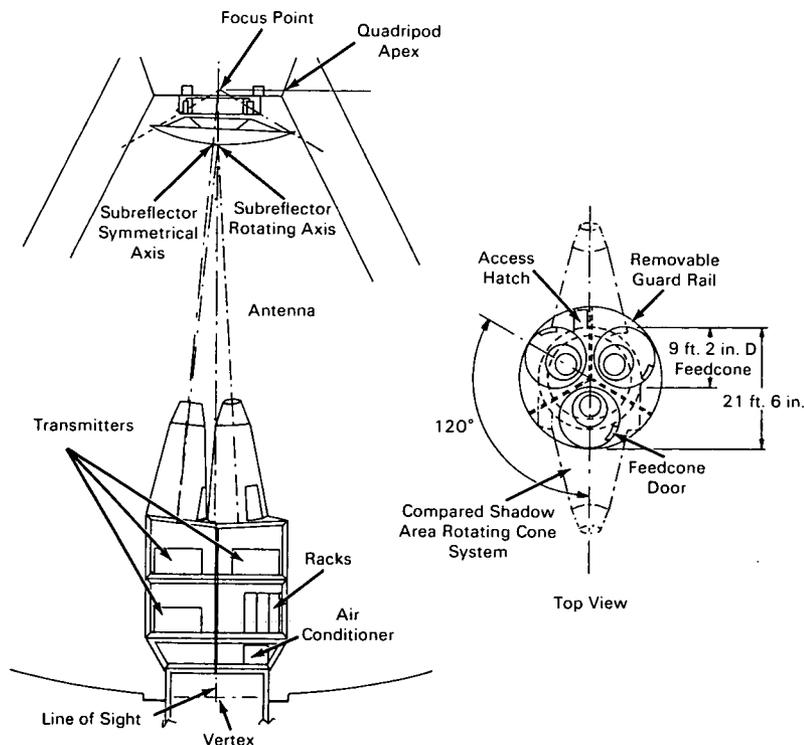


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Multi-Feed Cone for Cassegrainian Antenna



Multi-Feed Cone for Cassegrainian Antenna

The problem:

To design a multiple-cone feed horn system for a cassegrainian antenna using a rotatable hyperboloid in conjunction with a multiple cone system. The present method to change feed systems on the advanced antenna system is to remove the entire cassegrainian feedcone housing and replace it with another unit. An investigation has been made into various procedures for rapid feedcone changing. The combinations con-

sidered were; 1) move feed cone relative to hyperboloid and paraboloid, 2) mount multiple feeds, which are fixed, with respect to hyperboloid and paraboloid, 3) move hyperboloid relative to fixed multiple feeds and paraboloid. The third method proved to be most feasible and is described below.

The solution:

To move hyperboloid relative to fixed multiple feeds and paraboloid.

(continued overleaf)

How it's done:

The hyperboloid can be adjusted so that, for each feed, it is in the best possible position. Focusing on individual cones is accomplished by rotating the hyperboloid. Advantages incorporated by this innovation are: 1) the use of special purpose cones provides improved performance and permits rapid changing of the antenna system from one configuration or frequency to another; 2) spillover is kept to a minimum by use of a configuration having the hyperboloid axis between the paraboloid axis and the feed-to-focus line and using an asymmetrical hyperboloid; 3) there is substantially no phase error or boresight shift; 4) return to symmetrical feed is possible for special missions.

Notes:

1. The innovation described in this NASA Tech Brief should be of interest to manufacturers of communication satellites and communications research personnel.

2. Documentation is available from:

Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Price \$3.00
Reference: TSP69-10269

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, non-exclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

Source: Charles T. Stelzried of
Caltech/JPL
under contract to
NASA Pasadena Office
(NPO-10539)