Joint Standoff Weapon (JSOW)

The Joint Standoff Weapon (JSOW) is a family of kinematically efficient (~12:1 glide ratio) 1,000-lb class, air-to-surface glide weapons intended to provide for low observable, standoff precision engagement and launch-and-leave capability against a wide range of targets during day/night, all weather conditions. All three JSOW variants employ a tightly coupled Global Positioning System/Inertial Navigation System (GPS/INS). JSOW is employed for interdiction of soft/medium fixed, re-locatable and mobile light and heavy armored targets; massed mobile armored targets; anti-personnel; and air-to-surface threats. JSOW primarily functions in a preplanned mission mode. The system will allow pilot manual inputs of up to eight targets as well as third party targeting as long as the targeting system can meet JSOW's targeting requirements. The weapon is planned for land- and carrier-based operations.

Mission planning is accomplished using the Navy's Tactical Automated Mission Planning System and the Air Force Mission Support System. Integration of operations with the Joint Mission Planning System is planned. JSOW will be employed on the following aircraft: F/A-18C/D and E/F; F-16C/D; F-15E; JSF; B-1B; B-2A; and B-52H. The weapon comes in three operational variants:

- AGM-154A (JSOW Baseline) – Air Force and Navy: The payload of the AGM-154A consists of 145 BLU-97/B submunitions. The BLU-97/B is a combined effects munition. The bomblets consist of a shaped charge for light armor defeat capability, a fragmenting case for material destruction, and a zirconium ring for incendiary effects. JSOW Baseline is designed to conduct pre-planned attacks on stationary soft targets such as air defense sites, parked aircraft, components of airfields and port facilities, command and control antennas, stationary light vehicles, trucks and artillery, and refinery components.
- AGM-154B – (JSOW BLU-108) – Air Force and Navy: The payload for the AGM-154B is the BLU-108 submunition from the Air Force Sensor Fuzed Weapon (SFW). JSOW carries six BLU-108s, each of which dispenses four warheads, or skeets. Each skeet carries an infrared or dual-mode sensor, and upon detecting a target, detonates to create an explosively formed penetrator that impacts the target. This system is an interdiction weapon. The target set consists of tanks, infantry fighting vehicles/armored personnel carriers, and trucks in a tactical road march formation.
- AGM-154C (Unitary Variant) – Navy only: The AGM-154C, in addition to the common GPS/INS guidance, will use an autonomous imaging infrared seeker for target acquisition and terminal guidance. The AGM-154C will carry the British Aerospace multiple warhead system (Broach), and is designed to attack point targets such as industrial facilities, logistical systems, and shipping locations.

The currently deployed hardware and software variant did not undergo an adequate operational test prior to deployment.

AGM-154A, Baseline Variant

The JSOW program incorporated a new control section and guidance unit into all variants in FY01. This change is a cut into the full-rate production of AGM-154A. However, a redesign of this control section is currently under development to enable the F-16 to employ the weapon throughout the entire F-16 operational envelope.

A shortfall in JSOW software's ability to accurately assess wind effects was identified during combat employment. An update to rectify this shortfall is currently under development and testing.

DOT&E submitted a combined AGM-154A Operational and Live Fire Test and Evaluation (LFT&E) Report to Congress to support a Milestone III decision in October 1998.

AGM-154B, BLU-108 Variant
Low-rate initial production of the AGM-154B was approved in FY99. Continued developmental tests ceased in FY00 during production verification due to numerous system performance shortfalls. The Air Force and Navy plan to withdraw support for AGM-154B. Review of the program is underway and the program office intends to operationally test the variant.

LFT&E of AGM-154B is based upon live fire testing conducted for the SFW program. AGM-154Bs will incorporate the SFW Preplanned Product Improvement BLU-108.

AGM-154C, Unitary Variant
An operational assessment to support the AGM-154C Milestone III decision is planned for FY03.

In September 2000, the Under Secretary of Defense (Acquisition, Technology and Logistics) approved incorporation of the developmental Broach warhead. Due to incorporation of the new warhead, LFT&E is required. LFT&E and Initial Operational Test and Evaluation (IOT&E) are planned for FY03.

TEST & EVALUATION ACTIVITY

AGM-154A, Baseline Variant
The currently deployed JSOW hardware and software variant did not undergo an adequate operational test prior to deployment. Although a Navy-only Quick Reaction Assessment was conducted to support a decision to release the new software variant to the fleet, this test was only a subset of the test plan already approved as minimally adequate. Tests to date demonstrate accuracy within prescribed requirements. These tests occurred under moderate wind conditions with releases in the heart of the JSOW employment envelope. Future tests are planned to validate the operational edge of this employment envelope and the robust nature of the new software. Currently, test operations are suspended, pending examination of apparent release envelope inaccuracies in JSOW software.

The redesign of the JSOW tail section is scheduled to conclude in FY03. Operational test of this redesign is planned for FY03.

AGM-154B, BLU-108 Variant
Operational test is delayed due to JSOW common technical issues outlined above and the incorporation of the redesigned tail section. Multiservice Operational Test and Evaluation is planned for FY04. Although the Air Force and Navy intend to withdraw support for AGM-154B, the program office intends to evaluate this weapon in operational test.

AGM-154C, Unitary Variant
The program conducted developmental tests, to include guided flight tests, in FY02. An operational assessment is planned for FY03, along with a combined IOT&E/LFT&E.

TEST & EVALUATION ASSESSMENT

AGM-154A, Baseline Variant

DOT&E's evaluation of the results of Navy Operational Evaluation and Air Force IOT&E confirmed that the AGM-154A, in the Low-Rate Initial Production (LRIP) configuration, is operationally effective and suitable.

Developmental tests during FY02 of weapons that encounter repeated carrier launch and recovery operations resulted in reliability failures. No cause-and-effect relationship has been yet identified for these failures. Further tests during the current Follow-on Test and Evaluation (FOT&E) with such weapons are planned.

Preliminary test results of the full-rate production JSOW, with the new hardware and software, are inconclusive, due to the minimally challenging nature of wind conditions during recent tests and the small data size to date. Tests of the new configuration are also planned for a non-permissive GPS environment during FOT&E.

The F-16 is currently unable to employ JSOW throughout its entire operational flight envelope. Operational test with the redesigned tail section are planned for FY03.

In FY02, the contractor identified software anomalies that affect JSOW flight profiles and jeopardize JSOW's ability to reach the target when released at high altitudes, at the low end of tactical employment speeds, and in the face of stiff headwinds. Examination of these anomalies for effects on deployed weapons, as well as effect on AGM-154B and C, are also being evaluated.

AGM-154B, BLU-108 Variant

The capacity for AGM-154B to demonstrate its ability to perform adequately in an operationally realistic battlefield is dubious. Concepts of operation validation tests are yet to be conducted.

AGM-154C, Unitary Variant

Developmental testing continues. Free-flight test of the AGM-154C to evaluate basic seeker performance occurred in FY02 and static tests of the Broach warhead are planned for FY03. An operational assessment to support an LRIP decision is also planned for FY03.

An operational evaluation of AGM-154C is planned for FY03. However, planning to date does not provide for an adequate minimum of live weapons nor a sufficient number of end-to-end, free flight test events sufficiently counter-measured. End-to-end, free flight tests of the AGM-154C in a non-permissive GPS environment must also occur for the operational evaluation to be adequate.

The draft AGM-154C LFT&E strategy includes static arena tests of the Broach warhead, all-up-round sled tests, and live warhead flight tests against realistic targets. The arena and sled tests should provide characterization of warhead performance at the component level. Flight tests against realistic targets will provide an end-to-end, system-level demonstration of lethality. DOT&E agrees with this basic structure for the LFT&E proposed by the program office.

To support LFT&E, the program office proposed arena tests based on simultaneous detonation of both components of the Broach warhead. Since the Broach warhead may function in one of two modes, either simultaneous detonation of both warheads or sequential detonation with the follow-through-bomb (FTB), data on simultaneous detonation only is insufficient. Test-supported characterization of the blast and fragmentation characteristics of the FTB will be required to support LFT&E.

The program office has identified two, of as many as seven, possible targets for live warhead flight tests. The adequacy of data collection for LFT&E hinges on the number and fidelity of these targets, the extent of their instrumentation, and the quality of the post-test damage assessment. Discussions about these important details continue.