OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDT&E/ Defense Wide BA# 5	**0604051D8Z - Defense Acquisition Challenge Program (DACP)**

Cost ($ in Millions)		FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total Program Element (PE) Cost		24.727	33.533	29.500	29.855	31.055	31.758	32.102
P051	Defense Acquisition Challenge Program (DACP)	24.727	33.533	29.500	29.855	31.055	31.758	32.102

A. Mission Description and Budget Item Justification: Authorized by Title 10, Section 2395b, the Defense Acquisition Challenge (DAC) Program provides increased opportunities to insert innovative and cost-saving technologies into acquisition programs of the Department of Defense. DAC funds the test and evaluation of technologies and products with potential to improve performance, affordability, manufacturability, or operational capability of current acquisition programs at the component, subcomponent, or system level.

In FY 2003/2004, DAC was a sub element in the Quick Reaction Special Projects Program (Program Element 0603826D8Z), which had three separate efforts: Defense Acquisition Challenge (DAC) Program, Technology Transition Initiative (TTI) and Quick Reaction Special Projects (QRSP). In FY 2005, the Defense Appropriation Act directed the Department of Defense to transfer the Defense Acquisition Challenge (DAC) Program from Budget Activity 3 to Budget Activity 5.

As a result of the DAC Program's rapid establishment in mid-FY 2003, the Comparative Testing Office and its Foreign Comparative Testing (FCT) Program were selected by OUSD(AT&L) as the infrastructure to support the DAC pilot business model. Currently, U.S. Special Forces Command, U.S. Army, U.S. Marine Corp, and the Navy's Naval Sea Systems Command, Naval Air Systems Command, and Space and Naval Warfare Systems Command are supporting DAC with the current FCT service infrastructure. The U.S. Air Force is supporting DAC through Secretary of the Air Force for Acquisition (SAF/AQ).

Proposal Solicitation Process:

The DAC process is a two-phased annual process. During Phase I, interested parties, within and outside the DOD, are invited through a Broad Area Announcement (BAA) to submit summary proposals. Summary proposals are evaluated and prioritized based on merit and their potential to benefit a DoD Program of Record (POR). In Phase II, candidate summary proposals are matched to the POR that has the potential to benefit from the proposed technology. POR Program managers, in collaboration with the weapon prime where applicable, evaluate and either "accept" or "reject" the proposed technology. A "reject" is defined as the POR determination that the technology cannot benefit the POR. An "accept" is defined as the POR determination the technology has potential benefit and wishes to compete for funding. The POR then develops a final proposal to compete for DAC funding to test and evaluate the proposed technology. The final proposal contains a brief description of the issue and how the proposed technology resolves the issue, test and evaluation strategy, and procurement and transition strategy if the technology meets the PORs requirements. Final proposals are submitted into OSD DAC by the POR where the proposals are evaluated and prioritized, then selected for funding by the OSD DAC Program Manager.

The DAC pilot business model leverages off the successful FCT personnel and business processes, where possible, except OSD DAC annually issues a BAA inviting interested parties to submit summary proposals.

Results of FY 2005 BAA Solicitation

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Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDT&E/ Defense Wide BA# 5	**0604051D8Z - Defense Acquisition Challenge Program (DACP)**

More than 580 summary proposals were submitted by industry and government representatives in response to the February 2004 BAA. Approximately 200 summary proposals were rejected during the administrative review for lack of proper documentation. Admin Review was completed in mid-July. Proposal Match to Program of Record was completed in September 2004. Final selection of 15 FY 2005 DAC new start projects was made in January 2005.

Results of FY 2006 BAA solicitation

Approximately 450 draft proposals addressing key technology thrust areas were submitted by industry and government representatives in response to the January 2005 BAA. Of the approximately 450 draft proposals submitted, approximately 400 summary proposals were rejected during the administrative and program manager review. 53 final proposals were submitted for consideration for FY 2006 funding. Final selection of FY 2006 DAC new start projects was determined in September 2005. Final selection of 18 FY 2006 DAC new start projects was made in January 2006.

B. Program Change Summary	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2006)	25.116	28.975	29.238
Current BES/President's Budget (FY 2007)	24.727	33.533	29.500
Total Adjustments	-0.389	4.558	0.262
Congressional Program Reductions		-0.542	
Congressional Rescissions			
Congressional Increases		5.100	
Reprogrammings			
SBIR/STTR Transfer	-0.333		
Other	-0.056		0.262

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Performance Metrics: Not Applicable.

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B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Affordable Net Shape Stiffener-Forming Technology for F/A-18E/F (Navy)	1.766	0.000	0.000

This project is improving the affordability of the US Navy F/A-18E/F Super Hornet Strike Fighter by automation of the forming process for composite hat stiffeners in the airframe structure. Creating a process that reduces the cost of composite stiffening elements also has a potential benefit for future aircraft programs such as J-UCAS where lower cost stiffeners will reduce the cost of skin-stringer construction. Skin-stringer construction is more robust than competing structural solutions (e.g., sandwich construction) and should result in lower O&S costs. Successful execution will result in a RDT&E cost avoidance of $7.500 million by building on technology developed under an OSD/SADBU Challenge program. Implementation into F/A-18E/F production process is planned.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Battery Free Remote Sensing (USSOCOM)	1.004	0.000	0.000

This project is testing and evaluating a solar-based energy storage system for use in Unattended Ground Sensors (UGS). Existing vendor technology will be extended to provide higher output power and improved energy storage in a package more consistent with the stringent size, weight and power requirements necessary for SOF operations. FY 2005 Plans: Conduct project planning. Contract for and receive test articles. Conduct analysis, study and integration. Analyze vendor data. Conduct Phase I Technical Testing. Conduct Phase II Operational Test and User Assessment. Milestone C Decision. Submit DAC Close-out Report. Estimated total cost savings associated with this project exceeds $20.000 million.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Composite Twisted Rudder (Navy)	1.506	1.770	0.000

This project will build, qualify and install a ship set of composite rudders on DDG 51 Class Ship to demonstrate improved survivability and reduced acquisition and life cycle cost. FY 2005 Accomplishments: Small-scale laminate characterization performed on reinforcements ultimately selected for construction. Component static & shock test, static load testing conducted to verify the composite rudder's ability to sustain the maximum load defined in the DDG Ship Specification. FY 2006 Plans: Manufacturing Test Article Discussion of Hydrodynamic Design Loading as Applied to FEA. Discussloads on and design of HY-80 structure. Identify the E-glass shear tie stiffeners added to bottom (vertical ties) and front (horizontal ties) of rudder. Discuss FEA Models including fracture model of FRP/Steel joint. Full-scale

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static & fatigue testing, a series of shock tests will be performed on the first article full-scale composite twisted rudder. This testing will be conducted to verify the structural integrity of the composite rudder and the dynamic response analysis. Schedule the full-scale shock test-inspection and vibration (SIDER) testing. Installation for the at sea validation. RDT&E Cost avoidance: $10.000 million; Manufacturing Savings: $5.000 million; Savings in Procurement costs: $5.000 million; Sailaway (Unit) Cost of a single item: $350 thousand.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Enhanced Gunfire Detection System (USSOCOM)	0.110	0.000	0.000

This project is evaluating system enhancements (i.e., addition of sensors and processors) which have the potential to significantly improve the accuracy of the Gunfire Detection System (GDS) and locate a sniper prior to the sniper's first shot. This improved technology will be brought about through the integration of selected sensors (e.g., hyper-spectral imagers, unattended ground sensors, visible micro-sensors, infrared sensors, etc.) in the GDS and through the inclusion of automatic processing software. FY 2005 Accomplishments: Fielding & Deployment Release (F&DR) approved. Successfully integrated a Vehicle GDS with the Kongsberg (Norway) Remote-controlled Weapon System (weapon turret) on a HMMWV in support of the Anti Sniper Vehicle program (sponsored by the Rapid Equipping Force Office) and conducted live-fire testing of the combined system with excellent results. Let a contract modification to procure 32 GDS Vehicle systems for USSOCOM. Project Manager awarded contract for system modification. Complete integration of sensors into the gunfire detection system. Initiate technical testing. FY 2005 Accomplishments: Completed technical testing. Conducted operational testing and user evaluation. Compiled test results and prepared documentation in support of a milestone decision. RDT&E, Operation and Support, and procurement savings are projected in excess of $17.000 million, and accelerates fielding by 3 years.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Enhanced Military Readiness, Safety and Personal Bearing through Treatment of Pseudofolliculitis Barbae (PFB) (Air Force)	1.224	1.481	0.000

This project provides an effective and user-convenient topical treatment for Pseudofolliculitis Barbae (PFB), an inflammatory skin disease that affects warfighter responsiveness and morale and, thus, military readiness. PFB is recognized as a significant dermatologic disease that affects combat readiness, personal safety, unit cohesion, and individual morale in the US military. Primarily affecting those of African descent or Hispanic origin PFB effects up to 33% (400,000) of active duty males. FY 2005 Accomplishments: Contract not awarded by end-FY 2005 due to contractual difficulties and devastation of Keesler AFB by Hurricane Katrina; project has therefore slipped one year with planned project milestones being moved forward accordingly and project management moved to Wilford Hall Hospital, San Antonio. FY 2006 Plans: Determine the clinical safety and effectiveness of the vendor-developed ISW-AP-01 compound by assessing whether it shows improvement in the signs and symptoms of PFB. Skin irritation, sensitization and systemic absorption testing will be performed. Improvement in the signs and symptoms of PFB will also be measured. The safety and efficacy tests will follow the Food and Drug Administration and Wilford Hall medical institutional review board-approved protocol/plan for the topical therapeutic. In addition, product testing will be performed with the ISW-AP-01 compound to determine compatibility and impact on the integrity of the self-contained breathing apparatus seals. $25.000 - 30.000 million in RDT&E cost avoidance.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Enhanced Simulation Capabilities for Testing and Training (Army)	0.618	0.598	0.000

This project applies a client/server architecture that features network quality of service capabilities to the existing Distributed Interactive Simulation (DIS) architecture widely used by legacy simulations throughout the military. This effort will enable the re-use of millions of dollars worth of existing simulations in new warfighter training simulation applications. Currently, however, these simulations cannot be used in large-scale scenarios with real-time requirements. The Conductor platform will enable these large-scale scenarios with real-time requirements simulations and also provide a central integration point with new standards, the central collection of simulation data for analysis and the ability for field units to participate in high quality simulation. FY 2005 Accomplishments: Contract was awarded to Circadence in early July and all funds are obligated. All material has been purchased, and the threat simulations were delivered to the Circadence facility in August. Circadence has begun development of the interface between the existing DIS threat simulations and the Conductor technology platform. FY 2006 Plans: Comparison testing with and without the Conductor platform. Measurements will be taken to report on Throughput, Effective Data Throughput, Network Utilization, and Network Latency. In addition, application-level metrics such as frame rate and responsiveness will be developed to assess the impact on the

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simulation itself. The goal of the testing is to demonstrate a marked improvement in both the utilization of network resources as well as the quantitative measurement of simulation performance. Expect program completion June 2006. The estimated cost savings due to this program are RDT&E cost avoidance $12.000 million, Procurement savings $100.000 million, O&S Life-cycle savings $10.000 million, and Manufacturing savings $5.000 million.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Friction Stir Processing (FSP) for Virginia Class Submarines (Navy)	0.662	0.000	0.000

This project is assisting in the transition of a new manufacturing technology into the US Navy's propeller manufacturing infrastructure. FY 2005 Accomplishments: A FSP attachment feasibility study/design contract was awarded to General Tool Company (GT), Cincinnati, OH. The feasibility study was initiated and consisted of a initial kick-off meeting to establish the goals of the study and to identify the logistics of executing this study. GT was supplied with the available information on a large (Danly) N/C machine, which was the targeted equipment for introduction of the FSP process at the Naval Foundry and Propeller Center (NFPC). GT and NFPC agreed to make the equipment available in October to allow GT to conduct the necessary testing on the machine's axes motors and controls.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
GBS Transponder Throughput Improvement Using DVB-S2 (Air Force)	0.800	0.142	0.000

This project will dramatically reduce--by 30%, or about $58.000 million annually--the cost of transponders required to support the Air Force's Global Broadcast System (GBS) waveform by transitioning from the current air interface to a new, more efficient commercial standard. It will also provide advanced services such as a High Definition video and broadband data. Fewer transponders will be required to satisfy the mission requirements, thereby reducing the number of commercial Teleport sites needed. FY 2005 Accomplishments: Contract awarded 17 Aug 05. Satisfactorily completed Preliminary Design Review 7 Oct 05 and Critical Design Review 18 Nov 05. Completed the final version of the DVB-S2 for Global Broadcast Service (GBS2) Project - Functional Requirements. FY 2006 Plans: Perform satellite loop-back testing using Efficient Channel Coding (ECC) supplied DVB-S2 prototype equipment. Perform broadcasting of data from the Norfolk uplink facility to GBS user terminals in the field. Effort includes ECC providing an operational DVB-S2 transmitter for the Norfolk uplink facility and DVB-S2 receivers for the existing GBS terminals. The final GBS demonstration will show the operational effectiveness and suitability of the DVB-S2 waveform for actual field operations. Test will be conducted as part of field trials to furnish normal data products (digital video, imagery, FTP traffic, and Web traffic) and to perform adaptive modulation and coding operations for different terminal aperture sizes. Subsequently, final reports and documentation will be completed and this one-year project will be closed. Tangible benefits: Savings of about $58.000 million annually. Intangible benefits: More cohesive and comprehensive situational awareness for the warfighter.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Improved Durability F100 Ceramic Matrix Composite Divergent Seals (Air Force)	0.701	0.335	0.249

This project will significantly reduce the maintenance down-time for F-15 and F-16 aircraft by replacing existing metal components in high heat (hot streak) areas of the F100-PW-229 turbine engine nozzle with greater heat resistant ceramic matrix composite components. This replacement will result in a quantum (estimated to be a six-times) increase in the effective life of high stress components, thereby increasing the availability of combat-ready weapons platforms for USAF pilots. FY 2005 Accomplishments: Contract signed with Pratt & Whitney as a vehicle for directly supporting a live-fly field service evaluation. A field service evaluation test plan was developed and signed by Air Combat Command, Mountain Home AFB, McEntire ANGS, ASC-PRSS/YM, AFRL/ML, and OC-ALC. A field service evaluation is now in progress on McEntire ANGS F-16s. A site visit took place at Mountain Home AFB in preparation for that unit's field service evaluation activities. Snecma, the seals manufacturer, provided eight seals to the program free of charge in 2004 to allow for an early start of the flight program. Five of these seals were delivered to McEntire ANGS. A subcontract from Pratt & Whitney to Snecma for purchase of 20 divergent seals for flying at Mountain Home AFB was sent to Snecma on 3 Aug 05. FY 2006 Plans: Continue field service evaluation flight test of divergent seals at McEntire ANGS and Mountain Home AFB. Evaluate properties of a single divergent seal after it has accumulated adequate flying hours. Efforts to qualify Snecma as an approved vendor for Pratt & Whitney will continue. FY 2007 Plans: The field service evaluation flight test program will be completed. Measures of retained strength and properties of flight-tested hardware that reaches 700 total accumulated cycles will be completed. Compilation of test results and document preparation to verify flight durability of hardware will be completed. An engineering change proposal to officially document divergent seals as

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fully flight certified will be prepared. Tangible benefits: Approximately $7.000 million acquisition cost savings annually for component replacement. Intangible benefits: Significant decrease in maintenance downtime of critical combat aircraft.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Infrared Thermal Friendly Force Identifier (USSOCOM)	0.166	0.000	0.000

Current means of distinguishing dismounted operators as friend and foe are not sufficient to meet evolving battlefield situations. This project is determining final designs and testing and evaluating a compact lightweight beacon will that allow differentiation of friendly forces versus foe when viewed through current infrared and thermal sensors. The beacon will be programmable and adjustable for use in multiple situations and easily attachable to various types of existing Special Operations Forces (SOF) individual equipment. FY 2005 Plans: Complete technical review and down-select. Acquire test articles for Phase I technical and safety testing. Perform Phase I final test and design. Acquire test articles for Phase II testing. Begin Phase II Technical and Operational Tests. RDT&E, O&S, and procurement savings are projected at $3.500 million.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Integrated Defensive Countermeasures Alternative (Air Force)	0.397	0.000	0.000

This project will provide aircrews and aircraft a more effective countermeasure to and enhanced protection from enemy radar-guided missiles. USAF fighter aircraft employ a towed decoy that is deployed from and trails the aircraft and emits a radar signature that will spoof an inflight radar-guided missile. A fiber optic alternative towline, the centerpiece of this project, has shown superior performance in the laboratory and requires engineering efforts to qualify it for integration and testing with the existing towed decoy. FY 2005 Accomplishments: System integration noise and unanticipated control signal problems were successfully resolved. Final integration testing followed at the F-18 Integrated Defensive Electronic Countermeasures facility and was successfully completed at Pt. Mugu. Subsequently the project successfully completed two milestones: the hardware Critical Design Review (CDR) was accomplished and the AFOTD software Preliminary Design Review (PDR) was accomplished. Thermal hardening of the fiber optic towline saw significant improvement. Two new towline designs were investigated. One was selected and successfully passed ground testing and surrogate aircraft flight testing. This new towline design is being incorporated into the mass models and electronic AFOTDs being delivered and will go through flight testing in FY 2006. RDT&E cost avoidance/procurement costs: Estimated $100.00 milion. Intangible benefits: Increased protection and survivability for USAF aircrews and aircraft.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Low Frequency Synthetic Instrument Measurement System (Air Force)	0.307	0.245	0.000

This project will expedite repair of critical aircraft avionics and electronic attack jamming pods, measurably contributing to aircrew and aircraft survivability and weapons platform availability. This single synthetic instrument leverages the power of the latest technologies in Digital Signal Processing (DSP) techniques and simplified VXI-based hardware to measure electrical signals more accurately than the many special purpose measurement instruments it replaces. The reduction in hardware resulting from the replacement of traditional measurement instruments with a single DSP-based system will increase the reliability of the test equipment and reduce the maintenance and calibration downtime of test equipment. FY 2005 Accomplishments: Successfully transition of SIMSS-LF instrumentation into full-scale development. Electronic Attack Improved Avionics Intermediate Shop (EA-IAIS), VXI Mobile IAIS (VXI M-IAIS), and production rackmount IAIS (R-IAIS) in place at Lockheed Martin Simulation, Training and Support (LM STS) for capabilities functional testing on the AN/ALQ-131 electronic attack pod and F-16 avionics line replaceable units. Initiated technical testing. Initial test results have met or exeeceded expectations. FY 2006 Plans: Complete technical testing to include completion of data gathering, analysis, and tabulation; test and evaluation report, signal measurement demonstration; and operational verification: Conduct operational testing. Incorporate SIMSS-LF into EA-IAIS and R-IAIS production baseline. RDT&E cost avoidance: $3.750 million; Procurement cost savings: $6.500 million; Operations and support life cycle savings: $5.000 million. Intangible benefits: Increased test station availability increases aircraft availability and reduces station enhancement costs necessitated when avionics configurations change. Timely and accurate diagnosis of electronic attack pod failures contribute to aircrew and aircraft survival.

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Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Nickel Boron Coating to Extend the Service Life of Diesel Engine and Drive Assembly (USSOCOM)	1.270	0.000	0.000

This project is evaluating a process for Nickel Boron Coating to extend the service life of diesel engines and drive assembly. A lightweight high power density diesel engine is a highly desirable replacement for the current gasoline engines. Coating the propulsion system components with Nickel Boron is an effective way to increase the power to weight ratio and extend the propulsion systems lifecycle. This project will imrove engine performance by 8-10%, increase maintenance intervals by 150% and service life by 125%, and save over $3.000 million in RDT&E cost avoidance. FY 2005 Plans: Completed test planning. Contract awarded and received test articles. Begin Phase I test of uncoated test articles.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Miniature - Controlled Receive Pattern Antenna (MCRPA) (Navy)	0.183	0.000	0.000

The MCRPA is providing anti-jamming (A/J) GPS capability to the Navy's platforms that have size and weight restrictions for antenna systems, such as the UH-1Y and AH-1Z helicopters and submarines. The small footprint, integrated antenna electronics, light weight, and low cost of MCRPA all make it a viable solution for the size and weight restrictive platforms than the only other production CRPA available to the Navy today, the GAS-1. FY 2005 Accomplishments: The M-CRPA Antenna Electronics specification, Interface Control Drawing, and Outline & Mounting drawing were completed. The detailed designs for the antenna, nulling electronics, control box, and mechanical interface and packaging were completed. Initiated measurements on the first prototype antenna, ground plane and H-1 bracket assembly. Vibration tests were conducted on antenna assembly with a dummy AE unit to verify the bracket design. Testing has been conducted on the AE power and control card.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Miniature Day/Night Sight Integration (MDNS) (USSOCOM)	0.739	0.000	0.000

The Miniature Day/Night Sight (MDNS) program enhances Special Operations Forces (SOF) weapons capabilities for carbines, rifles and machine guns. It includes weapons components/sub-systems for fire control, target acquisition, and aiming. This project will evaluate the improvement, miniaturization, ruggedization and integration of numerous existing/improved components/ sub-systems to provide one fully integrated, modular and MDNS system for SOF weapons. FY 2005 Accomplishments: Received project funding. Contracted for and received test articles. Source selection completed. User assessment conducted. Estimated total cost savings associated with this project is $14.000 million.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Navy Close In Weapons System (CIWS) (Navy)	1.876	0.000	0.000

This effort will address several critical issues facing the power amplifier section of the Close-in Weapon System. This effort will convert the power amplifier section to a Spraycool solution to dissipate heat more efficiently and improve reliability. The improved reliability will also allow a greater range of choices for follow-on commercial-off-the-shelf circuit card replacement. Spray cooling is a very efficient process that enables the use of high density Circuit Card Assemblies (CCAs). It also provides other important attributes contributing to harsh environment survivability. FY 2005 Accomplishments: Technical interchange meeting and agreed to the schedule dates and milestones. Finalized the System Requirements Specification for cooling CIWS and concept was developed. RDT&E Cost avoidance: $ 37.000 million Life-Cycle Cost Reduction (~$60.000 million based on reduced failure rates resulting in only 2 technology refresh insertions over the remaining life of the program).

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
On-Aircraft (B2) Laser Additive Repair (LAR) of Titanium (Air Force)	1.887	0.427	0.000

This project will result in significantly greater operational availability of the Air Force's premier stealth bomber. Full mission capability rates of the B-2 Spirit have suffered due to the severe cracking issue

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that currently exists in the aft deck titanium structure. This project will operationalize an on-aircraft repair process that will provide a field repair option that will ensure full B-2 mission capability and avoid the necessity to return aircraft to depot for required maintenance. This program could represent the long-term solution to the aft deck cracking problem which could result in a large savings (~$200.000 million) to the Air Force and DoD. FY 2005 Accomplishments: Developed program requirements document with B-2 Systems Engineering at Northrop-Grumman. Formulated a repair design that does not introduce mechanical or thermal damage to substructure. A controlled process was demonstrated for Titanium 6-4 where maximum pore size found was less than 0.002". A well-defined systems engineering path to system development was also produced. Review by B-2 SPO and AFRL approved continuation of LAR program. FY 2006 Plans: Characterize fatigue life of Titanium 6-2-4-2 alloy LAR deposits for both on and off aircraft applications. Develop B-2 specific process details (e g., demonstrate process for a non-linear repair path and demonstrate remove and repair defect through fastener holes). Design/develop/build prototype repair hardware. Complete demonstration of mobile repair hardware to B-2 requirements. Tangible benefits: Estimated operations and maintenance cost savings of as much as $200.000 million. Intangible benefits: Significantly increased mission availability rates for the Air Force's frontline bomber fleet.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Precision Parachute Delivery System (PPDS) (USSOCOM)	0.166	0.000	0.000

This project is evaluating the High Altitude-Low Opening/High Altitude-High Opening (HALO/HAHO) Navigation Aid which will allow Special Operations Forces (SOF) infiltration capabilities in all environmental situations. Currently teams have little ability to navigate to a target unless it is seen at aircraft exit. This system makes it possible to land precisely during adverse weather conditions, which greatly reduces the possibility of detection, i.e. clouds, rain, and snow. This program will give the SOF community the capability and the confidence to accomplish the infiltration portion of their mission safely, accurately, and undetected in a wider range of environmental conditions. FY 2005 Accomplishments: A Basic Ordering Agreement (BOA) was initiated thru Yuma Proving Ground's contracting center to support tests and evaluation. A firm fixed price contract was awarded to Prescott Products. Discussions regarding equipment integration conducted with the user community as well as the prime contractor. Development of an IPT is underway with NSC, USSOCOM and USASOC. The Special Operations Airborne Test Board completed six High Altitude High Opening Free Fall operations to collect eight data sets, which defines the flight characteristics of the standard free fall parachute system (MC4 / MC5). Additional integration modification was carried out by contractor. RDT&E, O&S, and procurement savings are projected at $13.000 million.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Qualification of Conformal Fabrics (Air Force)	0.883	1.195	0.000

This project will qualify a conformal fabric material that will allow the integration of non-corrosive, highly durable composite structures into a greater cross section of airborne platforms. The fiber in this conformal fabric is discontinuous, allowing it to stretch into complex shapes before or during molding. The fabric conforms to complex shapes, thereby reducing fabrication costs of composite structures; the fabric becomes the reinforcement for composite structures used in advanced aircraft. FY 2005 Accomplishments: Pepin Associates signed a contract with Boeing to perform tasks contained in the Statement of Work. Fabric manufacturing process is ongoing. FY 2006 Plans: Finalize the fabrication process for discontinuous fabric. The Boeing Standard Material Specification (BSMS), the ultimate goal of the program, will be started during this time period. The design of the demonstration will also be started during FY 2006. Team will complete the fabrication of qualification lots of fabric and will fabricate test coupons in accordance with the approved test matrix. Testing will be done on these specimens and Boeing will develop material allowables for the Pepin discontinuous composite based on these test data. Nondestructive testing (NDT) tasks will be completed during this period. These tasks include inspection of the coupon panels, and development of an NDT process specification and standard. The demonstration component design will be completed and the part fabricated. It will be inspected using the NDT process developed under the program. The process control document will be updated from lessons learned during the program and the BSMS will be completed and approved. Tangible benefits: Probable 10-20% reduction in weight when aluminum structures on aircraft are replaced by composites; airframe weight reduction results in increased operational range, fuel savings, and increased armament loads. Intangible benefits: Decreased aircraft downtime due to corrosive maintenance; increased combat effectiveness.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007

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Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 5	**0604051D8Z - Defense Acquisition Challenge Program (DACP)**	**P051**

Quiet Eyes Low Cost Directional Infrared Countermeasure (DIRCM) Laser-Pointer-Tracker Demonstration (Air Force)	2.980	3.641	0.000

This project will result in a lower cost directed infrared counter-measures turret that will provide protection from and defeat multiple-band, enemy-fired infrared missiles. The turret is based on the currently-in-production AIM-9X guidance unit; thus, dramatically significant savings can be achieved. FY 2005 Accomplishments: Two test IPT working group meetings occurred with appropriate Raytheon, Large Aircraft Infra-red Countermeasure (LAIRCM), and AFRL lab personnel participating. Completed Master Test Plan. Raytheon completed an internal authorization-to-proceed review, establishing that the program is in compliance with Raytheon's Integrated Product Development System and best practices. A System Demonstration Requirements Review (SDRR) was held in July 2005 during which an opportunity pertaining to newly available laser technology was identified. Diode pumped semi-conductor continuous wave (CW) laser technology was discussed and the team concluded that the CW laser would be able to transmit more energy out of the DIRCM system, thereby increasing the system effectiveness. It was also determined that the CW laser had potential to better execute jam codes, also increasing the system effectiveness. A Turret Design Review was conducted 14-15 Sep 05. FY 2006 Plans: Continue integration and testing of laser-pointer-tracker assembly. Complete environmental performance testing. Demonstrate capability on Raytheon range, Tucson. Conduct final demonstration at Aeronautical Systems Center laser tower facilities at Wright Patterson AFB. Complete Quick Look report and other required documentation. Tangible benefits: RDT&E cost avoidance: $100.000 million; manufacturing savings: $25.000 - 50.000 million; procurement savings: $140.000 million. Intangible benefits: Increased aircrew and aircraft protection in a wider sector of the electro-magnetic spectrum.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Restore Effective Survival in Shock (RESUS) (Air Force)	1.655	0.448	0.000

This project, polymerized hemoglobin (Hemopure), has the potential to save warfighter lives. This candidate item is a low volume and weight, room temperature stable substitute for blood transfusions for combat casualties, which can be stored for 3 years without refrigeration and is pathogen free. It is highly likely to significantly decrease combat casualty morbidity and mortality. FY 2005 Accomplishments: An Investigational New Drug (IND)-enabling preclinical traumatic brain injury was completed. This animal study was required before the Food and Drug Administration (FDA) would accept/approve the IND from the Navy. Submitted IND application to the FDA in order to execute the RESUS study. The FDA issued a clinical hold until a complete response to several questions was submitted and reviewed. An updated protocol was submitted to the Naval Medical Research Center Institutional Review Board (IRB), revisions were made and the protocol was approved pending minor modifications. Eighteen study sites were recruited, and contract and budget negotiations are in progress with these sites. The laboratory interference challenge was initiated at five sites and a contract was established for a data management system and system development has begun. FY 2006 Plans: When FDA allowance is granted, protocol will be submitted to the Navy Bureau of Medicine and Surgery. As RESUS requires provisions for Exception from Informed Consent, approval will be required from USN Surgeon General. Site recruitment and laboratory interference challenge activities will be completed. Conduct the Community Consultation and Disclosure process at each site as local IRB approval is received. Implement data management system and begin patient enrollment and data collection activities as all required approvals are granted. Operations and support life cycle cost: 50-70% reduction due to Hemopure increased shelf life. Intangible benefits: Life saver. Room temperature storage and long shelf life allow greater access in combat.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Secure Army Wireless Intercomm System (Army)	0.690	0.000	0.000

This project modifies the baseline PM Air Warrior Aircraft Wireless Intercommunications System (AWIS) to add an encryption module known as Windtalker that will provide compatibility with secure crew communications systems for all crew served air and ground vehicles. Tethered systems have inherent operational limitations and safety hazards and a fully integrated secure wireless intercommunications system will enhance combat crew performance and save lives. FY 2005 Accomplishments: Achieved Joint program status with the Navy's PMA 209. The Navy has merged their wireless intercom program with the Army, adopted the Trulink technology, and is participating in the Sectera technology secure encryption development program sponsored under this DAC. Memorandum of Agreement (MOA) kickoff meeting between the Navy and Army completed. Successfully demonstrated the Windtalker technology in Scottsdale, AZ at General Dynamics C4I, with representatives from the National Security Agency (NSA), Army, Navy, PM DCATS, and the prime contractor, Telephonics. This was a significant risk reduction milestone for technical integration. Completed the User Partnership agreement with the NSA, and obtained NSA endorsement of our technical approach. RDT&E investment costs of $48.000 million and Procurement investment costs of $1.687 million on the first 10 years.

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Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Spray Cool TM Counter Targeting System (CTS) (Army)	0.230	0.000	0.000

This project is evaluating a new technology insertion to enable spiral development of the Counter Targeting System (CTS). CTS utilizes an infra-red (IR) sensor at high frame rates to detect sniper, mortar, RPG, and large caliber weapons fires. This system will assist in near real-time targeting and situational awareness for direct support of combat troops in operations such as Iraq and Afghanistan. First test articles will be field tested in Iraq. FY 2005 Accomplishments: Successfully deployed 5 Systems in support of OIF operations. Reduced form and fit from 350 pounds to less than 22 pounds. Satisfied our commitment to OSD to procure 20 additional systems. Submitted request for follow on OSD funding for aerial integration. Developed CONOPS for ground, air and on the move employment options. Established mission/procurement partnering with Department Of Energy (DOE). Integrated Acoustics sensor with CTS as a cueing sensor in June 05 at Quantico, VA in support of Marine Corps Warfighting Laboratory evaluation testing. Integrated CTS with existing Force Protection and Early Warning OIF architecture. Reduced sustainment cost in OIF by over 300% through DAC by reducing form, fit and increase functionality of CTS. Integrate system into aerial vehicle (manned/unmanned). $15.000 million Total O&S Savings ÷ Total Procurement of $150.000 million Total Procurement Cost = 10%.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Superior Surface Treatment Techniques (Army)	0.430	0.583	0.000

This project applies innovative surface treatment and plasma engineering technology to improve the deposition process of protective coatings on gun bores. This technology is applicable to US Army Legacy (Abrams), Future Combat System-FCS-MCS, FCS NLOS-C, FCNLOS-M, Navy Advanced Gun System, etc. FY 2005 Accomplishments: Completed contracting with SwRI (Southwest Research Institute) with extensive experience and expertise in plasma engineering and sputtering deposition. Under, SwRI prepared plasma enhanced planar magnetron system to test Army next generation environmental friendly sputtered Ta and Cr coatings. Conducted over 50 thin and thick Cr, Ta, and Ta on Cr depositions on gun steel to optimize sputter clean procedures and deposition parameters for planar magnetron sputter system. Analysis of these coatings at Benét Labs showed the coatings are hard, dense, with excellent microstructure and adhesion, which cannot be failed using Benét Labs aggressive microscratch and groove adhesion testing. FY 2006 Plans: Conduct surface cleaning tests in the cylindrical environment. Deposition tests on gun steel samples will be also be conducted. Thick Ta and Cr coating will be deposited on 1 ft long 120mm gun barrel sections for laser heating and vented combustor simulated firing tests. This is to evaluate adhesion of cylindrical magnetron sputter deposited coatings using techniques developed under, for potential transition to production. $53.000 million in total program cost savings in the next 5 years.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Transcritical CO2 Environmental Control System (Army)	0.214	0.000	0.000

This project is evaluating CO2-based environmental control technologies (refrigerant, compressors, and heat exchangers) for insertion into the Up-Armored HMMWV program to provide more cooling for soldiers and equipment in hot environments such as Southwest Asia. CO2 technologies will replace current environmentally-harmful synthetic refrigerants and systems with smaller, lighter and higher-capacity systems which are vital to the legacy fleet, the Future Tactical Truck System (FTTS), and the Future Combat System (FCS). This is extremely critical for the US Army to meet international environmental protocols in order to allow it to operate worldwide. FY 2005 Accomplishments: Demonstrated system at Expedited Modernization Initiative Procedure in Yuma, Arizona, explaining quicker and deeper pulldown of the vehicle's interior temperature. A next-generation CO2 air-conditioning system was fabricated with improved components and air-distribution, reducing size and weight. Completed new round of wind tunnel testing. Conducted field testing at Death Valley, California, demonstrating improved occupant comfort. Tested at Yuma Proving Ground to observe the system's ability to withstand rough terrain. Initiated design and fabrication of a Hot Gas Bypass system to provide supplemental passenger compartment heating. 25-50% capacity improvement, 10-20°F lower evaporator outlet temperature, and 30°F pull-down. Achieve 50-100% improvement in pull-down time. Weight and space claim less than or equal to current system.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
WDM Fiber Optice GPS Anti-Jam Antenna (Navy)	0.828	0.000	0.000

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This project is evaluating Wave Division Multiplexing (WDM) technology with shipboard GPS Anti-Jam antenna assembly to determine if it can provide transmission of multiple RF signals through a single optic fiber. This project will enable relocation of the GPS antenna electronics from high on the mast to below decks where it is proteeted and readily accessible for maintenance. FY 2005 Accomplishments: Component Level Test and System Performance testing on the GAS-1 Antenna/Antenna Electronics using 7-Channel WDM was completed. The Pre-Production Unit of the WDM FOAL was received. A Pre-Production Unit Test Plan was finalized. Reliability Analysis based on Fiber-Span WDM Bill of Material for the transmitter and receiver was tasked to the Reliability Analysis Center (Defense Technical Information Center). Performance Specification for GAS-1 WDM FOAL subsystem was finalized. This investigation of the use of WDM technology for shipboard anti-jam installations has been briefed at the Navigation Warfare Multi-National Memorandum of Understanding Conference. The Pre-Production Unit was tested under RF signals and temperature variations and for comparison to a non-WDM configuration.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
X-Cor Replacement for Conventional Honeycomb (Army)	1.435	1.195	0.000

This project is a lightweight, damage tolerant core material that replaces conventional honeycomb in aerospace structures. A 10% weight reduction over the baseline honeycomb on Black Hawk is estimated. This is critical because weight reduction is quite significant to the program in two respects. First, it greatly increases helicopter performance, particularly in vertical lift/rise capability, which greatly increases aircraft survivability and capacity; and, second, this 10% reduction could amount to a 25% RDT&E cost avoidance over other weight reducing alternatives. FY 2005 Accomplishments: Risk reduction: A revised set of manufacturing requirements has been implemented to control and monitor the manufacturing processes that control the pin reveal which will assure repeatable mechanical properties. Quality control: Process and quality control procedures have been revised to incorporate the latest requirements. During the past quarter, a draft process specification and acceptance criteria were reviewed during a technical interchange meeting at GKN. Work continued at Aztex to develop quality control documentation for each of the raw materials and manufacturing processes employed in core manufacture. The quality plan continues to mature with the inclusion of data gathered from the producibility trials conducted as part of the manufacturing scale up task and process trials conducted in conjunction with the evaluation of material property variability. Configuration: X-CorTM boundaries of the right hand and left hand skin were finalized. All 20 core-forming tools were designed and fabricated. FY 2006 Plans: Complete testing. Fabricate full scale components for flight test articles. Savings in Procurement costs: $67.200 million minimum 45%.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
7.62 & 9mm Small Arms Reduced Environmental Hazard Ammunition (SAREHA) (Navy)	0.000	0.807	0.000

This project will provide the warfighter with a lead-free, training and combat cartridge that will alleviate $106.000 million in range remediation costs while demonstrating the Marine Corps greater commitment to its stewardship of preserving the environment. This project will qualify commercially available Small Arms Reduced Environmental Hazardous Ammunition (SAREHA) to replace the current 7.62mm, 4 & 1 Linked cartridges (DODIC A131) and 9mm cartridges (DODIC A363) that contain lead components. Without regular remediation, the lead based components in these cartridges can seep into the ground and poison the supply of drinking water used by surrounding communities or wildlife and can make the air within indoor training ranges toxic to breathe. By qualifying commercially available ammunition, the USMC will avoid $8.800 million in RDT&E costs and provide a ROI of 280:1. FY 2006 Plans: Contract Prep & Award will be completed following the release of FY 2006 DAC Funding. During the same period, test planning will be conducted in preparation for the receipt of test articles. The fabrication of test articles from each of the vendors will commence after contract award. Test article delivery is anticipated during the 4th Qtr FY 2006, at which point, the comparative testing of each round will begin at the NSWC, Crane. The Project Office will determine which vendor best meets the USMC requirements and perform a down select to one vendor. A contract option for additional test quantities from the winner will be exercised. After delivery, the project office will conduct testing for the qualification of energetics, safety/environmental testing, and a user evaluation coordinated with the Navy Ordnance Safety and Security Activity (NOSSA). After completion of all testing, a WSESRB package will be prepared for certification. Concurrently, the technical test report will be completed.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Topical Paromomycin for the Treatment of Cutaneous Leishmaniasis (Army)	0.000	1.494	0.990

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This project will provide the first Food and Drug Administration (FDA)-approved, easily applied skin cream treatment for Cutaneous Leishmaniasis (CL), a parasitic disease spread by sand-flies that has become a serious medical threat to our forces deployed in support of OIF/OEF. As of Dec 2005, approximately 1,100 US soldiers have been diagnosed with CL which is endemic to Iraq, Afghanistan, and other areas in the Middle East. Although the disease is non-life-threatening, it is potentially disfiguring, and the resulting ugly "volcano crater" lesions can persist for many weeks to months. The FDA has allowed use of daily injections, over a 10 to 20 day period, of intravenous Pentostam™ to treat CL in soldiers as an investigational drug but it may only be administered under strict medical surveillance within the US at either Walter Reed or Brook Army Medical Centers. Infected soldiers must be evacuated to one of these two US locations where they must reside during the extent of the treatments. Currently, the average cost per patient receiving Pentostam™ is approximately $17,000 for hospitalization and treatment with approximately 60 lost duty days per incident. This equates to roughly $18.000 million in direct costs for the infected troops requiring treatment from 2003-2005. "Topical Paromomycin" will be positioned as a first-line therapeutic drug at deployed combat hospitals to treat this disease. Prior to selection as a DAC Program new start, a Phase 2 clinical study was completed in Tunisia and France, and awarded a contract to a pharmaceutical company for production and continued testing of the drug product. FY 2006 Plans: Manufacture the drug product for Phase 3 clinical studies that will support FDA approval. FY 2007 Plans: Initiate the pivotal Phase 3 clinical study and continue stability testing of the drug. Finish the Phase 3 clinical study and prepare the licensure package for FDA approval. Cost Avoidance: $17.000 million per 1000 soldiers treated while minimizing lost duty time.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Compact Broadband Remote Antenna (CoBRA) Intelligence and Information Systems Enhancements (USSOCOM)	0.000	1.046	0.055

This project will provide SOF with a more robust communications capability, reduce the dependence of commercial satellites for secure satellite transmissions and to provide military users with increased mission flexibility using existing Compact Broadband Remote Antenna (CoBRA) equipment sets to complete their missions. This project will test and evaluate an enhanced tri-band satellite antenna design that has been optimized for FCC compliance for Ku-band, X-band and Ka-band. The RDT&E and manufacturing cost avoidance is $10.000 million. Savings in procurement costs is expected to be $2.500 million and Operational Life Cycle savings are $1.000 million. FY 2006 Plans: Receive funds, contract for and receive test articles. Conduct analysis/study/sntegration and analyze vendor data. Conduct initial technical testing in Phase I. FY 2007 Plans: Perform operational test in Phase II, Milestone C decision.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Communications and Networking for a Deployable Internet (CANDI) (Air Force)	0.000	1.494	0.220

This project will enhance the warfighter's network-centric operations and warfare capabilities by providing risk reduction and enhanced operational capabilities for emerging Joint Tactical Radio System (JTRS) communications equipment. The program will take the software of the existing Interim Capability for Airborne Networking (ICAN) program and retool it in compliance with the Software Communications Architecture (SCA) standards. This technology provides enhanced warfighter capabilities and addresses an urgent operational need to enhance existing worldwide command and control communications. The SCA standards provide a software framework, enabling modular, standardized architecture for the emerging JTRS radios. Rewriting the ICAN system software to be SCA compliant provides an evolutionary migration path to future network-centric capabilities, improving JTRS, and streamlining integration with existing legacy capabilities. FY 2006 Plans: Develop required architecture and documentation. Perform required software modification and enhancements to implement SCA compliance. Initiate testing of modified software in laboratory environment. Investigate and develop additional transition opportunities. FY 2007 Plans: Complete testing and finalize documentation. Continue to investigate and develop additional transition opportunities. Tangible benefits: Provides compatibility between existing platform networking capabilities and emerging future systems (JTRS), seamlessly enabling improved communications. Provides additional networking capabilities, and lessons learned for JTRS, resulting in cost savings. Intangible benefits: Improved network centric operational capabilities for existing and emerging weapons systems and warfighters.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Covert Eyes 3-D Video Camera (USSOCOM)	0.000	1.121	0.066

This project will test and evaluate a multi-purpose, high-resolution, 3-D flash laser system that enables Special Operations Forces (SOF) to acquire and view targets through vegetation, window blinds, smoke, and tinted windows during daylight or total darkness. This system serves as both a camera and camcorder, and will support standoff ranges of up to 250 meters. It will allow the viewer to rotate/pan/zoom and

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examine a subject from any viewing angle, in real-time. This camera will provide SOF: increased force protection, enhanced building inspection and surveillance capabilities, plus improved warfighter spotting, tracking and reconnaissance capabilities. The RDT&E cost avoidance is $10.000 million. Additionally, savings in procurement, operations and support life cycle cost saving are expected to be $2.750 million. FY 2006 Plans: Receive funds. Contract for and receive test articles. Conduct Phase I system definition and analyze vendor data. Conduct Phase II Technical Testing. FY 2007 Plans: Conduct Phase III Operational Testing and User assessments. Milestone C Decision.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
ELINT Receiver (USSOCOM)	0.000	0.299	0.000

This project will evaluate a threat warning receiver that detects threat radar signals emitted from enemy missiles, maritime craft, helicopters and surveillance aircraft which represent a potential threat to Special Operations Forces (SOF) personnel and maritime craft. Paramount to the safety of SOF is the ability to detect and immediately react whenever counter-detection by hostile forces has occurred. This receiver will provide that capability. FY 2006 Plans: Receive funds, contract for and receive test articles, analyze vendor data, conduct initial technical and operational tests. Perform user evaluation in a side by side test. Milestone C decision. Cost savings include a $5.000 million RDT&E cost avoidance, $2.000 million in manufacturing savings and $5.000 million in procurement cost savings. Additionally $1.000 million in Operations and Support Life Cycle savings are expected.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Extended 1553B Databus (Air Force)	0.000	2.331	1.815

This project will save the Air Force approximately $1.600 million per generic aircraft and avoid extended non-availability of combat and combat support aircraft by eliminating the need to install new cabling to accommodate required higher throughput rates within an aircraft's local area network (LAN). The integration of an innovative scheduling and control capability, the centerpiece of this project, will enable increased throughput rates, in excess of 200 Mb/sec, over existing cable, and will thus provide legacy aircraft, such as the F-15 and 16, a capability to more responsively support network-centric operations and warfare. FY 2006 Plans: Activities will include testing of 1553 performance compliance and B-2 systems integration lab integration to validate that the technology is capable of supporting B-2 avionics requirements. This testing will result in verification of basic functionality on all B-2 bus lengths with analysis of signal characteristics, validation of acceptable system performance and verification of system compliance with established MIL-STD 1553C protocols. The DAC team will work closely with the FCT to leverage findings and to refine DAC demonstration activities that will occur in FY 2007. FY 2007 Plans: Qualification testing and demonstration of the capability to maintain suitable and predictable LAN operation during imposed system overload conditions. Continue qualification testing and evaluation while characterizing the LAN operation under a full spectrum of degraded conditions that could be expected by the inherent demands of net-centric operational warfare activities, battle damage or adverse environmental conditions such as electromagnetic interference or jammers. Tangible Benefits: $15.000 million plus in RDT&E cost avoidance; procurement cost savings about $1.600 million per aircraft. Intangible Benefits: Tri-Service utility (main battle tanks, ships, Navy and Marine aircraft); enhanced support to network-centric operations and warfare; avoidance of major re-wiring effort.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
HH-60M External Aircraft Rescue Hoist (Army)	0.000	1.460	0.000

This project will lower the risk of potential loss of life of wounded soldiers in the field by providing the HH-60M Medical Evacuation (MEDEVAC) Helicopter with a fully mission capable External Aircraft Rescue Hoist. Improvements: Increased Time Between Overhaul from 5 years to 10 years and a 25% reduction in the procurement price. Procurement Savings: $10.000 million; Life Cycle O&S Savings: $60.000 million. 1st Quarter FY 2006 Accomplishments: Conducted IPT Meeting, Test Plan finalized. FY 2006 Plans: Initiate and complete Phase I of testing (Bench/Environmental Testing) at the Redstone Technical Testing Center (RTTC). Initiate Phase II (Flight Testing) at the Aviation Technical Testing Center (ATTC) at Fort Rucker. Complete Phase II Testing at ATTC at Fort Rucker, complete Engineering Change Proposal, and begin installing hoist on new production HH-60M aircraft.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007

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Green Light Aiming Laser for SOF Small Arms (USSOCOM)	0.000	0.515	0.000

This project will evaluate green light laser aiming devices as a superior replacement to the existing red light laser aiming device for small arms. Green light lasers are closer to the center of the spectrum of human vision and they provide much better contrast than red lasers when used against green or black targets, even in bright sunlight. FY 2006 Plans: Contract for and receive test articles. Technical and safety testing. Operational Tests. Obtain Milestone C. RDT&E cost savings are expected to be approximately $4.000 million. Manufacturing savings will be $3.975 million and savings in procurement costs and Operations and Support Life Cycle savings are about $2.500 million each.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Improved IR Missile Self-protection for F-15 Aircraft (Air Force)	0.000	0.628	0.561

This project will significantly enhance the F-15 self protection capability against IR missile threats. The existing operational and fielded AN/ALE-58 self protection countermeasure dispenser (CMD) system is not integrated into the aircraft systems. Project improvements to the current AN/ALE-58 dispenser and LAU-128 missile launch rail will provide the MIL-STD-1553 interface needed to enable the path to full integration into the aircraft Operational Flight Program (OFP). Integration provides the path to full situational awareness of the operating state of the BOL system, which is not available in the current configuration. FY 2006 Plans: Test planning, upgrade of initial dispenser and missile launch rail test units, and design and upgrade of the Boeing System Integration Lab (SIL) to support the initial testing. FY 2007 plans: Development of the test software, verification test and evaluation at the Boeing St. Louis SIL, implement design changes coming out of testing and obtain final design hardware. Tangible benefits: Procurement savings: $3.6 million. Intangible benefits: With the enhancements provided, pilots will be able to protect themselves and their aircraft during threat engagements through increased situational awareness, enhanced self protection and reduced pilot workload. These benefits will result in greater mission effectiveness.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Land Warrior Modular Fuel Cell Power System (Army)	0.000	2.166	1.430

This project, led by DuPont, will enable the U.S. Army's Land Warrior (LW) and future soldier systems to meet current and future requirements for power, mission duration, and weight. This hybrid soldier power source, using a revolutionary miniature fuel cell technology has been determined to be the only course available to satisfy cost, schedule, and performance metrics for the mid and far term to meet overall immediate and next generation soldier power needs on the battlefield. Miniaturized Direct Methanol Fuel Cell (DMFC) technology will dramatically reduce the number of batteries that must be organically transported by the future force unit of action soldier and/or the requirement for battery recharging capabilities. The DMFC will efficiently convert small quantities of an inexpensive and safe fuel into large quantities of electrical energy needed by Soldiers. Four ounces of fuel is equivalent to one Li Ion battery (35 oz). This 9 to 1 weight advantage quickly translates into a lighter load for the soldier while also providing a robust power system for long missions where resupply may not be feasible. FY 2006 Plans: Generate Program SOW, milestone payments, test and safety requirements, prepare test plans, and safety plans. Award the contract for building and testing of the DMFC power system. Convene Integrated Product Team (IPT) meetings and prepare final test evaluation, and safety assessment plans. Conduct system requirements, preliminary, and critical design reviews. Contractor will build and test alpha units, prepare for critical design review, and perform integration into Land Warrior systems. FY 2007 Plans: Convene beta system critical design review. Contractor builds and delivers Beta systems for technical test (verification of interface with Land Warrior, environmental requirements, and user feedback. Conduct the final design review. Contractor builds and delivers M-25 Test and Evaluation systems. Final procurement decision. RDT&E Cost Avoidance is estimated to be $45.000 million. O&S Cost Savings is estimated at $193.000 million.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Nickel Nanostrands for Plastics, Coatings and Composites (Air Force)	0.000	1.120	1.100

This project will result in a cost reduction on refueling booms manufactured as a component of the boom redesign to a composite structure. The materials supplied under this effort will enable a cost saving in the boom manufacture by providing a previously unavailable lightning strike protection and electromagnetic interference (EMI) protection mechanism of the article. In addition the boom will allow for refueling in an all weather environment, greatly increasing the mission capable rate of the aircraft. FY 2006 Plans: Obtain contract for test articles, manufacture prototype booms for 1/4 scale testing. By June

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2006, manufacture and ground evaluate a full scale boom representative of the production article. By the end of FY 2006, demonstrate a flight capable boom based on technology accelerated under this effort. FY 2007 Plans: Limited flight testing, make nanostrand materials available on GSA schedule. Tangible benefits: RDT&E cost avoidance: $4.000-10.000 million; manufacturing savings: $10.000-25.000 million; procurement savings: $35.000 million. Intangible benefits: Enable improved all weather mission refueling capability and protect aircraft for the direct and indirect (EMI) effect of lightning.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Risk Reduction for Specific Emitter Identification (SEI) Insertion into AN/ALQ-211 Systems (USSOCOM)	0.000	0.523	0.715

This project will first be tested and validated as an integral part of the AN/ALQ-211 multi-spectral threat awareness console aboard the MH-47, MH-60 and eventually the CV-22. It will then be validated as a cost savings initiative to integrate the SEI concurrently with the development of the digital receiver upgrade scheduled for FY 2007. FY 2006 Plans: Receive funds, contract for and receive test articles. Phase I Tech Requirments Definition, Phase II Implementation of Test Equipment. FY 2007 Plans: Complete Phase II, Acceptance decision. Production cost savings of approximately $38.500 million could be realized by developing an SEI capability during the development of the digital receiver. Additionally $5.000 million RDT&E costs, $23.200 million savings in procurement and $19.500 million Operations and Support Life Cycle savings will be realized.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Supercapacitor Power Source for Gun Launched Munitions (Army)	0.000	0.515	0.279

The supercapacitor power source has an unlimited usage life that will eliminate the need to discard or fire the Excalibur projectile within fifteen days after the projectile has been initialized with GPS data. It will also allow the Excalibur to be field-initialized an indefinite number of times versus a maximum of twenty-times over a fifteen-day operating life period associated with the current battery. Completion of this project will provide the warfighter with improved operational flexibility at significant cost savings per projectile. FY 2006 Accomplishments to date: SOW was completed and contract award awaiting funding. Preparations completed to start the accelerated life testing and conducted preliminary cold temperature electrical performance characterization testing at ARDEC on sample supercapacitors. FY 2006 plans: Develop an artillery gun launch survivable packaging concept for the power source. Conduct power source subassembly high G survivability air gun and electrical performance validation testing. Conduct component level accelerated aging tests. Modify the Excalibur Guidance and Navigation Unit (GNU) subsystem design to incorporate the new power source. Conduct performance verification testing using prototype GNU subassemblies. Demonstrate interoperability between the prototype GNU and the Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS) which is used to charge the power source and program the projectile. FY 2007 plans: Manufacture two tactical GNUs that incorporate the new power source for electrical performance qualification testing and high G survivability testing in the rail gun. Modify the Excalibur projectile production TDP for insertion of the supercapacitor power source into the production build. RDT&E Cost Savings: $1.400 million. O&S Cost Savings: $1.100 million. Procurement Cost Savings: $5.400 million. Fielding Reduction: 30 Fewer Rounds @ $36 thousand ea. Procurement Potential: $2.100 million. Other Benefits: Increased factory handling safety since supercapacitor power source approach eliminates battery primer.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Tactical Remote Sensor Systems (TRSS) Monitoring System Modernization Program (Navy)	0.000	2.240	0.000

This project will provide a compact TRSS Monitoring System that will enable sensor monitoring on-the-move at the unit level, be adaptable to legacy sensor systems as well as future designs, and reduce equipment and lifecycle costs of over $98.000 million. By integrating commercially available components into a unit level monitoring system, intelligence information will be provided directly to the units on the battlefield and in operation centers simultaneously. Successful completion of this project will enable the USMC to avoid RDT&E costs of up to $15.000 million. FY 2006 Plans: Test Planning will start upon project approval and will be completed prior to the delivery of test articles. The fabrication of test articles will start at the completion of contract award and delivery is expected at the beginning of the fourth quarter FY 2006. Technical testing will commence at Nova Engineering in Cincinnati, OH to accurately evaluate true operational performance, measuring three dozen RF parameters required by the TRSS communications interface specification. Completion of Technical Testing. The hardware will be installed in a HMMWV platform for Operational Testing at Camp Pendleton to determine the system's on-the-move capabilities for picking up sensors as they come into range and its ability to capture data. The User Evaluation will be conducted at the Marine Corps Communications-Electronics Schools in 29

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 5	**0604051D8Z - Defense Acquisition Challenge Program (DACP)**	**P051**

Palms, CA to determine user interface deficiencies and to test the Built-In Test (BIT) and repair processes. Upon completion of all testing, a Technical Test Report will be furnished and a procurement decision reached.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Titanium Encapsulated Skirt Armor (TESA) (Navy)	0.000	1.124	0.385

This project will allow the Expeditionary Fighting Vehicle (EFV) to integrate multi-hit capable composite skirt armor that will provide a 5% vehicle weight reduction and a durability increase of up to 6 times, translating into a minimum cost savings of over $56.000 million for EFV production and maintenance. To protect the lower half of the vehicle, including the track system, propulsion components and operators inside, the EFV currently utilizes composite skirt armor protection, which has experienced environmental durability issues and lacks multi-hit capability. Successful transition of TESA for EFV will result in RDT&E savings of $2.5 million. FY 2006 Plans: Test Planning will commence upon receipt of funding and will be complete by the third quarter FY 2006. Test articles will be fabricated and lab tested at Cercom, Inc. in Vista, CA to ensure a consistent thickness and encapsulation. Upon successful lab testing, the test articles will be shipped to EFV. FY 2007 Plans: Validation Testing will commence at EFV with support from General Dynamics and Cercom for EFV fit and integration. The Safety/Environmental Testing will be conducted at the Aberdeen Test Center for rapid aging, durability, flammability and on vehicle testing. During the S/E Tests, the Army Research Lab at Ft. Belvoir, VA will conduct the Field/User Evaluation with representatives from EFV and General Dynamics to complete live-fire testing. Upon completion of the live-fire testing, a technical test report will be provided. Upon successful completion of the project, a procurement decision will be made by General Dynamics for inclusion in the EFV design and build.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
UUV Mine Neutralization by EOD teams in the VSW environment (Navy)	0.000	1.345	1.320

An effective, efficient, low risk method for providing mine neutralization initially from a Manned Surface and ultimately from a Unmanned Surface Vehicle (USV) is proposed. Notional USV will be a Rigid Hull Inflatable Boat (RHIB) currently in use by NSCT-1, using a developed and proven USN fleet mine neutralizer system. This fleet Mine Neutralization System is a Military-off-the-Shelf (MOTS) mature and reliable system for the relocation, identification and disposal of sea mines and other ordnance found at sea. FY 2006 Plans: Definition and establishment of a DAC UUV-N IPT; Refining the SOW and deliverables (includes life cycle support contract); DAC Contract Award; Development of notional CONOPS and Exit criteria; AMNS Prototype Demonstration to NSCT 1; Contract execution RDT&E Cost avoidance: $6.300 million, Manufacturing Savings: $3.000 million, Savings in Procurement costs: $3.000 million, Operations and Support Life-Cycle savings: $600 thousand.

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
Washable Read/Read-Write 2.45GHz RFID Tags with Highly Flexible Antenna (Army)	0.000	1.245	0.000

This project is testing Radio Frequency Identification (RFID) tags that have the capability of being read swiftly from long distances. These labels are suitable for applications where exposure to temperature and weather extremes is possible. The Air-Tune Tag has a memory lifespan of 10 years and can be rewritten 100,000 times. FY 2006 Plans: Tags will be tested and evaluated for military environment use on Army M4 Carbine modular weapon, AN/PRC-148 Multi-band Inter/Intra Team Radio (MBITR), and other Soldier equipment items. Technical tests will include, but are not limited to: RF emissions interference testing to determine potential effect on sponsor identified military and commercial systems; Best use recommendations for adhering RFID tags to M4 Carbine modular weapon, AN/PRC-148 Multi-band Inter/Intra Team Radio, other systems and uniforms/textiles; Recommendations for operator programmed data content; Field trials and operation tests with the M4 Carbine, AN/PRC-148 Multi-band Inter/Intra Team Radio, and possibly NBC clothing; Standard DoD MIL-STD-810 testing; Characterize and confirm read/read-write function; Opposing force analysis, readability distance scenarios; Conformity to applicable standards; Other test/evaluation criteria as required. A full test plan and detailed pass / fail criteria for individual tests will be provided to the OSD DAC program office within 90 days of contract award. RDT&E cost avoidance: $22.000 million. Using publicly available information on US Army annual expenditures on military uniform issue and maintenance as a benchmark, ~$180.000 million in FY 2005 with 10% annual adjustments for the out years, we determined estimated savings of $29.700 million over the three year period, or approximately $10.000 million annually.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 5	**0604051D8Z - Defense Acquisition Challenge Program (DACP)**	**P051**

Accomplishment/Planned Program Title	FY 2005	FY 2006	FY 2007
FY 2007 Plans	0.000	0.000	20.315

For FY 2007, the DAC program will continue to fund testing activities on 15 projects executing $11.000 million in FY 2007 funding.
Remaining funding will be used to initiate new start DAC Projects selected from the FY 2007 DAC Proposal Process. The FY 2007 DAC Proposal Process began with the release of the BAA in December 2005. Final selection of FY 2007 New Start DAC Projects is planned for the third quarter FY 2006.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
Others				
	VARIOUS	VARIOUS	The majority of funding from this Program Element is forwarded directly to the Services and US Special Operations Command (USSOCOM) who manage all contracting and support requirements for the DACP projects identified above.	

OSD RDT&E COST ANALYSIS (R3)

Date: February 2006

APPROPRIATION/ BUDGET ACTIVITY
RDT&E/ Defense Wide BA# 5

PE NUMBER AND TITLE
0604051D8Z - Defense Acquisition Challenge Program (DACP)

PROJECT
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
DACP			0	24727		33533		29500		0	0	0
Subtotal:			0	24727		33533		29500		0	0	0

Remarks: R3 submitted separately

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:			0									

III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:			0									

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal:			0									

Project Total Cost:			**0**	**24727**		**33533**		**29500**		**0**	**0**	**0**