

# NASA TECH BRIEF



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## Internal Velocity Factors

### The problem:

To devise a method for analyzing the entries and planetary trajectories of space vehicles.

### The solution:

A computer program which obtains the equivalence of altitude and flight path angle, respectively, to acceleration load factor with respect to velocity for a given inertial velocity.

### How it's done:

Although altitude and flight path angle are convenient parameters for trajectory analysis, they are not readily determined with simple flight hardware. In the interest of design simplicity, the combinations of altitude and path angle were replaced respectively with equivalent parameters of acceleration load factor and the rate of change of load factor with respect to inertial velocity.

The equations include an oblate, rotating planet model and the 1962 U.S. standard atmosphere or provisions for atmospheric data input as curve data.

### Notes:

1. This program is written in Fortran IV for use on the IBM 7094 computer.
2. Inquiries should be made to:  
COSMIC  
Computer Center  
University of Georgia  
Athens, Georgia 30601  
Reference: B68-10403

### Patent status:

No patent action is contemplated by NASA.

Source: A. J. Frank, J. R. Cathcart,  
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under contract to  
Manned Spacecraft Center

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Category 06



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## General Velocity Feature

The velocity feature is a new feature of the IBM 7090 computer system. It allows the user to specify a velocity for the execution of a program. This feature is useful in many applications, such as the simulation of physical processes.

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