Photography's Place in Space

Speaking on the theme of "Photography and the Search for Knowledge" at the Annual Banquet of the Society of Photographic Scientists and Engineers, Oct. 9, in Rochester, N.Y., Donald McMaster, Vice-President and General Manager of Eastman Kodak Co., took his "man with a camera" out toward Mars and back to the Earth, and showed him photographically recording information "in a way to stagger the imagination."

Among his predictions, based on present accomplishments of photography: "As of today, the output of electronic computers can be recorded by photography at the rate of 100,000 characters a second. We foresee a rate of one million characters a second in the near future."

In his discussion on computers — among many photographic applications — Mr. McMaster told of a computer which is being programmed to translate Russian into English. "The information it must have to do this," he said, "is provided on a 12-in. disk where 60 million discrete bits of information have been transcribed by photography. . .and only part of the surface of the disk is used."

In discussing possible future developments, he mentioned recent advances in the resolving power of films. He pointed out that there are, at the present time, films available which can clearly resolve 2000 lines/mm, at low sensitivity levels, "a capacity which. . .exceeds that of present day optics." He predicted that better lenses would be designed which will match the potentialities of these films.

In his talk Mr. McMaster spoke at some length of the challenge of space technology. In a reference to rockets around the Moon, he suggested that a rocket carrying automatic cameras with telephoto lens and automatic processing equipment, linked to a TV system to scan the finished film and transmit the image to Earth would give man his first glimpse of the "dark side" of the Moon. "When man himself eventually goes out into space, it's a dead certainty that he'll take his cameras with him," he said.

He told the assembled photographers that it might be their destiny to open up whole new areas of knowledge and that the development of present programs may make possible the gathering of information "which is beyond all present comprehension."

Education, Industry News

Two especially impressive exhibits were seen at the Western Electronic Show and Convention held in the Pan Pacific Auditorium and Ambassador Hotel, Los Angeles, Aug. 19–22. The Historical Exhibit suggested a journey back into the past of only a little more than 50 years ago, while the Future Engineers Show, which displayed the work of high-school students, afforded a rather startling glimpse into the very near future.

Replicas of early vacuum tubes, lent by Lee de Forest, a 1912 radio license, a shipboard radio receiver (circa 1916) and other early equipments and documents suggested the beginnings of a different world and a different kind of auditory and visual communication. Over in the Future Engineers Exhibit, high-school students demonstrated and described such projects as "Radio Controlled Robot," "Determination of E," "Satellite Model," "Cybernetics," "Ionic Loudspeaker," and others — 33 in all — equally indicative of the strange ways to be traveled in the next 50 years.

New research areas in speech and television are foreseen by using general purpose digital computers in the simulation of new coding and transmission devices, according to scientists at Bell Telephone Laboratories, who reported most recently at the Western Electronics Conference in Los Angeles. Earlier, in July 1957, R. E. Graham presented a paper on "Communication Theory in Television Coding" before the UNESCO-sponsored International Symposium on Physical Problems of Color Television, held in Paris. He described techniques of picture coding research based on computer simulation. Highlights of the Paris Symposium of special interest to the Society were reviewed by Mr. Graham at the SMPTE 1957 Fall Convention in Philadelphia.

In using computer simulation to evaluate proposed television coding schemes and to

improve others, an input picture of 100 × 100 elements, corresponding to an area about 1/25 that of a conventional TV frame, is used to hold machine time and memory requirements to a reasonable level. For typical coding schemes, the total computer time required is 5 sec to 10 sec per picture. A magnetic tape recording of the video signal is prepared by scanning a square picture with 100 scanning lines in 2.4 sec. Each picture dot is quantized to 10-bit accuracy, providing 1024 amplitude levels and is recorded in 7 parallel tracks with 200 characters to an inch of tape. The tapes are then fed into the computer where they are processed according to a preassigned program. The resulting signal is rooted, mixed with a synchronizing waveform in the conventional manner, and band limited to 2500 cycles/sec. In playback, the computed picture signal is converted back to analog form. It is then passed through a low-pass filter, and displayed on a monitor with two kinescope tubes. One of these tubes has a slow phosphor for direct viewing, while the other has a fast phosphor for photography.

A coding scheme relevant to TV transmission, called "Predictive Quantizing," has been studied by simulation and by conventional methods. This scheme takes advantage of the relatively low level of viewer perception during periods of scene change or motion, and in areas of picture confusion,

R. E. Graham, Bell Telephone Laboratories, prepares to photograph a reproduction of a TV picture following processing by computer simulation, while E. E. David, also of Bell Laboratories, adjusts the monitor controls.

these being the only regions in which predictive coding systems make significant errors. The method involves quantizing the difference between the original continuous signal and a predicted version of that signal. It employs fine quantum steps for small errors and coarse steps for large errors where the predictor and the viewer are surprised. This tapering of steps in the quantizing staircase allows the use of a smaller number of total levels, and thus reduces the channel capacity requirements.

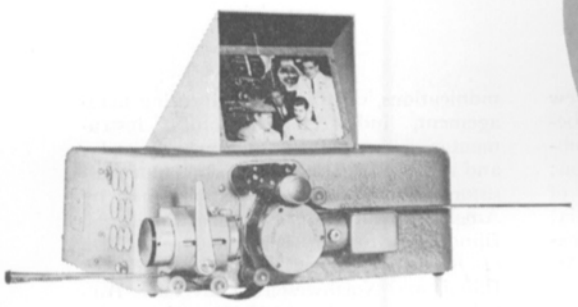
A limiting case of predictive quantizing, in which the predictor is simply a one-sample delay, has been tested with simulation equipment and with standard 525-line television, and found to afford a picture not significantly degraded from the original, and requiring only three bits per picture dot.

Computer simulation has provided a method for the investigation of a number of variations of predictive quantizing. Its use in picture analysis for pattern recognition and for statistical computations is being studied.

Dr. James R. Killian, special assistant to the President for science and technology, addressing the Annual Meeting of the Land Grant Colleges and State Universities in Washington, D.C., November 11, said that college science teachers should abandon "high-hat attitudes about movies and TV" and learn to use these media to train future scientists. Research on new teaching aids is important, he said, because "in the immediate years ahead the rising number of students will outrun the supply of college teachers." The flow of new graduates into teaching in the next few years will be less than a quarter of the number needed; to compensate, educators must find ways to use these tools to bring the teacher into effective touch with greatly increased numbers of students.

For every location — From the frozen north to the sun-drenched tropics —

Pros depend on CECO

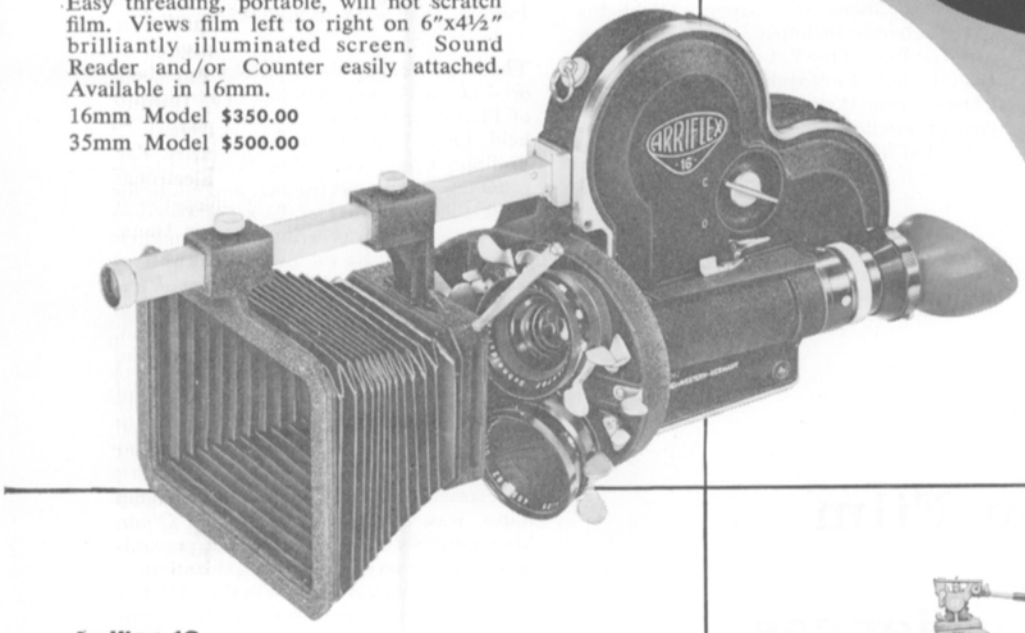


35mm Professional Film Viewer

Easy threading, portable, will not scratch film. Views film left to right on 6"x4½" brilliantly illuminated screen. Sound Reader and/or Counter easily attached. Available in 16mm.

16mm Model **$350.00**

35mm Model **$500.00**



Arriflex 16

The most versatile professional 16mm camera in the world. Includes three-lens DIVERGENT turret, registration pin movement, side pressure rail, and quickly interchangeable motors. Has a mirror reflex system to permit viewing and focusing through taking lens while camera is in operation. Viewfinder shows parallax-corrected right-side-up image. Accepts 100 ft. daylight loading spools and accessory 400 ft. magazines.

When "location" is just a cab-ride away, it's comforting to know that CECO'S vast storehouse of sales and rental equipment is at your disposal. But when you have to journey to the North Pole or to the South American jungle, it's even more important to depend on CECO for cameras, dollies, lights, generators and a host of other equipment that will perform under severe climatic conditions.

After you've compiled your list, check it out with CECO. We have outfitted hundreds of crews for location, far and near. Our wide experience can save you time, money and needless grief.

You owe it to your career as a film maker to use CECO service for sales, rentals, repairs— and experience.

Magnasync Magnaphonic Sound Recorder Mark IX—

The perfect answer to the needs of *every* film producer, large or small. It is compact, lightweight and distortion-free. Academy and SMPTE Specification. No royalties. 16mm, 35mm & 17½mm models available.

Professional Jr.* Tripod on CECO

3-Wheel Collapsible Lightweight Dolly

The *newest* PRO JR. Tripod features simple camera attaching method, telescoping pan handle with adjustable angle, pan tension knob, cast-in tie-down eyelets, and self-aligning double leg locks.

Price $150.00

3-WHEEL DOLLY collapses into compact shape. JUNIOR weigh 15½ lbs. SENIOR weighs 18 lbs Any tripod easily attached. Ball bearing locking rubber tired caster with indexing device.

Junior $99.50 Senior $150.00

* Reg. U. S. Pat. Off No. 2318910

Colortran Grover Masterlite Convertable—

Holds either PAR 56 or PAR 64 Bulbs in a PYREX SEALED BEAM unit. Weighs only 5 lbs. and equals performance of a 5000 watt bulb with just a PAR 64 500 Watt and converter. Consumes less than 10 amperes current at 3200° Kelvin!

$42.50 with PAR 56 Bulb

$48.05 with PAR 64 Bulb

SALES • SERVICE • RENTALS

FRANK C. ZUCKER

CAMERA EQUIPMENT CO., INC.

Dept. JS, 315 West 43rd St., New York 36, N. Y. JUdson 6-1420

The worlds of theater and classroom, once widely separated by custom and tradition, are moving closer together as teachers and professors are required to learn a few acting techniques and basic "tricks of the trade" as part of their teaching equipment. Teachers of TV courses at New York Univ. and others selected for the Channel 11 project in elementary and high-school courses are instructed by TV personnel at the University Studio, 51 W. 4 St., New York. One of the first things TV teachers are taught is to write legibly on the blackboard, bearing in mind the limitations of the camera's eye, so that words and equations do not appear to be sprawling off into outer space.

The Institution of Telecommunication Engineers will hold its Second Technical Convention Dec. 27–28, 1958, in New Delhi. Papers scheduled for presentation before the Convention will be on such subjects as Antenna and Wave Propagation; Broadcasting in India; Tropicalization of Communication Equipment in India; Semiconductors; Telephone Communication in India; Navigational Aids; and Atmospheric and Radio Noise.

The 14th Annual National Electronics Conference held in Chicago, Oct. 13–15, contained about 100 papers. Highlights of the program included a panel discussion on "The Role of the Laboratory Program in Engineering Education," a session on "Engineering Writing and Speech," a report on satellites and space stations and a discussion of automatic navigation. There were such topics as antennas, audio, communications, computers, engineering management, industrial electronics, instrumentation, amplifiers, microwaves, radar and radio navigation, television and transistors. The Conference was sponsored by American Institute of Electrical Engineers, Illinois Institute of Technology, Institute of Radio Engineers, the University of Illinois and Northwestern University. Participants were the SMPTE; Electronics Industries Assn.; and the Universities of Michigan, Michigan State, Notre Dame, Purdue, Wayne State and Wisconsin.

Three photographic scientists were honored at the Annual Banquet of the Society of Photographic Scientists and Engineers, held Oct. 9 in Rochester, N.Y. Louis Philippe Clerc, venerable French photographic scientist and teacher, and editor for more than 30 years of *Science et Industries Photographiques*, was granted the highest honor bestowed by the SPSE, that of honorary membership. Cyril J. Staud, Vice-President in charge of research at Eastman Kodak Co., and Edward K. Kaprelian, associated with the direction of research and development at the U.S. Army Signal Research and Development Laboratories, were made Fellows of the SPSE. They were cited for "outstanding service in the advancement of photography."

A special award of senior membership status was made to Edward S. Cobb, Managing Secretary of SPSE, in recognition of major service to the organization.

Dr. Staud, who is a Fellow of the SMPTE, is the author of papers in the fields of general color, photography and industrial research. Mr. Kaprelian, a Past-President of the Society of Photographic Engineers, has been recognized for distinguished service to the government in the field of photographic science.

An International Convention on Transistors and Associated Semiconductor Devices will be held May 25–29, 1959, under the auspices of the Radio and Telecommunication Section of the Institution of Electrical Engineers, Savoy Place, London W.C.2. The Convention will review the ten years that have passed since the invention of the transistor in terms of the significance of its development, the extensive engineering that has resulted from it and its long-range potentialities. An Exhibition, held in connection with the Convention, will cover all aspects of transistors and semiconductor devices. Early plans include lectures by internationally known scientists and presentation of papers by specialists in the field from European countries, Russia and the United States.

Alfred N. Goldsmith, consulting engineer in the electronics and motion-picture fields, has been elected to the Board of Directors of RCA Communications Inc. Dr. Goldsmith joined RCA in 1919 as Director of Research and later was appointed Vice-President and General Engineer. Since 1931 he has served as a technical consultant to RCA. A Past-President of this Society, he was awarded the Progress Medal in 1956. Other honors include the IRE Medal of Honor and the Founders Award, and the Modern Pioneers Award. He has also served as

President of the IRE. Organizations in which he holds the rank of Fellow, besides the SMPTE, include the AIEE, the IRE, American Physical Society, American Assn. for the Advancement of Science, Optical Society of America, and the International College of Surgeons.

Solita Palmer has been engaged to write the original music for the film *Statehood*, now in production for the U.S. Information Agency, Washington, D.C., for multilingual overseas distribution. Miss Palmer is a member of ASCAP and AGAC (American Guild of Authors and Composers). Producer of the film is Emerson Yorke. Mr. Yorke, a Fellow of the Society, is an independent producer.

Louis L. Behrmann has been appointed Director of Technical Sales for Unicorn Engineering Corp., a subsidiary of Pacific Industries Inc. Prior to his present appointment, he was Chief of the Motion-Picture and Kine Recording Section of Walter Reed Army Hospital. His work there included development of color kinescope recording equipment and the establishment of a color TV system. In his present post he will maintain liaison between the company and users of automated printers and other motion-picture equipment manufactured by the firm.

CBS Laboratories, a division of Columbia Broadcasting System, Inc., opened its new Research Center in Stamford, Conn., on October 7. Situated on a 23-acre site, the glass-enclosed building is constructed of aluminum and steel. The laboratories contain facilities for research and development in such fields as audio-video systems, solid state physics, physical chemistry, optics, vacuum tubes, data processing systems and electronics for communications and other applications.

SMPTE Elections

Names of the new SMPTE officers were announced at the 84th Convention. Officers elected for the two-year terms beginning January 1, 1959, are: Norwood L. Simmons, President; John W. Servies, Executive Vice-President; and Reid H. Ray, Convention Vice-President. The last two elections left vacant the offices of Financial Vice-President and Treasurer. These offices were later filled by appointment. G. Carleton Hunt was appointed Financial Vice-President for 1959; and S. P. Solow was appointed Treasurer. Glenn E. Matthews was re-elected Editorial Vice-President; and Wilton R. Holm was re-elected Secretary. The terms of Engineering Vice-President Axel G. Jensen and of Sections Vice-President Ethan M. Stifle expire in 1959.

The six Governors elected or re-elected for the 1959-1960 term are: Gerald G. Graham, Theodore B. Grenier, Ub Iwerks, Kenneth M. Mason, Robert C. Rheineck and James L. Wassell. The Section Chairmen-Governors for 1959 are: James C. Diebold, Chicago; and Robert G. Hufford, Hollywood. The slate of Governors is short one member for 1959 because of the election of the Chairman of the New York Section (Mr. Rheineck) to the Board of Governors for the 1959-1960 term. The Chairman of this section is automatically a Governor for the term of his office as Chairman.

The Section Chairmen, Secretary-Treasurers, and Managers elected or re-elected for the 1959 term are listed below. Managers elected for the 1958-1959 term were not, of course, candidates in this election. A new section, Nashville, held its first election and the names of officers and managers elected for the one-year and the two-year terms are listed.

Atlanta
Chairman, B. M. Loden; Secretary-Treasurer, Wesley Sandell; Managers, Charles D. Beeland, Jr., Edward E. Burris and William Henry White.

Canada
Chairman, R. J. Beaudry; Secretary-Treasurer, Ronald E. Ringler; Managers, B. James Bach, Findlay J. Quinn and Rodger J. Ross.

Chicago
Chairman, Jerome C. Diebold; Secretary-Treasurer, William H. Smith; Managers, H. Richard Hertel, John H. Maynard and George Meyers.

Dallas-Fort Worth
Chairman, Edward J. Pattist; Secretary-Treasurer, Philip Wygant; Managers, Richard T. Blair, Lewis Cearly, Jr., Bruce Howard and Bruce Jamieson.