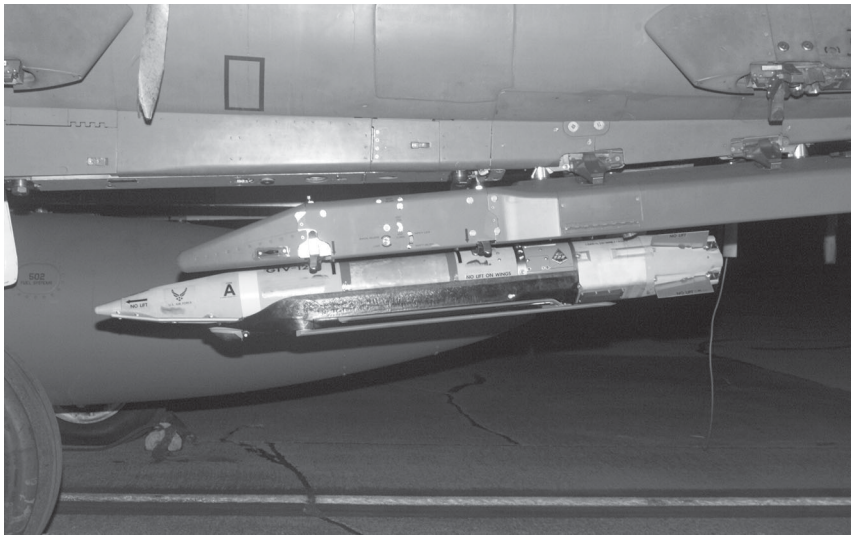
Small Diameter Bomb (SDB)

SUMMARY

- The Small Diameter Bomb (SDB) entered System Development and Demonstration on October 17, 2003, coinciding with the approval of the Test and Evaluation Master Plan.
- An operational assessment began in August 2004 and will conclude in FY05.
- Developmental weapon flight tests indicate SDB continues to meet accuracy requirements, although only in a non-Global Positioning System (GPS) jamming environment.
- Free-flight operations in a GPS-denied environment under realistic combat conditions are necessary to confirm ground test results.



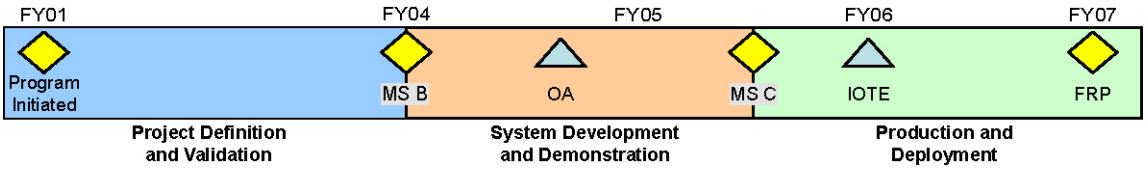
In a non-GPS jamming environment, SDB free-flight performance utilizing the Accuracy Support Infrastructure continues to demonstrate the ability to meet accuracy requirements.

- Fuze system anomalies were discovered during flight tests and sled tests in FY04. Follow-on sled tests demonstrated proper function of fuze system redesign. To confirm that shortfalls in fuze function performance are resolved, all remaining test program sled and free-flight weapons testing with live fuzes must be completed.
- To confirm SDB effectiveness and suitability against the required target set, the Air Force must conduct free-flight testing of fully-functioning, production-representative weapons in a field test under realistic combat conditions against targets that are fixed, and against targets that are fixed during weapon time of flight but have relocated after mission planning is complete but prior to weapon release.
- IOT&E should begin in October 2005.

SYSTEM DESCRIPTION AND MISSION

The SDB, produced by the Boeing Company for the Air Force, is a 250-pound class, air-launched weapon using deployable wings to achieve standoff range. The Air Force is developing the SDB to provide increased weapon loadout per aircraft for employment against offensive counterair, strategic attack, interdiction, and close air support targets. A differential GPS signal, transmitted through the launch platform prior to weapon release provides a near-precision navigation solution against targets that are fixed during weapon time of flight. This differential system is referred to as the Accuracy Support Infrastructure. The Air Force anticipates the SDB system will possess a GPS anti-jam and anti-spoof capability. The SDB warhead is a penetrator design with an added blast/fragmentation capability. The warhead uses the same explosive fill as on the Joint Air-to-Surface Standoff Missile. Fuzing of the warhead is initiated by either contact, reaching a preset height above the intended target, or by achieving a specified delay after warhead impact. The SDB is employed from a four-place carriage mounted to the aircraft. Initial integration of the SDB is with the F-15E. Follow-on integration may occur with the F/A-22, F-35, J-UCAS, F-16 (Block 30/40/50), F-117, A-10, MQ-9, B-1, B-2, and the B-52. An additional SDB increment is planned to conduct attack against specified moving targets.

TEST AND EVALUATION ACTIVITY



Since entry into System Development and Demonstration, the Air Force has conducted ground tests of the weapon, carriage, container system, and weapon components to evaluate system performance under anticipated field, environmental, and aerodynamic stress. Ground testing was also conducted to evaluate the performance of the weapon's GPS hardware and software in a simulated GPS jamming environment.

Free-flight weapon testing consisted of single-weapon releases against point, non-threat representative targets. Free-flight testing is facilitating the evaluation of release conditions, in-flight performance, impact parameters, fuze function, and guidance and navigation accuracy. It will also be used to confirm weapon flight path modeling accuracy. Testing is also supporting the evaluation of reliability, availability, maintainability, and supportability of the SDB system.

The contractor conducted several sled tests to investigate anomalies discovered during the first Live Fire sled test. Sled tests will evaluate weapon penetration capability and fuze function after penetration. Three arena warhead characterization tests provided warhead performance data to support the development of the Joint Munitions Effectiveness Manual.

An operational assessment of the potential operational effectiveness and potential operational suitability of the SDB weapon system will examine all testing results of SDB systems. The operational assessment concludes in FY05.

TEST AND EVALUATION ASSESSMENT

Based on developmental test results, modeling of SDB free-flight weapon release events appears predictive. The full complement of production-representative SDB weapon free-flight tests are necessary to confirm free-flight model profile predictive capability.

Ground tests continue to identify shortfalls in the SDB design. However, additional testing after component re-design demonstrates the SDB is progressing toward meeting requirements. Although GPS hardware demonstrates the potential to resist GPS jamming during ground tests, testing of the SDB system during free-flight operations in a GPS-denied environment under realistic combat conditions is necessary to confirm these ground test results.

In a non-GPS jamming environment, SDB free-flight performance using the Accuracy Support Infrastructure continues to demonstrate the ability to meet accuracy requirements. However, the fuze demonstrated shortfalls revealed in both sled and free-flight developmental test events.

Sled testing conducted at the close of FY04 to evaluate fuze system modifications demonstrates fuze function as required. To confirm fuze function performance shortfalls are resolved, all remaining test program sled and free-flight weapons testing with live fuzes must be completed. Sled test results will contribute to lethality assessment along with data from free-flight tests in developmental and operational testing.

To confirm SDB effectiveness and suitability against the required target set, the Air Force must conduct free-flight testing of fully-functioning, production-representative weapons. These tests include a field test under realistic combat conditions against targets that are fixed, and against targets that are fixed during weapon time of flight but have relocated after mission planning is complete but prior to weapon release.