



Program Executive Office, Missiles and Space



Close Combat Missile Systems Overview to Precision Strike Association



Presented By

Mr. Dave Hicks




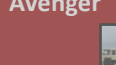







Department of the Army System Coordinator,
Assistant Secretary of the Army
(Acquisition, Logistics & Technology)

20 March 2013



CCWS PORTFOLIO



AVIATION	FIRES					MANEUVER	SMDC
Joint Attack Munition Systems (JAMS)	Cruise Missile Defense Systems (CMDS)	Counter - Rocket, Artillery, Mortar (C-RAM)	Integrated Air and Missile Defense (IAMD)	Lower Tier Project Office (LTPO)	Precision Fires Rocket and Missile Systems (PFRMS)	Close Combat Weapon Systems (CCWS)	Space
 <p>Hydra-70</p>  <p>Joint Air-to-Ground Missile (JAGM)</p>  <p>Small Guided Munitions</p>  <p>HELLFIRE</p>  <p>Launchers</p>	<p>Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS)</p>   <p>IFPC Inc 2-1</p>  <p>NASAMS</p>  <p>Sentinel</p>  <p>STINGER</p>  <p>Avenger</p>  <p>Lightweight Counter Mortar Radar (LCMR)</p>  <p>FireFinder</p>  <p>AN/TPQ-53</p>	 <p>C-RAM</p>  <p>RAM Warn</p>  <p>Air & Missile Defense Planning & Control System (AMDPCS)</p>  <p>Forward Area Air Defense Command & Control (FAAD C2)</p>	 <p>IAMD Battle Command System (IBCS) Engagement Operations Center</p>  <p>A/B Plug and Fight Interface Kits</p>  <p>Integrated Fire Control Network (IFCN) Relay</p>	 <p>PATRIOT/ Ground Support Equipment</p>  <p>PATRIOT Advanced Capability (PAC-3)</p>  <p>Medium Extended Air Defense System (MEADS)</p>  <p>PAC-3 Missile Segment Enhancement (MSE)</p>  <p>Joint Tactical Ground Station (JTAGS)</p>	 <p>Guided Multiple Launch Rocket Systems (GMLRS)</p>  <p>High Mobility Artillery Rocket System (HIMARS)</p>  <p>M270A1</p>  <p>Army Tactical Missile Systems (ATACMS)</p>	 <p>JAVELIN</p>  <p>Tube-Launched, Optically-Tracked, Wire-Guided (TOW)</p>  <p>Improved Target Acquisition System (ITAS)</p>  <p>Improved Bradley Acquisition System (IBAS)</p>  <p>Lethal Miniature Aerial Munitions System (LMAMS)</p>  <p>Precision Fires Manager (PFM)</p>	 <p>SNaP-3 Nanosatellite</p>  <p>Kestrel Eye (KE) Microsatellite</p>  <p>Soldier-Warfighter Operationally Responsive Deployer for Space (SWORDS)</p>

CLOSE COMBAT WEAPON SYSTEMS HISTORY



TOW



Threat



Launcher



Close Combat Weapon Systems Used Effectively in Combat Operations since 1972!

Javelin





TOW PRODUCT DESCRIPTION

Program Description

TOW 2B Aero RF:

- Range: 200M min / 4,500M max
- Weight: 65 lbs

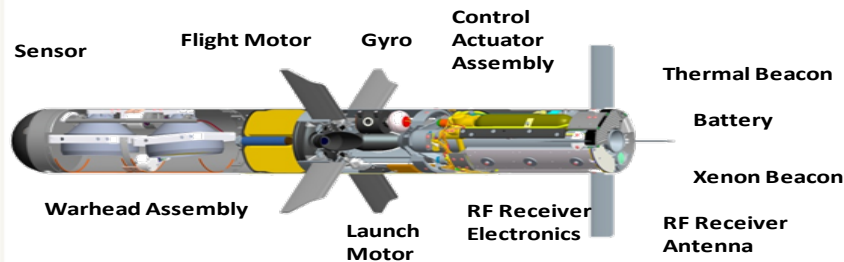
TOW Bunker Buster (BB) RF:

- Blast fragmenting HE Bulk warhead
- IM Compliant PBXN-109 explosive
- Range: 65M min / 4,200M max
- Warhead optimized for urban targets and field fortifications.

TOW 2B Aero RF & TOW BB RF:

- Compatible with all TOW platforms and stowage racks: ITAS, Bradley Fighting Vehicles, Stryker Anti-Tank Guided Missile (ATGM) Vehicle and USMC platforms.
- Will be in the field beyond FY2035
- Prime Contractor: Raytheon Missile Systems (RMS), Tucson, AZ; Contract Type: Firm Fixed Price; FY12-16 Multi-Year Contract, \$237.7M cost savings
- Customers: USMC and 43 Allied Nations
- Missile Prior Production: 156,806 U.S. Army / 699,386 Total

TOW 2B Aero RF



Capabilities/Improvements

TOW 2B Aero RF:

- Defeats all current and projected threat armor systems
- Dual Explosively Formed Penetrator (EFP) warheads configured for top attack
- Aerodynamic nose reduces missile time of flight to target
- 20% improvement in max range increases survivability by providing more standoff from threat weapons
- Increased Pk/s at extended ranges



TOW BB RF:

- Breaches 8" thick double reinforced concrete walls; provides overmatch against urban targets and bunkers.

Program Schedule

	FY12				FY13				FY14				FY15				FY16			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Contracts	FY12-16 MYP Production CA																			
Deliveries	FY06-11 TOW MYP Deliveries								FY12-16 TOW MYP Deliveries								FY12-16 TOW MYP			
																	FY12 1,104 FY13 1,396 FY14 988 FY15 1,008 FY16 1,556			



ITAS PRODUCT DESCRIPTION



Program Description

Characteristics / Description:

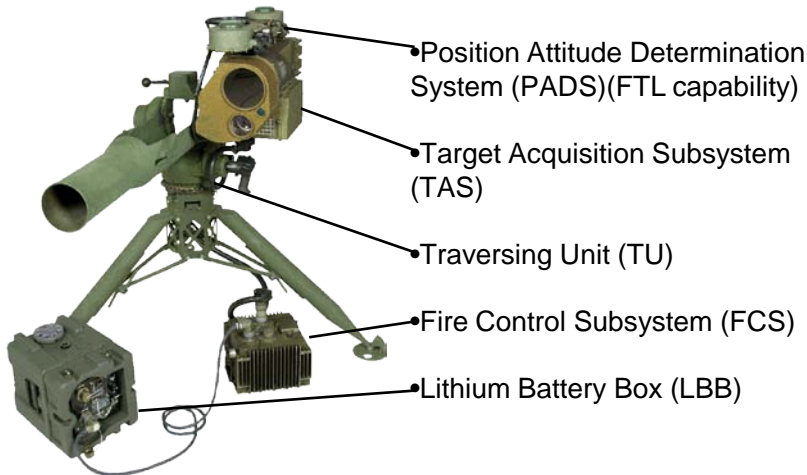
- Superior Long Range Surveillance (2nd Gen FLIR)
- Long Range, Lethal, Heavy Close Combat and Precision Assault Fires
- Laser Range Finder (10 km)
- Aided Target Tracker
- Fires all versions of TOW missile
- Automatic boresight capability
- Far Target Location Capability (10 digit grid to target)
- Embedded training
- 16 Hour Silent Watch Capability

Capabilities/Improvements

- More lethal and survivable
 - Doubles target detection/recognition of Ground TOW
 - Increased probability of hit
 - Assists in the target location for other direct fire, indirect fire, and close air support weapons
- Improved supportability
 - 50% reduction of TOW 2's support costs
 - No higher level maintenance verification required
 - No support equipment required



M41A4 ITAS



Program Schedule

	FY13	FY14	FY15	FY16	FY17
Program Events		FY14 IE Prod CA	FY15 IE Prod CA	FY16 IE Prod CA	
Fielding		FY12 IE Fielding		FY14-16 IE Fielding	
Deliveries		FY12 IE Deliveries		FY14-16 IE Deliveries	

Any Warfighter - Anywhere - All the Time



TOW ITAS IMAGE ENHANCEMENT

- Reduces operator workload and mitigates lack of institutional training
- Optimizes image presented to gunner to increase stand-off range
- Provides hardware & software baseline to provide networked lethality capability

Image Enhancement Provides:

Electronic Focus – sets sensor for optimal focus on Operator command

2X, 4X & 8X Zoom - electronic zoom provides expanded range recognition

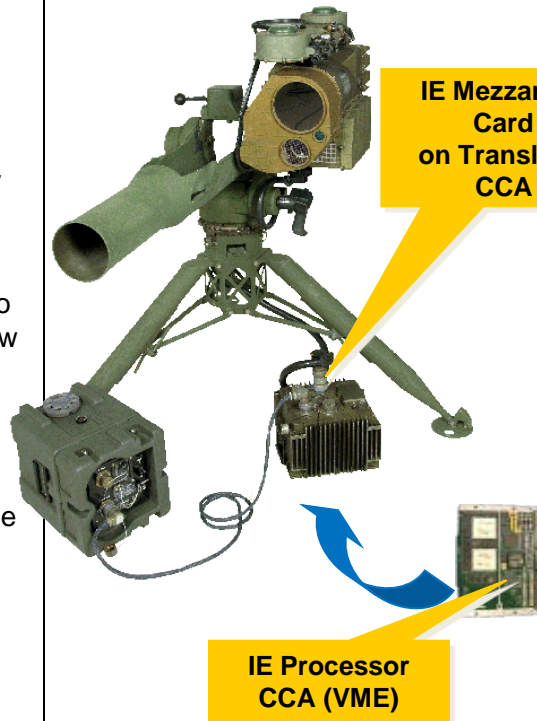
Polarity Reversal – provides image contrast polarity control, switchable between black hot and white hot

Enhanced Local Area Processing (ELAP) - Electronic contrast between target and background to make target acquisition and identification easier in low contrast scenes

Frame Integration – produces a better image using noise reduction techniques

Electronic Image/Scene Stabilization – provides the operator an image with jitter removed. Provides a path forward for image detection and accurate LOS measurements.

D-Zipper – removes the zipper effect from object edges, most apparent in zoom modes



JAVELIN PRODUCT DESCRIPTION



Program Description

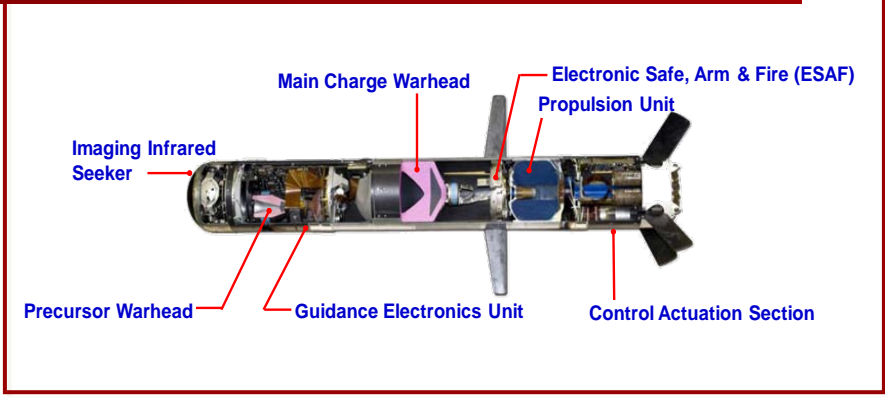
- 48.8 pounds (Block I), Man-portable
- Medium range (2500 meters) precision fires
- Missile: 64x64 I2R Staring Focal Plane Array (FPA)
- CLU: 240x2 Imaging Infrared Seeker (I2R) Scanning FPA
- Enhances Battlefield Surveillance
- Multi-purpose warhead defeats a variety of targets
- Employed by Infantry Brigade Combat Teams (IBCT), Armor Brigade Combat Teams (ABCT) and Stryker Brigade Combat Teams (SBCT)
- Ability to defeat armored vehicles, fortifications, and soft targets.
- Will be in the field beyond FY2035
- Prime Contractor - Javelin Joint Venture (Lockheed Martin – Orlando & Raytheon – Tucson); Contract Type: Firm Fixed Price.
- CLU AAO: 7,407
- Customers: USMC & 12 Allied Nations
- Missile Prior Production: 26,062 U.S. Army / 35,000 Total

Capabilities/Improvements

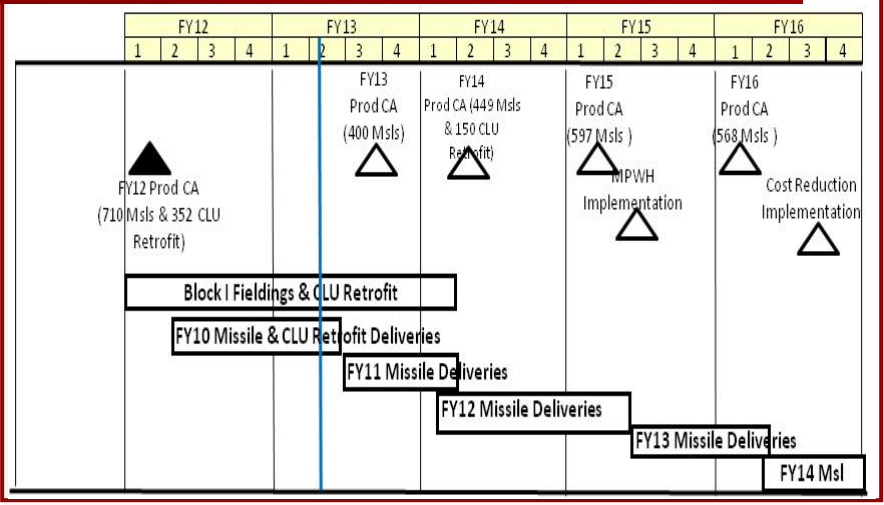
- High lethality against Advanced Armor
- Fire-and-Forget/Top & Direct Attack
- Fire-and-Forget capability provides increased gunner survivability
- Soft Launch (Fire from Enclosure)
- Range 2500 Meters (Qualified), 3600 Meters (Predicted)
- MPWH provides improved capability against non-armored targets & current lethality against traditional armored threats (Planned FY15 proc implementation)
- Cost Reduction Initiative missile includes uncooled seeker and guidance electronics unit for reduced cost missile (Planned FY17 proc implementation)



Javelin Block I Cutaway



Program Schedule

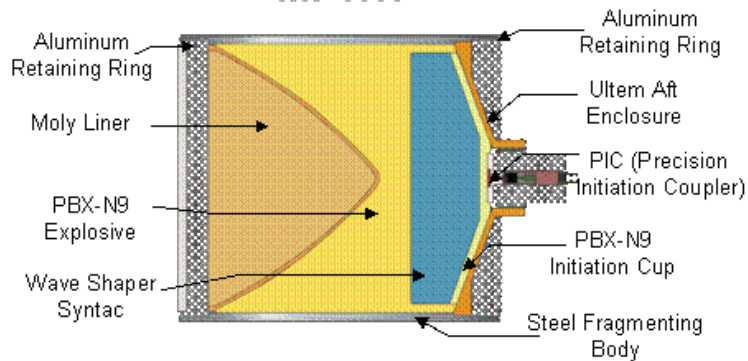




JAVELIN MISSILE MULTI-PURPOSE WARHEAD

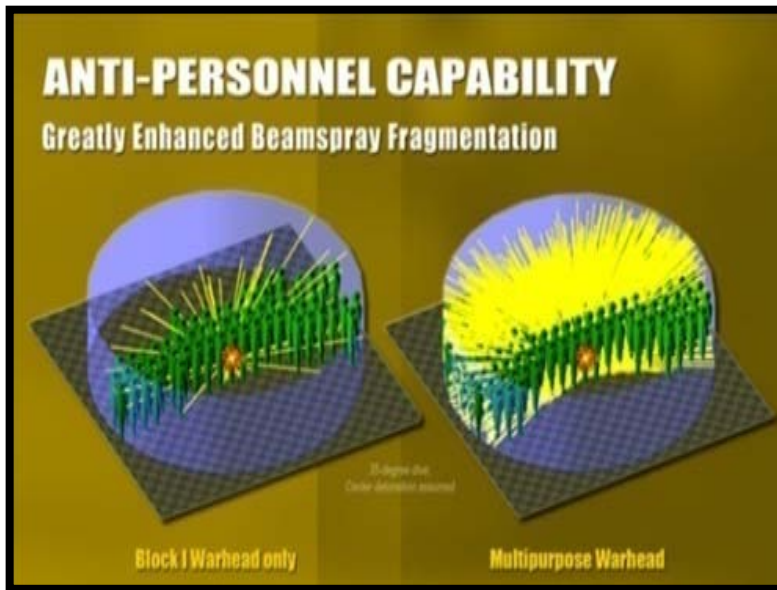


MPWH



Capability/Benefits

- **Meets Current Lethality Requirement against Traditional Armored Targets**
- **Fragment Sleeve Increases Capability against Non-Armored Targets**
- **2X Improvement in Lethal Area against Exposed Personnel**
- **Provides Overmatch for IBCTs and SBCTs in Close Combat Engagements**
- **No Training or Logistics Impacts**
- **System Safety Improvements**
 - Insensitive Munitions-Compliant Explosive



Capability Fielded in FY 2016 Timeframe



JAVELIN LIGHTWEIGHT CLU



Lightweight CLU



Greatly Improved Size, Weight and Power (SWaP) over Block I

- 70% Size Reduction
- 40% Weight Reduction
- 50% Battery Life Increase



Block I CLU





LIGHTWEIGHT CLU FEATURES

-
- Long-wave IR Sensor
 - 5 Megapixel Color Camera
 - Laser Pointer
 - IR and Visible
 - Far Target Locator
 - GPS, Laser Range Finder & Heading Sensor
 - Hi-definition Display
 - Improved Spatial Resolution
 - Picture in Picture
 - » IR and Day Camera
 - » Network and CLU Image
 - Modernized Electronics
 - Extended Battery Life
 - Networking Support
 - Embedded Training
 - Integrated Handgrips

Lightweight Javelin CLU provides small units the ability to see first, understand first, act first and finish the fight decisively



OPERATIONAL IMPACT

(TOW AND JAVELIN NON -ANTI-ARMOR USE IN CURRENT OPERATIONS)

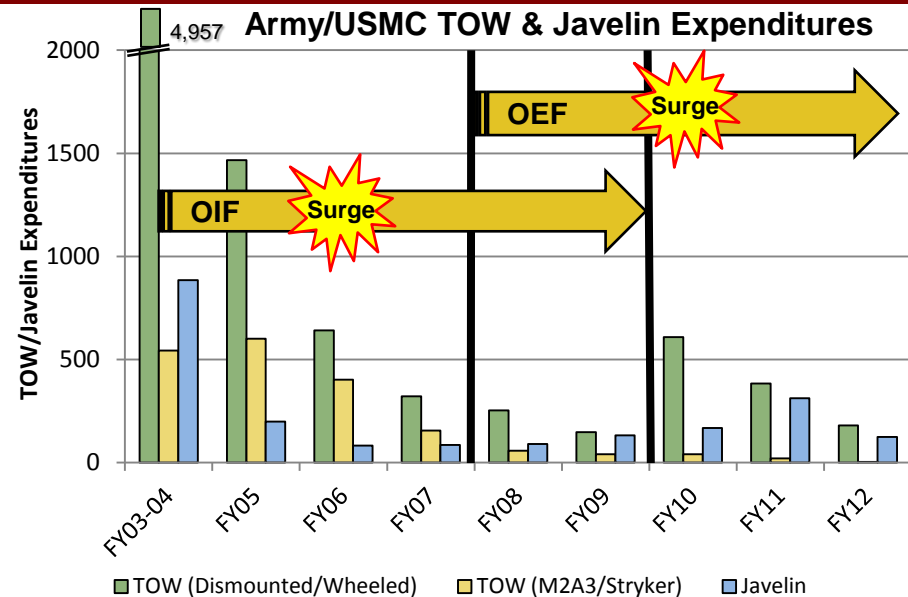


- Since 2003 in OIF & OEF, 10,887 TOW (1,521 fired from IFVs/Stryker) and 2,074 Javelin variants have been fired against non anti-armor threats.
- **Key AAR comments:**
 - The TOW/ITAS weapon enabled Friendly forces to find, fix and kill Threats with an immediate, lethal response in a firefight.
 - Javelin and TOW are force multipliers providing a single-shot, precision-guided, direct fire capability to engage Threat.
 - When faced with an irregular Threat, firing a Javelin and TOW end the firefight resulting in reduced Friendly force casualties and minimal collateral damage.

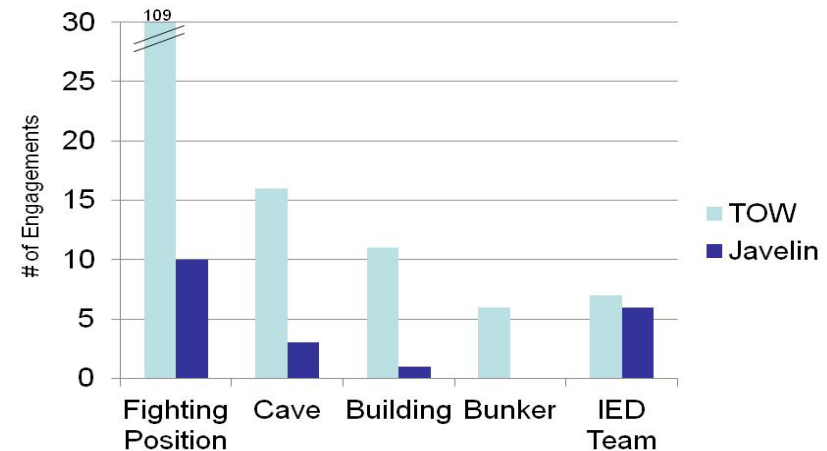
The Finger of God – “The TOWs were our most lethal weapon system on the battlefield. We had the ability to destroy fighting positions from 300m to 3800m.”

- 1 PLT/D Co/2-327 INF

*“When you have big-bang precision munitions like the Javelin and the TOW, the ability to put the same effect as for example a 155 round on the enemy, but make sure you hit the enemy with it – **it not only stays within the ROE**, I think it makes it that much stronger.” - 3/10MTN, 1-32IN, OEF*



TOW and Javelin Engagements against Threat Targets
1-101st OEF Deployment May 2010 – May 2011 Kunar Province, AFG





LETHAL MINIATURE AERIAL MUNITIONS SYSTEM (LMAMS)



Capability/Benefits

- **Single-Use, Man-Portable, Ground Launched, Unmanned, Direct Fire Missile**
- **Selectable Range Laser Radar Proximity Fuze, Low Collateral Damage Warhead**
- **Infrared & Electro-Optical Cameras and Target Tracker to Allow Surgical Defeat of Troops and Fleeting Soft Targets Not Within the Direct Line-of-Sight of other Organic Weapons**
- **Potential to Fly Switchblade/Raven/Puma/Wasp Simultaneously from Small Unmanned Aerial Sensor (SUAS) Controller**

Components

Air Frame

Warhead

Notional Specifications

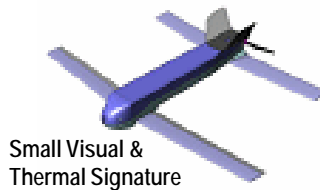
Weight:

- Warhead: < 0.7 lbs
- Air Frame & Warhead: < 5.5 lbs

Launcher Length: < 22 in

Range: < 10 km

Flight Time: >10 min



Small Visual & Thermal Signature



Modular

Launcher

Fits Inside Backpack
Quiet Launch

Raven Ground Control Unit (GCU)

Hardware &
Custom Software





CLOSE COMBAT WEAPON SYSTEMS

CCWS

One Shot - One Kill