

# AES CONVENTION PROGRAM

**C**OMMENCING AT 10:45 A.M. on October 26th, the Second Annual Convention of the Audio Engineering Society will open at Hotel New Yorker, 34th Street at Eighth Avenue, in New York City, and will feature a series of five technical sessions. All of these sessions will be held in the Grand Ballroom, assuring considerably more space than was available for the meetings in 1949.

Twenty-one full-length papers will be presented at the technical sessions, which will meet on Thursday morning and afternoon, Friday morning and afternoon, and Saturday morning. The opening session is to be devoted to High-Fidelity Sound for the Home, and offers three papers; the Thursday afternoon session and the two on Friday are devoted to miscellaneous audio problems, with the Saturday morning meeting being given over to magnetic recording.

The Second Annual Banquet will be held in the Grand Ballroom on Thursday evening, and will feature the presentation of the Society's Annual Award, the John H. Potts Memorial Award, and a number of Society Fellowships. These presentations will be followed by entertainment.

The complete program for the convention follows:

## THURSDAY, October 26, 1950

**9: 30 a.m. to 6: 00 p.m.**

Registration .....6th Floor  
 Audio Fair Exhibits open  
 5th & 6th Floors  
 Advance Sale of Banquet Tickets  
 Room 627

**10: 15 a.m. to 10: 45 a.m.**

**Business Meeting**

*Grand Ballroom*

Installation of Officers—Committee reports

**10: 45 a.m. .... Technical Session**

*Grand Ballroom*

**HIGH-FIDELITY SOUND FOR THE HOME**

C. G. McPROUD, *Chairman*

**1. TOWARD A MORE REALISTIC AUDIO**

ROSS H. SNYDER, *Consultant, Consumers' Research, Inc.*

**2. WIDE-RANGE REPRODUCTION**

M. S. CORRINGTON, *Radio Corporation of America*

**3. GENERAL PROBLEMS**

NORMAN C. PICKERING, *Pickering & Co.*

**12: 00 noon to 2: 00 p.m. . . Lunch Recess**

**2: 00 p.m. .... Technical Session**

*Grand Ballroom*

C. J. LEBEL, *Chairman*

**STANDARD METHODS OF CALIBRATING DISC RECORDING AND REPRODUCING HEADS**

H. E. ROYS, *Radio Corporation of America*

Where response and other characteristics of recording heads and pickups are being specified, it is desirable to have a common method of test so that the results obtained with different types and different manufacture can be compared directly. It is the purpose of this paper to discuss methods of measurement that might be appropriate for such standardization purposes.

Obtaining the frequency-response characteristic of a recording head under no-load conditions (with the stylus vibrating in air) appears to be a logical means of determining the basic response characteristic. Likewise, the response characteristic of a pickup obtained by the variable-speed method also provides a basic measurement.

Additional information is necessary, however, in order to determine the actual operating characteristics since these are so dependent upon the recording medium and the physical characteristics of the stylus, as well as other factors.

**2: 35 p.m.**

**SOME APPLICATIONS OF SQUARE-WAVE TESTING TECHNIQUES TO THE EVALUATION OF DISC RECORDING SYSTEMS**

SAMUEL R. BRADSHAW and WEIANT WATHEN-DUNN, *Naval Research Laboratory*

Some of the ways in which square waves may be used to determine performance during disc recording and reproducing operations will be discussed, and the inherent limitations of the method will be noted. A practical use of square waves for evaluating overall equalization of recording and reproducing channels on a "yes-no" basis will be described.

**3: 00 p.m.**

**R.T.M.A. STANDARDS OF SOUND EQUIPMENT**

O. L. ANGEVINE, JR., *Stromberg-Carlson Co.*

R.T.M.A. Standards SE-101A through SE-106 for Commercial Sound Equipment were approved during 1949 after six years of committee work in a field in which no previous standards existed. These standards are reviewed to show their content and to discuss some concepts peculiar to sound equipment. Among these are the 70-volt standard for speaker lines and the matching of speakers to amplifiers by the use of voltage and power ratings, the measurement of speakers using a source having a 3-db voltage regulation, and the use of "transducer gain" as the gain of an amplifier.

A new "Loudness Efficiency" and a "pressure Efficiency" are used for rating speakers, and a new method for rating sensitivity of microphones is introduced. The body of standards is so integrated that the sensitivity of the microphones, the gain of the amplifier, and the efficiency of the speaker can be added to get a system rating.

The new standards will be followed in the next catalogues of most sound equipment manufacturers and should eliminate the present confusion as to the meanings of ratings.

**3: 45 p.m.**

**EDUCATIONAL AUDIO REQUIREMENTS**

PROFESSOR WILLIAM J. TEMPLE, *Brooklyn College*

Educational needs are not always met adequately by audio equipment designed primarily for other applications and only incidentally for the uses of

the teaching profession. Features which are desirable in equipment for communications or entertainment may be disadvantages in certain classroom uses. Special areas in the fields of speech and language instruction call for recording and reproduction of very high quality. Teachers are learning to analyze their needs and appraise these new tools of their trade functionally in terms of essential features, desirable refinements, and meretricious gadgetry.

**4: 20 p.m.**

**TEST AND DEMONSTRATION RECORDS**

An AES Committee Report; R. D. Darrell, *Chairman.*

**7: 00 p.m. SECOND ANNUAL BANQUET**

*Grand Ballroom*

COL. R. H. RANGER, *Toastmaster*  
 Presentations: Society Annual Award, the John H. Potts Memorial Award, and Society Fellowships

**FRIDAY, October 27, 1950**

**9: 30 a.m. to 9: 00 p.m.**

Registration .....6th Floor  
 Audio Fair Exhibits ..5th & 6th Floors

**9: 30 a.m. .... Technical Session**

*Grand Ballroom*

JOHN D. COLVIN, *Chairman*

**LOW-NOISE MINIATURE PENTODE FOR AUDIO AMPLIFIER SERVICE**

R. A. WISSOLIK and D. P. HEACOCK, *Radio Corporation of America*

The RCA-5879, which was designed for audio applications requiring a miniature tube having reduced noise, is described. The design features which account for the improved microphonics level, the low hum, and the reduced leakage noise in this single-ended, 9-pin miniature pentode are discussed. Data are presented to compare the performance of the 5879 tube with other tubes used in similar applications.

**10: 05 a.m.**

**A CONSIDERATION OF THE INTENSITY-LOUDNESS FUNCTION AND ITS BEARING UPON THE JUDGMENT OF "TONAL RANGE" AND "VOLUME LEVEL"**

STEPHEN E. STUNTZ, *U. S. Naval Medical Research Laboratory*

Acoustical intensity not only affects the loudness of sounds, but also profoundly influences the listener's perception of certain ranges of frequencies. The data of Fletcher and Munson demonstrate that the effective frequency response of the ear varies with signal intensity-level. On the basis of this variation, it is possible to account for certain anomalies appearing in the Eisenberg and Chinn study of listeners' preference for frequency ranges and intensity levels in the reproduction of speech and music. It is also possible to explain the disparity between their results and those of Olson's investigation of preference for frequency ranges. For example, it can be shown that when frequency is plotted against loudness, raising the intensity level from 50 to 70 db will add more than one whole octave downward to the effective frequency response of the ear at 50 millisonnes loudness.

**10: 40 a.m.**

**CBS TELEVISION STUDIO INTER-**

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## COMMUNICATION FACILITIES

R. B. MONROE, *Columbia Broadcasting System*

Television studio intercommunication facilities are just as important in successful television program production as the associated audio and video facilities. The intercommunication installation should therefore receive the same careful planning and attention to design detail as is accorded to the sound and picture portion of the plant. This paper discusses the philosophy underlying the design of television studio intercommunication systems and describes the facilities in use at CBS.

11:15 a.m.

## A NEW POWER-AMPLIFIER CIRCUIT INCORPORATING "EXTENDED CLASS-A OPERATION"

HOWARD T. STERLING, *The Electronic Workshop, Inc.*

A new power-amplifier circuit is described which features Class-A operation at power levels and efficiencies normally associated with Class-AB and Class-B operation. The new method of operation, which has tentatively been called "extended Class A," avoids the distortion resulting from the switching transients encountered when tubes are driven to cutoff. No special transformers are required. The new circuit provides damping factors of the order of those obtainable with conventional triode amplifiers without the use of feedback.

12:00 noon to 2:00 p.m. Lunch Recess

2:00 p.m. . . . . Technical Session  
Grand Ballroom

THEODORE LINDENBERG, *Chairman*

## DIRECT RADIATOR LOUDSPEAKER MOUNTINGS

H. F. OLSON, *RCA Laboratories*

Variations in the response-frequency characteristic of a direct-radiator loudspeaker are produced by resonance and diffraction effects introduced by the mounting arrangement. Variations in the response are also produced by the diffraction effects introduced by the outside configuration of the cabinet. Grills, screens, and cloths used as coverings for loudspeakers introduce variations in the response-frequency characteristic due to the lumped acoustical impedance presented by these systems. Experimental data will be given to show the effect of these elements upon the response of direct-radiator loudspeakers. Demonstrations will be arranged to show the effect of the mounting arrangement, cabinet, and grill upon the response-frequency characteristic of a loudspeaker.

2:35 p.m.

## THE MEASUREMENT OF AUDIO VOLUME

HOWARD A. CHINN, *Columbia Broadcasting System*

This tutorial paper reviews the basic philosophy which led to the concept of audio "volume" and discusses the relative merits of peak versus r.m.s. measurements. The American Standard volume indicator is described, together with the principles that should be observed in the application of the instrument. Volume measurement terminology (e.g., vu vs. dbm) is explained, and accepted program transmission level practices detailed.

3:10 p.m.

## A NEW LOW-COST INTERMODULATION MEASUREMENT AND ANALYSIS TECHNIQUE

C. J. LEBEL, *Audio Instrument Co.*

The old method of using an oscilloscope to judge intermodulation in audio systems has been

developed into an inexpensive but quantitative method by this study.

The widely held opinion that there is a firm relationship between harmonic and intermodulation distortions is shown to be entirely wrong. The only way to determine the intermodulation distortion of a unit is to measure it directly.

The use of oscilloscope patterns for adjusting amplifiers and other components in factory test and laboratory will also be discussed, with a number of illustrations.

3:45 p.m.

## LOUDSPEAKER DAMPING

ALBERT PREISMAN, *Capital Radio Engineering Institute*

Adequate damping of the motion of a loudspeaker cone is shown to be one of the principal considerations in the design and application of these units. The effects of horns and of various types of baffles are shown, and it is proved that proper damping of a speaker by means of the correct design of its electrical characteristics will provide more satisfactory operation with an increase in efficiency, whereas mechanical damping decreases efficiency. Practical methods of measuring mechanical impedance of a loudspeaker are described, together with means for adjusting the electrical characteristics under which the loudspeaker operates.

4:20 p.m.

## REPORT OF AES STANDARDS COMMITTEE ON PLAYBACK CHARACTERISTICS

S. EDWARD SORENSEN, *Columbia Recording Corp.*

SATURDAY, OCTOBER 28, 1950

9:30 a.m. to 12:00 Noon

Magnetic Recording Session

Grand Ballroom

PRICE FISH, *Chairman*

## MULTI-CHANNEL MAGNETIC RECORDING

PAUL M. BRUBAKER, *Rangertone, Inc.*

Discussion on the problem of adjacent channel interference on low frequencies and use of amplitude modulation as a solution to the problem. This allows for a four-channel high-fidelity recorder using  $\frac{1}{4}$ " tape playing four hours at  $7\frac{1}{2}$ " / sec. and usable down to 45 cps or lower depending upon application. Utilizing amplitude modulation techniques, a 12-channel telemetering system is possible using  $\frac{1}{4}$ " tape. All of the possible sources of error are minimized by negative feedback or a.v.c. allowing for an over-all system accuracy of plus or minus 3 per cent.

10:05 a.m.

## A SOLUTION TO THE MAGNETIC TAPE TIMING PROBLEM

D. R. ANDREWS, *Radio Corporation of America*

The dimensional instability of base materials used in the manufacture of magnetic recording tape makes it imperative that some means of control be employed if careful timing of recorded programs is to be maintained. Various systems which may overcome this handicap are briefly described.

One specific system is described in detail. It provides very accurate timing over long time-periods. A signal is generated from optical markings on the reverse of the tape. This signal is scanned and compared with a standard frequency for speed correction. Means is provided for using either marked or standard tape interchangeably.

10:40 a.m.

## A NEW EXPLANATION OF THE ACTION OF A.C. BIAS IN MAGNETIC RECORDING

W. W. WETZEL, B. J. MURPHEY, and R. HERR, *Minnesota Mining & Manufacturing Co.*

Although the beneficial effects of a.c. bias on

magnetic recording have been recognized for over twenty years, no satisfactory explanation of its action has appeared in the literature. A series of simulated recording experiments was designed to determine the effect of recording gap fields on the final state of magnetization of a recorded tape. It was shown that an-hysteric magnetization alone was not sufficient to explain the bias action. However, if account is taken of the phase of the bias as a particle reaches the center of the gap and if the average value of the magnetization over one wavelength of the bias field is considered, the experiments are in qualitative agreement with observations made on recording machines. These experiments will be described and the new theory of the action of a.c. bias explained.

11:15 a.m.

## SPROCKET HOLE TAPE IN MAGNETIC RECORDING

ARTHUR C. DAVIS, *Cinema Engineering Co.*

A discussion of the mechanical, electrical, and electronic problems involved in synchronous drives employed in recording systems. Synchronization being necessary, it is shown to be far simpler to employ sprocket driven recording tape which interlocks directly with the cameras driving the film in TV recording cameras. The various types of sprocket drives are analyzed.