NASA TECH BRIEF

Modified Multhopp Subsonic Lifting Surface Loading Program

The problem:

In the process of wing design, one is often required to determine the load distribution for a given planform and mean camber surface. Since the planforms now being considered can be of a composite arrangement, lengthy mathematical calculations are required in order to obtain a solution for each wing. Therefore, a computer program was needed to perform these computations.

The solution:

A computer program which determines the longitudinal subsonic aerodynamic characteristics of wings which may be composite.

How it's done:

The program uses the basic theoretical method of Multhopp in predicting the loading data but employs a matrix solution. This method is based on steady, linearized, potential in compressible flow where the effects of compressibility are accounted for by use of the Prandtl-Glauert correction factor.

The aerodynamic characteristics determined include the overall lift-curve slope, the overall pitching-moment-curve slope, the aerodynamic center, the ratio of the induced drag based on the spanwise distribution of circulation to the lift coefficient, and many of the section features. The loadings for wings with twist and camber can also be computed.

Notes:

1. This program is written in CDC Fortran to run on CDC 6000 series computers with the SCOPE 2.0 operating system and library tape.
2. Inquiries should be made to:

   COSMIC
   Computer Center
   University of Georgia
   Athens, Georgia 30601
   Reference: B68-10452

Patent status:

No patent action is contemplated by NASA.

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