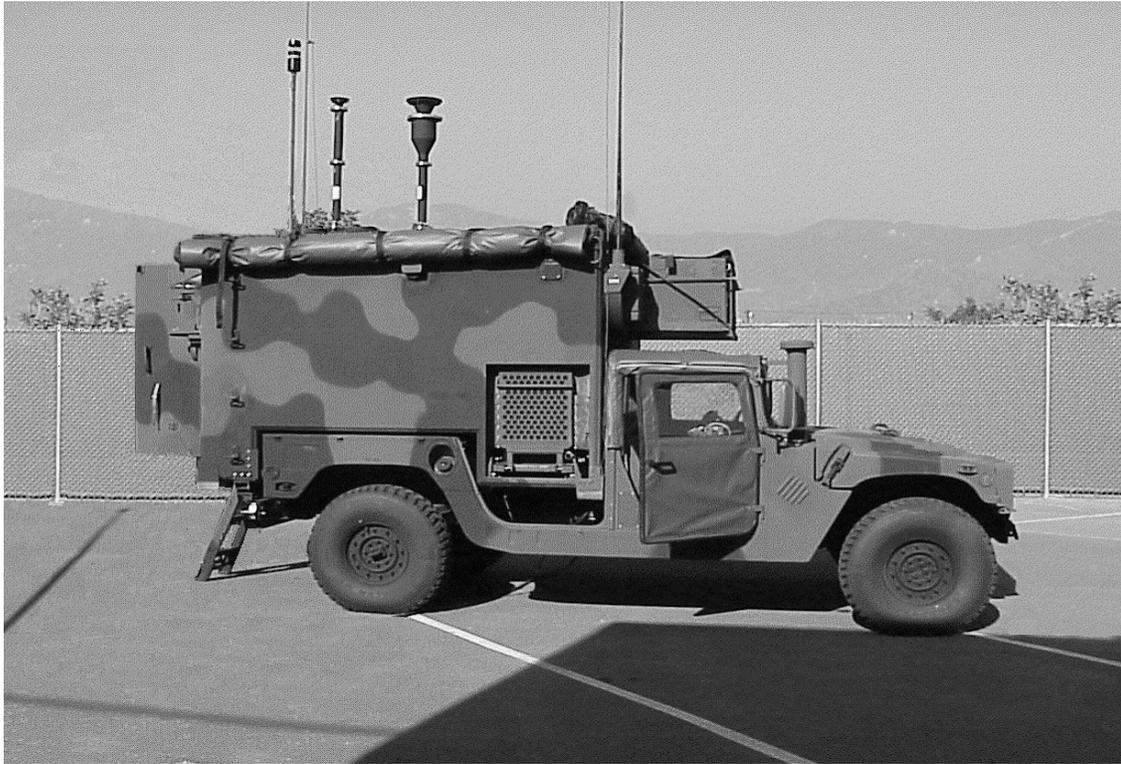


JOINT BIOLOGICAL POINT DETECTION SYSTEM (JBPDS)



Joint ACAT II Program

Total Number of Systems:	971
Total Program Cost (TY\$):	\$708M
Average Unit Cost (TY\$):	\$342K
Full-rate production:	2QFY02

Prime Contractors

Hardware:	Battelle
Software:	RTI
Logistics:	Lockheed Martin

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020

The primary purpose of the Joint Biological Point Detection System (JBPDS) is to limit the effects of biological agent attacks that have the potential for catastrophic effects to U.S. forces at the operational level of war. The specific function of JBPDS is to provide biological agent point-detection, identification, and sampling capability for both fixed-site and mobile operations. The system is intended to detect biological agents in less than one minute and identifies the agents in less than 15 minutes. The Block I version, scheduled for fielding during FY01, will detect 10 agents. The follow-on Block II version, scheduled for fielding during FY06, will integrate advances in technologies to decrease size, weight, and power requirements, as well as to detect 26 agents. Both block versions will interface with the Joint Warning and Reporting Network (JWARN).

The capabilities of JBPDS will be used by each of the Services. The Army's JBPDS platform is the S788 lightweight multi-purpose shelter mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) - Heavy Variant. The Marine Corps will deploy a stand-alone man-portable JBPDS configuration for employment by foot-mobile reconnaissance units. The shelter-mounted unit will also be integrated as a biological component suite installed on both HMMWV-based and LAV-based Joint Services Light NBC Reconnaissance Systems (JSLNBCRS). The Marine Corps is the lead Service for development of the JSLNBCRS.

The Navy's JBPDS platform will be installed on deployable surface ships and at high priority shore installations worldwide, while the Air Force will deploy the fixed-site, man-portable, and shelter-mounted JBPDS units.

JBPDS improves the survivability of both mobile and fixed Joint forces by providing increased situational awareness and *information superiority* to supported headquarters and combat elements. By providing these elements with the near real-time capability of detecting biological agent contamination, JBPDS is a key portion of the *full-dimensional protection* concept.

BACKGROUND INFORMATION

In June 1995, the Joint Program Manager for Biological Defense approved the Milestone 0 transition of the JBPDS into the Concept Definition Phase for Block I. A Milestone I decision in June 1996 formalized and established JBPDS as an Acquisition Category (ACAT) III Program. In December 1996, the Joint Program Manger approved the Milestone II decision for JBPDS, and the system transitioned into the EMD Phase. In August 2000, the Joint Program Manager recommended that the system be re-designated an ACAT II program.

The Army is JBPDS' lead materiel developer and developmental evaluator, while the Air Force is the lead operational evaluator.

JBPDS was placed on the DOT&E Oversight List of January 18, 2000. Its potential impact on the battlefield is enormous despite the fact that it is only an ACAT II program.

TEST & EVALUATION ACTIVITY

In October and November 1999, AFOTEC conducted an Operational Utility Evaluation (OUE) of the JBPDS. The OUE was conducted during field trials sponsored by the Joint Program Manager. These trials were primarily designed to compare different trigger/detector technologies in side-by-side testing. The OUE also allowed AFOTEC to make an initial evaluation of the military effectiveness and suitability of JBPDS based upon observations and data collected during the test period.

In conjunction with MCOTEA and OPTEVFOR, AFOTEC conducted in May-June 2000 an Operational Assessment (OA) of the man-portable, fixed-site, and shipboard versions of the JBPDS. ATEC simultaneously conducted a Limited User Test (LUT) of the HMMWV-mounted version of the system. The shipboard version of the JBPDS was tested on USS *Comstock*, while the other versions were tested at Dugway Proving Ground. The Dugway testing was conducted in conjunction with JBPDS Pre-Production Qualification Testing. The Director approved the OA Plan on May 15, 2000.

AFOTEC and ATEC evaluated the military effectiveness and suitability of JBPDS in a semi-operational field setting. JBPDS units were subjected to aerosol challenges using benign biological agent simulants and typical battlefield interferents. Sophisticated instrumentation was required to determine if and when the systems were exposed to the simulated contamination.

Military and civilian operators set up, replenished, monitored, and transported these units during the field trial events. The adequacy of the training program to support JBPDS deployment was evaluated, and reliability, availability, and maintainability (RAM) data were collected throughout the test effort. Fourteen JBPDS systems were evaluated during this testing: four HMMWV-mounted, four fixed-site, five man-portable, and one shipboard.

In addition to the field testing of JBPDS with biological agent simulants, Dugway Proving Ground personnel are conducting live biological agent testing of the system inside a specially sealed biohazard-safe chamber.

Data and insights gained from the OA, LUT, and the live agent testing were used to support the Joint Program Manager for Biological Defense two-phase Low-Rate Initial Production (LRIP) decision on October 2, 2000. Under this plan, nine systems will be built for First Article Test and a second operational assessment (OA2). After OA2, if the Service Operational Test Agencies assess the system to be ready for the Initial Operational Test (IOT), up to 16 additional systems will be constructed for IOT. Specific criteria addressing detection, identification and system reliability must be met to support the second phase of LRIP and entry into IOT.

DoD Regulations state that a TEMP must be submitted to OSD within 90 days after being placed on oversight. However, based on the Program Office's progress in developing a robust test program, the Director has extended the deadline for TEMP submittal to the end of CY00.

TEST & EVALUATION ASSESSMENT

The results of the OUE, OA, LUT, and live agent testing are still emerging. Early live agent test results indicate that JBPDS shows substantial promise for detecting biological agents in a sealed chamber under closely controlled environmental conditions. However, field testing of JBPDS variants has not demonstrated that these systems can meet the requirement that they must detect biological agents at least as well as currently fielded interim systems. (The exact requirement is classified.) During field testing, the systems experienced a large number of false detections; i.e., the systems indicated the presence of biological agent simulant when no simulant was present. Background soil concentrations of simulant at the test site may have contributed to the observed high false detection rate.

Given that a detection has occurred, JBPDS must have a probability of 98 percent or better of correctly identifying the detected agent within 15 minutes. Preliminary indications are that the JBPDS did not meet this requirement for all simulants under field conditions.

The system fell well short of the requirement for Mean Time Between Operational Mission Failures of 144 hours. Numerous hardware and software deficiencies were encountered.

The systems demonstrated significant human factors deficiencies. Operators in protective gear experienced difficulties, particularly in assembling and disassembling the system. The systems have numerous sharp edges that can injure users and puncture protective gear. The man-portable units are so heavy that the four-man crews experienced difficulties in transporting them. The interior component

configuration of the HMMWV-mounted units needs additional optimization. Generator exhaust hose leaks can allow generator exhaust to seep into the closed JBPDS shelter. The set-up time for the man-portable units often exceeded requirements.

CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED

The JBPDS Program Management office has studied the results of the OA and the LUT, and has prepared and is implementing an aggressive program that is working toward correcting the deficiencies observed during this testing. Modifications of the system variants include an enhanced capability for detecting and identifying biological agents under field conditions, reduction of false detections, improved system reliability and software performance, and correction of demonstrated human factors deficiencies. The lack of hardware maturity evidenced during the OUE/OA/LUT puts the Program Manager's ambitious schedule in jeopardy. However, this risk is at least partially mitigated through the two-phase LRIP approach and the provision for a second Operational Assessment prior to the Initial Operational Test.

Overall responsibility for assessing the operational effectiveness, operational suitability, and survivability of each Chemical and Biological Defense program is vested in a single Service. However, it is clear that each Service Operational Test Agency will have to provide its own assessment of each program variant that will be used by its own Service.