

THE JET/STAR ARCJET SYSTEM END-TO-END
TEST

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Air Force recognition of the potential for an electric orbit transfer vehicle (EOTV) to provide greater launch vehicle flexibility, increased payload capability, and prolonged on-orbit time has led to formulation of the Electric Insertion Transfer Experiment / Space Track and Autonomous Reposition (JET/STAR) flight test. This joint Air Force and TRW inc. flight test will demonstrate key power supply and thruster technologies.

This paper describes the results of an end-to-end high power testbed demonstration ground test. The objective of the test was to simulate the JET/STAR spacecraft high power distribution system with an actual arcjet kind. By demonstrating the end-to-end high power distribution system, many of the associated risks will be eliminated. The end-to-end tests of the arcjet propulsion system are being conducted at JPL, and included the JPL ammonia arcjet, the NASA Lewis Research Center (LeRC) Power Conditioning Unit (PCU) and the TRW Solar Array Simulator (SAS). For this demonstration the 10 kW test used a SAS programmed to simulate solar array current-voltage (I/V) curves which represented actual on-orbit conditions. The SAS also contains software for maintaining operation at the peak-power-point of the solar array. The solar array current and voltage characteristics simulated during the ground tests represented beginning of life, radiation degraded, and end of life performance.