Abstracts of Interest

Titles published in other technical journals selected to be of interest to E/T readers . . .

ACOUSTICS

Field Assessment of Highway Noise Barriers
by J. Desormeaux

Actual noise attenuations of highway barriers do not agree most of the time with analytical predictions; therefore, field measurements are usually conducted to verify noise-attenuation predictions and to assist in further development of highway-noise-prediction methods. Presently, there is no standard for the assessment of barrier acoustical performance although ANSI is developing one. This article describes various aspects of field assessment of noise barriers such as influence of environmental factors and traffic variables, site selection, and techniques to analyze measured data. A simple practical procedure for the field assessment of barrier performance is described. *Sound and Vibration,* **16** *(12), (Dec. 1982).*

Automated Measuring System for Sound Power Measurement
by T. Yanagisawa and W. Tsujita

It is sometimes important to know the sound power radiated from a sound source so that, for example, the solution noise abatement can be carried out on the basis of the sound power radiated. Measurement of the sound power in general is carried out in a reverberant enclosure. This measuring method is classed as an indirect one in that the sound power is obtained via the sound-pressure level. Consequently, in order to determine the sound power radiated as precisely as possible, some measurement procedures for obtaining the space-average sound pressure have been devised. However, the procedure, which involves moving the measuring microphone from point to point, is extremely tedious . . . The development of an automated measuring system for sound power is discussed and it is shown that the sound power obtained with the system devised agrees well with that obtained by more familiar means. *Applied Acoustics,* **15**, *445-457 (Nov. 1982).*

Sound Intensity—A Powerful New Measurement Tool
by Roger Upton

Traditional sound-pressure measurements indicate the total sound-pressure level at the receiver. Intensity measurements, on the other hand, can reveal the contributions of individual sources. This article covers some of the background to sound intensity and its applications. Additionally, a new system is described which allows the measurement of sound intensity in real time. *Sound and Vibration,* **16** *(10), (Oct. 1982).*

FRACTURE MECHANICS

A Comparison of Theoretical and Experimental Methods of Calibrating the Electrical Potential Drop Technique for Crack Length Determination
by M.A. Hicks and A.C. Pickard

The calibration of the dc-pd technique for determining crack length in compact-tension, corner-notched and fin-cracked test pieces is described. Good agreement is shown between finite-element, conducting-paper and specimen 'bench-marking' methods. *International Journal of Fracture,* **20**, *91-101 (Nov. 1982).*

Dynamic Crack-tip Stresses Under Stress Wave Loading—A Comparison of Theory and Experiment
by K. Ravichandar and W.G. Knauss

The characterization of the electromagnetic-stress-wave generator is described. The method of caustics applied to birefringent materials is examined in detail in order to explain the lack of double caustics in Homalite-100. The accuracy of the method of caustics is demonstrated experimentally by using two loading configurations and comparing the results with the theoretical analysis of Freund. *International Journal of Fracture,* **20**, *209-222 (Nov. 1982).*

TEMPERATURE MEASUREMENT

A Miniaturized Differential Temperature (ΔT) Gage for Detection of Boundary-Layer Transition Onset for Hypersonic Re-entry Vehicles
by J.M. Cassanto, C.R. Droms, J. Metzger and T. Moller

The results of the development program to miniaturize the existing flight-proven ΔT gage for detection of re-entry vehicle boundary-layer transition onset is described. The miniaturized gage (mini ΔT) has been designed to provide a minimum in-board profile, so that the gage can be packaged and used anywhere on the re-entry vehicle heatshield and particularly near the nose. In addition, the mini ΔT gage has a smaller diameter than the standard transition gage (0.080 in. vs. 0.125 in.) and thus is less prone to aggravated erosion effects downstream of the gage. The development program has been completed and the gage has performed well when subjected to ablation ground tests simulating re-entry thermal heat fluxes. The gage now awaits the next RV flight opportunity. *ISA Transactions,* **21** *(3), (Sept. 1982).*

OPTICAL METHODS

Elimination of Depolarization Effects in Holography
by P.C. Mehta and R. Hradaynath

The polarization of a scattered beam from any object depends on the nature of the surface of the object. Depolarization of the laser beam can occur as a result of reflections from metallic and dielectric surfaces; it can also be due to multiple scattering in some of the media-like aerosol particles when the laser beam passes through them. While recording a hologram this fact is altogether ignored, and it is assumed that object and reference beams are polarized linearly and parallel to each other. We have studied the variation of diffraction efficiency of a hologram with the degree of polarization of the object beam. There is a 43-percent decrease in the efficiency value when the degree of polarization falls from 1 to 0.9. A method for minimizing the effects of depolarization is suggested. *Applied Optics,* **21** *(24), (Dec. 1982).*

Measurement of Stresses in Optical Fiber and Preform
by P.L. Chu and T. Whitbread

A method of measuring the stresses, residual or applied, in an optical fiber or preform is presented. It is shown that the stress profiles can be obtained from the Abel transform of the derivative of the retardation. The axial-stress profile is shown to bear the same shape as the refractive-index profile. Measurement results indicate that the applied-tension during the fiber-drawing process is frozen into the fiber, consequently affecting the intrinsic strength of the fiber. The method of estimating the fiber-drawing tension from the fiber-stress profile is also given. *Applied Optics,* **21** *(23), (Dec. 1982).*