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# NASA TECH BRIEF



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## Development of a Silver-Zinc Battery System

A summary report gives both historical documentation and detailed design data from the project that developed a successful silver-zinc battery for use on the Surveyor spacecraft. The development of the battery, from a sealed single cell to a manifold design, is described in chronological order. The most significant data are presented in order to allow the reader to follow the design decisions, and to provide a basis against which future battery designs can be evaluated.

Electrical power for the seven Surveyor spacecraft was provided by a planar solar panel and a sealed silver-zinc battery. The battery provided energy during flight, touchdown, and the lunar night. Unique features of this limited-cycle-life silver-zinc battery include high energy density (80 W-h/lb), hermetically sealed design, a common gas manifold, and a pressure transducer for permitting automatic charge termination.

The battery design evolved through four distinct phases: (1) experiment, (2) development, (3) prototype, and (4) flight. The evolution of the final design, the test data relating to each model, and the logic leading to the adoption of design improvements are described. The electrical and physical characteristics of each battery model are included, along with data on

qualification, acceptance, solar-thermal-vacuum, and mission-simulation testing, and actual flight. Thermal and calorimetric measurements are presented in conjunction with the lunar night survival data.

### Note:

The following documentation may be obtained from:

National Technical Information Service  
Springfield, Virginia 22151  
Single document price \$3.00  
(or microfiche \$0.65)

### Reference:

NASA-CR-108207 (N70-19319), Surveyor Batteries

### Patent status:

No patent action is contemplated by NASA.

Source: A. J. Moses et al., of  
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