RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE: February 2003

BUDGET ACTIVITY: 06 - RDT&E Management Support

PE NUMBER AND TITLE: 0604759F Major T&E Investment

PROJECT: 4597

COST ($ in Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
4597	Air Force Test Investments	59,080	59,971	50,215	59,606	57,628	62,507	63,727	64,868	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

In FY 2004, Project 4597, Air Force Test Investments, includes a new start effort

(U) A. Mission Description

This program element provides planning, improvements, and modernization for test capabilities at three Air Force test organizations: 46 Test Wing of the Air Armament Center (AAC) (to include 46 Test Group at Holloman), Arnold Engineering Development Center (AEDC), and Air Force Flight Test Center (AFFTC). The purpose is to help test organizations keep pace with emerging weapon system technologies. For example, advances in missile seeker technology and capabilities drive the requirements for improvement in missile seeker test capabilities such as the Scene Characterization and Reconstruction for Advanced Munitions (SCRAM) project; advances in the Global Positioning System (GPS), providing greater time-space-position accuracy, will be integrated into the ranges at Eglin and Edwards Air Force Bases; and advances in computer capabilities, which will enhance efficiencies in data collection, analysis, and distribution, will be exploited in the Data Processing Multi-Stage Improvement Program (DPMSIP). Test investment activities are also funded for activities supporting the Test and Evaluation (T&E) Board of Directors and for the Technology Insertion & Risk Reduction (TIRR), formerly the Test Technology Development (TTD), Program. The TIRR program will provide funds to initiate studies of new technologies and test methodologies to determine their feasibility for future T&E investment. The intent is to reduce the cost and risk associated with new technologies and methodologies using short term (1-3 years) limited funding studies prior to investing in larger projects. The first TIRR sub-project is Flight Safety System (FSS), which will provide the interface standards and an initial ground processor operations station to support over-the-horizon long range operational test requirements of Unmanned Air Vehicles (UAVs). Additional TIRR subprojects are Enhanced Time Space Position Information (ETSPI) and Low Observable Instrumented Tow-Target (LOIT).

The fluctuations in the funding at these locations are due to changing priorities in the improvement and modernization requirements as defined through the AF Test Investment Planning & Programming Process. Also, all projects have been reviewed through the tri-Service Reliance effort (to communicate AF efforts to the other Services and avoid unwarranted duplication of effort) and are documented in Reliance Area Capability Summaries (RACS). Further, each project has its own planning, development, equipment acquisition/facility construction, equipment installation, and checkout phases which often requires significant differences in funding from one year to the next. As such, the changes in funding from year to year do not necessarily indicate program growth but rather a planned phasing of improvement and modernization efforts. The test capabilities at these locations enable testing through all phases of weapon system acquisition from system concept exploration through component and full scale integrated weapon system testing to operational testing. These test organizations are a national asset operated and maintained by the Air Force for DoD test and evaluation missions, but they are available to others having a requirement for their unique capabilities.

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(U) A. Mission Description Continued

46TW, located at Eglin AFB, FL, conducts and supports developmental test and evaluation and operational test and evaluation of non-nuclear air armaments, Command, Control, Communications, Computers and Intelligence (C4I) systems, and target acquisition and weapon delivery systems; navigation systems; provides a climatic simulation capability; and determines target/test item spectral signatures. Advanced Airborne Instrumentation Integration (AAII) provides standardized airborne test instrumentation to enhance interoperability and commonality. C4I Advanced Simulation and Test Environment (CASTE) will provide connectivity to existing capabilities and add needed networks and hardware to develop a C4I test bed. Operational Facilities (OPFACs) for Link-16 Weapon-Platform Integration (formerly Link-16 Support) will provide a host platform simulator for C4I testing. Scene Characterization and Reconstruction for Advanced Munitions (SCRAM) will measure, characterize, and reconstruct high fidelity multispectral target scenes that will be integrated into the Guided Weapon Evaluation Facility (GWEF). Weapon Integration Compatibility Support (WICS) will provide upgrades to support post System Development and Demonstration (SDD) F-22 weapons integration and certification. Climatic Lab Upgrades will provide upgrades to instrumentation and climatic simulation equipment. Test Control & Visualization will upgrade telemetry systems and network infrastructure to handle higher data rates. Advanced GPS/Hybrid Simulation (AGHS) capability will support laboratory testing with the new GPS signal structure and provide digital modeling of modernized GPS equipment. Armament and Munitions Digital Modeling and Simulation will develop, verify, and validate a standard set of reusable models and simulations to support armament and munitions T&E. These projects ensure test center technology is compatible with weapon systems to be tested such as AMRAAM, JDAM, ASRAAM, AGM-130, JTIDS, JSTARS, Combat Talon, etc.

AEDC, located at Arnold AFB, TN, provides ground environmental test support for DoD aeronautical, missile, and space programs. The center has 53 test facilities providing: aerodynamic testing of scale model aircraft, missile, and space systems; testing of large and full-scale satellites, sensors, and space vehicles in a simulated space environment; altitude environmental testing for aircraft, missile, and spacecraft propulsion systems; and testing of large-scale models such as space boosters together with their propulsion systems. The Propulsion Wind Tunnel (PWT) Upgrades project improves long-term operation of tunnels 16T and 16S to meet transonic/supersonic test needs. The Improve Turbine Engine Structural Integrity project will provide new state-of-the-art structural test monitoring and data analysis systems to support turbine engine structural tests to detect and analyze high cycle fatigue. Real-Time Display and Analysis System will provide upgraded displays and analysis systems to several key test facilities to help achieve a portion of AEDC's vision of integrating test/plant/utilities operations. The Enhanced Turbine Engine Installation and Productivity (formerly JSF STOVL Engine Test Cells Upgrade) will modernize the sea level test cell 3 (SL3) transferred from Trenton NAS under BRAC and installed at AEDC. This cell will be utilized for environmental and structural endurance testing of the Joint Strike Fighter (JSF) and other aircraft engines, F119/F120 derivatives. The cell will be upgraded for the size of the JSF engines and for the testing of the STOVL features of the engines. Propulsion Consolidation and Streamlining (PC&S) program invests in modernization of AEDC jet engine test capability by consolidating major industrial aeropropulsion test facilities, improving plant and test cell reliability, increasing test cell capability, and streamlining test processes.

AFFTC, located at Edwards AFB, CA, conducts and supports development test and evaluation and operational test and evaluation of aircraft and aircraft systems,

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(U) **A. Mission Description Continued**

aerospace research vehicles, unmanned aerial vehicles, cruise missiles, parachutes delivery/recovery/systems, and cargo handling systems. The Flight Simulation Modernization (FSM) project will upgrade the Test and Evaluation Modeling and Simulation (TEMS) facility to meet future man-in-the loop simulator requirements. The Modeling and Simulation T&E Resources (MASTER) program is a joint development effort between the Air Force Flight Test Center (AFFTC) and Arnold Engineering Development Center (AEDC). The goal is for the two centers to integrate modeling and simulation (M&S) more closely to ground and open-air range flight test to reduce the cost and time of developmental testing. MASTER has been divided into five separate development efforts to meet this goal: the Consolidated Model and Data Repository; the development of a Configuration Management, scheduling and asset tracking system; the Propulsion Data Validation and Analysis System; the Store Separation Simulation Capability and the Fluid Structural Interaction Capability project will provide the TEMS facility with subsystem models to build future simulations and the tools to validate real-time modeling with ground tests and open-air range flight test. The Advanced Range Telemetry (ARTM) Integration project will procure and integrate improved range telemetry instrumentation, aircraft instrumentation suites, and ground support systems. It also provides a quick reaction capability for future weapon systems and enhancements required by AFFTC customers. The GPS Range Sensors (AGRS) project will provide increased Time, Space, Position Information (TSPI) accuracy and data link capabilities for pod and internal mount configurations. These objectives will be accomplished by integrating state of the art GPS and data transfer COTS equipment, upgrading software to provide high accuracy kinematics GPS processing and near-real-time data processing, and utilizing the Enhanced Range Application Program (EnRAP) Centeral Test and Evaluation Investment Program (CTEIP) project to procure tri-service interoperable GPS and datalink equipment. DPMSIP will provide a common system for real-time data display, near-real-time analysis, and post-test analysis. DPMSIP will also be compliant with current modeling and simulation data interface standards. The Next Generation Instrumentation (NexGenInst) project will upgrade instrumentation systems on test and test support aircraft in addition to improving the ground support systems used to program and preflight these systems and the AFFTC modification program management capability.

(U) FY 2002 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program:
(U)	$0	46 Test Wing, Air Armament Center
(U)	$866	Advanced GPS Hybrid Simulation (AGHS). Began procurement of hardware and software required to simulate the new GPS signal structure.
(U)	$1,203	Weapons Integration Compatibility Support (WICS). Began F-22 flutter, loads, stability and control M&S. Began Eglin-Edwards high-speed data link for near real-time data analysis.
(U)	$1,084	Advanced Airborne Instrumentation Integration (AAII). Began acquisition and integration of state-of-the-art airborne instrumentation such as Advanced Common Airborne Instrumentation System (CAIS) and CTEIP developed ARTM. Acquired ground support equipment to support pre/post flight operations
(U)	$4,685	SCRAM. Began acquisition of instrumentation to support scene characterization and reconstruction for T&E of Electro-Optic (EO)/Infrared (IR), Radio Frequency (RF)/Millimeter Wave (MMW), and GPS seeker/sensors.
(U)	$820	Test Control & Visualization. Began upgrades to telemetry (TM) systems and network infrastructure to handle higher data rates. Acquired real

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

time computing servers, data recorders, and video displays.

(U) $1,371 C4I Advanced Simulation and Test Environment (CASTE). Acquisition of equipment, instrumentation, hardware, software, and connectivity.

(U) $2,731 OPFACs for Link 16 Weapon-Platform Integration (formerly Link-16 Support). Began acquisition of platform simulators and related datalink equipment. Began development of mobile ground station and control room for support of Link 16 T&E capability at AFFTC.

(U) $730 Climatic Lab Upgrade. Began upgrades to instrumentation systems, climatic simulation equipment and facility equipment.

(U) $991 Airborne Separation Video. Begin procurement of video systems to support Seek Eagle munitions test requirements.

(U) $2,477 Holloman High Speed Test Track Upgrade. Validate magnetic levitation concept. Construct/install partial guideway. Design/fabricate cryogenics. Design/fabricate magnet system instrumentation and control. Conduct limited test of sled.

(U) $0 Air Force Flight Test Center

(U) $1,958 Flight Simulation Modernization. Design of second and third aircraft configuration consoles to be integrated with the generic baseframe cockpit and associated visual system, simulation software, and support equipment.

(U) $2,399 LITENING. Completed expansion of Asynchronous Transfer Mode (ATM) Network to range support buildings and new Combined Test Force (CTF) facilities. Expanded Multi-media capabilities for flight testing and modeling and simulation. Monitored and managed network traffic loads. Expanded secure network links to allow classified test data to be transferred between integrated secret, compartmentalized facilities.

(U) $2,139 MASTER. Incorporated engine propulsion rule-based techniques, engine manufacturer techniques, statistical logic, trending algorithms, and sensor characterization to detect operational non-conformance events and an information archival system to archive test information for ground and flight test systems. Began the development of the automated tracking and scheduling system for Avionics Test & Integration Complex (ATIC) assets. Provided the ATIC with automated services to support additional ground testing at the ATIC. Provided for the storage and version control of tools obtained from such sources.

(U) $2,680 Advanced Range Telemetry (ARTM) Integration. Provided training for operations and maintenance of ARTM-developed FQPSK demodulation technology. Initiated refurbishment and integration of antenna systems based on integration roadmap. Integrated high-data rate receivers based on implementation roadmap. Continued the migration of telemetry users from S-band to L-band. Evaluated high-data rate telemetry communication systems for ground stations and develop roadmap. Continued to integrate ARTM-developed technology and upgrade the telemetry support infrastructure to improve spectral efficiency, link reliability, and spectrum utilization.

(U) $457 Advanced GPS Range Sensors (AGRS). Planned GPS range equipment upgrade to reflect enhanced capabilities made to GPS constellations. Began development of Inertial Measurement Unit (IMU) to be integrated into next generation range GPS instrumentation equipment. Provided AFFTC inputs to the Range Instrumentation Systems Program Office (RISPO) for GPS and datalink equipment to be developed under the Enhanced Range Applications Program (EnRAP).

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

(U)	$1,018	Data Processing Multi-Stage Improvement Program (DPMSIP). Development and integration of the first telemetry processor upgrade was completed. This upgrade will support high rate telemetry streams and large data formats. Development of a PC based common data display system started with the capability to provide aircraft sub-systems displays. Improved data and object interoperability between the three standard post-test analysis products at AFFTC.
(U)	$897	Next Generation Test Instrumentation. Began the integration of ARTM developed systems into multiple aircraft. Provided enhancements and improvements to the Internet based Instrumentation Management Information Systems. Expanded the capabilities of Instrumentation Loading, Integration, Analysis and Decommutation (ILIAD) to program and preflight test vehicles. Developed airborne instrumentation components to address new sensor interfaces. Continued to purchase instrumentation components to upgrade obsolete and unreliable instrumentation components. Continued the migration of telemetry users into higher efficiency modulation techniques and AL-band. Integrate on-board data processing devices into data acquisition systems. Conducted initial testing of NexGenBus devices.
(U)	$0	Arnold Engineering Development Center
(U)	$15,085	PWT Upgrades. Continued procurement of electric motor upgrades. Continued installation of plant control systems in 16T/16S wind tunnels. Began acquisition planning of flow quality improvements.
(U)	$1,727	Improve Turbine Engine Structural Integrity. Continued dynamic data system upgrades in the turbine test cells and further development of Non-Intrusive Stress Measurement System (NSMS) algorithms. Upgraded recording systems from analog to digital.
(U)	$2,090	Real-Time Display and Analysis System. Completed the design of hardware and software for the replacement of the C2 Test Unit Supervisory System (TUSS). Developed the requirements and conceptual design for the Steady State Acquisition System and the Test Systems and Network for 4T. Completed the design, procurement, installation, checkout, and turnover for the Pressure Scanning System and the Steady State Data Acquisition System.
(U)	$1,211	Enhanced Turbine Engine Installation and Productivity (formerly JSF STOVL Engine Test Cells Upgrade). Began design and procurement of hardware for sea level (SL3) test cell upgrades for JSF, F-22, F-15, F-16, F-18 and other programs.
(U)	$991	Laser Induced Surface Improvement (LISI). Develop LISI prototype processing facility for selected DoD target applications.
(U)	$8,421	Hypersonic Capability Development (also called MARIAH II). Continue experiments to prove enabling technologies for the wind tunnel concept in the areas of ultra high pressure air supply, supersonic energy addition, high Reynolds number boundary layer characterization, and nozzle survivability.
(U)	$0	Space & Missile Systems Center, Detachment 12
(U)	$460	Combined Space Test Task Force. Completes CTF tasks including final installation, test, and activation.
(U)	$0	Other Projects

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

(U)	$88	T&E Board of Directors Support. Wrote and coordinated Test Resource Master Plan documenting the joint Reliance process. Coordinated tri-service investment efforts. Coordinated joint Reliance documents.
(U)	$501	Technology Insertion and Risk Reduction (TIRR). First TIRR subproject is Flight Safety System (FSS) at AFFTC. Initiate Unmanned Air Vehicle (UAV) interface and constraint study which will define the electrical, physical, and functional requirements for the airborne FSS prototype unit. Integrate vehicle flight safety information with prototype FSS ground processor station Geographic Information System (GIS) software. Initiate integration of the Enhanced Flight Termination System (EFTS) message formats.
(U)	$59,080	Total

(U) FY 2003 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program:
(U)	$0	46 Test Wing, Air Armament Center
(U)	$970	Advanced GPS Hybrid Simulation (AGHS). Continue procurement of hardware and software required to simulate the new GPS signal structure.
(U)	$2,034	Weapon Integration Compatibility Support (WICS). Continue F-22 flutter, loads, stability and control M&S. Continue Eglin-Edwards high-speed data link for near real-time data analysis.
(U)	$1,292	Advanced Airborne Instrumentation Integration (AAII). Continue acquisition and integration of state-of-the-art airborne instrumentation such as Advanced CAIS and CTEIP developed ARTM. Acquire ground support equipment to support pre/post flight operations
(U)	$4,155	SCRAM. Continue acquisition of instrumentation to support scene characterization and reconstruction for T&E of EO/IR, RF/MMW, and GPS seeker/sensors.
(U)	$1,250	Test Control & Visualization. Continue upgrades to TM systems and network infrastructure to handle higher data rates. Acquire real time computing servers, data recorders, and video displays.
(U)	$1,410	C4I Advanced Simulation and Test Environment (CASTE). Continue acquisition of equipment, instrumentation, hardware, software, and connectivity.
(U)	$2,453	OPFACs for Link 16 Weapon-Platform Integration (formerly Link-16 Support). Continue acquisition of platform simulators and related datalink equipment.
(U)	$944	Climatic Lab Upgrade. Continue upgrades to instrumentation systems, climatic simulation equipment and facility equipment.
(U)	$489	Armament and Munitions Digital Modeling and Simulation. Begin development and coordination of Modeling and Simulation Master Plan.
(U)	$1,091	Airborne Separation Video System. Procure high speed digital video systems to support Seek Eagle munitions test requirements on B-1 aircraft.
(U)	$2,478	Holloman High Speed Test Track. Extend Maglev guideway begun in FY02. Demonstrate magnetic levitation of test sled at higher velocities on

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(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

the extended guideway.

(U) $0 Air Force Flight Test Center

(U) $1,815 Flight Simulation Modernization (FSM). Complete fabrication of second and third console sets (Joint Strike Fighter), provide multiple simulation networking hardware and linking software. Provide capability to simulate flight of two-ship configuration in Performance and Flying Qualities (P&FQ) testing, and capability to upgrade simulation to link live and simulated avionics and Electronic Warfare software and hardware into simulation environment. Fabricate fourth console set of a new aircraft configuration, or provide enhancements to either the previous three sets provided, or the reconfigurable simulator. Complete capability to provide separable simulations in a secure (Secret and higher) facility over a secure network.

(U) $3,016 MASTER. On-line comparisons of predictions with flight trajectories will be developed and the resolution of anomalies between predictions and flight will be made. Will document the result of F-22 simulation and re-usable code validation. 4th Generation information distribution interface and automated model-based fault detection and diagnostic capability for ground and flight test will be developed. AEDC development of fluid-structural models will be provided and a complete transfer of fluid-structural technology will be available to AFFTC and AEDC Test Operations. Enhanced capabilities of fluid-structural technology to ground and flight test requirements will also be provided. MASTER will develop the facility management, configuration management and data management capabilities providing control of pre-test, test, and post test operations. The initial operational capability enabling collaboration between AFFTC and AEDC engineers will also be developed.

(U) $2,719 Advanced Range Telemetry (ARTM) Integration. Initiate integration of ARTM-developed Multi-h Continuous Phase Modulation (CPM) technology into telemetry ground stations. Continue the migration of telemetry users from S-band to L-band. Continue the refurbishment of old and integration of new antennas based on integration roadmap to support high-data rate users. Continue integration of high-data rate receivers based on implementation roadmap. Integrate high-data rate telemetry communication systems for ground stations based on roadmap. Continue to integrate ARTM-developed technology and upgrade the telemetry support infrastructure to improve spectral efficiency, link reliability, and spectrum utilization.

(U) $1,227 Advanced GPS Range Sensors (AGRS). Produce the first iteration of the Modular Affordable GPS IMU Receiver (MAGIR I) that integrates a miniature Inertial Measurement Unit (IMU) into a compact GPS internal mount instrumentation unit. Initiate high-accuracy kinematic GPS TSPI processing software upgrade. Initiate low cost commercial spectrum datalink effort. Continue to provide AFFTC inputs to the Range Instrumentation System Program Office (RISPO) for GPS and datalink equipment to be developed under their Enhanced Range Applications Program (EnRAP).

(U) $1,361 Data Processing Multi-Stage Improvement Program (DPMSIP). Deploying the first telemetry processor upgrade to support higher data rates and large data formats. Developing second telemetry processor upgrade kit to improve data transfer between systems. Continuing development of a

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(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

		PC based common display system. Developing the first control room display upgrade kit. Developing additional standard post-test analysis software to support avionics flight-testing.
(U)	$1,483	Next Generation Test Instrumentation. Continue to integrate new measurement technology into multiple aircraft. Provide enhancements and improvements to the Internet based Instrumentation Management Information Systems. Expand the capabilities of ILIAD to program multiple vendor hardware suites and preflight test vehicles. Develop airborne instrumentation components to address new sensor interfaces. Continue to purchase instrumentation components to upgrade obsolete and unreliable instrumentation components.
(U)	$2,578	Instrumentation Loading, Integration, Analysis, and Decommutation (ILIAD). Develop enhanced capabilities to program, load, operational check, and troubleshoot airborne data acquisition systems installed on test and evaluation vehicles. Provide improved and Range Commanders Council standardized enhancement to the components that decommutate, display, and process the data generated by the data acquisition system for preflight checkout, troubleshooting, and analysis. Modernize flight line ground support unit and engineering support unit hardware to current technological specification.
(U)	$1,983	Electronic Countermeasures Upgrades for the Generic Radar Target Generator. Provides injected simulated radar targets as a part of the electronic warfare battlespace at the Benefield Anechoic Facility.
(U)	$0	Arnold Engineering Development Center
(U)	$10,377	PWT Upgrades. Begin installation and checkout of electric motor upgrades. Continue installation and checkout of plant control systems in 16T/16S wind tunnels. Begin installation and checkout of flow quality improvements.
(U)	$1,743	Improve Turbine Engine Structural Integrity. Continue the development of the Non-Intrusive Stress Measurement System (NSMS) software and hardware systems.
(U)	$2,210	Enhanced Turbine Engine Installation and Productivity (formerly JSF STOVL Engine Test Cells Upgrade). Continue design and procurement efforts. Initiate fabrication activities for sea level (SL3) upgrades for JSF, F-22, F-15, F-16, F-18, and other programs.
(U)	$2,775	Real Time Display and Analysis System. Complete the design, procurement, installation, check-out and turnover of the SL3 TUSS. Complete the design, procurement, fabrication, installation, check-out, and turnover of the 4T Test Article Control System. Complete the design and procurement activities for the 4T Test System.
(U)	$991	Laser Induced Surface Improvement (LISI) Technology. Continue expansion of LISI process to DoD components and development of LISI prototype processing facility for selected DoD target applications.
(U)	$5,948	MARIAH II Hypersonic Wind Tunnel. Continue experiments to prove enabling technologies for the wind tunnel concept in the areas of ultra high pressure air supply, supersonic energy addition, high Reynolds number boundary layer characterization, and nozzle survivability.
(U)	$0	Other Projects

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(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

(U)	$305	T&E Board of Directors Support. Coordinate tri-service investment efforts. Coordinate joint Reliance documents.
(U)	$874	Technology Insertion & Risk Reduction (TIRR). Finish development of Flight Safety System (FSS) ground processor station for Over-the-Horizon UAV operations. Develop ranger safety interface and display software/hardware. Initiate Enhanced Time Space Position Information (ETSPI) subproject which will begin development of a low-cost miniature instrumentation package that provides accurate position, pitch and heading, in real-time, on air-to-ground weapons throughout its flight path. Initiate Low Observable Instrumented Tow-Target (LOIT) subproject which will begin development, signature evaluation, and instrumentation of a low observable tow target.
(U)	$59,971	Total

(U) FY 2004 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program:
(U)	$0	46 Test Wing, Air Armament Center
(U)	$1,018	Advanced GPS Hybrid Simulation (AGHS). Procure/receive/install hardware and software required to simulate the new GPS signal structure. Perform necessary calibrations.
(U)	$2,868	Weapon Integration Compatibility Support (WICS). Continue F-22 flutter, loads, stability, and control M&S. Continue Eglin-Edwards high-speed data link for near real-time data analysis.
(U)	$1,794	Advanced Airborne Instrumentation Integration (AAII). Continue acquisition and integration of state-of-the-art airborne instrumentation such as Advanced CAIS and CTEIP developed ARTM. Acquire ground support equipment to support pre/post flight operations.
(U)	$4,630	SCRAM. Continue acquisition of instrumentation to support scene characterization and reconstruction for T&E of EO/IR, RF/MMW, and GPS seeker/sensors.
(U)	$1,693	Test Control & Visualization. Continue upgrades to TM systems and network infrastructure to handle higher data rates. Acquire real time computing servers, data recorders, and video displays.
(U)	$1,517	C4I Advanced Simulation and Test Environment (CASTE). Continue acquisition of equipment, instrumentation, hardware, software, and connectivity.
(U)	$2,780	OPFACs for Link 16 Weapon-Platform Integration (formerly Link-16 Support). Continue acquisition of platform simulators and related datalink equipment.
(U)	$1,008	Climatic Lab Upgrade. Continue upgrades to instrumentation systems, climatic simulation equipment and facility equipment.
(U)	$2,689	Armament and Munitions Digital Modeling and Simulation. Continue development and coordination of Modeling and Simulation activities.
(U)	$0	Air Force Flight Test Center

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(U) A. Mission Description Continued

(U) FY 2004 ($ in Thousands) Continued

(U)	$3,391	Advanced GPS Range Sensors (AGRS). Initiate the second iteration of the Modular Affordable GPS IMU Receiver (MAGIR I) into next generation software receiver GPS instrumentation. Deliver high-accuracy kinematic GPS TSPI processing software upgrade. Continue low cost real-time GPS integration effort. Initiate first purchase of Enhanced Range Applications Program (EnRAP) equipment.
(U)	$4,034	Advanced Range Telemetry (ARTM) Integration. Continue integration of ARTM-developed Multi-h CPM technology into telemetry ground stations. Continue the migration of telemetry users from S-band to L-band. Continue the refurbishment of old and integration of new antennas based on integration roadmap to support high-data rate users. Continue integration of high-data rate receivers based on implementation roadmap. Integrate high-data rate telemetry communication systems for ground stations based on roadmap. Continue to integrate ARTM-developed technology and upgrade the telemetry support infrastructure to improve spectral efficiency, link reliability, and spectrum utilization.
(U)	$2,203	Data Processing Multi-Stage Improvement Program (DPMSIP). DPMSIP will start the deployment of common display system at three mission control centers. DPMSIP will complete the second telemetry processor upgrade. DPMSIP will deploy new telemetry processing software. Continuing development of a PC based common display system. DPMSIP will continue to improve post-test data analysis tools.
(U)	$2,638	MASTER. Add the data management and configuration management capabilities to the MASTER system. AEDC and AFFTC will continue the development of models and store them in the MASTER repository. Enhanced capabilities of Fluid-Structural Technology to Ground and Flight Test requirements at the AFFTC will be developed. Execution of code validation plan and place validated codes and data in MASTER repository as well as the documented results of simulations and re-usable code validation. Enhancement of the 4th Generation Propulsion Analysis System's information distribution interface and automated model-based fault detection and diagnostic capability for ground and flight test will be developed.
(U)	$1,725	Next Generation Test Instrumentation. Replace some obsolete data systems (ATIS, Metraplex) and unreliable data recorders on Test aircraft, support fleet, and Test Pilot School aircraft. Upgrade the Instrumentation Management Information Systems to improve modification cost accounting and program management. Expand the capabilities of ILIAD to program multiple vendor hardware suites and preflight test vehicles. Continue to integrate new measurement technology into measurement systems and support labs.
(U)	$0	Arnold Engineering Development Center
(U)	$1,743	PWT Upgrades. Finalize installation and checkout of electric motor upgrades. Finalize installation and checkout of plant control systems. Finalize flow quality improvements.
(U)	$5,805	Propulsion Consolidation and Streamlining (PC&S). Begin jet engine test facility investment efforts improving plant and test cell reliability, increasing test cell capability, and streamlining test processes. [NEW START]
(U)	$2,651	Improve Turbine Engine Structural Integrity. Complete final software validation and fabrication of the second Non-Intrusive Stress Measurement System (NSMS). Continue upgrades of on-line dynamic data monitoring and processing. Begin procurement of a dynamic data

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(U) A. Mission Description Continued

(U) FY 2004 ($ in Thousands) Continued

system.

(U) $2,727 Read-Time Display and Analysis System. Complete the design, procurement, installation, check-out and turnover of the SL3 TUSS. Complete the installation and checkout of the 4T Test System. Complete integrated checkout and turnover of the 4T Data Acquisition Processing Systems (DAPS). Complete the design and procurement activities for the 4T Plant Automation effort. Complete the design and procurement activities for the 4T Operations Center.

(U) $2,651 Enhanced Turbine Engine Installation and Productivity (formerly JSF STOVL Engine Test Cells Upgrade). Design environmental systems (icing, steam, sand, corrosion). Install and checkout SL3 Thrust Stand, Inlet, and Service Systems.

(U) $0 Other Projects

(U) $150 T&E Board of Directors Support. Coordinate tri-service investment efforts. Coordinate joint Reliance documents.

(U) $500 Technology Insertion & Risk Reduction (TIRR): Enhanced Time Space Position Information (ETSPI) subproject which will continue development of a low-cost miniature instrumentation package that provides accurate position, pitch and heading, in real-time, on air-to-ground weapons throughout its flight path. Low Observable Instrumented Tow-Target (LOIT) subproject which will continue development, signature evaluation, instrumentation, and test of a low observable tow target.

(U) $50,215 Total

(U) B. Budget Activity Justification

This Program Element is in Budget Activity 6, Management and Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of T&E capabilities at Air Force Test Centers.

(U) C. Program Change Summary ($ in Thousands)

	FY 2002	FY 2003	FY 2004	Total Cost
(U) Previous President's Budget	49,857	46,338	54,231	TBD
(U) Appropriated Value	62,857	61,138		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-585	-646		
b. Small Business Innovative Research	-1,701			
c. Omnibus or Other Above Threshold Reprogram		-521		
d. Below Threshold Reprogram	-1,200			
e. Rescissions	-291			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 2003
BUDGET ACTIVITY: 06 - RDT&E Management Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment	PROJECT: 4597

(U) C. Program Change Summary ($ in Thousands) Continued

		FY 2002	FY 2003	FY 2004	Total Cost
(U)	Adjustments to Budget Years Since FY 2003 PBR	0		-4,016	
(U)	Current Budget Submit/FY 2004 PBR	59,080	59,971	50,215	TBD

(U) Significant Program Changes:
Congressional Action, FY03 plus up of 14,800; Holloman High Speed Test Track (2,100), Airborne Separation Video System (1,100), Laser Induced Surface Improvement Technology (1,000), MARIAH II Hypersonic Wind Tunnel (6,000), Electronic Countermeasures Upgrades for the Generic Radar Target Generator (2,000), ILIAD (2,600)

(U) D. Other Program Funding Summary ($ in Thousands)

	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
(U) AF RDT&E										
(U) Other APPN										

Related RDT&E: PE 0604256F, Threat Simulator Development and PE 0604940D, Central Test and Evaluation Investment Program, 065978F, Facility Sustainment and Support, 065976F, Facility Restoration and Modernization.

(U) E. Acquisition Strategy

This program element uses several different contracting strategies to provide the most cost effective T&E investment solutions. The main acquisition strategy is to use full and open competition wherever possible to improve and modernize existing test capabilities.

(U) F. Schedule Profile

	FY 2002				FY 2003				FY 2004			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Air Force Test Investments												

This PE contains multiple schedule profiles which are available upon request.