Boeing F/A-18E/F Super Hornet Completes Flutter Testing

The F/A-18E/F Super Hornet integrated test team (ITT) at Naval Air Station Patuxent River, Md., has successfully completed the engineering and manufacturing development flutter flight test program. Data collected by the team shows that the Super Hornet not only meets the U.S. Navy's required flutter safety margins but also that no aeroelastic limitations exist on carriage speeds of external stores.

"The amount of testing we have completed and our ability to clear every combination of external stores is a testament to the success of the ITT approach," said Capt. Robert Wirt, Government Flight Test Director. "Although we invested many hours in analysis, ground tests and wind tunnel tests to predict the aircraft's performance, the final answers can only be obtained in flight test."

The team was contractually required to prove that the Super Hornet would be safe from flutter throughout its flight envelope and 15 percent above its design limit airspeed. Flutter is a destructive aeroelastic phenomenon that can best be described as a vibration that continuously builds in intensity. Flutter testing was conducted on a "clean" aircraft -- an aircraft with no external stores -- as well as 15 different critical external store configurations.

Flutter flight testing began in March 1996 and concluded Oct. 23, 1998 -- one month ahead of schedule. All flutter tests were flown by E1, a single-seat version of the U.S. Navy's newest strike fighter. ITT test pilot Jim Sandberg of Northrop Grumman was at the controls during the Oct. 23 milestone flight.

"We have demonstrated through testing that this aircraft has no aeroelastic limitations and is structurally robust," Sandberg said. "We've eliminated one more headache for pilots and the mission planning staff because the Super Hornet can carry any combination of stores at its design speed limit."

During the 1.7-hour flight, Sandberg successfully completed two limit (V_L) speed dives. Limit dives are one of the many test maneuvers performed during flutter testing. E1 was carrying two AIM-7 Sparrows, two AGM-65E Mavericks and two AGM-154 JSOWs.

"Flying V_L tests is a challenge but it's rewarding," explained Sandberg. "We have to climb as high as we can, go as fast as we can, and then dive, but only to the speed limit and no farther."

The team will now use E1 for flying qualities tests.

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