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THE INTERNATIONAL JOURNAL OF BROADCAST TECHNOLOGY

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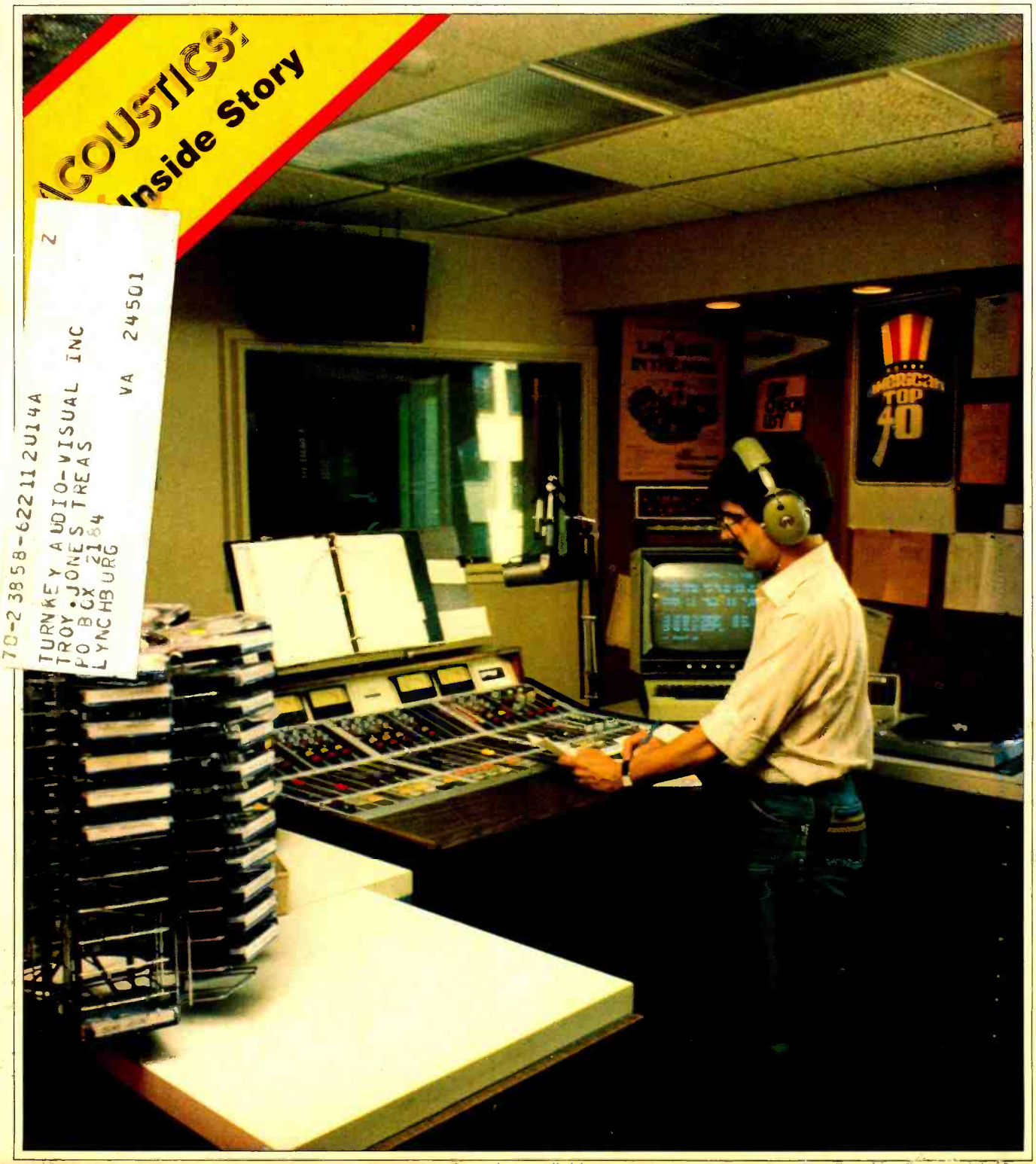

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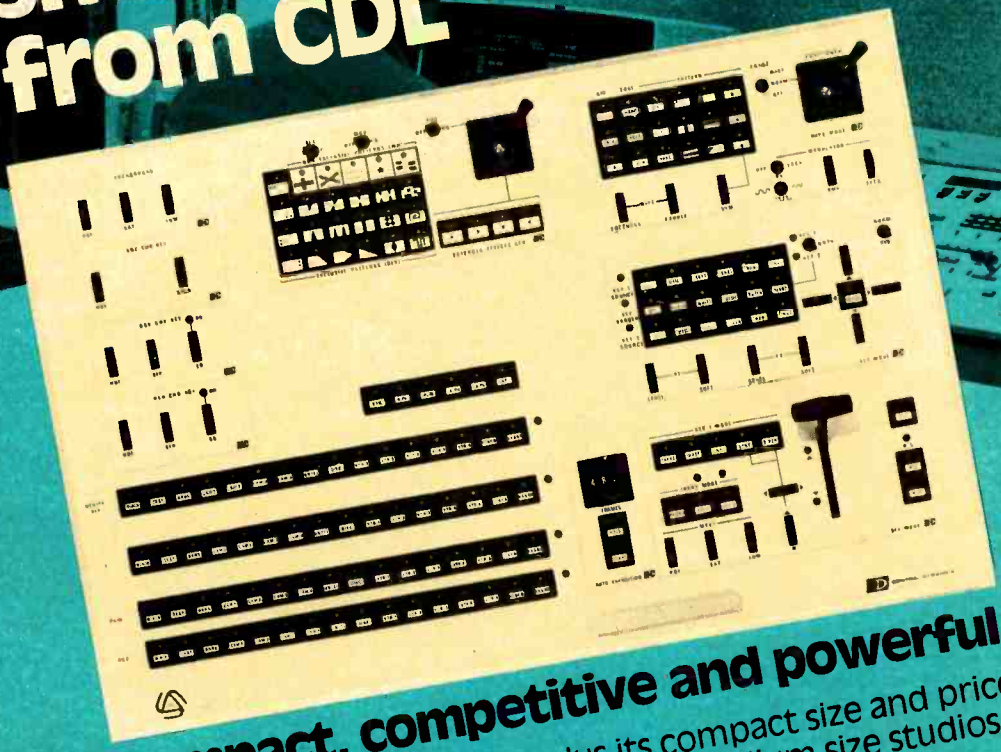

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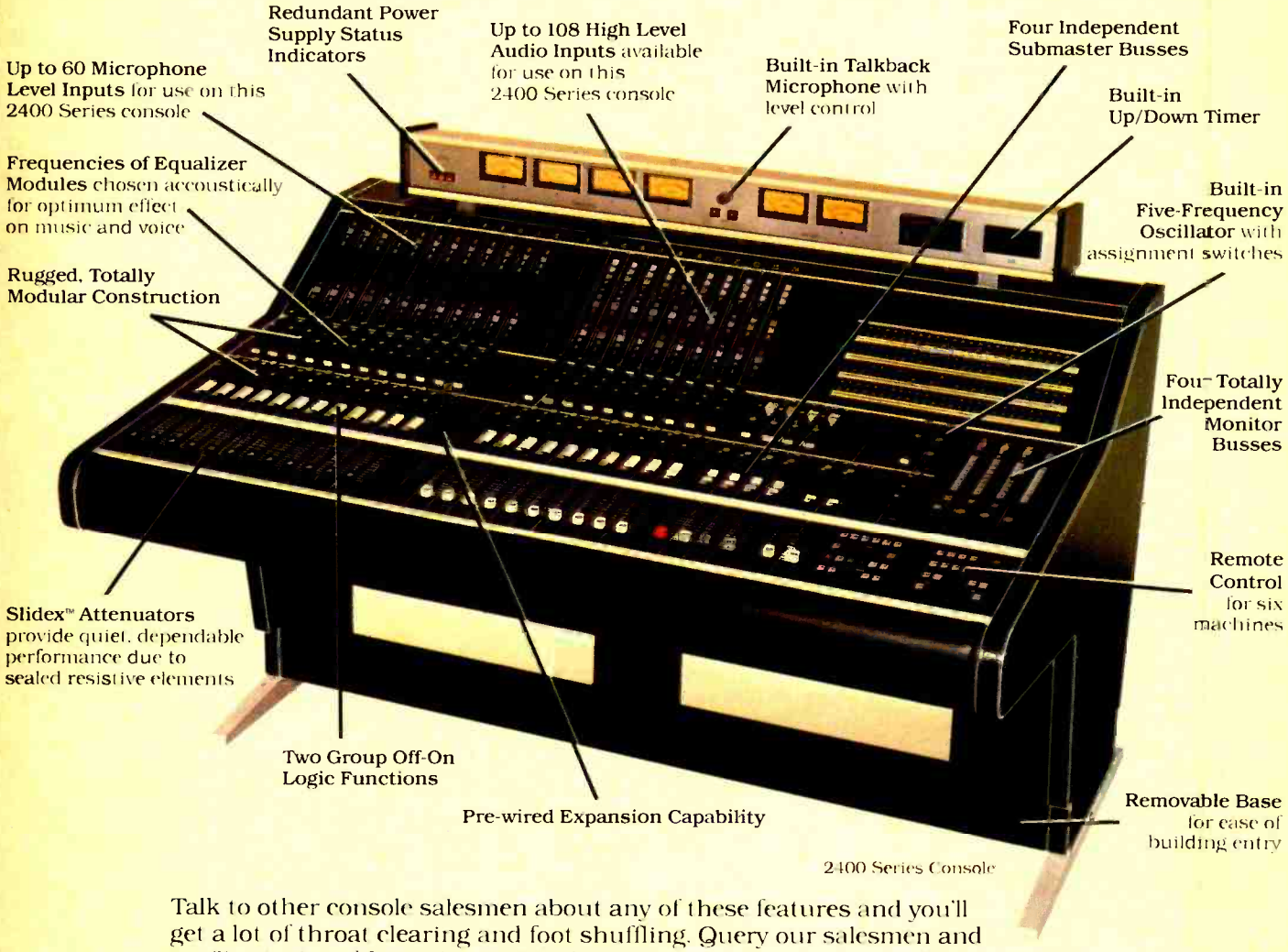

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OCTOBER 1980 VOLUME 3/NUMBER 10

BROADCAST COMMUNICATIONS® THE INTERNATIONAL JOURNAL OF BROADCAST TECHNOLOGY

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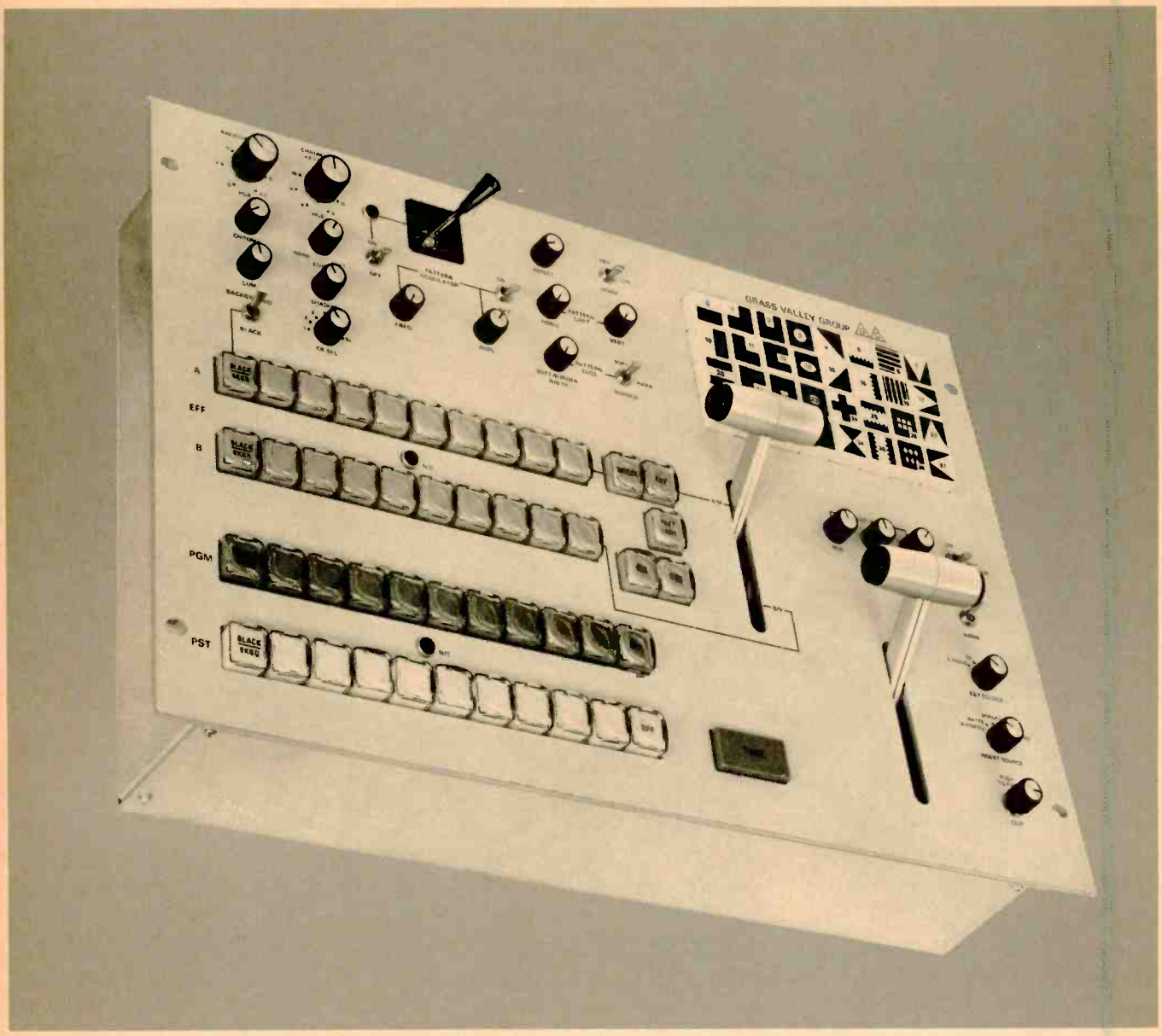
OUR GOOD THING for



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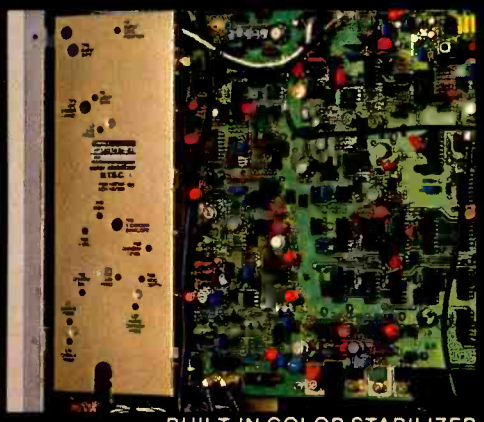

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SMPTE: World standard

Robert M. Smith
President
Society of Motion Picture
and Television Engineers

Standardization and the dissemination of technical information are two of SMPTE's major concerns. In 1980, the SMPTE was 64 years old, having been founded in 1916 by C. Francis Jenkins. In 1950, the word "television" was added to the name of the Society of Motion Picture Engineers and since that time the SMPTE has become involved in television.

Some of the earliest standards in television were developed by SMPTE Engineering Committees in the early fifties. More recently, the SMPTE has received recognition for its standards work on the universal videotape time code and the Tvpe-C 1-inch videotape recording.

The SMPTE, which serves the interrelated fields of motion pictures and television, has tried to achieve a balance between the two. This has not always been easy. In the early days of the Society, most of the technological developments occurred in motion pictures. Now, as film has become a mature discipline, major technological advances occur more frequently in television.

The activities which give the SMPTE the most visibility are its technical conferences and equipment exhibits. Since the SMPTE went from two conferences a year to one a year in 1975, the SMPTE conference and exhibit attendance increased substantially as had the number of booths taken. Last year in Los Angeles we had more than 300 booths of equipment with a total attendance of 9,000. We hope to do better this year.

In addition to the large annual Technical Conference, the SMPTE also puts on the annual Television Conference which has become a major event in itself, although on a much smaller scale. This is a two-day meeting on specific areas of television technology with a small equipment exhibit that supports the program. These TV Conferences have been very successful. The attendance at these conferences has been over 800. Our exhibits at these meetings are limited to equipment related to the conference technical program and usually has between 30 to 40 booths. The next SMPTE Television Conference is scheduled for Feb. 6-7, 1981, at the St. Francis Hotel in San Francisco.

The SMPTE has been very active internationally. The Society is very interested in promoting standardization on an international level. The SMPTE supports other organizations abroad whose aims are the same as the SMPTE's in this area.

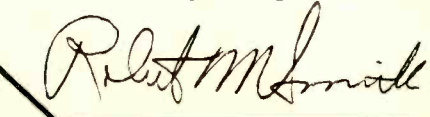
Representatives and delegations from the Society recently visited Europe, Asia, the Orient, and Australia in the hope of strengthening SMPTE's international standards work. In the travels of these delegations, we were able to see how important these standardization efforts have been. We are proud that the SMPTE is sought after for advice and council by other countries. The reason is that the SMPTE has a system that seems to be working, i.e., the bringing together of manufacturers and users in one room on the same committee to discuss the users' needs and how manufacturers can meet them. Do you know that in many other countries, manufacturers are not part of the standard-making process? That is one reason why the SMPTE is important in the international standardization effort that is taking place today.

As an example of SMPTE's close ties with the international television community, and the high esteem in which the SMPTE is held, the EBU (European Broadcasting Union) is holding a bureau meeting in conjunction with SMPTE's Television Conference in San Francisco in February. This is the first time the EBU has left Europe for such a meeting. We are delighted that the EBU has accepted our invitation to meet in San Francisco at that time.

The SMPTE, of course, is a membership organization with more than 8,500 individual members and 185 Sustaining (corporate) Members. In the beginning, the SMPTE was primarily motion-picture oriented. Today, 64 years after its founding, membership composition is equal between motion pictures and television.

The important thing is that no matter how many members we have in a particular segment of our areas of interest, the SMPTE continues its work in encouraging worldwide standardization and the advancement of technology. To this end the SMPTE will continue to organize engineering committees, to publish its monthly technical magazine, the *SMPTE Journal*, and to sponsor technical conferences and equipment exhibits.

In support of these activities, and others, the SMPTE has a staff of 26 at its headquarters in Scarsdale, N.Y., a suburb of New York City, plus a huge reservoir of talent within its 8,500-strong roster of members and 185 company members. The SMPTE requires new blood to keep it strong and I therefore encourage any qualified person to join the Society as an individual member, or any company or TV station to join as a Sustaining Member. The SMPTE exists, really, as simply a service to the industry. We welcome all who wish to join in our industry engineering efforts.



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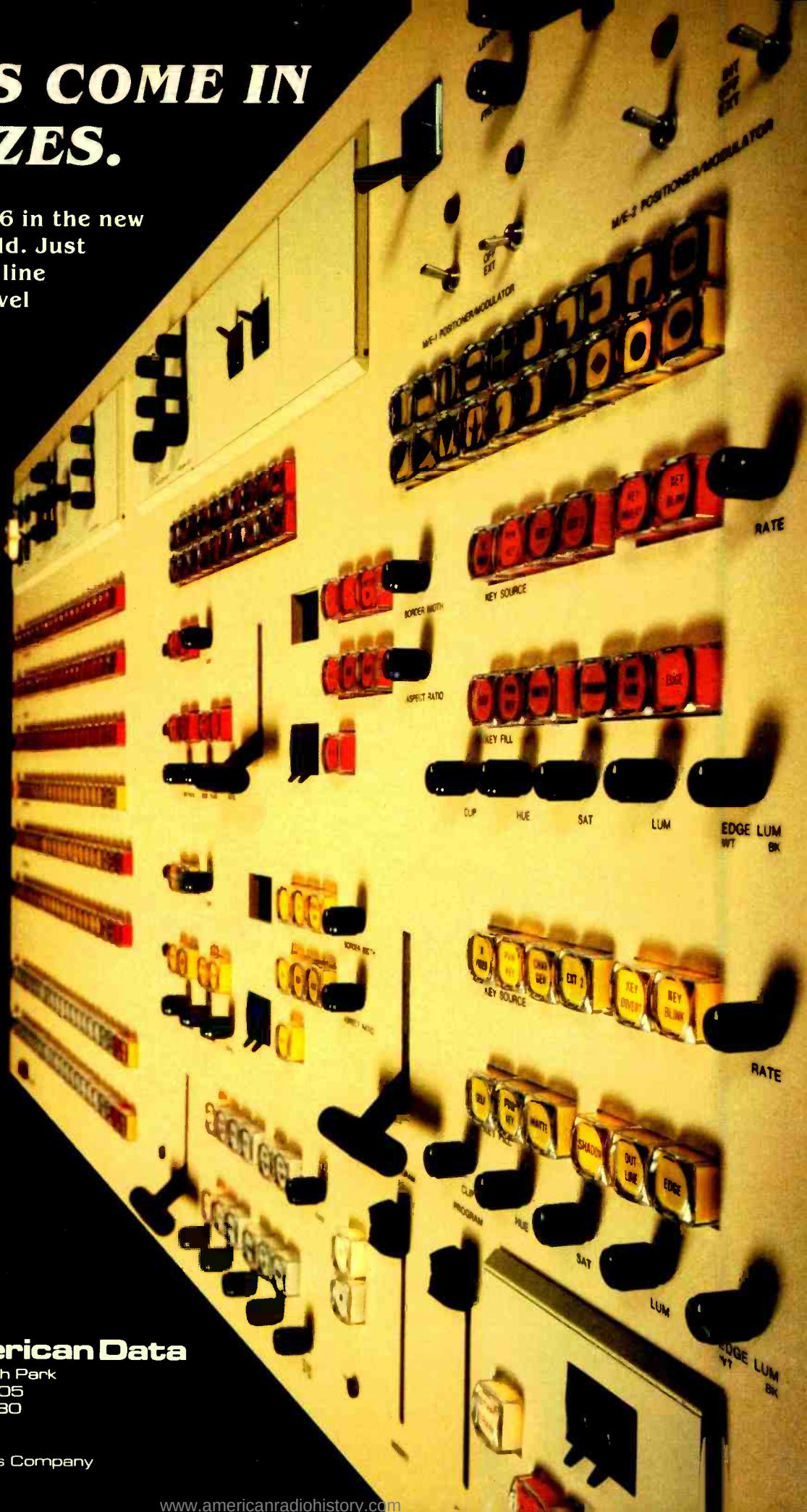

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JAPAN

Solar on line

Solar power is aiding picture quality in Japan and running a microwave system in Australia.

Solar energy applications in the worldwide broadcast community have been multiplying, despite the fact that few stations are seriously investigating solar as the main source to power their primary broadcast service.

Looking to improve translator picture quality, the Nippon Hoso Kyokai (NHK) in Japan has turned to solar power. Using a solar cell array, the NHK is powering up a SHF radio relay station located on the summit of Mt. Gomanodan, 70 km south of Osaka.

This area is in a national park with no access to a transmission power line. In several recent investigations of power lines vs. solar power, solar cell arrays have been winning out. This is especially true in isolated areas. Power-line installation is becoming enormously expensive, while solar arrays are becoming more cost effective and efficient.

Ribbon silicon solar cells are being used in this array. The arrays are economical and have a high output per unit area. The maximum output from this array is 24 volts at 12 amps. Included in the system is a 1,000-Ah, 18-volt storage battery, backed by a DC stabilizer, and charge and discharge protectors.

It is estimated that this solar cell installation was 1/18 of the cost for a suitable power line. The storage capacity of this system when it is fully charged will supply two months of power, with no additional sunlight.

In Australia, the world's first large-scale solar-powered microwave system is also on-line. Established by Telecom Australia, the relay system has 13 solar-powered stations relaying television, telex, and telephone signals. Three solar panels at each site generate the electricity that is stored in 33 lead cells. The storage capacity is 1,500 Ah.

UNITED STATES

The CNN story

Ted Turner's news network continues to grow, but still can't claim success.

Ted Turner's Cable Network News (CNN) is forging its way into the U.S. news scene, but the jury will be out a long time on this one. While the critics have fired broadsides at CNN's lack of a recognizable news format and technical muscle that often delivers "so what" stories, CNN still is piling up numbers.

It was late in August that CNN announced that Teleprompter was pumping up its original CNN commitment from 80,000 subscribers to 300,000, a move that should be completed by February 1981. Teleprompter says the additional commitment was based on research conducted among its systems.

Commenting on the agreement, William J. Bresnan, president of Teleprompter, explained that Teleprompter has traditionally been a supporter of the concept of specialized programming. "We have been carefully monitoring CNN since its inception on June 1 and have come to the conclusion that it is everything that was promised."

From figures available in late August, CNN had increased its penetration to more than two million households in 45 states. But with an operational overhead of about $3 million per month, CNN's 24-hour-a-day, seven-days-a-week news program is still a gamble.

UNITED STATES

FCC Report: Live hijack coverage requires FAA approval

Although a West Coast newspaper ran an item stating that four Seattle stations have been cited for "broadcasting live radio conversations with a would-be hijacker," *BC* has found that citations, as we understand the use of the word when dealing with the FCC, have not been issued.

Responding to complaints about an incident that occurred on July 11 at the Seattle-Tacoma International airport, the FCC has made an inquiry of the stations. In early September the FCC had not yet received a response from all four stations.

After a nine-hour ordeal, the young hijacker was arrested. The Portland-bound Northwest Orient 727 never got off the ground.

When *BC* asked the Complaints & Compliance Division of the Broadcast Bureau for an explanation of the rule involved, the answer was simple: "As a practical matter I think the FAA has a working relationship with the press," meaning that normally the FAA will respond to broadcast requests.

There are certain frequencies intended for the general public. However, the FCC says, you may not intercept and use for your own benefit, transmissions on frequencies not intended for the general public. But how about later on-air use of recorded FAA communications? The FCC says that too must be approved!

For the present, *BC* does not intend to probe the specifics of the Seattle incident. It's too early. Anyway, the FCC says that after it receives responses from the stations and reviews them, depending upon what they find, they could just drop the matter.

Based partly on a hijacking incident, the FCC did issue a policy statement in 1972. The basic reference is to Section 605 of the Act. And it's passed along here as a reminder that FAA approval for broadcast use of FAA communications should not be taken for granted.

UNITED STATES

Reducing power, not coverage

PBS and Comark Communications conduct study on ways to reduce power consumption.

According to a study by the Public Broadcasting Service (PBS), UHF TV stations could cut their power consumption in half without reducing their coverage. At a time when energy costs are rising everywhere, that's good news.

While the tests are still under way, a PBS progress report has detailed the techniques used in laboratories and at public TV stations in Connecticut and Mississippi. These included combining a new tuning system for the klystrons and an anode pulser. A new power transfer system (from transmitter to antenna) was also used.

While the study is aimed at making UHF comparable with VHF, the results may be much more rewarding. The results submitted by John Wilner show that new transmitters could be built, or old ones modified, with a 40 to 60 percent power-consumption reduction.

Tests in this program were carried out at the Comark Communications facility in Southwick, Massachusetts, as a joint effort with the PBS Engineering Committee. Wilner, along with Tom Keller,

Continued on page 12

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Fiber Optics Video Transmission System, 4210 has audio subcarrier. Provides interference-free video and aural transmissions for STL and ENG applications.

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director of engineering for PBS, and LeRoy A. Wallace of Comark worked jointly in evaluating the super-high-efficiency system.

The significance of this development is that the UHF station owner could reduce his power bill by a minimum of $35,000 per year. Additionally, it improves the UHF TV broadcasters' ability to compete against VHF TV stations.

According to a statement issued by Comark's president, Richard E. Fiore, his company intends to market a total product line that includes conversion kits for existing systems so that maximum energy conservation can be achieved.

CANADA

Who controls what?

The provinces want control of cable TV, but the CAB warns of the possible danger from such a move.

The Canadian Association of Broadcasters (CAB) has asked Prime Minister Pierre Trudeau for a meeting to discuss what the association sees as a potential threat to the national broadcasting system.

The threat stems from an apparent decision among the 10 provinces to seek control of cable television and to regulate telephone companies.

According to the CAB, there is danger in the idea of handing over control of cable television carriage to the provinces "in the absence of clear national policies designed to preserve the present relationship between cable and broadcasting."

Broadcasters are worried about control over cable interfering with the free flow of television signals to their audiences across political boundaries within Canada.

The CAB letter reads, in part, "Broadcast signals are pervasive and do not observe political boundaries. It is easy to imagine, however, the attraction to a province of wishing to exercise transborder control over broadcasting by imposing rules about what signals will be carried on provincially controlled cable systems."

The CAB has data showing that in English Canada 85 percent of all TV viewing is to stations affiliated with Canada's national networks or to foreign stations whose signals cross international borders. In Quebec it is 60.2 percent. Multiple ownership of broadcasting stations and networks also spreads across the country in interprovincial fashion enabling economies of scale to be achieved in Canadian program production.

CAB president Ernest Steele says that the public should be concerned about the possibilities that wrong kinds of agreements can slip by. "News media commentators tell us that there is public indifference to the subject of constitutional reform," Steele said. "Whether or not that is true we are at a point where negotiations on reform may be akin to someone's wry comment about air travel: 99 percent boredom and one percent terror. And bad things can happen just when we're not taking notice."

UNITED STATES

More stations may be on the way

As many as 300 additional stations could be on the air by the late 1980s as a result of recent FCC actions.

While it may be a year before the FCC will see any international action on the 9 kHz AM channel-spacing proposal, the

Continued on page 16

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SALHANY

"Programmers have come into their own!"

Lucie Salhany, 1980 President of the National Association of Television Program Executives, is Vice President of Programming for Taft Broadcasting, with corporate headquarters in Cincinnati. She divides her time between Philadelphia and the Taft Broadcast Group in Cincinnati.

"The role of television is changing. It's becoming more informational. There's so much information available today, we can't absorb it all. We can't read enough or learn enough to keep up. So television has to help fulfill that role. Most people get their information from TV as their primary source. And that's going to increase.

"There's going to be fragmentation. We have got to respond and compete. We can't do that by buying reruns. We can go back to basics—the era of personalities, when Donahue and Douglas were local. We can go back to that era and start building new personalities in a little more sophisticated vein. Or we can go to informational programming, expand the news, a magazine format, programming that teaches in an entertaining fashion. I'd love to see a program that's segmented, with live elements, dealing with international events.

"Broadcasting must plan for the future now. At some point, home satellite receivers are going to affect us. Are the networks going to bypass the local stations and go right to the home? If that's the case, how are we going to program for ourselves? I've already done a program schedule for 1990!

"Even today demographics are changing. We see the 25 to 54 segment growing, 18 to 49 dropping back. The working woman is becoming very important. At some point, we could see the ten o'clock news on the affiliates, because people are going to bed earlier.

"Programmers have always been looked upon as people back in the control room, sitting in shirt sleeves, creating programming with no 'feel for the business.' That's no longer the case. Programmers are getting smarter. Now they are salespeople, marketers, buyers, and creative people. Programmers really have come into their own. And the smart companies are accepting that and are using them in all phases of broadcasting.

"Taft is in the family entertainment business and, of course, uses both film and tape. There is a need for film in some things that film does best, like news magazines, documentaries, and investigative reporting. Film gives us excellent sensitivity and flexibility.

"I started with an independent television station. I think there's no finer way of learning broadcasting. You become a generalist rather than a specialist. You're involved in the total station operation and an independent programs all day long, versus segmented time that an affiliate programs. If you want to get in the business, you should begin with an independent group or station."

In our publication, TELEK, *broadcasters talk about their experiences, and we tell you about our latest technical and product developments. If you would like to be on our mailing list, write: Eastman Kodak Company, Dept. 640, Rochester, New York 14650.*

Commission is busy laying the groundwork for the move in that direction. In August the FCC issued a further Notice of Inquiry with a comments deadline set for November 1.

The Commission wants those "interested in applying for new stations that could go on the air by the end of 1987" to spell out the proposed station's location and nature of service in "statements of intent." Existing broadcasters who would like to expand their service also have been requested to send in similar statements.

At stake for those already on the air is increased competition for advertising and further fractioning of the audience. For those waiting in the wings, it could mean as many as 300 will make it on the air in the late '80s. What they find when they get there may be a surprise to everyone.

One of the main complaints of active broadcasters is that if they are required to change their operating frequency, it will be an expensive burden for the encumbents. And how much will it cost? Looking into this fact of the problem, the NTIA's Institute for Telecommunication Sciences conducted a study to determine the approximate costs and to see if station personnel could make the adjustments. The authors were assisted in the experimental phase of the program by engineering staffs from cooperating radio stations and by FCC engineers.

This report concludes that in many cases the station staff could make the changes and that, in fact, except for some very few critical arrays, no redesign would be necessary.

The report (NTIA Report 80-39) entitled "Effect of Small Frequency Changes on the Radiation Patterns of MF (AM) Directional Antennas" is available for $7 by writing to the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. The accession number is PB 80-199433.

Business Hotline

CONTROL VIDEO — Control Video has moved its headquarters from Sunnyvale to Campbell, California. The move was prompted by the needs of an expanding manufacturing operation. Control Video manufactures a line of software-based, microprocessor-controlled SMPTE readers, writers, and VTR controllers, marketed as the Intelligent Controller™.

IMAGE TRANSFORM — Ed Marzola & Associates was recently appointed as exclusive representative in Mexico for Image Transform, a California-based film and videotape specialty firm. Services covered by Marzola include Image Transform's electronic tape-to-film and film-to-tape transfer technologies, as well as its PAL, NTSC, and SECAM standards conversion. Ed Marzola & Associates is located at 8831 Sunset Boulevard, Suite 408, Hollywood, CA 90069; (213) 652-7481.

PYE TVT LIMITED — The NOS (Netherlands Omroep Stichting), the Dutch national broadcasting organization, has purchased a four-camera outside-broadcast (OB) production unit from Pye TVT, United Kingdom. The design of the vehicle is the result of a year of close collaboration between the NOS and TVT's design engineers. The NOS has also ordered an identical vehicle, which will be delivered this fall.

Continued on page 20

QUANTAFONT™

Teleproduction Graphic Titlers

The unique microcomputer technology that enables self-contained, high performance titling at affordable costs.

See Us At SMPTE Booth No. 179

Q-7A

- Proportional characters and spacing with
- NANOLOG 20 nsec resolution*
- 16 resident fonts from 8 to 64 raster lines high
- Colorized characters and backgrounds
- Full border and shadow edge selections
- Extensive composition and editing functions
- 10, 16-row page resident memory with memory protect battery
- Roll, crawl and flash with 2-speed control
- And more

Q-VII

- 3 resident fonts with 20 selectable display sizes of all fonts
- NANOLOG 20 nsec resolution*
- Colorized characters and backgrounds
- Full border and shadow edge selections
- 12, 16-row page resident memory with memory protect battery
- Extensive composition and editing functions
- Roll, crawl and flash with 2-speed control
- And more

Q-VI

- 24 character sizes selectable by row
- Upper and lower case font of capital letters
- Character resolution up to 32 horizontal pixels
- Color backgrounds and graphic separators
- Extensive composition and editing functions
- 12, 16-row page resident memory with memory protect battery
- Roll, crawl and flash with 2-speed control
- And more
- Monochrome only (Q-VI/A)

Q-V

- 12 character sizes selectable by row
- Upper and lower case font of capital letters
- Character resolution up to 32 horizontal pixels
- 12, 16-row page resident memory
- Random access to 48 resident positionable titles
- Vertical title positioning at any raster location
- Roll, crawl and flash
- Mini-cassette extended memory — optional
- And more

Flexible Disc Memory Accessories

- Single or dual mini-disc storage systems
- 100, 16-row pages per disc
- Random or sequential page access of less than .5 seconds
- Data block of titler resident memory per disc
- Memory console can accommodate 6-inch monitor

Digital Cassette Memory Accessories

- High speed computer grade cassette tape systems
- Block load storage of entire resident memory
- **Top mounting** console with or without 6-inch monitor
- **Self standing** style coordinated tape transport only

QST Sub Titling System

Incorporates all of the Q-7A composing and display capabilities for self-contained, automatic sub-titling. Interfaces directly to audio or TTL level EBU/SMPTE time code.

- Full function titler for entry of translated text
- Automatic disc indexing
- Flexible title editing
- Off-air edit and control display

Q-VI/M Automatic Mass Memory Display

- Programmable control over a digital cassette mass memory
- Over 3,000 rows — 400 pages, typical
- All display capabilities of Q-VI titler available for automatic recall

International Alphabets

- Accented international alphabets available for all titling systems

Mini-Cassette Digital Tape Transport

- **On board** mini-cassette digital tape extended memory — Q-V only
- Block load storage of resident memory on each side of mini-cassette

SYSTEM CONCEPTS

To Be Letter Perfect

System Concepts, Inc.
395 Ironwood Drive
Salt Lake City, Utah 84115
Phone: (801) 486-3833
TWX: 910-925-5684

Eastern Corporate Office and
System Concepts International
16006 Waterloo Road
Cleveland, Ohio 44110
Phone: (216) 692-3410
TWX: 810-421-8192

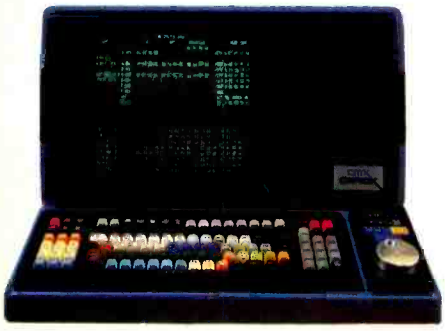
*Effective average start-point resolution with patent pending NANOLOG™ circuit.

Circle (12) on Action Card

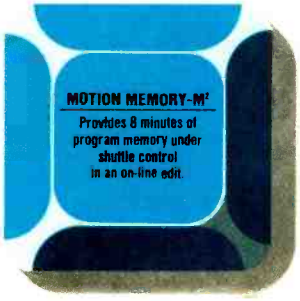
If you think you own a CMX look and 34X edit

"Some day I hope to own a CMX." Occasionally we'll hear someone voice this wish. It's time for another look. With the design improvements and cost advantages we've built into today's 340X and 34X we think you'll want to include CMX in your future.

We have completed some advanced engineering and added new features to these computer-assisted editing systems, and we're delivering a brand new model, THE EDGE™. We've also come up with an impressive new way to generate CMX Edit Decision Lists using lower cost pulse count controllers. That's our EDL Logger.



CMX 340X—Real Editing Power
There are lots of reasons why the CMX 340X is the preferred video tape editing system. Check the features we've illustrated on these pages—Motion Memory, Gismo, List Management and Auto Assembly. Add to this a software enhancement package that includes Editing on The Fly (Sync Roll), Master/Slave, Jam Sync and Second Audio. Also control of a production switcher, either directly or through its intelligence option is standard.



And with our distributed processing you own the ultimate in expandability. A central processor, or "supervisor", communicates with the operator and our Intelligent Interfaces™ (I^2's), or "specialists" in control of any one of many post-production VTR's, switchers and other devices. When you expand you simply add an I^2 for each device. Built-in expandability means long-term protection for your investment from the moment we install your CMX.

But the 340X is more than a combination of smartly-engineered electronic components. Installed and ready to use it is a complete system, a partnership that keeps you in post production. We think of it as our "total" commitment to you.

Today's 340X is a complete on-line/off-line system that includes a dual 8" disk drive for list input/output/copy, a printer, and a central processor designed to give you the option of MOS memory or core. All this editing power plus the widest variety of machine and switcher interfaces available.

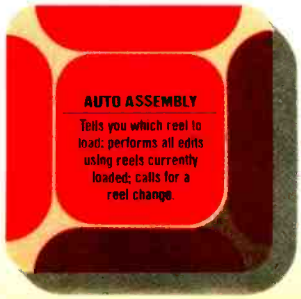
So look again. Here's the real thing. A 340X in a three-machine configuration that's priced under $55,000 in the U.S.

CMX 34X—Easy to Own
The CMX 34X is everything the 340X is, does everything the 340X does except control a production switcher and include the software enhancement package. If you want the long-range advantage of expanding to a full 340X system, start with the off-line capabilities of the 34X.

You can put the most complex transition in the Edit Decision List. By adding CMX's General Purpose Interface option you can control switchers and effects systems.

A 34X, with three I^2's, an 8" dual disk drive for input/output/copy, a printer, a 5 × 1 cuts and preview switcher, and full CMX list generation and list management is $34,500 in the U.S.

For less than the price of a 1" VTR you can own the system everyone prefers to work with.



can't afford to at today's 340X ing systems.

THE EDGE™

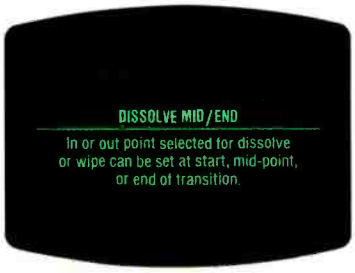
Innovation in Editing

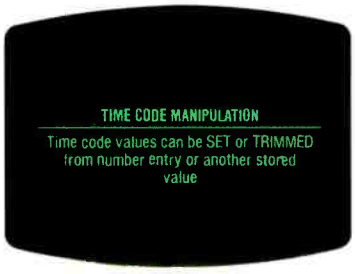
The newest technological advance from CMX is SMART KEYS™. They are the heart of THE EDGE, an ingenious editing system that uses a CRT display to label 12 keys according to their function. The system is so simple and logical that the next step appears on the screen.

THE EDGE is a two-source, one-record system that can do dissolves, produce a CMX-standard Edit Decision List with wipes and delayed transition events. It auto assembles or list processes with new record start and re-edit or ripple times.

It includes two General Purpose Interfaces (GPI's) to control auto-transition switchers, digital video effects, character generators, etc. These GPI events, as well as splits (audio or video displays) can be entered on the fly (MARKED). And locating any point in a scene is as smooth and easy as turning THE EDGE's Reel Motion Controls.

THE EDGE permits mixing of SMPTE time code and control track (pulse count) and works with 1", 3/4" and 1/2" formats.





Simplicity, flexibility, and versatility are hallmarks of THE EDGE. And its priced from $17,000 in the U.S.

THE EDL LOGGER

The EDL Logger generates CMX Edit Decision Lists from a two-machine controller for 1/2 and 3/4" VTR's. This list can be either on paper tape, hard copy or both for use on a CMX. Wipes, dissolves and reel numbers can be included. It's priced at $10,000.

THE PARTNERSHIP

It's all part of CMX's considered approach to editing—an approach that comes from perspective. We created the first practical video editing systems over 11 years ago and have consistently set new standards in the state of the art, year after year.

We've made sure that every one of the over 300 CMX video tape editing systems ever installed throughout the world is still operating today.

And it's this kind of commitment, not only to service and training, but to technological leadership that reflects the continuity of management at CMX/Orrox.

CMX means creativity, expandability, efficiency and freedom from obsolescence. CMX means editing.

Circle (13) on Action Card

CMX
ORROX

The World Standard for Editing

Orrox Corporation 3303 Scott Blvd., Santa Clara, CA 95050 (408) 988-2000 Telex 910-338-0554
Chicago (312) 325-8488/Los Angeles (213) 980-7927/New York (212) 371-1122
International Representatives: Magna Techtronics Pty. Limited, Artarmon, N.S.W., Australia/Totsu, Tokyo, Japan/TeknoMerica, S.A. Mexico City/F.W.O. Bauch Ltd., Herts, United Kingdom/Thomson-CSF, Gennevilliers, France/GTC GmbH, 2070 Grosshansdorf, W. Germany

LOGITEK — Giesler Broadcasting Supply, sales representative for Logitek broadcast equipment in Texas and Louisiana, has moved into new facilities at 9440L Harwin Drive, Houston, TX 77036; (713) 974-6205. Giesler also distributes a full range of RF and audio equipment for broadcasters.

CONVERGENCE CORPORATION — ABC Network News, New York, used Convergence editing systems in the television coverage of both the Republican and Democratic conventions. For on-line and off-line production at the Democratic convention, ABC used 25 Convergence editing systems on ¾-inch VTRs, plus several Convergence/Ampex HPE editing systems on 1-inch VTRs. Various models were used, including current microprocessor-based joystick models ECS-90 and ECS-103B.

NIPPON ELECTRIC COMPANY (NEC) — NEC has received its second Emmy for Outstanding Engineering Achievement. This year's Emmy was for NEC's DVE® (Digital Video Effects) system. The first Emmy was awarded in 1975 for NEC's frame synchronizer. The DVE system is a creative television production tool that allows a video frame or picture to be reduced or expanded in size, repositioned, frozen, and otherwise manipulated "live" or from videotape. DVE systems are used in news programs to position the "mini-cam" remote picture over the newsperson's shoulder, or to zoom a small insert shot to full screen. NEC DVE systems are being used in television sports coverage, commercial production, news and documentary work, and entertainment shows at the network and local-station level throughout the U.S. and all over the world.

CROSSPOINT LATCH — Broadcast Video Systems Ltd., Toronto, has been named the exclusive master distributor in Canada for Crosspoint Latch Corporation, Summit, N.J. Broadcast Video Systems will handle all sales and service and carry a complete line of spares. The company will sell through their own dealership network.

A. F. ASSOCIATES — Marconi Electronics and A. F. Associates have signed an agreement under which AFA becomes the exclusive sales representative in the U.S. for all Marconi broadcast studio products. The agreement calls for AFA to be responsible for the sale, installation, and servicing of the 1-inch Type C format VTR as well as accessories, cameras, and standards conversion equipment. A. F. Associates is located at 100 Stonehurst Court, Northvale, NJ 07647; (201) 767-1000.

AMPEX — Ampex recently announced the delivery of its 2,000th VPR-2 helical scan videotape recorder/reproducer to Datacommunications in Paris. Datacommunications, a subsidiary of the government-owned Societe Francaise de Production, will use the system for broadcast teleproduction work. Two Ampex VPR-2s are already in operation at the Datacommunications video production facilities.

CMX SYSTEMS — CMX/Orrox has begun deliveries of its new editing system, The Edge, with the first one going to Editel, a Los Angeles production house. The new computer-assisted editing system is designed to provide greater speed and ease in control track and time code editing than previous medium-priced systems. The Edge is available in NTSC and PAL. BC

Budgeting For a "Super Editor"?

Get a VANGUARD and Save Enough To Buy a Tempo 76 Too!

You don't have to spend a fortune to get the creative flexibility, speed and convenience that you want in a videotape editor.

Over 400 Tempo 76 and Vanguard editing systems are in service at post-production facilities all over the world. No one else in our price/performance bracket has more editing systems in operation.

The reason for our success? Simply this: Tempo and Vanguard offer higher performance and more features for the money than any other editing systems available.

Tempo provides A/B roll editing capability with up to 3 decks and a switcher. Vanguard provides A/B roll and A/B/C/D sync'd roll editing capabilities with up to 5 decks and a switcher, and also gives you selectable preroll, postroll and operator reaction times.

Both Tempo and Vanguard share an impressive list of features rarely found in their price ranges:

- ***Modularity*** — Your editing system can grow as you do.
- ***SMPTE or Control Track Operation*** — Edit with or without SMPTE code, or through time code dropouts.
- ***Interfaces*** — for over 40 makes and models of decks: quads, 1" types A, B & C, ¾" VCRs, audio decks, and the Rank Cintel Mk IIIB.
- ***VaraScan™*** — Variable speed tape search control allows continuously variable forward/reverse tape shuttle from high speed to freeze frame. Tempo can be equipped with one assignable VaraScan™ control; Vanguard can be equipped with dual controls. Also available on Vanguard is SmartScan™, which allows the system to memorize and perform variable speed edits, edit compression/expansion & a variety of other variable motion edit effects.
- ***Edit Lists*** — Tempo can store up to 300 edit decisions; Vanguard, up to 999. Both feature powerful, uncomplicated edit list management and the full range of edit list I/O options.
- ***Auto-Assembly*** — Tempo performs auto-assemblies from up to 2 source decks; Vanguard can draw upon up to 4 source decks.
- ***Human Engineered Operator Consoles*** — Dedicated function keyboards for fast, efficient entry of edit and split times, switcher control commands and tape deck motion control commands. Large, well organized edit parameter displays.

And to cap-off this impressive list of features, we back-up Tempo and Vanguard editing systems with a complete line of compatible SMPTE code equipment, routing switchers and editing production switchers.

Find out why creative editing doesn't have to cost a fortune. Call or write us today. Datatron, Inc./Video Systems Division, P.O. Box 11427, Santa Ana, CA 92711, Telephone (714) 544-9970.

Circle (15) on Action Card

datatron, inc.

VIDEO SYSTEMS DIVISION

We Make Creative Editing Affordable

Introducing the only ¾" time code editing system that performs 20 automatic edits from multiple sources. The Panasonic 700 B-2 Series Time Code Editing System.

700 B-2 SERIES

Now Panasonic adds a new dimension to the speed and accuracy of time code editing with our new 700 B-2 Series Time Code Editing System. The AU-700 editing recorder, the AU-A70 programmable editing controller, and the AU-J10 multiple source adapter. Together they let you do what other time code editing systems don't: Perform up to 20 automatic, multiple-source insert and assembly edits. And the 700 B-2 Series is packed with outstanding performance features.

The precision of direct drive.

Check out the excellent stability and precision of the AU-700's direct-drive video head cylinder and capstan servo motor. The superb performance and durability of our crystal-oriented HPF™ heads. All combine to produce an outstanding picture with horizontal resolution of 260 lines color, 330 lines monochrome and S/N ratio of 46 dB color, 50 dB monochrome. You'll also get an edit with less video noise because video head switching has been moved to the vertical interval so it never shows up in the picture. At the same time, we incorporated DUB IN and DUB OUT connectors with separate Y/C signals and a flying erase head. And to keep that good-looking picture looking good, all circuitry is mounted in a durable annealed aluminum die-cast chassis.

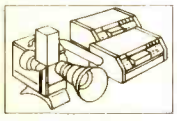
The speed of microprocessors.

Another touch of ingenuity is the AU-700's microprocessor controls. Designed to work perfectly with the AU-A70 editing controller, they give you the speed, accuracy and versatility of full-logic, mode-to-mode switching. The AU-700 will accept SMPTE time code on a separate track or on audio track one as well as standard CTL pulses. And its electronic

Shown from left AU-700 editing recorder, AU-A70 programmable editing controller.

digital tape counter displays LED readouts of CTL pulses in minutes and seconds—even in fast forward and rewind.

Multiple source versatility.



With our AU-A70 editing controller not only can you generate and read time code pulses, microprocessors let it perform up to 20 time code edits automatically. Add an AU-J10 multiple source adapter and it will accept inputs from two source decks and one live line plus perform A/B rolls. Microprocessors also let you automatically go to specific tape locations. You can also search both ways at speeds of 1/20X, 1/5X, 1X, 2X, 5X plus pause with picture. Other features include program check, program exchange, insert programming and overflow indication. For editing convenience, separate address time and lap time indicators are included. The AU-A70's error codes pinpoint any procedural errors to avoid incorrectly programmed edits. The AU-A70 can also be used with any Panasonic solenoid-operated ¾" and ½" VHS™ decks. For worldwide versatility, there is a built-in voltage selector that is compatible with 100V / 120V / 220V / 240V AC, at either 60 Hz or 50 Hz.

Total service capability.

When it comes to servicing and maintaining the 700 B-2 Series, Panasonic backs you with a full network of B-2 dealers, equipped with total service capability. Each has the parts, test equipment and technical expertise professional applications require. For further information, call your regional Panasonic office: Midwest—(312) 364-7936; Northeast—(201) 348-7620; Southeast—(404) 923-9700; Southwest—(214) 356-1388. The new 700 B-2 Series Time Code Editing System. Only from Panasonic.

Panasonic
VIDEO SYSTEMS DIVISION
Circle (16) on Action Card

NEWSMAKERS

Mike Townley, the engineer-in-charge for the British Armed Forces radio facilities on Cyprus, has joined the BROADCAST COMMUNICATIONS masthead as a foreign correspondent. Townley will report on broadcasting from that part of the world, with his first report appearing in the November issue. In this article, he will cover the British Forces Broadcasting Service on Cyprus: its structure, purpose, format, and technical operations. Townley is on the lookout for broadcaster/hams at 0330 Z just below 21.300 Saturdays.

Alan Lafferty has succeeded **Gwyn Morgan** as manager, engineering promotions, for the British Broadcasting Corporation (BBC). Lafferty will be responsible for organizing exhibition displays and press coverage to promote the BBC's engineering achievements. He joined the BBC in 1971 after serving 10 years in the Royal Corps of Signals in the U.K., Germany, and Singapore. After a short tenure at the Daventry transmitting station, he joined the BBC Research Department where he worked in the carrier systems section on a variety of advanced projects. In 1978 he joined the Engineering Information Department as an engineer in the liaison section. Morgan left the BBC to join Logica Ltd., a computer consultants firm.

George Davies has been appointed director of affiliate affairs for Enterprise Radio/The Sports Network, which begins sports programming to radio stations nationally on January 1, 1981. Davies comes to Enterprise Radio with an extensive background in the area of affiliate relations, having served as regional manager of affiliate relations for ABC Radio from 1969 to 1975 and regional affiliate relations manager for NBC Radio from 1975 to 1978. Prior to joining Enterprise Radio, Davies was northeast sales manager for Media Statistics, a firm specializing in audience research.

Lewis Wetzel has taken over as senior vice president for engineering at the National Association of Broadcasters. Wetzel, who comes to the NAB with almost 30 years of working knowledge of broadcast engineering, was most recently sales manager for Flash Technology. He began his career in 1952 as a design and development engineer on TV transmitting antennas for RCA. In 1957 he joined the broadcast consulting firm of Kear and Kennedy as senior staff engineer. From 1960 to 1971, Wetzel was assistant director of engineering for the Radio and Television Division of Triangle Publications. Since 1971 he has held positions with Shively Laboratories, Dielectric Communications, Bird Electronic Corporation, and Flash Technology. He is also a Fellow and past national president of the Society of Broadcast Engineers, chairman of the FM sub-group of U.S.-International Radio Consultive Committee (CCIR), past U.S. State Department delegate to international CCIR meetings, and associate member of the Association of Federal Communications Consulting Engineers.

Stephen Hom has been appointed corporate director in charge of all television broadcast facilities and operations at Lincoln Television Inc., a leading San Francisco UHF broadcasting corporation with extensive pay TV programming commitments with Subscription Television of America. Hom, station manager of KTSF-TV, will be responsible for the technical operations, marketing, and sales of all tele-

Continued on page 26

When you upgrade, start with Auditronics new 110B on-air console

The 110B on-air mixer gives you up to 18-inputs in either stereo or mono with these standard features • Control room monitor • Headphone control • Seven mono line output amps • Three stereo bridging line amps • Five VU meters • Stereo program and audition output channels with meters • Mono output with meter • Cue on all mic and line inputs.

Auditronics modular design lets you start now with a basic main-frame and add modules for greater operational flexibility later when you need them. And, all Auditronics input modules and faders are interchangeable and obsolescence-proof. If you'd like to air a signal that is truly state-of-the-art, the place to start is with an Auditronics 110B console. For complete information and the name of your nearest dealer, circle reader service number or call us.

auditronics, inc.

3750 Old Getwell Road, Memphis, Tennessee 38118 (901) 362-1350

Circle (19) on Action Card

NEWSMAKERS

vision programming now being produced or presently distributed by broadcasting representatives.

Louis Pollack was elected to the new position of vice president, Intelsat Technical Services, of COMSAT. Pollack had been executive director, satellite communications research, in COMSAT Laboratories.

Dan Snyder was recently appointed general manager of KCAP-AM/FM, Helena, Montana, and vice president of radio for Western Broadcasting Company, Missoula, Montana. Snyder returned to Montana from Los Angeles, where he was vice president and divisional manager of Broadcast Marketing Company. While with Broadcast Marketing, he worked with radio and TV stations in improving their expertise in co-op advertising and retail marketing as it applies to broadcast.

Jeffrey Jay Weber left WAZY, Lafayette, Indiana, to become general manager of WWCM-WBDJ in Terre Haute, Indiana. Weber joined WAZY in 1977 to do the morning drive show. He later became program/operations manager.

Homer Lane, executive vice president and general manager of KOOL Radio-TV, Phoenix, Arizona, was recently named chairman of the newly organized Government Relations Committee at CBS Television. The committee, which consists of 13 members and two at-large members, represents CBS affiliate stations from across the country. Lane joined KOOL in 1951. He became vice president in 1958, general manager in 1961, and executive vice president and general manager in 1972.

Charles Rhodes, chief engineer, television products, Tektronix Inc., has been named a Fellow of the Institute of Electrical and Electronics Engineers (IEEE). Rhodes joined the IEEE organization 10 years ago. He began his career as a field engineer with CBS before joining Tektronix in 1956. Associated with the company's instrument design engineering department, Rhodes has contributed toward the design of Tektronix' television products introduced since 1960.

Chris Davala is the new director of news and public affairs for Golden West Broadcasters' all-news Oklahoma City UHF TV station Channel 43, set to begin formal operations in late fall. Davala has spent the past three years as assistant news director and news anchor for heavily news-oriented Oklahoma City radio station KTOK.

Steve Thompson was promoted to news manager at WTOP Newsradio 15, Washington, D.C. Thompson has worked with WTOP since 1975 as a reporter and as producer of the station's morning all-news programming. He initiated WTOP's airborne traffic service in 1977 and continued daily reports from above the city until 1979, when he was critically injured in the crash of the WTOP traffic airplane. He was previously news director at WYRE in Annapolis, anchored congressional coverage for National Public Radio, and reported for WMAL News from 1972 to 1975.

Ted Carson has joined KSRR-FM, Houston, Texas, as program director. Carson had previously been the morning air personality with the former KAUM, now KSRR-FM. Prior to that he was program director for KXYZ, Houston.

Don Insley is the new vice president of the Radio Division of Standard Broadcasting Corporation. In another appoint-

Continued on page 28

Portable Studio Quality. BCN-KCA

50 BOSCH FERNSEH 1929-1979

The first portable studio quality recording system with reels and cassettes. 1 inch type B format according to SMPTE/EBU operating in all TV standards throughout the world. Full compatibility in the most extreme environmental conditions. Battery powered, self contained units: Cassette version BCN 5, reel to reel version BCN 20, compact light weight system camera KCA. The advanced and economical equipment for electronic news and field production. From Bosch.

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Television Systems Division
Your Video System Partner

FERNSEH Inc.
The Video Corporation of
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Circle (22) on Action Card

ment, **Bill Hall** was named vice president and general manager of Standard Broadcasting's CFRB, Toronto.

Mike Sommerfeld has been promoted to general sales manager of KGUN-TV, the ABC affiliate in Tucson, Arizona. In his new position, Sommerfeld will be responsible for coordinating and supervising the sales effort for Channel 9's local, regional, and national sales.

Jon King, Robin Nunnelly, and **Jim Jackson** recently joined the engineering staff at KSDF-TV, St. Louis. King was formerly a videotape engineer at WTVG-TV, Toledo, Ohio. Nunnelly was a technical director, and tape and audio engineer with KCBJ-TV, Columbia, Missouri, before joining KRCG-TV, Jefferson City, Missouri, earlier this year. Jackson had been assistant chief engineer with KWK Radio, St. Louis.

Stephen Crook, named chief engineer at all-news Channel 43, will be responsible for coordinating the construction of the station's technical facilities along with assembling the engineering staff. Crook was formerly chief engineer at WPOC Radio, Baltimore.

Dave Kaylor is the new co-anchor on the 11 p.m. *Eyewitness News*, WBNS, Columbus, Ohio. Kaylor will also handle the sole anchor role for the station's 7 p.m. newscast, plus reportorial duties as well.

Brooke Spectorsky assumed the position of director of programming for KTLA, Los Angeles. Spectorsky joined KTLA from San Francisco independent television station KTVU, where he had been assistant program director and special projects director since 1978. Spectorsky spent the previous four years as KTVU production manager. BC

Moving Up

W.H. "BILL" BORMAN has been named national sales manager at Adda Corporation. Borman was formerly product manager at Ampex Corporation, and prior to that was OEM sales manager for the Computer Media Division at Memorex Corporation.

MICHAEL PAPPAS has been appointed to the newly created position of field sales engineer, broadcast/industrial sales specialties, at Otari Corporation. After several years of successful sales representation of the Otari line in the Chicago territory, Pappas brings his technical sales skills to Otari's various markets, including tape duplication and videocassette loading industrial products.

ROBERT MATAYA, formerly director of marketing at C.G. Conn Ltd., is the new market planning coordinator at Shure Brothers. His educational background includes degrees in marketing and business administration.

MARK FEHLIG moved from Moseley Associates to the Broadcast Products Division of Harris Corporation, where he is the new product marketing manager for satellite and microwave products. He will be responsible for integrating Harris Satellite Communications Division and Farinon Video products into the Broadcast Products Division's marketing efforts.

GARETH NELSON has been appointed national sales manager of Orange County Electronics. Nelson's extensive background included nine years as Midwest sales manager for Scully Recording Instruments. He will be based in Orange County's new office at 2100 West 98th Street, Minneapolis, Minnesota.

DIANE TALSMA joined Convergence Corporation as communications manager. She will handle advertising, trade shows, sales promotion, public relations, and technical publications for the company.

DONALD LINEHAN has been named manager, marketing communications and merchandising, for 3M's Magnetic Audio/Video Products Division. In his new position, Linehan will be responsible for the development of sales promotion and merchandising materials as well as advertising programs for the business, educational, broadcasting, and professional recording markets.

JIM MORRISON, named western district sales manager at Central Dynamics, will operate out of the CDL office in Sherman Oaks, California. Morrison began his broadcast career at KTLA in 1961 and was manager of technical operations in 1967. Since then he has been in sales with TV equipment companies, including Philips and Fernseh.

PATRICK HAYES has joined Clear-Com Intercom Systems as operations manager. In his new position he will apply his expertise to manufacturing and company expansion while maintaining Clear-Com's high level of customer service and product availability.

DONALD THORKELSON moved from JVC Professional Video Products to Convergence Corporation, where he takes over as national sales manager. Thorkelson, who will direct all sales activity in the U.S. and Canada, announced that his first priority is to expand the Convergence distribution program. The need for expansion is due, in part, to the demand for the company's new ECS-90 computer-based editor, which is compatible with most editing videotape recorders.

KENT PORTER, formerly with Dynair, was recently named sales manager for Sigma Electronics. Porter will head Sigma's new West Coast office at 531 Dover Road, Covina, CA 91722; (213) 967-4526.

SONNY FUNKE is the new national sales manager at Sound Technology, leading manufacturer of test equipment. Funke had been Sound Technology's California sales manager.

JERRY BRINNACOMBE has been promoted to Midwest regional manager at Hitachi Denshi America Ltd. He had been the Cincinnati regional manager. Also at Hitachi Denshi, BOB McLAUGHLIN is the new regional manager operating out of the Dallas office and BILL JARCHOW has been appointed to the position of VTR engineering manager for the western region.

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- ☆ OUR 30 VOLT SUN GUN BELTS PROVIDE POWER FOR A 250 WATT LIGHTING SYSTEM OR A VIDEO CAMERA.
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RTNDA/United States

RTNDA exhibit sold out

Computer firms, equipment manufacturers, and program syndicators will be on hand at this year's annual conference and exhibit.

Exhibit space at the annual convention of the Radio-Television News Directors Association (RTNDA) is completely sold out, it has been announced by Eddie Barker, chairman of the exhibits committee.

This year's International Conference is being held at the Diplomat Hotel, Hollywood, Florida, from December 3-5. And, according to Barker, the association will see a 40 percent increase in revenues over last year, when the conference was held in Las Vegas.

Barker expressed gratification over the continued participation of firms that have brought their wares to RTNDA conventions for many years, as well as the large number of new arrivals.

Exhibitors will include Angenieux, Boston Electronics, Cinema Products, Compact Video, Convergence, Eastman Kodak, Farinon Video/Harris, Ikegami, Jefferson Data Systems, Marti Electronics, Microwave Associates Communications, RCA, RF Technology, Sony, Station Business Systems, System Concepts, Uni-Set, Weather Services International, Weathermation, Winsted, and many more.

"It looks as though more and more people who supply news-related materials are waking up to the fact that even in a second-level market a news director may have $2 million to spend," Barker said. "And those who come to our conventions hoping to convey a point of view are doing so in the realization that a news director is remarkably well situated to influence public opinion."

The November issue of BROADCAST COMMUNICATIONS will feature a special review of the 1980 RTNDA International Conference.

Continued on page 32

SBE MONTHLY LOG

CHAPTER 1 — Binghamton, N.Y. John McMahon, CE WSKG-TV & FM, gave a presentation, including slides and videotape, on the installation and operation of a PBS Satellite Receiving System. New officers for the coming year are Gino Ricciardelli, chairman; Charles Hallinan, vice chairman and Ron Shoemaker, sec/treas.

CHAPTER 2 — Northeastern Pa. Chet Sawicki, manager, engineering, for WNEP-TV; Barry Erick; and Joe Donnelly hosted a tour of the WNEP-TV post-production TV facility. One of the items on hand was the Rank-Cintel new flying-spot scanner which provides exceptional quality in transfer from film to videotape. Only about a dozen of these are in existence.

CHAPTER 3 — Kansas. Rod Brown of Main Electronics spoke on the computers handled by Main Electronics, the Pet and the Durange. Following the discussion, Dennis Main conducted a tour of his plant. New officers are Bob Fulkerson, chairman; Don Hogg, vice chairman; and Bob Locke re-elected sec/treas.

CHAPTER 15 — New York City. Jeff Brooks-Stewart, senior product manager, Amperex Plumbicons, discussed the operation of diode gun plumbicons and the current status of new cameras designed around that tube. He also discussed the status of retrofit for existing cameras.

CHAPTER 24 — Madison, Wisconsin. Members were guests of the Wisconsin Power & Light Company computer control facility near Cottage Grove. This facility is relatively new and represents a modern, up-to-date operation which utilizes a computer to monitor power lines and control power distribution over a large area.

CHAPTER 25 — Indianapolis, Indiana. Mark Russell conducted a tour of the WNAP-Radio transmitter site.

CHAPTER 43 — Sacramento, Calif. Dale Harry from KFBK was on hand to answer questions and explain the "Emergency Broadcast System, Sacramento Operational Area Plan."

CHAPTER 45 — Charlotte, N.C. Scott Johnson and Jim Jupin of PTL gave a slide presentation on the Radio Shack computer and the Heath Kit digital training slides. Johnson had some programs worked out that will be useful in the broadcast field.

CHAPTER 47 — Los Angeles, Calif. This month the chapter planned basically a "social evening" but did allow Dick Burden to moderate a discussion on technical problems in radio, including 9 kHz AM spacing and the dropping of the First Class FCC License.

CHAPTER 49 — Central Illinois. Mike Flood, chapter member, presented a program on the various uses of op-amps. His presentation detailed circuit configurations for six different amplifiers circuits, nine functional circuits, and four signal generators. He explained how each circuit worked and could be used in broadcasting.

CHAPTER 53 — South Florida. Roger Harvey, 3M Co., and Frank Fitzhenry, R & H Associates, demonstrated the new 3M/Mincom TT-7000 1-inch VTR and time base corrector. The TT-7000 will have the new NTC-10 TBC with an incredible S/N ratio of 65 dB. It will also feature slow motion and still frame.

CHAPTER 59 — Kansas City, Mo. John Romanko of Arvin/Echo demonstrated the EFS-2 which can be used as a random-access slide storage unit and can also be used for slo-mo applications. He also showed a videotape demonstrating the Arvin/Echo video Squeezer which is a device for compressing video images.

CHAPTER 64 — Tennessee Valley. Scientific Atlanta presented a program on "Earth Satellite Receiving Stations & Communications."

CHAPTER 67 — North Texas. Barry Epstein, president, Amtek Systems, spoke on the problem of line surges on AC primary circuits and Amtek's approach to protection of electronic equipment from these surges.

CHAPTER OF THE AIR. The net meets every Thursday night at 7 p.m. Mountain Daylight Time on 7285. The net control station is located in Durango, Colorado. Chuck Kelly (KIUP/KRSJ) is acting as the net control for the Chapter of the Air and he says that everyone is welcome to join in, propogation permitting, for the fruitful discussion of matters relating to both TV and radio in major and minor markets. SBE welcomes another new Chapter #71 from Eureka, California. Donald E. Pope, KIEM-TV, has been elected chairman; William Green, Arcata Radio Engineering, vice chairman; and Ron Bricker, KEET-TV, sec/treas. SBE is very proud to now have six active Chapters in the State of California and a total of 58 active SBE Chapters throughout continental United States and the State of Hawaii.

FOR ADDITIONAL INFORMATION about the Society of Broadcast Engineers, contact the National SBE Office, P.O. Box 50844, Indianapolis, IN 46250; (317) 842-0836.

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In a professional quality turntable, you want musical vibrations, not mechanical ones. That's why our Professional Audio Division presents the Technics R&B Series SL-1015 turntable and EPA-500 interchangeable tonearms. They put vibration and resonance where they belong—out of the audible level.

The SL-1015 turntable system has a visco-elastic base that absorbs external and mechanical vibrations instead of transmitting them. The extra-heavy platter is damped 3 ways to help cancel platter resonance and acoustic feedback. A high-torque motor provides instant starts. And quartz-synthesized pitch lock with digital display precisely controls speed.

The EPA-500 tonearm system is a series of 5 independent, instantly interchangeable titanium tri-pivot tonearms that let you match the correct tonearm mass to the correct cartridge compliance. The result is music in focus, with inaudible resonance.

The SL-1015 turntable and EPA-500 tonearms are available at select locations. For one near you, call 800-447-4700 (in Illinois, 800-322-4400). We challenge you to hear anything but the music.

Technics
R&B series

Circle (24) on Action Card

CAB/Canada

Tax retribution?

A new U.S. tax proposal aimed at Canadian TV ad expenditures is "solely retaliatory in nature," according to the CAB.

In an effort to stem the flow of Canadian dollars into the United States, Canada passed a tax law which makes Canadian advertising expenditures non-deductible when spent on foreign media penetrating the country.

Now the U.S. is planning to adopt a similar law, making U.S. ad dollars spent in Canada non-deductible. But Ernest Steele, president of the Canadian Association of Broadcasters (CAB), considers the U.S. tax law unjustified and unfair.

The Canadian tax law has stopped the annual flow of more than $25 million in advertising expenditures from Canada to U.S. media. This figure constitutes a substantial portion of the Canadian television advertising market.

"The $25 million lost by border TV stations in the United States, however, is less than one-half of one percent of U.S. television's total revenue," Steele said. "It is impressively apparent that the huge American television industry does not need this same kind of protection."

NAB/United States

$1 million club

TV stations responding to an NAB study report net revenues of over $4 million, with gross profits of $1 million plus.

Nearly 90 percent of those TV stations responding to a financial study conducted by the National Association of Broadcasters (NAB) reported a profit in 1979.

According to the NAB findings, the typical television station had gross time sales of $4,588,100 and net revenues of $4,016,800. Combined with operating expenses of $2,978,100, the station showed a profit before taxes of $1,038,700, or a 25.9 percent profit margin.

Local advertising provided the primary source of revenues, accounting for 48 cents of every sales dollar. National regional spot sales accounted for another 43 cents, and the rest (9 cents) came in the form of network compensation. About 2 percent of the revenues were from non-broadcast sources.

The typical station's expense dollar was spent as follows: 38 cents for general and administrative, 35 cents to programming, 15 cents to selling and 12 cents to technical.

Station payroll totaled $1,094,500. The payroll dollars were distributed as follows: 42 cents to programming, 24 cents to selling, 19 cents to technical, and 15 cents to general and administrative. The typical station had a fulltime staff of 69 people.

Depreciation and amortization reserves passed the quarter-million mark at $264,600. Film and tape rental costs amounted to $252,800. Twenty-four cents of every dollar spent in the program department went to buy or rent programs.

The consensus of responding broadcasters — representing 434 stations — is that net revenues will increase 10 percent during 1980, a somewhat more conservative estimate than those of the professional forecasters. BC

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SMPTE, PAL, SECAM rates, and film...24 frames per second!

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Television audio post production.

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Fully automatic.

New, Synch and Timing System
Built around ultra-stable Philips SPG sync generator.

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Modulators, demodulators, VITS analyzer & generator, and new waveform monitor and vectorscope.

New, Teletex
Text display system component.

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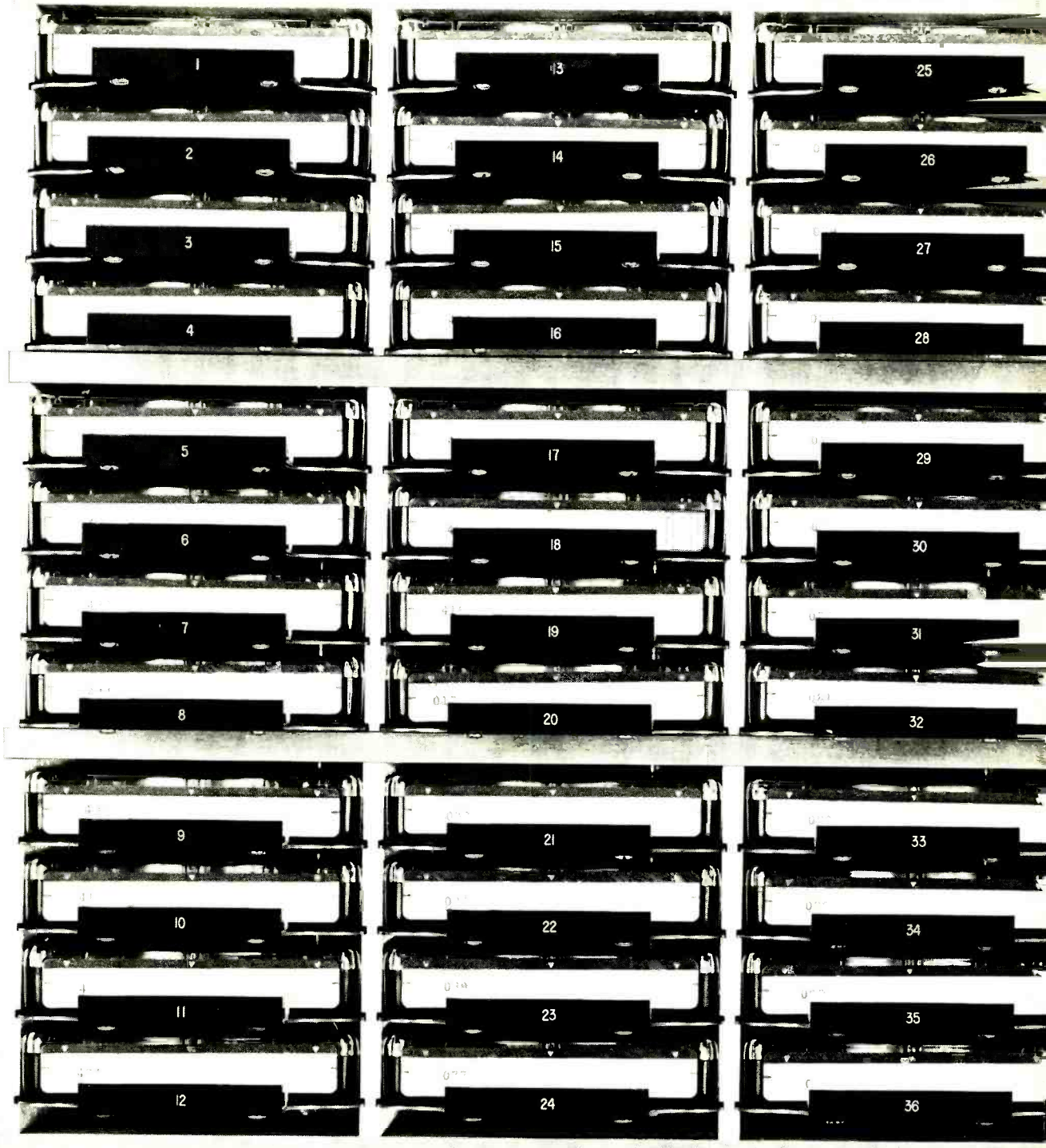

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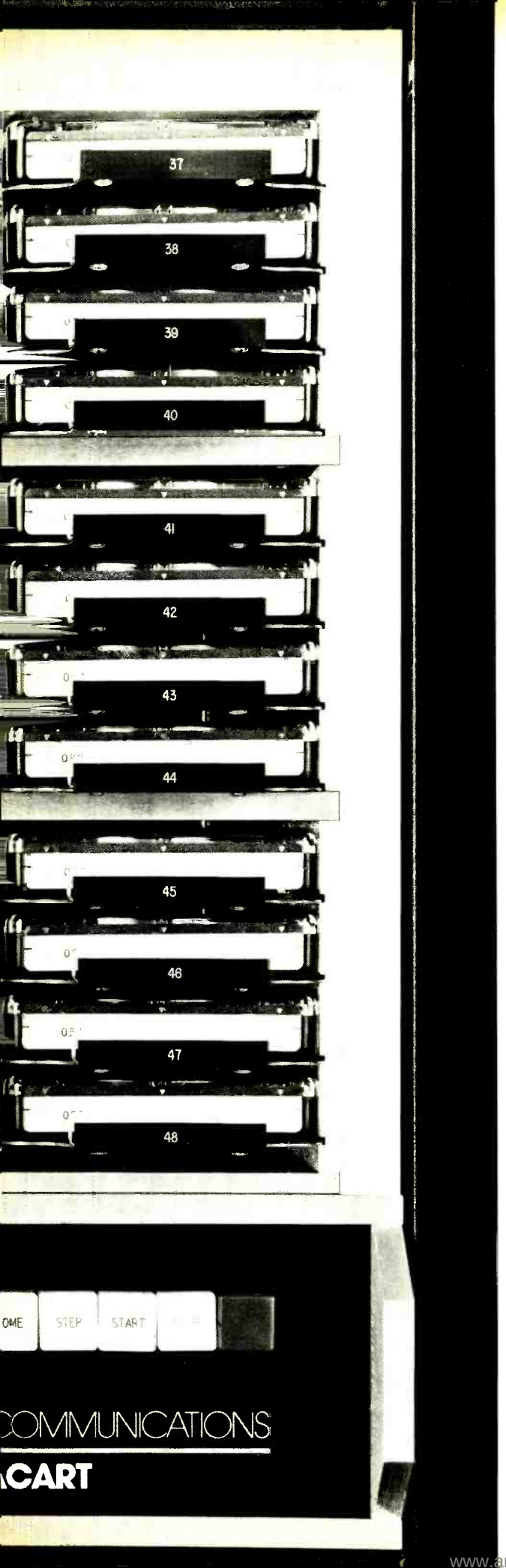

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Because it frees you to do instant random access programming.

No search time.

You can program the entire day without ever repositioning a cart. Simply tell the Instacart what sequences to play and you've got it. In any order, even back to back.

Instantly.

It can even record sentence fragments from different carts and play them back as a single continuous sentence.

At the touch of a button.

It gives the "live" disk jockey or the pre-recorded format programmer total control, speed, and freedom to do what they do best.

Creative programming, instead of wasting time juggling cartridges.

It's also an engineer's dream. Perfect fidelity. Comes in modules of 12. And gives you plug-in electronics for easy maintenance.

It's no wonder the IGM Instacart has become the standard of the industry.

And no wonder it came from IGM. We've been in the radio equipment business since 1929. And nobody knows more about this kind of equipment than us. To find out more, return the coupon, and we'll get back to you.

Instantly.

Dear IGM:

☐ I'm interested. Send me your salesman.
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☐ I'm not ready yet. But send me more facts next year.

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Station _____

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Circle (28) on Action Card

BC STAFF

SMPTE has front row seats for the state-of-the-art

SMPTE's 122nd Conference and Equipment Exhibit will be remembered as one of the most important conventions of the 1980 season. And you still have a chance to get into the action, because the doors won't open until November 9 at the New York Hilton in New York City.

With more than 300 exhibitors uncrating their equipment just a few weeks from now, it already stands as an exhibition record for a New York SMPTE meeting. In the last few years, SMPTE exhibit areas and booth numbers have been climbing at a rate that has everyone involved talking about the dramatic changes. This being so, it's worth remembering that the SMPTE Conferences have always sidestepped the commercialization that is so obvious — if not the main attraction — at other conventions. The result is that while the exhibitor totals are jumping, don't look for booths of the King Kong variety.

Despite the magnet-like attractions of the Equipment Exhibition, the strength of SMPTE's meetings has always been its papers and sessions. With the Society endlessly embarking on new equipment and technology standards and compatibility formats, it figures that one of the best state-of-the-art closeups of the technology race you can get today is to be on the line with the front runners at the next Conference.

But that's not all. Eastman Kodak will sponsor an evening of food and entertainment for all registrants on the opening night. Magna Tech will sponsor the refreshments at the Fellows' luncheon on Tuesday. Then Wednesday Sony will sponsor the music and entertainment at the evening banquet. The Coffee Club activity will be sponsored by Fuji Photo Film USA.

Now there's still time to register, and if you do, you'll get a reduced registration rate.

A listing of sessions follows:

Monday morning, November 10 — New Television Technology — Once Over Lightly, Joe Roizen, Telegen; The Victaphone System, Bell Labs.

Monday afternoon — The History of British Television, Phil Sidey, Robert Longman, and A. Pilgrim of the BBC, and David Glencross of the ITA.

Tuesday morning, November 11 — Motion Picture Film Production (concurrent with Television Transducers): The Development of Color Motion Picture Films, Dr. Wesley Hansen, consultant; A New Improved Color Negative Film, Elias Drexler, Fuji Photo Film USA; How Would a Feature Shot in Super 16 Compare with One Shot in 35mm on a Theater Screen?, Irwin Young, Du Art Film Laboratories; ImageVision™, Film or Tape?, Gary Matz and Ken Holland, Compact Video Systems; Relation Between the Effective Exposure Latitude of Color Negative Film and the Lighting Parameters, Karel Staes, Agfa-Gevaert; A New Filmmaking Concept — Bidirectional Memory in Cameras, Jean-Pierre Beauviala, Aaton.

Television Transducers: Video Disc Replication with Photopolymerizable Resins, Don Kerfeld, 3M Company; Design of a TV Monitor — A New and Accurate System for Lining Up, System Timing, and Sub-Carrier Phase, Lenco Inc.; A Primer on Television Pickup Tubes, Greg Murphy, Amperex; Current Developments in Television Camera Tubes, K. Blair Benson, Video Corp. of America; Character Generators and Allied Species, E. Leonard, DaVinci Research Group.

Tuesday afternoon — Motion Picture New Film and Equipment (concurrent with Computer Graphics): A Television Equipment Primer for Filmmakers, Technicians, and Producers, C. Robert Paulson, AVP Communication; A New 35/16 Interchangeable-Format Wet Printer With Damage Proof Transport, W. D. Carter, Carter Equipment Co.; Design Challenges in Developing a New 16mm Film Editor, Vernon Bushway and Robert Olodort, Cinema Products; 3M Photogard, 3M Company; New Innovations in Film Splicing Technology, C. Mossman, R. Barnett, and R. Sharpless, Rank Film Laboratories.

Computer Graphics: Papers to be announced at the conference.

Wednesday morning, November 12 — Television Production and Post Production: The Forces At Work Behind the NTSC Standards, Donald Fink, IEEE; Productive Coding of Composite NTSC Color Television Signals, Bell Laboratories; A New Approach to Space Ships and Aerial Scenes in Television Production, Reginald King, Evershed Power Optics; A Lightweight Portable Broadcast Camera with Optional Digital Setup Control, Y. Miyaji, N. Morita, and T. Nizhizawa, Toshiba; The Cost of Camera Mobility, Part 1 — Conventional Cameras, Part 2 — Lightweight Cameras, W. Vinten Limited; Recent Advances in the Fast Charging of Sealed Nickel Cadmium Batteries, D. Hamill and E. James, PAG Power Ltd.; The Development of the Zoom Lens, Dr.

Continued on page 38

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Frank Back; Automated Enhancement for Portable ENG Recorders, Yves Faroudja, Faroudja Inc., and Joe Roizen, Telegen; Design Considerations for an Electric-Cinematograph Camera, R. Streeter, CBS-TV.

Wednesday afternoon — Motion Picture Laboratory Technology (concurrent with Problems of Maintenance): A Collection of Persistence of Vision and Other Motion-Producing Devices, 1830 to the Present, S. Spira, Spiratone; Persulfate Bleach and Motion Picture Film Processes, Richard Schlin, Eastman Kodak; REGENOMAT, An Electronic Replenishment System Brings Remote Control to the Operator's Fingertips, Dr. Y. Cramer, Virginia Tech; Silver Management in a Motion Picture Laboratory, Paul Deer, Calvin Communications; Challenges to the Concept of Cancellation, Roland Zavada, Eastman Kodak; The Super Color Master Processor for Interchangeable 35/16mm, I. Ryman and D. Macho, Houston Fearless 76 Inc.

Problems of Maintenance: Design of Equipment, B. Williams, Ampex; Design of Plant, Steven Smith, Broadcast Technology Corp.; Diagnostic Techniques, W. Welland, System Concepts; Care and Training of Good Maintenance Personnel, Norman Rosenshein, Unitel; Documentation and Vender Support, TBA; Panel Discussion with Eugene Leonard, DaVinci Research Group.

Thursday morning, November 13 — Lighting and Sound for Television and Motion Pictures: The Development of Stereo Magnetic Recording for Film, Hazard Reeves, Reeves Teletape Corp.; The Historical Development of Cinema Architecture and Its Acoustical Effect on Filmsound Recording, Ted Uzzle, Altec; The Emergence of Cinematographic Lighting Techniques from Those of Still Photography, Dr. Evan Cameron, Washington State University; High-Power Single-Ended Discharge Lamps for Film Lighting, R. Hall and B. Preston, Thorn Lighting Ltd.; An Innovative Approach to HMI Fixture Design, Edwin Clare and Joe Tawil, Cinema Products; A Procedure for Optimizing Photographic Sound Recording Systems, Charles Nairn, Communications Technology; CBC Experience in Stereo Broadcasting, James Kitchen, CBC; Fixtures for Tungsten Halogen Lights, George Panagiotou, Cool Light Company.

Thursday afternoon — Videotape Recording: The Rise of Mechanical Television, 1901-1930, George Shiers; The Development of the Video Tape Recorder, Charles Ginsburg, Ampex; Videotape Post Production — Operating Procedures 1980, Lawrence Kreeger, EUE Video Services; VIDEOSCOPE — An Accurate Method for Certifying, Timing, and Analysis of RS-170A Systems, Bruce Blair, Lenco; The IVC 1-11 — A Different Approach, David Edmonds and Peter Lowten, IVC; HBU and Portable HBU Video Tape Recorders, Sid McCollum, Recortec; The New RCA One-Inch Type C Helical VTR, L. Hedlund, RCA.

Friday morning, November 14 — Digital Television: Status Report on SMPTE Task Force on Component Digital Recording, Frank Davidoff; What Do We Expect from Digital Video Equipment, Frederick Remley; Progress Report on the Study Group on Digital Tape Recording, W. Connolly, CBS-TV; Digital Audio Technology, Today and Tomorrow, Toshi Doe, Sony; The Advanced Video Tape Editing/Dubbing System in NHK, K. Sata, T. Ogawa, and I. Obata, NHK, Japan; SqueeZoom Digital Video Effect Unit, Sidney Dodd, VTR Productions Ltd.

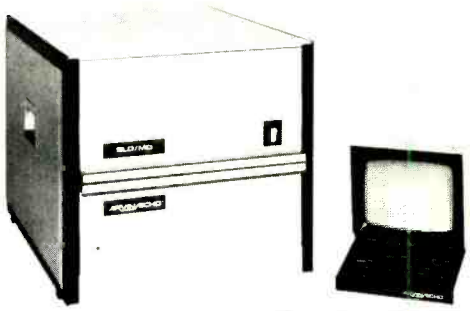
BC

ARVIN/ECHO: Innovation in Intelligent Video Production Equipment.

Arvin/Echo is a division of the Arvin Applied Technology Group, one of the most comprehensive and prestigious private research and development companies in the world. As a technological leader, Arvin/Echo has built its reputation on producing rugged, reliable broadcast production equipment.

EFS-1A: The EFS-1A offers the industry an extraordinary Frame-Stor™ Recorder in a small package (38 pounds). It is also available in PAL/SECAM. The relative low cost of the EFS-1A enables broadcasters to install a system in news, production or wherever the capability is required. The unit uses Arvin's unique, flexible Discassette® which electronically stores 400 slides (200 per side), is virtually indestructable, and is interchangeable with any EFS-1A System in the world. Remote random access to the EFS-1A System is also available with an optional interface to character generators.

SLO/MO™-1: Another use for the Arvin/Echo Discassette principle is the capability to provide the instant replays which are expected by sports fans. The SLO/MO-1 is a versatile production tool which is light weight, rugged, transportable and sells for a reasonable price. The system gives broadcasters capabilities such as slow motion, freeze/frame select and time saving editing. SLO/MO's usefulness in sports, news and commercials is enhanced by its High Band Color, Digital Comb Filter, Digital Time Base Correction and Digital Field Storage.



SS-2 Slide-Stor™ System: The SS-2 System is replacing 35mm slides as the medium for still presentations because it greatly simplifies the production and storage of graphics. All graphics can be preprogrammed on disc for instant call-up during broadcast. The SS-2 System frees a camera during the show, and eliminates the need for expensive tele-cine chains. Vertical/interval switching for on air use from one disc to another is built in. At the heart of the SS-2 System are two EFS-1A Broadcast color Discassette Frame-Stor Recorders which together will store up to 400 NTSC, or 200 PAL/SECAM high quality television frames—on line. Add more Discassettes for access to unlimited images.

THE IMAGE MAKER (EFS-2)®: All the advantages of our EFS-1A and much, much more. The Image Maker is a compact, versatile, programmable unit which delivers random access to 500 images on line with our exclusive Discassette. Preview and program outputs are built in. It also has the capability to do sequences and motion loops from 16 frames to 500 frames. Record and playback in single frame, real time, or anything in between for exciting animation effects. Serial digital interface is standard.

THE SQUEEZER™: A unique and highly affordable production tool which can reduce images to four discrete sizes ($^1/_4$, $^1/_9$, $^1/_{16}$, and $^1/_{25}$ of original) with complete positioning capabilities. Squeeze stills or live video. Border the image with full color which can be adjusted for width, saturation and hue. Then use the border to crop from one of the four sizes to infinity. Or, leave the border off entirely. It's your choice. The Squeezer can also insert one image into itself or key it over another. Signals for down stream keying are provided. And, it can be preset to four positions before air time.

Contact Dennis Shelton, Marketing Director at

ARVIN/ECHO™ 485 E. Middlefield Road, Mountain View, California, 94043
Telephone: (415) 961-7145, TWX: (910) 379-6499

APPLIED TECHNOLOGY GROUP ARVIN

Circle (31) on Action Card

SMPTE Exhibitors

The SMPTE's 122nd Conference and Equipment Exhibit is sold out. More than 140 companies will occupy the 300-booth exhibit area, making this year's exhibit the largest equipment show the SMPTE has ever had in New York. The previous record was the 1978 New York exhibit, which had 211 booths of equipment on display.

This will also be one of the year's largest shows in which a combination of both film and video equipment is on display side by side under one roof.

The Technical Conference is set for the New York Hilton Hotel in New York City, November 9-14. The exhibit will open Tuesday, November 11, at 10:00 a.m. and run through Thursday at 6:00 p.m. Here's a preview of what you can expect to see:

AATON CAMERAS — Aaton 7 LTR 16mm camera; Scribe system, which provides daily transcripts direct from cameras and sound recorders; magnetic tape printer. BOOTH 136.

ACMADE INTERNATIONAL/EASTERN EDITING EQUIPMENT — Compeditor editing machine. BOOTH 156.

ADDA CORPORATION — VW-1 and VW-2 digital frame synchronizer; VIP-II video compressor; ESP (electronic still processor) with computer library control systems. BOOTHS 213, 214, 215, 216.

AGFA-GEVAERT — 2-inch Quadruplex videotape in ½, 1, and 1½ hours; 1-inch Type C videotape in ½, 1, and 1½ hours; ¾-inch bulk U-matic videotape; studio mastering tape in ¼-inch, ½-inch, 1-inch, and 2-inch configurations; 2-inch, 1-mil mastering tape. BOOTHS 193, 194.

ALLEN PRODUCTS — Custom-built motion-picture processors and accessories; Rotex 7309 solution management system. BOOTH 58.

AMERICAN DATA — Video production systems; distribution switching systems; master-control automation systems. BOOTHS 32, 33.

SEE AD ON PAGE 9

AMPEREX ELECTRONIC CORP. — Plumbicon® television camera tubes; low-capacitance diode gun™ tubes. BOOTH 34.

AMPEX — Production and post-production systems; videotape recorders; time base correctors; broadcast television cameras; graphic art systems; magnetic tape. BOOTHS 16, 17, 18, 19, 28, 29, 30, 31.

SEE AD ON PAGES 6-7

ANTON/BAUER — NiCad batteries and accessories; lighting gun; video and lighting belt systems. BOOTH 107.

ARRIFLEX — HMI lighting system; 16mm and 33mm cameras and accessories; image stabilizer; Zeiss superspeed lenses; editing consoles; Sachtler camera support system. BOOTHS 145, 146, 147, 148, 149, 150, 151, 152.

ARVIN/ECHO SCIENCE — EFS-1A Frame-Stor™ recorder; SS-2 Slide-Stor™ System; Slo-Mo™-1, featuring slow-motion, freeze-frame select, editing; The Image Maker (EFS-2)®; The Squeezer™, which reduces live or still video images. BOOTHS 234, 235.

SEE AD ON PAGE 39

ASACA/SHIBASOKU — New ASW200 portable production system; video noise meter with computer interface; color monitors; envelope delay measuring set, color pattern generator, test signal generator with computer interface; battery-operated color bar generator; white balance checker. BOOTH 254.

AUDIO KINETICS (U.K.) LTD. — SMPTE time code equipment, including audio/visual synchronizers with integral autolocators and multistanding generator; high-speed readers; time code generators; tape locator. BOOTH 166.

BELDEN COMMUNICATIONS — Lee filters; portable HMI lights; new line of CSI/CID lights. BOOTHS 122, 123, 124.

BELL & HOWELL — Modular wet and dry motion picture printers; special effects printers; printer accessories. BOOTHS 77, 78.

BERKEY COLORTRAN — Lighting fixtures; dimmers; distribution; manual and memory controls for television and motion picture studios and location shooting. BOOTHS 85, 86.

BOGEN PHOTO — Camera supports; background supports; copy equipment. BOOTH 111.

BOLEX (USA) INC. — 16mm electric and spring-wound cameras, projectors, lenses, motors, splicers, tripods, and accessories; super 8 silent and sound cameras, projectors, and accessories. BOOTH 109.

BRUMAC INDUSTRIES — Densitometers, including new microprocessor-enhanced model MPST; new Lab Master System featuring the model MPST, a low-cost computer, color monitor, plus software. BOOTH 110.

CEI — CEI 310 modular, broadcast-quality color television camera for EFP or studio applications; CEI 330 and 340 cameras. BOOTHS 36, 37.

CMX SYSTEMS/ORROX CORP. — Audio/video film editing systems. BOOTHS 242, 243.

SEE AD ON PAGES 18-19

CAMERA MART — Ikegami cameras and monitors, plus video equipment by Sony, Panasonic, Sharp, Hitachi, Ultimate, Dynasciences, Videotek, Arriflex, Elemack, Cinema Products, Eclair, Aaton. BOOTH 97.

CAN-AM PHOTO EQUIPMENT — Animation stand with control console; aerial image with control console; film cleaning machine. BOOTH 206.

CANON — New J20 x 8.5 wide-angle lens; J25 x 11.5B for 2/3-format cameras; and J13 x 9BIE for ENG cameras. BOOTHS 185, 186.

SEE AD ON PAGE 55

Continued on page 42

FUJINON

ENG/EFP and BCTV lenses...to improve your image.

F/1.7 3.5x6.5 ultra-wide angle zoom

F/1.4
Ultra-wide 6mm

F/1.6 10x11
I ghtweight zoom

F/1.7
12x9 lig ntweight
zoom with 2.2X extender

F/1.7 14x9.5 lightweight zoom with 2X extender

F/1.7 14x9.5 lightweight zoom with diascope and 2X extender

F/1.7 17x9 zoom with built-in 2X extender

F/2 22x12.5 zoom with built-in 2X extender

10x close-focusing wide angle zoom

4-range 16X wide angle zoom

30X twin range field zoom

Here's the FUJINON line. With more ENG/EFP lenses than anyone else. All available with studio converison kits for extra economy. All with adjustable back focus for faster lens changing.

If you want to get in close, consider the new 22X zoom with built-in 2X extender. It gives you F/2 speed with a total range of 12.5 to 550 mm. If you're already in close, use the unique F/1.4 6 mm ultra wide angle distortion-free lens. It gives you a "0" MOD with a 70° horizontal field of view.

For studio and field productions, FUJINON BCTV lenses are now offered with built-in test pattern projectors for the fastest, most accurate computerized camera set up. (Not available on 10X wide angle zoom.)

For maximum definition, the new 14X ultra high resolution lens reads 1300 TV lines and maintains a fast F/2.1 in all zoom and focus ranges.

Quality, performance and service make FUJINON best. Camera manufacturers, networks, stations and production companies around the world have made FUJINON first. Before you buy any camera from any manufacturer or replace any lenses on your existing cameras, see the difference for yourself. Specify FUJINON It will improve your image.

FUJINON

Fujinon Optical Inc.
672 White Plains Road
Scarsdale, New York 10583
(914)472-9800

West Coast Distributor
FUJI OPTICAL SYSTEMS INC.
4855 Atherton Avenue
San Jose, California 95130
(408) 866-5466

See FUJINON at SMPTE Booth 253.

Circle (32) on Action Card

Exhibitors

CECO COMMUNICATIONS — Electron tubes; solid-state devices; RCA parts. BOOTH 174.

CENTRAL DYNAMICS — CD480 production switcher. BOOTH 200.
SEE AD ON PAGE 1

CETEC VEGA — Wireless microphone systems and accessories; wireless cueing system. BOOTH 134.

CHYRON TELESYSTEMS — RGU-1 portable graphics and titling system; top-of-the-line Chyron IV system. BOOTH 11.
SEE AD ON PAGE 26

CINEMA PRODUCTS — CP35, CP-16R, GSMO film cameras; MNC-81A Co-Ax control; Steadicam film/video stabilizer; Camraprompter; Bubbelite; RDS/HMI lights; Angenieux, Canon, and Fujinon lenses; tripods. BOOTHS 153, 154, 155, 159, 160.
SEE AD ON PAGE 45

CINEMILLS — Daymax™ daylite bulbs; Lee filters; Strand Century/Ianaro lighting equipment. BOOTH 88.

CINE 60 — NiCad battery belts and packs; 12 and 30 V Sun-Guns; Sun-Gun kits; four-channel sequential fast chargers; camera snaplocks; shoulder pods; HMI lights; battery cables; quartz lights and lighting kits; NiCad dememorizers. BOOTHS 268, 269.

CINETRON COMPUTER SYSTEMS — Computerized animation stand; computerized optical printer. BOOTHS 157, 158.

CLEAR-COM INTERCOM SYSTEMS — ENG/EFP fixed and portable intercoms in single- and multiple-channel configurations. BOOTH 165.
SEE AD ON PAGE 42

COHERENT COMMUNICATIONS — New SMPTE time code equipment for motion picture production and post-production equipment. BOOTHS 113, 114.

COMPACT VIDEO SALES — ENG/EFP units; portable satellite uplink truck. BOOTHS 211, 212.

COMPREHENSIVE SERVICE AUDIO-VISUAL — Reels; cans; shipping cases; editing supplies; projection lamps; studio lamps; printer lamps; audio tape; magnetic film; video reels and boxes; labels; padded mailing bags. BOOTH 84.

COMPREHENSIVE VIDEO SUPPLY — Mike mixer; PAG battery belts and portable lighting systems; tripods and dolly systems; VCR/monitor trollies and stands. BOOTHS 169, 170.

CONTROL VIDEO — Intelligent Controller™, a modular, microprocessor-based SMPTE/EBU time code reader, writer, keyer, VTR controller, and editor. BOOTH 219.

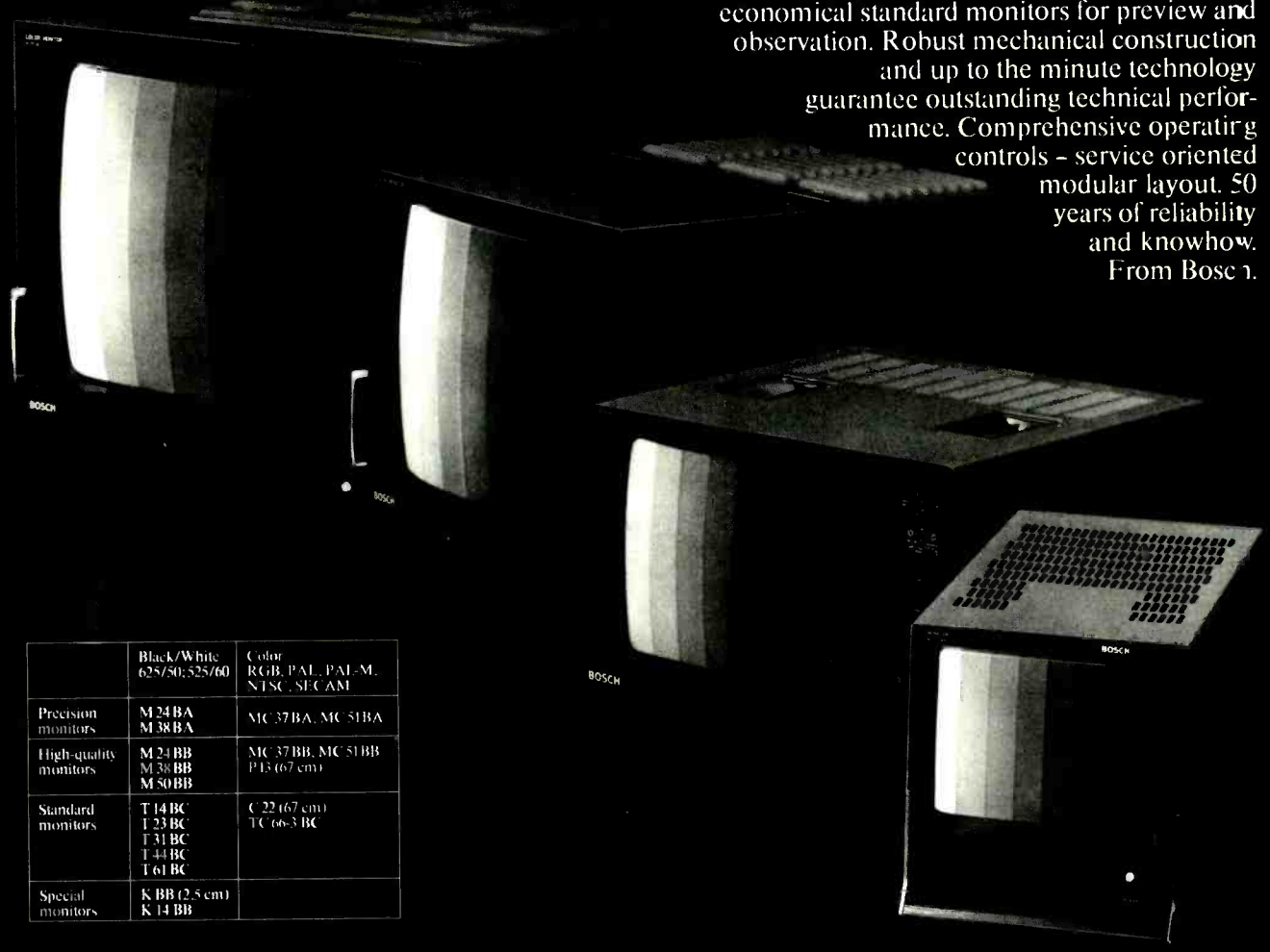
CONVERGENCE CORPORATION — ECS-90 low-cost microprocessor-based

Continued on page 44

One Range for Everyone

50 BOSCH FERNSEH 1929-1979

The complete monitor range for all applications in professional television. 20 color and monochrome monitors in three classifications for all TV standards. Precision monitors for test and measurement, high quality monitors for technical and aesthetic picture evaluation, economical standard monitors for preview and observation. Robust mechanical construction and up to the minute technology guarantee outstanding technical performance. Comprehensive operating controls – service oriented modular layout. 50 years of reliability and knowhow. From Bosch.



	Black/White 625/50; 525/60	Color RGB, PAL, PAL-M, NTSC, SECAM
Precision monitors	M 24 BA M 38 BA	MC 37 BA, MC 51 BA
High-quality monitors	M 24 BB M 38 BB M 50 BB	MC 37 BB, MC 51 BB P 13 (67 cm)
Standard monitors	T 14 BC T 23 BC T 31 BC T 44 BC T 61 BC	C 22 (67 cm) TC 66-3 BC
Special monitors	K BB (2,5 cm) K 14 BB	

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Television Systems Division
Your Video System Partner

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Robert Bosch Ltd., P.O.B. 166, Watford, Great Britain · Robert Bosch Pty. Ltd., 69 Edward Street, Pyrmont, NSW 2009, Australia · Robert Bosch Pte. Ltd., P.O.B. 4, Thomson Rd., Singapore 20.

Circle (35) on Action Card

editing system; ECS-103C editing system; ARC-100 animate remote control for animation directly onto videotape. BOOTHS 213, 232, 233.

CREMER, S.A./PEP — HMI dim control units. BOOTHS 181, 182, 183.

DATAMETRICS — SMPTE time code equipment, including readers, generators, character generators, vertical interval time code. BOOTH 25.

DATATRON — Tempo 76 videotape editing system operating with two VCRs; Vanguard videotape editing system operating with 5, 1-inch Type C VTRs; production switcher. BOOTHS 260, 261.

SEE AD ON PAGE 21

DIGITAL VIDEO SYSTEMS — Time base correctors; synchronizers; frame storage devices; special optical effects. BOOTHS 22, 23.

DOLBY LABORATORIES — Dolby A-type noise reduction equipment; Cat. No. 155 and 255 dual-channel A-type audio noise reduction modules for use in Sony and Ampex C format VTRs; CP50 and CP200 cinema processors for exhibition of films with Dolby stereo sound tracks. BOOTHS 120, 121.

DYNASCIENCES — New microprocessor-based multi- and mixed-source editing controller. BOOTH 168.

EASTMAN KODAK — Film systems and silver recovery systems. BOOTHS 72, 73, 74.

SEE AD ON PAGES 14-15

EDUTRON — Video time base correctors incorporating noise reduction, image enhancement, and an RS-170A sync generator. BOOTH 218.

EEG ENTERPRISES — Line 21 encoders and decoders for captioning and text; closed captioning for the hearing impaired; video decoder for monitoring; complete captioning system including floppy disc data source. BOOTH 164.

EEV INC. — Leddicons and Vidicons and character display tubes. BOOTH 223.

EIGEN — Video disc recorders. BOOTH 64.

ELMO MFG. CORP. — 16mm portable and Xenon auditorium projectors; sound filmstrip projectors; overhead projectors; super 8 cameras and projectors. BOOTH 94.

FERNSEH — Mach One™ computer-assisted videotape editor; KCK automatic studio camera; KCP-60 studio camera; KCA-100 ENG/EFP camera; FDL-60 CCD telecine system; Compositor I™ graphics system; TVS/TAS-1000 video/audio distribution switcher; TCS-1 machine control system; Automax™ machine control and switching system. BOOTHS 59, 60, 61, 62, 63.

SEE ADS ON PAGES 27, 43

FREZZOLINI ELECTRONICS — New line of Frezzi on-board batteries for use with ENG color cameras; new line of lightweight one-hand-operation portable 30V and 12V lightheads with swing-away dichroic and scrims for studio production or field work; Frezzi-Flex model FR-16 camera for single- or double-system 16mm filming operations. BOOTHS 39, 40.

FUJI MAGNETIC TAPE DIVISION — H701E low-noise, high-band 2-inch videotape; H621 Beridox 1-inch professional videotape; Beridox U-matic videocassettes; third-generation "fine grain" VHS and Beta videocassettes. BOOTHS 41, 42.

SEE AD ON PAGE 37

FUJINON OPTICAL — Complete line of ENG/EFP lenses for 2/3-inch color cameras; ENG/EFP accessories. BOOTH 253.

SEE AD ON PAGE 41

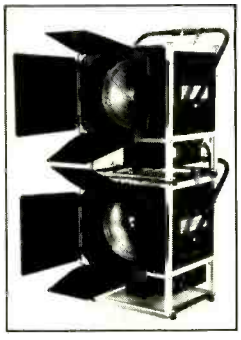
GENERAL ELECTRIC — Lamps for television and motion-picture production. BOOTHS 43, 44.

Continued on page 46

"Working as we often do under less-than-controlled circumstances — where power is sparse, cables have to be stretched across large areas, and there are large crowds to contend with — we've come to appreciate the enormous versatility and rugged reliability of the RDS/HMI Fresnels," says Bill McManus, president of McManus Enterprises, the prominent production lighting design company (based in Bala Cynwyd, PA) and member of the official 1980 Winter Olympics lighting team.

"I applaud their original and innovative design!" says McManus. "Their unique cube-shaped design and rugged modular construction provide RDS/HMI Fresnels with distinct advantages over other HMI lights currently on the market.

Stackable



"An obvious advantage is that several luminaires can be vertically stacked for ease of transportation and convenient storage. It allows you to cut down on the size of the truck you're taking along... Stack them three or four high at the edge of a tail gate and strap them to the truck. When you pull up to a location, just undo one strap and start handing the lights off. This makes setups real quick and easy.

Convertible

"Another important feature is that RDS/HMI luminaires can be easily converted to incandescent Fresnels by simply replacing the HMI insert assemblies with optional insert assemblies which accept standard tungsten-halogen lamps. That means a lot to a company like McManus which is involved in both sales and rental of equipment, because shelf space is so valuable.

Wider Focusing Ratio

"The lights have such long range, such reach, we were able to use them at Lake Placid from the roof tops of two hotel buildings as if they were regular follow-spots!

"And the specially designed RDS/HMI Fresnel lens provides a smoother field of light as well as a wider focusing ratio from spot-to-flood.

Safe, Rugged and Reliable

"The entire RDS/HMI insert assembly — including lamp socket, ignitor circuitry and switches — can be removed easily without the use of tools for safe, convenient relamping.

"At Lake Placid, a couple of lights were knocked down accidentally. In both instances the lamps were not broken, and the fixtures fired right up within minutes of the accidents. I credit this to the specially designed, shock-mounted heat sink lamp sockets. We had no major breakage, no downtime, no leaks, and no loss of life to the lamps!"

Bill McManus (right) with Joe Tawil of The Great American Market, one of Cinema Products' major dealers for RDS/HMI 575W, 1200W, 2500W and 4000W Fresnel spotlights.

For further information, please contact:

cinema products CORPORATION

Technology In The Service Of Creativity

2037 Granville Avenue, Los Angeles, California 90025
Telephone: (213) 478-0711 • (213) 477-1971 • Telex: 69-1339

GOLDBERG BROTHERS (J&R FILM CO./CIRO) — Reels; cans; cases; racks; splicers; editing supplies; editing equipment. BOOTHS 75, 76.

ALAN GORDON ENTERPRISES — Mk IV Director's viewfinders; tripods; Swintek wireless sound system; Neilson Nordel animation camera and stand; cassette recorder. BOOTHS 69, 70, 71.

GRASS VALLEY GROUP — Production and post-production switching systems and other terminal equipment. BOOTH 241.

SEE ADS ON PAGES 5, 12

HAZELTINE — Model 200H color film analyzer including 16mm A&B timing attachment; model 240 tape preparation system for preparation of frame-count cueing; exposure tapes for programming additive printing. BOOTHS 52, 53.

KARL HEITZ — Tripods; dollies; projector stands; platforms; mike booms; 16mm and double super 8 cameras; lenses. BOOTH 201.

HITACHI DENSHI AMERICA — ENG/EFP color video cameras; studio video cameras; 1-inch Type C VTRs; color monitors. BOOTHS 19, 20, 26, 27, 49, 50.

HOLLYWOOD FILM CO. — Total-immersion printer; film-handling equipment. BOOTH 87.

HOUSTON FEARLESS 76 INC. — Film processor; replenishment systems; film transport system; mix tanks; silver recovery units. BOOTH 98.

IKEGAMI ELECTRONICS (USA) — New EC-35 electronic cinematography camera; new TKC-970 telecine with 700 TV lines resolution; ENG cameras; HK-312E Multicore/Triax studio camera with optional computer setup; HK-357A Multicore/Trian field/studio camera with optional computer setup; RH, PM, and 8 series picture monitors. BOOTH 256.

SEE AD ON INSIDE BACK COVER

IMAGE DEVICES — IDI Micromike, Superstix, Superkart, Communicator, Micro Mixer MK2, Compact Crystal Coder, wireless earphone, video access, Superstrap, and Crystal Pistol; IDI rentals, sales, and service. BOOTH 47.

IMAGE TRANSFORM — Tape-to-film and film-to-tape transfers; standards conversions. BOOTH 102A.

INDUSTRIAL SCIENCES INC. (ISI) — Video production switchers, including the 200 series with PolyKey effects system, model 902, and the 1200 series with two-level processing; terminal equipment; audio console. BOOTH 167.

U.S. JVC CORP. — Three-tube color TV camera; one-tube TV camera; ¾-inch videotape editing system; color monitor/receivers; ½-inch VHS videotape recorders and players; and ¾-inch videotape players and recorders. BOOTH 251.

K B SYSTEMS — "Magic Slippers," a new device for tensioning uneven film reels. BOOTH 133.

KLM ASSOCIATES — Cinemont editing tables. BOOTHS 54, 55, 56, 57.

KLIEGL BROTHERS — HMI daylight units; portable Kliegpac 9 packaged dimming system; Performer and Performer II memory lighting control consoles. BOOTHS 80, 81, 82.

LA VEZZI MACHINE WORKS — Sprockets for all film sizes; Geneva intermittent components and assemblies; high-precision machine components for all film equipment. BOOTH 48.

LENCO/ELECTRONICS DIVISION — RS170 and RS170A sync generators; video distribution; television test generators; system timing; video noise

meter; color monitors; monochrome monitors; new Video Scope. BOOTHS 227, 228.

LIPSNER-SMITH — Film cleaning machine with solvent recovery. BOOTHS 95D, E, F.

LISTEC TV EQUIPMENT — Vinten post head on Vinten dolphin arm using Listec tracking; Ikegami monitor; Ikegami HL-79A. BOOTH 192.

LOWEL-LIGHT — Complete line of location lighting equipment for film and television; new Lowel Space Lamp and Lowel Screw-in stud mounting devices; new Lowel Grand Stand light stand; new Lowel Weight, a modular ballast and counter-balance for stands and booms. BOOTHS 195, 196.

LTM CORP. OF AMERICA — Lighting equipment, audio recording equipment; small-format editing equipment. BOOTHS 116, 117, 118, 125, 126, 127.

L-W INTERNATIONAL — Athena 4000, 5000, and 6000 slo-mo, freeze-frame telecine projectors. BOOTH 270.

MM EDITING SYSTEMS — Film-to-video transfer machines. BOOTHS 101, 102.

3M COMPANY/MINCOM DIVISION — Model D-8800 graphics system; model TT-7000 Type C VTR; routing switcher; machine control equipment. BOOTHS 190, 191.

MAGNASYNC/MOVIOLA — 16mm and 33mm editing and recording equipment, featuring Videola®, a new film-to-video transfer system, and Moviola "Portable," a new 16mm 6-plate flatbed editor. BOOTHS 245, 246, 247, 248, 249, 250.

MAGNA-TECH ELECTRONIC CO. — New combination 16/35mm high-speed electronic drive studio projector; new Vidi-Mag™ 16mm sprocketed video film recorder; high-speed recorders and reproducers; "electronic looping" consoles. BOOTHS 66, 67, 68.

MARCONI INSTRUMENTS — Automatic audio broadcast test system; automatic video measurements; H and B blanking and vertical interval test signal; automatic moire distortion analyzer for videotape recorders. BOOTH 262.

MATTHEWS STUDIO EQUIPMENT — Stands; dollies; dolly track; overhead light diffusion sets; flags and scrims; mounting equipment; and accessories. BOOTH 103.

MERLIN ENGINEERING WORKS — Quadruplex VTRs and accessories; accessories for 1-inch helical VTRs. BOOTH 35.

MICRO CONSULTANTS INC. (MCI)/QUANTEL — The Quantel DLS 6000 digital library system, featuring computer disc storage, multiple disc drive capability, off-line storage system, "browse" editing, picture positioning, zoom, and new slide build-up. BOOTH 244.

MICROTIME — Model 4000 video scrambler; model 2525 SP video signal synchronizer and smart proc; model 2020 digital time base corrector with 2121 image processor. BOOTH 244.

MICROWAVE ASSOCIATES COMMUNICATIONS — Portable transmitters and receivers in 2.5-GHz and 7-GHz broadcast bands; DA624 dual-model ENG central receive antenna and lightweight high-gain disc rod antenna with switchable polarity; frequency-agile satellite receiver; new retractable aircraft antenna mount. BOOTHS 177, 178.

MILLIMETER MAGAZINE — BOOTH 184.

MOLE-RICHARDSON — New nine-light Molequartz Molecool; four HMI

Continued on page 48

Exhibitors

Mole Solar-Arc Solarspots; 1000W, 2000W, 5000W, and 10,000W Molequartz Baby Solarspots; light fixtures; lighting kits; grip equipment; hangers; adapters. BOOTHS 265, 266, 267.

MOTION PICTURE ENTERPRISES — Motion picture equipment and supplies; various reels and cassettes; shipping cases; silver recovery units. BOOTH 90.

MOTOROLA COMMUNICATIONS & ELECTRONICS — Remote pickup broadcast and studio/field radio communications and cueing systems; radio paging systems; base station; mobile and portable equipment; CCTV communication systems. BOOTH 135.

MOVIECAM CORP. OF AMERICA — 33mm motion picture camera with accessories. BOOTHS 139, 140.

MULTI-TRACK MAGNETICS — 33mm studio reversing high-speed projector with DC servo motor drive; 16/35mm master pickup recorder with DC servo motor drive; 16/35mm master recorder with DC servo motor drive. BOOTHS 209, 210.

NAGRA MAGNETIC RECORDERS — Motion-picture tape recorders, featuring Nagra 4.2L and Nagra Stereo. BOOTH 95A.

NEC AMERICA — FS-16 frame synchronizer; DME (Digital Mix Effects) system; Action-Trak digital strobe-action special video effects system. BOOTHS 229, 230.

NEUMADE PRODUCTS — Complete line of film handling and editing equipment; filing systems for audio and video tape. BOOTH 115.

NL FILM PRODUCTS — Flatbed horizontal editing equipment for two to eight plates, with up to four individual picture or sound combinations. BOOTH 207.

NORTON ASSOCIATES — Norton magnetic heads and amplifiers for motion picture sound. BOOTH 119.

NURAD — Asymmetrical parabolic "Orange Peel" antenna and other products for ENG/EFP applications. BOOTHS 198, 199.

NYTONE ELECTRONICS — Solid-state motion-picture analyzer. BOOTH 208.

OSRAM — Osram HMI lights in 200, 575, 1200, 2500, and 4000 W; tungsten filament (3200 K) light sources for television and motion picture production. BOOTH 106.

OXBERRY DIV./RICHMARK CAMERA SERVICE — BOOTH 83.

PACE INTERNATIONAL — Pacex™ water recycling systems for photographic wash water (also recovers silver); algae and bacteria control system. BOOTH 108.

PANASONIC — Color video studio and ENG cameras; 3/4-inch videocassette editing systems; videocassette recorders (¾-inch and ½-inch); portable VCRs; monitors; production systems. BOOTH 252.

SEE AD ON PAGES 22-23

PERF-FIX — The Perf-Fix system for film perforation repair and protection. BOOTH 93.

PETERSON ENTERPRISES — Automatic full-immersion printer; loop cabinet; model CP adaptor for Peterson light valves. BOOTHS 91, 92.

PHILIPS BROADCAST — Color television products, including the LDK-14 ENG, EFP, and studio camera; the LDK-25B multi-conductor studio and field camera; Video-80 convertible cameras for ENG, EFP, studio, and production systems; 1-inch video recorders for stand-alone and camera systems; solid-state exciter modulator; new digital noise reducer; new tape synchronizer; test and measuring equipment. BOOTHS 12, 13, 14, 15.

SEE AD ON PAGE 33

PLASTIC REEL CORP. OF AMERICA — Post-production equipment and supplies for sale and rental, including reels and cans, shipping cases, and lab supplies. BOOTHS 45, 46.

RF TECHNOLOGY — Wireless microphone; microwave systems; FlightPac System; power amplifiers; antennas; QA-4 antenna. BOOTH 217.

RANK CINTEL — MK3B Digiscan Flying Spot Telecine. BOOTH 99, 100.

RANK PRECISION INDUSTRIES — New lens for super 16mm and new lightweight zoom lens for 33mm motion picture, complete with accessories. BOOTH 89.

RCA BROADCAST SYSTEMS — Television studio and field cameras; videotape recorders. BOOTHS 187, 188, 189.

RECORTEC — High-band U-format (HBU) recorders providing 1-inch and 2-inch quality video with ¾-inch cassette convenience. BOOTHS 263, 264.

SEE AD ON PAGE 46

RESEARCH TECHNOLOGY — Film editing equipment, including the new CineScan high-speed previewer with Quik-Trac speech processor and LED film timer. BOOTHS 95D, E, F.

SEE AD ON PAGE 26

ROHDE & SCHWARZ SALES — Barco CTVM 3 monitor with new split-screen and cross-pulse options, in both the 15- and 20-inch size; new receiver/demodulators VSD1, VSD2, and BSD2/X for Barco; new redesigned EKF2 demodulator for on-site monitoring; new SPF2 video signal generator with 32 different signals available. BOOTHS 162, 163.

ROSCO LABS — Cinegel light control media; Roscolux line of heat-stable special effects color filters. BOOTH 141.

SERA — Six-plate flat-bed editing console with accessory two-plate auxiliary picture modular for fast film

search; low-cost portable four-plate console. BOOTH 203.

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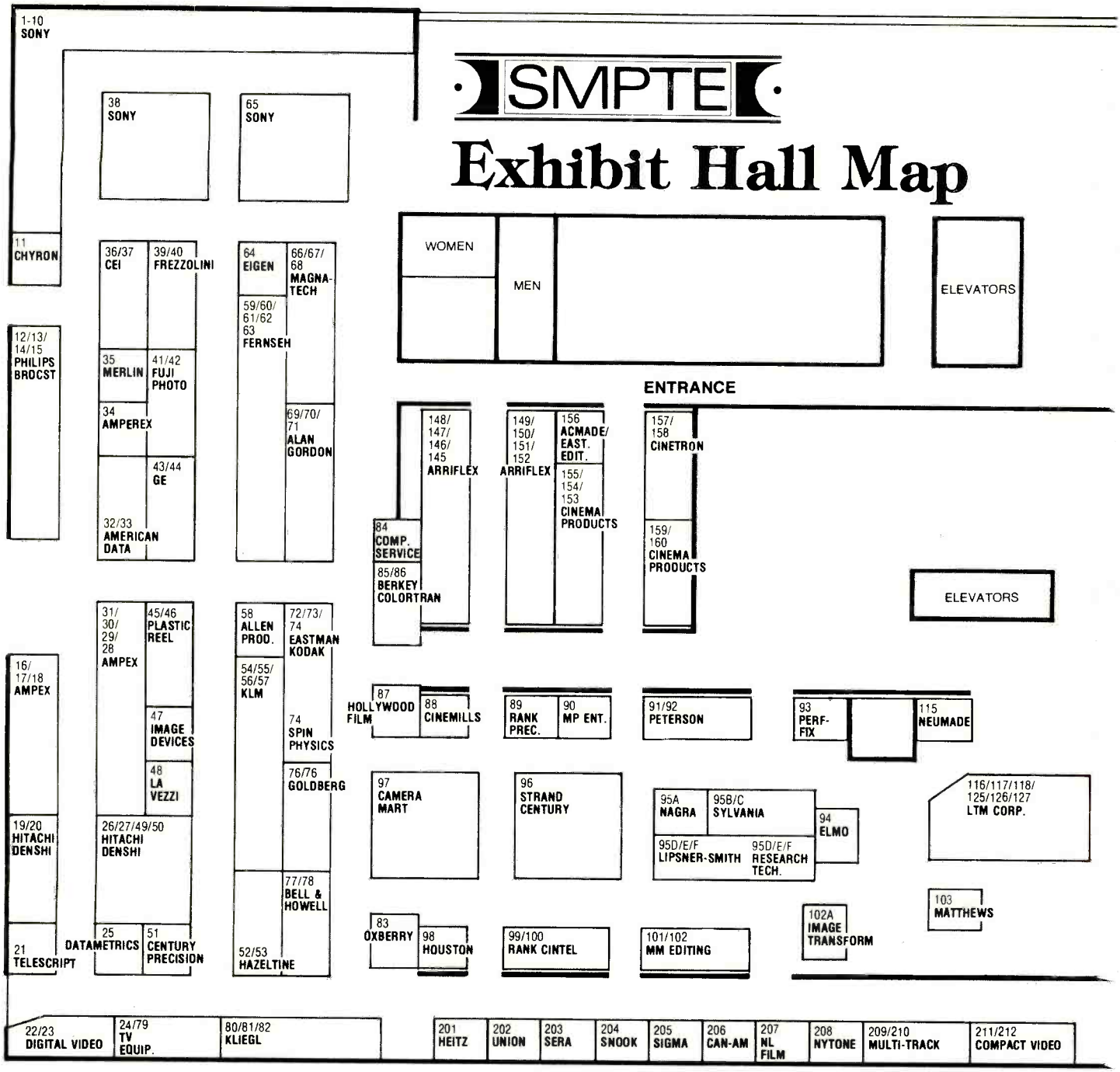

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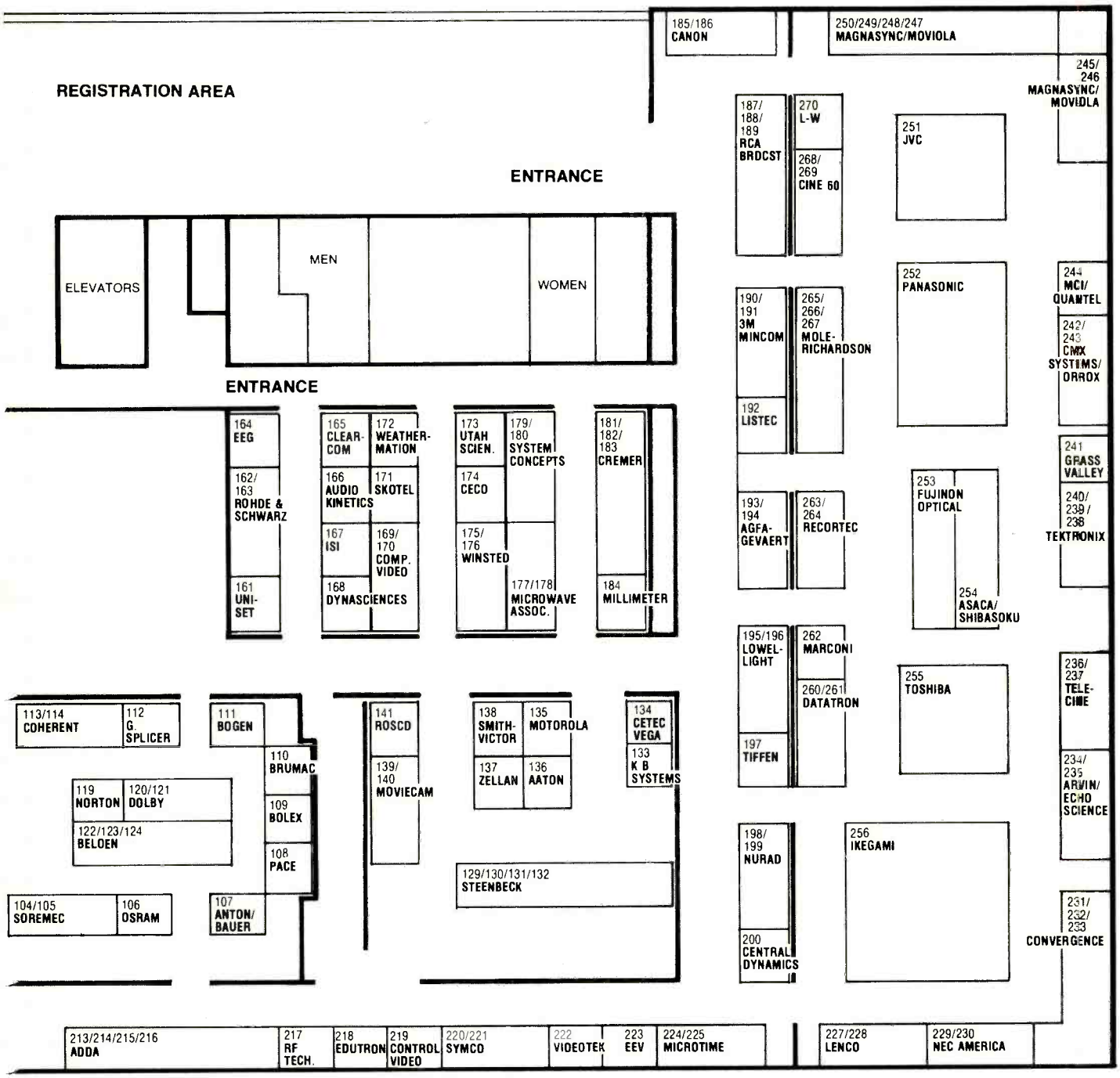

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ERIC NEIL ANGEVINE

ACOUSTICS:

The guessing game is over, Part 1

Studios with good acoustics don't just happen. The creation of a first-rate broadcast facility must be planned and carefully constructed to achieve the desired results. Acoustics is both a science and an art, but with adequate guidance anyone can achieve the ideal studio environment, assuming that they are willing to listen to their consultant.

There are many misconceptions about acoustics and acoustical materials which should be laid to rest. The foremost of these is the use of sound absorption in noise control. Most of the materials commonly thought of as *acoustical* materials are absorptive materials.

Sound absorptive materials reduce sound reflections from a hard surface. Materials which are sound absorptive are either porous or fibrous materials of some thickness. Thin products can be absorptive only at high frequencies. The sound absorption of a material can be increased, particularly at low frequencies, by providing an airspace behind it. This means a suspended acoustic ceiling is more absorptive than a ceiling of the same material attached directly to a plaster or gypsum board ceiling.

Most materials which are sound absorptive are not very good at containing sound. Just like a sponge with water, sound absorbent materials soak-up sound. But to contain sound, a material must be solid and massive. The overused word *soundproofing* usually refers to sound containment or sound transmission loss. But adding an absorbent material to a wall, as is so often done, does not improve the sound transmission loss.

The sound transmission loss of a material is generally a function of the surface mass or weight of the material in pounds per square foot. Materials which provide good sound attenuation are solid, non-porous, heavy, and preferably somewhat limp — at least not excessively stiff. Some materials which have these characteristics are concrete, masonry products, and gypsum wallboard. Lead is one product which is very heavy for its thickness, but its primary advantage is its ability to form to any shape. For wall construction, the cost of lead compared to other materials seldom is justified for a minor saving in wall thickness.

All materials are more effective at reducing sound transmission at high-frequencies than they are at low frequencies. The transmission loss of a homogeneous single panel has a frequency characteristic like that shown in Figure 1. For most common materials, the audible frequencies are in the mass-controlled part of the curve, where the material's ability to contain sound increases by 6 dB per octave (doubling of frequency).

The relationship between sound transmission loss and surface mass of a wall is logarithmic. Consequently, each doubling of mass (or panel thickness) accomplishes only a 6 dB increase in the sound attenuation afforded by the wall. It is possible to achieve a greater increase in sound insulation if the extra mass is added to the wall as a separate septum. Thus two 4-inch concrete walls are more effective at reducing sound than one 8-inch wall.

Far too often it is not possible to use concrete or masonry partitions because the building structure just will not support them. But frame partitions can be as good as masonry walls if built properly.

Note that a simple wood-stud partition will provide more sound attenuation if one sheet of wallboard is fixed to each side of the studs than if two sheets are attached to the same side. But this wall does not provide twice the attenuation of a single panel of wallboard. This is because the two panels are rigidly connected by the studs and the wall acts somewhat as a single unit. To improve upon this, one would like to vibration isolate the two sides of the wall. In the ideal case, a double-stud cavity wall with a one- to two-foot airspace, it is possible to nearly achieve the maximum sound attenuation of each panel, but this is an extravagance of space as well as materials.

Continued on page 54

Our acoustics author is Eric Neil Angevine. He holds a B.S. in Architectural Engineering and an M.S. in Architectural Engineering specializing in Acoustics, both from the University of Texas at Austin. He is a certified Intern Engineer in the state of New York and is a Visiting Lecturer in the School of Architecture at the State University of New York at Buffalo.

Angevine is a member of the Acoustical Society of America and the American Society of Heating, Refrigerating and Air Conditioning Engineers, for which he serves on Technical Committee TC 2.6 on Sound & Vibration. He is also an affiliate of the Institute of Noise Control Engineering.

Angevine Acoustical Consultants Inc. is located in West Falls, New York.

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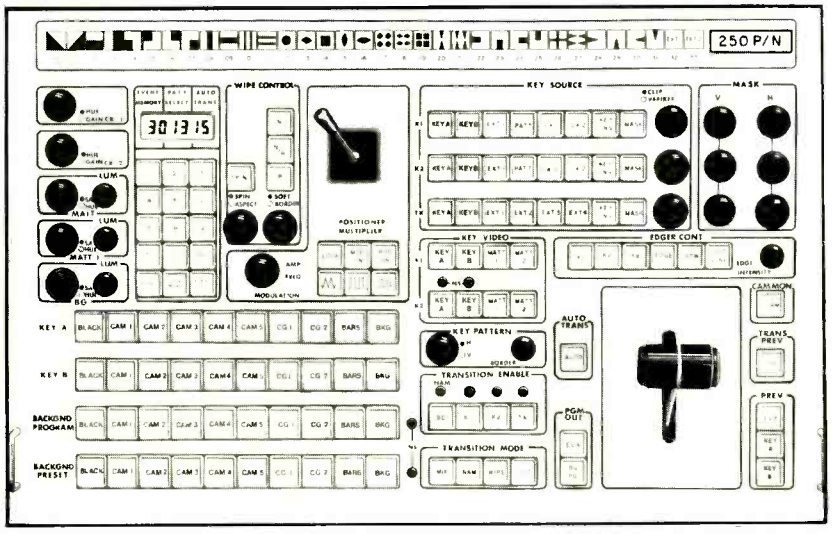

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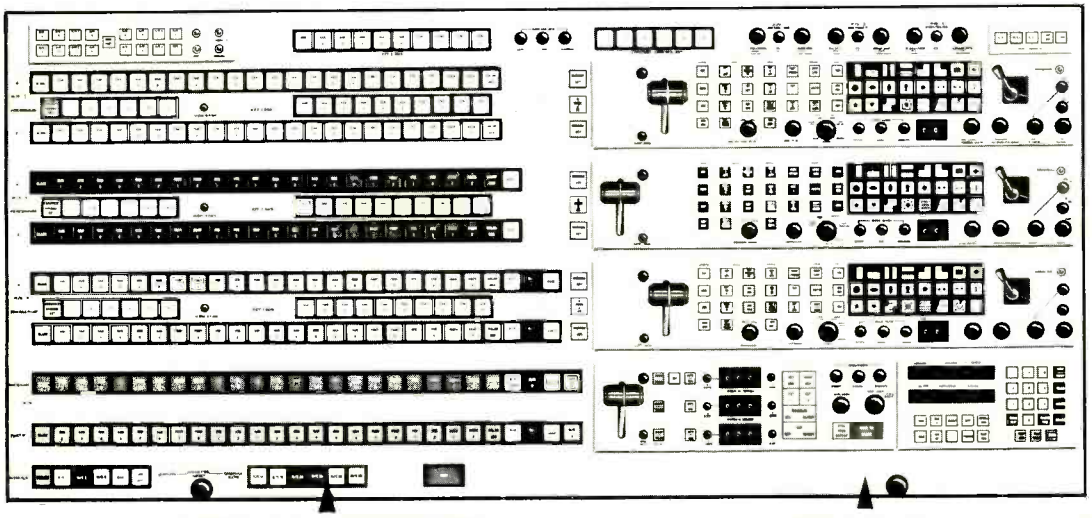

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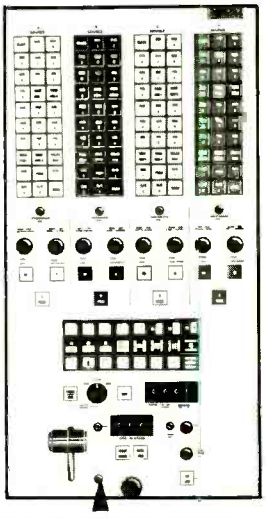

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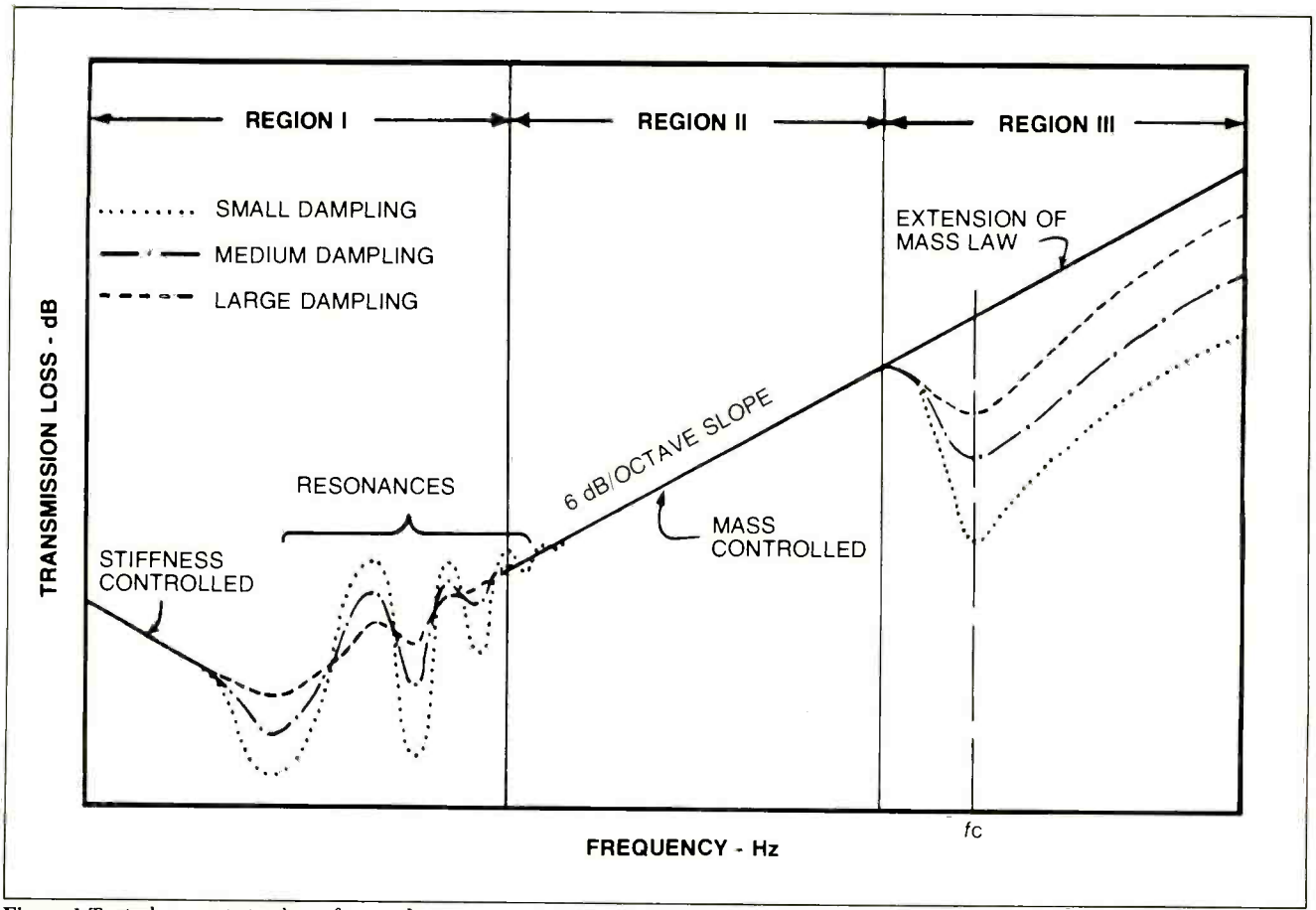

Figure 1 Typical transmission loss of a panel.

Several procedures have been developed to partially isolate the two sides of a frame wall. Lightweight metal screw studs have cut-out webs which reduce structural transmission of sound through the wall. When using wood studs, resilient furring channels, or "clips," can be applied to accomplish the same result. Normally these clips are used only on one side of a partition, since the reduction of structure-borne sound is a fractional, rather than absolute change. (For example, if one set of clips reduce 60% of the structural transmission, a second set will reduce only 60% of the remaining 40%, for a total reduction of 84%.) In critical situations, however, resilient channels should be used on both sides of a wall.

When using resilient channels, a precaution must be taken that the drywall screws which fasten the Sheetrock to the channels do not penetrate the studs, creating a short-circuit of the isolation. To prevent this, screws should be just long enough to secure the drywall to the channels or all screws must be located off the stud lines.

Another material which is used to help isolate the two sides of wood-stud partitions is "sound-deadening board." This is probably one of the most misunderstood of all acoustical materials. The purpose of sound-deadening board is only to provide a resilient mounting for gypsum wallboard. It is not as resilient as the metal clips and should therefore be used on both sides of a partition. It is not a good sound barrier material.

The precautions for applying sound-deadening board are similar to those for resilient channels. Care must be used to assure that the isolation provided by the resilience of the material is not compromised. Since sound-deadening board is usually applied with nails, the nails should all be "dimpled" or driven in so that their heads do not contact the drywall attached as a finish layer. In addition, the drywall must be screwed off the stud lines or attached with glue.

Further improvement in isolation can be accomplished by supporting the two sides of the wall on separate studs. This can be a staggered-stud wall, where alternate studs face opposite sides of the partition, usually with common plates (for example 2 x 4 studs with 2 x 6 plates). To be effective, a staggered-stud partition should employ resilient metal-channel studs or resilient furring channels. A staggered wood-stud partition without resilient clips is little better than a simple wood-stud wall. Split studs have also been used, but the improvement in sound attenuation is usually not worth the labor involved.

The use of independent studs on separate plates begins to approach ideal isolation. If the effort is made to construct such a wall, it is relatively easy to provide a third septum by applying a layer of wallboard to the inside of the first set of studs, before erecting the second set.

All of the foregoing discussion relates to hollow-cavity partitions. A further improvement in the noise reduction afforded by a wall can be achieved by placing sound absorptive material (insulation) in the cavity. Sound absorptive insulations are soft, porous materials, such as fiberglass or mineral wool. Open-cell foams are sound absorptive, but rigid foams such as Styrofoam, polystyrene, and closed-cell polyurethane are not.

Many people do not understand the purpose of placing sound absorption into a wall cavity, and therefore are confused about how much it can improve the wall's sound attenuation. Even with resilient furring channels or staggered studs, a wall tends to act as a single sound barrier.

Continued on page 56

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Acoustics

Mechanically, the panel-cavity-panel construction (neglecting the studs) will act as two masses tied together by an air spring. This allows the wall to transmit sound more easily at some (resonant) frequency. Placing a sound absorptive blanket in the cavity will reduce this resonance.

Again a precaution must be taken. The absorptive blanket should not fill the wall cavity. Compressing a 3-inch blanket of insulation into a 2½-inch cavity will only substitute the spring-effect of the insulation blanket for that of the air. As a rule, the cavity should be one-half to one-inch thicker than the absorption material placed in it.

All interior partitions must extend to a hard ceiling. The common technique of stopping partitions at or just above a suspended acoustic ceiling will allow the ceiling plenum to transmit sound between the two rooms, since acoustical ceiling materials are not good sound barriers. Partitions may stop at a suspended plaster or drywall ceiling, if the sum of the two ceilings equals the thickness of both sides of the wall. Placing acoustical insulation in the ceiling plenum will increase the sound attenuation through the ceiling space, but not by a lot.

Good sound control can be accomplished through room arrangement. Since studio spaces are both acoustically critical and occasionally noisy, it is not desirable to locate two studios right next to each other. Studios can be separated by quiet corridors, news or announce booths, or electronic equipment spaces.

The individual effects of resilient mounting of wall panels, independent or staggered studs, and absorptive material in the wall cavity do not add arithmetically when combined. In addition, the factor which most influences the sound transmission loss of a given wall structure is the quality of con-

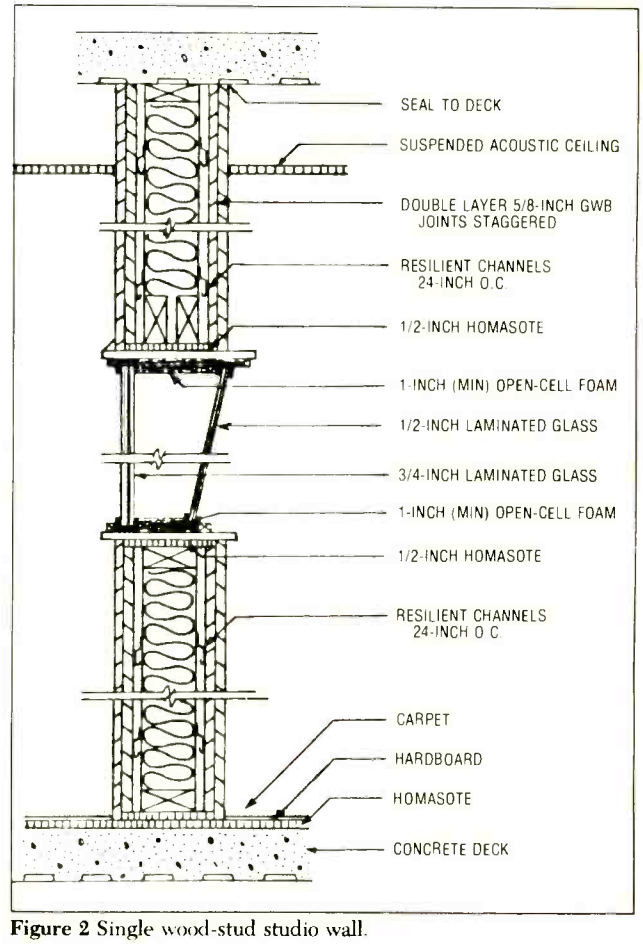

Figure 2 Single wood-stud studio wall.

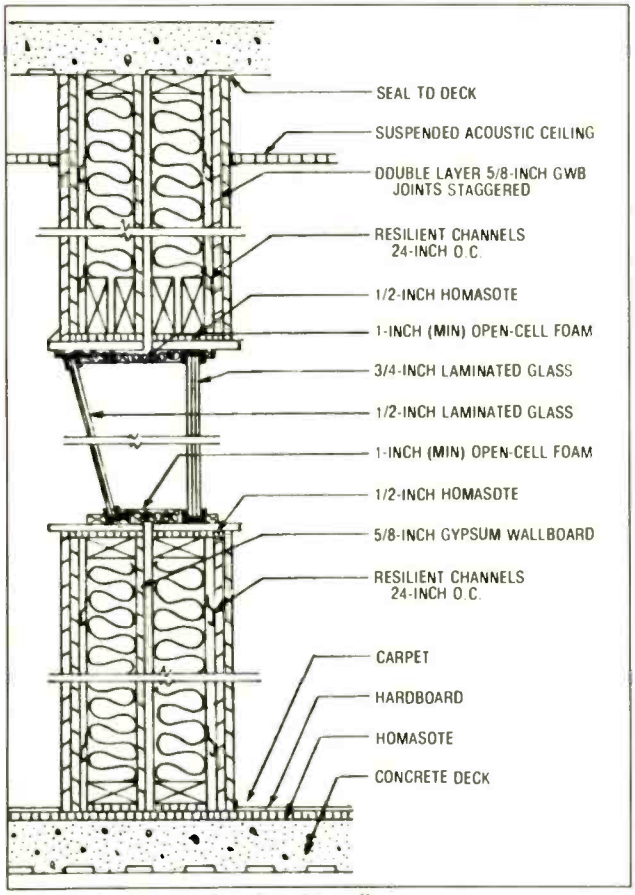

Figure 3 Double wood-stud studio wall.

struction. For this reason, it is possible to see several laboratory ratings for the same wall construction.

Many people strive to achieve the "ultimate" wall construction, and then use doors and windows which are not as effective at reducing sound transmission. The transmission loss of a composite wall is a logarithmic function of both the area and transmission loss of each element. But windows and doors amounting to only 10% of a wall area can reduce the effective sound attenuation of the wall by 10 dB. As windows and doors begin to approach half the area of a wall, they control the effective attenuation of the enclosure, regardless of how good the wall is. It is important, then, to be sure that windows and doors provide good sound attenuation.

Windows should be restricted to a reasonable size. Remember that a window need not fill a wall in order to allow observation of most of the room interior. If window area is kept to a minimum, the sound attenuation of the enclosure will not be seriously affected.

Simply making windows out of thicker glass will not greatly increase their sound-attenuating ability. As with other materials, a doubling of glass thickness accomplishes only a 6 dB increase in sound transmission loss. It is usually necessary to construct a window unit employing two or more plates of glass, resiliently mounted in their frames. The glass panes should be of different thicknesses. Since the coincidence frequency (*fc* on Figure 1) is a function of material thickness, two panes of different thickness have difference coincidence frequencies. The use of two different thicknesses of glass is an assurance that the window unit will not transmit excessively at one frequency. The panes should also be slanted with respect to one another, to avoid coincidence

Continued on page 58

effects and problems with light reflections. It is customary to slant the pane on the studio side of a wall out at the top, so that it does not reflect light from ceiling fixtures into the eyes of studio performers.

There are also several glass manufacturers who produce laminated glass which has a greater sound transmission loss than ordinary plate glass. Used in conjunction with the construction described here, it can produce windows nearly equal to a good studio wall.

Doors also create sound leaks in studio construction, and their use should be kept to a minimum. Doors connecting adjacent production areas should be avoided. All doors must be carefully installed to assure that they provide the sound insulation they are rated for. Mechanical drop-seals can be used at the floor, but these require periodic adjustment. A threshold seal is better. A single door is seldom as good as any studio wall, so two doors are recommended. The wasted space of several "sound-locks" can be avoided by having all studio doors open off a common quiet lobby or corridor. But this corridor should not open into the rest of the building.

Openings, even small cracks, can nearly negate the sound attenuation of a good sound barrier. The attenuation of an enclosure containing openings may be approximated as:

$$10 \log_{10} \frac{\text{Area of enclosure}}{\text{Area of openings}}$$

While this appears to provide adequate attenuation, it should be noted that this expression limits the attenuation from a wall with 0.01% cracks to 40 dB! So it is important to close up all small holes and caulk peripheral joints.

Some openings must be left for electrical conduits, and these openings can spoil the effectiveness of an otherwise excellent wall. It is important to close up and seal these openings once electrical installation is complete. Electrical conduits should not run directly from room to room. It is recommended that each room be served individually from an electrical buss in the corridor.

Air-conditioning ductwork can also transmit sound from one room to another. Several precautions should be taken to avoid this potential problem. Supply and return ducts should run individually to each room from a central duct or plenum in the corridor or lobby ceiling. All of these ducts should be lined with fiberglass duct liner. All ducts should be small, at least in one dimension, since sound does not propagate well through narrow ducts. Both supply and return air must be ducted, since ceiling plenum return systems allow transmission of sound.

Floor/ceiling constructions must be similar to wall constructions in order to contain high level sound. This means that concrete floor slabs are preferred to lighter weight floors. Prefabricated concrete T's or planks should be avoided unless they employ a poured-in-place top layer which fills the joints between panels.

In order to increase the sound transmission loss of most floor slabs, it is necessary to add a continuous hard ceiling in the space below. This ceiling should be suspended from the slab using resilient hangers in order to vibration isolate the two.

Electrical and mechanical systems should not penetrate the floor slab in acoustically critical spaces except for electrical conduit installed prior to pouring a concrete slab.

Construction inspection is essential if all elements of a studio enclosure are to provide adequate sound attenuation. Contractors are not used to building walls of this type and one or two small leaks can destroy the integrity of the whole enclosure.

We'll return next month for an inside look at studio acoustics. BC

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RON MERRELL

At WBNO..."Solar exceeded our expectations"

We're all becoming aware of the rising costs of energy, but that hasn't made much of a dent in our demands. To the contrary, in the face of rising costs, and even shortages, our energy appetite is growing. If we were counting on bottomless fossil fuel wells, or drawing from power plants typically running at 25 percent of capacity, the gorging could go right on for another decade.

But even if that fantasy were true, by 1990 we'd be faced with the same situation that confronts us today.

There are alternatives. They are real. And while the broadcast industry isn't going to plunge headlong into alternate energy, the incentives and opportunities will rise up as irresistible forces by the middle of this decade.

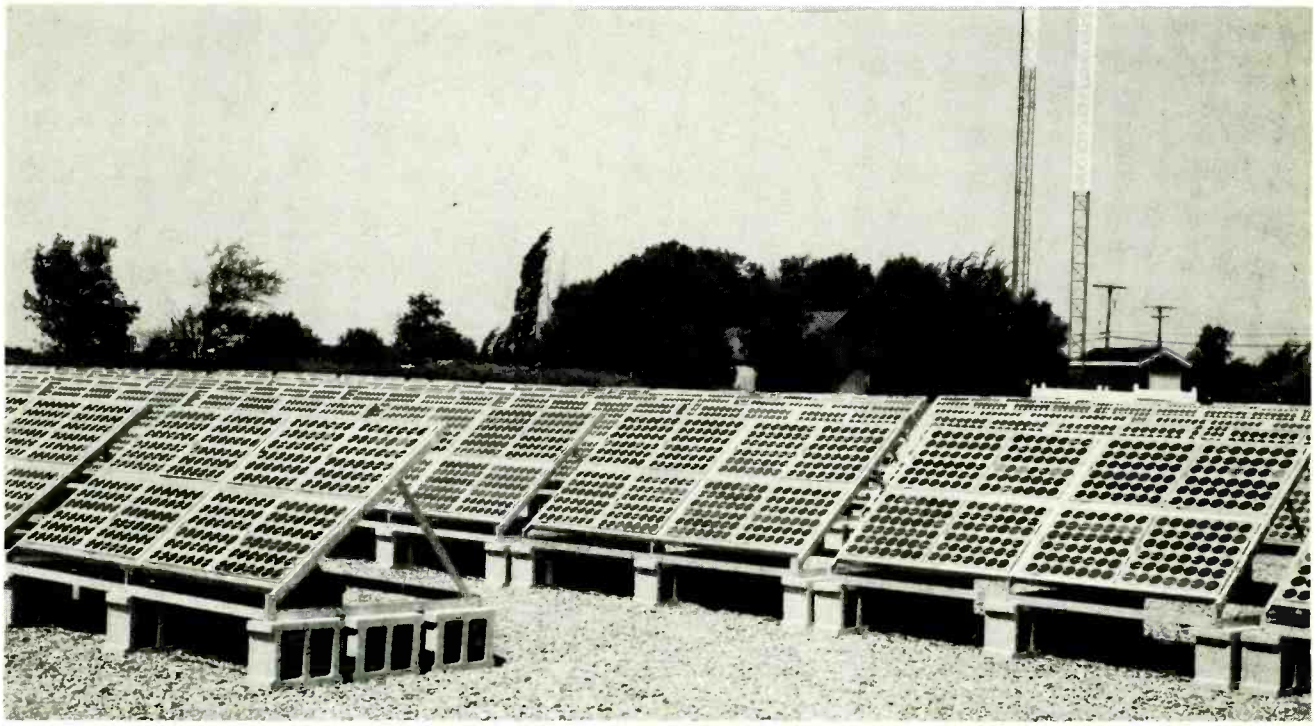
The U.S. Department of Energy (DOE), for example, has decided that visibility among broadcasters is important. It's not that their primary target is the broadcast facility. Instead, they hope to go through the broadcaster to get to the general population.

Earlier this year the DOE's Office of Conservation and Solar Applications manned a booth at the NAB convention in Las Vegas. And they'll be in the exhibit hall at the NRBA convention in Los Angeles this month. The message will be, let's promote the solar index.

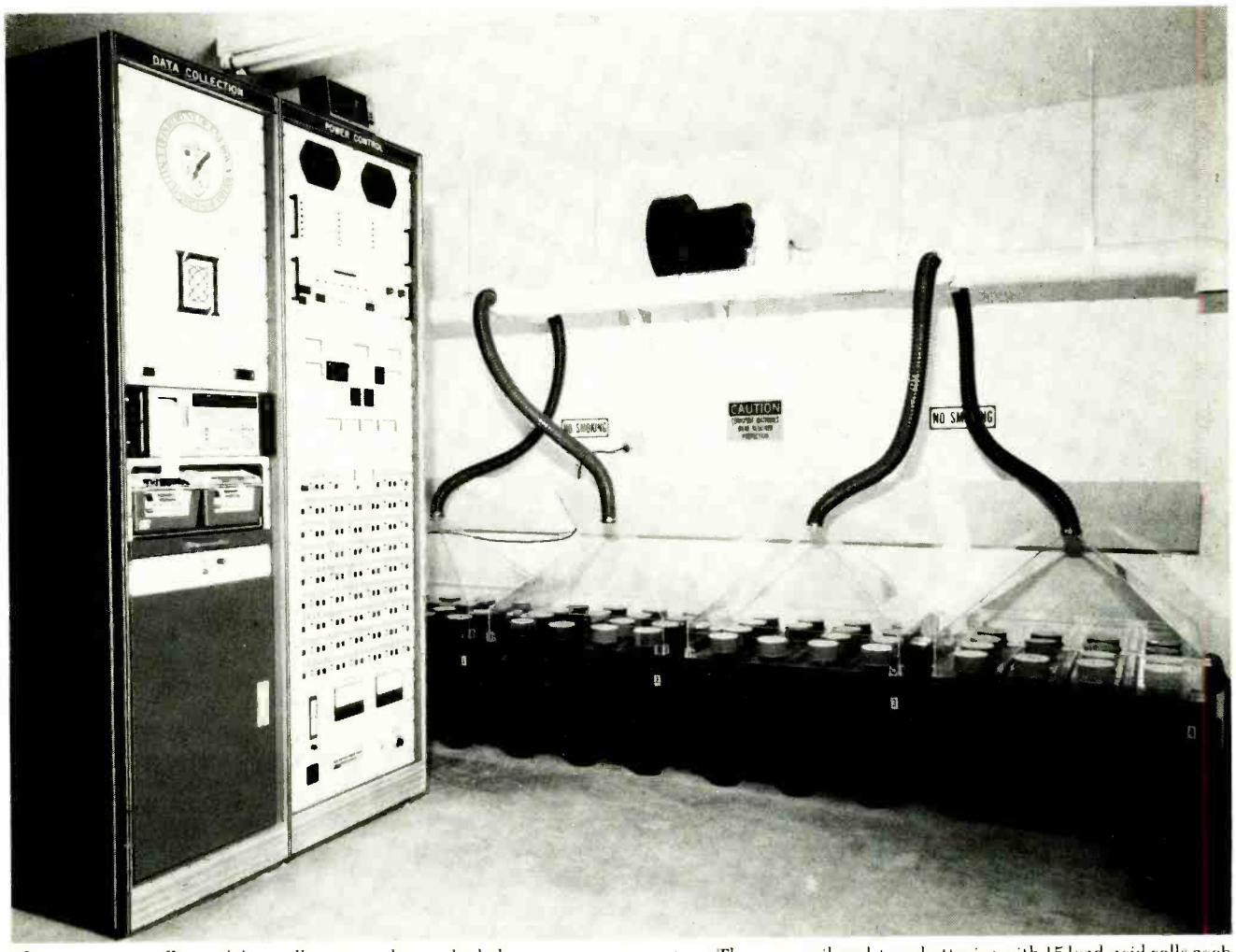
The solar index is simply a number between 0 and 100 which gives the expected percentage of heat that could be supplied on a given day by a typical solar domestic heating system.

The DOE, in conjunction with local weather bureaus, figures the solar index using a computer. Solar energy is measured to get the amount available for use in a hot-water heating system. The typical domestic solar system operates for a family of four, uses about 80 gallons of hot water a day, and has a collector area of between 50 and 80 square feet. So, the higher the number, the more hot water that can be produced.

Now if broadcasters use the solar index in their weather forecasts, and if they should occasionally remind listeners/viewers that the number



This is the solar panel system at WBNO. Other systems available today include sun direction sensors that rotate the panels for maximum power production from sunrise to sunset. While these are ground-mounted, a smaller system could be mounted on a building with a flat surface roof.



The power controller and data collection racks overlook the power storage system. These are railroad-type batteries with 15 lead-acid cells each. Along with solar cell research, storage system design should yield a more compatible system in the 1980s.

means they could have had that percentage of their hot water produced in a solar system, the DOE will increase its odds on domestic solar investments. Of course it already has occurred to more than a few broadcasters that the broadcast facility also could take advantage of such systems when a new facility is on the drawing boards.

A move to solar heating is not necessarily patriotic. It's just good business. The original investment looks steep, until you consider the federal tax deduction and the down-the-line savings vs. endless energy cost hikes.

If you'd like more information on the solar index, the DOE suggests you write to Solar Index, Department of Energy, Washington, DC 20545. Or you can call (toll free) the National Solar Heating & Cooling Information Center at 800-523-2929. In Pennsylvania, call 800-462-4983.

Nearer and dearer to all our hearts is our power line consumption multiplied by our local rates. Here the technology assist to alternate energy isn't clearly as practical as solar heating. Photo-voltaic solar cells are becoming more and more accessible. After all, cell demand has been growing steadily in other industries. And as the demand spurs production, so competition will take solar cell R&D from push to shove.

It was a year ago that WBNO in Byran, Ohio, converted to solar power as their primary power-input source. So on the anniversary of that historic switch, BROADCAST COMMUNICATIONS asked WBNO to reflect on their first year of solar energy experience.

"Right now we're saying we're the first and only solar-powered radio station. But I don't think it'll be too long until we can only say we were the first solar-powered radio station." That's how WBNO program director Bill Priest assesses solar in broadcasting on the station's first anniversary.

Fortunately, it's been a very good year for a station committed to solar. In fact, Priest says that their system actually exceeded expectations. When asked to explain, Priest told *BC* that the MIT engineers who designed the system calculated that it would supply about 80 to 85 percent of their annual needs. But at year's end, the result was something over 90 percent.

Priest explained that Bryan had experienced an unusually mild winter, so the system output during that particular period probably couldn't be considered typical. It is a fact, though, that Bryan got more than its share of spring rain. And it was during those soggy, dark days that the system did occasionally automatically switch over to commercial power, making that 90 percent a lot more realistic.

Actually the WBNO site was selected for this cooperative effort because Bryan is a less-than-ideal area for solar operations. Certainly an ideal spot would be a place like Yuma, Arizona. And sure enough, as WBNO was preparing for their first solar anniversary celebration, KAWC in Yuma was in the midst of mapping out their plans for a solar-powered station that will far exceed the solar power input at WBNO.

It would seem that wintery weather

Continued on page 62

Solar Index Monthly Averages

	Jan	Feb	Mar	Apr	May	June	July	Aug
Phoenix, Ariz.	46.9	68.3	64.2	87.5	81.7	84.6	85.8	84.1
Los Angeles, Calif.	37.8	58.7	36.4	68.8	76.8	79.7	77.3	72.6
Denver, Colo.	54.9	68.6	82.0	86.5	69.8	89.5	91.4	84.0
Washington, D.C.	41.2	46.2	82.9	50.1	79.3	91.3	85.2	91.0
Miami, Fla.	54.7	70.6	88.0	82.8	56.7	87.2	85.7	81.7
Atlanta, Ga.	51.4	46.9	80.0	58.5	68.4	77.2	65.7	83.6
Chicago, Ill.	38.1	57.1	56.1	70.6	92.4	88.7	84.8	74.3
New Orleans, La.	51.6	43.5	79.5	49.0	73.7	79.0	69.0	77.7
Baltimore, Md.	42.8	55.1	85.7	51.1	69.8	89.0	80.8	83.0
Boston, Mass.	46.4	67.5	63.4	62.9	75.6	89.3	87.2	73.8
Minneapolis, Minn.	47.2	59.3	39.4	66.6	67.0	79.2	73.3	58.0
St. Louis, Mo.	46.1	32.6	54.4	52.6	79.1	86.8	68.7	81.9
Albuquerque, N.M.	41.5	67.5	66.2	70.7	74.2	78.2	85.5	80.0
Raleigh, N.C.	N/A	63.4	70.3	57.7	65.3	73.0	67.4	76.5
Fargo, N.D.	37.0	44.7	53.0	52.4	68.3	83.3	88.1	82.8
Philadelphia, Pa.	36.5	38.1	80.8	58.2	68.2	79.0	68.5	78.6
Seattle, Wash.	38.7	27.6	76.9	68.5	62.7	89.1	99.6	76.0

These are average solar index readings from selected U.S. cities. Some figures are surprising, such as Seattle's August and Denver's March average.

would have a drastic effect on solar panel outputs. And in some instances that might prove to be the case. When it snowed last winter, Priest explained, the snow melted off the panels fairly quickly. That's partly because it's the nature of this particular type of photo-voltaic cell to rise about 10 degrees in temperature when it is active. So if snow were falling with temperatures in the high 20s, it would fall on cells operating in the high 30s.

According to Priest, one of the latest developments in photo-voltaic cell design is the makeup of its covering. The cells at WBNO have a rubberized silicone covering, and MIT engineers report that after operating in sunlight over a long period of time the cells tend to darken in color. Even though this has not been a problem at WBNO, the newest cells on the market have a unique glass covering that is reported to resist darkening.

While Byran didn't get enough typical winter weather to fully test the solar system's ability to produce under those conditions, the engineers did find that the panels worked well on cold days. In fact, says Priest, the panels produce better on cool days than on hot days, because the added heat drives up the cell's internal resistance.

So where will WBNO go from here? There certainly isn't any official word yet, but a not-too-distant check on WBNO might find them installing a solar heating system.

The WBNO experience is a tremendously important one for broadcasting, because the solar commitment was designed to test its practicality. If the WBNO staff had decided to promote the station in its market area largely on the basis of its solar panels, outsiders would see it as a contrived and not-so-noble experiment.

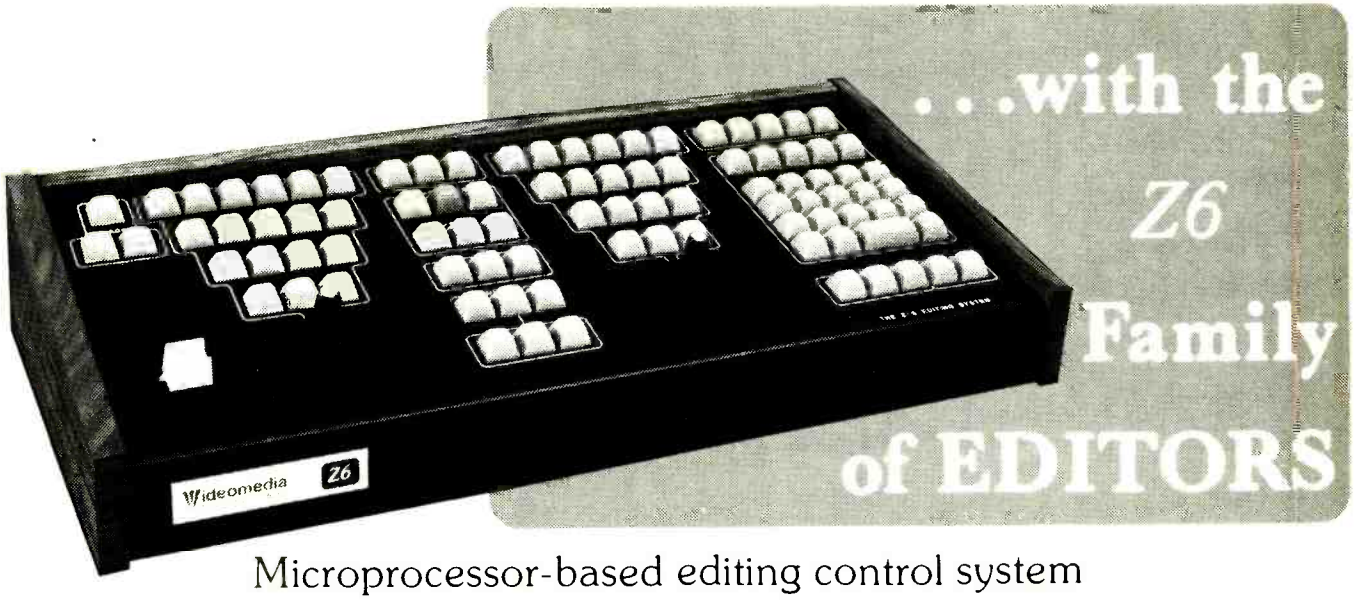
Obviously WBNO doesn't down play their solar investment. But neither do they promote it as their position in the market. In fact, when *BC* asked Priest to recite the promotional advantages of being a solar-powered station, he responded, "We do call ourselves Sunsational, but we haven't done any heavy solar promotions." However, their booth at the fair this year did feature "solar popcorn" and "solar coffee" (meaning both appliances were powered at the booth by solar panels). While booth visitors undoubtedly tied WBNO to solar energy applications, the most probable result was an increased awareness of solar's potential. And that's the intent of this article.

Of course the industry isn't going to rush right out to buy solar panels. After all, at this stage of cell development, the panel space needed for any significant power input restricts their application to stations with adequate unused adjacent real estate.

Sooner than many suspect, conventional energy input source rates will make solar more and more attractive. Eventually, for many stations the changeover will hardly be newsworthy.

Editor's Note: If your station has been designing energy-saving systems or devices into your operation, drop a line to *BC* and let us hear about your progress. Our address is Broadcast Communications, 4121 West 83rd Street, Prairie Village, KS 66208. BC

CREATIVE FREEDOM



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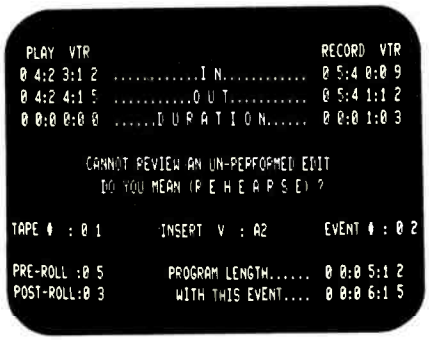

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JOE ROIZEN

Was it really 1928?

The great optical illusion revives the 30-line story

For those fortunate enough to be visiting London during most of 1980, the Science Museum on Exhibition Road has gathered together an amazing collection of television equipment which is in a special display called The Great Optical Illusion. Best of all, it's not just a static display of hardware, but a working demonstration of equipment spanning 50 years of development both in the U.K. and abroad.

The display includes everything from John Logie Baird mechanical scanners that produce 30-line pictures, to the latest in digital effects. The audience-participation booths permit a visitor to appear in a simulated flight pattern while chroma keyed on a moving background or to be a do-it-yourself newscaster reading the daily bulletins off the teleprompter in front of the color camera.

A special opening ceremony was held by the Royal Television Society to inaugurate this unique milestone of British television, and one of the distinguished guests was Thornton (Tony) Howard Bridgewater, a retired BBC chief engineer who is one of the few surviving members of John Logie Baird's team that built and demonstrated mechanically scanned TV in the late 1920s.

Bridgewater consented to share some of his fascinating recollections about the early pioneering work he and his colleagues were associated with, and what follows is a result of that interview.

It is not generally remembered that when the BBC began public television service from Alexandra Palace in 1936, there were actually two competing sets of hardware working on alternate days. One studio was equipped with the rotating lenses and carbon arcs of the Baird system while the other had an electronically scanned TV camera supplied by EMI. In retrospect, it would seem that the mechanical system was doomed to failure and would not get even that much consideration. In fact, there were some mitigating circumstances that warranted this decision to have a public "shoot-out" between the two systems.

Thornton "Tony" Bridgewater:
One of the very few people who worked with John Logie Baird on the world's first television system in the 1920s.

John Logie Baird was a zealous and intrepid Scotch inventor who had formed a corporation to exploit television. He was backed by a lot of U.K. investors, some of whom were influential individuals. In addition to this, he had obtained a substantial amount of public recognition as a result of various demonstrations that spanned the late '20s and early '30s. Bridgewater recalls this period as being both exciting and frustrating. Exciting because each new technical development improved the ghostly images just a bit. Frustrating because it was hard to get all the material help needed. The BBC was reluctant to allocate transmitter time or technical resources, and some of the early experimental broadcasts were less than successful.

In 1928, from a small studio at Long Aires in Covent Gardens, Baird was permitted to transmit a 30-line, 12.5-frame picture over medium waves (350-400 meters). This BBC operation was at that time known as the London Radio Service. The limited bandwidth available forced Baird to send either picture or sound, but not both. Bridgewater doubled as a commentator and a technical director, first announcing the name of the singer to be featured, then switching to video, where the viewer now saw the performer but couldn't hear the audio.

The few viewers around had rather simple TV sets consisting of a motor-driven scanning disc, which could be "servoed" into sync by holding a finger against it until the picture looked right!

All of this had to be done after mid-

Continued on page 66

Joe Roizen, international video editor, is president of Telegen, Palo Alto, California.

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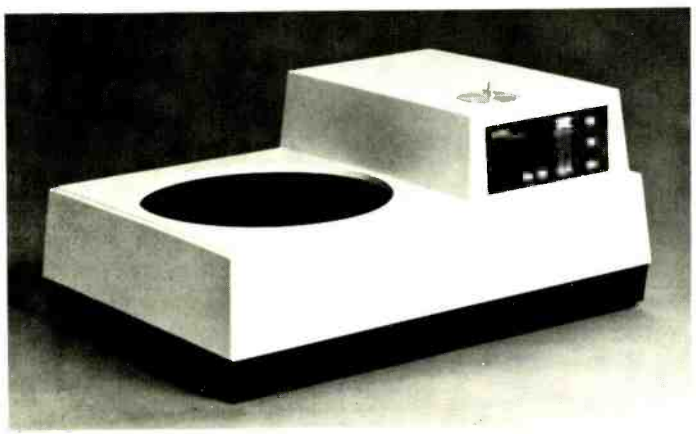

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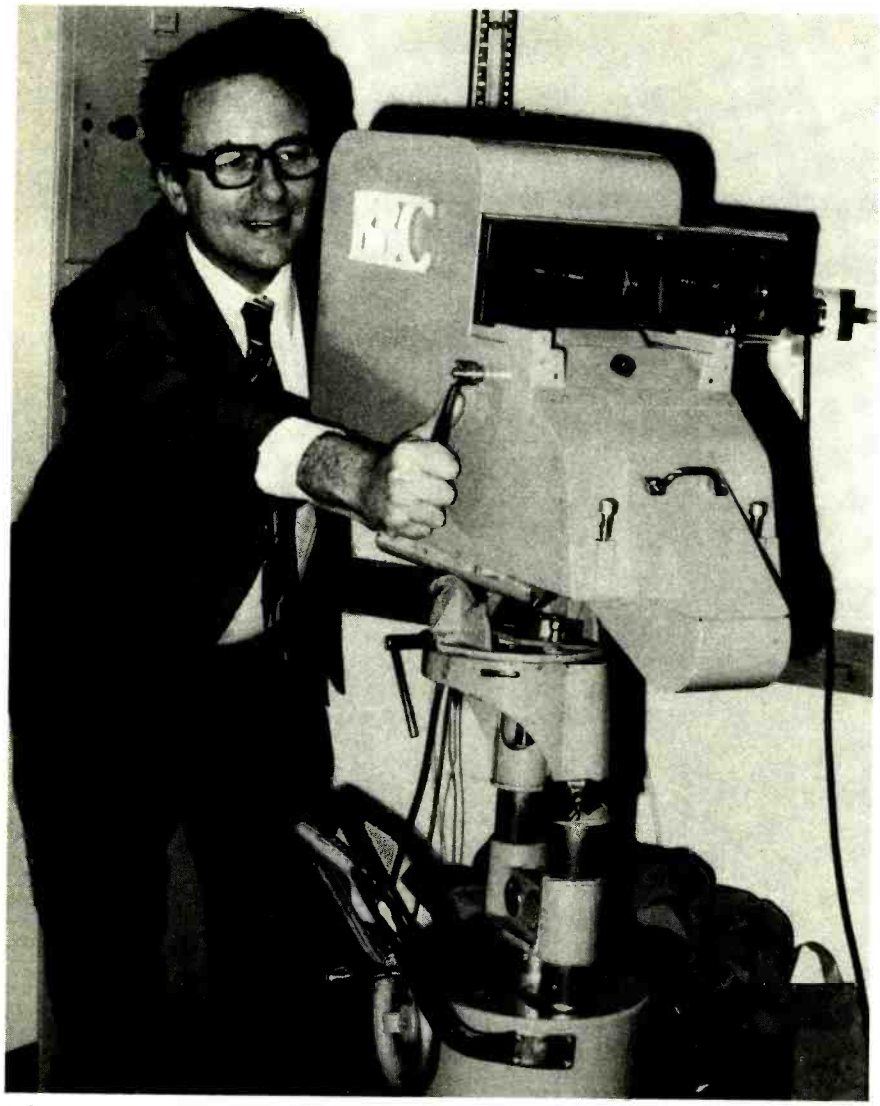

Bob Longman, chief engineer for the BBC at White City, displays an Emitron camera that dates back to the mid 1930s. This camera was used for some of the earliest TV programs put on by the BBC. *(Photo by Donna Foster-Roizen)*

night, when the BBC normally went to bed, and Bridgewater often slept in the studio, if he was too tired to go home. By his own admission it was rather lucky that he was not married at that time.

Later that year, the BBC installed a new and better transmitter which made it possible to transmit the sound with the picture, and a new set of experimental broadcasts were scheduled.

Baird's favorite program material was a puppet called Stookey (Scotch for a ventriloquist doll) who could easily stand the harsh lights and heat that came with early TV. However, it was realized that viewers would soon tire of this static view and that image movement improves the illusion of television. As a result, a variety of singers, cartoonists, and puppeteers were convinced to appear over this new entertainment channel on a voluntary basis, if only for the fun of it.

Since the camera had to be fixed, the object being televised was raised and lowered. They had all the modern devices to do this, including a variable-height music stool and extra phone books for particularly short artists.

Between 1932 and 1935, Baird Television Limited progressed from the circular scanners to a mirror drum, and the camera could now move around a bit. The BBC, using their own engineering expertise, replaced the dim neon display tube with a Kerr cell which gave much brighter projected images. By now the studio was at Broadcasting House in the West End, Upper Regent Street district, and programs were aired at 11 p.m. and even during the day.

Meanwhile, back at the factory, Baird was building and selling TV receivers, and over 1,000 such sets went into service in parallel with an estimated equal number that were assembled by amateur TV fans who could get kits or construction information from trade magazines.

With Sir Noel Ashbridge in charge, the BBC had become better disposed toward television; programs now included such novelties as a Balalaika band, fashion shows, zoo animals, and dramatic plays. The medium-wave signals were picked up several hundred miles away in places like the Channel Islands and Newcastle.

However, the BBC was not putting all of its TV eggs in the Baird basket. An engineering team that included Bishop and Birkenshaw was formed to scale up all of the problems of 30-line television and assess how a better system could be devised. An in-depth analysis of such television parameters as screen size, viewing distance, visual acuity, etc., was made, and the information obtained was very useful in preparing the BBC for the high-definition 405-line TV that was to follow.

As television attracted public attention it also became a political football. A government inquiry into the future of television in the U.K. produced a report which recommended that both the Baird mechanical system and the EMI electronic TV were to be given "equal time" by the BBC.

In fact, at that time, all the technical advantages were not yet on the EMI electronic system. Bridgewater explained that the Baird telecine worked very well on 240 lines at 50 frames, and it actually made better pictures than the EMI Iconoscope-based unit which was hard to shade. To sum it up, in late 1935 the EMI system made better live TV pictures while the Baird system did better film TV transmissions, and the BBC was commissioned to try them both and choose the best for a national service.

In early 1936, equipment from both contenders began to arrive at Alexandra Palace, the site chosen to have this very important evaluation made.

Identical studios were set up for both the EMI and Baird technical teams to operate their equipment under the scrutiny of the BBC engineering staff. The EMI combination consisted of three Emitron cameras using the Iconoscope principle. They operated on 405 lines 50 fields and exhibited little or no flicker as compared to the Baird system.

The electronic cameras were flexible enough to be moved to the balcony for outdoor scenes. And with 1000-foot cables attached they were used on the Palace grounds to cover gardening, dog training, and army shows. They even had a fire walker put on his act.

Continued on page 68

THE STATION WITH A STUDER HAS A REPUTATION TO MAINTAIN.

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Illusion

On the Baird side things were not so good. To make any kind of a live image required a 1000-amp overheated arc light, whose carbons had to be changed every 30 minutes, and whose luminous intensity was reduced to a dim light on the announcers head and shoulders because of the microscopic-sized holes in the scanner. Even with the best photomultiples available at that time, and even with garish blue makeup on the actors to overcome the red sensitivity of these tubes, the pictures were too noisy.

Another system used by Baird was an "intermediate film" approach where the scene in the TV studio was recorded on film which then went into a rapid processor and was put on the air over a scanner. This system had the unique characteristic that the delay between the original scene and its transmission on the air gave the performers a chance to run into the control room and see the last minute of the show they had just appeared in.

Bridgewater acknowledges that the problems of keeping the Baird equipment operational were monumental. The film broke frequently, dangerous chemicals were used for fast processing under conditions that would never get by today's environmental rules, and the sound tracks on the film were ruined by bubbles and dirt.

The situation was becoming desperate

An ENG team (at right) fielded by the BBC runs trials using the high-band U-matic format recorder. *(Photo courtesy of the BBC)*

The major BBC-TV production center (below), called White City, is located in the Shepherds Bush suburb of London. It is a huge complex of studios and administration offices, where the best-known BBC productions are made. *(Photo by Donna Foster-Roizen)*

for the Baird team. As a last-minute effort, a connection Baird had with Philo T. Farnsworth was activated and a few Image Dissector tubes were brought over. A crash program produced a prototype camera on a breadboard full of crocodile clips and temporary connections. Pictures were reasonably sharp, but there were linearity and field-storage problems which were not solved in time.

As far back as the first month, the EMI equipment had demonstrated an impressive superiority over the mechanical Baird system. All signs pointed to an EMI victory and by February 1937, the British government decided to standardize on 405 lines 50 fields. A sad irony to this turn of events was the Crystal Palace housing Baird's laboratory went up in smoke, the fire destroying all of the equipment that had been so laboriously and meticulously constructed.

Baird's company was taken over by Gaumont Films and then absorbed by Rank Cintel, where Baird began working on large-screen color projection via a mechanical system. He was able to show field sequential color in the Dominion Theater in London, but it never grew into a commercially viable development.

The United Kingdom had 405-line, 50-field monochrome television, considered in its day a high-definition system, providing the British audience with the first such public service in the world.

With the Baird tests over and with the company out of the running, Bridgewater joined the BBC, where he progressed from studio engineering to outside broadcasts and eventually to a chief engineering post which he held until his retirement in 1968. It would be impossible to recount all of the memorable TV events he had a significant hand in, but he did pick out a few highlights worthy of note.

The first challenge was the 1937 Coronation of George VI in May of that year. There was no special mobile gear available, and the best that EMI could do was to duplicate the equipment at Alexandra Palace. Bridgewater was put in charge of mounting this bulky equipment in four vans that were to cover the event. One vehicle held the three CCUs and sound gear, one had a transmitter operating on VHF at 60 MHz, one had auxiliary power if local AC was not available. The last one was a fire engine with an antenna on an extension ladder. They started with the Coronation ceremony at Hyde Park corner, and after all that effort could only show about two minutes of the king's royal carriage going by. But it put BBC television on the map!

The success of the Coronation coverage allowed them to order another mobile unit, and in the next two years they went to those world-renowned sporting events like Wimbledon and Epsom Downs. They began cutting their TV teeth on news events like Chamberlain's return from Munich.

In the studios their colleagues were learning to cope with Shakespeare and the ballet. The BBC was still small, there were no unions, no impediments to creativity or productivity.

The BBC darkened their TV operations on September 1, 1939, and Bridgewater and his cohorts took on a far more serious task that was to last until the middle of the next decade.

With VE days over, the BBC began rebuilding its TV operation. It wasn't easy; much of the gear had been cannibalized and it took six months to put it back together again. The goal was to be ready for a Victory Parade scheduled for June 1946. Bridgewater, now in charge of Outside Broadcast operations, managed to field three working cameras that captured the images of Churchill, Eisenhower, Montgomery, Mountbatten, and all the other famous names of the "war to end all wars." Bridgewater remembers it as a glorious TV event, a marvelous beginning to the rebirth of British TV.

By 1954, he was the BBC engineering representative to the growing Eurovision network. He had always had a penchant for long-haul TV and had experimented with a Calais (France) to Dover link on 7 MHz in 1950. A special show of folk dancing and circus acts was relayed to London over a three-hop path using abandoned 360-foot radar towers fitted with 4 MHz links.

In June 1954, a link up with the continent included a round-robin switch to eight European countries. The Pope from Rome, a flower festival in Montreux, a Danish brewery and the World Cup from Switzerland were among the images that reached U.K. viewers from this hook-up. An optical standards converter took care of making European 625-line and French 819-line images useable to the enthralled BBC audience.

Tony Bridgewater's career included two more important projects in his last years at the BBC: the implementation of a UHF 625-line service in 1964, and the conversion to PAL color in 1967. As a Fellow of the Royal Television Society and the British Institute of Electrical Engineers, he is still active in the professional affairs of these two prestigious organizations. We are indebted to him for sharing with us his recollections of the first half century of British television. BC

MORRIS COURTRIGHT

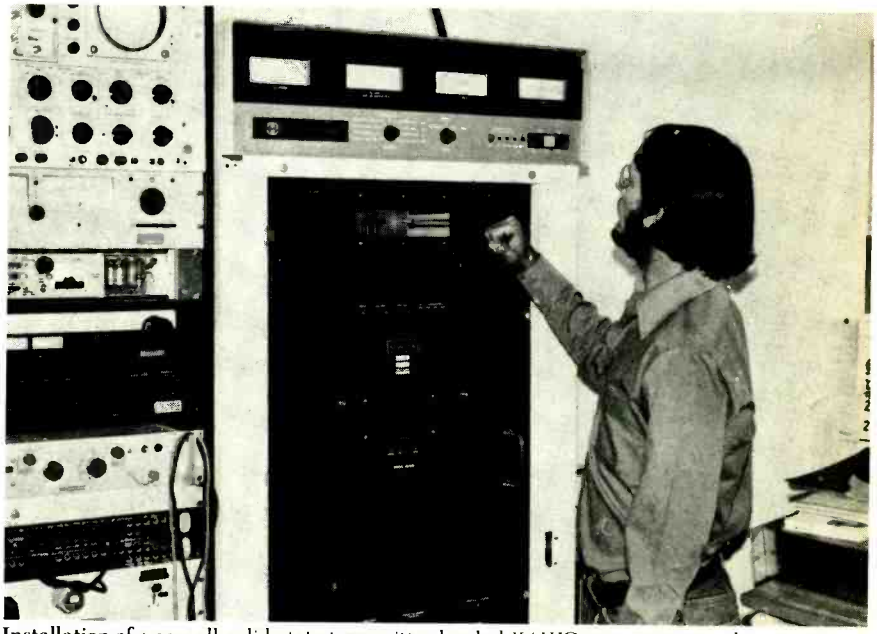
Keeping up really means staying ahead

KAWC and Arizona Western College outwardly look very much like your typical radio-station/college-campus combination. Nestled among the palm trees and sand of the desert mesa near Yuma, and situated on a neatly landscaped environment, the combination is interesting . . . but so are hundreds of other campuses.

Of course you can easily spot the AM tower. And with a little searching, you'll find the 10-foot earth-station dish. But somewhere in the not-too-distant future, a major modification will have its impact on KAWC and the college.

Here in the far reaches of southwest Arizona you will find full-service AM education radio backed by the state-of-the-art NPR satellite service.

Morris Courtright, facilities editor, is president of his own consulting engineering firm, and is a member of the Arizona State Legislature, representing his Yuma district.



Installation of a new all-solid-state transmitter has led KAWC to investigate solar energy as a power source.

NPR satellite dish fits neatly into the campus of Arizona Western College.

What's more, they have just installed a solid-state transmitter and are working with the Arizona Solar Energy Office to build a photo-valtaic array to power it.

The solar array is a natural for this area, which has one of the highest solar-insolation ratings in the nation. The U.S. Army Yuma Proving Ground, a few miles north, has a fully operational solar system for heating and cooling the Range Operations Center and is working on a 100-kW generating system.

KAWC's station manager and director of broadcasting, Bob Hardy, is especially proud of the progress the station is making, and that certainly includes the solar project. When asked about the seriousness of their solar plans, Hardy leaves no room for doubt: "It's more than just an idle fancy with us. It's still very much on the burner. We are in the process now of putting together the exact materials that we'll need on paper and the dollars and cents to go after it."

It was a year ago that BROADCAST COMMUNICATIONS covered the WBNO solar story. But the anticipation at KAWC is for an even greater commitment than that at WBNO. "It is our intention," says Hardy, "that we go after a system big enough to power the entire station. All the lights, the equipment, the air conditioning, everything."

As solar continues to make inroads into other industries, we can look for more economical arrays and cells. And if photo voltaic cells benefit as much from R&D as so many other devices

have, we can expect to see perhaps smaller and even more efficient cells. But for now, solar-array space requirements could prohibit their use at many stations, but not at KAWC.

"We have two things in our favor," says Hardy. "One is that we have a lot of space. With the desert area, we're not hampered by real estate. Also, whatever amount of sun Ohio has, we have it in spades. If they can generate it in Ohio and the Midwest, we can do it."

KAWC's chief engineer, Dennis Gilliam, is still looking into the question of storage batteries. It could involve railroad batteries similar to those used at WBNO. But in any case, they will be lead-acid types.

Starting from scratch on a system of this size is no small undertaking, but Gilliam is backed by technically competent people already on staff in other departments of the college. For example, when the exact site for the solar array is selected, the surveying class will plot the site and figure the correct orientation. The welding shop will assist in building the solar panel mounts. And other engineering talent is just a campus phone call away.

While Gilliam agrees that future developments in cell and array design will make it much more attractive to broadcasters, he feels that the KAWC solar installation will allow practical translations for broadcasters. Translations, by the way, that you can expect to find KAWC sharing with BROADCAST COMMUNICATIONS readers.

Typical of many education broadcast stations, the road leading to this

KAWC master control. The Western Electric console actually has all-new solid-state plug-in module electronics.

new-technology equipment at KAWC was paved by a lot of hard work and a shortage of funds. Often the station remained on the air through the ingenuity and resourcefulness of Gilliam.

An example of this is the main studio console. Outwardly appearing to be a relic from the past, the Western Electric console in reality has an entirely new electronics package behind its old panel. Faced with the need for a new console, and lacking funds, Gilliam gutted the old console and rebuilt it from the chassis up with modern plug-in solid-state modules.

Gilliam's commitment to cutting costs at station has in no way affected his larger commitment to serving both the educational and working communities, which include a large Mexican-American population.

According to Gilliam, "The strong community support for KAWC proves that people appreciate 'different' radio." Extending this nationwide, Gilliam also points out that, "NPR and 'different' broadcasters did what commercial radio is still talking about. Our satellite network saves money in the long run. Line charges for the network were about to outstrip the costs of setting up the system, so we moved ahead."

Hardy notes, "Satellites are here. The FCC may have taken a hands-off attitude toward earth terminals, but local broadcasters better figure out how they are going to fit in when (conventional) networks are gone."

In the installation at KAWC, four channels are being utilized: two for stereo and two for mono feeds. A total of 12 channels have been reserved on Westar for NPR use, providing for future expansion and changing service needs. Gilliam says, "Noise is 80-90 dB down, a vast improvement." Switching from satellite feed to telco feed leaves no doubt about the improvement in audio quality as well. If we're going to take full advantage of the technological advancements in our industry, Gilliam says, "an objective point of view is needed by those in the business as opposed to the narrow legislative or engineering aspects."

"The FCC doesn't get it all together," Gilliam continued. "They are proposing 9 kHz spacing on one hand while proposing AM stereo on the other, and the two really aren't compatible." He allows that "9 kHz may win because of the demand for more channels. However, it will result in lower standards for receiver bandwidth and continued degradation of AM quality. An unnecessary degradation, because KAWC(AM)

Continued on page 72

Chief engineer Dennis Gilliam demonstrates operation of the NPR satellite link.

proofs out better than many FM stations."

Broadcasting has come a long way from the days of hardware tinkering. Knowledge of the current hardware is a basic, essential requirement, but much more is needed in our modern environment. Integration of modern technology, and its effect on the overall operation of the facility, must be considered with an objective, open mind if profitable decisions are to be reached.

The successful engineer must learn to translate his technical knowledge for management, sales, and programming. When he does, he becomes a partner in the management team, and is able to use his specialized knowledge for the betterment of the station. As the technology races forward, engineering must race to keep up. When both are in step, everyone wins. BC

Serving the community

Arizona Western College and KAWC are proud of their record of service and acceptance by the community. "We need to be sure we are serving the areas of agriculture, tourism, and the military, which are the mainstays of the local economy," says Bob Hardy, station manager and director of broadcasting.

Located at the juncture of Arizona, California, and Mexico, about halfway between Phoenix and San Diego, Yuma is probably best known as one of the hottest spots in the nation. It's the place to gas up on the way through, and the home of the old Yuma Territorial Prison (which has the reputation of being the "hellhole" of the Old West).

What may not be so well known is that Yuma is a major agricultural area, one of the breadbaskets of the nation. It is also the home of the Marine Corps Air Station Yuma, which is a major flight training base for the Marine Corps and Navy pilots, and the Yuma Proving Ground, which is one of the Army's best-instrumented weapons-system testing areas.

Finally, Yuma is located on a major route of tourist travel and is home to thousands of winter visitors from all over the U.S. and Canada.

videotape editing system

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Auto assembly from up to four sources is standard, as are paper tape edit list input/output, teletype edit list printout, and scrolled CRT edit list output. And if you wish, floppy disk is available.

It's all here, and at a price that's about half of what you'd pay for just one Type-C VTR with TBC.

And, just in case you're not ready to convert to Type-C, it will probably come as no surprise that Vanguard also interfaces to more than 35 other makes and models of decks, including quads, 3/4 inch cassettes, 1" Type-A/B, multi-track audio recorders, and the Rank Cintel scanner.

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Circle (58) on Action Card

BC STAFF

PRODUCTION SWITCHER REVIEW

In the early 1970s some very unique video production switchers were pushed into place on the exhibit floor of the NAB conventions. Surrounded by carpet and backdropped by velvet, these switchers could do marvels. Considering the technology of the day, they were ahead of their time. After all, the artistic effects they could create certainly were not considered new answers to old problems. But it was marvelous to watch, anyway.

In today's broadcast world we've come to depend on some of the capabilities of those earlier models. A somewhat more creative breed sits at the console today, bringing to life those far-out dreams of earlier R&D.

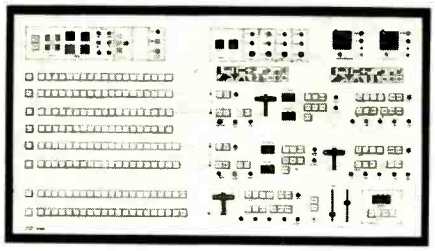
If we tie-in the digital-effects units that are compatible with some of these switchers, we'll see why there is a demand for more creative people in television. We hear everything from "Who needs it?" to "We wouldn't be without it!" Fortunately, there are enough design philosophies available to satisfy the variations of all production formats.

To give you a better idea of what's available today, *BC* has collected summaries of most of the best sellers on the market today. You'll probably find there's a production switcher somewhere in this collection that meets your needs, whatever they are.

If you want to change patterns by changing chips, you'll find it here. How about an effects memory? If you're ready to invest over $100,000 or if your limit is a few thousand, you'll find one here. In fact, if you want to step into a new frontier like voice recognition, we've included one that has been demonstrated with a recognition system. Even for chroma key and quad split you'll find a wide choice of models and price ranges.

But because of the number of manufacturers covered, it was not possible to include their entire lineups. We suggest that you circle the Action Numbers for the ones that are most interesting right on the Reader Action Card in this issue. The manufacturers will send their product information directly to you. And if you can't find exactly what you need, ask the manufacturer about customizing.

The order we'll follow is strictly alphabetical, so let's get started with American Data.



American Data
Model 3106

The **American Data** (Action Number **212**) model 3106 production switcher is designed for the most demanding studio or remote operations.

The 3106 was designed around a four-channel serial processor. This four-channel theory of operation allows the 3106, as well as the complete 3100 switcher series, to perform multiple functions on a single mix effects amplifier, functions requiring at least two mix effects amplifiers on many other production switchers.

Features of the 3106 are 20 clamped inputs, including black, color background, and quad split entry, along with eight buses: mix/effects/key 1 A&B; Preview/Key; A&B; Flip-Flop mix; two 4-channel video processors, each with 100 patterns, wipe generators, variable softness and borders, pattern presets, positioner, modulator, variable ratio spotlight, luminance keyer, color matte generator, key blink, and one flip-flop output mixer system. Black-burst and color-background generators also are included.

Options for the 3106 are a linear RGB chroma keyer; encoded chroma keyer; a 4 x 2 chroma signal switcher; a linear downstream mix/key system with master fade to black; key edge generators; one bus quad split; a quad pattern selector; utility buses; and a frame-accurate auto fader.

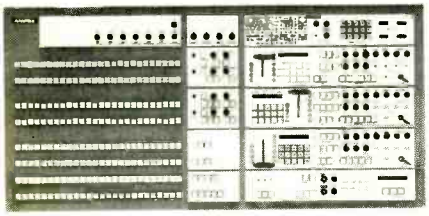
All American Data switchers are available in NTSC, PAL, and PAL-M versions. Prices start at less than $17,000.

Standard models of the **Ampex** 4000 Series (Action Number **201**) are made with four to eight buses and 12, 16, 20, or 24 inputs plus color black and color background. Up to seven auxiliary buses also may be prewired for future expansion. But let's take a look at the features that make this series a drawing card for Ampex exhibits.

With the 4000 Series, 65 patterns are standard, but an optional additional 35 patterns, including rotary and rotating patterns, are available. The individual size and aspect ratio of each quadrant is fully variable on the quad split panel. Also, three border choices are available with variable width, softness, and color control. A quadrant selector for quad split option doubles the number of video sources available to the quad split. And it allows any bus video from buses 1A, 1B, 2A, 2B and the preview bus to be placed in any of the quadrants. With this option, quadrant video sources can be preset.

Other major features include extended A/B format for logical signal

flow and straightforward operation. The 4000 keypad control offers control of several visual functions from a small space with speed and accuracy. Dual bus keyers can put any of 10 key sources upstream of the M/E amplifier. Auto-transition is standard on each M/E and downstream keyer. In addition, the Function Module, together with the keypad's operation, lets you fully control the M/E bank without having to reach away from the M/E itself.



Ampex
4000 Series

Options include a digital effects interface, bi-level linear RGB chroma keyer, processed external key input, an electronic editing interface, and a linear key border generator/composite chroma keyer.

Adding to our variety in this review, **Asaca** (Action Number **219**) has a portable video production switcher, the ASW-100. Capable of operating from both AC and DC, it's a truly portable switcher designed for remote productions.

The switcher will operate with up to three cameras. And there are 12 wipe patterns available; you select the ones you like from a collection of 30 patterns. There are three edge controls: Hard, Soft 1, and Soft 2. It has three wipe directions: Normal, Reverse, and Normal/Reverse.

Tally and intercom systems are provided, and the ASW-100 has camera remote-control capability, along with camera mix and fade, and automatic camera phase control. Camera iris and pedestal controls are optional. In addition, the unit's internal sync generator can be locked by external black burst.

The switcher also has VTR remote-control facilities. Preview monitoring is provided for each camera, and the camera cable can be equalized by the ASW-100 up to 1,000 feet. For superimposing, the character generator input system downstream can be mixed or keyed.

The unit is lightweight, with suitcase portability, so refer to our Action Number on this one if you're looking for more information on portable production units.

The **Beaveronics** BI-156 (Action Number **202**) production switching system is the largest and most complete in the family of three production systems available from Beaveronics. It has been designed to meet high professional requirements with what Beaveronics calls a balance between performance capability and reasonable cost ($21,795).

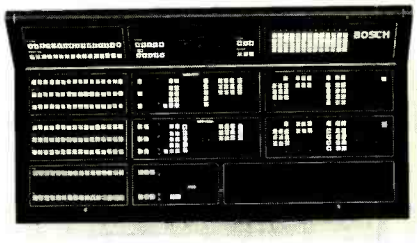
The BI-156 has 15 inputs and 6 output buses. It's based on a plug-in modular construction, with all active video circuits rack-mounted and with the control panel containing only control circuitry. BCD logic control simplifies cabling and possible customer interfacing.

In addition to direct Program and Preview buses, two identical mix/effects/key systems are included, each with 32 wipe patterns, positioner, and a matte color generator. ME1 re-enters ME2, and they both re-enter the Program and Preview buses. Non-synchronous detection is provided, allowing only cuts on non-synchronous sources.

As is true with the smaller Beaveronics BI-154 switcher, the 156 system gives the operator most of the frequently required optional features which may be added initially or added later. Removable blank panel plates and wired rack frames can accommodate most of the optional expansions when it's needed. The options include RGB chroma keyers, quad split, downstream keyer, DSK borderline, a mix/key amplifier on Program and Preview buses, and two additional buses controlled from remove panels.

The RBFE series from **Bosch** (Action Number **213**) consists of 1-, 2-, or 3-stage systems with or without a flip/flop mixer connected downstream. The switcher has 24 or 16 video inputs, three crossbar buses, and a color matte generator. The output signals of previous mixing stages and signals for chroma or video key are applied to each mixing stage. Each stage can perform crossfade or split lever mix and wipe with colored borders and continuous softness adjustment. Key insertions can be superimposed on background mixing or, in keyed video form, be mixed with the next event. A title key stage enables the insertion of characters over a keyed video signal.

This switcher has many signal processing possibilities: 60 wipe patterns including combined conventional and rotary wipes; the modification of the patterns by general aspect ratio with distort facility; H and V multipliers; positional blanking; preset positioner and internal or external sinewave; and triangular or rectangular modulation of the pattern



Bosch/Fernseh
RBFE Series

transitions.

Other features are external key; self-key; married or single chroma key with selectivity and remote shifting adjustment; and shadow and mask key, which demonstrate the versatility of the keying stage.

Titles with black, white, or colored one- or two-line borders or in the original color can be inserted automatically by fade, H wipe, or cut. Other signal processing possibilities are spot light (with continuous adjustment of intensity) and pattern (split) key. Each stage has an independent key and mask key preview combined with an automatic "next event" preview.

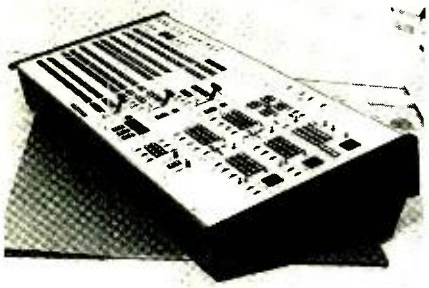
Additional crossbar outputs are provided for connecting to digital effects processors and for technical control. The entire switcher is synchronized by a black burst or unipulse (FASK) signal.

Options include a Control Function Memory system, single or double downstream keyer, encoded chroma keyer, and a centralized color matte generator with internal or external H-locked modulation.

The **Central Dynamics** (Action Number **214**) pictured in this review is the CD480 model 10, the latest in the extensive range of CD480 production switchers produced by the company. This model includes two sequential effects (SFX) amplifiers, a mix amplifier with a choice of A-B mix or preset/take operation, two key buses and two secondary selectors for feeding additional network lines, slow motion machines or digital effects.

Continued on page 76

FOR MORE INFORMATION
on the models listed in the Production Switcher Review, circle the number on the Action Card that corresponds with the number assigned to each model.



Central Dynamics
CD480 Model 10

The full range of standard CD480 options is available to enable customization of the switcher to meet specific requirements. And, as with all CD480 models, options may be field retrofitted.

In addition, CDL's Computer Assisted Production (CAP) is available for the model 10, enabling storage of all switcher set-ups and transitions. CAP can learn up to two minutes of continuous fader movement per event (to a total of 10 minutes of continuous movement within 32 events). Each event can handle several functions. For example, a single event can include a complete switcher set-up, up to three learns of auto-transition, and an effects dissolve. Long-term storage of CAP events is possible on a mini floppy disc. Full editing capability is provided for all CAP events, enabling quick and simple deviation of, say, the opening sequence of one show of a series from the previous program's disc.

The CD480 model 10 with CAP ($100,000 to $120,000 depending on options) is the top of the line. The smallest CD480 is the $25,000 model 4, equipped with a single SFX amplifier. It's particularly suited for mobile and small/medium production studio applications. In all, the CD480 family includes seven basic switchers, each available with 16, 24, or 32 inputs and a full range of options.

Over at **Crosspoint Latch Corporation** (Action Number **203**), the model 6124 is a best seller. It has 12 inputs (including colorizer/black) and two mix-effects generators, each of which has 12 patterns and an independent positioner. And, the downstream keyer can be previewed before it is aired.

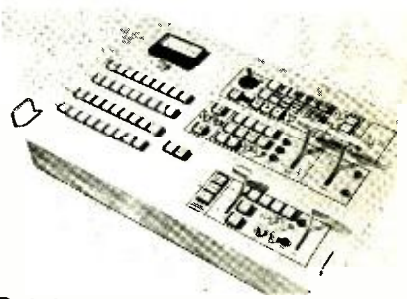
The switcher has an encoded chroma keyer with a unique (patent-pending) horizontal positioning control which completely eliminates timing of signals during initial installation. This control enables either a dedicated camera or the Preview output to be used for chroma keying. The arrangement of the buses permits cascading of ME systems on Program without tying up the Preview bus.

A direct plug-in accessory for the switcher is the model 7200 Auto Drive™ with its S-100 bus computer. Auto Drive can be programmed to control all functions (both analog and switch) up to a maximum of 255 events with a duration of 99 minutes per event.

Each event retains the entire status of all controls on the panel. A real time clock on the auto Drive panel can be set to trigger the start of the first event in any sequence at any time. This enables a complex station break to be accurately programmed and then started automatically at the correct time. Transitions, such as wipes and mixes, may be either smooth or abrupt. At press time, the 6124 was listed at $13,500.

The basic 2100E from **Datatron** (Action Number **204**) is available with eight video inputs, along with black, color background and matte. It will accommodate eight external key sources. There are two output buses, one linear M/E amplifier, and one audio mixer. Features include audio switching of eight audio inputs in either audio-follow-video or breakaway modes, with bus-to-bus linear mixing.

The prewired options include a downstream keyer with fade key and program fade to black; RGB or composite chroma key with integral delay line and DA; and a border/dropshadow generator. Other options include a genlocking color generator with variable luminance, remote controls and cables, and electronic nest wiring.



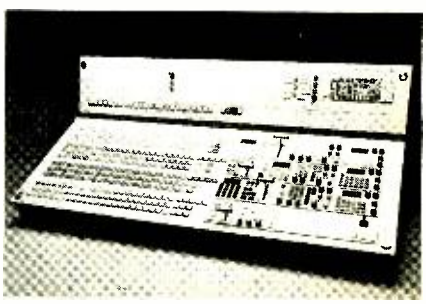
Datatron
2100E

The 2100E uses TTL computer compatible interfaces, and it will accept four additional key sources. It has additive and non-additive mix capability, and includes an audio monitor output for an external amplifier or speaker.

Features also include 87 effects plus spotlight with joystick control, preset limits, and wipe direction.

The **Grass Valley Group** (Action Number **218**) 300 series switcher has been developed to complement the 1600 series, to answer the utmost demands of production houses, broadcast facilities, and networks. It is the first production switcher designed specifically to accommodate digital video effects and fully integrated E-MEM™ effects memory control. What's more, the 300 series provides vastly increased video and title capabilities, improved interface flexibility, no-compromise video performance, and careful consideration to operator convenience in control.

Four input buses per Mix/Effects (M/E) handle most common effects sequences without re-entry. Transitions



Grass Valley Group
300 Series

from one background to another, the addition of a video key, a title key, or combinations can be accomplished with one lever movement on a single M/E. Title hierarchy is selectable over or under the video key for full flexibility. Four input buses also permit a quad split output from each M/E, making dissolves or wipes possible between quad splits from different M/Es. Automatic Preview displays the exact result of the next lever movement (including re-entries) in the Preview monitor.

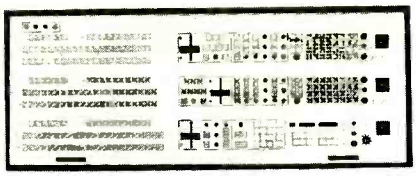
Lever and title auto transitions with independent rate programming are provided on each M/E. Titles can be added or deleted in combination with background or video key transitions, or independently from title mix or title cut buttons.

Other features in brief include preset black enabling any composite effect to go to black with one lever movement; new high-performance chroma keyers with Luminance Annihilator circuitry; new wipe patterns; fully integrated E-MEM effects memory on each M/E; unlimited re-entry of effects; and a Pgm/Pst mixer with DSK feeding Pgm output.

Options for the 300 series include RGB chroma keyers; encoded chroma keyers; Digital Borderline® generators; quad split systems; effects PGM Output options; Quad DAs; two aux switching buses; redundant power supplies; and Mark II digital effects.

Prices for the 300 system start at $110,000.

Two of the most popular production switchers at **Industrial Sciences Inc.**, (Action Number **208**) are the 200 and 1200 series. Available with both models is the Automated Production Effects



Industrial Sciences Inc.
200 Series

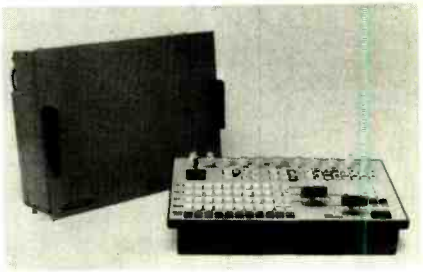
(APE) unit. Event storage and retrieval of virtually all of the switcher's functions is activated with the touch of a button, allowing the automation of complex production sequences. Sequences and panel set up can be stored on floppy discs for later use or to provide a consistent look to regular programming.

The 200 series features the PolyKey® concept. Graphics keying, chroma keying, and external keying (the mode used for digital effects), or all simultaneously are now possible on one PolyKey® effects unit. Other features of the 200 series include a black burst/colorizer, flip/flop mixer with auto transitions and cut bar, a downstream keyer/edger, quad split generator, an 8-position generator, and a 30-degree input phase adjustment. Model 200-1 has 8 buses, 200-2 has 12 buses, and 200-3 has 15 buses.

Most of the switchers in the 1200 series start with 20 clamped and equalized inputs, including a black burst/colorizer. Bus availability runs from 4 to 8, depending upon model. All also have a 32-pattern generator, BCD control, full tally, and ± 10 degrees of continuous phase adjustment on the input amplifiers. Options in this series include quad split, colorized border, RGB chroma keyer, a 6 x 4 random-switching chroma-key routing matrix, downstream key edger with outline and shadow, video inverter, a rotary wipe generator, and much more.

Standard features on the 1200 include mix, key, wipe, mix wipe, wipe key, plus ISI's special fadethrough black mode, electronic spotlight, dual or tandem keying with a primary key followed by a secondary downstream key with outline, shadow, or border and color. Mask key, key invert, matte key, pull to review, and a key preview functions are also standard.

3M's model 3300 studio production switcher (Action Number **217**) is a 5-bus, remote-controlled, 11-input broadcast-type color production switcher which features most of the functions found in larger and higher priced units.



3M Company
Model 3300

Eighteen patterns with vertical interval selection allows on-air pattern changes. Soft edges are available on all wipes. A linear (soft edge) amplifier operates downstream from the effects amplifier. This allows wipes behind a key and dissolving or cutting to a key.

An optional internal plug-in RGB

Continued on page 78

chroma keyer associated with the mixer permits dissolves and wipes behind a chroma key.

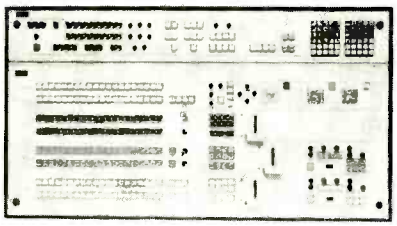
The low profile of the control panel does not interfere with leg room when mounted in the horizontal portion of control consoles. All controls have been grouped for operating convenience, with knobs mounted across the top of the unit. A hinged panel allows access to the panel wiring.

Smooth, direct-drive fader handles give you the feel for smooth fades, dissolves, and wipes. All switches are the momentary, illuminated type. And separate color inserts and color black inputs are available on all buses.

The 3300's color generator can be used as a color background to color key inserts, borders, and key edges. The border generator is standard and the key edger is available as an option. 3M has three other switchers, but this one is priced at a nifty $8,900.

NEC America (Action Number **215**) drew plenty of attention and comments at NAB when the company showed their series TAKS-1000 switcher interacting with their Connected Voice Recognition System. In that configuration, the switcher was programmed to respond to spoken word commands to "take" to each of the inputs in one of the M/E buses. In other industries, especially for military applications, speech recognition and speech synthesis developments will be running full speed ahead in the early '80s.

FOR MORE INFORMATION
on the models listed in the Production Switcher Review, circle the number on the Action Card that corresponds with the number assigned to each model.



NEC America
TAKS-1000

The TAKS-1000 series employs a low-power LSI for major functional circuits to assure high reliability and compactness. This switcher can be classified in the following models by the scale of the system. TAKS-1000A: 20 inputs, 1 mix/key bus, and PVW/Key and PGM buses. TAKS-1000B, 20 inputs, 2 mix/key buses, and PVW/Key and PGM buses. TAKS-1000C: 20 inputs, 3 mix/key buses, PVW/Key and PGM buses. The switcher is composed of LS (Large Scale) units, each incorporating respective buses.

There are eight output buses and three complete mix/keyer (mix/effects) systems (C standard) each with a modulated positioner, color matte generator, and a digital wipe pattern generator. The series also features a color-black and color-background generator, along with a camera talley system.

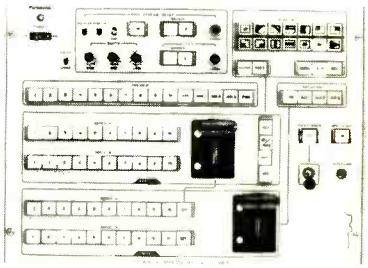
The basic LS units of the Mixer Card incorporates primary and re-entry crosspoints and a mixing and effects system, the Aux-1 SW Card which incorporates 27-inputs/4-outputs auxiliary switching matrices, and the BB/BC Gene Card which generates color black and color background signals.

Options include RGB chroma keyers with a shadow key system and chroma key switching matrices; encoded chroma keyer with chroma key switching matrices; a quad split generator with input switching crosspoints; borderline generators; digital rotary pattern generators; digital rotary pattern generators; a downstream keyer with insert fade and fade-to-black controls; and auxiliary switching buses with separate control panels.

One of the top switcher attractions at **Panasonic** (Action Number **210**) is the AS-6100 quality production switcher. This switcher has 10 video inputs and four input buses. And as you can see in the AS-6100 picture, it has two sets of fade/wipe levers, 14 wipe patterns, positioner, spotlight, colorizer, and two downstream key inputs. There are also two external inputs plus auxiliary inputs.

The AS-6100's four input buses with fade/wipe levers allow for downstream mixing of up to three cameras. This model accepts 10 composite or non-composite video inputs plus three auxiliary inputs for non-synchronous sources, such as VTRs. The 6100 also supplies intercom power and tally light switching for 10 cameras. When any of the 10 inputs is not in use, it automatically produces a black burst when selected.

Its 14 wipe patterns can be adjusted with both the positioner and the wipe levers, and they can be used with sharp



Panasonic
AS-6100

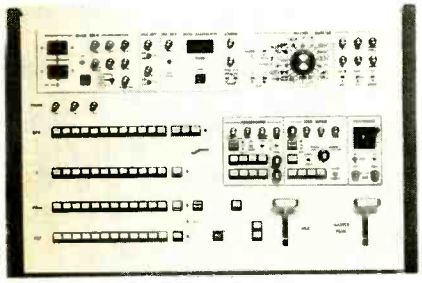
or soft edges. Wipes can be done in the normal, normal-reverse, or reverse wipe modes.

The spotlight feature is adjustable in size and position with the wipe levers and positioner, for highlighting a particular area. This is done by reducing the A-bus signal to one-half, giving a spotlight effect of a subject on the B-bus signal. When the AS-2000 chroma key generator is used with the 6100, chroma keying is possible through two external key inputs. A fully adjustable colorizer allows the addition of color to the background of the key signal. Of course the external key inputs can be wiped into a program with any one of 14 patterns.

The AS-1000 color sync generator produces broadcast-stable EIA RS-170 sync using a crystal oscillator. It also

genlocks to incoming non-synchronous composite video signals or composite sync. For studio adjustments it generates encoded EIA RS-189 and full-field color bars with adjustable phase. It also has a built-in subcarrier DA to provide four subcarrier outputs: one with fixed phase and three with independently adjustable phase.

The **Ross Video** (Action Number **216**) RVS-514 is a new switcher for use in any small studio, suite, or van. The operational convenience of the PGM/PST style of switcher takes on a new dimension with the added power of a fully integrated MLE system that is easy to operate. Complex multilevel effects are immediately accessible via wipe, dissolve, or cut transitions.



Ross Video
RVS-514

With the RVS-514 you can always see the next event on the preview monitor as you compose it. Complicated transitions, that include up to four sources, can be previewed and adjusted with the effects amplifier on-air. For example, the transition effect of a bordered wipe with color and softness, or a wipe limit, can be previewed exactly as it will occur.

The new Ross Analog Key Border Generator produces a smooth and quiet border without any tendency to jaggedness or breakup, even on small characters or slightly inclined horizontal edges.

Chroma crawl on bordered, colorized characters is greatly reduced, without the loss of apparent sharpness, by the unique Ross chrominance modulation system. Also, the quad split does not tie up any bus, virtually giving four extra buses.

The options for this switcher include RGB and encoded chroma keyer; rotary and spin wipes; quad split; analog key border generator; editor interface; digital effects interface; and auto transition.

The Ross lineup of switchers runs from $10,000 to $100,000.

At **Shintron** (Action Number **205**) the spotlight these days is on their model 375-375P. The Chromatic Special Effects Generator produces highly sophisticated special effects and is intended for use as a main switcher in any advanced teleproduction situation, studio, or mobile operation.

The 375-375P SuperSwitcher is designed with a new concept of video signal handling. In the past production switchers were designed with three major components: the cross-point group, the processing amps, and the downstream cross-point group. The video signal travelled through this complex maze of amps. Some switchers were full of delay lines to compensate for the delay caused by the amplifiers. As a result, the video signal deteriorated significantly through the switcher. Substantial efforts in circuit design were spent to compensate for the signal deterioration, making switchers generally expensive to manufacture.

Shintron's approach takes another route. After the cross-point group, selected signals are processed through one precision summing amplifier having multiple input capability. Each

Continued on page 80

input circuit is equipped with a digitally-controlled high-speed switch element.

The summing amplifier is an extremely precise short-electrical length design and has a near-zero differential phase and gain. All combinations of effects are processed through the identical path, and the resultant electrical delay through the switcher is also identical.

Shintron
MODEL 373-375P

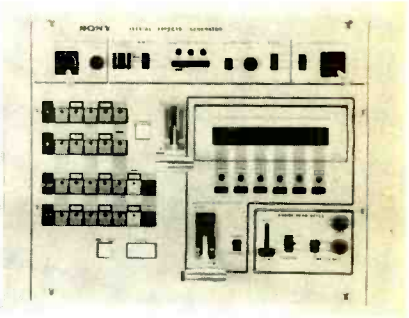
Video inputs number 12, with 10 undedicated, two dedicated. Video outputs show two each for program bus, preset/preview bus, and preview bus. This switcher will work with NTSC, PAL, and PAL-M.

One of the really unique wipe pattern arrangements is that concept designed into the **Sony** (Action Number 211) SEG-1210. Each pattern is programmed by a unique Sony "wipe chip" that slips easily into the wipe select compartment. Six patterns are available at any one time, or all can be used simultaneously. But these chips can be changed when a different pattern is needed. Of the 36 wipe chips supplied, 26 are coded and 10 are uncoded. These uncoded chips may be easily coded to any pattern you select from the 107 available patterns.

Wipe capability allows you to perform soft or hard wipes, create color border wipes, reverse the direction of your wipe, adjust its position, or modulate your wipe pattern automatically with a built-in frequency adjustment.

With the SEG-1210 you can also mix or switch automatically from preview bus to program bus instantly (cut) or dissolve, as well as mixing or switching manually with the mix level. A built-in downstream keyer allows you to insert letters or figures from a live monochrome camera, with adjustable shadow effects for greater legibility. A built-in color matte generator gives a color background for both wipe or key patterns, with luminance, hue, and chroma saturation independently adjustable.

With four color camera inputs, external key input, auxiliary input, plus three program outputs, the 1210 is flexible enough for studio applications. Also, a simple switch next to the wipe lever reverses the normal wipe direction. The wipe lever, along with the switch, can be used for successive wipes in the same direction.



Sony
SEG-1210

A, B, program, and preview bus, as well as Take and Soft Take buttons can be remotely controlled by a TTL control signal.

Viscount Industries (Action Number **206**) has expanded their switcher line and taken advantage of the small mobile and ENG video assignments with their portable model 1107. It

provides many features that can increase the production capability of any small mobile or ENG facility. For example, the 1107 can provide many effects during videotape editing.

Available in NTSC or PAL, this switcher has three inputs and three buses. Solid-state switching is accomplished in the vertical interval, while it also has H and V drive outputs.

The 1107 has full color delay compensation through all paths. Mix, wipe, mix of effects, key, matte, and wipe of key are standard controls, with mix and wipe on slide controls. And, there are 22 standard effects patterns. Numerous additional "non-standard" effects can be performed by combining square and diagonal patterns.

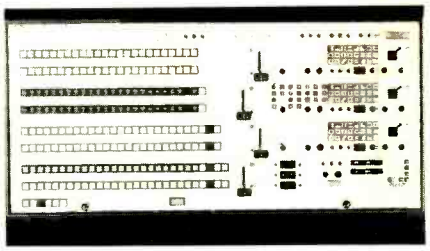
Viscount
Model 1107

Input-to-input crosstalk is better than −60 dB and 5 MHz. Video input and output return loss is 40 dB and 4 MHz, or better. It's a desk-top unit that makes ENG editing a lot less restricting.

Vital Industries' (Action Number **207**) best-selling production switcher is their largest, the VIX-114-4. It's a digitally controlled system designed for TV stations, production centers, and remote operations. And it's available in NTSC, PAL, and PAL-M.

The "dash four" is offered with 12, 16, 20, or 24 inputs, including built-in color black and color background. It has 10 output buses, three mix/effects systems, automatic transition on all M/Es and the program mixer, downstream keyer, quad split, flip flop program/preset mixer, downstream fade-to-black, and pulse processing.

The mix/effects units have two-level keying for simultaneous chroma keying with a luminance key, soft or border wipe with positioner and modulation, key bordering shadow or outline — all the conventional effects patterns and rotary wipes, plus spin wipe, and 62 wipe patterns (including heart, star, and binoculars). Preset pattern, along with a spotlight generator reverse key capability and Vital's Varikey are also standard. Varikey allows see-through keying and the creation of shadow chroma key.



Vital Industries
VIX-114-4

Options to the 114 include the PSAS Production Switcher Automation System, composite chroma keying, an Editor Access System with audio, and an auxiliary switching matrix with remote control panels. The Vital Squee-Zoom Digital Manipulation Unit is offered as a plug-in accessory to the 114 with no interfacing necessary. BC

H. EDWARD GORDON

KCOP makes TV audio a high priority

From time to time the subject of television audio comes to the surface, and when it does, little of the attendant dialog is positive. Despite the best intentions of TV station sound engineering, the end result is usually mediocre sound from an inappropriate speaker in a TV set that's probably fine tuned for video, not audio.

Win Korabell, KCOP's director of engineering, is fully aware of this, but there's an added dimension. Korabell points out that there is going to be signal degradation between the transmitter and the receiver. It's his opinion that more attention should be given to noise reduction, for example, a Dolby-type noise-reduction system built right into the TV receiver. Otherwise, even the advent of television stereo audio and more adequate receiver speaker systems wouldn't bring TV sound to its potential.

KCOP is an independent TV station with a 22½-hour broadcast day, and they also have a commercial production arm called Chris-Craft Video Tape Center. These operations have been growing in scope in the past few years, and that means KCOP has had to stay in step with the state-of-the-art.

Korabell felt that with the delivery of two audio tracks on the 1-inch VTRs and the necessity for using four-track recorders in the production of "Operation Prime Time" radio spots, it was time to get serious about stereo.

Engineering manager Ed Gordon, audio supervisor Herb Holmberg, and audio maintenance engineer Lou Schneider, sat down with ADM Technology and spelled out the specifications for their 3200 Limited Stereo Custom Console.

The console has 80 microphone inputs to 20 preamps and 96 high-level inputs, 8 to each of 12 input modules. All channels have full equalization through ADM's 4-band, 14-frequency reciprocal equalizers. There are two grouping buses, cue and solo channels. Four panable submasters feed the right, left, and mono masters.

The board also has noise reduction, limiting, and five monitor buses, one for each of four studios and one for the control room.

Live end of the control room, with Lou Schneider at the console and Rod Davis at the Mackenzie control.

H. Edward Gordon is the engineering manager for KCOP, a Chris Craft Station in Hollywood, California.

An additional necessity for KCOP was to have a second isolated output from each of the microphone channel preamps to feed a second audio console to be used for audience PA during the production of such shows as *The Jokers Wild*, *Joker, Joker, Joker* and *Play the Percentages* and national game shows done in the KCOP studios by Chris-Craft Video Tape Center.

Taking audio another serious step forward, a new studio audio control room was designed and built.

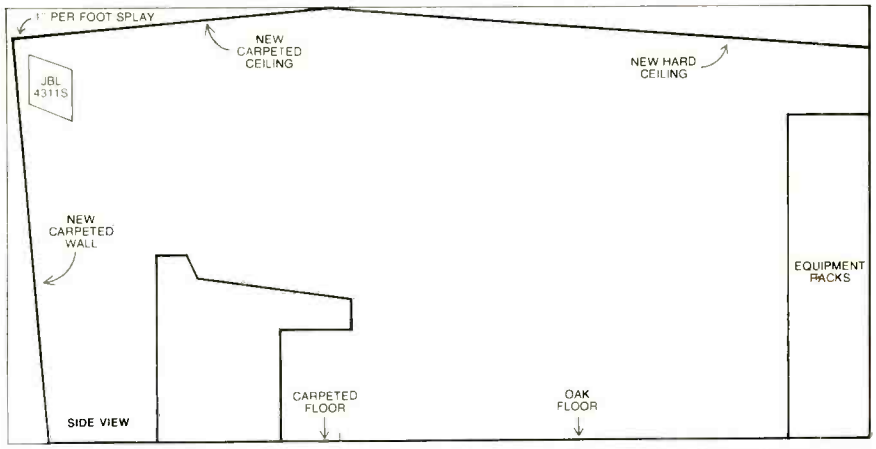
Rod Davis, audio maintenance engineer, designed the new room by adapting the principles of the live-end/dead-end theory to the greatest extent possible. Although unable to meet the complete criteria due to space limitations, the room is dead-carpeted on the end that faces the console and live behind the console, with pine paneled walls and an oak floor.

Since audio control rooms with parallel surfaces tend to exhibit low-frequency standing waves, it was necessary to splay the wall and ceiling one inch per foot.

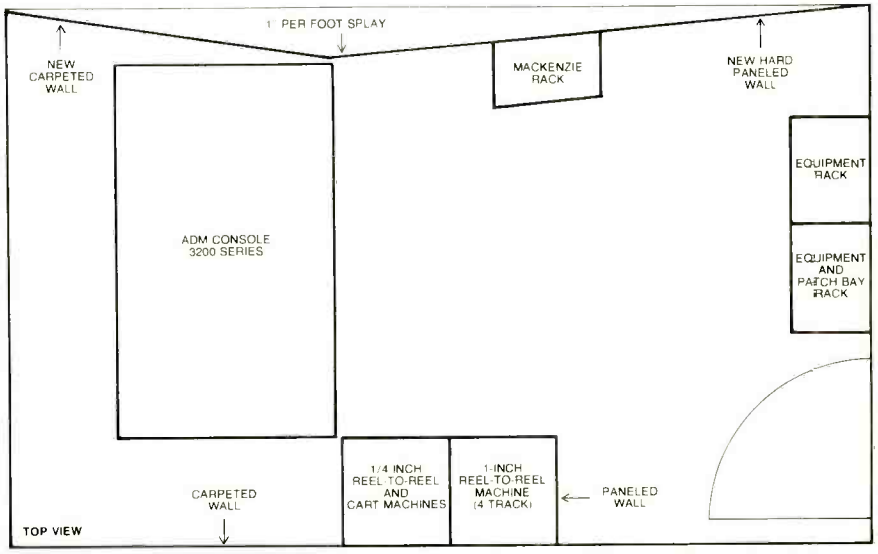
The front section of the control room was made absorbent, so there were no early order reflections to create broadband anomalies through the audio spectrum.

Often times, control rooms are engineered absorbent at the rear wall, but current state-of-the-art control-room design takes into consideration the Henry-Hass effect.

According to the Henry-Hass effect, if you place two signal sources (speakers) side by side and delay one signal source 20 milliseconds, the delayed source will seem to disappear.



The walls of the audio control room are splayed one inch per foot, so there are no two parallel surfaces in the room.



This top view shows the equipment layout. Note that even the side wall is splayed.

Dead end of room showing the ADM 3200 Limited Stereo Custom Console.

Using the Henry-Hass effect to advantage, we made the rear half of the control room hard, to reflect the sound back to the mixing position. The sound, having traveled the 20 milliseconds from the mixing position to the rear wall and back again to the mixing position, makes the rear wall seem to disappear, creating a pleasing listening environment.

The result is a control room that needs minimal equalization and is comparable to most Hollywood recording studio control rooms for ability to hear exactly what is going to the tape.

Additionally, 20 Mackenzie cart decks, for use in sweetening, and a control console, which folds out of sight when not in use, were added to enhance production capabilities.

With the FCC approving stereo TV transmission tests, for the near future,

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Rod Davis at Mackenzie machine controls.

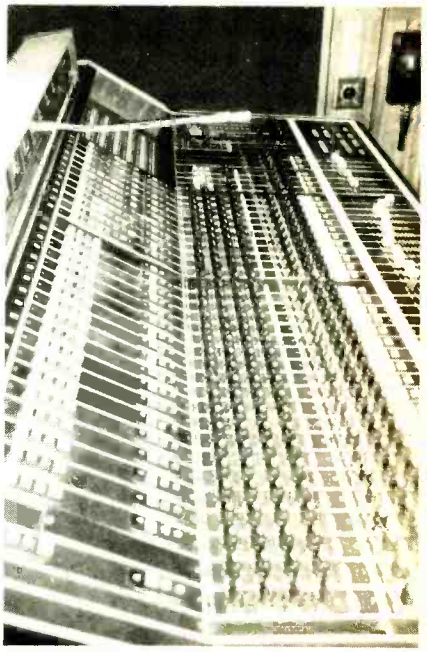
KCOP is ready.

Editor's Note: As Win Korabell puts it, one of the main reasons TV audio is still so far from its potential is that in its earlier stages of development, most of the R&D emphasis was pumped into video signal generation. And this is especially true when we look back on the introduction of videotape.

Meanwhile, of course, TV receiver manufacturers have not been disposed to make the changes necessary to improve their audio reproduction capabilities. When stereo becomes an on-line reality in television, it's not likely that the public will stand for stereo audio that gets lost in a poor speaker system.

While we wait, or start making preparations, the point is to remember that the audio signal is being reproduced on a small speaker. What can be done to the processing of the audio signal at the station that would give audio its best shot through a small speaker? Certainly radio stations go through it every day in drive time.

BROADCAST COMMUNICATIONS invites your comments and ideas. Drop a line to the editor by writing to 4121 W. 83rd St., Suite 132, Prairie Village, Kansas 66208. (Prairie Village? Yes, it's a suburb of Kansas City.) BC



ADM 3200 Limited Stereo Custom Console.

DENNIS MARTIN
and BRUCE PLASSE

FM'S LIMITING ELEMENT

An inside look at peak limiters PART 6

Manufacturer's specification sheets are not really designed to confuse or mislead you. While terms such as compression slope, attack and release time, and the like, may seem somewhat nebulous, these sheets do offer some very worthwhile information that can aid in proper selection for the station. It is, however, extremely difficult to compare limiters from the specifications alone. There is also a problem with standardization in measurement procedures, specification terms, and even in what information to publish.

If possible, before studying some of the more common terms and how they apply to limiters and their performance, we suggest you test your stereo generator for overshoot and ringing. Since units differ widely in design, it is not practical to give detailed instructions. Refer to our tests in Part 5, (BROADCAST COMMUNICATIONS, July 1980). You should be able to duplicate and apply our procedures to your unit. It will then be possible to tabulate your results against ours for a direct comparison.

The specified performance of your limiters can be checked by several very effective tests. The information we provide is general but usually applicable, and the test equipment required is far from elaborate. It will also provide some background as to how limiter manufacturers come up with their specifications.

Frequency Response in dB

Unit A	+0.5, −0.2
Unit B	0, −4.8
Unit C	+0.4, −7.4
Unit D	+1.0, −0.7

NOTES:
1) Frequency sweep of 50 Hz to 15 kHz with a 400 Hz reference
2) Input level adjusted 10 dB below threshold (10 dB below the point of meter indication)
3) Output terminated in 600 ohms resistive and adjusted for +10 dBm

Figure 14-1 Frequency response of four limiters 10 dB below threshold.

Be sure to consult the unit's manual for any special test procedures it may offer, and adjust our methods accordingly. Also, be sure your limiters are properly adjusted.

Unless the manual specifies otherwise, the basic test setup we suggest calls for both input and output controls to be set at their normal operating positions (left and right channel controls should be at about the same setting), terminating the output in 600 ohms resistive, and then feeding the input with a 600 ohm source.

FREQUENCY RESPONSE — This is perhaps one of the most common of all terms, stating the overall performance of the limiter across the specified frequency spectrum and usually below the threshold of limiting. As we have seen, units that incorporate preemphasis will tend to attenuate high frequencies more as the input signal level is increased.

One test procedure is to connect an audio generator to the input of the limiter, set the frequency to 15 kHz, and determine the limiting threshold. This is found by carefully watching the meter on the limiter and adjusting the generator's output level control until very slight meter movement is detected. Then, drop the generator's output 5 to 10 dB to make certain you are well below the threshold of limiting. Connect an AC VTVM to the output and run a frequency response check as you normally would.

For multiband limiters, use a sweep-type generator, with stable amplitude *vs.* frequency characteristics, if possible. Sweep slowly, and pay particular attention to limiter bands crossover points. If you get too much overlap at a crossover point, a "peak" will be noticed. Too little overlap will show up as a dip. In either case, you should find the unit will meet published specifi-

Continued on page 86

Dennis Martin is a consulting engineer and the chief for stations KGUD/KOLA, San Bernardino, California. Bruce Plasse is the operations manager at KOCM, Newport Beach, California, and GM of Balboa Productions Inc.

cations, typically ±1 dB. This test also insures accuracy between the predeemphasis networks.

We had four FM limiters that were available for test and inspection. The test results are included throughout this section. As for overall frequency response, refer to Figure 14-1 for our findings.

High frequency attenuation characteristics can be checked by feeding in a 15 kHz signal of sufficient amplitude to cause full-scale meter deflection, or deflection to some reference point as the manufacturer may specify. Note the input signal level. Switch to 400 Hz and adjust the input for identical meter deflection. Many units will exhibit a 17 dB difference between these two frequencies, indicating 75 μs operation. As you can see, driving your unit to the measurement point continuously will cause the listener to receive a relatively dull signal since the limiter is essentially nullifying the preemphasis in the transmitter.

DISTORTION — Most manufacturers publish total harmonic distortion (THD) and not intermodulation distortion (IMD) measurements. THD is often measured below the threshold of limiting, or with limiting control disabled, especially if the unit depends on diode clipping as the only limiting method. In this case, don't let "at rated output" mislead you. A unit does not necessarily have to be limiting in order to meet rated output specs.

Distortion tests are somewhat easier than frequency response. Connect a distortion analyzer to the output of the limiter, and using the generator connected to the input, determine the threshold of limiting once again. Then drop 5 to 10 dB below it. Harmonic distortion measurements at all frequencies should meet factory specs, usually 1% or better. If possible, test for IM distortion as well. Although most manufacturers are not providing specs, IMD will probably measure well below threshold, even 1% or under.

Now for the real test. Feed about 10 kHz and adjust the audio generator for a level 5 to 10 dB above the threshold. If your unit depends primarily on clipping for high frequency control, don't be surprised to find distortion figures of about 8% THD or higher if it uses a deemphasis circuit. Limiters not using deemphasis produce even more distortion. Remember, though, this is a *maximum* distortion measurement using a single tone of constant amplitude, which is not typical of program material.

If the unit uses diodes for protection only, you'll probably find THD measurements around 1% or under, which should meet factory specs. Figure 14-2 is a brief listing of the harmonic distortion characteristics of the units we measured.

As for IMD, try testing it at different compression levels. With this test, distortion around 10%, or even up to 32%, is not at all uncommon. The units we tested are tabulated in Figure 14-3. Some may be fairly linear; that is, the IM distortion increases as the input signal level increases. Others, though, may have a hump down near their threshold.

In the two units with which we experimented, one (Unit D) was in the "bias change" category, and the other (Unit A) used the light emitting diode (LED) and light dependant resistor (LDR) control approach.

We found that Unit D exhibited high IM distortion because the control bias, developed as the result of rectifying and filtering the audio signal, was not pure DC and contained sufficient ripple to modulate the gain control stage. When we added two 1.0 uF mylar capacitors — one on each of its two control lines — and were able to reduce IMD from about 32% to 21%. Due to the extended charge/discharge time characteristics of the large capacitors, however, unit performance was sluggish and no longer considered optimum. Tests of two other units provided similar data. We can therefore see that IMD in these units is primarily generated by the 60 Hz component of the standard IM test. Increasing this frequency reduces IM distortion because higher frequencies are easier to filter and are, in fact, converted into a pure DC control voltage that contains absolutely no ripple.

Unit A performed well as a result of its control design. The audio signal is rectified and filtered, like the other units, but then connected to an LED that is completely isolated from the audio path. The reaction time of the rectifier and filter circuit, and especially the slow response of the LDR, completely ignores any ripple that may be present on the control line. This practice apparently provides excellent results throughout the audio spectrum and at any level of compression.

Next month we'll continue our testing with details on noise, maximum compression, and attack and release time measurements. BC

Maximum Total Harmonic Distortion in Percent

	40 Hz	400 Hz	5 kHz	10 kHz	15 kHz
Unit A	0.60	0.34	0.18	0.18	0.18
Unit B	1.40	1.39	5.1	5.6	4.4
Unit C	0.99	1.65	7.1	7.4	7.0
Unit D	1.40	0.56	1.40	1.15	0.92

NOTES:
1) Input level adjusted to produce maximum compression (full-scale meter indication)
2) Output terminated in 600 ohms resistive and adjusted for +10 dBm, if attainable

Figure 14-2 Maximum harmonic distortion of four limiters at full-scale operation.

Intermodulation Distortion in Percent

	10 dB Below Threshold	Full Scale
Unit A	0.16	1.16
Unit B	0.63	8.2
Unit C	0.33	15.9
Unit D	0.98	32.0

NOTES:
1) Standard test frequencies of 60 Hz and 7 kHz at 4:1 used
2) Input level adjusted: a) 10 dB below threshold (10 dB below the point of meter indication) or, b) to produce maximum compression (full-scale meter indication)
3) Output terminated in 600 ohms resistive and adjusted for +10 dBm, if attainable

Figure 14-3 Intermodulation distortion characteristics of four limiters above and below threshold.

LPB introduces audio console

For more information on products highlighted in this section, use BC's *convenient Action Card.*

While this column has been a clearing house for new products introduced to the industry, we must admit that not all new products coming off the line make it onto these pages. Weekly we receive more new product information than we could print in any month's issue. So if there's a product category you'd like to see more of, drop the editor a line.

Meanwhile, the conventions have been a great place to introduce new products. Even at the recent NAB Radio Programming Conference in New Orleans, new products were showing up. And one that caught our eye was the Citation Series of audio consoles by LPB. Let's take it from there.

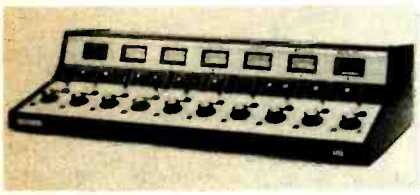
New audio console line (Circle **113**)

LPB — At the Radio Programming Conference in New Orleans, LPB took the wraps off a completely new console product line, the Citation Series.

This is a grouping of 6, 8, and 10 mixer dual stereo consoles that offer the versatility and performance of custom consoles. Each console offers features such as pre-fader pushbutton cue, LED status indicators, and the capacity for up to four meters and/or digital clocks. And a wide range of options are available.

These consoles have transformer balanced inputs and outputs, with three inputs per mixer. There are two 4-input auxiliary input selectors, along with continuous or momentary remote control contacts. An option here is that these contacts can control a digital timer reset/start.

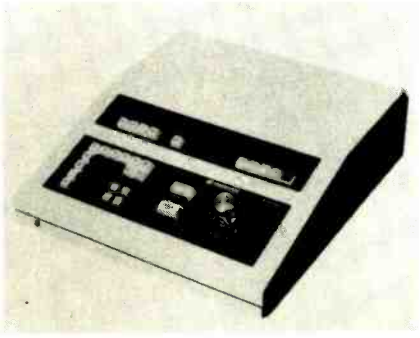
Another feature is the gain selectable microphone preamps. They are provided with center tap access for phantom condenser microphone power, processor input/output port with buffer amplifier for outboard compressors, limiters, etc. The three consoles in the series also have programmable muting logic. An internal pin-programmed matrix allows any selection of monitor and cue muting for the first five mixer positions.



Accessories and options include mono mixdown; high impedance (cassette) line input plug-ins; reference oscillator/line input plug-in; additional microphone input plug-ins, a digital clock, a digital timer, and linear faders.

Videotape editing system (Circle **111**)

CONVERGENCE — At the IBC Convention in Brighton, England, Convergence unveiled their new ECS-103C auto conforming editing system. Designed as a full-feature, on-line and off-line editor, the ECS-103C is a multi-source editing system that is particularly suited to broadcast production houses and high-end industrial users where critically accurate and intricate editing is required. Edit decision listing and automatic dialogue replacement are included as standard features.



Auto assembly and list management functions were demonstrated from both floppy disc and paper punch tape. Dissolves, keys, and wipes were also demonstrated using a Convergence SW1-100 Switcher Interface with a Grass Valley 1600 1L-1A production switcher. You'll see more on the ECS-103C in the near future, but you can get to the head of the line by using the Reader Action number on the card supplied in this issue.

Triple-standard VTR/monitor (Circle **101**)

CANTER-REDMAN TECHNOLOGIES — Canter-Redman Technologies Corporation of New York City has announced the availability of their exclusive triple-standard VTR and 26-inch color monitor.

The VTR and monitor are triple-standard machines which plays back and records in NTSC, PAL, and SECAM standards automatically. Canter-Redman sees it as an exciting development in the video industry, and they'll be happy to send details when you use the Action Number above.

Expandable automation (Circle **102**)

BROADCAST CONTROLS — The company, formerly known as Automated Broadcast Controls, has a budget approach to radio automation. For example, a station can start with their System One, and as time goes by, the System can be expanded all the way to System Four.

System One is ideal for the budget-minded station. It includes the 1600S sequential controller that's a solid-state automation programmer. This gives you 16 events and the capability of expanding to 32 events. It offers 9 repeatable audio sources with one special event. The internal clock can be programmed to repeat your station format in 15- and 30-minute segments or 1-hour segments, sound an alarm with the adjustable silence delay, and monitor upcoming programs. Two reel-to-reel machines and a kartel are included.

System Two virtually doubles the capability of System One. System Three is a three-bay system that takes you up to a 2,000-event program memory storage capability that is expandable to 8,000 events. Finally, System Four, with the 2800 APM Digital Automatic Program Control Center, includes a time-announce control system and an English Logging System. It's the big-station approach, and it is expandable to 8,000 events.

Random select controller (Circle **110**)

AUTOGRAM CORPORATION — The RS-512 random select controller is a microprocessor-based unit which allows the operator to program up to 16,384 steps on

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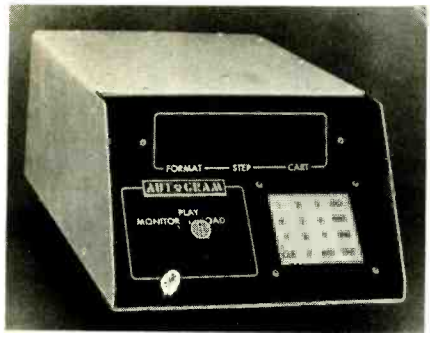
PRODUCT PREMIER



a 24-position carousel cartridge player. The operator keys in the sequence information by the controller's front panel into a battery backed-up memory.

The microprocessor uses the contents of the memory to determine which cartridge is ready for presentation. An external system controller supplies the start pulse to play the cartridge. After the cartridge is played, the microprocessor again looks the memory for the next cart to be played.

The RS-512 controller also has a keyboard, a display, and an interface to the carousel. There are four PC boards in the basic unit, and they're accessible from the rear. Capable of being interfaced with any random-select carousel, the unit has a monitor position to review programming. And you can add or delete any cart at any step in the program. A "wrap around" number may be programmed to reset to step 1.

Receiver/monitor (Circle 104)

VIDEOTEK — The company has just introduced their model RM-13B. It's a 13-inch receiver monitor that features a slot-mask in-line gun picture tube.

Other design features include TV-Line-VTR selection, DC restoration, E to E for video taping, and it's completely solid-state.

The RM-13B has complete AC chassis isolation, and has an 8-pin VTR connector. It is available immediately, and is going for just over $700.

Routing switcher (Circle 106)

IMAGE VIDEO — The 6010 self-contained switcher is a 10 x 1 design suitable for use throughout the plant. It offers video only, mono or stereo audio only, or AFV with mono or stereo audio all in just one rack unit.

One or both audio channels may be replaced with time code or control bus. Remote control is available through a shielded audio pair that can be factory installed or installed in the field. BC

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EYE-OPENERS

Just when everyone had their eyes wide open to the outstanding line of Ikegami broadcast and production color cameras, Ikegami introduced its color and B&W monitor line, engineered with the same innovative technology as its cameras. A great tradition of eye-opening continues with precision, quality and beautiful images.

The Ikegami color monitor line consists of the High Resolution Series RH Color Monitors and the High Performance Series 8 Color Monitors. The High Resolution Series RH Color Monitors are available in the 14" TM 14-2RHA and the 20" TM 20-8RH. Both provide precision color reproduction at 600 plus lines for professional studios, control rooms, remote vans, etc., and feature a high resolution CRT with High Density Dot Matrix, a switchable comb filter in the decoder, and the AFPC (Automatic Frequency Phase Control) system to maintain exceptional color reproduction. Both models are rack-mountable, with the TM 14-2RHA featuring plug-in circuit boards for easy maintenance.

The High Performance Series 8 Color Monitors are available in the 14" TM14-8RC, 20" TM20-8R and 25" TM25-8. The Series 8 monitors offer high quality color reproduction, a Shadow Mask Dot Matrix CRT, Pulse Cross Circuit, Active Convergence Circuit, low power consumption, and more.

The B&W Monitors are engineered to the same exacting Ikegami standards and are available in Triple 5", Dual 9", 5", 9", 12", 17" and 20" sizes.

Video Products built to Ideal Standards

Ikegami

Ikegami's Eye-Openers are available at most dealers. For details and additional information, contact: Ikegami Electronics (USA) Inc., 37 Brook Ave., Maywood, NJ 07607, (201) 368-9171; West Coast: 19164 Van Ness Ave., Torrance, CA 90501, (213) 328-2814; Southwest: 330 North Belt East, Suite 228, Houston, TX 77060, (713) 445-0100; Southeast: 522 So. Lee St., Americus, GA 31709, (912) 924-0061

Circle (66) on Action Card

100 Huntley Street

100 Huntley Street, known to millions of television viewers across North America, Europe and the Far East, is both the title of a daily program series and the location of a dynamic production centre operated by Crossroads Christian Communications Inc. Network and syndicated programs in ten different languages are produced and mixed here in newly expanded facilities that include this comprehensive custom Ward-Beck model 790637 television audio control console.

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