OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2007

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

Cost ($ in Millions)		FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost		33.198	29.332	28.970	30.210	31.175	31.309	31.721	32.167
P051	Defense Acquisition Challenge Program (DACP)	33.198	29.332	28.970	30.210	31.175	31.309	31.721	32.167

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.

The 2007 Congressional language directed DAC to establish a mechanism that would address a Nunn-McCurdy breach. Implementation details are being finalized and the FY08 DAC Broad Area Announcement (BAA) has a provision addressing programs experiencing a Nunn-McCurdy breach.

Approximately 450 draft proposals addressing key technology thrust areas were submitted by industry and government representatives in response to the December 2005 BAA. 53 final proposals were submitted for consideration for FY 2007 funding. Final selection of FY 2007 DAC new start projects was determined in September 2006. 18 FY 2007 DAC new start projects were funded.

B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	33.533	29.500	29.855	31.055
Current BES/President's Budget (FY 2008/2009)	33.198	29.332	28.970	30.210
Total Adjustments	-0.335	-0.168	-0.885	-0.845
Congressional Program Reductions				
Congressional Rescissions		-0.168		
Congressional Increases				
Reprogrammings				
SBIR/STTR Transfer	-0.335			

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Other			-0.885	-0.845

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy The Acquisition Strategy for DAC is as outlined in Title 10. DAC is to provide opportunities for the increased introduction of innovative and cost-saving technology in acquisition programs of the Department of Defense. DAC funding is used to fund testing of commercial and non-developmental items that could result in improvements in performance, affordability, manufacturability, or operational capability of an existing acquisition program. It is expected that should testing be successful, procurement using the respective current program funding would be used for acquisition.

E. Performance Metrics: Not Applicable.

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Cost ($ in Millions)		FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
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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 Operations 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).

Final selection of FY 2007 DAC new start projects was determined in September 2006. 18 FY 2007 DAC new start projects were funded.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
7.62 & 9MM Reduced Environmental Hazard Ammunition (REHA) (Navy)	0.598	0.000	0.000	0.000

Outcome: A successful DAC Project will provide the Warfighter with a lead-free, training and combat cartridge that will alleviate $106M in range remediation costs while demonstrating the Marine Corps' greater commitment in preserving the environment. This project will qualify commercially available Small Arms Reduced Environmental Hazard Ammunition (SAREHA) to replace the current 7.62mm, 4 & 1 Linked cartridges and 9mm cartridges 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. A three-year project under sponsorship of the OSD Comparative Testing Office (CTO) and the Marine Corps Systems Command (MARCORSYSCOM). Projected completion of testing and qualification will be CY 2008 with transition to USMC MAGTF forces during CY 2008. The primary outputs and efficiencies to be demonstrated in the DAC Test are: (1) rounds are produced with environmentally safe components; (2) rounds must meet or exceed the ballistic performance of the current cartridges; (3) avoid $8.8M in RDT&E costs and provide a ROI of 280:1.

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FY 2006 Output: Initial funds were received at the end of the 2nd Qtr. Contract Prep & Award was completed at the beginning of the 3rd Qtr. Test Planning was completed middle of the 3rd Qtr. The test articles received during 4th Qtr. Completed comparative bid sample evaluation at the Naval Surface Warfare Center, Crane, Indiana. USMC 9mm Down Select to Olin Winchester, type classified as DODIC AA16, and awarded IDIQ production contract. 9mm Technical Test Report and Project Close-out Report anticipated during 1st Qtr FY07. Program Office will release a Performance Specification and Technical Data Package for full and open solicitation of 7.62mm test samples. 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).

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Clinical Development of Topical Paromomycin for the Treatment of Cutaneous Leishmaniasis (Army)	1.108	1.043	0.000	0.000

Outcome: Project outcome includes: (1) Provide a safe & effective treatment for Soldiers with CL who deserve to have one; Minimize the administrative burdens to medical personnel associated with administration of the IV drug Pentostam; (3) Minimize or eliminate regulatory costs associated with the continued use of Pentostam, an investigational drug; and (4) Mitigate psychological impacts from the potentially disfiguring disease. The first safe and effective topical treatment for CL in the US; Cost avoidance of $17.000 million per 1000 soldiers treated; and greatly minimized number of lost duty days or duty hours from a safe and simple treatment regimen (topical versus intravenous) for this disease. Manufacture the drug product for Phase 3 clinical studies that will support FDA approval. This project will develop and obtain FDA approval for a new, safe, effective, and easily applied topical drug to treat 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 December 2005, approximately 1,100 US soldiers were diagnosed with CL, a disease endemic to Iraq, Afghanistan, and other areas in the Middle East. Infected soldiers are evacuated to one of two US locations where they must reside during the extent of the treatments. Currently, the average cost per patient receiving Pentostam™ are approximately $17,000 for hospitalization and treatment with roughly 60 lost duty days per incident. This equates to roughly $18 million in direct costs for the infected troops requiring treatment from 2003-2005. "Topical Paromomycin" will be positioned as the new first-line therapeutic drug at deployed combat hospitals to treat this disease.

FY 2006 Output: Initiate the pivotal Phase 3 clinical study.

FY 2007 Planned Output: Continue stability testing of the drug, conduct end-of-phase 2 meeting with FDA, and initiate preparation of the new drug application package for FDA approval.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
CoBRA Intelligence and Information Systems Enhancements (SOCOM)	0.775	0.058	0.000	0.000

Outcome: This project will provide Special Operations Forces with a more robust communications capability that reduces dependence on commercial satellites for secure satellite transmissions and provides military users with increased mission flexibility using existing Compact Broadband Remote Antenna (CoBRA) equipment sets to complete their missions. The primary outputs and efficiencies to be demonstrated in this DAC project will be: enhanced tri-band satellite antenna design that has been optimized for FCC compliance for Ku-band, X-band and Ka-band; higher data rates (20Mbs), capability to access wideband Gapfiller, Xtar and future US and NATO high power military satellites; enhanced pod integrated platform for mounting X, Ku- and Ka-band trans and IF converters for remote control. The RDT&E and manufacturing cost avoidance is $10M. Savings in procurement costs is expected to be $2.5M and Operational Life Cycle savings are $1M.
Completion date is 15 January 2008.

FY 2006 Output: Developed final project plan of action and milestones; analyzed vendor data; completed contract negotiation re-defining test article functionality and performance specification.

FY 2007 Planned Output: Perform Phase I technical testing and Phase II operational test and evaluation; finalize Milestone C production and fielding milestone decision documentation based on test and evaluation outcome. Complete project closeout report in 2008.

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Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Communications and Networking for a Deployable Internet (CANDI) (Air Force)	1.207	0.128	0.000	0.000

Outcome: To demonstrate modified software of the existing Interim Capability for Airborne Networking (ICAN) program that has been retooled in order to make compliant 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. Rewriting the ICAN system software to be SCA compliant provides an evolutionary migration path to future network-centric capabilities, improving Joint Tactical Radio System (JTRS), and streamlining integration with existing legacy capabilities. The lead service is Air Force. The primary outputs and efficiencies to be demonstrated are 1) compatibility between existing platform networking capabilities and emerging future systems, 2) provision of additional networking capabilities and lessons learned for JTRS, resulting in cost savings, and 3) improved network centric operational capabilities for existing and emerging weapons systems and warfighters.

FY 2006 Output: Performed analysis of existing ICAN architecture to facilitate development of SCA compliant architecture. Developed decomposition of ICAN functionality into appropriate SCA resources. Initiated software development to implement required ICAN functionality in SCA compliant code. Initiated assembly of tools and development of CANDI software development and testing.

FY 2007 Planned Output: Complete development of SCA compliant ICAN implementation. Test and evaluate system in completed CANDI software development and lab. Finalize documentation. Continue to investigate and develop additional transition opportunities, including potential integration into SCA compliant commercial radio hardware. The CANDI project is scheduled for completion in September 2007. The transition manager is JTRS Joint Program Office.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Composite Twisted Rudder (Navy)	1.311	0.000	0.000	0.000

Outcome: The complex curved surface of the twisted rudders can be more easily manufactured using composites. Structural Composites has experience building composite rudders for the Navy's Mine Counter Measure ships to reduce rudder weight by 50%. The future DD(X) platform also plans on utilizing composite rudders. Completed port plugs and molds; concluded coupon testing; completed the process trials and cavitation testing for surface treatment; three HY-80 hub castings; built HY-80 hub assembly for test article; installed fiber optic and mechanical strain gages on hub assembly; developed manufacturing guide for CTR; conducted two scale model process trials.

FY 2006 Output: Manufacture test article; complete shock test planning and conduct tests; comprehensive testing report; Manufacturing Readiness Review; manufacture port and starboard rudders; install rudders on DDG 66, April 2007; at-sea evaluation. Remove test articles. Evaluate and prepare test report and close out report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Covert Eyes 3-D Video Camera (SOCOM)	0.830	0.070	0.000	0.000

Outcome: 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. The camera will provide SOF increased force protection, enhanced building inspection and surveillance capabilities, as well as improved warfighter spotting, tracking and reconnaissance capabilities.
The primary outputs and efficiencies to be demonstrated in the DAC include: standoff ranges of up to 250 meters; capability to rotate/pan/zoom and examine a subject from any viewing angle; real-time detection and identification during daylight and in total darkness. The RDT&E cost avoidance is $10M. Additionally, savings in procurement, operations and support life cycle cost saving are expected to be

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$2.75M.

FY 2006 Output: Developed project plan of action and milestones; authored test and evaluation plans; completed contract negotiation for test articles and vendor test support; analyzed vendor data; began Phase I system definition.

FY 2007 Planend Output: Complete Phase I system definition; conduct Phase II technical testing and Phase III operational testing /user assessment. Finalize Milestone C production and fielding decision documentation based on test and evaluation outcome; complete project closeout report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Digital Head Up Display for F/A-18 Aircraft (Navy)	1.925	1.044	0.000	0.000

Outcome: The current Heads Up Display (HUD) in the F/A-18 is a critical flight instrument that is one of the most unreliable components in the aircraft. When HUD is inoperative, the aircraft is NOT MISSION CAPABLE until HUD is repaired. A reliance on obsolete Cathode Ray Tube (CRT) and other analog technologies makes HUD a logistics nightmare to troubleshoot from the flight line to depot level repair facilities. CRTs and the other analog components of the system suffer from a diminishing vendor base driving higher repair costs at all levels. Rockwell Collins is supplying an all Digital HUD (DHUD) to commercial airlines, business/regional jets and military transports--one that does not rely on CRTs, high-voltage electronics, or high-power analog circuitry. The DHUD will replace the CRT with a Liquid Crystal on Silicon (LCoS) projection engine backlit by a solid state high-intensity lamp system. High power components will be removed from the HUD, enhancing reliability of the system. The lead service is Navy.

FY 2006 Output: Developed a project plan of action and milestones; completed contract for test articles.

FY 2007 Planned Output: Rockwell Collins will focus on fabrication of flyable prototype Digital HUD hardware. Flight Worthiness testing of the prototype hardware will begin during this period. (Flight Worthiness testing is a subset of full qualification testing to verify that the units are safe for flight). Flight Worthiness testing will be completed. Full qualification testing will be performed to verify units are capable of withstanding and performing in the operational environment. Flight demonstration of prototype hardware will be performed. Full aircraft integration and developmental testing will begin.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
ELINT RECEIVER (SOCOM)	0.221	0.000	0.000	0.000

Outcome: 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 promises to provide that capability. The ELINT receiver may be qualified for possible SOF maritime and unmanned aerial vehicle integration for radar detection and threat avoidance. The primary outputs and efficiencies to be demonstrated in the DAC include: improved sensitivity detecting Band 3 emitters (8-18 Ghz); smaller, lighter weight, lower cost than current threat warning receiver in existing Joint Threat Warning System architecture. Anticipated cost savings include $5M in RDT&E cost avoidance, $2M in manufacturing savings, and $5M in procurement cost savings. Additionally $1M in Operations and Support Life Cycle savings are expected. Developed project plan of action and milestones; authored test and evaluation plans; completed contract negotiation for test articles and vendor test support; analyzed vendor data.

FY 2006 Output: Conducted initial technical and operational tests; performed user evaluation in a side by side test; obtained Milestone C production and fielding milestone decision; completed project closeout report.

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Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Enhanced Military Readiness, Safety, and Personal Bearing through (PFB) Treatment (Air Force)	1.097	0.000	0.000	0.000

Outcome: To demonstrate the safety and efficacy of a topical treatment for Pseudofolliculitis Barbae (PFB), a significant inflammatory skin disease that impacts negatively on the warfighter by degrading combat readiness, personal safety, unit cohesion, and individual morale. PFB disproportionately affects those of African and Hispanic origin, resulting in up to 33% (400,000) of active duty males affected by this condition. PFB can range from minor skin irritation to severe skin lesions which can act as portals for biological or chemical agents. If left untreated, PFB can result in infection and keloid scar formation. The lead service is Air Force. 1) a significant savings in research and developmental cost to Government, and 2) increased morale and greater warfighter responsiveness and effectiveness. Clinical trial relocated from Keesler AFB LA, to Wilford Hall Medical Center (WHMC), San Antonio TX. Contract was let and pre-study preparation and manning completed. Concurrently, the USAF Surgeon General approved the trial and WHMC Institutional Review Board approval was secured. Recruitment and enrollment of study subjects was initiated, and study medication was transferred to the two study sites, WHMC and Washington University Medical School, St Louis Mo.

FY 2006 Output: Complete enrollment of study subjects. Complete study on 90 subjects, analyze data and finalize study report containing a description of the study rationale, description of study procedures and patient population, efficacy and safety results and information regarding material compatibility. The PFB project is scheduled for completion in September 2007. The transition manager is USAF Surgeon General's office.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Enhanced Simulation for Training and Testing (Army)	0.443	0.000	0.000	0.000

Outcome: This project will enable the re-use of millions of dollars worth of existing simulations in new warfighter training simulation applications. Currently, 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 2006 Output: Comparison testing with and without the Conductor platform. Measurements taken to report on Throughput, Effective Data Throughput, Network Utilization, and Network Latency. In addition, application-level metrics such as frame rate and responsiveness developed to assess the impact on the 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. 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 2006	FY 2007	FY 2008	FY 2009
Extended Databus-Graceful Degradation (Air Force)	1.726	1.914	0.000	0.000

Output: To save the Air Force approximately $1.6 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 lead service is Air Force. The primary outputs and efficiencies to be demonstrated are increased throughput rates, in excess of 200 Mb/sec, over existing cable and 2) provide a capability to more responsively support network-centric operations and warfare.

FY 2006 Output: Contracting actions were completed as well as a demonstration plan.

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FY 2007 Planned Output: Testing of 1553 performance compliance and B-2 systems integration lab 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 1553 protocols. 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. Capabiity is expected to transition through block upgrades to aircraft through 2018.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
External A/C Rescue Hoist for the US Army HH/UH-60 Black Hawk (Army)	1.081	0.000	0.000	0.000

Outcome: 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. It will provide the Army with a second source vendor for purchasing future hoist and allow the procurement of the best and most affordable hoist for the soldier. Both vendors have provided an upgraded hoist as compared to the existing hoist. The Army is the lead service. The primary outputs and efficiencies to be demonstrated in the qualification of these hoists are (1) each hoist susceptibility to electromagnetic environmental interference, (2) each hoist susceptibility to environmental affects, (3) Airworthiness qualification for each vendor's 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.

FY 2006 Output: Conducted IPT meetings. Finalized EMI and Environmental Test Plans for both Breeze-Eastern and Goodrich hoists. Procured Goodrich test hoist. Requested and received existing test reports from vendors for review. Received qualification by similarity support documentation from both vendors. Aviation Engineering Directorate evaluated test data and provided recommendation of required qualification test. Wrote and received approval for both vendors Environmental and Electromagnetic Environmental Interference Test Plans. Received test item from Goodrich. Activities to be completed in FY 2007: Initiate Phase I of testing (E3/Environmental Testing) at the Redstone Technical Testing Center (RTTC). Complete E3/Environmental testing at RTTC. Complete Test Reports and submit to AED for approval for Airworthiness Qualification. Initiate and complete Phase II (Flight Testing) at the Aviation Technical Testing Center (ATTC). Complete Engineering Change Proposal, and begin installing hoist on new production HH-60M aircraft.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Friction Stir Process (FSP) for Submarine Propellers (Navy)	0.625	0.000	0.000	0.000

Outcome: Friction stir processing is a new method to improve propeller casting surface quality strengthen weld joints by altering the microstructure via thermo-mechanical working. Casting defects can limit the structural integrity of propellers; conventional weld repair has become a significant part of the manufacturing process. Substituting FSP for conventional welding will save manufacturing time and cost while increasing strength and quality of processed area.

FY 2006 Output: Completed final feasibility study. Finalize FSP design in FY 2007. Award contract to manufacture FSP. Build and Deliver FSP Equipment. Equipment delivery. Equipment installation. Equipment shakedown. Demonstrate 3-D capability on propeller.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
GBS Transponder Throughput Improvement Using DVB-S2 (Air Force)	0.105	0.000	0.000	0.000

Outcome: To reduce--by 30%, or about $58.0mil 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. This capability will also provide advanced services such as a High Definition video and broadband data. Fewer transponders will be required to satisfy

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the mission requirements, thereby reducing the number of commercial teleport sites needed. The lead service is Air Force. Efficiencies to be demonstrated are 1) increased speed of data transmission rates by 30%, and 2) triple the number of users that receive data at any given time.

FY 2006 Output: Completed satellite loop-back testing using DVB-S2 equipment. Performed broadcasting of data from the Norfolk GBS uplink facility to GBS user terminals. Tests were conducted to evaluate data products (digital video, imagery, FTP traffic, and Web traffic). The final GBS2 demonstration was held 19-20 JUL 06 at DISA Headquarters to show the operational effectiveness and suitability of the DVB-S2 waveform for actual field operations. This effort was scoped to develop constant coding and modulation (CCM); it was delivered as demonstrated. Also delivered and demonstrated were DVB-S2 variable coding and modulation (VCM) for concurrent operation of different terminal aperture sizes. The VCM demonstration employed ultra lightweight encapsulation (ULE), which also exceeded objectives. In addition to CCM, VCM and ULE, this effort laid the foundation for continuing DVB-S2 developments in Adaptive Coding and Modulation (ACM) and IP(v)6. The pursuit of these capabilities will be turned over to the GBS JPO. Subsequently, final reports and documentation were complete and this one-year project closed 15 Sep 06. Transition of this capability will occur through the change in policy issued by OSD/NDI and the Joint Internet Protocol Modem program office beginning in FY 2010. The GBS Transponder Improvement Program is complete. Transition Manager is DISA.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Green Light Aiming Laser for SOF Small Arms (SOCOM)	0.382	0.000	0.000	0.000

Outcome: This project will evaluate green light laser aiming devices for small arms as replacement for the existing red light laser aiming devices. 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. The primary outputs and efficiencies to be demonstrated in this DAC include: target acquisition to 200 meters; better contrast and visibility in bright sunlight; increased visibility on black and green targets; improved ergonomics; enhanced operational effectiveness in inclement weather conditions. RDT&E cost savings are expected to be approximately $4M. Manufacturing savings will be $3.975M and total savings in procurement costs as well as operations and support life cycle savings are about $5M.

FY 2006 Output: Developed a project plan of action and milestones; obtained responses to a request for proposal and sample products; completed initial user assessment of product samples. Complete contract for test articles in 2007 with 2006 funds; conduct technical validation of test articles; finish operational evaluation of suitability and effectiveness; obtain Milestone C production and fielding decision; complete project closeout report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Improved Durability F100/F414 Exhaust Nozzle Divergent Seals (Air Force)	1.188	0.262	0.189	0.000

Outcome: To demonstrate and document the flight characteristics of Ceramic Matrix Composite (CMC) Turbine Engine Exhaust Nozzle Divergent Seals. This documentation will occur through a field service evaluation (FSE) flight program. The goal is to qualify the CMC divergent seals as preferred spares for the F100 engine family, as well as the F414 engine used in the US Navy F-18 aircraft. The lead service is Air Force. The primary outputs and efficiencies to be demonstrated are 1) realization of significant acquisition cost savings annually for component replacement and 2) a significant decrease in maintenance downtime of critical combat aircraft. Eight Ceramic Matrix Composite (CMC) F100 exhaust nozzle divergent seals flying in an FSE at McEntire ANGS since 17 Aug 05 on two F-16 fighter aircraft. Five seals accumulated 429 Total Accumulated Cycles (TAC) while the remaining three seals have accumulated 361 TAC. The goal is to reach 700 TACs per seal.

FY 2006 Output: Twenty additional CMC seals were purchased to expand the FSE. These 20 seals were shipped to Mountain Home AFB to begin a second FSE using two F-15 and two F-16 aircraft. Project recently expanded to include evaluation of the CMC seals on the F414 engine that powers the Navy F-18 fighter. Six F414 exhaust nozzles were shipped to the engine manufacturer for ground testing on an F414 test engine.

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FY 2007 Planned Output: Continue FSE flight test of CMC Divergent Seals at McEntire ANGS and Mountain Home AFB. Measure retained strength and properties of flight-tested hardware that reaches 700 TAC. Conduct a full life cycle cost analysis to document the value of using CMC divergent seals. Prepare an Engineering Change Proposal to officially document CMC divergent seals as fully flight certified. Submit final report on F100 field service evaluation. Establish a contract with F414 engine manufacturer to analyze CMC seals and to conduct ground testing of CMC seals on a F414 engine. A total of 24 additional F414 seals will be purchased for continued ground testing and an FSE.

FY 2008 Planned Output: Continue ground tests of CMC seals on F414 engine. Proceed to an FSE on an F-18 aircraft if ground testing is successful. The Divergent Seals project is schedule for completion in March 2008. The transition managers are the F100-100/200/220 Augmentor Program Manager and Naval Air Systems Command.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Improved IR Missile Self Protection System for F-15 Aircraft (Air Force)	0.658	0.441	0.000	0.000

Outcome: To 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. 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. Project improvements to the current AN/ALE-58 dispenser and LAU-128 missile launch rail will provide the 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 ALE-58 system, which is not available in the current configuration. The lead service is Air Force. Primary outputs and efficiencies to be demonstrated are 1) integration of new flare into the self protection suite on the F-15, 2) upgraded cockpit display showing IR Self Protection systems integrated into the glass cockpit, and 3) provision of improved situational awareness to the pilot as to the status of the IR self protection systems.

FY 2006 Output: Accomplished the aircraft computer interface design, completed test planning, initiated the upgrade of initial dispenser test unit and modified the initial missile launch rail test unit, and designed and initiated the upgrade of the Boeing System Integration Lab (SIL) to support the testing.

FY 2007 Planned Output: Complete the upgrade of the dispenser test unit and SIL, develop test software, verification test and evaluation at the Boeing St. Louis SIL; implement design changes coming out of testing and obtain final design hardware. Capability is projected to transition to warfighting capability by 2011. Project is scheduled to be complete and test report provided by September 2008. Transition Manager is F-15 Program Office.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Live Fire Testing of Composite Materials for Future Air Platforms (Air Force)	0.133	0.000	0.000	0.000

Outcome: This project will provide data/analysis to guide future design/fabrication and determine requirements for future composite aircraft. This project will determine the hydro-dynamic ram effects of a 23mm HEI round penetrating a water-filled (wet) composite wing under load and the fragmentation effects of a 23mm HEI round penetrating a dry composite wing under load.

FY 2006 Output: Conducted tesing for effects of penetrating a pressurized composite fuselage and determining the effects of rock coupon foreign object debris (FOD) impacting a non-pressurized composite fuselage. Collected ballistic damage data on a Raytheon Starship composite structure using 23mm High Explosive Incendiary (HEI) projectiles. Final analysis and evaluation are expected in FY2007.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2007

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

Low Frequency Synthetic Instrument Measurement and Stimulus System (SIMSS-LF) (Air Force)	0.181	0.000	0.000	0.000

Outcome: To 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. The lead service is Air Force. The primary outputs and efficiencies to be demonstrated are 1) timely and accurate diagnoses of electronic attack pod failures, thus contributing to aircrew and aircraft survival.
Successfully completed technical testing to include completion of data gathering, analysis, and tabulation.

FY 2006 Output: The SIMSS-LF project was completed in September 2006. Final report developed. Transition Manager is Ogden Air Logistics Center.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Modular Land Warrior Fuel Cell Power System (Army)	1.605	1.508	0.000	0.000

Outcome: This project 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. 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. RDT&E cost avoidance is estimated to be $45.000 million. O&S cost savings is estimated at $193.000 million.

FY 2006 Output: Generate Program SOW, milestone payments, test and safety requirements, prepare test plans, and safety plans. Award contract for building and testing of the DMFC power system. Convene 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 Planned Output: Convene beta system critical design review. Build and deliver Beta systems for technical test verification of interface with Land Warrior, environmental requirements, and user feedback. Conduct the final design review. Build and deliver M-25 test and evaluation systems. Final procurement decision.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Nickel Nanostrand Coatings for Improved Lighting Strike Protection (Air Force)	0.830	0.754	0.000	0.000

Outcome: To demonstrate a high probability of reduction in cost of aerial refueling booms manufactured as a component of the boom redesign to a composite structure program. 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. The lead service is Air Force.
The primary outputs and efficiencies to be demonstrated are 1) significant RDT&E cost avoidance ($4-10mil), manufacturing savings ($10-25mil), procurement savings ($35 mil) and 2) improved all weather mission refueling capability and protection of aircraft from the direct and indirect EMI effect of lightning.

FY 2006 Output: Contracted for test articles, manufactured prototype booms for 1/4 scale testing. Developed and delivered prototype lighting strike composite repair kits. Contracted with commercial vendor

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to produce initial low rate production of nickel nanostrand resin films.

FY 2007 Planned Output: Manufacture second generation of improved refueling boom design on ¼ scale article. Demonstrate a full-scale boom sheath and validate EMI hardening. Complete initial ground based test and evaluation of patch kit material and make nanostrand repair kits available as a GSA scheduled item. Commercialize nanostrand resin film for both EMI hardening and lightning strike protection. The Nickel Nanostrand project is scheduled for completion in September 2007. The transition manager is Air Force Research Lab, Materials Directorate.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
On-Aircraft (B2) Laser Additive Repair (LAR) of Titanium (Air Force)	0.316	0.000	0.000	0.000

Outcome: To demonstrate an on-aircraft repair capability that will significantly increase the 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 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, in turn, 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 (~$200mil) to the Air Force and DoD. The lead service is Air Force. The primary outputs and efficiencies are 1) estimated operations and maintenance cost savings of as much as $200mil, and 2) significantly increased mission availability rates for the Air Force's frontline bomber fleet.

FY 2006 Output: Completed fatigue testing for both on and off aircraft type repairs. Developed a macro-level view and notional mechanical core for on-aircraft laser-additive repair process. Outlined summary of technical risks that will need to be addressed in a systems engineering approach for successful on-aircraft application. Built test-bed demonstration unit; demonstration not yet completed. Created LAR development and transition roadmap to outline path forward for successful prototyping and validation.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Portable Tactical Wireless Broadband Network (SOCOM)	0.719	0.000	0.000	0.000

Outcome: This product will greatly improve Special Operations Forces (SOF) communication on the battlefield. It will provide a voice, video and data transmission capability in areas where communications traditionally have been difficult such as caves, tunnels, mountainous and urban areas. The primary outputs and efficiencies to be demonstrated in the DAC include: ability to provide short/long haul, bi-directional wireless communications and interface with conventional and satellite reach-back technology; secure capability to authenticate entities attempting to enter the network; capacity to provide communication underground, in-buildings and shipboard environments, to include personnel tracking; capability for field-deployable WiFi or "Cell Tower on the Move" communications, supporting VOIP, Internet, video, and data to hand-held devices. RDT&E Cost avoidance is estimated as $12M and savings in procurement costs $3M. Procurement cost avoidance savings is estimated between $1.5M and $3M for orders of 500-1000 units.

FY 2006 Output: Developed a project plan of action and milestones based on project resourcing: contracted for test articles and vendor technical support; analyzed vendor test data. Conduct technical validation and operational testing; finalize Milestone C procurement and fielding decision package based on project test and evaluation results.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Project Angel Fire (Air Force)	2.766	0.000	0.000	0.000

Outcome: To demonstrate a real time tactical persistent surveillance situational awareness system capable of providing very high resolution, city-sized images of vehicles, people and other items of tactical and operational interest to hundreds of users simultaneously. This capability provides situational awareness to tactical decision makers and facilitates forensic and predictive analysis, directly supporting urban

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combat, base defense, border security, and other anti-insurgency/counter terrorist efforts. Upon successful completion of the six-camera suite demonstration, the Angel Fire system will be enhanced to a 24-camera array, replicated and deployed in 2007 to the OIF Area of Responsiblity. The lead service is Air Force.
The primary outputs and efficiencies are 1) RDT&E cost avoidance ($10mil), procurement cost avoidance: ($7mil), 2) quantum improvement over existing Predator-type ISR capability, 3) vastly increased real-time tactical situational awareness to battle staff, tactical managers and intelligence analysts and 4) fratricide avoidance and force protection.

FY 2006 Output: The 6-camera system was successfully demonstrated at the Mojave Viper Exercise, 14 May-7 June, 2006, resulting in continued endorsement of the system and its operational potential by the USMC. The decision to deploy the system in conjunction with a Marine infantry battalion was sustained. Commander, Air Force Research Lab, agreed to provide a 24-person manpower package to support the system in-theater. Necessary hardware engineering and software development were completed for the 24-camera package, and airborne platforms sufficient to provide continuous coverage over a designated urban area, dawn to dusk, seven days a week, were secured. Deploy to OIF for operational support of USMC and other ground forces. The Project Angel Fire project was completed in September 2006. Transition manager is the Air Force Research Lab.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Qualification of Conformal Fabrics (Air Force)	0.885	0.000	0.000	0.000

Outcome: To 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. 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 loadsThe lead service is Air Force. 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. The lead service is Air Force.
The primary outputs and efficiencies to be demonstrated are 1) fabrication of complex shapes to Boeing specification and award of the Boeing Standard Material Specification.

FY 2006 Output: Fabrication process was verified. The Boeing Standard Material Specification was drafted, setting the performance goals of the program. The performance verification test matrix was designed, and the requirements for material production were established. Fabricated test coupons in accordance with the approved test matrix. Testing included inspection of the coupon panels and development of a (nondestructive testing (NDT) process specification and standard. NDT tasks were completed. The demonstration component design will be completed and the part fabricated. Finish testing, publish test results and submit final report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Quiet Eyes Low Cost DIRCM Laser-Pointer-Tracker Demonstration (Air Force)	3.073	0.000	0.000	0.000

Outcome: To demonstrate a lower cost Directed InfraRed Counter-Measures (DIRCM) turret that will provide protection from and defeat enemy-fired infrared missiles. The turret is based on the currently-in-production AIM-9X guidance unit, thus, significant savings can be achieved. The lead service is Air Force. The Primary outputs and efficiencies to be demonstrated are 1) demonstrate that a laser jammer can be integrated inside the seeker head of an AIM-9X seeker assembly. Conducted multiple test planning meetings in preparation for the demonstration of the capability. Fired Smokey SAM missiles at the Wright-Patterson LID Range to verify the QE turret ability to acquire and track a missile-like object rather then an aircraft. Collected live fire data at Air Force 46th Test Wing Live Fire, showing the ability to track MANPAD threats. Tested Quiet Eyes (QE) turret under the vibration environment of a C-17 and AH-1Z. Completed a digital model of the QE turret. Demonstrated the ability of the QE turret to maintain stable track of a target while under vibration. Air Force and NAVAIR continued to work together to add value to efforts by jointly planning the LID range testing at WPAFB to benefit both the QE and Scorpion Programs.

FY 2006 Output: Completed assembly of a fully functional QE turret, turret/laser integration and characterized laser characteristics through the QE turret. Demonstrated the ability of the QE turret to maintain

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track of a target while emitting laser power into the receiver/ transmitter set. Completed final demonstration during "tower test" at WPAFB. Publish final report on the results of qualification of the Quiet Eyes laser and seeker head demonstration. The Quiet Eyes Low Cost DIRCM project is complete. Transition of this capability will occur through the modification of the Cost Effective Light Aircraft Missile.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
RESUS (Restore Effective Survival in Shock) (Air Force)	0.332	0.000	0.000	0.000

Outcome: To demonstrate the efficacy of bovine polymerized hemoglobin for the pre-hospital resuscitation of casualties in hemorrhagic shock. The trial product, Hemopure, is a low volume and weight, room temperature stable substitute for blood transfusions for combat casualties that can be stored for 3 years without refrigeration and is pathogen free. It is highly likely to significantly decrease combat casualty morbidity and mortality. The lead service is Air Force. The primary outputs and efficiencies are 1) operations and support life cycle cost reduction of 50-70% due to Hemopure increased shelf life and 2) life saving potential of product since room temperature storage and long shelf life allow greater access in combat.

FY 2006 Output: Subsequent to the 8 July 2005 clinical hold placed on RESUS by the Food and Drug Administration (FDA) as a result of concerns about potential elevated blood pressure and secondary side effects on clinical trial subjects, little progress has been achieved within the RESUS program. On 3 October 2005 FDA counter-responded to an 8 September 2005 Naval Medical Research Center (NMRC) response to the clinical hold, requesting additional information. NMRC responded to this request. FDA subsequently continued the hold and asked for an FDA Blood Products Advisory Committee review of RESUS. This review was scheduled for 14 July 2006. On 12 July 2006, a public citizens' group sued the FDA in federal court to force the meeting to be open to the public or cancelled. FDA elected to cancel the meeting and reschedule it in October 2006. The October meeting was subsequently rescheduled for mid-December 2006. Funds will continue to execute if the clinical hold is lifted as a result of the December 2006 review.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Risk Reduction for Specific Emitter Identification (SEI) Insertion into AN/ALQ-211 System (SOCOM)	0.387	0.754	0.000	0.000

Outcome: Digital SEI insertion into the Special Operations Active Rotary Wing Survivability System architecture will accurately ascertain previously irresolvable ambiguous emitter identifications. 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 2007-2008, and fully 3 years ahead of planned spiral development integration of the same technology with the AN/ALQ-211. The primary outputs and efficiencies to be demonstrated in the DAC include: improved Geo-location of threats; correct correlation of preloaded database threats against actual collected threats 95% of the time; subsequent accurate update of threat database 100% of the time. Production cost savings of approximately $38.5M could be realized by developing an SEI capability during the development of the digital receiver. Additionally $5.0M RDT&E costs, $23.2M savings in procurement and $19.5M Operations and Support Life Cycle savings should be realized. Completion date is 30 September 2007.

FY 2006 Output: Completed Phase I Technical Requirements Definition; concluded contract negotiations involving data rights issue; began Phase II Implementation Test and Evaluation planning.

FY 2007 Planned Output: Receive test articles; complete Phase II test to include an architecture study and integration of SEI receiver test fixture with Suite of Integrated Radio Frequency Countermeasures system to validate improved performance; obtain Milestone C procurement and fielding decision; submit project closeout report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Super-Capacitor Power Source for Gun Launched Munitions (Army)	0.382	0.295	0.000	0.000

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RDT&E/ Defense Wide BA# 5	**0604051D8Z - Defense Acquisition Challenge Program (DACP)**	**P051**

Outcome: To eliminate the need to "double set" the projectile at cold temperature due to slow battery rise time, eliminate the need to discard or fire the Excalibur projectile within fifteen days after the projectile has been initialized with GPS data and 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. The lead service is Army. The primary outputs and efficiencies to be demonstrated are as follows: (1) high G artillery gun launch survivability; (2) 20 year storage life capability, (3) Data hold Battery part replacement at approximately one third the unit cost, (4) Excalibur projectile integration, Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS) interoperation, and (5) unlimited re-charging and projectile re-initialization cycles. 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.

FY 2006 Output: Four months of accelerated life testing consisting of approximately three hundred temperature cycles was successfully conducted on sixty hundred parts. High G, air gun survivability testing up to approximately 14000 G's were successfully conducted on scores of supercapacitors. A packaging feasibility study was performed showing that the circuitry can fit inside the current data hold battery volume constraints. Preliminary cold temperature electrical performance characterization testing was performed on sample supercapacitors.

FY 2007 Planned Output: Conduct component functional tests pre, post and during level, high G, rail gun test at hot and cold temperature extremes using an OBR. Develop artillery gun launch survivable packaging concept for the power source. Conduct power source subassembly high G survivability air gun and electrical performance validation testing. Modify Excalibur Guidance and Navigation Unit (GNU) subsystem design to incorporate new power source. Conduct performance verification testing using prototype GNU subassemblies. Demonstrate interoperability between prototype GNU and Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS) used to charge the power source and program the projectile. Spiral Output - mechanical and electrical design features have already been incorporated into the Excalibur projectile were incorporated for future insertion of the supercapacitor power source.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Superior Surface Treatment Techniques for Adherent Bore Coatings (Army)	0.432	0.000	0.000	0.000

Outcome: This project applies innovative surface treatment and plasma engineering technology to improve gun bore coating deposition process for US Army Legacy (Abrams) cannons, Future Combat Systems, and Navy Advanced Gun System. The new technology represents a cost-effective innovation to deposit EPA-compliant bore coatings with component cycle life comparable or exceeding current production Cr bore coatings. Under this project, plasma enhanced cylindrical magnetron technology will be developed to coat a 1-ft long 120mm diameter gun bore section and to demonstrate superior adhesion properties. The project is under the sponsorship of US Army ARDEC Warfighting Systems Integration Directorate, and a total program cost saving of $53.000 million is expected in 5 years after implementation.

FY 2006 Output: Superior plasma surface techniques including pre-deposition surface cleaning and ion-assisted sputtering deposition were tested in the planar geometry. The EPA-compliant coatings demonstrated superior properties: Thick sputtered Ta coatings showed no cohesive and no adhesive failures under cross groove test; and showed excellent crack resistance, no delamination, no failures under pulsed laser heating test simulating 120mm firing hot round at 1490ºK. A 1-ft long 120mm diameter RF plasma-enhanced cylindrical magnetron sputtering system has been constructed and pre-deposition surface cleaning techniques successfully developed. Preliminary testing of thin Ta coatings deposited on steel in 120mm cylindrical geometry showed very promising results. A patent application entitled 'RF Plasma Enhanced Cylindrical Magnetron Sputter Deposition of Inner Surface of Cylinders' has been filed. Planar magnetron deposited thick coatings will be tested in Benét Labs Vented Combustor, simulating the thermal-mechanical-chemical environment of gun bore firing at 1490ºK. RF-plasma enhanced cylindrical magnetron will be used to deposit coatings, followed by analytical testing, pulsed laser heating and vented combustor testing. A 1-ft 120mm M256 section will be coated with thick adhesive EPA-compliant bore coatings for delivery to US Army ARDEC Warfighting Systems Integration Directorate. An internal summary report will be prepared; presentation and publication in several technical journals are planned. Begin transition of this technology to US Army ARDEC Warfighting Systems Integration Directorate, through Benét Labs MTO-CMS (Cylindrical Magnetron Sputtering) project.

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Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Tactical Remote Sensor Systems (TRSS) Monitoring Station Modernization Program (Navy)	1.660	0.000	0.000	0.000

Outcome: A successful DAC 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 by over $98M. Based on an operational requirement to remotely monitor and collect intelligence on the threat presence and movements with TRSS, the USMC will test the TRSS Monitoring System manufactured by Nova Engineering, Inc. of Cincinnati, OH to replace the obsolete technology currently utilized in the Global War on Terror (GWOT). These Monitoring Systems provide the "hub" between the deployed remote sensor systems and the Warfighter's command and control infrastructure by collecting, displaying, and disseminating remote sensor information to intelligence collection activities. A two-year project under sponsorship of the OSD CTO and MARCORSYSCOM. Projected completion of testing and qualification will be CY 2008 with transition to USMC MAGTF forces during CY 2008. The primary outputs and efficiencies to be demonstrated in the DAC Test are: (1) reduces user complexity, power consumption, and provides Intelligence information directly to the units on the battlefield and in operation centers simultaneously; (2) reduces system size and weight by 90% (backpackable); (3) provides 100-fold increase in system bandwidth; and (4) avoid RDT&E costs of up to $15M with a ROI of 80:1.

FY 2006 Output: Initial funds were received at the end of the 2nd Qtr. Contract Preparation and Award completed. Test Planning and fabrication of test articles. Complete Test Planning. The delivery of test articles. Technical Testing will commence at Nova Engineering and finalize. Concurrently, test articles will be installed in a HMMWV platform for Operational Testing at Camp Pendleton to determine the system's on-the-move capabilities. The User Evaluation will be conducted at the Marine Corps Communications-Electronics Schools in 29 Palms, CA to be completed at the end of the 1st Qtr FY 2007. Upon completion of all testing, a Technical Test Report will be furnished.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Titanium Encapsulated Silicon Carbide Skirt Armor with Multi-Hit Capability (Navy)	0.832	0.406	0.000	0.000

Outcome: A successful DAC project will allow DRPM AAA to integrate multi-hit capable, composite skirt armor on the EFV. To meet the EFV skirt armor requirement for protection from 14.5mm armor piercing rounds at 300 meters and 155/152mm fragments at 15 meters, the USMC will test TESA manufactured by BAE Advanced Ceramics (formerly Cercom, Inc.) of Vista, CA. The EFV currently utilizes composite skirt armor to protect the lower half of the vehicle, including the track system, propulsion components and operators inside, but has experienced environmental durability issues and lacks multi-hit capability. A two-year project under sponsorship of the OSD CTO and MARCORSYSCOM. Projected completion of testing and qualification will be CY 2008 with transition to DRPM AAA during CY 2008. The primary outputs and efficiencies to be demonstrated in the DAC Test are: (1) provide a five percent vehicle weight reduction; (2) increase skirt armor durability a minimum of one and half times; (3) incorporate multi-hit armor protection; (4) provide a minimum cost savings of $56M for EFV production and maintenance, and avoid RDT&E costs of $2.5M with and ROI of 108:1.

FY 2006 Output: Initial funds received at the end of the 2nd Qtr. Contract Preparation & Award was completed at the end of the 4th Qtr.

FY 2007 Planned Output: Initiate test planning. Commence test article fabrication. Perform lab testing at BAE in Vista, CA to ensure a consistent thickness and encapsulation. Completion of Test Planning and delivery of Test Articles anticipated for end of 2nd Qtr. Upon successful Lab Testing, the Test Articles will be shipped to DRPM AAA, where Validation Testing will be completed with support from General Dynamics and BAE for EFV fit and integration. Completion of Validation Testing anticipated during the 4th Qtr. The Safety/Environmental (S/E) 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, including a Live-Fire Testing, with representatives from DRPM AAA and General Dynamics. Upon completion of the Live-Fire Testing, a Technical Test Report will be provided. A Procurement Decision will be made by DRPM AAA for inclusion in the EFV design and build during the 2nd Qtr.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009

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Trailer Mounted Power Generator & ECU (Navy)	0.562	1.146	0.000	0.000

Outcome: A successful DAC project will provide the USMC with an integrated TMG/ECU that can be deployed to provide power and environmental management for expeditionary command and control systems to allow sustained operations in any environment. The Marine Corps will test the Generator Environmental Control System Trailer (GET) produced by General Dynamics C4 Systems of Scottsdale, AZ, to meet the urgent requirement for an off-road, HMMWV towable, trailer system that is capable of producing 20-40 kW of electric power and 100,000 BTU of cooling or heating for the Marine Expeditionary Forces. A two-year project under sponsorship of the OSD CTO and MARCORSYSCOM. Projected completion of testing and qualification will be CY 2007 with transition to USMC Marine Expeditionary Forces during CY 2007. The primary outputs and efficiencies to be demonstrated in the DAC Test are: (1) integrate increased power generation and cooling/heating capability for sustained functionality of Command Operation Centers; (2) capability to move on-road and off-road with the speed of the MEF; (3) towable by HMMWV to minimize logistics footprint; (3) RDT&E cost avoidance of $4.0M, Procurement Cost savings of $16.0M, and provide an ROI of 16:1. FY 2006 Out of Cycle approved project.

FY 2006 Output: Initial project funding was received during the 3rd Qtr. Test Articles were received at the Aberdeen Test Center (ATC) and Limited User Evaluation was completed during the 3rd Qtr. Source Selection was awarded to General Dynamics C4 Systems. A contract option for additional test quantities from General Dynamics was exercised for delivery to MARCORSYSCOM.

FY 2007 Planned Output: After delivery of the test articles, the program office will conduct parallel Verification Testing and a Field/User Evaluation. Upon completion of all testing, a Technical Test Report will be furnished, a Procurement Decision will be reached at the end of the 3rd Qtr FY 2007, and a Close-out Report provided to complete the project during the 4th Qtr FY 2007.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
UUV-N Mine Neutralization by EOD Teams in VSW Environment (Navy)	1.015	1.393	0.378	0.000

Outcome: An effective, efficient, low risk method for providing mine neutralization initially from a Manned Surface and ultimately from a Unmanned Surface Vehicle (USV). 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 Output: Developed the SOW and deliverables (includes life cycle support contract); Contract Awarded and development of notional CONOPS and Exit criteria; AMNS Prototype Demonstration to NSCT 1.

FY 2007 Planned Output: Preliminary Design Review for vehicle and launcher and control console.

FY 2008 Planned Output: Complete User Evaluation and Performance Testing. After completion of all testing, a Technical Test Report will be provided, and a Close-out Report submitted.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Washable Read/Read-Write 2.45GHz RFID Tags with Highly Flexible Antenna (Army)	0.922	0.058	0.000	0.000

Outcome: This project is testing Radio Frequency Identification (RFID) tags that can be 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. 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, estimated savings of $29.700 million over the three year period.

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FY 2006 Output: Tested and evaluated Tags 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 included, 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.

FY 2007 Planned Output: A full test plan and detailed pass / fail criteria for individual tests will be provided to the program office within 90 days of contract award.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
X-Cor Replacement for Conventional Honeycomb (Army)	0.886	0.000	0.000	0.000

Outcome: This project demonstrated lightweight, damage tolerant core material that replaces conventional honeycomb in aerospace structures. The DAC project provided an enabling technology in support of a four-year project sponsored by Army ManTech, Utility Helicopter, and Special Operations PMOs.
The primary outputs and efficiencies demonstrated by the X-Cor replacement project (1) based on 47 lb. weight reduction - reduced negative effect of Aft CG condition, (2) elimination of corrosion prone metallic structure - reduce O&S cost 20% (3) part count reduced 73% (4) fastener count reduced 92% (5) Highly desired by Special Operations variant (6) reduction of touch labor hours in assembly. FY 2006 Output: (1) demonstrated all X-Cor and K-Cor manufacturing and inspection process steps, (2) developed formal process documents for each processing step and "Fixed" , (3) implemented a "Customer" approved Quality plan, (4) validated through testing all material properties, (5) validated through inspection all dimensional requirements, (6) manufactured and delivered six sets of core to the composite tailcone manufacturer. Savings in Procurement costs: $67.200 million minimum 45%.

FY 2006 Output: The DAC technical effort was successfully completed in FY 2006 with the ManTech work scheduled to be finished in FY 2007 with the delivery of four test articles and two flight test articles. Utility PMO will commence qualification test, including a flight test program. The Common Composite Tailcone is slated for implementation in Block 1A of the UH-60M program. There will be one common tailcone for both the UH-60M and MH-60M platforms. The UH-60 Blackhawk is part of the Army's Objective Force. To meet Objective Force goals of improved aircraft performance, Blackhawk aggressively pursued weight reduction. Aircraft weight is directly tied to vertical rate of climb (VROC) and range. Implementing X-Cor™ onto Blackhawk allows weight savings by replacing metallic structure with lightweight low O&S cost composite structure. Current estimates put this weight savings at 47 lbs. This technology also increases damage tolerance therefore improving ballistic survivability and reducing maintenance repairs due to damage.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
FY 2007 New Start Projects	0.000	0.000	0.000	0.000

FY 2007 Plan: The DAC program will continue to fund testing activities on 16 continuting projects executing $11.274 million in FY 2007 funding. The remaining $17.465 million in funding will initiate 18 new start DAC Projects which have been selected from the FY 2007 DAC Proposal Process. Detailed descriptions of these new starts are provided below.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Improved Performance Environmental Control System (Army)	0.000	1.154	0.464	0.000

Outcome: 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 ECS. It will provide the Army with a more robust and efficient heating and cooling environment for the HH-60M. The future ECS will be more efficient, more affordable and weigh 49 lbs. less than the current ECS.

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The Army is the lead service. The primary outputs and efficiencies to be demonstrated in the qualification of the ECS are (1) the ECS susceptibility to electromagnetic environmental interference, (2) ECS susceptibility to environmental affects, (3) Airworthiness qualification for the ECS. Improvements: Increase cooling capacity of 25%; a weight reduction of 49.2 pounds; a reduction in the procurement and operational maintenance costs; Resolves obsolescence issues; Life Cycle O&S savings: $31 million.

FY 2007 Planned Output: Conduct IPT meetings. Procure ECS from Enviro. Inc. Request and receive qualification by similarity support documentation from the vendor. Prepare and finalize test plans. Aviation Engineering Directorate will evaluate test data and provided recommendation of required qualification test. Write and receive approval for Environmental and Electromagnetic Environmental Interference Test Plans. Receive test article and Initiate Phase I of testing (E3/Environmental testing at the Redstone Technical Test Center (RTTC).

FY 2008 Planned Output: Complete E3/Environmental testing at RTTC. Complete Test Reports and submit to AED for approval for Airworthiness Qualification. Initiate and complete Phase II (Flight Testing) at the Aviation Technical Testing Center (ATTC). Complete Engineering Change Proposal, and begin installing ECS on new production HH-60M aircraft.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Application of Low Plasticity Burnishings to F-100 Engine Airfoils (Air Force)	0.000	0.812	0.252	0.000

Outcome: To demonstrate a metal stressing process on aircraft engine airfoils that will reduce foreign object damage to those components and thus reduce the substantial maintenance burden incurred due to unscheduled engine removals caused by foreign object damage. This can be accomplished, in a cost effective manner, by using the low plasticity burnishing (LPB) process to induce FOD mitigating deep compressive stresses in vulnerable engine blades. The estimated cost avoidance for the remaining service life of the selected engine system (F100-220 engine) is conservatively estimated at $144.000 million. The lead service is Air Force. The primary outputs and efficiencies are 1) the LPB-imparted stresses are sufficient to meet increased FOD tolerance requirements and do not impair performance or life of the blade, 2) no distortion of blade geometry and no cracking or other damage to blade, and 3) cost of the LPB process to be $20 per blade, with a threshold of $40.

FY 2007 Planned Output: Contract awarded; test planning and engineering; validation and verification of LBP process; deliver prototype turnkey solution to Oklahoma City Air Logistics Center (OC-ALC).

FY 2008 Planned Output: Continue refinement and delivery of solution; inaugurate on-floor capability at Air Logistics Center. The Low Plasticity Burnishing project is scheduled for completion July 2008. The transition manager is jointly the Air Force Research Lab, Materials Directorate and the OC-ALC.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
USMC M1A1 Improved Loader's Weapon Station (Navy)	0.000	1.154	0.000	0.000

Outcome: A successful DAC Program will provide the USMC with an ILWS for the M1A1 that will decrease the loader's exposed profile by 50%, while providing a more stable firing platform for up to 25% increased downrange firing accuracy, and enables rapid change in the direction of fire. Situational reports from OIF have identified that loaders are significantly prone to enemy fire due to their high seated position in the loader's weapon station in the M1A1. In order to increase the survivability and lethality of the M1A1 Main Battle Tank, the USMC will test non-developmental items from Recon Optical Inc. of Barrington, IL and EFW of Fort Worth, Texas. A one-year project under sponsorship of the OSD CTO and MARCORSYSCOM. Projected completion of testing and qualification will be CY 2007 with transition to USMC Tank Battalions during CY 2008. The primary outputs and efficiencies to be demonstrated in the DAC Test are: (1) facilitate rapid change in direction of fire; (2) increased firing accuracy over current system (10% threshold / 25% objective); (3) decrease crew exposure (50% threshold / 100% objective); (4) ring operation does not interference with loader's hatch; (5) avoid RDT&E costs of $1.1M and provide a ROI of 4.6:1.

FY 2007 Planned Output: Test article contract award and test planning completion anticipated during the 2nd Qtr. Delivery of test articles is expected during the 3rd Qtr. Completion of Integration Testing

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anticipated during the 4th Qtr. at ATC, Aberdeen, MD. Initiation of User Evaluation and Performance Testing is planned for 4th Qtr at ATC. Complete User Evaluation and Performance Testing. After completion of all testing, a Technical Test Report will be provided, Milestone C Decision reached, and a Close-out Report submitted.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Lithium Ion Battery System for the MK8 MOD1 SEAL Delivery Vehicle (SOCOM)	0.000	2.088	0.000	0.000

Outcome: This project will test Lithuim Ion (Li Ion) energy storage system upgrade for the SEAL Delivery Vehicle (SDV) from the current system that is based on Siver Zinc (Ag Zn) battery cells originally designed for SDV use in the 1970's. The Ag Zn system is insufficient to provide adequate power to meet the increased demand garnered by several SDV enhancements incorporated over the past 10 years (increased navigational accuracy, situational awareness, and communications). Ag Zn is being utilized beyond designed capability; Li Ion will exceed requirements with a charge in-place capability in the limited space available. The primary outputs and efficiencies to be demonstrated in the DAC is increased covert range mission duration and safety; 17 times longer service life than existing silver zinc technology; lower overall life cycle costs. The Li Ion battery system will realize an RDT&E cost avoidance savings of approximately $8.0M and anticipates a procurement cost avoidance savings of approximately $1.0M. The operations and support lifecycle cost avoidance savings is estimated to be $18.2M.

FY 2007 Planned Output: Analyze vendor test data and complete project test planning; complete procurement contract for test articles and take possession of test articles; conduct initial technical testing and begin operator/user assessment test. Complete operator/user assessment testing; finalize Milestone C procurement & fielding decision documentation based on test and evaluation; if applicable, accomplish "first unit equipped" fielding; submit project closeout report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
10kW Tactical Vehicle Inverter System (Army)	0.000	1.138	0.806	0.000

Outcome: The project is testing a 10 kW Tactical Vehicle Inverter Systems (TVIS), to determine if these systems can meet electrical requirements currently addressed with either a vehicle mounted Auxiliary Power Unit (APU) or Trailer mounted generator sets (3 - 10 kW). If successful, this project has the potential to replace both the APU and the trailer mounted Tactical Quiet Generators for Command Post Platform (CPP) Operations. One of the critical benefits is reduction of weight to light tactical vehicles (approximately 455 lb reduction in weight) This is especially important given that vehicle weights have increased with the addition of Up-Armor kits.

FY 2007 Planned Output: Develop test plan, award contract, procure test articles.

FY 2008 Planned Output: Complete User Evaluation and Performance Testing. After completion of all testing, a Technical Test Report will be provided, and a Close-out Report submitted.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Angel Fire - Situational Awareness of Large-Area Urban Operations (Air Force)	0.000	1.972	1.638	0.000

Outcome: To provide a high-resolution spot-beam capability; a night, infrared, wide-area surveillance capability; and a comprehensive plan to transition Angel Fire (AF) to a full acquisition program. AF is a tactical situational awareness system that provides real-time, high resolution (.5m), city-sized images (66 mega pixels) of infrastructure, vehicles and people to hundreds of users. This expansive coverage enhances tactical support, forensic analysis, and predictive analysis that in turn directly support urban combat, base defense, border security, improvised explosive device detection and other anti insurgency/counter terrorist efforts. Following a successful demonstration of the basic AF capability at the Marine Corps Air/Ground Combat Center in May/June 06, USMC specifically requested the three further refinements that would "customize" AF for deployment/employment in OIF. The lead service is Air Force. The primary outputs and efficiencies are 1) spot beam performance that will provide a

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multi-beam high-resolution capability to augment the wide-area lower resolution AF imagery at 3-inch resolution vice one-half meter resolution, 2) provision of a night-time infrared capability similar in military utility to the day, optical capability; and 3) provision of a transition plan and associated documentation that will allow rapid transition of the AF capability to a fully developed acquisition program.

FY 2007 Planned Output: Contract awarded; high resolution spot beam cameras procured; software integration activities; aircraft integration; flight evaluations.

FY 2008 Planned Output: Infrared cameras procured; software integration activities; aircraft integration; flight evaluation operations; transition planning. The Angel Fire project is scheduled for completion in July 2008. The transition manager is Air Force Research Lab.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Combat Rubber Raiding Craft (CRRC) Product Improvement Plan (PIP) (Navy)	0.000	0.868	0.000	0.000

Outcome: A successful DAC project will provide the USMC with a CRRC that features a self inflation system and an inflatable, rigid floor that reduces system weight by 17% and set up by 87% with a single Warfighter resulting in significant improvements for operational capability and force protection. Lessons learned from the GWOT and new submarine capabilities for subsurface insertions of Marine reconnaissance forces have driven the requirement to improve the deployment and transportability of the CRRC. The USMC will test the F-470 Evolution 7 manufactured by Zodiac of North America to maximize the Marine Recon Mission Profile. One-year project under sponsorship of the OSD CTO and MARCORSYSCOM, with completion of testing and qualification in CY 2007, transition to USMC MAGTF forces during CY 2008. The primary outputs and efficiencies to be demonstrated in the DAC Test are: (1) carry 2080 lbs. (fully combat loaded) and transom must support the Small Craft Propulsion System and the NBOE; (2) must not fold or "taco" in the surf zone when encountering waves; (3) must perform in a variety of temperature requirements for cold and heat; (4) must be able to fully inflate to proper pressure with one scuba tank cooled to 3200 psi.; (5) avoid RDT&E costs of $6M and provide an ROI of 14:1.

FY 2007 Planned Output: Test article contract award and test planning completion anticipated for the 2nd Qtr. Delivery of test articles is expected during the 3rd Qtr. Operational Testing planned for 3rd Qtr. at NSWC Carderock, MD. User Evaluation scheduled for 3rd Qtr. with 3rd Recon Battalion. With 2007 resources we will complete the Operational Testing and is anticipated during the 1st Qtr FY 2008. After completion of all testing, a Technical Test Report will be provided, Milestone C Decision reached, and a Close-out Report submitted during the 2nd Qtr FY 2008.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Improvements to Suite of Integrated Radio Frequency Countermeasures Systems (SOCOM)	0.000	0.506	0.819	0.000

Outcome: Technology advances have made gallium arsenide (GaAs) high frequency Radio Frequency (RF) Amplifier chips commercially available, which would reduce bare component costs as well reduce test and tuning time for Microwave Component Assemblies (MCA's) within the AN/ALQ-211 Suite of Integrated Radio Countermeasures (SIRFC) system, thereby preventing obsolescence of RF micro-chip assemblies and reducing the threat of diminishing material sources of supply. Primary outputs and efficiencies to be demonstrated in the this DAC project include: validation that commercially available GaAs RF chip component insertions to replace the current MCA's provide easier tuning during manufacturing and depot repair operations; demonstration of the capacity to detect and jam the most modern RF threats to Special Operations Aviation (SOA); reduction in unit/operations and sustainment cost and no necessity for skilled labor. Significant cost savings could be realized for upcoming manufacturing, assembly and sustainment of the ALQ-211 SIRFC on MH-47, MH-60, CV-22 and other non SOA Joint aircraft applications totaling approximately $17.9M. Completion date is 30 September 2008.

FY 2007 Planned Output: Analyze vendor test data and complete project test planning; conduct analysis and integration studies; complete procurement contract for test articles and vendor services and take possession of test articles; begin Phase I concept demonstration.

FY 2008 Planned Output: Complete Phase I concept demonstration and Phase II implementation and validation testing; finalize Milestone C procurement & fielding decision documentation based on test and

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evaluation; submit project closeout report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Fiber Optic Gyro Rate Sensors for Combat Vehicles (Army)	0.000	1.044	1.134	0.000

Outcome: This project will provide the Army with a family of Rate Sensors based on fiber optic technology for use in current force combat vehicles. Rate Sensors are the sensing elements of the stabilization and fire control subsystems and hence are an integral part of the lethality of these vehicles. Traditional Rate Sensors are based on the use of mechanical gyros with moving parts which are subject to wear in the extreme harsh environments. Fiber optic gyros use deflection of light waves to determine rate of motion change, which provides a much more reliable and accurate sensor. This project takes advantage of this more reliable device in a form, fit and function replacement for combat vehicle platforms. The Army is the lead service, with Marine Corp. support for integration to the LAV platform. Improvements: Longer Life, Better Performance, Less Stringent Handling Requirements, and Lower Cost. More Reliable 5-6 times MTBF (No moving parts). O&S Cost Avoidance : $6.27 million (5 Years) / $41.75 million (life). Procurement Cost Avoidance: $2.27 million (5 Years) / $15 million (life). RDTE Cost Avoidance: $1.3 million. Fielding Reduction: 3 + years. Procurement Potential: 1400 units per year, 7,000 units first 5 years. Lifetime potential is ~33,400 rate sensors /$167 million.

FY 2007 Planned Output: Conduct requirements Review for Bradley, M1, and LAV platforms; Design Verification Testing; Qualification Plans and Procedures for LAV and M1 vehicles; Test Readiness Review; and subassembly testing at White Sands Missile Range.

FY 2008 Planned Output: Conduct IPT meetings; Gun Fire Testing at government site; ECP/ERR development and release; Automated Test Equipment Development and Testing; M1 vehicle testing.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Cost Effective Light Aircraft Missile Protection (CELAMP) (Air Force)	0.000	1.160	3.149	0.000

Outcome: To demonstrate an integration of the Quiet Eyes turret with AAQ-24(V) with Directed Infrared Countermeasures (DIRCM) components that will provide infrared (IR) threat protection for sub-sonic platforms such as the A-10 and helicopters. The AAQ-24(V) Large Aircraft Infrared Countermeasures (LAIRCM) system is not optimized to provide protection for small aircraft such as helicopters and fighters because of its cost, form, fit and weight. Raytheon has developed a light-weight, low-cost IR countermeasure assembly (Quiet Eyes) that leverages guidance components from the combat-proven AIM-9X IR missile to provide highly responsive, all-aspect IR protection. The lead service is Air Force. The Primary outputs and efficiencies to be demonstrated are 1) the ability of the Quiet Eyes turret to handle the higher power laser associated with the AAQ-24, 2) demonstrate that the Raytheon Quiet Eyes turret can successfully be integrated with the Northrop Grumman processor, resulting in a readily available lightweight IRCM jammer for Army and Navy helicopters while meeting the requirement for the next generation IRCM jammer for the Air Force.

FY 2007 Planned Output: Generate contractual agreement between Air Force, Raytheon and Northrop Grumman and start integration efforts.

FY 2008 Planned Output: Test CELAMP turret in lab and live fire environments with a production-ready turret. The CELAMP project is scheduled to be completed September 2009. Capability will transition to Army and Navy helicopters starting in 2011 and cargo aircraft for the Air Force in 2012. Transition manager is Air Force Aeronautical Systems Center.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Non-Gasoline Burning Outboard Engine (Navy)	0.000	1.089	0.000	0.000

Outcome: A successful DAC project will provide the USMC with a NBOE that will increase safety by reducing the need for gasoline and allow continued use of the Combat Rubber Reconnaissance Craft

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(CRRC), maintaining the USMC's primary amphibious capability for Over-The-Horizon reconnaissance operations. To meet the objective requirement to replace the current Small Craft Propulsion System with a NBOE, the USMC will test the 55 horsepower, Evinrude Vindicator, manufactured by Bombardier Recreational Products of Waukegan, IL, for compliance with DoD policy for fuel standardization to kerosene-based and diesel fuels. Two-year project under sponsorship of the OSD CTO and MARCORSYSCOM, with completion of testing and qualification in CY 2008, transition to USMC reconnaissance forces during CY 2009. The primary outputs and efficiencies to be demonstrated in the DAC Test are: (1) must function on JP5, JP8, and Diesel in addition to gasoline; (2) must function with a pump jet, no propeller; (3) must meet requirements for a 50% plunging surf with a wave height of 8 ft. and a period of 8 seconds; (4) must have a range of 50 nautical miles (5) must reach a top speed of 15 knots with a combat loaded CRRC; (6) avoid RDT&E costs of $3.0M and provide an ROI of 19:1.

FY 2007 Planned Output: Contract Preparation and Award scheduled for completion during the 2nd Qtr. Anticipate completion of Test Planning during 2nd Qtr. Delivery of test articles is expected during the 3rd Qtr. Signature/ Destructive Testing is planned for 3rd Qtr at Naval Surface Warfare Center (NSWC) Carderock, MD. Fleet User Evaluation scheduled for 3rd Qtr; including, Low Temp Evaluation in Kodiak, Alaska, High Surf Evaluation with the Expeditionary Warfare Training Group-Pacific in San Diego, and a High Temp Evaluation in Key West, Florida. Completion of Technical Testing is anticipated at the end of the 1st Qtr FY 2008. After completion of all testing, a Technical Test Report will be provided, a Milestone C Decision reached, and a Close-out Report submitted by the end of the 2nd Qtr FY 2008.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Crew Served and Heavy Weapons Aiming Laser (CSHWAL) (SOCOM)	0.000	0.500	0.000	0.000

Outcome: The CSHWAL is envisioned as a small lightweight, highly effective laser pointing and aiming system to facilitate both day and night time operations for crew served and heavy weapons platforms. This green laser pointer will provide the Special Operator with a multiplicity of function making the CSHWAL the most cost-effective weapon aiming system available to the warfighter today. The primary outputs and efficiencies to be demonstrated in the DAC is effective operation out to 2200 meters; 8X more visibility than red lasers in daylight; infrared laser pointer and wide illuminator for night use; compact, lightweight system design. The products to be tested will be based on commercial-off-the-shelf and non-developmental items that will require only minor modification prior to fielding for combat. The CSHWAL will increase the Special Operations Forces survivability and lethality, by enhancing weapon performance and target acquisition. The total RDT&E, manufacturing, and operations and maintenance cist avoidance savings is approximately $15.96M. Completion date is 31 January 2008.

FY 2007 Planned Output: Complete project test planning; complete procurement contract for test articles and take possession of hardware; conduct technical testing and operator/user assessment test. Finalize Milestone C procurement & fielding decision documentation based on test and evaluation; submit project closeout report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Portable oxygen concentrator for patient treatment and transport. (Army)	0.000	0.367	0.378	0.000

Outcome: This project will test devices that concentrate oxygen from the air to provide oxygen to hospital patients during treatment and transport. Oxygen from these concentrators will also be used to make oxygen for use in anesthesia machines during surgery. This device will greatly reduce the need to refill oxygen cylinders, and thus reduced the logistics burden associated with this task.

FY 2007 Planned Output: Develop test plan, award contract, procure test articles.

FY 2008 Planned Output: Complete User Evaluation and Performance Testing. After completion of all testing, a Technical Test Report will be provided, and a Close-out Report submitted.

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Modular Advanced Composite Armor Kits for SUVs (SOCOM)	0.000	1.338	1.571	0.000

Outcome: The project will test lightweight, advanced composite armor for SUVs and Special Operation Non-Standard Civilian Vehicles that can be easily installed and repaired in the field by non-technical personnel without the need for special tools or equipment. This technology will provide immediate force protection and increased survivability for Special Operation Forces prosecuting the Global War on Terrorism. The primary output and efficiency to be demonstrated in this DAC is modular fit and design armor kits that provide National Institute of Justice Level IV/NATO-STANAG Level 3 protection from small arms and antipersonnel fragmentation mines. RDT&E, manufacturing and production cost avoidance savings anticipated as a result of this DAC are approximately $68M. Completion date is 30 June 2008.

FY 2007 Planned Output: Complete project plan of action and milestones; solicit and receive product sample coupons from interested vendors; conduct Phase I initial technical evaluation and live fire testing; carry out a down selection of vendor materiel solutions for further testing; complete procurement/test article contracts with selected vendors.

FY 2008 Planned Output: Complete evaluation of vendor data and finalize test planning; conduct analysis and vehicle integration studies; obtain contracted test articles; carry out Phase II technical, environmental and live fire testing; conduct Phase III form fit function, safety and operational testing and evaluation; finalize Milestone C procurement and fielding decision package based on test and evaluation; submit project closeout report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Low Cost Land Warrior Cable Connector System (Army)	0.000	0.795	0.500	0.000

Outcome: This project will reduce manufacturing time and cost for connectors down to $15/shell and cut manufacturing and connector lead time significantly. Current Land Warrior connectors are made with connector shells that are machined out of stainless steel. This machining process requires more than 15 minutes of machining time, costing approximately $25/shell.

FY 2007 Planned Output: Each Land Warrior ensemble needs 10 cables, 20 cable connector shells plus 20 receptacle body connector shells, (40 shells total) costing approximately $1000 per ensemble. Develop test plan, award contract, procure test articles.

FY 2008 Planned Output: Complete User Evaluation and Performance Testing. After completion of all testing, a Technical Test Report will be provided, and a Close-out Report submitted.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
AN/BSN-2 Digital Depth Detector (Navy)	0.000	0.471	0.000	0.000

Outcome: The AN/BSN-2 Digital Depth Detector (DDD) was developed to be a form, fit, and functional replacement for the current antiquated (1950's technology) depth detector installed on SSN/SSBN submarine platforms. The DDD is a state-of-the-art microprocessor-based system that utilizes readily available Commercial Off-the-Shelf (COTS) components. The DDD is more reliable and maintainable, reducing system life cycle costs by 87% and provides additional functional/operational capabilities necessary to support the objectives of the Navy's Submarine Modernization Program.

FY 2007 Planned Output: Develop TEMPALT, test Plan and installations and operational test. Develop Final Test report and Close Out Report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009

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C2 Resource Management: Master Caution Panel (MCP) (Air Force)	0.000	1.160	0.252	0.000

Outcome: To demonstrate technology that allows network/system administration personnel to monitor the internal network of a C2 enterprise, such as an Air Operations Center (AOC), providing status of machine availability, connectivity, software processes, and host health. MCP "bridges the gap" between the warfighter environment and the system administrators and engineers maintaining the IT resources used to plan and conduct AOC missions. The lead service is Air Force. The Primary outputs and efficiencies to be demonstrated are 1) improved situational awareness during real world operations.

FY 2007 Planned Output: Produce a web-based training package that will guide a user through the configuration of MCP in a new environment (i.e., AOC). A test plan to test the training package as well as the existing MCP software in an AOC environment will also be produced. To support demonstration of MCP at an operational site and to prepare for transition to the AOC SPO a system security authorization agreement (SSAA) will be developed. This document is required in order to certify that MCP is safe to operate in a network.

FY 2008 Planned Output: Evaluation reports based on the tests. Updates to the training package will also be accomplished depending on the results of the demonstration. A final package of deliverables (training package, test plan, test reports, and SSAA) as needed at the end of the effort. The C2MCP Project is scheduled to conclude in FY 2008. Integration of the capability will be conducted through block upgrades to Air Operation Centers through FY 2010. Transition Manager is AF Research Lab.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
Rucksack Portable Receive Suite (Navy)	0.000	0.442	0.000	0.000

Outcome: This project will evaluate the Portable Receive Communications Suite, a lightweight, ruggedized Global Broadcast Service (GBS) developed by Windmill International of Nashua, New Hampshire. The Windmill communications suite will enable the warfighter to set up and receive GBS satellite broadcast anywhere, allowing reception of a full array of on-the-spot actionable intelligence (classified and unclassified) information including live Predator video, full resolution satellite imagery, and up-to-date sensitive information rebroadcast products.

FY 2007 Planned Outcome: Develop test plan, award contract, procure test articles, conduct test, prepare final test report.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
FY 2008 Plans	0.000	0.000	17.440	0.000

FY 2008 Plan: The DAC program will continue to fund testing activities on 13 projects executing $11.529 million in FY 2008 funding. Remaining funding will be used to initiate new start DAC Projects selected from the FY 2008 DAC Proposal Process. The FY 2008 DAC Proposal Process will begin with the release of the BAA in December 2006. Final selection of FY 2008 New Start DAC Projects is planned for the fourth quarter FY 2007.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
FY 2009 Plans	0.000	0.000	0.000	30.210

FY 2009 Plan: The DAC program will continue testing activities on the projects selected from the FY 2008 proposal cycle. Remaining funding will be used to initiate new start DAC projects selected from the FY 2009 DAC proposal process. The FY 2009 final proposal selection process is scheduled for the fourth quarter FY 2008.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)		Date: February 2007
APPROPRIATION/ BUDGET ACTIVITY RDT&E/ Defense Wide BA# 5	PE NUMBER AND TITLE **0604051D8Z - Defense Acquisition Challenge Program (DACP)**	PROJECT **P051**

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy The Acquisition Strategy for DAC is as outlined in Title 10. DAC is to provide opportunities for the increased introduction of innovative and cost-saving technology in acquisition programs of the Department of Defense. DAC funding is used to fund testing of commercial and non-developmental items that could result in improvements in performance, affordability, manufacturability, or operational capability of an existing acquisition program. It is expected that should testing be successful, procurement using the respective current program funding would be used for acquisition.

E. Major Performers Not Applicable.

OSD RDT&E COST ANALYSIS (R3)

Date: February 2007

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

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

PROJECT
P051

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Various Projects	TBD	TBD	0	0		0		0		0	0	0
Subtotal:			0	0		0		0		0	0	0

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Various Projects	TBD	TBD	0	0	1-4Q	0	1-4Q	0		0	0	0
Subtotal:			0	0		0		0		0	0	0

III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Various Projects	Various		33198	29332	1-4Q	28970	1-4Q	30210	1-4Q	0	121710	0
Subtotal:			33198	29332		28970		30210		0	121710	0

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Various Projects	Various	TBD	0	0	1-4Q	0	1-4Q	0		0	0	0
Subtotal:			0	0		0		0		0	0	0

OSD RDT&E COST ANALYSIS (R3)

Date: February 2007

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

Project Total Cost:	**33198**	**29332**		**28970**		**30210**		**0**	**121710**	**0**

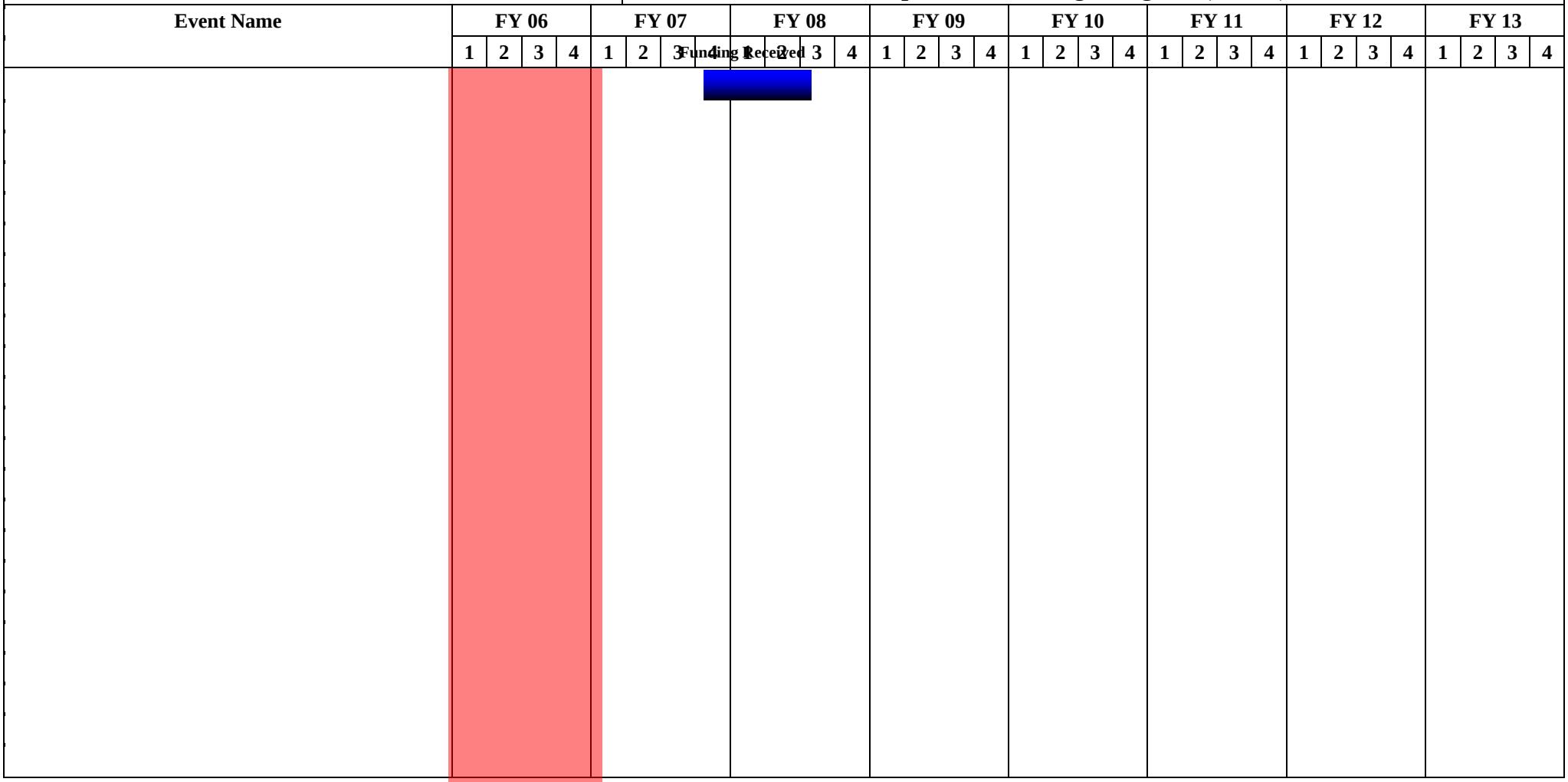
Schedule Profile (R4 Exhibit)

Date: February 2007

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

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

PROJECT
P051



Schedule Detail (R4a Exhibit)

Date: February 2007

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

Schedule Detail	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Funding Received		2Q						
Test Plan / Initial Testing and Down Selection		2-3Q						
Test Item Procured / Received			1Q					
Technical / Operational Testing			1-4Q					
Evaluation Report			4Q					
Decision / Close Out Report			4Q					

Comment: