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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2000			
BUDGET ACTIVITY 3 - Advanced Technology Development			PE NUMBER AND TITLE 0603734A Military Engineering Advanced Technology							
COST (In Thousands)	FY1999 Actual	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	16270	15762	5207	4725	2916	5009	5346	0	Continuing	
DT08 Combat Engineering Systems	2188	3746	5207	4725	2916	5009	5346	0	Continuing	
DT12 Rapid Terrain Visualization	14082	12016	0	0	0	0	0	0	50844	

**A. Mission Description and Budget Item Justification:** This program encompasses demonstrations of technologies that provide the capabilities required for the engineer and logistician to successfully plan, rehearse and execute missions in support of the commander and the force projection Army. Critical deficiencies exist in the Army's ability to rapidly acquire, update, maintain and distribute terrain data in support of both terrain and battlefield visualization; to apply physics-based reasoning to planning and executing mobility, counter-mobility, survivability, and general engineering missions; to conduct logistics-over-the-shore operations in adverse sea states; to establish in-transit visibility of materiel and supplies; and to manage logistics distribution and logistics automation. The demonstration projects in this program element focus on the technologies required to correct these critical deficiencies. Capabilities demonstrated will be applicable to missions at all echelons within the force structure during either combat operations or operations other than war. Demonstrations are integral components of Army Advanced Warfighting Experiments, Advanced Concept Technology Demonstrations, other Advanced Technology Demonstrations, and joint field training exercises. Emphasis is placed on rapid transition of technologies into Command and Control (C2) systems, combat/war models and simulations or simulators. This provides shared situational awareness, common representation of terrain and consistent predictions or assessments of mobility, counter-mobility, survivability, and logistics missions in the linkage of C2 systems, models, and simulations being developed by the Army to exploit information technologies. The work in this program element is consistent with the Army Science and Technology Master Plan, the Training and Doctrine Command (TRADOC) Battlefield Visualization Concept, the Office of the Deputy Chief of Staff, Operations (ODCSOPS) Battlefield Visualization Objectives, the Army Modernization Plan, and Project Reliance.

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<b>B. Program Change Summary</b>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget ( <u>FY 2000/2001</u> PB)	15523	15881	5240
Appropriated Value	15564	15881	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-41		
b. SBIR / STTR	-59		
c. Omnibus or Other Above Threshold Reductions		-64	
d. Below Threshold Reprogramming	+814		
e. Rescissions	-8	-55	
Adjustments to Budget Years Since <u>FY 2000/2001</u> PB			-33
Current Budget Submit ( <u>FY 2001PB</u> )	16270	15762	5207

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BUDGET ACTIVITY <b>3 - Advanced Technology Development</b>				PE NUMBER AND TITLE <b>0603734A Military Engineering Advanced Technology</b>				PROJECT <b>DT08</b>		
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost	
DT08 Combat Engineering Systems	2188	3746	5207	4725	2916	5009	5346	0	Continuing	
<p><b>Mission Description and Justification:</b> This project will demonstrate, at full scale, a capability to conduct logistics-over-the-shore (LOTS) operations at sea-state 3 (wave height – approx. 3 to 5 feet); this will greatly increase LOTS throughput of equipment and supplies from ship to shore, and significantly reduce the time and materials required to establish linkages between LOTS sites and the inland transportation infrastructure. Present LOTS operations are limited to sea-state 2 (wave height – approx. 1 to 3 feet) or less; this is an unacceptable limitation to force projection. A complete engineering design of a full-scale Rapidly Installed Breakwater System (RIBS) will be developed based on detailed engineering analyses, and laboratory and ¼-scale field tests. A full-scale demonstration of RIBS that reduces waves conditions from the lower range of sea-state 4 (wave height – approx. 5 to 8 feet) by 50 percent will be performed. Evaluations of the full-scale deployability, transportability, mooring loads, structural integrity, and potential of RIBS for storm survival will be conducted. The capability to rapidly, and with minimum logistics burdens and reduced engineer equipment, stabilize beach sands and soft soils for roads, material storage areas, heliports, and other horizontal operating surfaces associated with LOTS operations will be demonstrated. The work is performed by the U.S. Army Engineer Research and Development Center (ERDC). Note: Sea-state is a measure of wave height and frequency of maximum wave energy.</p> <p><b>FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 261 - Deployed ocean-scale RIBS and successfully collected data required for optimal RIBS design and mooring system; developed initial design for prototype RIBS. - Established mooring/anchoring load requirements for RIBS.</li> <li>• 1927 - Evaluated selected geo-materials for soft soil (beach) stabilization and surfacing. - Developed initial Integrated Logistics Barge design for RIBS and Roll-On/Roll- Off Discharge Facility deployment.</li> </ul> <p>Total 2188</p> <p><b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 3146 - Complete engineering design for full-scale rapidly installed breakwaters based on detailed engineering analyses, laboratory tests, and ocean scale field tests; provide the capability to rapidly stabilize beach sands with minimum logistics burdens and reduced engineer equipment .</li> <li>• 499 - Develop concept for RIBS Advanced Technology Demonstration (ATD) to include RIBS deployment and sandy beach field demonstration. - Complete field test of mid-scale final version ATD RIBS.</li> <li>• 101 - Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)</li> </ul> <p>Total 3746</p>										
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 3 - Advanced Technology Development				PE NUMBER AND TITLE 0603734A Military Engineering Advanced Technology				PROJECT DT12		
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost	
DT12 Rapid Terrain Visualization	14082	12016	0	0	0	0	0	0	50844	
<p><b>Mission Description and Justification:</b> The Rapid Terrain Visualization (RTV) Advanced Concept Technology Demonstration (ACTD) will develop the first airborne capability to rapidly generate (within ~72 hours) high-resolution digital terrain maps. This capability to rapidly generate digital terrain data does not exist today. These map products will include very high-resolution (10 meter, 3 meter, 1 meter) 3-D digital terrain elevation data and digital map features like roads, rivers and vegetation. Digital terrain products are the critical foundation for planning, rehearsing, targeting and executing modern warfare. The RTV ACTD will provide the first and only stand-alone digital terrain data collection and generation system to meet this critical warfighting requirement. This revolutionary all weather day/night system will reduce the timelines for delivery of digital maps from years to days and increase the accuracy and resolution of products by over 100%. This system will be based on a de Havilland DHC-7 aircraft, and will include a Light Detection and Ranging (LIDAR) Laser and an Interferometric Synthetic Aperture Radar (IFSAR). The aircraft will be deployed in FY01 to support a wide variety of XVIII Airborne Corps missions.</p> <p>This project is managed by the Joint Precision Strike Demonstration (JPSD) Project Office, Fort Belvoir, VA, Program Executive Office, Intelligence, Electronic Warfare and Sensors (PEO-IEW&amp;S), Fort Monmouth, NJ.</p> <p>Contractors include: Raytheon, Bedford, MA; SAIC, Rosslyn, VA; MRJ, Oakton, VA; TASC, McLean, VA; EO-IR Measurements, Spotsylvania, VA; and MTC, Shrewsbury, NJ. Participating government laboratories include: Topographic Engineering Center (TEC), Alexandria, VA; Army Research Laboratory, Adelphi, MD; Communications and Electronics Research, Development and Engineering Center, Ft. Monmouth, NJ, and Sandia National Laboratories, Albuquerque, NM.</p> <p><b>FY 1999 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• 6562 - Acquired and processed high-resolution digital elevation data set and commercial satellite imagery in direct support of XVIII Airborne Corps Warfighter Exercises (WFXs).             <ul style="list-style-type: none"> <li>- Exploited multi-spectral and radar imagery to accelerate the terrain feature extraction process using the prototype RTV database generation system.</li> </ul> </li> <li>• 7520 - Iteratively upgraded workstations and RTV software at XVIII Airborne Corps and III Corps.             <ul style="list-style-type: none"> <li>- Demonstrated RTV process in the Joint Integration and Evaluation Center (JIEC) at TEC, including capabilities for rapid elevation data collection and semi-automated extraction of feature data.</li> <li>- Extended selected RTV capabilities from XVIII Airborne Corps to selected III Corps elements for further user evaluation.</li> <li>- Completed modifications to deHavilland-7 Aircraft, including installation and integration of RTV Interferometric Synthetic Aperture Radar (IFSAR) sensor and onboard processing capability.</li> <li>- Conducted evaluation of sensor and products and collect "ground truth" for IFSAR data verification.</li> </ul> </li> </ul> <p>Total 14082</p>										
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<p><b>FY 2000 Planned Program:</b></p> <ul style="list-style-type: none"> <li>• 6058 - Complete integration and testing of high-resolution elevation data collection capability on DASH-7 aircraft. - Demonstrate integrated end-to-end RTV process.</li> <li>• 3782 - Acquire and process digital terrain data using DASH-7 aircraft collection platform and commercial satellite sources in direct support of XVIII Airborne Corps WFXs. - Extend RTV system upgrades and capabilities to topographic units within III Corps.</li> <li>• 1853 - Complete upgrade of workstations and software to objective capability in the IEC and XVIII Airborne Corps and evaluate in WFX.</li> <li>323 - Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)</li> </ul> <p>Total 12016</p> <p><b>FY 2001 Planned Program:</b> Project not funded in FY 2001.</p>		
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