

WEAPON SYSTEMS BOOK



ANY WARFIGHTER • ANYWHERE • ALL THE TIME

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BOOK PURPOSE

The Weapons Systems Book is an Authoritative Source of Descriptions, Characteristics and Essential Programmatic Information for the Programs Managed by the Program Executive Office Missiles and Space (PEO MS).

The PEO's Project Offices have Direct Responsibility and Oversight for the Development, Production, Fielding and Sustainment of these Systems.

This Book is Organized by Project Office. To Facilitate the Users' Ability to Gather System Data, Each System is Treated as Stand-Alone. This Results in Some Information Being Repeated in a Number of System Write-Ups.

SUPPORT TO THE WARFIGHTER

PEO MS Supports a Variety of Fielded Systems, Identifies Opportunities for Advancing Applicable Technologies and Innovatively Develops the Army's Rocket, Missile and Space Systems of the Future.

Fielded Programs Must Continue to Meet Warfighters' requirements. Technology Advancements Must be Incorporated into Today's Systems in Order to Provide the Most Far-Reaching Capabilities to the Warfighter.

The Future Depends Upon the Successful Development of Army Missile Systems that Leverage State-of-the-Art Technology and Offer a Unique Contribution to Full-Spectrum Operation.

PEO CHARTER

- ◆ As the Program Executive Officer, you will utilize the Family of Systems concept to ensure integration and interoperability are achieved between Army programs to support a full-spectrum force.
- ◆ You will, as the responsible management official, provide overall direction and guidance for the development, acquisition, testing, product improvement and fielding while ensuring total ownership cost reduction. You will establish processes that facilitate communication, cooperation, information exchange and collective decision-making between and among organizations.
- ◆ You will maintain the Army perspective in managing your programs and will report directly to me. You will keep the leadership fully informed of program status and report any matters that could affect the Army's ultimate commitment to the program. Your responsibilities include planning and executing the transition of programs and systems when appropriate.
- ◆ You will place primary management emphasis and oversight on balancing cost, schedule, performance and supportability while capitalizing on acquisition reform initiatives. You will also ensure compliance with applicable national policies to include environmental protection and socio-economic programs.
- ◆ You will lead and directly control assigned program managers. You will ensure that acquisition workforce career development and competency standards are actively pursued. You will also serve as an advocate to ensure the necessary force structure is in place to support acquisition career development programs.
- ◆ You are hereby designated full-line authority as the Program Executive Officer for the management of assigned programs. Unless rescinded, this designation will remain in effect until your reassignment.

//Signed//
Army Acquisition Executive

PEO MISSION

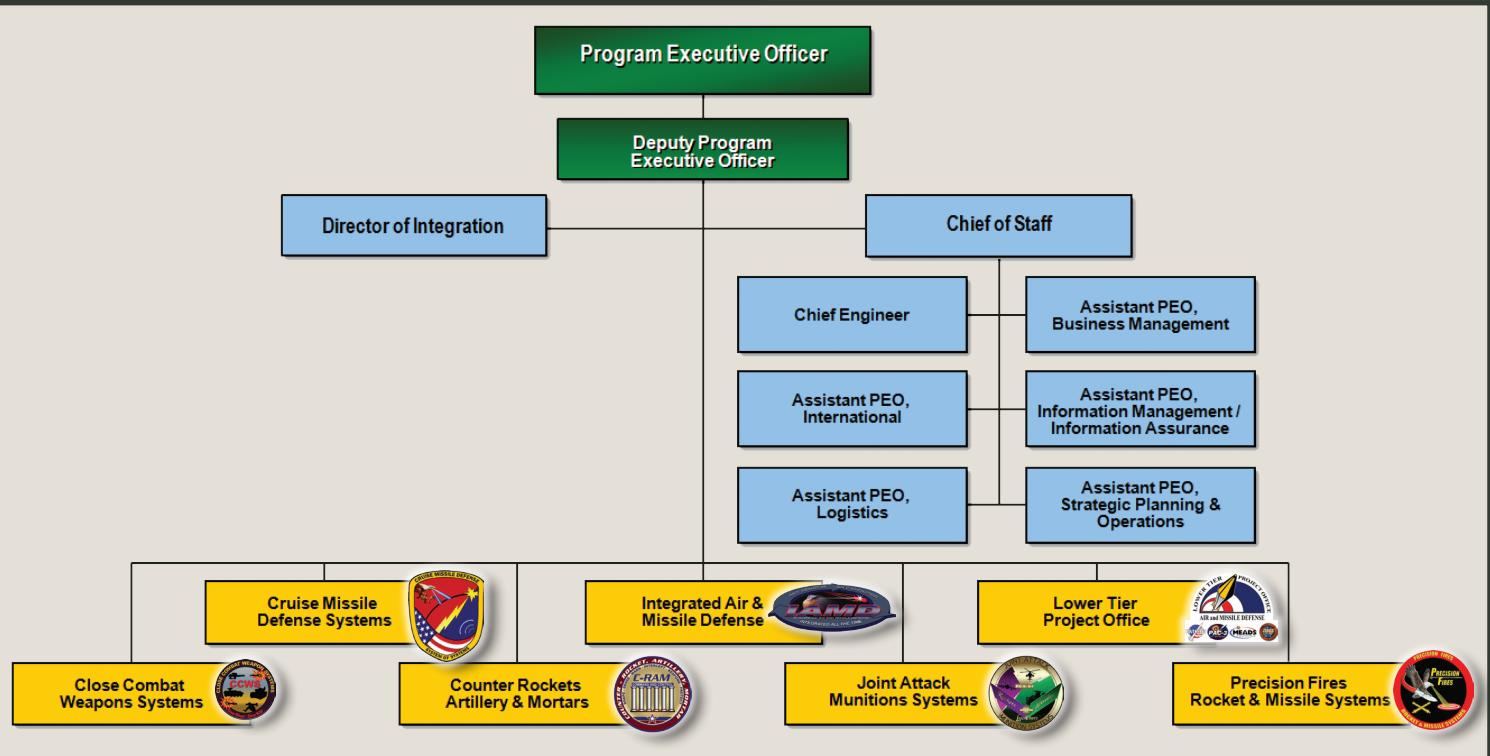
Provide Overall Direction and Guidance for the Development, Acquisition, Testing, Product Improvement and Fielding of Assigned Systems While Ensuring Total Ownership Cost Reduction. To Diligently Work With International Partners to Support Multi-National Programs as Well as Fostering Foreign Military Sales in Support of National and Army Objectives.

PEO VISION

Be the Trusted Worldwide Provider of Missile Systems for Our Allies and U.S. Warfighter with Uncompromising Service in Development, Procurement and Sustainment.



PROGRAM EXECUTIVE OFFICE ORGANIZATION



PEO MISSILE AND SPACE PORTFOLIO



























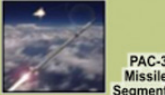




Close Combat Weapon Systems (CCWS)	Cruise Missile Defense Systems (CMDs)	Counter - Rocket, Artillery, Mortar (C-RAM)	Integrated Air and Missile Defense (IAMD)	Joint Attack Munition Systems (JAMS)	Lower Tier Project Office (LTPO)	Precision Fires Rocket and Missiles Systems (PFRMS)
 <p>Javelin</p>	 <p>Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS)</p>	 <p>Warning Tower FAAD C2 Land-based Rhalanx Weapon System (LPWS) Lightweight Counter Mortar Radar (LCMR) C-RAM</p>	 <p>IAMD Battle Command System (IBCS) Engagement Operations Center</p>	 <p>Hydra-70</p>	 <p>PATRIOT</p>	 <p>Guided Multiple Launch Rocket Systems (GMLRS)</p>
 <p>Tube-Launched, Optically-Tracked, Wire-Guided (TOW)</p>	 <p>Surface Launched Medium Range Air-to-Air Missile System (SLAMRAAM)</p>	 <p>WLAN Rajant Radio Warning Tower CCN 2.1 C-RAM C2 RAM Warn</p>	 <p>A/B Plug and Fight Interface Kits</p>	 <p>Joint Air-to-Ground Missile (JAGM)</p>	 <p>PATRIOT Advanced Capability (PAC-3)</p>	 <p>High Mobility Artillery Rocket System (HIMARS)</p>
 <p>Improved Target Acquisition System (ITAS)</p>	 <p>SENTINEL</p>	 <p>ADAM Cell Air & Missile Defense Work Station (AMOWS)</p>	 <p>WIN-T Inc 2 Highband Network Radio (HNR)</p>	 <p>Small Guided Munitions</p>	 <p>Medium Extended Air Defense System (MEADS)</p>	 <p>M270A1</p>
 <p>Improved Bradley Acquisition Subsystem (IBAS)</p>	 <p>STINGER</p>	 <p>Air & Missile Defense Planning & Control System (AMDPCS)</p>	 <p>Integrated Fire Control Network (IFCN) Relay</p>	 <p>Hellfire</p>	 <p>PAC-3 Missile Segment Enhancement (MSE)</p>	 <p>Army Tactical Missile Systems (ATACMS)</p>
	 <p>AVENGER</p>	 <p>Shelter Miltype Pony FAAD C2 Forward Area Air Defense Command & Control (FAAD C2)</p>			 <p>Joint Tactical Ground Station (JTAGS)</p>	

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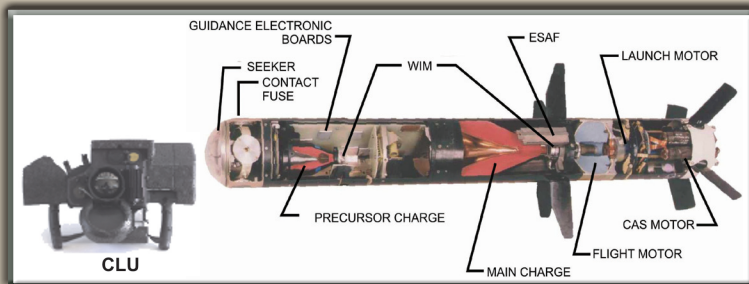
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JAVELIN BLOCK 0



SYSTEM DESCRIPTION:

Provides U.S. Army, U.S. Marine Corps and our allies a man-portable, fire-and-forget, medium-range missile with enhanced situational awareness and precision direct-fire effects to defeat armored vehicles, fortifications, and soft targets in full spectrum operations. Javelin has a high-kill rate against a variety of targets at extended ranges under day and night light conditions, battlefield obscurants, adverse weather and multiple counter-measure conditions. The system's soft launch feature permits firing from a fighting position or an enclosure. The system consists of a reusable Command Launch Unit (CLU) with built-in-test, and a modular missile encased in a disposable launch tube assembly. The Javelin provides enhanced lethality through the use of a tandem warhead which will defeat all known armor threats. It is effective against both stationary and moving targets. This system also provides defensive capability against attacking and hovering helicopters.

SYSTEM CHARACTERISTICS:

The total system weight is 48.3 lb with the round weighing 34.3 lb and the CLU with battery weighing 14 lb. The round has a length of 47.2 inches and an endcap diameter of 11.75 inches. The missile contained inside the launch tube assembly (LTA) has a diameter of 5 inches. Javelin has two attack modes. Top attack, which is the primary mode, allows the missile to impact the less heavily armored top area of the armored vehicle. The direct fire mode allows the weapon to be fired at targets under cover. Missile range is in excess of 2,000 m.

SENSOR/SEEKER:

The missile seeker focal plane array (FPA) is an imaging infrared (IIR) 64x64 element consisting of Mercury-Cadmium-Telluride (Hg-Cd-Te) detectors combined with an integrated readout circuit.

WARHEAD:

The system's tandem warhead contains both a precursor and a main charge warhead. The precursor is designed to initiate explosive reactive armor (ERA). The main charge warhead has a trumpet copper liner and is designed to penetrate and defeat current base armor and projected armor threats.

TARGET SETS:

Battle tanks and armored personnel carriers, fortifications and soft targets in full spectrum operations.

CONTRACTOR:

Joint Venture between Raytheon and Lockheed-Martin Corp.



ACQUISITION PHASE:

Production for FMS only.

MILESTONES:

MS I (DSARC)	May 1986
MS II (DAB)	Jun 1989
LRIP Decision (OSD).....	Jun 1994
Full Rate Production (ASARC).....	May 1997

FIELDING:

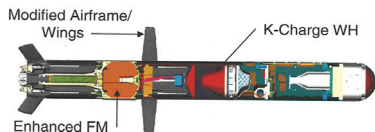
FUE: Jun 96. First OCONUS fielding completed April 00. Fielding complete for all active components, to include: U.S. Army Rangers, U.S. Army Special Forces groups, with the exception of Grow the Force BCTs and certain Engineer Elements. Fielded to U.S. Marine Corps.

POINTS OF CONTACT:

PM.....	256-876-5185
DPM	256-876-0728
ASA(ALT) DASC.....	703-604-7209

JAVELIN BLOCK I

MISSILE



COMMAND LAUNCH UNIT



SYSTEM DESCRIPTION:

The improvements in the current production JAVELIN Block I CLUs are improved target detection and acquisition range, increased endurance through a combination of longer lasting batteries and power management, Improved Processing, Digital Display with menu-driven access to features, Electronic Zoom, Black Hot/White Hot, RS-170 video input and output, Forward/Backward FFT compatibility and ruggedization. The performance improvement in current production Javelin Block I missiles are: increased probability of hit/kill at 2500 m, improved warhead lethality, and reduced time of flight.

SYSTEM CHARACTERISTICS:

The total system weight is 48.8 lb, with the round weighing 33.3 lb and the CLU with battery weighing 15.5 lb. The round is fully compatible with the existing Launch Tube Assembly (LTA). It maintains both top attack and direct fire capability. The CLU Sensor Utilizes a 240x2 FPA that is scanned to provide a 240x480 image. Resolution is enhanced by increasing optics from 9X to 12X magnification along with improved signal processing, electronic zoom, black/hot white/hot, and digitized color flat panel display. RS-170 video output is provided for exporting the video for exploitation. The flight motor case is extended by 1 inch to decrease time of flight to target.



SENSOR/SEEKER:

The missile seeker Focal Plane Array (FPA) is an imaging infrared (IIR), 64x64 element consisting of Hg-CD-Te detectors combined with an integrated readout circuit.

WARHEAD:

The system's tandem warhead integrates a K-Charge Warhead. The K-Charge maintains current system lethality while reducing total warhead weight by 2 lb.

TARGET SETS:

Battle tanks and armored personnel carriers, fortifications and soft targets in full spectrum operations.

CONTRACTOR:

Joint Venture between Raytheon and Lockheed-Martin Corp.

ACQUISITION PHASE:

Production and Deployment.

MILESTONES:

Program StartAug 2001
 Program Deliverables..... Jul 2006
 Full Material Release Block I CLU 3QFY07
 Full Material Release Block I Missile 4QFY08

FIELDING:

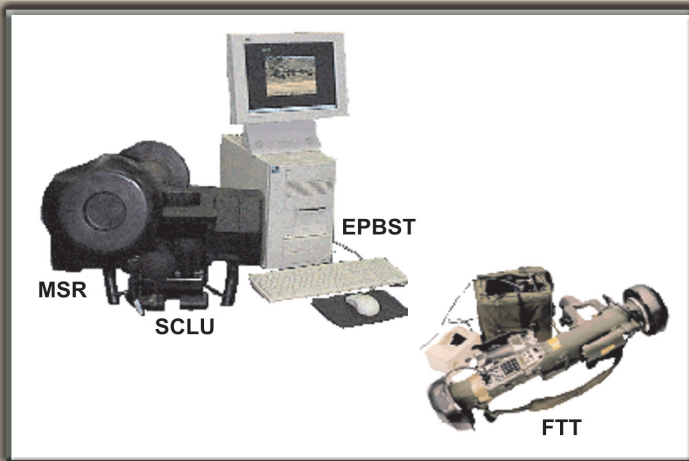
FUE: Jun 07.
 Javelin Block I CLUs are being fielded initially to high priority units (i.e. IBCTs, SOF and SBCTs).

POINTS OF CONTACT:

PM..... 256-876-5185
 DPM 256-876-0728
 ASA(ALT) DASC..... 703-545-0787



JAVELIN TRAINING DEVICES



SYSTEM DESCRIPTION:

The JAVELIN Training System consists of three unique devices for specific training roles; the Enhanced Producibility Basic Skills Trainer (EPBST), the Field Tactical Trainer (FTT) and the Missile Simulation Round (MSR). The EPBST is a classroom trainer designed to provide the soldier instructional exercises for teaching the basic skills required to engage targets with the JAVELIN system. It consists of an instructor station, a student station comprised of a Simulated Command Launch Unit (SCLU) and Missile Simulation Round (MSR), and shipping and storage containers. The FTT is used to refine the gunner's abilities, allowing gunner participation in both range training and force-on-force exercises. It consists of a student station, instruction station, batteries, charger, and interface cables. The MSR is used to familiarize the soldier with the physical characteristics of the JAVELIN round. It is a full-size, non-operational replica of the JAVELIN round in the field-handling mode.

SYSTEM CHARACTERISTICS:

The system weight and physical dimensions of each of the missile simulated rounds are representative the tactical round. The MSR is also used as the simulated round for the EPBST.

SENSOR/SEEKER:

The CLU uses a 240 x 2 Hg-Cd-Te FPA.

The FTT uses CLU imagery to emulate the missile seeker and incorporates the acquisition module of the JAVELIN tactical tracker software. This software has also been ported to the EPBST, allowing an accurate simulation of the tactical system software functions.

WARHEAD:

Not Applicable.

TARGET SETS:

The CLU is used for surveillance and target acquisition. The training devices are used for training the gunners and users.

CONTRACTOR:

Joint Venture between Raytheon and Lockheed-Martin Corp. The CLU is produced at Tucson, AZ. Cubic Corporation, as subcontractor to the Joint Venture, produces the FTT and the EPBST. The Training Support Center at Ft. Benning, GA, produces the MSR.

ACQUISITION PHASE:

Operations and Support.

MILESTONES:

MS I (DSARC)	May 1986
MS II (DAB)	Jun 1989
LRIP Decision (OSD).....	Jun 1994
Full Rate Production (ASARC).....	May 1997

FIELDING:

FUE: Jun 96. First OCONUS fielding completed April 00. Javelin training devices are being fielded concurrently with the CLU to both AC and RC units.

POINTS OF CONTACT:

PM.....	256-876-5185
DPM	256-876-0728
ASA(ALT) DASC.....	703-545-0787



TUBE-LAUNCHED, OPTICALLY-TRACKED, WIRE-GUIDED (TOW) 2A



SYSTEM CHARACTERISTICS:

The TOW 2A missile is optimized for performance against tanks with reactive armor and is also an effective assault weapon against buildings and field fortifications. Range is 65 to 3,750 m. The TOW 2A configuration weight varies from 47.1 to 49.9 lb (digital vs. analog guidance) and is nominally 6 inches in diameter. Encased, the weights are 61.8 to 64 lb, and the diameter is nominally 8.6 inches. All future production will replace the obsolete wire guidance link with a RF guidance link.

SYSTEM DESCRIPTION:

The Tube-launched, Optically-tracked, Wire-guided (TOW) missile is a heavy, anti-tank weapon system, consisting of a launcher and a missile. The gunner defines the aimpoint by maintaining the sight cross hairs on the target. The launcher automatically steers the missile along the line-of-sight toward the aimpoint via a pair of wires which physically link the missile and the launcher. The TOW 2A is a direct attack missile capable of defeating modern threat targets. It consists of a single main warhead and a standoff probe. The probe contains a precursor charge which detonates upon contact with the target for pre-emptive removal of reactive armor. The main charge is detonated by a subsequent timed interval or by contact with the target. The missile is fired from the Bradley, High Mobility Multi-Purpose Wheeled Vehicle (HMMWV), Stryker Anti-Tank Guided Missile (ATGM) Vehicle, U.S. Marine Corps AH-1W Cobra helicopter, or a ground mount.

SENSOR/SEEKER:

The TOW 2A has two impact sensors. The sensors are crush switches located in the probe tip and the main-charge ogive.

WARHEAD:

The TOW 2A main warhead weighs 13.5 lb, and is 6 inches in diameter. It contains a single, copper liner and LX-14 explosive. The precursor warhead is 38 mm in diameter, contains a copper liner, and LX-14 explosive.

TARGET SETS:

Tanks, armored vehicles, and field fortifications.

CONTRACTOR:

Raytheon Missile Systems.

ACQUISITION PHASE:

U.S. systems in Operations and Support. Foreign systems in production and Operations and Support.

MILESTONES:

The last U.S. Army TOW 2A missile was produced in Jul 1993. Foreign Military Sales (FMS) production has continued from FY98 through the present.

FIELDING:

FUE: FY87. Fielded to U.S. Army Brigade Combat Teams (BCTs), U.S. Marine Corps, and FMS to over 40 other countries. The TOW 2A missile is being retired from the U.S. inventory as shelf life expires.

POINTS OF CONTACT:

PM.....	256-876-5185
DPM	256-876-0728
ASA(ALT) DASC.....	703-545-0787



TUBE-LAUNCHED, OPTICALLY-TRACKED, WIRE-GUIDED (TOW) 2B



**TOW 2B
With Aero Modifications**



**TOW 2B Aero Missile
T-72 at 4,200 Meters**

SYSTEM DESCRIPTION:

The Tube-launched, Optically-tracked, Wire-guided (TOW) 2B Aero Missile is a fly-over, shoot-down missile with the actual missile flight path offset above the gunner's aimpoint. TOW 2B flies over the target and uses a laser profilometer and magnetic sensor to detect and fire two downward-directed, explosively formed penetrator warheads into the target. The TOW 2B Aero modifications incorporate a new aerodynamic nose and additional wire to increase the range to 4,500 m. The missile is fired from the Bradley, High Mobility Multi-Purpose Wheeled Vehicle (HMMWV), Stryker ATGM Vehicle, and ground mount.

SYSTEM CHARACTERISTICS:

The TOW 2B Missile is optimized for performance against tanks and is also an effective precision assault weapon against buildings and field fortifications. The missile is fired directly from the case. Range is 200 to 4,500 m. The TOW 2B configuration weight is 49.8 lb. It is nominally 6 inches in diameter and 49 inches in length. Encased, the weight is 65 lb, and the diameter is 8.6 inches. All future production will replace the obsolete wire guidance link with a RF guidance link.

SENSOR/SEEKER:

The TOW 2B has three sensors: laser, magnetic, and impact (crush switch). Target detection range is from 0.3 to 7.5 m.

WARHEAD:

Warhead unit contains two EFP warheads weighing approximately 1.4 lb each. Warhead liners are of tantalum, explosive is LX-14.

TARGET SETS:

Tanks, armored vehicles, and field fortifications.

CONTRACTOR:

Raytheon Missile Systems.

ACQUISITION PHASE:

Production and Deployment.

MILESTONES:

In production for U.S. Army, U.S. Marine Corps, and Foreign Military Sales.

FIELDING:

Fielded to all U.S. Army BCTs.

FUE.....FY91

IOC.....FY93

POINTS OF CONTACT:

PM..... 256-876-5185

DPM 256-876-0728

ASA(ALT) DASC..... 703-545-0787



TUBE-LAUNCHED, OPTICALLY-TRACKED, WIRE-GUIDED (TOW) BUNKER BUSTER



SYSTEM CHARACTERISTICS:

The TOW Bunker Buster missile is optimized for performance against urban terrain targets and field fortifications. The range of the missile is 65 to 3,750 m. The weight of the TOW Bunker Buster missile is approximately 45.2 lb and is nominally 6 inches in diameter. The encased missile weight is approximately 63.7 lb, and the diameter is 8.6 inches. All future production will replace the obsolete wire guidance link with a RF guidance link.

SYSTEM DESCRIPTION:

The Tube-launched, Optically-tracked, Wire-guided (TOW) Bunker Buster missile provides the BCT with an optimized precision heavy assault weapon. The missile incorporates a high-explosive, bulk charge warhead onto the existing, reliable TOW 2A missile airframe. The TOW Bunker Buster missile provides the capability to breach 8 inch thick, double-reinforced concrete walls and provides a structural overmatch against earth and timber bunkers. The missile uses existing TOW 2A flight algorithms and can be fired from existing TOW platforms. The TOW Bunker Buster Missile was initially deployed with the Anti-Tank Guided Missile (ATGM) variant of the Stryker Vehicle. Due to its performance in Operation Iraqi Freedom / Operation Enduring Freedom (OIF/OEF), the U.S. Army procured additional TOW Bunker Buster missiles which are now available for issue to all BCTs and are compatible with all TOW platforms.

SENSOR/SEEKER:

The TOW Bunker Buster has an impact sensor (crush switch) located in the main-charge ogive and a pyrotechnic detonation delay to enhance warhead effectiveness.

WARHEAD:

The TOW Bunker Buster has a 6.25 lb, 6 inch diameter, high-explosive, bulk charge warhead. The PBXN-109 explosive is housed in a thick casing for maximum performance.

TARGET SETS:

Urban structures, bunkers, and field fortifications.

CONTRACTOR:

Raytheon Missile Systems.

ACQUISITION PHASE:

Production and Deployment.

MILESTONES:

In production for the U.S. Army, U.S. Marine Corps and Foreign Military Sales.

FIELDING:

The initial fielding of ~500 missiles to the Stryker Brigade Combat Teams (SBCTs) has been exhausted during combat operations in OIF. Additional TOW Bunker Buster missiles have been deployed to OIF and OEF for issue to all BCTs.

POINTS OF CONTACT:

PM.....	256-876-5185
DPM	256-876-0728
ASA(ALT) DASC.....	703-545-0787



TUBE-LAUNCHED, OPTICALLY-TRACKED, WIRE-GUIDED (TOW) IMPROVED TARGET ACQUISITION SYSTEM (ITAS)



SYSTEM DESCRIPTION:

ITAS provides long-range, lethal, anti-armor and precision assault fire capabilities for U.S. Army IBCTs and SBCTs. ITAS doubles target acquisition ranges over first generation systems and enables maximum range engagements with TOW missiles, thus significantly enhancing system lethality and soldier survivability. ITAS' superior surveillance capability enables the soldier to shape the battlefield by detecting targets at long range and either engaging with TOW missiles or directing the employment of other weapon systems to destroy those targets. ITAS will replace all U.S. Army and Marine Corps Ground TOW systems by the end of FY12.

SYSTEM CHARACTERISTICS:

The ITAS is composed of a Target Acquisition Subsystem (TAS), Fire Control Subsystem (FCS), Lithium-Ion Power Source (LPS), and modified Traversing Unit (TU). The TAS integrates a day and night sight, a laser range finder, and a position attitude determination subsystem (PADS). The laser range finder and PADS combine to provide a far target location capability that gives an accurate ten digit coordinate for targeting of indirect artillery fires and close air support. The FCS includes processing, aided target tracker, and embedded training capabilities. The LPS provides dismounted power and acts as a battery charger and power conditioner. The modified TU includes a brake to dampen TOW launch transients, and pistol grips with switches that link with symbology visible in the TAS on a menu-driven display. ITAS is mounted on the HMMWV and can be transported by helicopter (CH-47 and/or CH-53) and cargo aircraft. Detection range is beyond the maximum range of the TOW missile. The system fires one missile at a time from the current family of TOW missiles and has built-in growth for improved/future missiles.

SENSOR/SEEKER:

Second Generation Target Acquisition FLIR. The system also has a video thermal tracker and xenon beacon tracker. Provides GPS based far target location capability.

WARHEAD:

Fires all versions of the TOW Missile.

TARGET SETS:

Tanks, other vehicles, field fortifications, and other materiel targets.

CONTRACTOR:

Raytheon Network Centric Systems Company - Prime Contractor and Contractor Logistics Support (CLS).

ACQUISITION PHASE:

Production and Deployment.

MILESTONES:

In production for U.S. Army and U.S. Marine Corps.

FIELDING:

ITAS is being fielded to all U.S. Army and U.S. National Guard IBCTs and to the U.S. Marine Corps.

POINTS OF CONTACT:

PM.....	256-876-5185
DPM	256-876-0728
ASA(ALT) DASC.....	703-545-0787



TUBE-LAUNCHED, OPTICALLY-TRACKED, WIRE-GUIDED (TOW) WEAPON SYSTEM M220A4



SYSTEM DESCRIPTION:

The Tube-launched, Optically-tracked, Wire-guided (TOW) is a long-range, heavy anti-tank/assault weapon system, consisting of a launcher and a missile. The automatic missile tracking and control capabilities of the TOW weapon system provide a high first-round-hit probability. To operate the system, the gunner places the cross hairs of the sighting system (either the daysight tracker or the nightsight) on the target, fires the missile, and centers the cross hairs on the target image until missile impact. The optical tracking and command functions within the system guide the missile along the gunner's line-of-sight. The gunner does not apply lead, windage, or elevation. The TOW provides precision assault capability against heavily fortified bunkers, pill boxes, and gun emplacements.

SYSTEM CHARACTERISTICS:

The M220A4 TOW 2 launcher is compatible with all TOW missile configurations. The traversing units, the digital Missile Guidance Set (MGS), and the thermal nightsight are improved on the M220A4 launcher. The launcher system weighs ~256.5 lb with all of its components and carrying cases. The AN/UAS 12A/C Nightsight is the thermal Nightsight Equipment Set (NSES) used in conjunction with the M220A4 TOW 2 Launcher.

SENSOR/SEEKER:

Optical sight with 13 power magnification and First Generation Forward Looking Infrared (FLIR) based on the DT591A common module detector. The detector is an 8 to10 μ Imaging Infrared IIR Mercury- Cadmium-Telluride (Hg-Cd-Te).

WARHEAD:

See TOW missile variants.

TARGET SETS:

Tanks, armored vehicles, and field fortifications.

CONTRACTOR:

Raytheon Missile Systems for launcher and Kollsman for FLIR.

ACQUISITION PHASE:

Operations and Support.

MILESTONES:

U.S. and Foreign Military Sales (FMS) systems are in Operations and Support.

FIELDING:

Fielded to the U.S. Army National Guard and U.S. Marine Corps light forces, and FMS to over 40 other countries.

POINTS OF CONTACT:

PM.....	256-876-5185
DPM	256-876-0728
ASA(ALT) DASC.....	703-545-0787

