run on the IBM 7094, model I, and the results are summarized in Table 1.

Furthermore, in many problems, the total time for both relabeling and solution of the equations, where two or more unknowns were associated with each node, was less than the solution time without relabeling.

As a concluding remark, we have to note that single interchanges with repeated sweeping procedures are very promising. It is always possible to improve the existing provisions of the programs or implement various "look ahead" features without altering the basic philosophy of the scheme.

Errata†

The following errors and basic differences from the working program have been discovered in Ref. 3 in the listing of SUBROUTINE ARAN: 1) statement below 1105 should read IF (XSA-XSAP) 1107, 1107, 1108; 2) statement above 1290 should read IF (IJ-IN) 1290, 1290, 1310; 3) statement above 1600 should read CALL SEBIN (BCH, JBIP, NCH). In addition to these, the authors suggest that the empirical constant NCYCN = 3 + IN/100 be changed to NCYCN = IN to improve the chances of obtaining optimum bandwidth at the expense of increasing computation time.

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† The author wishes to thank A. Whitney of McDonnell Douglas Corp. for pointing out the errors.

The Siren Revisited

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In a recent Note, Myklestad[1] recalls the glory that was once the desk calculator. He compares matrices to the Sirens. "Your next land-fall will be upon the Sirens: and these craze the wits of every mortal who gets so far. If a man come on them unwittingly and lend ear to their Siren-voices, he will never again behold wife and little ones rising to greet him with bright faces when he comes home from the sea." (Circe's warning to Odysseus, Ref. 2, p. 170.) This writer prefers to regard matrices as providing the means of leading Odysseus (the structural dynamicist and aeroelastician) past the Sirens (the Myklestad vibration analysis[3]?), between Scylla (the computer systems programmer) and Charybdis (the computer), and safely home to Penelope (the optimum structure).

The idealization of current aerospace structural designs as statically determinate systems of bending and twisting beam elements located along an elastic (elusive?) axis is an anachronism. The approximation may still be adequate for certain preliminary design purposes, but it can hardly be regarded as a reliable means to arrive at an optimum design for minimum weight with sufficient strength, stiffness, and life. Matrices of structural[4] and aerodynamic[5] influence coefficients do provide such a means. Beam methods may still continue to be useful for analysis of helicopter blades and long, slender missiles, but their utility in optimizing the design of highly swept or low-aspect ratio surfaces and large-diameter shell missile or fuselage structures for high-performance aerospace vehicles is gone with the wind—like the City of Troy.

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Reply by Author to W. P. Rodden

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Mr. Rodden seems to have missed the point of my Note, since I was not comparing different methods of analyses at all. The gist of my message was that any method of analysis could be arranged in various ways for efficient numerical computations, and, if matrices were used for this purpose, it could result in greatly increased machine time. The real advantage of using matrices is in the simplication of the program, but, if the calculations are to be performed frequently, it may pay to write the program without the use of matrices.

Of course, if a matrix method of analysis is used the programming is automatically done in matrix form; but the method referred to in my Note was developed without the use of matrices, and later matrices were introduced ostensibly to make the method more efficient. However, the introduction of matrices in this case reduced the efficiency of the computer program by more than 50%.

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Comments on "Natural Frequencies of Clamped Cylindrical Shells"

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In a recent paper, Smith and Haft[1] used Flügge's equations,[2] as uncoupled by Yu,[3] to determine natural frequencies of clamped cylindrical shells. Nondimensional

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