FY 2003 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2002

BUDGET ACTIVITY: 3

PROGRAM ELEMENT: 0603747N
PROGRAM ELEMENT TITLE: UNDERSEA WARFARE ADVANCED TECHNOLOGY

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X1933 Air Anti-submarine Warfare	10,148	0	0	0	0	0	0	0	179,556
R2142 Undersea Warfare Concepts	28,965	0	0	0	0	0	0	0	175,534
R2267 USW Weapons Advanced Technology	12,532	0	0	0	0	0	0	0	44,477
R2844 Magnetrestrictive Transduction	2,417	2,081	0	0	0	0	0	0	4,498
R2845 Prototype Multi-Function Radar	2,899	0	0	0	0	0	0	0	2,899
R2846 Low Frequency Broadband Acoustic Airgun Source	2,899	0	0	0	0	0	0	0	2,899
R2916/Undersea Warfare Advanced Technology	**	55,805	40,125	40,966	39,258	45,956	50,094	CONT.	CONT.
R9033/Multipulse Airgun System	0	1,289	0	0	0	0	0	0	1,289
TOTAL	59,860	59,175	40,125	40,966	39,258	45,956	50,094	CONT.	CONT.

** In FY01, efforts under project R2916 were executed under projects X1933, R2142 and R2267.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: All Navy advanced technology development in undersea target detection, classification, localization, tracking and neutralization is funded through this Program Element (PE). In countering the proliferation of quiet diesel submarines to third world countries and Russia's continued heavy investment in submarine technology, work within this PE provides an enabling capability for power projection and force sustainability. This approach protects the country's capital investment in surveillance, submarine, surface ship and air Anti-Submarine Warfare (ASW) assets by exploring those high risk/high payoff technologies that promise to provide capabilities of exceptionally high military value in three to five years. Emphasis is on development of fieldable prototypes, components and systems necessary to demonstrate and validate concepts and techniques previously developed in

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Basic and Applies Research, or developed and suggested by industry, academia, or military research laboratories/agencies. These technology options include advanced research in the following areas:

- Improving reliable undersea target detection and tracking to enable on-command application of precision offensive military force. Programs include undersea sensors and arrays to provide robust shallow water (SW) surveillance and reconnaissance, and to detect undersea threats to the surface battleforce.
- Dominating the undersea battlespace to enable timely execution of joint/combined operations and to ensure joint force sustainability. Programs include advanced sensors and arrays for both improved ASW surveillance and enhanced battleforce self-defense, ASW data fusion for better tactical control, and low frequency active sonar and rapidly deployable surveillance systems for covert/non-covert indication and warning.
- Improving reliable undersea target detection and tracking, thus enabling joint battleforce sustainability. Programs include the entire spectrum of technology development undertaken in support of the Littoral ASW (LASW) Future Naval Capability (FNC).
- Improving undersea weapons effectiveness while reducing overall costs through improvements to current systems as well as the development of new weapons concepts. The goal of Undersea Weaponry is to produce cost effective, quick reaction intelligent weapons incorporating broadband processing with battlegroup connectivity, intelligent countermeasures, hard kill torpedo defense, improved littoral operation, and weapon flexibility. Several S&T challenges must be addressed including cluttered operating environments, multipath acoustic propagation, low/no doppler targets, detonation physics, high density power sources, and fusing/safety/arming mechanics. The technology developed under this project will be transitioned to the acquisition community for incorporation into existing platforms. For a complete picture of these efforts, see also PE 0602747N. These efforts support the LASW and Platform Protection FNCs.

(U) The Navy S&T program includes projects that focus on or have attributes that enhance the affordability of warfighting systems.

(U) While the program addresses technical issues associated with a broad range of high interest operational areas, the emphasis is on SW environments

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

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

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PROGRAM ELEMENT: 0603747N
PROGRAM ELEMENT TITLE: UNDERSEA WARFARE ADVANCED TECHNOLOGY

B. (U) PROGRAM CHANGE SUMMARY:

	FY 2001	FY 2002	FY 2003
FY 2002 President's Budget	66,182	56,303	
Adjustments from FY 2002 President's Budget:			
Congressional Plus-up		+3,400	
Section 8123 Management Reform Initiative		-528	
Execution Adjustment	-4,103		
SBIR/STTR ADJ	-2,219		
FY 2003 President’s Submission	59,860	59,175	40,125

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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603747N
PROGRAM ELEMENT TITLE: UNDERSEA WARFARE ADVANCED TECHNOLOGY

PROJECT NUMBER & TITLE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R2916/Undersea Warfare Advanced Technology	**	56,303	40,663	40,739	39,542	46,366	50,622	CONT.	CONT.

In FY01, efforts under project R2916 were executed under projects X1933, R2142 and R2267.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) JUSTIFICATION FOR BUDGET ACTIVITY: All Navy advanced technology development in undersea target detection, classification, localization, tracking and neutralization is funded through this project. In countering the proliferation of quiet diesel submarines to third world countries and Russia's continued heavy investment in submarine technology, work within this project provides an enabling capability for power projection and force sustainability. This approach protects the country's capital investment in surveillance, submarine, surface ship and air Anti-Submarine Warfare (ASW) assets by exploring those high risk/high payoff technologies that promise to provide capabilities of exceptionally high military value in three to five years. Emphasis is on development of fieldable prototypes, components and systems necessary to demonstrate and validate concepts and techniques previously developed in 6.1 and 6.2, or developed and suggested by industry, academia, or military research laboratories/agencies. These technology options include advanced research in the following areas:

- Improving reliable undersea target detection and tracking to enable on-command application of precision offensive military force. Programs include undersea sensors and arrays to provide robust shallow water (SW) surveillance and reconnaissance, and to detect undersea threats to the surface battleforce.
- Dominating the undersea battlespace to enable timely execution of joint/combined operations and to ensure joint force sustainability. Programs include advanced sensors and arrays for both improved ASW surveillance and enhanced battleforce self-defense, ASW data fusion for better tactical control, and low frequency active sonar and rapidly deployable surveillance systems for covert/non-covert indication and warning.

FY 2003 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2002

BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603747N PROGRAM ELEMENT TITLE: Undersea Warfare Advanced Technology PROJECT NUMBER: R2916 PROJECT TITLE: Undersea Warfare Advanced Technology

- Improving reliable undersea target detection and tracking, thus enabling joint battleforce sustainability. Programs include the entire spectrum of technology development undertaken in support of the Littoral ASW (LASW) Future Naval Capability (FNC).
- Improving undersea weapons effectiveness while reducing overall costs through improvements to current systems as well as the development of new weapons concepts. The goal of Undersea Weaponry is to produce cost effective, quick reaction intelligent weapons incorporating broadband processing with battlegroup connectivity, intelligent countermeasures, hard kill torpedo defense, improved littoral operation, and weapon flexibility. Several S&T challenges must be addressed including cluttered operating environments, multipath acoustic propagation, low/no doppler targets, detonation physics, high-density power sources, and fusing/safety/arming mechanics. The technology developed under this project will be transitioned to the acquisition community for incorporation into existing platforms. For a complete picture of these efforts, see also PE 0602747N. These efforts support the LASW (ASW), Autonomous Operations, and Platform Protection FNC.

(U) While the program addresses technical issues associated with a broad range of high interest operational areas, the emphasis is on SW environments.

(U) The Navy S&T program includes projects that focus on or have attributes that enhance the affordability of warfighting systems.

B. PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 2001 ACCOMPLISHMENTS:
(U)($3,492) Wide Area Surveillance
(U) Continued:
(U) Design/construction/testing of the Deployable Autonomous Distributed System (DADS) in preparation for FY03 barrier demonstration.

(U) Completed:
(U) Development and demonstration of a compact prototype Lead Zirconate Titanate (PZT) slotted cylinder transducer mini-array to address Littoral Low Frequency Active (LFA) requirements with decreased ship impact.
(U) Demonstration of improved slotted cylinder shell technology that will help reduce the cost of these key transducers.

(U) Development of "A" size slotted cylinder source elements/array design to support NAVAIR PMA 264 requirements for the Air Deployed Low Frequency Projector (ADLFP) program.
(U) Delivery of a prototype lightweight power amplifier for acoustic sources that will allow operation from smaller vessels.
(U) Advanced development and testing of deployable LFA multistatic technologies.

(U)($26,225) Battlegroup Anti-submarine Warfare (ASW) Defense
(U) Initiated
(U) Design and installation of an acoustic array testbed to support future passive sonar system designs.
(U) Diesel Electric Submarine Speed-Related Tone feature detection for automatic detection and classification of threat diesel electric submarines.
(U) Sonar automation study to establish next generation Sonar Automation requirements.
(U) Auto-change detection, dwell time compensation for surveillance applications and multi-sensor auto-classification processing features for inclusion in the Interactively Trainable Passive Acoustic Classifier (IPAC).
(U) Design and development of high frequency (HF), high power, broadband projector arrays for conformal submarine, surface ship, unmanned underwater vehicle (UUV), and weapon applications with a 2+ octave frequency band of operation.
(U) At-sea demonstrations of the EA-53C sonar system using fleet test platforms.

(U) Continued:
(U) Characterization of undersea threat signals and environmental clutter to be used to design improved signal-processing algorithms for submarine and surveillance passive sonar systems.
(U) Cable Strum Mitigation technique to improve the ability to detect very low frequency acoustic signals associated with threat submarines.
(U) Single-Ping Hyperbolic Frequency Modulation (Markov Random Field (MRF)) Cluster Version 2.0 pre-detection technique.
(U) Improved Very Low Frequency (VLF) Type 1 autodetector to exploit certain acoustic vulnerabilities of modern threat nuclear submarines.
(U) Spatial Doppler Reverberation Suppression technique to improve the performance of active sonar systems in shallow water environments.
(U) SXXX Version 2.0 autodetector that exploits certain acoustic vulnerabilities of modern nuclear submarines.
(U) Striation autodetector modified for IPAC.

(U) Integration and testing of Lightweight Broadband Variable Depth Sonar LBVDS subsystems in preparation for the final fleet operational system demonstration in FY02.
(U) At-sea engineering shakedown and structured operational test for LBVDS.
(U) Development of EA-53C sonar signal processing and system control software.

(U) Completed:
(U) Transition of Ridge Distance Measurement (RDM) active classification and Single-Ping Range Rate detection techniques to the Advanced Processing Build (APB 01).
(U) Transition of dwell-time compensation feature in IPAC for surveillance applications to APB 02.
(U) Automatic Radar Periscope Detection and Discrimination laboratory demonstration of reduced false alarm rate using data from FY99 airborne test; conduct airborne evaluation during western Pacific deployment; complete and publish final documentation.

- (U)($9,396) Cooperative ASW

(U) Continued:
(U) Littoral Warfare Advanced Development (LWAD) scientific support, fleet and research vessel coordination, test reconstruction, logistical and environmental compliance support for three Littoral ASW (LASW) Future Naval Capability (FNC) at-sea experiments. One of which was conducted around the continental United States (CONUS) and two were conducted overseas in conjunction with the Seventh Fleet, teaming with Surface Warfare Development Group (SWDG) for one and operating with Destroyer Squadron Fifteen for both.

(U) Completed:
(U) Integrated ASW (IASW) sea-test planning
(U) At-sea demonstration of IASW data-fusion capabilities
(U) IASW technology transition planning to the Advanced Undersea Warfare Concept (AUSWC) program

- (U) ($12,532) Neutralization

(U) Initiated:
(U) Development of modular warhead concept for Canister Counterweapon Anti-Torpedo (CCAT) all-up-round (AUR)

(U) Continued:
(U) Frequency agility/optimum frequency selection using adaptive cancellation and low resolution imaging against countermeasures.

(U) Development and demonstration of broadband signal processing and intelligent torpedo control for dramatically improved single- and multi-ping detection of broadband signal processing and intelligent torpedo control advancements (including waveforms, algorithms, etc.) that will dramatically improve single- and multi-ping detection, classification, and localization transition to MK-48 CBASS Program (PE 0205632N). for the MK 48 CBASS Program.
(U) Development of torpedo countermeasures for close-in waterborne/underwater threats and high-speed weapons, and torpedo Detection, Classification, and Localization (DCL) algorithms and anti-torpedo torpedo technologies for transition to NAVSEA (PMS415) Tripwire Torpedo Defense System (AN/WSQ-11).

(U) Completed:
(U) Integration of affordable countermeasure components in common MK3/MK4 configuration; performed at-sea testing.
(U) Low rate semi-fuel cell and lithium Wick-Stirling power sources for undersea vehicle propulsion. Low rate propulsion transferred to Autonomous Operations FNC.

2. (U) FY 2002 PLAN:

- (U)($19,142) Wide Area Surveillance
  (U) Initiate:
  (U) Development of automated multi-static sonar classification algorithms.
  (U) Compact Deployable Multistatic Active Receiver (Super-ADAR).
  (U) Super-ADAR in-buoy processing laboratory demonstrations.
  (U) Development of Compact Deployable Multi-static (CDMS) sources for use by the air as well as other communities.
  (U) At-sea tests of long-endurance off-board source prototypes that will complement platform mounted sources while avoiding the beaconing effect of on-board transmissions.
  (U) Requirements and technology study for CDMS.

  (U) Continue:
  (U) Advanced development and test of multi-static source technologies.
  (U) Five-node test at sea to verify sensor stability, array element localization capability, acoustic/non-acoustic track fusion and automatic feature extraction (DADS).
  (U) Construction/testing of DADS in preparation for FY03 barrier demonstration.

- (U)($20,551) Battlegroup Anti-submarine Warfare (ASW) Defense

  (U) Initiate:

  (U) Sonar automation technology development plan to be used as a long-term master plan for the 6-year Sonar Automation Program.
  (U) Development, demonstration and transition of signal processing algorithms designed to detect and classify acoustic signatures of threat submarines.
  (U) Design and analysis of conformal arrays (including sparse and closely packed variations) using theoretical tools employing both analytical and numerical methods.

  (U) Continue:

  (U) Characterization of undersea threat signals and clutter to be used to design new signal processing algorithms for submarine and surveillance passive sonar systems.
  (U) Design and installation of an acoustic array testbed to support future passive sonar system designs.
  (U) Development and interim testing of on-board, in-flight real-time processor and associated detection algorithms. Additionally will continue development of a "strawman" Engineering, Development and Manufacturing (EMD) assessment (Claymore Marine).

  (U) Analyze and document the results of the FY 2001 LBVDS engineering shakedown and operational sea tests.
  (U) Development of EA-53C sonar signal processing and system control software.
  (U) Development and fabrication of prototype, high power, high frequency transducers and subsequently small partial arrays for the conformal array program. The transducer designs will enable a 2+ octave frequency band of operation.
  (U) Demonstrations of multiple EA-53C sonar systems at-sea using fleet test platforms

  U) Complete:

  (U) Transition of Cable Strum Mitigation technique to improve the ability to detect very low frequency acoustic signals associated with threat submarines.
  (U) Transition of the Single-Ping Hyperbolic Frequency Modulation Cluster Version 1.0 or the Hyperbolic Frequency Modulation (Markov Random Field) pre-detector to APB, depending on performance results.
  (U) Transition of improved VLF Type 1 autodetector, which exploits certain acoustic vulnerabilities of modern threat nuclear submarines to APB 02.
  (U) Transition of Spatial Doppler Reverberation Suppression technique which improves the performance of active sonar systems in shallow water environments to APB 03.

(U) Transition of SXXX Version 2.0 autodetector, which exploits certain acoustic vulnerabilities of modern nuclear submarines, to APB 03.
(U) Transition of Diesel Electric Submarine Speed-Related Tone feature detection for automatic detection and classification of threat diesel electric submarines to APB 03.
(U) Transition of auto-change detection and multi-sensor auto-classification processing features of IPAC to APB 03.
(U) Transition striation autodetector signal processing algorithm to APB 03.
(U) Transition Single-ping Cluster signal processing algorithm to APB 03.
(U) Transition of Improved Feature Space Classification technique to APB 02.
(U) Sonar automation technology development plan.
(U) Development, demonstration and transition of signal processing algorithms designed to detect and classify acoustic signatures of threat submarines.
(U) Analysis of system characterization test data and complete tactical testing (Claymore Marine). The results of the System Characterization Test will be analyzed and the results incorporated into preparations for the Tactical Test at the end of FY02; this test will involve a cooperative target, and data will processed post-flight vice real-time.
(U) Development and demonstration of LBVDS.

- (U)($6,600) Cooperative ASW
  (U) Continue:
  (U) LWAD scientific support, fleet and research vessel coordination, test reconstruction, logistical and environmental compliance support for three LASW FNC at-sea experiments. One experiment is to be conducted around the continental United States (CONUS) and two overseas. The overseas experiments will be collaborative with SWDG for one, and the other collaborative with The Technical Cooperative Program (TTCP)

- (U) ($9,512) Neutralization
  (U) Initiate:
  (U) Development and demonstration of technologies that will enable a Heavyweight torpedo and a shooting platform to be effectively employed as a fully linked on-board and off-board sensor system.
  (U) Adaptation, application, and validation of DYSMAS explosion effects hydro-code to full-ship scale.
  (U) Development and demonstration of a broadband array for the MK 54 Lightweight Torpedo.

  (U) Continue:

(U) Development and demonstration of broadband signal processing and intelligent torpedo control for dramatically improved single- and multi-ping detection of broadband signal processing and intelligent torpedo control advancements (including waveforms, algorithms, etc.) that will dramatically improve single- and multi-ping detection, classification and localization transition to MK-48 CBASS Program (PE 0205632N).
(U) Development of modular warhead concept for CCAT all up round (AUR).
(U) Development of torpedo countermeasures for close-in waterborne/underwater threats and high-speed weapons, and torpedo DCL algorithms and anti-torpedo torpedo technologies for transition to NAVSEA (PMS415) Tripwire Torpedo Defense System (AN/WSQ-11).
(U) Frequency agility/optimum frequency selection using adaptive cancellation and low resolution imaging against countermeasures.

(U) Complete:
(U) Development and demonstration of improvements in torpedo effectiveness of a Torpedo Intelligent Controller and transition to MK 48 CBASS Program (PE 0205632N).

3. (U) FY 2003 PLAN:

- (U)($14,044) Wide Area Surveillance

(U) Continue:
(U) Development of Compact Deployable Multi-static Sources.
(U) Advanced development and test of multi-static source technologies.
(U) Development of multi-static active classification algorithms.
(U) Development of Compact Deployable Multistatic Active Receiver (Super-ADAR).
(U) Laboratory demonstrations of Compact Deployable Multi-static Receiver (Super-ADAR) in-buoy processing, including field management concepts.
(U) DADS field demonstration at sea with automated detection and contact reporting of a submarine crossing a sensor barrier.
(U) Preparation for FY05 demonstration of DADS with maneuvering submarine in the sensor field.

(U) Complete:
(U) Requirements technology study for CDMS.
(U) The initial at-sea operational demonstration of off-board multi-static source

- (U)($11,591) Battlegroup Anti-submarine Warfare (ASW) Defense

  (U) Initiate:

  (U) Fabrication of partial HF conformal transducer array for concept demonstration using transducer technology identified in the HF prototype conformal transducer development task. The design shall be tailored for specific operational requirements and power levels.

  (U) Continue:

  (U) Design and installation of an acoustic array testbed to support future passive sonar system designs

  (U) Development, demonstration and transition of signal processing algorithms designed to detect and classify acoustic signatures of threat submarines.

  (U) Characterization of undersea threat signals and clutter to be used to design new signal processing algorithms for submarine and surveillance passive sonar systems.

  (U) At-sea demonstration of LBVDS in an operational scenario.

  (U) Development of EA-53C sonar signal processing and system control software.

  (U) Multiple demonstrations of EA-53C sonar systems at-sea, using fleet test platforms.

  (U) Evaluation of HF prototype transducers and small arrays and identification of the most promising technology for full development. We also will continue to confirm design goals of broadband high power operation in a conformal array configuration.

  (U) Design and analysis of conformal arrays through the development of theoretical models that are computationally efficient.

  (U) Complete:

  (U) Development and demonstration of EA-53C sonar systems.

  (U) Sonar automation technology development plan to be used as a long-term master plan for the 6-year Sonar Automation Program.

  (U) Development and testing of project CLAYMORE MARINE; an airborne non-acoustic ASW technology on an SH-60 helicopter (technology may also be employed on fixed-wing aircraft). Completion of project CLAYMORE MARINE will document sufficient technical information to support a decision whether or not to proceed to an Engineering Development Model (EDM).

  (U) Claymore Marine (CM) EMD assessment and document results. Provide recommendation for a potential acquisition decision.

  (U) Analysis of CM tactical test data from the FY02 Tactical Test. Complete incorporation of results into planning for the Demonstration Test later in FY03.

(U) Development of the in-flight real-time processor and the advanced detection algorithms. Resulting processor will be flown during the Demonstration Test later in FY03. The Demonstration Test will include limited free-play against a non-cooperative target, with detections called in-flight.

- (U)($6,800) Cooperative ASW
  (U) Continue:
  (U) LWAD scientific support, fleet and research vessel coordination, test reconstruction, and logistical environmental compliance support for two LASW FNC CONUS at-sea experiments and one overseas demonstration.

- (U) ($7,690) Neutralization
  (U) Continue:
  (U) Demonstration of technologies that will enable a Heavyweight torpedo and a shooting platform to be effectively employed as a fully linked on-board and off-board sensor system.
  (U) Development of torpedo countermeasures for close-in waterborne/underwater threats and high-speed weapons, and torpedo DCL algorithms and anti-torpedo torpedo technologies for transition to NAVSEA (PMS415) Tripwire Torpedo Defense System (AN/WSQ-11).
  (U) Frequency agility/optimum frequency selection using adaptive cancellation and low resolution imaging against countermeasures.
  (U) Adaptation, application, and validation of DYSMAS explosion effects code to full-ship scale.

  (U) Complete:
  (U) Development and Demonstration of broadband signal processing technologies and transition to the MK 48 CBASS Program (PE 0205632N).
  (U) Development of modular warhead concept for CCAT all-up-round

C. (U) PROGRAM CHANGE SUMMARY EXPLANATION: See program change summary for PE.
(U) Schedule: Not applicable
(U) Technical: Not Applicable

D. (U) OTHER PROGRAM FUNDING SUMMARY: The Navy’s 6.1 program contributes to this effort.

(U) RELATED RDT&E:
(U) NAVY RELATED RDT&E:

(U) PE 0204311N (Integrated Undersea Surveillance System)
(U) PE 0601153N (Defense Research Sciences)
(U) PE 0602235N (Common Picture Applied Research)
(U) PE 0602747N (Undersea Warfare Surveillance Applied Research)
(U) PE 0602782N (Mine and Expeditionary Warfare Applied Research)
(U) PE 0602435N (Ocean Warfighting Environment Applied Research)
(U) PE 0603235N (Common Picture Advanced Technology)
(U) PE 0603254N (ASW Systems Development)
(U) PE 0603506N (Surface Ship Torpedo Defense)
(U) PE 0603553N (Surface ASW)
(U) PE 0604221N (P-3 Modernization Program)
(U) PE 0604261N (Acoustic Search Sensors (ENG))
(U) PE 0604784N (Distributed Surveillance Systems)
(U) PE 0604503N (SSN-688 and Trident Modernization)

(U) NON-NAVY RELATED RDT&E:
(U) PE 0602173C (Support Technologies Applied Research)
(U) PE 0602702E (Tactical Technology)
(U) PE 0603739E (Advanced Electronics Technologies)
(U) PE 0603763E (Marine Technology)

E. (U)SCHEDULE PROFILE: Not Applicable

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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603747N
PROGRAM ELEMENT TITLE: Undersea Warfare Advanced Technology

CONGRESSIONAL PLUS-UPS

This section describes the following Congressional Plus-Ups appropriated in FY 2001 and FY2002 whose efforts fall within scope of this program element, or were appropriated in this PE:

(U) Advanced Technology Demo (Prototype Multifunction Hull Mounted Sonar), Project R2845
(U) Hybrid Lidar Radar Project R2840
(U) Low Frequency Broadband Acoustic Airgun Source, Project R2846
(U) Magnetrestrictive Transduction, Project R2844
(U) Multipulse Airgun System, Project R9033

1. FY 2001 Congressional Plus-ups:

- (U) ($2,899) Advanced Technology Demo (Prototype Multifunction Hull Mounted Sonar). The focus of this effort was to perform an advanced technology demonstration of smaller, hull-mounted sonar and to evaluate the potential for enhancing both ASW and mine avoidance for new surface combatant ships.
- (U) Hybrid Lidar Radar. The focus of this effort is to build hybrid lidar/radar research instruments for brain imaging and for underwater propagation; collect data with these instruments and analyze their performance; develop and test narrowband optical sources, and collect/analyze optical properties of littoral waters to support utility estimates of potential hybrid lidar/radar systems During FY 01 the microwave research facility was augmented with microwave network analyzers, spectrum analyzers, short-pulse mode-locked laser and ultra-narrow line frequency-locked lasers. (Appropriated in 0603712N, $2,972).
- (U) ($2,899) Low Frequency Broadband Acoustic Airgun Source. The focus of this effort was to develop a compact multi-pulse air gun system as an acoustic source deployable from small platforms, to create a system design and to conduct mechanical, electrical and acoustic testing.
- (U) ($2,417) Magnetrestrictive Transduction. The focus of this effort was to develop high energy density magnetostrictive material (TERFENOL-D) and demonstrate its applicability to naval acoustic transduction systems.

2. FY 2002 Congressional Plus-ups:

- (U) ($2,081) Magnetrestrictive Transduction. The focus of this effort will be to finalize the development of TERFENOL-D, a magnetostrictive material, for use with naval acoustic transduction systems.

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PROGRAM ELEMENT TITLE: Undersea Warfare Advanced Technology

- (U) ($1,289) Multipulse Airgun System. The focus of this low frequency, broadband acoustic airgun source will be to continue concept development, demonstration and evaluation of the system for the detection of submarines in littoral environments.