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NASA TECH BRIEF

Scanning Means for Cassegranian Antenna

The problem:

In microwave antennas, synchronous switching techniques are generally used to detect weak signals over atmospheric and equipment noise sources. These electrical switching techniques involve relatively high insertion losses and equipment complexity that contributes appreciably to maintenance problems.

The solution:

A mechanical antenna beam switching device that periodically nutates the paraboloidal subdish in a Cassegranian reflector system.

How it's done:

The antenna beam is switched from the source of interest to an adjacent point in the sky by nutating the paraboloidal secondary reflector.

The beam switching requires that the secondary reflector rotate 0°58′ about an axis at right angles to its axis of symmetry to produce one direction of the antenna beam. The reflector is then moved past center position 0°58′ in the opposite direction for the second position of the beam. These positions are periodically repeated at rates of 5 to 15 cps. Movement of the reflector is by means of a remotely located motor that drives camways through a driveshaft and universal joint arrangement. A cam follower on the reflector traces the cam configuration that imparts the nutating motion. A counterweight, driven in opposition to the reflector by a cam follower in a camway, cancels momentum of the reflector to minimize vibration.

Note:

Inquiries concerning this invention may be directed to:

Technology Utilization Officer
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103
Reference: B67-10174

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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