

Turboelectric Distributed Propulsion Test Bed Aircraft

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Purpose

An important segment of aircraft technology Rolling Hills Research Corporation believes must be developed and optimized is that of an effective and efficient distributed electric propulsion system. By replacing a single engine, or small number of engines, with a distributed array of boundary-layer ingesting propulsors, several revolutionary efficiencies can be achieved. A distributed array of ducted fans can be embedded in an aircraft's mold-lines, reducing aerodynamic interference and installation drag. By distributing the propulsion, the thrust can be tailored to provide enhanced directional stability and control, as well as improved redundancy. Also, by ingesting the boundary-layer, the aircraft wake can be re-energized, resulting in reduced energy waste and increased overall efficiency.

Background

Electric propulsion for aircraft offers revolutionary potential to reduce emissions and noise. The level of emission and noise reduction possible with electric power is far beyond what is capable using conventional internal combustion or turbofan technologies. One of the biggest challenges to electric flight is the current energy density available in battery systems. On board charging systems, such as a turboelectric hybrid, will be required in order to obtain the desired range and endurance.