CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification										DATE: **June 2001**	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7**						R-1 ITEM NOMENCLATURE 0205633N, AVIATION IMPROVEMENTS					
COST ($ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Total PE Cost		**48.959**	**50.475**	**41.423**							
W0601 Common Ground Equipment		**3.985**	**3.224**	**3.358**							
W0852 Consolidated Automated Support System (CASS)		**8.117**	**7.890**	**6.741**							
W1041 Aircraft Equip Reliability/Maintainability Improvement Program		**0.867**	**0.739**	**0.628**							
W1355 Aircraft Engine CIP		**35.990**	**38.622**	**30.696**							
Quantity of RDT&E Articles **Not Applicable**											

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

Common Ground Equipment is a Naval Aviation Project to apply new technology to common support equipment necessary to support multiple aircraft. CASS is a standardized Automated Test Equipment (ATE) with computer assisted, multi-function capabilities to support the maintenance of aircraft subsystems and missiles. AERMIP is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment, and provides increased readiness at reduced operational and support cost. Aircraft Engine Component Improvement Program develops reliability and maintainability (R&M) and safety enhancements for in-service Navy aircraft engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, fuel systems , fuels, and lubricants.

(U) JUSTIFICATION FOR BUDGET ACTIVITY:

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W0601 Common Ground Equipment					
COST ($ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		**3.985**	**3.224**	**3.358**							
RDT&E Articles Qty											

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

This project introduces effective, efficient fleet support equipment through the application of new technology, thereby improving fleet supportability and aircraft readiness.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

- (U) ($. 271) Continued Advanced Boresight Equipment (ABE) development Low Rate Initial Procurement (LRIP) program.
- (U) ($. 261) Continued development of USAF Next Generation Munitions Handler (NGMH).
- (U) ($ .554) Completed Joint Service Electronic Combat Tester (JSECT).
- (U) ($ 2.899) Continued development of Joint Engine Test Initiative (JETI).

2. FY 2001 PLANS:

- (U) ($ .380) Continue ABE program.
- (U) ($. 490) Continue NGMH program.
- (U) ($ 1.484) Complete JETI program.
- (U) ($. 300) Continue new Aircraft Axle Jack program.
- (U) ($ .1 70) Initiate Aviator Breathing Oxygen (ABO) program.

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	**0205633N Aviation Improvements**	W0601 Common Ground Equipment

1. FY 2001 PLANS (CONT):

- (U) ($ .200) Initiate Composite Material Inspection program.

- (U) ($. 200) Intitate Non-Destructive Inspection (NDI) Ultrasonics program.

3. FY 2002 PLANS:

- (U) ($ .980) Initiate Fuel Cell Application program.

- (U) ($ .270) Continue ABE program.

- (U) ($.950) Continue NGMH program.

- (U) ($.915) Initiate Shaft Engine Test Instrumentation program.

- (U) ($ .100) Initiate Electronic Warfare (EW) Threat Simulator Study.

- (U) ($ .143) Initiate Thermal Image Non-Destructive Inspection (NDI) study.

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W0601 Common Ground Equipment

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	4.088	3.259	3.410
(U) Adjustments from the President's Budget:	-0.103	-0.035	-0.052
(U) FY 2002 President's Budget Submit	3.985	3.224	3.358

CHANGE SUMMARY EXPLANATION

(U) Funding:

The FY 2000 net decrease of $.103 million reflects decrease of $.016 for a Congressional Recission, a decrease of $.005 million for Small Business Innovative Research assessment, and a decrease of $.082 million for reprioritization of requirements within the Navy. The FY 2001 net decrease of $.035 million reflects a decrease of $.005 million,for reprioritization of requirements within the Navy,a decrease of $.023 million for a Congressional Reduction,and a decrease of $.007 for a Congressional Recission. The FY 2002 net decrease of $.052 million reflec decrease of $.039 million for economic assumptions and decrease of $.013 for reporitization of requirements within the Navy.

(U) Schedule: FY 2000 Joint Engine Test Initiative was erroneously stated as (9/00MSIII) under Contract Milestones, which should have been (9/00MSII) under Program Milestones.

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
APN 070500 Ground Support Eq	140.531	102.144	146.705							

Related RDT&E: Not Applicable

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W0601 Common Ground Equipment

(U) D. ACQUISITION STRATEGY: * This is a non-ACAT program. Field activities propose tentative RDT&E projects. Internal panel merits and selects projects. Field activities develop projects and submit results. Operational Advisory Group (OAG) process selects projects to transition to procurement (APN-7).

(U) E. SCHEDULE PROFILE:

	FY 2000	FY 2001	FY 2002
(U) Program Milestones			
Advanced Boresight Equipment			12/01 (MSIII)
Next Generation Munitions Handler			
Joint Engine Test Initiative	9/00 (MSII)		12/01 (MSIII)
(U) Engineering Milestones			
(U) T&E Milestones			
Joint Engine Test Initiative		4/01 (DT)	
Shaft Engine Test Instrumentation			
(U) Contract Milestones			
Joint Engine Test Initiative	2/00 (Pre-Production Contract Award)		12/01 (Contract Award)

R-1 SHOPPING LIST - Item N192

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: **June 2001**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W0601 Common Ground Equipment							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	Various	Various	11.955	0.050	10/00	0.800	01/02					
Subtotal Product Development			11.955	0.050		0.800						
Remarks:												
Miscellaneous Support	Various	Various		2.324	01/01	2.258	01/02					
Subtotal Support			0.000	2.324		2.258						
Remarks:												

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)											DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W0601 Common Ground Equipment							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Miscellaneous Test & Evaluation	Various	Various		0.850	01/01	0.300	01/02					
Subtotal T&E			0.000	0.850		0.300						
Remarks:												
Subtotal Management			0.000	0.000		0.000						
Remarks:												
Total Cost			11.955	3.224		3.358						
Remarks:												

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W0852 Consolidated Automated Support System					
COST ($ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		**8.117**	**7.890**	**6.741**							
RDT&E Articles Qty											

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

The Consolidated Automated Support System (CASS) project designs, and develops modular constructed automated test equipment with computer-assisted, multi-functional capability based, standardized hardware, and software elements. CASS responds to Fleet Commanders' expressed requirements to correct serious deficiencies in existing automatic test equipment. Program objectives are: (1) increase material readiness; (2) reduce life cycle costs through standarization; (3) improve tester sustainability at depot, and intermediate maintenance levels; (4) reduce proliferation of unique test equipment, and (5) provide test capability for existing and future avionics/electronics systems.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

- (U) ($ .337) Continued development of DOD Automated Test System (ATS) standard interfaces and architectures.

- (U) ($. 177) Continued development of A Board Base Environmental, for Test (ABBET) standards instrument control software.

- (U) ($. 366) Continued CASS station upgrades to include tunable lasers.

- (U) ($ 6.919) Continued development of instrument control upgrades and virtual instruments (RTCASS).

- (U) ($ .318) Continued development of advanced digital/video process.

2. FY 2001 PLANS:

- (U) ($ 7.000) Continue development of instrument control upgrades and virtual instruments (RTCASS).

- (U) ($ .661) Continue CASS station upgrades.

-(U) ($.229) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 68.

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W0852 Consolidated Automated Support System

3. FY 2002 PLANS:

- (U) ($ 5.617) Initiate development of a Synthetic Instrument Package.

- (U) ($ 1.124) Continue CASS station upgrades.

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	8.523	7.974	8.614
(U) Adjustments from the President's Budget:	-0.406	-0.084	-1.873
(U) FY 2002 President's Budget Submit:	8.117	7.890	6.741

CHANGE SUMMARY EXPLANATION

(U) Funding:
The FY 2000 net decrease of $.406 million reflects a decrease of $.293 million for reprioritization of requirements within the Navy, a decrease of $.80 million for a Small Business Innovative Research (SBIR) assessment, and a decrease of $.033 million for a Congressional Recission.
The FY 2001 net decrease of $.084 million reflects a decrease of $.011 million for reprioritization of requirements within the Navy, a decrease of $.017 million for a Congressional Recission, and decrease of $.056 million for a Congressional Reduction.
The FY 2002 net decrease of $1.873 million reflects a decrease of $1.841 million for reprioritization of requirements within the Navy and a decrease of $.032 for economic assumptions.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Cost
APN 070500 CASS	94.634	120.567	106.832							
Related RDT&E: Not Applicable										

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-7	0205633N Aviation Improvements	W0852 Consolidated Automated Support System	

(U) D. ACQUISITION STRATEGY: The stragtegy for Parts Obsolescence is a combined effort with the contractor, any changes to present strategy will add additional risks to achieving a continuous production schedule, and will cause technical uncertainty. For new technologies we will have competitive studies to ascertain the market technology; which, will result in maximum information for minimum expenditure.

(U) E. SCHEDULE PROFILE:

	FY 2000	FY 2001	FY 2002	TO COMPLETE
(U) Program Milestones				
(U) Engineering Milestones				
(U) T&E Milestones				
(U) Contract Milestones				
RTCASS	11/99 (Contract Award)	4/01 (Contract Award)		
Synthetic Instrument Package			3/02 (Contract Award)	

R-1 SHOPPING LIST - Item No. 188

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)											DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W0852 Consolidated Automated Support System							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	C/FFP	LMC	12.900	7.000	03/01							19.900
Hardware Development	Various	Various		0.661		1.124	01/02					
Hardware Development	C/FFP	TBD				5.617	03/02					9.450
Subtotal Product Development			12.900	7.661		6.741						
Remarks:												
SBIR Assessment				0.229								
Subtotal Support			0.000	0.229		0.000						
Remarks:												

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W0852 Consolidated Automated Support System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Subtotal T&E			0.000	0.000		0.000						
Remarks:												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.000						
Remarks:												
Total Cost			12.900	7.890		6.741						
Remarks:												

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W1041 Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP)					
COST ($ in Millions)	Prior Years Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		**0.867**	**0.739**	**0.628**							
RDT&E Articles Qty											

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

AERMIP is the only Navy program which provides Research, Development, Test & Evaluation (RDT&E) engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through Reliability and Maintainability (R&M) and safety improvements to existing systems and equipment installed in Naval aircraft. It also provides a transition vehicle to deploy Total Ownership Cost (TOC) reduction initiatives through flight-test support and Fleet Test & Evaluation. It meets affordable readiness objectives by providing a cost-effective solution to obsolescence problems encountered when service lives are extended. AERMIP promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-developmental items. AERMIP also decreases life c costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high priority flight testing which is not associated with any acquisition or development program under the Flight Test General (FTG) task.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

- (U) ($.867) Completed multi-platform application of SKYFLEX with approval for use on all platforms. Completed Airborne Air Removal Device (EA-6B application) and Multi-Place Life Raft Improvement Program. Continued with the extension of application of the Replacement Attitude Heading Reference System (RAHRS). Investigated high value pay back return on investment candidates.

2. FY 2001 PLANS:

- ($.737) Continue Total Ownership Cost (TOC) reduction corrosion initiatives. Continue with extension of RAHRS application. Investigate high value return on investment candidates and transition of TOC reduction initiatives. Complete RAHRS.

- ($.002) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 68.

3. FY 2002 PLANS:

- ($.628) Complete the Corrosion Preventative Compound initiative by developing a best practices plan to be implemented by all Naval Aircraft. Initiate the Common Instrument Program. Investigate high value pay back return on investment candidates and transition of TOC reduction initiatives.

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W1041 Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP)

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	0.894	0.747	0.641
(U) Adjustments from the President's Budget:	-0.027	-0.008	-0.013
(U) FY 2002 President's Budget Submit:	0.867	0.739	0.628

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2000 net decrease of $.027 million consists of $.005 million decrease for Small Business Innovative Research assessment, a $.004 million decrease for a Congressional recission and a $.018 million decrease for reprioritization of requirements within the Navy. The FY 2001 net decrease of $.008 million consists of $.001 million decrease for reprioritization of requirements within the Navy, a $.005 decrease for a Congressional reduction, and a $.002 million decrease for a Congressional recission. The FY 2002 net decrease of $.013 million consists of a $.003 million decrease for a reprioritization of requirements within the Navy and a $.010 million decrease for economic assumptions.

(U) Schedule: Not Applicable

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable

(U) D. ACQUISITION STRATEGY: This is a non-ACAT program with no specific acquisition strategies.

(U) E. SCHEDULE PROFILE: Not Applicable

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements					PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program					
COST ($ in Millions)	Prior Years Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		**35.990**	**38.622**	**30.696**							
RDT&E Articles Qty											

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

The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy aircraft propulsion systems. The highest priority issues CIP addresses concern safety-of-flight deficiencies which account for approximately 80% of CIP efforts. The program also corrects service-revealed deficiencies, improves Operational Readiness (OR) and Reliability and Maintainability (R&M), and reduces platform Life Cycle Cost (LCC). Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term plans. CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion system as an integral part of Reliability Centered Maintenance (RCM) initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during DESERT SHIELD/DESERT STORM operations due to sand erosion. In addition, new problems arise through actual use during deployment of the aircraft. Development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those the aircraft was designed to perform. Therefore, it has been found that CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, and fuel and lubricant systems. CIP efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

(U) ($32.005) Platform-specific efforts:

T56 engine (P-3, E-2, C-2, C-130) Maintained safety margins by investigating turbine coatings and developing new designs, continued propeller integration efforts with potential propeller designs, performed engine hot section corrosion and fatigue analysis, and continued bearing improvements.

E-2/C-2/C-130 Continued propeller safety improvement program, initiated pump housing improvement, performed Hub Internal Supply System development, eliminated starter failures, continued generator improvement program to triple durability.

S-3 Established and implemented an engineering plan to improve TF34 reliability, performed analysis to obtain better performance from existing hardware, redesigned low reliability parts, conducted control system reliability and maintainability analysis, validated and implemented recommended part life changes.

F/A-18C/D Identified obsolescence problems, continued efforts on aft cooling plate, low pressure turbine nozzle and fan stage 3 shroud redesigns. Continued life management issues including the fleet leader program, engine analysis studies, and improved analytical models, analyzed engine performance data and updated mission analysis.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements	PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program

1. FY 2000 ACCOMPLISHMENTS (CONT):

Mature Aircraft Addressed the top readiness degraders and Aviation Depot Logistic Repair (AVDLR) costs; implemented efforts on the J52 engine (EA-6B) ASMET test, corrected deficiencies in #3 hub, continued to study and implement solutions to aging aircraft and future obsolescence problems.

H-2/H-60 Implemented I-level screening techniques for the Digital Electronic Control Unit (DECU) and Hydro-Mechanical units, continued the Advanced Helicopter Transmission Lubricant Program, extended transmission component lives, increased readiness by reducing corrosion, continued Mission Profile Data Collection and Dynamic Component Life Limit efforts.

AV-8B Addressed top readiness degraders and AVDLR costs; safety of flight issues, engine removal drivers, and mission failure drivers, assessed life management program issues for engine components.

H-53/H-46/H-3 Continued efforts on the top cause for engine removals; completed transition of program to reliability-centered maintenance; implemented goals at depot level to improve compressor performance and engine power, resolved oil consumption and leakage problems, and improved on wing times.

H-1 Addressed top safety concerns as ranked by the Operational Advisory Group (OAG) and System Safety Working Group, updated Navy maintenance manuals, continued to improve time-between-overhaul and reduced impact of high-time parts, continued improvements on tail rotor drive system.

T-45 Completed four year engine surge recovery program, addressed platform safety, increased predicted part life confidence, provided mission profile updates and life cycle management.

F-14A Performed minimal level of sustaining engineering to address safety-of-flight issues.

F-14B/D Addressed extension of component life and the reduction of maintenance hours, improved propulsion system safety through an active life management program for critical rotating components, reduced the engine Non-recoverable In-Flight Shutdown Rate by 75%, reduced the propulsion system related mission abort rate by 50%.

F/A-18E/F and V-22 Closed out ongoing efforts.

(U) ($3.985) Multi-Platform Product Support Teams Continued projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

2. FY 2001 PLAN:

(**U) ($33.626) Platform-specific efforts:**

T56 engine (P-3, E-2, C-2, C-130) Begin and implement the Engine Monitory System version 7.0 upgrade. Maintain safety margins by investigating turbine coatings and develop new designs, continue propeller integration efforts with potential propeller designs, perform engine hot section corrosion and fatigue analysis, and continue bearing improvements.

E-2/C-2/C-130 Begin incorporation of improved blade heaters. Begin development of improved propeller control system.

S-3 Complete new fan blade design. Complete safety related fan High Pressure Compressor (HPC) life limit analysis. Complete Main Fuel Control (MFC) durability investigation. Perform analyses on commercial hardware incorporation analyses. Continue validation and implementation on recommended part life changes.

R-1 SHOPPING LIST - Item No. 192

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements	PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program

2. FY 2001 PLAN (CONT):

F/A-18C/D Identify obsolescence problems, continue efforts on bushing, aft cooling plate, low pressure turbine nozzle and bolted dome combustor redesign efforts. Continue life management issues including the fleet leader program, engine analysis studies, and improved analytical models, analyze engine performance data and update mission analysis.

Mature Aircraft Address the top readiness degraders and AVDLR costs; implement efforts on the J52 engine (EA-6B) ASMET test, perform annual maintenance awareness brief and annual P-408A major engine inspection program. Continue to study and implement solutions to aging aircraft issues and future obsolescence problems. Begin redesign of diffuser case for increased life.

H-2/H-60 Complete integrating of the improved Digital Electronic Control Unit (DECU) to the H-60 fleet. Complete implementation of I-level screening techniques for the DECU and Hydro-Mechanical units, continue the Advanced Helicopter Transmission Lubricant Program, extend transmission component lives, increase readiness by reducing corrosion, continue Mission Profile Data Collection and Dynamic Component Life Limit efforts. Continue time on wing and Mean Time Between Removals (MTBR) cost drivers initiatives including compressor durability, Titanium Nitrates (TiN) coating and three-stage turbine.

AV-8B Complete design efforts associated with the exhaust duct cracking, and failure of the Low Pressure Compressor (LPC) and HPT blade cracking and shaft sulfidation. Complete Shell Deer Park fuel burner rig testing to eliminate all risk associated with fuel incompatibility in the F402 engines. Address top readiness degraders and AVDLR costs; safety of flight issues, engine removal drivers, and mission failure drivers, assess life management program issues for engine components.

H-53/H-46/H-3 Start Bleed Valve redesign. Continue efforts on the top cause for engine removals; complete transition of program to reliability-centered maintenance; implement goals at depot level to improve compressor performance and engine power, resolve oil consumption and leakage problems, and improve on wing times.

H-1 Address top safety concerns as ranked by the OAG and System Safety Working Group, continue to update Navy maintenance manuals, continue to improve time-between-overhaul and reduce impact of high-time parts. Continue improvement program to the Bleed Valve, T5 Harness, Gas Generator Case Diffuser Inlet, and Compressor Stub Shaft. Initiate development of environmentally friendly repairs such as High Velocity OXY fuel coatings to replace chrome and nickel plate repairs.

T-45 Continue investigation of engine vibration problems to resolve safety issue. Address platform safety, increase predicted part life confidence, provide mission profile updates and life cycle management. Continue Critical Parts Life management to ensure no overfly of parts, continue life management to double most expensive parts life, and address obsolescence issues.

F-14B/D Complete final life limit updates for F110-GE-400 engine. Complete High Pressure Compressor Spool life improve redesign. Address extension of component life and the reduction of maintenance hours. Continue improvements to propulsion system safety through an active life management program for critical rotating components, reduce the engine Non-recoverable In-Flight Shutdown Rate by 75% by 2003, reduce the propulsion system related mission abort rate by 50% by 2003.

F/A 18-E/F and V-22 These platforms are unfunded in FY 2002 due to budget shortfalls.

(U) ($4.210) Multi-Platform Product Support Teams Continue projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

(U) ($.786) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 68.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0205633N Aviation Improvements	PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program

3. FY 2002 PLANS:

(U) (**$25.797**) **Platform-specific efforts:**

T56 engine (P-3, E-2, C-2, C-130) Continue the implementation of the Engine Monitory System version 7.0 upgrade. Maintain safety margins by investigating turbine coatings and develop new designs, continue propeller integration efforts with potential propeller designs, perform engine hot section corrosion and fatigue analysis, and continue bearing improvements.

E-2/C-2/C-130 Continue incorporation of improved blade heaters. Continue development of improved propeller control system.

S-3 Initiate High Pressure Compressor (HPC) life limit implementation. Continue validation and implementation of High Pressure Turbine (HPT), Low Pressure Turbine (LPT), and Fan critical part life limit changes. Initiate the development of Combustion Chamber Frame (CCF) and HPT physics based thermal models. Complete the development of LPT physics based thermal models. Collect engine parameter flight data required to perform updated engine mission analysis. Initiate the development of improved Eddy Current (EC) inspection techniques for small holes and specific features. Analyze and correlate HPC EC inspection requirements to critical part Fracture Mechanics (FM) capabilities. Investigate propulsion and power system obsolescence. Conduct engine component and propulsion and power electrical system reliability/maintainability analysis. Conduct commercial critical part hardware commonality analysis.

Mature Aircraft Address the top readiness degraders and AVDLR costs; implement efforts on the J52 engine (EA-6B) ASMET test, perform annual maintenance awareness brief and annual P-408A major engine inspection program. Continue to study and implement solutions to aging aircraft issues and future obsolescence problems. Continue redesign of diffuser case for increased life.

H-2/H-60 Continue the Advanced Helicopter Transmission Lubricant Program, extend transmission component lives, increase readiness by reducing corrosion, continue Mission Profile Data Collection and Dynamic Component Life Limit efforts. Continue time on wing and Mean Time Between Removals (MTBR) cost drivers initiatives including compressor durability, Titanium Nitrates (TiN) coating and three-stage turbine.

AV-8B Address top readiness degraders and AVDLR costs; safety of flight issues, engine removal and mission failure drivers, assess life management program issues for engine components. Projects will include but not be limited to: ASMET testing, support of a Fleet Leader Program, Analytical Condition Insepction (ACI), Engine Life Management Program (ELMP) execution and design fixes for any service revealed deficiencies.

H-53/H-46/H-3 Complete bleed valve redesign. Continue efforts on the top cause for engine removals; improve on wing times; address top safety concerns as ranked by the Operational Advisory Group (OAG); continue reliability-centered maintenance program; improve compressor blade retention design; and initiate development of corrosion resistant bearing designs.

H-1 Address top safety concerns as ranked by the OAG and System Safety Working Group, continue to update Navy maintenance manuals, continue to improve time-between-overhaul and reduce impact of high-time parts (T700 and T400); address Blisk, Rear Shaft, Spacer & Tierod Life Update (T700), Continue development of environmentally friendly repairs such as High Velocity OXY fuel coatings to replace chrome and nickel plate repairs; and initiate development of Durability Project (T700-401/-401C), N5 Blades w/ tip cap & Nozzles, T700 TiN Coating (Test Articles, Corrosion/Erosion/Full Sand Engine Testing), T700 Diagnostics Life Mgt Performance Evaluation (IMD), T700 Diagnostics (Performance Evaluation), Durability Project (T700-401/-401C), T700 TiN Coating (Pending Pass/Fail... Incorp TiN), EPAMs Mission Update to 4BN, T700 Diagnostics (Performance Evaluation), T400 Improved Compressor Turbine Stub Shaft, T400 Improved Gas Generator Case Diffuser Inlet, T400 Improved Compressor Coating, T400Life Management, Study T400 Parts Obsolescence.

F-14B/D Address obsolescence of electrical components. Complete high pressure turbine redesign efforts. Address extension of component life and the reduction of maintenance hours. Continue improvements to propulsion system safety through an active life management program for critical rotating components. Continue efforts to reduce the engine non-recoverable in-flight shutdown Rate and propulsion system related mission abort rate.

F/A-18 C/D This program is unfunded in FY 2002 due to budget shortfalls.

F/A-18 E/F and V-22 These programs are unfunded in FY 2002 due to budget shortfalls.

T-45 This program is unfunded in FY 2002 due to budget shortfalls.

(**U) ($4.899) Multi-Platform Product Support Teams** Continue projects designed to provide common support to multiple platforms in the areas of improved drive systems, secondary power and mechanical systems; improved tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improved products and processes for fuels, lubricants, and refueling equipment; improved blade and vane repair processes and life cycle support; and improved electrical system product support and battery systems.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	0205633N Aviation Improvements	W1355 Aircraft Engine Component Improvement Program

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	39.495	39.038	38.827
(U) Adjustments from the President's Budget:	-3.505	-0.416	-8.131
(U) FY 2002 President's Budget Submit:	35.990	38.622	30.696

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2000 net decrease of $3.505 million reflects a decrease of $.593 million for Small Business Innovative Research assessment, a decrease of $2.757 million for reprioritization of requirements within the Navy, and a decrease of $.155 million for a Congressional Recission.
The FY 2001 net decrease of $.416 million reflects a decrease of $.058 million is for reprioritization of requirements within the Navy, a decrease of $.273 million for a Congressional Reduction, and a decrease of $.085 million for a Congressional recission.
The FY 2002 net decrease of $8.131 million reflects a decrease of $7.930 million for reprioritization of requirements within the Navy, and a decrease of $.201 million for economic assumptions.

(U) Schedule: Not applicable

(U) Technical: The FY 2002 reduction will require vertical cuts to the CIP program specifically safety-related efforts in support of the F/A 18 C/D, F/A 18 E/F, V-22 and the T-45 aircraft. The remaining CIP funds will be utilized to support safety-related efforts for out-of-production legacy aircraft.

(U) C. OTHER PROGRAM FUNDING SUMMARY:

PE 0203752A (Aircraft Engine CIP Army)
PE 0207268F (Aircraft Engine CIP Air Force)
PE 0602236N (Turbine Engine Improvement, TOC, FNC)
PE 0603236N (Turbine Engine Improvement, TOC, FNC)
PE 0602114N (UAV Propulsion Autonomous Operations FNC)
PE 0603114N (UAV Propulsion Autonomous Operations FNC)

(U) D. ACQUISITION STRATEGY: Not Applicable

(U) E. Schedule Pofile : Not Applicable

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **June 2001**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvements			PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
F110 Engine Program*	SS/CPAF	GE - OHIO	12.786	1.890	12/00	2.100	12/01					16.776
F402 Engine Program	SS/CPFF	ROLLS ROYCE- UK	19.195	2.487	12/00	3.320	12/01					25.002
F404/T58/T64 Engine Programs	SS/CPFF	GE - MASS	20.873	7.813	04/00	1.672	10/01					30.358
J52 Engine Program	SS/CPFF	P&W - FLORIDA	6.406	2.500	12/00	2.600	12/01					11.506
T56 Engine Program	SS/CPFF	INDIANA	3.575	1.700	02/01	2.005	02/02					7.280
F405 Engine Program	SS/CPAF	ROLLS ROYCE- UK	4.544	1.940	12/00							6.484
F/A 18 E/F Engine Program	SS/CPFF	GE- MASS	0.664									0.664
T700 Engine Program	SS/CPFF	GE - MASS	3.092	1.050	11/01	1.255	01/02					5.397
TF34 Engine Program	SS/CPFF	GE - MASS	3.840	0.600	11/00	0.775	11/01					5.215
V22 Engine Program	SS/CPFF	GE- MASS	1.000									0.000
Props Program	SS/CPFF	HAM SUNSTRAND - CONN	3.395	1.000	12/00	1.155	12/01					5.550
Contracts under 1.0M aggregate	VARIOUS	VARIOUS	10.659	1.107	10/00	1.200	10/01					
Lab Field Activity (1.0M or more)	WX	NAWCAD-PAX	86.306	13.189	10/00	12.064	10/01					
Other in-house support (1.0M or less)	VARIOUS	VARIOUS	13.740	0.750	10/00	0.840	10/01					
GFP Fuel Increment	MIPR	KAFB - TEXAS	3.695	0.300	10/00	0.360	10/01					
Award Fees**				0.610		0.450						
Subtotal Product Development			193.770	36.936		29.796						

Remarks:

* F110 (F14 B/D) AF contract has a ten year period of performance.

**Award fees for F110 (.210), F402 (.240) and F405 (.160, FY 01 only).

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)												DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0205633N Aviation Improvmeents			PROJECT NUMBER AND NAME W1355 Aircraft Engine Component Improvement Program						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Other in-house less than 1.0M	VARIOUS	VARIOUS	3.146	0.650	10/00	0.650	10/01					
SBIR assessment				0.786								
Subtotal Support			3.146	1.436		0.650						
Remarks:												
Other in-house less than 1.0M	VARIOUS	VARIOUS	2.394	0.150	10/00	0.150	10/01					
Subtotal T&E			2.394	0.150		0.150						
Remarks:												
Other in house less than 1.0M	VARIOUS	VARIOUS	0.397	0.100	10/00	0.100	10/01					
Subtotal Management			0.397	0.100		0.100						
Remarks:												
Total Cost			196.561	38.622		30.696						
Remarks:												

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