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

June 2001

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - ENG MANUFACTURING DEV	**0604280A - Joint Tactical Radio System**	**162**

COST (In Thousands)		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
162	JOINT TACTICAL RADIO SYSTEM	35537	61648	80449	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

PLEASE NOTE: This administration has not addressed FY2003-2007 requirements. All FY 2003-2007 budget estimates included in this book are notional only and subject to change.

The mission of the Joint Tactical Radio System (JTRS) Joint Program Office (JPO) is to develop an open standard Software Communications Architecture (SCA) and software waveforms that will enable the Services to acquire a family of affordable, scaleable, high-capacity, interoperable Line of Sight (LOS) and Beyond Line of Sight (BLOS) radios. The Army is the Executive Service for this joint program. The singular functionality of current stovepipe systems lacks the connectivity and throughput capacity to support required simultaneous networked voice, video, and data operations with low probability of intercept over multiple frequency bands. Each unique current radio system requires significant allocation of space, weight, power, and cooling on weapons systems platforms, and has a costly logistics infrastructure. These inadequacies are addressed in the revised JTRS Operational Requirements Document (ORD), dated 30 January 2001. The JROC validated the revised ORD on 01 March 2001. In addition to addressing the problems associated with stovepipe radios, the JTRS program will provide a significant increase in capability while providing a solid foundation for interoperability, and for achieving network connectivity across the RF spectrum. This program element is continuing to incorporate Industry-recommended, validated changes to the evolving SCA through hardware prototypes and software waveforms developed by multiple vendors. This program element will also develop a set of software-based waveforms, as described in the ORD, and provide a certification infrastructure for compliance testing of all hardware and software products. The program element also provides a path for advancing technology, including software crypto algorithms, and resolving problems unique to the military environment. The open standards based SCA will provide the path for future hardware and software growth of delivered systems by allowing the Services to take advantage of advances in technology being driven by the commercial wireless communications marketplace. The overall JTRS program will provide software programmable and hardware configurable digital radio systems that demonstrate increased interoperability, flexibility and adaptability. JTRS will provide the operational forces with an upgraded communications capability for more effective battlespace management and interoperability among Command, Control, Communications, Computers and Intelligence (C4I) Systems supporting the warfighters' goal of realizing a fully digitized battlespace. A Defense Acquisition Executive Memorandum dated February 12, 2001 also tasks the JTRS JPO with responsibility for oversight of all DoD radio acquisitions to ensure JTRS interoperability, and with pursuing the goal of SCA acceptance as an international standard.

This system supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

FY 2000 Accomplishments

FY 2000 Accomplishments (Continued)

- 28257 Validated SCA, through Step 2A Consortium and Step 2B third-party validation efforts (see Acquisition Strategy, paragraph D), using prototype hardware and software waveforms built to SCA documentation. Initiated architecture disputes resolution process. Planned for post-Defense Acquisition Executive (DAE) review program implementation. Conducted market survey.
- 4788 Continued JPO technical support, including systems engineering, spectrum allocation and approval for use, and systems security engineering, in support of SCA activities.
- 2492 Continued JPO program support, including administration, program management, legal, contracting, budget execution and cost estimating activities.

Total 35537

FY 2001 Planned Program

- 9987 Maintain and evolve the SCA (see Acquisition Strategy, paragraph D).
- 31486 Begin acquisition of waveforms listed in JTRS ORD. Initiate waveform testing; develop crypto algorithm software.
- 5711 Provide for technology advancement and problem resolution, to include areas such as multiple independent levels of security (MILS), multilevel security (MLS), and network security.
- 5845 Implement hardware and software waveform certification process (SCA compliance testing).
- 4170 Continue JPO technical support, including waveform development, systems engineering, spectrum allocation and approval for use, systems security engineering and problem resolution and support of SCA activities. Provide technical guidance to Service program management offices (PMOs). Provide oversight for all DoD radio acquisitions and international cooperative efforts to ensure JTRS interoperability.
- 2616 Continue JPO program support, including administration, program management, legal, contracting, budget execution and cost estimating activities.
- 1833 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Program.

Total 61648

FY 2002 Planned Program

- 3900 Maintain and evolve the SCA.
- 53030 Continue acquisition of waveforms listed in JTRS ORD, including significant efforts associated with development of complex waveforms initiated in FY01. Continue waveform testing and development of crypto algorithm software. Begin waveform sustainment engineering activities.
- 7500 Continue technology advancement and problem resolution, to include areas such as multiple independent levels of security (MILS), multilevel security (MLS), and network security.
- 6300 Continue hardware and software waveform certification process (SCA compliance testing).

FY 2002 Planned Program (Continued)

- 6289 Continue JPO technical support, including waveform development, systems engineering, spectrum allocation and approval for use, systems security engineering and problem resolution and support of SCA activities. Provide technical guidance to Service PMOs. Provide oversight for all DoD radio acquisitions and international cooperative efforts to ensure JTRS interoperability.
- 3430 Continue JPO program support, including administration, program management, legal, contracting, budget execution, and cost estimating activities.

Total 80449

B. Program Change Summary	FY 2000	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY2001 PB)	36520	62218	80065	0
Appropriated Value	36797	62218	0	0
Adjustments to Appropriated Value	0	0	0	0
a. Congressional General Reductions	0	0	0	0
b. SBIR / STTR	-983	0	0	0
c. Omnibus or Other Above Threshold Reductions	-150	0	0	0
d. Below Threshold Reprogramming	0	0	0	0
e. Rescissions	-127	-570	0	0
Adjustments to Budget Years Since FY2001 PB	0	0	384	0
Current Budget Submit (FY 2002/2003 PB)	35260	61648	80449	0

C. Other Program Funding Summary	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
RDTE, 0604805A, D615 JTRS Ground Domain	5836	28281	79034	0	0	0	0	0	0	0
RDTE, 0603713A, D370, JTRS Army, Block I PJH-PLRS/JTIDS HYB	3724	17	0	0	0	0	0	0	0	0
OPA, Army, Army Data Distribution System (ADDS), BU 1400/JTRS	0	0	0	0	0	0	0	0	0	0

D. Acquisition Strategy: The JTRS development strategy consists of a three-step process. Step 1 resulted in a baseline architecture definition. Step 2 includes Step 2A, Step 2B, and Step 2C. Step 3 requires the Services perform acquisition, integration, testing, fielding and training activities.
Step 3 activities have begun following the successful DAE review. The Services will perform acquisition, integration, testing, fielding and training activities.

In Step 2A, a four-company Consortium (Raytheon, ITT, Rockwell-Collins, and BAE) developed the architecture and validated it as the Software Communications Architecture (SCA). SCA Version 2.0 was finalized and published on the JTRS JPO Webpage in December 2000. In Step 2B, other companies are providing additional third-party validation. The validation process uses hardware prototypes and an initial set of software-based waveforms. Step 2C, which is funded and managed by PM TRCS, also is a prototyping activity to validate the SCA. Step 2C will demonstrate that the SCA supports JTRS networking requirements. Concurrently with validation activities, the Joint Program Office (JPO) also conducted a market survey, which benchmarked industry capabilities with respect to the architecture.

A Defense Acquisition Executive (DAE) review was held on October 30, 2000. On February 12, 2001, the DAE signed a memorandum that approved the proposed JTRS management concept and acquisition approach, including the concept of independent but cohesive waveform application development (by the JPO) and hardware development (by the Services). The memo also directed the JPO to provide oversight for all radio acquisitions to ensure JTRS interoperability, and directed that individual radio programs will be grouped in "clusters" based on their similarity of application and the timeframe required for fielding.

The JPO will continue to maintain and evolve the SCA, acquire waveforms listed in the ORD, and address technology advancement and problem resolution issues. The JPO will provide certification of JTRS SCA compliance for acquired systems and waveforms.

The SCA is expected to become the government and industry standard for software radios.

As such, it will be the basis for acquiring future Department of Defense (DoD) software radios. In late FY01, the SCA initially will be submitted to an international standards body. During FY02/03, the JPO will manage the acceptance process for the government, while continuing configuration management and evolution of the SCA. After acceptance of the SCA as the software radio standard, the JPO's role will be to participate in the standards body activities and maintain the military addenda to the SCA.

E. Schedule Profile	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Begin Architecture Development and Validation	1Q			0	0	0	0	0
Deliver Version 1.0 of SCA	3Q			0	0	0	0	0
Consortium Prototypes and Required Waveforms Available to Begin Validation Process	3Q			0	0	0	0	0
Conduct Market Survey	4Q			0	0	0	0	0
Complete Step 2A Consortium SCA Validation with Waveforms and Prototypes		1Q		0	0	0	0	0
Deliver Version 2.0 of SCA		1Q		0	0	0	0	0
DAE Review		1Q		0	0	0	0	0
Acquire ORD Waveforms		3-4Q	1-4Q	0	0	0	0	0
Maintain and Evolve SCA		1-4Q	1-4Q	0	0	0	0	0
Address Technology Advancement Issues and Problem Resolution		3-4Q	1-4Q	0	0	0	0	0
Provide Certification of JTRS SCA Compliance for Acquired Systems and Waveforms		2-4Q	1-4Q	0	0	0	0	0
Provide Waveform Sustainment Engineering			1-4Q	0	0	0	0	0

NOTE: All milestones scheduled through 1Q FY2001 have been accomplished.

ARMY RDT&E COST ANALYSIS(R-3)

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Architecture Development and Validation; Maintain & Evolve SCA*	Other Trans Agreements (OTA); Various	Step 1: Various (3 Consortia) ; Step 2A: Raytheon Consortium ; Step 2B: Various (7 OTAs)	43257	9987	1Q	3900	2Q	0	0	0	0	Continue
b . Waveform Development, Test; Crypto S/W; Waveform Sustainment Engineering	Waveform Dev: TBD; Test, Crypto: OTA	Waveform Dev: TBD; Test SW: Aeronix; Crypto: Raytheon; Other: TBD	0	31486	2-3Q	53030	1-3Q	0	0	0	0	Continue
c . Certification Infrastructure (SCA Compliance Testing)	Initial contracts: OTA; Others:TBD	Initial contracts: Raytheon; Others: TBD	0	5845	2Q	6300	1Q	0	0	0	0	Continue
d . Technology Advancement/Problem Resolution	TBD	TBD	0	5711	3Q	7500	1Q	0	0	0	0	Continue
Subtotal:			43257	53029		70730		0		0	0	Continue

Remarks: * Step 2C activities funded in Army
Program Element 0604805A;
Managed by PM TRCS.

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II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . FFRDC - MITRE and Other contracted Technical Support	FFP	Various	10540	4170	1-3Q	6289	1-3Q	0	0	0	0	Continue
Subtotal:			10540	4170		6289		0		0	0	Continue

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . N/A*	N/A	N/A	0	0		0		0	0	0	0	0
Subtotal:			0	0		0		0		0	0	0

Remarks: *System and operational testing performed by the Services; funded in Service appropriations.

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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Support	Various	Various	6145	2616	1-3Q	3430	1-3Q	0	0	0	0	Continue
b . Other (SBIR/STTR)			0	1833		0		0	0	0	0	Continue
Subtotal:			6145	4449		3430		0		0	0	Continue
Project Total Cost:			59942	61648		80449		0		0	0	Continue