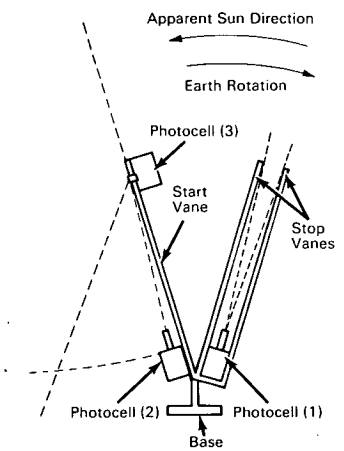
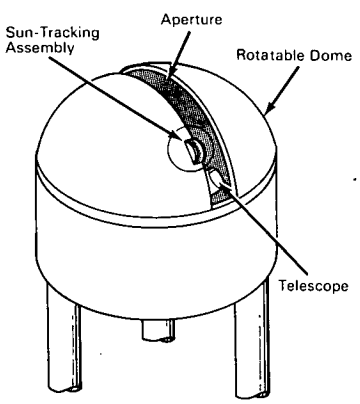
NASA TECH BRIEF

Telescope Dome Control System Automatically Tracks Sun



SUN-TRACKING ASSEMBLY
(As viewed from underneath Van Assembly)



This automatic control system is designed to rotate a dome so that a telescope, or other instruments, within the dome will continuously view the sun as the earth rotates.

The dome control system includes a sun-tracking assembly which incorporates three sun vanes (one start vane and two stop vanes) and photocells mounted on a base adjacent to a viewing aperture on the outer surface of the dome. This system operates in conjunction with dome rotation and shutter motors.

Initially, in the morning, the telescope and dome aperture are positioned for sunrise-of-the-earliest-morning. As the sun rises, its rays are detected by photocell (2), and the dome is rotated by the dome rotation motor until the sun is detected by photocell (1), which removes power from the dome rotation motor. As the earth continues to rotate, the sun is again detected by photocell (2) and the dome again rotates until sunlight, detected by photocell (1), causes the dome to stop rotating. Thus the dome rotates progressively as the sun rotates. Should the sun be obscured by clouds, the dome would not rotate until the sun is once again detected by a photocell. Should the sun be obscured for hours and then reappear, it would be detected by photocell (3) but not necessarily by photocell (2) and the dome would once again rotate until the sun's rays are detected by photocell (1). Photocells (2) and (3) are electrically connected in parallel, so that should light rays be detected, either by photocell (2) or photocell (3), the dome will begin to rotate. If during the time the dome is rotating because of energization of either photocell (2) or (3) the sun should become obscured by clouds, the dome will continue rotating to the position of sunset-longest-day, since the light rays would not be detected by photocell (1). When the dome

(continued overleaf)

has reached sunset-longest-day, it will automatically rotate back to sunrise-earliest-day. When the sun once again is no longer obscured by clouds, the light sensor detects the sun's rays and the dome will again rotate to the correct position. Dome rotation is fast enough so a minimum of data is lost.

The dome rotation and shutter motors are connected, through a switch chassis, to rain and humidity sensors. These sensors act to close the dome shutter when predetermined levels of rain or humidity are detected. A photo control sensor mounted on the telescope camera prevents photography when the sun's illumination is below a predetermined intensity.

Note:

Details may be obtained from:

Clearinghouse for Federal Scientific and Technical Information
Springfield, Virginia 22151
Price $3.00
Reference: B68-10521

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive 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.

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