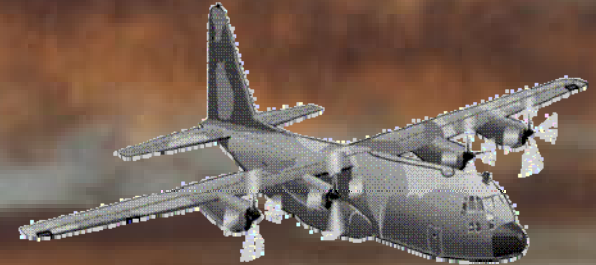




Small Guided Munitions - Path Ahead



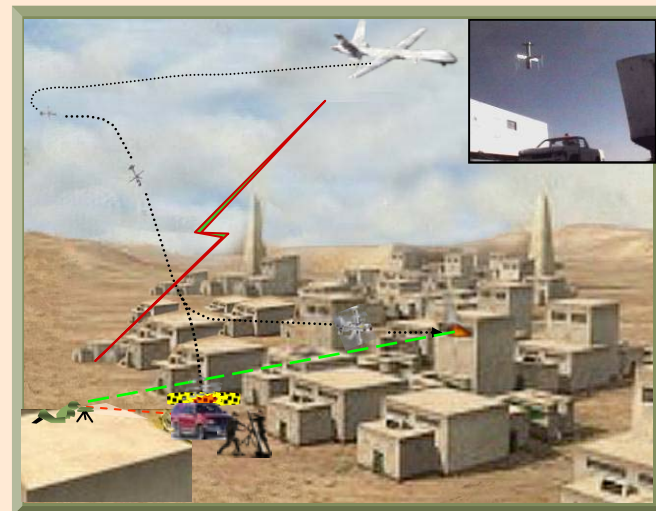
Distribution Statement A – Approved for public release; distribution is unlimited

11 Mar 09

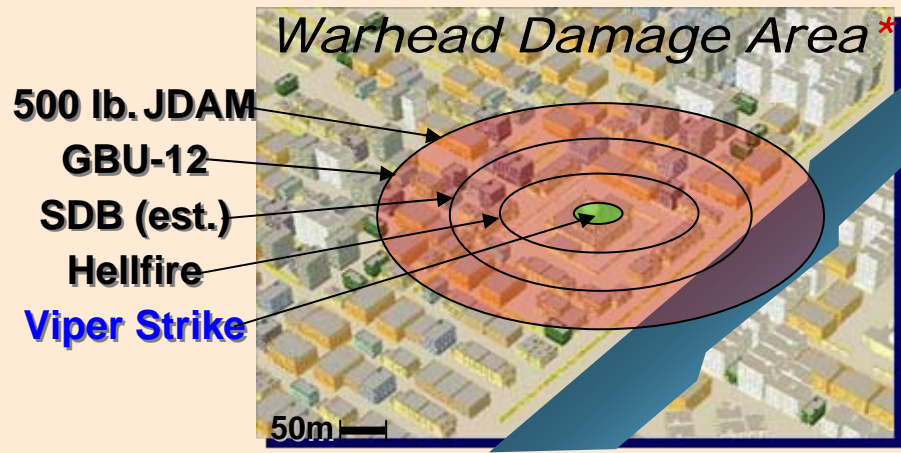
Viper Strike Snapshot



Diameter	5.5 in
Wingspan	36 in
Length	36 in
Weight	44 lb
Glide Ratio	9:1
Explosive	2.3 lb



- GPS / INS Navigation + SAL Terminal
- Precise <1m CEP
- Low Probability of Collateral Damage
- GPS Extends Glide Range to 10+km
- Agile: 360 deg. off-axis, steep/shallow, direct/indirect attack
- Key Target Set Capable
 - Personnel
 - Moving/Stationary Targets
 - Room in a Building

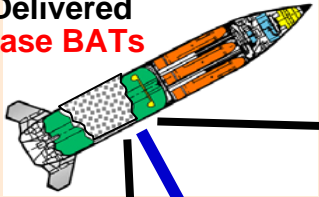


*Joint Pub 3-09.3 Joint CAS (.1% PI)

Viper Strike Lineage



**ATACMS
Delivered
Base BATs**



**Eagle Eyes
Multi-Mode Seeker
Proof of Principle**



Operational Capability

**Convert Block II
Base BAT to
Viper Strike
Munitions**



**Viper Strike SAL Seeker
Proof of Principle
Demos I & II**



**Hunter-Viper Strike
Quick Reaction Capability
Munitions Fielded**

**AC-130-Viper Strike
ACTD**

**Platform
Integration**



**Multiple Manned &
Unmanned Platform
Viper Strike Demos**

**New Production
Viper Strike
Munition
Requirements**

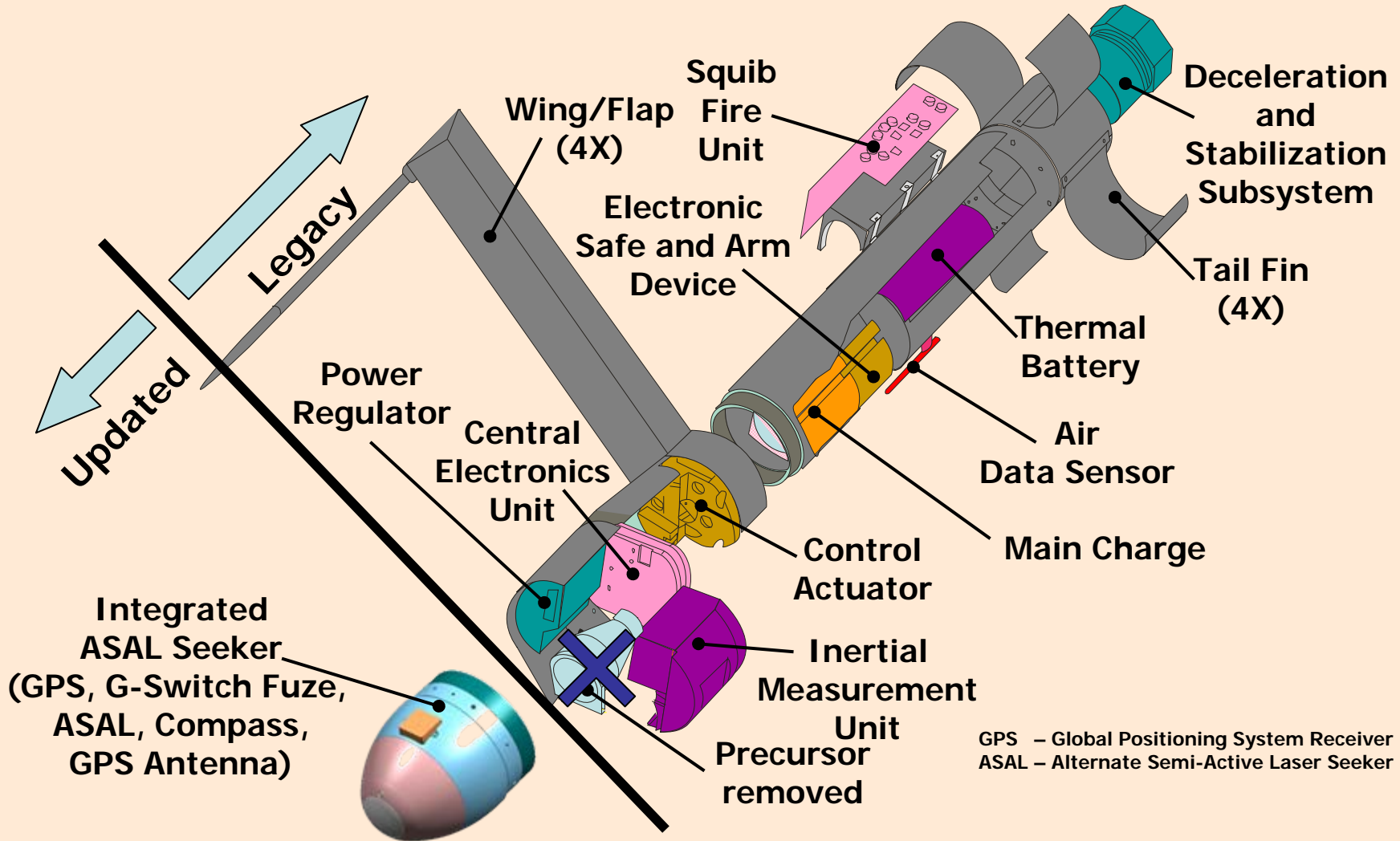
**Viper Strike
Operational Use
on
Multiple Platforms
for
Multiple Missions**

**Hunter - Base BAT
Demo**



Proof of Principle

Viper Strike Subsystems



Viper Strike Variants

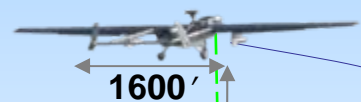


**Direct Attack
Fielded Capability
2004**

GPS

**GPS
Fielded Capability
2008**

**Air or Ground
Designation**



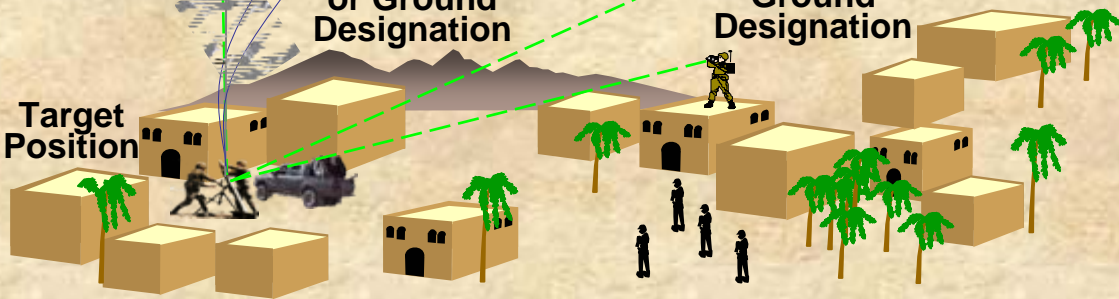
1600'

10K' AGL

**Self, Buddy,
or Ground
Designation**

**Ground
Designation**

**Target
Position**



3 to 10+km



- 8.5 to 18K ft AGL
- Up to 24.7K ft MSL External Carry
- Up to 31K ft MSL Internal Carry



Viper Strike Direct Attack Capabilities



- **Launch Altitudes – 8K' to 13K'**
- **Low Circular Error of Probability – Less than One Meter CEP**
- **Low Collateral Damage – 16 Meters for Urban Targets**
- **Top Down Blast Effect – Limits Damage in Urban Canyons**
- **Moving Targets – Up to 30 mph**
- **Danger Close – ATEC Approved at 50 Meters**
- **Double the Payload – Half the Weight of Hellfire**
- **Multiple Laser Designation Options – Air, Buddy, or Ground**
- **Day or Night Capability**
- **Stand Off – 1/2km to 1km**
- **Tandem shaped charge warhead for armored targets**
- **Only Qualified Weapon for Hunter Class UAS**
- **Capability Fielded in OIF – Proven & Certified**
- **First Weapon employed from an Army UAS in combat**

Direct Attack



Viper Strike ASAL GPS Improvements

- **ASAL GPS variant provides 360° “see and shoot” capability and significantly simplifies engagement execution versus Direct Attack VS**
- **Provides indirect and top/shallow attack capabilities (urban CAS, ground party targeting/designation)**
- **Increases standoff range by greater than 10 times that of Direct Attack**
- **Adds covert capability (no observable signature)**
- **Increases launch altitudes:
24.7K’ MSL External Carry
31K’ MSL Internal Carry**
- **ASAL Seeker dramatically increases Field-Of-View and Detection Range**
- **G-Switch replaces Impact Fuze Sensor for better reliability against soft targets**
- **GPS Munition Unit Cost reduced by > 40% in 2008**
 - **Lean Production Line Initiative eliminated many unnecessary tasks**
 - **Alternate Domestic Suppliers found for critical components**





GPS Viper Strike





Viper Strike Missions



- **“Golden Shots”**
 - **Pinpoint a moving armored car in a motorcade**
- **Restricted (Minimal Collateral Damage) Urban Targets**
 - **Reach down into cordoned urban canyons**
 - **Near vertical angle of attack projects warhead shrapnel into the target and ground minimizing collateral damage**
- **Convoy & TOC ISR & Security**
 - **At 10K’ AGL, UAVs relatively unseen, unheard, and undetectable**
 - **Allows observation of enemy preparations, IED placement, and ambush points**
- **Key Infrastructure ISR & Armed Response**
 - **Refineries, pipelines, politically sensitive locations, etc.**
- **Monitor critical situations with timely response**
 - **Undetected observation without ground troops in harm’s way**
- **(GPS) Extended Stand-off Range Attack**
 - **Up to and beyond organic sensor range**
- **(GPS) Close Air Support (CAS); Ground Party/Off Board Designate**
 - **Indirect Attack: 360° target relative azimuth attack**



VS Weapon System

Viper Strike Munition



Battle Management Systems (BMS)



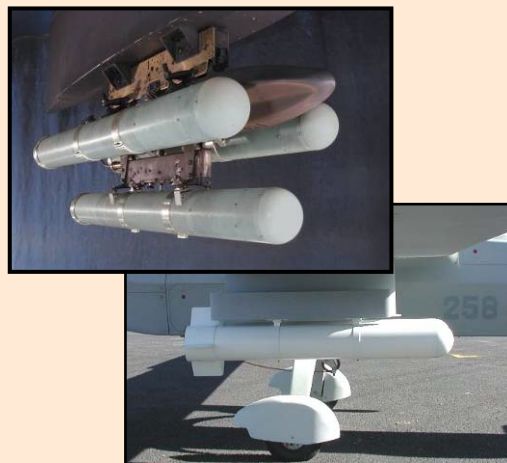
Laser Designators



Launch Tubes



Launcher Racks



Munition Interface Unit (MIU)



CONOPS / TTPs, Training, Logistics



APKWS Proven Performance

Mid-body Design is Supportable

- No platform modifications required
- No changes to weapons loading
- Limited pilot training required



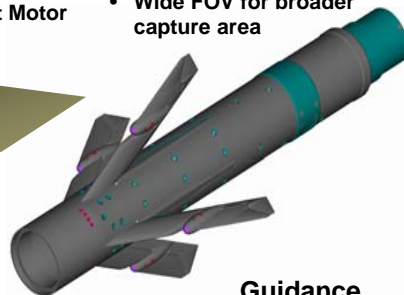
Mid-body Design is Reliable

- Optics protected prior to launch from adjacent firings, sand, moisture, etc.
- Wide FOV for broader capture area

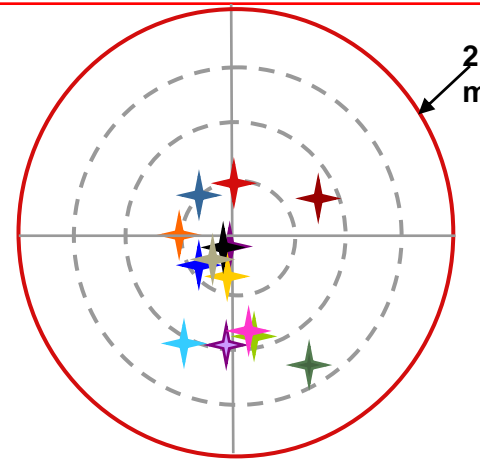
Warhead & Fuzes

No Impact on Warhead Effectiveness

- Warhead does not "fire through" guidance unit



Guidance Section



Average laser spot to impact point <0.5m or ~1½ ft

News

September 19, 2007

USMC Cobra



BAE SYSTEMS CONDUCTS FIRST EVER SHOTS OF ADVANCED PRECISION KILL WEAPON SYSTEM FROM AN AIRCRAFT

News

December 20, 2007

U.S. Army Kiowa Warrior

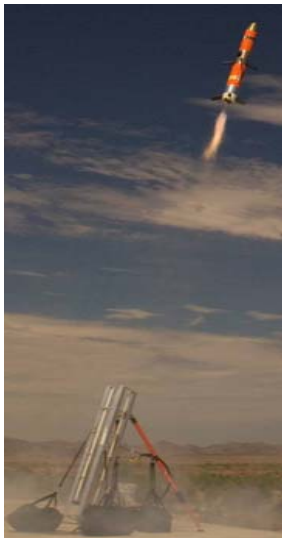


BAE SYSTEMS COMPLETES TWO TEST FIRINGS OF ADVANCED PRECISION KILL WEAPON SYSTEM FROM ARMY HELICOPTER

Raytheon Missile Systems' Griffin™ Missile System



- Substantial internal investment by Prime Contractor.
- Extensive re-use and repackaging of proven weapon components.
- Highly successful flight-test and qualification series.
- Now in low-rate initial production.
- Tests show suitability for employment from host of ground and air platforms, and ground teams.
- Powered, maneuverable, small, lightweight, accurate and lethal, with reduced risk of collateral damage.





POCs

- **LtCol Sean Hayes, PM Small Guided Munitions**

256-313-3904

sean.hayes@msl.army.mil

- **Steve Borden, DPM Small Guided Munitions**

256-842-7725

steven.borden@msl.army.mil