PLUTO EXPRESS POWER SYSTEM ARCHITECTURE

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The Pluto Express power system must answer the challenge of the next generation spacecraft by reducing its power, mass and volume envelope. Technologies developed by the New Millennium Program will enable the power system to meet the stringent requirements for the Pluto Express mission without exceeding the spacecraft mass and volume budget.

Traditionally, there has been an increasing trend of the percentage of the power system electronics with respect to the total spacecraft mass. While all of the previous technology focus on high density digital packaging, the power system electronics has not been keeping pace forcing the spacecraft to take a major hit in the power system mass. The increasing trend can be reversed by using mixed signal ASICs and high density multi-chip-module (MCM) packaging developed by the New Millennium Program.

As the size of the spacecraft shrinks the power system electronics must become tightly integrated with the spacecraft loads. The power system architecture needs the flexibility to accommodate the specific load requirements without sacrificing the capability for growth or reduction as the spacecraft requirements change throughout the development. Modularity is a key requirement that will drive down the overall power system cost.

Although the focus has been on shrinking the power system volume and mass, the efficiency and functionality cannot be ignored. Increased efficiency and functionality will only enhance the power systems capability to reduce spacecraft power requirements.

The combination of the New Millennium packaging technology with the Pluto Express power system architecture will produce a product with the capability meet a wide range of mission profiles while driving (low) system development costs.