



A Polyhedral Assembly of Solar Panels would be deployed from compact stowage in two stacks, each containing ten hexagonal and six pentagonal panels. The deployment hinges between the panels would be key components that would accommodate the unfolding during deployment, hold the panels in their proper alignments after deployment, and provide electrical connections for the panels.

- lying polymeric components against erosion by monatomic oxygen in low orbit around the Earth;
- 2. It is sufficiently ultraviolet-transmissive to enable curing of the resin by exposure to ultraviolet light from the Sun or another suitable source;
- 3. It exhibits improved (relative to prior coating materials) transmittance of visible light for collection by solar cells; and

- 4. It resists darkening under long-term exposure to ultraviolet light.

This work was done by Thomas W. Kerslake of **Glenn Research Center**; Edward J. Simburger, James Matusmoto, Thomas W. Giants, and Alexander Garcia of *The Aerospace Corporation*; Alan Perry, Suraj Rawal, and Craig Marshall of *Lockheed Martin Corp.*; and John Kun Hung Lin, Jonathan Robert Day, and Stephen

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Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Commercial Technology Office, Attn: Steve Fedor, Mail Stop 4-8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to LEW-17476-1.

## Temperature-Controlled Clamping and Releasing Mechanism

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A report describes the development of a mechanism that automatically clamps upon warming and releases upon cooling between temperature limits of  $\approx 180$  K and  $\approx 293$  K. The mechanism satisfied a need specific to a program that involved repeated excursions of a spectrometer between a room-temperature atmospheric environment and a cryogenic vacuum testing environment. The mechanism was also to be utilized in the intended application of the spectrometer, in which

the spectrometer would be clamped for protection during launch of a spacecraft and released in the cold of outer space to allow it to assume its nominal configuration for scientific observations. The mechanism is passive in the sense that its operation does not depend on a control system and does not require any power other than that incidental to heating and cooling. The clamping and releasing action is effected by bolt-preloaded stacks of shape-memory-alloy (SMA)

cylinders. In designing this mechanism, as in designing other, similar SMA mechanisms, it was necessary to account for the complex interplay among thermal expansion, elastic and inelastic deformation under load, and SMA thermomechanical properties.

This work was done by David Rosing and Virginia Ford of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1). Further information is contained in a TSP (see page 1). NPO-40541