

JOINT DIRECT ATTACK MUNITION (JDAM)



AF/Navy ACAT ID Program

Total Number of Systems:	62,500 Air Force 25,500 Navy
Total Program Cost (TY\$):	\$2590.9M
Average Unit Cost (TY\$):	\$18K (Est.)
Full-rate production:	1QFY00

Prime Contractor

Boeing-St. Louis, MO

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2010

The Joint Direct Attack Munition (JDAM) is a low cost, autonomously controlled, adverse weather accurate guidance kit for Air Force/Navy 2,000 pound MK-84 and BLU-109 general-purpose bombs and 1,000 pound MK-83 bomb. There are no planned design changes to the bombs (casing metallurgy, explosive fill, fusing mechanism, etc.), but the existing inventory weapons will be configured with JDAM guidance kits and accessories. The guidance is accomplished via a Global Position System (GPS) aided Inertial Navigation System. Actual weapon launch will occur when the aircrew has flown the aircraft into the weapon Launch Acceptability Region (LAR). The LAR is the three-dimensional area in space in which the weapon may be released to fly directly to a selected target on a predetermined bearing.

The JDAM kit will yield delivery accuracy of 13 meters when GPS is available and less than 30 meters when GPS is absent or jammed. JDAM is designed to be employed by a variety of fighter/attack and bomber aircraft, allowing *precision engagement* from all altitudes. The primary aircraft for

integration of the 2,000-pound JDAM will be the B-52H and the F-18C/D. The 1,000-pound JDAM will be tested and integrated on the AV-8B and F-22.

BACKGROUND INFORMATION

JDAM has been designated a Pilot Program in accordance with the Federal Acquisition Streamlining Act of 1994, which authorizes relief from numerous DOD regulatory requirements. However, Title 10 OT&E and LFT&E statutory requirements have not been waived. JDAM successfully completed a Milestone I review in October 1993 and entered an 18-month DEM/VAL source selection phase (McDonnell Douglas vs. Lockheed Martin). In October 1995, the Air Force selected McDonnell Douglas Aerospace as the winning JDAM contractor for Phase II EMD and production. Selection was based on overall performance, design, and cost.

JDAM was removed from OSD live fire oversight in November 1993. The lethality and survivability of both the Mk-84 and BLU-109 bomb bodies were well documented.

In fall 1994, USD(A&T) approved a plan to accelerate the JDAM program by approximately 18 months to get precision guided munitions into the field at the earliest possible date. The April 1997 JDAM LRIP decision approved the procurement of 937 MK-84 and BLU-109, 2,000-pound kits in Lot 1, representing approximately 1 percent of the total planned buy. In January 1998, USD(A&T) approved the delay of Milestone III to 3QFY99 and added a second LRIP for JDAM. In May 1998, the LRIP II decision approved the procurement of 2,202 additional 2,000-pound MK-84 kits. In December 1998, USD(A&T) approved further delay of Milestone III until 1QFY00 and added a third LRIP for JDAM. The June 1999 LRIP decision will procure an additional 2,527 2000-pound tail kits, 1,191 MK-84 and 1,336 BLU-109 kits. Test article delays pushed the threshold date for Milestone III to May 2000.

TEST & EVALUATION ACTIVITY

An AFOTEC OA was completed to support the LRIP decision, and combined DT/OT was completed in Nov 1998. The B-52 completed two missions and released nine successful JDAMs. The F/A-18 also successfully completed two missions and released six JDAMs.

Both Air Force and Navy OTAs began dedicated OT&E of the 2,000-pound MK-84 and BLU-109 kits in November 1998. Operational testing of friction brake design weapons, including the delivery of 122 MK-84 and BLU-109 weapons from F-18s and B-52s, was completed in August 1999. IOT&E will be completed after planned testing of pin-lock design weapons during the Verification of Correction of Deficiency (VCD) phase scheduled for January-March 2000.

The Navy's F/A-18 served as the threshold fighter and the B-52 served as the threshold bomber during the dedicated IOT&E phase. However, results of concurrent JDAM integration testing on the F-16, B-1, and B-2 will also be available to support an informed full-rate production decision. The results of B-2 JDAM deliveries during Operation Allied Force will also be used by DOT&E, as appropriate, to support the Milestone III decision.

Developmental testing of MK-83 has begun with ground tests, fit checks, and weapon separation tests. Operational testing of the MK-83 is currently planned for June-July 2000. The scale of testing is expected to be less than testing for the 2000 pound variants due to the high commonality of already tested

components. No date has been established for integration and OPEVAL on the AV-8B. Qualification on the F-22 is planned for FOT&E in FY03.

TEST & EVALUATION ASSESSMENT

JDAM has currently met or exceeded all accuracy requirements. However, the program continues to work through a series of developmental, integration, and programmatic issues causing delays in the commencement and completion of OT. Initial problems with the tail actuator system and JDAM's Inertial Navigation System have been investigated at length and appear to be resolved; however, a bending fatigue problem was also discovered in the high-speed, low to medium altitude environment, resulting in cracks in the fin shafts. (These cracks have only occurred in MK-84 tail assemblies carried on the inboard stations of the F/A-18.) A pin-locking mechanism and a redesigned fin shaft are being developed to prevent the cracks from recurring. These parts will be evaluated during VCD. OPEVAL/IOT&E will be considered incomplete until the new tail assembly has been tested for performance and suitability during VCD. This testing will occur prior to Milestone III.

JDAM has experienced significant reliability problems with the Joint Programmable Fuze (JPF). The Air Force decertified the JPF for use with the BLU-109 version of JDAM. The Navy's failure rate during testing of the BLU-109 and MK-84 versions exceeds the ORD requirement. Redesign of the JPF is expected to take approximately two years. Existing fuzes are available as temporary stopgap measures but are in limited quantities, particularly for BLU-109. The non-availability of JPF negatively impacts JDAM's airborne retargeting capability due to the inability to change fuze settings of alternative fuzes in flight.

Initial storage reliability problems, discovered in pre-IOT&E, exhibited a sufficient number of failures to prevent achievement of Joint Operational Requirements Document requirements. These problems have been aggressively attacked and have shown significant improvement.

BLU-109 instability and maneuverability problems have been overcome with strake redesign and fin realignment. Launch Acceptability Region inconsistencies between mission planning software, aircraft display, and weapon capability have been sufficiently rectified to complete OT.

A B-LRIP report is expected to be completed in April 2000, pending timely completion of VCD and service test reports.

Over 650 JDAMs were successfully released from the B-2 during Operation Allied Force. An overall release probability was 96 percent. Weapon performance subsequent to release is unknown. Of those weapons not released, roughly half were traceable to aircraft problems and the remainder were JDAM reliability problems.

