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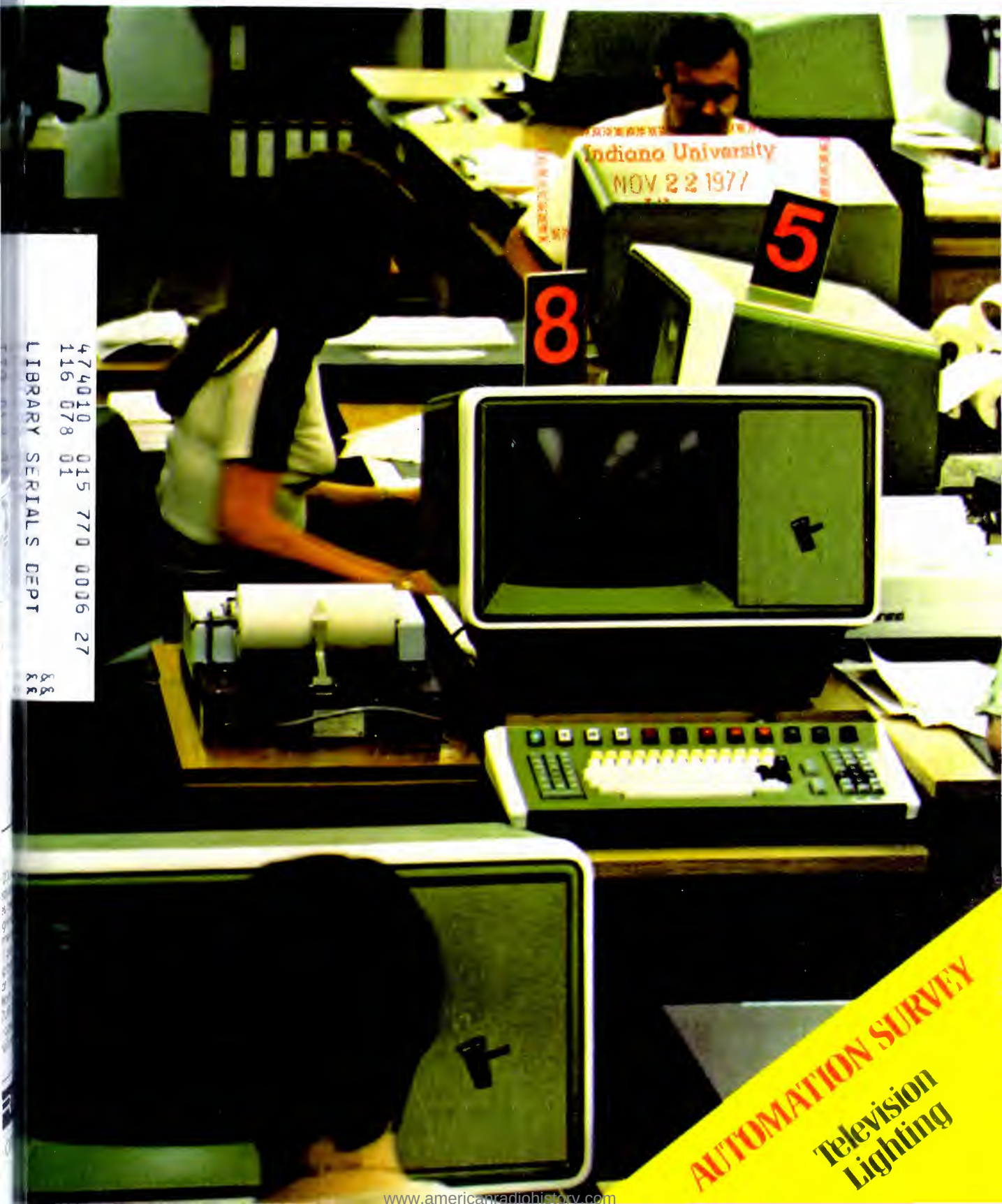

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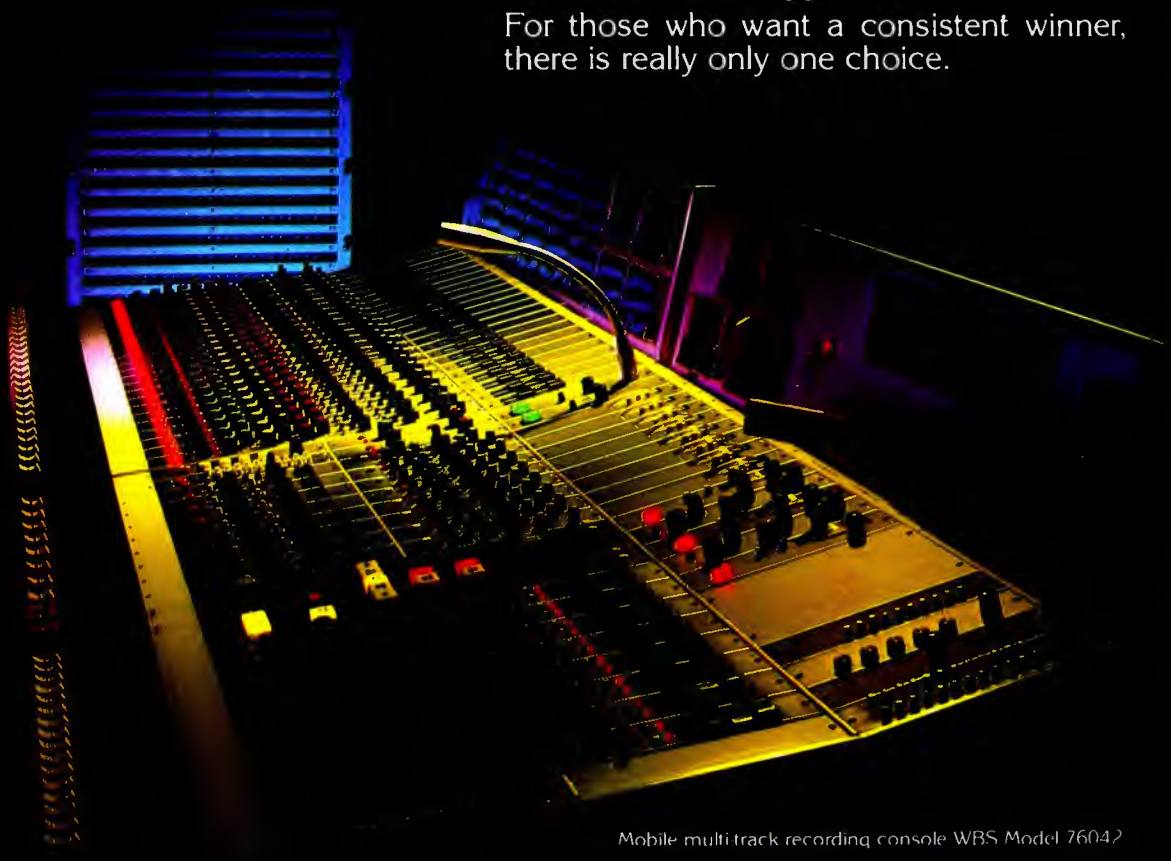

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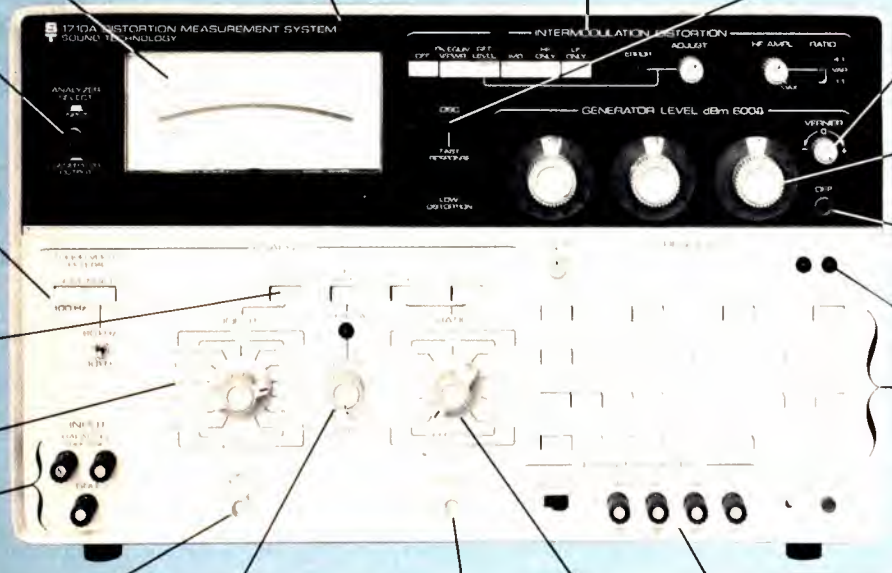
Here's how useful a distortion analyzer can be



voltage, power, dis- r dB ratio.

generator signal at h the push of a

le 18 dB per oc- rs reject hum and quency noise.

hbutton operation set level, measure r power, then mea- ortion.

voltage or power Hz to 110 kHz.

Balanced Input.

out signal on a

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%.

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View distortion products on a scope.

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

of the above features are so outstandingly ble that we especially invite your attention m.

e is the fast, easy measuring you get with button-selected distortion-measuring circuits al source and measuring circuits are simul- usly selected with the **same** pushbuttons). uttons make it so simple to measure quickly o repeat measurements.

condly, you can drive virtually any type of t 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.

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November, 1977 ☐ Volume 19 ☐ No. 11

BROADCAST ENGINEERIN

The journal of the broadcast-communications industry

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About the cover

Our cover photo this mont
was taken in the newsroo
Radio Free Europe's facilit
Munich. The article explair
RFE's switch to automatio
begins on page 22. [*Photo
courtesy of Megadata*].

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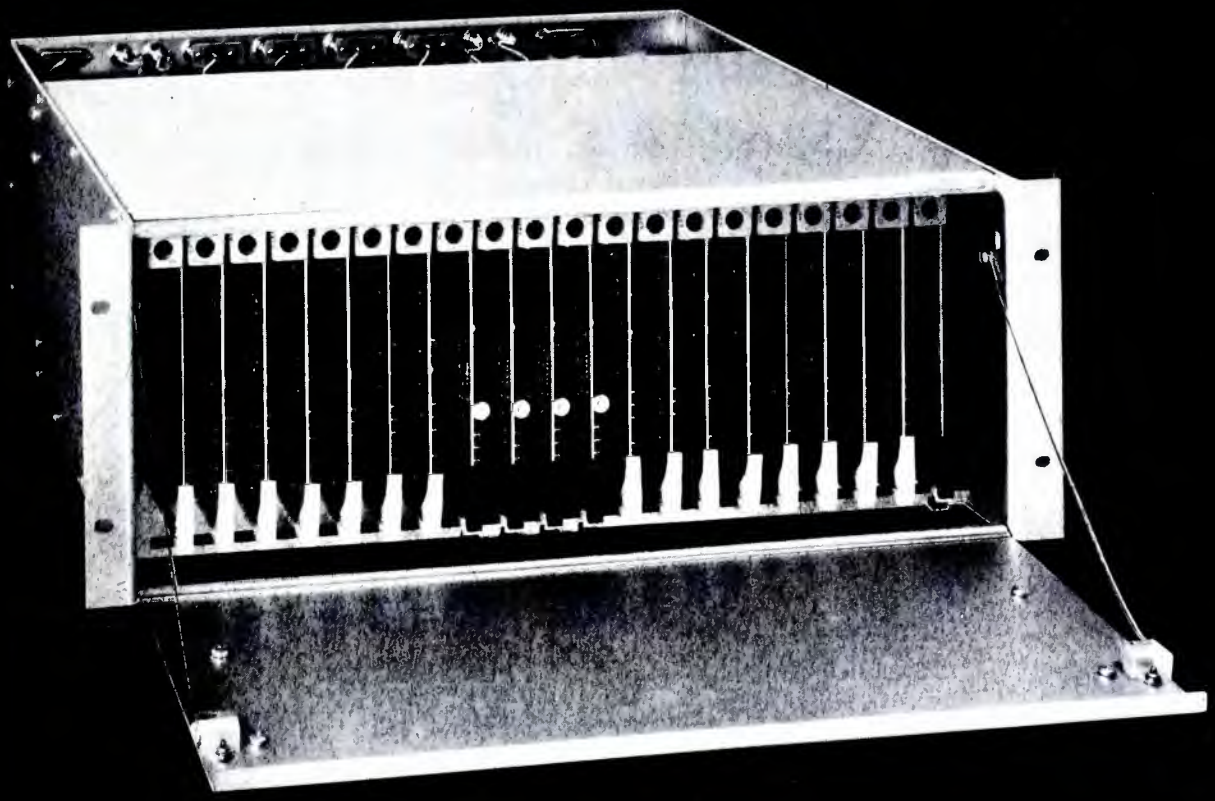

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DIRECT CURRENT FROM D.C.

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 ar

continued on pag

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eries 7000.

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processor complement to the 900 Series
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h is constantly displayed. And the display

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ly make changes, updates, and special event
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re. A 7000 Series built-in safeguard is

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

upgrading with expandable memory,
tion of CRTs for remote locations, and
puter 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.

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DIRECT CURRENT FROM D. C.

continued from page 4

that several other equally close approximations find occasional u
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 su 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 Broad casting (CUB) to restore UHF channels 70-83 for assignment to new television translators. These channels were withdrawn from trans tor service when the upper portion of the UHF television broadcas band was reassigned to the land mobile services although existing translators have been permitted to continue operation on the basi 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 55-6 which are preferred for new UHF television translators, but also channels 14-54 where translator operation is permitted if higher channels are not available. However, the Commission concluded th most translator assignments could be made on channels 14-69 and e pressed 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 th 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 pain on your tower is truly International Orange...Unattended operatio of FM translators is now permitted, the same as TV...All commer- cial radiotelegraph operators certificates issued after January 1 1978 must bear the photograph of the holder...Part 17 of the Comm sion's Rules governing painting, lighting and marking of radio an television towers has gone metric, with dimensions and requiremen being stated in the metric system.

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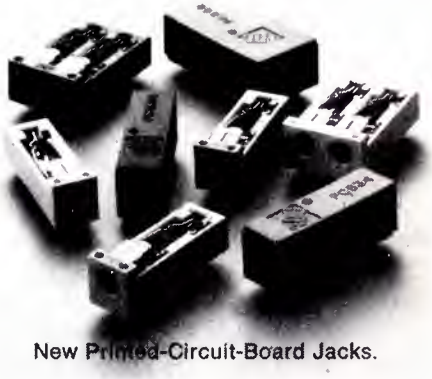

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Assembled Panels.

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
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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 fiel 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-inte not recorded on the video track, plus an adeq overlap.

For those users not requiring the informa contained in the sync track, the format allows omission of this track. However, no other informe 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 sepa record and erase heads for both the video and s tracks. In addition, it provides for optical featu such as video and sync confidence heads and an a matic tracking head. When a particular head is used, a dummy head tip will be provided in its pl to minimize velocity errors.

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

continued on page

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 continued from page 10

Audio tracks

Three longitudinal audio tracks of equal w provide for three program quality audio channels. two adjacent audio tracks can be used for ste audio or for two separate audio signals. The t audio track can be used for time code, cuing purp or an additional audio channel. In addition separate control track has been provided t identifies the odd and even fields and alter frames. All longitudinal tracks are recorded at same position perpendicular to the edge of the t and downstream on the tape path.

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

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

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

Roizen elected RTS Fellow

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

Roizen is only the third American to be so hono in the 50-year history of the world's oldest televis society. The citation, read by John Ware, cour chairman of the RTS, reviewed Roizen's techni developments in the field of videotape editing e color TV recording as well as his many contributi to the Society in the area of symposium lectures a journal articles.

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

Joe Roizen (center) receives the citation from John Wa RTS council chairman, as Donna Foster Roizen watche

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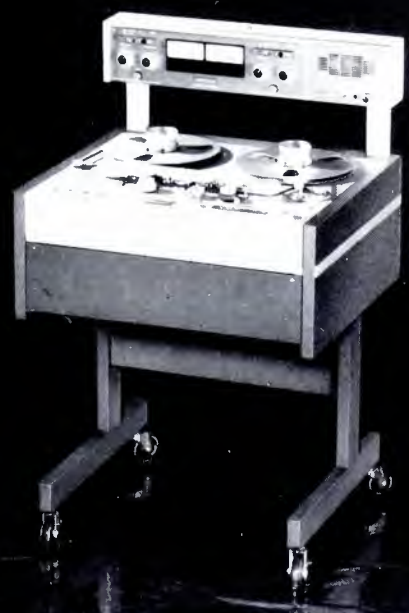
Studer introduces the A80/RC

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:

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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 cons tionally be imposed on nonc mercial stations when there wa similar regulation for comme stations.

Since implementation of the rules covering Section 399 several noncommercial educati stations had sought judicial rev contending the Act and FCC v impinging on their freedom of pression in direct violation of First Amendment.

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

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LDK-11 is an ENG and EFP Camera.

unique Philips camera that everyone thinking ENG *and* roduction. The one camera es *both* without compromising or operational features. One many innovations that has Philips its reputation as "the ISION company."*

clusive Philips design and per ce, the LDK-11 outperforms mini" and "micro" ENG-Only s. It is lightweight, battery or vered, totally portable and operate for ENG; with full pro control either remotely or at ckpack. Yet the LDK-11 rates the Philips picture-deter features that *go into our most d studio cameras.*

the LDK-11 includes many al unique features for difficult roduction and ENG appli Here are just a few:

tanding low-light performance. 12 dB additional gain to match specific requirements down to 8 ft candles.

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- True broadcast quality (27 MHz) 2-line contours with coring and combing for maximum sharpness and minimum noise
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- Optional 5" viewfinde

The broad applic- -n of the LDK-11 in studios, doc-in.entaries, 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.

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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. □

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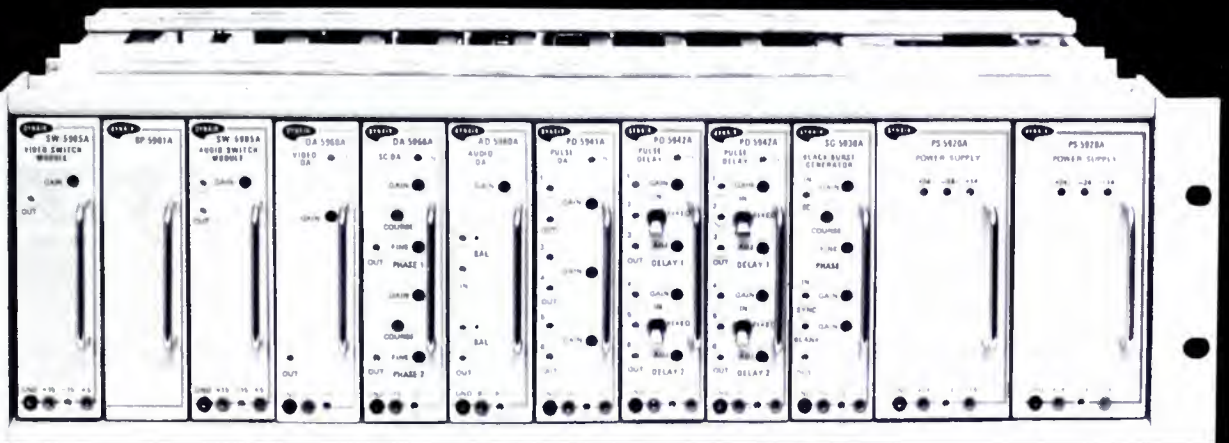

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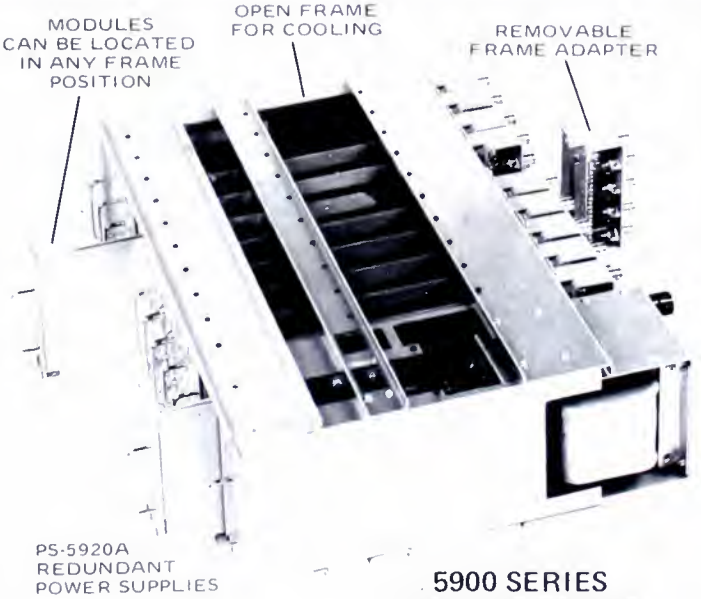

5900 SERIES MODULE FRAME

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
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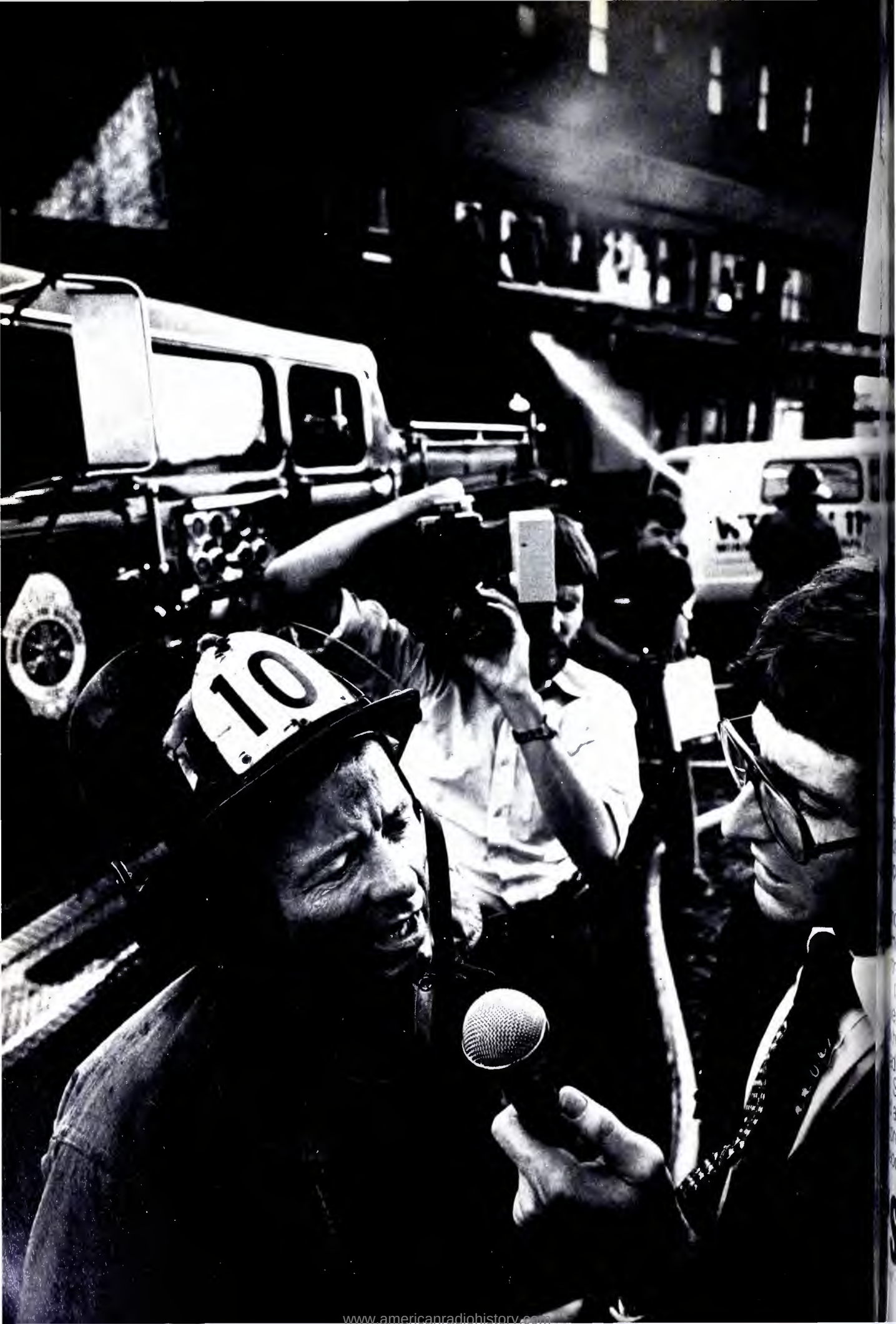

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New SBE re-certification procedures proposed

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 examina has been given by those chapters having candid whom the certification board had ruled eligible to a particular level of test. Also taking the exam each of these chapters were several previo certified members who were participating "control group." This group's tests were graded and the profiles of the results were then use evaluate the candidate's examinations.

The SBE was unable to arrange for non-membe members not affiliated with local chapter participate in the first series of certification ex Tentative plans call for the second roun examinations to be administered in April or Ma next year.

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

Certification changes

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

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

The examinations will be different for each cl and all exams will undergo periodic revisions. In s cases, several versions may be used simultaneous

It should be noted that certification is determi both by the candidate's experience and by his pas the examination. An applicant for certification at Broadcast Engineer level must have five years *suitable* experience, as determined by the certifica board from the information supplied on the appl tion. For Senior Broadcast Engineers, the requiren is 10 years of *responsible* broadcast enginee experience.

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

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

The address is: Certification Secretary, Societ Broadcast Engineers, Inc., P.O. Box 50844, Ind apolis, IN 46250.

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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 U and the communist countries of Eastern Europe. switchover is attracting considerable attention f West Germany's state radio networks.

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

continued on pag

*Assistant News Director, *Radio Free Europe*

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SOMETIMES, THE NEWS CAN HAVE TOO MUCH IMPACT.

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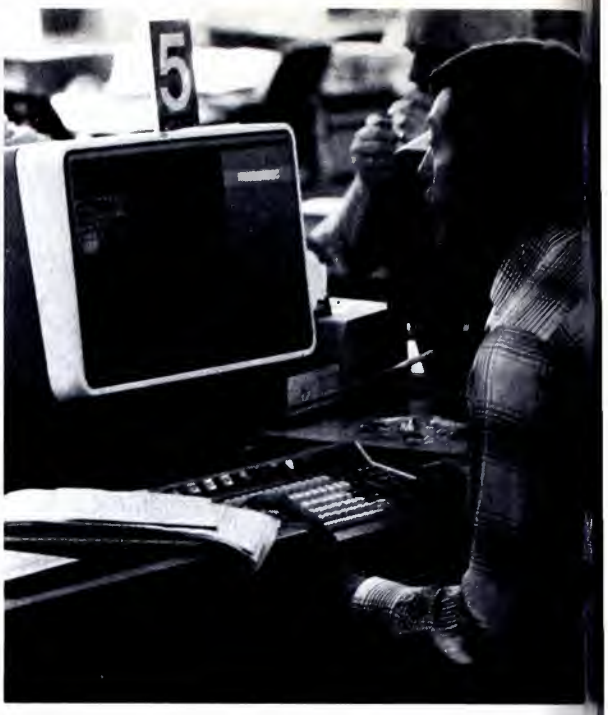

Radio Free Europe

continued from page 22

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

The station broadcasts to Bulgaria. Czechoslov Hungary, Poland, Romania, and the many diffe nationalities of the Soviet Union. It is one of the sources of information in these countries outside official, party-line media. Its role has been magn since the signing of the European Security Confer Agreement providing for a freer exchange of i mation. Some groups (basing themselves on Helsinki accord) have been active in the Soviet Un Poland, Czechoslovakia, and Romania, and dep upon such western radio to get their message acr President Carter's decision to increase the transm 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 broadc Officials at the station say the conversion to VDUs produced a marked increase in the speed efficiency of its news operation.

The station compiles its news broadcasts from output of four western news agencies: United P International, Reuters, and the West German French agencies. RFE/RL also uses correspondent the U.S. and Western Europe, plus nine comm news agencies, as well as monitoring more tha Soviet and East European radio stations. This ma material, more than a million words a day processed by a central newsroom into Engl language and Russian-language news files that

continued on pag

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For More Details Circle (20) 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 sr computer system was the first problem. The next insuring there would be no interruption in the 'rou the-clock' flow of news to the men at the microphor

The inflow is handled by a concentrator wh stores, for 24 hours, the files of the western agen and the RFE/RL correspondents, delivering individ items to any terminal in the system at the touch o button. At 9,600 words a minute, it's alm instantaneous. In addition, monitors transcrib material from East European radio broadcast work terminals which have been set apart from the m system, feeding their output into the concentra storage as if they were a separate news agen Through the concentrator, this output is available all editing terminals for processing.

Breakdown protection

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

Another master terminal is used in a seco four-slave system producing news and features or cyrillic teletype net servicing 17 desks broadcasting the Soviet Union in Russian, Ukrainian, Latvi Georgian, Uzbek, and other languages of the Sov nationalities. This system has the only text-edit

continued on page

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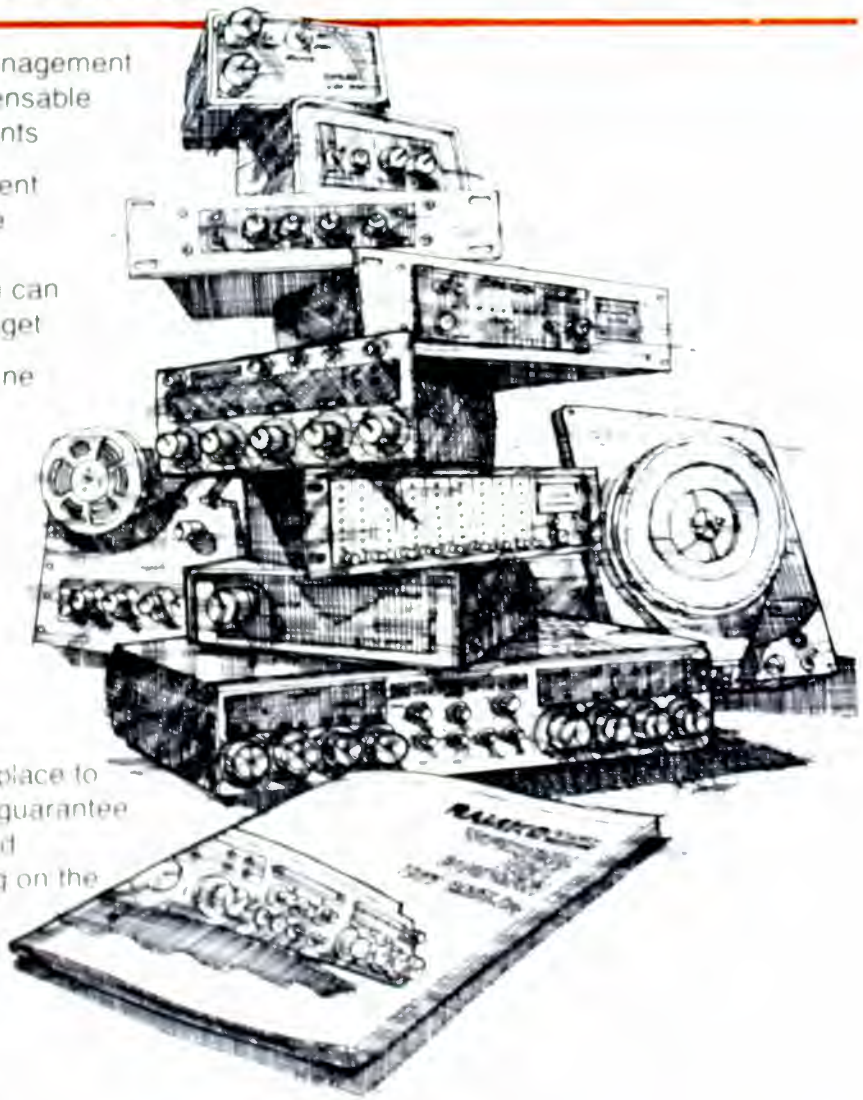

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Radio Free Europe

continued from page 26

terminals in the West using cyrillic letters (le drawn on graph sheets by RL staffers and reprod on a video screen by MEGADATA engineers). I too, a separate terminal feeds Russian-lang monitoring of Soviet radio broadcasts directly int teletype network.

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

Chief benefit is speed

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

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

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

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

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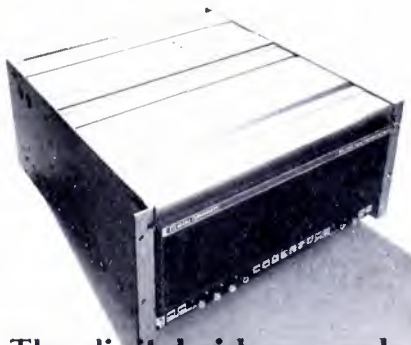

The digital video people

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 elim some staff personnel. Autom was supposed to give the reme engineers and operators more to spend on creative efforts, some engineers and many oper translated this into job slic Another problem was that enough people anticipated what would do to those DJs who surv the intitial stages of program mation. In fact, many became b with their new role. After all, it possible to purchase taped grams and special station IDs. what was the DJ going to do? buttons while the station lost personality?

Shortly, of course, it was pr that there was nothing so ter unique about program-autom equipment. DJs could operate it engineers could deal with it. way, if everything had to be carts and reels, how was it goin get there? If it wasn't syndic tape, who would make the tr fers? And wouldn't this bring even more equipment to be m tained or repaired? At leas would surely place heavier deme on existing recording equipment.

While AM stations were wrest with carts, FM stations were ping away from discs and stat recorded tapes and getting reel-to-reel syndicated tapes. even here, the system could wired to play the program ree reel, automatically interrupted ads, promos, and IDs on caro cart machines. This approach di require any program creativity the part of the local station. course, the programmed tapes to be on target. Despite t chance, this approach grew popularity.

In the last 18 months, there been a new surge of interest radio program automation. Syst are being offered now that store and play more than 100 ca in addition to controlling reel-to- machines. In fact, automati equipment manufacturers have b busy designing systems that handle almost any format challe or length of broadcast day requ ments.

Industry survey

In 1971 and 1974, **Broadcast E neering** checked the pulse of radio broadcast industry and tected considerable interest in a mated programming. This sum **BE** undertook its third automa survey.

In all three surveys, opera

continued on pag

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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 disenchanted 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, its 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. (Operating on the same principl system could be designed for that would hold all coded news for immediate recall.) At the this year, at least one manufact offered a CRT terminal that w read out upcoming program s tions, IDs, promos, and ads. other system will show you up ing items as event numbers on readouts.

Automate everything?

Programming has been in spotlight from the beginning, ar still overshadows logging, acco ing, and availabilities. Of th logging is the second area w automation is earning its w Accounting and billing are a dis third, while traffic is automate only 6% of all stations committe automation. In all cases, the FM combination is, according to survey, the best prospect for a mation.

How about ATS?

At the beginning of this article looked at mini-automated stat operations. Well, just how m could be operated automatically the station? Practically everyth And now we can add autom transmission systems (ATS). plugged ATS in to our 1977 sur to get an idea of station inter About 31% of the stations respo ing say they intend to purchase equipment in late 1977 or 1978.

What about the future?

Prospects for radio automati whether it be programming, loggi traffic, or equipment control, good. They aren't so good that stations will totally automate. the prospects, especially for A FM combinations, have never b better. However, many stations never delete their personality mixed-format approach to progra ming, while others will say t can't afford the investment.

The latest systems have made much progress in format comp bility that both management engineering now have clearly fined choices over a broad range capabilities. For the present, ra will continue to equate automat with programming. But the fut holds much more.

Meanwhile, a subject that sho be held up for closer inspection operator errors. What is needed a series of meetings between us and manufacturers. With any lu one of the professional associati will provide the platform for air the problem and, hopefully, gett something accomplished.

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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.

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 calcul their ideal position. *In essen there is no short cut in the creat process: each step must be follow through in an orderly mental o physical pattern.*

The television industry has me efficient lighting men who w through these complex areas a have their project set up a completely lighted while the cam crew is still looking for the line charts. But their hastily ma masterpieces, in all probability, nothing to enhance the progr because they overlook the valu which good lighting contributes visual communication.

It is impossible for these values be there unless the lighting ar takes the time to provide them. what are these values?

One of the most important fu tions of lighting is the "center interest": the brightest area in composition that automatically tracts and holds the eye with viewer violation. Next, there is

continued on page

Senior Production Consultant, Imero Fiorentino Associates, Inc.

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pex Corporation, Audio-Video Systems Division, 401 Broadway, Redwood City, California 94063, 415 367-2011.

Lighting

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

orderly selection and indication the relative importances of comp tion of elements—careful separa and modeling without appar emphasis (which, if noticeable, feats effective communication).

There is a great deal more lighting than simple illumination visual elements. In fact, illumina elements for the camera (or the e is the easy part of lighting. more difficult part—the part t makes lighting an art—is the c ation, control and placement shadows.

Figure 4 Flat lighting—dull picture.

Inexpert lighting has a rand multiplicity of shadows or no sh ows 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.

Lighting

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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 the visual message. This is complished by careful analysis the relationship between lumina placement, subject movement a camera angles. Conversely, shadc less pictures are quick, easy and effective—indicating complete fr tration in controlling the shad patterns or a definite lack lighting skill. *It is always appar that insufficient time has been sp on the project.*

Figure 5 Complex shadows (double nose shadow).

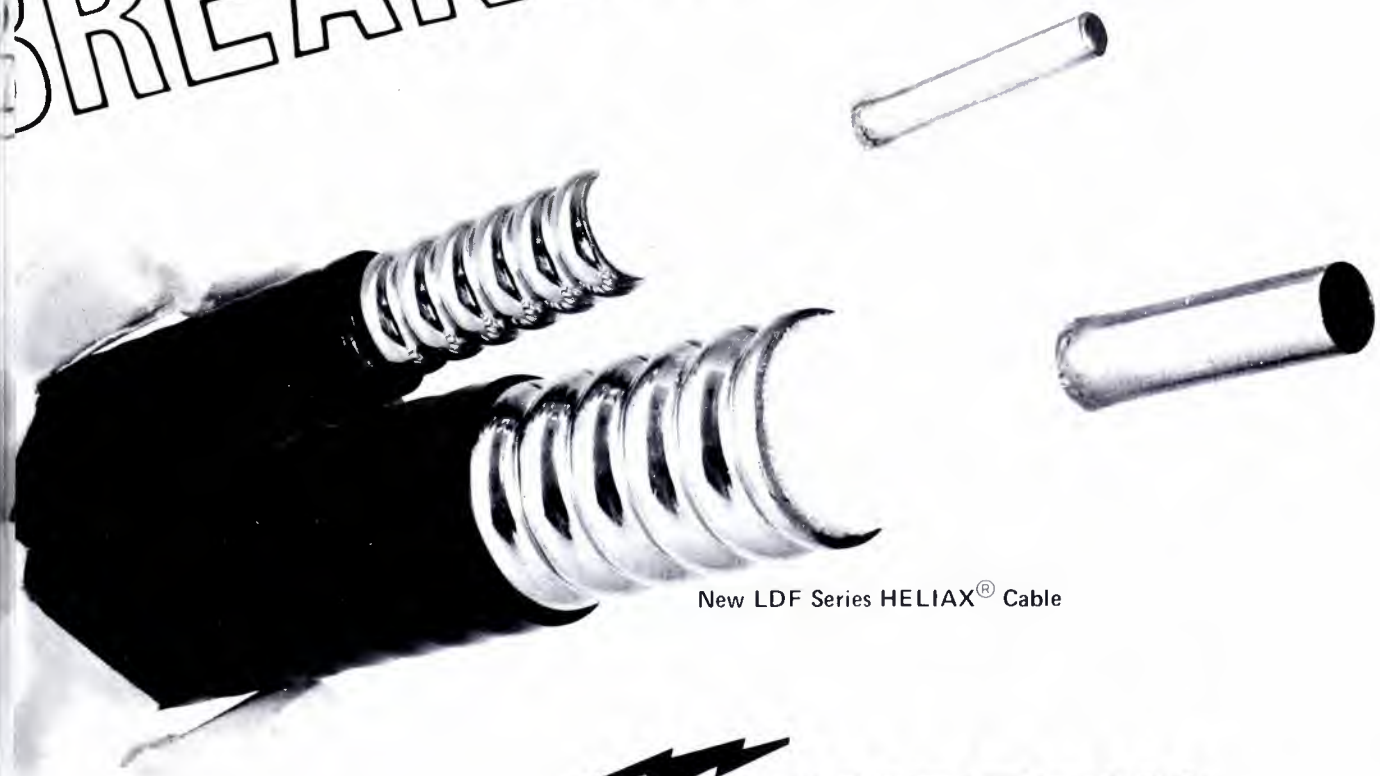
General lighting practice is first focus the luminaires at f intensity to make it practical to s the specific area of coverage, a hot spots or the need for featherir Second, it is important to work c the requisite "balancing," whi involves adjustment of intensity r lationships that cause the pr planned picture to emerge from t flare. The balancing process another one that requires time a cannot be rushed. Balancing may done partly through light met measurement, partly by eye a experience, or it may be do almost entirely by observing camera image on the control ro monitor.

Of course, before any of the steps can be contemplated, t lighting man must learn his trad learn which luminaire has sufficie control to allow shadow placemer learn intensities, diffusion and fle bilities; and learn to differentia between fact and myth in t extensive lore of lighting.

One very important and positi thing a lighting man with less th complete expertise can do towar growth in his chosen field is to lea to ask, "Why?" This question, ask with an open mind when approac ing each new lighting problem, w bring out the fallacies in formul and how it is that short cuts nev seem to work out.

Practical experience shows th thinking the job through logical and then following each step in painstaking manner is actual quicker as well as surer becau when you do it *right* you won't ha to do it *over*.

LOW LOSS CABLE BREAKTHROUGH



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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 auxil numeric pad on the right wh controls curser positioning and scrolling through the computer me ry. This feature allows the operato directly examine and edit the mer contents. The Dataphone on the le used to tie the system into Marke for access to ARB data. The CR used by the operator at all ti except when finished hardcop produced.

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

hard copy only. Our printer is DECWRITER II, manufactured Digital Equipment Corporation. initial cost was several hund dollars more than a teletype, the DECWRITER is a much qui machine and has very few mov parts. The printer is interfaced the computer at RS-232 levels wh also allows it to be used as terminal on a commercial data co munications network. An auxili keyboard was added to the syst to allow the printer to be remot located from the computer.

continued on page

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plete three-element package
single supplier:

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5—the same one that helped
g you Superbowl XI.

2-watt, 2GHz video trans-
er, the FV-2MF, that can
ate from two 12V batteries.

w high-gain,
noise preamp,
0576 for the
ver end.

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sitter/amplifier
nation is that it
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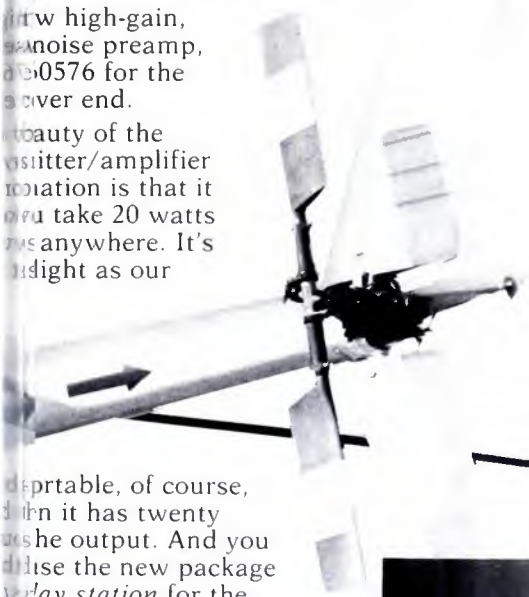


portable, of course,
n it has twenty
he output. And you
use the new package
relay station for the
portable. (The 60515
ier requires only one to
atts drive.)

o units take up only
ounting spaces in a
rd ENG rack (that's
4 inches). And because
eed only 24 volts, they'll
where 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 subcarrier 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.

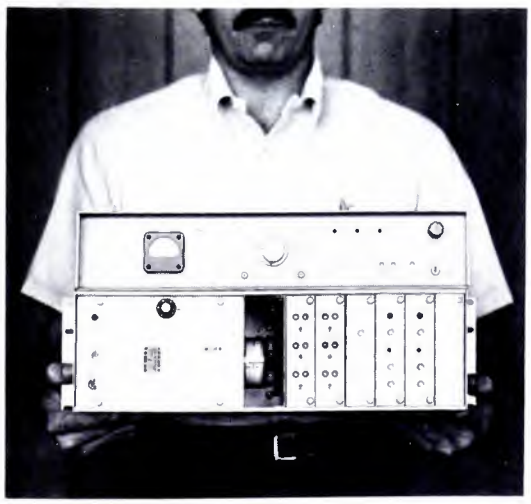
With the audio in the normal position, you get the higher-quality video you need for studio transmission.

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

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

```
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:
T= 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

OK
```

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      TAP 1      60      CM

THE ACCOUNT NUMBER IS 47

THE CLIENT NAME IS AMALGAMATED WIDGET

THE TIME PRIORITY CODE IS TAP 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.

Microcomputer

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interfaced a standard Cherry board to the system and locat directly in front of the video dis

The composite video output a Processor Technology VI video card is displayed on a 17 Conrac monitor. We selected VDM-1 video module for se reasons. It is capable of displ 16 lines of 64 characters per the display can be black on whi white on black or any combin of the two, and it has nine keyb selectable scrolling speeds ra from about one character second to 2000 lines per secon blinking cursor is optional an entire display is under soft control. The module simply into the computer mainframe.

Data storage

Mass data storage is being complished by two methods: cassette and floppy disc. The sette method has evolved into separate subsystems. First we a slow 300 baud FSK techn since this is the method used to the BASIC interpreter. All of preliminary development prog have been saved using this met It works by converting the par data from the processor bus serial form and then feeding data into a modem for recordin a standard audiocassette mac The playback procedure dem lates the FSK signal from the and converts the serial data ba parallel form.

The second tape cassette sch is a true digital recording met Specially modified cassette d manufactured by Phil Deck connected to a Digital Group sette controller which provides ware control of all motion funct and data encoding and deco This system operates at a speed of 5 ips and writes 1600 reversals per inch, yielding a rate of 6400 baud. This give storage capacity of about 250 bytes per 30-minute cassette. cause of this tremendous amou bulk storage, the digital reco method is a natural choice storing commercial inventory other large data bases.

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

ge of a mini floppy disc is d to about 90 kilobytes, but the s time is on the order of ds instead of minutes with a tte. Consequently, the disc is for setting up files for data pulation. The disc drive is by Shugart Associates and the oller is from North Star Com-s.

Using the system

entioned earlier that BASIC is hly conversational high-level age. We are presently using .2 version of 8K BASIC sup-by MITS, Inc., which makes ltair computer. Let's take a t what it can do.

e ask BASIC to add two and he dialog would look like this:

?2+2 4 OK

computer answers and then **OK** to signify it is ready for er command. Print commands s any numerical data or string nation to be printed or dis-d. For example: PRINT 3*7∧2 s **147 OK** to be printed. irly, the command: PRINT Quick Brown Fox" causes **The Brown Fox OK** to be printed. eric or string variables may be d as well.

itional features of BASIC that vailable include the TAB and ommands which are identical tab and space on a typewrit-EEK and POKE commands let rectly examine the contents of m access memory without the matrices. The ASC command s the ASCII value of a string is very useful when alpha-ng file entries. Direct I/O ands include INPUT and INP, let the user enter data into a am as it is executing, and T which outputs data to a ied I/O port.

Basic manipulations

w we'll see how BASIC can ulate strings. A string is a of alphanumeric characters. is a string" is a string. "4000 its" is also a string. The $, RIGHT$, AND MID$ com-s allow the user to take strings , manipulate the data con-d in the string, and then emble the string in any desired , as shown in Figure 4. A ical example is the following le 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
SPC(	THEN	NOT	STEP
+	-	*	/
^	AND	OR	>
=	<	SGN	INT
ABS	USR	FRE	INP
POS	SQR	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	OV	OM	US
BS	DD	/0	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
TOTAL	$5374

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

Microcomputer

continued from page 47

as it might be entered by a t clerk:

```
47      Amalgamated Widg
  TAP 1     60     CM
```

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

```
LET A$="47      Amalgama
    Tap 1     60     CM"
  NAME$=MID$ [A$,12,18]
```

We have now created a subs called NAME$ which is equa "Amalgamated Widget." In the fashion the product code, acc number (47), spot length (60), priority (TAP 1), and whether spot is a commercial or a PS whatever can be extracted fron original string as shown in Figu

Once the computer has br down the inventory entry into strings it can proceed to autom ally sort and place the spot future inventory or on a fini log.

Integrating the system into station operations

First we must assume that system is up and that it inventory available for about weeks. The traffic clerk comes i 8:30 am and instructs the comp to verify what spots ran the p ous day. The machine has previous day's log in its memory asks the clerk to enter the list from the program log discrep sheet. These entries are comp against the log in memory and the system prints out a listin spots that were aired for bi purposes. It also notes which s must be made good.

At this point the clerk may to update the inventory files. the spots which are to be n good are re-entered. Next, the sales contracts are entered sample data entry might co various number codes, the spo name, and any pertinent sched information.

Suppose the sales contract c for 12 spots per week between am and eight spots per w between 3-7 pm for broad weeks 30 through 36. A ty dialog that would take place tween the computer and the t clerk appears in Figure 6. computer would automatically p the spots in inventory files on disc. When all sales contracts

continued on pag

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.

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For More Details Circle (41) on Reply Card

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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 too slow or lack the capacity to do the 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 no 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 also want to thank Lou Elkins of Gateway Electronics in St. Louis for his patience while we debugged our hardware in conjunction with his Altair system.

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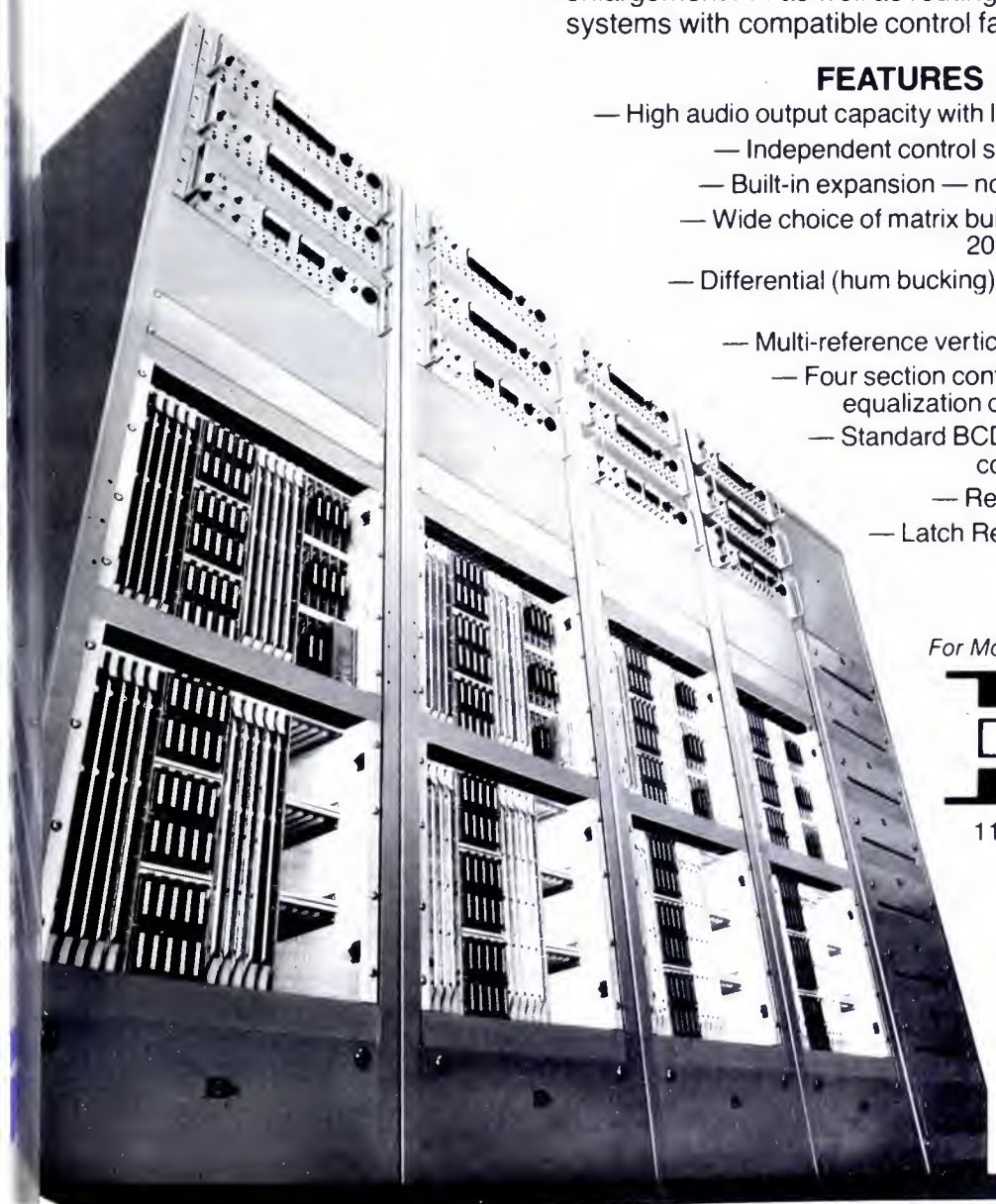

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For More Details Circle (43) on Reply Card

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 a in the Pepperdine amphitheater. Since available power would not handle b 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 u on this location to move into areas which were inaccessible to the three fi position cameras. Directional Sennheiser mikes were used on each TK-76.

low do you prepare for a -hour extravaganza TV special uring 30 top stars from the three mercial networks? Answer: very roughly.

ou start months in advance aning for power, production pment, and personnel, as well naking decisions on camera and ote van locations.

ou finish building your camera forms, etc. several days in dance, and you set up and check your camera two days before actual event.

l the case of the *Battle of the ework Stars, '77*, four sites had to covered on the mountainside perdine University campus in abu, Calif.: the beach, the amphi-eter, the pool and the track. n these areas nine events were ured: swimming, rowing, bowl-g golf, baseball, the obstacle se, the relay, football and the of war.

l all, 10 cameras were used, cluding the one in the Goodyear p. Portable cameras were used nsively to get into areas in-ssible to the fixed cameras.

wo production companies com-rd facilities: Trans American do and Hollywood Video. The cial was produced by Trans dd International in association it ABC-TV.

he two-day production was mas-rd on 2-inch videotape. In all, machines were used. The arity of the "production" ac-dly took place in the post-duction phase.

Emphasis on post-production decisions

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

ne of the four clustered monitors played the line-out of the video cher. Two others had the video the two "iso" (isolated) cam-s, which were being recorded on ch tape independent of the nal line out. The fourth monitor played SMPTE time code, full en.

color TV camera focused on the monitors fed a signal to the inch tape machine. In the post-duction phase the director could n view the 3/4-inch cassette taining the "quad-split" record the video sources. By using the e code designations he could

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TV extravaganza

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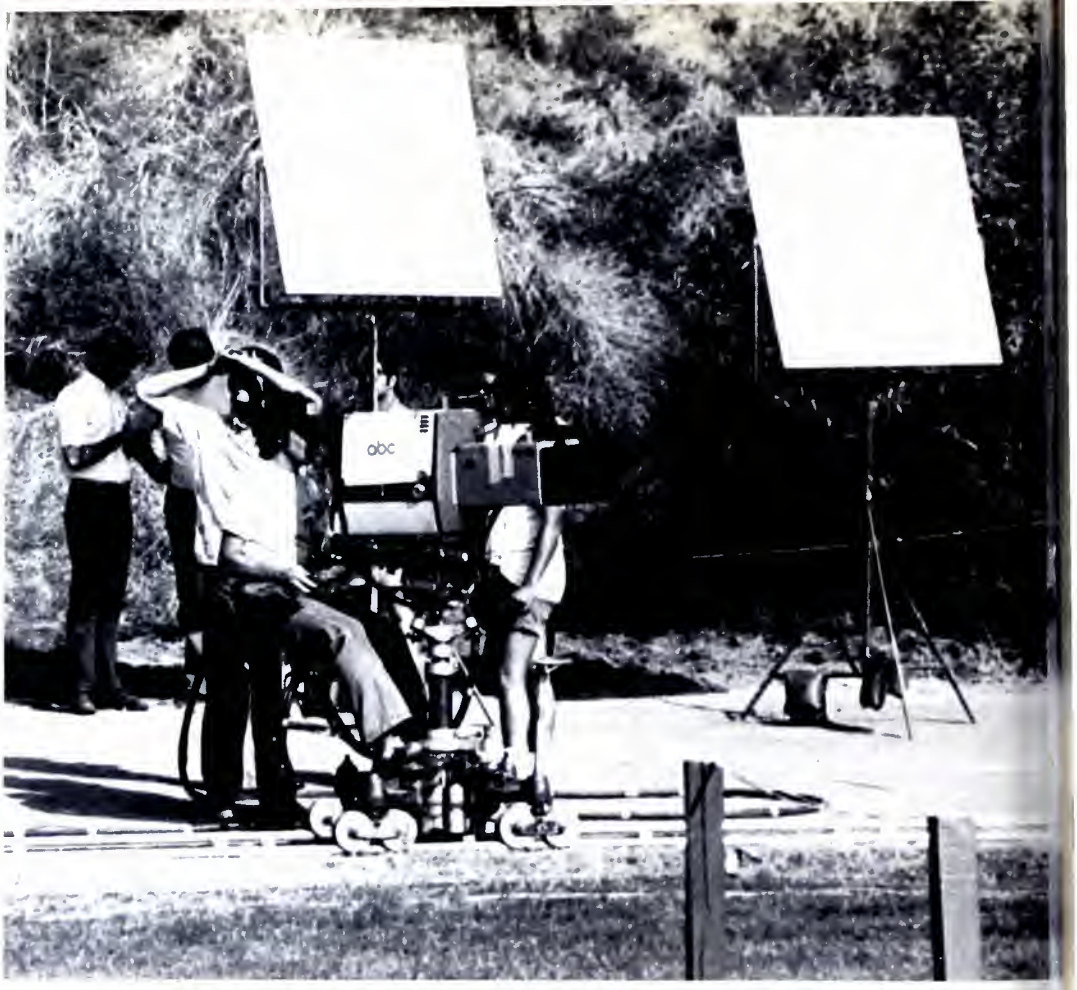

Since this camera was shooting into the sun, two large reflectors were used to help fill in objectionable shadows during taping at the obstacle course. Note also the track at the base of the camera dolly which will enable the camera to move with the contestants.

stitute video from either of the cameras into the final pro-tion.

nce the address track is part of three simultaneous 2-inch re-lings, it became simply a matter eeding time code information into computer editor during post-duction.

me code, of course, can be used ocate audio as well as video. a can be juggled in any way red to provide the best presen-n. For example, the video from articular sports event can be d into the subsequent descrip-of the event by the contestant ved. The sequence of all re-ed audio and video becomes a ter of what will work best, re, and at what time in the uction.

post-production, audio can be

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oving camera shot was important overing both the boating competi-and the obstacle course. When picture was taken the track for the era dolly had been assembled and zoom lens was being attached to PC-70 camera.

all pre-production preparation tes to hardware. Here a make-up st applies lip liner to Suzanne mmers of *Three's Company*. There a number of important differences ween "street make-up" and make-suitable for television.

TV extravaganza

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"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, su as freeze frame and video compr sion and enlargement.

ile control room for one of the te units for *Battle of the Network* ntains 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 neras to get a worm's-eye view of cle course competition. This was 0 cameras used to cover this tle of the Network Stars.

port equipment and personnel

ce this production took place a rather large campus area, munication was a major con-. A few dozen VHF walkie-es were needed to coordinate onnel for crowd control. In tion, a separate RF "wireless ne" communication system was to keep in touch with crew bers. Cameramen used their nal PL system.

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

e event took place at night and ired artificial light. The base-throw (hit the target and a star an opposing network falls into ld 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-ered generator was brought in. television vans and equipment the existing power sources.

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

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 encounter the options are limited: someh make the announcers feel a part both operations, or split the s completely. You just can't creat competitive atmosphere betwe two facilities and expect any amo of cooperation at the same time.

Pilot error

Listening to some automati salesmen, you might conclude t the boss' four year old could run t system flawlessly. Thank goodn for child labor laws...we're spar the agony of finding out! Inste we go down to the bus depot, pi out a likely looking candidat promise him 47 dollars a week, gi him a "Stereo Rock" tee shirt, a turn him loose in the radio statio

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

ll too often, memos about how to idle problems go up on the letin board **after** the problem urs. This can be solved by paring a comprehensive oper- g manual **before** trouble starts.

eep the language simple. As long our calculator has more buttons it than theirs, you don't need thing else to convince everyone you're an electronic genius. t guy who just got off the bus is g to have to read and under- d enough to be able to get him- l out of trouble when things go ng.

Fire drills

d possible, conduct hands-on ning for all operators. Take the mation system off line and allow operator to practice handling mulated failures. Simulate tape aks, cartridge jams and pro- amming errors. If you've kept d records of past failures, you'll v what to concentrate on. And t overlook power failures. Every rator must be familiar with the t-up procedure when the lights e back on.

Feedback

order for you to keep the m free of bugs, you need lots of back from the people who live t the system day in and day out. ourage the operators to make estions and spell out trouble s.

aintain a discrepancy log that ides operator errors as well as hine failures. If the same oper- c error keeps showing up with vral operators, it's possible that problem can be "engineered" of the system.

People-oriented hardware

far, we've talked mostly about to get people to work with the hine. Now let's see if we can the machine to bend a little, too! ne of the primary functions of automation system is to relieve ole of tedious, mundane chores. equipment isn't as smart as a an, 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.

nalyze the way you're utilizing r automation equipment now. you fully exploiting the capabili- of the equipment? Or are you a e to the machine? You should be g the built-in capabilities of the tem to **reduce** human errors.

he errors that are occurring in r system can be broken down 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 readings, or forgets to load the next newscast cart, or forgets to change the program sequence for a different day-part. The number of forgetting errors can be reduced by generating reminders from the automation system.

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

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Automation

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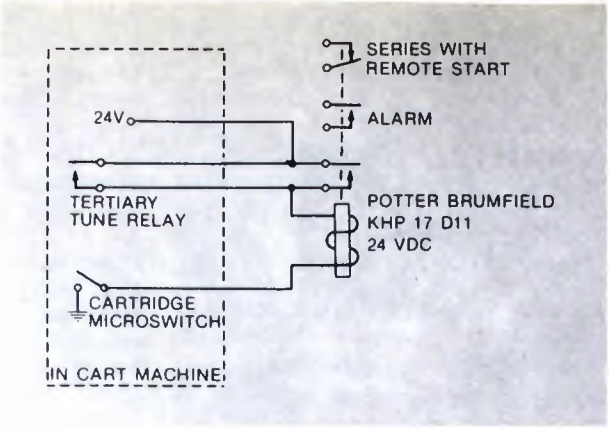

Figure 1 Outboard relay on cart machine provides warning that all cuts have been played and disables machine until cart is replaced.

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

"Forgetting" errors also can reduced by trying to establ patterns that become almost au matic. For infrequent procedures check list is a good idea.

Ignorance is not bliss

"Unaware of condition" err probably account for many of operator errors that your stat tallies. Actually, this type of er usually is chalked up to a techni failure. Let's face it...there are many possible equipment failu that the question isn't whether not the system will fail, but **wh** Through good preventive main nance, we attempt to reduce number of failures, but sooner later something is bound to happ How quickly the operator respon to the failure determines wheth the incident is a minor inconve ence or a major disaster.

Condition alarms are a big h here. Try to plan the system alarms alert the operator **before** t condition becomes obvious on t air. If possible with your syste alert the operator if the **next** sour to run is not ready. The extra f minutes or even seconds might enough to cram another cartrid into the slot.

A carrier alarm is a good ide but it's a little like locking the ba after the horse has escaped. **corporate alarms that signal pro lems which may lead to a loss carrier.** Transmitter temperatur exhaust air flow and RF drive a good examples.

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

The carrier alarm and loss carrier alarm should be distinctive different, with visual indicatio that are clearly labeled. Too oft an inexperienced operator will a sume that when the sound stops t transmitter is off the air. Valuab time is wasted while he tries to tu on a perfectly content transmitter

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**. □

Every move a picture

"nappropriate action" errors fre-ıtly follow an event that is out ıe ordinary. That's an euphe-ısic way of saying that people get ısy when disaster strikes. This p of error plagues every tech-l industry, so perhaps we can n something from other fields re considerable research has n done to reduce this type of r.

l aviation, for example, switches n knobs that must be located e to each other are shaped ıbrently. We don't have to carry ıi to an extreme, but in most tions the engineer picks out his ıorite style of pushbutton and ss it for everything from doorbells ransmitter controls. It wouldn't too tough to use round switches start functions and square for o, for instance.

ower priority functions should be ysically smaller switches to lessen confusion. Use a logical and sistent system for direction of ntrol movement, too. **Up is always**

Panel layouts for automation re-te control should be planned very refully to reduce confusion. If you e controlling two rows of three chines, the switches should be ranged in the same configuration

people in the news

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

Thomas R. Meyer, product manager/applications e neer for TeleMation since 1972, has been appoin product manager at Dynair Electronics Inc. Prio joining TeleMation, he was a communications fac consultant for Hubert Wilke Inc. and product m ager/systems engineer for RCA Corporation.

Wallace Anderson has been appointed custo service manager at TeleMation. Anderson's respo bilities will include service, parts and training on products manufactured and sold by the company. time, day or night, customers will be able to call (8 972-8340 to contact Anderson.

MEYER

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DUCART

Jack M. Ducart, a veteran of more than 20 years the broadcast industry, has joined Ramko Research general sales and marketing manager. Ducart p viously held similar positions with McMartin Ind tries and Moseley Associates.

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

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

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

of Georgia; **Julian D. Hopkinson**, technical manager, Pacific region, Motion Picture Products, Agfa-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; and **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 respective operating units.

The marketing director at the time products division of Fairchild Camera and Instrument Corporation is **Charles Jacoby**. Jacoby, who has been in charge of video 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 Videotron Systems, a division of Automation Electronics Inc., as eastern regional sales manager for the Ohio home office. □

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 pers ally-owned, rented for the proc tion, or drawn from the stu equipment room. He might prefer ARRI 35BL, a Frezzolini 16mm c or maybe the CP-16R, etc., etc. TV counterpart uses the vi equipment that comes with studio, lens included. This might RCA, Sony, IVC, Ampex, or w have you. This is not to say that of the aforementioned cameras not do an excellent job, but it is say that the assigned camera makes no decision as to what equ ment he will be using.

Next, it is the practice in Hol wood for the director to run throu upcoming scenes with the direc of photography (cameraman) purposes of angles, lighting, d matic import, etc., etc. The came man is a partner to the fin decisions. How does our TV came man make out in this proces What, if any latitude is he allow in order to be creative?

Finally, the encumbrances: matter how many cable-men mig be assigned, and no matter h well they perform, a cable is cable is a cable; and, it is one le factor that the *film* cameraman h to be concerned with. Now, if some special reason the performe require the attachments of vid prompters, then you find that ev the so-called "balanced" came presents problems that, once agai your *film* counterpart does not ha to contend with. Your TV came not only has to support the additio al weight of the video monitor, b is now also *hampered* with t harness and mirror assembly th goes with the video prompter. ideal working arrangement? Not all! Your cameraman has no become part moving-man.

It is a wonder, and a *compliment* to their skill and endurance, th the TV cameraman performs as we as he does, given the handicaps th never were a part of the Hollywo *film* scene.

Take 2...Inserts

Gerry Gander was re-assigne from North-East regional director director, Schools Liaison Group. H will be moving to the west coast th winter.

Janet Doka was named as exec tive assistant and associate d rector, special activities.

Newly appointed North-We regional rep is Anthony St. Joh now associated with KRON-TV.

Fade to Black....

Probing the problem of down digitals

By Christopher B. Downing, Overland Park, Kansas

ital devices are now found ncreasing frequency in nearly piece of broadcast equipment: achines, audio boards, mas-ocks, remote controls, trans-s of every description, modu-r monitors, antenna monitors BS monitors. In spite of an incredible reliability, a little o chip will occasionally mal-on internally.

n something is wrong inside l, the entire piece of equip-malfunctions. Using a logic sheet, an engineer can tell s **supposed** to happen, but an ing device is needed to show s **actually** happening.

o can poke a probe from a eter around and see if a ular point in the circuit reads lts or .35 volts, but you'll be ig several ounces of meter d and be getting a lot more cy than you need. The best o service digital logic is with a evel probe. After all, we only if a device is on, off or here in between (where it ln't be). We're not interested ether the high-state voltage is 4.91 volts.

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

e probe schematic shows how e it is to build your own. The t will draw less than 30 ma a five volt power supply (the owering the piece of equip-is usually a good source while ing), and indicates "high", and "pulse" logic states. The impedence is limited to 10k by the input resistor, and you 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. capa-

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station-to-station

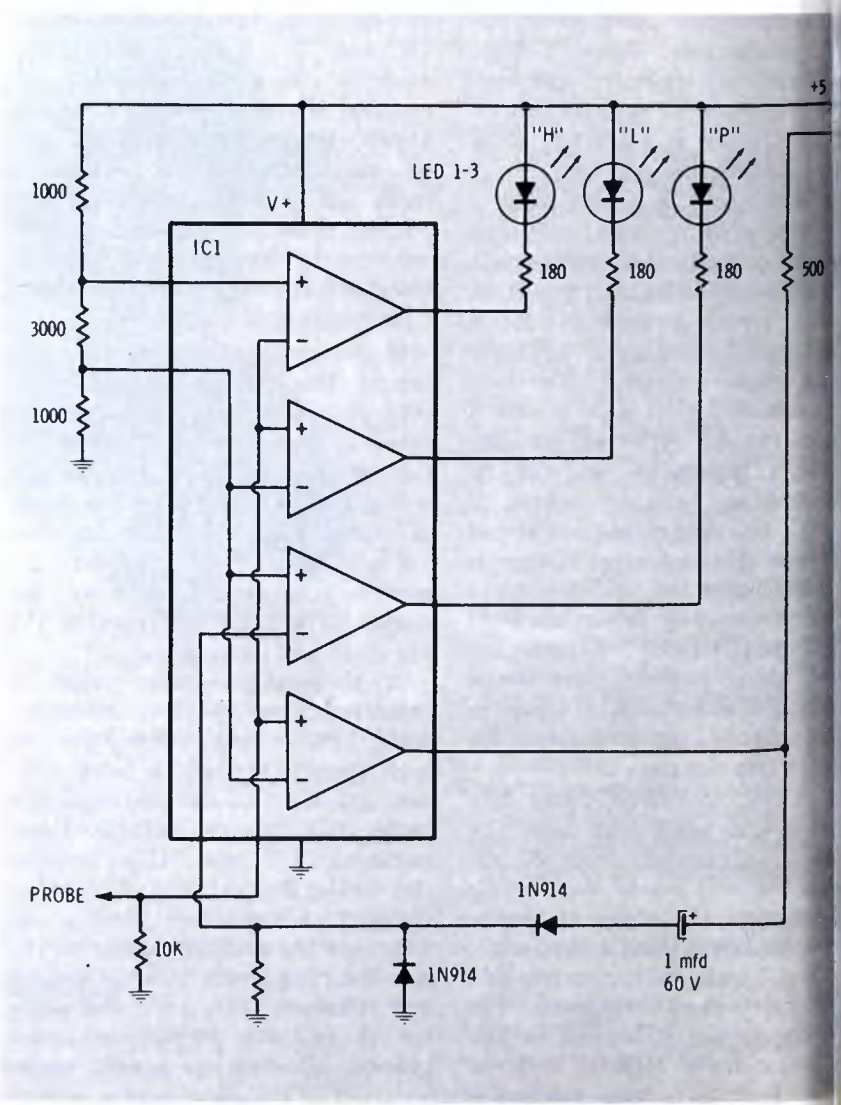
continued from page 65

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 doe ny things.

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

National Semiconductor m factured the quad comparat bought from Radio Shack (and quick), and it will take u 36 volts on the inputs before input transistors in the IC sta blow. If you really worry a hitting some negative potential ruining the IC, put a diode in s with the probe input and rea the voltage divider to compe for the forward voltage drop. versing the power supply leads definitely cause trouble, so s



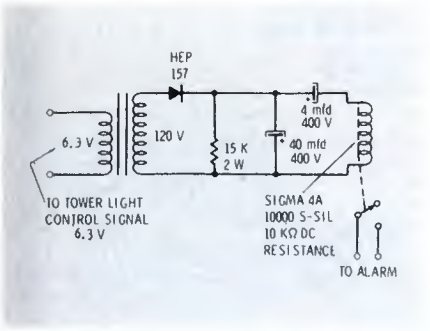
emergency protection might be in order in that respect, also.

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≈3 sec, and T off≈2 sec.

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SOCIETY OF
BROADCAST ENGINEERS, INC.
P.O. Box 50844, Indianapolis, Indiana 46250

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 bers about their concerns an pectations.

Chapter 9—Phoenix, Arizona

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

Chapter 16—Seattle, Washingto

Chapter 16 kicked-off the 197 year September 14. The chair presented certificates for Ce cation as Senior Broadcast E neer. Jack Shawcraft also led a cussion on the University of consin's digital technology co and played some samples of course's videotape lessons. A cussion of FCC docket #20817 d ing with proposed licensing cha followed.

Chapter 25—Indianapolis, Indian

The September 29 meeting place in the Indiana Univer School of Nursing's new televi studio, which is equipped with latest of Strand Century ligh systems. Strand Century prese a program on television lighting, cluding a demonstration that interesting and informative.

Chapter 28—Milwaukee, Wiscon

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

Chapter 40—San Francisco Area

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

Forming Chapter—Los Angeles, California

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

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 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 ½-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 configuration: ½-track stereoph 2-channel, 7½ ips.

For More Details Circle (95) on Reply Ca

Mike preamplifier/limiter

The model 1400 in-line m phone preamplifier/limiter from *Systems* may be used to boost out microphones for driving gain mixers, to boost mike ou to line level, or to buffer me level lines; all due to its contin ly variable gain.

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

The unit's low output imped enables it to drive microp cables of 1000 feet or longer wi significant loss of high frequen This also improves the S/N rati keeping the signal well above noise level, RTS reports.

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

r More Details Circle (96) on Reply Card

Mass feed audio DA

Ramko Research model DA-
Audio Distribution Amplifier
eed up to 30 600-ohm loads
aneously with complete isola-
The stereo version will handle
60 loads.

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

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

More Details Circle (97) on Reply Card

Error corrector

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

nproves the interchange play-
signal of standard and non-
rd recordings. It also has a
ble automatic or manual first
rrection.

further information, contact
pter Magnetics Corporation.

More Details Circle (98) on Reply Card

iplock audio pitch control

LL-7 Liplock pitch control by
rgence Corporation produces
ible 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 reshape 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 between 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 developed a line-of-sight infrared optical carrier (model 761) that can send audio and TV composite video signals up to a half mile.

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

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new products

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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 videocassete 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.

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

More Details Circle (102) on Reply Card

Deck sequencer

ta-Matics, Inc. has introduced ical interval deck sequencer, /ISA 350, which provides aphonic cassette convenience being compatible with ¾-inch ic decks. It also can control econd switching for as many i decks.

VISA 360 automatically re- tones of proper time and on in the cue, preroll and positions; and in the play- node, automatically cues up to pes simultaneously. Then, the first designated tape is ted manually or by automatic the VISA plays all tapes or in sequence, switching be- tapes in the vertical interval. VISA 360 is available as a tanding or standard rack unit, connects to tape ma- through their remote control tors, and can be used with eck as well as up to six.

More Details Circle (103) on Reply Card

25 kw FM final tube

has designed a Cermolox power tube, RCA 4695, spe- ly for use in high-gain, high- ncy FM service. It provides 25 eful power output at 20 dB nd 80% overall plate efficien- h plate supply of 10 kV.

4695 is rated for full input to 230 MHz. Its coaxial construction and thoriated-tungsten mesh filament minimize tube inductance and feed-through capacitance. Broadband 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 ¾-inch videotape machines 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 briding 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

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new products

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

For More Details Circle (105) on Reply Card

Scope rack mount kit

B&K-Precision's RM-14 osci scope rack-mounting kit is desig to allow rack mounting of company's models 1474, 147 1471B or 1461.

The kit provides everything ne ed to mount the 5-inch oscilloscc in a standard 19-inch rack, inc ing panel, hardware and comp instructions.

For More Details Circle (106) on Reply Card

Video DA

Fung Engineering's model V 500B battery-operated video dis bution amplifier is designed to n all broadcast specifications over operating range. It provides f identical and isolated outputs one-looped video input. The includes a self-contained rechar able battery supply.

For More Details Circle (107) on Reply Card

Autoranging digital multimeter

Hewlett-Packard has combi low cost ($650) with accuracy i 4½-digit, five-function autorang digital multimeter. Built for b bench and field use, the mo 3466A measures DC from 1 mic volt to 1.2 kilovolts full-scale. Tr rms AC measurement range is millivolts to 1200 volts with microvolt sensitivity.

AC and DC current measurem range is from 10 nanoseconds t amps. DC current accuracy for

s except the 2 ampere range is 1.5% of reading + 2 counts). urrent is a true-rms measure- over a frequency band of 50 10 kHz with an accuracy of % of reading + 35 counts) on anges except the 2 ampere 3.

istance range is 1 milliohm to gohms with a midrange accu- y of ±(0.3% of reading + ut). A new diode test measure- capability measures forward across diode junctions. This the 2 kilohm range, which les a 1 milliamp current 0.

More Details Circle (108) on Reply Card

Tape storage unit

Mini Tape Storage Unit from *d Corporation* holds 84 RCA 0 tape cartridges, although it es only 34" width of wall unit can be hung on the wall ted to other units. The uik" cartridge removal sys- ermits fast, accurate tape on; just tip back adjoining dges to grasp and remove d tape.

More Details Circle (109) on Reply Card

r/lower case CRT terminals

el 400D terminals are now ble with an upper/lower case ter display option from *Ann Terminals, Inc.* terminal has a 2000 charac- mory and displays 20-line by racter alphanumerics. Five emain hidden in the scrollable y and can be accessed in Roll or Scroll modes. Charac- e written in a 7x10-dot matrix 0x12-dot field. Blinking char- , for accent purposes, are rd. The cursor is displayed linking field.

case options are available to flexibility in tailoring the con-

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new products

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figuration to a particular a cation. They include the com desktop terminal, the desktop te nal without keyboard for serial applications, the C-Case contr version for use with free-stan monitors and keyboards, and R-Case rack-mountable controlle

Other options include 40-cha ter line, double-height charac export power and CR/LF opti RS232 data interface and R video output for driving auxil monitors are standard.

For More Details Circle (110) on Reply Car

Logging recorder/reproducer

Magnasync/Moviola Corpora is offering a 4-channel log recorder/reproducer system in porating several electronic adva ments.

The TR-2004 offers the follo features: "Simul-Scan" fail-safe tem, square-wave bias techni in-line vertical tape path, LED a channel monitoring, and time m plexing with high-speed search.

Other standard features incl a lockable, plexiglas security d automatic gain control, voice-o ated control, dynamic tape mo control, heavy-duty motors, m channel monitoring, and full rem capability.

For More Details Circle (111) on Reply Card

Videocassette tape

Designed for critical applicat in ENG, industrial and educati fields, *Fuji Photo Film's* Beridox tape uses a formulation of thollide iron oxide.

tapes for ¾-inch U-matic cassettes are available in 20-e lengths (KCS-20) and 10-e lengths (KCS-10).
tape offers high-sensitivity, frequency response, and an ved signal-to-noise ratio.

More Details Circle (112) on Reply Card

Video equipment cart

nd H Products' Porta-Brace™ is a heavy-duty, adjustable equipment cart. For studio or the Grip has 16-inch spoked s, adjustable shelves and axle and padded bearing sur-s. The standard model, G-1, is ct. The Grip model G-2 has an shelf which nearly doubles ng capacity. Both models are ole with accessory cases, tri-lder and light stand.

More Details Circle (113) on Reply Card

ulti-track master recorder

iam Audio Corporation has aced the Telefunken M 15A Track Master Recorder. This ne, available in 8-, 16-, 24-2-track configurations, fea-locked CMOS logic with Hall pushbuttons and solid-state ing throughout.
indirect capstan drive system orates a brushless DC motor its speed referenced to a crystal oscillator. A me-cal servo system provides nt tape tension in all modes of ion, yet affords editing flexi-Fast wind speeds are con-sly speed variable, while a ee LED timer accurately in minutes and seconds on ides of zero.
machines are available in or 15/30 ips speed configu-s and have a tape capacity of nches, equivalent to 3300 feet ndard tape.

More Details Circle (114) on Reply Card

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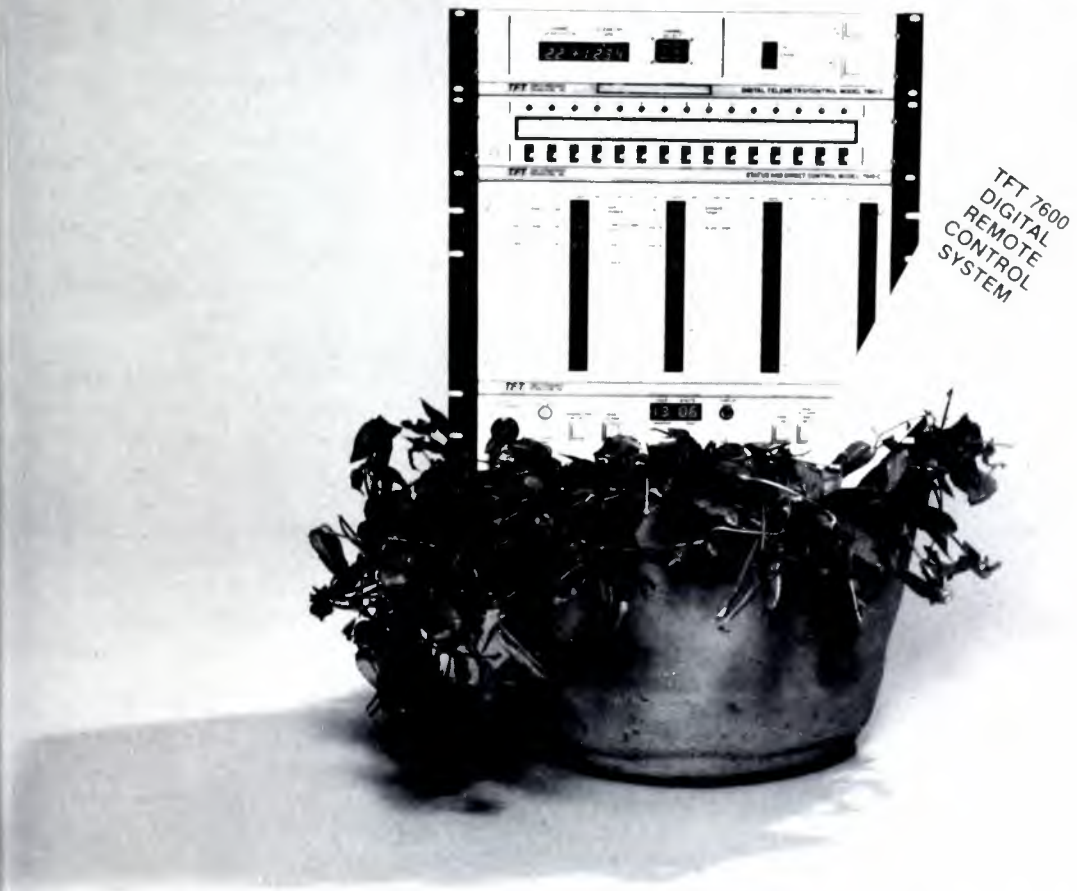

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