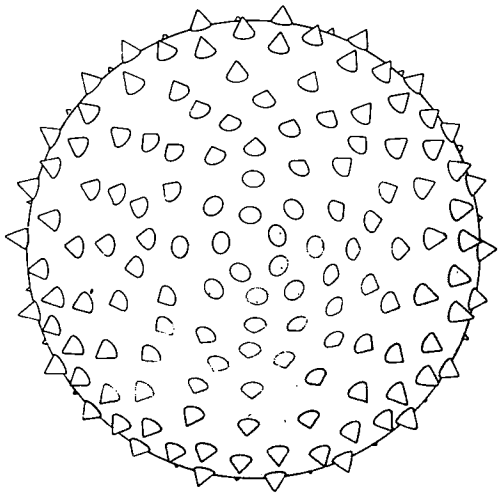
NASA TECH BRIEF

Rough Surface Improves Stability of Air-Sounding Balloons



The problem: To improve the aerodynamic stability of spherical balloons used to measure the intensity and direction of atmospheric winds at various elevations. Because standard smooth-surfaced sounding balloons are aerodynamically unstable, they ascend erratically, even in gentle winds, and are therefore difficult to track.

The solution: Use a rough-surfaced balloon.

How it's done: The stability of the balloon is considerably improved by incorporating numerous conical protuberances on its outer surface. A theoretical analysis indicates that the increased surface roughness stabilizes the drag forces at high Reynolds numbers, thus reducing the magnitude of the lift forces acting on the balloon and as a consequence minimizing the erratic horizontal motions.

Notes:

1. This improved type of balloon should be useful to organizations concerned with the collection of wind-profile and other meteorological data.
2. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama, 35812
   Reference: B65-10326

Patent status: NASA encourages the immediate commercial use of this invention. It is owned by NASA, and a patent application has been filed. When patented, royalty-free nonexclusive licenses for its commercial use will be available. Inquiries concerning license rights should be made to NASA, Code AGP, Washington, D.C., 20546.

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