ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE
3 - Advanced technology development	**0603270A - EW TECHNOLOGY**

COST (In Thousands)		FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate
	Total Program Element (PE) Cost	28825	24367	11600	10867	14556	18244	21648
K15	ADVANCED COMM ECM DEMO	5169	6526	3495	2278	5558	8953	12168
K16	NON-COMMO ECM TECH DEM	8755	7220	8105	8589	8998	9291	9480
K19	MULTIPLE INTEL REMOTED SENSOR SYSTEM - BLK 1	12017	4666	0	0	0	0	0
K20	SHORTSTOP	2884	5955	0	0	0	0	0

A. Mission Description and Budget Item Justification: This Program Element (PE) matures and demonstrates multi-intelligence remote sensor technologies and electronic warfare (EW) systems in support of the Army's Objective Force commanders. It addresses the need to locate, disrupt or destroy the enemy's command, control, and communications (C3) systems and infrastructure. The goal of this PE is to significantly enhance the Objective Force's conduct of offensive operations to win the information war. Both non-communications and communications applications are addressed by this PE. It also looks at communications countermeasures (CM) and communications counter-countermeasures (CCM) applications. Project K15 provides technology demonstrations in CM, information collection and reporting to transition to Army intelligence and electronic warfare (IEW) systems. This transformation will be accomplished through a phased improvement process. This project also supports demonstrations of automatic/automated fusion of intelligence, information, and data from multiple sources. Project K16 focuses on the feasibility and effectiveness of non-communications Electronic Countermeasures (ECM) and electronic support/electronic intelligence. This project provides self-protection from radar, electro-optical (EO), and infrared (IR) guided anti-aircraft artillery, surface-to-surface missiles, artillery, and top attack weapons. Further, it provides precise targeting information on non-communications emitters. Technologies developed and matured as part of this PE will be demonstrated in the integrated situation awareness (SA) and targeting advanced technology demonstration (ATD), and the integrated counter measures platform survivability effort. This work is consistent with the Army Science and Technology Master Plan, the Army Modernization Plan, Project Reliance, and the tri-service reliance agreements on EW. This system supports the Objective Force transition path of the TCP.

B. Program Change Summary	FY 2001	FY 2002	FY 2003
President's Budget (FY2002 PB)	30575	13868	11185
Appropriated Value	30859	24568	0
Adjustments to Appropriated Value	0	0	0
a. Congressional General Reductions	0	-201	0
b. SBIR / STTR	-840	0	0
c. Omnibus or Other Above Threshold Reductions	0	0	0
d. Below Threshold Reprogramming	-910	0	0
e. Rescissions	-284	0	0
Adjustments to Budget Years Since FY2002 PB	0	0	415
Current Budget Submit (FY 2003 PB)	28825	24367	11600

Change Summary Explanation: Funding: FY 2002 - Congressional adds were made for Multi-functional Intelligence and Remote Sensor System, Project K19 ($4700); and Shortstop Electronic Protection System, Project K20, ($6000)

Projects With No R-2A:
- Project K19 ($4700): The objective of this one-year Congressional add is to mature tactical communications, power management, sensor design, advanced processing techniques and methods of sensor delivery/emplacement for technology insertion into Multi-functional Intelligence and Remote Sensor System. No additional funding is required to complete this project.
- Project K20 ($6000): The objective of this one year Congressional add is to perform threat analysis, architecture analysis, prototype hardware and software development, implementation, and test/evaluation to expand the Shortstop Electronic Protection System technology, capability and performance to include the selective disruption and usage denial of modern communication devices, in specific environments for specific duration. No additional funding is required to complete this project.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603270A - EW TECHNOLOGY**	**K15**

COST (In Thousands)		FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate
K15	ADVANCED COMM ECM DEMO	5169	6526	3495	2278	5558	8953	12168

A. Mission Description and Budget Item Justification: This project improves the Objective Force's ability to conduct uninterrupted air and ground based intelligence collection and targeting operations in a hostile electromagnetic environment. Recent operations have re-enforced the necessity for timely and accurate gathering and dissemination of information and intelligence. This project provides flexible, modern systems to achieve information dominance, protect the force and shape the battlespace. It also investigates, researches, and demonstrates communications CM and CCM technologies to first intercept, identify, and locate tactical communications and then manipulate threat computer networks and their components. It demonstrates electronic attack products that have the ability to disrupt, deny, degrade or destroy computer networks and resident information/data. Knowledge gained will also be used to assess the vulnerability of US/friendly systems to cyber-attack and to develop protection capabilities. This program supports the Objective Force transition path of the TCP.

FY 2001 Accomplishments:

- 1462
  - Integrated a wide-band, conformal antenna and specific emitter identification technology into advanced CM and intelligence collection models, prototype inserted in tactical software radio testbed.
  - Performed battle lab simulation experiments to refine operational concepts and improve signal mapping, visualization, and analysis tools for Future Combat Systems (FCS).
  - Demonstrated a multi-function RF collector prototype to search for, intercept, identify and locate low-power threat emitters.
- 3707
  - Provided Objective Force with information operation capability to detect and recognize threat computers and resident information.
  - Provided a stealthy information operation capability to disrupt, deny, degrade or destroy information resident in threat computers or computer networks.
  - Designed and conducted distributed simulation experiments to support development efforts and training for integrated command and control (C2), protect and attack capabilities. Demonstrated in a field test for the digitized division.
  - Provided results/recommendations to Program Executive Officer (PEO) Command, Control and Communications Systems and PEO Intelligence, Electronic Warfare and Sensors.
  - Jointly developed a transition and integration plan.

Total 5169

FY 2002 Planned Program

- 1141 - Demonstrate the ability to protect the Army's tactical information systems by evaluating the effectiveness of attack tools against protection mechanisms in a laboratory demonstration. Validate the successful attainment of Tactical C2 Protect ATD exit criteria.
- 3335 - Demonstrate and evaluate the multi-function electronic collection and mapping system in a simulation model that reflects the FCS environment.
- 2050 - Complete tools for automated intelligence support system mission planning and military intelligence (MI) asset management tools.
  - Complete antenna pattern test system mission planning tools for joint intelligence, surveillance, and reconnaissance (JISR) advance concept technology development (ACTD).
  - Complete terrain reasoning tools for JISR ACTD.

Total 6526

FY 2003 Planned Program

- 2771 - Integrate advanced intelligence web applications into existing brigade intelligence systems to enhance situation awareness.
- 724 - Demonstrate warfighter RF collection system on surrogate Objective Force platforms.

Total 3495

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February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603270A - EW TECHNOLOGY**	**K16**

COST (In Thousands)		FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate
K16	NON-COMMO ECM TECH DEM	8755	7220	8105	8589	8998	9291	9480

A. Mission Description and Budget Item Justification: This project researches and demonstrates the Army's Objective Force non-communications Electronic Warfare sensors counter reconnaissance deception and CM technologies. The intent of this project is to provide Army aviation and ground vehicles with full dimensional protection using an integrated multi-spectral suite of precision warning sensors and countermeasures. This project demonstrates the feasibility and utility of these technologies to provide area and self-protection against optical, EO, IR and radar threats. The project will demonstrate integrated multi-spectral radar, laser and IR precision emitter location warning sensors. It will develop and demonstrate CM to provide Army aircraft and ground vehicles with full spectrum protection against advanced surface-to-air and anti-tank guided missiles to include integrated air defense systems. Additionally, this project will demonstrate a non-traditional use of electronic combat systems to provide precision targeting, combat identification, and real time SA updates. It also demonstrates the non-traditional use of standard equipment like a radio to perform another function, such as RF collection of threat emissions. This program supports the Objective Force transition path of the TCP.

FY 2001 Accomplishments:

- 7250
  - Conducted distributed interactive simulation (DIS) experiments with aviation and ground users to evaluate integrated sensors and targeting functions, then defined demonstration scenarios and performance measures.
  - Completed development of compact, multi-wavelength missile warning sensor modules.
  - Continued development of data fusion software and circuit card modules that located and identified missile launches, radars, laser designators, laser range finders and laser beamriders.
  - Completed the development of data fusion software modules that generate SA displays and messages, and select and manage threat-specific countermeasure responses.
  - Incrementally inserted integrated situation awareness and targeting (ISAT) modules into a systems integration testbed and conducted hardware-in-the-loop simulation and testing to verify end-to-end functionality.
  - Completed development of precision angle of arrival laser warning sensor.
- 1505
  - Developed and tested component technologies for an integrated countermeasures capability.

FY 2001 Accomplishments: (Continued)

- Integrated and tested Defense Advanced Research Projects Agency (DARPA) and Army Research Laboratory (ARL) microwave and millimeter wave power modules which reduce transmitter weight and increase reliability and jamming power output.

Total 8755

FY 2002 Planned Program

- 5381 - Conduct DIS to evaluate ISAT feeds into the Joint Intelligence, Surveillance and Reconnaissance (JISR) Advanced Concept Technology Demonstrations (ACTD).
- Integrate ISAT hardware and software in a UH-60 (Black Hawk) test aircraft.
- Demonstrate through flight testing the overall ISAT capabilities in regard to exit criteria capability and transition the ISAT technologies to Program Executive Officer-Aviation.
- 1839 - Integrate and test integrated countermeasures capabilities in a ground vehicle.
- Field test millimeter wave electronic countermeasures live fire top attack fuze jamming and deception of battlefield surveillance radars.

Total 7220

FY 2003 Planned Program

- 2755 - Complete anti-tank guided missile (ATGM), surface-to-air missile and anti-aircraft artillery modeling and simulation.
- Integrate ground vehicle missile warning sensors with IR jammers for use against ATGMs with RF counter reconnaissance deception and jammer subsystems for use against surveillance radars and top attack munitions.
- 4075 - Demonstrate in a field test, RF collection system on surrogate RF radio platform to detect and geo-locate enemy's close battle, low power tactical communications.
- Demonstrate ability of radios to network and pass threat situation awareness information to Battle Command Brigade and Below and JISR in under two minutes.
- Demonstrate electronic mapping at vehicle, company and JISR levels.
- Transition to Program Manager (PM) Prophet and PM Aerial Common Sensor (ACS).

FY 2003 Planned Program (Continued)

•	1275	- Perform final experiment to demonstrate data correlation, cueing, complete mission planning, and analysis tools. - Correlate imagery intelligence, human intelligence and signals intelligence into human centered decision making formats that can be quickly used at levels from combat vehicle to division commander. - Transition to JISR ACTD, PM Prophet and PM ACS.
Total	8105	