



Air Armament Center



*Deliver War-Winning Technology, Acquisition, Test, Sustainment...
Expeditionary Capabilities to the Warfighter*



**Precision Strike:
Enabler for Force Domination**

**Dave Eidsaune, Maj Gen, USAF
Program Executive Officer for Weapons
Commander, Air Armament Center**

U.S. AIR FORCE

10 June 2008

Integrity - Service - Excellence



Air Force Acquisition Leadership



Mr Michael Wynne
Secretary of the Air Force



Ms Sue Payton
Asst Sec for Acquisition



Maj Gen
Eidsaune
PEO Weapons



Lt Gen
Hudson
PEO
Aircraft



Lt Gen
Bowlds
PEO
Electronics



Maj Gen
Riemer
PEO F-22



Brig Gen
Davis
PEO F-35



AF Materiel Command Leadership



Gen T. Michael Moseley
Air Force Chief of Staff



Gen Carlson
AFMC/CC



Maj Gen
Eidsaune
AAC/CC



Lt Gen
Hudson
ASC/CC



Lt Gen
Bowlds
ESC/CC



Maj Gen
Close
OO-ALC/CC



Maj Gen
Reno
OC-ALC/CC



Maj Gen
Owen
WR-ALC/CC



Eglin Land Ranges

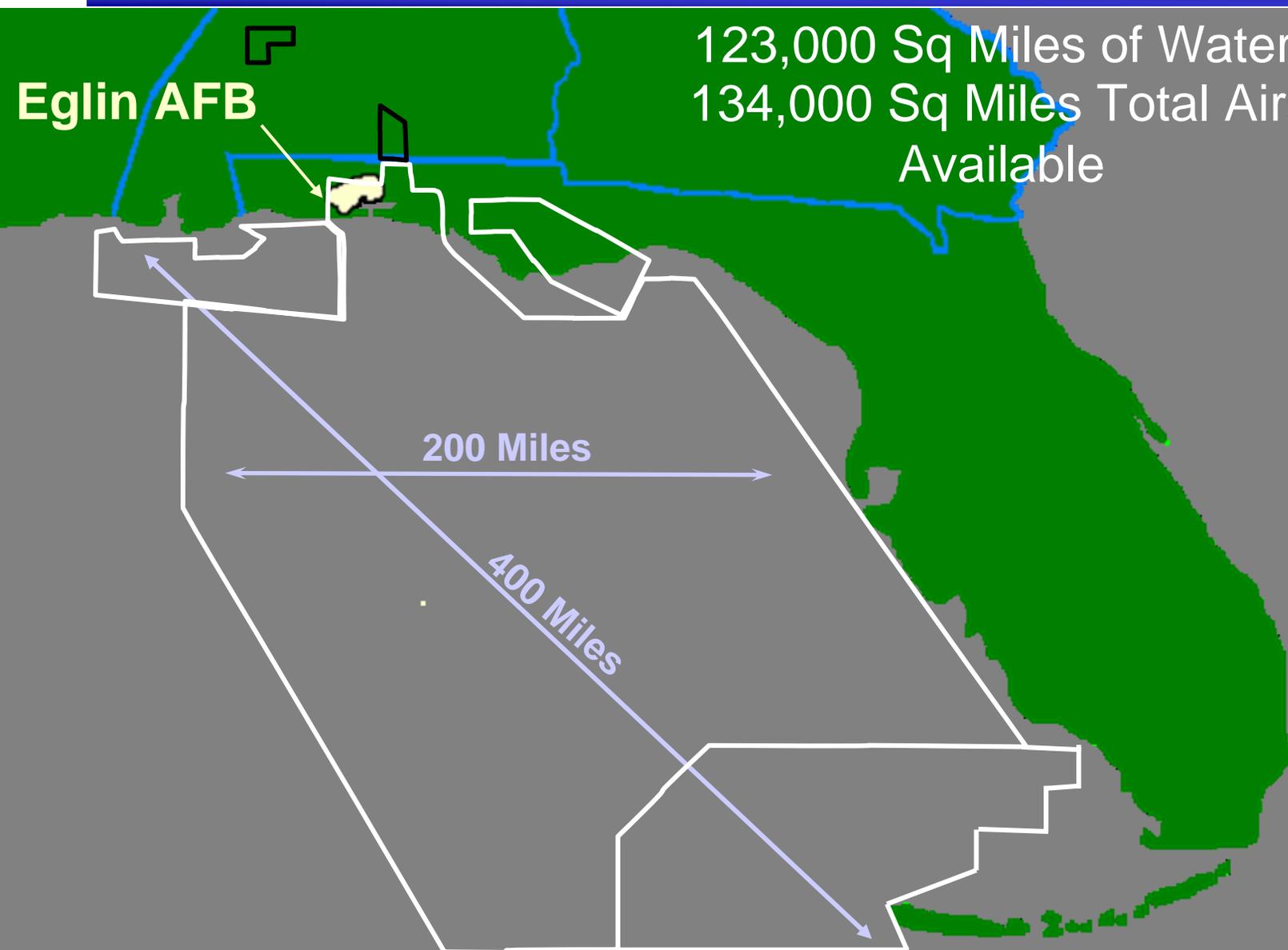


463,448 Acres
724 Square Miles





Eglin Water Ranges



123,000 Sq Miles of Water Range
134,000 Sq Miles Total Airspace Available



Eglin Video





Eglin AFB – Full Spectrum Operations



Research



Development/Acquisition



Developmental Test



Operational Test



Combat Operations

Arming the Warriors

Transition
Technology to
Weapon Systems
and Provide War
Winning
Capabilities On
Time, On Cost





Weapons Portfolio Overview

Mission: Deliver war-winning technology, acquisition, test, sustainment...expeditionary capabilities to the warfighter



ADS



MAC II



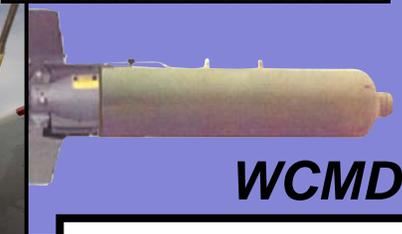
AMRAAM



HTS



P5CTS



WCMD



ATL



MALD



SFW



JASSM



JDAM



AMRAAM Surface Launch



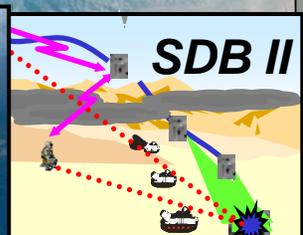
Aerial Targets



ARTS



SDB



SDB II



AIM-9X



SEAD



LIMT

Vision: War Winning Capabilities... On Time, On Cost



Advanced Medium Range Air-to-Air Missile (AMRAAM)



- Joint AF/USN program; 33 international customers
- Radar guided, launch and leave, beyond visual range, all weather missile
- Army/USMC international & surface-launched programs
- Operational on:
F-15C/D, F-15E, F-16C/D, F-22A,
F/A-18A, F/A-18C/D, F/A-18E/F
- Entered inventory in 1989
- Over 14,000 delivered
- Combat proven in Bosnia, & Kosovo, and Iraq (9 kills)





Joint Dual Role Air Dominance Missile (JDRADM)



- Single missile for USAF/USN Air-to-Air and Air-to-Ground missions – potential follow-on to AMRAAM and HARM
- Defeat evolving air and ground threats
- Increased standoff, load-out flexibility
- Enhanced lethality, propulsion, agility
- Integrate on F-22, F-35, legacy aircraft
- Notional Schedule:
 - Risk Reduction – FY08-09
 - Concept Refinement – FY10-11
 - Tech Development – FY12-13

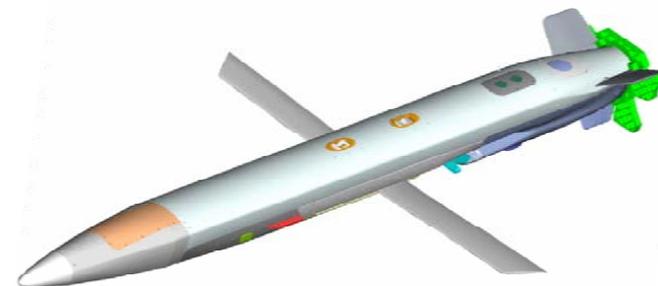




Miniature Air Launched Decoy (MALD) MALD Jammer (MALD-J)



- Low-cost, Air-launched, Expendable Decoy - Can Represent Fighter/Attack/Bomber
- Increase Enemy's "Fog Of War"-Global Strike CONOPS Enabler
 - Profiled in the Airborne Electronic Attack (AEA) Systems of Systems Approach
 - Degrades Awareness, Highlights Location, and Depletes IADS Resources
 - Increases Survivability of "Kick Down the Door" Force
- Threshold aircraft F-16 & B-52
- Currently in DT with RAA projected for FY 09
- MALD-J Will Add a Stand-in Jamming Capability

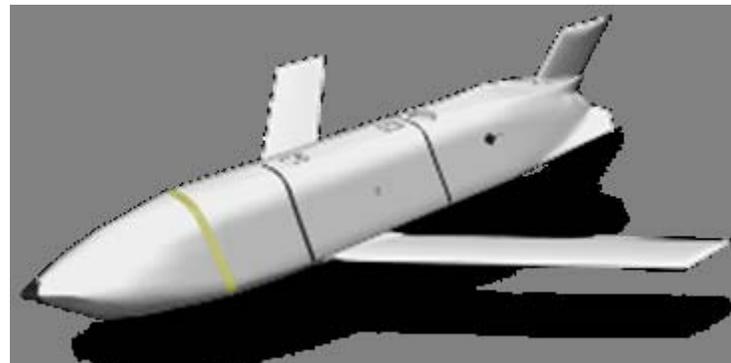




Joint Air-to-Surface Standoff Missile (JASSM)



- **Autonomous precision strike cruise missile**
- **Fixed and re-locatable targets**
- **Insensitive munition compliant 1000 -lb class warhead**
- **Guidance: Inertial Navigation / GPS**
- **Operational on:**
F-16C/D, B-1B, B-2A, B-52H
- **Entered inventory in 2003**
- **Over 600 delivered**
- **Nunn-McCurdy Certification – May 08**





JASSM 16 Shots

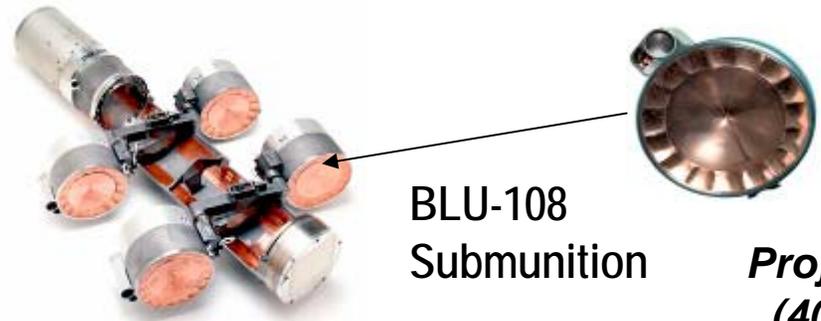




Sensor Fuzed Weapon (SFW)



- Anti-armor wide area coverage weapon
- Moving and stationary enemy armor (main battle tanks and support vehicles)
- Multiple kills per pass
- Operational on:
F-16C/D, F-15E, A-10, B-52, B-1B, B-2
- Entered inventory in 1996
- Over 4,000 delivered
- Combat Proven in OIF
- Production ongoing



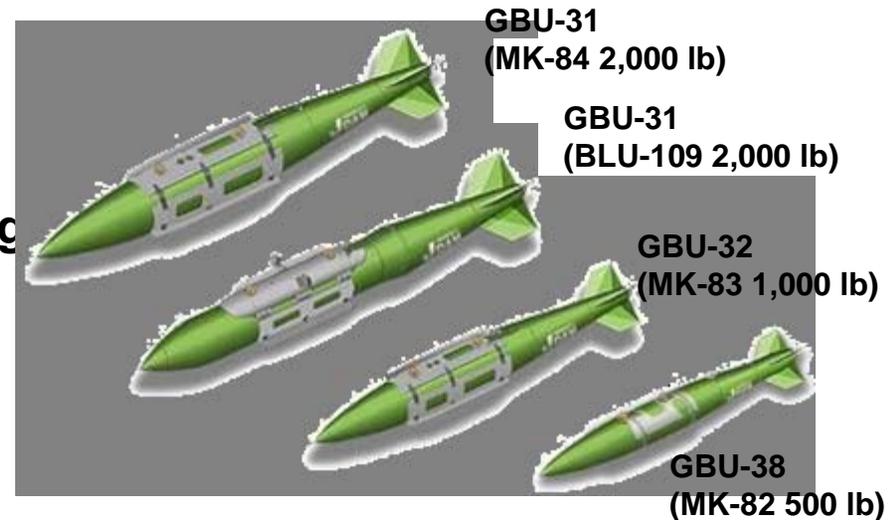
BLU-108
Submunition

*Projectile
(40 per)*



Joint Direct Attack Munition (JDAM)

- Global Positioning System (GPS) aided Inertial Navigation System (INS) tail kit
- Mk 80 series / BLU-109 warhead compatibility
- Accurate <5 meters, in-flight retargeting
- Autonomous and adverse weather
- Operational on:
F-15E, F-16C/D, F/A-18C/D, F/A-18E/F, F-22A,
F-117, AV-8B, B-1B, B-2A, and B-52H
- Entered inventory in 1998
- Over 179,000 delivered
- Over 19,000 used in combat (OAF, OEF, & OIF)



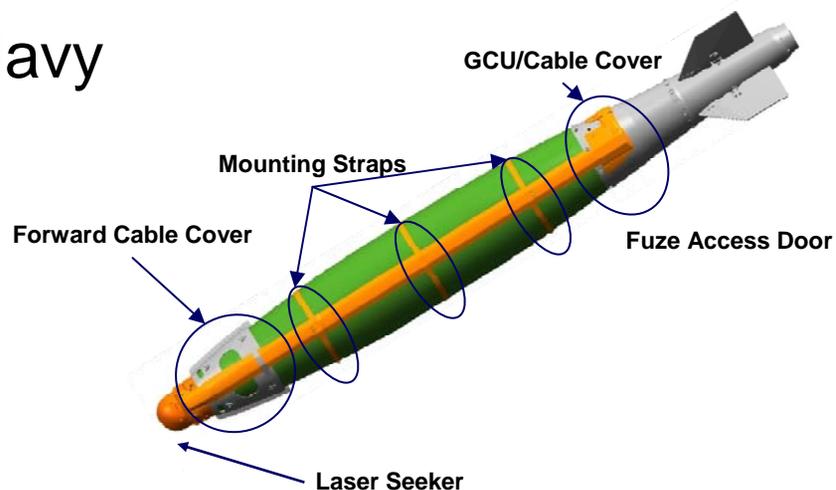
Warfighter's Air-to-Ground Weapon of Choice



Laser JDAM



- Response to Urgent Operational Need
- Adds Field-Installable Precision Laser Guidance Kit to GBU-38 JDAM
- Extends JDAM Capability to include Moving Targets up to 70 mph
- Production: 400 Air Force, 200 Navy
- Accuracy: 6m at 70 mph
- Mk-82, BLU-111, BLU-126 Compatibility
- F-15E, F-16, F/A-18
- Initial Kits Are in the AOR

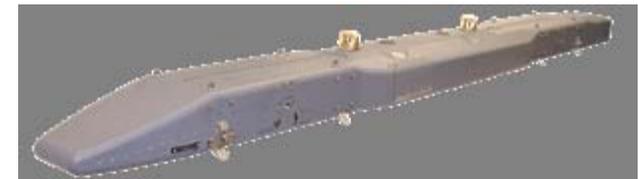




Small Diameter Bomb (SDB)



- All-weather, autonomous, precision strike, 250 lb class GPS/INS weapon
- Reduced collateral damage
- Flexible attacks with standoff ranges
 - SDB derives its own non-ballistic flight path (0.4M glide) based on release range, altitude, speed, climb, and winds
- Increased loadout--multiple strikes per sortie
- Cockpit-selectable electronic fuze
- Operational on F-15E, 700 delivered
 - F-15E radar or Sniper pod can self generate accurate coords or receive data-linked transfer of coords and imagery
- Combat proven in OEF/OIF



BRU-01



SDB Flight Characteristics

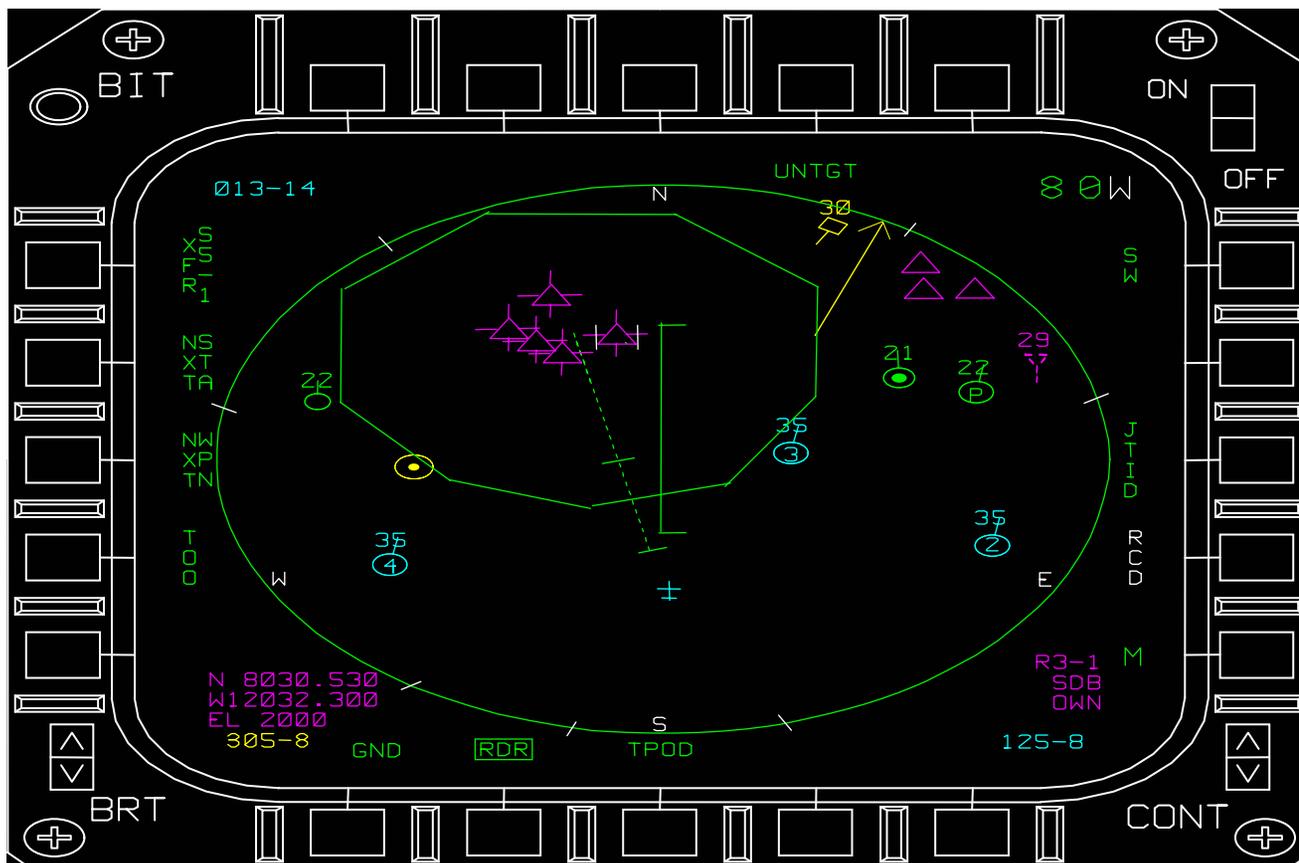




F-15E/SDB Systems Integration



- Up to 28 SDBs planned per F-15E, or mix of LGB, JDAM, and SDB – current loadout of 20 per aircraft





Small Diameter Bomb

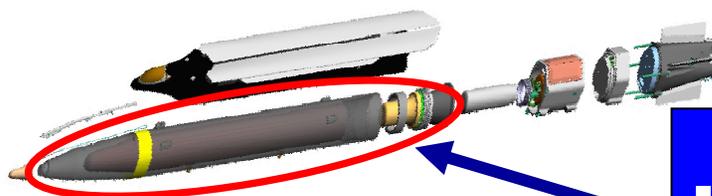




Small Diameter Bomb Focused Lethality Munition (SDB FLM)



- FY06 Out-of-Cycle JCTD
- CENTAF urgent need
- Low collateral damage variant of SDB
- Precisely delivers lethal, short range blast
- Completed JCTD testing – Dec 07
- 50 residual assets delivered to AOR – Mar 08



SDB I Hardware Attaches to FLM Composite Case

- New Technology*
- Composite Case Warhead
 - Multi-Phase Blast Explosive
 - Blast Only



Small Diameter Bomb II (SDB II)

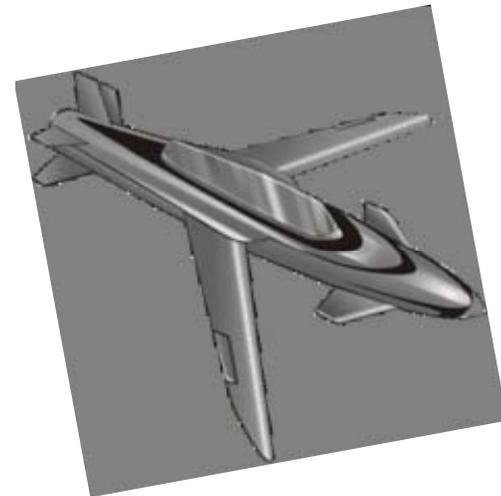


System Description

- **Capable against moving targets**
- **Compact, all weather, standoff weapon**
- **INS/GPS guided, precision weapon**
- **Tri-mode seeker (IR, radar, laser)**

Acquisition Activities

- Currently in risk reduction
- Two competing contractors
- Milestone B - FY10

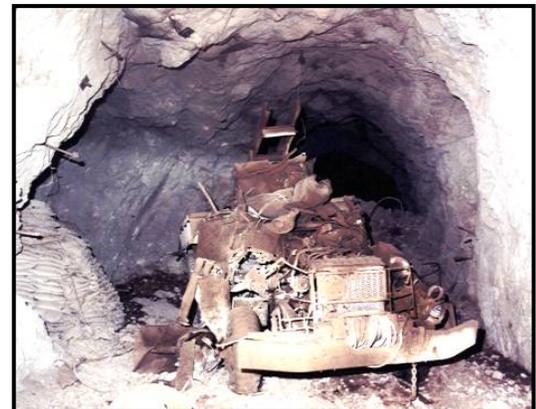




Hard Target Void Sensing Fuze



- System to be employed against new and emerging hard and deeply buried targets
- Detects multiple voids
- Survives and operates after penetrating 5K-15K PSI concrete target
- Programmable from cockpit
- Competitive Prototype JCTD FY08-10





Universal Armament Interface (UAI)



Program Objective: Decouple weapon integration schedules from aircraft OFP update cycle



Future Weapon Capability Themes

- Low Collateral Damage
- Moving Targets
- Non-Lethal/Non-Destructive
- Hard/Deeply Buried Targets
- Flexibility
 - Targeting on the Net
 - “Dial-a-Yield”
- Supersonic/Hypersonic
- Extended Ranges
- Perpetual/Persistent
- Directed Energy



Small, Low Collateral Damage, Flexible Yield Weapons



Directed Energy Opportunities





Advanced Tactical Laser (ATL)



- Ultra-precise target engagement
- 100KW-class high-energy laser
- Integrated in C-130 airframe
- Speed of light weapon
- Deep magazine
- Scalable effects
- Reduced collateral damage
- ACTD ends 4TH qtr FY08
- Extended User Evaluation continues thru FY10
- Developing CONOPS for solid state laser





Active Denial System (ADS)



- Warfighter Urgent Need
- Counter-personnel, non-lethal DE weapon
 - Deters advancing adversary--perimeter protection
- Induces intolerable sense of heat
- Uses antenna to direct focused, invisible beam
 - Heat sensation ends when beam removed—no permanent injury
- Gov't acceptance – Jun 08
- Possible deployment in Jul 08
- Planning for program of record in FY10



System 1



System 2



System 0





High Power Microwave - Counter Electronics



- Overview
 - Packaged in inventory munitions mold line
 - Weapon services multiple targets
 - Established effectiveness in realistic scenarios
 - Selective target engagement
- Strategy
 - Industry Technology Assessment, FY08
 - JCTD submission, FY09
 - FY10 POM Submission





Industry's Role – How Can You Help?



- Robust Systems Engineering
- Vendor and Supplier Management
- Reliable, Quality Products
- Cost and Schedule Realism

Thank You For Your Efforts and Dedication to Excellence



*To the Air Armament
Center Commander,*



War-winning Capabilities ...

... On Time, On Cost





BACK-UPS



Accomplishments

MALD/MALD-J

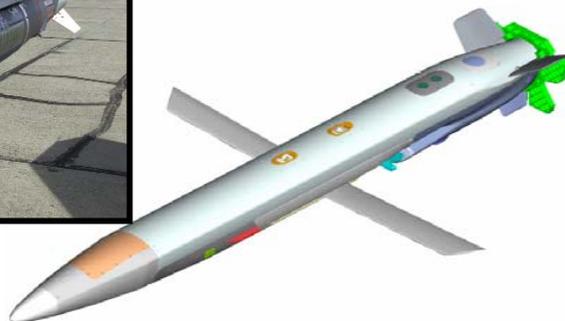
- MALD completed DT - Feb 08
- MALD production award - June 08
- MALD-J risk reduction contract award - Mar 08

Laser JDAM – JUON

- OUE completed/Fielding authorized
- First units delivered to AOR - Apr 08
(2 months early)

JASSM

- Successful reliability tests - Feb 08
- Nunn-McCurdy Certification - May 08



SDB FLM – UON

- Completed JCTD testing – Dec 07
- 50 residuals to AOR - Mar 08
(2 months early)

FUZES

- HTVSF JCTD: 2 competitive contracts
- Second JPF production line now operational

AMRAAM

- AIM-120C-7 fielding – Dec 07

P5 Combat Training System

- Declared operational at 5 USAF & 1 Navy Site



Universal Armament Interface (UAI)



- UAI Implementation on Aircraft and Weapons is Underway
- Initiative to Provide Standardized Software Interfaces in Platforms, Weapons, and Mission Planning
- Decouple Weapon Integration Schedules from Aircraft Platform Block Upgrade Cycle
- Industry Consortium Developed New Interface Standard
 - Baselined Dec 05; Rev 01 May 06; Rev 02 in work
 - Managed at Aeronautical Systems Center:
 - Ms Nadine Thomas, (937) 255- 7089 or DSN 785-7089
 - F-15E, JASSM, & JDAM UAI – Ready for the Unexpected in FY09

**First Fielded Capability Without Aircraft OFP Change:
SDB II on F-15E in FY14**



Network Enabled Weapons

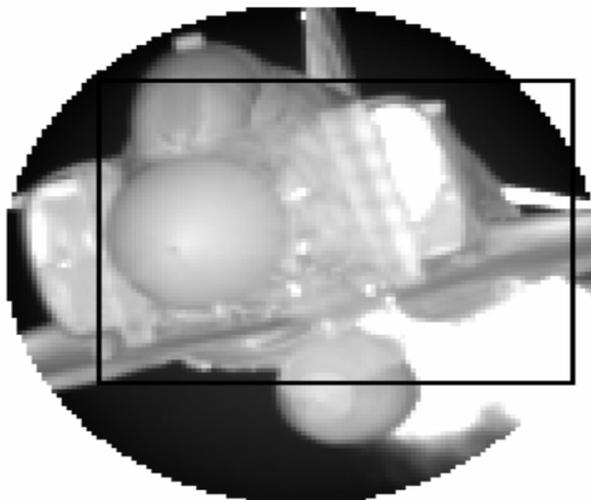


- Government and Industry Team developed Interface/Message Standard
 - Expect CY08 start for Link-16 NATO coordination
 - Already released to Australia and United Kingdom
- Aggressively tackling operational challenges
 - Common key handling procedures for munitions
 - Common Joint Mission Planning Components
 - Network Designs
 - Changes to ATO, MTO, OPTASK LINK
- CONOPS and CONEMP JROC items of interest

First Fieldings Expected ~ 2010: JSOW, HARPOON

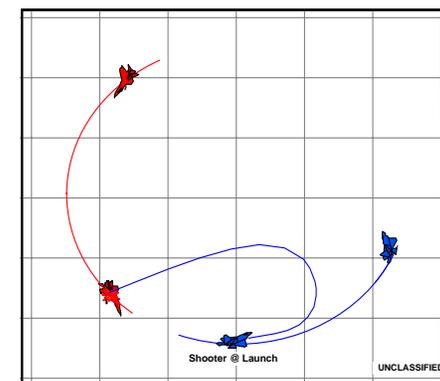


AIM-9X

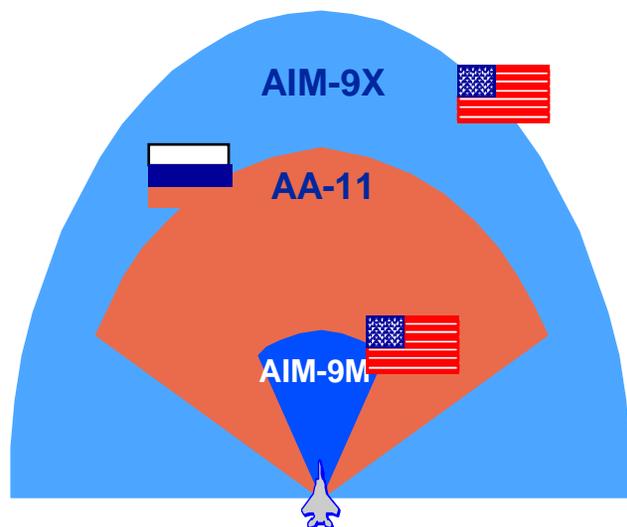


- Counter Superior Fielded Threat (16 Years)
- Extremely Maneuverable, High Off-Boresight
- Beyond and Within-Visual-Range Combat

- Increased Pk
- Interoperable
- Full Day/Night Capability
- Enhanced IRCCM Capability



- High Off-Boresight Acquisition and Launch
- Improved Acquisition in Blue Sky / Clutter
- Improved Maximum and Minimum Range
- Operational deliveries to date
 - 816 to USAF, 560 to USN
- Operational on F-15C/D, F-16C/D, F/A-18





SDB Takeaways



- Evolutionary leap in combat capability
 - Precision, increased standoff, and reduced collateral damage
- Challenges to overcome
 - Long and unpredictable TOF
 - Deconfliction considerations
 - Battle damage assessment



IOC Declared – 3 Oct 06

1st Combat Drop – 11 Nov 06



Small Diameter Bomb (SDB I)



- 250-lb class GPS/INS weapon providing very accurate CEP
- All-WX, autonomous, reduced collateral damage
- Flexible attacks with significant standoff range
- SDB derives its own non-ballistic flight path (0.4M glide)
 - Depends on release range, altitude, speed, climb, and winds





Small Diameter Bomb II (SDB II)



- System Description

- Capable against moving targets
- Compact, all weather, standoff weapon
- INS/GPS guided, precision weapon
- Tri-mode seeker (IR, radar, laser)

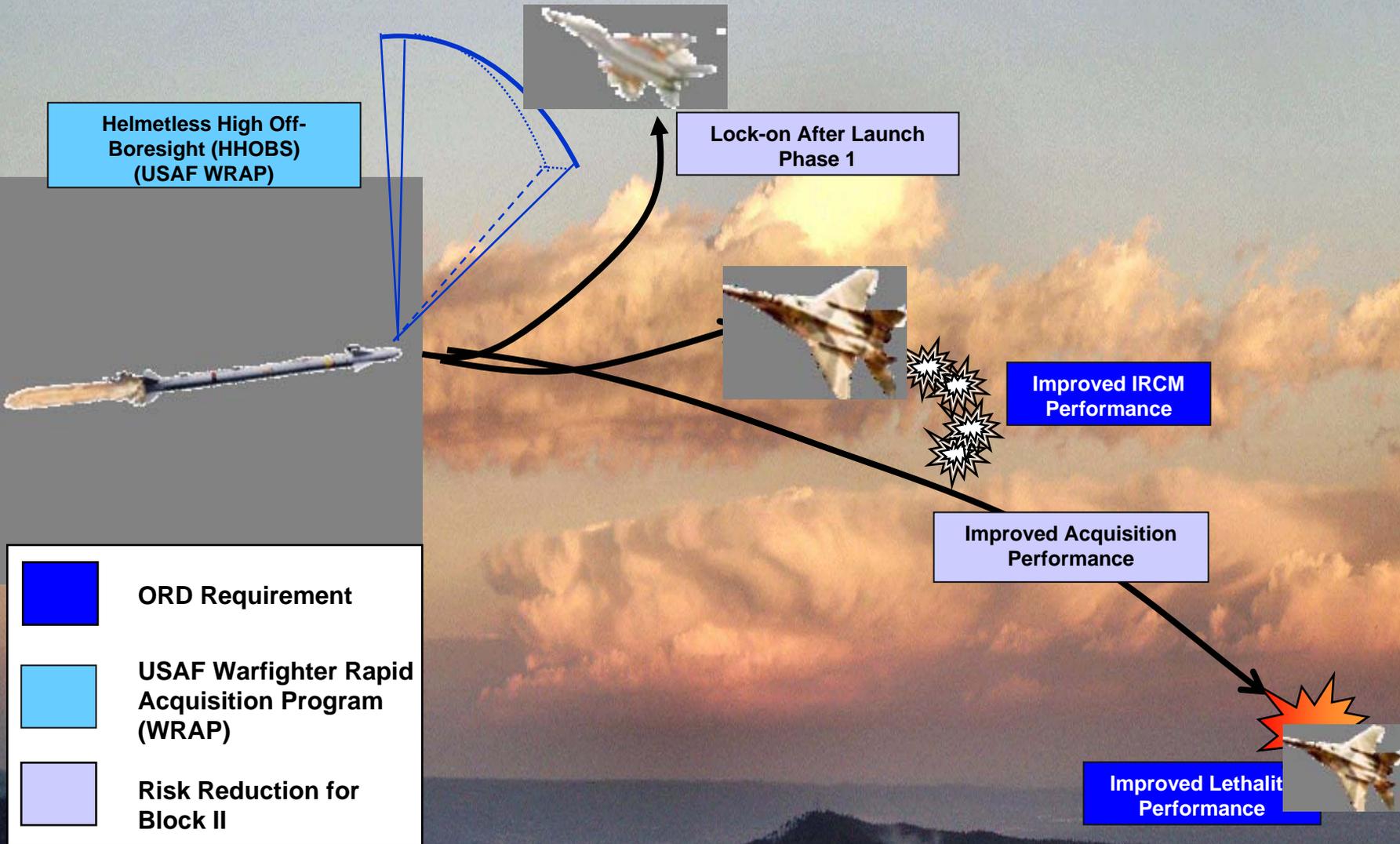
- Acquisition Activities

- Currently in risk reduction
- Two competing contractors
- Milestone B - FY10





AIM-9X OFS v8.209 ...In OT NOW





C4I and C2 Systems Testing

Internetting the Warfighter

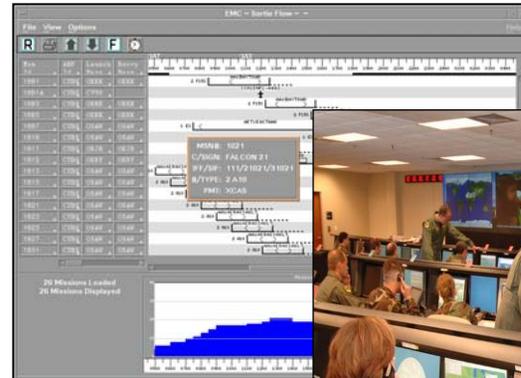


Distributed Common Ground System



Global Broadcast System

- Air Operations Center (AOC)
- Theater Battle Management Core System (TBMCS)
- Time Critical Targeting
- Control/Reporting Center (CRC) Upgrades
- Regional/Sector AOC (R/SAOC)



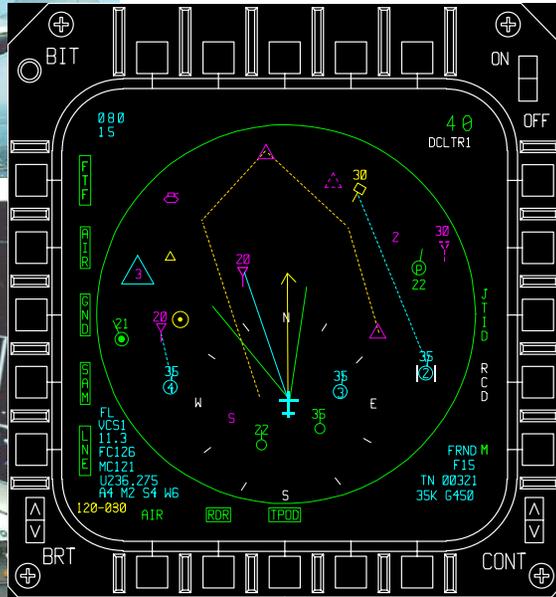
- Deliberate/Crisis Action Planning Execution Segment (DCAPES)
- Integrated Broadcast Service (IBS)
- Global Combat Support System – Air Force (GCSS-AF)



Tactical Comm and Datalinks

Test Center of Expertise

- JTIDS
- FDL
- JTRS
- B1 IDL





Wind Corrected Munitions Dispenser (WCMD)



- Tail kit for guiding dispenser weapons
- INS corrects for winds, launch transients and ballistic errors
- Accuracy: 100' req'd; ~50' demo'd
- Fielded on B-1, B-52, F-15, F-16
- Future fielding on A-10, F-35
- Combat proven: 1,650 used in OEF/OIF
- Full Rate Production completed Oct 06
 - 27,596 tail kits built
 - AUPP (BY94): \$25K req, \$13.5K actual
- WCMD-Extended Range SDD cancelled on 9 Aug 06





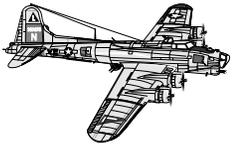
“The Heart and Soul of the Air Force is Range and Payload”

*Gen T. Michael Moseley
Chief of Staff*



Evolution of Precision

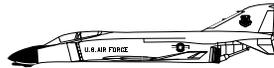
1943



WWII

1500 B-17 sorties
9000 bombs (250#)
3300 ft CEP
One 60' x 100' target

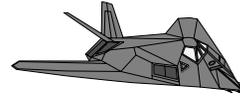
1970



Vietnam

30 F-4 sorties
176 bombs (500#)
400 ft CEP
One target

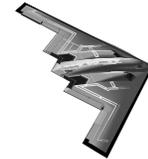
1991



Desert Storm

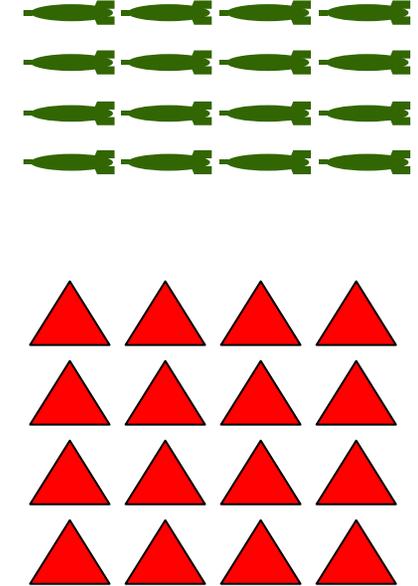
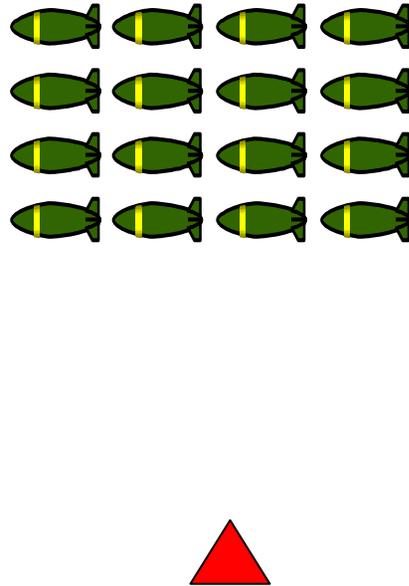
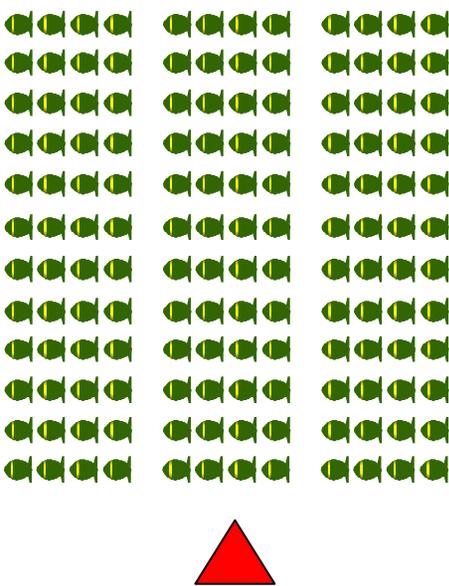
1 F-117 sortie
2 bombs (2000#)
10 ft CEP
2 targets per sortie

2004



OAF/OEF/OIF

1 B-2 sortie
16 bombs (2000#)
7 ft CEP
16 Targets per Pass





Air Dominance

AMRAAM



HTS



AIM 9X



MALD / MALD-J





Long Range & Area Attack

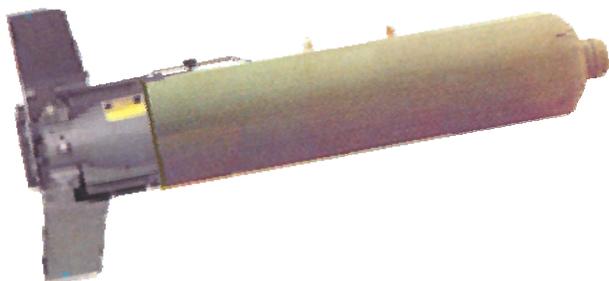
JASSM



SFW



WCMD





Direct Attack & Miniature Munitions



JPF



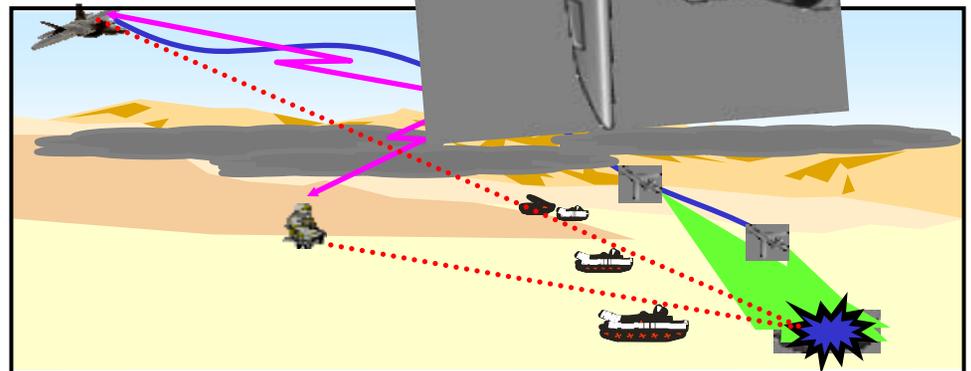
JDAM



SDB



SDB II



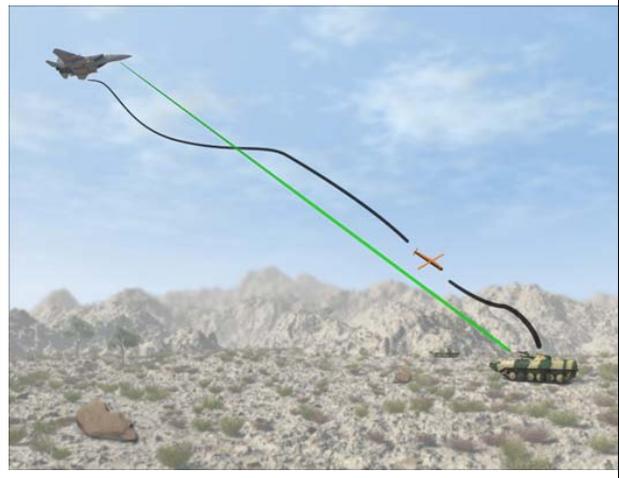
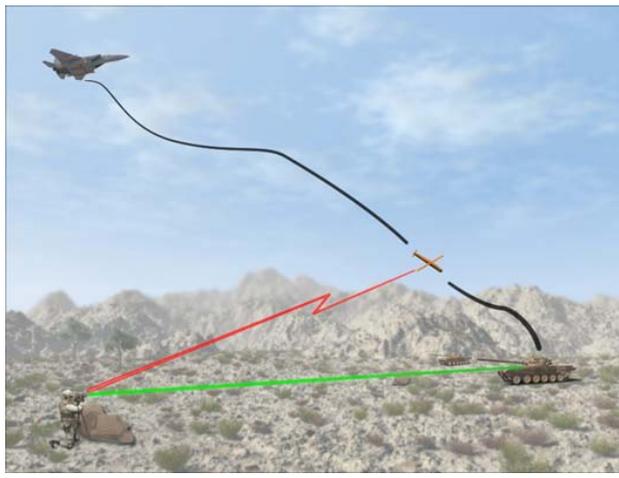
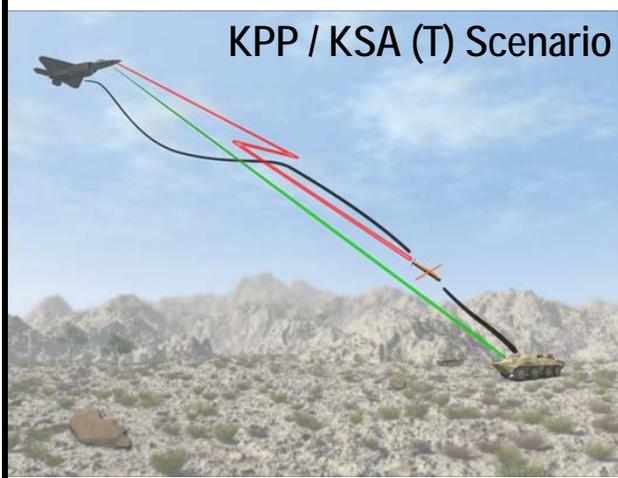


Attack Modes



Normal Attack Modes

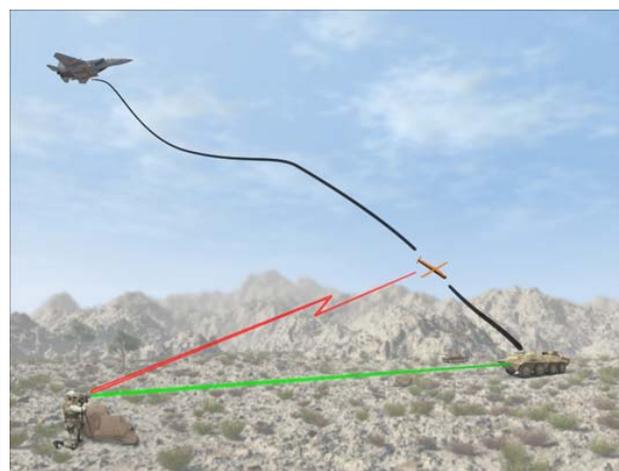
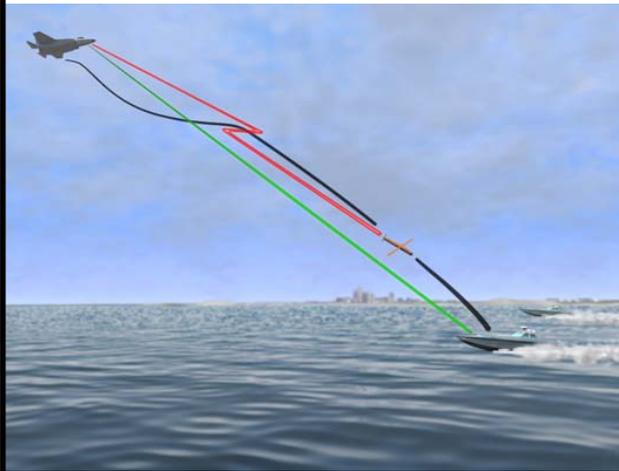
KPP / KSA (T) Scenario



Coordinate Attack



Semi-Active Laser Modes





PEO - Weapons RADAR Scope

- **GWOT Urgent Needs**
- **JASSM Follow Through**
- **Continued Success**
 - JDAM, AMRAAM, SDB
- **New Opportunities**
 - CRIIS, QF-16, MALD-J, HTVSF
- **Program Challenges**
 - MALD, AIM-120D
- **Future - Directed Energy**





GWOT Successes



**Over 30,800 Total Combat Drops OEF/OIF
(JDAM, DSU-33, JPF, SDB, SFW, WCMD)**



- **JDAM**

- **FY08: Delivered 11,734 Units – 1,925 Combat Drops**
- **Proven Ability to End Combat Engagements**



- **JPF**

- **FY08: Delivered 4,914 Fuzes – 1,412 Combat Drops**
- **Operational Reliability 98% (95% requirement)**



- **SDB**

- **49 Total Combat Drops**
- **~40,000 Captive Flight Hours on F-15E**

**Government / Industry Team Delivering
Capability to the Warfighter**



DEFENSE THREAT REDUCTION AGENCY



AFRL MUNITIONS



AIR ARMAMENT CENTER



AFOTEC



53rd WING



20th SPACE CONTROL SQUADRON

NAVY EOD SCHOOL



COAST GUARD



ARMY RANGERS



ARMY 7th SFG



919th SPECIAL OPS WING



33 FW

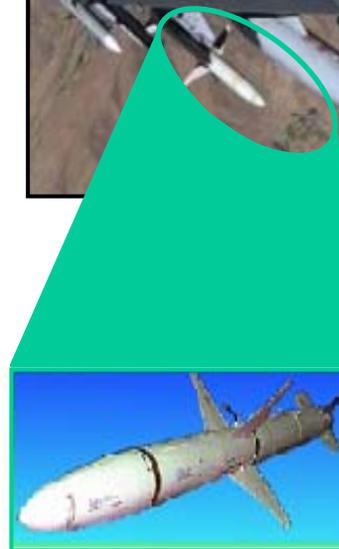




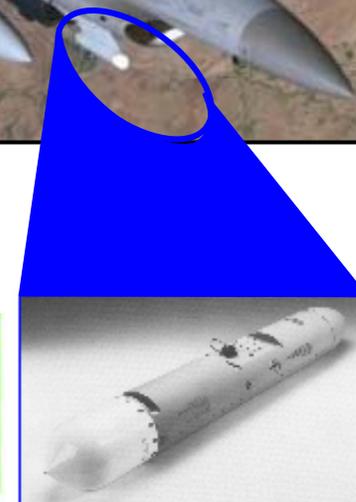
HARM Targeting System (HTS)



- Target/Kill Enemy Radar
- Supports Suppression Of Enemy Air Defenses (SEAD) Wild Weasel Mission Area with HARM
- New R7 Pod Allows PGM Targeting
 - Brings JSOW, JDAM, JASSM, & SDB to SEAD mission
- Operational on F-16CJ
- Entered inventory in 1994
 - Over 200 delivered
- Combat proven in Operation Deliberate Force (Bosnia), Operation Southern/Northern Watch, Operation Enduring Freedom, and Operation Iraqi Freedom



**AGM-88
(HARM)**



HTS Pod



Networked Weapons

