Symposium on Television Broadcast Monitoring

Thursday, 14 November 1974, Toronto

Symposium chairman, Roland J. Zavada, opened the morning session with a brief report on the activities of the SMPTE Working Group on Program Identification Systems. Historically, the Society has been involved in symposia which have often brought together challenging and divergent points of view. We are interested to learn today, he said, whether the emerging technology and new conceptual approaches will either challenge or supplement traditional and accepted monitoring methods. In this symposium the content has been structured to direct attention to the business aspects of the broadcasting industry and the potential of available technology to meet those needs.

In 1970, as a result of a petition for rule making, the Federal Communications Commission evolved a modification of its existing broadcast rules to permit the transmission of visual code patterns in the four corners of the picture image, to permit automation and sophisticated electronic technology to determine when and how television commercials were being broadcast. Motion-picture laboratories and broadcasters soon found that the FCC had derived a rule to govern the use of visual code markings which could not be applied within the technical limitations of the film/telecine broadcast process. An ad hoc committee prepared a tutorial paper and written comments stating that the tolerances allowed were insufficient to permit successful film operation in the present state of the art. Later the Commission issued a report and order that provided for retention of the 1970 rule and directed compliance with it within two years. It was acknowledged that in requiring adherence to the rule they were restricting identification and transmission to codes in videotape recordings. At the same time they urged others who may be interested in this matter to devise an identification system of more general utility.

Symposium Chairman Roland J. Zavada making opening remarks at the Broadcast Monitoring Symposium.

Mr. Zavada went on to say that today's presentations may indicate a need for a universal approach to monitoring. If so, the Society's role in the field of standardization would make it responsible for recognizing those characteristics of the system or sub-system that would lend itself to national and perhaps future international standardization.

THE MONITORING SYSTEMS

Robert Morris of Broadcast Advertisers Reports, New York, reviewed the background of monitoring systems. The purpose of these systems is to ensure that advertisers get full value for money spent. Monitoring was started over 20 years ago and soon became so popular that now there is a nationwide information system in operation. Each month 18 or 19 market areas are monitored for one week periods. At central offices listeners review the audio recordings at high speed, enabling a 1-h broadcast to be dealt with in 15 min. Last year over three million commercials were checked, against predetermined standards of performance and 52,000 adjustments resulted. In the New York area monitoring is continuous time-lapse video recording, and network reporting takes place every day of the year. The resulting reports are used by the networks and agencies.

Three questions are posed: Who will pay? Is the system viable? And how much is enough? There is mounting concern with the rapidly increasing volume of commercials. But program scheduling leaves "holes" for the insertion of commercials, and something has to be inserted in these holes—if there is no commercial then an unpaid "promo" has to be put in. Mr. Morris said that setting up a costly and complicated electronic monitoring system would not be warranted. Already many schemes for automatic monitoring have been rejected.

The IDC System

In a paper with the title "Teleproof 2 Today — Teleproof 3 Tomorrow," Paul Roth and John Fletcher of IDC outlined the technology of inserting small code patterns in the four corners of the television picture. This system is applicable only to videotape. The code patterns are hidden behind the masks on home receivers. Two code frequencies and four code positions are utilized. Each commercial is assigned an IDC number, and this is repeated in five consecutive fields for a period of ¾ s at the beginning and end of the commercial. The system has a capacity for a quarter of a million commercial numbers. The encoding of the commercials is done at a VTR facility during post production. The IDC number is set up with a punched card. Two VTR machines are used, one playing back the master tape and the other recording the dub and the superimposed code patterns.

Broadcasts are monitored by means of an unattended facility and data derived from the video signals is recorded on a tape machine. Data can be sent on telephone lines to a center in Chicago by commands sent to the monitoring stations. IDC also have a manual monitoring system in which videotape recordings are made. The present code patterns take up 5 lines at the top and bottom of the television picture. A changeover to 3-line codes is being made to conform with an FCC ruling.

Mr. Roth described a new system that is being proposed with the designation Telepay. This system would give agencies prompt verification of broadcasts to enable prompt payment to be made to the stations.

The Identimatch System

Warren Moon of Real Time Technology/Identimatch, Norwood, Mass., outlined the Identimatch system. Since February 1974 automatic electronic recognition of commercial broadcasts has been in operation in 25 of the top markets, including 117 stations. Identimatch uses recognition patterns and does not involve coding nor is broadcasting affected in any way. The principle employed is pattern recognition. Use is made of information already within the commercials, thus avoiding the need for coding. The Identimatch system can be used with either videotape or film. All that is needed is a copy of the commercial from the client or advertising agency. A recognition pattern is derived from the commercial which is then stored in a digital memory like a fingerprint. Field recording units are installed in each market area, and all broadcasts are recorded with a time code. Recordings are sent to a central location for processing in a high-speed comparator at 250 times original speed. In this way a full day's recording can be checked in 5 min, in which thousands of recognition patterns occur. Comparisons with the previously stored patterns will show any discrepancies. A high degree of accuracy can be achieved.

VIAC Pattern-Recognition System

Another type of pattern-recognition system was described by Gerald Auerbach of Video Image Analysis Corp., New York. This speaker commented on his experiences when he worked in a broadcasting station and became involved in operational problems. Some say that commercial monitoring is an example of overkill, but agencies have the right to know if their commercials have been broadcast, and whether acceptable

Representatives from Agfa-Gevaert and their wives, M. N. Vrancken on the left and Raymond Eynard on the extreme right.

quality is being maintained. There have been unhappy experiences with monitoring systems — confidence is lacking. VIAC, according to this speaker, is the only meaningful approach. In addition to monitoring this system provides electrical pattern recognition of both aural and visual elements.

Several forms of pattern recognition are already well known. VIAC was the first to employ pattern recognition in television, in real time, in each and every frame all day. With this method processing must also be in real time.

There is the possibility of data reduction by a factor of 10^5 through the use of microprocessors at monitoring sites. Broadcasts of commercials are compared with patterns stored in on-site processors and data can then be sent to a central office on voice lines. VIAC samples several frames throughout commercials. When the comparison of data sets is made and the match becomes less than perfect, an appraisal can be made. Stored data sets have information on common aberrations related to both videotape and film characteristics. On-site memories can be up-dated on telephone lines. A reliability rate of better than 97% has been achieved.

The Audicom System

A description of the Audicom System for Auditing Television, Radio and Recordings was given by Alex J. Rutman of Audicom, New York. In this system a permanent recording can be made of any broadcast material that has an audio track. Coded information is inserted into the audio recording momentarily, at a sub-audible level. This can be done when the original recording is being made. In commercials the code appears at the beginning and end. The code is inserted as a short burst of 2563 Hz two to three seconds in length at 50 to 55 dB below 100% modulation. It was claimed by the speaker that the code causes no objections among viewers. A demonstration recording played back at the end of the presentation showed that there is minimal interference with program audio.

ELECTRONIC DATA APPROACHES

Michael Bower of Donovan Data Systems, New York, raised the question, are the business needs important enough to warrant expensive electronic technology? Thirteen years after the introduction of computers their original promise has not been achieved. At first computers were hailed as a foolproof system of proof of performance in commercial broadcasting. Early attempts met with little success. Today many agencies use computers for simplifying paper work, clerical functions, traffic verifications and billing.

At one time monitoring of broadcasts was thought to be a great idea, but this has decreased in importance through greater use of computers by the stations. Ongoing monitoring is not profitable if the number of errors detected are too low to make the monitoring process cost-effective. The greatest need in the broadcasting industry is business processing functions — greater productivity or increased efficiency. The main problem now is a practical, universally acceptable coding system.

It should be possible to employ computerized transmittal of information to and from stations. A three-way interface could provide an agency file, a station file and a monitoring of performance file.

A Perspective on Broadcast Material Identification

David W. Dole, Ichtus Ltd., Des Plaines, Ill., again raised the question, is there a need for proof of performance. His answer was that there is a need for the use of ancillary signals, but these would not be for proof of performance. Verifying signals do not have to leave the stations. In electronic organizations, electronics should be utilized for bookkeeping and automated verification of broadcasts. Proof of performance is only the tip of the iceberg. A standard method of coding needs to be developed to deal with future problems. There is no need for FCC involvement. What is the minimum requirement in the coded signals? At present 1800 advertisers are using TV. The coding system should provide for at least 10 times that number. In Australia a scheme using 21 characters was considered, and in the United States another organization proposed that 31 characters would be needed, but the proposal was dropped as unworkable. A 6-character code would be preferable. An 8-character code with 4 letters and 4 numerals could be used for all commercials. Reference was made to the Industry Standard Commercial Identification code adopted by the advertising industry for identification of commercials. It was proposed that the ISCI code should be recorded in the station at the time of broadcast, but not transmitted. A broadcasters code could be included. The ISCI code is only a standard identification. An additional character could be added for international distribution making a 9-character code. This could be used to accommodate advertising distribution between the United States and Canada.

George Arnold of Ogilvy and Mather and chairman of AAAA subcommittee on broadcast paperwork standardization, as well as the IRTS Committee on Coding, took as his subject, "What Happened and Who Cares?" The advertiser starts the process that involves all those who deal with a commercial. A great deal of information is needed to put a commercial on the air and get back verification of broadcast. About 20 identical pieces of information are required to make sure the advertiser gets his money's worth. Something more direct and more positive is needed for verification.

Views of the Agfa-Gevaert Festival Cocktail Party held at Ontario Place.

Identification codes for film and tapes should be capable of recapturing use. Identification should be obvious to anyone observing the commercial on a receiver. Many people need to use the same data, to determine when, where and how money is being spent. Why should all of these people make use of the same data in different ways? Codes should be as simple as possible and broadcasters should be the leaders in this field.

NON-ADVERTISING CONSIDERATIONS

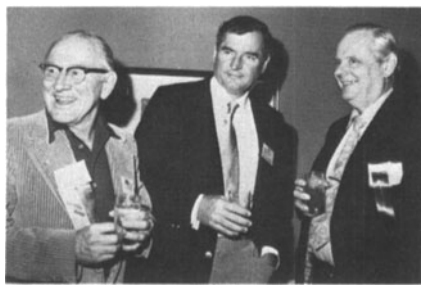
At the opening of the afternoon session Paul Siren, ACTRA, New York, outlined the performers' interest in electronic monitoring.

CONCERNS AND CONSIDERATIONS OF ADVERTISING AGENCIES

Then Joseph W. Ostrow of Young and Rubicam Agency, enumerated the advantages that electronic monitoring offers for agencies and broadcasters. Present methods of authenticating performance especially in television fosters an environment of distrust. In some quarters there is a fanatical devotion to complicated systems. Many monitoring services have collapsed. Electronic monitoring is not the only method that can be employed. There is a concern for the degree of interference involved, but the greatest concern is the incremental costs of these services. Payment by the client to the monitoring service may be as much as two-thirds of the cost of the agency's work in buying. To require all commercials on videotape would cost two or three times as much as film, and the work would be doubled. Monitoring services duplicate much of the verification work performed by the agency. Proof of performance must be put in the proper perspective -- in one large sampling discrepancies amounted to only one tenth of one percent. This would not cover the cost of monitoring. The conclusion is that there are negligible broadcasting discrepancies — in the 0 to 1½% range. This speaker recommended that monitoring, either total or by spot checks, should start at the station level to provide an authenticated service. However, stations are not likely to volunteer to undertake this work.

"An Agency's Views on Television Monitoring" was given by Jerry Still of Tracy Locke Agency, Dallas, Texas. In this speaker's view, some monitoring services are good and others bad. In one test 8 out of 300 commercial spots ran incorrectly. The agency detected six of these. In another test there were 11 discrepancies out of 390 commercials and internal verification detected all of them. Stations are delivering 98.2% accuracy. The problem is not in major markets, but there may be more errors in smaller centers. This agency does not expect to recommend continuous monitoring, but selective sampling can be advantageous. The question is who pays — the station, the advertiser or the agency? All say no.

Canadian Film Commissioner Sidney Newman with SMPTE Editorial Vice-President Gerald G. Graham and Conference Program Chairman Maurice French.



Robert Colburn, Roy Edwards, recipients of the E. I. du Pont Gold Medal, and A. Earl Quinn, at the President's Reception.

The Canadian agencies' views on television monitoring were presented by Roy Chernoff, McKim Advertising, Toronto, who was giving the views of the Canadian Media Directors Council. Rates have risen 14% in Canada and there is increased demand for advertising time. Cable penetration in Canada is four times as great as in the United States. Advertisers will demand proof of value for dollars spent. A basic flaw in the checking system is that most agencies do not carry out a proper checking procedure. One way to avoid this problem is to automate the checking operation and have this done by the stations. With present methods accuracy is as great as the results produced by the lowest paid clerk involved. Clerical work is a poor substitute for electronic monitoring. Advertisers are becoming more knowledgeable and aware of the weaknesses of present monitoring methods.

THE BROADCASTER'S VIEWPOINT

A paper on the Broadcasters Views on Commercial Coding, prepared by Harold Dorschug, Director of Engineering, WTIC, Hartford, Conn., was read by John Walters, CFTO, Toronto. To the question, how does the broadcaster feel about coding of commercials, the answer is that he has no objections. However, no coding scheme should be adopted without adequate testing. In the IDC case, the FCC acted with unusual speed to rule that visually coded material could be broadcast. The first example to be encountered was a film commercial in which the codes were not correctly located. A call to FCC brought out the information that broadcasting this commercial would constitute a violation. The agency was advised that the commercial could not be telecast. Later is was discovered that the network was carrying the same commercial. It was withdrawn and replaced by a videotape. Visual coding has created many problems and now the system appears to be in limbo. In the chain of commercial production and distribution broadcasting is the only operation under government control. It is a question whether monitoring is necessary. The standard procedure now is that an affidavit is provided for broadcasting of commercials. A number of services are now carried out by spot checking. Even FCC examines station logs only for short periods. One hundred percent monitoring is not practical. Broadcasters should have advance notice of the use of codes, and there should be some indication that the code has been read out. In the future the use of automated equipment will increase and this can be used for commercial verification. There is no objection to the use of verification systems, but any system that is adopted must not jeopardize the station's license.

James Parker spoke on the subject "NAB Looks at Monitoring." He explained at the outset that he was speaking on behalf of the National Association of Broadcasters. NAB has an engineering advisory committee that takes up technical issues on regulatory matters and Mr. Parker is a member of that committee.

Individual broadcasters may differ, but in general they are not opposed to monitoring. Monitoring may, in fact, offer certain advantages, such as the settlement of differences that now cost millions of dollars. Fully automated monitoring services will include station logging. There is concern over four questions. First, before any technique is adopted everyone should be aware of what is being done. Second, technical feasibility should be verified. Third, the system adopted should be applicable to all forms of materials. Fourth, any system that piggybacks anything on the broadcast signal should conform with existing regulations and should not impose any burden for compliance with the rules.

THE ADVERTISER'S VIEWPOINT

The media director for American Cyanimid Corp., James Gibbs, reported on tests that had been made in a number of markets in which it was found that rebatable errors amounted only to 1.4%.

In a paper on A Test of Monitoring— Results and Conclusions, William Pedersen of the Eastman Kodak Co. summa-

rized what had been said in the present debate. So far there is no unanimity. The Kodak Co. has been concerned that the coding system proposed by IDC does not include film. The FCC has recognized the desirability of further investigation. A system applicable equally to film and videotape is needed. A study has been made of the Identimatch system. This system has been used to monitor some of the company's advertising, and the results of these tests have been sent to FCC. In a number of tests in several markets, accuracy of 96.3–99.2% was achieved. The conclusion is that the test results are meaningful and the system works well with the major source materials, film and tape.

REGULATORY CONSIDERATIONS

In the final paper in the symposium, Bruce S. Longfellow of the Federal Communications Commission in Washington had as his subject Subsidiary Signals in Broadcasting. The commission's rules define broadcasting as a service for direct reception by the public. Program modulation does not always utilize all possibilities of the broadcast signals. An early scheme proposed was to turn street lights on and off by a broadcast signal. Program identification signals are not intended for reception by the public. A broadcast-related service is the system developed in FM broadcasting where sub-audible tones are used to eliminate spoken material in background-music services. Broadcasters must retain control of all material transmitted — this is a requirement of all stations. Broadcasters have responsibility for all materials transmitted including ancillary signals. In 1959 the commission permitted the broadcasting in the television signals of data not normally received by the public. The rules were amended in 1970 to permit transmission of coded information for program identification. This information is normally hidden from viewers by the television receiver mask. In allowing the IDC proposal, the Commission departed from previous rules. Difficulties were encountered in application to film. The program identification signals can be used only with videotape, and must be included in the program material. The method by which this is done is of critical importance. Then the signals must be extracted from the program, and this must not result in degradation of the program as viewed by the public.

The commission has authority over transmission and the operation of stations. The parameters of program identification signals must be established. The relationship of the signals is established outside of the control of the stations. The stations are responsible for the transmission of the signals and also for the content of programs. Stations may become the unwitting agents in the transmission of undesirable materials. A feasible solution will be found, this speaker remarked, which applies to all materials that the stations do not produce. In conclusion, Mr. Longfellow expressed the appreciation of the Commission to all industry groups assisting in the development of technical standards for ancillary program identification signals.

SHORT FILMS

The short films that introduce each Conference session were among the most popular features of this Conference. With the exception of the sessions on Television Broadcast Monitoring, all sessions opened with films. Sir Arthur Chetwynd, Chetwynd Films Ltd., as Short Films Chairman, was responsible for obtaining the films. The following is a list of the films shown at the Toronto Conference.

Mother Earth, Father Sky, Ford Motor Company
Schenley Awards 1975, Chetwynd Films Ltd.
Life Times Nine, Insight Productions
Mirrors to the Sun, Government of British Columbia
Le Feu Pas Pour Les'Hommes, National Film Board
Creation Des Oiseaux, CBC
Wilber, Chetwynd Films Ltd.
Sunburst, Insight Productions
Synchromy, National Film Board
The Eye, National Film Board
Beding, Bedang, Bedong, CBC
Manitoba in the Wintertime, Province of Manitoba
Thoroughbred, Insight Productions
CBC Animation Techniques, CBC
Laser Holography, A New Tool for Measurement, Dept. Trade & Industry, Great Britain

SOCIAL ACTIVITIES

One of the functions of the SMPTE Conference is to provide a place where persons may meet to talk over common problems, to discuss old times, or simply to enjoy each others company. The Toronto committee provided ample times for the Conference attendees to meet socially.

Harold Eady interviewing Findlay Quinn for the closed-circuit television service provided by the National Film Board of Canada.

Opening the Conference, on Sunday evening, Kodak Canada Ltd. sponsored a *Novemberfest* where everyone attending the Conference met to dance to German music, eat delicious German food and drink good old German beer. Kodak provided little green Alpine hats for everyone. The mood of the evening was indeed festive.

Monday of Conference week saw the traditional SMPTE Get-Together Luncheon where more than 500 members and guests were welcomed by SMPTE President Roudabush. The main highlight of the luncheon was the presentation of Awards. [A complete story on the Awards presentation is published later in this issue.]

Part of the program was a brief talk by Ms. Barbara Green, Controller, Borough of North York. She welcomed SMPTE delegates to Toronto on behalf of the Metro Toronto Council and discussed some of the highlights of the City.

President Roudabush introduced SMPTE Past President Wilton R. Holm who spoke for a few minutes on his career with the SMPTE. He said that when one is elected to Executive Vice

President, he has to look forward to 6 years of hard work for the Society: first two years as Executive Vice President, then two years as President, and finally two years as Past President. Holm reflected on his last six years and praised the Society and those other officers with whom he had worked in that time. Holm's brief "farewell message" was received with a standing ovation.

Following this, President Roudabush presented incoming President Kenneth M. Mason with the President's gavel.

The luncheon was concluded by an 8-min film, *SMPTE Conference, Toronto 1974*. The film was produced by Harold Eady, Bonded Services International, Ltd. It was directed by Maurice French, Canadian Broadcasting Corp. The film was narrated by Rick Cambell of Destination Films, Toronto. The following companies provided services which contributed to the success of the film: Bonded Services International, Ltd., Canadian Broadcasting Corp., Film Opticals of Canada Ltd. and Quinn Laboratories. The film traced the evolution of a conference from its inception through its conclusion. There were shots of Toronto, scenes of planning committees at work, and interviews with many of the key people who helped put the Toronto Conference together. Luncheon Chairman was Geoffrey Oliver, Kodak Canada, Ltd.

On Tuesday evening, Conference attendees boarded buses for Ontario Place where they were treated to a fine film program, and a cocktail party called the Agfa-Gevaert Festival.

Ontario Place, straddles the shores of Lake Ontario. It is a fantastic place, dominated by a huge triodesic dome. Inside the dome is a theater with an enormous screen — 67 ft tall and 90 ft wide (20.4 × 27.4 m) — that covers an entire quadrant from floor to ceiling. The picture projected on this concave vinyl screen overwhelms its audience with its size, clarity and realism. Two films, *North of Superior* and *Catch the Sun*, had viewers gripping their seats with such scenes as a roller coaster ride, a flight through a narrow gorge, and a ride on a rubber raft over foaming rapids. The excellent picture quality on the giant screen was achieved by the use of the Ima Projection System. The system employs 70mm film (with frame dimensions of 51.0 × 70.9 mm, 2.01 × 2.79 in approx.) which travels horizontally through the projector by means of a remarkable Australian invention, the Rolling Loop. It advances the film in gentle caterpillar-like waves, and positions each frame, during projection, on *fixed registration pins*. In addition, the film is held firmly against the rear element of the lens by vacuum.

Photo Importing Agencies Ltd. of Toronto was the host for the Agfa-Gevaert Festival and they supplied the round-trip bus transportation, cocktails, delicious food and a polka band.

Finally, on Wednesday, the SMPTE held its traditional Cocktail Party, Banquet and Dance. Banquet Chairman was Steve Cook, Braun Electric, Ltd. The banquet featured a delicious meal, plus dancing to the music of Benny Louis and his Orchestra. Highlighting the banquet was the singing of the White Oaks Men of Harmony (SPEBSQSQ), a 45-man barbershop chorus. The chorus received a standing ovation and was called upon perform an encore. The banquet also heard Michel Guay, Director General, Technology and Construction, Comite Organizateur des Jeux Olimpiques. The cocktail party, orchestra and entertainment were sponsored by the Canadian Broadcasting Corp.

LADIES' PROGRAM

The ladies program was described by many of the women who attended as one of the most interesting in recent Conferences. Sheila Oliver was the Ladies Committee Chairlady.

On Monday, the ladies had a Get-Together Brunch and later, a choice of three shopping excursions. On Tuesday, the ladies lunched at Chinatown and in the afternoon toured the Chinese Exhibition at the Royal Ontario Museum. This was said to be the highlight of the week.

On Wednesday, the ladies traveled to the Ontario Science Center. On Thursday, they went to the Doctor's House, Kleinburg for a luncheon followed by a tour of the McMichael Gallery — Group of Seven Canadian Art Collection. On Friday, the ladies said tearful goodbyes to each other at the Farewell Brunch.

ACKNOWLEDGMENTS

The Society thanks the following companies and organizations for providing the services and equipment at the Conference:

Philip A. Hunt Chemical Corp., *Coffee Club*

Kodak Canada Ltd., *Novemberfest, Ladies Gifts*

Government of Ontario, *Program at Ontario Place*

Photo Importing Agencies, *Agfa-Gevaert Festival*

Canadian Broadcasting Corp., *Cocktail Party, Banquet Orchestra, and Entertainment.*

Denlen Electronics Corp. (International) Ltd., Toronto, *International Delegates Reception*

National Film Board of Canada; *Closed Circuit Television in Hotel*

W. Carsen Co., Ltd., *Pin-On National Flags*

Braun Electric Canada Ltd., *Coffee for Thursday Symposium; Ladies Gifts*

Bonded Services International, Ltd., *Ladies Gifts*

3M Co., Canada, *Ladies Gifts*

The Wednesday evening Banquet and Dance. At right, the excellent work of the Conference Committees was acknowledged by those attending.

TORONTO Post-Conference Report

(Continued from page 950)

sure information is displayed in the viewfinder along the bottom edge of the frame by a series of light-emitting diodes masked to indicated correct exposure, overexposure and underexposure (in half *f*/stops). Two variations of the exposure-control system may be purchased—one a match-display type and the other using a servo mechanism with option for manual override.

Besides exposure information, the viewing system incorporates four warning displays, indicating low-battery condition, camera running out-of-sync, film load nearly expended, and proper modulation (if a Crystasound amplifier is part of the camera system). Other accessories new to this camera are an orientable viewfinder, a motorized zoom control, the Crystalink wireless receiver and the Auto-Slate/Pilotone system.

Two studio cameras were also on display: a studio version of the CP-16R 16mm reflex camera and a compact 35mm studio camera, model XR35. This camera has been updated to include an electronic footage counter in the magazine blimp housing, which is positioned for convenient checking by the camera assistant.

Cinequip Camera and Equipment Rentals The O'Connor Model 102-B Hydro-Ped, a new concept to replace the tripod, was shown here. With an ordinary tripod, leveling of the camera by three leg adjustments is always difficult, and lack of rigidity makes smooth panning and tilting very difficult. The Hydro-Ped is four times as rigid as a conventional tripod in torsion and bending. It eliminates the need for a ball leveling base because it levels hydraulically in any situation utilizing the exclusive O'Connor fluid-action principle. It can be set at any angle and adjusted hydraulically for height. The Hydro-Ped can be folded up into a space 9 in (23 cm) in diameter and 30 in (76 cm) in length. Wheels can be provided as an accessory making the Hydro-Ped a portable dolly. Weight is only 23 lb (10.4 kg).

Alex L. Clark Ltd. The new Spectra TriColor Meter was shown here. At Photo Research, the Spectra people realized some years ago that simple color-temperature meters measuring only blue and red light are not spectrally selective enough to provide balance information. To be meaningful the green light, as well as the blue and red, has to be measured. The first film-balanced 3-color meter was introduced by Photo Research a few years ago. Now the new Spectra Tricolor Meter is available. The meter is aimed at the light source and when a trigger is depressed the Tricolor reads the full range of color in the light through built-in computer-matched filters. Two separate scales simultaneously display blue/red and green/red values. When the trigger is released the meters "remember" the readings and a simple dial calculator shows which filters are needed to balance the scene for the film.

Also shown was the new Spectra Mini-Spot Spotmeter, which was described in a paper "A New Photometer for Measuring Screen Brightness" in the Sept. 1974 *Journal*.

Denlen Electronics Corp. Shown here was the Aston Video Character Generator and Multipage Message Store. The Video Character Generator VCGI is a piece of television equipment that provides the user with the ability to compose alphanumeric messages, store messages and superimpose messages on program video signals either internally within the unit or externally in a suitably keyed vision mixer.

Digital Video Labs Shown for the first time here was the DVL 2002 Video Processor which, according to John Lowry, president of Digital Video Labs, is the first digital time-base corrector that can be used with any type of videotape recorder. Using seven lines of digital storage for an extra wide correction window, the new processor can bring many otherwise unusable, damaged or off-standard videotapes up to full broadcast standards.

The DVL 2002 is unique in that it samples the input analog signal at 14.3 MHz, or four times during each cycle of the subcarrier to set a new standard for the industry. This new higher rate dramatically improves the signal-to-noise ratio, frequency response, differential phase and differential gain of the system.

The DVL 2002 video processor is designed as a basic building block for future system expansion, with space allotted in a 10½-in (27-cm) high rack-mounted unit for a number of innovative options that will be introduced soon. Conversion of heterodyne to direct color requires, for the present, a minor modification in the VTR, but with the heterodyne option any heterodyne VTR including those without capstan servo can be played in full vertical, horizontal and color-lock referenced to external sync.

Dolby Laboratories Inc. The Dolby A-type noise-reduction system is an integral part of professional recording practice and enables studios to produce better master tapes than could be done previously.

Now with the aid of the Dolby 364 cinema noise-reduction unit optical soundtracks can be improved to meet the standards of today's audiences. The Dolby system of noise reduction transforms optical sound into a medium with excellent fidelity. This system resolves the dilemma of optical sound recording by suppressing noise without affecting fidelity in any way. Already more than 18,000 studio channels are Dolby-equipped, many in the film industry.

The exhibit included both the cinema playback package and studio noise-reduction units used for the production of Dolbyized soundtracks.

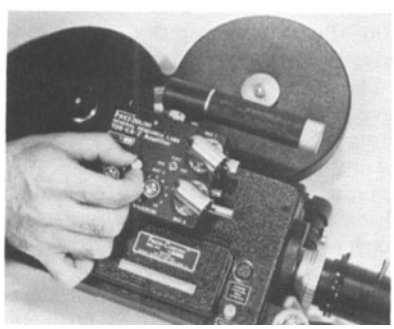
Dynatel Systems The Dynatel CBG-2 Video Colorizer is a color background generator with caption keyer and NTSC full-field color bar generator. This unit will translate any plant-synchronous black-and-white or color video source into the luminance-equivalent colors. Commercial material, halftone cartoons, cells and animated drawings can be colorized with B&W cameras to produce different colors within the same frame by controling the associated density.

The Video Colorizer generates 75% saturated NTSC background chrominance with the correct associated luminance level for each hue, and this can be dc remotely controlled with a single wire pair. The unit provides a separate white or dark keying input for caption scanners, temperature dials, weather wheels, character generators and graphic art.

Frezzolini Electronics Inc. On exhibit at this booth was the complete line of Frezzi-Cordless® professional 16mm sound-in-film motion-picture cameras. An extensive range of Angenieux lenses and viewfinders were also shown. One lens, shown on their model LW-16 camera, had an automatic diaphragm which received its power from the internal batteries in the camera.

A lightweight battery pack, the model 800 NC, supplied 250 W at 30-V dc for up to 30 min without need for recharging. It can be used with any professional portable light head and can also be used to power 28-V dc camera motors.

Also shown were ac-power inverters, amplifiers for side-mounting on Frezzi-Cordless cameras, magnetic sound recording heads for Frezzi cameras, a lightweight nickel cadmium video-camera battery pack and associated battery recharger.

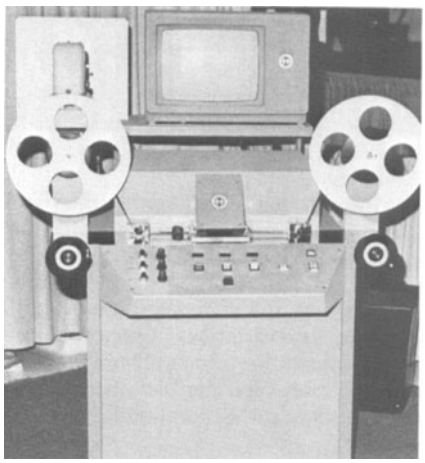


A close-up view of the Frezzolini "Frezzi" TOS-2 amplifier on a LW-16 Camera.

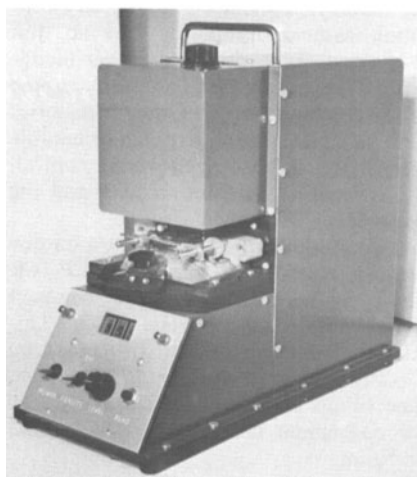
The Frezzolini Model LW-16 with the optional Angenieux automatic iris.

Hazeltine Corp. The Hazeltine Model 116 color film analyzer for 16mm is an electrooptical system that accurately simulates the characteristics of the film process. It provides instantaneous electronic analysis of color film to determine exposure information for making acceptable color-balanced prints prior to committing the film to printing and processing. This analyzer provides timing data for 16mm negatives, intermediate negatives, CRIs and reversal films. Red, green and blue exposure data are displayed on digital readouts in increments of 0.025 logE steps. The new all-electronic fingertip control panel features LED numeric readouts and contains dual exposure controls with common density. The exposure range is 50 printer points, compatible with Bell & Howell and other additive printers.

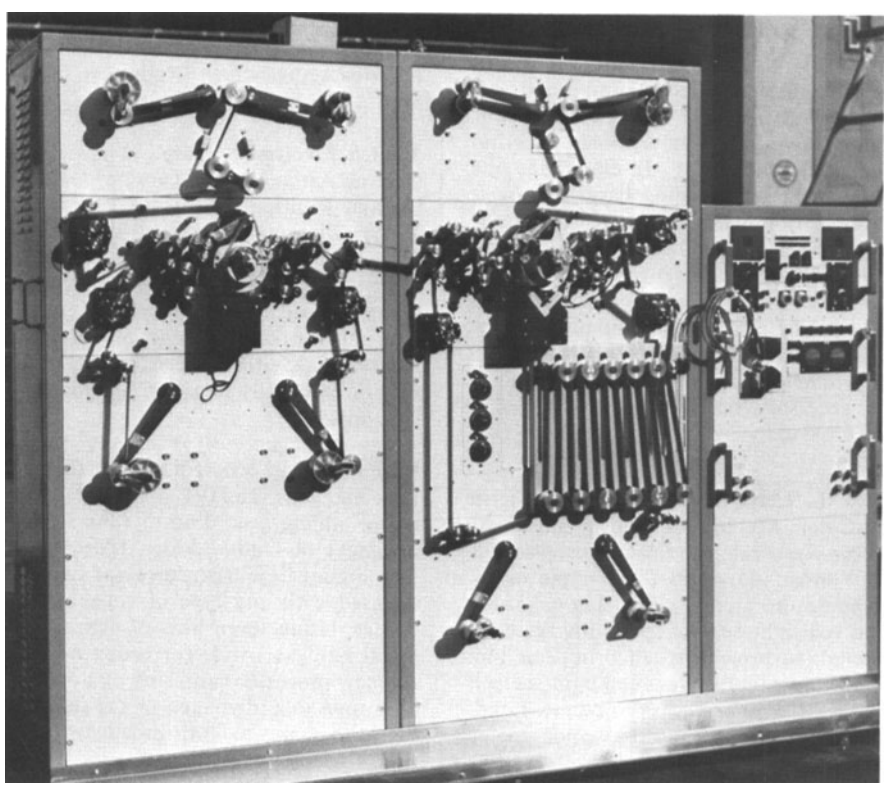
Hollywood Film Co. Featured here was the HFC Cross-Mod tester with digital display for immediate recognition. The tester was developed for laboratories and sound studios for measuring cross modu-



Hazeltine Model 116 Color Film Analyzer.



The Hollywood Film Company Cross-Modulation Tester with Digital Readout.



The Hollywood Film Company High-Speed Bi-directional additive contact printer.

The KEM RS-Super Sound/Editing Table.

lation from a few inches of the standard 9000/400 Hz cross-modulation signal. Also, the instrument indicates the appropriate corrections needed, that is, to increase or decrease print density. At the same time, the approximate density change required for minimum cross modulation can be determined.

The instrument is about 7 in wide, 15 in long and 13 in high (18 × 38 × 33 cm). A control panel includes digital display, power switch, selector switch for reference or density, a gain control for setting the 400 Hz reference level, and a switch to actuate the scanning action. A knob selects 35mm, 16mm or super-8 slit width. Platens maintain the film in a flat condition in the light path, and the film is transported back and forth over the platen by two rubber-covered drive discs. In the optical system a lens projects the soundtrack on a 0.003-in (0.08-mm) wide slit over a cell at a magnification ratio of 6. As the track is scanned the cell produces a signal for detection, demodulation, phase comparison and display.

Kem Elecktronik Mechanik GmbH. The main features of the Kem RS-Super 4/6 plate editing table are: interchangeable modules for different film gauges; quick and easy threading; parallel film paths; variable speeds (0 to 100 frames/s) forward and reverse; starting and stopping within one frame; high-quality picture and sound reproduction; no decrease in brightness with film stationary in the gate; heat filter prevents heating of the film; synchronizing points on right and left sides; inching buttons for adjusting sync with machine stationary or running; frame counter in each film path.

Accessories available are: automatic synchronizing facility; fast "take" rewinder with magnetic head; foot pedal to actuate stop and start; minutes/seconds counter; extension table for left side with three spindles for spools. A comprehensive range of interchangeable sound and picture modules are available making this an extremely versatile editing table.

Picture modules have optical equalization, with quartz iodide lamps giving bright crisp pictures. Picture size is 24 × 30 cm (9.4 × 11.8 in).

Kingsway Film Equipment Ltd. Featured in this exhibit were the Steenbeck picture and sound editing tables. The model ST 928 editing table has 8 plates, making possible a working procedure with two picture films and one soundtrack, or two soundtracks and one picture film.

Threading is accomplished easily. All elements are in an easy to follow layout. Two pictures can be seen simultaneously on side-by-side rear-projection screens. The photo element for optical sound and the magnetic head for striped film are mounted on a rotating element that corrects for corresponding picture advance automatically. Synchronizing points are provided outside of the sprockets on both sides of the transport deck for all four tracks. Each track can be disengaged from the main drive and moved by hand. The advance/retard system between picture and sound is located on the front soundtrack. It is fully electric and activated by pushbuttons. A dial will indicate sync differences up to 50 frames.

Large bright pictures are produced on the viewing screens with quartz iodide lamps, with cold light mirrors to reduce the heat in the projection light beams. This model is also available with an automatic start marking system which simplifies synchronizing considerably. Another option is an electronic cut marking system for recording pulses on the front soundtrack. These pulses switch over two pilot lights behind the projection screens and stop the drive system on desired cutting points. When new pulses are to be recorded existing pulses are erased, thus permitting correction of cutting points.

Metro/Kalvar Inc. Metro/Kalvar has developed a new ultrasonic film splicer, model 2008, for high-speed splicing of super-8 film with polyester film base. This unit has been designed as a part of the production line in cartridge-loading operations. At one location where the ultrasonic splicer is being used, most of the operators are producing over 1500 splices per shift, and the yield of high-quality splices is reported to have risen dramatically. The minimum acceptable tensile load in that application is 10 lb (4.54 kg), but the splice strength far exceeds requirements.

Also shown were other models of the Metro/Kalvar ultrasonic splicer. The model 2001 fuses polyester to polyester, raw stock or prints, without scraping emulsion or base. It is simple to operate, precuts and positions films in precise alignment, with a foot switch available as an accessory.

Photographic Analysis Ltd. Among the equipment displayed here were three items of special interest — the L-W model 4000 TSM 16mm television film chain projector, the Pallite VIII lighting unit, and the Locam 200 ft (60 m) model 50 pin-registered intermittent 16mm camera.

The L-W Projector has a heavy-duty quick-access case for easy servicing and multiplex use, magnetic and optical sound playback, with remote control of all functions, interchangeable lenses from 50 to 240mm available, provision for internal mounting of an interlock motor and broadcast-quality amplifier.

The Pallite Lighting Units have eight quartz iodide lamps arranged in a circular configuration with center opening for the camera lens. The lamps have dichroic reflectors minimizing forward heat to protect subject material. They are especially useful in small and confined areas.

The Locam models 50 and 51 are the most advanced and general purpose and instrumentation cameras available in the intermediate-speed range. A continuous reflex viewfinder is available. A phase-lock system can also be obtained as an option to synchronize two or more Locams.

PSC Technology Inc. An important new product for the motion-picture industry was being shown here — the C/Kit for the Bell & Howell Model C printer. The C/Kit allows users of the printer to upgrade this machine to a high-speed bidirectional printer with automatic light changes. The C/Kit can be completely field installable and PSC provides an easy-to-use tool kit for assistance in installation, an operation that takes only 4 to 8 h. With the C/Kit the users of the Model C printer have at their disposal a panel printer at a price four to eight times less expensive than commercially available panel printers.

Also shown was the new Acme Optical Printer called the Miniprinter. It has been designed for super-8 and 16mm duplication in 1:1, reduction and blow-up modes. Acme Optical Printers are known the world over for their high-quality workmanship and the Miniprinter is a fine example of this. The unit consists of a high-quality camera, projector and lens system in a table-top mounting configuration. The Miniprinter is simple to use and produces high quality optical dupes. The unit operates at speeds up to 960 frames per minute, with a registration accuracy of ±0.002 in (±0.05 mm) and it can be operated in forward and reverse modes.

Rosco Laboratories Inc. Displayed here was the range of Rosco Cinegel materials, a complete system of light control. Until recently, light control materials available to the cinematographer consisted only of a haphazard collection of gels, filters, reflectors and diffusion screens,

borrowed from other fields. Now with the help of several leading cinematographers Rosco has put together a total system that really answers the needs of this industry. A full range of Rosco Cinegels is available to control color temperature of lights of all kinds as well as to convert daylight to 3200 K and to reduce its intensity. Diffusion materials and reflector surfaces control the quality of light in another dimension.

Gels are available to balance daylight and dichroics to fluorescent light. There is even a gel that takes an ordinary 3200 K source, raises it to daylight and adds just enough green to match fluorescents.

Rutherford Photographic Ltd. Several interesting pieces of equipment were shown here — Macbeth transmission densitometers, Astro orbiting mixer for preparation of solutions, Leedal model 5629 thermostatic water mixer, Singh-Ray fluorescent light filters, Oscar Fisher jet mixer and Treise processing machines.

The Treise line of film processors is well known throughout the industry and many are in use in film studios, laboratories and television stations. The first processor in the MTV series was introduced in 1965. It was a small compact unit occupying an area of only 14 × 3 ft (4.27 × 0.91 m) and was designed for low-cost high-quality processing of color TV news spots. Due to its modular design the processor was easily adapted to handle other types of work. In 1966 the MTV-50 machine was introduced. It had redesigned film racks accommodating 50% more film and increased production output. Further developments in machine design and film transports resulted in 1971 in the Minaflex which can handle 16 different processes. The secret is in its unique system of "uni-tanks" combined with a design that makes it possible to pipe in chemicals, water or air wherever desired. Needed accessories can be added or subtracted to meet any chemistry requirements. The Minaflex runs any size film, intermixed with any type perforation. With the ultrasmooth SBR drive film, sizes can be changed while maintaining uniform tension.

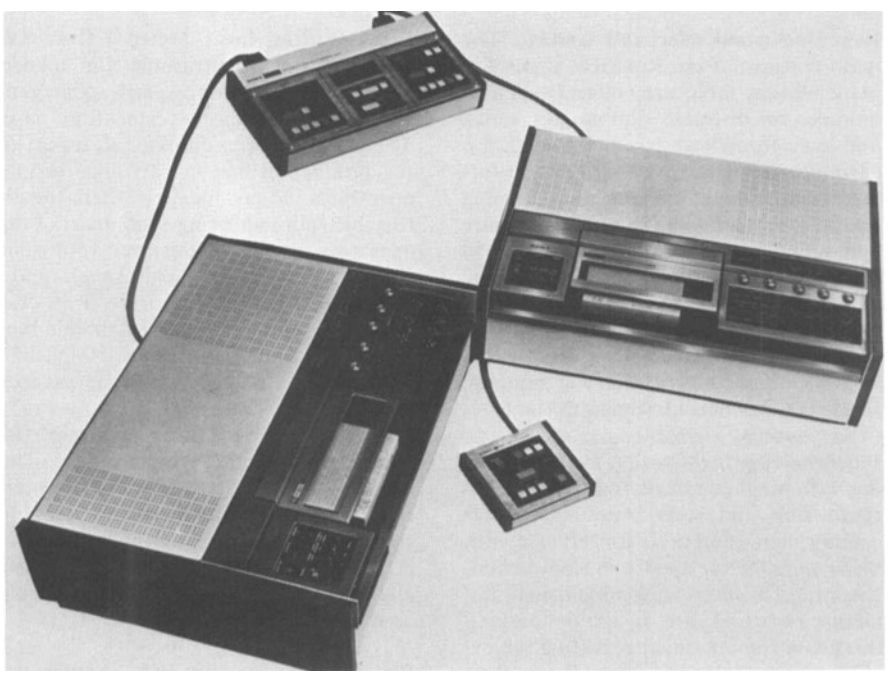
Showchron America Corp. This exhibit featured the Showchron Expandable Editing System. This equipment is designed on the building-block principle. The basic Showchron console composed of one picture and one sound, is expandable to one picture/two sound, one picture/three sound, two pictures/two sound, or three pictures/one sound. The editor can thread up and alternately run any of the combinations when the system is expanded to three pictures/three sound. The units are interchangeable and may be added at any time.

The basic console cradle assembly is designed for moving from one room to another through a 30-in (76-cm) door opening. The pivot arrangement of the console permits secure latching of the unit for transport by station wagon or van. The console will also pivot 180° which places the console's "under side" in a horizontal profile.

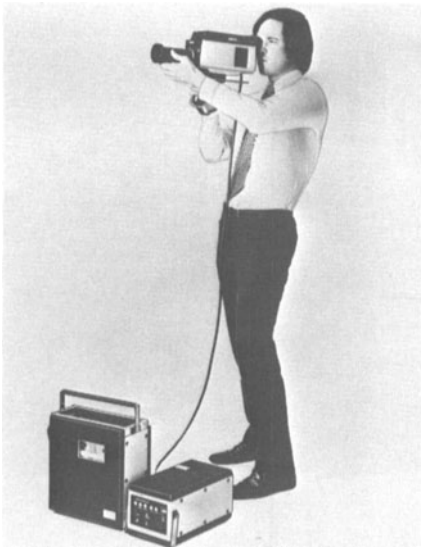
The Showchron Expandable Editing System.

The Showchron editing system has many attractive features, including: selective advance-retard; displacement advance-retard; electromechanical brakes; inching of picture and soundtracks; foot pedal operation; interlock drive; torque-motor differential; clutched core assemblies and tapered film turntables.

The Showchron Preview Editor.



Sony Model 2850 U-Matic Videocassette Recorder Player.



The Sony Model 3800 Portable Color Videocassette Player with Sony Trinicon Video Camera Model DX C-1000.

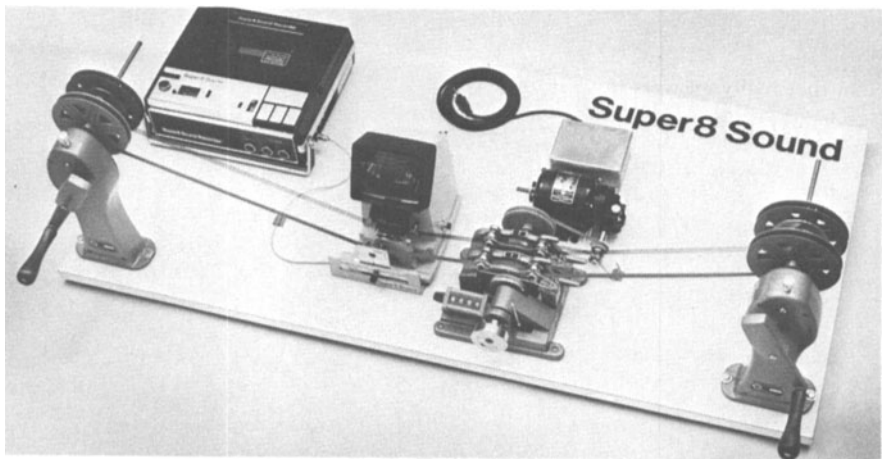
Also shown was the Showchron Preview-Editor for preview screening and editing of originals and work prints, single-system editing, editing and monitoring for TV definition, agency programming, classified showings and briefings, rapid search and assembly of documentary and other program footage, evaluation of medical data and action sports, and library viewing.

Sony of Canada Ltd. Shown here were the new Sony Portable Color Videocassette system — VO-3800 and DXC-1600 — and the VO-2850 U-Matic Electronic Editing Color Videocassette Recorder/Player.

The VO-3800/DXC-1600 is a complete portable U-Matic Color Videocassette Record/Playback chain that can be carried and operated anywhere. It consists of a handheld camera, DXC-1600, combined with a shoulder or backpack videocassette recorder/player. Compact and light in weight, the system operates on batteries or external dc. It is suitable for outdoor sports, education and entertainment. Playing time on a KC-20S cassette is 20 min. Weight of the recorder/player with battery and cassette is 30.8 lb (14 kg); weight of the camera with lens and battery and camera control unit is just over 20 lb (9 kg).

The VO-2850 U-Matic Electronic Editing Color Videocassette Recorder/Player is the most advanced model available in the U-Matic format. It features full electronic editing including insert mode permiting any combination of video and two audio channels. Each unit is in itself a complete editing machine, but when used with the RM-400 optional accessory, two machines can be remotely controlled in an editing setup.

Super-8 Sound Inc. This display was devoted entirely to super-8 equipment,



The Super-8 Sound Recorder (at left) and the Super-8 Sound Editing Bench.

which is now gaining recognition as a professional format. The Super-8 Sound Recorder records in sync with any one of thirty-five sync cameras now available, and can be used also as a laboratory resolver for transferring cassette sync recordings or pilotone recordings to super-8 fullcoat magnetic film. This sound recorder brings to super-8 the straightforward double-system editing techniques of 16mm filmmaking.

The Super-8 Sound Editing Bench is a vertical editing bench which has been designed to incorporate all of the traditional editing techniques of 16mm filmmaking, but at the same time overcome some of the problems of editing with a sync block and rewinds. The sync block has been motorized. Speed is 24 frames/s for accurate program timing (an 18-frames/s option is available). It is engaged with a foot-operated electric clutch. Also used are differential rewind adaptors that prevent spilling of the strands and an unusual sliding magnetic head assembly to "tune" sync accurately in scenes with no clapmark.

Shown also here was the new Cinema Beaulieu 5008S single-system super-8 camera. An incredible 6-80mm $f/1.2$ Angenieux XL lens is combined with a sound-on-stripe recorder with specifications exceeding most cassette sync recorders: 50-12,000 Hz ±1.5 dB; SNR, 57 dB; wow 0.4% rms.

Telemation The Television Frame Synchronizer, described in a paper during the Television session on Monday, was shown here. The NEC FS-10B Frame Synchronizer performs a function that has been needed by broadcasters since the development of television. It permits any station to accept a remote signal including satellite feeds, and correct the time base as the signal enters the production switcher to match local signal sources. The frame synchronizer makes genlock obsolete. At the input the frame synchronizer accepts a non-synchronous signal and through a process of converting the signal to digital bits, storing the information for a time and then reconverting it to video, the same signal becomes available at the output but now it is with the same time base as local station sync.

The FS-10B frame synchronizer components take up almost one full equipment rack. Two thirds of the rack houses the 3.145728-megabit random-access memory and power supply, and the remaining one-third contains the necessary analog-to-digital/digital-to-analog converters for processing the signal.

The frame synchronizer is marketed by Nippon Electric's wholly owned subsidiary, NEC America Inc., New York, and is sold exclusively in the United States and Canada through Telemation Inc., Salt Lake City. Telemation has appointed Applied Electronics Ltd. as their agents for synchronizer sales in Canada.

Wm. F. White Ltd. The Lees lamp heads shown in this booth were designed for lighting film and television locations. Two versions are available — twin and single head. These are fitted with Thorn CSI sealed beam lamps. Lamp life is at least 250 h with a possible 1000 h at fall-off. A choice of lenses will cover all requirements. A choke unit can be used with the twin units which enables the lamps to be operated in series, thus reducing bulk and weight of another ballast. Comparing light output with a color-corrected tungsten lamp, one 1-kW CSI lamp is equal to a 10-kW tungsten lamp.

The CIE color rendering of the Thorn lamps used in these heads, compared with a reference source at 5500 K is 80. The visual appearance is similar to warm daylight. Lees lamp heads are available also with HMI lamps. Early experience with these lamps showed that a dark frame appeared at intervals when the lamps were powered from 60-Hz mains. It is claimed that this problem can be avoided by utilizing in the Lees system a 2000-Hz power supply from an inverter unit.