINTRON

World Wide

Cambridge, Ma

02142 U.S.A.

617-491-8700

Telex 921497

For More Details Circle (14) on Reply Card

news briefs

Television seminar/workshop

Imero Fiorentino Associates announce that its seventh regional television lighting and staging seminar/workshop will be held Jan. 23 through 25, 1978 at Loyola Marymount University, Los Angeles, Calif. The company's experienced staff of lighting and production specialists will provide authoritative instruction covering the spectrum of current techniques to improve picture quality for both broadcast and non-broadcast television operations. The firm is currently accepting reservations. Further information can be obtained from the education division, Imero Fiorentino Associates, 10 West 66th Street, New York, NY 10023, (212) 787-3050.

Moseley Associates sold

Flow General Inc. has acquired Moseley Associates Inc., manufacturer of specialized equipment for the radio and TV broadcast industry and other industrial communications. John Moseley, who founded Moseley Associates in 1961, will remain with the company; no personnel changes are planned. Flow General Inc. is a diversified corporation engaged in the manufacture and sale of various products.

Session on microprocessors slated

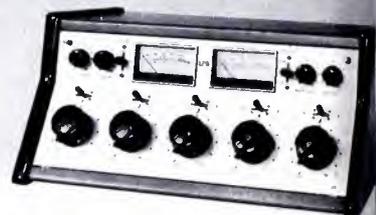
Worcester Polytechnic Institute will sponsor an all-day executive briefing session on "The Microprocessor Revolution: Impact and Outlook for Business and Industry" on November 30 at WPI in Worcester, Mass. The session will be the first of its kind, designed especially to meet the information needs of senior management, whether computer experts or not. A second session will be held December 7 at the Copley Plaza Hotel in Boston. For more information, call (617) 738-5021.

Edmonds elected ATEA president

Calvin R. Edmonds, Data Test Corp., has been elected president of the newly formed Automatic Test Equipment Association (ATEA). The association, organized in May 1977 to serve the needs of both the manufacturer and user of automatic test equipment, is currently working out the details of its organization. The first full membership meeting is scheduled for Los Angeles in early March 1978. □

LISTEN CAREFULLY...

that's how you'll discover the quality in every 5 channel Audio Console built by LPB



With LPB's S-12 Stereo and S-14A Mo SIGNATURE II SERIES Audio Console the "small" console comes of age. Flexible, immune to RFI, quiet and reliable, these boards have been built to match the most critical studio application. Features include: step attenuators, LED peak indicators, transformer inputs and output internal power supply and more.



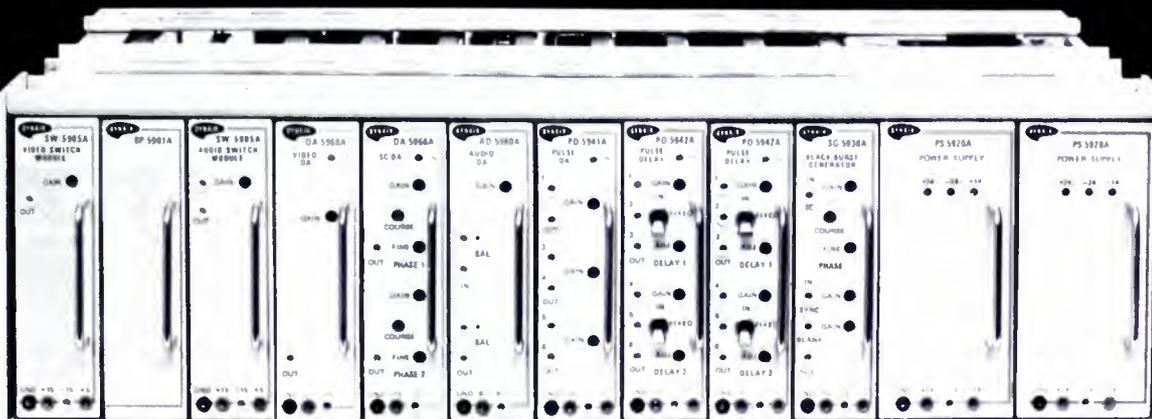
When you need an audio console that's small in stature and has quality written all over it, listen carefully to what we have to say. Call or write today for details.

LPB®

LPB Inc.
520 Lincoln Highway
Frazer, PA 19355
(215) 644-1123

BROADCAST ENGINEER

If distribution is troubling you... use **DYNAIR'S 5900 SERIES** for **FAST** relief!



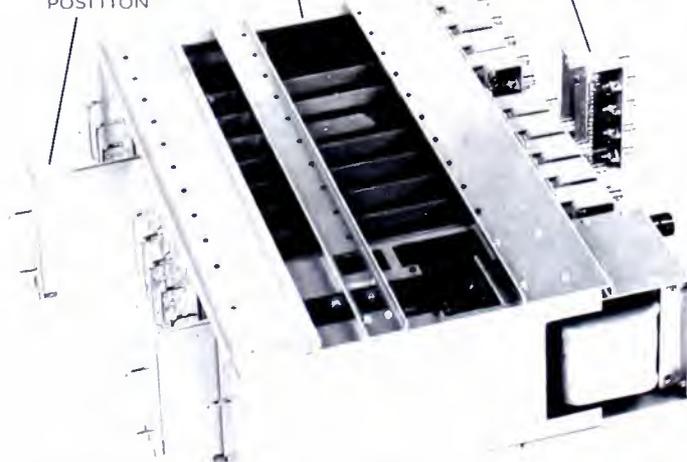
KEY FEATURES

- Full broadcast color performance
- Move or install modules without soldering
- Mounting space for redundant power supplies and ten modules in any combination
- 115 or 230 VAC, 50/60 Hz, NTSC or PAL operation
- Up to 60 outputs in 5¼ inches of standard 19-inch rack space

MODULES CAN BE LOCATED IN ANY FRAME POSITION

OPEN FRAME FOR COOLING

REMOVABLE FRAME ADAPTER



PS-5920A
REDUNDANT
POWER SUPPLIES

5900 SERIES
MODULE FRAME

MODULE VERSATILITY

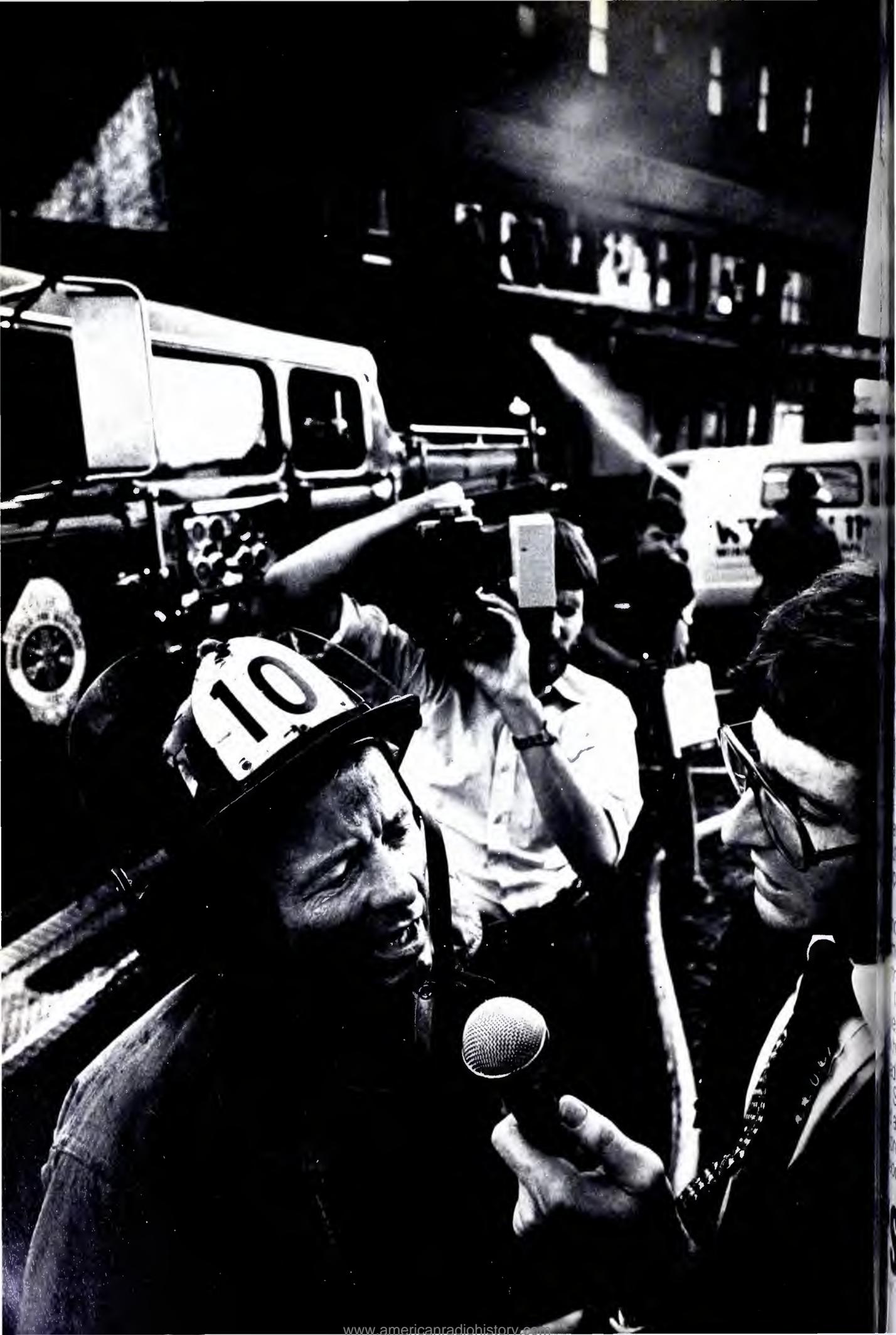
- AD-5980A, 1 looping in, 6 out, Audio DA
- DA-5960A, 1 looping in, 6 out, Video DA
- DA-5966A, 1 looping in, 6 out, Subcarrier DA
- PD-5941A, 1 looping in, 6 out, Regenerative Pulse DA
- PD-5942A, 1 looping in, 6 out, Regenerative Pulse Delay DA
- SG-5930A, 3 looping in (sync, blanking, sub carrier), 2 out, Blackburst Generator
- SW-5905A, 5 in (looping or terminating), 1 out, solid state remote control vertical interval Video Switcher, available in 5x1, 10x1, 5x5 configurations
- SW-5985A, 5 in (looping or terminating), 1 out, solid-state remote control Audio Switcher, available in 5x1, 10x1, 5x5 configurations

DYNAIR ELECTRONICS, INC.

5275 MARKET ST., SAN DIEGO, CA. 92114; TELEPHONE: (714) 263-7711; TWX: (910) 335-2040

DYNAIR

For More Details Circle (15) on Reply Card



ONE THING ABOUT THE NEWS BUSINESS: YOU NEVER GET A SECOND TAKE.

Here's a videocassette made for the people who make the news. It's the new "Scotch"® Brand Master Broadcast U-Matic videocassette. MBU for short. The first 3/4" videocassette designed specifically for tough ENG recording and the repetitive stress editing.

We took the same high energy oxide videotape you've used years and fused it to an incredibly strong backing. The result is a videotape that won't twist, tear or jam in the field. An unyielding videotape that won't stretch under the strain of tape editing's jostling modes or degrade in extended motion.

And to protect it even under the worst conditions, "Scotch" MBU videotape comes packed inside a high impact plastic bridge.

Of course, "Scotch" MBU videocassettes have the same high signal-to-noise ratio and low headwear and dropout rates of our superb U-Matic tapes.

So if you've ever worried about a good story slipping away and a videocassette breaking at the same time, record on "Scotch" Master Broadcast U-Matic videocassettes. They'll always back you up.



3M
COMPANY

"Scotch" MBU Videocassettes.

"Scotch" is a registered trademark of 3M Company, St. Paul, Mn. 55101. © 1977, 3M Co.

For More Details Circle (16) on Reply Card

www.americanradiohistory.com

New SBE re-certification procedures proposed

By Jim Wulliman

Chairman, SBE Certification Board, and
Manager of Engineering, WTMJ, Milwaukee

At the present time there are more than 1400 broadcast engineers from across the U.S. and from many foreign countries who have been certified by the Society of Broadcast Engineers. Because of their engineering background, the majority of these engineers qualified for certification under the "Grandfather Provision."

SBE certification is awarded for a period of five years, after which re-certification by the board is necessary. This re-certification is not automatic; the board feels that the continuing education of broadcast engineers is necessary to maintain their competence in the state of the art and that all engineers must continue their professional development in an industry that is changing at a phenomenal rate.

In order to be re-certified, all engineers must accumulate a certain number of professional credits each five years or they must take and pass a certification examination. At the present time the values of professional credits for re-certification have not been finalized, but the following is a draft of the proposed re-certification procedures.

In order to be re-certified without examination a candidate must accumulate 25 professional credits each five years. These credits may be earned by the following:

- Employment as a full-time manager or supervisor, or at a decision-making level in broadcast engineering, or as a consultant or equivalent. Two credits per year.
- Successful completion of an accredited broadcast engineering course, either as a student or as a teacher. One credit per 10 contact hours (1 CEU—Continuing Education Unit). Teaching a course is worth 2 credits per 10 contact hours if the individual is not a full-time teacher.
- Presentation of a significant paper or talk on a broadcast engineering subject before a national or regional engineering meeting or conference. Two credits per paper.
- Publication of a technical article in a national broadcast periodical. Three credits per article.
- Active participation as an elected or appointed officer or committee member in the SBE or other professional society, either at the local or national level. Two credits per group per year.
- Attendance at local, regional or national SBE meetings and other technical conferences and seminars. Three-tenths credit per local meeting; 1 credit per day for attending conferences, seminars and workshops of one or more full day's duration.
- Any other activity approved by the certification board. Credits as evaluated by the certification board. (Please write to the board for a ruling.)
- Home study courses, as determined by the certification board. (Please write to the board for a credit ruling.)

Exams

The first round of SBE Certification examination has been given by those chapters having candidates whom the certification board had ruled eligible to a particular level of test. Also taking the exam each of these chapters were several previously certified members who were participating in a "control group." This group's tests were graded and the profiles of the results were then used to evaluate the candidate's examinations.

The SBE was unable to arrange for non-member members not affiliated with local chapters to participate in the first series of certification examinations. Tentative plans call for the second round examinations to be administered in April or May next year.

Since the goal of the certification board is to constantly improve the examinations and to insure that the questions are representative of the "real world" of broadcast engineering with an emphasis on the ability to solve problems rather than on memorization of answers, there will be several changes and improvements in our program.

Certification changes

The earlier-planned levels of Associate Broadcast Engineer (no experience requirement) and Broadcast Engineer (five to ten years experience) have been revised and combined. The new classes of certification will be: Broadcast Engineer—Radio, and Broadcast Engineer—Television.

The two Senior levels will be kept as they are: Senior Broadcast Engineer—Radio, and Senior Broadcast Engineer—Television.

The examinations will be different for each class and all exams will undergo periodic revisions. In some cases, several versions may be used simultaneously.

It should be noted that certification is determined both by the candidate's experience and by his passing the examination. An applicant for certification at the Broadcast Engineer level must have five years of suitable experience, as determined by the certification board from the information supplied on the application. For Senior Broadcast Engineers, the requirement is 10 years of responsible broadcast engineering experience.

Candidates should keep in mind that the board relies on the application information in making evaluations, so applicants should provide complete experience and achievement data. In the past we have received a number of applications listing only station call and length of employment of the candidate. Obviously, such a lack of information delays the processing of these applications.

All those wishing to take one of the spring exams please write to the Certification Secretary at the national office as soon as possible for a copy of the complete program and application forms. Included in the list of SBE chapters, a list of suggested study materials and sample exam questions for each level.

The address is: Certification Secretary, Society of Broadcast Engineers, Inc., P.O. Box 50844, Indianapolis, IN 46250.



**If you want
Plumbicon* picture quality
from your ENG camera—
specify Plumbicon TV camera tubes.**

As predicted, the Plumbicon $\frac{2}{3}$ -inch camera tube changed the entire course of broadcast journalism and helped make ENG the world's most important medium of information.

Amperex

TOMORROW'S THINKING IN TODAY'S PRODUCTS

A NORTH AMERICAN PHILIPS COMPANY

AMPEREX ELECTRONIC CORPORATION, SLATERSVILLE DIVISION, SLATERSVILLE, RHODE ISLAND 02876 • TELEPHONE: 401-762-3800

* Registered trademark N.V. Philips of the Netherlands.

For More Details Circle (17) on Reply Card



Radio Free Europe automates their newsroom

By Barry Griffiths*

Video display unit (VDU) text-editing systems are just beginning to catch the interest of Europe's broadcasting media. One of the first radio stations to install terminals to handle news and feature processing was Radio Free Europe/Radio Liberty, the American

station broadcasting from Munich to the Soviet Union and the communist countries of Eastern Europe. The switchover is attracting considerable attention from West Germany's state radio networks.

The RFE/RL news operation is a complicated involving a massive input of material which has to

continued on page

*Assistant News Director, Radio Free Europe

When you're shooting ENG, two things are certain: You never know where news will happen next. And you never know what will happen when you get there.

For the first, you need lenses with proven performance. The kind of versatility to handle most any kind of shooting situation. Plus the ruggedness and reliability to withstand daily use. And abuse.

For the second, you need lenses backed by service. To keep your lenses in top condition. And solve the problems no one can foresee, but everyone faces.

At Canon, we offer the widest selection of ENG lenses in the business. Premium lenses, engineered by the same people responsible for our Academy Award in lens design.

Built by the people who helped make our Scoopic camera the network newsman's favorite silent '16'. And backed by a dedicated

group of servicepeople, in key cities, nationwide.

When you're shooting ENG, you need more than lenses that work when the going's easy. You need lenses you can depend on. To reliably handle everything you'd reasonably expect to find on location. Backed by loaner lenses and quick-turnaround service when the unexpected shatters your peace of mind.

You need Canon.

For more information about Canon ENG lenses, please contact Jack Keyes or Ken Morishima in New York; Matt Miyazaki in Chicago; or Harry Hirai in Costa Mesa.

Canon U.S.A. Inc. Head Office
10 Nevada Drive, Lake Success, N.Y.
11040 (516) 488-6700

140 Industrial Drive, Elmhurst, Ill. 60126 (312) 833-3070
123 Paularino Avenue East, Costa Mesa, Ca. 92626 (714) 979-6000
Canon Optics & Business Machines, Canada, Ltd.
3245 American Drive, Mississauga, Ontario L4V 1B8, Canada
Canon Amsterdam N.V., Industrial Products Division
De Boelelaan 8, Amsterdam, Netherlands

Canon[®]

Corporate Sponsor, American Society of Television Cameramen

SOMETIMES, THE NEWS CAN HAVE TOO MUCH IMPACT.



For More Details Circle (18) on Reply Card

some inventions SAVE you TIME, WORK & MONEY



THIS ONE DOES ALL THREE

Color sub-carrier burst phase requires close attention to prevent visible color faults (objectionable hue shifts) during a production or duping. Especially if you want to keep normal fleshtones when using special effects, supers and chroma key during color productions. Phase shifts greater than 5 degrees can distort normal fleshtones creating visible color faults. This can result from mis-adjusted video equipment or from various cable lengths and amplifiers which create delays and different burst angles according to their location in a color video system. Phase shifts could also result from normal aging of various components throughout the video system. You can check for phase shift the old way or the VACc way.



phase shift checked

the old way



phase shift checked

the VACc way

VACc's Burst Phase Meter (model BPM-1) is a \$599.00 replacement for most vectorscope applications. The unit requires only ac power, video and subcarrier inputs. An easy-to-read analog meter indicates phase shift in the video burst relative to the subcarrier over a full 180 degree range with 1/2 degree accuracy. (360 degrees phase range can be obtained with a coax delay line).

NEW! You saw it at NAB...now available for immediate delivery.

H-Phase Meter

Option 02...includes Burst Phase and H-Phase...all in one unit! \$729.00 list.



USA (303) 667-3301
Canada (Toll Free) (800) 261-4088
VIDEO AIDS corporation of colorado
327 E. 7th St.
Loveland, Colorado 80537



Radio Free Europe

continued from page 22

processed for news desks broadcasting in 23 different languages. It needed text-editing terminals of unusual versatility, including some in cyrillic for its Russian editors. These requirements stumped several West German computer firms, with one estimating it would take three years to produce a VDU system capable of the job. But a U.S. firm, MEGADATA of Bohemia, New York, computerized the RFE/RL operation partially within three months and totally within six months, a feat which the technical director of the West German news agency had said would be impossible.

The station broadcasts to Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and the many different nationalities of the Soviet Union. It is one of the major sources of information in these countries outside of official, party-line media. Its role has been magnified since the signing of the European Security Conference Agreement providing for a freer exchange of information. Some groups (basing themselves on the Helsinki accord) have been active in the Soviet Union, Poland, Czechoslovakia, and Romania, and depend upon such western radio to get their message across. President Carter's decision to increase the transmission power of RFE/RL and the Voice of America provoked loud, almost daily complaints.

News is chief product

RFE/RL considers news the heart of its broadcast. Officials at the station say the conversion to VDUs has produced a marked increase in the speed and efficiency of its news operation.

The station compiles its news broadcasts from the output of four western news agencies: United Press International, Reuters, and the West German and French agencies. RFE/RL also uses correspondent news agencies, as well as monitoring more than 100 Soviet and East European radio stations. This material, more than a million words a day, is processed by a central newsroom into English language and Russian-language news files that

continued on page

their weight makes them portable.
their performance makes them professional.



Introducing Technics new professional portable cassette decks. Our top-of-the-line RS-686DS speaks for itself. Its 6 lbs., 13 oz. say it's portable. Its 3 heads say it's professional. And all the other features say it will give you recordings of professional caliber.

Features like a unique anti-rolling mechanism for unprecedented portable transport stability. A frequency generator servo motor that immediately counteracts any variation in rotational speed. Separate bias and equalization. Even Dolby.*

The RS-686DS also gives you controls you won't find on many non-portables. Like a tape/source monitor switch. Low cut filter. Mike attenuator. And a three-minute tape end alert eye.

A less expensive alternative is the RS-646DS. The portable deck with performance specifications usually

found only in higher priced cassette decks.

The RS-686DS and RS-646DS. Professional specifications. Plus the flexibility of recording sound wherever it may take you.

TRACK SYSTEM: 4-track 2-channel record/playback. MOTOR: FG servo-controlled DC motor (RS-686DS). DC electronic speed control motor (RS-646DS). FREQ. RESP. (CrO₂, \pm 3 dB): 50-16,000 Hz (686). 50-14,000 Hz (646). WOW AND FLUTTER (WRMS): 0.07% (686). 0.10% (646). S/N RATIO (Dolby): 66 dB (686). 65 dB (646). DIMENSIONS: 3" H x 9 1/2" W x 7 7/8" D (686). 4 1/4" H x 14 1/4" W x 11" D (646). SUGGESTED RETAIL PRICE: \$599.95* (686). \$299.95* (646).

Technics RS-686DS and Technics RS-646DS. A rare combination of audio technology. A new standard of audio excellence.

*Dolby is a trademark of Dolby Laboratories, Inc.

*Technics recommended price, but actual retail price will be set by dealers.

Technics Professional Series
by Panasonic

For More Details Circle (20) on Reply Card

VIDEO PATCHING

- Self-normaling, no patchcords or plugs required for standard connections.
- Self-terminating, unused sources automatically terminated within the jacks.
- Non-interrupting, on-line monitoring of live circuits.
- Best frequency response and isolation specifications in the industry.
- Patented design in wide use by TV broadcasters, industry and government.



Patented
COTERM® 22T jack
22 per 19" panel
1 1/2" or 3 1/2" high

COOKE ENGINEERING
COMPANY
ALEXANDRIA, VIRGINIA
COTERM® 22T
U.S. PAT. NO. 3,457,841

Dynatech Data Systems
900 SLATERS LA. ALEXANDRIA VA 22314 DIVISION OF DYNATECH CORPORATION
PHONE 703-548-3889 ■ TELEX 89-9119
FORMERLY COOKE ENGINEERING COMPANY

For More Details Circle (21) on Reply Card

TOWER WARNING LIGHTS



Complete Kits

New/Improved solid state microwave control for easier maintenance. Many special features. 300mm Beacons • Flashers • Obstruction Lights • Photo Controls • Isolation Transformers • Lamp Failure • Alarm Systems • Meets all FCC/FAA Regulations • Technical Support Provided.

HUGHEY & PHILLIPS
3050 N. California St., Burbank, CA 91504

For More Details Circle (22) on Reply Card



Radio Free Europe

continued from page 24

transmitted to the language broadcasters on internal teletype system.

Enter the computer

Feeding all this raw information into a system computer system was the first problem. The next step in ensuring there would be no interruption in the 'round-the-clock' flow of news to the men at the microphone. The inflow is handled by a concentrator which stores, for 24 hours, the files of the western agencies and the RFE/RL correspondents, delivering individual items to any terminal in the system at the touch of a button. At 9,600 words a minute, it's almost instantaneous. In addition, monitors transcribe material from East European radio broadcast work terminals which have been set apart from the main system, feeding their output into the concentrator storage as if they were a separate news agency. Through the concentrator, this output is available at all editing terminals for processing.

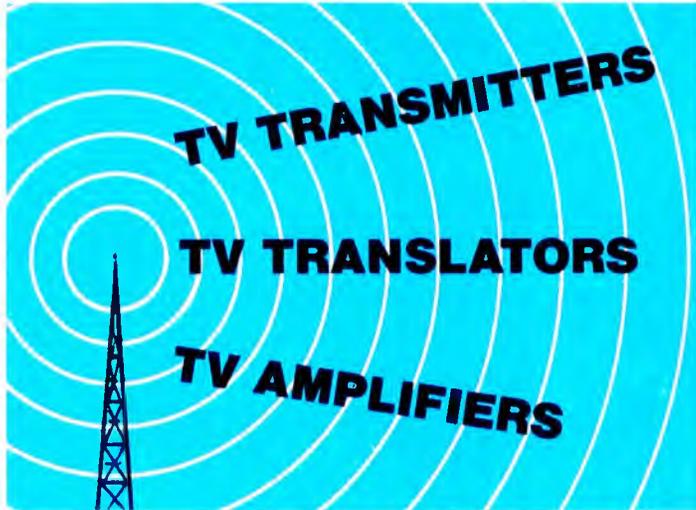
Breakdown protection

The solution for preventing a system breakdown is unique. The English-language news file is processed on a system of several slave terminals and two master terminals, rather than one. (The master, which controls the slave terminals and the copy flow to the internal teletype system, was duplicated because it was the weak link.) Two masters were programmed into the system, each controlling the slaves and output lines, and in communication with each other. If one fails, the other can run the entire system. And if both fail, a slave terminal can be converted into a master.

Another master terminal is used in a second four-slave system producing news and features on a Cyrillic teletype net servicing 17 desks broadcasting to the Soviet Union in Russian, Ukrainian, Latvian, Georgian, Uzbek, and other languages of the Soviet nationalities. This system has the only text-editing

continued on page

On the Air®



@/ acrodyne
industries, Inc.

21 Commerce Drive • Montgomeryville, Pa. 18936
(215) 368-2600 TWX 510-661-7265

For More Details Circle (24) on Reply Card

What do you do about videocassette problems? **Dump 'em?**

...or suffer through them, hoping to avoid the panic of another tape failure. Either way it's a waste of time and money.

Meet the problem-solver:
The Chyron Cassette Cleaner & Evaluator

CCE Model C-1...for 3/4-inch videotape...the remarkable little machine that removes dirt and embedded particles from tape surfaces while it detects surface and edge damage...**at a rate ten times faster than real time without altering the recorded signal.**

Regular use of the Chyron CCE reduces VTR head clog, improves image quality, minimizes tape replacement costs...and at an affordable price.

Dept. B117

CHYRON
TELESYSTEMS

DIVISION OF CHYRON CORPORATION
223 NEWTOWN ROAD, PLAINVIEW, NEW YORK 11803

Completely automatic.
Self-contained. Simple to use. Call or write today.
TELEPHONE: (516) 249-3296
TELEX: 144522 CHYRON PLW

For More Details Circle (25) on Reply Card

Radio Free Europe

continued from page 26

terminals in the West using cyrillic letters (learned drawn on graph sheets by RL staffers and reproduced on a video screen by MEGADATA engineers). In addition, too, a separate terminal feeds Russian-language monitoring of Soviet radio broadcasts directly into the teletype network.

English-language news backgrounders aimed at evening radio newsreel shows are produced by a separate unit working with three slaves and one master. This unit, which produces about 4,000 words of feature programming a day, did not exist before the switchover to VDUs. It was not possible for teletype operators to consistently move its output in time to meet programming deadlines. Now its entire production can be transmitted to the programmers in less than 15 minutes.

Chief benefit is speed

Speed and accuracy have been the main benefits from the VDU switchover for RFE/RL. Providing news and feature programming material for the vast tastes of an audience stretching from Warsaw to Bucharest to Vladivostok had strained to the limits the capacity of its old 100-word-a-minute teletype system. The introduction of the VDUs tripled this capacity to 300-words-a-minute. Roundups of American and European press editorials, for example, can be moved to programmers doing press review shows within a matter of minutes. A 30-word bulletin reaches newscasters in six seconds. It is now standard at some RFE/RL newsrooms that any urgent message is moved on the teletype during a 10-minute newscast goes into the newscast. And the copy the broadcasters receive is clean, easily readable, and free of the sort of errors which used to be made by teletype operators and typists getting things out in a hurry.

With the English and Russian VDUs feeding directly into the internal teletype lines, RFE/RL was able to reduce its teletype and typing staff by 17 and close from its central newsroom bulky and noisy teletype transmitters. Officials at the station say the reduction of noise level in a newsroom, which still has teletype and telex printers for incoming agencies, is remarkable.

RFE/RL says the switchover presented no training or operation problems. While the sophisticated terminals have won high praise for their text-editing capability, their operation was kept as simple as possible. There is, for instance, only one computer involved in the process: a teletype line designating the station's newsmen were able to operate the system competently after only a day's training, and after two weeks many were inventing additional things for the VDUs to do.

Some of these inventions were still being incorporated into the system by MEGADATA long after installation. There was a problem with the headline listing which the central newsroom issues to broadcasting newsrooms at 15 minutes before every hour. The teletype girls who use to shout "headline" at forgetful deskmen about 20 minutes before the headlines were sorely missed. So MEGADATA built a beep into the master terminal which begins beeping at 15 minutes to the hour and keeps on beeping until a deskman presses a button which brings the headline format onto his screen. RFE/RL newsmen ruefully describe it as a diabolical device. And it doesn't beep downstairs for coffee!

GREAT MOMENTS IN DIGITAL VIDEO HISTORY.



THE SYNCHRONIZER BECOMES MORE POWERFUL. AND LESS POWERFUL.

AND MICRO CONSULTANTS IS THERE WITH THE QUANTEL DFS 3100 AND DFS 1500.

The new DFS 3100 is the successor to the DFS 3000, the world's most highly acclaimed digital framestore synchronizer. But the microprocessor-controlled DFS 3100 is more powerful. Its production control option puts a wide range of effects at the producer's fingertips. Effects like freeze with automatic updating. Video compression. Joystick control of compressed and full frame pictures. Automatic positioning to predetermined locations. Automatic tracking of chroma key for compressed images. Automatic fast or slow wipes. Smooth cuts from compressed to full time video. And more.

But if you need **less**, the new DFS 1500 gives you basic fieldstore synchronization and truly outstanding time base correction. It's ideal for broadcasters who don't need all the power of the 3100, as well as those who have a need to use it **in addition to** a 3100.

Both synchronizers are portable and rugged. Both dissipate only 250VA. Both are perfect for studio or OB van.

So whether you need more synchronizer—or less synchronizer—get in touch with Micro Consultants, Inc., P.O. Box 10057, Palo Alto, California 94303, (415) 321-0832.



The digital video people

For Demonstration Only Circle (26) On Reply Card
For Literature Only Circle (27) On Reply Card

New systems put automation on the front burner again

By Ron Merrell

The results of our latest survey indicate that interest in automation is picking up again, but the old problem of operator errors is still detracting from automation's acceptance.

There probably was a time when a low-key, low-budget station decided to do something about their DJ overhead. And back in those long-forgotten days an engineer probably was charged with the responsibility of solving the problem.

The enterprising engineer hauled in a moderately-priced automatic changer turntable, hit the reject button, and let the platters fall (ouch!) in sequence. Of course, it wouldn't be long before he realized that two of these turntables could be sequenced. Once wired into the system, everyone could walk away from the control room until it was ID or ad time. (If you read our Blue Bananas column, you can see how this kind of operation would have been wide open to humorous possibilities.) But was it automation?

Not so long ago

In the early 1970s, radio program automation was the hot topic at the NAB equipment exhibitions. If we believed all we heard, it would only be a matter of time until all stations were automated. A few years later, automation program equipment control systems began to show up here and there on the classified ad pages under "used equipment."

The problem then, as it is now, was not that the automation equipment could not perform. Rather, it was that owners and engineers had not anticipated how this equipment would affect all aspects of their operation and their air sound. After all, there are big differences in individual approaches to operating classical, MOR, C&W, Top 40, and mixed formats.

When the subject of radio automation surfaces today, there is some confusion as to what is meant by saying a station is automated. Suppose, for example, we are using a multiple-deck cart machine. Depending upon the make and model,

it can be plugged up with music, IDs, promos, and ads...and they will run as ordered. The machine will automatically play each of these carts, or it can be punched into standby while the DJ reads an ad or interjects the sort of chatter that makes him popular. Is this automation? And what of limited-number random select?

What about the station that uses two triple decks plus single-play carts? While as many as six out of every ten entries will automatically play, most engineers would not consider this to be automation. So, for the sake of this article, we're going to sidestep the mini-automation level.

You must mean programming

Even now, when we talk of automation, most radio people assume we're talking about program automation. They've seen the station down the street automate programming; they've seen the program automation ads, read program automation articles, and maybe even sat in on convention program-automation sessions.

Meanwhile, if we talk about automation with the television side of the industry, automation would mean something quite different. The invasion in television has settled mainly around traffic and billing. However, a number of stations have opted for machines that automatically sequence IDs, promos, and ads. Switching is a new way to go, logging is not.

Because of the nature of their differences in needs and programming, TV has leaned on the data processing side, while at many stations, radio has accepted automated programming as a way of life.

Among the early attractive features of automation was that as it smoothed out and simplified the

operation, it also would eliminate some staff personnel. Automation was supposed to give the remaining engineers and operators more to spend on creative efforts, some engineers and many operators translated this into job satisfaction. Another problem was that enough people anticipated what would do to those DJs who survive the initial stages of program automation. In fact, many became bored with their new role. After all, it was possible to purchase taped programs and special station IDs. What was the DJ going to do? Push buttons while the station lost its personality?

Shortly, of course, it was pointed out that there was nothing so terribly unique about program-automation equipment. DJs could operate it and engineers could deal with it. In any way, if everything had to be done with carts and reels, how was it going to get there? If it wasn't syndicated, who would make the transfers? And wouldn't this bring about even more equipment to be maintained or repaired? At least it would surely place heavier demands on existing recording equipment.

While AM stations were wrestling with carts, FM stations were pushing away from discs and staterecorded tapes and getting into reel-to-reel syndicated tapes. Even here, the system could be wired to play the program reel-to-reel, automatically interrupted by ads, promos, and IDs on cart machines. This approach did not require any program creativity on the part of the local station. Of course, the programmed tapes had to be on target. Despite the chance, this approach grew in popularity.

In the last 18 months, there has been a new surge of interest in radio program automation. Systems are being offered now that can store and play more than 100 carts in addition to controlling reel-to-reel machines. In fact, automation equipment manufacturers have been busy designing systems that can handle almost any format challenge or length of broadcast day requirements.

Industry survey

In 1971 and 1974, **Broadcast Engineering** checked the pulse of the radio broadcast industry and detected considerable interest in automated programming. This summer **BE** undertook its third automation survey.

In all three surveys, operators

continued on page



The new CEI-310. Is it really that good?

A lot of people who saw our broadcast quality field production camera at NAB could hardly believe it. They asked us a lot of curious questions.

Is it really that small? That portable? Is it really making those incredibly good pictures we're seeing on the monitors? Even at those abominably low light levels? Is the resolution actually as good as it looks?

Does it really require only one lightweight cable out to the electronics unit—for video and broadcast quality audio? Up to 400 feet? Or up to 2500 feet with a systems integration unit?

Is it really that automatic? Does it really have full signal pro-

cessing? Does it really accept different tube types—2/3 inch Saticons or Plumbicons?

Can it really operate from battery belt? Battery pack? Any 12-volt DC source? Or normal AC power?



Is this studio camera really the same as the portable one above?

Is it really totally modular? Can it truly be reconfigured in minutes to a full-fledged studio camera—self-contained or system—with a big 8-inch viewfinder?

The answer to all these questions, of course, is yes. Now ask yourself this question. Shall I play it safe with a big name like Philips or RCA or Fernseh? Or shall I show a little initiative and take a look at this new CEI camera everybody's talking about?

Just give us the chance to show you. Call your local CEI representative now. Or get in touch with us directly at 880 Maude Avenue, Mountain View, California 94043, (415) 969-1910.

TAKE A NEW LOOK

It's really that good!

CEI

For Demonstration Only Circle (28) On Reply Card
For Literature Only Circle (29) On Reply Card



The recording industry needed it... so Stanton developed a new stylus system for playing back stampers

Stanton Magnetics is proud to introduce the world's first and only stylus system Model 681 BPS*, capable of playing and repairing metal stampers and matrices.

Up until now, it was impossible to check the quality of the matrix until the metal mother was made, or the plating quality in the stamper, until actual records were pressed. By introducing this new special stylus system, Stanton is offering to the record industry the tool which will save precious time, improve the quality of the records, and offer a new way to evaluate the quality of the pressing by comparing it to the first generation copy of the master matrix.

Because this new 681 BPS stylus system is designed around the famous Stanton 681 Calibration series, its performance is recognizably superior, and matches that of a 681 Triple-E Calibration Standard cartridge.

Stampers and matrices being negatives of the record require a counter-clockwise rotation of the turntable** and a custom mounted tonearm, or a special arm with head shell offset in the opposite direction.

The new stylus system has two models: the BPSR, which tracks at 3 to 7 grams, for making minor repairs on stampers; and the BPSM, which tracks at 1 to 1½ grams, for stamper and matrix evaluation.

Audiophiles, who think highly of the professional quality of Stanton products and use them for home entertainment purposes, will find it difficult to use this new system... unless the distribution of metal stampers heads this new system Stanton maintains its position as a prime innovator and supplier to the recording industry.

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



*Patent applied for.

**Stanton is even making special turntables for this purpose.

For More Details Circle (30) on Reply Card

Automation

continued from page 30

errors surface as a major problem. And this has remained a nagging problem because we still have not worked out daily duties and responsibilities that satisfy the needs of the operator. As with any form of automation, radio can't avoid garbage in, garbage out. The equipment will do the job...but will disenchant operators or weekend part-timers do theirs?

Some of the newer systems can handle the toughest format assignments, but they still must be plugged up with carts and tapes. Those carts must be recorded and programmed into the system. So what we have is a human problem. We've been so tied to making certain the equipment would solve our format problems that we've neglected the key link.

Of all stations responding to our survey (who listed themselves as automated in AM, FM, or AM/FM), 17% said they had no major problems. However, 42% reported operator-related problems. Only about 8% said they are having format problems.

In the top-50 and top-100 market stations, it's the combination stations that report the highest incidence of operator errors. The problem is also evident at stations below the top-100 markets. Below the top-100 markets, however, FM stations report the lowest incidence of operator problems.

On the engineering side, FM also checks in with the fewest problems, while AM stations (depending upon market size) vary between 8% to 12%.

Automated formats

According to our latest survey, of those stations which automate programming (41% of all stations reporting), Easy Listening is the most often automated format at 60%. Country & Western is 53.5% automated, with Top 40 and MOR running a close third and fourth. On the other end, close to 30% of all classical stations automate their programming. Hard Rock is the lowest of all automated music formats with a penetration of only 20%.

Some approaches to formats have yet to lend themselves to automation. But don't bet that some day we won't have a machine coded in such a way that the operator can punch up anything in the entire library for immediate play. He'll play his keyboard and inject comments. (Oper-

ating on the same principle system could be designed for that would hold all coded news for immediate recall.) At the this year, at least one manufacturer offered a CRT terminal that would read out upcoming program selections, IDs, promos, and ads. Another system will show you upcoming items as event numbers on readouts.

Automate everything?

Programming has been in spotlight from the beginning, and still overshadows logging, accounting, and availabilities. Of the logging is the second area where automation is earning its way. Accounting and billing are a distant third, while traffic is automated only 6% of all stations committing automation. In all cases, the FM combination is, according to survey, the best prospect for automation.

How about ATS?

At the beginning of this article I looked at mini-automated station operations. Well, just how many could be operated automatically the station? Practically everything. And now we can add automated transmission systems (ATS). plugged ATS in to our 1977 survey to get an idea of station interest. About 31% of the stations responding say they intend to purchase ATS equipment in late 1977 or 1978.

What about the future?

Prospects for radio automation, whether it be programming, logging, traffic, or equipment control, are good. They aren't so good that stations will totally automate. The prospects, especially for AM/FM combinations, have never been better. However, many stations will never delete their personality. A mixed-format approach to programming, while others will say they can't afford the investment.

The latest systems have made much progress in format compatibility that both management and engineering now have clearly defined choices over a broad range of capabilities. For the present, radio will continue to equate automation with programming. But the future holds much more.

Meanwhile, a subject that should be held up for closer inspection is operator errors. What is needed is a series of meetings between us and manufacturers. With any luck one of the professional associations will provide the platform for airing the problem and, hopefully, getting something accomplished.

20 20

Plus

Total Signal Corrector

Corrects time base errors
Reduces luminance
noise by 6dB
Reduces chrominance
noise by 12dB
Improves horizontal and
vertical picture detail
Reduces cross color errors

Microtime, Inc.
30 Blue Hills Avenue
Hamfield, Ct. 06002
Tel 242-4242 TWX 710-425-2390

MICROTIME

For More Details Circle (31) on Reply Card



Figure 1 Back light on dark hair.



Figure 2 Back light on blond hair—light flare.

No short cuts - no formulae - lighting is painstaking work

By E. Carlton Winckler*

Every professional television lighting director knows that a major hazard of venturing out of his office is confronting the student or beginner who asks, "What is the proper ratio between key light and back light?"

When flustered by such apparitions the poor pro is likely to stammer something about preferring "1½ to 1, or 2 to 1" in self defense. In reality, however, he never uses any such formula, because a specific formula doesn't exist.

In Figures 1 and 2 the ratio of key light to back light is exactly the same, although there are apparent differences. This demonstrates why formulae in lighting couldn't work even if they existed.

These photographs also illustrate why it is not practical to make a fixed lighting setup in a studio and move different subjects and programs into the lighted area without making adjustments.

*Senior Production Consultant, Imvero Fiorentino Associates, Inc.

Each subject or picture component is unique and individual, requiring special consideration, and is, in effect, a separate challenge to the lighting designer. This constant challenge is what makes the lighting profession so absorbing and fascinating.

Lighting is an art and not a mechanical exercise; and, like the arts of painting, music and sculpture, it takes a great deal of technical skill and hard work, along with planning and imagination, to transform the artist's concept and inspiration into reality.

In lighting, just as in the other arts, a fine product takes time to achieve. There must be time to understand the subject or setting to be lighted, the mood or feeling that must be achieved, the action, the colors, the space—not to mention the requirements of the cameras to be used.

Lighting should first begin as a picture in the mind of the lighting artist, who must then work back to find the luminaires that will be

required. He then must calculate their ideal position. *In essence there is no short cut in the creative process: each step must be followed through in an orderly mental or physical pattern.*

The television industry has many efficient lighting men who work through these complex areas and have their project set up and completely lighted while the camera crew is still looking for the line charts. But their hastily made masterpieces, in all probability, nothing to enhance the program because they overlook the value which good lighting contributes to visual communication.

It is impossible for these values to be there unless the lighting artist takes the time to provide them. *What are these values?*

One of the most important functions of lighting is the "center of interest": the brightest area in the composition that automatically attracts and holds the eye without viewer violation. Next, there is

continued on page

Only the finest ingredients go into our pancakes.

oes practically without saying that the company responsible for the leading reference cassette tapes should offer the finest available pancake product for cassette dupes. And with TDK 1/8" bulk tape for high speed duplication for industrial A/V use, you get the same high performance tape found in our Dynamic cassette, with its low noise and high output characteristics, its broad dynamic range and low distortion. You can also have it ready-loaded into our 7 series bulk duplicator cassettes, for lifetime guaranteed jam-proof, dropout-free performance. We're equally particular about our audio/visual, beta, endless and leaderless dictation cassettes, as well.

Along with superior performance, TDK pancakes offer the added advantage of two separate series: "L," similar to our superb Audia reel product, and "S," for general purpose applications. Both are available on 3600-foot 10 1/2"

NAB bulk hubs. Or, you can buy them on 1200, 1800 and 3600-foot reels.

All TDK products are made with only the finest ingredients, so you can taste their good performance in any industrial and professional application.

So, if you want high quality and reliability in all your professional applications, go TDK all the way. Let us show you how TDK professional products can upgrade the quality of your products—and save you time, too. For further information, write us or call (516) 746-0880.



World leader in recording tape technology.



TDK Electronics Corp., 755 Eastgate Boulevard, Garden City, New York 11530 In Canada, contact Superior Electronics Industries, Ltd

For More Details Circle (32) on Reply Card



In real time, it's the best helical. In slow motion, it's the only helical. VPR-1.

AmpeX has the first one-inch helical VTR produced that records and plays back broadcast quality material in real time, slow motion or still frame.

VPR-1 is a High Band Color recorder designed to deliver the finest audio and video program material. Totally new signal concepts elevate the VPR-1 far above other helicals.

The real magic, though, comes from the Analog Automatic Scan Tracking (AST) technology. AST delivers slow motion and still frame material, directly from tape, without a noise bar. And AST means absolute tape interchange, even across wide ranges of temperature and humidity. The pictures are sharp, color true, and just the ticket for special effects and instructional programs. AST even helps in post production editing, where the touch of a finger

unfolds a frame at a time in the manual jogging mode.

You'll want to add a TBC-1 digital time base corrector to your VPR-1 system; it's the only TBC on the market that can handle AST special effects work.

A companion unit, the new VPR-10 portable one-inch recorder, takes a full hour of battery-powered material in the field, automatically back-spaces every shot for a smooth assemble edit, and provides audio and video verification playback. VPR-10 tapes are compatible with VPR-1 tapes, so you can take advantage of all VPR-1 special effects capability.

It's been a long wait for a broadcast quality one-inch system with full special effects, but the wait is over. VPR-1 takes you all the way down to a frame at a time.



AMPEX

The New Standard for Improved TV Signal Transmission

Harris' Circularly Polarized Television Antenna

Custom built and tested, Harris' Cavity Backed Radiator (CBR) circularly polarized television broadcast antennas offer the very finest in television signal transmission and reception.

- Excellent axial ratio
- High power handling capabilities
- Outstanding horizontal circularity
- Superb control of vertical pattern

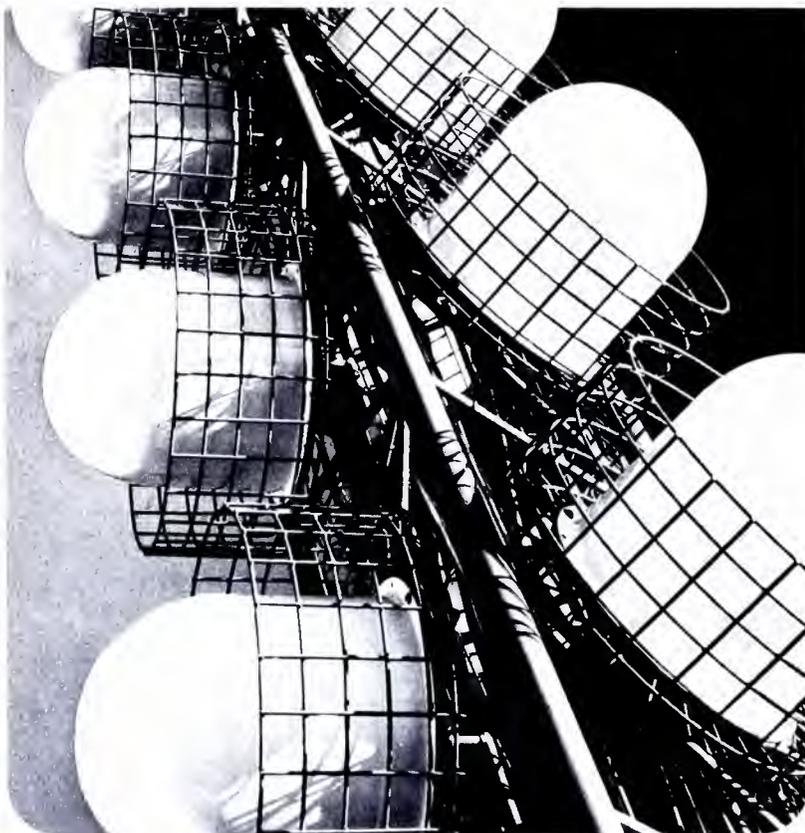
Problem areas will notice significant reduction of ghosting

effects. In addition, signal-to-noise ratios in fringe areas are improved. And the extremely wide bandwidth inherent in the Harris design permits multiplexing of any two or more stations in the VHF high band channels.

For complete information about the Harris circularly polarized TV antenna, write Harris Corporation, Broadcast Products Division, Quincy, Illinois 62301.



HARRIS
COMMUNICATIONS AND
INFORMATION HANDLING



For More Details Circle (34) on Reply Card

Lighting

continued from page 34



Figure 3 Center of interest is correct; lighting is not flat.

orderly selection and indication of the relative importances of composition of elements—careful separation and modeling without apparent emphasis (which, if noticeable, defeats effective communication).

There is a great deal more lighting than simple illumination of visual elements. In fact, illumination of elements for the camera (or the eye) is the easy part of lighting. The more difficult part—the part that makes lighting an art—is the creation, control and placement of shadows.



Figure 4 Flat lighting—dull picture.

Inexpert lighting has a random multiplicity of shadows or no shadows at all, and both are equally

continued on page

TeleMation Announces First-Half Earnings

(SALT LAKE CITY, UTAH)—TeleMation, Inc., reported first-half profit of \$257,000, or 25 cents per share, on revenues of \$4,709,000. This compares to a loss of \$536,000, or 52 cents per share, on revenues of \$4,754,000 for the first half of 1976.

Results for the three-month period ended June 30, 1977 were a net profit of \$213,000, or 21 cents per share, on revenues of \$2,414,000 compared to the loss of \$314,000, or 30 cents per share, on revenues of \$2,339,000 for the three-month period ended June 30, 1976.

The above figures are after extraordinary credits resulting from reduction of taxes by use of a tax loss carry-forward. Profits before the extraordinary credits were \$144,000, or 14 cents per share, for the first half and \$120,000 or 12 cents per share, for the second quarter.

W. Paul Warnock, president of the video equipment manufacturing and television production company, said that the return to profitability in the first half of 1977 was due to the substantially improved performance of the hardware portion of the company's business. "TeleMation Productions, our television production studio in Chicago, continues profitable as in recent years," he stated.

He attributed the improvement in the company's hardware business to a continuing strong demand for the company's principal products and to extensive action taken at year-end 1976 to bring the company's expense level into line with revenues. Mr. Warnock pointed out that backlog at June 30 was \$1.7 million compared to \$2.1 million at December 31, 1976. "The return of our hardware business to profitability has been very gratifying to us at TeleMation. The dedicated efforts of all our employees have made it possible," he said.

TeleMation, Inc. A Salt Lake City based manufacturer of professional television equipment, maintains offices in San Francisco; Minneapolis, Danbury, Connecticut; Washington, D.C.; and London. TeleMation also operates a television commercial production division in Chicago.



Which character generator produces the highest- quality graphics?

Our customers tell us that the Composer I Graphics System gives them the sharpest, clearest, most distinctive electronic characters they've ever seen. Like to see for yourself? Circle the number below on the reader reply card and we'll send you a series of actual unretouched color monitor photographs of Composer I graphics. Compare these pictures with those provided by any other manufacturer, and you'll agree with what our customers are saying. Or, circle the alternate number below for a demonstration in your area. Find out why our customers call the Composer I "the Excitement Generator". TeleMation, Inc., P.O. Box 15068, Salt Lake City, Utah 84115. Call (801) 972-8000, ext. 350.



For Demonstration Only Circle (35) On Reply Card
For Literature Only Circle (36) On Reply Card

Lighting

continued from page 38

desirable. A carefully constructed shadow pattern is what gives a picture strength, meaning, separation and depth, and such shadow patterns are never accidental.

A multiplicity of meaningless shadows is called "dirty light" and is attributable to the fact that every light source casts a shadow. The basic problem usually is due to too many sources, sources in the wrong place, or attempts to "wash out" unwanted shadows with additional

light sources (usually resulting in more shadows).

The skilled artist designs his shadow pattern through the placement and control of the main sources. He works diligently with the director for subject and camera placement, and the designer for composition space where unavoidable yet unwanted shadows are cast unseen by the camera.

As mentioned earlier, every light source casts a shadow, so the art lies in hiding the ones you don't want the camera to see and accenting the ones that contribute to



Figure 5 Complex shadows (double nose shadow).

the visual message. This is accomplished by careful analysis of the relationship between luminaire placement, subject movement and camera angles. Conversely, shadowless pictures are quick, easy and effective—indicating complete frustration in controlling the shadow patterns or a definite lack of lighting skill. It is always apparent that insufficient time has been spent on the project.

General lighting practice is to first focus the luminaires at full intensity to make it practical to see the specific area of coverage, a hot spot or the need for feathering. Second, it is important to work out the requisite "balancing," which involves adjustment of intensity relationships that cause the planned picture to emerge from the flare. The balancing process is another one that requires time and cannot be rushed. Balancing may be done partly through light meter measurement, partly by eye and partly by experience, or it may be done almost entirely by observing the camera image on the control room monitor.

Of course, before any of the steps can be contemplated, the lighting man must learn his trade, learn which luminaire has sufficient control to allow shadow placement, learn intensities, diffusion and flexibility; and learn to differentiate between fact and myth in the extensive lore of lighting.

One very important and positive thing a lighting man with less than complete expertise can do toward growth in his chosen field is to learn to ask, "Why?" This question, asked with an open mind when approaching each new lighting problem, will bring out the fallacies in formulas and how it is that short cuts never seem to work out.

Practical experience shows that thinking the job through logically and then following each step in a painstaking manner is actually quicker as well as surer because when you do it right you won't have to do it over.

What Ampro calls "STANDARD," the others call "OPTIONAL."

We're talking about features like Audio Switching in Ampro Cartridge Equipment And RF Shielding in Ampro Consoles.

They're just two of the features built into our equipment as standards. They help assure you of top performance and dependability for years.

Because at Ampro, quality and reliability are standard, not optional.

Shouldn't you switch to Ampro?

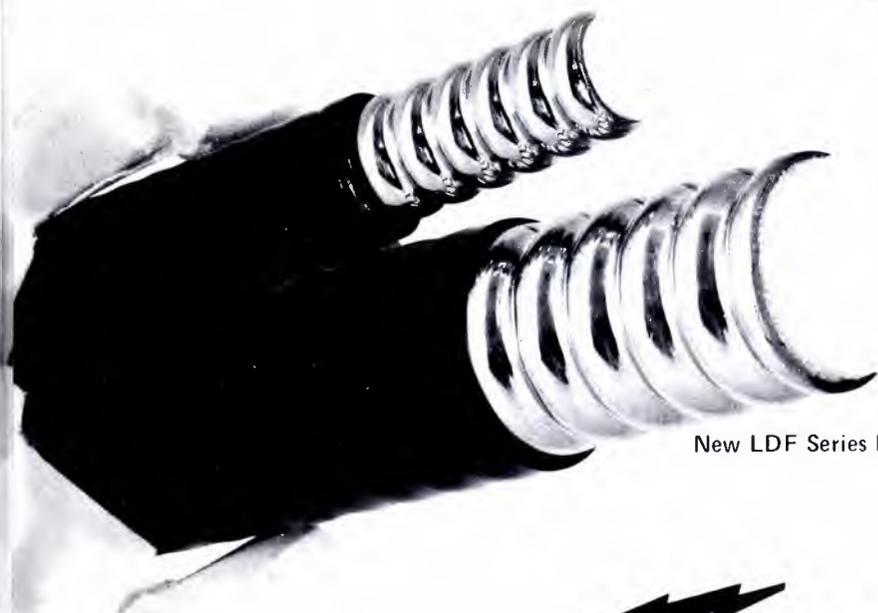


AMPRO BROADCASTING INC.

850 PENNSYLVANIA BLVD., FEASTERTVILLE, PA 19047 • (215) 322-5100
Professional Equipment for Broadcasting Professionals

For More Details Circle (37) on Reply Card

LOW LOSS CABLE BREAKTHROUGH



New LDF Series HELIAX[®] Cable



ANDREW

Lower loss, improved moisture barrier, plus all the traditional advantages of HELIAX foam-dielectric cable. New low density foam dielectric reduces attenuation, almost to that of air-dielectric cables. Annular corrugations, in conjunction with connector "O" ring seals, provide a positive longitudinal moisture block.

Connectors have been improved too. New features include self-flaring assembly, superior electrical contact, high resistance to pull-off and twist-off, moisture seals, and low VSWR through cable cut-off frequency.

Two sizes, 1/2" and 7/8" are available now for immediate shipment. For further information contact your Andrew Sales Engineer or ask for Bulletin 1160.

ANDREW CORPORATION

10500 W. 153rd St., Orland Park, IL, U.S.A. 60462
Telephone: (312) 349-3300

ANDREW ANTENNA COMPANY LTD.

606 Beech St., Whitby, Ontario, Canada L1N 5S2
Telephone: (416) 668-3348

ANDREW ANTENNAS

Lochgelly, Fife, Great Britain KY5 9HG
Telephone: (0592) 780561

ANDREW ANTENNAS

171 Henty St., Reservoir, Victoria, Australia 3073
Telephone: (03) 460-1544

ANDREW ANTENAS LTDA.

Av. Victor Andrew, 585, Caixa Postal 600, 18100 Sorocaba-
SP-Brasil Telephone: (0152) 28900

ANTENNES ANDREW S.A.R.L.

B.P. 44, 28400 Nogent-le-Rotrou, France
Téléphone: (37) 52 19 06

ANTENAS Y PERITAJES

Av. Reforma 445 P.B.-K., México 5, D.F. México
Teléfono: (905) 525-5443

For More Details Circle (38) on Reply Card

Microcomputer controls traffic for KEZK

By Noel Moss

One of the most tedious jobs in broadcasting is performed by the traffic department. The task of producing a complete and accurate program log can take hours, to say nothing of organizing the commercial inventory, as well as producing availability sheets and account lists. This repetitive work causes fatigue which, in turn, reduces efficiency.

The purpose of this article is to describe how KEZK is implementing an in-house computerized traffic system based on one of the new microcomputers currently on the market.



Figure 1 The author is shown at the operating position of the computer system. From top to bottom the equipment is as follows: switching panel, Altair 8800 computer, mini floppy disc drive, digital cassette drives, video monitor, and keyboard. The system power supply (not in photo) is in the bottom of the rack.

While surveying the available word-processing systems one very important factor became evident: most commercial machines required the system operator to conform to the machine. Meanwhile, we had already decided that our system had to conform to the user.

To implement this approach, a high-level language called BASIC was chosen. BASIC was originally developed at Dartmouth University and is a highly conversational computer language. The ability of BASIC to manipulate strings of alphanumeric data was also a deciding factor in its choice. Some of the commands and error statements are summarized in Table 1.

System description

After considerable thought, we began to configure our system. An Altair 8800A microcomputer was selected for the mainframe. This machine uses the popular Intel 8080A microprocessor chip which is an 8-bit parallel processor capable of addressing up to 65 kilobytes of random access memory (RAM). Each byte, a computer term, consists of 8 binary bits in this system. All ASCII characters can be represented in this format, thus compatibility is maintained with the outside world. (ASCII stands for American Standard Code for Information Interchange and is a widely used code for data communications.)

The system's main memory is 32 kilobytes of static RAM. It is built on four 4K boards and one 16K board with the first 6K reserved for the BASIC interpreter; 512 bytes are reserved in the high end of memory for the resident link program that controls the video display. The remaining 26 kilobytes are used for active program storage and execution.

System I/O (input/output) is usually done on a keyboard printer, but we built a video display to save on paper costs and wear and tear on the printing mechanism. This reserves the printer for finished



Figure 2 This is an operator's eye of the keyboard and CRT. The board layout includes an auxiliary numeric pad on the right with controls cursor positioning and scrolling through the computer memory. This feature allows the operator directly examine and edit the menu contents. The Dataphone on the left is used to tie the system into Market for access to ARB data. The CRT is used by the operator at all times except when finished hardcopy is produced.



Figure 3 This is the DECWRITER printer used for hardcopy for finished logs. It also allows the system to handle special forms and mail labels when the computer is used in an automatic typewriter mode.

hard copy only. Our printer is a DECWRITER II, manufactured by Digital Equipment Corporation. The initial cost was several hundred dollars more than a teletype, but the DECWRITER is a much quieter machine and has very few moving parts. The printer is interfaced to the computer at RS-232 levels which also allows it to be used as a terminal on a commercial data communications network. An auxiliary keyboard was added to the system to allow the printer to be remotely located from the computer.

continued on page

Leitch!... A good word to know in television terminal equipment.



ACO-101
Automatic Changeover

VSI-500
Video Source Identification

SPG-100N
Sync Pulse Generator

Distribution Amplifiers

20N
Distribution Test Generator

100N
Video Processing Amplifier

Video engineers
specialize in designing and
building the key elements in
temporary test, pulse and
distribution systems.
The latest state-of-the-art techniques are
employed to bring you exceptionally reliable
performance within the tolerances of today's finest
specifications. Solid state circuits are housed in

standardized modules
to provide easy operation,
simple maintenance, and
engineering flexibility at
surprisingly reasonable cost.

Whenever you contemplate acquiring new
video equipment, it's well worth giving us or our
representatives a call. We will be happy to quote
on your requirements.



leitch video

leitch video incorporated

100 Pineola Blvd.,
Pineola, New York 11501.
Tel: (516) 248-4858.

In Canada:
leitch video limited
705 Progress Avenue
Scarborough, Ontario M1H 2X1
Tel: (416) 438-5060.

For More Details Circle (39) on Reply Card

ENG microwave: the next generation.

Farinon announces the lightest 20 watts you can buy.



How many times have you wished for more microwave power in a system you could use almost anywhere?

Farinon's new ENG package is the answer. Now you can upgrade with a complete three-element package from a single supplier:

1. 2-watt, 2GHz amplifier, the 60515 — the same one that helped you win Superbowl XI.

2. 2-watt, 2GHz video transmitter, the FV-2MF, that can operate from two 12V batteries.

3. A new high-gain, low-noise preamp, the 60576 for the receiver end.

The beauty of the transmitter/amplifier combination is that it can take 20 watts anywhere. It's as light as our

portable, of course, when it has twenty watts of power. And you can use the new package as a relay station for the portable. (The 60515 amplifier requires only one to two watts drive.)

Two units take up only 12 mounting spaces in a standard ENG rack (that's 12.84 inches). And because they need only 24 volts, they'll be wherever you can bring

or find two regular 12V batteries. An important point: the combination accepts either negative or

positive ground power, making it adaptable to a wider range of vehicular power systems. (Consider the other way to get 20 watts of power: a big remote unit, interconnecting cable, a big RF head, a big motor generator.) You can also use 110VAC if you have it.

The FV-2MF has other advantages. Like our mini-portable, it's frequency-agile. And when you're transmitting a signal through a tricky downtown path challenged by high-rises, you can move the aural sub-carrier from the top of the baseband to 4.83 MHz, assuring that your audio will arrive at the other end. It's a remote-controlled function.

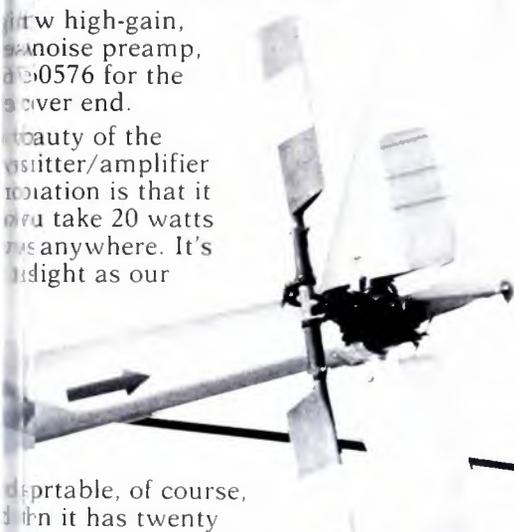
With the audio in the normal position, you get the higher-quality video you need for studio transmission.

The 60515 amplifier, despite its high-power output, needs only low drive power. It's a high-quality bipolar device, with gold-to-gold transistor bonding to prevent metal migration and softening over years of use.

The preamplifier, used at the receiver, is a new high-gain, low-noise device with excellent selectivity (channel filtering). And it can be pressurized — for use at a location remote from the receiver.

The next time you wish you had a high-power system that could go in a car, a van, a fire engine, a power boat, or a helicopter — either with the camera or as a relay station — think of Farinon's next generation ENG package. It accepts any audio and video input, is compatible with everybody's existing ENG equipment, and is 25 pounds lighter than Farinon's own FV-2P portable — with the same power output.

Call the Video Sales Group in San Carlos collect. They'll be glad to give you the scoop on 20 very light watts.



Farinon Electric
1691 Bayport
San Carlos, CA 94070
Phone (415) 592-4120
Telex: 34-8491

Farinon

```

THIS IS A SAMPLE
ELPMAS A SI SIHT
THIS IS THE ORIGINAL SENTENCE: 'THIS IS A SAMPLE'

THIS IS THE SENTENCE REVERSED: 'ELPMAS A SI SIHT'

THESE ARE THE ORIGINAL WORDS: THIS      IS      A      SAMPLE

THIS IS THE SENTENCE BROKEN INTO ITS ASCII EQUIVALENT:
I= 84      H= 72      I= 73      S= 83
 = 32      I= 73      S= 83      = 32
A= 65      = 32      S= 83      A= 65
M= 77      P= 80      L= 76      E= 69
    
```

Figure 4 This is an example of string manipulation by BASIC. The original inputted string is printed followed by the reversed string after it has been processed by the computer. The original string is also shown broken down into its ASCII values.

```

THE COMPLETE ENTRY IS

47      AMALGAMATED WIDGET      1A 1      60      CM

THE ACCOUNT NUMBER IS 47

THE CLIENT NAME IS AMALGAMATED WIDGET

THE TIME PRIORITY CODE IS 1A 1

THE SPOT LENGTH IS 60

THE CLASSIFICATION IS CM
    
```

Figure 5 This shows how the computer can take apart an inventory entry to extract any data it may need for sorting and merging.

```

CLIENT NAME? AMALGAMATED WIDGET
ACCOUNT NUMBER? 47
PRIORITY OR TIMES? 6A-10A      3P-7P
NUMBER OF SPOTS 6A-10A? 12
NUMBER OF SPOTS 3P-7P? 8
SPOT LENGTH? 60
CLASSIFICATION (CM PSA POL)? CM
BROADCAST WEEK TO START? 30
BROADCAST WEEK TO END? 36
DAYS TO RUN IN WEEK 30 ? 5
DAYS TO RUN IN WEEK 31 ? 5
DAYS TO RUN IN WEEK 32 ? 4
DAYS TO RUN IN WEEK 33 ? 6
DAYS TO RUN IN WEEK 34 ? 5
DAYS TO RUN IN WEEK 35 ? 5
DAYS TO RUN IN WEEK 36 ? 6
THE AMALGAMATED WIDGET SPOT WILL RUN ON THE FOLLOWING SCHEDULE
WEEK 30      12 SPOTS 6A-10A TO RUN ON 5 DAYS
WEEK 30      8 SPOTS 3P-7P TO RUN ON 5 DAYS
WEEK 31      12 SPOTS 6A-10A TO RUN ON 5 DAYS
WEEK 31      8 SPOTS 3P-7P TO RUN ON 5 DAYS
WEEK 32      12 SPOTS 6A-10A TO RUN ON 4 DAYS
WEEK 32      8 SPOTS 3P-7P TO RUN ON 4 DAYS
WEEK 33      12 SPOTS 6A-10A TO RUN ON 6 DAYS
WEEK 33      8 SPOTS 3P-7P TO RUN ON 6 DAYS
WEEK 34      12 SPOTS 6A-10A TO RUN ON 5 DAYS
WEEK 34      8 SPOTS 3P-7P TO RUN ON 5 DAYS
WEEK 35      12 SPOTS 6A-10A TO RUN ON 5 DAYS
WEEK 35      8 SPOTS 3P-7P TO RUN ON 5 DAYS
WEEK 36      12 SPOTS 6A-10A TO RUN ON 6 DAYS
WEEK 36      8 SPOTS 3P-7P TO RUN ON 6 DAYS
ANOTHER ENTRY? NO
ENTER NEXT TRAFFIC OPERATION
? UPDATE INVENTORY
WORKING
    
```

Figure 6 An example of the dialog between the computer and the system operator when data is being placed in the inventory files. The printing after the ? is the operator's answer to the computer's question.

interfaced a standard Cherry board to the system and located directly in front of the video display.

The composite video output of a Processor Technology VI video card is displayed on a 17" Conrac monitor. We selected VDM-1 video module for several reasons. It is capable of displaying 16 lines of 64 characters per line. The display can be black on white or white on black or any combination of the two, and it has nine key-selectable scrolling speeds ranging from about one character per second to 2000 lines per second. A blinking cursor is optional and the entire display is under software control. The module simply plugs into the computer mainframe.

Data storage

Mass data storage is being accomplished by two methods: cassette and floppy disc. The cassette method has evolved into separate subsystems. First we used a slow 300 baud FSK technique since this is the method used by the BASIC interpreter. All of our preliminary development programs have been saved using this method. It works by converting the parallel data from the processor bus into a serial form and then feeding the data into a modem for recording on a standard audiocassette machine. The playback procedure demodulates the FSK signal from the cassette and converts the serial data back into parallel form.

The second tape cassette subsystem is a true digital recording method. Specially modified cassette decks are manufactured by Phil Deck and connected to a Digital Group cassette controller which provides software control of all motion functions and data encoding and decoding. This system operates at a speed of 5 ips and writes 1600 reversals per inch, yielding a rate of 6400 baud. This gives a storage capacity of about 250 bytes per 30-minute cassette. The cause of this tremendous amount of bulk storage, the digital recording method is a natural choice for storing commercial inventory or other large data bases.

One other peripheral device we are using is a mini floppy system. A floppy disc is simply a flexible rotating magnetic disc the size of a 45 rpm record. Read and write functions are accomplished by moving a magnetic head across the disc as it rotates.

size of a mini floppy disc is added to about 90 kilobytes, but the access time is on the order of seconds instead of minutes with a cassette. Consequently, the disc is better for setting up files for data manipulation. The disc drive is available from Shugart Associates and the controller is from North Star Computers.

Using the system

As mentioned earlier that BASIC is a highly conversational high-level language. We are presently using version 2 of 8K BASIC supplied by MITS, Inc., which makes it suitable for a minicomputer. Let's take a look at what it can do. We will ask BASIC to add two and the dialog would look like this:

?2+2 4 OK

The computer answers and then displays **OK** to signify it is ready for another command. Print commands display any numerical data or string information to be printed or displayed. For example: PRINT 3*7^2 displays **147 OK** to be printed. Similarly, the command: PRINT "The Quick Brown Fox" causes **The Quick Brown Fox OK** to be printed. Numeric or string variables may be displayed as well.

Additional features of BASIC that are available include the TAB and PRINT commands which are identical to the tab and space on a typewriter. PEEK and POKE commands let you directly examine the contents of memory access memory without the use of matrices. The ASC command returns the ASCII value of a string which is very useful when alphabetizing file entries. Direct I/O commands include INPUT and INP. INPUT let the user enter data into a program as it is executing, and OUT which outputs data to a specified I/O port.

Basic manipulations

Now we'll see how BASIC can manipulate strings. A string is a sequence of alphanumeric characters. "4000 bits" is a string. "4000 bits" is also a string. The LEFT\$, RIGHT\$, and MID\$ commands allow the user to take strings apart, manipulate the data contained in the string, and then reassemble the string in any desired manner, as shown in Figure 4. A typical example is the following file commercial inventory entry

continued on page 48

TABLE 1

COMMANDS IN MITS 8K BASIC

END	FOR	NEXT	DATA
INPUT	DIM	READ	LET
GOTO	RUN	IF	RESTORE
GOSUB	RETURN	REM	STOP
OUT	ON	NULL	WAIT
DEF	POKE	PRINT	CONT
LIST	CLEAR	CLOAD	CSAVE
NEW	TAB	TO	FN
SFC	THEN	NOT	STEP
+	-	*	/
..	AND	OR	>
=	<	SGN	INT
ABS	USR	FRE	INF
POS	SOR	RND	LOG
EXP	COS	SIN	TAN
ATN	PEEK	LEN	STR\$
VAL	ASC	CHR\$	LEFT\$
RIGHT\$	MID\$		

OK

ERROR MESSAGES IN MITS 8K BASIC

NF	SN	RG	OD
FC	UV	UM	US
BS	DD	/O	ID
TM	OS	LS	ST
CN	UF		

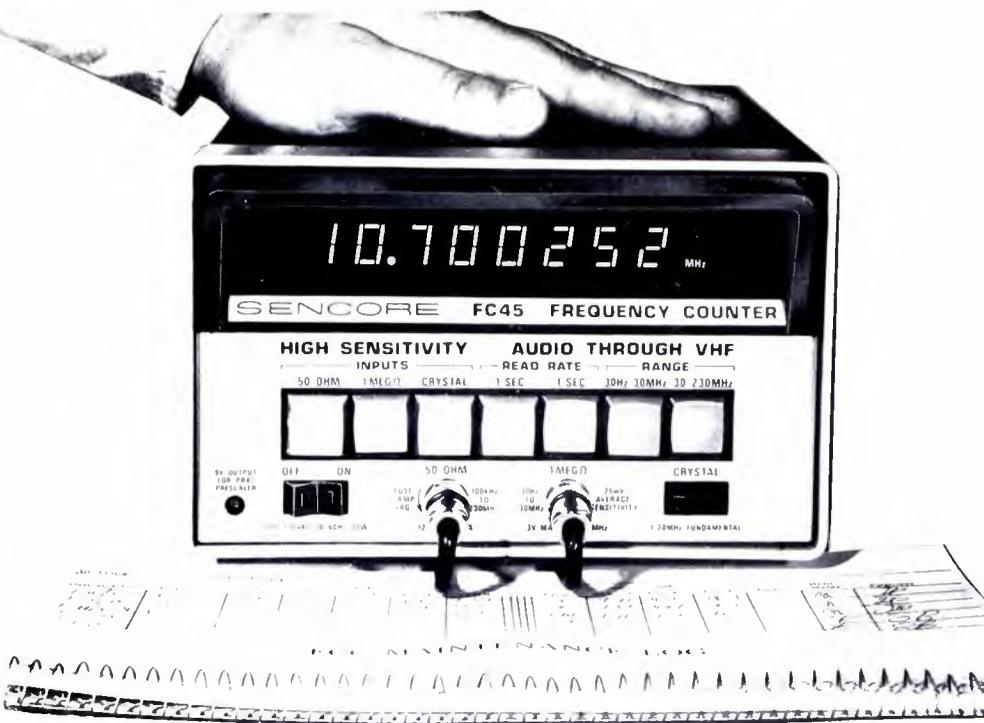
OK

TABLE 2

APPROXIMATE EQUIPMENT EXPENDITURES
FOR THE KEZK SYSTEM

Mainframe	\$539
Serial Interface	140
Parallel Interface	150
FSK Cassette Modem	140
Static Memory (4 boards)	600
16K Static Memory	700
VDM-1 Video Module	180
DECWRITER II	1500
Digital Cassette	400
Mini Floppy Disc	650
Monitor (used)	40
8K Basic (2 copies)	90
Keyboard with interface	110
Keyboard Cabinet	35
External System Power Supply	100
<hr/>	
TOTAL	\$5374

NOTE: All computer assemblies and interface cards and storage peripherals were purchased as kits.



YOUR FCC DOCUMENTOR

Here's your number one standard source for documenting your FCC broadcast frequency at more than five times better than the FCC tolerance for your station. One part per million (.0001%) accuracy means there will be no doubt about your documentation when you use Sencore's new FC45 Frequency Counter. It's a counter you can really count on, yet saves you hundreds of dollars compared to other frequency meters and counters on the market.

You can make the FC45 your single source for every AM, FM, VHF, or UHF frequency check with a full, continuous spectrum range from 30 Hz audio through 230 MHz VHF. Use it with the plug-in PR47 600 MHz UHF Prescaler, too, for extended UHF range testing.



It's also super-handly around the studio for maintaining recorders and cart machines, VTRs, sync generators, and cameras. Extremely high 25 millivolt average sensitivity across the entire frequency range allows you to troubleshoot by "sniffing" frequencies with the exclusive PL207 "Snoop Loop", all without direct circuit connections that may cause frequency change and loading.

Plus every reading is pushbutton-easy to get on the big eight-digit direct-reading display that provides 10 Hz resolution at the highest VHF frequencies.

So why pay more than \$395 for your FCC documentation? Order the new Sencore FC45 from your local Sencore Full Line Distributor, or use the order coupon below.

New FC45 230MHz FREQUENCY COUNTER

SENCORE

3200 Sencore Drive, Sioux Falls, So. Dak. 57107 (605) 339-0100
In Canada: Superior Electronics

- I WANT TO BUY IT. Send _____ FC45s to me at \$395 each.
 Check/MO enclosed. Send C.O.D.
 Also send:
 _____ PR47 600 MHz Prescaler \$125.
 _____ PA202 Power Adapter for PR47.. \$9.95.
 _____ PL207 "Snoop Loop"..... \$9.95.
 I WANT TO TRY IT. Have my nearest Sencore distributor bring the FC45 to me.
 SEND FULL SPECIFICATIONS.

NAME: _____
 COMPANY: _____
 STREET: _____
 CITY: _____
 STATE: _____ ZIP: _____
 PHONE: _____

For More Details Circle (40) on Reply Card

www.americanradiohistory.com

Microcomputer

continued from page 47

as it might be entered by a clerk:

47 Amalgamated Widget
TAP 1 60 CM

If we consider this entire entry string, we can first separate the name of the advertiser as follows:

LET A\$ = "47 Amalgamated
 Tap 1 60 CM"
 NAMES = MIDS [A\$, 12, 18]

We have now created a subcalled NAMES which is equal to "Amalgamated Widget." In the fashion the product code, account number (47), spot length (60), priority (TAP 1), and whether the spot is a commercial or a PS, whatever can be extracted from the original string as shown in Figure 6.

Once the computer has broken down the inventory entry into strings it can proceed to automatically sort and place the spot in future inventory or on a final log.

Integrating the system into station operations

First we must assume that the system is up and that the inventory available for about a week. The traffic clerk comes in at 8:30 am and instructs the computer to verify what spots ran the previous day. The machine has the previous day's log in its memory and asks the clerk to enter the list from the program log discrepancy sheet. These entries are compared against the log in memory and the system prints out a listing of spots that were aired for billing purposes. It also notes which spots must be made good.

At this point the clerk may want to update the inventory files. The spots which are to be made good are re-entered. Next, the sales contracts are entered and sample data entry might contain various number codes, the spot name, and any pertinent scheduling information.

Suppose the sales contract covers 12 spots per week between 7 am and eight spots per week between 3-7 pm for broadcast weeks 30 through 36. A type dialog that would take place between the computer and the traffic clerk appears in Figure 6. The computer would automatically place the spots in inventory files on disc. When all sales contracts are

continued on page

BROADCAST ENGINEER

*It's not for you.
It's for them.*



Why do you think it's called public address?

The audience is there to have a good time. You're there to work. But, if you're not projecting the sound you've worked so hard to perfect, you just wasted all those long hours in rehearsal.

Now that you're increasing your public, it's time to address yourself to an investment in PA. Check out Yamaha's EM-Series of affordable, fully-integrated sound reinforcement systems.

The EM-80, 100 and 150 integrated mixer/amplifiers. From four to six input channels, from 60- to 150-watts RMS. Link them together for even greater flexibility. They're reliable and roadable because they're built Yamaha tough.

Yamaha's unique stereo balance control lets you optimize sound levels in different parts of a room. Practically any setup is possible with combinations of microphones and electric instruments taken direct, amplified and submixed.

When it comes to speakers, Yamaha has two impressive models to choose from.

Every component is made by Yamaha to our own exacting specifications. Yamaha's super-efficient, two-way S4115H enclosures with a horn-loaded 15" woofer, HF horn/driver combination with level control, and 100 watts power handling, make perfect mains. On the other hand, our S0112T enclosure with 10" and 12" woofers, four 2" cone-type tweeters; and 80 watts power handling, are ideal as stage monitors or excellent low-cost house mains. Both models have built-in passive crossovers, and are available with built-in power amps.

For all the facts, send this ad along with four dollars. (Please, certified check or money order only. No cash or personal checks.) We'll rush you an operation manual complete with block diagrams on our EM-Series. Or better yet, see your Yamaha dealer and plug-in to an EM. It may be for your audiences, but their enjoyment is going to pay off for you.



YAMAHA

Musical Instrument Combo Division
6600 Orangethorpe Avenue, Buena Park, CA 90620
Write: P.O. Box 6600, Buena Park, CA 90622

For More Details Circle (41) on Reply Card

Microcomputer

continued from page 48

been entered, the machine would begin a merging routine where it would attempt to sort and place the new entries into the existing inventory with regard to competing advertisers and too-frequent repetition. It would also take into account the priority codes and any spot that could not be placed would be printed out. Sometimes it might be necessary to have human intervention to make a decision on spot placement in case of a conflict. Remember: A computer is not infallible.

When the disc files are completed the system rewrites them on the inventory cassettes for long-term storage.

It's now 3 pm and the system has spent the past few hours juggling inventory files. It's time to print out tomorrow's log. The traffic clerk enters the current date into the system and the computer displays which inventory cassette to load. Another merging routine begins as the computer combines the contents of the inventory file with the log format. After a few minutes the

finished log is printed. Now that one day of inventory has been cleared out of the system, the computer opens a new file for another day 13 weeks in the future.

System costs

Most people talk about computer time costing X number of dollars per minute or per second. With a small in-house system such as ours, that argument becomes non-existent because the machinery is owned outright by the station. If it currently takes your traffic clerk eight hours to get the work done and the computer reduces the time to four or five hours, the system is justified. A system configured like ours can be brought in for about \$5,000 in hardware expense. Table 2 itemizes our approximate equipment expenditures. Labor costs can't really be added to the systems total if the work is done in-house because the engineering salary would have been paid whether or not the decision was made to build the system.

The other costs involved are incurred in developing the software necessary to perform the traffic functions. There are a few routes that can be followed here. Hiring a professional programming house is

very expensive. One alternative is to develop the programs in-house. This involves one or more staff people becoming skilled at programming and it's a very time-consuming option. The approach we took was to hire a computer science major from a local college and turn him loose on the system. Some very innovative programs have been developed this way because our programmer hasn't been conditioned to believe that small computers are slow or lack the capacity to do work.

In the distant future we plan to integrate the traffic system directly with the bookkeeping functions that are still manual. If the system proves to be flexible enough and reliable, it will eventually generate invoices and affidavits with minimal human involvement.

Acknowledgments

Most of the credit for the concept of the system goes to William Clark, general manager at KEZK. The software development has been due to the efforts of Mark Kuntz, a senior at Southern Illinois University at Edwardsville. I want to thank Lou Elkins of Gatev Electronics in St. Louis for his patience while we debugged our hardware in conjunction with his Altair system.

Superior SMPTE from BTX

4300 Reader
and Video Display
\$1,500

4200 Reader
and Digital Display
\$2,850

4100 Edit Code
Generator
\$2,850

4400
Decoder
\$995

BTX guarantees superior performance from 1.5 to 1200 IPS even at -18dBm or with any degree of time jitter.

BTX guarantees superior reliability and assures it with a 100-hour operational burn-in prior to shipment.

BTX guarantees time-code system compatibility with its complete line of cost-effective modular building blocks. For complete information, call:

The BTX Corporation • 438 Boston Post Road
Weston, Massachusetts 02193 • 617-891-1239



For More Details Circle (42) on Reply Card

BROADCAST ENGINEERING

THE BETTER WAY

Datatek ROUTING SWITCHER SYSTEMS

- Video-Audio Switching Systems
- Additional Audio Levels
- Video-only Switching Systems
- Audio-only Switching Systems
- SMPTE Time Code Signal Switching Systems
- Source-oriented Assignment Systems

Look to Datatek for all your routing switcher needs. We manufacture a high quality system to satisfy your initial requirements, with built-in expansion provision for future enlargement . . . as well as routing switcher-related systems with compatible control facilities.

FEATURES

- High audio output capacity with low noise (dynamic range)
 - Independent control system for each output bus
 - Built-in expansion — no group switching required
 - Wide choice of matrix building block size — 20x10, 20x15, 20x20, 30x10, 30x15
 - Differential (hum bucking) bridging video inputs with high return loss
 - Multi-reference vertical interval video switching
 - Four section continuously adjustable cable equalization on both inputs and outputs
 - Standard BCD positive logic, computer-compatible control systems
 - Redundant Power Supplies*
 - Latch Retention Battery Supplies*
- Optional

For More Information, write or call

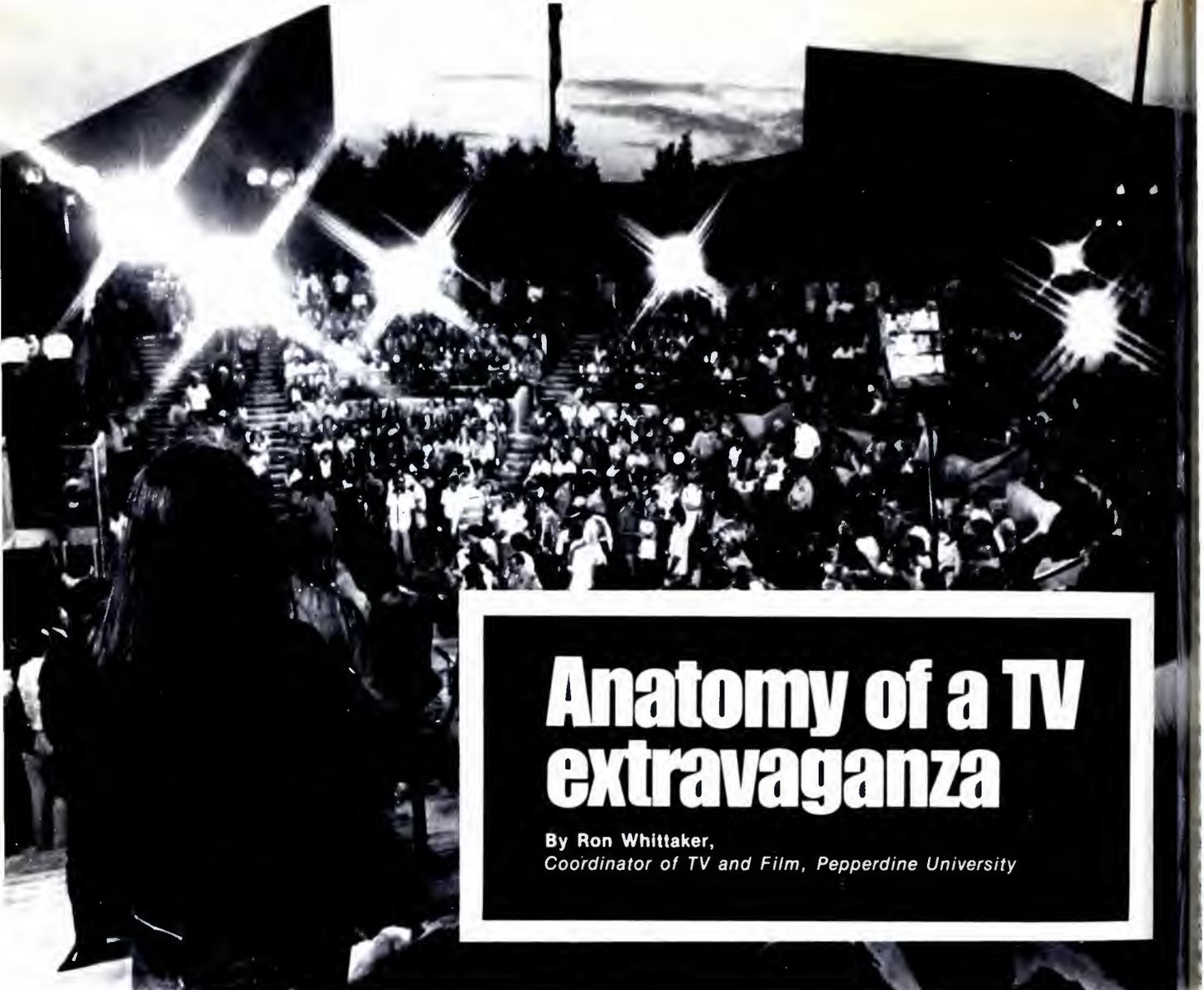
D
DATATEK
CORP.

1166 W. CHESTNUT ST.
UNION, N.J. 07083
(201) 964-3656

Other Advanced Datatek Products:

TV Transmitter Color Phase
Equalizers and Waveform
Correctors, Video Sweep
Generators, Envelope Delay
Measuring Sets, and
Distribution Amplifiers for
video, pulse, audio and
SMPTE time code signals

For More Details Circle (43) on Reply Card



Anatomy of a TV extravaganza

By Ron Whittaker,
Coordinator of TV and Film, Pepperdine University

A total of 40,000 watts of light were needed to light up the baseball throw in the Pepperdine amphitheater. Since available power would not handle the TV equipment and lights, a 45kW gasoline-powered generator was used for lighting.



A large folklift provides an elevated shooting position for one of the PC-70's. This particular camera shot was important in providing a reliable "cover shot" during the swimming competition. [Photos by author]



Howard Cosell interviews team captain Jimmy Walker of *Good Times*. Pe Marshall of *Laverne & Shirley* is on the left. Two RCA TK-76 cameras were used on this location to move into areas which were inaccessible to the three fly position cameras. Directional Sennheiser mikes were used on each TK-76.

How do you prepare for a 24-hour extravaganza TV special featuring 30 top stars from the three commercial networks? Answer: very thoroughly.

You start months in advance planning for power, production equipment, and personnel, as well as making decisions on camera and van locations.

When you finish building your camera rigs, transforms, etc. several days in advance, and you set up and check out your camera two days before the actual event.

In the case of the *Battle of the Network Stars, '77*, four sites had to be recovered on the mountainside Pepperdine University campus in Pebble Beach, Calif.: the beach, the amphitheater, the pool and the track. At each of these areas nine events were scheduled: swimming, rowing, bowling, golf, baseball, the obstacle course, the relay, football and the tug-of-war.

In all, 10 cameras were used, including the one in the Goodyear blimp. Portable cameras were used extensively to get into areas inaccessible to the fixed cameras.

Two production companies commanded facilities: Trans American Video and Hollywood Video. The special was produced by Trans American Video International in association with ABC-TV.

The two-day production was mastered on 2-inch videotape. In all, 100 machines were used. The majority of the "production" actually took place in the post-production phase.

Emphasis on post-production decisions

A relatively new technique was used to aid the important post-production phase. A small van with four color monitors, a color camera and two 3/4-inch recorders were used to create an overall "record" of post-production decisions.

One of the four clustered monitors displayed the line-out of the video camera. Two others had the video from the two "iso" (isolated) cameras, which were being recorded on each tape independent of the camera's line out. The fourth monitor displayed SMPTE time code, full time.

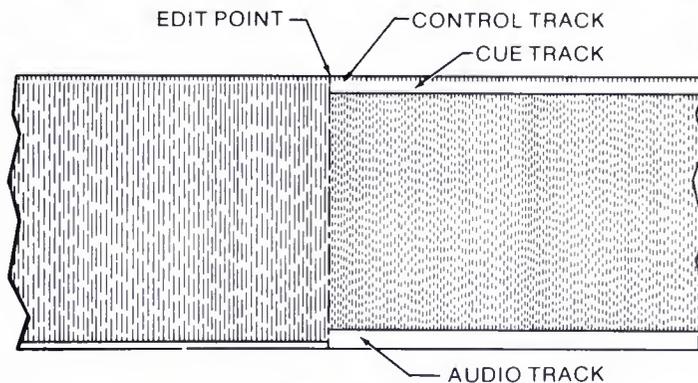
A color TV camera focused on the four monitors fed a signal to the 3/4-inch tape machine. In the post-production phase the director could view the 3/4-inch cassette containing the "quad-split" record of the video sources. By using the SMPTE code designations he could

continued on page 54

AFA says:

BUZZ OFF!

to the 960Hz. tone in your video only edits



If you've got it... you know it!... and AFA's unique Gated Video Circuit Module will get rid of it.

Buzz tone during video only edits on a VR 2000 or VR 1200 can be stopped cold with this all-digital, CMOS module. Simple installation, RF turn-on, turn-off. Used by major networks and post production operations.

For information, call or write:



AFA

A.F. ASSOCIATES, INC.

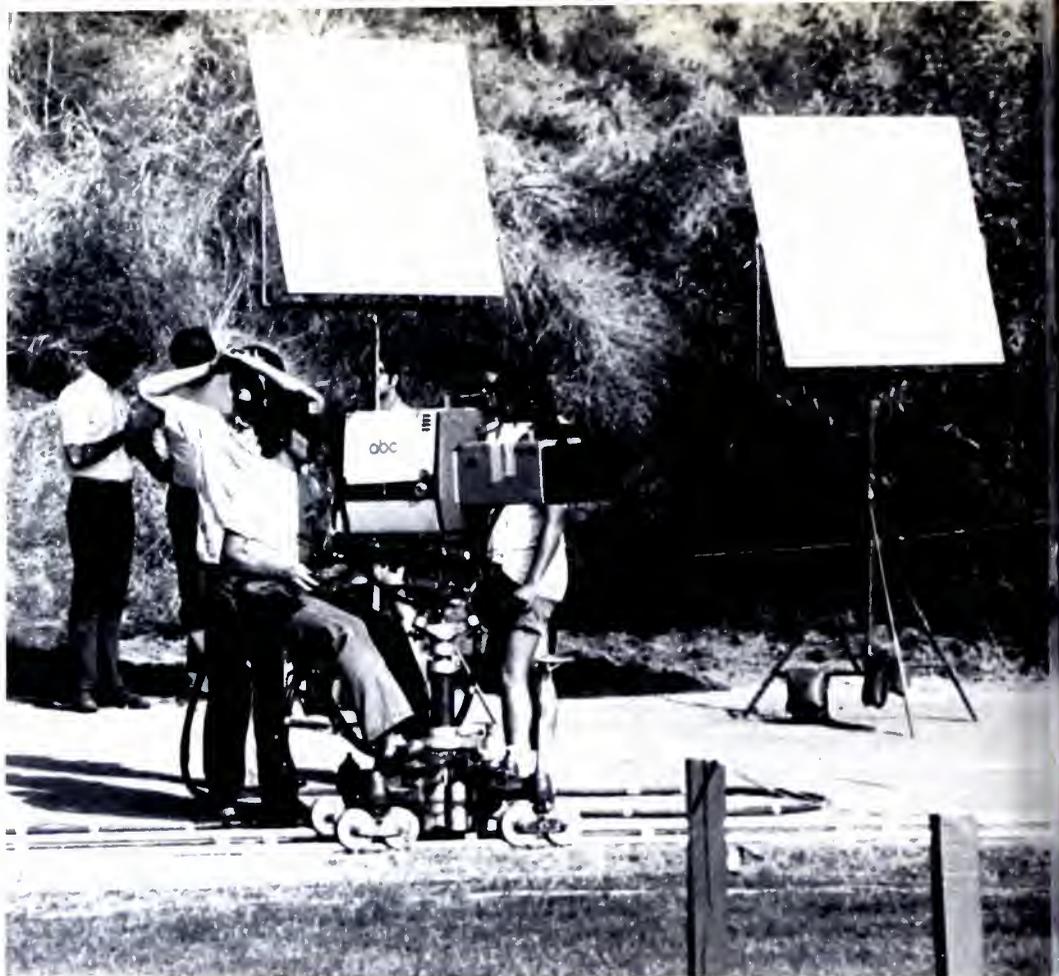
100 Stonehurst Court, Northvale, NJ 07647 ■ (201) 767-1000
 2465 E. Bayshore, Suite 301, Palo Alto, CA 94303 ■ (415) 321-4823
 Europe: Keeline Productions, 1 Spring Villas, Broomfield Place,
 London, W13 9LH, England ■ 01-579 3447

For More Details Circle (44) on Reply Card

TV extravaganza

continued
from page 53

Since this camera was shooting into the sun, two large reflectors were used to help fill in objectionable shadows during taping at the obstacle course. Note also the track at the base of the camera dolly which will enable the camera to move with the contestants.



Split Second Time Machine

The Telex/Magnecord 7400 features a grid of 524 magnetic heads, a capstan revolution, and a DC servo drive some 4000 times per second, so accurate the National Weather and the Environmental

Services selected Telex/Magnecord 7400 over all others to record meteorological displays.

Of course, broadcasters also favor the rugged stability of the die cast main frame, DTL logic and exceptionally clean electronic design. Compare our speed, specs, and price. We invite you to make a split second decision.

*At 7½ ips, adjustable \pm 1% to compensate for tape thickness and mechanical wear.

PRODUCTS OF SOUND RESEARCH

TELEX
COMMUNICATIONS, INC.

9600 ALDRICH AVE. SO. • MINNEAPOLIS, MINN. 55420 U.S.A.
Europe: 22 rue de la Legion-d'honneur, 93200 St. Denis, France
Canada: Telak Electronics, Ltd., Scarborough, Ontario

For More Details Circle (45) on Reply Card

stitute video from either of the cameras into the final production.

Since the address track is part of three simultaneous 2-inch recordings, it became simply a matter of feeding time code information into the computer editor during post-production.

Time code, of course, can be used to locate audio as well as video. It can be juggled in any way desired to provide the best presentation. For example, the video from a particular sports event can be added into the subsequent description of the event by the contestant involved. The sequence of all recorded audio and video becomes a matter of what will work best, where, and at what time in the production.

In post-production, audio can be

continued on page 56



moving camera shot was important in covering both the boating competition and the obstacle course. When the picture was taken the track for the camera dolly had been assembled and a zoom lens was being attached to the PC-70 camera.



All pre-production preparation relates to hardware. Here a make-up artist applies lip liner to Suzanne Somers of *Three's Company*. There are a number of important differences between "street make-up" and make-up suitable for television.

The eyes of the world are upon us.

Around the world, more people now look to Electrohome for excellence in video equipment than ever before.

We manufacture solid state video monitors in monochrome and color to NTSC and PAL standards for broadcast, educational, industrial, commercial, medical, security and data applications.

The reason for such wide-spread acceptance is two-fold: a standard of quality and a record of service to our customers that have earned our products top rating around the world.

For complete information, contact Electrohome Limited at one of these offices:

Electro-Visual Corporation of America

3617 West MacArthur Blvd., Suite 508, Santa Ana, Calif. 92704
(714) 545-6991

Electrohome (U.S.A.) Limited

182 Wales Ave., Tonawanda, N.Y. 14150
(716) 694-3332

Electrohome Limited

809 Wellington St. N., Kitchener, Ontario N2G 4J6
(519) 744-7111



ELECTROHOME

... an extra degree of excellence in video equipment for every application.

Distributed in:

- | | | | |
|-----------|-----------|--------------|----------------|
| Austria | France | Netherlands | Sweden |
| Australia | Greece | New Zealand | Switzerland |
| Belgium | Hong Kong | Norway | Taiwan |
| Canada | Italy | Philippines | Thailand |
| Denmark | Japan | Portugal | United States |
| Egypt | Malaysia | Saudi Arabia | United Kingdom |
| Eire | Mexico | South Africa | Venezuela |
| Finland | | Spain | West Germany |

For More Details Circle (46) on Reply-Card

QUALITY TALKS FOR WKY

Oklahoma City, Okla.



Continental's new 5/10 kW AM transmitter is setting records for acceptance. It has performance and efficiency, with the cleanest sound around. Listen to Continental: quality talks.

Write for brochure Continental Electronics
Mfg. Co. Box 270879 Dallas, Texas 75227
(214) 381-7161

Continental *Co.*
Electronics 

For More Details Circle (47) on Reply Card



TV extravaganza

continued from page 55

"sweetened" (cheering or laughter added) and names, titles and credits can be added.

Post-production also enables

colorizing (color correction) a digital frame storage effects, such as freeze frame and video compression and enlargement.

The Professional's Parametric

Introducing the 622 ... a Parametric Equalizer with even better performance and more cost-effectiveness than its highly reliable predecessor. Improved manufacturing efficiency and state-of-the-art componentry help us provide more for less money.

We've added a host of features important to you—the professional user. The 622 now includes in/out switches for each band, balanced inputs (with transformer-balanced

"constant-Q" design by enabling 40 dB notches to be consistently obtained.

The 622 is backed by an outstanding quality control program, including the use of burned-in, hermetically-



output optional), extensive RF protection, and the latest FET-input opamps which reduce transient intermodulation to the vanishing point and which provide THD guaranteed less than 0.025%, 20-20,000 Hz at + 18 dBm output. A 115/230 volt 50-60 Hz AC power supply is now standard. A new proprietary parametric bandpass filter has been designed which virtually eliminates the effects of control wear and complements the notching capability of our

sealed IC's, and further burn-in procedures on the entire equalizer. We know this is important to you when your equalizer doesn't fail in front of an arena audience of 5,000 people ... or on the air in drivetime ... or in the middle of a critical mix. This combination of unbeatable performance and quality makes the 622 the professional's choice.

Your Orban/Parasound dealer has all the details. Write us for his name and a brochure with the complete 622 story.

orban/parasound

680 Beach Street, San Francisco, CA 94109
(415) 673-4544

...ile control room for one of the
...te units for *Battle of the Network*
...tains 23 video monitors. Video
... Dick Schirle checks out one of
... feeds prior to production. The
... for the two-hour special was
...odman.

... was used for one of the Hitachi
... cameras to get a worm's-eye view of
... cycle course competition. This was
... 0 cameras used to cover this
... *Battle of the Network Stars*.



...port equipment and personnel
... Since this production took place
... a rather large campus area,
... communication was a major con-
... A few dozen VHF walkie-
... were needed to coordinate
... personnel for crowd control. In
... addition, a separate RF "wireless
... ne" communication system was
... a to keep in touch with crew
... members. Cameramen used their
... al PL system.

... ighly directional Sennheiser 415
... 815 mikes were used on stands
... on cameras to pick up back-
... and audio (such as the cheer-
... ers from each of the three
... networks).

... he event took place at night and
... required artificial light. The base-
... throw (hit the target and a star
... an opposing network falls into
... old water bath) was held at the
... perdine amphitheater. To illumi-
... this area 40,000 watts of light
... e needed. (See photo.) Since this
... h power was not readily avail-
... in the area, a 45 kW gasoline-
... er generator was brought in.
... television vans and equipment
... and the existing power sources.

... umerous additional production
... ole were hired to cope with the
... nitude of the event. Fortunately,
... e was a readily available supply
... manpower (and womanpower) in
... form of university students from
... perdine's Radio and TV Division.
... and finally, the producers didn't
... e to worry about one problem:
... eather. "It never rains in
... thern California." □

MODEL 110
V.D.A.
9 dB G.

MODEL 120
V.D.A.
DIFF-IN
CL./EO.

MODEL 150
P.D.A.
2 TO 8 VPP
INPUT

MODEL 151
P.D.A.
VARIABLE
DELAY

MODEL 170
A.D.A.
+18dBm
OUTPUT

**AUDIO
VIDEO
PULSE
DISTRIBUTION
AMPLIFIERS**

ALL D.A.'s
6 OUTPUTS

OTHER PRODUCTS
• A/V ROUTING SWITCHERS • TOUCH TONE SYSTEMS
• VIDEO PRESENCE DETECTORS • AUDIO MONITOR AMPL.

di-tech inc.
315 Wyandanch Ave., North Babylon, N.Y. 11704 516-643-4040

For More Details Circle (49) on Reply Card

ITC's 750 Series open-reel recorder/reproducer



PROFESSIONAL IN ALL BUT PRICE

MONO
\$1900

STEREO
\$2190

A marvel of simplicity, yet built like a tank. ITC's 750 Series record/playback equipment compares in cost to semi-professional or consumer-type machines. But it's so quiet, so dependable and so flexible in operation that you can use it daily in live studio work and heavy production and editing operations. Many of its features are normally found in only the most expensive open-reel machines.

- Monitor control with automatic meter switching
- Play/Record Synchronization system
- Motion sensing and start memory
- Flip-top head cover
- Straight-line tape threading
- Manual tape lifter defeat
- And much more... all backed by a complete 2-year warranty on all parts and factory labor, plus ITC's famous 30-day money-back guarantee of satisfaction

How can you lose? For more details on the "professional" 750 Series recorder/reproducer, phone ITC collect at 309/828-1381.

it INTERNATIONAL TAPETRONICS CORPORATION
2425 SOUTH MAIN STREET • BLOOMINGTON, ILLINOIS 61701

Marketed exclusively in Canada by McCurdy Radio Industries Ltd., Toronto

© 1976 ITC

Form No. 113-0005

For More Details Circle (50) on Reply Card

radio workshop

Radio automation: beast or beauty?

By Peter Burk

Automation has been with us for over a decade now. The systems have changed...solid state amplifiers replacing tubes and microprocessors replacing relay logic... but one important link in the system hasn't changed: **the man/machine interface.**

No matter how simple or how sophisticated the system is, a good marriage between the operators and the hardware is essential. Let's look at both sides of the interface separately and try to find ways to improve the relationship.

The people side of the system is somehow overlooked at many stations. The boss calls a meeting and announces that a model 2001 automation system is on its way. Half of the staff trembles in fear of being replaced by a button. That's not exactly the way to start the honeymoon.

No creative person is going to sit

back and watch a piece of machinery take over without at least putting up a fight. Not only is he expected to tolerate it, he's expected to learn how to run it!

If these people are shown that the system merely relieves the operator of the **mundane** chores, it should be apparent that the opportunity for creative expression is actually increased. Of course, one of the reasons for automating is to maintain tighter control of the format. If an announcer's idea of creative expression is to wander from the format, he's certain to find an automation system rather restrictive.

Every operator's shift should include ample opportunity for creative expression. An announcer who has a flair for writing can be given copy assignments to be written during his shift. Maybe part of the production load can be shifted to an evening or overnight operator.

Combination automation

A common application for automation is an FM jointly operated with an AM station. If the AM announcers are to tend to the FM system, a new set of problems crops up. It wasn't so bad a few years ago when most FMs were considered orphans, but now there's a

good chance that the automated is beating the AM in the ratings! a bit much to expect an announcer to do a good job running his own competition.

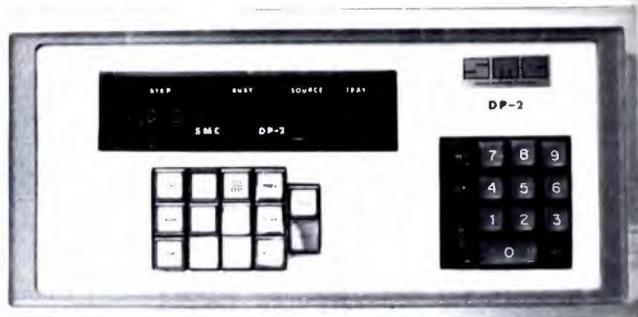
When this problem is encountered the options are limited: somehow make the announcers feel a part of both operations, or split the system completely. You just can't create a competitive atmosphere between two facilities and expect any amount of cooperation at the same time.

Pilot error

Listening to some automated salesmen, you might conclude that the boss' four year old could run the system flawlessly. Thank goodness for child labor laws...we're spared the agony of finding out! Instead we go down to the bus depot, pick out a likely looking candidate, promise him 47 dollars a week, give him a "Stereo Rock" tee shirt, and turn him loose in the radio station.

Breaking new people into the business is a noble effort, but somebody must train these people. Frequently, the chief engineer, most familiar with the system, should provide a thorough and in-depth training program for the operators.

Meet the MILLION DOLLAR Success Story: the SMC DP-2 Digital Programmer



We've sold over one million dollars of DP-2 automation so far in 1977. And that's a success story we want you to investigate. Because the DP-2 is the finest microprocessor automation system available today — out-performing the human functions of action and decision-making. To discover how the DP-2 can work for your station, **call:**

Southeast: **Joe Toher**, Box 4468
Columbia, SC (803) 788-5683

Central: **Bob Popke**, 805 Yale Lane
Highland Park, IL (312) 433 1253

Southwest: **Pete Charlton**,
491 Elbow Ct.,
Weatherford, TX (817) 441 8052

National & Foreign Sales:
Stephen S. Sampson,
1005 W. Washington St.,
Bloomington, IL (309) 829 6373

Send me more information:

Name _____

Address _____

City _____

State _____ Zip _____

World's largest maker of automated broadcast equipment

With over 30 years of quality products and service to the broadcast industry.



SONO-MAG CORPORATION
1005 W. Washington Street
Bloomington, IL 61701 (309) 829-6373

For More Details Circle (51) on Reply Card

...ill too often, memos about how to
...iddle problems go up on the
...etin board **after** the problem
...urs. This can be solved by
...paring a comprehensive oper-
...ing manual **before** trouble starts.
...eep the language simple. As long
...our calculator has more buttons
...it than theirs, you don't need
...othing else to convince everyone
...e you're an electronic genius.
...at guy who just got off the bus is
...ing to have to read and under-
...med enough to be able to get him-
...out of trouble when things go
...ing.

Fire drills

...ed possible, conduct hands-on
...eigning for all operators. Take the
...mation system off line and allow
...na operator to practice handling
...mulated failures. Simulate tape
...rks, cartridge jams and pro-
...ramming errors. If you've kept
...nd records of past failures, you'll
...ow what to concentrate on. And
...not overlook power failures. Every
...erator must be familiar with the
...et-up procedure when the lights
...e back on.

Feedback

...in order for you to keep the
...stem free of bugs, you need lots of
...eedback from the people who live
...at the system day in and day out.
...ourage the operators to make
...uggestions and spell out trouble
...es.
...tainain a discrepancy log that
...cides operator errors as well as
...achine failures. If the same oper-
...tic error keeps showing up with
...veral operators, it's possible that
...the problem can be "engineered"
...n of the system.

People-oriented hardware

...s far, we've talked mostly about
...to get people to work with the
...achine. Now let's see if we can
...the machine to bend a little, too!
...ne of the primary functions of
...utomation system is to relieve
...eople of tedious, mundane chores.
...n equipment isn't as smart as a
...man, but it is certainly more
...sistent and a lot less likely to
...et to do what it's told. Our job
...o capitalize on these assets to
...imize our human frailties.
...alyze the way you're utilizing
...r automation equipment now.
...you fully exploiting the capabili-
...of the equipment? Or are you a
...ve to the machine? You should be
...ng the built-in capabilities of the
...stem to **reduce** human errors.
...he errors that are occurring in
...r system can be broken down
...o three basic types:

Forgetting errors

Unaware of condition errors Inappropriate action errors

"Forgetting" errors are almost
...always time related. The operator
...forgets to take transmitter read-
...ings, or forgets to load the next new-
...cast cart, or forgets to change the
...program sequence for a different
...day-part. The number of forgetting
...errors can be reduced by gener-
...ating reminders from the automa-
...tion system.

Strictly time-related functions can
...be set up for an alarm to sound at
...pre-selected intervals, with the re-
...set for the alarm located near the

point where the action must be
...taken. For instance, if transmitter
...readings are to be taken every two
...hours, the alarm should sound on
...every even hour, and the reset for
...the alarm should be located at the
...transmitter control point.

Another common operator error
...has to do with newscasts, weather
...reports and other program events
...that are time related. If the material
...is put on a cartridge, there is a risk
...that the cart won't be changed and
...the same event will be repeated. If
...time announcements are included,
...the result is embarrassing.

continued on page 60

Beaucart 4D.



When we first intro-
...duced our four-slot
...Beaucart® 4D cart ma-
...chine, it was, frankly, with some trepidation. Sure, our 4D had
...enough product advantages to knock the standard three-slot
...machine right out of the running. But could we counter the
...headstart they had on us, we wondered?

Well, we needn't have worried at all. Our 4D, with its indi-
...vidual tape drive motor for each slot, has become a runaway
...best seller. Broadcasters have been quick to recognize that
...the single motor and shaft of a three-deck machine make
...operating specs impossible to maintain from slot to slot. And
...the 4D's 25% extra capacity means that three slots are still
...on-the-air if one machine is down for service.

There's a lot more to the Beaucart 4D story. Built-in
...recorders, stereo, fast forward, and on and on. For the whole
...picture, write today for Bulletin 102 or call us at (203) 288-7731.
...We're the Broadcast Products Division, UMC Electronics Co.,
...460 Sackett Point Road, North
...Haven, Connecticut 06473.

UMC®

For More Details Circle (52) on Reply Card

Automation

continued from page 59

Figure 1 Outboard relay on cart machine provides warning that all cuts have been played and disables machine until cart is replaced.

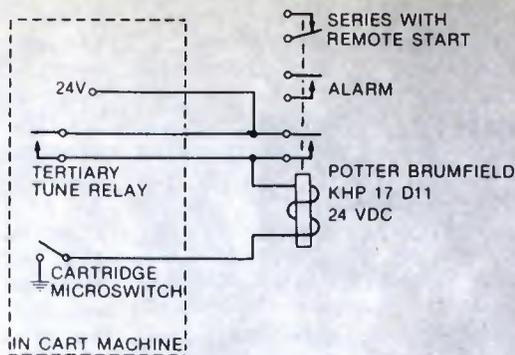


Figure 1 shows a simple solution that allows for several consecutive newscasts (or whatever) to be on one cartridge, yet precludes possibility of the first cut being played again. To use the system, announcer records a tertiary cut following the last cut. When the cut is played by the system, a warning light comes on, reminding operator to change the cartridge. Just to be certain, the start line of the machine is also inhibited so that even if the operator ignores the alarm, the 1:30 newscasts will play at 4:30. Removing the cartridge resets the alarm.

"Forgetting" errors also can be reduced by trying to establish patterns that become almost automatic. For infrequent procedures a check list is a good idea.

Ignorance is not bliss

"Unaware of condition" errors probably account for many of the operator errors that your statistics tallies. Actually, this type of error usually is chalked up to a technical failure. Let's face it...there are many possible equipment failures that the question isn't whether the system will fail, but when. Through good preventive maintenance, we attempt to reduce the number of failures, but sooner or later something is bound to happen. How quickly the operator responds to the failure determines whether the incident is a minor inconvenience or a major disaster.

Condition alarms are a big help here. Try to plan the system so that alarms alert the operator **before** the condition becomes obvious on the air. If possible with your system alert the operator if the **next** source to run is not ready. The extra few minutes or even seconds might be enough to cram another cartridge into the slot.

A carrier alarm is a good idea but it's a little like locking the barn after the horse has escaped. **Corporate alarms that signal problems which may lead to a loss of carrier.** Transmitter temperature, exhaust air flow and RF drive are good examples.

A "loss of audio" alarm is also a good idea. Make sure that the time constant is long enough to prevent false trips.

The carrier alarm and loss of carrier alarm should be distinctive and different, with visual indications that are clearly labeled. Too often an inexperienced operator will assume that when the sound stops the transmitter is off the air. Valuable time is wasted while he tries to tune on a perfectly content transmitter.

The 3D



Three reliable ITC decks in a space-saving common housing.

- **Compact** — three decks convenient to the operator in the space of two single deck machines.
- **Individual** — decks operate independently with separate audio output and remote control.
- **Versatile** — multi-tone machines may be readily adapted so each deck automatically starts the next.
- **Economical** — three premium line reproducers for little more than the price of two single deck units.
- **Rugged** — decks are 1/2 inch thick hardened aluminum to insure stability.
- **Quiet** — guaranteed by ITC's air-damped solenoids.
- **Serviceable** — simple, reliable mechanics easily accessible through a hinged front panel and slide-out decks.
- **Record** — add a WRA Recording Amplifier and convert the bottom deck to a Master Recorder/Reproducer.

Put the 3D to work in your station. Pick up the phone and call ITC collect (309-828-1381). Ask about our 30 Day Guarantee of Satisfaction.



INTERNATIONAL TAPETRONICS CORPORATION

Marketed exclusively in Canada by McCurdy Radio Industries, Toronto, Ontario, Canada

For More Details Circle (53) on Reply Card

©1975 by ITC

The AUTOMATIC Audio Test System

That Measures. . .



MODEL AT-51
AUDIO TEST SYSTEM

- Harmonic Distortion
- Intermodulation Distortion
- Volts
- dB
- Signal + Noise / Noise Ratio
- Wow and Flutter
- Stereo Phasing
- Differential Gain in Stereo Channels

Contact Us Now For Complete
Details And Descriptive Literature.

of two rows of three switches each. Error can further be reduced by labeling the sources in the system according to their function and using that nomenclature anywhere the source appears. You'll still have to use numbers since the automation system is organized by numbers, but a descriptive label along with the number helps reduce confusion. A cart machine that is always used for newscasts might be labeled "NEWS-2." Another might be "ID-3" or "SPOT-4."

It's worth the effort

Any automation system is capable of playing the hits as long as everything is working properly. **The difference between a good system and a mediocre one is the way errors and failures are handled.** No matter what make or model your automation system is, the way you put it to work in your station will make it a beast or a beauty.

We can't possibly cover all specific situations in the **Workshop**, but hopefully, we've stimulated some thinking along the right lines. Readers are encouraged to use the **Station-to-Station** column to share ideas, offer solutions, or pose new questions about this, and other subjects discussed in the **Workshop**. □

POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE.
SILVER SPRING, MD. 20910
(301) 589-2662

For More Details Circle (54) on Reply Card

Every move a picture

"Inappropriate action" errors frequently follow an event that is out of the ordinary. That's an euphemistic way of saying that people get busy when disaster strikes. This type of error plagues every technical industry, so perhaps we can learn something from other fields where considerable research has been done to reduce this type of error.

In aviation, for example, switches and knobs that must be located close to each other are shaped differently. We don't have to carry this to an extreme, but in most situations the engineer picks out his favorite style of pushbutton and uses it for everything from doorbells to transmitter controls. It wouldn't be too tough to use round switches to start functions and square for stop, for instance.

Lower priority functions should be physically smaller switches to lessen confusion. Use a logical and consistent system for direction of control movement, too. **Up is always**

Panel layouts for automation remote control should be planned very carefully to reduce confusion. If you are controlling two rows of three machines, the switches should be arranged in the same configuration

NEW FM AND TV FIELD STRENGTH METER FIM-71

- Accurate — Direct Reading — Volts or dB
- 45 MHz to 225 MHz — Continuous Tuning
- Peak or Averaging Detector (switch selectable)
- Wide or Narrow IF Bandwidth (switch selectable)
- 20 dB or 60 dB Meter Range (switch selectable)
- AM or FM Demodulator (switch selectable)
- Calibrated Dipole Antenna, Mounted on Case for Near-Ground Measurements or Removable for TASO Measurements
- 140 dB Measurement Range (1 μ V to 10 V)
- 4 1/2-Inch, Mirrored Scale, Taut-Band Meter
- Front Panel Speaker
- Recorder Output
- Rugged, Portable Package
- Calibrated Signal Generator, 45 MHz to 225 MHz
- Battery or External Power
- Use as Signal Source/Selective Voltmeter for Insertion Loss Measurements of Filters, etc.
- Measures FM Harmonics to -80 dB
- Price — \$2,500 complete with dipole antenna.



CONTACT US FOR DETAILS.

POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE.
SILVER SPRING, MD. 20910
(301) 589-2662

For More Details Circle (55) on Reply Card

PHILLYSTRAN®

The Tough Guys



Far surpassing steel guys in strength and durability, PHILLYSTRAN is manufactured from impregnated KEVLAR* and polyurethane. Completely non-metallic, PHILLYSTRAN eliminates electrical problems and the usual problems of RFI.

- **Non-interference**
Outstanding dielectric properties
- **Minimum Stretch**
New designs substantially reduce creep
- **Corrosion Proof**
Non-metallic construction: polyurethane jacket
- **Non-Conducting**
Outstanding insulation properties

PHILLYSTRAN . . . The Tough Guys in more ways than one.

®PHILLYSTRAN . . . proprietary resin impregnation process of Philadelphia Resins Corp.
*duPont registered trademark



manufacturers of Chockfast®, Phillystran®, Phillybond®, Wearex™

PHILLYSTRAN® ROPES AND CABLES

PHILADELPHIA RESINS CORPORATION
20 Commerce Drive, Montgomeryville, Pa. 18936, U.S.A.
215/855-8450 • Telex: 84-6342 • Cable: PHILRES MMLL

For More Details Circle (56) on Reply Card

people in the news

Lyle O. Keys, an original founder and long-time president of TeleMation Inc. has left that company to start a new firm, Utah Scientific Inc. Keys began his television career as a sales engineer for Allen B. DuMont Laboratories in 1952, moving to KUTV, Salt Lake City in 1957 as director of engineering. TeleMation was formed by Keys and KUTV's owners. The new company will design and manufacture television broadcast products for sale to broadcast, industrial, government and teleproduction users worldwide.

Thomas R. Meyer, product manager/applications engineer for TeleMation since 1972, has been appointed product manager at Dynair Electronics Inc. Prior to joining TeleMation, he was a communications facilities consultant for Hubert Wilke Inc. and product manager/systems engineer for RCA Corporation.

Wallace Anderson has been appointed customer service manager at TeleMation. Anderson's responsibilities will include service, parts and training on products manufactured and sold by the company. At any time, day or night, customers will be able to call (801) 972-8340 to contact Anderson.



MEYER



ANDERSON



DUCART

Jack M. Ducart, a veteran of more than 20 years in the broadcast industry, has joined Ramko Research as general sales and marketing manager. Ducart previously held similar positions with McMartin Industries and Moseley Associates.

E. Carlton Winckler, Sr., of Imero Fiorentini Associates, has been awarded the Progress Medal of the Society of Motion Picture and Television Engineers (SMPTE) for 1977. The award was presented October 17 in recognition of Winckler's outstanding career since the early 1930s as a lighting consultant to both theatrical and television productions.

Also receiving SMPTE special awards for 1977 were **Renville McMann, Jr.**, president of Thomson-CRN Laboratories, the David Sarnoff Gold Medal; **William Offenhauser, Jr.**, a pioneer in the development of many standards for 16mm sound films and author of the 16 mm Sound Motion Pictures, the John Grierson International Gold Medal Award; and **John D. Low**, vice president and director of development of Digital Video Systems, the Agfa-Gevaert Gold Medal Award.

New fellows recently elected to SMPTE include the following: **Jack Bush**, director of film, ABC News; **Domenico Ettore De Cinque**, technical director, Tecnospes Rome, who designed and installed the first demand drive processor with spring-centered rollers in Italy; and **Edward Graham, Jr.**, chief engineer, WGTV, University of Georgia.

BROADCAST ENGINEERING

of Georgia; **Julian D. Hopkinson**, technical manager, Pacific region, Motion Picture Products, Sola-Gevaert, Inc.; **John Jurgens**, executive vice president and vice president for engineering, Cinema Products Corporation; **John D. Lowry**, vice president and director of development, Digital Video Systems; **Herbert L. Rees**, assistant vice president and director of corporate technical affairs, Eastman Kodak Company.

Corporate manager of advertising and sales promotion at Sola Basic Industries, **Alan Vierthaler** will be responsible for all of the advertising, sales promotion and trade show activities at the corporate level, as well as coordinating the activities of the above operating units.

Marketing director at the time products division of Fairchild Camera and Instrument Corporation is **Charles Jacoby**. Jacoby, who has been in charge of radio game marketing activities since 1976, is responsible for marketing the company's digital watches, clocks and related consumer products.

Ray Gold, formerly with TM Programming, joins Electron Systems, a division of Automation Electronics, Inc., as eastern regional sales manager for the home office. □

Industry Notice of a Memorable Event

On August 2nd, 1977,
I purchased QRK Electronic Products
from CCA Electronics. I own it now.
Nobody's calling the shots except
me and I'm putting my name and
reputation behind every product
that leaves our plant. I've made
changes already. Some big ones are
coming soon. But the biggest
change of all is that now, after 10
years, QRK is nobody's subsidiary
any more. Questions? Call me
toll-free at 800-344-2181.
Californians, call collect.

Bob Sidwell

Robert D. Sidwell, President



ELECTRONIC PRODUCTS, INC.

1568 No. Sierra Vista, Fresno, California 98703
Phone (209) 251-4213

For More Details Circle (57) on Reply Card

November, 1977

Perfect Timing

MASTER CLOCK SYSTEMS



CHOOSE THE RIGHT ONE FOR YOU!

If seeing the same time on all your clocks is important, select **ES 192** - Line Frequency timebase, for only \$275.

If a guaranteed accuracy of three seconds per month is what you want, choose **ES 160** - \$750.

How about one second per month? **ES 160/1** - \$900.

Or National Bureau of Standards accuracy! **ES 190** is synchronized to Radio Station WWV to provide a Master with unquestioned accuracy. \$900 with receiver and antenna.

For a Time / Temperature Master, ask for **ES 196** - \$650.

ESE Master Clock Systems are simple to install. All Masters have a Serial Time Code output, able to drive twenty slave displays without buffering. Slaves range in size from .3" LED to 4" Electromagnetic displays, priced from \$134 to \$475.

IF YOU ALREADY HAVE A SYSTEM AND WANT TO EXPAND IT, get the **ES 167** Serial Time Code Generator (\$125), then add any number of our low cost slaves.

Many, many options and accessories are available. Ask us about them. Our brochure tells the whole story, but not for long. We keep adding new products.



Write, Wire or Call: (213) 674-3021
505½ CENTINELA AVENUE • INGLEWOOD, CALIFORNIA 90302

For More Details Circle (58) on Reply Card

zoom in!

This is the official column of the American Society of TV Cameramen (ASTVC). The ASTVC can be contacted by writing to: P.O. Box 296, Sparkill, NY 10976 (914) 359-5985.

Take 1...A Camera is a Camera is a Camera [Not so!]

Lest there be any assumptions that what follows is a technical comparison of the video broadcast cameras currently on the market, stop right there. What we are about to elaborate on is the relative tasks assumed each working day by the TV cameraman vis-a-vis his film

counterpart (the "Hollywood" type).

For the purpose of our scenario, let us assume that we are about to critique a dramatic production "shot" in a typical network studio and a similar production "shot" on film *a la Hollywood*. We will balance the "handicap" further by assuming that the film type (as director of photography) is operating the camera himself, and not utilizing his ever-available camera assistants.

To begin, the film type usually

selects his camera, either personally-owned, rented for the production, or drawn from the studio equipment room. He might prefer ARRI 35BL, a Frezzolini 16mm camera, or maybe the CP-16R, etc., etc. The TV counterpart uses the video equipment that comes with the studio, lens included. This might be RCA, Sony, IVC, Ampex, or whatever you have you. This is not to say that any of the aforementioned cameras will not do an excellent job, but it is not to say that the assigned cameraman makes no decision as to what equipment he will be using.

Next, it is the practice in Hollywood for the director to run through upcoming scenes with the director of photography (cameraman) for purposes of angles, lighting, dramatic import, etc., etc. The cameraman is a partner to the final decisions. How does our TV cameraman make out in this process? What, if any latitude is he allowed in order to be creative?

Finally, the encumbrances: no matter how many cable-men might be assigned, and no matter how well they perform, a cable is a cable; and, it is one less factor that the film cameraman has to be concerned with. Now, if for some special reason the performers require the attachments of video prompters, then you find that even the so-called "balanced" cameraman presents problems that, once again, your film counterpart does not have to contend with. Your TV cameraman not only has to support the additional weight of the video monitor, but is now also hampered with the harness and mirror assembly that goes with the video prompter. An ideal working arrangement? Not at all! Your cameraman has now become part moving-man.

It is a wonder, and a compliment to their skill and endurance, that the TV cameraman performs as well as he does, given the handicaps that never were a part of the Hollywood film scene.

Take 2...Inserts

Gerry Gander was re-assigned from North-East regional director to director, Schools Liaison Group. He will be moving to the west coast this winter.

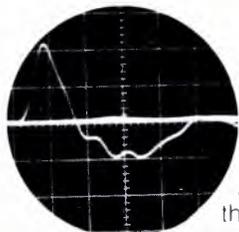
Janet Doka was named as executive assistant and associate director, special activities.

Newly appointed North-West regional rep is Anthony St. John, now associated with KRON-TV.

Fade to Black....

AND NOW, A WORD ABOUT OVERLOAD, FROM SENNHEISER'S MD 421:

NONE.*



A lot of musicians are worried about overload these days. And no wonder, special

effects, high amplification and combinations of acoustical and electronic instruments all make it more necessary than ever for microphones to be overload-free as well as accurate.

Like our tough MD 421 cardioid dynamic.

In a test beyond what any musical instrument or voice can produce, we used a starter pistol to produce an instantaneous sound-pressure level of 175 dB, which the MD 421 handled with no trace of distortion.

Whatever your application—sound reinforcement, recording or broadcasting—consider our MD 421. Besides freedom from overload, you'll discover its precise cardioid directionality, rugged design and wide, smooth response give you superb results. Even under difficult conditions.

The price won't overload you, either.

*Outdoor test with Tektronix scope, set for 10V/division vertical, 0.1 μ sec/div horizontal. 22 cal. starter's pistol mounted 15 cm from MD 421 measured pressure of 111,000 dynes/cm² (175 dB SPL). Smooth, rounded scope trace indicates total lack of distortion.

SENNHEISER

ELECTRONIC CORPORATION

10 West 37th Street, New York 10018 (212) 239-0190

Manufacturing Plant Bissendorf/Hannover, West Germany

Probing the problem of down digitals

By Christopher B. Downing, Overland Park, Kansas

Digital devices are now found in increasing frequency in nearly every piece of broadcast equipment: tape machines, audio boards, master clocks, remote controls, transmitters of every description, modular monitors, antenna monitors and BS monitors. In spite of an incredible reliability, a little probe chip will occasionally malfunction internally.

Often something is wrong inside the shell, the entire piece of equipment malfunctions. Using a logic sheet, an engineer can tell what is supposed to happen, but an probing device is needed to show what is actually happening.

You can poke a probe from a meter around and see if a particular point in the circuit reads 4.0 volts or .35 volts, but you'll be weighing several ounces of meter and be getting a lot more accuracy than you need. The best way to service digital logic is with a level probe. After all, we only care if a device is on, off or somewhere in between (where it shouldn't be). We're not interested whether the high-state voltage is 4.91 volts.

You could buy a logic level probe, but you'd be carrying around about thirty dollars worth of probe you don't need. It's easy to buy a reliable logic level probe for under five dollars.

The probe schematic shows how to build your own. The probe will draw less than 30 ma from a five volt power supply (the power source is usually a good source while probing), and indicates "high", "low" and "pulse" logic states. The probe impedance is limited to 10k ohms by the input resistor, and you can set your own level references

just by rearranging the voltage divider.

Because some offset voltage from the comparator inputs will appear on the probe, don't try testing micro-power CMOS IC's, or you'll end up with a whole bunch of bad ones instead of just one.

The sample logic potential appears across a 10k input resistor and is applied to the inverting input of comparator "A" and the non-inverting inputs of comparators "B" and "D". If the sample voltage exceeds the 4.0 volts from the resistor dividing network which appears on the non-inverting input of comparator "A", the comparator turns off. In the off state, the output sinks to ground, causing current to flow (via a limiting resistor) through the high-state light-emitting diode.

If the sample voltage does not exceed the voltage on the non-inverting input, the comparator stays on and no current flows through the LED. If the sample voltage on the non-inverting input of comparator "B" is less than the 1.0 volts on the inverting input, the comparator is off, sinking the output to ground and causing the low-state LED to light.

A slow-speed pulse train is indicated when the low and high-state LEDs light alternately. At high speeds, though, a more definite indication of the presence of a pulse train may be helpful. Comparators "C" and "D" comprise the pulse detection and display circuitry. Comparator "D" is on whenever the sample voltage on the non-inverting input exceeds the 1.0 volt reference. When the comparator is on, the output is above ground, allowing the 1 mfd. capacitor

continued on page 66

Nobody has it like the NEW Spotmaster 5300 A with Plug-in Decks



When we say "Nobody has it like Spotmaster," we mean it.

Here's the most advanced three deck on the market. It's our up-dated 5300A with plug-in decks for unsurpassed accessibility; and a new internal mechanical design which insures very stable and accurate deck and capstan positioning independent of front panel reference. And note the run lights next to each deck.



All leads to the deck go through this plug-in connector. There is nothing to disconnect to remove the deck.

More features? A premium, direct drive hysteresis synchronous motor; reliable low voltage, solid-state solenoid switching, the superb Phase Lok III head bracket, FET muting, active cue tone filters and rear panel LED service aids. It's all there in the new Spotmaster 5300A for mono or stereo.

NEW LOCATION

BROADCAST ELECTRONICS, INC.
4100 North 24th St., Quincy, Illinois 62301
Telephone (217) 224-9600



For More Details Circle (60) on Reply Card

WESTCLOX QUARTZMATIC STUDIO CLOCK—\$28



Battery powered—improved clockworks just delivered... Our unconditional full satisfaction guarantee. We recommend eight inch for control room use. \$28—2 for \$49, 3 for \$69. Twelve inch, \$34—2 for \$66.

ELECTROVOICE 635A—\$49



The largest-selling omnidirectional mike in broadcast. \$49—2 for \$96, 3 for \$141

REVOX-A77
Walnut Cabinet #1102
\$745
NAB Hub Adptr \$11



Prices are cash with order and expire 12/31/77. Write for details of our Loyalty Discount Plan.

davidgreen
broadcast consultants corporation
703-777-8660
Leesburg, Virginia 22075

For More Details Circle (61) on Reply Card

station-to-station

continued from page 65

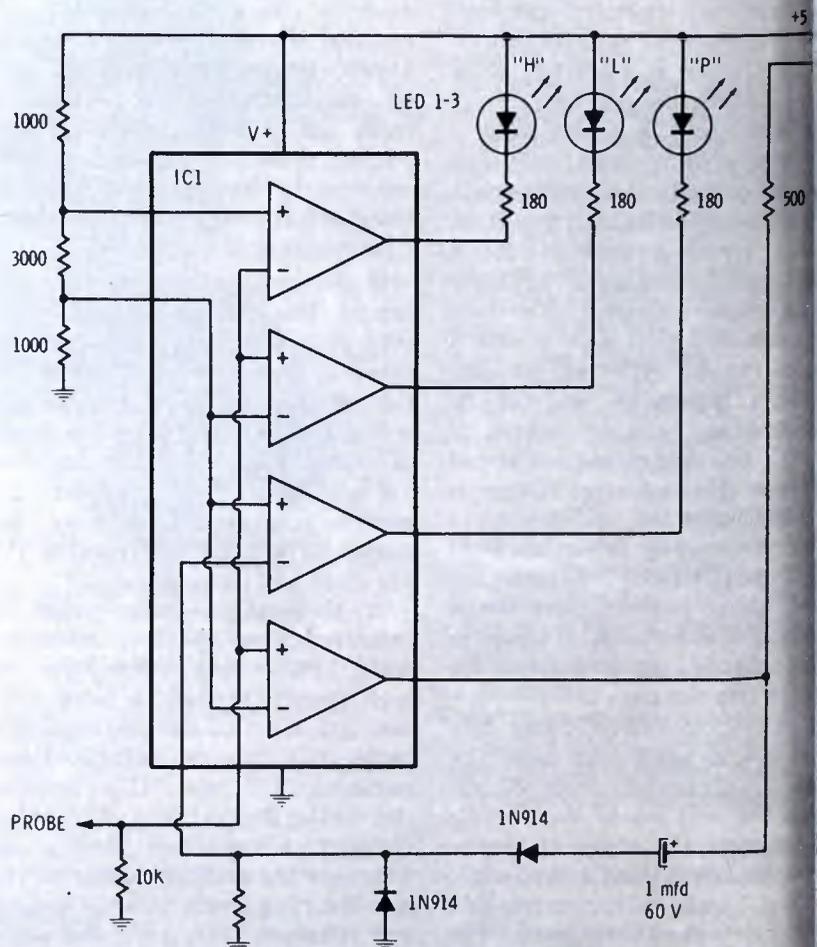
citor to charge through a 500 ohm resistor, a diode and the 1000 ohm resistor at the inverting input of comparator "C". As the capacitor charges, the charging current appears on the inverting input of comparator "C" and turns the comparator off when the reference level (1.0 volts) on its non-inverting input is exceeded.

When the comparator is off, the output sinks to ground and the pulse-state LED lights. As the sample voltage on the non-inverting input of comparator "D" drops to logic "0", the comparator turns off, sinking the output to ground. The 1 mfd. capacitor is discharged through a second diode. The two diodes are necessary to keep the negative discharge pulse from the capacitor off of the comparator input. When the input is driven

negative, the comparator does funny things.

I was particularly generous my reference levels, allowing at each end of a five-volt scale you like your indications a tighter, change the resistor values in the dividing network. Some pieces of equipment may use a potential of 3.6 volts, but if the power supply for the probe is 3.6 volts the indications will still be accurate (just not as bright!).

National Semiconductor manufactured the quad comparator bought from Radio Shack (cheap and quick), and it will take up to 36 volts on the inputs before the input transistors in the IC start to blow. If you really worry about hitting some negative potential ruining the IC, put a diode in series with the probe input and reverse the voltage divider to compensate for the forward voltage drop. Reversing the power supply leads will definitely cause trouble, so s



SCHNEIDER



for colour cameras

FIELD
1" f/2.1
33-1000
" f/1.7
26-800



UNIV.
1" f/2.1
20-600
" f/1.7
16-480



WIDE
1" f/2.1
16-480
" f/1.7
2.5-375



WIDE
1" f/2.1
16-240
" f/1.7
2.5-190



UNIV.
1" f/2.1
18-200
" f/1.7
14-150



20X
1" f/2
17-340



10X
1" f/2
17-170



ENG
3x f/1.8
10-100



LES — SERVICE — RENTALS

TELE-CINE INC.

5434 Merrick Road
Massapequa, New York 11758
(516) 798-2828

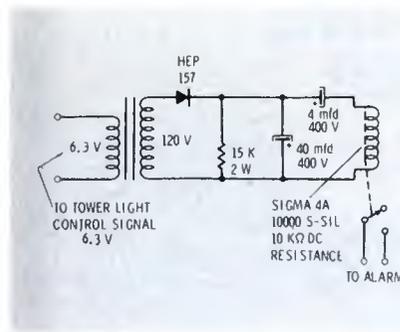
emergency protection might be in order in that respect, also.

I built my logic level probe on perfboard and cased it up in a penlight flashlight case. I don't worry much about damaging the probe because it only cost about \$3.50!

Tower light alarm circuit

By Robert Wittmer, Detroit, Michigan

Here is a tower light alarm circuit that is simple and works. Some relays may be more sensitive than others, in that case, some resistance can be paralleled across the relay to



decrease the energized time if necessary. The alarm indicates tower lights on or off: T on \approx 3 sec. and T off \approx 2 sec.

Send us your **station-to-station** ideas. We'll send you the NAB Engineering Handbook.

If your equipment tips or other operating ideas are selected by **Broadcast Engineering** to appear in Station-to-Station, you will receive a free copy of the prestigious **NAB Engineering Handbook** (or a cash payment, if you prefer).

Send your items to: Station-to-Station editor, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. Please indicate if you want to receive the *Handbook* or prefer to receive a check.

BASKETBALL REMOTE SPECIAL—\$499

Portability plus mixer Shure-M67, Telex CS-90 Sports-caster headset, Sennheiser shotgun and combo omni-directional mike-system, all complete with Shure AC60 carrycase. Package regularly list value \$671. Individually, M-67—\$169, CS-90—\$104, Shotgun plus omni-combo—\$209, Carrycase—\$29.

SENNHEISER SHOTGUN MKE-802, \$159



Common power (K2U) module buys you the opportunity to add an additional omni-directional head (ME-20) for only \$50 more. Shotgun plus omni head—\$209.

THREE CHANNEL CONSOLE—\$524



Production or Newstroom Microtrak microphone console with 4 mike inputs, 3 high-level inputs, turntable recamm, headphone, in-cue circuit with built-in cue speaker. \$524. Mounted in portable travel case—\$555. Stereo version \$695, in travel case \$755. Prices are cash with order and expires 12/31/77.

david green
broadcast consultants corporation
703-777-8660
Leesburg, Virginia 22075

For More Details Circle (63) on Reply Card

More Details Circle (62) on Reply Card

The national office has received many requests for the Chapter Kit of Starting Material from various areas throughout the country, and a number of these areas have already scheduled first meetings. The membership of SBE is continuing to grow as new projects to benefit members are being planned for the coming year.

CHAPTER REPORTS

Chapters 1, 2 and 22—New York

The Regional Convention and Equipment Show, held by Chapters 1, 2 and 22 September 30 in Syracuse, was the largest, and most successful, equipment show ever. The attendance was excellent, as SBE national president, Robert

Wehrman, spoke with many members about their concerns and expectations.

Chapter 9—Phoenix, Arizona

Chapter 9 met September 22 an interesting program by Baumann of BCD, Inc. There was a general discussion of radio stations licensing for input to the national office in determining an official SBE position. An update on the fall convention was presented.

Chapter 16—Seattle, Washington

Chapter 16 kicked-off the 1976 year September 14. The chair presented certificates for Recognition as Senior Broadcast Engineer. Jack Shawcraft also led a discussion on the University of Wisconsin's digital technology course and played some samples of the course's videotape lessons. A discussion of FCC docket #20817 dealing with proposed licensing changes followed.

Chapter 25—Indianapolis, Indiana

The September 29 meeting took place in the Indiana University School of Nursing's new television studio, which is equipped with the latest of Strand Century lighting systems. Strand Century presented a program on television lighting, including a demonstration that was interesting and informative.

Chapter 28—Milwaukee, Wisconsin

Matt Siukola, Ph.D., one of the world's leading authorities in the field of antenna design, spoke at the kick-off meeting September 20. Siukola spoke on Circular Polarization—FM and TV Antennas. His presentation covered the most recent work done in the field.

Chapter 40—San Francisco Bay Area

Chapter 40 met September 21 at Mt. Sutro Tower Transmission Facility, San Francisco's newest and most obvious landmark. The meeting began with a slide presentation by Harry Jacobs, resident engineer at Sutro, and continued with tours of some of the individual station facilities located at the site.

Forming Chapter—Los Angeles, California

The first meeting, held September 21 at KCET-TV, was attended by interested engineers. They discussed ideas for programs, meeting locations and attendance. If interested in membership, contact Douglas B. Howland, 1122 E. Chase Drive, Glendale, CA 91205, phone (213) 245-7708.

ITC's ESL-IV

**AUTOMATIC, ONE-STEP
TAPE ERASER AND
SPLICE LOCATER**



\$495

Now you can erase cartridge tape and locate the splice in the same operation automatically — without chance for human error. Simply insert your cartridge and press the start button. There's nothing else to actuate or hold down. When the splice is located, the machine automatically releases the cartridge — fully erased!

The ITC ESL-IV Series machine is super-fast (25-29 IPS), but gentle with tapes in NAB size A cartridges. It is super-quiet, super-rugged and ITC engineered to outlast and outperform any other eraser or splice locator made. Pays for itself in time saved and consistent results. All this and our famous 2-year warranty plus a 30 day money-back guarantee of satisfaction.

Reserve your unit now! Just call us collect at (309) 828-1381 for more information.

ITC INTERNATIONAL TAPETRONICS CORPORATION
2425 SOUTH MAIN STREET • BLOOMINGTON, ILLINOIS 61701

Marketed exclusively in Canada by McCurdy
Radio Industries Ltd., Toronto

© 1976 ITC

For More Details Circle (64) on Reply Card

Form No. 112-0008

Audio Tape

for professionals



REEL TO REEL TAPE
 Ampex, 3M. All grades,
 On reels or hubs.

CASSETTES, C-10-C-90,
 with Agfa, Ampex, 3M Tape

READER & SPLICING TAPE

EMPTY REELS & BOXES
 All widths, sizes.

COMPETITIVE • FROM STOCK

Recording Supply Co.
 1233 Rand Road
 Des Plaines, IL 60016
 312/297-0955

For More Details Circle (65) on Reply Card

Have you checked the competition? NOW CHECK OURS! Audio-Transmitter Link



For Transmission Of Superior Audio Program Quality

Full 10 Watts of RF Output Power
 Direct Reading Forward & Reflected Power
 Watt Monitor Amplifier in Receiver
 Unique Oscillator Design Assures Maximum Stability
 Built-In RFI Modules on Transmitter and Receiver Input and Output

Available as either a Wideband Composite or as a narrowband, Single or Dual Channel system this MCI STL employs modern day technology using Phase Lock Loop Techniques in both the composite STL transmitter and an accessory Subcarrier Generator. All MCI systems are enhanced by the use of the very latest chips available. Field tested and proven these systems provide unmatched quality, attractive styling and superior performance.

MICRO CONTROL ASSOCIATES
 Box 13250 Arlington, Texas 76013
 817/265-2912

For More Details Circle (66) on Reply Card
 November, 1977

from blue bananas to sag tails

David and Goliath

The AM-FM combine I work for used to broadcast the summer men's basketball league games, until the sponsors lost interest.

During the summer of 1976, we had one game a week on tap, and I was engineering at the studio. We used a Marti remote transmitter for the broadcast, since the games were played on an outdoor court at a tavern not too far from the station.

On this one particular evening, I came into the control room about a half-hour before the pre-game show was to air, and switched on the Marti monitor, which we have wired through the intercom in our Gates board. You can imagine my surprise when I heard cryptic messages crackle from the speaker: "Yeah, Vince, we'll bring the Shure mixer over to the Hilton, but you and Frank go down to the convention and stand by to fire up the video."

After the initial shock wore off, I checked the logbook for the remote transmitter, and to my dismay learned that we shared the frequency with NBC in New York, about 55 miles to our north. I phoned NBC, and was told that the frequency was being used to coordinate operations for the Democratic National Convention. The response was "No Way!" when I asked if they would be done with the frequency by 9 pm, our game time.

I called the executive vice-president of our station and relayed the situation to him, the board's intercom continuing to blare in my ear such profundities as "Wait till Carter comes down, and I'll give you a cue to fire up...." He promised to take care of the matter, as I sweated out the five minutes remaining before air time.

It came to a happy conclusion, at least for us. The VP called NBC and quoted the FCC rules which state that licensees using remote pick-ups for program continuity take priority over those who are using the frequency for dispatch.

Believe it or not, NBC relinquished the frequency, and our game was broadcast. As near as I can tell, so was candidate Carter. Steven L. Lebetkin, Oceanport, New Jersey.

NEW 25 KW Air Cooled Calorimeter-Load

- FEATURES:**
- Precise Power Measurement
 - Exceeds FCC Specifications
 - Mobile For Multi Use
 - Interlock Protected
 - Nonmeasurable VSWR
 - Freq. Range D.C.-1.8 GHz



WILKINSON ELECTRONICS, INC.

701 Chestnut St • P.O. Box 738
 Trainer, Pa 19013 • Telephone 215/497-5100
 TWX 510 669 3188 • Cables WILEC

For More Details Circle (67) on Reply Card

Broadcast
Component Distributors

BroadCom

▶ **Scully**

Recording Instruments

Program Loggers
Reel-to-Reel Tape Decks
Phono Pre-Amps
Microphones & Stands
Headphones
Phono Cartridges
Replacement Magnetic Heads
Monitor Speakers
AM/FM/AM Stereo Exciters
5 KW AM Transmitter
10 KW AM Transmitter
50 KW AM Transmitter
2.5 KW FM Transmitter
10 KW FM Transmitter
15 KW FM Transmitter
25 KW FM Transmitter
40 KW FM Transmitter
50 KW FM Transmitter

Equipment Leasing

(215) 437-0607

Communication Medias



P.O. Box 54/Allentown, Pa. 18105

For More Details Circle (68) on Reply Card

new products

Reproducer

The 750 Series Reproducer from International Tapetronics Corporation is designed and built for broadcasters, and is suited for use in program automation systems.

Among its many features are: precision milled 1/2-inch thick aluminum deck; straight-line tape threading; three-point micro-adjustable head (height, zenith, and true center-pivot azimuth); solid-state optical tape break sensor; and professional +8 dBm output with 10 dB headroom.

Audio output is rated at +18 dBm before clipping, into 600-ohm load. Unbalanced (600-ohm transformers optional). Distortion: 0.5% maximum total RMS amplifier distortion at +8 dBm output level from 50 Hz to 15,000 Hz.

All operating mode indicators and controls are remote-controlled. Standard with all 750s are rack mounting, NAB reel, NAB hub adapters, and technical manual.

The 750 Reproducer is priced at \$1190.00 in its most popular configura-

tion: 1/2-track stereophonic 2-channel, 7 1/2 ips.

For More Details Circle (95) on Reply Card

Mike preamplifier/limiter

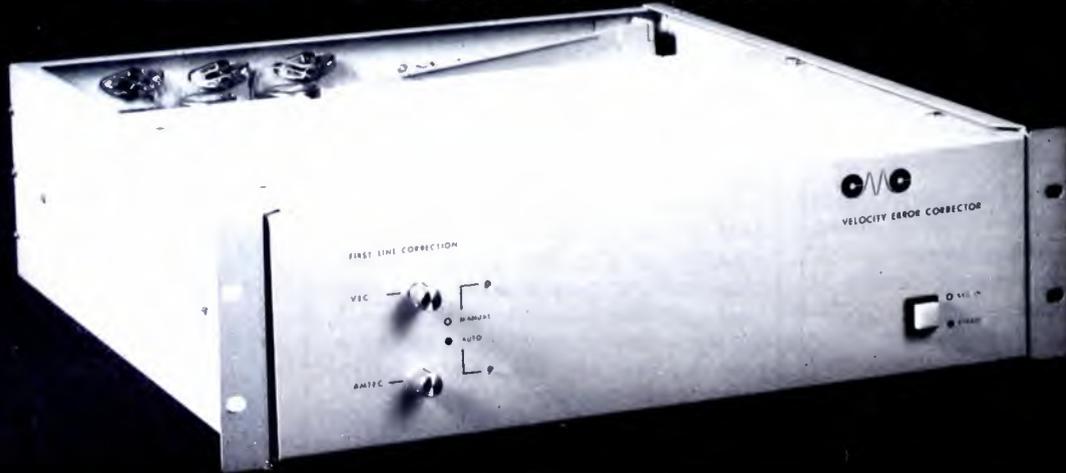
The model 1400 in-line microphone preamplifier/limiter from Systems may be used to boost out microphones for driving gain mixers, to boost mike output to line level, or to buffer microphone level lines; all due to its continually variable gain.

Because of the built-in limiter, the 1400 can be used to prevent drive of individual mike or inputs while maintaining high average levels. According to RTS, the 1400 has a fast rise time with overshoot, even with 20 dB limiting applied.

The unit's low output impedance enables it to drive microphone cables of 1000 feet or longer with significant loss of high frequency. This also improves the S/N ratio by keeping the signal well above the noise level, RTS reports.

INTRODUCING VEC-1200 & VEC-2000

VELOCITY ERROR CORRECTOR



- A self contained unit.
- Plug compatible with the VR-1200 & VR-2000 VTR's.
- Improves interchange playback signal of standard & non-standard recordings.
- Selectable automatic or manual first line correction.
- Improves useful quad head life.

COMPUTER MAGNETICS CORP., 125 W. Providencia Ave., Burbank, Calif. 91502
Tel: (213) 843-6674. Telex: 69-6279.

For More Details Circle (69) on Reply Card

distortion is less than 0.05% THD
 al. Frequency response: -0.5 dB
 0 Hz; -0.25 dB at 20 kHz.
 valent input noise: -127 dB ref
 V, 150-ohms source.

For More Details Circle (96) on Reply Card

Mass feed audio DA

The Ramko Research model DA-
 Audio Distribution Amplifier
 feed up to 30 600-ohm loads
 simultaneously with complete isola-
 tion. The stereo version will handle
 600 loads.

Frequency response is ± 0.75 dB
 10 Hz to 20 kHz. The output
 is +27 dBm. There are three
 units to choose from: a table top
 19" rack mount mono unit, and
 19" rack mount stereo unit.
 Prices range from \$145 to \$240.

For installation, run the single
 ended output of the DA-X30
 to the areas to be served and
 to this line any place desired.

For More Details Circle (97) on Reply Card

Error corrector

AM is introducing a new Velocity
 Corrector. The self-contained
 plug compatible with VR-1200
 VR-2000 VTRs.

It improves the interchange play-
 back signal of standard and non-
 standard recordings. It also has a
 cable automatic or manual first
 correction.

For further information, contact
 Myster Magnetics Corporation.

For More Details Circle (98) on Reply Card

Liplock audio pitch control

The LL-7 Liplock pitch control by
 urgence Corporation produces
 stable audio from videocassette

tape when it is moving from 1/10
 speed up to three times play speed
 during fast and slow ECS-1B Joystick
 editor operation.

This new development utilizes a
 microprocessor to sample and re-
 shape the monitor audio output
 during the edit point selection
 process.

This plug-in accessory eliminates
 the high-speed "Donald Duck effect"
 and permits the operator to locate
 audio cues quickly at fast Joystick
 speeds. Then the audio hole be-
 tween two sounds can be accurately

located at slow Joystick speed by
 eliminating low speed rumble.

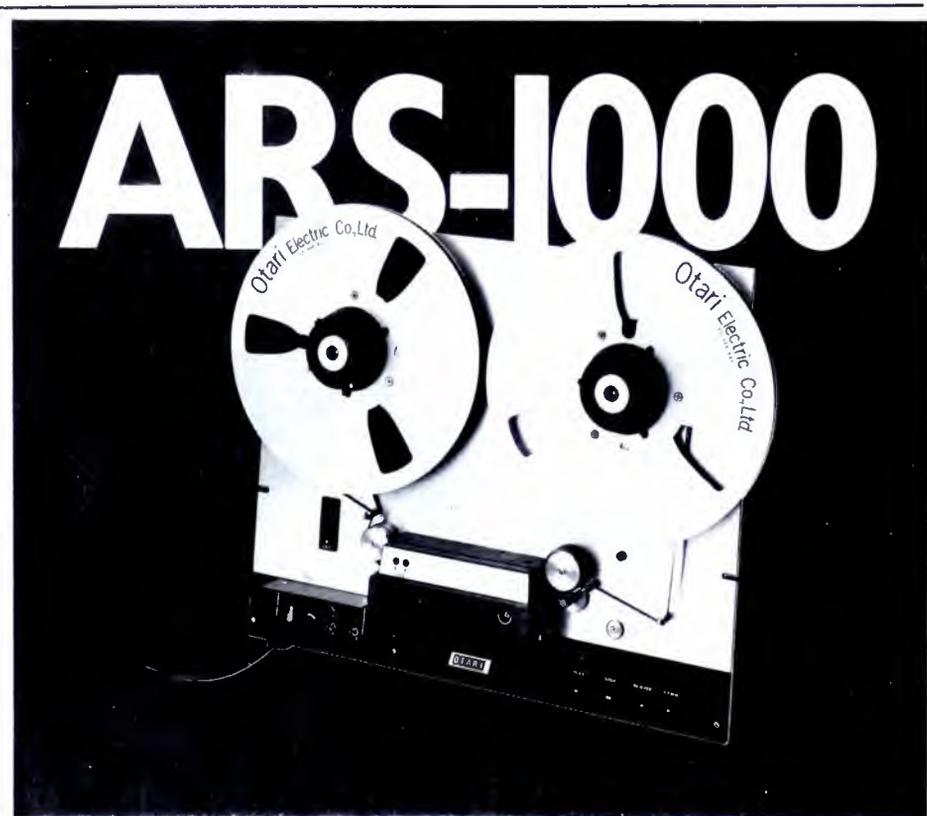
For More Details Circle (99) on Reply Card

Laser ENG link

American Laser Systems has de-
 veloped a line-of-sight infrared opti-
 cal carrier (model 761) that can
 send audio and TV composite video
 signals up to a half mile.

Broadcast applications include in-
 terface with remote equipment. No
 cables need to be layed. The unit can

continued on page 72



Specifically designed for automated systems

Otari, Japan's leading producer of
 professional recorders, announces
 the ARS-1000 Automated Radio
 Station Reproducer. This new
 machine is based on the successful
 MX-5050 professional recorder,
 with several components modified
 to meet the special needs of the
 automated broadcaster for
 consistent quality and greater
 reliability under heavy duty
 continuous operating conditions.

Compare these features:
 2500 hours MTBF; 7 1/2 or 3 3/4 ips;
 front switchable speeds; preamp in

head assembly for minimum RFI
 and improved S/N; optional 25 Hz
 sensor; improved low frequency
 response for reliable 25 Hz sensing;
 +4dB 600 ohm output; improved
 flutter performance; plug-in boards
 with gold-plated contacts; nation-
 wide parts and service from Otari
 MX-5050 service centers (mech-
 anical parts are interchangeable);
 one year parts and labor warranty.

If you're considering automa-
 tion, ask your automated system
 supplier for full details on the ARS-
 1000 or call Otari.

OTARI

Otari Corporation
 981 Industrial Road
 San Carlos, California 94070
 (415) 593-1648 TWX 910-376-4890

PRODUCTION FACILITY FOR SALE

and the rest of a color video production facility
 including 2-RCA TK630 Plumbicon Color Cameras,
 1-Color Film Chain with TK610B Color Camera, 1F56
 35mm Film Projector, TP7 Slide Projector, all remote
 controlled, 2-Sony DXC-1500 Portable Color Cameras
 and 2-Sony VO3800 Portable Cassette Vtrs, RCA
 Production Switcher with special effects gener-
 ator, 2-Ampex VP7900 Vtrs, Sony 2850 Vir, Ampex
 1900, CVS 504A TBC, TRI-EAS Editing deck,
 Tektronix 146 Sync Generators, Tektronix 529
 Waveform Monitor, Tektronix 520 Vectorscope, 2-ADS
 Distribution Switchers, Conrac 19" Color Monitor, 3
 Mac 9" B/W Monitors, TASCOM Model 10 Audio
 Console, other equipment too numerous to mention.
 Equipment is in excellent condition and presently
 being used in producing industrial and broadcast program-
 ing.

For information concerning the acquisition of this on-
 going business, including client list, please contact
 Ralph Price, Sun Information Services Company
 P.O. Box 100, Valley Forge Executive Mall 656 East Swedesford

Valley Forge Executive Mall, 656 East Swedesford Road
 Building #5, Wayne, PA 19087 (215) 293-9600

For More Details Circle (70) on Reply Card

Genieux service corporation of california
 10000 W. BEACH AVE., VENICE, CALIF. 90291 • (213) 821-5080

GENIUX SERVICE CENTERS
 FILMS • PARTS
 ACCESSORIES

Genieux service corporation of new york
 10000 W. BEACH AVE., BOHEMIA, N.Y. 11716 • (516) 567-2424

For More Details Circle (71) on Reply Card



Color, Action, Hands-free Mobility

Combine the finest omnidirectional dynamic boom mike with an equally high performance binaural headphone and you have the superior Sportscaster headset...the Telex CS-90. For live broadcasts, from the station or on remotes, with cue and program monitoring and hands-free convenience. The audience hears every word, clearly, crisply, with crowd noise for background color and atmosphere. Circumaural ear cushions screen out noise in the immediate area so that special acoustic facilities are unnecessary. Supplied with convenient in-line, mike-muting "push-to-cough" switch. The Sportscaster headset. Color, action and hands-free mobility. For complete information please write:

PRODUCTS OF SOUND RESEARCH

TELEX®

COMMUNICATIONS, INC.

9600 ALDRICH AVENUE SOUTH
MINNEAPOLIS, MINN. 55420 U.S.A.

Europe: 22, rue de la Légion-d'Honneur,

93200 St. Denis, France

Canada: Telak Electronics, Ltd., Scarborough, Ontario

For More Details Circle (72) on Reply Card

72

new products

.....
continued from page 71

be used on a tripod, or placed on a window ledge.

The system also can be used as a repeater to transmit greater distances and in the duplex mode. Permits supervisory video and audio to be transmitted to the cameraman at the remote site.

According to American Laser, the signals are of studio quality and NTSC color compatible. The 761 will operate on 1 volt (p-p) composite video signals from TV cameras, VTRs, or demodulated microwave basebands. No license is required. The company reports that the system is affected only by extremely dense fog.

For More Details Circle (100) on Reply Card

Video L-C delay lines

A complete line of passive video L-C delay lines in 75 ohms is being marketed by Allen Avionics. The units are manufactured with toggle and rotary switches, as well as terminals for strappable delay variations.

The series contains 10 variable delay units. The lowest delay is from 0 to 10.5 nanoseconds in .5-nanosecond steps. The longest delay available is from 0 to 2,075 nanoseconds in 25-nanosecond steps. All units feature amplitude flatness to 5.5 MHz, low insertion loss and low signal distortion.

For More Details Circle (101) on Reply Card

Videocassette tape timer

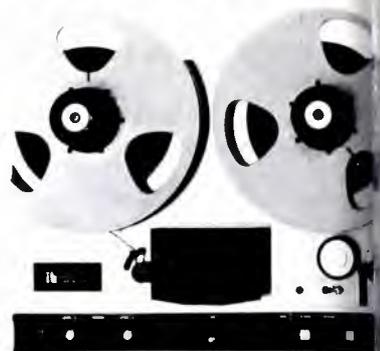
The Artists' Engineering model 300 Autosearch Timer, which displays videocassette tape time in minutes and seconds, interfaces directly with Sony Type 2850 and 2850A videocassette recorders and independently keeps time for both machines. Installation requires no modification and can be done in a few minutes.

Features include: independent record and playback displays; display freeze for logging program on the

IMPORTANT CORRECTION NOTICE

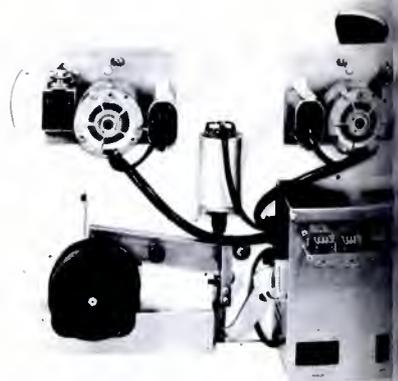
The price of ITC's 750 Series Reproducer was **incorrect** in ITC's ad on page 54 in September, 1977 *Broadcast Engineering*. The correct price for this unit is \$1190.

Profession



ITC's 750 Series Reproducer 1/2 Track Stereo \$1190

- Fully serviceable *in* the equipment rack.
- Straight-line tape threading.
- Complete access to head with flip-top head cover.
- Professional +8 dBm output with 10 dB headroom.
- Safe tape handling provided with differential braking.
- Optional motion sensing/sensing memory.
- ITC's two year warranty.



For more information contact your automation company or call ITC collect at 309-828-1111

INTERNATIONAL TAPETRONICS CORPORATION

2425 S. Main; Bloomington, Illinois

Marketed exclusively in Canada by
McCurdy Radio Industries, Ltd., Toronto

© 1975 by ITC

For More Details Circle (73) on Reply Card

BROADCAST ENGINEER

isplay store for later retrieval; speed search to stored point; update while assemble record; and optional edit preview.

More Details Circle (102) on Reply Card

Deck sequencer

Vista-Matics, Inc. has introduced a vertical interval deck sequencer, the VISA 350, which provides telephonic cassette convenience and being compatible with 3/4-inch video decks. It also can control second switching for as many as six decks.

The VISA 360 automatically re-sets tones of proper time and position in the cue, preroll and record positions; and in the playback mode, automatically cues up to tapes simultaneously. Then, when the first designated tape is started manually or by automatic start, the VISA plays all tapes or tapes in sequence, switching between tapes in the vertical interval. The VISA 360 is available as a stand-alone or standard rack-mount unit, connects to tape machines through their remote control connectors, and can be used with up to six decks as well as up to six.

More Details Circle (103) on Reply Card

25 kw FM final tube

General Electric has designed a Cermolox power tube, RCA 4695, specifically for use in high-gain, high-fidelity FM service. It provides 25 kw of useful power output at 20 dB and 80% overall plate efficiency with a plate supply of 10 kv.

The 4695 is rated for full input to

230 MHz. Its coaxial construction and thoriated-tungsten mesh filament minimize tube inductance and feed-through capacitance. Broad-band circuit cavities may be used. A total tube/cavity pressure drop of 2 inches of water is adequate to give the required 300 cfm cooling air flow. Prototype or production cavity assistance is available.

For More Details Circle (104) on Reply Card

Videotape sequencer

The Videomedia VMC-100 System is a professional approach to sequencing 3/4-inch videotape ma-

chines in a broadcast situation.

The system features: automatic re-cue or program segment advance; auto tape slack; full remote control of vertical-interval, audio-follow video switcher; pulse/re-start (allowing remote break to be made during any sequence of operation); remote status panel indicating which VTR is up; separate bridging switches for monitoring, cueing and engineering checks; and two-tone PLL system for tone cueing and indexing up/down counters.

The single system consists of two to six machines and by cascading

continued on page 74



HEADS NEED RELAPPING? SAVE TIME AND MONEY WITH HANDYLAP™

Magnetic Head Relapping Kit

New from Nortronic... everything you need to recontour worn heads yourself. Nortronic has translated professional relapping techniques into a simple process with step-by-step instructions that eliminates the need to send your worn heads out for relapping. HandyLap includes:

- A rugged, optically flat surface with a special vinyl overlay that produces a high quality face polish
- Three different grades of abrasive lapping film
- A magnifying lens for head inspection
- A support angle to keep heads vertical during relapping
- A head holder to assist in grasping the head

HandyLap... another technical advance from Nortronic that helps you cut back the high cost of downtime while maintaining optimum equipment performance. Contact your local Nortronic distributor.

Recorder Care Division



NORTRONICS

Nortronic Company, Inc.
8101 Tenth Ave North, Minneapolis, Minn 55427
Telephone (612) 545-0401, Telex 290304

For More Details Circle (74) on Reply Card

BUILDS STUDIOS

- *Audio Consoles
- *Studio Cabinetry

Box 1697
Taos, N. M. 87571
505 758-2686

More Details Circle (75) on Reply Card

CATALOG & AUDIO APPLICATIONS

CONSOLES
KITS & WIRED
AMPLIFIERS
MIC, EQ, ACN, LINE,
TAPE, DISC, POWER
OSCILLATORS
AUDIO, TAPE BIAS
POWER SUPPLIES

1033 N. SYCAMORE AVE.
LOS ANGELES, CA. 90038
(213) 934-3566

AMP
BS INC.

More Details Circle (76) on Reply Card

CATALOG

FIND PRECISION TOOLS

3000 Items: pliers, tweezers, wire cutters, etc. Also includes ten "Tool Tips" to aid in tool selection.

JENSEN TOOLS & ALLOYS

1000 N. PRIEST DRIVE - TEMPE, AZ 85281

More Details Circle (77) on Reply Card

ember, 1977

Beau Audio Heads.



A head is a head is a head. Except when it's a Beau Head. And the difference is price. Because at \$24.00 for mono heads and \$74.50 for stereo heads, our units are considerably less expensive than anything else on the market. But they still meet those tough NAB standards and deliver the broadcast quality performance you expect. We stock heads with no mounts, and models with threaded studs and leads, for Ampro, ATC, Beaucart[®], Collins, Garron, Harris/Gates, ITC, RCA, Sonogarron, Sparta, Spotmaster, and other popular cart machines. Where do you get them? Only from the Broadcast Products Division, UMC Electronics Co., 460 Sackett Point Road, North Haven, Connecticut 06473.

UMC

For a complete listing of all Beau Audio Heads with electrical specifications, write for our revised brochure today, or call us at (203) 288-7731.

For More Details Circle (78) on Reply Card

new products

.....
continued from page 73

controllers and more machines, owner can have an indefinite minimum number of machines. system is expandable.

For More Details Circle (105) on Reply Card

Scope rack mount kit

B&K-Precision's RM-14 oscilloscope rack-mounting kit is designed to allow rack mounting of company's models 1474, 1471471B or 1461.

The kit provides everything needed to mount the 5-inch oscilloscope in a standard 19-inch rack, including panel, hardware and component instructions.

For More Details Circle (106) on Reply Card

Video DA

Fung Engineering's model V500B battery-operated video distribution amplifier is designed to meet all broadcast specifications over operating range. It provides identical and isolated outputs from one-looped video input. The unit includes a self-contained rechargeable battery supply.

For More Details Circle (107) on Reply Card

Autoranging digital multimeter

Hewlett-Packard has combined low cost (\$650) with accuracy in a 4½-digit, five-function autoranging digital multimeter. Built for both bench and field use, the model 3466A measures DC from 1 millivolt to 1.2 kilovolts full-scale. True rms AC measurement range is from millivolts to 1200 volts with microvolt sensitivity.

AC and DC current measurement range is from 10 nanoseconds to 10 amps. DC current accuracy for

When accuracy Counts... Count on Belar for AM/FM/TV MONITORS



BELAR
AM MODULATION MONITOR

BELAR CALL ARNO MEYER (215) 687-5550
ELECTRONICS LABORATORY, INC.
LANCASTER AVENUE AT DORSET, DEVON, PA 19333 • BOX 826 • (215) 687-5550

For More Details Circle (79) on Reply Card

Still the industry's MOST WANTED

VIDEO TAPE TIMER

- Bright LED display
- More accurate tape time
- Optional remote display
- Hold button freezes display
- Available for all 2-inch VTRs



RECORTEC, INC. 777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-9367

For More Details Circle (80) on Reply Card

s except the 2 ampere range is
 (5% of reading + 2 counts).
 current is a true-rms measure-
 over a frequency band of 50
 10 kHz with an accuracy of
 1% of reading + 35 counts) on
 ranges except the 2 ampere

istance range is 1 milliohm to
 ohms with a midrange accu-
 y of $\pm(0.3\%$ of reading +
 out). A new diode test measure-
 capability measures forward
 across diode junctions. This
 the 2 kilohm range, which
 vides a 1 milliamp current

More Details Circle (108) on Reply Card

Tape storage unit

Mini Tape Storage Unit from
 Corporation holds 84 RCA
 0 tape cartridges, although it
 only 34" width of wall
 unit can be hung on the wall
 to other units. The
 "quick" cartridge removal sys-
 tem permits fast, accurate tape
 ejection; just tip back adjoining
 latches to grasp and remove
 tape.

More Details Circle (109) on Reply Card

Upper/lower case CRT terminals

Model 400D terminals are now
 available with an upper/lower case
 character display option from Ann
 Terminals, Inc.

The terminal has a 2000 charac-
 ter memory and displays 20-line by
 character alphanumeric. Five
 characters remain hidden in the scrollable
 memory and can be accessed in
 Roll or Scroll modes. Charac-
 ters are written in a 7x10-dot matrix
 or 8x12-dot field. Blinking charac-
 ters, for accent purposes, are
 available. The cursor is displayed
 in the linking field.

Other case options are available to
 provide flexibility in tailoring the con-

continued on page 76

NEW 19 ALL NEW Technics professional audio products in stock at RAMKO RESEARCH!



**Just introduced! Turntables, reel to
 reel recorders, portable and fixed
 cassette R/P units, power amps,
 parametric equalizers, tuners
 and speakers.**

The RS1500 reel to reel recorder that
 outperforms anything in its class. A new
 turntable, SL-1500 MK2, designed specifically
 for the broadcaster. A new portable cassette
 unit that gives the best portable reel to reel

units a run for their money. Power amplifiers,
 parametric equalizers and a series of studio
 monitor speakers that will astound you with
 their amazingly faithful reproduction.

Panasonic pulled out all stops on their
 research and development program for this
 series. Undoubtedly, with the performance,
 quality, and reasonable prices exhibited by
 this audio gear the "Technics" name will be a
 major consideration in your future
 purchasing decisions.

Whatever your needs, RAMKO RESEARCH
 offers a full line of the highest quality audio
 equipment available. Turntables, Tape
 Cartridge machines, a wide variety of
 distribution, mic, line, power and turntable
 preamps. Cassette record play units & reel
 to reel recorders. And of course the most
 advanced broadcast consoles in the industry.

If it's for the studio we have it.
 Write or call collect today for our newest
 catalog and further information on the all new
 Technics "Professional series" audio equip-
 ment. You'll be dollars and performance ahead.

RAMKO RESEARCH

11355 "A" Folsom Blvd.
 Rancho Cordova, Calif. 95670
 (916) 635-3600

For More Details Circle (81) on Reply Card

**ALL SOLID STATE PORTABLE
 MICROWAVE SYSTEM
 SELF CONTAINED IN TWO
 IDENTICAL BATTERY/AC
 POWERED UNITS**

**INTERNATIONAL
 MICROWAVE CORP.**
 33 River Road, COS COB, CT. 06807
 (203) 661-7655 TWX: 710-579-2925

For More Details Circle (82) on Reply Card

VR-MOD for Your VTR

Still the industry's MOST IMPROVED

available

VIDEO TAPE RECORDER

VR-1200	TR-22
VR-2000	TR-70
AVR-2	TR-600

- Faster and gentler shuttling
- Faster lockup, consistently
- Auto-Cue for exact cueing
- Auto-Edit for simple edits
- Prolongs head and tape life

ECORTEC, INC.

777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX 910-339-9367

For More Details Circle (83) on Reply Card
www.americanradiohistory.com

Who builds a simple, effective, reliable, versatile, reasonably priced compressor/limiter with thousands of satisfied users in the AM-FM-TV and Recording industries?

MARTI



CLA-40 Compressor/Limiter

USER SELECTED OPTIONS:

- Symmetrical or Asymmetrical Peak Limiting.
- Pre-Emphasized or Flat Response.
- Selection of Compress Limit, Compress Only, or Compress Off (For Proof of Performance).
- Release Time (3 Ranges).
- Meter Switch Selects Gain Reduction or Output Level.

Construction is modular and all solid state. Two units may be ordered matched for stereo.

\$445.00 Each



For More Details Circle (84) on Reply Card

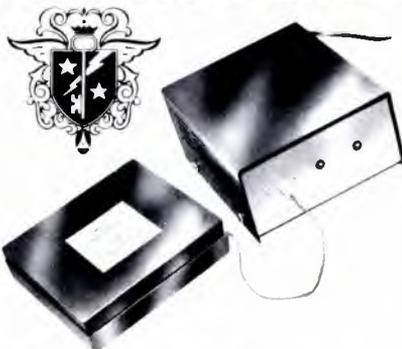
Our only business is the absolute dedication to the distribution of ALL brands and types of audio and video recording tapes—from simple audio cassettes and Fidelity broadcast cartridges through reel-to-reel tapes, U-Matic video cassettes, right up to 2" Quad video tapes.

Please call, write, or circle number indicated for our catalog—the most complete in the industry—and discover the **LOWEST** prices, anywhere.

DIMENSION 3 RECORDING CO.
BOX 326
New Milford, N.J. 07646
(201) 265-5599

For More Details Circle (86) on Reply Card

NICKEL CADMIUM ENG. BATTERIES AND ONE HOUR AUTOMATIC CHARGERS



For ALEXANDER Nickel-Cadmium REPLACEMENT BATTERIES For...

SONY (BP20) — JVC (PBP-1)
AKAI (PACK) — etc.

CHARGERS WILL AUTOMATICALLY CHARGE IN 1 TO 4 HRS. DEPENDING ON CAPACITY... (SWITCHES TO TRICKLE)

Write Wire or Phone

ALEXANDER manufacturing co.

Box 1645 Mason City, Iowa 50401

▷ Phone (515) 423-8955

For More Details Circle (85) on Reply Card

50% OFF

G. E. & Sylvania

STAGE & STUDIO LAMPS

At Sittler's you pay
LIST PRICE LESS 50%

All transportation prepaid on \$100.00 or more net orders. Your satisfaction guaranteed. Order today, or write for Sittler's complete price sheet!

Sittler's SUPPLIES, INC.

702 E. Washington St., P.O. Box 10-A
Washington, Iowa 52353 Ph. 319-653-2123

For More Details Circle (87) on Reply Card

new products

.....
continued from page 75

figuration to a particular application. They include the computer terminal, the desktop terminal without keyboard for serial applications, the C-Case conversion for use with free-standing monitors and keyboards, and R-Case rack-mountable controller.

Other options include 40-character line, double-height character export power and CR/LF optical RS232 data interface and RGB video output for driving auxiliary monitors are standard.

For More Details Circle (110) on Reply Card

Logging recorder/reproducer Magnasync/Moviola Corporation is offering a 4-channel logging recorder/reproducer system incorporating several electronic advancements.

The TR-2004 offers the following features: "Simul-Scan" fail-safe system, square-wave bias technique, in-line vertical tape path, LED channel monitoring, and time multiplexing with high-speed search.

Other standard features include a lockable, plexiglas security door, automatic gain control, voice-activated control, dynamic tape motion control, heavy-duty motors, multi-channel monitoring, and full remote capability.

For More Details Circle (111) on Reply Card

Videocassette tape

Designed for critical applications in ENG, industrial and educational fields, Fuji Photo Film's Beridox tape uses a formulation of tholide iron oxide.



RECORTEC, INC.

777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL: (408) 735-8821 TWX: 910-339-936

For More Details Circle (88) on Reply Card

Still the industry's MOST USEFUL

VIDEO TAPE ADDRESSOR

- Off line time code writer
- Records at 8 times speed
- Writes both control and cue
- Saves VTR time and heads
- Cleans and rewinds tape

3 tapes for 3/4-inch U-matic cassettes are available in 20-minute lengths (KCS-20) and 10-minute lengths (KCS-10).

The tape offers high-sensitivity, wide frequency response, and an improved signal-to-noise ratio.

More Details Circle (112) on Reply Card

Video equipment cart

Hand H Products' Porta-Brace™ is a heavy-duty, adjustable piece of equipment cart. For studio or home use, the Grip has 16-inch spoked wheels, adjustable shelves and axle nuts, and padded bearing surfaces. The standard model, G-1, is compact. The Grip model G-2 has an extra shelf which nearly doubles carrying capacity. Both models are available with accessory cases, tripod holder and light stand.

More Details Circle (113) on Reply Card

Multi-track master recorder

Cosam Audio Corporation has introduced the Telefunken M 15A Multi-track Master Recorder. This machine, available in 8-, 16-, 24- and 32-track configurations, features clocked CMOS logic with Hall effect pushbuttons and solid-state timing throughout.

The indirect capstan drive system incorporates a brushless DC motor with its speed referenced to a quartz crystal oscillator. A mechanical servo system provides constant tape tension in all modes of operation, yet affords editing flexibility. Fast wind speeds are constantly speed variable, while a free LED timer accurately counts in minutes and seconds on a scale of zero.

The machines are available in 15/15 or 15/30 ips speed configurations and have a tape capacity of 120 inches, equivalent to 3300 feet of standard tape.

More Details Circle (114) on Reply Card

Legible Characters Enhance Quality

- Title window. One or two lines. Vertical interval switching between pages.
- Page roll.
- Crawl display.
- Character blink.
- Preview and program functions independent.
- Improved Crawl Control
- Isotropic Font Enhancement.
- 16 page memory. Each page consists of 8 lines with 16 characters/line.
- 2 character sizes. 18 or 36 scan lines selectable. Excellent legibility.
- Keyed titles. Stores up to 72 single line titles or 40 double line titles. Self-keying.
- Auto Bypass

Model 505 Videotypewriter



SHINTRON World Wide

Cambridge, MA 02142 U.S.A. Phone 617-491-8700 Telex 921497

For More Details Circle (89) on Reply Card

Electric Rain Gauge

Model 525

Now you can report minute-by-minute rainfall amounts and not get wet! This new, low cost, remote-reading gauge shows announcer rainfall accumulations in 1/100 inch increments. Transmitter can be located several hundred feet away and is completely automatic—needs no service or attention. Ask for Spec. Sheet, Model 525. Free.

Also, a complete line of
Texas Weather Instruments

Texas Electronics, Inc.
P. O. Box 7225B (214) 631-2430
Dallas, Texas 75209



For More Details Circle (90) on Reply Card

Still the industry's MOST NEEDED

VIDEO CASSETTE EVALUATOR

- High speed cassette tester
- Edge damage counter
- Gross error counter
- Measures cassette length
- Still useful as recorder



RECORTEC, INC.

777 PALOMAR AVE., SUNNYVALE, CA 94086 TEL (408) 735-8821 TWX 910-334-0367

For More Details Circle (91) on Reply Card

www.americanradiohistory.com

advertisers' index

ADC Products	7
A. F. Associates	53
Acrodyne Industries, Inc	28
Alexander Mfg. Co	76
American Information Services	83, 85
Amperex Electronic Corp	21
Ampex Corporation	36, 37
Ampro Broadcasting, Inc	40
Andrew Corporation	41
Angenieux Corp. of America	71
Audio Design & Mfg	11
Audio-Video Engineering Co	85
The BTX Corporation	50
Belar Electronics Lab, Inc	74
Broadcast Electronics, Inc.	65
Broadcast Equipment Leasing Company	87
Broadcast Products Division UMC Electronics Co	74
Cannon USA, Inc	23
Cetec Broadcast Group	5
Chyron Telesystems	28
Cleveland Institute of Electronics, Inc.	87
Commercial Electronics, Inc	31
Communication Medias	70
Computer Magnetics Corp	70
Continental Electronics Mfg. Co	56
Datatek Corporation	51
Dimension 3 Recording Co	76
Di-Tech, Inc	57
Dyma Engineering, Inc	73
Dynair Electronics, Inc	17
Dynatech Data Systems	26
ESE	63
Electrohome Ltd	55
Farinon Electric	44, 45
Garner Industries	81
Grass Valley Group, Inc	3
David Green (Broadcast Consultants)	66, 67
Harris Corporation	38
Heath Company	85
Hughey & Phillips Inc	26
Inovonics Inc	14
International Tapetronics Corp	57, 60, 68, 72
Jensen Tools & Alloys	73
Key Personnell	80
LPB Inc	16
Leitch Video Ltd	43
3M Magnetic Tape/MBU Video Tape	18, 19
Marti Electronics	76
Micro Consultants, Inc	29
Micro Control Associates, Inc	69
Microtime, Inc	33
Nortronics Co., Inc	73
Opamp Labs, Inc	73
Orban/Parasound	56
Otari Corporation	71
Pacific Recorders & Engineering Corp	10
Panasonic, Technics Professional Series	25
Philadelphia Resins Corp	62
Philips Broadcast Equipment Corp	15, 81
Potomac Instruments, Inc	61
QRK Electronics Products	63
Ramko Research	27, 75
Recording Supply Co	69
Recortec Inc	74, 75, 76, 77
Howard W. Sams	81, 83
Sennheiser Electronic	64
Shintron Company, Inc	16, 77
Sittler's Supplies, Inc	76
Eric Small & Associates	87
Sono-Mag Corporation	58
Sony Corporation of America	8, 9
Sound Technology	1
Stanton Magnetics Inc	32
Stantron, Div. of Wyco Prod	87
Studer Revox America	13
Sun Information Services Co	71
TDK Electronics Corporation	35
Tele-Cine Inc	67
Telecommunications Industries Ltd	85
TeleMation Inc	39
Telex Communications, Inc	14, 54, 72
Texas Electronics, Inc	77
Thor Electronics Corp	83
Time & Frequency Tech, Inc	Cover 3
UMC Electronics Co	74, 59
Van Ladder, Inc	83
Video Aids Corp. of Colorado	24
Vital Industries Inc	Cover 4
Ward-Beck Systems, Ltd	Cover 2
Wilkinson Electronics, Inc	12, 69
Yamaha International Corp	49

profession services

VIR JAMES

CONSULTING RADIO ENGINEERS
Applications and Field Engineering
Computerized Frequency Surveys
345 Colorado Blvd.
Phone: (Area Code 303) 333-5562

DENVER, COLORADO 80206
Member AFCCE

MIDWEST ENGINEERING ASSOCIATION

Consulting Engineers

6934 A N. UNIVERSITY
PEORIA, ILLINOIS 61614
(309) 692-4233
Member AFCCE

James Tiner, *President*

TINER COMMUNICATIONS SERVICE, INC.

"We Specialize in Towers"
Complete Tower and Antenna
Installation and Service

P. O. Box 3827, 15201 Hickman Road
Des Moines, Iowa 50322 (515) 278-54

Joseph & Donna Roizen VIDEO CONSULTANTS

International TV Systems
Marketing/Technical Writing
800 Welch Rd., Suite 354
Palo Alto, Ca. 94304
Tel: (415)326-6103

SMITH and POWSTENKO

Broadcasting and Telecommunications
Consultants

2000 N. Street, N.W.
Washington, D. C. 20036
(202) 293-7742

W. H. BRADLEY, P.E. B. L. BRADLEY, BS/EE

Consulting Radio Engineer
Engineering Applications
& Field Engineering

Phone: 918-245-5444
300 West 41 Street.
SAND SPRINGS, OKLAHOMA, 74063

RALPH E. EVANS ASSOCIATES CONSULTING COMMUNICATIONS ENGINEER

216 N. Green Bay Road
Suite 208

Thiensville, WI 53082
Phone: (414) 242-6000 Member AFCCE

Applied Video Electronics, Inc.

STUDIO SYSTEMS DESIGN AND INSTAL-
LATION ENGINEERING. REFURBISHING/
MODIFYING COLOR CAMERAS AND
QUADRUPLEX VIDEO TAPE RECORDERS.

Post Office Box 25
Brunswick, Ohio 44212
Phone (216) 225-4443

Advertising rates in Classified Section are 25¢ per word, each insertion, and must be paid by cash to insure publication. Initial or abbreviation counts a full word. Minimum classified charge, \$2.00.

Replies on which replies are sent to us for blind ads, there is an additional charge of \$3.00 per insertion, to cover department processing of replies, and mailing.

Classified columns are not open to advertising products regularly produced by manufacturer unless used and no longer owned by manufacturer or a distributor.

EQUIPMENT FOR SALE

BROADCAST CRYSTALS for AM, FM, or TV transmitters. Frequency change, repair or replacement oven types. Also new vacuum tubes for Radios, Collins, etc. transmitters. Quality products at reasonable prices and better delivery! Offered without a spare crystal. Frequency standard service for AM and FM frequency transmitters. Over 30 years in the business. Eidson Electronics Co., Box 96, Temple, Texas, 76501. (817) 773-3901. 12-74-tf

BROADCAST AND STUDIO EQUIPMENT. New and used. Cart and reel recorders, consoles, graphic equalizers, monitors, mic's, turntables, preamps, racks, furniture, reconditioning services (including PT6). Authorized Spotmaster distributors. Contact us for best prices and in-deal deals. AUTODYNE, P.O. Box 13036, Jacksonville, Fla. 32209, (305) 855-6868. 9-77-tf

BROADCAST SPARE PARTS for 500 system transmitters. SESCO Inc., Mt. Vernon, WA 98273, (206) 461-333. 10-77-4t

STEREO AUTOMATION. Four years old, in excellent condition with spare parts. Available for sale. Consists of five rollouts, ten voice channels, one mono 48 tray Instacart, 16MB DA MOS memory with battery backup, remote control, 364J logger, SMC 382A time delay timer, two SMC 250 sequential carousels, remote encoder, ten step music sequencer, microphone, three racks, 500 system control console. Price is \$15,000 or best offer. Original price \$20,000. Contact Robert Royster, CE, KIFM, San Diego, (619) 560-9836. Went Live. 11-77-1t

CIRCUIT BOARDS—Refurbished boards, specs to original manufacturers. All boards sold in excellent condition. Custom modification and installation available. For more info write: North American Broadcast, P.O. Box 26, Potsdam, NY 13676. 11-77-1t

MAGNA TECH double dubbers (3), extra 8000 Forelco projector parts and pulsators; equalizers, rewinds, splicers, loop boxes. (816) 466-5. Dept. 398, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212. 11-77-1t

3003 DIGITAL TBC with six line floating equalizer drop-out compensator, and heterodyne processing. Operates at 4 times subcarrier frequency. Complete with internal Leitch broadcast sync generator with gen lock and all drives included. The sync gen has a proportional oven standard. Auto color phasing to correct timing field VTR lock-up or wrong field edits. Heterodyne luminance/chroma delay correction features are included. Also included is microprocessor logic board for providing gen lock drive for non-capstan servoed VTR's. Unit works extremely well with external modified Sony VO-2850A VTR's and is in excellent working condition. List price is \$10,000. Priced for quick sale at over 40% off list price. Call Video Associates, Inc., Austin, TX (512) 345/8860. 11-77-1t

EQPT. FOR SALE (Cont.)

MOTORS FOR SPOTMASTERS

NEW Paps hysteresis synchronous motor HSZ 20.50-4-470D as used in series 400 and 500 machines. Price \$49.00 each prepaid, while they last. 90 day warranty. Terms check with order only, no COD's. Not recommended for Tapecaster series 600 or 700.

TAPECASTER TCM, INC., Box 662
Rockville, Maryland 20851

1-72-tf

MICA AND VACUUM transmitting capacitors. Vacuum relays. Large stock; immediate delivery. Price lists on request. SURCOM ASSOCIATES, 305 Wisconsin Ave., Oceanside, Ca 92054, (714) 722-6162. 3-76-tf

RAZOR BLADES—Single Edge, Tape Editing, Raltec, 25884B Highland, Cleveland, Ohio 44143. 4-77-12t

CARTRIDGE LABELS: New, non-smear pressure sensitive labels. Fits all cartridges. Comes white & 4 colors. Write for FREE sample—MASTERTONE COMPANY, 1105 Maple, West Des Moines, Iowa 50265, (515) 225-6122. 8-77-tf

IKGAMI HL-33A1 ENG CAMERA, complete with batteries & accessories. Latest version, low hours mint condition. (212) 759-2515. 11-77-1t

ONE RCA TA-19 PROC. AMP. complete with SUBCARRIER REGENERATOR module only \$1,300.00. 10 day trial checkout OK! David Castellano, 209-466-6981. 11-77-2t

IF YOU OWN AN RCA TT-10, 25, 50, I have a complete inventory of over 200 unused parts. Free list. David Castellano, 209-466-6981. 11-77-2t

THIS IS YOUR CHANCE to go E.N.G. with "Broadcast (three Plumbicon) Quality" at a fraction of normal cost. ENG—2 Camera/Backpack including Genlock Sync generator, Encoder, AC power, Battery Pack, Charger. Brand New, Fully Tested. Including full warranty. Broadcast Plumbicons: \$18,750.00. Lenses 6X: \$850.00, 10X: \$3,225.00. LDH-1 Color Cameras, PCF 701 Telecine, Prism Multiplexer, Timebase Correctors Model 220, 280 and TBC for IVC 960. Angenieux 10 X 14 E. f. 1.7 with Ampex BC230 mount, including Extenders. Canyon Associates, 1355 Driftwood Drive, Palm Springs, Calif. 92262. (714) 327-3330, Telex 67-6341. 11-77-1t

TRAINING

FIRST PHONE in six to twelve weeks through tape recorded lessons at home plus one week personal instruction in Boston, Philadelphia, Detroit, Atlanta, St. Louis, Seattle or Los Angeles. Our twentieth year teaching FCC license courses. Bob Johnson Radio License Preparation, 1201 Ninth, Manhattan Beach, Calif. 90266, Telephone 213-379-4461. 8-75-tf

GET YOUR FIRST TO GET THERE FIRST! DON MARTIN SCHOOL OF COMMUNICATIONS! Since 1937, training Broadcasters for Broadcasting! 1st Phone training using latest methods and completely equipped Transmitter studio. Call or write for details and start dates. Don Martin School, 7080 Hollywood Blvd., 5th floor, Hollywood, CA 90028. Call (213) 462-3281 or (213) 657-5886. 8-75-tf

PASS FCC first and second class exams with new 21-lesson, 450-page course. Starts with basic electricity. Over 600 FCC-type, multiple-choice questions and sample exams included. No previous technical knowledge required. Commercial Radio Operator Theory Course, #15-01. Only \$5.95. Ameco Publishing, 275G Hillside Ave., Williston Park, N.Y. 11596. 8-72-tf

PASS FCC EXAMS with Ameco books. Each book contains FCC questions plus simplified answers plus FCC-type exams and answers. 3rd class includes broadcast endorsement \$1.25. 2nd class \$2.50, 1st class \$1.60. Free catalog. Ameco Publishing, 275G Hillside Ave., Williston Park, N.Y. 11596. 8-72-tf

TRAINING (Cont.)

REI offers intensive but quality instruction for 1st and 2nd class FCC license preparation. State approved for Veterans training. Student housing. Free brochure. 2402 Tidewater Trail, Fredericksburg, Va. 22401 or Phone 703-373-1441. 7-77-8t

GRANTHAM'S FCC LICENSE STUDY GUIDE—377 pages, 16 FCC-type practice tests, 1465 questions with answers and discussions—covering third, second, and first class license exams. \$13.55 postpaid. GSE Publications, 2000 Stoner Ave., Los Angeles, CA 90025. 10-77-tf

ELECTRONICS DEGREE by correspondence. No commuting to class. Study at your own pace. Begin with basics and continue, first for A.S.E.T. and then for B.S.E.E. For free brochure, write: Information Desk, Grantham College of Engineering, 2000 Stoner Avenue, Los Angeles CA 90025. 10-77-tf

SERVICES

FREQUENCY MEASURING SERVICE—WE'RE #2—MONITOR REPAIRS—MOBILE UNIT—covers Northern 3/4 Ill., Eastern Iowa, Eastern Minn., Southern 3/4 Wis., Western Mich., and Western Ind., monthly. Radio Aids, 528 Ravine Ave., Lake Bluff, Illinois 60044, (312) 234-0953. 2-74-tf

COMMERCIAL RADIO MONITORING CO. Precision frequency measurements since 1932. Local and mobile service covering entire midwest plus. Test instruments, counters, monitors repaired and certified. Lee's Summit, Mo. 64063 (816) 524-3777. 9-74-tf

ONE STOP FOR ALL YOUR PROFESSIONAL AUDIO REQUIREMENTS. Bottom line oriented. F.T.C. Brewer Company, P.O. Box 8057, Pensacola, Florida 32505. 7-71-tf

HELIX-STYROFLEX. Large stock—bargain prices—tested and certified. Write for price and stock lists. Sierra Western Electric, Box 23872, Oakland, Calif. 94623. Telephone (415) 832-3527. 1-73-tf

BUILD YOUR OWN TV AND RADIO PRODUCTION EQUIPMENT. Easy, inexpensive, (mostly IC). Plans or kits: Special Effects Generator, Automatic Logger, Vertical Interval Video Switcher, Solid State Lighting Board, Preset Audio-Video Board, Preset Lighting Board, Crystal Controlled Wireless Mikes with Matching receivers. Subsonic Tone Control for audio tapes, 8MM SOF Cameras and Projectors, Distribution Amplifiers (Sync. Video, Audio), Audio Control Boards (Studio & Remote) Proc-Amp with compensation and regeneration for adapting Helical Scan VTR's to broadcast standards. PLUS specialized correspondence courses in TELEPHONE Engineering (\$39.50), and Integrated Circuit Engineering (\$49.50). Plans from \$5.95 to \$15. SUPER CATALOG plus years updating of new devices Air Mailed \$1.00. Don Britton Enterprises, P.O. Drawer G, Waikiki, Ha 96815. 5-77-32t

CARTRIDGE RECONDITIONING SERVICE: CLEANING—NEW PARTS—NEW TAPE 12 Years Experienced Personnel. Write for additional information & prices sheet. MASTERTONE COMPANY, 1105 Maple, West Des Moines, Iowa 50265, 515-225-6122. 8-77-tf

SPECIALIZING IN FM STEREO STATION construction, recording studios, and production facilities. Total system design. Limited manufacturing. Namminga Engineering, Box 1494, Sarasota, Florida 33578, (813) 366-1756. 9-77-3t

TOWER PAINTING AND LIGHTING: Service and maintenance contracts offered. Pioneer Tower Service, P.O. Box 253, Carrollton, Missouri 64633. 9-77-tf

CANYON ASSOCIATES, VIDEO CONSULTANTS, your address for Service, Updating or Reconditioning of Broadcast Color Cameras. (714) 327-3330, Telex 67-6341. 11-77-1t

HELP WANTED

ENGINEERING OPPORTUNITIES

(Coast to Coast)

We specialize in the placement of well-qualified people in the Engineering fields of Broadcasting, Equipment Manufacture and Audio/Video Systems. Openings at all locations—all levels. Confidential, no cost to applicant. Employer inquiries invited. Send your resume, including salary history and requirement to Alan Kornish, Key Personnel, 116 S. Main St., South Main Towers, Wilkes-Barre, Pa. 18701 (717) 822-2196

WANTED

WANTED: All surplus broadcast equipment especially clean A.M. & F.M. transmitters, capacitors, 112 Clark & Potomac Phase monitors, Field Strength Meters, etc. High prices. All custom duties paid. Surplus Equipment Sales at 2 Thorncliffe Pk. Dr., Unit 28, Toronto 17, Ont., Canada (416) 421-5631. 1-76-1f

WANTED: Pre-1926 radio equipment and tubes. August J. Link, Surcom Associates, 305 Wisconsin Ave., Oceanside, Ca. 92054, (714) 722-6162. 3-76-1f

WILL PURCHASE FOR CASH any of your excess tubes—transmitting, camera types; anything in good condition, including lamps and electronic parts. Write to: S & M Associates, 1231 Water-view Street, Far Rockaway, N.Y. 11691. 4-77-eot-6t

USED AUDIO BOARDS—and other audio equipment wanted. Top dollar paid. Junk welcome. Send information and condition on equipment to: North Country Broadcast, P.O. Box 26, Potsdam, NY 13676. 11-77-1t

PHILIPS PC-72 CAMERAS wanted. CANYON ASSOCIATES, (714) 327-3330, Telex 67-6341. 11-77-1t

HELP WANTED (Cont.)

TELEVISION TECHNICIAN: Immediate opening at public TV station at West Virginia University located seventy miles south of Pittsburgh, Pennsylvania. Must have 1st FCC and color broadcast TV experience in operation and maintenance. Send resume along with salary requirements to: Jack Podeszwa, Personnel Officer, West Virginia University, Morgantown, West Virginia 26506. An Equal Opportunity/Affirmative Action Employer M/F. 11-77-2t

ENGINEER, MAINTENANCE: Studio, transmitters, ENG. KFMB AM, FM TV. Send resume to: KFMB, P.O. Box 80888, San Diego, California 92138. ATTN: John Weigand. 11-77-2t

TV MAINTENANCE/OPERATIONS ENGINEER—For top 10 Indie Quad and Helical VTR, Switching, Video, Projection. 3 years experience and 1st phone required. M-F and Equal Opportunity Employer. Dept. 396, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212. 11-77-1t

MATV INSTALLERS. Want more profits with less headaches? Information \$5.00 (free with MATV letterhead). Box 809, Boynton Beach, Fla. 33435. 11-77-eot-1f

STUDIO ENGINEERS: We are building new studios; install and maintain vital switcher, TR600 VTR's, weather radar, and ENG equipment. Excellent opportunity. Contact Chief Engineer, P.O. Box 3687, Lafayette, Louisiana 70502. 11-77-2t

MAINTENANCE ENGINEER: Experienced in AM, FM stereo, cable TV equipment. First phone and minimum 3 years experience preferred. Send resume to: Mass Communication Department, University of Texas at El Paso, El Paso, Texas 79968. An equal opportunity, affirmative action employer. 11-77-1t

HELP WANTED (Cont.)

R. F. SYSTEM'S DESIGN ENGINEER. Responsibility will consist of system design, ins. supervision, FCC and FAA application, installation and system testing of multi-unit teletypewriter systems within New York State. Requirements: 1st class radiotelephone BSEE with three years experience or Asst. Degree with six years experience or combination of 12 years military or commercial experience. Background shall include a minimum of 5 years experience as system design or inst. technician working with television transmission transmitters or microwave transmission. Salary: \$17,000+. Send resume to: Education Department, Room 325 EB, New York, 12234. ATTN: William Humphreys

TELEVISION—CCTV Video Maintenance Technicians. Full Benefits. Greater New York, County or New Jersey Area. Send resume to: VPC, P.O. Box 268, New Hyde Park, N.Y.

BROADCAST PRODUCTION, post-production facility in San Francisco area seeks chief engineer, maintenance engineer, video tech and CMX editors. Send resume to Dept. Broadcast Engineering, Box 12901, Overland Park, KS 66212.

STUDIO MAINTENANCE ENGINEER—New cameras, cart tape—Southeast—Salary open. Bob King (404) 324-6471. Equal Opportunity Employer. 11-77-1t

SITUATION WANTED (Cont.)

CHIEF ENGINEER seeking position in W. U.S. Experience in Major Market 50 Kw AM FM. Strong background in construction maintenance. Dept. 397, Broadcast Engineering, P.O. Box 12901, Overland Park, Kansas 66212. 11-77-1t

Help!

Anytime you have a question about your subscription to Broadcast Engineering, please include a mailing label to insure prompt service on your inquiry.

Change of Address

If you're about to move, please let us know approximately four weeks before the move comes about. Simply affix your present label here, and carefully print the updated information below.

AFFIX LABEL HERE

Please Help Us to Serve You Better

Broadcast Engineering
P.O. Box 12901
Overland Park, KS 66212

Name _____
(Please Print)

Employer _____

Address _____

City _____ State _____ Zip _____



"Yes, we can hire you if you don't mind starting at the bottom."

IT GROWS ON YOU!



Whatever matter what size your station, or how fast you're growing, TFT has a digital remote control system that can fit your budget and grow right along with you.

It's called the TFT 7600 System.

It's Expandable. The root of 7600 is the Model 7610, 15 Channel Raise/Lower System. Add Model 7615 Direct Control and Status Monitoring System and you have 15 more digital controls and 15 more status indicators. Now add Model 7620 or 7630 Channel Expander at the remote control and you increase the Raise/Lower control capability up to 3 fold. Several Expanders may be added to provide up to 110 channels of digital remote control and status indication. Finally, the Model 7640 Multiple Channel Data Display adds the digital display capability for simultaneous meter readings plus Limit Alarms and Automatic Logging.

It Saves Operating Costs. Your weekly calibration can be performed by one person. Also, several different remote controls can be operated by one person from a single control point.

It's Reliable. Proprietary TFT double-scan-compare digital data filtering plus parity check ensures highest possible data integrity throughout the system.

It's A.T.S. Compatible. Full provisions for A.T.S. (Automatic Transmission Systems) are built into the TFT 7600 System. An A.T.S. Override is also provided.

It's Wire or Wireless. TFT 7600 is designed to operate on either a voice grade phone line or STL and TSL transmission links.

It's Economical. Now you can have a full digital remote control system at competitive prices to analog, and at *about half the cost* of other digital systems.

As with all TFT broadcast products, engineering excellence is the key to acceptance. That's why, in the 9 months since TFT 7600 was introduced, over 60 systems have been delivered and are now handling the remote control needs of every size radio and TV station throughout the country.

Plan for your growth potential now, with the flexible TFT Model 7600 Digital Remote Control System. For full information, call or write TFT. In Canada, call C.C.A. Caldwell (800-261-4088)

TFT

TIME AND FREQUENCY TECHNOLOGY, INC.

3000 OLCOTT STREET, SANTA CLARA, CA 95051 (408) 246-6365 TWX No. 910-338-0584

For More Details Circle (2) on Reply Card

www.americanradiohistory.com

4 Nippon-Grass Valley DVEs



or

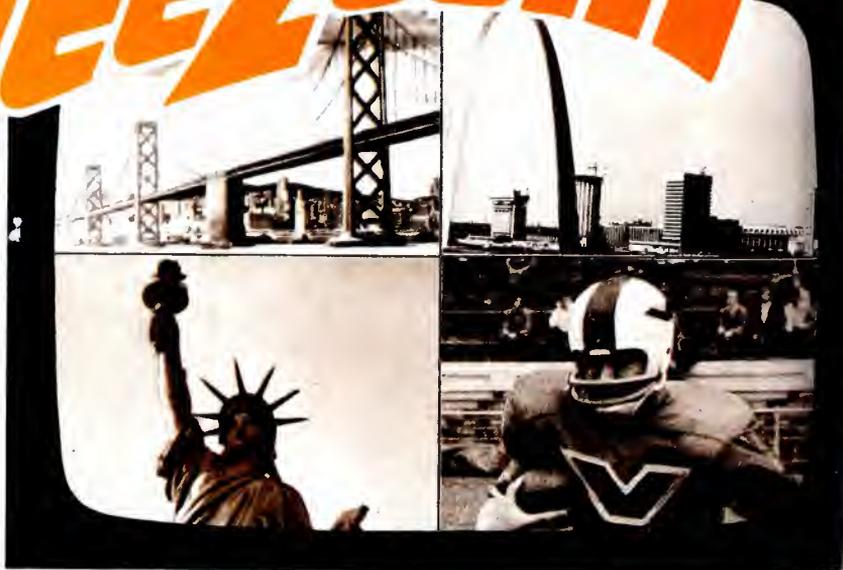
4 UK Micro-Quantels



don't make a

SQUEEZOOM

the only
4 in 1
frame store
synchronizer



American technology prevails at NAB 77. Vital introduces for the first time in TV history the only four input frame synchronizer through digitization of video signals. In 1974 Vital introduced the Digital effects for video switching and is holder of Patent Numbers 3 821 468 and 3 758 712.

The "Squeezoom" opens new vistas in television production both in real time use or post production.

You will not be locked out with one video channel "Squeezoom." Add other channels as you wish. Too many exciting features and applications to describe. Call us toll free 1-800-874-4608.

SQUEEZOOM VMU-1

- Synchronizes up to 4 non-synchronous NTSC color video signals simultaneously to studio sync.
- Continuously corrects variations in subcarrier phase from remotes or doppler effects from satellite transmissions.
- Full frame real time compression and zooming of pictures to any size.
- Joystick positioners place up to 4 compressed pictures anywhere on the screen.
- Microprocessor control for wider mode of operation.
- Real time freeze frame. ● Zero delay in switcher.
- Horizontal and vertical compression yield multiple effects.
- Eliminates tedious use of chroma keys in most cases.



HI TECHNOLOGY PRODUCT INNOVATORS

VITAL INDUSTRIES, INC.

MAIN OFFICE: 3700 N.E. 53rd Ave., Gainesville, Fla. 32601 U.S.A. • Tel.: Area 904-378-1581

MORRELL BEAVERS Midwest
2644 North Seventh St
Terre Haute, Indiana 47804
Phone 812 466-3212

ROBERT McALL Northeast
34 Autumn Lane
Hicksville, N Y 11801
Phone 516 735-0055

GORDON PETERS Southwest
P O Box 912
Arlington, Texas 76010
Phone 817/261-6855

ERIC KING Southeast
Fox Hill Road
Lynchburg, Va. 24503
Phone 804/384-7001

BARRY HOLLAND West Coast
7960 West Beverly Blvd.
Los Angeles, California 90048
Phone 213/653-9438

For More Details Circle (3) on Reply Card