ABSTRACTS

Moving-Coil Telephone Receivers and Microphones. E. C. WENTE AND A. L. THURAS. *J. Acoustical Soc.*, **III**, No. 1, Part 1, July, 1931, p. 44. This paper is concerned primarily with the general principles of design of moving-coil receivers and microphones. There are included circuit diagrams for several systems together with the calculated and experimentally measured response curves of a moving-coil head receiver and a moving-coil transmitter.

In regard to the microphone it "has important practical advantages over the condenser transmitter in that the amplifier may be at some distance from the transmitter without loss in efficiency and in that no polarizing voltage is required. The sensitivity of this transmitter is about 10 db. higher." W. A. M.

Mass Controlled Electrodynamic Microphones. H. F. OLSON. *J. Acoustical Soc.*, **III**, No. 1, Part 1, July, 1931, p. 56. A theoretical discussion of a mass controlled electrodynamic microphone is presented. A microphone of this type, which consists of a light corrugated ribbon suspended in a magnetic field and freely accessible to air vibrations, is described. The theoretical response-frequency characteristic to be expected is calculated and compared with the measured characteristic. The response is shown to be substantially uniform between 100 and 5000 cycles. A more detailed account of the application of the ribbon microphone will be found in an article by H. F. Olson, *J. Soc. Mot. Pic. Eng.*, June, 1931. W. A. M.

Microphone Technic in Radio Broadcasting. O. B. HANSON. *J. Acoustical Soc.*, **III**, No. 1, Part 1, July, 1931, p. 81. This paper is especially concerned with the difficult task of picking up action which takes place over a large area, such as symphony orchestra and stage presentation of an opera under conditions where the arrangement of the players cannot be adjusted to be ideal for sound pick-up. In particular is the use of a parabolic reflector discussed. Several specific cases of the usefulness of such a directional pick-up device in actual broadcasting are described. Also response curves of the directional effect at various frequencies are shown The author believes that the development of a directional pick-up has been a great step forward in microphone technic and he expects to see considerable development in directional microphones in the next few years, which in turn will enable broadcasters to build larger productions and transmit them with even more fidelity than at present. W. A. M.

The Development of the Microphone. H. A. FREDERICK. *J. Acoustical Soc.*, **III**, No. 1, Part 2, July, 1931. This paper is a presentation of the history of the microphone starting with developments as far back as 1837 and carried through to the present time. During the period immediately following 1875, almost every conceivable type of microphone was tried. Since the magnitude of the electrical output was of more importance than extreme faithfulness of reproduction, the granular carbon type of microphone rapidly came to the front, and extensive work on this type of transmitter led to successive improvement of both these

factors and also in the reliability of the instrument. Since the advent of the vacuum tube amplifier there has been a demand for microphones which would reproduce sounds of widely varying character with extreme fidelity with no restrictions on the level of output except that it should be considerably above the noise level. A number of microphones of this type have been developed and used, perhaps the best known type being the condenser transmitter. Fifty-one references are cited. There are twenty-seven figures, many of which are photographs of various types of microphones which have historical significance. W. A. M.

Some Physical Factors Affecting the Illusion in Sound Motion Pictures. J. P. MAXFIELD. *J. Acoustical Soc.*, **III,** No. 1, Part 1, July, 1931, p. 69. "This paper describes the results of an empirical study of methods of controlling some of the factors available to the engineer in sound recording and photography in such a manner that a pleasing illusion of reality is created in the theater." The author takes cognizance of the fact that an observer, in seeing and hearing a scene, uses two eyes and two ears, whereas in viewing the scene through the medium of a sound picture one is restricted to one eye, namely, the camera lens, and one ear, the microphone. Admitting this basic limitation of sound picture recording, an attempt has been made to make use of all the factors possible to make the sound motion picture of a scene appear as natural as possible to a member of the audience viewing it. A definite position of the microphone is specified as a function of the focal length of the lens being used and the acoustic quality of the set in which the action is being taken. W. A. M.

Bibliography of Acoustics of Buildings. F. R. WATSON. *J. Acoustical Soc.*, **III,** No. 1, Part 1, July, 1931, p. 14. In this bibliography an attempt has been made to include all articles concerning the acoustics of buildings from 1920 to 1930 which appeared in scientific and engineering journals together with certain others which were accumulated by the author. The references are divided into three groups, namely, "general," "acoustics of rooms," and "noise insulation." Some four hundred references are listed. W. A. M.

Wide-Film Color Cinematography. *Brit. J. Phot., Color Supp.*, **78,** Sept. 4, 1931, p. 35. The application of color to wide films raises difficulties, since the 56 mm. width involves a wider arrangement of the three films grouped in exposure position in the camera. Three methods of overcoming this difficulty are reviewed here. All are taken from recent patent specifications. Two are based on beam-splitting prisms, and the third uses one bi-pack and one single film at right angles to each other, with a rotating sector mirror to locate the image alternately upon the film surfaces. A. A. C.

Increasing the Usefulness of Theater Sound Equipment. G. S. MITCHELL, *Proj. Eng.*, **3,** September, 1931, p. 11. A description is given of auxiliary sound apparatus for extending the uses of standard equipment in the theater. A microphone for announcements; auxiliary loud speakers for reënforcing the audible parts of stage presentations, or to serve the director in rehearsing stage shows; and broadcasting from the theater are some of the subjects discussed. These additions to equipment can be made from standard parts and are of great service in increasing the effectiveness of the program A. A. C.

Acoustics of a Flexible Space Theater. C. W. MEYER. *Mot. Pict. Proj.*, **4,** September, 1931, p. 12 The article describes a series of analyses conducted to determine the nature and extent of the acoustical treatment which will be re-

quired in the proposed Ukrainian National Theater. The plans include a flexibility never before attempted; they propose a construction of stage and auditorium that may be instantly transformed by means of a central control into a concert hall, opera, multiple stage theater, circus, or convention hall. From analyses of models of all these arrangements it is concluded that excellent acoustical conditions can be secured. A. A. C.

Prevention of Interfering Noises. P. T. SHERIDAN. *Mot. Pict. Herald*, **104**, No. 5, Sec. 2, Aug. 1, 1931, p. 33. This is the second of three articles covering the prevention of noises in reproducing systems in theaters. This article covers noises of an intermittent nature. The sources of this type of noise may be any one or more of the following: run down batteries; corroded or dirty clip contacts on fuses or ferrule type resistors; loose connections throughout the sound system; dirty contacts on faders and volume controls; poor brushes and rough commutators on motor-generator sets. A. A. H.

Acoustical Problems of Sound Picture Engineering. W. A. MCNAIR. *Proc. I. R. E.*, **19**, No. 5, Sept., 1931, p. 1606. The author points out the fact that a great advance in acoustical engineering was necessary in order to control new conditions which have been brought up by sound pictures. The article mentions several problems encountered by the author and discusses one type of acoustical distortion encountered. Numerous curves and formulas give a concise explanation of these problems. A. A. H.

Prevention of Interfering Noises. P. T. SHERIDAN. *Mot. Pict. Herald*, **104**, No. 9, Sec. 2, Aug. 29, 1931, p. 28. This is the last of three articles covering the prevention of interfering noises in theater sound reproducing systems. This article describes and gives suggested remedies for the following steady noises: ground or "rush" noise; a-c. pick-up from power circuits; a-c. light leaks into PE cells; sprocket hole and framing line noise; electrical disturbance due to mechanical vibration. A. A. H.

The Reversal Process. W. RAHTS. *Kinotechnik*, **13**, June 20, 1931, p. 207. The theory and practice of photographic reversal processes are reviewed. Sensitometric curves on Agfa Reversal Film are given to compare the following methods of compensating for variations in the camera exposure: (1) variation in the time of first development in a developer containing a solvent for silver bromide; (2) variation in the second or reversing exposure; (3) bathing in 10 per cent hypo for various times before the second exposure; (4) reduction of the reversed image for various times in potassium permanganate. In the method of varying the second exposure, a sensitometric comparison is given of the effects of using the following bleaching and clearing baths: (1) potassium permanganate, followed by potassium metabisulfite; (2) potassium permanganate, followed by sodium sulfite; (3) potassium bichromate, followed by sodium sulfite. It is stated that (2) and (3) tend to allow re-reversal, and that therefore the controlled second exposure does not permit as wide a choice of bleaching and clearing baths as the controlled first development. Control by bathing in hypo is said not to give clear highlights, and reduction with permanganate is said to give a small range of control. M. W. S.

Improvements for the Motion Picture Camera. F. EULDERINK. *Focus*, **18**, August 15, 1931, p. 471. Favorable notice is given an article appearing in *Der Filmamateur* which suggests a number of features that should be added to the small film camera, presumably for the serious worker. These features are as

follows: (1) interchangeability of regular and telephoto lens; (2) a prism or mirror behind the finder to permit viewing from the side so that pictures can be made without the knowledge of the subject; (3) focusing directly on the film; (4) variable camera speed; (5) an iris diaphragm in front of the lens and a single-turn crank for backing the camera movement for double-exposures; (6) arrangement for fading in and out; (7) a device for shutting off the camera after letting it run for several seconds; (8) a chain support which has the function of a tripod but consists of a chain held under the foot or otherwise; (9) a tripod attachment point on the top of the camera so that it can be supported upside down. C. E. I.

British Separately Mounted Sound Reproducer. *Kinematograph Weekly*, **171**, May 21, 1931, p. 68. In this new type of equipment, the sound-on-film synchronizing parts are mounted on a separate pedestal quite apart from the projector. The sound-head itself is carried on a horizontal adjustable bar attached to the top of the film pedestal. It is claimed that the apparatus is extremely simple to install, and its design is such that no vibration is transmitted to the pedestal from the projector. C. H. S.

British Portable Projector with Sound. *Kinematograph Weekly*, **171**, May 21, 1931, p. 67. Describes a new type portable, sound-on-film, 35-mm. projector with a film capacity of 1000 feet. It is claimed that a 1000-watt lamp gives sufficient illumination for a clear and evenly illuminated 8 feet by 6 feet picture at a distance of from 50 to 60 feet. Cooling is accomplished by means of a fan which is attached to the main shaft of the projector and which forces air through a flexible tube into the heavily ribbed lamp housing. Also, to avoid excessive exposure of the film to the heat rays of the lamp, a novel type of rear shutter has been incorporated, which dispenses the hot air and maintains a low, even temperature.

Advice for the projection of the film in a stationary position for lecture purposes is incorporated. The amplifier is operated on alternating current only. A screen, 5 feet by 4 feet, is incorporated in the set and is withdrawn from the case much as a roll top of a desk, the ends being quickly affixed to a frame. C. H. S.

Apparatus for Panoramic Cinephotography. A. VISBECQ. *Bull. soc. franç. phot.*, **73**, April, 1931, p. 71. The principle of this newly designed camera is that the light rays entering the camera are reflected successively by each of a number of vertically set mirrors fixed on a drum which revolves on a vertical axis. The rays, after being reflected from a mirror, pass into a fixed photographic objective, then onto a vertical slit behind which a standard 35-mm. film moves laterally with a constant linear motion. The film behind the aperture follows the contour of a cylinder whose axis is determined by the focal length of the objective. The mirrors are of a non-oxidizable metal, and the objective in the camera has an ordinary diaphragm which controls the amount of light falling on the aperture. The width of the aperture can be varied so as to permit the different times of exposure. The sprocket carrying the film past the aperture is driven by a direct drive from the drum. For a drum carrying 12 mirrors with an optical system a panoramic range of 60 degrees, the length of the image will be 57 millimeters, taken at 15 frames per second.

The apparatus for projection is constructed almost identical to the camera. Light is focused on the film behind the slit, and as it is only necessary to illuminate a very narrow slit, very high light intensity can be obtained. The image of the slit

is focused by the objective onto the moving mirrors and then to the viewing screen. The inventor makes the following claims: (1) allows the taking of wide screen views; (2) permits continuous movement of the film; (3) economizes light energy in the projector; (4) apparatus is constructed very simply; (5) apparatus can easily be changed over for scanning motion picture films, for television work; (6) although individual frames are 57 millimeters wide, the apparatus is suitable for sound recording as fifteen frames are taken per second, which corresponds to standard practice of twenty-four ordinary frames per second. C. H. S.

The Unique Studio Theater. *Mot. Pict. Herald*, **104**, Sect. 2, August 1, 1931, p. 17. Describes the first of a series of small (turnstile) theaters to be instituted by a theater circuit located in Los Angeles. Front projection is planned, the throw being about 80 feet. The building will occupy a space 30 feet wide by 100 feet long. Novel features of the theater are: automatically changing bulletin frames connected to small loud speakers which will describe the copy; remotely controlled change machines for ticket purchasers; entrance doors operated by photoelectric cells and drinking fountains which are turned on by photoelectric cells. The seating capacity will be 300 and seats will measure 36 inches width back to back instead of the usual 32 or 34 inches. G. E. M.

Selection and Maintenance of Screens. F. M. FALGE. *Mot. Pict. Herald*, **104**, Sect. 2, August 1, 1931, p. 30. Screens are classified into three types: namely, (1) diffusive or matte screens, which direct light in all directions; (2) directive or beaded, which direct light back within a narrow angle to the source; and (3) reflective or metallic, which direct light much as the beaded type. Suggestions are given for choice of screen for various types of houses, and on care and maintenance of screens. Air currents should never be directed through a screen, and the surface should be protected from dirt when not in use. G. E. M.

Photo Sound Analysis. G. J. REID. *Mot. Pict. Herald*, **104**, Sect. 2, August 1, 1931, p. 54. Describes a rapid record oscillograph which mades on paper a photographic record of pure tone or complex frequency from 30 to 6000 cycles. Frequency, pressure, and deviation are recorded in the photographic strip of 35-mm. width. The string of the galvanometer is of duralumin, less than 0.001 inch in diameter, stretched between the poles of an electromagnet and stretched to provide a definite resonance frequency. Three such strings provide means for simultaneously recording data from as many sources. Means for automatically processing the exposed record are provided on the instrument so that the average oscillogram is ready for inspection within 30 seconds after the instrument is started. G. E. M.

The New B. & S. Rear Shutter. F. H. RICHARDSON. *Mot. Pict. Herald*, **104**, Sect. 2, August 1, 1931, p. 62. Two angular air-moving blades are fronted by a flat blade of equal size. The shutter is claimed to perform three operations effectively; namely, (1) to keep the film free from dust and dirt, and to prevent the entrance of air currents into the lamphouse; (2) to reduce the heat at the aperture; (3) to minimize film buckle. G. E. M.

Horizontal Film Inspection Device. F. H. RICHARDSON. *Mot. Pict. Herald*, **104**, Sect. 2, August 1, 1931, p. 65. Describes a film inspecting machine for use in exchanges. It is claimed that the device permits rapid detection of damages to film. Film travels through the machine at a speed of 350 feet per minute. Film is cleaned at the same time, but the device is not intended to renovate dirty film.

When any fault is detected, such as a poor splice, the machine stops automatically. G. E. M.

Asbestos Screen. G. J. REID. *Mot. Pict. Herald*, **104**, Sect. 2, August 1, 1931, p. 73. The material of this screen consists of rod-like threads of asbestos, on the surface of which a highly reflecting material has been coated. A uniformly high reflection of light at all viewing angles is claimed for the new product when woven into a reflective surface. Distortion is said to be eliminated. G. E. M.

The Technic of Recording. A. LOVICHI. *Technique Cinemat.*, **2**, July, 1931, p. 9. A brief discussion of the reasons for re-recording and a description of an American system for re-recording. J. W. M.

Acoustics and Ventilation of Rooms for the Generation and Reproduction of Sound. IV. *A priori* study of an auditorium. G. LYON. *Technique Cinemat.*, **2**, March–April, 1931, p. 3. A geometrical treatment of the relation of direct and reflected sound waves from the interior surfaces of auditoriums. J. W. M.

Acoustics and Ventilation of Rooms for the Generation and Reproduction of Sound. V. *A priori* study of an auditorium. G. LYON. *Technique Cinemat.*, **2**, May, 1931, p. 3. Desirable dimensions are worked out for an auditorium with stage, for the best acoustic results. J. W. M.

Acoustics and Ventilation of Rooms for the Generation and Reproduction of Sound. VI. Placement of the Microphone in a Sound Recording Room. *Technique Cinemat.*, **2**, July, 1931, p. 3. G. LYON. This discussion centers around the conditions for acoustic efficiency and freedom from reverberation in a room used for recording sound or the like. It treats briefly the cases where there are more or less widely distributed sources. [Abstractor's Note: The treatment is very general and does not include any discussion of the latest methods of adjusting sound reflection values for the sake of greater realism.] C. E. I.

New Kodascope. *Movie Makers*, **6**, August, 1931, p. 442. The recently announced Model K Kodascope is very easy and convenient to operate, since it has simple, straight-line threading and all the operating controls are grouped on a panel for easy accessibility. An added convenience is the outlet for attaching a table or floor lamp, which is then operated by the projector switch. Exceptional screen brilliance is obtained with the direct optical system, large aperture lens, and special 260-watt lamp. The lamp house is readily accessible for replacing bulbs and for cleaning, and is well light-trapped and so efficiently ventilated that it can not overheat. Lenses of varying focal lengths for both black-and-white and for Kodacolor are interchangeable. The projector will operate forward or in reverse, and has a rapid motor-driven rewind. H. P.

Sparton Visionola. *Movie Makers*, **6**, August, 1931, p. 443. A combined home talkie apparatus and radio composed of projector, turntable (operating at either 78 or 33 $^1/_3$ rpm.) pick-up, amplifier, and radio set, is completely housed in the console type of cabinet. The folding screen forms the cover of the cabinet, and in operation is set at a slight tilt for most convenient observation. Since the projector is a horizontal type, the picture is projected to the screen by an ingenious reflector device. Threading is very simple. The projector, turntable, or radio may be used independently if desired. H. P.

Pathe Sound. *Movie Makers*, **6**, August, 1931, p. 446. These combined radio and 9.5-mm. sound movie outfits for the home consist of a superheterodyne radio, projector, and synchronized turntable driven by a specially designed motor, and a

professional pick-up. In Model 1, the projector, turntable, and pick-up are contained in a sound-proof housing which is stored in a special compartment in the radio cabinet, but when in use is placed about 12 feet from the radio, before which the screen is mounted on sliding arms. In the Model 2, the above units are contained in two matched cabinets, designed to be placed on opposite sides of the room. A large library of 9.5-mm. sound pictures has been established for supplying subjects. H. P.

"Pan" Speeds Ahead. RUSSELL C. HOLSLAG. *Movie Makers*, 6, July, 1931, p. 373. The Supersensitive 16-mm. reversal film recently introduced offers new possibilities to the amateur cinematographer. It is twice as fast to daylight and three or four times as fast to artificial light as the older "pan" film. Since the increase in speed is to the red and yellow light, the former disproportionate sensitivity to blue is overcome, so that color filters are less necessary, but at the same time are much easier to use, as the filter factors are greatly reduced. The great latitude insures detail in the shadows as well as in the highlights, while a special backing prevents halation, thus making possible many shots which were formerly impossible. These qualities, coupled with improved sensitivity, make it especially adapted for telephoto work. Interior pictures may be made at night with only a few hundred watts of incandescent lighting, if the available light is intelligently conserved by use of reflectors, light walls, hangings, and light clothing of the subject. It also greatly increases the possibilities for industrial, educational, and medical filming, since the ordinary light equipment may be used, and for cinemicrography, where the light is often weak. H. P.
