

power radiated. This correction factor (called Directivity Index) is in turn converted to Loudness Directivity Index. Curves are given by means of which the Loudness Directivity Index may be found for most loudspeakers.

Experimental verification of the above computations has been obtained by computing the loudness efficiency of a wide variety of loudspeakers and comparing such figures with the results of listening tests. In most cases the calculated loudness came within one decibel of the values obtained by listening.

Further calculations are made to determine the amount of electrical power necessary to create satisfactory loudness in enclosures (rooms or auditoriums), taking into account the volume of the enclosure and the loudness efficiency of the loudspeaker. It is pointed out that while these measurements and calculations are useful in comparing the loudness which may be expected from various loudspeakers, with a given electrical input, they do not take into account such factors as uniformity of frequency response, distortion, damping, distribution, and other factors which are necessary in determining the relative over-all merits of loudspeakers.

## Book Review

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### Elements of Acoustical Engineering, by Harry F. Olson

Published (1947) by D. Van Nostrand Company, Inc., 250 Fourth Ave., New York, N. Y. 527 pages + 11-page index × xviii pages. 341 illustrations.  $6\frac{1}{4} \times 9\frac{1}{4}$  inches. Price, \$7.50.

The second edition of this well-known work treats acoustics from the electrical viewpoint, with heavy emphasis on equivalent circuits and the electro-acoustical aspects of audio engineering. Hence the reader with a background of general circuit and audio-frequency theory, aided by the methodical arrangement of the topics, will readily obtain usable and detailed information.

Especially well written are the portions on acoustical elements, loudspeakers, microphones, and measurements, which comprise over half the book. The properties of acoustical radiators, mechanical sound recorders, and pickups are also treated extensively, and there are excellent summaries of information on room acoustics, complete sound systems, and psychophysiological acoustics. Chapters on underwater sound and ultrasonics, embodying much war and industrial experience, are new to this edition. As a whole the book contains about 50 per cent more pages and 75 per cent more illustrations than the first edition; all chapters have been revised, and new material added.

As an aid to the user of electroacoustic transducers additional emphasis might have been placed on their use in systems. For example, in use the efficiency of a loudspeaker also depends on its ability to absorb power from the source, as well as its ability to transfer the accepted power to the output efficiently. The author accords the first item much less space than the second.

The usefulness of the book as a general reference is somewhat impaired by the

## Book Review

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emphasis placed on the work of the author and his associates. In particular, the material on magnetic recording and on anechoic chambers contains inadequate recognition and citation of the recent contributions of other workers. A newcomer to the field may be perplexed by the fact that not only do one fifth of citations given refer to the author's own work, but that also many of these are repeated. The most striking instance is in the chapter on Underwater Sound, where fourteen references are made in ten consecutive pages to the author's "Dynamical Analogies," which contains no specific material on underwater sound.

The text is written in a clear style with little use of ambiguous words. The only one deserving more than a mild objection is the use of "supersonic" to denote "high intensity." Present standardization efforts and usage tend to favor the denotation "velocity exceeding that of sound." However, as the foregoing comments are largely matters of opinion, this reviewer can unqualifiedly recommend this text as one that should be on the bookshelf of every practicing audio engineer.

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### Correspondence

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It is highly desirable that members avail themselves of the opportunity to express their opinions in the form of Letters to the Editor. When of general interest, these will be published in the JOURNAL of the Society of Motion Picture Engineers. These letters may be on technical or non-technical subjects, and are understood to be the opinions of the writers and do not necessarily reflect the point of view of the Society. Such letters should be typewritten, double-spaced. If illustrations accompany these contributions, they should be drawings on white paper or blue linen and the lettering neatly done in black ink. Photographs should be sharp and clear glossy prints.

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