

tional or promotional use. Patrons can select any one, or any number in succession, of 32 individual films in monochrome and color, running about 11 minutes. Manufactured in Italy by Societa Internazionale Fonovisione, the device is distributed in the United States by Don Twomey Associates, Inc., Suite 1512, 230 Fifth Ave., New York.

An all-purpose satellite communications system that would be available to all nations through two or three relay stations "fixed" in space high above the equator has been proposed to the Federal Communications Commission by the Radio Corp. of America. The proposed system would employ synchronous satellite repeaters — space-borne relay orbiting 22,300 miles above the equator, where their speed would match the speed of the Earth's rotation to keep each satellite effectively "fixed" above one point on the Earth's surface. Each satellite would carry relay equipment to receive, amplify and re-transmit signals between ground stations in various parts of the world, providing a high-capacity link for simultaneous telephone, radio and other services. The satellites are pictured as relatively small units, each consisting of a slender cylindrical body 13 ft long, with wide fins bearing solar cells to generate power from sunlight. A dish-shaped antenna at one end is directed constantly toward the center of the Earth. According to the proposal, such a system could be put in effect within the present decade.

Biographical Note



Arthur C. Hardy

Professor Arthur C. Hardy has announced his plans to stop teaching on June 30, 1961, at Massachusetts Institute of Technology where he has taught 41 years. He plans to do writing and consulting work at his home at 15 Kenilworth Rd., Wellesley 81, Mass., and as he says "reserve a little time for some of the things I've always wanted to do but never had time to do."

Dr. Hardy is a Fellow of the SMPTE, and has served on several committees, the Board of Editors and the Board of Governors. He has published more than 40 papers of which 8 appeared in the *Transactions* or the *Journal* of our Society. Dr.

Hardy's paper on "Graininess of Photographic Materials Used in the Motion Picture Industry," which appeared in the *Transactions* in 1922, was the forerunner of a number of papers on that subject that came out of the Kodak Research Laboratories.

A world authority on optics and photography, Professor Hardy is perhaps best known in the field of motion pictures for his work in the middle twenties on sound recording on film that was done as a consultant for General Electric Company. His researches in developing the concepts and instrumentation of colorimetry are important as well as the application of these concepts to color reproduction. His book *The Principles of Optics*, authored jointly with F. H. Perrin, is one of the standard references in this field.

Dr. Hardy completed his studies for the B.A. at the University of California in 1917. Almost immediately thereafter, he enlisted in the Photographic Branch of the Signal Corps, was later transferred to the newly formed Air Service, and served in France as the Commanding Officer of the 23rd Photographic Section.

After the war, he completed his Master's work at California and was an instructor at the Massachusetts Institute of Technology until 1920, when he accepted a position in the Research Laboratories of the Eastman Kodak Company. He returned to M.I.T. as an assistant professor in 1922, and in 1933 was made Professor of Optics and Photography.

During World War II, Professor Hardy was Chief of NDRC Section 16.3 (Camouflage) of the OSRD. In that capacity, he inspired and guided researchers in visibility, atmospheric optics, and the influence of color on the perception and recognition of distant objects. In recognition of the value of his war work, he was awarded a Presidential Certificate of Merit.

The St. Lawrence University conferred an honorary Sc.D. upon Professor Hardy in 1938. The next year, he received the Longstreth Medal of The Franklin Institute, which cited his invention of the recording spectrophotometer.

In his recording spectrophotometer, his pioneering use of the null balance principle throughout the optical and electrical systems established an ideal which is rarely attained to the same degree even in instruments designed now, a quarter-century later. The same instrument employed one of the first successful photoelectric servo systems, almost a decade before these systems attained prominence and commanded confidence in war-tested devices.

The commercial version of his spectrophotometer was a remarkably close copy of this prototype, and was not appreciably changed during twenty years, while hundreds were being delivered and used to establish color measurement laboratories throughout the world. The recent redesign by a new generation of engineers left all the basic features of his spectrophotometer unaltered, but used modern components and made concessions to mass-production requirements.

The invention of his spectrophotometer in 1931 coincided with the adoption, by the International Commission on Illumination, of data specifying the standard observer

Looking for a
BUY
in Motion
Picture
Equipment?

**Barry
Green**

509 MADISON AVE.
NEW YORK 22, N. Y.
PLaza 2-7970

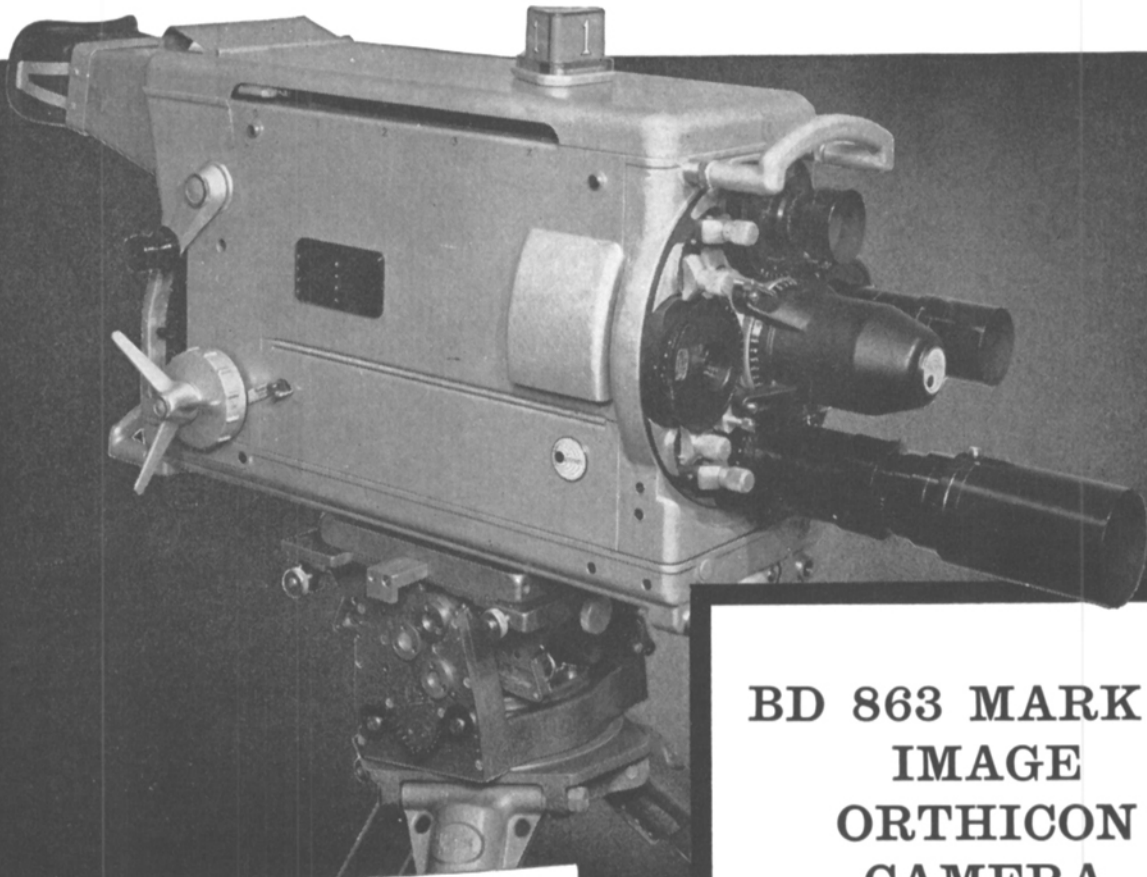
- *Laboratory*
- *Studio*
- *Editing*
- *Animation*

- Fish-Schurman Color Heads
- B & H 35 & 16mm Floor Splicers
- S.S. Editing Tables
- Neumade Rewinds
- S.S. Circulation Pumps
- S.S. Sprocket Drives
- B & H 35mm Printers
- Duplex 35mm Printers
- Light Change Boards
- 35mm to 16mm Reduction Printers
- Title Bench With B & H Camera
- 120 fpm Color Processing Machines
- Sound Reduction Printers
- Maurer Optical Recorder
- Mitchell Cameras

THE MARK IV CAMERA CHAIN

EXPERIENCE COUNTS

Marconi's pioneered the use of the 4½ inch Image Orthicon Camera using the tube developed by their associates, the English Electric Valve Company. Marconi's have amassed more 'know-how' on the use of the 4½ inch Image Orthicon than any other manufacturer.



**OVER 600 MARCONI IMAGE ORTHICON
CAMERA CHAINS HAVE
BEEN SOLD THROUGHOUT THE WORLD**

MARCONI®

COMPLETE SOUND AND TELEVISION SYSTEMS

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED
CHELMSFORD · ESSEX · ENGLAND

MARCONI BROADCASTING PRODUCTS ARE DISTRIBUTED IN THE U. S. A.
SOLELY BY

AMPEX Video Products Company
REDWOOD CITY · CALIFORNIA

BD 863 MARK IV IMAGE ORTHICON CAMERA

EXTREME STABILITY

Novel circuit design and careful choice of components gives such a high degree of stability that operational controls have been removed from the camera.

FIRST CLASS PICTURE QUALITY

The 4½ inch Image Orthicon tube gives a picture quality substantially better than any other type or size.

LIGHT AND COMPACT

By reducing and simplifying the camera electronics its weight has been held below 100 lb. and its size made correspondingly small.

M40

NOW...for
Ektachrome
users...

ONE-DAY SERVICE
on 16 mm
**COLOR
PROCESSING**

Licensed by Kodak

**EKTACHROME
COMMERCIAL** 5¢ ft.

**EKTACHROME
ER FILMS** 6¢ ft.

Chemical and
sensitometric
controls to rigid
Kodak standards.

**TEXAS INDUSTRIAL
FILM COMPANY**



2528 NORTH BLVD.
JA 9-4377

HOUSTON

**48
HOURS
Camera to
Color Print**

Let us process your
Ektachrome camera
film, assemble it,
make a

**COLOR (11¢)
B & W (6¢)**

print with printed edge
numbers, then ship to you
within 48 hours after
receipt of your original.

Write for
complete laboratory
price list.

and coordinate system for colorimetry. Professor Hardy immediately recognized the usefulness of this information, especially when used in combination with accurate spectrophotometric data. He spent many years devising and teaching methods for facilitating the combined use of these two groups of data, for color measurement in myriad applications.

Early in his program for facilitating the application of spectrophotometry to color measurement, Professor Hardy developed the selected-ordinate method of color calculation, which eliminates almost all of the nearly one hundred multiplications per sample required in other methods. This method employs spectrophotometric data at the closest wavelength intervals in spectrum regions where they are most needed according to the standard-observer data.

The selected-ordinate method and extensive tables to facilitate color computations by both this and the older methods were presented with clear descriptions and examples in the *Handbook of Colorimetry*, prepared under his direction and published in 1936 by The Technology Press. That book also contained a monumental set of large-scale sections of the chromaticity diagram, available nowhere else, for the convenient graphical representation and analysis of the relations among colors. Consequently, the Handbook is still a standard reference work in daily use in hundred of color measurement laboratories throughout the world.

He invented and had built during 1936, as an attachment for his spectrophotometer, an automatic digital integrator that calculated the color specifications for each sample which its spectrophotometric curve was being drawn.

Professor Hardy early recognized that the 1931 recommendations of the International Commission on Illumination necessitated a revision of the report of the 1922 Colorimetry Committee of the Optical Society of America, which had established similar data for use in this country. As Vice-President of the Optical Society, he was instrumental in persuading the late Dr. Loyd A. Jones, a member of the 1922 Committee and his chief during his two years at Kodak, to accept the chairmanship of a committee appointed in 1933 to revise the original Colorimetry Report. Professor Hardy served actively on that committee for almost two decades, until the revised report was published. He played an important role, often lonely and sometimes unpopular, in bringing about the final adoption of the psychophysical and operational basis of the revised report. The report finally appeared as a book, *The Science of Color*, published by the Thomas Y. Crowell Company of New York City in 1953.

Professor Hardy served as President of the Optical Society of America from 1935 to 1937, and as Secretary from 1939 to 1957. During his period of service as Secretary, the membership of the Society almost quadrupled, from 650 to over 2400. In recognition of his distinguished work in optics and related fields, he was awarded the Frederic Ives Medal of the Optical Society of America in 1957.—Glenn E. Matthews.

section reports



The Atlanta Section met on April 11 at the Protestant Radio and Television Center with an attendance of 15. Guest speakers were Dr. Ernest Arnold, President of the Center and Carl Degan, Production Manager.

Dr. Arnold welcomed the Section to the Center and explained its work pointing out that it is a nonprofit organization, producing religious programs exclusively for radio and television. It is the largest organization and the only interdenominational one doing this type of production work.

The excellently equipped center has a staff of 31 and handles 1200 taped radio programs each week. In addition to the present ¼-in. sound tape duplication equipment, plans are being made for the installation of facilities for originating and duplicating programs on video tape.

Mr. Degan escorted the group to the Chapel Studio where two films produced by the organization were shown. One, a 27-minute 16mm color film *The Triumphant Tradition* was of interest primarily because it demonstrated the multiple-camera technique used by Mr. Degan in his past experience in producing TV advertising films.

The other example shown was a 9-minute film strip in color with sound. This was an excellent example of the use of contemporary art to illustrate the origin of Christianity.

Following this latter presentation, there was a discussion period and a tour of the facilities of the Center.—John C. Horne, Secretary-Treasurer, 404 Page Ave., N.E., Atlanta 7, Ga.

The Atlanta Section met on May 15 at the Georgia Tech Library with an attend-

Erratum

January 1961, New York Section

On p. 56, lines 4-10 of second paragraph:

For: "In commenting on the future of 8mm sound films, he noted that about 8,000,000 8mm projectors are now in use, as against 600,000 16mm projectors, with production running at a rate of 800,000 8mm units versus 50,000 16mm projectors per year."

Read: "In commenting on the future of 8mm sound films, he noted that by the end of 1961 there will probably be between 4 and 5 million 8mm silent projectors in use in the United States as against an estimated figure of 727,000 16mm sound projectors in use in the U.S. as of January 1, 1961. Approximately 700,000 8mm silent units are sold in the United States annually versus 40 to 50,000 16mm sound projectors per year."