

## Inserting New Technology into Small Missions

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Part of what makes small missions small is that they have less money. Executing missions at a low cost implies that as many functions as possible be performed using cost sharing with a set of other missions or by using already existing solutions. However, in order to create many small missions, including challenging science missions both in Earth orbit and in deep space, new technology must be developed, applied, and assimilated. These statements seem to contradict one another. Luckily, there are methods for creating new technology and inserting it into faster-better-cheaper missions. NASA has invested in several techniques. The New Millennium Program demonstrates new technology, making it available at low risk for many new missions. The X2000 Program develops generations multi-mission avionics for many missions. The Telecommunications and Mission Operations Technology (TMOT) program delivers flight and ground systems technology to a multi-mission Engineering Office rather than to individual missions. The Cross-Enterprise Technology Development Program invests in far-term research that is applicable to a very wide range of missions. Each of these programs has had successes and each has also uncovered lessons on how to do this better in the future. This talk addresses examples from various NASA technology programs and proposes some ideals that may be applied to setting up similar programs aimed at inserting technology into small missions.