NASA TECH BRIEF

Langley Research Center

Fast Mars Communication Geometry Program

The problem:

To evaluate the communications link between orbiting spacecraft and lander vehicles.

The solution:

A computer program which calculates the trajectories of the orbiting spacecraft and lander vehicles simultaneously. Using data from both vehicles, the program calculates communications geometry.

How it's done:

The computer program simulates the trajectories of the two vehicles simultaneously. The simulation model is the three-dimensional path of a point mass about an oblate planet. Numerical integration consists of a new, fixed-interval, 3-pass Runge Kutta. The communications geometry consists of orbiting spacecraft cone and clock angle, lander cone and clock angle, range, range rate, range acceleration, fade margin, reflective margin, and system margin.

Notes:

1. This program is written in FORTRAN IV language for use on the CDC-6400 or CDC-6500 computer.
2. Inquiries concerning this program should be addressed to:

   COSMIC
   Barrow Hall
   University of Georgia
   Athens, Georgia 30601
   Reference: B71-10002

Patent status:

No patent action is contemplated by NASA.

Source: W.R. Garner and J.Q. Tully of
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