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

DATE: February 2002

BUDGET ACTIVITY: 06 - Management and Support

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

PROJECT: 4597

COST ($ in Thousands)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
4597 Air Force Test Investments	64,635	62,272	46,338	54,231	63,245	63,148	65,112	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

In FY 2003, Project 4597, Air Force Test Investments, includes new start efforts.

(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 requirement 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 develop and demonstrate a prototype miniature, over the horizon flight safety system to command, control and monitor next generation unmanned vehicles.

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 have over $10 billion worth of unique

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY: 06 - Management and Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment
	PROJECT: 4597

(U) A. Mission Description Continued

test facilities/capabilities. They 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.

46 TW, 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 sustains 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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY: 06 - Management and Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment / PROJECT: 4597

(U) A. Mission Description Continued

AFFTC, located at Edwards AFB, CA, conducts and supports developmental test and evaluation and operational test and evaluation of aircraft and aircraft systems, 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 Linked Interactive T&E Networking (LITENING) project will provide the network infrastructure to support inter-range simulations and support the efficient transmission of flight test data to various facilities at Edwards for processing and analysis. The Advanced Range Telemetry (ARTM) Integration project will procure and integrate improved range telemetry systems to provide greater efficiencies in telemetry frequency utilization. The Next Generation Test Instrumentation is required to modernize existing test instrumentation laboratories, aircraft instrumentation suites, and ground support systems. It also provides a quick reaction capability for future weapon systems and subsystems testing. The Advanced GPS Range Sensors (AGRS) project will provide increased Time, Space, Position Information (TSPI) accuracy and data link enhancements required by AFFTC customers. The GPS and data link instrumentation will also be miniaturized and modularized in order to meet customer size constraints for internal mount configurations. These objectives will be accomplished by a) integrating state of the art GPS and data transfer COTS equipment, b) upgrading software to provide near-real-time data filtering and kinematic GPS processing and c) utilizing the Enhanced Range Application Program (EnRAP) standardized equipment contracts. The Data Processing Multi-Stage Improvement Program (DPMSIP) will focus on providing IT tools to increase the number of test points cleared in the control room and to facilitate next day flight clearance decisions. 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.

(U) FY 2001 ($ in Thousands)

(U)	$0	46 Test Wing, Air Armament Center
(U)	$2,640	CAIS Integration. Completed integration and required support equipment acquisition.
(U)	$1,660	C4I Upgrade. Completed the acquisition of workstations, connectivity, HW/SW upgrades, and JTIDS OPFAC upgrades. Acquired test analysis equipment and M&S tools.
(U)	$2,350	GWEF. Completed the multispectral man-in-the-loop and imaging IR developments. Continued aircraft/munition M&S efforts.
(U)	$1,699	GPS Range Integration. Completed acquisition of ARDS pods, S/W improvements, and ground vehicle instrumentation.
(U)	$1,680	PRIMES. Completed the aircraft/munitions interface simulations and the off-board sensor simulator. Acquired a synthetic aperture radar target

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY 06 - Management and Support	PE NUMBER AND TITLE 0604759F Major T&E Investment
	PROJECT 4597

(U) A. Mission Description Continued

(U) FY 2001 ($ in Thousands) Continued

simulator.

(U)	$1,500	ASTE Range Systems. Completed acquisition of instrumentation/equipment for infrastructure upgrades in such areas as TSPI, microwave, TM, fiber optics/communications, arena test, gun ranges, high speed video, and fuze test.
(U)	$1,392	Mission Control/Data Analysis. Completed procurement of data acquisition equipment, near real-time data processing equipment, and a 3-D terrain generation/visualization capability.
(U)	$800	Seeker T&E. Completed upgrades to the MMW measurement system and acquired a high speed digital data recorder and a long wavelength FPA imaging radiometer.
(U)	$6,486	Eglin Range Upgrades. Supported Armament Systems Test Environment (ASTE) Infrastructure Upgrades: improved several subsystems by integrating latest technology to support the T&E of modern weapon systems. Began integration of the 3-DATA system.
(U)	$0	Arnold Engineering Development Center
(U)	$2,300	CMP. Procured and installed increment six worksystems. Completed Product Data Manager integration with application software packages. Upgraded older worksystems to the state-of-the-art PC hardware configuration. FOC of CMP systems.
(U)	$20,133	PWT Upgrades. Completed installation of 16S wind tunnel data acquisition and processing system. Completed installation of plant control systems in 16T/16S wind tunnels. Initiated procurements for electric motor upgrades. Began design of flow quality improvements.
(U)	$850	Improve Turbine Engine Structural Integrity. Completed installation of the dynamic data acquisition and processing system and the Non-Intrusive Stress Measurement System (NSMS). Began planning/design of the Structural Dynamic Response Analysis Capability.
(U)	$3,492	Hypersonic Capability Development. Continued requirements definition contracts. Conducted experiments to prove enabling technologies for the wind tunnel concept.
(U)	$1,098	Laser Induced Surface Induction (LISI). Developed LISI prototype processing facility for selected DoD target applications.
(U)	$0	Air Force Flight Test Center
(U)	$2,300	CAIS I&S. Completed the development and integration of an internet-based instrumentation management system. Completed development of CAIS Bus to NextGen Bus (Fibre Channel) Bridge. Continued to provide the capability to support new airborne instrumentation capabilities including: on-board processing innovations, on-board smart sensors, and high data rate decommutation and recording.
(U)	$2,340	ADAPS. Completed development of near real-time and post test analysis capabilities to include the Combined Test Force (CTF) level. Completed the installation of common data systems throughout the Flight Test Center. Upgraded and installed control room workstations.
(U)	$3,647	Flight Simulation Modernization. Completed upgrade to the TEMS Facility with the first of two aircraft specific configuration cockpits to be integrated with the generic reconfigurable cockpit.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY: 06 - Management and Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment
	PROJECT: 4597

(U) A. Mission Description Continued

(U) FY 2001 ($ in Thousands) Continued

(U)	$1,990	LITENING. Continued the extension of the ATM backbone network to critical Range Support buildings and CTFs. Developed the Network Operations Center to monitor and manage network traffic loads. Expanded the secure network links to allow classified test data to be transferred between integrated secret, compartmentalized facilities.
(U)	$1,400	MASTER. Developed and established propulsion, weapons, and airframe interaction models. Began design and development of the model/data repository.
(U)	$710	Advanced Range Telemetry (ARTM) Integration. Began integration of RCC FQPSK modulation/demodulation technology into telemetry transmitters/receivers. Began integration of PCM data compression and forward error correction technology into the range infrastructure (includes airborne and ground segments). Began improvement and modernization of telemetry ground stations. Began to migrate telemetry users, who are presently in S-Band, to L-Band.
(U)	$499	X-15 Rocket Test Stand. Began design, restoration and modification of the existing X-15 rocket engine test stand and control bunker. Studied the relocation of the AFFTC LOX maintenance facility away from the test stand, located at Edwards AFB, CA.
(U)	$2,594	Multi-Axis Thrust Stand. Began redesign, retrofit and relocation of the existing Overhead Support System (OSS) from NASA Ames Research Center to the existing outdoor engine test cell facility at Edwards AFB, CA. Initiated modification of existing control rooms, support systems, and data acquisition systems.
(U)	$0	Space & Missile Systems Center, Detachment 12
(U)	$870	Combined Space Test Task Force. Continued development and evaluation of expert systems to support operations and testing of future technology R&D satellites. Implemented lessons learned and transition technical advancements to operational users.
(U)	$0	Other Projects
(U)	$205	Joint Project Office for T&E support.
(U)	$64,635	Total

(U) FY 2002 ($ in Thousands)

(U)	$0	46 Test Wing Air Armament Center
(U)	$938	Advanced GPS Hybrid Simulation (AGHS). Begin procurement of hardware and software required to simulate the new GPS signal structure.
(U)	$2,157	Weapon Systems Integration Test Capability (WICS). Begin F-22 flutter, loads, stability and control M&S. Begin Eglin-Edwards high-speed data link for near real-time data analysis.
(U)	$1,173	Advanced Airborne Instrumentation Integration (AAII). Begin acquisition and integration of state-of-the-art airborne instrumentation such as

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY 06 - Management and Support	PE NUMBER AND TITLE 0604759F Major T&E Investment
	PROJECT 4597

(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

		Advanced CAIS and CTEIP developed ARTM. Acquire ground support equipment to support pre/post flight operations
(U)	$4,221	SCRAM. Begin acquisition of instrumentation to support scene characterization and reconstruction for T&E of EO/IR, RF/MMW, and GPS seeker/sensors.
(U)	$888	Test Control & Visualization. Begin upgrades to TM systems and network infrastructure to handle higher data rates. Acquire real time computing servers, data recorders, and video displays.
(U)	$1,485	C4I Advanced Simulation and Test Environment (CASTE). Acquisition of equipment, instrumentation, hardware, software, and connectivity.
(U)	$2,175	OPFACs for Link 16 Weapon-Platform Integration (formerly Link-16 Support). Begin acquisition of platform simulators and related datalink equipment.
(U)	$791	Climatic Lab Upgrade. Begin 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)	$2,120	Flight Simulation Modernization. Begin fabrication of second aircraft configuration cockpits to be integrated with the generic high fidelity reconfigurable cockpit and associated visual system and support equipment.
(U)	$2,598	LITENING. Complete expansion of ATM Network to range support buildings and new CTF facilities. Expand Multi-media capabilities for flight testing and modeling and simulation. Monitor and manage network traffic loads. Expand secure network links to allow classified test data to be transferred between integrated secret, compartmentalized facilities.
(U)	$2,315	MASTER. Incorporate 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 . Develop Initial Operating Capability of the automated tracking and scheduling system for Avionics Test & Integration Complex (ATIC) assets. Will provide the ATIC with automated services to support additional ground testing at the ATIC. Provide for the storage and version control of tools obtained from such sources.
(U)	$2,903	Advanced Range Telemetry (ARTM) Integration. Continue to integrate Tier I modulation (FQPSK) developed by ARTM into telemetry infrastructure. Continue the migration of telemetry users from S-band to L-band. Begin upgrading telemetry support infrastructure (includes airborne and ground segments) to fully utilize real-time data compression, error correction, standardized solid-state data recorders, and frequency and bandwidth reuse, deconfliction, and reallocation.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY 06 - Management and Support	PE NUMBER AND TITLE 0604759F Major T&E Investment
	PROJECT 4597

(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

(U)	$495	Advanced GPS Range Sensors (AGRS). Begin to plan GPS range equipment upgrade to reflect enhanced capabilities made to GPS constellations. Begin development of Inertial Measure Unit (IMU) to be integrated into next generation range GPS instrumentation equipment. Provide 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).
(U)	$1,103	Data Processing Multi-Stage Improvement Program (DPMSIP). Upgrade range telemetry data processing systems to support multiple data streams at higher data rates. Start work on a new control room data distribution network. Deploy a prototype mission control room with a new data display system. Start work on new post-test analysis workflow enhancements.
(U)	$972	Next Generation Test Instrumentation. Integrate next generation test instrumentation systems into multiple aircraft. Provide enhancements and improvements to the Internet based Instrumentation Management Information Systems. Expand the capabilities of Instrumentation Support Systems to program 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. Integrate on-board data processing devices into data acquisition systems. Conduct test of NexGenBus devices.
(U)	$0	Arnold Engineering Development Center
(U)	$16,332	PWT Upgrades. Continue procurement of and begin installation and checkout of electric motor upgrades. Continue installation of plant control systems in 16T/16S wind tunnels. Begin acquisition planning of flow quality improvements.
(U)	$1,870	Improve Turbine Engine Structural Integrity. Continue dynamic data system upgrades in the turbine test cells and further development of Non-Intrusive Stress Measurement System (NSMS) algorithms. Upgrade recording systems from analog to digital.
(U)	$2,263	Real-Time Display and Analysis System. Begin the planning and design phases for upgrading the data acquisition and control systems of the turbine test unit supervisory system and the turbine/wind tunnel test operations centers and initiate the procurement for the long lead time equipment.
(U)	$1,313	Enhanced Turbine Engine Installation and Productivity (formerly JSF STOVL Engine Test Cells Upgrade). Begin 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 Induction (LISI). Develop LISI prototype processing facility for selected DoD target applications.
(U)	$8,421	Hypersonic Capability Development (also called MARIAH 2). Continue requirements definition contracts. Conduct experiments to prove enabling technologies for the wind tunnel concept.
(U)	$0	Space & Missile Systems Center, Detachment 12
(U)	$479	Combined Space Test Task Force. Complete CTF tasks including final installation, test, and activation.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY: 06 - Management and Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment / PROJECT: 4597

(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

(U)	$0	Other Projects
(U)	$300	T&E Board of Directors for T&E support.
(U)	$501	Technology Insertion & Risk Reduction (TIRR). Initiate first TIRR sub-project: Flight Safety System (FSS). Assess flight safety technology and begin development of a prototype flight safety system. Modify aircraft to conduct test.
(U)	$62,272	Total

(U) FY 2003 ($ in Thousands)

(U)	$0	46 Test Wing, Air Armament Center
(U)	$1,002	Advanced GPS Hybrid Simulation (AGHS). Continue procurement of hardware and software required to simulate the new GPS signal structure.
(U)	$2,101	Weapon Systems Integration Test Capability (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)	$1,334	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)	$4,291	SCRAM. Continue acquisition of instrumentation to support scene characterization and reconstruction for T&E of EO/IR, RF/MMW, and GPS seeker/sensors.
(U)	$1,291	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)	$1,456	C4I Advanced Simulation and Test Environment (CASTE). Continue acquisition of equipment, instrumentation, hardware, software, and connectivity.
(U)	$2,534	OPFACs for Link 16 Weapon-Platform Integration (formerly Link-16 Support). Continue acquisition of platform simulators and related datalink equipment.
(U)	$975	Climatic Lab Upgrade. Continue upgrades to instrumentation systems, climatic simulation equipment and facility equipment.
(U)	$505	Armament and Munitions Digital Modeling and Simulation. Begin development and coordination of Modeling and Simulation Master Plan.
(U)	$0	Air Force Flight Test Center
(U)	$1,875	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

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY: 06 - Management and Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment
	PROJECT: 4597

(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

flying quality 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 or higher) facility over a secure network.

(U) $3,115 MASTER. Develop On-line comparisons of predictions with flight trajectories and resolve anomalies between predictions and flight. Document result of F-22 simulation and re-usable code validation. Develop 4th generation information distribution interface and automated model-based fault detection and diagnostic capability for ground and flight test. Provide enhanced fluid-structural technology. Develop facility, configuration and data management capabilities, providing control of pre-test, test, and post test operations. Develop initial operational capability enabling collaboration between AFFTC and AEDC.

(U) $2,808 Advanced Range Telemetry (ARTM) Integration. Begin integration of ARTM's Multi-H Continuous Phase Modulation (CPM) into telemetry infrastructure. Continue the migration of telemetry users from S-band to L-band. Continue upgrading telemetry support infrastructure (includes airborne and ground segments) to adapt to new bandwidth efficient modulation schemes.

(U) $1,267 Advanced GPS Range Sensors (AGRS). Continue development and integration of the Inertial Measurement Unit (IMU) into next generation range GPS internal mount instrumentation equipment. Initiate high-accuracy kinematic GPS TSPI processing software upgrade. Initiate low cost real-time GPS integration 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) $1,406 Data Processing Multi-Stage Improvement Program (DPMSIP). Study methods to increase range telemetry processor throughput. Complete work on a new control room data distribution network. Start work on an enhanced T&E data fusion processor. Complete the first operational mission control room with an enhanced data display system. Continue work on new post-test analysis workflow enhancements. Provide a prototype high level architecture (HLA) compliant engineering data display system to EW.

(U) $1,532 Next Generation Test Instrumentation. Continue to integrate next generation test instrumentation systems into multiple aircraft. Provide enhancements and improvements to the Internet based Instrumentation Management Information Systems. Expand the capabilities of Instrumentation Support Systems to program 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. Integrate on-board data processing devices into data acquisition systems.

(U) $0 Arnold Engineering Development Center

(U) $10,718 PWT Upgrades. Continue installation and checkout of electric motor upgrades. Continue installation and checkout of plant control systems

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2002
BUDGET ACTIVITY: 06 - Management and Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment
	PROJECT: 4597

(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

in 16T/16S wind tunnels. Begin installation and checkout of flow quality improvements.

(U) $1,800 Improve Turbine Engine Structural Integrity. Continue the development of the Non-Intrusive Stress Measurement System (NSMS) software and hardware systems.

(U) $2,283 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) $2,866 Real Time Display and Analysis System. Install, check-out and validate the TUSS system in J2. Design, release procurement and begin installation of TUSS system in SL3. Continue design, release procurement and begin fabrication and installation of 4T Test Article Control System (TACS), Test System and Network. Begin validation of TACS and Network.

(U) $0 Other Projects

(U) $305 T&E Board of Directors for T&E support.

(U) $324 Technology Insertion & Risk Reduction (TIRR). Complete first TIRR sub-project: Flight Safety System (FSS). Integrate and conduct flight test of the prototype flight safety system. Perform analysis and evaluation of the system performance.

(U) $550 Multi-Service Target Control System Early Success Risk Mitigation (MSTCS ES RM). Develop, procure, and integrate the MSTCS Early Success Data Link Transponder, Vehicle Interface Unit, and GPS Instrumentation into four QF-4 Drone aircraft in support of air-to-air DT/OT&E.

(U) $46,338 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 2001	FY 2002	FY 2003	Total Cost
(U) Previous President's Budget	64,635	49,857	50,230	
(U) Appropriated Value	68,257	62,857		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-148	-585		
b. Small Business Innovative Research	-2,470			

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: February 2002
BUDGET ACTIVITY: 06 - Management and Support	PE NUMBER AND TITLE: 0604759F Major T&E Investment
	PROJECT: 4597

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

		FY 2001	FY 2002	FY 2003	Total Cost
	c. Omnibus or Other Above Threshold Reprogram				
	d. Below Threshold Reprogram	-526			
	e. Rescissions	-478			
(U)	Adjustments to Budget Years Since FY 2002 PBR			-3,892	
(U)	Current Budget Submit/FY 2003 PBR	64,635	62,272	46,338	TBD

(U) Significant Program Changes:

Congressional Action, FY02 plus up of 13,000: Holloman High Speed Test Track Upgrade (2,500), Airborne Separation Video (1,000), Laser Induced Surface Improvement (LISI) (1,000), Hypersonic Capability Development (8,500)

FY03 reduction to fund other Air Force requirements.

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

	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 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

(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 2001				FY 2002				FY 2003			
	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.