Robert Sherwood (primary)
Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive, M/S 264-355
Pasadena, CA 91109
(818)-393-1271 fax: (818) -393-1 173
e-mail: rsherwoo@devvax. jpl.nasa.gov

Frank Deligiannis
Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive, M/S 277-212
Pasadena, CA 91109

A Computer Program for Automation of Spacecraft Operations Power Data Trending

The TOPEX/POSEIDON satellite was launched successfully on August 10, 1992. The satellite is powered by the Modular Power Subsystem (MPS) containing **3** NASA Standard **50** Ah capacity batteries manufactured by McDonnell Douglas. Batteries of a similar design on board other NASA satellites experienced battery anomalies. These satellites include the Extreme Ultraviolet Explorer (EUVE), the Upper Atmosphere Research Satellite (UARS), and the Gamma Ray Observatory (GRO). These satellites exhibited large voltage divergence of the half-battery voltage very early in life (4-7 months). This deteriorating condition normally would be exhibited near the battery end-of-life, which normally is approximately 5 years in a Low Earth Orbit regime.

In order to avoid similar battery problems on TOPEX, an investigation Team and the Battery Management Team were formed pre-launch to make operational recommendations for the TOPEX batteries. These recommendations included actively trending several battery and solar array parameters on a daily basis. During the initial phase of the mission, there was no automated system in place to trend spacecraft parameters over Icing periods of time. An automated database program (TPower) was written using FoxPro 2.6a on a PC to archive and trend the power data. This program provides easy access to the data, automatic archiving, report generation with parameter alarming, and long term power parameter trending and prediction capabilities.