

Analysis and Testing of the Predator UAV



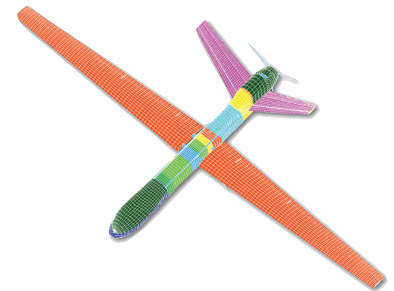
Case Study

OVERVIEW

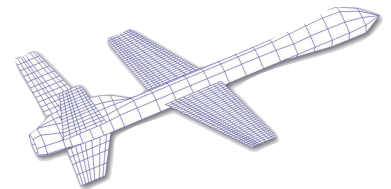
General Atomics Aeronautical Systems, Inc., (GA-ASI) develops and manufactures the Predator line of aircraft, a highly successful long-endurance remotely piloted aircraft (RPA) used in surveillance and reconnaissance missions around the globe. ATA Engineering, Inc., has supported GA-ASI by modeling, analyzing, and testing different variants of the Predator. Our suite of sophisticated test and analysis tools enables us to work very efficiently in a highly integrated design, analysis, and test environment. This allowed us to meet all schedule and technical needs and provide critical flight qualification information for the aircraft.

TASKS PERFORMED & KEY OUTCOMES

- Developed detailed finite element models (FEMs) of Predator variants from CAD models.
- Selected optimal sensor locations for modal tests of all aircraft.
- Performed modal tests (ground vibration tests) on aircraft to measure modes of vibration with various fuel configurations.
- Modified detailed FEMs to better correlate with modal test data.
- Used correlated models to calculate flutter margins for various phases of flight.
- Performed “whirl flutter” analysis for the Predator B.
- Calculated internal loads due to aerodynamic forces.
- Performed in-flight acceleration and control surface torque measurements.



Detailed finite element model



Flutter analysis panel model



Ground vibration test