WORLD'S LARGEST CONSOLE

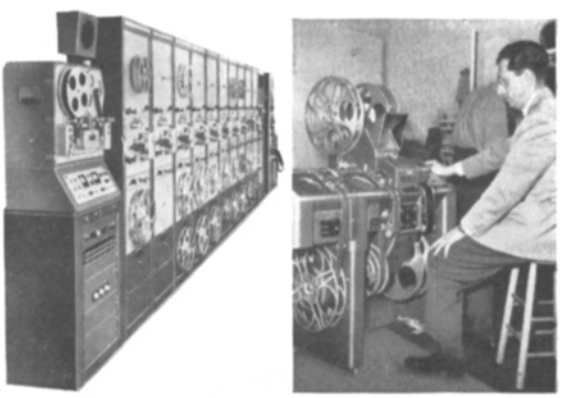
16 6-channel groups...96 input channels

This huge console, custom built by Westrex for the Todd-AO production, "Oklahoma", was designed, manufactured, and delivered in six months as part of the complete recording, re-recording, and editing equipment supplied by Westrex.

Research, Distribution and Service for the Motion Picture Industry

Westrex Corporation

111 Eighth Avenue, New York 11, N. Y.
Hollywood Division: 6601 Romaine Street, Hollywood 38, Calif.



AT LEFT: Lineup of dubbing machines and dubbing recorder. Re-recorded version is 6-track stereophonic sound on 35mm magnetic film. AT RIGHT: Westrex Editer—with 70mm film in the picture gate, and two 35mm sound films, one in the regular gate and one in the special sound head attachment.

news and reports

SMPTE Education Committee

The first concrete results of the program undertaken by the Society's Committee on Education have been achieved with the initiation in mid-September in Los Angeles of three courses of instruction for film industry technicians. These courses are sponsored by the Society in cooperation with the University of California, and are meeting once a week for eighteen weeks at the John Burroughs Junior High School, 600 South McCadden Place, Los Angeles.

A course in "Motion-Picture Laboratory Practice" will be held Thursday evenings and will be conducted by six experts in the field. They include: Dr. John G. Frayne of Westrex Corp., President of the Society and Chairman of the Society's Education Committee; William Gephart, Processing Director of General Film Laboratories; Alan Gundelfinger, Plant Administration, Technicolor Motion Picture Corp.; Allen Haines, Chief Chemist, Pathe Laboratories, Inc.; Donald H. Kelly, Member of the Research Staff, Technicolor; and Sidney P. Solow, Vice-President and General Manager, Consolidated Film Industries.

This course will include sessions on sensitometry, photographic chemistry, laboratory aspects of sound, practical laboratory practice and color. Prerequisites for enrollment is experience in motion-picture laboratory work.

On Monday evenings a course in "Illumination Optics" will be conducted by Ernest W. Silvertooth, Engineer, Librascope, Inc. This course will cover general image-forming optics; optics in illumination systems, light sources, optical glass characteristics, optical quality of film images and optical filters. College physics and consent of the instructor are necessary for admittance.

Roderick T. Ryan, Quality Control Engineer, Eastman Kodak Co., will conduct a course on "Duplication of Color Motion Pictures" on Wednesday evenings. Experience in printing and/or processing of color motion-picture film and consent of the instructor are necessary prerequisites for taking Mr. Ryan's course.

These three courses are the direct result of the activities of the Education Committee's Subcommittee on Training of Film Laboratory Technicians of which Mr. Solow is Chairman. This was one of five subcommittees appointed by Dr. Frayne following the first meeting of the group held in Hollywood on April 5, 1955. At that meeting the Chairman discussed the need for supplying trained engineers and technicians for the industry as well as the need for continued training on the job of those employed in the industry. It was then decided that the future work of the committee should be built around the following items:

(1) Making an inventory of jobs that might be available for the next ten years. A part of this study would aim to establish a roster of technical employees in the industry.

(2) Establishing short courses or institutes to meet current problems in the industry.

(3) Establishing a long-range training program.

The five subcommittees established to implement the various parts of this program include, in addition to the Subcommittee on Training of Film Laboratory Technicians: Studio Joint Subcommittee on Education Training, headed by Loren L. Ryder of Paramount; Film Laboratory Joint Subcommittee on Educational Training, headed by Alan Jackson of the Film Technicians Local; Subcommittee on Training of Sound Technicians, headed by Lorin D. Grignon of Twentieth Century-Fox; and a Subcommittee on the Training of Television Technicians, headed by Herbert W. Pangborn of CBS.

The Committee on Education is made up of representatives of universities, labor unions, motion-picture and television studios and laboratories who are anxious to cooperate to meet the growing need for trained technical people in the industry. Those on the Committee include:

Herbert Aller, Business Rep., Local 659, IATSE, Los Angeles

Charles Austin, Technical Rep., Mitchell Camera Corp., New York

Chester Bahn, Editor, *Film Daily*, New York

Wilbur T. Blume, USC

L. M. K. Boelter, Dean of Engineering, UCLA

Thomas A. Carman, International Sound Technicians Union, Hollywood

John W. Ditamore, Manager, Hall of Music, Purdue University

John Flory, Advisor on Nontheatrical Films, Eastman Kodak Co.

Lloyd T. Goldsmith, Sound Department, Warner Brothers Pictures, Inc.

E. E. Griffith, Research Engineer, Technicolor Motion Picture Corp.

Lorin D. Grignon, Development Engineer, Twentieth Century Fox Film Corp.
Robert Hall, USC
John K. Hilliard, Chief Engineer, Altec Lansing Corp., Los Angeles
Alan Jackson, Film Technicians Local 683, Hollywood
P. A. Jacobsen, University of Washington, Seattle
Wm. F. Kelley, Sec.-Treas., Motion Picture Research Council, Hollywood
Ellis F. King, UCLA
Ralph E. Lovell, Kinescope Recording Supervisor, NBC, Hollywood
John Mahon, Producer, Newport Films
Arthur C. Miller, President, ASC, Hollywood
Garland C. Misener, Ansco, Binghamton
Hollis Moyse, Photographic Products Dept., E. I. du Pont de Nemours & Co., Hollywood
H. W. Pangborn, TV Engineer, CBS, Hollywood
Loren L. Ryder, Director of Engineering & Recording, Paramount Pictures Corp.
N. L. Simmons, Motion Picture Engineer, Eastman Kodak Co., Hollywood
Sidney P. Solow, General Manager, Consolidated Film Industries
Henry Ushijima, Director of Production Services, Geo. W. Colburn Laboratory, Chicago
Robert Wagner, Ohio State University, Columbus

Commercial TV in Britain

Britain's first independent commercial television station began transmitting on September 22 from Croydon, near London, where equipment provided by Marconi has been installed and put into operation. The station has, in fact, been hand-built and the 10-kw vision transmitter and the 2½-kw sound transmitter are both "laboratory prototypes." Two more transmitters of approximately the same power outputs will be installed in the near future. These will be standard production versions. The three transmitters together will reach almost 60% of the English population. Stations will continue to be opened at the rate of one a year, until the total of 14 or 15 needed gives complete coverage.

The new station is owned and operated by the Independent Television Authority, or ITA, set up in August 1954 by Parliament, with a statutory life of 10 years. Programs are produced by private companies called "program contractors." These companies must get ITA's approval regarding taste and subject matter, in order to maintain a balance in the types of programs presented.

A private specialist organization, the Independent Television News Ltd., will produce all news shows and supply them to the private companies. ITA will pass on the accuracy and impartiality of the news.

To finance ITA, the Government is lending the organization up to £2,000,000 ($5,600,000) within the next five years, with arrangements made for additional, special government grants if necessary. The bulk of its finances, however, will come from selling time on its stations to private production companies.

The companies that produce the programs will sell advertising time within the shows but advertisers will not be permitted to "sponsor" shows. ITA controls the amount of time allotted to advertising and prescribes that commercials can come only at the beginning or end of programs, or in natural breaks in the script or program. There must not be more than six periods of advertising in an hour and none in programs of religion, royalty or national ceremonies.

BBC will continue its present program and may begin a second channel when allotted a wavelength but it will not become a commercial television service.

The Director-General of ITA, Sir Robert Fraser, has stated that there are likely to be 40 or 50 stations when commercial television is fully developed, all operating independently of each other.

10-kw Transmitter

The production version of the Marconi Band III 7½/10-kw vision transmitter will consist of a 2-kw transmitter together with a Band III Amplifier. The transmitter is housed in four standard cubicles, and the amplifier in three, all of which may be bolted together to form a continuous front.

The complete transmitter is designed to give a peak output power of approximately 10 kw under vestigial sideband conditions, at any chosen channel in the upper frequency band of 170 to 216 mc, using the British standard 405-line system. Other editions give similar facilities on 525- and 625-line systems.

Air cooling is used throughout for normal operation, and the transmitter incorporates the most advanced constructional techniques, the general design being based on the policy of generously under-running all components and valves so as to secure long life and high reliability. All units are readily accessible for maintenance.

Pushbuttons are provided on a Transmitter Control Panel for normal day-to-operation of the transmitter, which may thus be brought up on power from the control desk. The voltage and feed of the final amplifier are metered; a black level control and calibrated input attenuator are also provided on the control panel.

2-kw Transmitter

Drive Circuits: Crystal controlled. The crystal itself is oven-controlled and operates at a submultiple of the output frequency. Long-term stability better than 0.0002%, which permits offset carrier operation of two adjacent transmitters on the same channel. The crystal oscillator, together with associated frequency multipliers and stabilized HT supply, form a complete unit with an output of approximately 15 w at the operational frequency.

RF Circuits: The first and second RF amplifiers consist of triode valves working in single-ended grounded grid circuits, using coaxial lines as circuit elements. The final (modulated) amplifier employs an air cooled tetrode in a single-ended coaxial line circuit.

Modulator: The output signal from the control desk is bridged across the input of

two units, namely a clamp pulse generator and a correction unit.

Clamp Pulse Generator: This produces a clamping pulse of 2-v amplitude, which will remain correctly timed in presence of noise pulses on the incoming signal, positive or negative, up to 1½-μsec duration.

Correction Unit: In this unit the sync pulses are stretched, clipped to standard level, and pre-correction applied to compensate for transmitter nonlinearity. A fine gain control is provided on this unit. Signals are clamped by pulses from the clamp pulse generator, and the output is approximately 1.5 v double amplitude peak to the next stage, the preamplifier.

Preamplifier: Here the signal can be increased to approximately 50-v DAP. Since the input is correctly clamped, the black level is maintained in the succeeding stages by d-c restoration. Coarse, and fine preset gain controls are provided on this unit.

Final clamping and Black-Level Feedback Unit: A signal is obtained via a probe in the aerial feeder rectified, and fed to this unit. The amplitude of the sync pulse in the signal thus derived is used to maintain the black level constant. The signals are also clamped by pulses from the clamp pulse generator. Should a fault occur in the feedback path, the feedback control may be switched out of operation.

Final Amplifier and Modulator: The unit is fed from the final clamping stage through an input cathode follower, the whole circuit being directly coupled to maintain the constancy of black level. A cathode follower feeds a normal shunt regulated amplifier, followed by a shunt regulated cathode follower stage, in order to supply the large reactive current demanded by the stray capacitance appearing at the modulation terminals of the amplifier. A peak modulation limiter is incorporated in this unit.

Band III Amplifier

The modulated output of the 2-kw transmitter is fed to the input of this amplifier, which consists of a single-ended air-cooled triode operating in a coaxial line circuit to raise the output level to approximately 10 kw peak.

Wide-Screen Motion Pictures

The Society has just produced a brief booklet on wide-screen motion pictures. It is a comprehensive outline of the several new methods of motion-picture production and exhibition that came into use during and after 1952, and an indication of the ways in which they differ from the techniques that became "standard" during the late nineteen twenties.

The booklet, which was prepared at the suggestion of Ralph Hetzel, Vice-President of the Motion Picture Export Association, covers 35mm sound pictures, Cinerama, CinemaScope, VistaVision, Superscope and Todd-AO. Details of camera aperture, projecture aperture, aspect ratio, direction and rate of film travel, number and type of soundtracks and loudspeakers, and type of screen are included in each section.

Copies are available at no charge to Society members upon request until present supply is exhausted—*S.G.*

Education, Industry News

The National Association of Educational Broadcasters has made a survey of the television in the U.S. and reports much activity in this field. During the past summer TV workshops were offered with an increasing emphasis on the technical side of the medium.

In addition to the writing, directing and program planning courses which are given by a great many institutions, the University of Miami, Coral Gables, Fla., offered a series of courses including: Studio Operations, Control Room Operations, Performance Skills, Set Construction and Graphics. Michigan State University at East Lansing, Mich., offered workshops in Production Methods, and Production Laboratory; and the University of Southern California, which recently installed a good deal of modern, up-to-date projection equipment, offered a comprehensive course in Control Room Operation, Television Laboratory and Telecommunications Workshop.

Membership Certificates (Active and Associate members only). Attractive hand-engrossed certificates, suitable for framing for display in offices or homes, may be obtained by writing to Society headquarters, at 55 West 42d St., New York 36, Price: $2.50.

Meet Los Angeles "SCOTCH" Brand Account Executive Tom Gibbons, Jr., wife Cleyo Sue and their five children—Tommy, Jacky, Susan, Maureen and Jeffry. A high fidelity music fan, Tom also finds time to take his young sons on week-end trips to the High Sierras.

HE HELPED TO PUT THE FILM INDUSTRY ON A NEW "TRACK"

DECEMBER, 1948—a standout date for Tom Gibbons, Jr., motion picture industry Account Executive and member of the S.M.P.T.E. Just seven years ago he played an important role in helping the motion picture industry to adopt an entirely new sound recording method, now used by all major film companies for their original recordings. It's "SCOTCH" Brand Magnetic Film No. 115.

Because it assures brilliant and faithful reproduction of sound, "SCOTCH" Brand Magnetic Film No. 115 is recognized by studio engineers as the unsurpassed standard of quality. Its magnetic properties are unique: *only* "SCOTCH" Brand makes its own oxide coatings to guarantee uniform excellence from reel to reel and from year to year.

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SCOTCH
BRAND

MAGNETIC FILM
NO. 115

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James L. Wassell, Chairman of the Society's Central Section, was recently appointed Coordinator of a new department called the Professional Equipment and Instrument Division set up by Bell & Howell in Skokie, Ill., according to an announcement by George L. Oakley, manager of the division.

Wassell formerly was with Ansco where since 1949 he was midwest sales manager of the company's professional motion-picture division.

The new division at Bell & Howell is a further extension of the company's policy of developing and coordinating its efforts in designing new, specialized equipment for the professional and engineering fields. The number of sales and engineering personnel in this work has been quadrupled. This activity was formerly divided among the Bell & Howell engineering, manufacturing and merchandising divisions.

A special group will work on projects not suitable for the production line, and the division will concentrate heavily on research in the electronics field. Increased effort will be given to film printers and other equipment that the company pioneered for the motion-picture industry. Special research will be aimed at developing equipment to help film laboratories "automate" their operations.

Two other appointments have recently been announced, these by Malcolm G. Townsley, Vice President of Engineering: **John G. Heiland,** who was formerly Associate Director of research while Mr. Townsley was also serving as Director of Research, has been made Director of Research. **Gerhard Lessman,** formerly a special project engineer, has been made Associate Director of Research.

books reviewed

How to Do Home Movie Tricks

By Julien Caunter. Published (1955) by Focal Press Ltd., London; available in U.S. from American Photographic Book Publishing Co., 33 W. 60 St., New York 23. 176 pp. 5 × 7¼ in. Price $1.75.

This compact little book brings a wealth of ideas and information to the student and amateur cine filmer. The professional will not find anything in it that he does not already know since all the tricks suggested are very simple in themselves or based upon the most elementary principles. Simple language and clear linecuts combine to inspire the amateur to look upon his camera with new interest and respect. Although the trick work described is primarily designed to amuse the filmer and his audience, it will undoubtedly provoke serious thought among students. The more serious application of these methods will permit many a random motion-picture enthusiast to become a serious worker in the field. The judicious use of the trick filming methods coupled with imagination and good taste will increase the value of films that would otherwise be very ordinary.

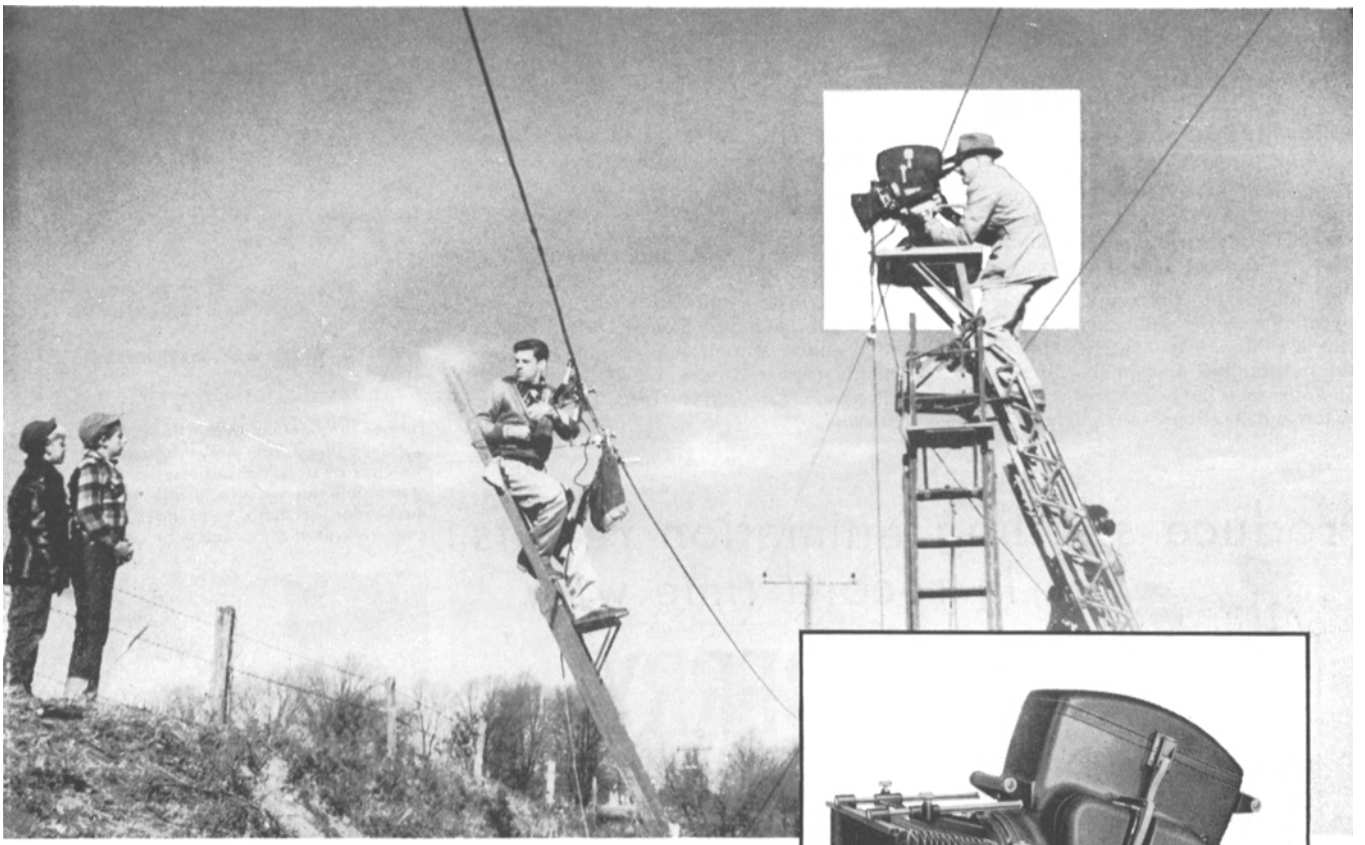
The chapter on varying camera speeds gives an unusually clear statement of the facts. Stop motion and animation come in for a very condensed but nonetheless informative pair of chapters which are well worth reading. Masks and before the lens effects are described in detail. All through the book there are very helpful general hints which apply to all types of filming and camera handling. Parallax errors in titling are adequately covered. A short chapter on editing, although not strictly keeping to the subject, has some hints worth considering.

The book as a whole makes a valiant attempt to cover a vast area of photography in a small amount of space. It succeeds in this without getting the reader involved in overly technical discussions.

The chapters devoted to animation and spot motion bring out some interesting and useful facts, but because of space limitations only the high spots are touched upon.

The glossary must be used with care because of the disparity between British and American nomenclature in some cases.

The fact that this book is too elementary to be of any use to the professional cinematographer does not lessen its value and importance to the student and amateur. It will find a welcome spot in the library of these last two, and is technically accurate, complete and full of useful information



Why SOUND MASTERS Selected... The **ARRIFLEX 35** Model IIA To Shoot *'Speechless By Mistake'* for the Bell System

The Bell System wanted a color film that would help prevent accidental damage to buried and aerial telephone cables by dramatizing some of the common causes of such damage and their effect on vital communications. SOUND MASTERS of New York was selected to make the film.

The script called for 'on location' filming — in fields, on highways, in ditches, on 'Main Street'. More than 95% of the film required live, lip-synchronized sound. A versatile, easily maneuverable camera was needed for this job.

SOUND MASTERS selected the Arriflex 35 Model IIA with Synchronous Motor and Sound-Proof Blimp — and filmed all the sequences with this equipment within a period of five weeks. *Speechless By Mistake* has been completed and will soon be released by the local Bell Telephone Companies for public showings.

Says Mr. F. C. Wood, Jr. vice president in charge of production, "We acquired and used the Arriflex outfit because it was the lightest, most compact equipment we could find. It would have been next to impossible to have done the job so quickly and easily with any other camera. The Blimp was perfect both indoors and out.

"Needless to say, we were pleased with the results, as was also the client. The pictures were rock steady and needle sharp — thanks to the new film gate and intermittent, and to those wonderful Schneider lenses. The whole film was a complete success.

"The most wonderful thing about the whole deal is that the price of the complete outfit was hardly more than what it would have cost us to rent other equipment."

And Mr. Wood's experience is, by no means, different or unique, for many other producers and cameramen have discovered the economy, the quality and the versatility of the Arriflex 35. No more easily manageable camera exists anywhere. Yet, it has every facility and convenience for truly first-rate filming.

ARRI

Write for complete information to:

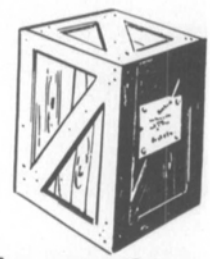
Sole U.S. Agents • **KLING** PHOTO CORP.
235 Fourth Ave., New York 3, N. Y.
7303 Melrose Ave., Hollywood 46, Cal.

which is conveniently arranged.—*E. M. Pittaro*, Consultant, 137–65 70 Ave., Flushing 67, N.Y.

Leica Manual and Data Book

By Willard D. Morgan and Henry M. Lester. Published (1955) by Morgan & Lester, 101 Park Ave., New York 17. 456 pp. incl. illustrations, graphs and tables. $5\frac{1}{2} \times 8\frac{1}{4}$ in. Price $6.00.

Now in its thirteenth edition and twentieth year of publication, this perennial classic continues to hold its reputation as the outstanding work in its limited field. Its audience is the Leica camera owner, and to this audience it presents a detailed factual account of the camera and its proprietary equipment. The present edition has been extensively revised and rewritten. It includes exposure and filter data for such recent film stocks as Adox, Anscochrome and the new Ektachrome. Tables and formulas from many separate sources are now conveniently grouped together in a 57-page appendix. Previous conflicts in statements of flash exposure figures have apparently been resolved by the editors, and the tables which they now present are warranted to be reliable. The editors have performed well and faithfully their task of presenting an informative volume, undiluted by inspirational copy.—*Bernard D. Plakun*, General Precision Laboratory Inc., Pleasantville, N.Y.



new products (and developments)

Further information about these items can be obtained direct from the addresses given. As in the case of technical papers, the Society is not responsible for manufacturers' statements, and publication of these items does not constitute endorsement of the products or services.

Two six-channel stereophonic production recording systems were specially designed by Westrex Corp. for the Todd-AO production of *Oklahoma*. These systems consisted of mixer input facilities capable of accommodating six stereophonic microphone inputs, a six-channel RA-1547 Recorder and associated power supply equipment. Both were mounted in van-type mobile units containing their own power supplies.

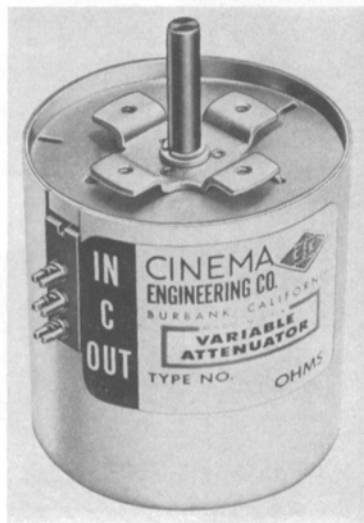
A special stage at M-G-M Studios was completely equipped to do the re-recording work necessary on *Oklahoma*, including a special console capable of accepting 96 separate input circuits. Arrangements were made so that circuits could be handled separately or grouped under controls so that each separate film containing six magnetic sound-tracks in a stereophonic relation could be controlled with one attenuator. The main console is over 20 ft long and can be operated by a five-man crew. All necessary equalizers, auxiliary volume indicators and associated equipment are included in the main console.

Associated with the console is an amplifier and power supply cabinet which also contains the large jack bay necessary for the

proper interconnection of all the circuits involved.

To reproduce the music, dialog and sound effects tracks associated with the re-recording operation, Westrex furnished twelve RA-1551 Type 6-Track Stereophonic Reproducing Machines and two RA-1547 6-Track Stereophonic Recording Machines. For monitoring the re-recording operation Westrex supplied five special horn systems for use behind the screen and two sets of surround speakers, with six special amplifier systems, each rated at 50 w. Associated with the dubbing monitor reproducing equipment are six special projection-type volume indicators and a projection-type footage counter.

The Westrex Editer was modified to accommodate two 35mm magnetic films each containing six stereophonic sound-tracks in association with the Todd-AO 70-mm picture film. The stereophonic sound conversions including the auxiliary six-track stereophonic reproducer were provided by Westrex.



A new manufacturers' type audio attenuator has gone into production at the Burbank, Calif., plant of Cinema Engineering Co., a division of Aerovox Corp. For use in sound mixing, special measuring and calibration units, the attenuator features Cinema self-wiping contacts of nickel, silver, carbon composition and wire-wound resistors. Available in 150, 250 and 600 ohms, the resistance element values are standard 5% accuracy. Audio ladder controls have a 6-db inherent insertion loss. All other network types of mixer controls have zero loss. Other rotary tap units are available in potentiometer, T, ladder attenuator networks. Controls are capable of handling levels as high as +30 dbm. The attenuator comes without knob and dial, but they are available as accessory items. Shipping weight is 8 to 12 oz per section.

Together with the latest developments in motion pictures and photography featured in Disneyland, Walt Disney's 160-acre park, the early days of photography have been revived in a gay-nineties, old-fashioned portrait studio and camera shop, created by Eastman Kodak on the "Main Street" entrance to the park. The professional photographer's studio is an exact replica of a studio of the nineties with a photographer and model posed with her head in the metal headrest typical of that period. All the cameras and equipment will be exact replicas of those used during that period. The historical exhibit shows the development of stereo photography, old-time "detective" cameras, and a Kinetascope, forerunner of the movies.

Eastman Kodak Company has obtained rights from Gasparcolor, Inc., to use the inventions of patents 2,344,084 and 2,312,543, according to an announcement by Dr. Bela Gaspar, President of Gasparcolor. These patents deal with the arrangement and color sensitivity of emulsion layers in a multilayer, multicolor photographic film.

According to patent 2,344,084 silver chloride emulsions insensitive to blue light (except for the short wave blue violet which is screened out) can be used for the two upper layers of a multicolor film and the lower layer can be an ordinary silver halide emulsion which is inherently blue sensitive. This permits the uppermost layer to be sensitized to green and the second layer to be sensitized to red so that the images which are subsequently converted to magenta and cyan, respectively, are recorded in the front of the film and consequently with greater sharpness. Thus the major role which these darker color images play in the overall definition of the final color print is more fully utilized. The arrangement also permits the elimination of a filter layer normally required to be used behind an ordinary blue sensitive silver halide layer when it is the uppermost layer of the film.

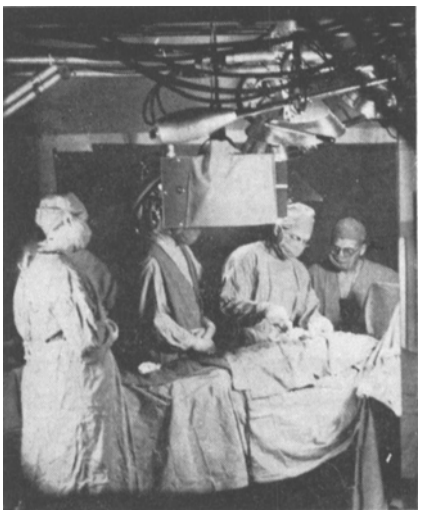
Patent 2,312,543 has to do also with the arrangement of color sensitive layers in which the relative speeds of overlying and underlying layers are utilized to obtain an advantage similar to that indicated above for the silver chloride emulsion patent.

Dr. Gaspar has announced that the rights granted are nonexclusive in character and that Gasparcolor, Inc., stands ready to license, on reasonable terms, other film manufacturers who may want to use the invention of either or both of these patents.

A new color television camera designed specifically for medical use has been developed by the Radio Corporation of America and first publicly demonstrated in Philadelphia at the Veterans Administration Hospital. The camera which is compact and flexible in design is mounted directly above the operating table. It picks up and transmits the scene to a mobile color TV unit outside the hospital and then by radio relay to a 15 × 20 ft theater-size television screen or to a standard 21-in. color set.

Speaking to the group in Philadelphia was Dr. Alfred N. Goldsmith, New York TV and electronics consultant. He envisioned a "Super Clinic" of hospitals throughout the country joined together by television conventions and pooling knowledge and techniques. Medical research and experiments can be carried on by using the compatible color camera with a light microscope, for color transmission of microscopic studies.

The new RCA color camera is compact and approximates the weight and size of standard black-and-white studio TV cameras. Reduction in size is achieved by using three vidicon pickup tubes similar to those used in industrial television systems. Light from the televised scene is divided into the three separate colors by a system of dichroic mirrors. Each vidicon tube has its own lens,



and the camera can be focussed remotely by a small reversible motor.

In addition to the vidicon camera the RCA compatible color system contains packaged units for camera control, monitoring, sync generation and regulated power supply. The system also includes a colorplexer and an r-f system to feed signals into standard home color receivers without alteration. The entire equipment weighs about 300 lb.