

Integrated Defense Systems  
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## Boeing Small Diameter Bomb Increment I

### Description & Purpose:

The Small Diameter Bomb (SDB) system is the next generation of low-cost and low collateral-damage precision strike weapons for internal and external carriage. SDB leverages a new level of precision guidance and navigation with the right size payload to provide the weapons effectiveness against a wide variety of targets. The smaller size of these optimized weapons, coupled with the SDB 4-place carriage, enables more weapons to be carried on each aircraft smart weapon station and improves mission effectiveness.



The SDB System, with its four-place carriage and four weapons, fits on current fighter/bomber external smart stations and in the internal bays of the F-22A, F-35, Unmanned Combat Air Vehicles and B-1 and B-2 bombers.

### Customer(s):

U.S. Air Force: Acquisition of the SDB System is managed by the Air Force Program Executive Officer, Weapons, and the 918<sup>th</sup> Armament Systems Group at Eglin AFB, Fla. The acquisition plan for the SDB included development, production, and sustainment of carriage and weapons, and also everything needed to field the system: containers, support equipment, mission planning system, and the Boeing precision inertial navigation system/global positioning system.

### General Characteristics:

- GBU-39/B Weapon: multipurpose, insensitive munition, penetrating, blast-fragmentation warhead for stationary targets; equipped with deployable wings for extended standoff range
  - Dimensions: (L x W): 70.8" x 7.5" (1.8 m x 19 cm)
  - Weapon Weight: 285 pounds (130 kg)
  - Warhead: 206 lb (93 kg) penetrating blast fragmentation
  - Warhead penetration: >3 feet of steel reinforced concrete
  - Fuze: electronic safe/arm fuze (ESAF) cockpit selectable functions, including air burst and delayed burst options
  - Standoff maximum range: more than 60 nautical miles

- BRU-61/A “smart” pneumatic carriage
  - Payload capacity: four weapons
  - Weight: 320 pounds (145 kg) empty, 1,460 pounds (664 kg) loaded
  - Dimensions (L x W x H): 143" x 16" x 16" (3.6 m x 40.6 cm x 40.6 cm)
  - Fits nearly all delivery platforms, including internal/external carriage in the F-15E, F-16, F-22A, F-35, B-1, B-2, B-52, and Unmanned Combat Air System (UCAS).
- Guidance
  - Precision inertial navigation system/global positioning system (INS/GPS)
  - Anti-jam GPS and selective-ability anti-spoofing module (SAASM)

### **GBU-39/B Weapon:**

The 250-lb. class weapon has an Advanced Anti-Jam Global Positioning System aided Inertial Navigation System (AJGPS/INS) to provide guidance to the coordinates of a stationary target. The payload is a very effective multipurpose penetrating and blast-and-fragmentation warhead coupled with a cockpit selectable electronic fuze.

### **BRU-61/A Carriage System:**

The four-place smart carriage system has its own avionics system and four pneumatic weapon ejectors. The carriage avionics provide stores management functions (including generating Launch Acceptability Region for the weapons) thus simplifying aircraft integration and provides features to facilitate in-flight planning. The pneumatic ejectors provide a long ejection stroke with lateral constraint and selectable end of stroke velocity/pitch rate that also simplifies aircraft integration. The pneumatic system eliminates the typical explosive cartridges and attendant installation/removal and cleaning required by conventional carriage racks. This design results in high performance, low maintenance, and low life-cycle cost to operate.

### **Background:**

In August 2003 following a two-year competitive phase, the Air Force selected Boeing to develop and build the SDB System. Subsequently the Boeing – Air Force SDB Team completed the most successful development program in recent history on cost and delivered the SDB system to the warfighter ahead of schedule. SDB is currently in full rate production of 2,100 units per year. The Air Force declared initial operational capability in October 2006, and has been in combat use on the F-15E since October 2006. SDB integration on the F-22A, F-35, and F-16 is underway. Initial estimates are that the Air Force will procure at least 24,000 weapons and 2,000 carriages.

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