Robert Desrosiers, Mini-Conference Chairman.

J. Creighton Douglas, Program Chairman.

Charles Pitts, Publicity Chairman.

Ken H. Hand, Hotel Arrangements Chairman.

Yvon Jean, La Maison de Radio-Canada.

Registration rates

Member .....CAN$12.00
Member and spouse .....CAN$15.00
Nonmember .....CAN$15.00
Nonmember and spouse .....CAN$18.00
Student .....CAN$5.00

Schedule of Activities

27 April 1979, Friday, 6 to 9 p.m.: Informal cocktail reception for out-of-towners; the Hospitality Desk will be in operation to help arrange social activities for registrants and spouses.

28 April 1979, Saturday: Registration begins at 7:30 a.m.; the Mini-Conference papers presentations are in session from 8:45 to noon and coffee breaks are sponsored; cocktails from 12 to 12:30 p.m. followed by a luncheon with a guest speaker; 2:00 p.m. to 5:00 p.m., continuation of technical papers presentations.

29 April 1979, Sunday: Departure from the hotel at 8:30 a.m. for La Maison de Radio-Canada; 9:00 a.m., breakfast; 10:00 a.m. to noon, papers presentations and guided tour for spouses.

Additional information on the Mini-Conference is available from:

Robert B. Desrosiers
Chairman, 1979 Mini-Conference
4710 Victoria Ave.
Montreal, Que.
Canada H3W 2N1
Tel. (514) 486-4423

or Walter H. Winchell
Co-Chairman
c/o Canadian Broadcasting Corp.
7925 Cote St. Luc Rd.
Montreal, Que.
Canada H4W 1R5
Tel. (514) 488-2551

or Charles Pitts, Publicity Coordinator, (514) 288-1261 (see address in footnote).

Report on the 13th SMPTE Television Conference

San Francisco, 2–3 February 1979

By E. STANLEY BUSBY, Jr.

San Francisco in February is a nice place to be. The sun was shining on the 13th Television Conference, and no topcoats were required. As is now usual, another record was set in terms of attendance. Paid registrants assembling at the St. Francis Hotel numbered 820 and, counting exhibitor personnel and authors, those attending professionally totaled about 1100. Well over 2000 people toured the exhibit area.

The Conference was organized by members of the San Francisco Section under the supervision of SMPTE Vice-President for Television Affairs Frederick M. Remley of the University of Michigan. In overall charge of this Conference was General Arrangements Chairman Donald E. Lincoln of KPIX-TV. The program was the responsibility of Papers Program Chairman Carlos Kennedy of Ampex Corp. Sue Blumenberg of ABC in San Mateo was Registration Chairman, and Joe Roizen of Telegen arranged valuable publicity. Kay Kibby of W. A. Palmer Films, Inc., was Audio Visual Chairman and also oversaw the opening videotape presentations. The Friday evening wine and cheese party at Sabella's Restaurant on Fisherman's Wharf was arranged by Joseph Semmelmayer of Eastman Kodak Co. And finally the sound recording of the presented papers and the panel discussion was arranged by W. A. Palmer of W. A. Palmer Films, Inc. Donna Roizen assumed the duties of Conference Photographer. Thanks go to all these people for contributing so much to the success of the program.

This report, submitted on 8 February 1979, was prepared at the request of the Editorial Vice-President by E. Stanley Busby, Jr., Ampex Corp., 401 Broadway, Redwood City, CA 94063.

Opening of the Conference

Friday morning opened with the replay of a tape "Jerusalem. . . The Old City," produced and sponsored by the Oral Roberts Evangelistic Association. It was a beautifully artistic treatment of the subject, and moreover offered examples of television production in an environment hostile to delicate equipment. Included was one travelling shot from what must be the world's most unstable camera platform, the back of a camel. Later in the morning, a paper was to allude to these and other rough conditions.

The traditional welcoming speech was delivered by Fred Remley, Vice-President for Television Affairs. Remley traced the growth of the conference, both in terms of attendance and range of subject matter, beginning with the snow-bound first TV Conference in Detroit. Noting that 40% of registrants were not members, Remley urged that sector to enhance their obvious interest by joining.

One-Inch Production Session

The morning session was chaired by David Fibush, assisted by Glen Pensinger. Fibush found himself in the odd position of introducing himself as the first speaker of the morning to deliver the One-Inch Helical Standards Subcommittee report. He outlined the efforts of the subcommittee's working groups — including the vertical interval time code, one-inch tapes and reels, and one-inch test materials groups.

Ray Schneider of CBS indicated that reduced costs enabled CBS to justify the dedicated assignment of VTRs to a particular studio, as opposed to using a central VTR pool with assignment switching. Growth, he said, was easier and less costly than expansion of a large assignment switching system. He gave as an example Studio 51 in New York City, located 30 blocks from CBS TV Center. Three VTRs are used to record the raw studio output. These are re-

Fig. 1. Attentive crowds were in evidence at all the sessions. Shown here is the opening session on Friday morning.

configured into an editing suite for post-production refinement.

Michel Oudin, of the Société Français de Production, Paris, detailed the results of a novel experiment. A film production team was provided with TV cameras and recorders and a video man, and was then charged with producing a 19-min TV special, "The Night Watch." Segments of the production were shown which illustrated the facility with which sequential scenes were color matched. Talent, costuming and direction all profited from the immediacy of television focussing, although a desire was expressed for the occasional use of a wide-aperture fixed-focal-length lens to achieve greater control over depth of field and overall light intensity. Mr. Oudin also outlined his plans for incorporating one-inch VTRs and multitrack audio recorders with off-line editing in future studio designs.

Richard Green of ABC used the production of "General Hospital" as an example of an early application of one-inch recording. Originally shot with little editing, it now has about 250 edits per show and is largely shot out of sequence and includes location shots. The network's promotional production was analyzed and the design criteria for a post-production facility were outlined.

In sports coverage the VTR is used both as a prime recorder and as a source of slow-motion replay.

Al Henderson of KSL, Salt Lake City, described his application of one-inch helical systems, stressing mobility. While the base facility employs both one- and two-inch VTRs, a four wheel drive vehicle equipped with a one-inch VTR finds wide use in the field. One camera and one VTR are used for film style taking. Editing is simple and mostly cuts-only. A simple color converter is used in the vehicle for monitoring.

Gridley Quihuis of Oral Roberts TV Productions, Tulsa, Oklahoma, brought his experience from a university campus atmosphere. Recording of medical and dental procedures on two-inch tape was considered too costly and ¾-in cassette format was judged inadequate. One-inch tape provided an economically justifiable answer.

Steve Michelson of One Pass Video, San Francisco, noted that his organization is one of the first companies to make a total commitment to the one-inch format. He claims as its chief advantage the easy implementation of film style taking and editing. He has also come to rely upon its one-hour capacity, and he cites the ease of reaching editing decisions as a major boon to productivity. Examples of his work were shown, many involving outdoor location shots.

The morning session was capped by a get-together luncheon. All present were entertained, even regaled, by the speaker, Russ Coughlan, Vice President of ABC and General Manager of KGO-TV, San Francisco. Embedded in his flippant style was a plaintive appeal for improved communications between management and engineering. Management often doesn't understand the jargon engineers use and can't keep up with its rate of change. (Hertz is not yet a cycle-per-second, just a car-rental company.) Engineers need to improve their knowledge of management's responsibilities and learn to impart understanding at nontechnical levels. It was an entertaining talk, containing a pertinent message, told in a memorable way.

Microprocessors in Video

Friday afternoon's session was chaired by Michael Fisher, assisted by Joerg Agin, and dealt with applications of computers and microprocessors in video editing and machine control.

The opening tape, "Don't Bother Me, I'm Learning," produced by David Shepardson and sponsored by The Best Co. showed the impact that inexpensive means of accessing and manipulating data is having on today's school-aged children. Yesterday's science fiction is in today's classroom.

Norman Hobson of RCA showed how a microprocessor was used in RCA's TK-47 camera to minimize component count and the number of controls and wires, and to reduce the number of steps necessary during set-up. A single terminal is shared among several cameras, one at a time. One hundred twenty separate functions are regulated, using only four knobs. When the setup is complete, the terminal is disconnected and switched to another camera. The analog values determined during the setup are maintained in the camera in memory. The memory is rendered nonvolatile by means of a battery whose capacity is adequate for three months. Data is moved between the camera control and head serially at one bit per horizontal interval.

Rush Hickman of Convergence Corp. described how a microprocessor with suitable software is used to improve the accuracy of time code reading under a number of adverse conditions. Time code recovery from tape fails at low speeds and is uncertain at very high speeds. Discontinuities in the normal progression of numbers occur routinely when the direction of motion is changed — periodically when drop frame counting is employed, and randomly when recordings are made throughout the day. Mr. Hickman sees midnight as a built-in discontinuity.

Jun Takayama of Sony Corp. spoke about the BV 5000 computer-assisted editing system. He has found that time code arithmetic places a severe load on a microprocessor and to extend control to more than three VTRs requires either distributed processing or hardware arithmetic. The latter choice was taken.

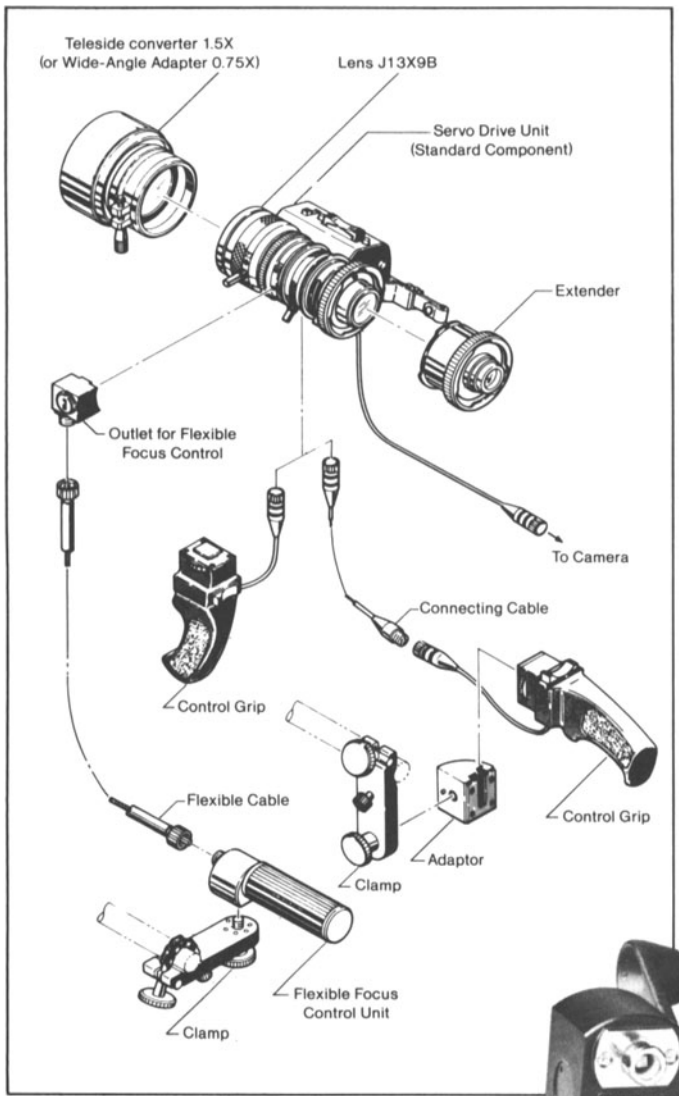
Vertical time code is used along with the longitudinal track to allow accurate acquisition of tape position at low and zero speeds. The typewriter-style keyboard was described, along with the format for displaying the edit decision list. Typical edit sequences were illustrated, including ones which include background key and delayed wipes. The display includes a small "map" which graphically shows the relative position of the various sources used in performing an edit.

Hans Dieter Geise of Bosch-Fernseh distinguished the difference between microprocessors and microcomputers. A single-chip microcomputer, for example is used in their time code generator, interrupt-driven by frame pulses. Data input and output are handled by a UART serially.

Editing systems currently distribute the machine control task among the machines. The central controller, using an 8080 microprocesor with 16K bytes of erasable PROM and 2K bytes of RAM, is therefore relieved of the onerous task of individual machine control. An eight-level interrupt structure is provided, one of which is fed vertical sync to instigate time-dependent tasks.

Also described was a slow-motion controller which remotes all control functions as well. Nine cue points may be stored in the unit.

IF YOU THINK OUR J13X9B IS VERSATILE, WAIT 'TIL YOU SEE THE SYSTEM.



It starts, of course, with our remarkable, lightweight 13x lens that's ideal for ENG and other field production use, yet versatile enough for the studio. Featuring a more sensitive f/1.6 aperture. Broad zoom range from 9mm to 118mm. And enough ruggedness for any application.

But that's just the beginning. By adding our accessory system, your ENG or small studio camera takes on new dimensions in versatility: Extend the focal length up to 1.5x *with no light loss*, using our teleside converter. Add a 2x rear extender, or combine with the converter for 3x extension.

For wider shots, snap on our 0.75x wide-angle attachment, which gives you a 6.75mm focal length *with no light loss*. Providing a wide-angle, wide-aperture lens with full auto-iris capabilities.

More? More. Remote focusing and zoom, manual or motorized. With easy-to-use rocker-switch controls. Or twist-handle grips via flexible cable couplings. For greater handling ease, either way you want it.

All in all, there's a lot more to our J13X9B zoom than meets the eye. In versatility, as well as performance. For more information, contact us directly, or specify the Canon J13X9B when ordering your new ENG camera.

Canon®

Canon U.S.A. Inc. Head Office: 10 Nevada Drive, Lake Success, N.Y. 11040 (516) 488-6700 • 140 Industrial Drive, Elmhurst, Ill. 60126 (312) 833-3070
123 Paularino Avenue East, Costa Mesa, Ca. 92626 (714) 979-6000
Canon Optics & Business Machines, Canada, Ltd., 3245 American Drive, Mississauga, Ontario L4V 1B8, Canada
Canon Amsterdam N.V., Industrial Products Division De Boelelaan 8, Amsterdam, Netherlands

Bruce Rayner of the Grass Valley Group had much to say about the relationship of digital effects and video switching. He feels that the logical place for such effects to be performed is at the switcher. Because the number of effects made possible by the onrush of digital processing exceeds the number of all previously known effects, the human operator has come to be severely taxed if not overloaded.

One answer is to store away transitions and effects at a time of "leisure" to be executed rapidly at a critical time upon a single start command. This technique, known as EMEM for enhanced memory, extends control of the switcher and effects to a host computer (such as an editing controller) by means of a serial input/output port so that the switcher may accept setup data electrically rather than manually.

Shin Ichiyanagi, of NHK Japan, told of a flying spot scanner offering variable frame rate now in use on Japanese television. It uses the "jumping raster" technique, organized to scan one frame three times and the next frame twice. Sequencing is controlled by a microprocessor. The microprocessor is also used to apply shading correction for fixed shading components.

Perforations are located by applying a pulsed light source through the perforations onto a CCD. The system will accommodate film frame rates up to 48 frames/s in either direction. Gross changes in detected position indicative of damaged perforations are ignored.

Friday evening had an auspicious start with the traditional (for San Francisco) wine tasting and cheese party, hosted by the local broadcasters KTVU, KRON, KPIX, KGO, and KBHK.

More Digital Video Effects

The Saturday morning session began with a showing of excerpts from the "Evening Show," produced by Westinghouse Broadcasting. The segment demonstrated electronic journalism under the difficult circumstances attendant to constructing the Alaska pipeline.

The morning session, chaired by Joe Roizen assisted by Gene Simon, dwelt upon digital video effects and computer automation.

Michael Negri of NBC brought to our attention some of the problems which result when rear screen projection is replaced by chroma key inserts which control the frame size of digital effects equipment. To avoid image instability the key screen must be evenly illuminated and must not have a high directivity. The key camera must be very well registered, and all three white clippers must be adjusted to equality. Hum must be kept very low, less than −50 dB. All three color channels must have equal blanking widths. Examples were shown from the "News 4" set to vividly illustrate the problems of mask generation under dynamic conditions.

Richard Taylor, of Quantel, Ltd., presented a dilemma: on the one hand engineers desire to employ digital effects and on the other they fear to purchase equipment that too quickly becomes obsolete. His answer is embodied in his DP 5000 system wherein effects are defined in software. The central computer is a DEC LSI-11 which develops the appropriate algorithms and communicates with peripheral storage devices such as floppy disk drives. A 2900-bit-slice microprocessor is assigned the task of mask generation. A fast arithmetic logic unit was developed to operate directly on the data stored in a frame buffer.

H. W. Mahler of CBS reported on the latest advances in the "Action Trak" system. In the older system, the image of a moving object of interest was stored and tagged to prevent further change to it. This resulted in the possibility of early stored images occluding later ones. Action Trak II solves this problem by the use of an additional fieldstore which serves as a reference to the motion detector. Another feature reminiscent of the "leaky integrator" used in DPCM systems allows stored images of moving objects to gradually fade away at a selected rate.

Edwin Catmull of the New York Institute of Technology showed a tape of samples of graphic arts work accumulated over the last three years, including full "actor" scenes with lipsync sound. The "painting" system allows the artist, using an "ultrasonic sketch pad" to color images faster than with the usual acrylics.

Images are stored during manipulation in three frame buffers, one for each primary color. Each buffer divides the image into 512 × 512 pixels, with eight-bit resolution for each pixel. Completed images may be stored on disk drives for later recovery.

Richard Shoup of Xerox Research described the graphics generation system used to provide the imagery during the coverage of the Pioneer Venus probe. In his system, a 480 × 640 pixel buffer with eight-bit pixels is used in conjunction with a smaller memory to provide color values. The artist selects color values by means of optical "sliding potentiometers" one each for hue, saturation and brightness. Images may be stored on disk or be output to a laser-driven color xerograph for hard copy.

Noboru Asamizuya of Sony Corp. outlined a graphics system designed to reduce drastically the task of the computer. All images are trapezoids. The computer can store the coordinates of the four corners of 256 trapezoids. Color values of the trapezoids are held in a pair of buffers. Priority bits are included to establish which color prevails in areas of overlapping trapezoids to allow a foreground image to occlude a background one. Taped examples were shown of moving shapes, graphs, and some simple animation. Expansion to 512 trapezoids is planned.

Fig. 2. The Wine and Cheese Party on Fisherman's Wharf was a big hit. Left to right: Bill Palmer, John Corso and Kay Kibby.

Shiberu Jumonji's paper on the "Mosaic Keyer" was read by Mr. Shin Ichiyanagi of NHK. It detailed a simple but very useful color pattern generator using a 6800 microprocessor with 12K bytes of memory. The picture is divided into a square matrix of up to 64 × 64 "tiles," with each tile having eight possible color values including black and white.

Digital Video Recording

The Saturday afternoon closing session was extremely well attended, rumors having gotten around that something big was in the offing. The opening film "Bridging The Bay," made in 1938 by the California Dept. of Public Works served, I think, as a contrast to what was to follow.

The session dealing with digital recording was chaired by Sue Blumenberg, assisted by Kay Kibby.

Peter Rainger of the BBC led off with a discussion of the various means by which the bit rate of digital television can be reduced without excessive picture impairment and in particular without impairments which are likely to accumulate with successive encodings and decodings. Blanking can be eliminated without degradation because it can be regenerated. Sub-Nyquist sampling can cut the rate by two with little impairment and by proper design can be made cascadable. Differential PCM can further reduce the transmission rate. Mr. Rainger is a proponent of sampling at four times the subcarrier frequency and performing reduction upon that input.

Charles Ginsberg of Ampex, Chairman of the Study Group on Digital Television, reported the repetition of an earlier experiment designed to measure the picture impairment as a result of passage through multiple codecs. Using nine codecs and an experimental digital recorder, a tape was prepared which is suitable for measuring the subjective effect of impairments to EBU specifications for up to 19 passages. Each of 57 measurements consists of a first-generation reference image followed by a test image which has suffered an unknown (to the raters) number of codec passages. Four different images were used, all of them 8 × 10-in color transparencies mounted in a light box and scanned with live camera.

The tapes have not yet been evaluated in the proper surroundings, but Mr.

GEVAERT AGFA-GEVAERT

Communications without visuals is like a play with the actors behind the curtain.

Film is the medium capable of capturing a unique moment in time in all its richness and color. In full action. In pulsating reality. Because whatever the eye can see, film can record.

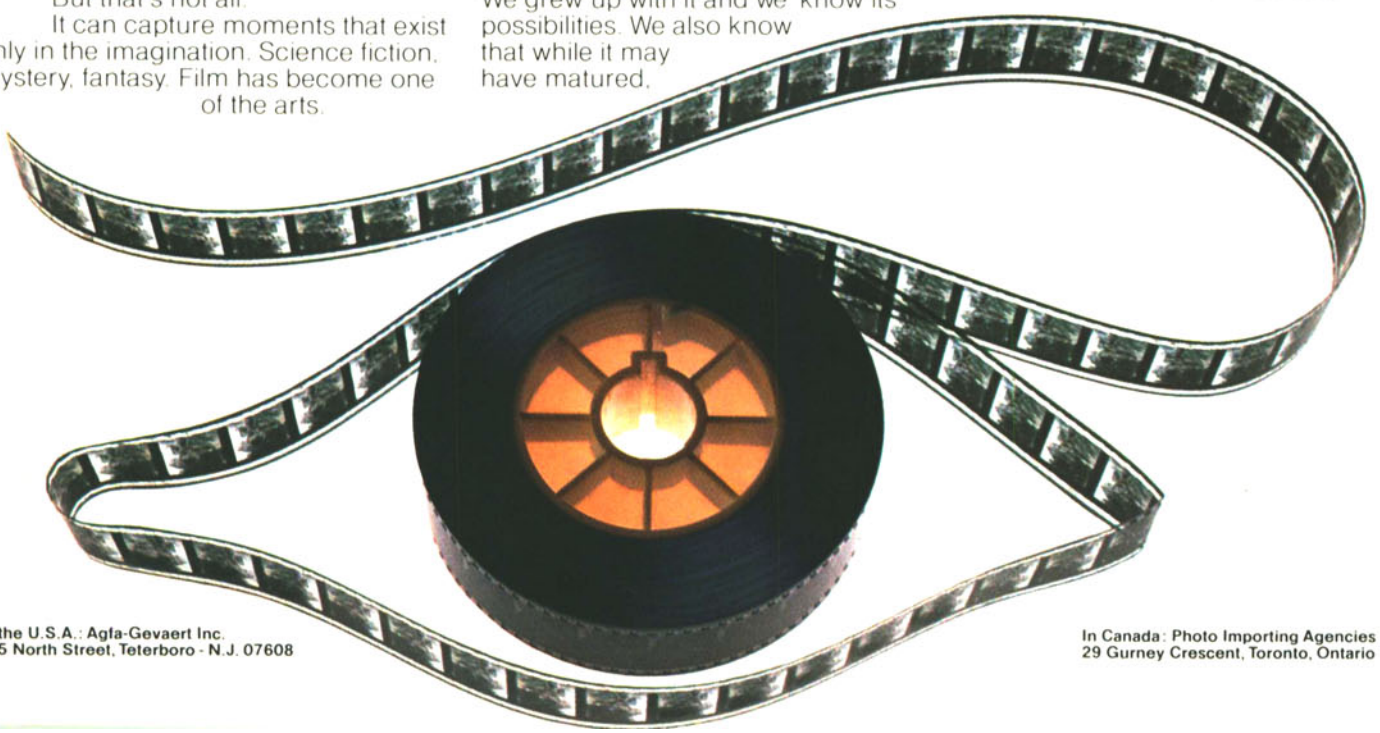
But that's not all.

It can capture moments that exist only in the imagination. Science fiction, mystery, fantasy. Film has become one of the arts.

For millions of people, it is an indispensable part of their daily lives. Whether at the cinema. On television. Or in their home projectors.

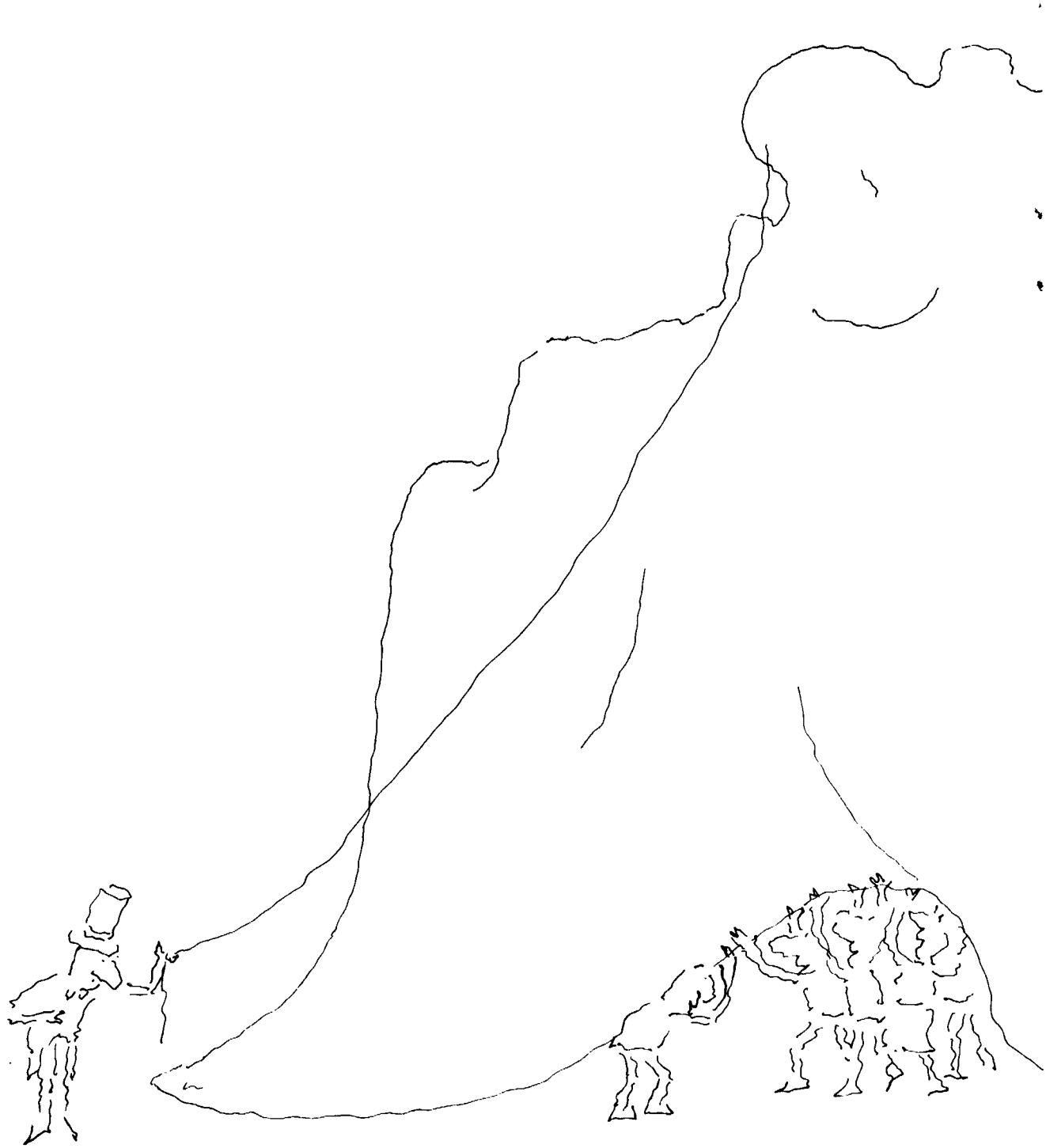
Agfa-Gevaert is a film pioneer. We grew up with it and we know its possibilities. We also know that while it may have matured, it has not aged. Film will be as vibrant tomorrow as it is today.

SYSTEMS FOR PHOTOGRAPHY • MOTION PICTURES • GRAPHIC ARTS • RADIOGRAPHY • VISUAL ARTS • REPROGRAPHY • MAGNETIC RECORDING



In the U.S.A.: Agfa-Gevaert Inc.
275 North Street, Teterboro - N.J. 07608

In Canada: Photo Importing Agencies Ltd.
29 Gurney Crescent, Toronto, Ontario



SONY INVITES YOU TO SEE HOW FAR BROADCASTING HAS COME SINCE 1978.

While the engineers at Sony continue to advance the state of broadcasting technology on a daily basis, NAB conventions are, unfortunately, held but once a year.

Which means you have only four fleeting days to examine first-hand what Sony has been developing for the last 365.

And the past 365 days have indeed been fruitful.

This year at NAB, for example, we'll be introducing our improved Type C 1" VTR: the BVH-1100. A state-of-the-art recorder incorporating everything from Sony "confidence" heads for monitoring off the tape during recording, to a dynamic tracking option that makes noise-free "on air" transmissions possible from ¼ speed in reverse to double speed in forward.

The NAB show will also mark the introduction of our new digital time base corrector, the BVT-2000, plus a new dynamic tracking remote control unit, a new mid-range editor, and some things so advanced they weren't finished in time to talk about here.

And, you'll also be able to examine the Sony computer editing unit, and the complete range of portable ENG/EFP cameras, recorders and monitors that have already proven Sony's leadership in 1" technology.

Don't miss the Sony booth at the NAB show this year.

Because it would be a pity to come all the way to Dallas and not see how far the industry has come.

SONY® BROADCAST

Fig. 3. When competitors meet in the Exhibit area or the marketplace, the industry benefits. More than 2000 people passed here in two days.

Fig. 4. Don Lincoln of KPIX-TV and Carlos Kennedy of Ampex have reason to be proud of their achievements as General Arrangements Chairman and Papers Program Chairman.

Ginsberg indicated that the tapes will be made available to those having the facilities and the inclination to perform the measurements. Portions of the tape were shown.

Mr. Dominique Nasse of CCETT, Rennes, France, reviewed the SECAM color system and outlined the difficulties faced when using tape playback for post production, stating that the necessary decoding and reencoding involves cumulative picture impairments. His tests show that satisfactory results can be had by sampling the luminance signal at a multiple of the horizontal scanning rate, at about 8.87 MHz, and sampling the color difference signal at half that rate.

Joachim Diermann of Ampex described an experimental digital VTR, crediting the co-author, Maurice Lemoine, for its creation. The system that was shown samples the NTSC composite signal at three times subcarrier, using eight-bit samples. All data is recorded and is divided between two tracks to permit reasonable clocking rates and head-to-tape speed. An eight-headed record drum is used. The machine operated at 15 in/s, used two-inch tape, and was housed in an AVR-3 console. Although shown without digital audio, it was indicated that as many as four 16-bit audio channels, sampled at 50 kHz, can be accommodated by writing blocks of audio data with the video heads in the area now known as "overlap."

Playback of various test signals and program material was demonstrated, including a section in which record currents were varied over a two-to-one range to demonstrate its insensitivity to that parameter. Even though the receivers used in the hall were a limiting factor, the complete lack of banding of velocity effects and the extremely low chroma noise were readily apparent. The machine was made available for close viewing later Saturday evening.

Edward Herlihy of Golden West Broadcasting, Los Angeles, provided the last paper before the terminating panel session. In it he discussed the results of a personal survey of broadcasters. He states that the greatest concern of the broadcaster is the proliferation of recording formats. While there is obviously room for more than one format, Mr. Herlihy feels strongly that the SMPTE should get an early start in establishing digital recording standards before proliferation gains a toehold.

The day ended with a panel discussion which included audience participation. In addition to the day's speakers, Mr. Marcel Auclair of CBC, Canada; Arch Luther of RCA; and Blair Benson, Video Corporation of America sat on the panel. The Moderator was Donald West, editor of *Broadcasting* magazine.

Mr. West began by asking for a brief statement from those mentioned above. Mr. Luther sees a digital VTR as best fitting into the high end of the market. He recommends trying for four times subcarrier and the addition of error-correcting codes, even at extra cost. Mr. Benson saw a need for digital input/output ports even though he was encouraged by the results of Mr. Ginsberg's experiment. The recently gained cost/performance improvement of the one-inch formats caused him to wonder if digital recording is needed in the near term. Mr. Auclair feels a need for a reduction in acquisition and operating costs. He is most concerned about the impact of digital recording on maintenance staff.

Between the questions from the audience and the pointed questioning of the moderator, the panel discussion proceeded at a lively pace.

In the opening paragraph I said the meeting was exciting. Now you know why.

Equipment Exhibit

The 13th SMPTE Television Conference's Equipment Exhibit complemented the technical papers program because it comprised only equipment that related directly to the subjects being discussed at the technical sessions. Exhibiting companies included:

Adda Corp.
Ampex Corp.
Arvin/Echo Science
Bosch-Fernseh
CMX Systems
Central Dynamics Corp.
Consolidated Video Systems, Inc.
Convergence Corp.
Datametrics, Inc.
Datatron, Inc.
Digital Video Systems
Electronic Applications, Inc.
Fuji Magnetic Tape
Listec Television Equipment Corp.
Micro Consultants, Inc.
NEC America, Inc.
Sony Corp. of America
TeleMation/Div. of Bell & Howell
Tentel Corp.
Videomedia/SED, Inc.
Vital Industries

Social Activities

Although the San Francisco Television Conference was only a two-day meeting, there were several enjoyable social activities. On Friday, there was the get-together luncheon, already described. The Friday evening wine and cheese party mentioned previously was open to all Conference registrants at no extra charge. This event has become a regular, popular feature of the annual Television Conference.

On Sunday morning, after the Conference was over, the social activities were themselves brought to a pleasurable conclusion for the attendees as they took a bus tour of the Sonoma Wine Region.

Acknowledgments

The Society thanks the following organizations for providing various facilities and services: Eastman Kodak Co., projection equipment; W. A. Palmer Films, sound recording; Ampex Corp., audio recording tape; KTVU, KRON, KPIX, KGO, and KBHK, Wine and Cheese Party. The Society appreciates that four Opening Tapes were made available, as noted in the body of this report.