Headquarters U.S. Air Force

Integrity - Service - Excellence

AF Science and Technology Game Changing Investments

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U.S. AIR FORCE

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AF S&T Vision

Create compelling air, space, and cyber capabilities for precise and reliable Global Vigilance, Reach and Power for our Nation

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Air Force S&T Strategy

- Summarizes S&T vision, tenets and priorities
- Signed by SECAF and CSAF, Dec 2010
- To be updated in 2012 to reflect FY13 PB

AF S&T Program Priorities

1. Support the current fight while advancing breakthrough S&T
2. Execute a balanced, integrated S&T Program
3. Retain / shape the critical competencies
4. Address the highest priority capability needs of the Air Force

Air Force S&T Strategy

Priority #2: Execute Balanced, Integrated Prgm

Increase emphasis in S&T that will:

- **Improve sustainment, affordability and availability of legacy weapon systems**
- **Reduce cyber vulnerabilities while emphasizing mission assurance**
- **Support nuclear enterprise**
- **Deliver autonomous systems and human performance augmentation technologies envisioned in *Technology Horizons***
- **Provide robust situation awareness by improving ISR capabilities and data processing, exploitation and dissemination (PED)**
- **Enable long-range precision strike**
- **Reduce energy dependency**

Where Air Force would put additional S&T funding

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S&T Program Tenets

- Prepare for an Uncertain Future and ***Investigate Game-Changers*** to Shape the Art-of-the Possible into Military Capabilities
- Create Technology Options that Address Urgent Warfighter Needs and Provide New AF Service Core Function Capabilities in Support of the Joint Mission
- Maintain In-House Expertise to Support the Acquisition and Operational Communities and Modernize and Improve the Sustainability of Unique Research Facilities and Infrastructure
- Develop Future Air Force Leaders with an Appreciation for the Value of Technology as a Force-Multiplier
- Remain Vigilant Over and Leverage Global S&T Developments and Emerging Capabilities

Anti-Access/Area Denial (A2/AD) – Key Game Changers

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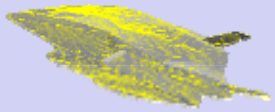
HIGH-SPEED

Hypersonic Cruise Missile Demo

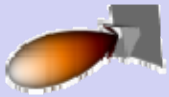


Hypersonic Tech

Supersonic Small Turbine

WEAPONS

CHAMP JCTD



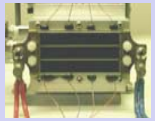
HPM

5th Gen Weapons

Laser Technologies

ENERGY EFFICIENT PLATFORMS

Adaptive Engine



F-35 Thermal Mgt

ELECTRONIC WARFARE

EW Plus

EW System of Systems

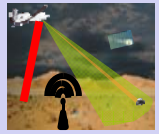
C4ISR

SCOTI Cyber

PCPAD-X

Advanced ISR

Comm & C2



Passive ISR Contested Environ

AUTONOMY

Autonomy

SPACE

ANGELS

Ground SSA

Rad-Hard Electronics

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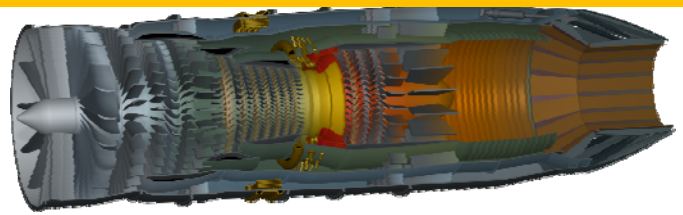
Adaptive Engine Technology Development (AETD)

Adaptive Engine Technologies Enable Reduction in USAF Energy Burden and Costs while Increasing Capability

25% Fuel Efficiency Improvement



Increased Strike Radius

Fewer Tanker Sorties

Increased Thermal Margins

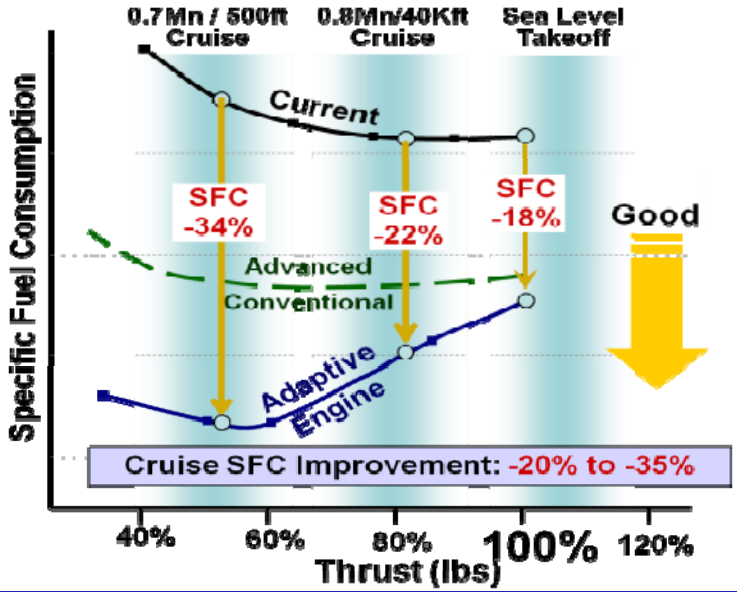
Increased Power Margins

Assured Energy Superiority

Energy Horizons

United States Air Force Energy S&T Vision 2011-2026

AF/ST TR 11-01
31 January 2012



Efficient Engines Providing Increased Capability Across Multiple Mission Areas

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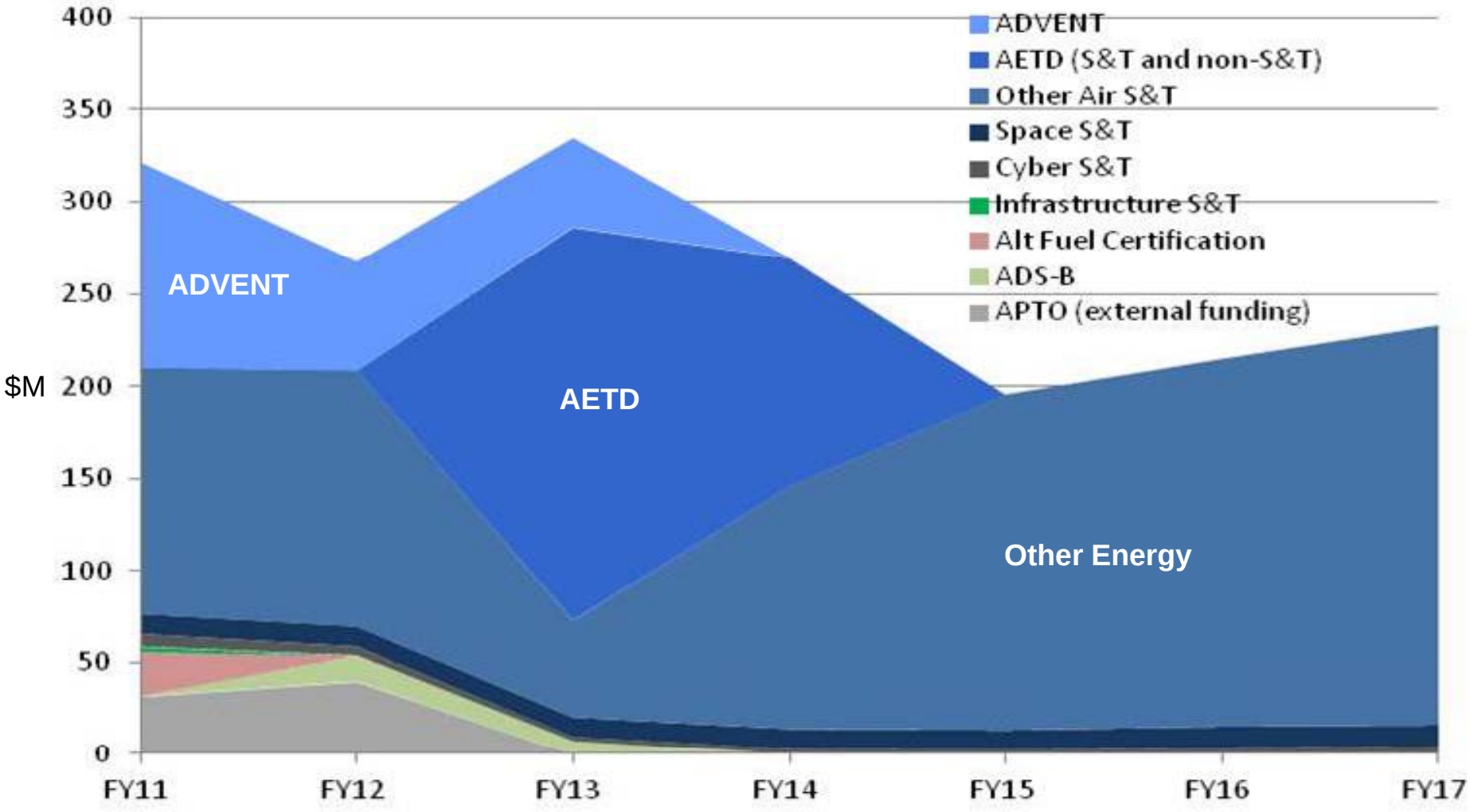
AF Energy RDT&E in FY13 PB Funding



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High Speed Technology

High Speed Air Vehicle and Propulsion Technologies Enable Long Range at High Speed with Effective Payload

High Speed
Small Supersonic Turbine
Rocket-Boost Scramjet
Turbine-Based Combined Cycle

Variable Warhead Effects

Long Range

Aircraft Systems
Internal bombers
Internal/External fighters

Precision Strike

Net-Enabled
In-Flight
Targetable

Large Ground Area Coverage

Rapid, Responsive Strike in Anti-Access/Access Denied (A2/AD) Environments

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Electronic Warfare

Full Spectrum Electronic Warfare Enables Access with Increased Survivability

EW M&S

All Source Threats Database

DE M&S

Cyber M&S

Rapidly Fieldable Countermeasures, High Impact Effect

Enable US Operations in Anti-Access/Access Denied (A2/AD) Environments

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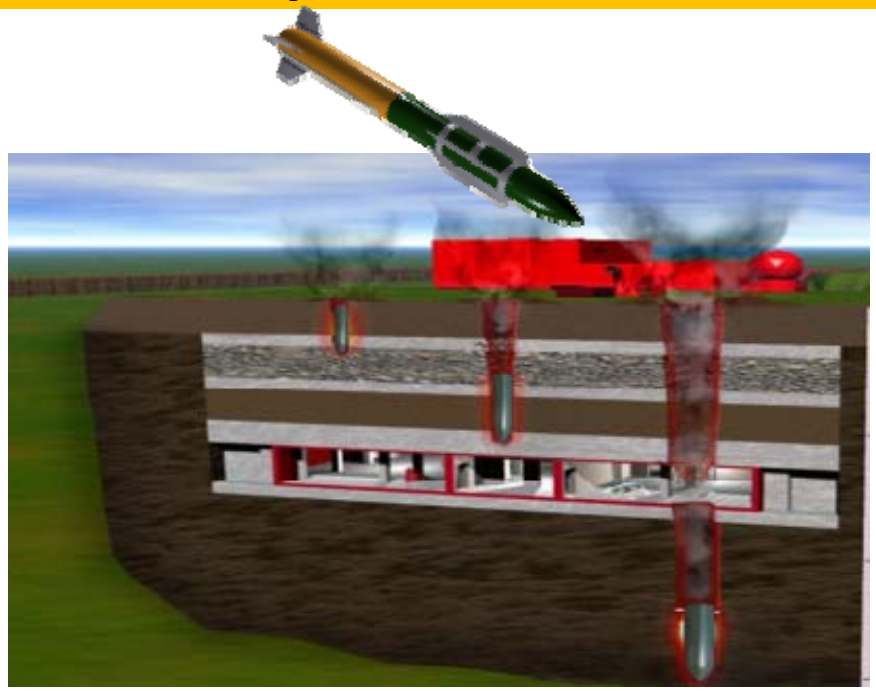
Fifth Generation Weapons

Advanced Kinetic Weapons Create Lethal Effects Across the Full-Spectrum of Warfare

Increased Weapons Loadout

Large Magazine



Selectable Effects

Small Weapons

Advanced PNT

Reduced Collateral Damage

Kinetic Options for USAF Fifth Generation Platforms

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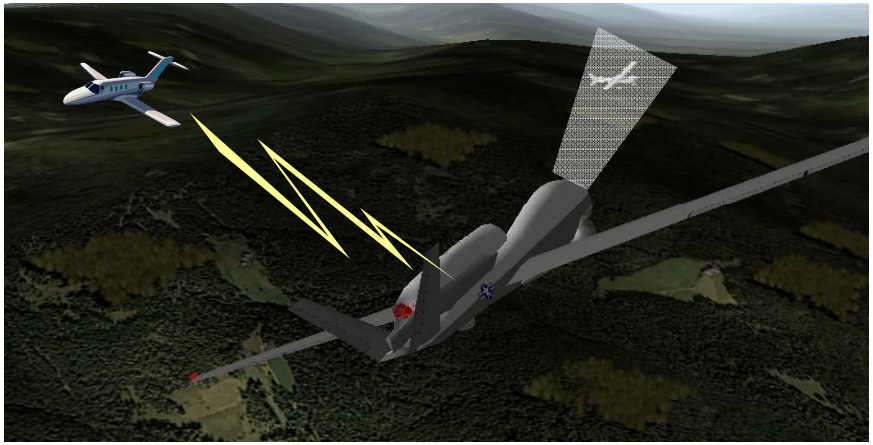
Autonomy

Advances in Autonomy Enable Time-Domain Operational Advantages Over Adversaries at Lower Cost

Collaborative Control Mixed Manned & Unmanned All Unmanned

Supervisory Control and Decentralized Decision - Making with Limited Comm



Advanced Visualization

Decision-Aiding Tools

Trust in Automation

Analyst Augmentation Tools

Autonomous Systems Reduces Friendly Exposure in A2/AD Environments

Advanced C4ISR Enables USAF Decision Superiority Across Air, Space and Cyber Domains

Defensive Cyber

Offensive Cyber

Cyber Vision

United States Air Force Cyber S&T Vision 2011-2026

AF/ST TR 12-01
31 December 2012

Advanced ISR

Comm and C2

Enhance Processing, Exploitation, and Dissemination

Trusted Comm

Mission Assurance

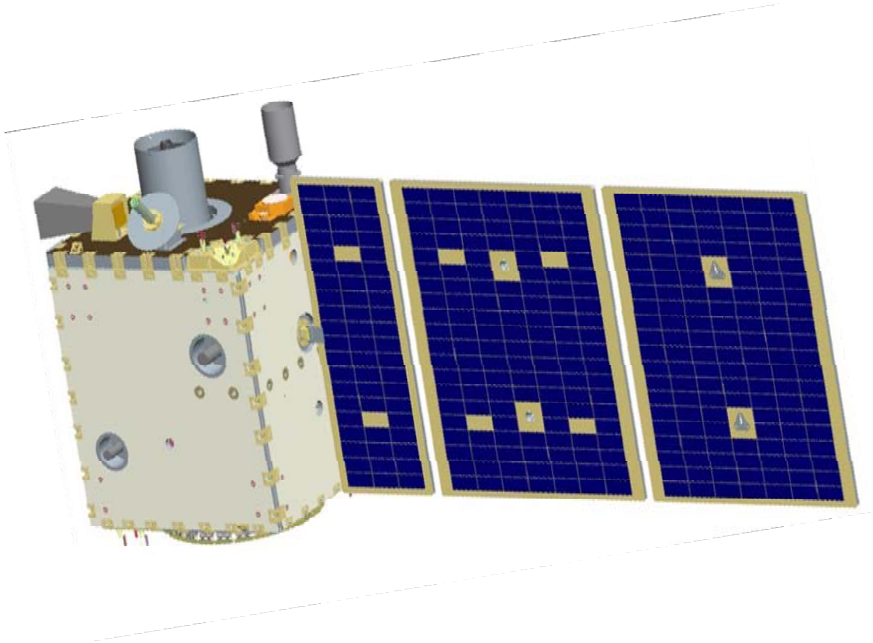
C4ISR Technology Enabling Mission Assurance in A2/AD Environments

Space Technology Supports the Full Range of Military Operations

Space-Based SSA

ID, Characterization, Health, and Attribution of Space Objects

Radiation Hardened Electronics



Ground-Based Optical SSA

Ensure Accurate Navigation and Communications

Geosynchronous Autonomous Proximity Operations and Characterization

Space Tech Provides Capabilities to Operate in Hazardous Natural/Man-Made Environments

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STEM Workforce

Our most important game-changer

- **Commissioned National Research Council Study to examine Air Force STEM workforce - Fall 2010**
- **VCSAF established STEM Advisory Council, chaired by 3-star**
- **Published *Bright Horizons* - STEM Workforce Strategic Roadmap - Signed by SECAF/CSAF - Mar 2011**
  - **Directed establishment of Air Force STEM Outreach Coordination Office (AFSOCO)**
- **AFSOCO established - Sep 2011**

"Strategic management of Airmen is the cornerstone of our future, and STEM Airmen will play an ever-increasing role in our success."

Michael B. Donley, Secretary of the Air Force

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Summary

- Air Force Depends on the S&T Program to discover, develop, and demonstrate high-payoff technologies across all domains – *Tech Push*
- S&T Program Priorities, Program Tenets, and Processes aligned to turn science and knowledge into militarily relevant capabilities – *Tech Pull*
- AF S&T fared well in last budget round, now must deliver technology options to the warfighter in the near, mid, and far-term
- *AF Game-changing investments are a critical component of technology options the warfighter may need in the future*

BACKUPS