

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602783A Computer and Software Technology	PROJECT DY10
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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
DY10 Computer and Information Science Technology	658	2170	5210	4012	4170	2291	2491	2610	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program element develops and applies information and communication technology to improve the performance and reduce the cost of Army tactical Command and Control (C2) systems and tactical embedded real-time systems. Efforts capitalize on computationally intensive approaches that exploit the rapidly evolving capabilities of emerging commercial computer technology. Focus is on providing general solutions that can be applied to a wide variety of C2 problems. Work in this program element is consistent with the resource constrained Army Science and Technology Master Plan, (ASTMP), the Army Modernization Plan and Project Reliance. This program is managed by the Army Research Laboratory (ARL). Research is concentrated in technologies that support command in a distributed environment and analysis tools that support the command process.

FY 1998 Accomplishments:

- 658 - Completed work on Virtual Hardware Development Language (VHDL) models developed in various communication modeling applications (ISDN Layers 1, 2, 3 and Tactical/Strategic Gateway according to MIL-STD-188-05). Seminal work led to complementary work in the Fed Lab (06011104.H50) and these products were transitioned to CECOM RDEC-SED (Software Engineering Directorate).
- Completed research for CAPS (Computer Aided Prototyping System). CAPS is an integrated software development environment aimed at rapidly prototyping real-time embedded software systems. CAPS was installed at the TACOM and MICOM RDECs.
- Participated and conducted research in NARA (National Archives and Records Administration) working group addressing creation, maintenance, and disposition of electronics records.

Total 658

FY 1999 Planned Program:

- 2121 - Develop initial distributed and collaborative group support environment that enables geographically separated commanders to collaborate in real-time and conduct battle planning, rehearsal and management tasks.
- Demonstrate initial collaborative tool set capability.
- Develop metrics to assess effectiveness of collaboration tools and environment.
- Develop network monitoring capability with commercial tools (e.g. OPNET) and build evaluation capability for tactical internet protocol.
- Investigate interfaces between information management and network management systems to support intelligent tuning of information distribution process.
- 49 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 2170

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<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 3810 - Conduct experiments on the initial distributed and collaborative group support environment in concert with Army Battle Labs. <ul style="list-style-type: none"> - Modify tool set capabilities based on experimental results. - Incorporate touchless interface tools to facilitate operations on the move (developed in Displays Fed Lab Program). - Incorporate course of action development and analysis tools (developed in Displays Fed Laboratory Program). - Incorporate low bandwidth Video TeleConferencing (VTC) technology (developed in Displays Fed Lab) to bring capability down to dismounted commander. - Develop techniques that will allow the army user to access internet protocol network management information on tactical wireless networks to determine the availability of bandwidth at any given time. Based on this data, develop active database triggering mechanisms that prioritize data packages to be sent. - Provide alternative approaches to Tactical Internet / Intranet routing protocol layer. - Transition and integrate technologies into CECOM's Cyber Command Post Program (CPP). • 1400 - Develop and demonstrate secure, internet-based mobile networking protocols to enable the ad hoc, peer-to-peer networking capability required for command on the move. <ul style="list-style-type: none"> - Demonstrate advanced anti-jam algorithms for mobile multiple access networks including adaptive rate source channel coding, interference avoidance techniques, and co-site mitigation. - Demonstrate agent-based vulnerability assessment techniques on wireless networks that automatically identify configuration errors. <p>Total 5210</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 2632 - Conduct Battle Lab experiments with second generation collaborative technologies and identify technology gaps. <ul style="list-style-type: none"> - Integrate intelligent agent technologies (research conducted in 0601102.H48). - Utilize planning metrics for display design (developed in Display Fed Lab) to enhance assimilation of information by commanders. - Measure and evaluate performance improvement of information management algorithms responding to network delay feedback. - Conduct experiment to empirically measure overhead due to intranet routing protocols and compare to simulation results. - Provide upgraded technology modules to CECOM's Cyber CPP. • 1380 - Develop and demonstrate advanced multicast mobile ad hoc networking protocols with interoperability with the fixed Internet, airborne routers, and satellite communications. <ul style="list-style-type: none"> - Demonstrate agent-based vulnerability assessment techniques on highly mobile networks that automatically identifies configuration and implementation errors. - Demonstrate advanced compression techniques for multimedia delivery over tactical networks including reliable layered Quality of Service (QOS)-capable video and information-hiding mechanisms for authentication. 		
Project DY10	Page 2 of 3 Pages	Exhibit R-2 (PE 0602783A)

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Total 4012

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	658	2185	3324	2217
Appropriated Value	679	2185		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-21	-15		
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+1886	+1795
Current Budget Submit (FY 2000 / 2001 PB)	658	2170	5210	4012

Change Summary Explanation: Funding – FY 2000 (+1948) and 2001 (+1854) - Funds added to enhance AAN-focused Science and Technology Objective (STO), Collaborative Technology for the Warfighter and to enable transition of products from the Advanced Telecommunications Federated Laboratory.

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