

UNCLASSIFIED

<b>ARMY RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>3 - Advanced Technology Development</b>	<b>PE NUMBER AND TITLE</b> <b>0603238A Air Defense/Precision Strike Technology</b>
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	12174	9907	24618	21434	19462	15168	13047	12900	Continuing	Continuing
D177 Joint Air/Land/Sea Precision Strike Demonstration	10049	9457	24618	21434	19462	15168	13047	12900	Continuing	Continuing
D546 Synthetic Aperture Radar Target Recognition and Location System	2125	450	0	0	0	0	0	0	0	12595

**A. Mission Description and Budget Item Justification:** Overall Joint Precision Strike Demonstration (JPSD) program goals are to reduce sensor-to-shooter timelines from hours to minutes as well as to achieve quantifiable improvements in target location and identification, weapons systems responsiveness and kill capability, and accurate damage assessment through such techniques as near-real-time sensor cueing, near-real-time data dissemination, seamless sensor-to-shooter node communication, dynamic re-targeting, improved weapons system accuracy and precision guided munitions. This program provides for the integration of new, high-payoff technologies, architectural and operational concepts, along with existing and emerging systems to demonstrate enhanced precision strike and counterfire capabilities for targets at deep and extended ranges. The JPSD objectives are: to locate, identify, and kill high-value, time-critical targets and to assess damage within tactically meaningful timelines. The program conducts building block demonstrations to identify technical and operational barriers to an adverse weather, day/night, end-to-end, sensor-to-shooter precision strike capability and to demonstrate and experiment with potential solutions to these barriers. This program element also funds development/experiment activities for the Synthetic Aperture Radar Target Recognition and Location System (STARLOS) real-time Aided Target Recognition (AiTR) technology. The work in this program element is closely coordinated with the Joint Staff, other services, the Army's combat development community, TRADOC Battle Labs, and appropriate materiel developers to conduct field demonstrations and experiments to assess specific technologies for military needs. Work in this program element is consistent with the resource constrained Army Science and Technology Master Plan, the Army Modernization Plan, and the Joint Warfare Science and Technology Plan. The work also supports Division XXI and the Army Warfighting Experiments (AWEs).

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<b>B. Program Change Summary</b>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget ( <u>FY 1999</u> PB)	12773	9973	19003	22383
Appropriated Value	13664	9973		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-977	-66		
b. SBIR / STTR	-313			
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming	-200			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			5615	-949
Current Budget Submit ( <u>FY 2000/ 2001</u> PB)	12174	9907	24618	21434

Change Summary Explanation: FY00 Plus up supports the Joint Intelligence Surveillance Reconnaissance (JISR) Technology Demonstration Program, the Joint Continuous Strike Environment (JCSE) ACTD and upgrade current capabilities to the Joint Integration and Evaluation Center (JIEC) at Fort Belvoir.

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<b>BUDGET ACTIVITY</b> <b>3 - Advanced Technology Development</b>	<b>PE NUMBER AND TITLE</b> <b>0603238A Air Defense/Precision Strike Technology</b>	<b>PROJECT</b> <b>D177</b>
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D177 Joint Air/Land/Sea Precision Strike Demonstration	10049	9457	24618	21434	19462	15168	13047	12900	Continuing	Continuing

**Mission Description and Justification:** Through a series of building block demonstrations, the Joint Air Land Sea Precision Strike (JT ALS PS) Demonstration Project has identified barriers to an advanced precision strike capability and assessed candidate solutions to these barriers. The FY95-FY96 Precision/Rapid Counter Multiple Rocket Launcher (P/RC-MRL) Advanced Concept Technology Demonstration (ACTD) was conducted with highly successful demonstrations in September 1995 at Fort Hood, TX, and in September/October 1996 in Korea. The P/RC-MRL ACTD provided U.S. Forces Korea (USFK) with a significantly enhanced capability to locate, track, and defeat the North Korean 240mm MRL threat by delivering and demonstrating Leave Behind prototype systems that include: connectivity between the Korean Combat Operations Information Center and the 2nd Infantry Division (2ID); enhancements to the Firefinder radar system; automation for the 2ID Main Command Post; enhancements of Army connectivity to Air Force and Navy command and control systems to provide a joint solution to the 240mm MRL threat; and Aided Target Recognition (AiTR) capability for the Tactical Endurance Synthetic Aperture Radar (TESAR) sensor on the Predator Unmanned Aerial Vehicle (UAV). The Commander in Chief, United Nations Command (CINCUNC) requested that the successful methodologies for solving critical precision strike issues be applied at theater level. In response, the concept for a Theater Precision Strike Operations (TPSO) ACTD was formulated in FY97 and formal program approval was achieved in FY98. TPSO is designed to provide a significantly enhanced joint and combined capability for the CINC to plan and conduct Theater Counterfire and Precision Strike Engagements through the real time synchronization of US/Coalition assets. Technologies to provide an improved Joint capability in these areas are demonstrated under this project beginning in FY98, to support the needs of the CINCUSNC and to serve as the Army's contribution to joint technology and digitization. Efforts in this project are managed by the Director, Joint Precision Strike Demonstration Project Office, Fort Belvoir, VA, Program Executive Officer, Intelligence, Electronic Warfare, and Sensors (PEO-IEW&S), Fort Monmouth, NJ. The Prime contractor is Raytheon, Bedford, MA.

**FY 1998 Accomplishments:**

- 4820 - Completed the transition and functionalities of P/RC-MRL ACTD leave behinds to 2ID and Army fielded systems, respectively.
  - Structured leave behind systems support for the P/RC-MRL ACTD.
  - Published a finalized comprehensive lessons learned P/RC-MRL ACTD report.
  - Ascertained P/RC-MRL product applicability to other Army/Joint Precision Strike requirements.
  - Defined technical growth areas for continued integration of Integration and Evaluation Center (IEC) capabilities.
  - Conducted a highly successful flight demonstration of the Reconnaissance, Infrared, Surveillance, Target Acquisition 2<sup>nd</sup> Generation (RISTA) II sensor on a UAV.
- 5229 - For the TPSO ACTD, identified and prioritized warfighter requirements to be developed in software enhancements. Assessed functionality resident in current Army baseline systems and in coordination with responsible PEOs, refined lists of functions to be completed, accelerated and added to future versions of software. Staffed TPSO ACTD Management Plan and received approval.

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BUDGET ACTIVITY <b>3 - Advanced Technology Development</b>	PE NUMBER AND TITLE <b>0603238A Air Defense/Precision Strike Technology</b>	PROJECT <b>D177</b>
<p><b>FY1998 Accomplishments (Continued)</b></p> <ul style="list-style-type: none"> <li>- Coordinated and improved the rapid software prototyping capabilities and network connectivity with the Central Tech Support Facility (CTSF), Fort Hood, TX, Depth and Simultaneous Attack Battle Lab (D&amp;SABL), Fort Sill, OK, and the Integration &amp; Evaluation Center (IEC) at Fort Belvoir.</li> <li>- Initiated joint cooperative software development and integration efforts with the United States Air Force, United States Navy, and United States Marine Corps necessary to support synchronized Joint/Combined deep operations planning and precision strike operations. Acquired the necessary HW/SW to replicate a "joint lab" environment from which integration efforts will be conducted.</li> </ul> <p>Total            10049</p> <p><b>FY 1999 Planned Program:</b></p> <ul style="list-style-type: none"> <li>•            9213 - Participate in Commander-in Chief United Nations Command (CINCUNC) warfighting exercises, Reception Staging Onward Movement &amp; Integration (RSOM&amp;I), Foal Eagle, Summer-Ex and Ulchi Focus Lens (UFL), documenting warfighting functional requirements and integrating emerging technologies/capabilities for the Theater Precision Strike Operations (TPSO) ACTD.</li> <li>- Provide CINCUNC with enhanced technical command and control capabilities for conduct of synchronized Joint/Combined deep operations and precision strikes for TPSO.</li> <li>- Execute the rapid prototyping capabilities at the IEC at Fort Belvoir, the CTSF at Fort Hood, TX and D&amp;SABL at Fort Sill, OK.</li> <li>- Expand the Joint Precision Strike Demonstration threat database to integrate joint systems into the simulation environment required supporting TPSO evaluations.</li> <li>- Refine the IEC analytical capability to measure performance and effectiveness so those objective conclusions can be made regarding the military utility of the demonstrated technologies and concepts.</li> <li>- Conduct technical reviews and demonstrations to assess the contribution of emerging technologies to TPSO.</li> <li>- Plan the FY99 baseline scenario exercise and assess the communications infrastructure necessary to conduct the demonstration.</li> <li>- Transition to a High Level Architecture (HLA) environment that supports simulating Man in the Loop (MITL) for FY00 demonstration.</li> <li>•            244 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.</li> </ul> <p>Total            9457</p> <p><b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>•            18102 - Participate in Commander-in- Chief United Nations Command (CINCUNC) warfighting exercises to document functional requirements supporting pre-prototype design and integration objectives for the Theater Precision Strike Operations (TPSO) ACTD.</li> <li>- Plan and execute a simulation stimulated demonstration, employing an unreinforced Korean scenario, in which United States Forces Korea (USFK) soldiers (Man-in-the-Loop) in the Ground Component Commander Deep Operations Coordination Center (GCC DOCC) will operate pre-prototype developmental systems, derived from baseline Command, Control, Communication, Computers and Intelligence (C4I) acquisition programs, as an early user evaluation and proof of concept in a realistic warfighting environment. Demonstration will include Republic of Korea (ROK) observation in preparation for ROK participation in the planned FY 01 Demonstration.</li> </ul>		
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<p><b>FY 2000 Planned Program: (continued)</b></p> <ul style="list-style-type: none"> <li>- Conduct rapid prototyping operations at the Joint Integration &amp; Evaluation Center (JIEC), Fort Belvoir, in conjunction with the Central Technical Support Facility (CSTF), the Depth &amp; Simultaneous Battle Lab (D&amp;SBL), Battle Command Battle Lab-Huachuca, as well as Air Force, Navy and Marine Corps activities, to develop pre-prototype systems, designed to facilitate the coordination planning and synchronization of joint and combined forces.</li> <li>- Expand, upgrade and implement the High Level Architecture (HLA) environment and automated Data Collection Architecture, that will stimulate the FY 00 and FY 01 Man-in-the-Loop (MITL) demonstrations, and provide the data collection capability required to make credible warfighting assessments.</li> <li>- Conduct technical reviews to assess the warfighting effectiveness of the emerging technologies integrated into the pre-prototype systems under development,</li> </ul> <p>1000 - Validate and coordinate Joint Continuous Strike Environment (JCSE) requirements in targeting Time Sensitive Surface Targets. Participate in Battlefield Maritime Experiment.</p> <p>1500 - Expand Analytical capability for Joint Integration and Evaluation Center (JIEC): (1) Provide additional connectivity to TRADOC Battle Labs and Joint Battle Center (JBC) to expand on current connectivities with Army, Air Force and Navy Battle Labs. Provides enhanced Joint user/developer testbed for rapid prototyping of new systems; and (2) Support analytical trade-offs for the Strike Force Technology Options.</p> <p>4016 - Define Joint Intelligence Surveillance Reconnaissance (JISR) technology demonstration program. Define data collection architecture. Design and begin integration of JISR family of models, and JISR testbed as part of the JIEC.</p> <p>Total            24618</p> <p><b>FY 2001 Planned Program:</b></p> <ul style="list-style-type: none"> <li>•            21209 - Participate in CINCUNC warfighting exercises to refine the functionality of pre-prototype systems demonstrated during the FY 00 Demonstration. <ul style="list-style-type: none"> <li>- Plan and execute a simulation stimulated demonstration, employing a scenario representative of the transition from an unreinforced Korean Theater to a reinforced Korean Theater. Both ROK and U.S. forces, including the III U.S. Corps, will participate in a MITL fashion both in the GCC DOCC and at the critical external nodes. They will operate the objective, residual capability candidate systems developed during the TPSO ACTD in a realistic warfighting environment.</li> <li>- Conduct rapid prototyping operations at the IEC, Fort Belvoir, in conjunction with the CTSF, the D&amp;SABL, as well as the Air Force, Navy and Marine Corps activities, to refine the functionality and improve the capability of the pre-prototype systems evaluated during the FY 00 Demonstration.</li> <li>- Conduct technical reviews to assess the warfighting value added contributed by each pre-prototype, residual capability, candidate systems during the demonstration, and determine which candidate systems exhibit sufficient maturity and capability to warrant qualification as an ACTD "Leave Behind".</li> <li>- Develop transition and sustainment plans to support the "Leave Behind" Systems during the period of interim capability (FY 02-03).</li> </ul> </li> <li>            225 - Evaluate and validate the value added of Joint Continuous Strike Environment (JCSE) system integration.</li> </ul> <p>Total            21434</p>		
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D546 Synthetic Aperture Radar Target Recognition and Location System	2125	450	0	0	0	0	0	0	0	12595

**Mission Description and Justification:** This project demonstrates the feasibility of locating and identifying high value targets from an Army designated aerial platform. The focus of the program is on Aided Target Recognition (AiTR) of short-range ballistic missiles, surface-to-air missile launchers, rocket launchers and other designated military targets of interest. The targets are located with airborne sensors and identified with a real-time AiTR system. In FY 97, the Synthetic Aperture Radar Target Recognition and Location System (STARLOS) AiTR effort for the Joint Precision Strike Demonstration (JPSD) Precision/Rapid counter Multiple Rocker Launcher (MRL) Advanced Concept Technology Demonstration (ACTD) was completed. This AiTR capability was successfully integrated in a ground control station and was successfully demonstrated against the North Korean 240 MRL threat. The STARLOS program is now actively involved in the adaptation of the STARLOS technology with the next generation sensors being procured for the Tactical Unmanned Aerial Vehicle (TUAV) program. The program direction is to utilize STARLOS technology to provide AiTR aids and processing capabilities that will enhance the Human Machine Interface and will alleviate the analytic requirements of the TUAV operator. This program is managed by Program Executive Officer-Intelligence, Electronic Warfare & Sensors, PM Tactical Endurance Synthetic Aperture Radar, with matrix support from Army Research Laboratory, Adelphi, MD and Night Vision and Electronic Sensors Directorate, Communications and Electronics Command (CECOM) Research & Development Engineering Center (RDEC), Fort Monmouth, NJ.

**FY 1998: Accomplishments:**

- 1219 - Adapted and integrated AiTR capabilities into the Multi-Sensor Testbed (MSTB) system for experiments/demonstrations with the Training & Doctrine Command Systems Manager Unmanned Aerial Vehicle (TSM UAV) and Battle Command Battle Lab (Fort Huachuca).
  - 325 - Upgraded MSTB and conducted data collection on a TUAV scenario target set.
  - 450 - Conducted experiment and demonstration with TSM UAV and Battle Labs on the incorporation of the AiTR capability into the TUAV system.
  - 131 - Investigated approaches on how to integrate AiTR technology with upcoming TUAV subsystems, i.e. the Multi-Mission Common Modular Unmanned Aerial Vehicle (UAV) Sensors Advanced Technology Demonstration (ATD) ((SAR & Electro Optical Infrared (EO/IR) Sensors)), the Tactical Control Station, the Data Link Programs and the TUAV platform.
- Total 2125

**FY 1999 Planned Program:**

- 438 - Continue the investigation on the utilization of a Common Aided Target Recognition (AiTR) capability and continue technical reviews with the Training & Doctrine Command Systems Manager Unmanned Aerial Vehicle (TSM UAV) and Battle Command Battle Lab (Fort Huachuca) on the incorporation of an AiTR solution for the Multi-Mission Common Modular Unmanned Aerial Vehicle (UAV) Sensors.
  - 12 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs..
- Total 450

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PROJECT <b>D546</b>		
<p><b>FY 2000 Planned Program:</b> Project not funded in FY 2000.</p> <p><b>FY 2001 Planned Program:</b> Project not funded in FY 2001.</p>		
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