

Leissa A W. *Vibration of plates*. Washington, DC: US Government Printing Office, 1969. 353 p. NASA SP-160. NTIS No. N7018461. \$26.50.
(Ohio State University, Columbus, OH)

All known results for the free vibration characteristics of plates are digested from the world's literature and summarized in this volume. Numerical results for frequencies, nodal patterns, and mode shapes taken from approximately 500 references are included. [The SC¹ indicates that this monograph has been cited in over 340 publications since 1969.]

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"This monograph was written as a summarization of existing knowledge on the subject of plate vibrations (a plate may be defined technically as a flat shape having one dimension, its thickness, much less than its other two dimensions). Plate elements exist in virtually all types of structures, and their vibrational behavior is often important to the engineer or designer. The work provides in one convenient location, organized in a rational manner, all known results for the free vibration frequencies, nodal patterns, and mode shapes of plates of all conceivable configurations (e.g., rectangular, circular, triangular, quadrilateral, other regular polygons, sectorial, etc.). Complicating effects such as anisotropy, inplane forces, variable thickness, surrounding media, large amplitudes, nonhomogeneity, shear deformation, and rotary inertia were included. The work was sponsored by NASA.

"Approximately 500 relevant references were turned up in a thorough search of the world's literature up to 1966, and all knowledge deemed useful was summarized (cf. references 1 and 2). Consequently, the monograph has also been quite valuable to researchers continuing to work in the field, and is frequently cited in their technical

papers. On the one hand, the researcher can quickly learn what problems are yet unsolved (at least up to 1966); on the other, he can use the results available to test the validity of a new theoretical or experimental approach to a problem.

"It is my impression that the need for such summarizing monographs in science and technology is great. In my opinion, if only five percent of all research funds spent in the next decade were used for this purpose, the value of existing knowledge to mankind would increase at least twofold. Probably the time and money not spent in duplicating existing research would alone make the expenditure worthwhile. But such monographs should be done thoroughly and accurately, or better not at all.

"Subsequent to *Vibration of Plates*, I wrote a second monograph of a similar nature, *Vibration of Shells*,³ which summarized approximately 1,000 references, and I am currently working on a third, *Buckling of Plates*. Since the first monograph was published, about 1,000 additional references on plate vibrations are known to have appeared (many generated because of the monograph), and these have been summarized in a short course bibliography and four review articles (in *Shock and Vibration Digest*).⁴⁻⁷ I do hope to bring out an updated version of *Vibration of Plates* in some future year, but it will be an enormous task, and will require significant financial sponsorship.

"Our primary obstacle was determining the existence of the relevant literature, and then procuring it. In this I was helped by numerous graduate and undergraduate students. Galley proofs, page proofs, and some overzealous 'professional' editing also caused some pain, but this will be avoided in future monographs by producing a photoreproducible manuscript. Fortunately, the many languages involved (English, German, Russian, Polish, French, etc.) were no serious problem to me, since I already knew a few. After focusing long enough on one particular topic (say, elliptical plates), I was even able to make sense out of those in Chinese and Japanese!"

1. Warburton G B. The vibration of rectangular plates. *Proc. Inst. Mech. Eng.* 168:371-81, 1954.
2., Citation Classic. Commentary on *Proc. Inst. Mech. Eng.* 168:371-81, 1954.
Current Contents/Engineering, Technology & Applied Sciences 14(44):20, 31 October 1983.
3. Leissa A W. *Vibration of shells*. Washington, DC: US Government Printing Office, 1973. 428 p. NASA SP-288.
4., Recent research in plate vibrations, 1973-1976: classical theory.
Shock Vibration Digest 9(10):13-24, 1977.
5., Recent research in plate vibrations: complicating effects. *Shock Vibration Digest* 10(12):21-35, 1978.
6., Plate vibration research, 1976-1980: classical theory. *Shock Vibration Digest* 13(9):11-22, 1981.
7., Plate vibration research, 1976-1980: complicating effects. *Shock Vibration Digest* 13(10):19-36, 1981.