

May, 1977/75 cents

# Broadcast engineering®



## NAB Convention Coverage

*Video Roundup*

*AM-FM Review*

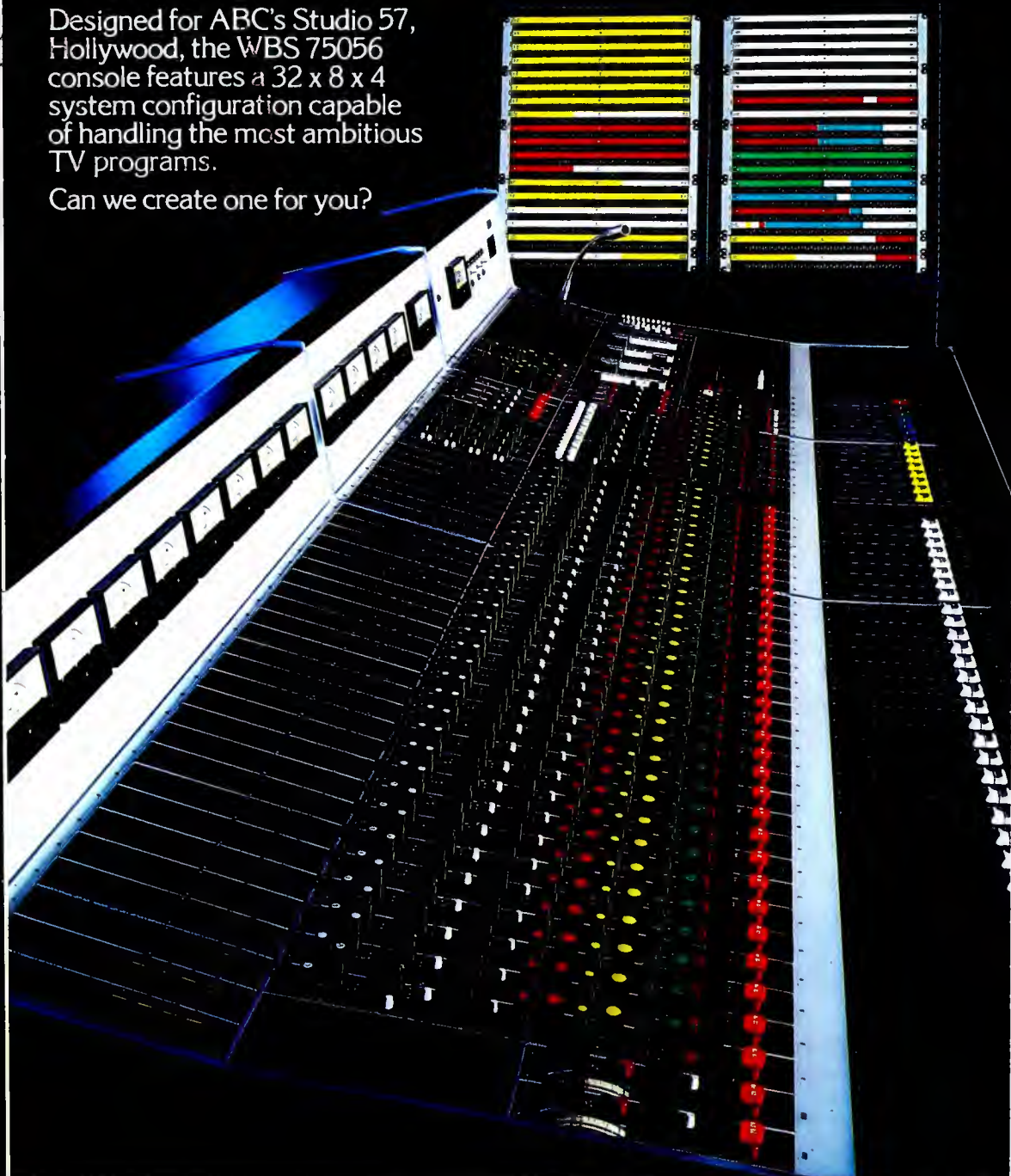
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## This is National Be Kind To Tape Operators Week

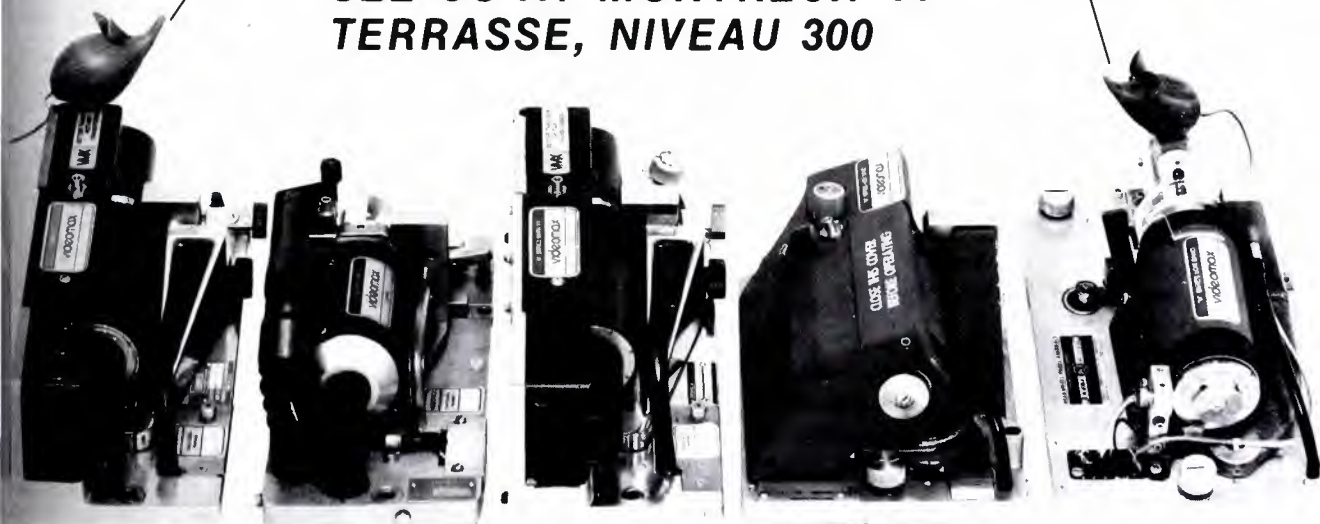
- Let him know at least 5 minutes in advance when overtime is required.
- Try to limit tape schedule changes to 20 seconds before air time.
- Tell him the cart machine is down at least 15 seconds before air time.
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## About The Cover

The NAB Convention was record-setting affair, but mime actors Mike Hoit and Rita Nachtmann show how attendees felt on the last day. (Photo by Donna Foster Roizen, courtesy of Warren Anderson of Philips, and mimes.)

## Departments

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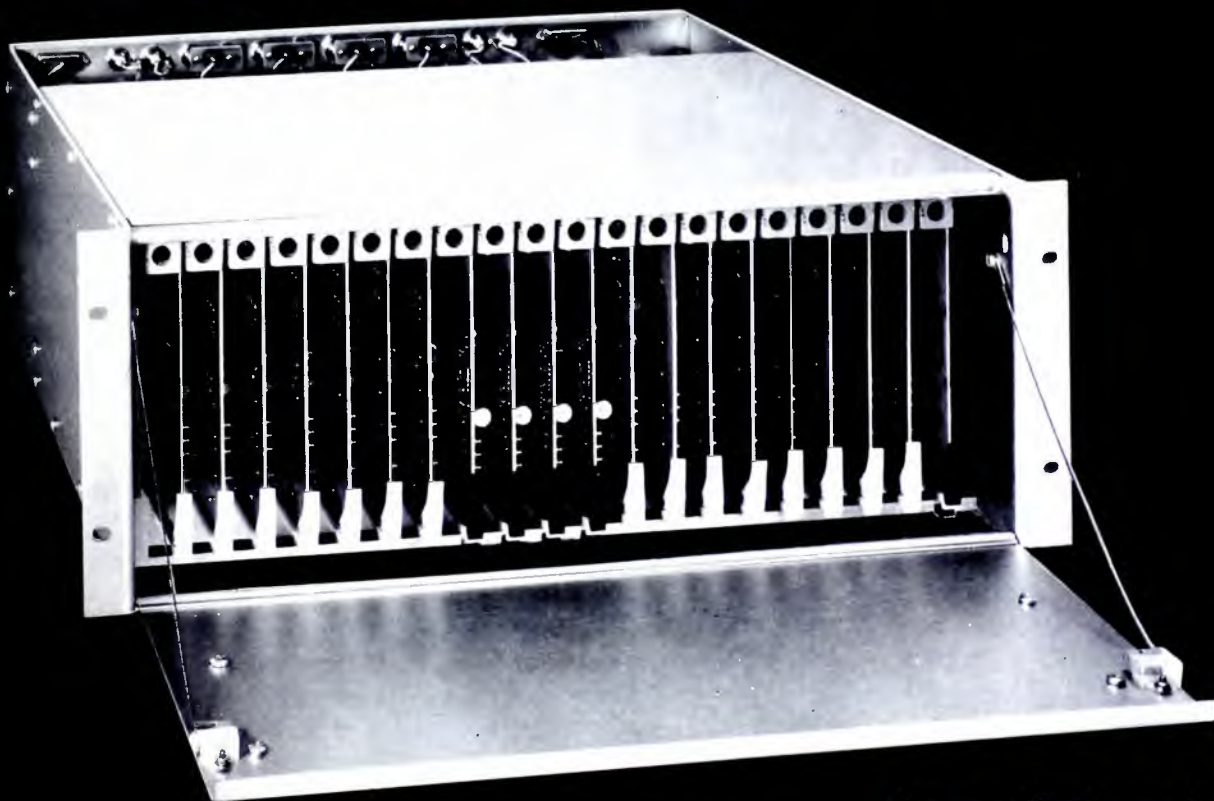
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# DIRECT CURRENT FROM D.C.



May, 1977/By Howard T. Head and Harold L. Kass

## VHF Television Drop-ins Proposed

The Commission has proposed to make four new VHF television channel assignments at substantially reduced mileage separations. This proposal is the latest step in a series of events dating back three years when the Office of Telecommunication Policy (OTP) proposed addition of approximately 65 new short-spaced VHF TV assignments in the nation's top 100 markets. (See April 1974 Broadcast Engineering.)

The markets and channels affected are Knoxville, Tenn. (ch. 8), Salt Lake City (ch. 13), Charleston-Huntington, W. Va. (ch. 11), and Altoona, Pa. (ch. 12, or alternatively, Johnstown, Pa., ch. 8). If these assignments are made, it will be the first time in the 20-year history of the television channel allocation plan that new VHF TV channels have been "dropped-in", except for one instance in the Virgin Islands, where interference to existing stations would occur entirely over water.

In making these proposals, the Commission concluded that the other assignments proposed by OTP were not feasible either from a technical or an economic point of view. The Commission stated its willingness to consider proposals in other markets, which Washington practitioners consider likely once the door is opened for the first drop-ins.

## OTP Urges Tough FCC Policy on Cable Leakage

In the wake of an incident last year in Harrisburg, Pa. in which RF radiation leakage from a faulty cable system interfered with communications between an aircraft and the ground station, OTP has urged the Commission to take stringent interim measures while the problem is studied further. A pending FCC proceeding deals with the subject.

Under the interim procedures, the Commission would control the specific frequencies used by cable systems in the band centered at 75 MHz, in the 108-136 MHz band, and above 225 MHz. Use of the 108-118 MHz band would be "discouraged". Each cable operator would be required to maintain an accurate and up-to-date list of all

*Continued on page 5*

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# DIRECT CURRENT FROM D. C.

(Continued from page 4)

carrier frequencies used on his system, and the list would be required to be supplied to the FCC and FCC field offices, as well as to the FAA and OTP.

Changes in cable carrier frequencies would be required where OTP criteria are not met, as would any future changes which might be required by FAA frequency changes, all at the expense of the cable system involved. The Commission is urged to continue the present leakage requirement of 20 uv/m at 10 feet, and to take steps to enforce compliance.

Finally, OTP expresses hope that cable carriage will ultimately be shifted to the UHF TV band above 470 MHz, in which event the problem would go away automatically.

## Circular Polarization Authorized for Television Transmission

The Commission has authorized the use of circular polarization for television transmissions for all channels. Right-hand rotation is specified as standard. The change in the rules was first sought by the American Broadcasting Company on the basis of testing on Channel 7 in Chicago. (See December 1974 "Direct Current".)

The use of circular rather than horizontal polarization is optional and its use is left to the discretion of the individual licensee. The same effective radiated power will be required in the vertical as well as the horizontal plane, thus requiring either a doubling of transmitter power output, an increase in transmitting antenna gain, or a combination of both.

Several broadcast organizations had urged the Commission to delay these changes until adequate testing had been undertaken in all television frequency bands. Several questions were not fully answered by the ABC tests on Channel 7 in Chicago, the amount of meaningful testing on the UHF channels was negligible, and no testing of any sort has been undertaken on the low VHF channels (ch. 2-6).

## Short Circuits

The Commission has turned down a request by a full-time AM licensee in New England for permission to carry commercial material while operating with daytime facilities in emergencies under Sec. 73.98(d)...A California man has been indicted for manufacturing and selling illegal 27 MHz band CB power amplifiers...NBC has proposed the use of a source identification signal (SID) on line 20 of the television vertical interval, to be repeated in two frames per second in odd fields only...An educational TV station (in Bethel, Alaska) has been authorized to carry network commercials as part of a satellite test program...The U.S. Court of Appeals for the District of Columbia has vacated the Commission's pay-cable TV rules, and has demanded strict standards governing off-the-record communications in such proceedings.



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## Broadcast Manufacturers Form International Association

Following a Royal Television Society lecture meeting, at which manufacturers of broadcasting equipment discussed broadcasting exhibitions and conventions, an organization to be known as the International Association of Broadcasting Manufacturers has been formed.

Over sixty companies, from several countries, have agreed to take part and the majority of these met during the 1976 International Broadcasting Convention in London, and elected a committee of representatives of the following companies: Ampex GB Ltd., Michael Cox Electronics Ltd., Crow of Reading Ltd., EMI, English Electric Valve Co. Ltd., Fernseh, Kodak, Marconi, Link Electronics Ltd., Neve Electronic Holdings Ltd., Philips, Rank Cintel, RCA, Tektronix Ltd., and Thomson-CSF.

Vic Gardiner, Chairman of Council of the Royal Television Society, has played a major part in the setting up of the new Association, having chaired all the meetings until the committee elected its own officers. The RTS Secretariat has

also provided invaluable administrative assistance to the embryonic Association.

The objective of the Association is to foster the interests of manufacturers of broadcasting equipment from all countries. The prime area of interest will initially be broadcasting conventions and exhibitions.

The committee has elected Tom McGann, Philips/Pye TVT Ltd., as Chairman and David Bryant, Michael Cox Electronics Ltd., as Hon. Secretary.

The original invitation to participate was made to companies who had, in the past, taken part in major European broadcasting conventions as these were easily traced but any companies active in the field of broadcast equipment manufacturing are welcome to join the Association.

Enquiries should be addressed to the Hon. Secretary, International Association of Broadcast Manufacturers, Tavistock House East, Tavistock Square, London WC1W 9HR.

## Three Video Seminars Announced

Following the "10th Motion Picture Seminar of the Northwest" in Seattle, Washington, Cinema Products Corporation will conduct a regional CP-16 Maintenance Seminar from 9 AM to 3 PM on May 22 at the Seattle Center House, Room 204.

Experienced quality control and maintenance technicians from the Cinema Products plant in Los Angeles will be on hand to lead special sessions on the operation and maintenance of CP-16 and CP-16R cameras, with special emphasis on effective troubleshooting and preventive care under field

conditions.

One of the highlights of the CP-16 Seminar will be a special demonstration of STEADICAM, Cinema Products' new film/video camera stabilizing system currently revolutionizing production methods all over the world. Documentarists, filmmakers, TV-news cameramen and all members of Local 600 (IATSE) are invited to attend.

For further details contact Gary Gross at Cinema Products Corp., 2037 Granville Avenue, Los Angeles, CA 90025, Tel: (213) 478-0711.

Imero Fiorentino Associates has

*Continued on page*

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Like an annealed aluminum die-cast chassis. For better stability of alignment, greater strength and long-term durability. Like individually removable cabinet panels on the outside. And low-density circuit boards on the inside. There's also a new jam-proof gear tape loading system. Less jitter. A high S/N ratio of 45 dB. And more.

For those who want a meaningful alternative in standard VCR performance, Panasonic offers the NV-9100 player. And the NV-9300 player/recorder

with VHF and UHF tuners. Both decks include high resolution: 330 lines mono and 240 lines color. A VTR/TV antenna switch. An optional RF modulator. And just about everything else you need for the kind of picture you want.

There are also two high-performance, direct-drive decks. The NV-9200 player/recorder and the NV-9500 editing recorder. The NV-9200 gives you outstanding performance at a very affordable price. Because it gives you a direct-drive video head cylinder. Patented HPF video heads. Chroma level adjustments. As well as the capstan servo system.

The results: Highly stable color and black and white pictures with less jitter. High resolution: 330 lines mono and 250 lines color. And dubs that look more like masters than copies. But whether you use it as a high-quality master recorder, a CCTV studio deck or a dubbing deck, the NV-9200 will give you the performance you expect at a price you don't.



# ould be your next 3/4" VCR.

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With the NV-9500 editing recorder, you also get frame-by-frame insert and assembly edits that are crisp and clear. Without tear, roll or loss of chroma information. And with its two independently selectable audio channels, you can also edit audio without affecting video.

But perhaps the best part about the NV-9200 and the NV-9500 is what goes between them—the NV-A950 editing controller. With its five-minute memory for entry and exit points of video and audio inserts, the NV-A950 will let you perform insert and assembly edits automatically. What's more, at a complete system price of under \$10,000 you can also achieve considerable savings over comparable editing systems.

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For More Details Circle (11) on Reply Card

announced that its sixth Television Lighting & Staging Seminar/Workshop will be held June 13 through 15 at The New Jersey Public Television Studios, near Princeton. Instructors will include Imcro Fiorentino, William Klages and Carlton Winckler, as well as lighting directors from the IFA stations. This seminar is designed for those engaged in both broadcast and non-broadcast television production operations.

Further information can be obtained from the Education Division, Imcro Fiorentino Associates, 89 West 66th St., New York 10023, (212) 787-3050.

Sony Corporation of America has announced a new schedule of National Video Production Workshops, conducted by its video utilization department.

Glasser said seven workshops are scheduled for video users in business, industry, education, government and medicine.

"Anyone who wants to learn basic video production techniques, how to approach instructional training programs, and gain practical information on non-commercial video approaches should be enrolled in the workshops," Glasser said. "The information can be applied immediately to specific applications."

Video users may enroll in the workshops, or arrange for a customized program for their organization, it was said. Additional information on the availability and costs of the services can be obtained from Glasser at Sony, 70 West Artesia Boulevard, Compton, California 90220.

Workshop dates and locations with the names of sponsoring dealers:

**May 9:** Hoffman Electronics, 800 West Pico Blvd., Los Angeles, CA 90015. Contact Ms. Helen Casabianca (213) 749-3311.

**May 23:** Videomed, 4878 Ronsdale Court, Suite A, San Diego, CA 92111. Contact Mr. Bob Benoit (714) 560-4454.

Additional workshops for the summer and fall of this year are now being scheduled.

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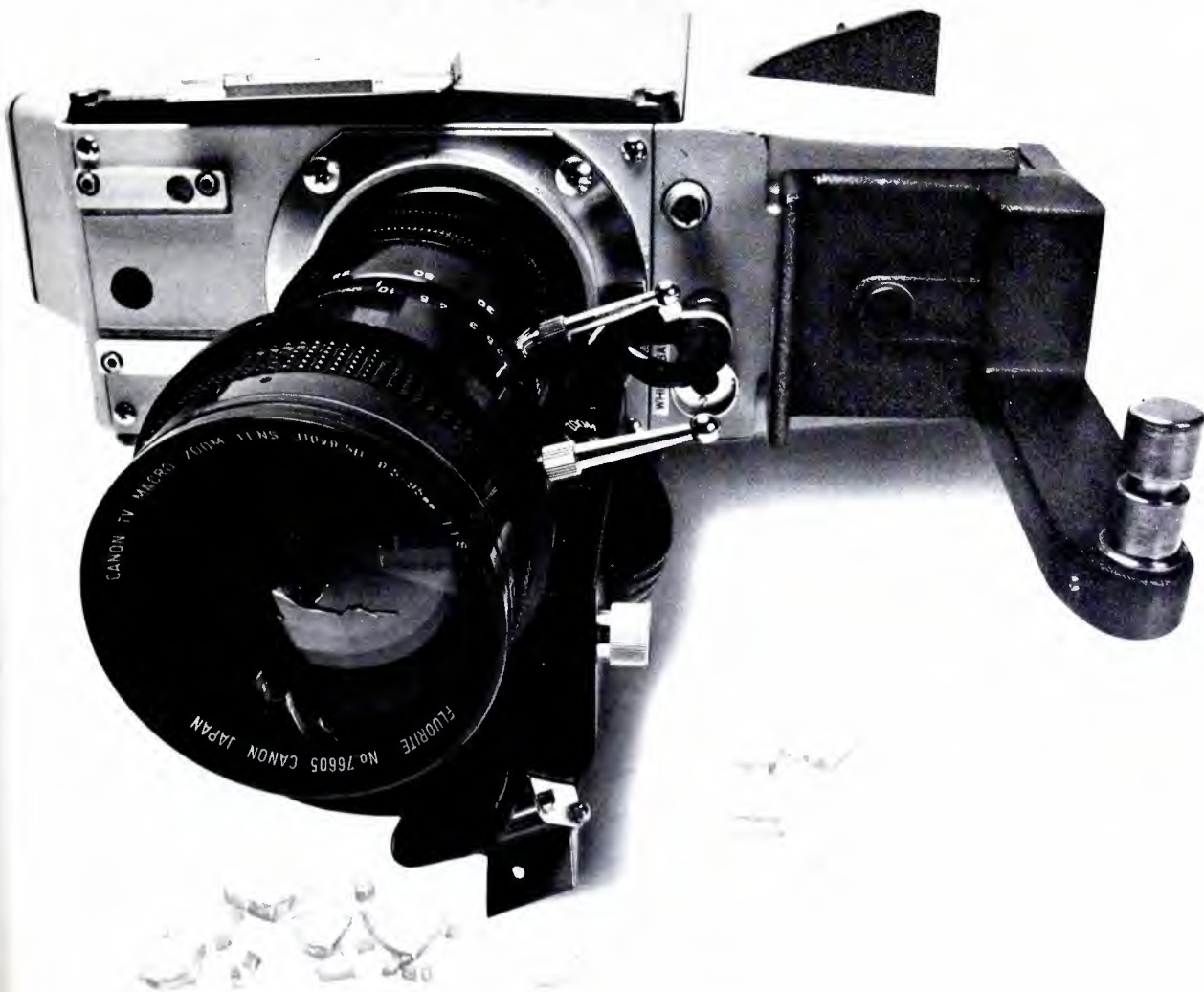
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For More Details Circle (12) on Reply Card

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| with Angenieux 12-120mm AV30 DA Zoom Lens (Automatic Iris Control) | \$6400                                                         | \$3040                  | \$7250                                                           | \$3455                  |
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| with Angenieux 9.5-57mm AV30 Zoom Lens                             | \$6500                                                         | \$1825                  | \$7350                                                           | \$2075                  |

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## NAB Asks FCC to Cut Red Tape

The National Association of Broadcasters has urged the Federal Communications Commission to amend several required forms in order to eliminate unnecessary paperwork by broadcasters.

In a letter to FCC Chairman Richard E. Wiley, NAB President Vincent T. Wasilewski cited President Carter's directive to reduce the amount of reporting the federal government places on the American public.

Specifically, Wasilewski asked the Commission to amend forms 301 (construction permits), 314 (assignment of license), and 315 (transfer of control). He said unnecessary questions could be eliminated in a manner similar to the new one page form for radio license renewal applications.

The NAB president recommended that the need for filing form 301 be eliminated "whenever a corporate licensee merely proposes to change its name or to relocate its studio outside the city limits." He said a letter should suffice.

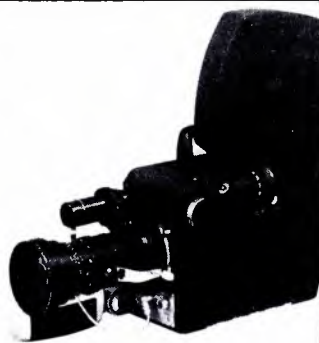
## Test Catalogs Are Available

The 1977 catalog of test materials for television and motion pictures has been published by the Society of Motion Picture and Television Engineers (SMPTE). The catalog is available free from SMPTE, 862 Scarsdale Ave., Scarsdale, N.Y. 10583.

The new catalog features a full line of test materials for the television and motion picture industries. Items listed include a large group of monochrome television test patterns for setting up and checking TV cameras and telecine systems, super 8 sound test films in both 18 frames per second and 24 frames per second, films and slides to test out film projector performance, and films for checking out movie sound reproducing equipment.



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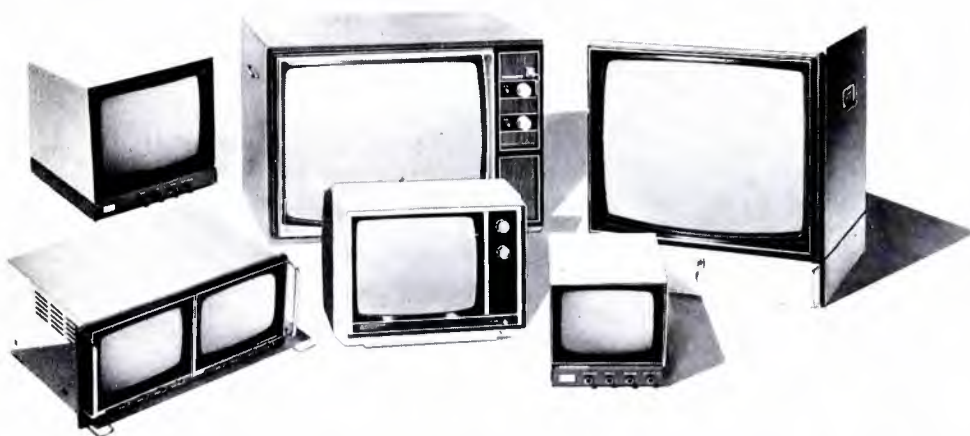
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## Industry News

### SMPTE Schedules Fall Conference

The 119th Technical Conference and Equipment Exhibit of the Society of Motion Picture and Television Engineers (SMPTE) will be held October 16-21, 1977 at the Century Plaza Hotel in Los Angeles. It was announced by SMPTE Conference Vice President Harry Teitelbaum, Hollywood Film Co.

The Conference will feature five days of technical sessions on motion pictures and television beginning on Monday, October 17. Also beginning on Monday will be one of the major attractions of the meeting—the SMPTE Equipment Exhibit. The exhibit, which is one of the year's most important shows of professional filmmaking and television equipment, is expected to have more than 175 booths of equipment with most of the major manufacturers of film and video equipment participating.

According to Teitelbaum, Warner Strang, Hollywood Film Co., has been named Local Arrangements Chairman. Strang, who in many previous Los Angeles SMPTE Conferences was Exhibit Chairman, will be in charge of all the non-program arrangements of this meeting.

SMPTE Editorial Vice President K. Blair Benson, Teletronics International Inc., has appointed Robert Buckley, Technicolor, Inc. as Program Chairman. Buckley will be assisted in his programming activities by Program Co-Chairman Charles E. Anderson, Ampex Corp., who will work on television subjects and John Lakotas, Eastman Kodak Co., who will work on motion picture subjects.

A total attendance of 5,000 film and television professionals is expected at this Los Angeles Conference. For additional information write to SMPTE Conference, 82 Scarsdale Ave., Scarsdale, N.Y. 10583.

**For Latest News  
See  
Direct Current page 4**



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Both models have a unique frequency offset capability that gives you a total of 21 microwave channels. Three times the frequency agility of older models.

If you want, we also offer the 2CP and 2EP in 1-channel and 7-channel versions.

In addition, the MA-2EP provides sophisticated diagnostics, switch-selectable tuning and the opportunity of mounting the

RF head up to 30 feet away.

Both the MA-2CP and MA-2EP are engineered with people in mind. And each system is compatible with all our Portable Line accessories.

So if you need two great little portables for ENG remotes, write or call for the complete details.

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They're guaranteed to give your news gathering a nice, light touch. Microwave Associates, Communications Equipment Group, Burlington, MA 01803. 617-272-3100.



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# The BVH-1000.

## Consider the advantages.

Last year, Sony Broadcast introduced the prototype of a new 1" high band video recorder. The BVH-1000.

The BVH-1000 produced picture quality difficult to believe. In fact, broadcasters didn't believe it. They had to see it for themselves. And they snapped up every prototype we could deliver.

Since then, we've made some changes. Added more features. Expanded the BVH concept to include a portable model, the BVH-500, for professional 1" production in the field.

And we've sold a lot of machines.

If you're considering the move to 1", consider the advantages of the BVH-1000.

**1. The Advantage of Shared Sector Scanning.** The Sony Broadcast BVH-1000 and BVH-500 both use an exclusive system of scanning that records video and sync (lines 1-17) with separate heads. Which means the entire vertical interval is captured and available for encoding any signal required in the future by the FCC.

Color banding is eliminated. And generation after generation, the BVH-1000 picture retains incredible clarity and precision.

**2. The Advantage of BIDIEX.** Film editing techniques, with a professional video recorder?

That's what you get with the BVH-1000. Not one, but two control modes are provided to give editors a true "film" feeling. In shuttle mode, the tape can be moved in either direction, from stop to 30 times normal speed. With a recognizable picture, so you can make fast editing decisions.

In jog mode, the BVH-1000 lets you move the tape as though you were positioning the reels by hand—while you monitor a fully locked picture.

**3. The Advantage of Interchangeability.** 1 dB down is the specification. Need we say more?

Sony's interchange is guaranteed by a gimmick-free devotion to precision mechanics and supported by the experience of building several hundred thousand video recorders.

**4. The Advantage of Color Framing.** Some high end production recorders don't offer color framing. Others make it available as an expensive option.

But both the BVH-1000 and BVH-500 provide color framing capability as standard equipment. Add that to a logic system ideally suited for computer assisted editing, and the Sony BVH-1000 is your best bet to produce that "word from our sponsor."

**5. The Advantage of High Fidelity Audio.** Not one, not two, but three isolated audio tracks with frequency response from 50 Hz to 15 kHz. With over 50 dB isolation between tracks.

Never before has any production recorder offered the level of audio quality found in these two new Sony Broadcast machines.

And a special wide band amplifier is automatically switched onto the cue track in search mode, to accommodate SMPTE code playback in high speed.

But it is impossible to describe all the advantages of the Sony BVH-1000 and BVH-500 high band recorders. You must see them to believe them.

Contact Sony Broadcast today, and ask for a demonstration. You'll see why networks and production companies alike are buying this remarkable new recorder.

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[www.americanradiohistory.com](http://www.americanradiohistory.com)

## Was It Elevator '77?

# NAB Outgrows Washington

By Ron Merrell and Peter Burk

The Washington, D.C. NAB scene was hard to play this year. It has never been easy to get from the Sheraton Park to the Shoreham and back again. This year it was complicated by the necessity of adding a third hotel, the Washington Hilton. A few exhibitors were as far away as the Mayflower Hotel. And even then, there was not enough room for all the exhibitors. So with the sessions and equipment exhibits strung out, it was difficult to manage the time to see all the exhibits and attend more than a few of the sessions. Las Vegas will be a pleasant relief.

Aside from the physical problems, it was a good convention. Exhibitors were showing the results of the digital invasion and the inroads being made by the mini computer technology. Even fiber optics got its foot in the door. Western Union Telegraph was showing its "big ear" capability with live demonstrations of satellite capabilities, and in general, the NAB attendee this year had to come away feeling that the snowballing technology is not slowing down.

As usual, the NAB's effort was to take a strong stand on broadcast problems, not the least of which is broadcast freedom—what there is of it. Of course the Washington, D.C. location did offer a more direct shot at the Hill.

### Wasilewski Calls For Action

The president of the National Association of Broadcasters warned that unless broadcasting, the most important news and information medium, gains its full First Amendment rights, all media will suffer "and the public will be the inevitable loser."

In a report on the state of the television industry at NAB's 55th annual convention, Vincent T. Wasilewski said broadcasting must recognize that it must end—and end soon—its "second class citizenship under the First Amendment."

"Let me flatly and unequivocally lay down broadcasting's claim to full and unqualified rights, both stated and implied, under the First Amendment," he said. "Let me state just as plainly that we do not have them now, and that we must gain them soon."

"My invitation and my challenge to each of you is to devote your time, your energy and the utmost of your resources to the job of getting them and, once gotten, of keeping them for all time."

The NAB president, addressing the opening television assembly, described broadcasting as "the most important of the news and information media." He noted that Roper surveys have found consistently over the years "that the American people increasingly rely on radio and television for most of their news and, furthermore, find them the most trustworthy of all media."

Wasilewski said the First Amendment's unequivocal guarantee against any restrictions on the press is one of four "basic foundation stones" upon which the American system of broadcasting rests.

Also basic to broadcasting, he said, is "the stability that is so vital to the continuity of excellence... recognition of and adaption to new technologies, and, perhaps above all else, the hallmark of American broadcasting, the principle of localism."

The NAB president said that any rewrite of the Communications Act now pending in Congress must:

- Assure "stability of broadcast operations and a continuing and viable base of economic support that makes free television possible"
- "Guarantee First Amendment freedoms for the electronic medium"
- "Carefully and deliberately evaluate new technology, making sure that the universally free system of broadcasting is enhanced, not diminished."
- "Preserve and nurture" the concept of local broadcasting.

Noting that broadcasters "are being challenged more frequently and more insistently and more stridently than ever about sex and violence," Wasilewski said they must permit in a program of "effective self-regulation."

"It is the only possible answer to those who call for government regulation of advertising and program content."

### FCC's Fogarty And White Discuss Major Issues

The two newest FCC Commissioners—Joseph R. Fogarty and Margita White—told broadcast educators that the quality of programming and First Amendment rights are among the most important issues facing broadcasting and the FCC.

They appeared with Roy Elders, NAB vice president for government relations, during a panel discussion entitled "New Faces, Etc."

Richard Block, a Los Angeles consultant and member of the NAB convention committee, moderated the panel.

Commissioners Fogarty and White mentioned programming, sex and violence, cable regulation, community ascertainment needs, censorship and current moves to rewrite the Communications Act.

We've seen the last of Washington, D.C. Well, at least through 1984. The growing exhibitor numbers are making demands that fewer cities can meet. The Chicago fiasco was at least at a central location. Now you can scratch off the D.C. area until something can be done about a convention center or larger, more understanding hotel operators. NAB '78 will take us to Las Vegas and the odds are good it will be a pleasant relief. From there, the schedule for NAB conventions looks like this:

**1979—Dallas, March 25-28**  
**1980—New Orleans, March 30 to April 2**  
**1981—Las Vegas, March 12-15**  
**1982—Dallas, April 4-7**  
**1983—Las Vegas, April 10-13**  
**1984—Atlanta (tentative)**

The 1978 convention will run from the 9th of April through the 12th.

major issues requiring continuing attention.

"It is clear to me," Fogarty said, "that, based on recent decisions, the courts are telling the Commission to tread carefully where the First Amendment is concerned and whenever business interests are also concerned."

He went on to say that intelligent, humanistic programming is also of prime importance.

"The creative community is as concerned as anyone else," he said, "but it does not want to be pressured into any pre-determined programming areas or have any programming restrictions imposed."

Fogarty also said the FCC needs more authority from Congress in regard to cable and pay television. The agency, he said, "cannot function properly as regulators of cable unless we can impose a fine."

Commissioner White noted that 80 percent of the questions she has been asked at FCC public hearings around the country concern program content.

She said the Commission should not be concerned with programming, per se; that it is "the broadcaster's responsibility." How broadcasters respond, she said, "will determine how well they fare against the new technologies such as cable, pay TV and Home Box Office type entertainment."

Elson said he expects the new Congress to give "some careful attention to broadcasting."

Noting all the changes on Capitol Hill, he said there are "200 new members of Congress"—meaning, all told, that nearly half of the 535 members have less than two years of congressional experience. In addition, he said, there is almost a

*Continued on page 24*



After the doors opened the reaction shown by the mimes in the Philips booth is representative of what NAB attendees were feeling. With three hotels, a new attendance record, and tired crowds, NAB '77 left no doubt as to why other cities have been selected for future NAB conventions. (Photo by Donna Foster Pizzen, courtesy of Warren Anderson, Philips, and some terrific mimes.)



# TK-76: rain-checked at NAB.

At NAB "rain shower" demonstration  
used the TK-76 44 times. No other TV  
camera went through any test like it.

Viewers saw the TK-76 come right  
out of its case and go on-line from cold  
start to crisp picture in just five seconds.

And they watched the great pictures  
this portable delivered with only 20 foot-  
candles of light.

These are just a few of the high-  
performance features of the lightweight  
self-contained, highly automatic TK-76.  
It's no surprise that more than 400 are  
already in use.

If you missed seeing the TK-76  
swinging in the rain at NAB, check with  
your RCA Representative.

Call him today.

## RCA

### The Dependables

## NAB Growing Pains

Continued from page 21

total change of leadership in both the House and Senate.

"There also are two new FCC commissioners, plus two more new ones coming up, including a new chairman."

### Advisory Committee Report On Engineering Problems

Chairman Robert W. Flanders reported that his NAB Engineering Advisory Committee spent a "very active year" on a wide range of issues from quality standards for AM/FM receivers to growing interference from citizen band radios.

He said some problems were "the normal number of everyday situations" but others were "especially pressing."

Flanders, vice president for engineering with McGraw-Hill Broadcasting Co., Indianapolis, Ind., told engineers attending a joint radio-television assembly that the Advisory Committee is concerned over the quality characteristics of AM/FM receivers presently on the market and has set up a special subcommittee charged with developing recommended standards of performance.

The committee, he said, also has "expressed concern about the increasing interference to radio and television" caused by the mushrooming use of CB radios by the general public. His group, he said, has "encouraged the [NAB] staff to participate in all activities intended to resolve this matter."

Flanders also cited work underway by the National AM Stereophonic Radio Committee, saying it is "making progress" with five separate systems "under active consideration." Field tests are to be started later this spring.

Elsewhere in his report, the EAC chairman advised:

- That his committee, after careful study, decided not to participate in proceedings looking toward the adoption of standards for the FM transmission of quadrasonic sound.
- That proposed new rules for non-commercial FM stations would have a "deleterious effect" on commercial stations broadcasting on channel six and have the potential

of increased interference with other TV channels. The committee approved the filing of comments urging that TV stations be protected from such interference.

- NAB's new Cartridge Tape Standard for recording and reproductions has been submitted to the International Electromagnetic Committee for adoption as an international standard.

- A subcommittee is being reactivated to review and update the NAB Standard on Reel-to-Reel Tape.

- The Committee has postponed for further study an NAB staff recommendation that technical laboratory be installed at NAB



FCC Chairman Richard Wiley's term ends soon, and one of the leading unanswered questions at NAB was who will replace him. (Photo by Donna Foster Roizen)

headquarters to help monitor and test the technical parameters of various proposals pending before the FCC.

### Radio In 1985

In our December, 1976 issue of **Broadcast Engineering**, we were looking ahead to see what changes will likely occur in the broadcast industry. Meanwhile, NAB was doing its homework, and the results of their futures probe was presented at the convention by John Dimling, NAB vice president for research.

The following is a summary of a future-of-radio study delivered to the Radio Assembly.

"There is a Chinese proverb that says, 'To predict is difficult—especially with respect to the future.' Even though prediction is difficult, your Radio Board of Directors and that radio broadcasters need some information about what the radio industry will look like in 1985, and so this study of the future of radio was undertaken. I designed the study, working with the consulting firm of Frazier Gross and Clay, and that firm carried out the study.

"Because my time today is limited, I'm going to show you just some highlights of the study. The study was organized into four broad areas. We wanted to know: (1) What will the technology of radio broadcasting look like in 1985? (2) What changes will occur in the regulation of broadcasting? (3) What will the radio audience look like? And finally, (4) How will the industry be doing economically in 1985?

"First, let's look at what might happen in the technical side of broadcasting:

- By 1985, quadrasonic sound will be in general use by FM stations. Paralleling that, AM stations will be broadcasting in stereo.
- Both FM and AM stations will be using ATS;
- FM stations will come up with innovative ways to use SCAs;
- Communications satellites will be used for networking.

"With respect to regulation of radio, there's good news. Our panel of experts believes, first of all, that:

- Deregulation of radio will continue;
- License renewal legislation should pass Congress, probably extending the license term to five years;
- There will not be any new rules against the advertising of specific products but the ban on cigarette advertising will continue;
- There will not be any major increase in the FCC requirements to keep records;
- There will be a limited increase in the number of stations on the air, possibly through an expansion of the AM band, or through reduction in FM channel spacing;
- An owner of an AM/FM com-

Continued on page 24

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which means the finest multi-core studio and field camera system ever produced.

In the decade since Philips re-invented color with the Plumbicon® tube, its PC-60 and PC-70 have successively stood as the reference standard for broadcast performance. Behind Philips leadership, that standard has steadily improved to today's ultimate—the LDK-25.

That Philips has again leapfrogged the competition can surprise no one who knows broadcast cameras...since we created Plumbicon® technology. After a decade of refinement and improvement Philips is still the *only* company that manufactures all of the critical picture determining components—computer-matched yokes, beam splitting prism, deflection circuitry and Plumbicon® tubes. The *only* company that can design each component for optimum performance of the entire camera system. These advances, of superior Philips design and in-house component availability, offer you unsurpassed stability, picture quality and value.

Further, at Philips, we offer you options that are options. The LDK-25 you buy is a custom unit, equipped

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But you can't just read about the LDK-25...you've got to experience it.

Only a demonstration can show you how our anti-comet-tail Plumbicon® tubes handle highlights up to 32x normal peak-white level without blooming or streaking—and without loss of our famous color rendition and resolution. 'Live' is the only way to learn what our Color Line-Up Equipment (CLUE) can do for ease of balance... what electronic color temperature control, auto white balance, flexible auto iris and contrast compression mean in use.

Only after you've seen it all—after you've actually handled this remarkable camera—will you understand why the Philips name is a guarantee of incomparable stability...why no one else can match our 1000-hour performance.

To get your hands on an LDK-25 or to get more information, call us today at (201) 529-3800, or write: Philips Broadcast Equipment Corp., 91 McKee Drive, Mahwah, N.J. 07430.

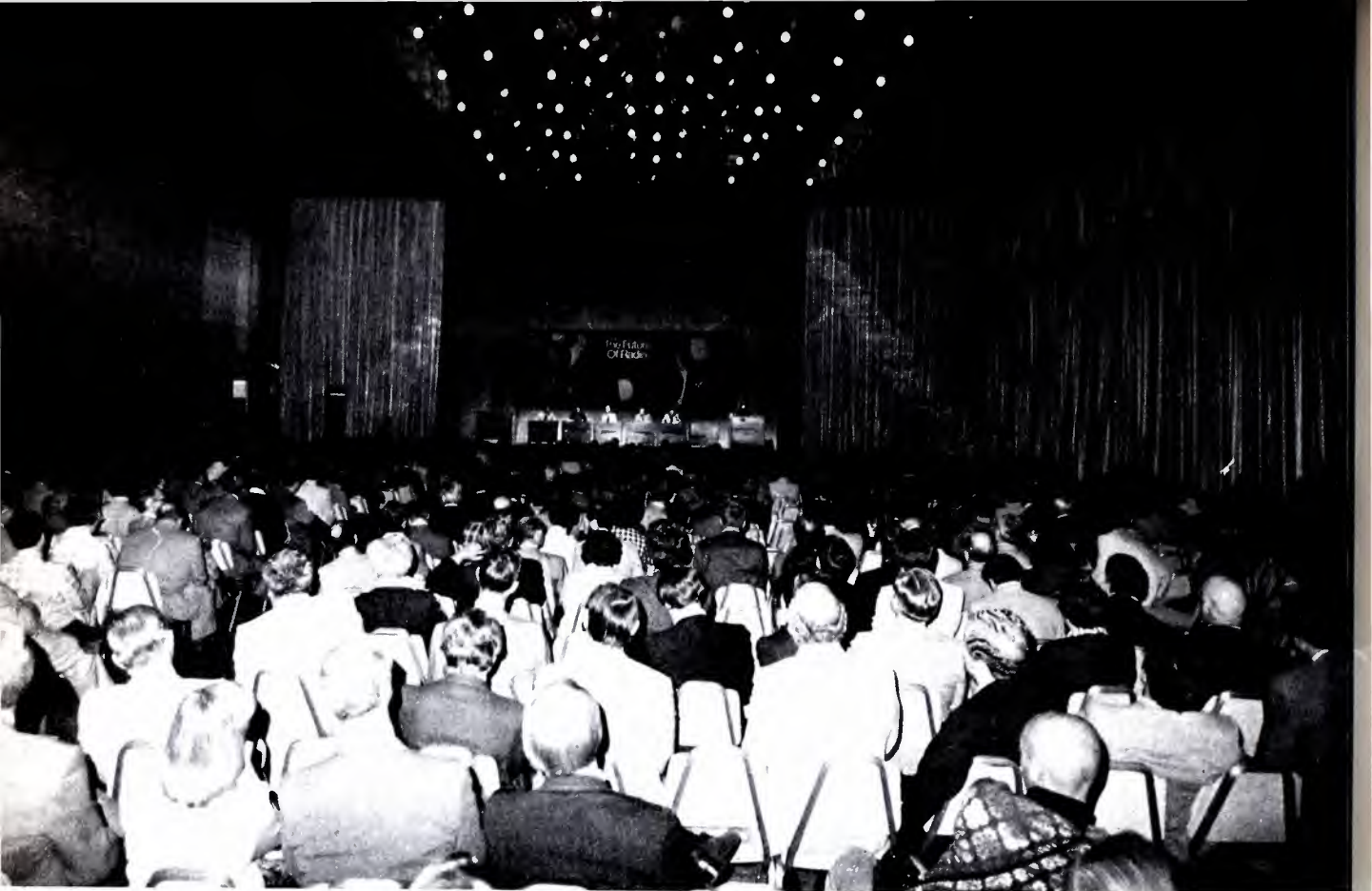
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The record crowds made floor traffic hectic in the smaller hotels. The sessions above were well attended. This session was on the future of radio. (Photo by Donna Foster Roizen)

## NAB Growing Pains

*Continued from page 24*

bination will not have to divest himself of one of his stations, but there may be rules requiring that the combination be split up if it is sold;

- Progress will continue to be made in employing minorities, and no specific employment quotas will be set by the government;
- The odds are better than 50-50 that all-channel legislation will pass;
- And finally, there is a possibility that there will be some regulation of cable systems' carriage of distant radio signals.

"Let's turn now to what the radio audience will look like in 1985. To get some idea about the audience, we must first look at how the population will change between now and 1985.

- Population will be nine percent higher than it is today, but the number of households will increase at twice that rate;
- In terms of age distribution, a large portion—about 40 percent, in fact—will be in their peak spending years;

- People should be better educated, and should have more money; and
- One reason they'll have more money is that more women will be working outside the home.

"What does this mean in terms of the radio audience?

- First, average daily listening will be up to 3 hours and 15 minutes per person by 1985;
- FM stations will actually have a larger share of the radio audience than will AM stations;
- CB will not have a major effect on audience levels, partly because most radio listening today is done places other than in automobiles.

"Finally, let's look at what the industry will look like financially in 1985:

- Total revenues should reach \$3.2 billion, an 86 percent increase over 1975;
- FM stations will be getting 42 percent of those revenues compared to only 18 percent today.
- Of particular importance, revenue-per-station will increase. Although there will be some increase in the number of stations on the

air, revenues will grow faster than the number of stations.

"Summing up the results of this study, the most important conclusions are:

- Regulation of radio by the FCC will not increase;
- Beyond the things we already know about—ATS, quadraphonic, etc.—there will not be any startling changes in technology;
- Audiences will grow;
- There will be no let-up in competition—and cable will probably make the competition even more intense;
- FM will be fully competitive with AM; and finally,
- The radio industry will be more profitable.

"That's a very quick trip to 1985. You can read about the study in this month's **Radioactive**, and you will be receiving a copy of the full report shortly after you return from your stations. We are also in the process of preparing material that you can use to make projections for your own market."

*Continued on page 100*

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# NAB Growing Pains

Continued from page 26

## Audio Processing Workshop

At NAB, radio broadcasters had the opportunity to sit in on a discussion of modern audio processing techniques. **Emil Torick**, CBS Technology Center, moderated the discussion, and opened the session with a brief history of audio processing. **John Bailie**, WMAQ, made the point that there are no magic black boxes. Engineers must use a systems approach to audio processing, starting in the production room. Each source must be handled differently.

**Jim Loupas**, James Loupas Associates, Inc., took the floor next, and made the point that you must know *why* you're processing. To be competitive, it is necessary to relate to the program director ("...hard to do if he's twelve years old."). We have to learn the "new language of audio processing...TSAs, cumes, quarter hour maintenance, aural dominance, etc." Loupas suggested a three step procedure to step up audio processing for a station. (1) Analyze your market, (2) determine the primary competition, and (3) design or specify a processing system that serves your needs ("one that you can control, that doesn't control you.").

**Hans Schmid**, ABC, with his Victor Borge sense of humor provided a light touch to the session with his observation that "perhaps we are providing rubber gloves for leaky fountain pens." Schmid exaggerated his position by maintaining that he does not believe in any processing at all in the broadcasting plant. His comments later in the session betrayed his claim that he was not an expert in this area.

A "back to basics" approach was advocated by **Dick Schumeyer**, Capital Cities Communications. "Processing in the air chain won't cure sloppy production techniques." Schumeyer stressed the importance of looking at each piece of equipment from the production room to the transmitter. He pointed out that headroom is particularly important, as a system that looks fine with tones might sound bad with program audio.

**Eric Small** of Eric Small and

Associates discussed the future of audio processing. Small sees the industry moving toward pure digital audio, just as television is doing with video. Presently, some systems are digitally oriented...mostly delay lines using charge coupled devices. "Once the audio is digitized, there is great opportunity to do extremely sophisticated processing."

Still another consideration in audio processing was brought up by **Jack Williams** of Pacific Recorders. Williams showed slides of frequency response runs made on various consumer radios. The curves for FM receivers showed the effects of less than perfect 19 kHz filters on the high end and fast AFC (to overcome instability) on the low end. AM receivers showed varying amounts of de-emphasis beginning at surprisingly low frequencies. It was obvious that by the time the signal gets into the listener's home, it has been greatly modified. Processing to overcome these problems is compounded by the fact that there are no standards for the receiver manufacturers.

Questions from the floor centered on modulation limits, fidelity (Is it really what we want?) and pre-emphasis in AM.

## AM Stereo Workshop

As might be expected, the AM stereo session was a lively one. The four major proponents of AM stereo systems were all represented, and questions toward the end of the session nearly caused bloodshed.

**Norm Parker** of Motorola outlined the similarities and differences of the four systems. All four use varying methods of altering side-band symmetry. Parker presented the math for the Belar (formerly RCA), Magnavox, Kahn and Motorola systems and pointed out some of the primary features of each.

**Leonard Kahn**, Kahn Communications, discussed interface problems with existing transmitters. He pointed out that not only will the transmitter have to handle amplitude modulation, it will have to pass the *angular* modulation that contains the difference information. Fortunately, said Kahn, most modern transmitters *will* satisfactorily handle the stereo signal. Transmitter modification will be minimal, and the installation fairly

simple. Kahn said prototypes have been sold for about twelve thousand dollars, but would expect the cost of the stereo generator to drop to about half that in production quantities.

**Arno Meyer** from Belar discussed possible monitoring systems for AM stereo. In addition to the envelope monitoring with which we are familiar, we'll have to monitor the phase angle of the difference signal. Meyer said that if the phase angle is excessive, nonlinearity problems occur. Decoded left and right signals would be optional as this probably won't be a specific requirement from the FCC.

Audio limiting in AM stereo may be quite different. **Mike Davis** from Thompson-CSF addressed the problems of handling the main channel and the difference channel separately. The difference channel will most likely be pre-emphasized (possibly 100 microseconds) which makes the problem more difficult. In addition, the main channel may not approach 100 percent negativity (except with the Kahn system) since it would effectively turn off the difference channel during the peak. Davis had a working system in display for those who like to play ahead.

The receiver industry was represented by **Al Kelsch** of Magnavox who described what a typical AM receiver might be like. Kelsch stated that the public has come to expect a stereo indicator, and feels that it is mandatory that the chosen system provide such an indication. Also interstation muting would likely be provided on all but the most inexpensive systems, since the noise with no signal present would be much higher than now and would be countered. Kelsch predicts receiver bandwidths of up to 12 kHz, but said that a narrow-band positioner would be provided for fringe area reception. Receivers could possibly be on the market in as little as six months once the rules are adopted.

**Harold Kassens** of AD Ring and Associates gave a report on the AM Stereophonic Radio Committee. Initially, there were systems proposed by RCA, Sansui, and Comm Associates. Now the committee is dealing with three systems, Motorola, Magnavox, and Belar (Kahn is going to present his system directly to the commission and is not working with

Continued on page 28

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## NAB Growing Pains

Continued from page 28

the committee). All of the systems have been analyzed, and the committee will begin field tests on May 2. The tests are being conducted on stations WTOP and WGMS in Washington, D.C., and WBZ, Boston. The committee will report to the FCC in late summer.

After these relatively orderly presentations, **Chris Payne**, who moderated the session, opened the session to questions and comparisons between systems. Somehow, Payne managed to keep the two sides from getting violent as Mr. Kahn and Mr. Kassens consistently came up with different options concerning sky wave effects, fringe area reception, and negative modulation capability.

During the convention, Cetec sponsored a number of AM stereo demonstrations.

### FCC Technical Panel

The Commission was again well represented this year with members

of various departments prepared to field questions in almost any area. **Wallace Johnson** indicated that re-regulation would continue, and mentioned several of the current projects at the commission...AM stereo, FM quad, clear channel proceedings, road side radio, and the World Radio Conference. **Phyll Horne** discussed a new TVI handbook which will be available soon, and offered a checklist to help stations know what the RI is looking for. He also had a few copies of a list of most frequently violated rules. (See this month's Radio Workshop.)

**Charles Higginbotham** explained the function of the Safety and Special Radio Services Bureau, followed by **Neal McNaughten**, who talked about satellite services and stressed the importance of protecting the 13 GHz band for ENG use.

**Dennis Williams** outlined some of the accomplishments of the Commission during the past year. Two in particular concern directional AMs: the availability of permanent authorization to switch

to night pattern for field strength measurements during the day, and the exclusion of the one-year study for stations with approved monitoring who wish to operate by remote control.

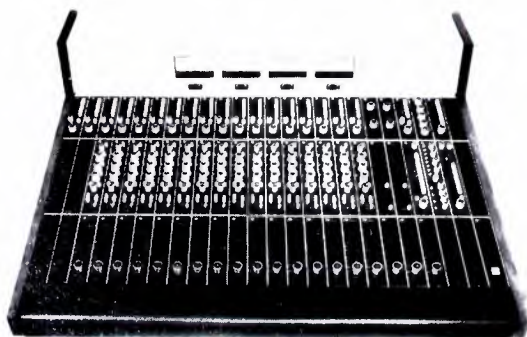
Questions from the floor ranged from very current (ATS) to perennial (pre-sunrise operation).

The panel assured engineers that equalizers may be "flattened out" for proof of performance, but indicated that new rules would be forthcoming that make the correction procedure easier to understand. The definition of "frequently recurring peaks" that suddenly appear in the ATS rules will be applied to all stations, ATS or not, according to the panel.

Twenty-four hour stations with an auxiliary transmitter may apply for authorization to conduct a proof into a dummy load if they don't have a regularly scheduled maintenance night.

Other questions involved interference, the Clear Channel issue, and the direct method of determining power in FM.

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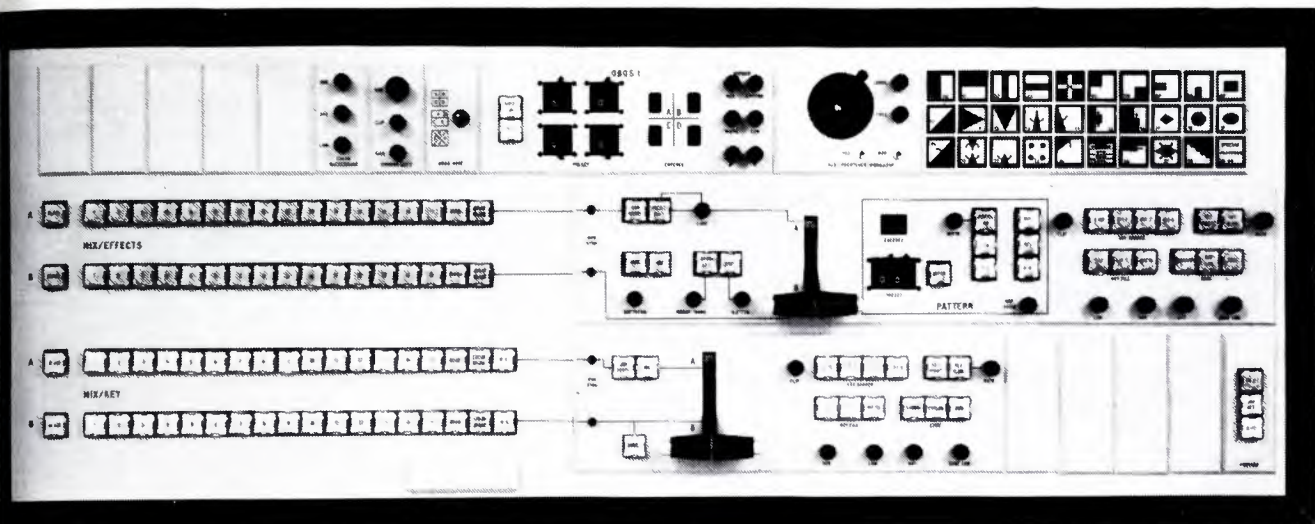
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# NAB'77

## Video Review

*By Ron Merrell, Joe Roizen and Ron Whittaker*

Technology breakthroughs were few and far between, somewhat like the hotels that housed the exhibition halls. Fourteen thousand delegates trooped or bused between the Sheraton Park, Shoreham and Washington Hilton hotels to see the more than 15 million dollars worth of equipment on display by nearly 200 manufacturers. For the users, Joe Flaherty of CBS summed it up succinctly by stating he had seen more sidewalks between hotels than exhibits.

There was a cheerful ambience about NAB '77 in spite of the crowded buses and jam-packed elevators that proved only too clearly that Washington is not set up adequately to handle this kind of convention.

Without exception the participants polled were displeased with the added burden of travel that left them limp at the end of the day. Fortunately, the usual good supply of hospitality suites were well attended.

From the equipment standpoint little was really new, or had not been seen in prototype form before. NBC's Frank Fleming, Blair Benson of Teletronics and Fred Remley of the University of Michigan, all NAB veterans, agreed that this show was one of equipment refinement and consolidation. Last year's marvels were now deliverable products with some track record to go on. Studio color cameras have all reached a performance level where there are no bad ones and it be-

comes a matter of price versus desired performance or versatility.

ENG cameras, of which there are now a seemingly endless variety, were fired up, each claiming some special feature like the lightest, the most sensitive, the most rugged or whatever its maker considers a desirable feature.

The most innovative equipment was found in the manipulation of video signals by digital or analog techniques. Special effects, noise reduction, image enhancement and still picture storage all benefited from a concerted attack on these areas by a variety of engineering groups.

The greatest dilemma for the potential buyer was still the V

eld where the one-inch format vacas continues unabated. The ne-inch machines all make excellent pictures. Fitted with appropriate accessories they all provide considerable flexibility for editing, low motion, still images, frame jogging and so on. But they still do not interchange between themselves, and any studio chief who can advise the station manager which format will become universal has to be a prophet.

**Ampex** had the largest exhibit in their long NAB history. According to Dick Sirinsky, their national sales manager, the business climate was excellent and sales were at an all time high. The products on display encompassed everything from the new master grade 195 videotape to the Electronic Still Store.

The new items at NAB '77 included a final configuration of the one-inch portable VTR, the VPR-10 which can be used for field acquisition or ENG. Its tapes can be relayed on the VPR-1 for editing or jugging. The price is 35K.

The VPR-1 has also had some new features added to it including continuous slow motion (last year's model only had one slo mo rate) and transient free jogging.

Ampex was also showing the new options (ASD-1) to their ACR-25 quad cart VTR which interfaces to outside computers and can be tied to a variety of switchers. Station automation is the goal of this combination.

Their EDM-1 editing system was in operation as were several color cameras of their manufacture including the BCC-4 which boasted an on-line built-in image enhancer.

The first formal public showing of the Ampex Electronic Still Store jointly developed with CBS attracted a lot of attention. This digital recording system using magnetic disc packs holds 1,500 video frames for on-line use with less than 100 milliseconds access time. The first such unit went into service on November 2, 1976 for the national election coverage by CBS. While many claims have been made that digital video recording will make generation degradation a thing of the past, the ESS proves it very graphically by showing a 128th generation copy that is virtually

undetectable from the original image.

**Arvin/Echo** had two new products at the show, both of which were tied to their highly successful EFS-1 Discassette recorder they introduced last year. With close to 100 basic units out that now have been used at the Olympics, the Inauguration, the Indy 500 and other events, Arvin/Echo used the theme that their disc recorder "never forgets a face." The BESS-1 (Basic Expandable Storage System) gives an on-line capacity of 400 slides and programmable random access. An RC-100 remote random access controller expands the capability of the EFS-1.

Like many of the other video suppliers at NAB '77, **CMX** used the time between the last NAB and this one to convert the newly introduced 340-X with its I<sup>2</sup> system into a deliverable and well accepted product. To show the versatility of interface, CMX had the 340-X tied to a variety of VTRs, including RCA TR-600, IVC-9000, Sony BVU-200 and even a multitrack audio Ampex MM-1000. Alfred Muller, a well-known editor, demonstrated the system by creating program segments while explaining the functions of the system. Bill Orr, President of CMX pointed out that TV industry interest in the 340-X has already resulted in major programs like the Carol Burnett Show, the Peter Marshall Show, many Group W Productions and Metromedia shows being done on CMX Systems installations.

**CVS** had their full product line of TBCs and Frame Store Synchronizers. Jim Summers, VP Marketing, reviewed their new products, one of which is the 515, a PAL-M digital TBC at 15K that doubles as a NTSC to PAL-M transcoder as well. He also announced the CVS-620, a full frame synchronizer with freeze frame and a positioner option; the 604 joystick controller which will store and recall four positions; and an A/D converter, the 720 at 5K. The synchronizer interfaces with the 530 TBC, giving a modular structure to the CVS product line. There was a new option to the 520 TBC in the form of a 32-line window.

The CVS booth also had a separate exhibit of AF Associates new

reconfigured quad recorder at 69.7K. This unit with the performance of an AMPEX-1200 uses a CVS-500 and reduces the weight of the VTR to less than half the original. It was a neat package with all of the monitoring and operating controls conveniently near at hand.

**Datatron's** perennial proponent Bob Ricci (who is now in the systems business) demonstrated edits while this interview was in progress. Datatron has refined and added capabilities to the basic Tempo-76 introduced last year which gives it a total capability in the editing field. It is now, according to Ricci, a complete on-line and off-line system. It features text editing, split ends, switcher control and auto assembly. It will interface with the TR-600, VPR-1, BPU-200 and was being used in the IVC booth with three 9000 recorders and a Vital switcher. There were some stand alone products such as a Jam Sync Generator and a portable time code generator that outboards on a BVU-100.

George Foster of **Eigen** claimed that their disc unit is the first slo mo recorder on the market with racing stripes! They had two versions, both with integrated TBCs. The NAB special for a 10-second capacity was 20K. The 20-second capacity unit was a brand new unit using a modified CVS-510 integral TBC. Foster felt that this was the first NAB where Eigen was being taken seriously as a supplier of color video disc equipment and that the business climate was "incredible."

The **Fernseh** stand leaned heavily toward the BCN format and the various ways in which this VTR can be configured to serve different needs. The BCN is a segmented helical recorder that is being marketed by IVC, Philips and RCA under other model numbers, but had interchangeability of tapes on any of them.

To show the new versatility of the BCN, Fernseh displayed one unit with a digital store attached which permitted slow and stop motion as well as jogging and fast motion. The single field memory and its A/D converter, which is available as a 15K option, has readout logic different than read in. Consequent-

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## NAB Video

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ly, it can reconstruct frames at slower than normal speeds or still images of broadcastable quality.

Another option is to use the BCN, frame store combination as a slide scanner which can pack 10,000 slides or still images on seven minutes of one-inch tape.

Hans Groll, Fernseh's executive from the home office in Darmstadt, pointed out that this slide scanner option was available at no additional cost when a BCN/frame store combo was purchased. There were even a few digital effects like quad split thrown in for good measure. Henry Zahn, the BCN engineering manager, demonstrated a cassette recorder in the same one-inch format. The cassette contains 20 minutes of tape. Placed on a regular BCN top plate it must be hand threaded, since this VTR is not designed for auto threading. However, the portable version which will be called the BCN-5 has an auto thread mechanism which was on private display in Fernseh's back room. The BCN-5 will weigh 22 pounds and operate 40 minutes on a battery. Another version called the BCN-55 will have dual tape decks that will accept the cassettes and have an automatic switch-over system. An electronic editor has also been added to the BCN-50 series with editing capabilities similar to those of the Ampex RA-4000, according to Mr. Groll.

Fernseh is also moving into the lower priced, lighter camera line. Their KCP now has a smaller backpack. The KCK-R, a new version of their widely used KCK and the TCX with  $\frac{2}{3}$ -inch Plumbicons or vidicons, is a modular camera starting at 17K for economic applications.

**Marconi's** color cameras worldwide now number over 1300 with at least 350 of these in North America. Tom Mayer, their broadcast division manager from the United Kingdom, said that their NAB posture this year was low key as the only new product for them was the DICE standards converter, one of which recently sold to J. D. Ivey of Orlando, Florida for production house use. Mayer also said that the EBU had given DICE a good rating and the Soviet Union had used one

during the Montreal Games.

DICE is a digital device using the 5-line interpolation and can transcode in both directions. Mayer was pleased with the large number of Latin American visitors that came to see their Mark VIII-B color camera and the portable version, the Mark VIII-P.

The **Merlin** booth encompassed three exhibits which related to a variety of products supplied by them. Yves Faroudja, Inc. and Amtorn Corp. John Streets of Merlin explained the compact quad in his area as being one of the ten delivered to Vidtronics in Hollywood. He believes this to be the largest system dedicated solely to quad duplication. Merlin designs, builds and supplies any configuration of quad desired. The YFI display showed the detailed results of the use of enhancement circuitry on test signals like multi-burst, sine<sup>2</sup> pulse and bar, etc. The Amtorn part of the exhibit showed a five inch color utility monitor that nested in a standard Tektronix 528 rack mount. It also works on 12 VDC for remote applications.

While the **Micro Consultants** booth showed the extended line of products in the digital time base correction and frame store field that this company is now known for, the real action was in their hotel suite where there were demos by invitation only of what the future holds in digital video effects.

Gil Kesser and Bruce LaCentra gave the rundown on new MCI products, the stand-alone TBC-300, the DFS-1500 field store and the DFS-300 control unit.

Kesser said that MCI equipment is modular, allowing a 12K entry price for a digital TBC with field additions that can provide the desired features. The reason for the separate suite demos was to solicit customer reaction to see what digital video manipulation is desirable. The suite demos were indeed impressive as the picture coming from a U-Matic portable was positioned at will by a smooth positioner, zoomed down to one quarter size, magnified up to 3:1 ratio (with line interpolation to avoid coarseness) and computer positioned to fit in a chroma key area regardless of changing size of the keyed section. Additional effects

are possible through the use of microprocessor packages which add ons. LaCentra confirmed good booth traffic and tremendous interest in digital video at this show.

The DFP-5000, which is the model number of the new digital effects box is based on newly available technology and includes noise reduction as well as other enhancement features.

**Microtime** has also consolidated last year's products and introduced improved overlays that further enhance video signals in a number of ways. In addition to their booth where the full line of products was displayed, they had private demos in a suite at the hotel. The Image Plus, their newest product, is an add-on unit that goes with the 200 TBC and adds about 4K to the price, bringing the total to about 22K for this package. The results are impressive, luminance and chrominance noise are reduced by at least 6 dB and the color quality is appreciably enhanced by such features as auto correction of luminance chroma delay and hue error reduction. This new unit will be available as a stand-alone later this year. It has three modes of operation covering direct camera pictures, high band VTRs and color under recorders. It is possible to independently adjust vertical enhancement and horizontal high frequency synthesis. There is a built in DC and line by line Velcomp and what being demonstrated on a Fernseh BCN recorder with good effect.

Microtime also introduced a lower cost, smaller TBC, the 160, intended for remote broadcast applications where portability and low power consumption are important.

While the major impact of NEC technology was at the Grass Valley booth where the Digital Video Effects unit was being put through its paces, NEC had a separate display on their own. NEC's one inch helical VTR, the TT-1000, and its portable cartridge versions of the TTR-5 and 7, produce excellent color pictures.

NEC also offered a wide window TBC which they consider low cost at 16K. At their booth they also had Masao Inaba, the engineer who developed the first Frame Synchronizer in 1973.

Continued on page 34

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## NAB Video

Continued from page 34

The **Nurad** booth nicely isolated their new products by painting them blue. There were 18 such devices on display, including the Super Quad antenna with digital control via microprocessor. Most of the new products were consolidations of previous devices to expand ENG capabilities. They could now handle multiple sources on a single 2 Ghz receiving antenna simultaneously by frequency sharing. Their omni-directional antenna is actually four aerials covering 90° sectors each.

**Philips** started their presentation with a special press conference at their booth using the theme of Innovation. Philips presented a clever pantomime of their entire camera and VTR product line. This show, which was easily the most visually innovative presentation, used a pair of mimes who frolicked, contorted and grimaced as they filled the well lit stage with LDK-5, 15 and 25's, BCNs and their newest line Video-80.

Paul Berquist, the new president for Philips in North America, called attention to the many innovations introduced by Philips in more than a decade. "We are now into Decade Two and still creating new and unique products," he said. Philips introduced a triax first, and it was widely adopted.

At this show, the live feed on the monitors came from a camera 6½ miles away and was controlled over a telephone line. Berquist stated that a new BCM cassette VTR with 20 minutes capacity will be available in portable version.

The central star of the show was the new Video-80 camera. A fully modularized system using ¾-inch tubes and starting at 15K. Addables were tiltable, rotatable and removeable viewfinder, paint pot controls and auto iris. Color line up was built in, so Philips says anyone can assemble these camera modules and have them working in just a few minutes. This aspect of the Video-80 camera was separately demonstrated at an adjacent exhibit area where students from the American University went through the mechanics of assembling and dismantling camera modules with adequate pictures in between.

Philips has also recently acquired

a switcher manufacturer, **American Data Products**, whose booth was directly opposite and where the full line of those switchers was being displayed. Warren Anderson of Philips explained that this broadened their system capabilities. Other new products at NAB '77 from Philips included the LDK-65 Telecine chain, and both VHF and UHF transmitters.

**Rank Cintel** has a new office in Chicago and their U.S. manager Neal Kempt was delighted with the interest at NAB in Rank's F.S.S. telecine of which at least five are now in the U.S. at such places as MCA and Ruxton. A new feature of the Rank Telecine is the two-position slide gate for giving the best possible color transfer of these images to E.S.S. type devices.

**RCA's** Ed Hill started off their "pianissimo" press conference by stating that RCA was going into a new business direction which would make them a more profitable company. However, within this framework they would still maintain their basic goals of improving current products, creating new products and innovating for the future.

The magic word at RCA this year is "Saticon." They are now putting improved Saticons in cameras and telecines, and claiming low lag as well as superior performance to Plumbicons. Their new camera product this year is the 760, a major new studio camera for general purpose studio and field use at 45K complete. Using high resolutions Saticons and auto equalization for up to 1,000 feet of cable, the camera can also work as a stand-alone with just an AC cord and video out cable. Built up from their popular TK-76, this camera uses a special 14:1 Fuji lens with 2:1 extender and with all accessories tips the scale at 42.5 pounds. It is weatherproof and RFI sealed.

RCA has also included in their TK-28 Telecine, one-inch Saticons, which have low lag and give the best pictures yet on this film chain. A one-machine non-time code editor, the SE-1, has been added to their line and its price starts at \$3,750.

The RCA frame synchronizer has a full frame store memory using digital techniques. It can interface

to any production switcher with an external key input. The basic unit at 39.9K provides an infinite window for external video signals, but it has new options of picture compression (15K) and freeze frame (3.6K), including an auto freeze mode which can give a controlled rate of animated images from a moving picture source. Compression is 2:1 and a joystick permits positioning the mini image anywhere on the screen.

In the one-inch VTR field, **RCR** also showed the BCN which is called the HR-200 or 400 depending on configuration. Another RCR first at this show at the 5 kW is a solid state AM transmitter which can be used for unattended operations. They are also offering circularly polarized antennas that help reduce ghosts for viewers, but need FCC approval to use.

The **Recortec** exhibit featured some new products which were covered by Dr. Lester Lee, the founder and president of the company.

To provide a more reliable reading of SMPTE time code, Recortec now sells a Time Code Enhancer that references itself to the tape timer and gives a more accurate readout at slow and stop tape conditions. Another new product was the Auto-Edit accessory for R-Mod VTRs. It is an automatic search feature which will be included in new R-Mods at no increase in price, and which will cue and pre-roll tape accurately for editing. The R-Mod kit sells for \$8,500 and the Auto-Edit controller for existing R-Mod VTRs is \$2,650.

Recortec also showed their Videob Spot Assembler which uses their own one-inch helical VTRs in a tandem arrangement. All spots are assembled on one reel and transferred in proper sequence to another. The controller then cues up and plays the sequential spots as needed.

To evaluate video cassettes, Recortec has developed an addition to their line of tape evaluators, the VCE. The cassette is tested by recording a signal on the tape which is then read back to give LED displays of dropouts and edge damage.

"Sony is in Broadcast to stay. Those were Harvey Schein's oper-

ing words at the **Sony** pre-NAB press conference where they introduced their new product line for this show. While he agreed that Sony had made their reputation in the semi-professional and consumer field, he assured the audience that Sony can produce the highest technology and have every intention of continuing to do so.

David MacDonald, their broadcast department manager, then took over the podium and announced that more than 30 BVH-1000 Sony one-inch helical recorders have already been sold. To augment this studio recorder, MacDonald announced a new portable machine, the BVH-500, which was on display in their booth. This 33 pound compatible VTR handles a one-hour reel of tape and provides a monochrome "confidence" playback in the field for checking purposes. There were also new cameras and new U-Matic units from Sony, and they made public their arrangement with Thomson-CSF Labs to produce and sell the Microcam which Thomson-CSF Labs showed for the first time last year.

One of the new cameras, the BVP-200 is a self-contained unit using two tubes, one 3/4-inch Saticon for luminance and a one-inch MF Tricon for chrominance. Sony claims lighter weight and lower power drain for this combination. A single tube Tricon camera, the DXC-1610, was also offered as an ENG camera even though it is aimed at the industrial user. MacDonald claims 500 such earlier version cameras are already in use by broadcasters.

Sony rounded out their ENG line with the new BVU-50, a record only portable U-Matic weighing under 15 pounds and connectable to a BVP-200 camera for an integrated ENG or EFP system with complete operating status displayed in the camera viewfinder.

As new accessories, Sony introduced a BVG-1000 vertical interval time code generator and reader (VITC) which allows time code display from stop frame conditions to 128 times normal speed in forward or reverse.

Steve Kerman, **Tektronix**' Industry Relations Manager gave a synopsis of his company's new

products and NAB posture. The booth contained a small, temporary auditorium they called the Measurements Theater. Here programmed presentations were made in the use of Tek instruments for various testing techniques on studio equipment or at transmitter sites.

Tektronix has also introduced their new 650-A color monitor which is an improved version of the standard 650. Aperture correction and a unique blue-only display for VTR error detection are among its features. The latter is accomplished by routing the blue bar signal to all three guns, thus giving a brighter display for adjustment or minimizing VTR defects. The demodulator introduced last year is now a product on which they are accepting orders for VHF and UHF units, Kerman said.

The **Thomson** booth this year was an open space with a minimum number of products actually on display. Members of the French parent company from Paris, including Giscard D'Estaing, were on hand while the T-TCSF Labs group from Stanford, under Renville McMann, displayed their latest electronic miracle, a digital noise reducer.

In the opinion of Fred Remley (U. of Michigan) and Blair Benson (Teletronics) and others queried, this was perhaps the single most significant device at the show. The unit has a digital frame store that functions as an adaptive filter. By interpolation between fields, the random noise is reduced by 12-15 dB and the visible result from a poor NTSC signal source is really dramatic. A motion detector examines every picture element and makes 358,000 decisions every 1/30 second relating to the application of the noise reduction processing.

The section of the Thomson booth where the Digital Noise Reducer (it is apparently too new to have a model number) was being put through its paces was constantly crowded with engineers marveling at the "in" versus "out" pictures. Thomson's hit of last year, the Microcam was also being shown as a standard product now with new, low light level performance capabilities. An interview with Joseph Polonsky, the technical director for Thomson-CSF revealed

that they considered the digital noise reducer as their most technically advanced contribution to the television field and expected it to alter operating practices in the ENG and Telecine areas.

The **Videomax** booth featured an unusual and interesting display of the head rebuilding process. One of their skilled employees was set up at the show with a binocular microscope and components she normally uses to thread the super fine windings on the head material. The microscope had a television camera fitted to it so that visitors to the Videomax booth could see a magnified image of this procedure very clearly on large monitors mounted overhead.

**Joe Roizen**

**Acrodyne Industries, Inc.** introduced a 6 kW visual, 600 Watt aural transmitter. The 6 kW transmitter on display was actually one-half of a 12 kW version, which utilizes two hybrid combined, but totally independent, transmitter assemblies.

**American Data** exhibited a new distribution system, modular amplifiers and Models 2102, 2103 and 2104 video switchers. New for '77 is the American Data 558-1 compact video processor which has four channel parallel video processing.

**Angenieux Corp. of America** demonstrated their new "total zoom lens system" which includes bayonet mount and fast change, wide angle and telephoto attachments.

**Asaca Corp. of America.** The highlight of the Asaca display was their new ACC-2000 no back-pack camera. Drawing about as much attention, however, was the AVS-3200B 1-inch quad VTR machine. Also on display was the 925-C chroma noise meter and the 201-1 envelope delay measuring instrument.

**Automated Processes, Inc** introduced a new compact broadcast audio console, an audio board with FM stereo and quad, and the Mini Mag Synchronizer for tape editing. Automated Processes also has automated audio consoles and audio amplifiers, intercom systems, and a programmer controlled post-production, multi-track recording

*Continued on page 38*

## NAB Video

Continued from page 37

console.

**Beaveronics, Inc.** displayed their new Model 154 and 156 production switchers. They also displayed a general production, master control and routing switchers, including the new J&D 712 production switcher.

**Belar Electronics Laboratory, Inc.**, which manufactures AM, FM and TV frequency and modulation monitoring systems, displayed new ATS accessories, a digital FM modulation monitor, an SCA and

stereo monitor and a digital FM frequency monitor.

**Berkey Colortran** demonstrated their new Memory II system, new economical 2 kW Fresnel lights, a trolley pantograph system, a motorized pantograph for TV monitors, 2 kW to 4 kW softlights, a greatly expanded Gelatran and designer pattern line, a new effects spotlight and a new HMI Sunlite line which boasts a number of important exclusive features.

**BIAS**, Broadcast Industry Automation System, a division of Data

Communications Corporation, described their station automation system that has been successfully used in several U.S. stations around the country.

**Cablewave Systems, Inc.** introduced a new 3½-inch, 50 kW, 10 MHz coaxial cable. The cable has an air dielectric and corrugated tubular copper center conductor. It has great flexibility and mechanical stability, with very low attenuation.

**The Camera Mart, Inc.** has a full line of film and video equipment for sale and rental. The Camera Mart emphasized a broad range of ENG/EFP cameras, recorders and accessories.

**Canon USA** showed their 2X 1000 mm, PV 25X20-B lens for the 1-inch format. The master lens range is from 20-500 mm, and through the use of the built-in 1X and 2X servo-operated extender, two additional ranges are provided. Canon also has a similar lens for the 1¼-inch format, which has a range of 27-1350 mm. Super wide angle 10X zoom for 1-inch and 1¼-inch ENG/EFP cameras were introduced.

**Central Dynamics Corp.** demonstrated their CD-480 production switcher, along with the VS10, VS14 and AFM10 compact studio switchers. Automated master control functions were demonstrated with the CD system 100 equipment. Other equipment included the VG2210 Digital Sync Decoder and RGB chroma keyers.

**Christie Electric Corporation** surfaced at the winter meeting of SMPTE and checked into Washington with a lineup of portable ENG power equipment and home base chargers.

**Cine 60, Inc.** confronted some of the ENG/EFP production problems with their line of battery power belts and power packs. Also displayed were portable battery-powered lights, snaplock camera mounts, and shoulder pods.

**Cinema Products** again featured their amazing "Steadicam," along with the popular 16mm camera and equipment. Also shown were Universal 2030 and 808 fluid head tripods, the new PCL-4A Lexan 400-foot magazine and the J-1 zoom lens control.

**Comark Industries, Inc.** RF am

Continued on page 41

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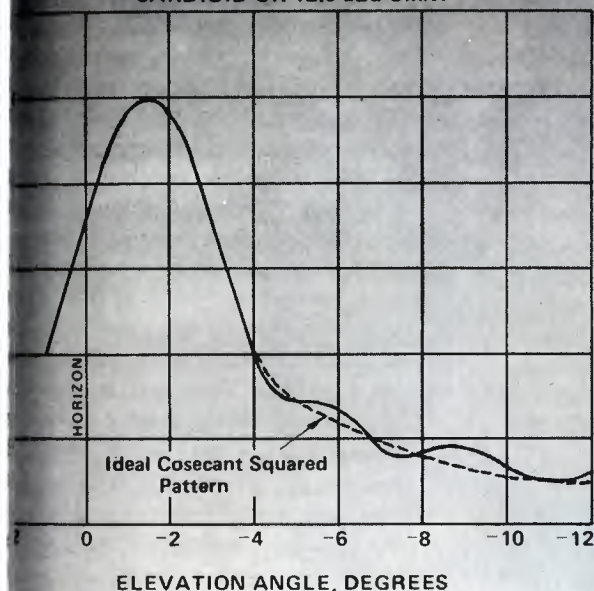
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## NAB Video

Continued from page 38

plifiers and switchers were featured by Comark, along with the RF test equipment, demodulators, microwave and waveguide components and microprocessor remote control units.

**Commercial Electronics** unveiled their CEI-300 camera. It's a studio camera and it's a portable camera. This camera system is totally modular, making it easy to convert it from portable to studio. Depending upon the options selected, the

camera should run in the \$30,000 to \$40,000 range. Designed to meet studio and ENG needs, the camera can take on various configurations, from a 3/8-inch head to a 1-inch head.

**Computer Magnetics Corp.** specializes in refurbishing audio and quad video heads, audio equalizers for up-dating VR-1200 and VR-2000, and velocity error correctors for the VR-1200 and 2000.

**Datatron, Inc.** displayed their Tempo 7600 editors, along with time code generators, character

generators, time code readers and the new 5152 stand alone jam system. The Tempo 7600 editors have expanded memory and control track or SMPTE capability.

**Dielectric Communications** features RF loads, wattmeters, waveguides, high-powered passive components and coaxial switchers.

**Dynasciences Video Products** showed the new Model 7400 and 7400-A remote controlled production switchers, which feature 30 wipe patterns, 12 inputs and computer compatible control logic. This was one of the main features in this year's Dynasciences exhibit.

**Eastman Kodak Company** was demonstrating their new 7250 Ektachrome video news film which has a normal tungsten speed of EI 40. The new film can be pushed one, two, and, if necessary, even three stops to achieve film speeds of 80, 1600 and 3200 respectively.

**Edutron** was out of the heavy traffic in the Mayflower with their 100A time base corrector. Heterodyne chrominance jitter is minimized by first demodulating chroma, then removing the time base error in parallel luminance and chrominance memories.

**ESE** introduced a hand-held time calculator, a time code reader and a clock/timer with memory. They also have digital clocks and time programmers.

**Flash Technology Corp. of America** featured their Electro Flash (FTB-205) high-intensity tall structure lighting system, which was introduced at the '76 NAB. The "hot tower" isolator was also displayed.

**Fujinon Optical, Inc.** demonstrated several new Electron Beam Coated (EBC) lenses along with high-speed 6mm f/1.4 super wide angle fixed focal length lens and 9-63mm 7X9 f/1.4 lens. At a slightly slower speed (f/1.7) was a three pound 9-108mm zoom lens with macrofocus, adjustable back focus and 3-way servo zoom.

**GBC TV Corporation** got into the ENG action with their CTC-7 camera. It includes a viewfinder, battery belt with charger, and is self-contained. GBC claims broadcast quality pictures at 20 FC, and usable pictures at 5 FC.

**Interand Corp., Telestrator Division**

Continued on page 4

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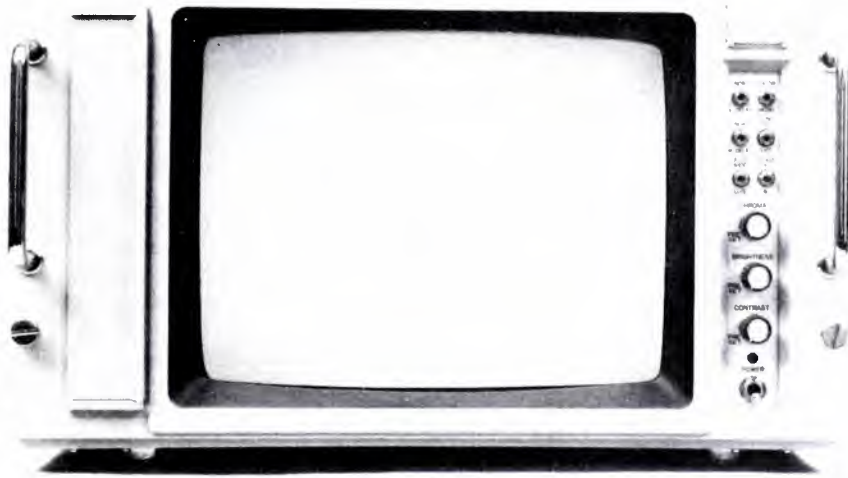
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## NAB Video

Continued from page 40

sion exhibited their video in active and teaching systems, including the versatile 600SE Titlstrator and the Star-Probe electronic graphics system.

**JVC Industries, Inc.** demonstrated their 3/4-inch editing machines, their lightweight 3/4-inch ENG/EFP recorder and the 4400LU and GC 4800U portable color cameras. Also shown was the CH 1800U, 3-vidicon studio color camera, the RM 83-U editing control unit and the CY 8800 17.4 lb., self-contained ENG/EFP camera.

**Kliegl Bros.** Memory lighting and control systems highlighted the Kliegl Bros. exhibit this year, specifically, the Performance 1 and Performance 2 Lighting Control Systems.

**Knox, Ltd.** had their low-cost K-50 titling unit with address memory. The K-50 has an 11-channel and crawl option. New this year was the "minidiskette" 30-page memory, which interfaces with their K-128 titling unit.

**L. W. International** featured their new Athena 5000 (5000-00 capacity) medium-priced professional broadcast television film projector and the 4000 TSM projector, which has freeze frame, 100 variable on-line speed change capability.

**Laird Telemedia, Inc.** introduced the new 360-A character generator, the 4220 dissolve slide projector and a new, inexpensive Model 32 time/date generator.

**Lenco Electronics** unveiled a PRC 361 video processing amplifier and PVD 354 delay amplifier. They also introduced a complete line of high resolution B&W monitors and a comb filtered chroma decoder.

**Lipsner-Smith Corp.** introduced their new Retec 16mm previewer. They also featured the CF-200 Ultrasonic Film Cleaning Machine and associated film accessories and a new Model 15011-A videotape conditioner.

**Listec Television Corp.** demonstrated their new Vinten leveling tripod and the new virtu fluid head. Listec also supplies television pedestals, tripods, mounting equipment, the EDS capture

Continued on page 41



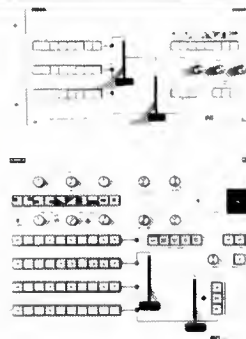
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The CD-480 is now being shipped.

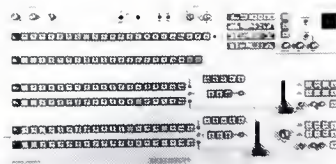


### VS-10

An inexpensive broadcast quality 8-input switcher that features flexibility and ease of operation. Self-contained electronics for rapid installation in ENG and other small mobiles.

### VS-14

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### System 100

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## NAB Video

Continued from page 42

roller and EDS random access 2X2 slide projectors.

**3M Company** had a wide array of quad and helical tapes, along with video carts and video cassettes. The Scotch 250 Studio Mastering Recording Tape and the Scotch High Audio 8250 Quadruplex Videotape were featured.

**3M Company, Mincom Division** exhibited the new D-8800 micro-processor titling system which features variable font sizes and letter spacing, font and color selection and underline. The 3M D-8800 has variable speed roll and crawl with complete masking.

**Mole-Richardson Co.** exhibited studio lighting systems and mechanical special effects equipment. Among the lighting instruments on display were broads, scoops, and Solarspots.

**Motorola** had a booth this year, but it wasn't represented by the division involved with stereo AM. The booth featured an optical video link, offering broadcast quality color and audio. Designed for short hop usage, the optical link can be used for ENG.

**NTI, U.S. Inc.** showed their digital color time coder and weather mark signal generator, the 531/534. This unit can insert time and weather symbols on the home set, and it can be done in color.

**The Olesen Company** booth included special effects front or rear projection, color filters, and walk-along, curved, and straight channel track for lino, scrim, velour, and chroma key fabrics.

**Panasonic Company, Video Systems Division** demonstrated their AK 900 broadcast studio cameras. Also featured in their complete line of video equipment were EIAJ cartridge and open reel video recorders and 3/4-inch video cassette recorders.

**Philips Test & Measuring Equipment** unveiled their new VITS automatic analyzers. Philips also has a new synchronous demodulator this year. The company manufactures a complete line of modular and synchronous demodulators, and test and measuring equipment.

**Power Optics, Inc.** highlighted their Scene-Sync device, which makes possible special background

effects through the use of chroma key. They also had their Gral optical color comparators Evershed-Power Optics remote controlled camera pedestal.

**Q-TV/Telesync** displayed VPS-100 and VPS-300 video prompter systems, with a complete line of accessories. There were console transport and convolution transport systems.

**Rank Precision Industries,** Once again the Rank Cintel III Flying Spot Color Television system was one of the highlights of this exhibit. An important new addition was the Varotal Multi-Role (MVR) Lens which makes use of modular elements to achieve great flexibility.

**RCA, Communications Division** once again had an extensive display of broadcast products. Among this year's new products were the TV 760 camera and a 5/10 MHz completely solid-state AM transmitter. A major commitment to ENG was evident. Back again were the RCA TK 76 and TKP 40 cameras. Among the transmitters RCA offers are the 3 kW BTF-IT, the 5 kW BTF-5E2 and the 40 W BTF-40E1 FM transmitters, and with their 5, 10, or 20 kW "widebandable" FM transmitter system. There were also audio processing items including the BA-145 A/C amplifier for AM, FM or TV, the BA 147 limiting amplifier for AM and TV, and the BA-146 limiter for AM.

**Rohde & Schwartz Sales** featured their Barco color monitors, along with automatic logging VITS transmitter performance measuring equipment. They also have video and audio performance measuring and testing equipment, demodulators, transmitters and FM transmitters, receivers and a new VIT automatic distortion analyzer.

**Rosco Labs** unveiled "Roscolux" an extensive line of heat stable color lighting media. They also showed TV and motion picture materials, 2500, 1200, 575 and Watt HMI lighting equipment.

**Spin Physics, Inc.** Among products were a quad panel refreshing service for Ampex Marl and RCA high band VTRs. A service is warranted for 1,000 hours.

**Spindler and Sauppe, Inc.**

Continued on page 46

# Maximum Color Performance Harris TV Transmitters with TSB. Because The Best is Getting Even Better!

Now--Maximum color performance...fewer adjustments...in the new line of Harris IF (Intermediate Frequency) Modulated TV transmitters, featuring the MCP solid-state visual exciter with TSB (Transversal SideBand) filter.

The latest state-of-the-art design techniques in the new visual exciter/modulator

include the TSB filter, which requires no group delay correction or tuning adjustments...ever! Only 1½ square inches in size, the filter is mounted on a PC board in the visual exciter. Harris transmitters are also ready for ATS.

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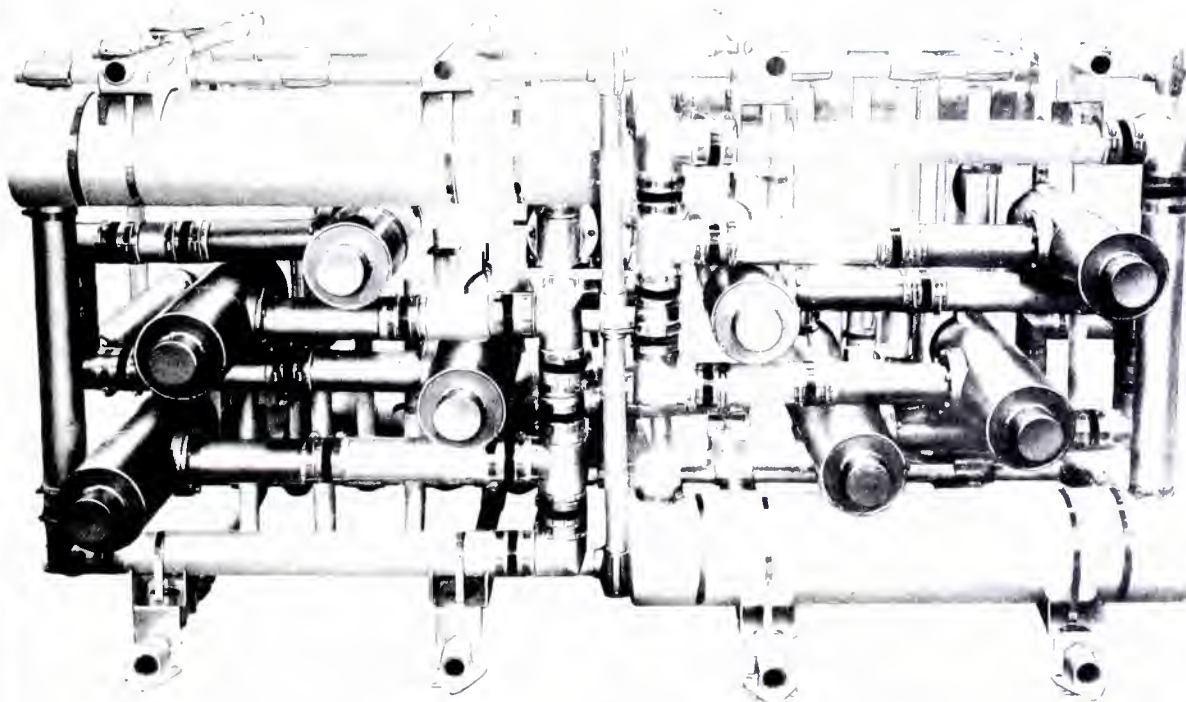
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WRE's wide range of degaussers are designed for years of dependable service for clean and simple erasure of magnetic film and tapes in just about any configuration.

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TYPE 9205A Degausser is ideally suited for complete erasure of program and residual noise from video, audio, and data recording tape and magnetic film—in reels, cartridges and cassettes. This unit will bulk erase reels up to 2 inches thick and 17 inches in diameter. Available for 115 or 230 volt operation.



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TYPE 8905 Magnetic Erasing Pencil is an excellent tool for erasing limited, small areas of tape or film and for demagnetizing record/play heads. In program material, words, complete sentences, and even syllables may be erased. This unit is equipped with a press-to-operate switch on the handle.

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## NAB Video

Continued from page 44

veiled the Producer 32 Selectroslide TV Film Chain Slide Projector which makes use of a micro-processor and features full random access capability. They also have a standard line of slide projectors for film chains.

**Strand Century, Inc.** Among Strand Century's new products was the low-cost Multi-Q memory light control system with CRT dynamic video display, remote master control and fail-safe back-up module. The booth also displayed the Quartz color Ianiro lighting equipment for video, pole-operated Fresnels, portable lighting kits and their highly sophisticated "Lightboard".

**Taber Manufacturing**, long known for their audio head rebuilding services, featured their VTR audio head rebuilding services.

**Telemet**. New this year were the sideband and spectrum analyzer, and a production switcher. Telemet also showed their line of video generators, video processing equipment, chroma keyers, image enhancers, VITS keyers, TV demodulators and TV test equipment. Other products include modulators, routing switchers, audio monitors, cable equalization equipment, monoscope generators, envelope delay equipment and video signal conditioners. One of the highlights of Telemet's activities this year revolved around their work with fiber optics for television transmissions.

**Telescript, Inc.** demonstrated the Telescript monitor prompting system which mounts adjacent to the camera lens. Through the use of a beam-splitting mirror, the talent can look directly into the camera lens while reading.

**Television Research International, Inc.** demonstrated their new EA-6 editor and Trichroma-U equipment. Other products included the EA-3 editor, digital video controllers, signal improvers and time code equipment.

**Video Aids Corp. of Colorado** showed battery operated ENG/EFP sync and black burst generators, the VITS inserter and an NTSC multi-test generator. The company also exhibited audio processing equipment, videotape editor programmers, picture monitors, elec-

tro-optical video line insulators, color burst phase meters.

**Vital Industries, Inc.** Vital's orate display was used in part to unveil their new "Squeezoom" VMU-1 switcher which synchronizes up to four non-synchronizing NTSC color signals simultaneously to video sync. The VMU-1 features full-time, real-time compression, zooming of up to four, full range pictures to any size, anywhere on the screen. It also has real-time freeze frame and will continuously correct variations in subcarrier phase or doppler effects from remotes and satellite transmissions. Vital also introduced a number of other new products, including a routing switcher, a frame synchronizer, sync generator and master control automation equipment.

**Uni-Set Division of Kniff Woodcraft** displayed in miniature form their versatile ready-made modular set systems. The Uni-Set needs only 80 square feet of space and consists of 26 set pieces of different configurations.

**The Winsted Corp.** manufactures modular cabinets for video editing, editors, recorders, monitors and equipment. The roll-away modular consoles have shelves which adjust in 1-inch increments and sliding pullouts to provide added working space and ease of maintenance. Their modular editing consoles are specifically designed for ENG/TV equipment. Winsted also manufactures videotape and film storage systems.

**World Video, Inc.** introduced their new RGB CR-6220 1080 resolution and NTSC monitor. A full line of broadcast and CTV monitors is also available, including an AC/DC portable ENG monitor with battery pack, which weighs only 21 lbs.

**Ron Whittaker**

**ADDA Corp.** was formed last year by two ex-CVS execs, Bob Hendershot and Mike Tallent. Their goal was to produce an electronic slide device for TV stations and they came to ADDA with a prototype ESP-100, a device that uses magnetic disc packs to store 200 frames on line with a maximum capacity of 32,000 frames. This unit is a middle management device.

Continued on page 48

# Something to build on -

## Add Audio Distribution

to your  
**5900 Package.**



Series 5900  
Modular Broadcast Distribution Equipment

## A few of the other Building Blocks...

- **DA-5960A Video Distribution Amplifier** module provides six DC coupled outputs from one differential high-impedance looping input. Frequency response flat  $\pm 0.1$  dB to 10 MHz, less than  $0.1^\circ$  differential phase and 0.2% differential gain.
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- **PD-5941A Regenerative Pulse Distribution Amplifier** module provides six DC coupled outputs from one high-impedance looping input. Outputs divided into three groups of two outputs with independent level controls for each group.
- **PD-5942A Regenerative Pulse Delay Distribution Amplifier** module provides six DC coupled outputs from one high-impedance looping input. Delay is adjustable over 0.35 to 4 microsecond range. Outputs are divided into two groups of three with independent delay and level front panel controls for each group.

The DYNAIR Series 5900 Modular Broadcast Distribution equipment is state-of-the-art in design, tops in reliability, and offers performance expected by the broadcaster.

Write or call for additional information and for the name of the broadcast dealer in your area who handles this family of products.



The AD-5980A Audio Distribution Amplifier adds audio distribution to the Series 5900 family. Six outputs are derived from one high-impedance bridging input with 60-dB common mode rejection. Features include +24-dBm output for plenty of headroom, flat response to 20 kHz, -80 dB s/n, +22-dB gain, and 0.15% maximum distortion.

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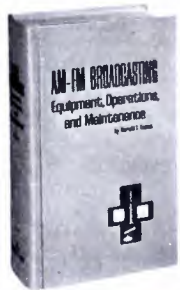
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## NAB Video

Continued from page 46

and up competitor to the Ampex ESS. Its base price is \$63,800 and it can be upgraded for more storage with \$23,000 added on. Jesse Blount, ADDA's Marketing Vice President, claimed that stations spend an average of \$60,000 per year on slide production and handling and could save two-thirds of that with the ESP-10. The unit has two full framestores as buffers, uses four times subcarrier for image quality and provides 12 dB of S/N ratio improvement. As a result, it can be used as a production tool as well as a replacement for the studio's slide chain.

Andrew Corporation's major innovation this year was a new low loss Heliac cable which has an improved moisture barrier and a special foam dielectric that provides very efficient signal transmission characteristics. This new LDF series of Heliac cables come in both 1/2-inch and 7/8-inch diameters and come with self-flaring assemblies. The VSWR is very low right up to the cable cut off frequency. Andrew also showed some of their other standard products in the Rigid Lines, STL Microwave Antenna Systems and Earth Station Antennas.

Anixter-Mark, manufacturers of a full line of point-to-point antennas, exhibited antennas for 5.9-13.25 GHz and 350-2700 MHz. The first model has a unique back frame that helps the antenna withstand winds up to 125 mph and one inch of radial ice. It's a low profile dish that features continuous polarization and is pressureable to 10 PSI.

The 350-2700 MHz model uses three-point mounting that reduces path alignment and installation time. Ringbacks further improve its already extremely low wind loading characteristics.

The Besten Electronics Company showed their line of automatic light controls for large image cameras and film chains and their character generators with eight pages of memory. BEI products are used by broadcast and cable companies for airing films or other graphic messages without operator control of light levels and maintains good color balance with tight hue toler-

ances in a 100:1 light level change. They are also the new manufacturers of the KSN Character Generator which is called the model CG-10. It sells for a base of \$3,200 with options for added memory (\$1,000) and audio interface at \$650.

Bogner was certainly visible at the convention. Aside from their own booth, they were exhibiting antennas through the CCA, M.C.E.E. and Comark booths. Wil Bogner has been heavily involved with the TV CP antenna, they also showed FM CP antennas, as well as low and medium power VHF and UHF antennas and translator antennas.

One of Bogner's latest introductions is their TV emergency antennas that can be ordered out of stock. These antennas will handle up to 500 kW on any UHF channel.

Boston Insulated's booth this year featured TV cable and connectors for color broadcast cameras.

The CECO display included a wide array of electron tubes for transmitters and TV cameras. David Gilden, their manager from Brooklyn, explained that one of the new areas his company had gotten into was a very complete line of new camera tubes and that they also handle the specialized high power transmitting tubes made by such well-known suppliers as Amperex, Eimac, RCA and EG. CECO pride themselves in being the sole source distributor for a large variety of electron tubes, Gilden said.

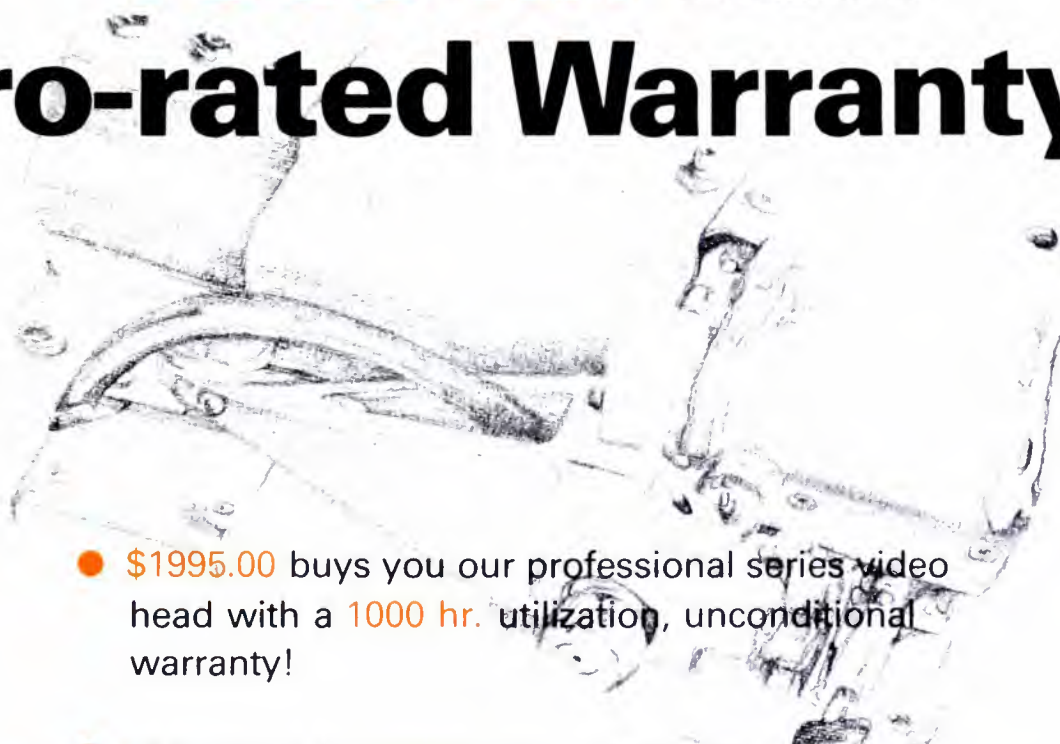
The Central Dynamics Ltd. booth featured an air feed from WTTG in Washington, a local station equipped with one of their station automation systems. Coupled to this was a video feed that displayed on a monitor the "events stack" of the actual station operation showing the timing and sequence of the automated events about to appear on air.

In the product area, the OB exhibit centered on their large production switcher which is capable of a large variety of effects including digital interfacing. The switcher on display was on its way to WGBH in Boston where its projected use will be on the Boston Pops series, as well as in standard studio operations.

Continued on page 50

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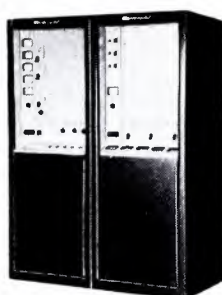
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## NAB Video

Continued from page 48

Gene Leonard, **Chyron** president, spent most of his booth duty showing the latest wrinkle in character generators which has been added to their system, animated graphics. The new technique allows the generation of cartoon figures or other pictorial graphics that can move and even interact with informational or humorous results. One such cartoon sequence on display was a caricature of Ford and Carter which whenever the figures collided on the screen a large "OUCH" was displayed. Also, weather reports could be animated with cloud figures that rained or sunshine that beamed. Leonard was very pleased with booth traffic and interest shown in the overall Chyron product line as well as the innovations.

**Colorado Video's** star was their model 260 video compressor. This has a real time video output for monitoring the sampling process.

Colorado Video got into the act on video special effects. The company displayed an interesting video color synthesizer. Colorado Video also displayed narrowband video equipment for TV remotes or FM/SCA picture transmission.

**Computer Image** was hitting well with the Hilton Hotel crowd. They featured five-bus switchers they claim can compare with seven-bus switchers. The key—no pun intended—is the video controller's hybrid format which allows full use of all buses, compared to other formats that functionally disable up to two buses. Meanwhile, Computer Image **does** offer a seven-bus switcher.

Their five-bus model has a full load of features, such as 100 effects, quad-split generator, Rho-terry wipe, shadow generator, etc. It also has image compression. It's a tough competitor, and it can be computer interfaced.

**Convergence Corp.** had two new additions to their line of pulse count editors on display. Their most unusual new product was a device which John Campbell, their Marketing Manager, claimed would do for audio editing what the joystick did for video. It is an audio time base corrector called "Lip Lock" and it makes intelligible the

normally unusable audio that comes from tape shuttling at very fast or very slow speeds.

Convergence has also put in half-time mode on their editing consoles which cuts cue and prep times, thus adding many more cues in a typical day of operation. Campbell said they were deluged with traffic and that distributors had ordered more than 50 packages of their products.

**Conrac** is usually more visible than the many exhibitor booths that add their own compact and attractive display area. This year was no different as dozens of Conrac monitors were distributed throughout the three exhibition locations. In their own booth they were showing production versions of monitors introduced at NAB 87. Their highest resolution monitor, the 5722, goes into a 10 3/4" mounting spacing and uses 14 mil spacing between picture tube phosphor dots. This renders up to 700 lines of resolution for critical color monitoring applications.

In the cost effective area, **Fink** explained that they have added a 5300 series using a dual conventional shadow mask tube with 24-26 mil spacing at \$2800. For master monitor applications, the 19" 6000 series with 17 mil center spacing gives higher than normal resolution and freedom from moiré on both 525 and 625 line color systems. All of their color monitors use matched phosphors, a traditional Conrac feature.

The company also displayed monochrome monitors for telecine, data display and general monitoring purposes. Fink also confirmed a very healthy business climate and good booth traffic.

If TV video sweep generators turn your head, you'd have enjoyed the **Datatek** booth. They put their emphasis on the D-629 and D-630A.

The D-629 provides sync and blanking inputs to generate a composite video sweep signal synchronous with station pulses. It is used to route video sweep throughout the plant to monitor system frequency response. It includes markers at 1 and 5 MHz intervals, and a separate marker for color subcarrier.

**Di-Tech, Inc.**, was busy showing

Continued on page 50

# Advanced Leitch design creates the flexible color black switching system.



Genlock Select  
and Remote  
Phasing Panel



Color Black  
Manual Assignment Panel



GVS-483  
Genlock Video Selector



CSA-410  
Sync Assignment Switcher

Leitch Video engineers have designed a series of components that bring reliability and flexibility to any switching system. Every unit fits into a standard rack allowing complete interchangeability for any number of design applications. While specifically designed for color black distribution to slave sync generators or drive decoders, other applications can be accommodated.

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## South-West: Mr. Gene Sudduth

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# AM-FM Convention Review

By Peter Burk  
and Dennis Ciapura



As we walked into the small ground floor entrance area, we caught sight of the first group of vertical pilgrims, resplendent in their convention garb and warming up their best convention rhetoric. We immediately felt a certain warmth for and from the group as we paced off an ever-tightening circle, secure in the knowledge that these were our comrades, here, like us, to experience new things.

Yes, we were really here at last. Then, after what seemed like an interminable wait, it came. What we all had hoped was inevitable really was, and while we watch the door open and the cavity disgorge its precious cargo, everyone who had waited so patiently knew for certain that this was it....Elevator '77.

Broadcasters interested in their studio image could find some of the smartest cabinetry around at the **AMCO** booth. AMCO features a line of cabinets that accommodate the user with a variety of trim and color combinations so that each installation has a customized appearance.

**Alford** brought its new Twin-Z circularly polarized TV antenna to the show, complete with an antenna expert to answer any questions. Lots of data was also available for ITFS, MDS, and FM installations.

One of the interesting devices demonstrated at the **Ampro** display this year was the Monomax Stereo Phase Corrector. Ampro also demonstrated the company's console line, which now includes both

standard VU and LED peak indicators, and the Ampro line of cart gear.

At the **Audio Designs** booth, broadcasters with an eye for audio gear could admire the company's  $\frac{1}{3}$  octave real time spectrum analyzer, check out two custom TV consoles and be among the first to see the Audio Designs studio intercom system just introduced at NAB '77.

**Auditronics** brought its grandson to the show...Granson console that is. The nifty little production board can be had with up to 18 inputs and full E.Q. on every channel. Auditronics' consoles also feature the company's own custom attenuators.

The center of attention at the **Automated Processes** booth this year was the company's super demonstration board chuck full of a complete array of console modules to perform every conceivable function. Interested broadcasters also got a close look at the 7000 series distribution amplifiers.

**Automation Electronics** exhibited their total radio automation system. It's called "Autotron," and it's one of the most complete automation paperwork systems on the market.

The Autotron is truly automatic, handling scheduling, analyzing, logging, billing, and bookkeeping. The Autotron also can handle program control and ATS supervision.

Autotron utilizes the Honeywell Level 6 mini computer, which allows multi-terminal and multi-station usage.

High speed broadcast data pro-

cessing was the name of the game at **BCS/KAMAN**. The BCS 100 system was demonstrated and drew lots of attention. Intended for large single stations or multiple small stations, the BCS 100 could be just what some NAB shoppers were looking for.

**Belar** showed enough new products to keep anyone busy. The new FMS-2 Stereo Monitor with auto-ranging, the FMM-3 Digital Band-band Monitor with LED readouts and a new AM Frequency Monitor were a few of the new offerings. The **ATS** Modulation Controller was demonstrated, too.

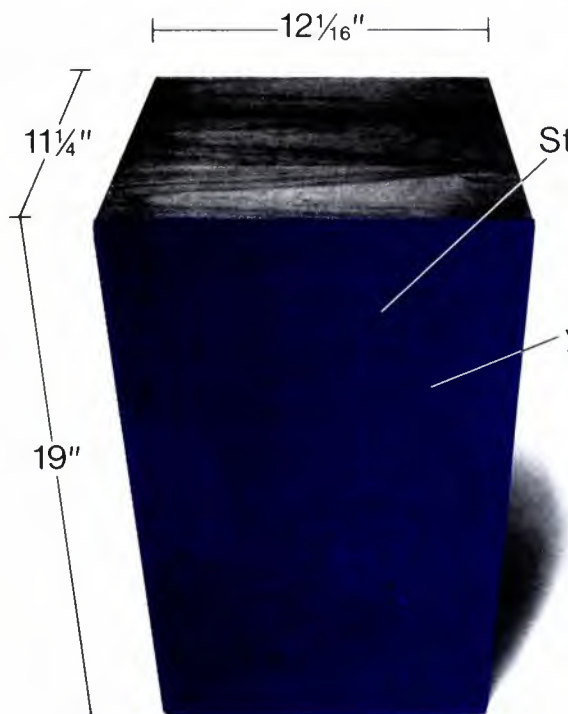
**CCA** had lots of new gear at the show this year including an optional ATS system, a CCA/Optimod audio processor for its new "E" line of exciters and a 55 Watt FM featuring two complete 27,000 Watt FM transmitters. CCA also introduced a new compact AM limiter at this year's show.

**CSI**, which has been quite successful in the Canadian Broadcast market, displayed a comprehensive line of AM and FM broadcast transmitters at the show and had plenty of people on hand to explain the innovative CSI designs. The company also manufactures a line of low power and carrier current broadcast equipment.

New colors and panel designs highlighted the **Cetec** panarama broadcast products at NAB '77. A 1 kW all solid state AM rig and the Schafer Model 903E Automation

*Continued on page 53*

# Now there's a JBL monitor specially designed for broadcast studios.



Fits on EIA  
Standard Rack shelf.

Does your monitor  
tell you about turn-  
table rumble and  
ambient noise (like  
your air conditioning)  
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The JBL 4301 will.

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If you're the station engineer or the jock on duty, why should you be the last to know what sound you're putting out?

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Among other good things, the 4301 has exceptional clarity, solid bass, open high frequency reproduction and a nice honest face.

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Title

Station

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City  State  Zip

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## AM-FM Review

Continued from page 52

System as well as a triple stack cart system all attracted interested broadcasters. Cetec gave AM stereo demos daily.

**Continental** proudly announced its 107th 50 kW AM Broadcast Transmitter and displayed the well-known "see through" 317C. Solid State Overload protection is new for this year as well as possible association with **Telcomex**, a Canadian

company in the business of making ATS gear. A Telcomex ACS-1000 system was demonstrated at the Continental booth.

**Cox Data Services** made a hit with its demonstration of the Cox business system for broadcast. The system handles every step from scheduling to billing, complete with an eight level priority system and demographic data to assist the guys in sales with their research.

Custom consoles were the order of the day at the **Robins** booth. A

standard broadcast module and unique Robins slide pot systems combine to make the latest line of Robins audio gear an eye opener for broadcasters looking for custom audio gear.

**Data Communications Corporation** was pleased to tell visitors about the 160 happy clients that are enjoying the field proven Total Automation Business System that they demonstrated at the show. The people at the show say the system is even suitable for small markets.

**Delta Electronics** featured its line of instrumentation and some ATS equipment as well. An operational demonstration of the Delta AMC-1 Amplitude Modulation Controller and APC-1 Automatic Power Controller kept Delta closed loop NAB broadcast standards right on target.

**Dolby** came to this year's show with news of 160 client stations under its belt and 46 receiver tuners equipped with Dolby encoding. The now famous model 161 FM broadcast unit was displayed with Dolby folks on hand to answer any questions.

A new audio cassette system for broadcast application was one of the stars of the **Edco Products** booth. The CA-77 cassette system even provides slow motion editing. In addition to its line of Rapidair cart equipment, Edco also showed the new Edvue low cost video switching system.

The ATC 100 Automatic Transmission System with a CRT readout attracted lots of attention at the **Eric Small & Associates** booth. The peak level meter conforming to the worldwide ERU standard was also demonstrated in a comparison with a standard VU meter to show the advantages of the peak reading devices.

**Gotham Audio** was on hand with its line of high quality audio products and a live demonstration of the Telefunken Noise Reduction System. A tape was fed into a unit that added hum & noise in enough proportions to reduce the S/N ratio to a horrible 25 dB. Then the Telefunken system was used to clean it up.

New colors and new equipment made the **Harris** display a fun spot to visit. Among the many new items

Continued on page 53

# From now on, all other multi-cart machines are out of date.



## Beaucart 4D.

Even if you've just purchased a multi-slot broadcast audio cartridge reproducer, you're already behind the times. Because Beaucart has introduced a revolutionary four-slot machine with features so advanced that existing units can't come close.

While standard 3-deck machines use a single motor and power supply to drive three carts, the Beaucart 4D is really four completely independent cart reproducers in one housing. Not only are key operating specs, like wow and flutter, easier to uniformly maintain, but the failure of an operating component will put only one slot out of service. Each machine may be individually removed from the 4D housing, leaving the other three still on the air. Try that with a 3-deck!

Other features? Dozens. 4D is the only multi-slot machine with the new, patented Beau pancake hysteresis-synchronous motor. This guarantees the quietest and coolest machine in the industry. And fast forward is available in any (or every) slot.

Let us tell you more about the exciting Beaucart 4D. Models available in stereo and with built-in recorders. Call today.

# UMC

BEAUCART DIVISION  
UMC ELECTRONICS CO.

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For More Details Circle (49) on Reply Card

# OPTIMOD FM:

## It's the only way to go!

If you demand uncompromised modulation control and natural, accurate, transparent audio quality, then Optimod-FM stands alone. Optimod is a *system*: compressor, limiter, and stereo generator are combined in one package. We have reduced loudness-robbing overshoots in the audio lowpass filters before the stereo generator to less than 3%. Unlike some new competing limiters which apply first-order correction and then claim that they have dealt with the overshoot problem, Optimod offers *absolute* modulation control that works with *all* program material.

Because of this control, we can apply optimum amounts of clipping without worrying about the overshoots usually produced. The amount of clipping is constantly monitored and controlled so that it never produces audible distortion. In contrast with ultra-fast attack time limiters now appearing, Optimod sounds solid and natural without

the shaky, unnaturally modulated quality that ultra-fast attack times give to program dynamics. And Optimod's steady-state system THD is astonishingly low: in *operate* mode it's typically below 0.05% midband, and 0.15% even at 50 Hz. The sophistication of the engineering and the attention to subtle psychoacoustical details in the processing makes Optimod's output sound exactly like its input for most program material. Optimod can be listened to for hours without fatigue, and can be an important factor in your station's quarter-hour maintenance ratings.

Find out more reasons why the original is still the greatest: **call (800) 227-4068 toll-free** for literature and applications information.

**urban / broadcast**

# Optimod delivers!

OPTIMOD-FM is an FM signal processing system that delivers a brighter, cleaner, louder sound. And that can deliver lots of things to you: dollars from quality or coverage-conscious advertisers... greater effective coverage because of your louder signal... increases in quarter-hour maintenance because OPTIMOD-FM's clean sound virtually eliminates listener fatigue... and state-of-the-art audio that stands up to the quality of major group and network stations, enough of whom have already bought OPTIMOD-FM to establish it as the new industry standard.

OPTIMOD-FM breaks through the performance limitations of conventional equipment by combining compressor, limiter, and stereo generator in a single package. It's fully FCC-approved, and works ideally with almost any FM exciter or STL. Delivery is fast... and your engineering staff will love the quick, easy installation.

At \$3195, OPTIMOD-FM is the most cost-effective way we know to improve your air sound. Available through selected dealers. Call us toll-free **(800) 227-4068\***... we'll help you arrange a very special delivery.

**urban / broadcast**

Eric Small & Associates, Marketing and Sales Agent  
680 Beach Street, Suite 315, San Francisco, CA 94109  
\* In California (415) 441-0666



Orban/Broadcast products are manufactured by Orban Associates, San Francisco, CA

For More Details Circle (37) on Reply Card

## AM-FM Review

Continued from page 54

at NAB '77 were an operational ATS system, the MS-15 synthesized exciter, MSP-100 Signal Processor and "K" line of transmitters. The MSP-100 appeared to attract much of the attention from a processing conscious crowd.

**IGM** stopped many broadcasters with its Magna Carta 1000 cart capacity multiple play cart machine. The system contains eight playback decks and a micro-processor to remember where everything is and a CRT readout to show the status of any cart programmed to play on any of the eight tables.

**I.T.C.** conducted an interesting bit of market research as it invited comments on a prototype of a new 1000 cart system called "The 1K System." A digital countdown system that even tells which cut is playing on a cart was also demonstrated along with an eraser/splice finder and the 750 Series Tape Decks.

**Jampro** was on hand with all the latest information on FM antenna

pattern optimization and had a few antennas for signal conscious broadcasters to inspect.

Although they made their first NAB appearance this season, the folks at **Kay Industries** have been making phase control equipment for broadcast transmitter power supplies for over 20 years. On display at Kay was the Phase-master, a unit that converts single phase inputs to three phase.

Guaranteed lightning protection was the theme of the **Lightning Elimination Associates** booth which featured a miniature lightning demonstration to show how lightning can be prevented by a dissipation array. L.E.A. power line and phone line surge eliminators were on display, too.

**3M Company** introduced a rugged video cassette intended for ENG application. Called the Umatic, the device is designed to endure the slings and arrows of outrageous field use. Also new is the 8250 high audio output videotape, which is expected to replace 420 as the industry standard.

**Micmix Audio Products** demon-

strated an interesting special effect generator and a new digital Meter. The digital meter made debut at this year's show with features fully digital computation level relative to an adjustable reference level and LED readouts.

**Microprobe** demonstrated their model 100-A automation programmer. The 100-A will handle 20 events and can be used as a semi-automatic or fully automatic tape machine controller.

The **Orban** display provided a line comparison of the Optimo with and without 25 usec. De FM, and the original program input. The demonstration proved the Optimo's compatibility with Dolby and fidelity of reproduction. Bob Orban himself was busy having a sneak preview of the Optimo now in the works.

**Pacific Recorders** enjoyed lots of action at the show and one of the main attractions seemed to be a unique digitally controlled console. Any module in the board can be digitally programmed to perform any function and it worked as well.

Continued on page 56



## - SYMBOL OF PROFESSIONAL TAPE HEADS

MMI Replacement Heads are professional heads — designed for the machines they will be used with — direct retro-fits, both mechanically and electrically — not modified or adapted heads originally intended for "home" or "semi-pro" recorders. But there is more to MMI Heads than their professional performance: An all-metal face that virtually eliminates oxide loading ... More than twice the gap depth-of-metal of some original equipment heads, thus permitting relapping (under normal head wear) for greatly extended head life ... Individual testing and calibrating of each head to insure meeting or exceeding original equipment specifications ... MMI has 1/4-inch tape heads for Ampex, ITC, Magnecord, Revox A-77, and Scully. Professional heads for professional recorders — from MMI.

ALSO FROM MMI  
(PROFESSIONALLY, OF COURSE) ...

- REPLACEMENT AUDIO HEADS FOR AMPEX VR-1100, 1200 & 2000 VIDEO RECORDERS (Relapping and refinishing of the complete columns, too)
- HEAD ASSEMBLY REFURBISHMENT AND REBUILDING (Loaner Assemblies available for only the shipping costs)
- HEAD RELAPPING AND REFINISHING (No-Charge head evaluation)

**NEW! MMI HAS HEADS FOR CART MACHINES!**



8125 PLEASANT AVE SO

MINNEAPOLIS, MINN 55420

(612) 884-7393

For More Details Circle (38) on Reply Card

# Tune-up, Preset and Change Scenes. In Real Time.

The Series 20A offers great flexibility in theatre sound mixing, television production, and concert sound reproduction.

The Series 20A is totally modular. That means you can have custom convenience at off-the-shelf prices. Because modularity lets you purchase only the modules you need. As your needs expand, you simply plug in more modules. And you can customize the arrangement for a particular show. Just plug the modules into any position on the chassis. No tools required.

The Series 20A simplifies your real time operation by allowing you to predetermine program content and distribution. Designed with human engineering in mind, the following features are provided.

- 4 chassis/enclosure sizes: 2½' with 21 module positions, 4' with 31, 5' with 39, and 6' with 47 positions.

- Up to 37 input channels, each switch selectable for mic and line level signals. Optional switching modules for selection of up to 48 additional remote inputs.
- Presettable (mute) circuit for each of four independent pre-sets. Any input can be assigned to any combination of the four muting circuits. Allows instantaneous changeover from one "scene" to another.
- Two complete foldback buses having level and switching controls at each input, with sub master controls.
- 3-Knob equalization on every input channel—with boost or cut.
- Unique datacable and roadmap configuration to interconnect Cetec's all solid-state printed circuits. Straightforward design provides simple plug-in module positioning.

For further information, contact Cetec Audio

A division of Cetec Corporation.

13035 Saticoy Street

No. Hollywood, CA 91605

Phone: (213) 875-1900 TWX: 9104992669

A division of Cetec Systems LTD.

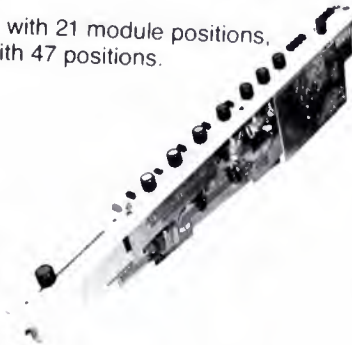
U.K. Sapphire House, 16 Uxbridge Rd., Ealing,

London W52BP

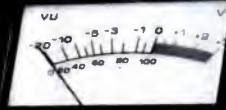
Phone: 01-579-9145 Telex: 837329

For More Details Circle (39) on Reply Card

**Cetec**  
**audio**  
For the educated ear.



1



2



3



4





## **Edit Code Reader And Video Display \$1500**

**BTX 4300** reads time code at play speed down to -15 dBm and generates 7 by 9 dot matrix characters for a full "in video" display.

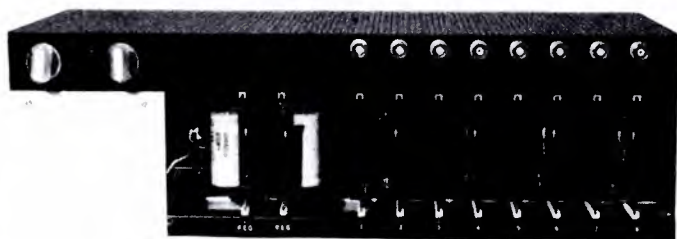
Use with economical helical editing systems or as an on-line display when recording or playing back video material. May be driven from 1/10 to 80 times play speed by the BTX 4400 Edit Code Decoder.

The BTX 4300, like BTX comparators, readers, decoders, remote digital displays and code generators, is a sensible building block which easily interfaces with, and improves the performance of any editing system at minimum cost. For complete information circle reader service card or

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



For More Details Circle (40) on Reply Card



Two units 10" rack space

## **COMPLETE VIDEO AND PULSE PACKAGE DESIGNED FOR COLOR BROADCASTING**

||||||| \$1,200.00 |||||

8-video amps. (8 input 40 outputs)

6-pulse amps. (6 input 30 outputs)

2-sub-carrier (2 input 10 outputs)

Complete with custom card cage  
regulated power supplies tested  
and ready for shipment.

Available only per this advs. Send orders to:

### **TELE-TEC**

8688 ROYAL DRIVE  
NOBLESVILLE, INDIANA 46060

For More Details Circle (41) on Reply Card

## **AM-FM Review**

*Continued from page 56*

as it looked. Another new unit from Pacific was the Multimax third band, low distortion AGC amp.

The BAT 1750 system was the star of the **Paperwork System** booth. The automatic scheduling features and a 2,000 line per minute printer made quite an impression on interested broadcasters at the show.

Along with its well-known line of field intensity instruments, **Potomac Instruments** demonstrated for the first time its new AT-51 Audio Test System. The compact system measures harmonic distortion, total distortion, volts, dB, S+N/N, wow & flutter, stereo phasing and differential gain.

**Rupert Neve** fans had ample cause for joy as Neve showed his new model 5305 console for radio. Available with 12 to 32 inputs, the sturdy mechanical construction and state of the art electronics made an impressive showing. The company's line of distribution amplifiers completed the display.

The latest development from the folks at **S.M.C.** was demonstrated at the show. S.M.C.'s PDC-4 is said by the company to be the first clock capable of directing an automatic system to a specific step. The micro-processor staffed unit can handle a full week of timed instructions and features a CRT readout.

**Sansui** treated its visitors to a demonstration of quadraphonic sound Sansui style. The QS system performed impressively, yielding some very good reproduction with excellent front to back separation.

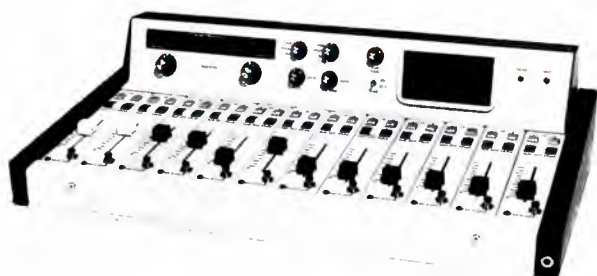
One of the interesting components shown by **Stanton Magnetic** this year was a stylus wear gauge that measures actual stylus wear time in 100 hour increments up to 1,000 hours. The Stanton booth did, of course, also provide auditioning facilities for the company's line of high quality phono and headphone gear.

**Studer** proudly displayed its new B67 1/4-inch tape deck which the company has priced within the reach of most broadcasters in the hope of increasing the company's market penetration in this country. The Studer portable mixer was also on display and generated lots of interest.

*Continued on page 60*

# Ramko stole the show

## with the most advanced trouble-free broadcast consoles in history!



**DC-12**

### FEATURES OF NEW DC-12 SERIES CONSOLES

- Remote controlled rack mount audio electronics. All solid state audio routing and attenuation. Completely DC controlled.
- Dual channel
- Plug in mixer/switching modules allow up to 12 channels on standard models
- Up to 20 channels with extender electronics
- 2 inputs per mixer
- Quiet, lighted push buttons
- Tone generator built in
- Duo-Q Two points of cue initiation. The standard full off mixer position and the lighted push on push off switch located just below each mixer. Thus the mixing pot may be left in the mixing position and still cue via the switch below
- Minimum 5 million operations on mixer controls
- Minimum 5 million operations on input and output select switches
- Talk back thru cue system
- Solid state balanced in and balanced out
- Zero tracking error on stereo consoles via Ramko's exclusive time shared attenuators
- All plug in electronics
- Patch panel programmable cue and monitor mute
- AC line filtering built in
- Lightning fast interior access
- Patch panel gain select on all inputs. All inputs may be made to accept anything from mic thru high level
- Interchangeable, colored push button caps
- 4 year warranty on all consoles
- 2 week free trial on all standard models
- Simulcast output and metering on all stereo models

Pricing from

**\$3600<sup>00</sup> TO \$4400<sup>00</sup>**

(12 channel mono)

(12 channel stereo)

Will be lower if fewer channels are desired.



**DC-38**

### FEATURES OF NEW DC-38 SERIES CONSOLES

- Dual Channel
- 5, 8 & 10 mixer versions
- 4 inputs per mixer
- Alpha numeric readouts above each mixer
- Solid state meters
  - (a) 3 meters for stereo. Left, right and mono mix (simulcast). The left & right meters are switchable to Audition or Program. The mono mix meter is switchable to a special circuit for phase checks
- Duo-Q
  - (a) 2 points of cue initiation are provided. The standard full counter clockwise position on the channel mixer & right above on the output switching group. Thus the mixing pot may be left in the mixing position and still cue via the switch above
- Up to 20 million operation mixer controls
- Up to 20 million operation push button switches
- Talk back thru cue system
- Completely DC controlled. All solid state audio routing and attenuation
- Exclusive time shared attenuators provide ZERO tracking error on stereo consoles
- Solid state balanced in and balanced out
- Plug in electronics
- Patch panel programmable cue and mute
- Patch panel programmable cue and live mic flashing indicators on each channel
- AC line filtering built in. Suppresses both line transients and RF
- Lightning fast interior access. Total access in less than 15 seconds
- Patch panel gain select on all inputs. Each input may be made to accept any input from mic thru high level
- Interchangeable snap in legends on input and output select switches
- Interchangeable back lighted alpha numeric status indicators
- Optional digital clock and production timer
- Front panel Prog. & Aud. balance controls (stereo only)
- 4 year warranty on parts and labor
- 2 week free trial

Pricing from

**\$2400<sup>00</sup> TO \$4700<sup>00</sup>**

(5 mixer mono)

(10 mixer stereo)

## An Unconditional 4 Year Warranty

# RAMKO RESEARCH

11355-A Folsom Blvd / Rancho Cordova, California / 95670  
(916) 635-3600

For More Details Circle (50) on Reply Card



Daniel Lee, President, discussing Stylus Replacement Policy with Howard Williams, Chief Engineer and Ken Rasek, Audio Engineer.

## "Not the loudest sound in town, but the best quality" claims WXRT, Chicago, longtime Stanton user. . .

WXRT is a progressive rock, FM station, unique in many ways. Its whole operation, Administration, Sales, Engineering, Programming, Broadcasting, Transmitting (even the tower), is located in one place . . . an unusual set-up for a major market.

In a market crowded with as many radio stations as Chicagoland, the excellence of sound can make or break a station like WXRT . . . which plays no tapes . . . has no record commercials . . . and goes totally with disc-to-air and live copy.

Since WXRT uses no limiters or compression to magnify the level of their signal, their turntables and cartridges are crucial to their sound quality.

For over 10 years, the station has used the Stanton product in its turntables. Today, it even uses the 681 Triple-E for disc-to-air playback and, although this stylus was not designed for back-cueing, the engineers and announcers report no problem.

Leading radio stations around the nation depend on Stanton 681 Calibration series cartridges, because they offer improved tracking at all frequencies . . . they achieve perfectly flat frequency response to beyond 20 kHz. Its stylus assembly, even though miniaturized, possesses greater durability than had been thought possible to achieve.

Each 681 Triple-E is guaranteed to meet its specifications within exacting limits, and each one boasts the most meaningful warranty possible . . . an individual calibration test result comes with each unit.

Whether your usage involves recording, broadcasting or home entertainment, your choice should be the choice of the professionals . . . Stanton 681.

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



For More Details Circle (51) on Reply Card

## AM-FM Review

Continued from page 58

A tape deck featuring a quartz crystal, phase-locked loop speed control system was one of the advanced audio products found at the **Technics** booth this year. The model 1500 deck is brand new and should prove interesting to automated operations. High quality cassette decks and monitor speakers shared the limelight.

**Telex** showed off their headset line, including the TV cameraman's headset series designed to interface with existing Western Electric circuits. These headsets have options such as push-to-talk and a carbon boom mike.

For radio visionaries, the '77 convention was a smash. Radio broadcasters got a chance to see what AM stereo might sound like and what the hardware might look like. ATS systems, mostly prototypes, drew a lot of attention and multiple cartridge playback systems jumped from 24 or so shelves to over 1,000, again, in prototype form. It was clearly a chance to see what you might want to prepare your checkbook for next year.

Although many of the attention getters weren't in production form, there were still plenty of black boxes on display for the guys with open check books. Traffic through the exhibit areas was good, and many manufacturers reported heavier sales than they had anticipated at the show.

Wandering through the radio exhibits went something like this:

In the Sheraton Park, first stop off the escalator...**McMartin**, with a 55 kW FM transmitter up front and (for contrast) a small three watt RPU transmitter. **Moseley Associates** featured remote control systems for both big budgets and little ones...the new top end model including a color CRT display. A new three deck cart machine and new audio processors were in the limelight at **Broadcast Electronics**. Next door, the **Marti** people introduced a new 450 MHz receiver with sub-audible tone decoding and logic designed for mobile repeaters, and displayed other members of their RPU family.

**Telex's** dual side, binaural unit receives the intercom line and monitors the program line. They are professional headsets.

One of the broadcast computing and data systems that made a hit at the show was the **Trace Inc. V.I.V.** system. This system features an in-station mini-computer and magnetic disc interface to link the system with the station's program automation gear.

**The Widget Works**, which had already had its new Automatic Transmission System installed at WDBN, Medina, Ohio was a new company at the show this year, but reliable sources tell us that they build the CCA ATS system, too.

Dennis Ciapponi

**International Tapetronics** surprised a lot of people with an operating 1K cart machine. The "ITC computer" with floppy disk memory keeps track of all 1024 carts located in two drums and loads the carts called for into one of six playback decks...like a bionic jock.

**Utility Tower** was on hand as usual, right next to **Shure Brothers**, who pleased many with a nifty acoustical coupler for sending actualities down the phone line.

**Tektronix** was a hit again this year with the measurement theater demonstrating proof measurements with both audio and RF spectrum analyzers.

Two more 25 kW FM transmitters were on display...**American Electronic Labs** and **Collins Division (Rockwell International)**, who also showed a 5 kW AM transmitter with a switching type series modulator, coupled from the pulse board by (visionaries take note) a two foot length of fiber optics!

**Fidelipac** introduced "HOT" (high output transfer) tape with a claim of 6 dB greater output. Around the corner, **Microtrak** presented a news desk with space for all of the newsman's hardware including an Extender printer and a five channel mixer all built in.

**Revox** displayed some new audio equipment including an "Analogue Time Processor" from Klark-Teknik and a new graphic equalizer.

Continued on page 62

# OTARI MX-5050 the original (and still the best) compact professional recorder

Just over two years ago, Otari introduced a unique new product—the first truly professional recorder in a compact package—the MX-5050. Since then, the performance and reliability of this innovative new machine have been tested and proven in over a thousand critical professional applications—by broadcasters, recording studios, A/V departments, musicians, and semipro recordists worldwide. Universal acceptance and repeat orders by these satisfied customers tell this remarkable recorder's success story better than we can.



*Bias can be re-optimized in seconds.*

As you compare the MX-5050 with other recorders, keep this in mind. The MX-5050 is not a hi-fi machine with a few professional features added later as an afterthought. It was designed from the ground up based on Otari's 10 year experience as Japan's leading manufacturer of professional recorders and high speed duplicators. It is a full professional machine with the performance, features, and field proven reliability that you expect to find only in the larger professional recorders.

Here are some of the key reasons why the MX-5050 is the best compact recorder available today.

**Production Features:** Creative production is simplified with: Front panel edit to spill tape. Lift-up head cover to mark splices and clean heads. Built-in splicing block on head cover. Adjustable cue to defeat head lifters. Selective reproduce to add new tracks in perfect time synchronization. Two speed operation, 15 and 7½ or 7½ and 3¾ ips (field changeable in dc servo versions).

**Performance Features:** Headroom is 19 dBm, a full 15 dBm over the switch selectable fixed output of +4 dBm. This standard reference level output can be rear panel switched to -10 dBm to drive a PA system or power amplifier. S/N ratio is NAB weighted 69 dB full track, 68 dB half track, and 65 dB quarter track. Crosstalk is greater than 60 dB half track. Outputs are 600 ohm balanced (standard on half track) or unbalanced. Line input and output connectors are XLR.



**Operating Features:** Bias is front-panel continuously adjustable (not limited to fixed positions). With built-in test oscillator (not available on other compact professional recorders) bias can be optimized in seconds when changing tape. Record EQ and standard reference level are also front adjustable. Straight-line tape path simplifies threading. Capstan is located on back side of tape for improved tape life. An extra reproduce head is standard on all versions to allow playback of tapes in different formats. For pitch control and freedom from power line variations, an optional dc capstan servo is available with ±10% correction range.



*Easy threading; capstan on back side.*

**Versatility:** Available in full-track (with half-track reproduce capability standard), two-track, and quarter-track versions. Walnut case (standard), rugged portable road case, rack mounting adaptor, or floor console. Universal power supply standard. Low impedance input and output transformers and remote control also optional accessories.

See your nearest Otari dealer for the full story or contact Otari. And, if it's multichannel you need, ask about the standard-setting four and eight channel versions of the MX-5050.

## OTARI

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

Otari Electric Co., Ltd.  
4-29-18 Minami Ogikubo  
Suginami-ku, Tokyo 167, Japan  
(03) 333-9631 Telex: J26604

## AM-FM Review

Continued from page 60

**Eric Small & Associates** displayed their ATC-100 ATS/Remote Control System, their tower light monitoring system, and the PLM-2 peak program meter. The ATC-100 includes the capability of programming events weeks or months in advance.

**Soll, Incorporated** was busy detailing their design, fabrication, and installation capabilities for broadcast stations. They also manu-

facture custom RF switching systems.

**Technology Service Corporation** showed their turnkey weather radar systems. The weather radar picture is color coded to represent weather intensities. The map data is stored in a digital memory.

**Western Union Telegraph** set up a 10-foot dish behind the hotel and demonstrated what it's like to get a 15 kHz audio relay from their Westar satellite. It was dramatic evidence that satellites will become increasingly involved. The surprise

is that many figured it would saturate TV first. Not so. Radio will get the emphasis.

**Garner Industries** displayed their bulk tape eraser and high speed reel-to-reel tape duplicator (full and two-track audio).

**Consolidated Electronic Industries** unveiled their cartridge library automation system that handles from 500 to 2,500 carts, depending upon how many basic units are used. The system uses their own cuemaster 900 replay units. The system is loaded with options, and the basic library unit can be added to existing automation systems.

**United Research Lab** demonstrated a new amplifier to replace tired tube electronics in older reel-to-reel machines. In the next booth **Scully/Metrotech** spotlighted their entry into the automation market with the lower cost 250 series recorder and reproducer. **Telex** gave top billing to their new DC series driven cart machine, which they say runs cool enough that no ventilation is required.

**Belar** introduced several new monitors, but attracted the most attention with a stereo monitor that has two auto-ranging voltmeters to simplify stereo proof measurements. Two LED displays show the decibels while the analog meters indicate tenths of units...really a bromide for tired wrists.

**McCurdy Radio** demonstrated their 8500 series modular FM studio package which includes a new, easy to maintain console and all the ancillary control room goodies in matching cabinets. In the next booth, **Capitol Magnet Products** offered a high output cassette tape, Q-18.

**Bird Electronics** introduced a new RF monitoring system called the "Watcher" and displayed a new series of high-power RF loads with field replaceable resistors.

The Washington Hilton housed mostly television exhibitors, but several treats awaited the radio folks that shuttled their way over. Engineers had a chance to fondle the controls on the new **Ampe** \$6,000 audio recorder. About the only thing it won't do is take your picture.

Also at the Hilton, **RCA** showed a number of new radio products.

# The 3D



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

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

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



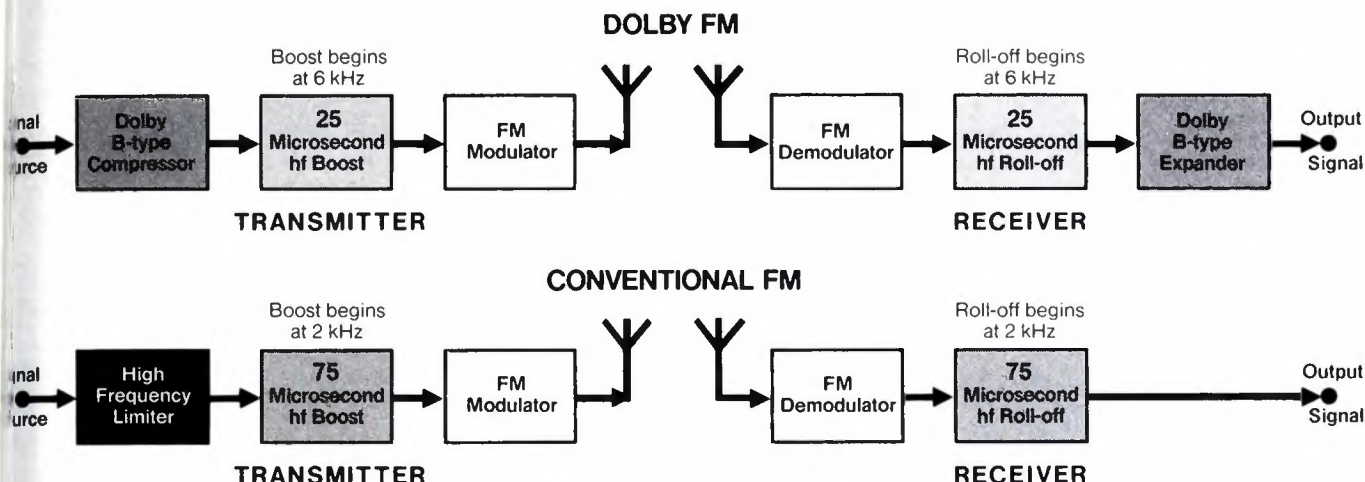
INTERNATIONAL TAPETRONICS CORPORATION

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# Dolby FM and Conventional FM

## Symmetry is the Difference



These block diagrams show the difference between Dolby FM and conventional 75 microsecond FM. The difference is symmetry. With Dolby FM, the circuits at the transmitter are matched by complementary circuits in the receiver. Such symmetry of signal handling has long been valued in disc and tape recording — and indeed in noise reduction systems. Unfortunately, in conventional FM broadcasting the standards were set so long ago (back in the 40's) that modern wide-range program material causes problems; high frequency limiting has to be used, and thus there is an extra process at the transmitter which is not matched by any complementary treatment in the receiver.

The Dolby B compression and ex-

pansion system is well known for its mathematically exact mirror-image operation; this is a key element in permitting FM stations and receivers to function in a symmetrical way. Here's how. First the conventional 75 microsecond high frequency boost and roll-off are reduced to the point where high frequency limiting is no longer required at the transmitter (this happens with a reduction to 25 microseconds, which gives a boost and cut beginning at about 6 kHz instead of 2 kHz). Unfortunately, this step is inherently accompanied by about a 5 dB increase in receiver noise. In the second step, however, the addition of the Dolby B system not only takes care of the additional noise but results in a noise level some 5 dB lower than conventional FM.

Thus, the overall effect is that about half of the 10 dB Dolby noise reduction capability is traded off for symmetrical signal handling. But, considering the two extremes of the dynamic range, there is still a genuine *total* increase of 10 dB in available dynamic range above about 3 kHz.

If you like the idea of a symmetrical FM system with reduced noise, then we invite you to write to us for further information. The following information is available:

1. Technical details and explanations of Dolby FM.
2. A list of stations with Dolby FM encoder units.
3. A list of receivers with built-in Dolby FM circuits.

### Listening to Dolby FM

Basically, listening to the improvement brought about by Dolby FM is like listening to any audio equipment improvement — such as those made to turntables, pickups, amplifiers, and speakers. A particular improvement in a component may well be there all the time, but its noticeability will depend on various factors, such as the listening environment or the type and quality of the program material.

In the same way, the overall Dolby FM listening improvement is subtle most of the time; occasionally, however, it will be quite obvious. It should be remembered that in FM the 10 dB action of the Dolby system is distributed nearly equally between the low-level noise and the high-level signals. The audibility of any change is therefore less obvious, and depends more on program material and other conditions, than the effect of the Dolby system on cassettes.

Relative to the hiss level of conventional broadcasting and reception, a somewhat (but not startlingly) reduced hiss will be

noticed by listeners with weak-signal reception conditions; listeners with a strong signal will note no change (as with conventional FM, the noise will be determined by the station's source material). Listeners in any reception area, though, will notice a full recovery of source material high-frequency dynamics, regardless of signal strength. On most stations, cymbal crashes and other program material containing high-level high-frequency components will sound distinctly brighter and cleaner. Otherwise, for those rare stations which conventionally hold down modulation in order to preserve high-frequency signal integrity, the introduction of Dolby encoding allows an increase in overall level by several dB. Of course, this increase will be apparent to all listeners, regardless of location and whether or not they have receivers equipped with Dolby FM circuits.

We think that critical listeners can hear and enjoy the various improvements described above often enough to make the extra cost of Dolby FM well worthwhile.

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S76/172

## AM-FM Review

Continued from page 62

including an all solid-state five and ten kilowatt transmitter. The new rig uses pulse width modulation and takes up about half the space as its predecessor.

**Phelps-Dodge** showed their FM antennas with **Storeel Corp.** next door displaying space-saving tape storage systems.

At the Shoreham, **Wilkinson Electronics** displayed a new 25 kW

dummy load in addition to their line of transmitters and accessories. **Time & Frequency Technology** demonstrated a new digital remote control system and a prototype ATS system.

In the next aisle, several consoles by **Ward-Beck Systems** drew attention, including a scaled-down version of the large recording console. **Nortronics** told the folks about a new wear-resistant head material and again offered their head replacing kit.

**Sintronic Corp.** introduced a kilowatt AM transmitter that's solid state, and incorporates some unique design features aimed at simplicity. **Electro-Voice** displayed their line of broadcast microphones.

**QEI Corp.** is marketing an ATS system for FM stations that they claim is compatible with all brands of transmitters. Their system fits somewhere near the low end of the ATS price scale, coming in at a little under three kilobucks. An ATS system is in the works.

**Sound Technology** again displayed the model 1710A distortion measurement system with an optional IM analyzer available. **UMI** displayed their line of cartridge tape equipment, and **David Lab Associates** offered a cassette copier. **MCI** showed their SMPTE tape lock system.

**Comrex** called attention to their booth with a one watt 450 MHz ENG microphone that's about the size of a flashlight. **Ramko Electronics** also grabbed their share of the crowd with several unique console designs. LEDs replace VU meters and, on one model, alpha-numeric readouts indicate the output assignment of each fader. Next door at **Audi-Cord**, the Mod-Quo was the feature attraction. It's a four transport cart unit with two power supplies and four independent tape decks.

Moving into the Ambassador Room at the Shoreham (after a pause to nurse those blisters) **Saunders** was demonstrating their C-1 broadcast encoder. They also had an AM stereo box in the booth, but because of a beat problem with the local station, they weren't able to demonstrate the system.

**Otari** introduced a new line of recorders, a 25 Hz decoder for automation, and a full track compact recorder that will accept 10 1/2 inch reels. **Nagra** gave the radio people a recorder similar to their model 4.2 but without sync. The "gull" (for economy) model has a built-in spare parts kit and a probe that converts the VU meter into a test meter. Clever, those Swiss.

Peter Bur

The editors of **Broadcast Engineering** wish to thank all those interviewed at NAB. It was their cooperation that made these reports possible.

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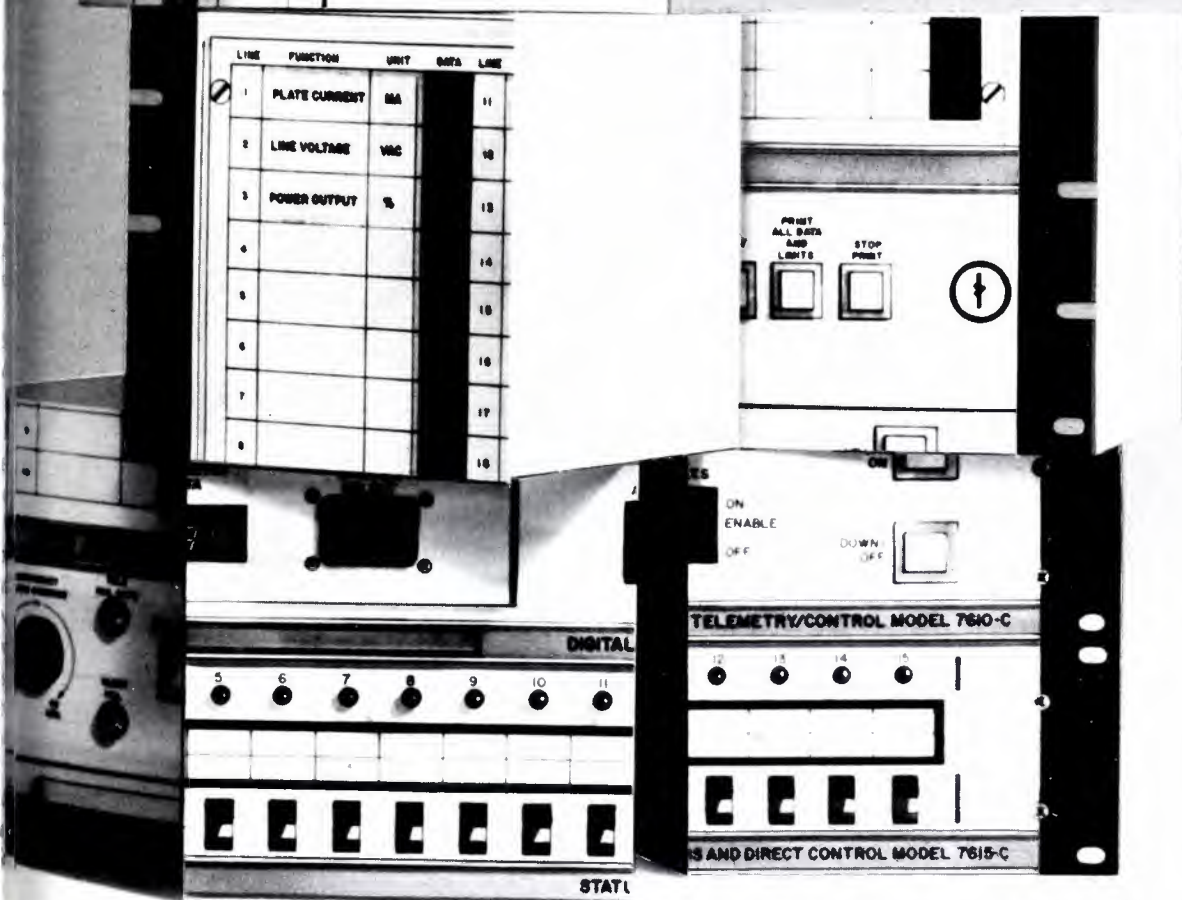
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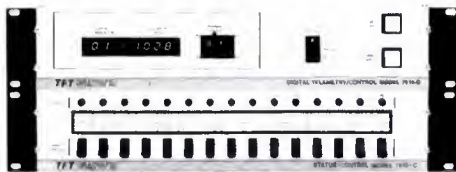
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# Montreux '77

## THE TENTH ANNIVERSARY

By Joe Roizen

The new Exhibition Hall in Montreux uses Corten steel as the outside shell of the building. This U.S. development has two advantages: it will oxidize naturally and give a rich brown finish; and it is easy to put in temporary holes for camera or power cables. (Photos by Donna Foster Roizen)

The International Television Symposium and Equipment Exhibition that will take place in Montreux, Switzerland between June 3rd and 10th of this year has grown to be the world's largest event of its

kind. It brings together more than 3,000 technical experts from every corner of the globe to participate in a symposium covering all aspects of television technology and to

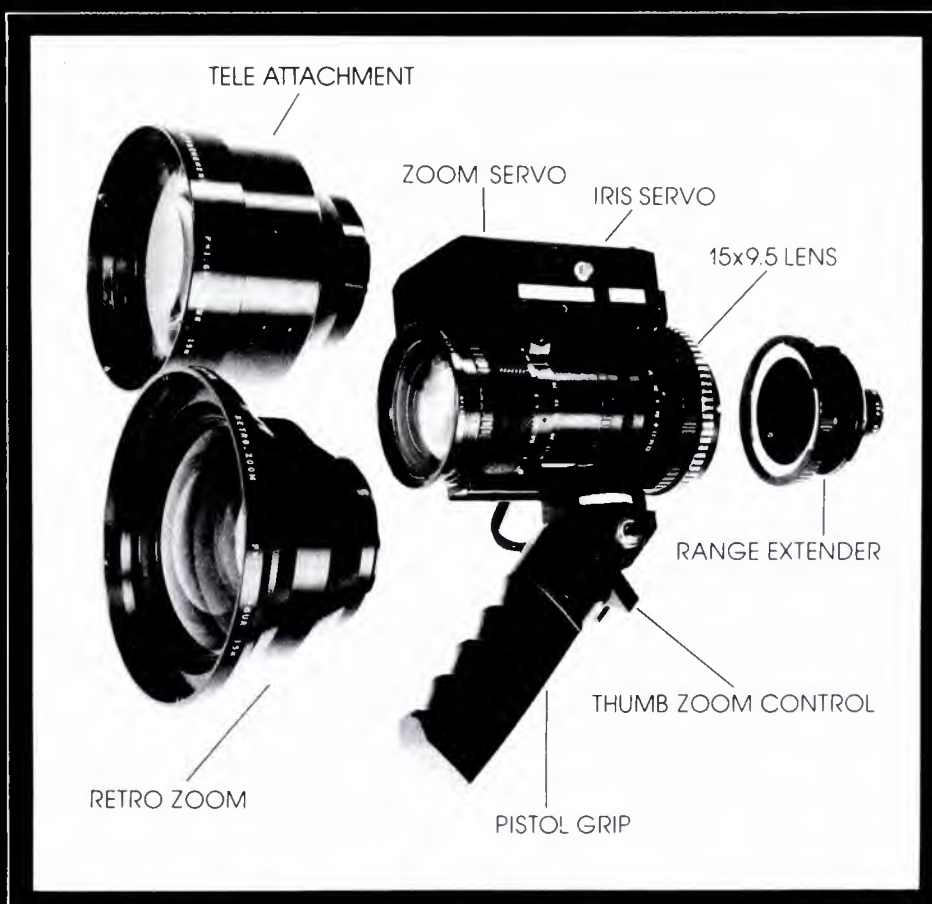
*Continued on page 11*



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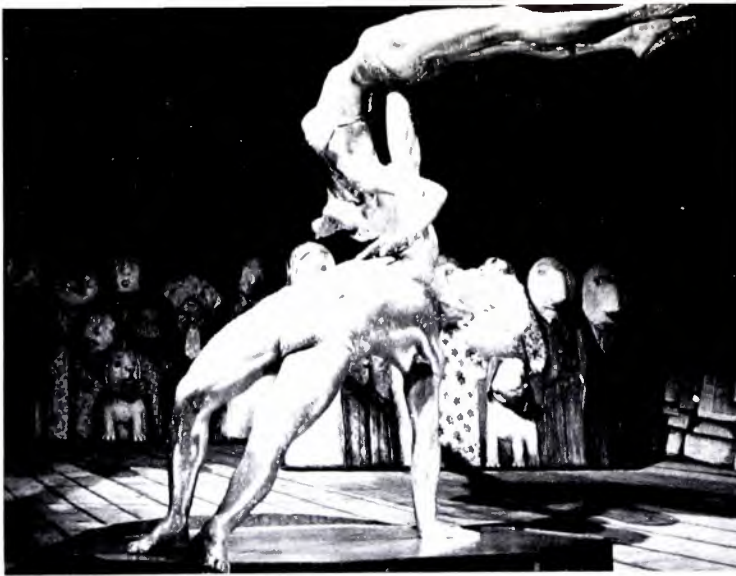


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Montreux exhibitors are not constrained from putting on lavish or spectacular shows. This is a pair of gilded and spangled Adio dancers who put on a graceful performance on a rotating platform. As you can imagine, this show put on in the Thomson CSF area attracted large crowds.

## Montreux '77

Continued from page 66

the products of more than 120 exhibitors who make the varied hardware that serves this field.

This year's program will begin with a general meeting at the new Casino where the delegates will hear presentations on the major television events that have taken place recently. The Olympic Games in Innsbruck and Montreal, the technical progress of TV organizations like the European Broadcasting Union (EBU), the Asian Broadcasting Union (ABU), the Organization for Radio and Television of Eastern Europe (OIRT), and the SMPTE. There will also be an invited lecture on the "Role and Social Responsibility of Television."

The real heart of the Symposium is the spate of papers by cognizant authorities on TV Systems, Electronic and Film Pick Up, Editing Accessories, Digital Video and Automation, Terrestrial Links, Satellite Communications, Digital Techniques in TV Transmission, and CATV. Five days of concentrated information in parallel sessions; the mornings devoted to invited papers or others of fundamental interest and the afternoons dealing with specific equipment details, but related to the day's major theme or topic.

Perhaps the most interesting aspect of the Symposium is the Round Table Conference format which proved so popular at the last Symposium in 1975. This is a

dialogue that is generated by an invited blue-ribbon panel of users (network and TV studio representatives) and manufacturers of the major TV hardware like Ampex, Marconi, Philips, RCA, Thomson-CSF, etc. The audience, which last time was of standing room only proportions, is then invited to join the discussion after the panelists make their opening statements.

This year's Round Table is on "Trends in Television Systems and Technology." It will be chaired by the same able moderator, Joseph Polonsky, Technical Director of Thomson-CSF who did such an outstanding job at the 9th Symposium. There will be an attempt made to look into the technical trends that will impact television between the present and 1985.

### A Little History

The Montreux Symposium and Exhibition started in 1961 as a combination program contest (The Golden Rose) and symposium which was then called a Festival. It was quickly discovered that there was little commonality between the two sides of the TV camera, and the events separated in time but continued individually. The Golden Rose remained annual, the Symposium changed to a biennial format. There was not enough technical innovation to warrant an annual symposium and exhibition. By 1967, with the

alternate-year arrangement, Montreux began to grow rapidly, attracting well over one hundred exhibitors and several hundred papers.

### The Montreux Environment

Unlike most large industrial exhibitions or technical conferences which are usually held in metropolitan areas, the symposium and exhibition in Montreux provides a picturesque setting and more relaxed atmosphere for the participants to enjoy.

Switzerland in spring almost seems like a national Disneyland of manicured forests, snow-capped mountains, and lake vistas that were installed for maximum visual beauty. Montreux, nestled along Lac Lemman, gives the visitor flower strewn walkways along the shore, spectacular mountain scenery in view of every lakeside hotel veranda, and verdant forests or endless green arbors that backdrop the city.

There are cogged railways or funiculars to high places where you can picnic or just look; there are "gemutlich" restaurants at all levels of gastronomic quality from simple serve cafeterias to superb French and Italian cuisine. For the brave on spirit, a Porter Pilatus ski-equipped plane will land you on a glacier and more important, get you dry again. For those whose bravery isn't in their wallet, gambling establishments nearby or across the lake in France will provide the opportunity of "breaking the bank!" Of course some of the major exhibitors have some private social functions held in convenient ancient chateaux where the food and wine help to renew old friendships or make new ones.

Montreux caters to just about everyone. There is a ladies program for wives or sweethearts, wine and cheese parties and cocktail receptions for everyone, and award banquets for Citation recipients. Most of all it's a platform for the exchange of ideas about communications by the very people who make it most possible. It's a conference worth attending by anyone interested in the field of television technology.

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as seen at N.A.B.  
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One of the more concrete and recognizable forms of video art is represented in the form of image. Many forms of video art are more abstract and "nonrepresentational" in nature and are often totally synthesized by electronic circuitry.

# VIDEO ART:

## Passing diversion or serious art form?

By Ron Whittaker

When "video art" made its appearance about ten years ago there were many observers who thought that it would be like many "new toys" and quickly pass from the scene. This did not happen. In fact, the general concept of video art has been slowly growing year by year, in both general popularity and in the number of people who are taking it seriously.

This does not mean that there is widespread acceptance, or even widespread understanding of what it is all about—there isn't. But, for a number of rather interesting and important reasons, the general area of video art will undoubtedly continue to grow.

Although the term **video art** has been applied to film (motion pictures), for the purposes of this discussion, the whole (and admittedly rather vague) subject area will focus primarily on the direct electronic video and audio synthesis of program materials by means of special **television** processes.

This type of video art is often an impressionistic, highly abstract visual experience, not unlike the paintings of modern abstract artists. Only instead of a two-dimensional static canvas, the video artist has important additional variables to work with—specifically, movement, time, and sound, with all its available dimensions. Consequently, much more can be conveyed; in the same way much more can be conveyed by a full-fledged television program than by a single, static photograph.

The great potential of the television process for artistic expression was realized many years ago by such people as Brice Howard of the National Center for Experiments in Television in San Francisco. At the

national center artists of all types were brought in to use elaborate video and audio synthesizers in the creation of new artistic "statements."

The results were "breathtaking," "dull," "highly involving," "incomprehensible," "a new artistic breakthrough," or "just some full-grown adults playing with expensive equipment"—depending upon who you talked to. In short, the results were no less controversial than modern art itself. But, everyone did agree, "it was different."

### What Is Video Art?

It would be impossible to define video art in a way that would satisfy all its practitioners. It might be simpler first of all to talk about what it isn't. It isn't anything like traditional commercial television programming. It isn't something that a large number of people understand or appreciate. And it isn't something that is even concrete enough to be interpreted in a reasonably consistent way by different people.

It is something that goes outside the bounds of the typical audio and video experiences which we've become used to in broadcasting. And, at best, it is something which can help us view things in new ways, and even evoke meanings and feelings from our subconscious in the process.

In the same way a Rorschach ink blot test or a psychological Thematic Apperception Test will be interpreted in different ways by different people (according to their own experiences, present feelings and future goals), video art can serve a similar purpose—as a vehicle for expanding one's awareness.

One of the earliest and most

noteworthy creations in this area was, in fact, a film: Stanley Kubrick's "2001—A Space Odyssey," which was recently presented on national television. The interpretation of the latter part of the film is left entirely to the viewer. Kubrick reportedly will not even discuss the film's meaning, since "meaning" should be assigned by the individual viewer. In a sense, it is an "ink blot," a projective visual which allows an individual to think about possibilities and to experience abstract sensations and feelings. All this, of course, leaves many viewers uneasy, since they are used to television programming which is rather concrete and obvious in both its story line and its meaning.

Even though "2001" was a film and not electronic video art, it can serve as a kind of introduction to the far more synaesthetic video art. The last part of "2001" should not be debated in terms of "meaning"; it should simply be "experienced" and left at that. The same goes for video art.

Many of the recent "synaesthetic films" have relied heavily on electronics to generate their effects. At some time the direct electronic synthesis of video effects has many important advantages over film opticals for synthesizing imagery.

### How Video Art Is Produced

Video art can and does take many forms. It may make use of regular TV cameras and equipment to present subject matter in a totally new frame of reference; it may make use of a complex "network" of cameras, video synthesizers, videotape machines; or it may

*Continued on page 70*





**Video feedback** is the most popular way of creating a wide variety of intricate video patterns. The slightest change in the camera's attitude, video level, iris setting or zoom position will affect the pattern being generated.

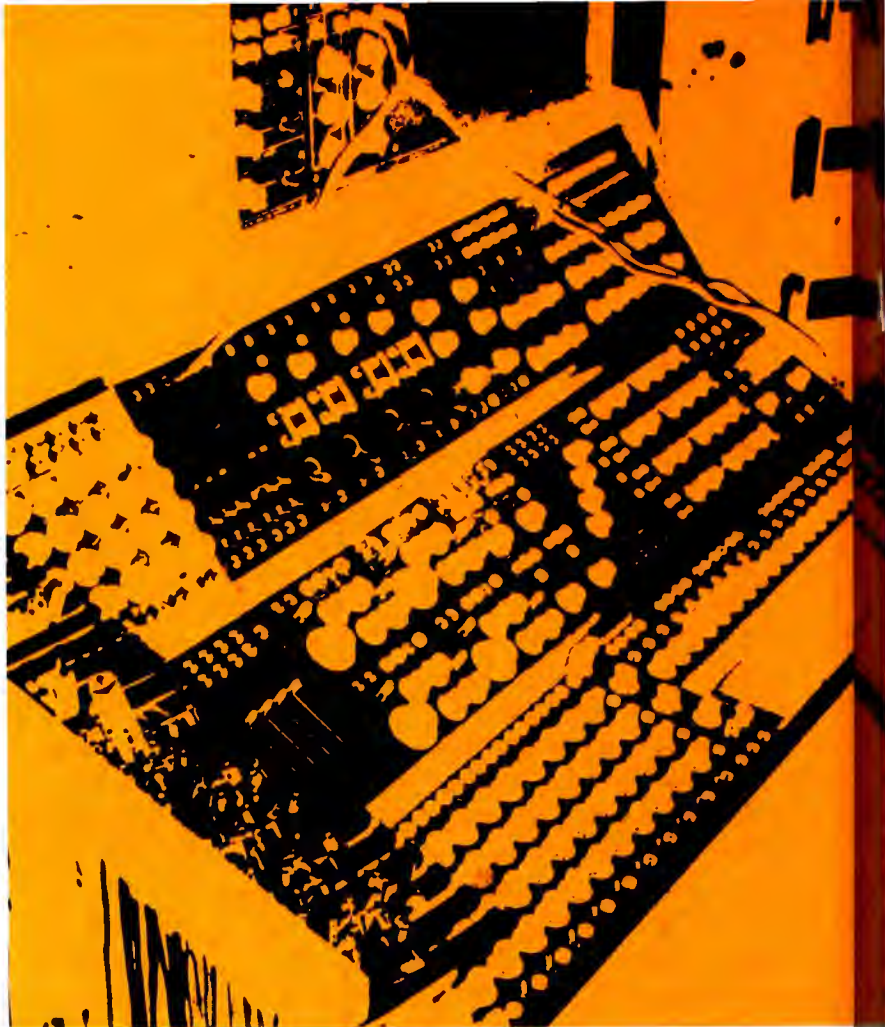
## Video Art

*Continued from page 70*

totally on the synthesis of audio and video in a direct, on-line creative situation. In the latter case, the "art" is totally originated in circuitry and appears for the first time at the surface of a video monitor. Unlike regular television, the subject matter exists nowhere else except at the surface of the monitor. The same applies to audio; there is literally sound origination rather than sound reproduction.

Television engineers are often rather uncomfortable around video art workshops because equipment is typically being used in rather unorthodox ways. Abnormal operating procedures become the norm; in fact, they become the very essence of creativity.

Video feedback, with its sometimes beautiful and often unexpected results, was one of the



"In video art, television can separate itself from a stage, film and radio influence, and the sole origination point for the 'message' can be in electronic circuitry—audio and video synthesizers."

first means of producing video art. (See photo.) Controlled feedback is, in fact, still the most popular way to create special effects, even though highly complex video and audio synthesizers are now available. Anyone who has zoomed a TV camera into a monitor displaying the camera's output, knows the rich variety of patterns and images which can be created through very subtle changes in the camera's attitude, video level, zoom position, iris, etc.

In addition to video feedback, there are a number of other effects which can be produced without special equipment. Cameras can be de-beamed, short videotape delays can be set up between cameras (and this line-out result fed back as a video source again) and chroma-key, matting and colorizing effects can be added to video sources. Even the interactions between these relatively limited effects can produce an almost endless variety of possibilities for a creative "artist-

engineer." (Many video engineers report that they regularly and inadvertently produce "special effects" when trying to fix equipment, but that their supervisors aren't too often impressed!)

The specially designed hardware for producing video art has become quite sophisticated in recent years. Now any image which is humanly imaginable (and even some which aren't!) can be created on a video screen. Beautifully intricate geometric patterns can be made which build and transform themselves into music. Or the audio, itself, can generate video, representing a multi-faceted reflection of various sound components. Their results can be engrossing and even hypnotic in their effects.

In addition to sound-video interaction effects, an almost unlimited variety of effects can be made with the modified electronic feedback and interactive frequency generators. To supplement chroma-

*Continued on page 71*

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## Video Art

*Continued from page 72*

luminescence-key will also provide interesting effects.

The pictures accompanying this article are much more concrete than much of the video art we have been alluding to. They started with familiar subject matter and then transformed it into the unfamiliar; colors were reversed and positive images were combined with negative images to produce a haunting unreality. Unfortunately these pictures are static, and one of the whole points of video art is to break away from static pictures and to introduce the elements of movement, time and sound.

Probably one of the most familiar types of video art is the geometric design type, which has appeared recently in several publications.

### A Short History

Because the whole concept of video or electronic art is so hard to isolate and define, it might help to examine its development through a historical perspective. Pierre Schaeffer and Pierre Henry of the Radio-Diffusion Francaise Research Center are associated with the early attempts to systematically synthesize music (sound) electronically. Quite a few years later, in the early 60s, projects were launched to also synthesize video in some meaningful way. Fred Barzyk, a producer-director for WGBH, a Boston public television station, produced five short tapes in 1964, called "Jazz Images." Although rather primitive by today's standards, they did represent notable examples of what was termed "unrepresentational television."

The first significant nationwide exposure for electronic art was in 1969 when PBS broadcast "The Medium is the Medium," a show produced by WGBH by Ann Grosser and Patricia Marx. The program attempted to squeeze six visual artists' works into 29 minutes. Among the six segments was James Seawright's "Cappriccio" which was an electronic dance piece which used two effective electronic processes—negative color to achieve an effect similar to photographic solarization and a controlled time lag between the three primary TV colors.

The last segment of "The Medium is the Medium" was called "Doctored TV," and was done by Nam June Piak. Piak, who was born in South Korea, studied in the U.S. with composer John Cage. Piak at first experimented extensively with alterations in TV hardware to create his effects. Later he changed; and, in fact, Piak's work represents a transition point in video art—from the "misique" or "doctored" period of doctoring TV and videotapes to the new technique of producing extemporaneous works by sophisticated video synthesizers.

In 1970, Nam June Piak, with the help of Shuya Abe, a Japanese engineer, developed the first real-time video synthesizer. The machine's capabilities were later demonstrated at a four-hour, uninterrupted WGBH video concert. The reaction of Boston viewers ranged all the way from raves to moans.

Since that time PBS has broadcast a number of programs featuring different types of video art. Some readers may be familiar with the series "Video Visionaries," produced by KQED in San Francisco or the 60 minute PBS program "Video: the New Wave," which explored a very wide range of video applications.

### "Getting Into It"

The audience for video art, at least as we have been discussing it, is admittedly rather limited. PBS programming in this area, for example, has met with mixed reactions. Of course, this does not necessarily mean that the area is of little artistic consequence. The art of Picasso isn't something that everyone can get into either. So, to some extent, at least, we'll have to leave the artistic merits of video art works to those who claim expertise in the area.

One important thing should be mentioned in this regard, however. Video art generally takes a good deal of getting used to before we can "get into it."

I spent four weeks at the National Center for Experimental Art in San Francisco under the able direction of Brice Howard "20th company." Each day I was exposed to several hours of video art productions.

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ly accomplished friends, I began to slowly recognize the potential of the television medium for presenting an entirely different type of "message." And once that door of perception is opened, it can never really be closed again.

### Practical Applications

The concept of meaningful art by television is nice, of course, but in the pragmatic world of commercial broadcasting, it would seem to have little value. Interestingly enough, however, "spin offs" from video art experimentation have seen many applications in commercial broadcasting.

It was almost 20 years ago that the author, while a producer-director at a commercial television station, was given the task of presenting a 30-minute program of "good music" on television. The only catch was that the music had to be from records! Fortunately, the host for the show was an internationally-known musician with a flair for discussing music. But this left us with no video (except maybe a record turning or a turntable)

*Continued on page 77*

At first, most of the examples are largely without meaning to me; sometimes pretty and attention getting, but largely meaningless from any deeper perspective. This began to change over time, however. But before it did, I had to start with preconceived beliefs about television representing basically an entertainment medium with very clear and obvious messages. The fact that this rather concrete medium could be a source of very subtle, abstract, non-rational messages took quite a bit of mental reconditioning on my part.

By the third and fourth weeks I was beginning to produce my own abstract video messages (I won't say "art"). And to me these "compositions" represented actual ideas which I was "feeling" at the time. I'm not quite sure what they did for anybody else, since I was a little embarrassed to show them to anybody. (I felt they would have looked like a second grade finger painting exhibit at the Museum of Modern Art.) But the point is that with a little help from my rather artistical-

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For More Details Circle (57) on Reply Card

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While the actual music was being presented.

The solution to the video problem was solved by creating a wide variety of visual effects through the use of kaleidoscopes, oscilloscopes, prisms, etc. We also had the use of a wide variety of supportive objects, and some very adaptable TV hardware, including a switcher which would allow four "tapes" on the line at the same time.

Everything was live and in black and white in those days, so the situation was made all the more challenging." (Somehow that word didn't seem to fit at the time, however.)

I did not realize it then, but I may have been inventing "video art" out of pure, desperate necessity. That weekly program certainly pre-dates anything in the current video art literature.

But, turning to more current applications, we only need to look at the rather large industry which is growing up around computer

graphics to realize the expanding use of synthesized video in the broadcast industry. Although the product is rather concrete and commercial, much of the hardware for the current video processing devices originated with the generation of artist-engineers associated with video art.

The state-of-the-art in video generating devices is probably best represented by today's computer animation systems. One such system is currently in use at the University of Illinois at Chicago Circle. The system is billed as a "synergistic cohabitation of television and computer technology."

The multi-module system is programmed like a computer in a language called GRASS (Graphics Symbiosis System). GRASS is a multilevel, flexible computer language which uses tree and stack data structures to provide an easy-to-learn and easy-to-use system of commands which can produce virtually any conceivable image.

The University of Illinois is using the system to generate complex chemical structure images for instructional television programming.

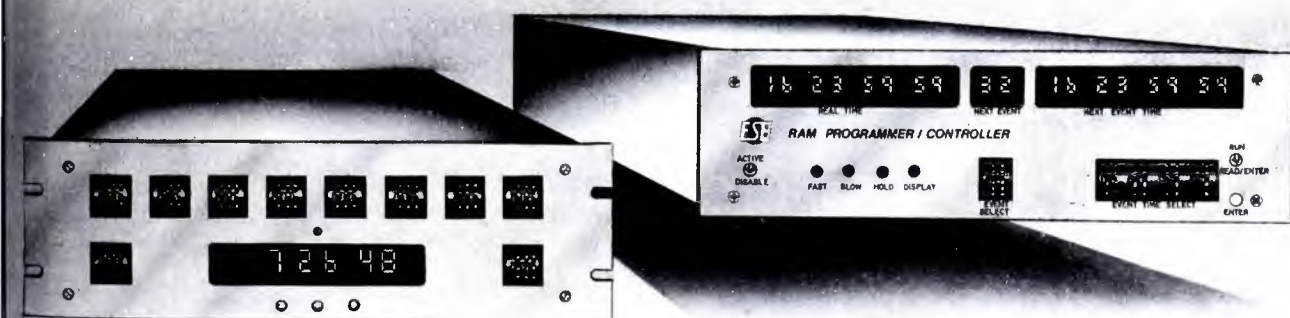
Research and development for the \$120,000 system was paid for by grants from several large U.S. corporations.

## Video Art's Future

As we have seen, much of the "far out" video art experimentation of a few years ago has now found practical applications in commercial and instructional television. "Art" must to some degree continually keep moving to stay at the leading edge of perception and thinking. Because of this, video art may always have to be unorthodox in its content, and, therefore, rather limited in its appeal. This is probably the way it should be and has to be.

In a fast-moving and competitive industry like commercial broadcasting it just might be beneficial to keep an eye on the trends in video art. Knowing that some of the things which were avant-garde several years ago have now found their way into the mainstream of the industry, it is quite probable that today's "far out" video art represents some of tomorrow's "new" production ideas. □

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## Headache No. 793...

# Getting ready for the RI

By Peter Burk

"The FCC's in town!" The manager speaks the words with a sense of urgency. Someone spotted a "blue van" sprouting lots of antennas. Must be the RI. The rumor gets embellished as it filters down. "The driver was wearing a white shirt and a skinny tie...*must* be the RI!" By the time word gets to you, he's reportedly carrying a clipboard and a stack of pink documents.

What if the inspector *does* show

up at the station? What will he find? Your palms get sweaty thinking about citations and fines. Your mind races with all of those details that you were going to take care of when you could find time. Is it too late?

This month's **Workshop** is devoted to **Excedrin Headache #793...** anticipating an FCC inspection. We'll show you how to prepare, then take you along on a typical inspection.

### Getting It Together

The inspector will undoubtedly ask for some basic documents that you should have on file at the station. Take a few minutes to round up the things he'll ask for and file them together in a place where you can put your hands on them in a hurry. The RI will be underwhelmed if he has to wait for you to dig through stacks of id

Continued on page 40

## FREQUENTLY VIOLATED RULES

The Violations Division of the FCC Operations Bureau has issued an analysis of violation notices (FCC Form 793-A) issued to broadcast stations after inspection and/or measurements by Bureau field personnel during the fiscal year 1976.

The following is a representative list of rules most frequently violated:

**Modulation Levels (Aural)**—Modulation in excess of 100 percent on peaks may cause excessive loudness in the received signal. Frequently, this is a result of an improperly calibrated modulation monitor.

**Operating Power**—Operation for extended periods of time with power levels outside of authorized tolerances. This includes both over- and under-power operation. FM and TV stations determining their operating power by the direct method commonly fail to calibrate the output power meter at six-month intervals.

**Remote Control Operation**—Remote control operation with defective power adjustment control circuits or uncalibrated indicating instruments. Stations authorized remote control operation commonly fail to terminate operation by remote control when a malfunction causes improper control of the transmitter or inaccurate remote meter readings.

**Indicating Instruments**—Operation by either direct control, remote control or extension metering with indicating instruments that do not have the proper scale range to obtain an accurate indication of the parameter.

**Equipment Performance Measurements**—Failure to conduct equipment performance measurements each calendar year.

**Operator Requirements**—Operation of broadcast station transmitters by persons who do not hold the required class of operator license.

**Emergency Broadcast System (EBS)**—The station either is not equipped with an EBS two-tone encoder or is not capable of modulating the transmitter with the proper signal for Emergency Broadcast System purposes. The station also has failed to conduct weekly EBS test transmissions.

**Other Technical Requirements**—FM Stereo stations often fail to maintain the pilot subcarrier injection level (modulation) within tolerance.

**Other General Requirements**—Failure to make a daily observation of the antenna tower lights for proper operation and to enter the observation in the station's operating log. Also, failure to inspect the lighting system and control circuits at three-month intervals and indicate the results of the inspection in the maintenance log.



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For More Details Circle (46) on Reply Card

May, 1977

| SUN                                              | MON             | TUE                  | WED                         | THU | FRI                                     | SAT                                    |
|--------------------------------------------------|-----------------|----------------------|-----------------------------|-----|-----------------------------------------|----------------------------------------|
| 1<br>XMITR INSP. ✓<br>REMOTE CAL. ✓              | 2               | 3                    | 4                           | 5   | 6<br>CHECK FIRE<br>EXTINGUISHER         | 7                                      |
| 8 MOTHER'S DAY<br>XMITR INSP. ✓<br>REMOTE CAL. ✓ | 9               | 10<br>FREQ. CHECK ✓  | 11                          | 12  | 13                                      | 14                                     |
| 15<br>XMITR INSP.<br>REMOTE CAL.                 | 16              | 17                   | 18                          | 19  | 20<br>JEFF JACK'S<br>LICENSE<br>EXPIRES | 21                                     |
| 22<br>XMITR INSP.<br>REMOTE CAL.                 | 23              | 24                   | 25                          | 26  | 27                                      | 28<br>QUARTERLY<br>TOWER<br>INSPECTION |
| 29<br>XMITR INSP.<br>REMOTE CAL.                 | 30 MEMORIAL DAY | 31<br>REVIEW<br>LOGS | AUDIO PROOF DUE NEXT MONTH! |     |                                         |                                        |

Use a calendar to make sure everything gets done on time.

## Radio Workshop

Continued from page 78

### OPERATING LOG CHECKLIST

MONTH \_\_\_\_\_ 19\_\_

Check daily:

- ☐ Pattern change
- ☐ Tower lights
- ☐ Sign on/off
- ☐ EBS equipment check
- ☐ Power within limits
- ☐ Readings within 3 hours

Check weekly:

EBS test  
sent rec'd

Week 1 \_\_\_\_\_  
Week 2 \_\_\_\_\_  
Week 3 \_\_\_\_\_  
Week 4 \_\_\_\_\_  
Week 5 \_\_\_\_\_

Discrepancies:

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paper looking for the one report you wants to see. What goes in his inspection file? Your last antenna resistance measurement, if you're an AM station, a copy of the audio proof of your directional array, and the document that shows how the efficiency factor was determined. If you are using the indirect method, Copies of the two most recent audio proof of performance measurements should be in the file, too.

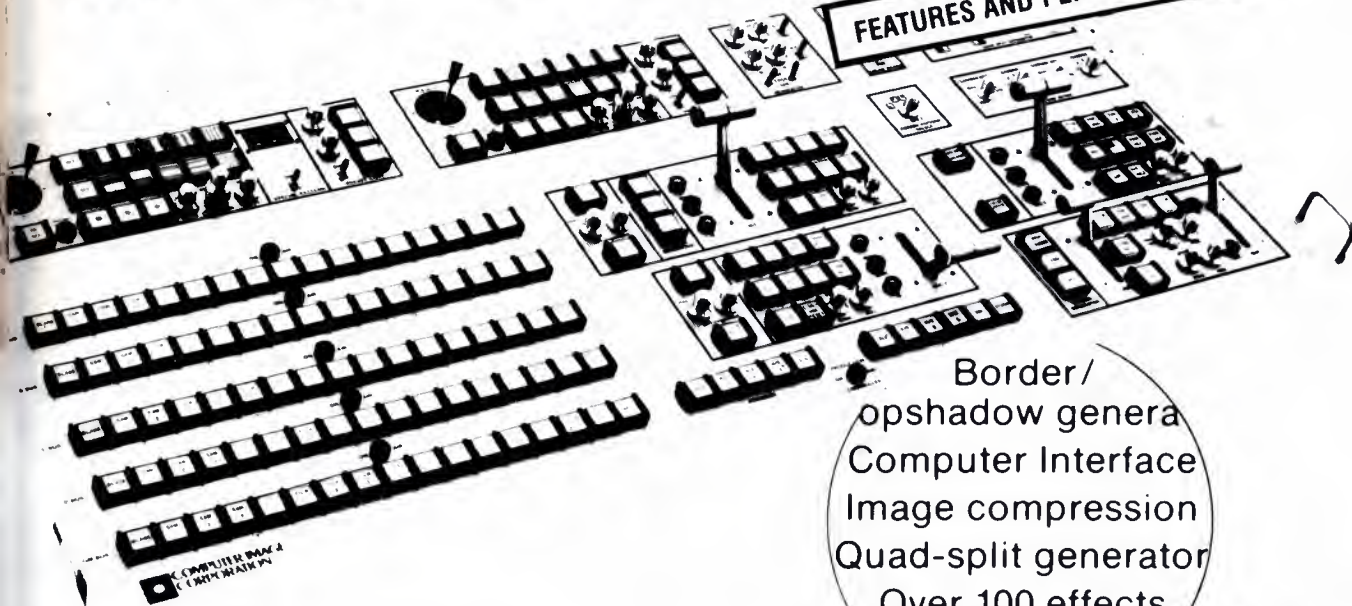
Some things can't go in the log, but you should know exactly where they are located. Operating logs and maintenance logs should be neatly filed by month to make it easy to pull out the ones the inspector wants to see. If your transmitter is at a remote site, you can make it easier for the inspector by filing the maintenance logs at the studio so he can check them at the same time he looks at the other logs.

Most engineers don't have much to do with the program logs, but the inspector will ask for them too, so be sure you know where they are. The same goes for the public file.

Check to see that all the required data is posted in the control room.

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## Radio Workshop

Continued from page 80

Station licenses, operator's licenses, RPU licenses, and (don't forget this one) the EBS checklist. It isn't necessary to post each document separately...they can be put in a single ring binder. Just make certain the binder is clearly labeled and placed in plain view in the control room.

Operator instructions must be posted in the control room, too. They should include transmitter

on/off and power adjust instructions, pattern change, tower light monitoring information (with a phone number for the FAA in case of failure) and EBS procedures. Include the legal limits on antenna current or output power and, if you are using the indirect method, some means of calculating the output power. Note that the RI won't be happy if you expect your third-class operators to multiply the values by hand. A nomograph is probably the most common solution, but with four-function calculators selling for under ten dollars, installing one permanently right by the trans-

mitter or remote control unit provides a simple solution.

### First Impressions Count

You can improve your chances of getting through an inspection scathed if you impress the inspector *before* he ever walks in the door. The first thing he'll do when he comes to town is listen to your station for several hours. He'll record the program to check against the program log later, watch your modulation level, and measure your frequency. He sees a lot of radio stations every year, and can get a pretty good idea of what to expect just by listening and watching. He hears a bunch of hum on the tape tables, or an air conditioner in the control room that sounds like it's powered by a Cummins Diesel. He's likely sharpen an extra pencil or two before he knocks on your door.

If your modulation level is all over the place, he'll spend a little longer watching for it to water out of bounds. It's especially important to make sure that the voice isn't hitting higher than the music. (Perhaps a carryover from the old TV problem where stations were accused of running their commercials louder than the program.)

One RI commented that seeing the carrier frequency right on his money helped create a good impression. He figures that if he engineer is conscientious enough to keep the frequency closely controlled, he's probably on top of other technical details at the station. (It used to be a good idea to keep the frequency offset slightly to confirm that the frequency monitor was working. This isn't too important now that we don't have to monitor frequency continuously.)

### The Big Day

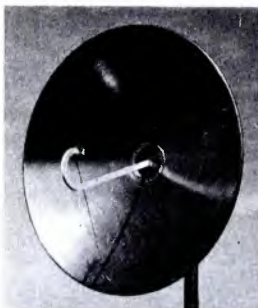
The receptionist has just buzzed your office with word that a Mr. T. Tation is in the lobby and would like to see you. Oh, yes, he said he is with the FCC. Well, it's too late to catch a flight to Brazil...guess we'd better go talk to the man. The inspector has already formed an idea of what he expects to see at your station. Let's see if we can keep him favorably impressed.

The first thing you notice is that he isn't wearing a skinny necktie and doesn't even have a crewcut.

Continued on page 82

## Anixter-Mark makes the best performing communications antennas.

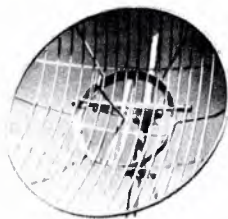
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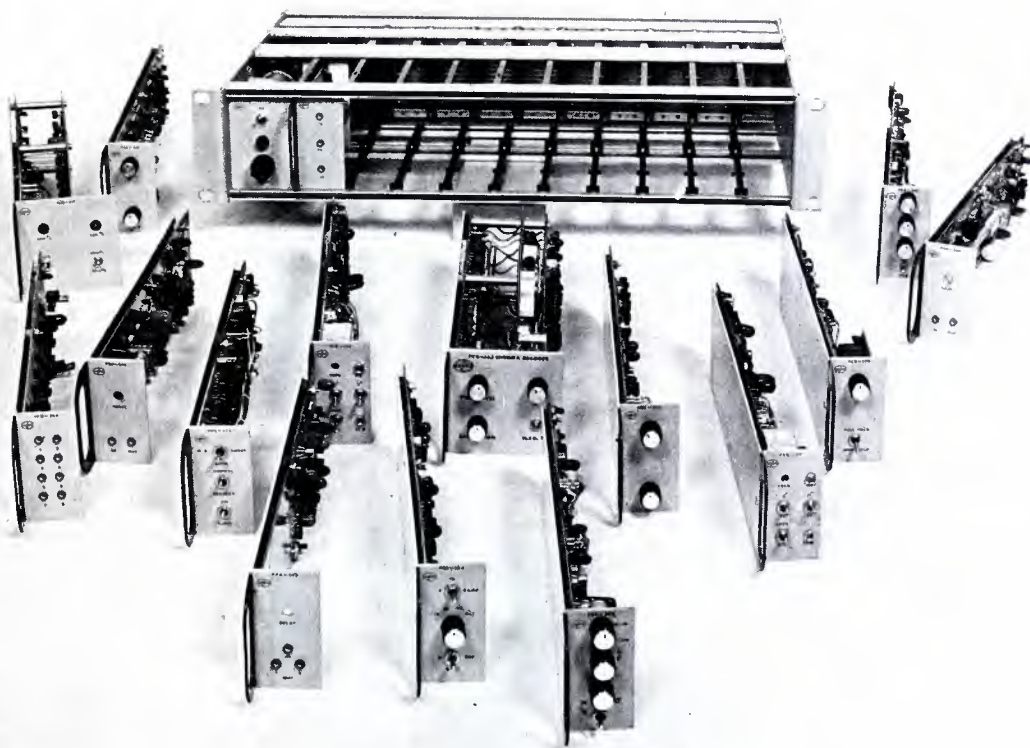
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## Radio Workshop

Continued from page 82

His ID looks official enough though. He even shows a friendly smile when he asks to see the control room.

You look over his shoulder as he examines the operating log. Fortunately, your third class operators have been doing a good job. Everything seems in order, even the EBS tests (one of the areas frequently cited). The operator can easily see the meters, and the EBS encoder/decoder tests okay, so there's no

problem there. The modulation monitor compares quite closely with his field observations. Looks like this inspection is off to a good start.

A quick look at the remote control meters satisfies the RI that the meter scales are appropriate and the power is within tolerance. Another line gets checked off on the inspector's form.

While we're still in the control room, the RI makes some notes from the program log to compare with the tape he made earlier. We

won't know how that one comes out until later.

Next, a complete inspection of the station licenses. Since you have yours all together in a ring binder the inspector picks up the book and asks for a place to sit for awhile. He'll go over the operator licenses as well, making sure they're all current and signed. He'll also check for several weeks of program logs and several months of operating logs and maybe six months of maintenance logs. You smile as you pull them out of a neat, organized file.

The inspector almost hates to ask this next question. "How about the last antenna resistance measurement and the last two audio proof of performance measurements?" Again you smile as you pull your "inspection folder" from the file.

The inspector will want some time now to study the data. He has a pretty good idea of what violations he'll see, if there are any. In the operating logs, he'll check for proper sign-on and sign-off, that power is at all times within tolerance, or at least properly adjusted and logged if it does come out, and look for tower light observations. He'll look for EBS tests received and sent, too. If power is determined by the indirect method, the efficiency factor must be shown on the log.

The maintenance logs will have to show proper remote meter calibrations and the required inspections for both transmitter and antenna. (Don't forget that quarterly tower inspection!) The results of monthly frequency checks should be a part of the maintenance logs, too.

The audio proof of performance will be scrutinized to make sure that the station is up to snuff. You'll make the inspector's job easier if you prepare the proof in a fairly standard manner and make sure that it is easily readable. (Proofs are the topic of next month's **Workshop**.)

In addition to the engineering data, the inspector will study the program logs and the station's public file. He may also ask to see the logs for your remote pickup equipment.

After he's satisfied at the station, the inspector will ask to see the transmitter. One of the first things

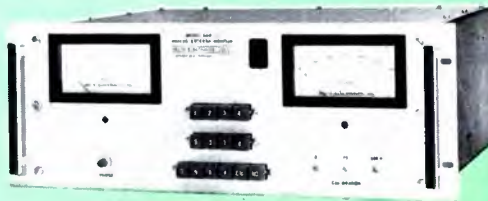
Continued on page 86

**—Reminder— June 1, 1977 deadline is fast approaching—**

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## Radio Workshop

Continued from page 84

he'll probably do is have you call the studio for an antenna current (or power output) reading. He'll read the antenna current meter (which you've clearly labeled just for this occasion) and satisfy himself that the two meters read within two percent of each other. He'll look at the readings of the other meters at the transmitter, and probably make a calculation of efficiency.

The RI may also want to stroll around the antenna system. One of the things that gets a lot of stations in trouble is the matter of a safety fence around the base of each tower. It should be locked and in good condition.

In many cases, although no citation is indicated, the RI can spot a potential problem that could be corrected. He might make a suggestion or two just for your own benefit. Remember, the RI isn't just a civil servant that carries a clipboard...in most cases he's a well-trained engineer, and probably can contribute to your broadcast knowledge.

That's really about all there is to a typical FCC inspection. Some take just a couple of hours, others stretch into an all-day affair. We haven't mentioned all of the things that the inspector could check, but we've touched upon the ones that most frequently result in that ugly Form 793.

### What Are The Odds?

Frankly, the chances are good that your station *won't* be inspected this year. There are just too many stations for the small number of RIs in the field. At the present time, the Commission is concentrating on stations that haven't been inspected for several years and those that have made major changes recently. If your station recently received an inspection which resulted in several notices of violation, you're also a prime candidate for a re-inspection. They want to see that the trouble spots have been taken care of.

### How To Make Sure

If you want to make certain that you won't get tripped up on something when the inspector comes, there are several things that you

can do.

First, sit down with a current copy of Part 73. It's not the most exciting reading, but it will give you a chance to see if you're missing something. Make a list of things that you should double check at your station. If your operation is typical, you'll find at least one or two minor things that could stand a little attention. Maybe the problem was there before you came to the station. Even so, it's *your* responsibility to rectify the problem. Check each item off the list as you get the problem resolved.

Next, set up a tickler system to make certain that everything is performed on time. A calendar like the one shown works well. Include due dates for your audio program annual RPU checks, quarterly tower inspections, monthly frequency checks and monitor pin readings. Also include the expiration dates for all operator's licenses. Check off each item when it is completed. It's also helpful to include a reminder of things coming up soon.

To keep the logs in order, set up a checklist like the one shown here. Put a copy in the folder for each month's logs, then check off the weekly items as you review the logs.

As a double check, it's a good idea to have someone else look at your station. If you are part of a group of stations, you might suggest a trade with another engineer in the group. Invite him to your station to act as an inspector, then make a reciprocal visit to his station. (Don't forget your clipboard and skinny necktie.) Even if your station is independent, you can try to find a cooperative engineer in a nearby town to trade inspections with you.

### You're The One

When the inspector comes to your station, the chances are that the only person he'll want to see is the chief engineer. The station owner, depending on you. Take the time now to make certain you are prepared. A notice of violation can ruin your whole day.

Have you had an inspection recently? If you'd like to share your experience with other engineers, write to us in care of the **Radio Workshop** editor.

# PEOPLE IN THE NEWS

The National Association of Broadcasters has announced the election of 19 prominent broadcasters from throughout the nation as members of its Board of Directors. The Association represents more than 400 radio stations, some 525 television stations and 15 five national radio and three national television networks.

Elected to the Radio Board are:

**Arnold S. Lerner**, president, WLLH/WSSH, Lowell, Mass. (District 1—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont).

**Jerry Lee**, president, WDVR (FM), Philadelphia, Pa. (District 3—Delaware, District of Columbia, Pennsylvania, West Virginia and Maryland).

**Paul Reid**, president and general manager, WBHB, Fitzgerald, Ga. (District 5—Alabama, Florida, Georgia, Puerto Rico and the Virgin Islands).

**Walter E. May**, president, WPKE/WDHR, Pikeville, Kentucky (District 7—Kentucky and Ohio).

**Charles E. Wright**, president and general manager, WBYA AM-FM, Canton, Ill. (District 9—Illinois and Missouri).

**John G. Lemme**, president and general manager, WPTF, Little Falls, Minn. (District 11—Minnesota, North Dakota and South Dakota).

**Stan McKenzie**, president and general manager, WED AM-FM, Seguin, Tex. (District 13—Texas).

**Frank W. McLaurin**, vice president and general manager, KSRO, Santa Rosa, Cal. (District 15—California, excluding the counties of San Luis Obispo, Kern, San Bernardino, Santa Barbara, Ventura, Los Angeles, Orange, Riverside, San Diego and Imperial; Nevada; Hawaii and Guam).

**Ted A. Smith**, president and general manager, WJMA, Pendleton, Ore. (District 17—Alaska, Oregon and Washington).

**Virginia Pate Wetter**, president and general manager, WASA/WHDG, Havre de Grace, Md. (Class "A"—markets of 500,000 population or more).

**Daniel W. Kops**, president, Kops-Monahan Communications, Inc., New Haven, Conn. (Class "B"—markets with population between 100,000 and 500,000).

**Bill Sims**, president, KOJO/KIOZ, Laramie, Wyo. (Class "C"—markets with population between 50,000 and 100,000).

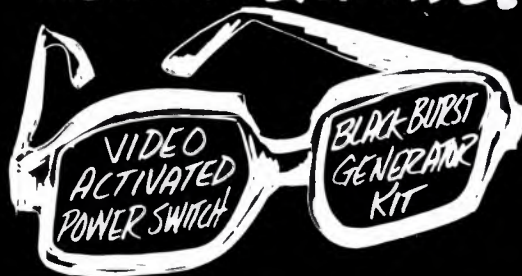
**Edward O. Fritts**, president, WNLA AM-FM, Indianola, Miss. (Class "D"—markets with population below 15,000).

The six elected to the Television Board are:

**Leslie G. Arries, Jr.**, president, WBEN-TV, Buffalo, N.Y.; **Bill Bengtson**, vice president and general manager, KOAM-TV, Pittsburg, Kansas; **Thomas E. Bolger**, president, WMTV, Madison, Wis.; **Eugene B. Dodson**, general manager, Gaylord Broadcasting Co., WTVT, Tampa, Fla.; **Robert B.**

*Continued on page 88*

## LOOK at what's NEW from VAC



### TRULY, TWO UNCOMMON VALUES IN VIDEO EQUIPMENT

FROM VIDEO AIDS CORPORATION OF COLORADO

Video Aids Corporation of Colorado's Model VPS-1 Video Power Switch. Reduces color monitor maintenance, electrical energy consumption, and viewer distractions when no video is applied to a color monitor. The Power Switch turns monitors or other devices on and off automatically by sensing the horizontal sync of a composite video signal.

Ideal for race tracks, universities, airports and other locations where monitors are located or mounted in high inaccessible locations, the Video Switch eliminates the need for special ac or dc control lines or the use of tall ladders to turn the monitors on and off. Turn-on time is 0.5 seconds with a 1 volt plus 3db minus 6db video input. Turn-off time is 12 seconds minimum. The video monitor will not turn off when color black is present and the Power Switch is immune from most radiated or superimposed ac noise. Cost of the easy to install Video Power Switch is \$95.00 list.

Video Aids Corporation of Colorado (VACc) Model BBG-1 black burst generator kit provides easy addition of black-burst to any NTSC color sync generator for driving new color cameras and for users of video switchers who desire to fade to color, black. Only eight wires connected to the sync generator's outputs and +5 volt power supply make electrical connection fast and easy to do. The generator kit is self-contained on one small printed circuit board for easy mechanical installation. Typical installation time by a video technician or engineer is less than 30 minutes. Cost is \$89.00 list.

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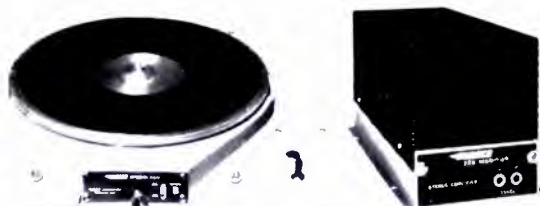
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## People

Continued from page 87

**McConnell**, president and general manager, WTHI-TV, Indianapolis, Ind., and **Mike Shapiro**, president, Belo Broadcasting Corp., WFAA, Dallas, Tex.

This month's People In The News...or people on the move...**Herb Heller**, senior staff engineer at Electronic Corp., has been appointed to the United States Activities Board of the Institute of Electrical and Electronics Engineers...**Frank Santucci** joined Orban Associates as marketing coordinator. Frank's last assignment was with Ampex as senior product manager.

Panasonic announces the appointment of **John Sykora** to the position of manager for creative services...**Richard A. Daunoras** has been elected senior vice president of North American Philips Broadcast Electronics. **Thomas Humphrey** has joined the company as manager of audio products. Humphrey was formerly with McMartin Industries as marketing vice president.

**Donald E. Greer** has been elected assistant to president for general services at COMSAT...Rockwell International's newly organized International Telecommunications Systems has added **B. A. Harrison** as vice president...Dynasciences has announced the appointment of **Erwin "Bernie" Bernstein** as director of marketing. **Joseph Waltrich** moves to director of engineering.

**Jack F. Underwood** has been elected vice president of Communications Services at RCA Americom. At RCA Broadcast Systems, **Charles J. Gaydos** has been appointed manager of teleproduction systems sales...**A. Pinski** is RCA's new broadcast equipment sales rep in the northwest, and **Jesse L. Nickels** has been named midwestern broadcast sales manager...**Bob Richards** moves from Marti to Micro Control Associates, Arlington, Texas.

**Katherine M. Smith** has been promoted to a regional sales position with the Scoopic Division of Canon U.S.A., Inc.

**Jack Oswald** has been installed as 1977 President of IFPA, Film and Video Communicators. Others elected to the National Board of IFPA were: **John Markstahler**, Sears, Roebuck and Company, Executive Vice President; **R. Michael Saxton**, IFA, Financial Vice President and Treasurer; **Motley Wertenberger**, Pix Productions, Recording Secretary; **Liz Brady**, California Motion Picture Development Council, Editorial Vice President; **Mal Snyder**, Aetna Life & Casualty, Vice President of Public Relations; **Phil Rapp**, Scripps Institute of Oceanography, Vice President-Western Chapters; **Ralph Burrell**, Union Pacific Railroad, Vice President-Central Chapters; and **Tim White**, Vice President-Eastern Chapters.

**J. A. (Jack) Leonard** has been named Director of Eastern Sales Operations for Berkey Colortron Inc...**Patricia Ann Bejlovec** has been promoted from Executive Secretary to Assistant Manager of WTRF-TV, LaGrange, Illinois...**Tom Longfellow**, General Manager of the Arkansas Radio Network, was elected to a second term as President of the National Association of State Radio Networks.

# The VTR Connection

It is hard to recall a single broadcast product which has raised such a welter of claims and counter-claims or has appeared in such a gaggle of guises. It confuses even the most proficient observer, and under any decision as to purchase or adaptation a difficult one to make.

Starting with the lowest cost units in U-Matic format that have now entrenched themselves in the on-line or off-line editing applications, this year's crop is worthy of some note. The U-Matics now being offered by various manufacturers are the result of some upward mobility in design. The units are more rugged than the industrial counterpart they came from. They have been improved in signal and servo system performance, external accessories such as digital TBCs, noise reducers and subjective enhancers, and they produce amazingly good pictures. However, there are still color VTRs, possessing inherent limitations that restrict them to minimum generation origination for hot news or documentaries where no other gear will easily go. For off-line editing, U-Matics also provide an inexpensive and convenient setup for edit decisions when they are tied to computerized SMPTE Time Code systems or even to a console.

The next step up in VTRs, which is making its real debut this year after hurried introductions at the '76 NAB, is the new or revamped one-inch helical machine now manufactured and sold by at least seven well-known companies. These machines fall into two basic categories: segmented and non-segmented helical. The segmented VTRs follow the BCN format first offered by Bosch-Fernseh and now either made or sold by IVC, Philips and RCA. These recorders interchange tapes among each other, but since they divide the image into 51 line segments, they cannot take still frames without an expensive framestore attachment. The BCN is an excellent VTR and the present configurations of portable and studio models have been augmented by a cassette unit shown in prototype form. However, up to this point, the BCN has not made a major impact on the NTSC market.

The BCN may have a writing speed advantage in 60 Hz PAL and SECAM countries where the scanner speed may be kept the same, but in NTSC applications, the non-segmented machines offer adequate writing speed at 60 Hz operation. As a result, the BCN is making headway in Europe and other CCIR countries where it has yet to face competition from PAL/SECAM versions of the Sony/Ampex non-segmented helicals.

The one-inch, non-segmented recorders suffer from a different dilemma. The two major proponents, Ampex and Sony, offer recorders with almost identical characteristics as far as writing speed (100 ips) and tape consumption are concerned, but they have different tape geometry and a very different approach to recording the vertical interval. In single head helical recorders must lose a small

*Continued on page 90*



ULT-1703

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portion of the video signal as the head crosses from one edge of the tape to the other. This signal is usually placed in the vertical interval and replaced by regenerated sync and blanking signals. The Ampex, Recortec and NEC recorders all function this way with no visible picture deterioration as a result. However, the Sony recorder uses a separate head to record the entire vertical interval, then reconstitutes the complete field from the main video head and the vertical interval head. Sony calls this the 1.5 head system.

Aside from other differences in sound track positions, number of longitudinal tracks, and shuttling ratios, the major controversy seems to be around the vertical interval question of "to record or not to record."

In the meantime, the SMPTE have two ad hoc committees looking into the standardization of the non-segmented and the segmented one-inch VHS. On the segmented side, there is no contest since the four companies are proposing the same BCN format. On the non-segmented, it's a little more complicated since these four companies all have good reasons as to why its tape geometry and operating parameters were selected. What's more, no one can fault the pictures they make since they are all high quality systems with good technical specs.

So, the questions continue. The one-inch helical will replace the quads in due time as they perform adequately; but since quads are still the only truly universal format, those in doubt as to which one-inch VTR to go to may just throw up their hands and buy a few more quads to keep their plant operating at the necessary capacity for the near future.

Joe Roiznot

## WMFO Needs Your Help!

WMFO, Medford, Massachusetts, Tufts University Radio, was totally destroyed by fire on April 4th. The station needs the help of all other broadcast stations to rebuild. While the station is back on the air, it has suspended all regular programming including a su...



BROADCAST ENGINEERING

initial amount of public service programming, until has raised its target of \$50,000. Any individual or broadcast station who can make donation of cash or equipment should contact General Manager Todd Feinberg at (617) 776-4273, write directly to the WMFO Fire Fund, c/o Citybank Middlesex, 406 Highland Ave., Somerville, Mass. 02144.

## RCA Demonstrates Satellite Network Capabilities

RCA American Communications, Inc., has demonstrated how satellites can be used to distribute radio network quality programs directly and economically to broadcasting stations throughout the United States.

Communications satellite technology now makes possible low-cost distribution of press service, radio network and specialty programming to large numbers of radio stations equipped with small dish antennas. This satellite receiving capability eliminates the need for terrestrial communications lines currently used for radio network distribution.

"This would permit us to use satellites the way they were meant to be used," said Philip Schneider, Executive Vice President, Operations and Engineering at RCA Americom. "Using the RCA Satcom as a single repeater/amplifier in the sky virtually eliminates noise build-up and delivers uniformly high quality program signals throughout the country."

Program distribution costs are currently subject to the phone company's interexchange rates, charged per mile and calculated to include the distance to each receiving station, point to point.

The alternative is point to multipoint satellite distribution with rates which are distance insensitive and consequently lower.

For the demonstration, a receive only earth station six feet in diameter, located on a 15th floor roof terrace at the New York headquarters of United Press International, provided line of sight to the RCA Satcom II spacecraft in geostationary orbit 22,300 miles above the equator. The original signal was sent to RCA's Vernon Valley, New Jersey, earth station, from there to the RCA Satcom II satellite, and back down to the six-foot antenna.

An advantage of satellite technology is its freedom from many interconnections such as switches, amplifiers and other ground equipment that cause noise build-up in the audio signal.

The satellite is distance insensitive and beams down a uniform signal, just like a floodlight, delivering sound or teletype copy to ten, hundreds or thousands of small receive only stations across the country. Small antennas, such as the six-foot dish used in the demonstration, can be installed easily on the ground or rooftops in cities or remote areas.

Small and economical receive earth stations can be used effectively to provide an 8 kHz service. This would result in a signal quality improvement over 5

*Continued on page 92*

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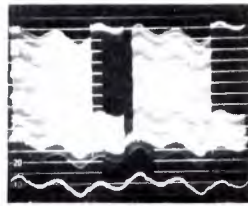
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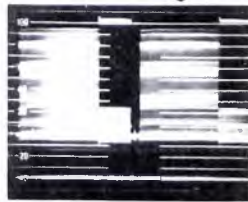
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Continued from page 91

kHz service, which is used for most radio program distribution.

Multi-channel service can be designed so that receiving radio stations may select alternate channels for programming as desired. Alternatively, stations may receive two or more programs simultaneously, or so that two channels to receive stereo programming.

Transmission can be originated by live performances, tape recordings, teletype or CRT display terminals. Programs can originate at a major RCA earth station or at any location with terrestrial links to one of RCA Americom's operations centers in various cities.

The six-foot antenna used in the demonstration was made by Prodelin of Hightstown, New Jersey, but has not yet been approved by the FCC for general use. Related ground equipment components of the satellite earth station are a low noise amplifier, made by Scientific Communications, Inc. of Garland, Texas; a Scientific Devices of Englewood, New Jersey, provided an RF spectrum analyzer which was used to test signal quality; the FM receiver by Comtech Laboratories, Inc. of Smithtown, New York, and the receiver modem made by Coastcom of Concord, California. Coastcom also designed and built a special transmitter modem for RCA's audio network services.

## Satellite Earth Station Symposium Set For June

Scientific-Atlanta will conduct its 1977 Satellite Earth Station Symposium in Atlanta, Ga. on June 14 and 15. The annual symposium is sponsored by the Atlanta-based communications firm as a service to technical and management personnel in the CATV and broadcast industries.

The three-day meeting will provide a review of the current status and future plans for satellite communications. Company personnel and leaders in the cable and broadcast industries will conduct panel discussions on satellite earth station applications and on effective operation of earth stations. The June 1977 session will give special emphasis to the impact on domestic satellite communications of the recent ruling by the FCC authorizing the use of smaller 4-meter diameter antennas.

The 1977 symposium will follow the format of two previous conferences held in 1976. Demonstrations are scheduled for the newest company equipment including the small earth terminal. Conference participants will be able to exchange ideas on ways to capitalize on opportunities presented by satellite communications equipment and programming.

The three-day June meeting will be held at the Quality Inn in Presidential Park in Atlanta.

For more information, contact: Pat Rooney, Scientific-Atlanta, Inc., 3845 Pleasantdale Road, Atlanta, Georgia 30340, Telephone: 404-449-2000.

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## Guinea Switches To TV

The Republic of Guinea is to begin television broadcasting this year with a studio equipped by Marconi Communication Systems Ltd., a GEC-Marconi Electronics company.

The equipment was purchased by the Libyan Arab people's Jamaheria for Guinea as part of the program of economic, technical and cultural assistance which Libya is offering to help the developing countries in general and the African countries in particular.

The studio will contain three MkV monochrome television cameras, and Marconi is also supplying the lighting and sound facilities as well as an air conditioning system. In addition, the company will provide training in the use of the equipment. The installation, in the capital Conakry, should be complete by August. However, a temporary installation will be in use by May 14th, in time for the independence Day anniversary celebrations. Guinea, on the west coast of Africa, has been independent since 1958.

## KDIX-TV CE Wins Drawing

Shintaro Asano, president of Shintron Inc., has announced the winner of their convention drawing for model 370-Mark III color special effects generator. The unit was the 1000th Mark III manufactured since its introduction in 1972.

The winner, Robert Stockert, CE for KDIX-TV, Dickinson, ND, was drawn from over 900 entries.

"I predict," Asano said, "that two years from now [at the 1979 convention] we will be giving away the 1000th 373-DX." The 373-DX is a chromatic reduction switcher.

The generator Stockert won was specially prepared for this giveaway with golden levers and several other unique features.

## NAB Forming Violence Policy

Wilson C. Wearn, chairman of the Joint Board of Directors of the National Association of Broadcasters, said NAB is formulating a policy to reduce the amount of sex and violence on television, and it expects to have a concrete plan by this summer with the cooperation of the networks and program producers.

Wearn, president of Multimedia, Inc., Greenville, S.C., made his statement today during an appearance before the House Commerce Committee on Communications.

He pointed out that the NAB Board has directed the Television Code Review Board to formulate clear, strong advisory guidelines. He said NAB representatives have met with representatives of the three major networks and with a number of producers of television programming.

He said both groups expressed concern over the

*Continued on page 94*

# Audio Heads? Get on the Beau bandwagon.

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problem and a willingness to work with NAB to develop new and effective methods of self-regulation.

The NAB chairman said Code Board members will meet this month with representatives of the National Citizens Committee for Broadcasting and the American Medical Association. Also, a meeting is being scheduled with the Parent Teachers Association.

Wearn said NAB "has no illusions that this process will be a smooth one and meet all concerns, but rather we expect that it will produce many differing views and opinions on how best to attack this problem. We all must recognize that this is an area where no precise measurements exist and where no clear answers will suddenly appear to the satisfaction of all."

He added that "violence is not going to suddenly disappear on television just as it is not going to suddenly vanish from our society. But we are trying to do something about the total amount of violence and the programming that is offensive to the public...By doing so we believe we are recognizing our responsibility to the American public."

The Board chairman said, "We will do so even though we have no real hard evidence that television violence is the sole cause of any actual violence in this nation. We will act although we believe the reduction of violence on television will be just a drop in the bucket, when one considers all the other models of violent conduct that will continue to be available in

our society. We will act voluntarily through the NAB framework to deal with the concerns of parents and others, and we will encourage each of our Code members to exercise restraint and self-discipline in this area."

## Petition Filed For New Educational Service

A petition for rulemaking was filed with the FCC for the establishment of a new community fixed educational radio service to be known as "Communicating" since it embodies the basic elements of both communication and broadcasting.

"Communicating" can be defined as the use of cochannel multilateral communication to educate and enlighten the participants as well as a listening or viewing audience. It is an idea that can, in a more cost effective manner, implement the concept of "Communicate Instead of Commute" to provide electronic classrooms, forums and lecture halls to cover a community for interactive educational purposes.

The use of radio repeaters, whose value has been proven in the land mobile and amateur radio services, is cited as the most cost effective way to blanket an urban, suburban or rural area with aural and television signals.

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## TV TRANSMITTERS

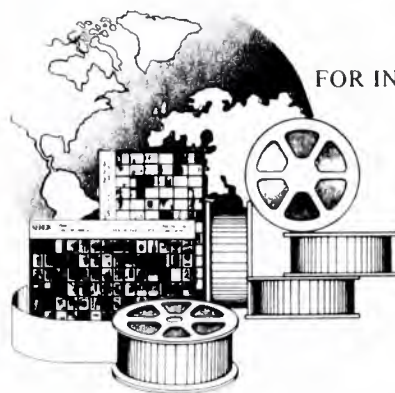
## TV TRANSLOCATORS

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# From BLUE BANANAS to SAG TAILS

While working at a suburban Chicago AM station an incident happened which tickled my funny bone. It was the annual Founders Day parade, complete with local dignitaries, floats and marching bands. The station had arranged to do a curb side remote of the event with all the station brass listening back at the studio. Being a moderate operation, I was the chief engineer as well as the afternoon DJ and was obliged to set up the system as well as operate the board of the remote with studio inserted commercials, news and other items. The remote announcer was a seasoned veteran of the station having done "radio" all of **two weeks!** Needless to say my enthusiasm for the new recruit was diminished by the passing moments. I was often tempted to turn off the studio/control monitor as the new DJ stumbled over the words and curb of the city street interviewing onlookers of the parade.

The afternoon ticked by and the class was beginning to become a little uneasy listening to our curb side report of the parade and were making more and more trips to the coffee urn. Finally, as some of the last floats were going by the viewing stand, one of the local award winners was announced over the parade PA as the Tri City Sheet Metal float. Our pride and joy DJ quickly picked this up, and he repeated it with just the alliteration error you'd expect....

Needless to say, that warm summer day in 1968 proved to be the last day of employment for the w DJ.

**Henry B. Ruh**

It had been a hectic night. Murphy's Law ("If anything can go wrong it will") had been working overtime, and our late evening TV newscast production was going awfully. As luck would have it the

station manager was watching, and halfway through the newscast he telephoned the control room.

"What in heaven's name is going on out there?" he angrily queried the already harried audio engineer.

"Sir, if you don't like what you see," the engineer responded, "you can switch channels."

"Young man, do you know who this is?" the boss demanded, as the awful realization of just who it was dawned on the audio man.

Deftly making complicated audio transfer with one hand he spoke into the telephone. "No, do you know who this is?"

"No," came the reply.

"Good," said the engineer, as he eased the instrument into its cradle with a sigh of relief.

**J. Tom Badgett**

## Murphy Slept Here

Oh those Blue Bananas! Did you notice how one slipped through the bunch a few issues back? It was at our urging that Joe Roizen finally committed the "Original Blue Banana" to ink and paper.

At the end of that delightful version of an industry classic, we pulled a Murphy (Remember Murphy's Law?). We neglected to give credit to Joe. If you missed reading that riotous tale of laughable woe, dig out your December, 1976 issue and turn to page 68. And keep in mind that it was written by Joe Roizen.

## Moving Right Along...

It'll be a sad day when we can't see the humor of our business. Some stories, like Joe's, are classics and are a reflection of the comic relief (or relief for tensions) we all could appreciate. Don't let your favorites fade away or be too soon forgotten. Send your entries to: Blue Bananas, Broadcast Engineering, P.O. Box 12901, Overland Park, KS 66212.



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For More Details Circle (66) on Reply Card

At the national meeting this year, the Board and its new president, Robert Wehrman, took time out to recognize Ben Wolfe and John Wilner for their outstanding service to the Society. They were presented plaques and officially given engineering certification numbers one and two, with number one going to Ben Wolfe.

Also at the meeting, Wehrman called **BE** editor Ron Merrell to the front and presented him with an Honorary Membership certificate. Obviously moved by the honor, Ron promised a renewed effort to assist



the Society and added, "Now I challenge you to challenge me."

In other business, outgoing president Glenn Lahman and John Lyons were given the highest honors conferred by the Society. They both were named SBE Fellows. (See April, **BE**, page 52.)

Before the meeting ended, it was agreed that the Board would check into the possibility of working out an agreement with the University of Wisconsin whereby SBE chapters could take the University's course in Digital Logic through a package deal.

### **New Address**

Due to the rapidly expanding duties of the National Office it was necessary to move to larger quarters. This entailed moving the National Office and acquiring a Post Office Box closer to the headquarters. The mail will still be picked up at the old box number for the indefinite future but all

correspondence should be addressed to: Society of Broadcast Engineers, Inc., P.O. Box 50844, Indianapolis, IN 46250.

### **Certification**

The first batch of 800 Certificates were mailed to their recipients in March. For those wishing to take the exam please send for the complete examination packet at the above address.

### **Chapter 1—Binghamton, New York**

At the Chapter meeting on February 8th, Jim Stevenson from Ampex presented a technical paper on the new Ampex ATR-100 and the ATR-700. The ATR-100 represents the newest in technology from Ampex. As many of you are aware, it was presented at the mini-vention held in Syracuse this past October. The ATR-100 is pinchwheelless and servo controlled. The Ampex ATR-700 is designed as a workhorse to replace the current Ampex 600 that all of us have hanging around.

### **Chapter 2—Northeastern Pennsylvania**

On Wednesday, March 1st, the meeting was held at the studios of WVIA-TV-FM in Pittston, PA. The program "A Choice for FM Signal Processing," was presented by Keith Leach, Manager, District Sales Engineering, Broadcast Division, Collins Radio Group. His talk related partially to the Moseley TFL-280. He also brought along equipment for demonstration and evaluation. A discussion on signal processing in general for AM, FM and TV was also included.

### **Chapter 5—Atlanta, Georgia**

On January 31 at Squires Inn in Atlanta, Georgia, a most interesting program was presented—"A look at the Turner Satellite Entertainment Network." Scientific Atlanta and RCA (Americom) assisted Ned Jay, Dir. of Promotion Turner Communications, and Jack Voerner, Project Engineer. Description of a new earth station located in

Northwest Atlanta was presented with tape and slides. It was the consensus that this program was the most interesting yet presented to the local chapter.

### **Chapter 16—Seattle, Washington**

Chapter 16 met on March 9, 1977 at the Swedish Club. Al H. Wood presented a progress report on the Seattle Chapter's Regional Convention scheduled for May 21st and 26th at the Seattle Center. Chapter elections were held with the incumbent officers being elected for another term. The slate of officers for next year are: Al Saito, Chairman; Bob Plumber, Vice Chairman; and Bob Evans, Secretary-Treasurer.

Charles Rhodes, Tektronix, presented a very interesting paper on "Analog to Digital Test Equipment." He also discussed in general future applications of digital technology in video and audio systems.

### **Chapter 17—Minneapolis/St. Paul**

The February 9th meeting was held at the 3M Company. Topics covered included the manufacture of magnetic tape, care and handling of magnetic tape, improvements in U-Matic video tape format, and presentation on the 20th anniversary of video tape, and a tour of the 3M laboratories. The information was of concern to both audio and video engineers.

The March meeting was held on March 16, 1977 at Telex Communications, Inc. Our host was Ed Fitzgerald, Product Manager, Broadcast Sales Division. A tour of the Telex facilities, as well as a demonstration of their new broadcast camera machine, was given. Mike Arnold, Project Engineer, and Don McKeen, National Sales Manager, were also with us.

### **Chapter 18—Philadelphia**

The February meeting of the Philadelphia Chapter, was held on Monday, February 21, 1977 at Williamson's Restaurant. A very interesting program was presented through the courtesy of Kass Electronics Distributors featuring Raleigh Utterbach and Bob Heroult of Ampex on Lag, Light Bias and Making Better Video.

### **Chapter 21—Spokane, Washington**

The March 1st meeting was held at Scotts Restaurant. The program that was planned for KREM on March 2, 1977, was cancelled since the main speaker was unable to be there. It was decided that it would be impossible to get a program together before the NAB, so the meeting in April to be held at KREM was to be on reports of the SE meeting and the NAB convention.

### **Chapter 22—Central New York**

On the 17th of February, Roger Person, Eastern Microwave Chief Engineer, discussed network design and problems of microwave systems. Eastern Microwave operates one of the largest common carrier microwave networks in the country, possibly second only to AT&T.

### **Chapter 25—Indianapolis, Indiana**

The March meeting was held on March 8, 1977 at the Defense Information School. This meeting was a presentation by Hal Barron of the Defense Information School, Fort Harrison on ENG. Operations as used in Military Services. Then there was a tour of equipment facilities.

### **Chapter 26—Chicago, Illinois**

Chapter 26 held their meeting on February 22 at Newark Electronics. Those in attendance were given conducted tours, in small groups, of facilities from which Newark supplies you with equipment, parts, and miscellaneous supplies. The Data Processing Department was shown which is at the heart of the operation as well as the offices and warehouse. Our host was Sales Manager Tony Favia. Copies of the new edition of the Catalog were available and experts in many lines were available for discussion. New products were also on display along with the new line of Microprocessors.

### **Chapter 34—Albuquerque, New Mexico**

Chapter 34 held their January 24th meeting at the Royal Fork Restaurant. Larry Weisman spoke of security systems for remote

transmitter sites, to include smoke, heat and entry alarms. In addition, the appointment of a nominating committee for new officers took place. All present were advised of membership dues to be paid.

On February 23rd, our speaker at lunch this month was Larry Ellis, consulting engineer from Denver. He is an expert at setting up directional array antennas for broadcast stations. Ellis is presently working on the KRKE antenna system for their AM station.

### **Chapter 37—Washington-Maryland-Virginia**

The February meeting of Chapter 37 was held at TeleColor Productions. John Reiser of the Federal Communications Commission was with us to tell us a little about the FCC's January 4th Automatic Transmission System rules, and to talk with us on the subject and answer our questions. This very timely subject has allowed us to better evaluate the equipment which will be shown at NAB on this subject, or better yet, build our own. Nominations for officers and elections of officers were also held at this meeting.

### **Chapter 40—San Francisco**

On January 19, 1977, Tektronix presented several new pieces of video equipment and a discussion of measurement and operational techniques. Bud Rees of Tektronix covered the 1450 NTSC TV Demodulator, 1405 TV Sideband Analyzer. Don Lollie of Catel also discussed features of their WFMS-2000 video FM modulator/demodulator system.

### **Chapter 42—Central Florida**

During the January 5, 1977 meeting, Lee Sauer of Texas Instruments spoke about the Semiconductor industry, marketing and the developing micro processor technology.

On February 2, 1977, Southeast Electronics was present for a demonstration of the Ampex ATR100 and ATR 700 Audio Recorders. A question and answer period followed the presentation. In addition, Luke Beasley of WLOF was elected as Chairman and Ken Mathison of WOKB was elected as Vice-chairman of Chapter 42.

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# Zoom In!

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

## Take 1...NAB '77... A First for ASTVC

We just missed it in '74...and in '75 and '76 there were valid reasons as to why we could not attend... BUT...this time we made it! We were encouraged by BE, and as if that wasn't enough, we had the warm support of our Corporate Sponsor members and also the very cordial letter from NAB VP Harold Niven which gave us that final push to go...go...go...

I would like to quote, in part, from said letter: "...I am pleased to learn that you have made arrangements to participate in the NAB Convention...You can contact me...in our convention office if you need assistance. We shall be in the Council Room of the Shoreham Hotel. Cordially, Harold Niven (Vice-President for Planning & Development)."

We in the American Society of TV Cameramen would like, through this column, to express our deep gratitude to Vice-President Niven and the NAB for their recognition of, and encouragement to, this young and growing association of professionals.

We won't attempt to report on the vast assortment of cameras, lenses, editors, VTRs and other

assorted gear that reached from the Sheraton Park through the Shoreham and on to the Hilton. That is being ably covered in the other columns. However, we should like to go behind the scenes with a look at some of the personalities who helped make this convention a rather memorable one.

What do you do when, while cruising along the turnpike at 60 mph, the driver you are sitting along-side tells you that he's been up all night shooting commercials for CMI (Albany, NY) and hasn't had any shut-eye for the last 24 hours? Do you hit the EJECT button or do you hit the driver? Well, that was how we started our NAB adventure heading from New York to Washington, D.C. when Gerry Gander let us in on his secret.

We did reach Washington...and there waiting to take us in tow was Thomas Jocelyn, our regional director from WTTG. Tommy, Gerry and I huddled for awhile discussing what our approach would be as representatives of ASTVC at the Convention. This out of the way, Tom led us on a tour of Metro-media's Washington facilities... where we were fortunate enough to run into Cliff Herbert, one of the

charter members of the chapter WTTG...Lady Luck continued to smile down at us because next day, against odds of several thousand to one, at the Shoreham we ran into Teddy Stewart who promises to lead the enrollment effort at WTTG...How about that!

Teddy is with the EJ (electronic journalism) unit at NBC. Typically the wonderful reception given us was the greeting extended us by Gordon Schutte of the 3M Company. Mr. Schutte invited us into the 3M hospitality suite where we were introduced to various corporate executives of that company who listened to our proposals for planning and execution of upcoming seminars and other training events, and who evidenced concurrence with ASTVC's goal of promulgating standards of professionalism within our segment of the TV industry.

## Take 2...An Award for Our Friends

It's one thing to correspond with someone you have never met; quite another to meet for the first time. And that is exactly the way it was Tuesday evening, the 29th of March when representatives of ASTVC went to the hospitality suite of **Broadcast Engineering** at the Sheraton Park Hotel and met with the staff of BE led by Ron Merrill and Mike Kreiter, editor and publisher respectively. It was then, after getting into the right mood by imbibing quantities of ginger



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cherry phosphates, that Bob Zuck, acting for the ASTVC, mented Ron Merrell on behalf of staff and publishers of **BE** with a plaque in appreciation for the encouragement and assistance rendered the American Society of TV Men. We don't know if the accompanying photo can fully reproduce the warmth, camaraderie, genuine feelings of friendship that were engendered by this encounter...BUT they were felt by all present. We, of the ASTVC, are privileged to have been able to effect this relationship with the wonderful people of **BE**, and we sincerely hope that this relationship will continue for a very long time to come.

### The 3...Word of Advice

His initials are J.S....it might stand for Job Seeker...the guy or gal who thinks it might be better to be the small fish in the BIG pond rather than the BIG fish in the little pond...They have just got to give the BIG Apple one try...We would like to tell you about J.S. who wrote that after years of trying, he had finally made it...at one of the networks. He promised that he would come and visit with us as soon as he was settled in his new home and apartment in the Big Apple. Weeks passed and he never contacted us.

After wondering what had happened to J.S., we finally traced him to his "Big Job" in the Big Apple...It was a little more than slightly embarrassed and apologetic...It seems that he had left a reasonably good paying job with lots of seniority in his "little market" to end up, not with an engineering position as supposed, but as a talk-dispatcher with some vague promise that "when the opening came up"...he would be transferred to operations!

Listen, you out there, New York is FAR from the most desirable location...for MANY reasons. Without going into all of them, suffice it to say that it would be WISE to carefully evaluate what you might be giving up back home in order to accept tentative, tenuous, or temporary employment in the packed, polluted, and pressured environment of New York City...And we're leaving it like it is...

**fade to black...**

## NEW PRODUCTS

### Video Activated Power Switch

Recently introduced at NAB in Washington, D.C. by **Video Aids Corp. of Colorado** is the Model VPS-1 video power switch. Said to reduce color monitor maintenance, electrical energy consumption and viewer distractions when no video is applied to a color monitor, the power switch turns monitors or other devices on and off automatically by sensing the horizontal sync of a composite video signal.

Ideal where monitors are located or mounted in high inaccessible locations, the video switch eliminates the need for special AC or DC control lines or the use of tall ladders to turn the monitors on and off. Turn-on time is 0.5 seconds with a one-volt plus 3 dB minus 6 dB video input. Turn-off time is 12 seconds minimum. The video monitor will not turn off when color black is present and the power switch is immune from most radiated or superimposed AC noise.

For More Details Circle (115) on Reply Card

### High-Speed News Film

**Eastman Kodak Company** has announced a new high-speed color film for television news recording and an improved filmstock for printing from reversal originals.

Eastman Ektachrome video news film high speed 7250 (tungsten) is designed to allow filming under extremely low-light levels. The new film is rated at EI 400 under tungsten illumination and has an EI of 250 when exposed under daylight conditions with a filter such as a Kodak Wratten 85B filter.

Eastman Ektachrome video news film high speed 7250 (tungsten) can be exposed at EI 800 or higher with extended processing. The new film displays excellent forced-processing characteristics and, at these higher speeds, maintains its neutral color balance.

The company also introduced a new print film for making duplicate

Continued on page 100

## TENTEL FOR TENSION NOW MORE THAN EVER



Shown measuring the critical supply tension on a Sony 2850

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## New Products

Continued from page 99

prints from camera reversal originals. Eastman Ektachrome VN print film 7399 produces excellent quality duplication prints when printed from camera originals, according to Kodak.

Eastman Ektachrome VN print film 7399 also uses process VNF-1 with a reduced first development time.

Eastman Ektachrome video news film high speed 7250 (tungsten) and Eastman Ektachrome VN print film 7399 are now scheduled to enter general distribution in March.

For More Details Circle (116) on Reply Card

### Status and Control System

**Time and Frequency Technology** have introduced a digital status and control system. TFT X-14, for remote monitoring and control applications in AM, FM and TV broadcasting. It consists of two, compact units: one for the control point and one for the remote point.

Both have 14 status channels, each with its own independent LED indicator. Either a switch closure or a logic level will trigger the status monitoring circuitry and cause the appropriate LED to go on. Any combination of on/off can occur.

Both units have 14 front panel toggle switches for easy control of fourteen different on/off functions. The remote unit also has a switch that converts it to local control for on-site work. Each toggle switch controls an individual, electronically latched relay. Relay contacts are Form A, and are uncommitted (not grounded).

For More Details Circle (117) on Reply Card

### Solid-State AM Transmitters

The new solid-state **Cetec Sparta** AM transmitters now in production have undergone the most severe and prolonged testing ever given any Sparta transmitter product.

The SS1000A 1 kW model departs from other solid-state transmitters in that its sensitivity to load variations is no greater than con-

ventional tube transmitters. Its optimized audio system produces less than one percent harmonic distortion. Its two digital meters have identical capabilities, so one can be switched to substitute for the other, meeting the "spare meter" rule for digitals.

The 125 percent modulation is easily produced by the SS1000A as a result of circuitry so advanced that some of it is being patented.

For More Details Circle (118) on Reply Card

### Multi-Pattern Switcher

**Vital Industries, Inc.** has a switcher that offers some really unique patterns. The VIX-114 star, heart, binoculars, keyholes, rotary clockwise and 75 more.

The VIX-114 can take 12, 16, or 24 inputs. It uses all digital waveform and quad split generators. Digital key edging, border shadow and outline are available on all MEs, with automatic transition control on each ME. The switcher comes ready to interface for computer aided operation.

A star in its own right, the VIX-114 also can wipe or dissolve each quadrant, as well as adjustable soft pattern edges.

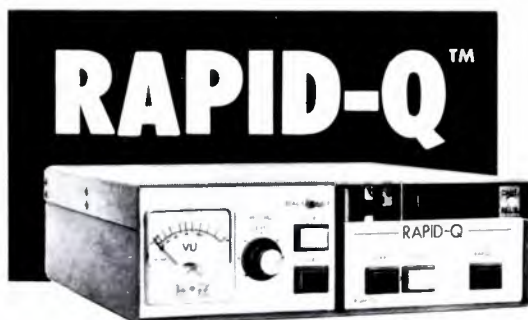
In the VIX-14A series you can count on digital automatic transition timed in frames. Also you can dissolve or cut between three separate chroma key scenes each with different background and different title keys. Pulse processing is secured, with no horizontal picture shift at the end of transition, even when the plant is not timed properly.

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### Master TV Monitor

A beam current feedback (BCF) system which automatically stabilizes color temperature reference with the color temperature reference featured in the **Conrac** Model 621 Master Monitor.

Engineered so that color temperature stability is no longer limited by the stability of the cathode-ray tube itself, the BCF system samples the beam current from each CRT gun and corrects for any deviation from a predetermined reference. Utilizing this approach, the maximum change in light output is held better than two percent at any level between 1 fL and full brightness. This color temperature stability in-



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maintained over 150 hours of operation.

Compact in design, the Conrac Model 6022 occupies only 15¾ inches of vertical rack space. Designed for easy maintenance, all circuit modules are accessible from the front. A full width, pull-out drawer containing plug-in convergence, signal processing, decoding and pulse-generating circuitry affords fingertip access to controls. The long-term stability of the unit permits all secondary adjustments to be located behind a hinged, locked cover. Intended for critical signal evaluation, the Model 6022 has a new 17 Colormatch CRT with improved resolution and specific chromaticity coordinates. Convergence is accomplished by operational amplifiers, allowing independent control of all screen areas, including corners. Controls are positioned on a grid which corresponds physically to actual point of action on screen.

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### New Tape And Wow/Flutter Meter

Idelipac announced a newly formulated High Output Transfer (H.O.T.) Tape—and its first electronic product, the Model 65-490 Wow and Flutter Meter at the convention.

H.O.T. Tape is an exclusive lubricated tape formulation that gives up to 6 dB increased output. The net effect of this is lowered distortion, greater signal-to-noise ratio as well as an apparent reduction in audio system white noise components.

The Model 65-490 Wow and Flutter Meter conforms to DIN and IEC 193-1971 specs. It will track a carrier frequency of 2-4 kHz with an input level of 50 mV or more. It has an internal oscillator and is completely self-contained as to function. Available as a desk top unit with tilt carrying handle.

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### Cartridge Locating Stereo Machine

Recent additions to the Beaucart broadcast audio cartridge tape machine line, produced by the Beaucart Division of UMC Electronics Co., are stereo machines which incorporate proprietary cartridge locating features.

Spring-loaded rollers provide repeatable location of each cart's left-corner post. Second, a special tapered cartridge guide allows each cart to squarely contact the roller and feed smoothly into the machine every time. In addition, a locating spring precisely positions the cart against the right-hand guide for positive squareness in relation to the heads.

Perhaps most important of all, patent pending spherical head/conical seat adjusting screws provide uniform, positive azimuth adjustment with the heads immune to movement from external sources. This combination of four mechanical components provides as positive a positioning of each cart in the reproducer as is currently possible.

For More Details Circle (122) on Reply Card

### Video Switchers

American Data featured their 2100 series of video switchers. The 2102 color production switcher is designed for small studios and remote vans.

The 2103 has A/B mix and

produces nine wipe patterns with controls for adjusting edge softness and pattern position. It includes a built-in luminance keyer that will accept either internal or external sources to provide self-fill or color matte title keys from the internal color matte generator.

Model 2104 includes 12 wipes with a full range softness control. The limits of any wipe can be preset. It also features independent key and mix key systems. An optional RGB chroma keyer is available.

For More Details Circle (123) on Reply Card

### Black Burst Generator Kit

Now you can update your NTSC color sync generator to provide black burst output. Video Aids introduced their BBG-1 Black Burst Generator Kit at the convention.

This low-cost black burst generator can be used to drive new color cameras and by users of video switchers who want to fade to color black. The BBG-1 has only eight

Continued on page 102

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## New Products

wires that need to be connected to sync generator's outputs and +5 volts.

The generator kit is self-contained on one small PC board that allows easy mechanical installation. Video Aids says it should take less than 30 minutes to install.

Output levels look like this: sync, 40 IRE divisions; setup, 7.5 IRE divisions; and burst, 40 IRE divisions. Price is under \$90.

For More Details Circle (125) on Reply Card

## Video Switching Systems

Duca-Richardson showed their 4000 series audio/video switching systems that offer a variety of effects mixing. Each system can process a keying mode and two switching buses simultaneously.

Its ten key sources can be selected, along with mix, nonadditive mix, mix to preset limits, wipe, and mix. All these are available for A/B transitions. Keys can be outlined, filled with key video or matte, or bordered with symmetrical or dropshadow borders.

The sequence of effects possible with one function module on the Duca-Richardson switcher could go something like this: replace live background with new background behind chroma key; wipe on new background behind chroma key; wipe on new captioned background behind chroma key; wipe on new caption with same background behind chroma key; wipe on new captioned background; wipe on new background behind new chroma key; wipe a masked caption on and off; wipe to live scene; pop on caption; and fade composite to black.

Using a keyboard on the function module, its 15 buttons can access up to 100 patterns, 100 automatic transition durations and ten key sources.

For More Details Circle (124) on Reply Card

## Studio And ENG Cameras

Single triaxial cable handling of all signal, control, and intercom functions between cameras and base station CCU's is now available on four Ikegami cameras. Led by the HK-312, the triax-equipped cameras were shown in Ikegami's

Booth 508 of the NAB Show in Washington.

The HK-312 is a sophisticated studio camera using three 1 1/4-inch Plumbicon tubes with a better than 56 dB signal-to-noise ratio and an add-on minicomputer that automatically cycles it in 15 seconds through all setup adjustments. The new triax facility combines 15 functions into one single, light 14mm cable through the use of digital techniques and frequency multiplexing. The triax cable carries the video signal, power, post regulation signal, audio, picture brightness and color correction signals, video to camera for viewfinder overlay, intercom, and command functions for V&H centering, size, and linearity. The triax facility makes the H-312 remote controllable at distances up to a mile.

Also shown with the new triax facility at the Ikegami booth were three other cameras. The HUF-1 "Ike" self-contained ENG/EB color camera is a 21-pound all-in-one-the-shoulder unit, latest in the famous family of Ikegami cameras that pioneered ENG at such events as the Democratic and Republican Conventions of 1976.

For More Details Circle (126) on Reply Card

## Precision Test Slides And Film

D and S Corley Limited has developed a new generation of telecine test objects to facilitate critical telecine alignment.

New patterns include: TA2-A crossed gray scale; CB2-Color bar with six colors plus reference wheel; MT-Multitest, four neutral grays and six colors, including a fishbone; FT-Flare Test; DM-Depth Modulation, and a multi-purpose TC-Test Chart.

The gray scale, color bar and multitest are used to set up color channel relationships, have a narrow gray surround and, being produced on the same stock, have identical spectral characteristics to those of the films most widely used in television programming. All color patches, with the exception of the fishbone, are designed to fall on their respective vectorscope radials and produce waveform signals of 400 to 80 IRE units. The calibrated accuracy of all colors and grays is  $\pm 1/2$  IRE unit.

All six patterns are available.

" x 4" and 35mm slide versions the multitest is also made in 16mm film versions.

A recommended replacement is now printed into the active area of each pattern; Corley believes that this will eliminate the inadvertent use of out-dated test materials and for this reason, now offers the option of purchase to the published policy of leasing.

For More Details Circle (127) on Reply Card

### Stereo Cartridge Matrixing System

A newly designed stereo cartridge matrixing system was introduced by **Pro Corporation**.

Designed to encode NAB broadcast tape cartridges, as well as reel-to-reel, the Monomax is easily integrated into all present broadcast systems.

Monomax<sup>TM</sup> works by matrixing left and right stereo signals and recording the actual mono sum (L+R) audio onto a single tape track, eliminating the possibility of between-track phase shifts. The difference signal (L-R) is recorded on a second track allowing full recovery of the original stereo signal upon playback and dematrixing. The net result of this is a fully compatible stereo signal assuring stereo integrity for the stereo listener and a mono signal devoid of response "holes" with its resultant dull, lifeless sound.

Designed as two independent channels, Monomax can be used either as a simultaneous matrix-dematrix system for a single recorder, or as two independent dematrix channels for two separate playback units.

For More Details Circle (128) on Reply Card

### New CCD TBC

**Microtime** introduced a new, high quality, light weight time base corrector (TBC) at the NAB in Washington, D.C. This new TBC, the 1600, is the first to utilize large coupled device (CCD) technology.

It was specifically designed for portable and mobile use by broadcasters. The resulting system provides an input window of 4H lines, weighs less than 25 lbs., and uses less than 50 watts of power. Signal-to-noise performance is better than 50 dB and phase and gain performance under to two degrees,

two percent. The 1600 is designed for use in mobile vans or for field use when size, weight, and high quality are essential.

Because of the low cost of CCD technology, the 1600 Remote TBC is priced at about one-third less than a conventional digital design. Full scale deliveries will begin by this June, according to John Lackworthy, president of Microtime.

For More Details Circle (129) on Reply Card

### Vidicon Camera Tubes

**RCA Electro Optics** has announced the availability of their broadcast vidicons for colorcasting and telecine operation. They also introduced their Saticon 2/3-inch broadcast vidicon that literally can make small cameras better and big cameras smaller.

The Saticon has low lag when used with bias light, and also has very low dark current. RCA claims this tube packs picture quality equal to any 1-inch type, with resolution rivaling all 30mm lead oxide vidicons. The Saticon is available now.

For More Details Circle (130) on Reply Card

### Lighting Control Memory

**Kliegl Brothers** introduced a lighting control memory board that has virtually no limit to the number of channels or memories it can handle.

With add-on capabilities, this unit offers split dipless cross fade and pile-on masters, fade within a fade, submasters, cue insert, full integral manual preset, and all this can be interfaced with a station's existing equipment.

Options include a visual display unit, disc storage, portable remote, a hard copy printer, submaster, and tailored software.

For More Details Circle (131) on Reply Card

### Production And Routing Switchers

**ComTec** featured expandable routing switchers with numerous level and input options.

Their production switchers included the 3100 and 3300 models. The 3100 has 11 inputs, soft wipes, linear key, and 19 effects. The 3300 has a five bus 11 input configuration, with chroma key, key edger, border generator, and soft wipes and keys.

For More Details Circle (132) on Reply Card

Continued on page 104



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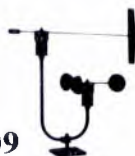
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## New Products

Continued from page 103

### Video Switcher

**Vital Industries, Inc.** introduced their Squeezoom® VMU-1. What's a Squeezoom®? For one thing, it will give you full frame real time compression and zooming of pictures to any size. In addition, joystick positioners place up to four compressed pictures anywhere on the screen.

The VMU-1, through a micro-processor control that allows a wider mode of operation, continuously corrects variations in sub-carrier phase from remotes or doppler effects from satellite transmissions. It synchronizes up to four non-synchronizing NTSC color video signals simultaneously to studio sync.

The VMU-1 also offers real time freeze frame and zero delay. Its horizontal and vertical compression will yield multiple effects. Another plus is that, in most cases, the VMU-1 eliminates the tedious use of chroma keys.

For More Details Circle (133) on Reply Card

### ENG Chargers And Battery Packs

**Christie Electronics**, an old name in industrial battery chargers, has developed a charger ENG application. Called the System 20, these chargers will fully charge a nicad battery in 15 to 20 minutes.

Christie also will show battery packs for ENG. The chargers include status lights that indicate the recharging condition.

For More Details Circle (134) on Reply Card

### Broadcast Computer Systems

**Automation Electronics, Inc.**, has opened offices in Lafayette, Indiana. Broadcast computer systems are featured products of the new firm. Larry E. Zaiser, President, announces that initial products include in-house mini-computing systems to include: automatic scheduling, logging, analysis, billing, payables, payroll, general ledger, ATS interfaces and program automation interfaces.

The four principles of the firm have been previously integral to development and marketing of data-processing systems, including broadcast and of program auto-

mation. Principles include: Larry Zaiser, President; Thomas R. Rossom, Executive Vice-president; Larry Edwards E. Reed, Vice-president Services; and Richard W. Edyver, Vice-president for Engineering.

For More Details Circle (135) on Reply Card

### Reel-To-Reel Recorder

**International Tapetronics Corporation** displayed their broadcast reel-to-reel recorder, the 850.

Designed with the broadcaster in mind, the 850 starts with coded touch button controls and ends with differential braking and smooth stops without breaking or stretching the tape. In between there are such features as a fool-proof push button tape marker, low wow and flutter high-friction roller that pulls tape with light pressure, and a playback record synchronizer that lets the operator record on one channel and listen to another, in complete synchronization.

The 850's 4-position meter meter switch allows for visual comparison of recording input and playback output, allowing the operator to create virtually distortion-free recordings.

For More Details Circle (136) on Reply Card

### Editor-Programmers

**Spectra-Vision** demonstrated the JBT-104 and JBT-104-B editor programmers. These units manage videotape, film, and audio tape editing less time-consuming.

Color preview and digital insert memory are standard on both models.

The JBT-104-B features a programmable insert timer, insert preview, and automatic edit review. Buttons are illuminated and re-outs are on bright LEDs.

For More Details Circle (137) on Reply Card

### Duracore Heads

**International Tapetronics** announces that they now provide long-life Duracore heads.

The new heads have been provided in all ITC premium 100 cartridge machines shipped since November 1, 1976 and are available from ITC for field replacement of old style heads.

Tests in Nortronic's® laboratories have shown that the new material wears up to ten times longer than the conventional high permeability materials.

For More Details Circle (138) on Reply Card

## NAB Video

Continued from page 50

air audio/video routing switchers. The Di-Tech booth also featured video and pulse distribution amplifiers, touch tone control systems, and audio monitor amplifiers. The booth was manned by George Trilak and Tony Bolletino.

**Duca-Richardson** had a very impressive production switcher on display which was connected to an MCI framestore and digital video manipulator. Jim Duca, their Chief Designer, specifically pointed out that the DR switcher could interfere with any digital video effects device including the NEC unit. The switcher in their display had been purchased by Versatile Video and represented an \$88,000 investment toward better program production, according to Richardson.

The **Dynair** booth at the Hilton was right in the mainstream of traffic into the exhibition area. Their president, Gary Gramman, and marketing V.P., Bob Vendel, were fully occupied in demonstrating the variety of routing switchers and modular broadcast distribution gear in audio and video which makes up a major portion of their product line.

One of their newest products on display was the model AD-5980-A Audio Distribution Amplifier with 16 outputs provided from a single 70V bridging input. Dynair has recently expanded and moved to new facilities in San Diego, and Vendel felt the upbeat mood of NAB further reinforced their optimism about the acceptance of their new products in the video marketplace.

**HEIMAC**, a division of Varian Associates, and an old hand at developing power transmitting tubes, displayed megawatt super triodes, zero bias triodes for FM, high efficiency UHF Klystrons, and power grid finals.

Somewhere in the middle of all these products, your editors wonder how great it would be to have all associated products displayed by groups. Instead, some really interesting booths get sandwiched between the giants, and the poor convention attendee comes up short. Of course, many manu-

facturers who have smaller booths feel that they can take advantage of the traffic around the giants. That isn't always true. But remember fellas, Las Vegas has no Bird Cage Walk or other equally embarrassing locations. Well, let's get back to the action.

**Electro Impulse** survived the Shoreham and displayed high power RF dummy loads, attenuators, power meters, and baluns.

Shoreham conditions were never worse, but Electro Impulse had good booth traffic.

**Electrohome** was making bigger noises than ever in the video monitor marketplace, and they were doing very well at backing it up with products at NAB. Electrohome has entered the US market after establishing itself on the world market. They offer solid state monitors in monochrome and color, and they meet the NTSC and PAL standards for broadcast, educational, and a host of other TV applications.

Aside from their quality products, they have earned a reputation for customer service.

**EMCEE Broadcast Products** has been supplying television translators for about as long as they've been in use. And their NAB booth featured what they called the first application of "surface acoustic wave" (SAW) technology to broadcast equipment.

Looking upon this development as the fourth generation of television translators and transmitters, the new equipment incorporates these SAW filters with the target being improved selectivity without group delay distortion, while providing adjacent channel operation potentials.

According to EMCEE, the SAW filters insure easy alignment and long term stability. There's more to it than just SAW filters, but it would run us past our deadlines to fill in all the details.

And you guessed it, **Farinon Electric** held forth in the (ugh!) Shoreham with their latest array of portable and "mini-portable" microwave ENG video/audio signal transmission equipment.

Farinon's 13 GHz to the truck, 2 GHz to the station approach gets rid of a lot of cables and qualifies as a bona fide ENG transmission

Continued on page 106

## Remote Control

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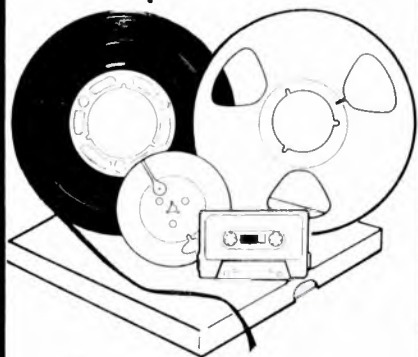
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## NAB Video

Continued from page 105

system.

Their equipment line also gets into fixed microwave systems for STL uses, and intercity relay.

Fuji came to the NAB five years ago with only a single type of quad tape (#701) according to John Dale, their general manager of the magnetic tape division. This year Fuji had on display all types of tapes, quad, helical, open reel, 8-track and three types of audio cassettes. New products included a special two-inch quad tape for syndication, a 1/4-inch audio mastering tape and special bulk stock pallet packs for duplicators who use tape in high volume. Dale particularly stressed the high quality of their new 701-E tape which has very good characteristics for super hi band recording on quad VTRs.

The Grass Valley Group, Inc., booth drew large crowds through the last day. The reason was their unusual Digital Video Effects (DVE) demonstration.

Use of the DVE can give you such unique effects as splitting the picture down the middle, perfectly, and pulling the two images apart. You could imagine running copy down the open middle. The DVE also can split the picture so that it divides and leaves a horizontal hole.

Other interesting effects come from compression techniques normally associated solely with optical effects. For example, the DVE demonstrated its ability to compress a picture vertically so that the effect on the monitor was to pull in the sides of the picture while leaving the top and bottom at full frame. This made people and buildings look narrow and tall. The horizontal effect was to keep the left and right at full frame, yet the top and bottom of the picture were squeezed together. It was truly one of those unique demos that just had to be seen.

Grass Valley also had their 1600-7K and 1600-1L switchers on display. They also showed and demonstrated a frame synchronizer.

Mike Skerry of GTE was on hand at the booth to explain the line of lighting products for television that GTE provides. He also was showing the 6th edition of a

new lighting handbook that has been an industry standard for a long time. Mike was pleased with booth traffic, but expressed a common complaint about the locations of exhibits.

The Harris exhibit was one of the largest at the Sheraton Park and right at the main entrance. It included a wide range of products, the antenna and transmitter field, well as color cameras, audio processors and a telecine chain. Gagnon, their product merchandising manager, pointed out that in addition to the newly introduced AM transmitters in the 1, 5 and 10 kW range, they also had 2.5 and 5 kW FM transmitters and a 25 W VHF color TV transmitter.

Gagnon also revealed some special NAB discount prices on their Plumbicon live color camera which brought their TE-301 down to about 21K. Another unique development was their new circularly polarized TV antenna which, according to Gagnon, gives viewers less ghosting and better signal-to-noise ratios. The Harris booth was well filled with visitors most of the time and "SOLD" signs sprang up on most of the equipment by the time NAB was over.

Hitachi, who are the main suppliers of Saticons, were introducing a series of low-cost color cameras using their own tubes. Their portable FP-1020 aimed at the ENG field starts at under \$20,000 and is available on 60-day delivery. They have also introduced the modular concept to broadcast cameras and their SX-70 line goes from the smallest production configuration to full studio size. A new camera, the SK-80, uses 3/4" Saticons and is also intended for ENG or EFP work.

Ikegami is another company that has graduated from the field of small ENG cameras into a full-blown studio series with modular features. This year's ENG model on display was the HL-77 "Ike" which is popular enough with ABC that they just ordered thirty more from Ikegami.

Another new offering is the telecine feature on both studio cameras such as the HK-312 and on the HL-77. Ikegami also showed a new color monitor with a built-in white balance system for easy setup.

ICC showed a wide variety of video products, including SMPTE code generators and readers under 2K, character generators, switchers and video signal modules. This was their first time at the NAB show and they were well impressed with the good booth traffic, high interest and good business volume. Across the aisle from ICC, another small company, **COMTEC**, also showed a variety of production and routing switchers which according to Frank Zimmerman, their SVP. of sales, must have been popular as almost everything at the booth sold at the show. Their newest switcher was billed as an ENG special which was specifically designed to handle three VTRs, three TBCs and three time code generators. The COMTEC base price for a model 3300 production switcher was about 8.3K with options of 1.0K each for chroma keying, edging and special effects. Zimmerman said all their literature was gone in two days and business was excellent.

Around the corner, out on what the Shoreham called the "Bird Ge Walk" (we still don't understand it), **IMC** was talking mostly about their EJ-1013. Most model numbers don't mean much these days, but at least you have a chance at this one. The EJ here refers to a unit designed as a portable microphone link for electronic journalism. Other IMC products include AM and FM links.

If you went to the convention with a switching problem, there were certainly enough switcher manufacturers and equipment to satisfy your appetite. **Industrial Sciences, Inc.**, was on hand offering production switchers, routing switchers, master control switchers, and television audio consoles. Their line also included chroma keyers, proc amps, pulse and distribution amplifiers, sync generators, VIRS generators, and an automatic telecine light control.

**Industrial Sciences** also displayed colorizers and special effects generators.

**Innovative Television Equipment's** line of tripods and pan tilt heads seem to grow larger every NAB and this one was no exception. Art Rosenberg, ITE's president, displayed a tripod specifically for

ENG work and called it the P-9 E.N.G. TRIPED. The unit folded into an amazingly small package, but when set up could provide 19 inches of elevator adjustment to a maximum of 66 inches. The Triped weighs 30 pounds and can carry a 100 pound load.

For the hardy traveler who wanted to see yet another ENG camera offered by **GBC**, a bus trip to the Mayflower was a must. Here GBC had what they billed as the most sensational development in ENG color portable cameras as well as some other video products like a low cost 16mm film chain and a microscope camera. The GBC camera, model CTC-7X, is a self-contained shoulder mount, claiming broadcast quality pictures in 20 foot candles at less than 20K. They were also showing a hand held single tube color camera, the CTC-5X for \$1,995 plus lens.

If you were interested in television circularly polarized antennas, you couldn't have been disappointed this year. There were models on display from all the manufacturers who lead the way in the development of these antennas. (See Broadcast Engineering, December, 1976 issue for a roundup of CP antenna manufacturers.) **Jampro** was one of those CP developers not about to let NAB pass without showing the object of so much conversation and tests the past two years.

Jampro also touted their conventional TV antennas.

**Kings Electronics Company** displayed some of the nuts and bolts hardware that keeps this industry together. Mainly, they featured coaxial and triaxial connectors.

**Leitch** is a Canadian company that designed and built special phase locking system for the Montreal Olympics. Their NAB display included some of their newest products for broadcast studio applications. Their CTG-200N Color Test Generator uses digital design techniques to produce test signals for evaluation and calibration of broadcast color television equipment.

Accuracy is claimed to be superior to that required by existing industry standards. A wide range of products provides for genlocking a number of remote sources, supply-

ing color black signals, and allocating sync assignment. Leitch equipment is also modular and may be built up as the needs arise.

The **Memorex** approach for NAB '77 was the "inside" story. Of course Memorex has several products, but they are proudest, currently, of their video cassettes using chromium dioxide tape. They make their own cassette shells to insure a

*Continued on page 108*

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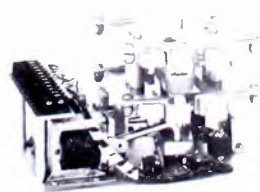
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better fit for their tape. Memorex feels this lowers the chances for mechanical failures.

The company also demonstrated two-inch quad tape, one-inch 500 oersted videotape, half-inch 500 oersted tape, and one- and half-inch 300 oersted videotape.

Portable and practical was Eric Stromstead's description of the new **Microwave Associates** line of microwave gear. Their 2 GHz equipment is lightweight and even works on 12 VDC when necessary. A battery belt can keep it running for one hour, a hand-held power pack for four hours. It's a modular structure in the \$6,500 to \$8,000 price range that puts out two watts with seven channels that can be shaded to give 21-channel performance. There are no operational adjustments and high rejection filters to insure proper operation.

New remote control equipment includes rotating antenna with four preset bearings that receive two, seven and 13 GHz signals. Very good noise figures are achieved with FET front ends and truck mount units have up to 10 watts output for longer hauls.

Hopscotching right along, we stopped by the **O'Connor Engineering** booth and inspected the Hydro-Ped. It's a unique camera tripod that puts new features into an old product category. The Hydro-Ped levels hydraulically on any terrain. Its column raises or lowers smoothly by hydraulic pressure in order to counterbalance the camera weight.

But the beauty of this model is that it folds to 10 inches by 30 inches for instant removal from any site. Weighing in at 29 pounds, the Hydro-Ped can handle up to 100 pounds.

**Optek** showed its visual transmitter demodulator that goes for under \$1,100. Its broadband design eliminates tuning. It also has a vertical interval chopper, and the unit can be used to feed automatic video correctors.

Optek also showed their 7400C automatic bulk tape degausser, designed for use with 3/4-inch cassettes. It's fully automatic, and when used with adapters, it works on ACR-25 and TCR-100 cassettes.

They also displayed the Optek alpha numeric graphics generator.

Television charts and test patterns for all purposes were on display at the **Porta-Pattern** booth where Ed Ries was demonstrating a new highly critical Color Flesh Tone Reference Chart which was designed by the research department of the BBC and manufactured under their supervision. Other new products included a Monitor Grey Scale Matching Unit and a Pulse Bar Camera Chart. Ries also said that their recently introduced ENG chart package with a registration and color balance chart in a handy carrying case has become very popular with ENG and EFP crews.

**Quick-Set, Inc.**, showed their complete line of tripods, studio pedestals, cam heads, fluid heads, dollies, and accessories for broadcast, engineering and cine requirements.

**Richmond Hill Laboratories** featured its production switchers, along with quadsplit generators, chroma keyers, and a composite out background generator. They also showed an audio-follow-video switcher.

Other products on display included a video clamping amplifier, a video distribution amplifier, and a pulse distribution amplifier.

The amazing growth of satellite communications for both domestic and international video distribution was evident from the **Scientific Atlanta** display which featured their ground communications receivers and exciters that work with their various antennas and serve as earth stations.

Their model 414 Video Receiver is widely used in ground terminals of the Intelstat system. It works on the 3.7 to 4.2 GHz range and has frequency agile synthesizer tuning. Dual conversion to 70 MHz precedes the demod and video clamp after which the signal can be routed by terrestrial means from the earth station to the distribution center for network or station use.

Shintaro Asano was on hand at the **Shintron** booth where the emphasis these days is broadcast all the way. Shintron displayed the model 375 production switcher, 370 chromatic special effects generator, 367 edit code switcher, and 315

color sync generator.

They also exhibited an all program monitor and distribution amplifiers.

**Spectra Vision** makes a variety of backspace editing device intended to interface with reel-to-reel and cassette type VTRs. At NAB they had a special publication called the "Producers Guide to Backspace Editing" which explained the process and equipment requirements for non-time editing and included a glossary at the back which gave the meanings of terms like "Digital Insert Memory" and "Glitch." Spectra Vision also had on display a remote control unit for Super-8 Video Players and their CC-77 pulse cross in non-monochrome monitor with which VTR playback stability can be critically observed.

Billed as "The Smart Television Production Titler," **System Concepts'** product offers variable titles, sizes, an eight-page memory for random or sequential page selection, as well as many other features for under \$7,000. According to J. M. Unrath, the President of System Concepts, this is the most attractively priced product in its field for broadcast and CCV applications.

**TELCOM**, another Canadian company was showing a line of SMPTE time code generators and readers and a device called a Time Code Centre which included a calculator for entering via its keyboard, information related to broadcast edit decisions.

The video tape cleaner and evaluator was part of the **Television Equipment Associates** exhibit which was being shown by Bill Pegler, director of TEA. The device claimed to reduce video dropouts by 50-70 percent and to extend tape life up to 80 percent. Mounted in an enclosed 19-inch rack-type structure, it is capable of constant tension winding of a one-hour tape in 10 minutes and providing a printed evaluation chart as to tape condition. According to Pegler, it is used for certifying used tape for incoming inspection of stock.

In addition to the standard product line of precision modular monitors, tunable preselectors

higher level meters, the **TFT** booth showing a remote control unit. **ENG** microwave antennas that operates via telephone grade lines. **TFT** president Joseph Wu explained that this unit, the **TFT** 100, consists of two units—one for the control point and one for the remote point. Both are only 3½ inches tall. They use digital circuitry, provide ten control channels and have LED status indicators which verify command activation. The device permits remote antenna rotation with push button control of a quadrant of operation. **TRI** split their demonstrations between their booth in the exhibit area and a suite in the hotel. At their booth they had a wide array of editing products including the **16 Edit Automator** and the unique time code system they have developed and introduced previously. **TRI** has also acquired a license to manufacture and sell the Lowry designed digital TBC which they call the **DPS-1**. This unit has a 32-inch window and according to its developer, John Lowry, it was the first new digital TBC at the show. Lowry claimed no adjustments and

more than 50 PROMS in the unit which provide an inexpensive memory and a correction range down to 500 pico sec  $\pm 100$  PS. The basic TBC sells for 14K. It can be updated to a frame store for 10-12K additional and video effects can eventually be added.

**Tele-Cine's** new products included lenses for ENG and field cameras.

**Tele-Cine** is a specialty company that also offers products like zoom lenses, accessory optics, lens drive systems, and remote camera positioning heads.

**TerraCom** featured their new **TCM-7** microwave transmitter and the **TCM-3** programmable receiver. The **TCM-7** is TerraCom's camera-located transmitter. If you didn't see this booth, you missed quite a lot, because this equipment was used at the last Olympic affair, and the Republican and Democratic conventions.

Next year their booth may take on a different flavor. The company is working with satellite earth stations. And while we're in a predicting mood, how about satellites leading the way at the network level

in radio before TV. Watch for more companies to catch on. You'll see more on satellites at next year's NAB convention in Las Vegas.

And just how do you get maximum performance from an outdated TV transmitter? **Townsend Associates** offered an answer at NAB, an answer based on swapping the exciter for an IF modulated exciter with up to 10 Watts on UHF and 60 Watts on VHF.

With the booth manned by George Townsend and his team, you could hear that using this approach you could save 90 percent of what it might cost you to replace that old rig by going their way.

**The Video Tape Company** featured **VTC 1000** broadcast videotape. This guaranteed tape has a film base of precision carbon back-coated polyester. The tape life is said to be capable of 4,000 passes.

The Video Tape Company also featured video cassettes, plastic spot reels, plastic shippers, shelf boxes, and metal reels. The company also has a duplication service available.

**Ron Merrell**

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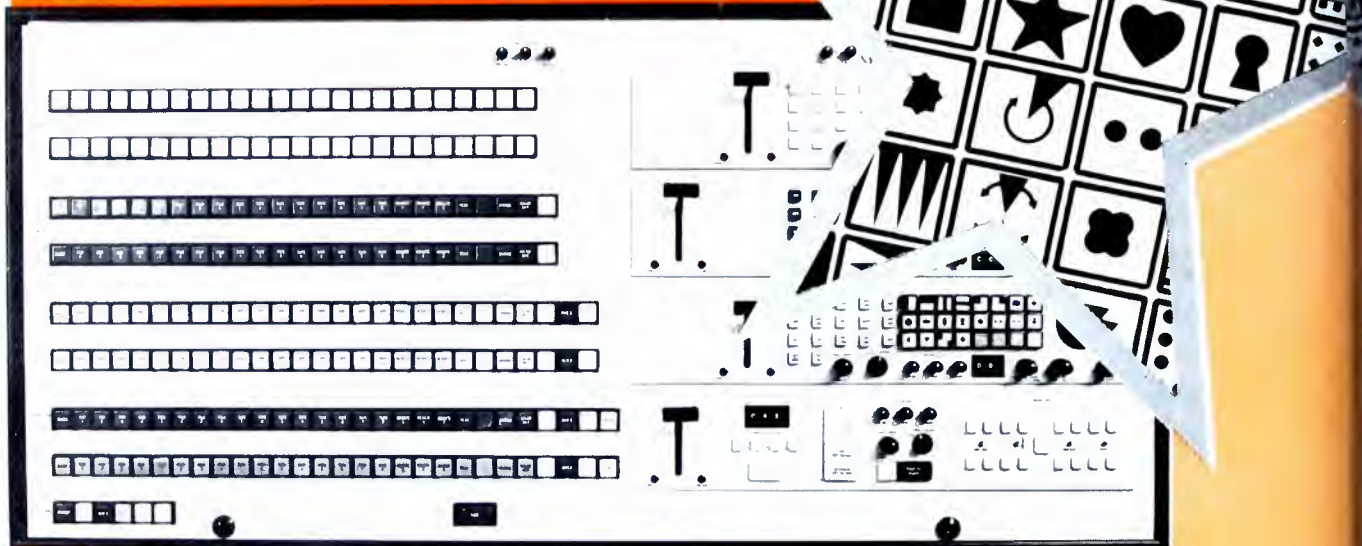
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