Active Noise Control Systems

Active Noise Control Systems
Sen M. Kuo and Dennis R. Morgan
John Wiley & Sons, 605 Third Avenue, New York, NY 10158, USA.
389 pp., hard cover, USD 74.95

This text on active noise control has the subtitle Algorithms and DSP Implementations. As the subtitle implies, it is written from the point of view of electrical engineering for electrical engineers and others concerned with the implementation of active noise control systems. The emphasis is not on transducers, amplifiers, and other components required in active control systems, but on the electronic systems needed to control these components.

The introduction is a summary of the history of active control, and a review of areas in which active control has been applied in the past and will be applied in the future. Several key areas are identified. The first is Air-Acoustic Active Noise Control (ANC) which includes duct noise, noise generated in enclosed spaces, noise in free space, and personal hearing protection. The second is Hydroacoustic ANC which includes underwater systems and fluid flow in pipes. The third is Vibration ANC, an area which is identified as being in need of a definitive text.

The general types of systems used in ANC are then identified, and methods for performance evaluation are given.

Today, essentially all ANC systems use digital control, and it is the description of these digital control systems that forms the body of the text. The following subjects are covered: adaptive transversal filters, broadband feedforward active noise control, multiple- channel active noise control, Feedback active noise control, on-line secondary-path modeling techniques, and other ANC structures and algorithms. The latter includes the recursive-least-squares (RLS) algorithm and lattice ANC systems.

The final chapter is devoted to ANC applications - systems used for active control of noise in ducts, noise in rooms, exhaust noise, personal protection devices, active barriers, transformer noise, and beam vibrations are all discussed.

Several appendices are devoted to specialized subjects. The book also comes with one 3 1/2 inch IBM-compatible floppy disk titled Active Noise Control Systems. The disk contains programs used to analyze and implement the algorithms in the text. The files include ANSI C Language source code and assembly-language files for the TMS 320C25 and TMS 320C30 systems. The disk also contains a 1549-word README.TXT file which explains how to install the diskette. The e-mail addresses of the authors are included on the disk so that they can receive any comments about the software.