FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603114N
PROGRAM ELEMENT TITLE: Power Projection Advanced Technology

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE
R2911 Power Projection Advanced Technology	**	**	76,410

**The Science and Technology Program Elements (PEs) were restructured in FY 2002. The work described in FY 2000 & 2001 was funded in PEs 0603238N, 0603792N and 0603217N.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program includes RDT&E,N funds to develop and demonstrate advanced technologies for naval weapon systems, including Electric Warship and Directed Energy, which provide enhanced lethality and enable new capabilities for locating, identifying and killing high-value, short-dwell military ground and undersea targets, and suppression of enemy defenses. These technologies will include those that minimize exposure of naval personnel to lethal fire (autonomous vehicles), reduce the total ownership cost of systems, and provide responsive/cost effective high speed sealift.

In support of this overall mission the following specific areas are included:

The specific mission of Time Critical Strike integrates surveillance, indications and warnings, target identification, targeting, fire order generation and dissemination, engagement and kill mechanisms, and damage assessment processes to address critical mobile targets, urban targets, short dwell targets and deeply buried targets. Time Critical Strike must address time sensitive targets in complex urban areas over crowded skies shared with civilian commercial and neutral country aircraft. A common, shared picture is required to enable distributed collaborative planning. Unmanned combat air vehicles will be investigated to effectively and affordably prosecute Strike and surveillance missions. The fusion contained within this picture should include all source data (raw as well as processed from organic, theater, and

national sensors). The approach must be responsive in that it can quickly process and disseminate organic data from platforms. Additionally, it must be unambiguous–for instance, uncertainty in a track should be properly

portrayed to the users. Intelligence processing, execution speed, command decisions, and accuracy of strike are in constant tension.

The autonomous operations program aims to enhance the mission capability of Naval forces by developing technologies that will dramatically increase the autonomy, performance, and affordability of Naval organic unmanned vehicle systems. These efforts are focused in four areas: Unmanned Ground Vehicles (UGV) which focuses on the increasing utility of UGV systems to Marine Corps units in all environments but specifically in urban and littoral terrain; Unmanned Air Vehicles (UAV) which includes intelligent reasoning for autonomy, technologies to enhance “see and avoid” capabilities, object identification, vehicle awareness, and vehicle and mission management; Unmanned Undersea Vehicles (UUV) which will demonstrate the technical feasibility for a UUV system to effectively search, detect, track and trail undersea threats while maintaining a robust communications link to enable appropriate command, control and transmission of collected data; and UAV Propulsion: which will develop propulsion and power technologies unique to Naval UAVs operating on surface combatants. The project is related to on-going projects such as the Integrated High Performance Turbine Engine Technology program.

In addition specific technology efforts are associated with affordability, reduction of total ownership costs for power projection systems, and cost effective high speed sealift.

Due to the number of efforts in this PE, the programs described are representative of the work included in this PE.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is budgeted within the ADVANCED TECHNOLOGY DEMONSTRATION BUDGET ACTIVITY because it encompasses design, development, simulation, or experimental testing of prototype hardware to validate technological feasibility and utility, and reduce technological risk prior to initiation of a new acquisition program or transition to an ongoing acquisition program.

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(U) PROGRAMS PLANS AND ACCOMPLISHMENTS:

Time Critical Strike	FY00	FY01	FY02 $50,610
Initiate			▪ Naval-Unmanned Combat Air Vehicle (UCAV-N) Phase II: Development of UCAV-N advanced technology demonstrator system • UCAV-N Phase II: Refine System Plans and Designs initially developed in 6.2 program. Conduct sub-system development and test leading to prototype demonstration ▪ Real Time Execution Decision Support System (REDS): Develop software methods for collaborative planning, options generation, and mission target folder generation

Initiate			▪ Analysis of seeker alternatives and mission need assessment for a next generation mid-range, ship launched, precision strike weapon ▪ Low Cost Terminal Seeker Trade study of seeker, processor, and weapon interface in accordance with concept study and performance requirements ▪ Image Analysis Survey and develop methods for target exploitation in image and video streams ▪ Develop chemical and mechanical processes for low cost Fiber Optic Gyroscope inertial measurement unit fabrication ▪ Integration studies of an advanced dual mode anti-radiation missile seeker incorporating a balljoint gimbals into a ramjet-powered missile airframe for a flight test demonstration of seeker Anti-Radiation Missiles effectiveness at high speed ▪ Hyper-spectral Imaging System : Develop rugged, high through-put

			Infra-Red Spectrometer, optical train analysis, select position/pointing system reference, and enhance detect algorithms for real time processor
Continue	▪ High speed, gun launched, barrage round projectile demonstration program, gun launch of high velocity, unguided flight test vehicle to range (>40nmi) and preliminary lethal mechanism tests supporting Marine Corps Volume of Fire Requirements	▪ High speed, gun launched, barrage round projectile demonstration program, high-g testing of critical electronic guidance components and structural components. Analysis/simulation of projectile system lethality in support of Marine Corps Volume of Fire Requirements	
Complete			▪ Complete flight test demonstration of a high speed gun launched barrage round to measure flight time and distance, guidance package accuracy, and fleechette lethality

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Autonomous Vehicles	FY00	FY01	FY02 $17,700
Initiate			▪ Develop self-awareness sensors to enable adaptation and independent action for detection (threats, terrain), display, and decision ▪ Design definition and risk reduction for intelligent vehicle self-management and fault tolerance targeting concepts ▪ Design and develop advanced propulsion system for reliable UAV systems ▪ Design and develop mobility UGV testbed for platform, sensor, and command & control sub-systems ▪ Integrate and Demonstrate UUV technologies supporting Maritime Intelligence, Surveillance, Reconnaissance missions ▪ Demonstration of reconfigurable network technology for multiple mobile UUV and stationary nodes in shallow water

Initiate			▪ UUV-Development of acoustic and Radio Frequency communications for mobile and stationary nodes ▪ UUV-Development of low rate, long endurance power sources and precision navigation methods for undersea vehicles
Continue	▪ ADVANCED LINEAR MOTOR TECHNOLOGY Advanced Technology Demonstration to demonstrate the use of a linear motor for shipboard recovery of naval aircraft	▪ ADVANCED LINEAR MOTOR TECHNOLOGY-Develop demonstration system design and conduct critical component testing	

Complete			▪ ADVANCED LINEAR MOTOR TECHNOLOGY ATD-Complete fabrication of demonstration system. Demonstrate single sided portion of linear motor recovery system w/simulated aircraft recovery loading
Total Ownership Costs	FY00	FY01	FY02 $8,100
Initiate		▪ Finalize reconfigurable rotor blade system requirements and conduct concept trades ▪ Initiate development of a prototype ¼-scale Shaped Memory Alloy actuator	• Evaluation / assessment of High Speed Sealift Vehicle.
Continue	• Develop and flight demo enhanced air platform	• Develop and flight demo enhanced air platform	▪ Develop and flight demo enhanced air platform operational

	operational capability	operational capability	capability ▪ Design and build of a ¼-scale model actuator and blade assembly continue with manual lock for reconfigurable rotor blade program to enhance the affordability and mission effectiveness of tilt-rotor and rotary wing aircraft. Conduct preliminary bench test.
Complete			▪ Reconfigurable rotor blade system requirements and concept trade studies

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(U) PROGRAM CHANGE FOR TOTAL PE:

	FY 2000	FY 2001	FY 2002
FY 2001 President's Budget			0
Adjustments from FY 2001 President's Budget:			
Program Adjustment			+9,918
PE Restructure			66,504
Non-Pay Adjustment			+97
NWCF Adjustment			-109
FY 2002 President's Submission	**	**	76,410

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(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Not Applicable
(U) Schedule: Not Applicable

(U) OTHER PROGRAM FUNDING SUMMARY:

(U) NAVY RELATED RDT&E:
(U) 0602114N Power Projection Applied Research
(U) 0603236N Warfighter Sustainment Advanced Technology
(U) 0602435N Ocean and Atmospheric Technology
(U) 0603782N Mine and Expeditionary Warfare Technology

(U) NON NAVY RELATED RDT&E:
(U) Not Applicable

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(U) SCHEDULE PROFILE: Not Applicable.