

PROGRAM EXECUTIVE OFFICE MISSILES AND SPACE

# WEAPON SYSTEMS BOOK

# PEO MISSILES AND SPACE

| 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

## MISSION

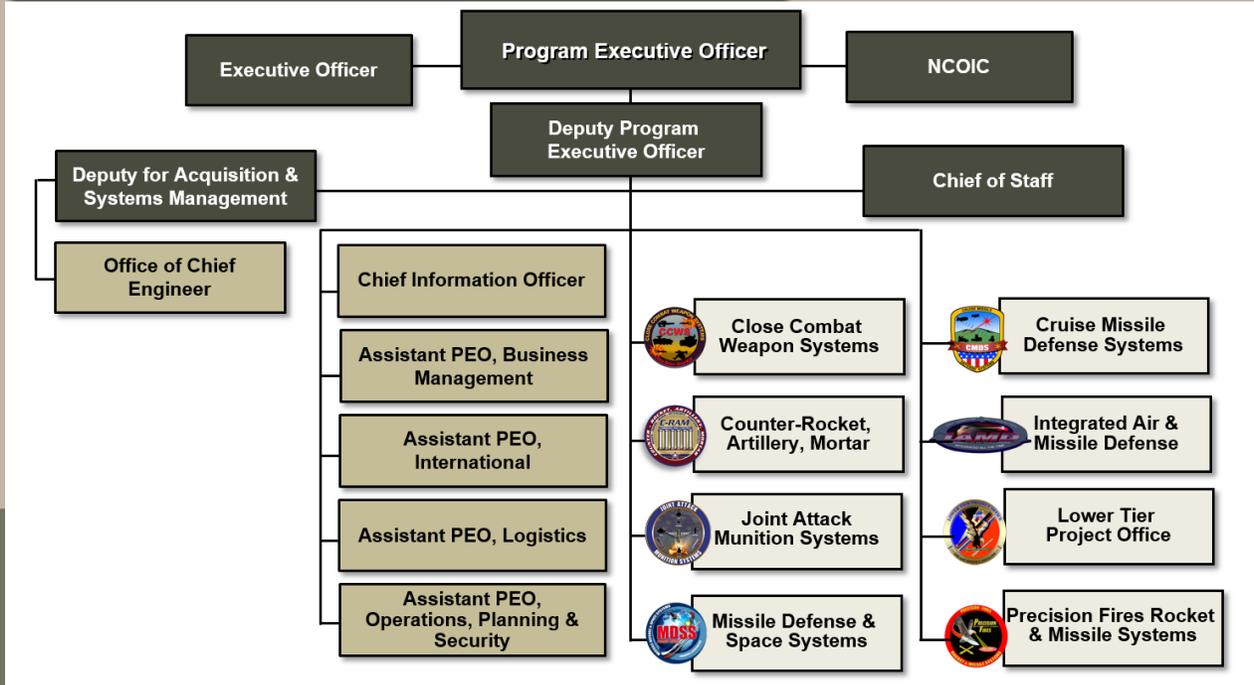
To Develop, Field, and Sustain Missile and Space Systems for the U.S. Army, Joint and Coalition Warfighters that Provide a Decisive Battlefield Advantage

## VISION

To be a Highly Efficient, Effective, Agile, and Innovative Warfighter - Focused Organization for Developing and Sustaining Missile and Space Systems



# PROGRAM EXECUTIVE OFFICE ORGANIZATION



## PROGRAM EXECUTIVE OFFICE MISSILES AND SPACE

# PEO MISSILES AND SPACE PORTFOLIO

AVIATION	FIRES					MANEUVER	AIR DEFENSE & SPACE
<p>Joint Attack Munition Systems (JAMS)</p>  <p>Hydra-70</p>  <p>Joint Air-to-Ground Missile (JAGM)</p>  <p>Small Guided Munitions</p>  <p>HELLFIRE</p>  <p>Launchers</p>	<p>Cruise Missile Defense Systems (CMDS)</p>  <p>IFPC Inc 2-I</p>  <p>NASAMS</p>  <p>Sentinel</p>  <p>STINGER</p>  <p>Avenger</p>	<p>Counter - Rocket, Artillery, Mortar (C-RAM)</p>  <p>C-RAM Intercept (LPWS)</p>  <p>RAM Warn</p> <p>Air and Missile Defense Planning &amp; Control System (AMDPCS)</p>  <p>Forward Area Air Defense Command &amp; Control (FAAD C2)</p>  <p>AN / TPQ-50</p>  <p>AN / TPQ-37</p> <p>Range Radar Replacement Program (RRRP)</p> 	<p>Integrated Air &amp; Missile Defense (IAMD)</p>  <p>IAMD Battle Command System (BCS) Engagement Operations Center (EOC)</p>  <p>A / B Plug &amp; Fight Interface Kits</p>  <p>Integrated Fire Control Network (IFCN) Relay</p>	<p>Lower Tier Project Office (LTPO)</p>  <p>PATRIOT/ Ground Support Equipment</p>  <p>Lower Tier Air Missile Defense Sensor (LTAMDS)</p>  <p>PATRIOT Advanced Capability (PAC-3)</p>  <p>PAC-3 Missile Segment Enhancement (MSE)</p>	<p>Precision Fires Rocket and Missile Systems (PFRMS)</p>  <p>Guided Multiple Launch Rocket Systems (GMLRS / U / AW)</p>  <p>Army Tactical Missile Systems (ATACMS)</p>  <p>Long Range Precision Fires (LRPF)</p>  <p>High Mobility Artillery Rocket System (M142 HIMARS)</p>  <p>Multiple Launch Rocket System (M270A1 MLRS)</p>	<p>Close Combat Weapon Systems (CCWS)</p>  <p>JAVELIN</p>  <p>Tube-Launched, Optically-Tracked, Wireless-Guided (TOW)</p>  <p>Improved Target Acquisition System (ITAS)</p>  <p>Lethal Miniature Aerial Missile System (LMAMS)</p>  <p>Precision Fires Manager (PFM)</p>  <p>Containerized Weapon System (CWS)</p>	<p>Missile Defense &amp; Space Systems (MDSS)</p>  <p>Joint Tactical Ground Station (JTGS)</p> <p>THAAD &amp; AN / TPY-2 Sustainment Management Office (T2SMO)</p>  <p>Space Directorate</p> <p>SMDC Nanosatellite Project (SNaP-3)</p>  <p>Kestrel Eye (KE) Microsatellite</p>

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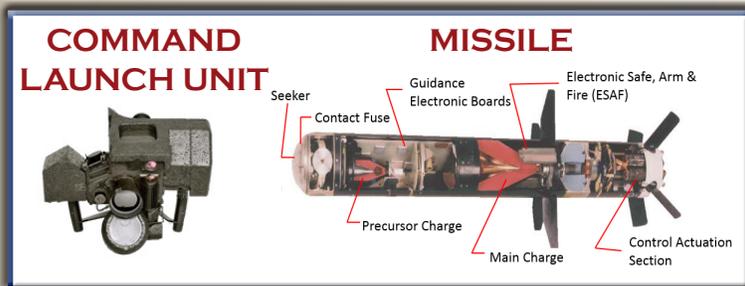
**MISSION:** To provide the Warfighter the world's best CCWS capabilities by developing, producing, fielding, training and sustaining the best weapon system capabilities in an affordable, timely, reliable and responsive manner in support of Warfighter needs at home and abroad.

**VISION:** CCWS is the premier Warfighter focused organization providing the best Close Combat Missile Systems as one Team, one Mission.



**CLOSE COMBAT WEAPON SYSTEMS**

# JAVELIN BLOCK O



## 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) 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:**

Sustainment.

**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, National Guard and Army Reserve components. Fielded to U.S. Marine Corps.

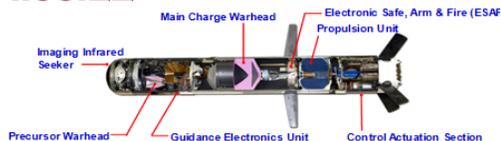
**POINTS OF CONTACT:**

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



# JAVELIN BLOCK I

## MISSILE



## COMMAND LAUNCH UNIT



## SYSTEM DESCRIPTION:

The improvements in the current production Javelin Block I (Command Launch Unit) 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 Field Tactical Trainer (FTT) compatibility and ruggedization. The performance improvement in current production Javelin Block I missiles are: increased probability of hit/kill in excess of 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 Focal Plane Array (FPA) that is scanned to provide an 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. The flight motor case is extended by 1 inch to allow for additional propellant resulting in decreased time of flight to target.

**SENSOR/SEEKER:**

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

**WARHEAD:**

The system's tandem warhead integrates a K-Charge Warhead. The K-Charge meets current system lethality requirements 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 Start .....	Aug 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 fielded to high priority units (i.e. IBCTs, SOF and SBCTs). New production CLU fielding is complete. Retrofit f limited number of Block 0 CLUs to Block I configuration will continue through FY19.

**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 of the tactical round. The MSR is also used as the simulated round for the EPBST.

**SENSOR/SEEKER:**

The FTI 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. The Javelin indoor trainer (EPBST) is produced and maintained by the Software Engineering Directorate (SED) at Redstone Arsenal. Additionally SED provides maintenance for the Javelin Missile Simulated Round (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:**

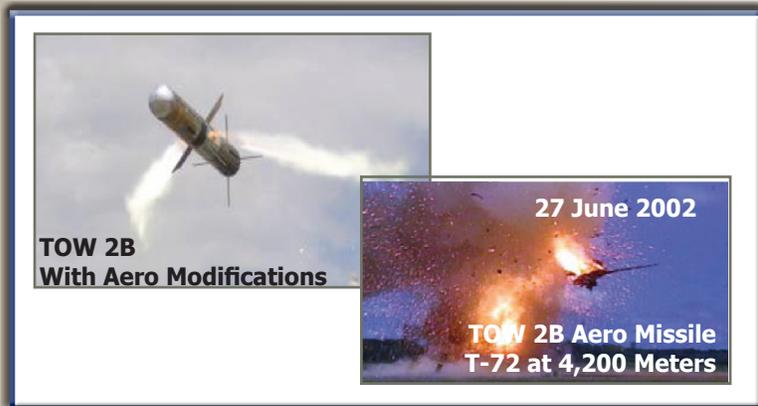
FUE: Jun 96. First OCONUS fielding completed April 00. Javelin training devices are being fielded concurrently with the CLU to both AC and RC units.

**POINTS OF CONTACT:**

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



# TUBE-LAUNCHED, OPTICALLY-TRACKED, WIRELESS-GUIDED (TOW) 2B RADIO FREQUENCY (RF)



## SYSTEM DESCRIPTION:

The Tube-launched, Optically-tracked, Wireless-guided (TOW) 2B Aero RF Missile is a fly-over, shoot-down missile with the actual missile flight path offset above the gunner's aimpoint. TOW 2B Aero RF 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 missile is fired from the Bradley, High Mobility Multi-Propose Wheeled Vehicle (HMMWV), Stryker Anti-Tank Guided Missile (ATGM) Vehicle, and ground mount.

## SYSTEM CHARACTERISTICS:

The TOW 2B Aero RF 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 Aero RF 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.

**SENSOR/SEEKER:**

The TOW 2B Aero RF has three sensors: laser, magnetic, and impact (crush switch).

**WARHEAD:**

Warhead unit contains two Explosively Formed Penetrator (EFP) warheads weighing approximately 1.4 lb each.

**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, WIRELESS-GUIDED (TOW) BUNKER BUSTER RADIO FREQUENCY (RF)



## SYSTEM DESCRIPTION:

The Tube-launched, Optically-tracked, Wireless-guided (TOW) Bunker Buster RF missile provides the Brigade Combat Team (BCT) with an optimized precision heavy assault weapon. The missile incorporates a high-explosive, bulk charge warhead. 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 can be fired from all 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.

## 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 4,200 m. The weight of the TOW Bunker Buster missile is approximately 63.7 lbs.

**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, and light vehicles.

**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:**

Fielded to all Army BCTs.

**POINTS OF CONTACT:**

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



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



## SYSTEM DESCRIPTION:

ITAS provides long-range, lethal, heavy anti-armor and precision assault fire capabilities for U.S. Army Infantry Brigade Combat Teams (IBCT)s and Stryker Brigade Combat Teams (SBCT)s. 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.

## SYSTEM CHARACTERISTICS:

The M41A7 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. The Image Enhancement/Networked Lethality modification provides for image optimization and automated focus adjustments improving the image presented to the operator. It also provides the architecture to allow for networked capability in response to future requirements. ITAS is mounted on the HMMVV 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 (Wire-Guided and Wireless-Guided) and has built-in growth for improved/future missiles.

**SENSOR/SEEKER:**

Second Generation Target Acquisition Forward Looking Infrared (FLIR). The system also has a video thermal tracker and xenon beacon tracker. Provides Global Positioning System (GPS) based far target location capability.

**WARHEAD:**

Fires all variants of the TOW Missile (Wire-Guided and Wireless-Guided).

**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:**

Operations & Support.

**MILESTONES:**

U.S. Army and U.S. Marine Corps in Operations & Support.

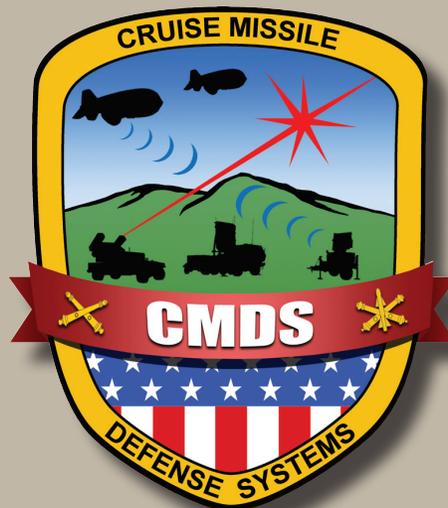
**FIELDING:**

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

**POINTS OF CONTACT:**

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





**MISSION:** CMDS develops, produces, fields and sustains the world's premiere short and medium range air defense systems to protect the force and its selected geopolitical assets against Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), Rotary and Fixed Wing assets, Rockets, Mortars and Artillery (RAM) projectiles.

**VISION:** The Cruise Missile Defense Systems (CMDS) Project Office is the centralized manager for the Army's short/medium range air defense systems. CMDS is responsible for the full life-cycle management of its assigned programs. The CMDS Project Office is equipping the current and future force with an Integrated Air and Missile Defense capability. CMDS programs include the AN/MPQ-64 Sentinel Radar, Stinger Based Systems and Indirect Fire Protection Capability Increment 2– Intercept (IFPC2-I), a pre-Major Defense Acquisition Program (MDAP). Additionally CMDS supports Homeland Defense of our Nation with Avenger, Stinger, Sentinel and the National Advanced Surface to Air Missile System (NASAMS).

## PROGRAM EXECUTIVE OFFICE MISSILES AND SPACE



## AVENGER

### SYSTEM DESCRIPTION:

The Avenger Air Defense System is a lightweight, highly mobile, short-range, surface-to-air missile and gun weapon system mounted on an M1097A1 High Mobility Multi-Purpose Wheeled Vehicle (HMMWV). Avenger is designed to counter hostile, low-flying Unmanned Aerial Systems (UASs), cruise missiles, rotary-wing aircraft, and fixed-wing aircraft. Avenger, operated by two crewmen, is capable of day, night, and adverse weather operations, can be transported by a UH-60L helicopter or C-130 aircraft, is air-droppable (M45 version), and can shoot on the move. The system can also be operated by remote control from a protected position up to 50m away from the fire unit. The system employs a turret consisting of a gunner position, two missile launcher pods containing four STINGER missiles each, a Forward Looking Infrared (FLIR), a Laser Range Finder (LRF), an Identification Friend or Foe (IFF) system, and a very high rate of fire M3P .50 caliber machine gun.



### SYSTEM CHARACTERISTICS:

Fielded configurations include a basic Avenger (M47A1), "Slew-to-Cue" (STC) Avenger (M47A2), an air-drop-capable Avenger (M45A1), Foreign Military Sales versions (M46A1 and M46A2), and a dismounted version used for Homeland Defense of the National Capital Region. Fire units equipped with the STC upgrade are capable of automatically slewing to a specific target reported by the Forward Area Air Defense Command and Control (FAAD C2) system, placing it directly into the gunner's field of view.

**SENSOR/SEEKER:**

FLIR: Day and Night vision. Wide, Rain (medium), and Narrow Fields of View.  
  
Optical Sight.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

UASs, Cruise Missiles, Fixed & Rotary Wing Threats.

**CONTRACTOR:**

Boeing Aerospace.

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MS C ..... Apr 1990  
IOC ..... Jan 1991  
Sustainment Readiness Review..... Sep 2005

**FIELDING:**

Basic ..... Jul 1990  
Slew-to-Cue(STC) FUE ..... Feb 2002  
Avenger is currently in service with the U.S. Army (Active Component and National Guard) and international customers.

**POINTS OF CONTACT:**

PM..... 256-876-4927  
DPM ..... 256-876-6193  
ASA(ALT) DASC..... 703-545-0817



# INDIRECT FIRE PROTECTION CAPABILITY INCREMENT 2 - INTERCEPT (IFPC Inc 2-I)



## SYSTEM DESCRIPTION:

The Integrated Fire Protection Capability Increment 2-Intercept (IFPC Inc 2-I) System is a mobile, ground-based weapon system designed to defeat Unmanned Aircraft Systems (UAS), Cruise Missiles (CM), and Rocket, Artillery and Mortar (RAM) projectiles. The system provides 360-degree protection with the ability to engage simultaneous threats arriving from different azimuths. The IFPC Inc 2-I capability will be developed in three blocks, each a separate acquisition program. Block 1 will use an existing interceptor (AIM-9X) and sensor (Sentinel), and will develop a multi-mission launcher (MML) on an existing vehicle platform to support the Counter-UAS (C-UAS) and Cruise Missile Defense (CMD) missions. The MML will use an open architecture that allows a variety of missiles to be employed. Block 2 will develop a new interceptor capability (missile or directed energy (DE)), to support the counter-RAM mission. Block 3 adds the capability for extended range engagements against UAS and CM to create an area defense system. The system will use the Army Integrated Air and Missile Defense (AIAMD) open systems architecture, and will use the IAMD Battle Command System (IBCS) Engagement Operations Center (EOC) as its mission command component.

## SYSTEM CHARACTERISTICS:

The IFPC Inc 2-I System will Roll On/Roll Off (RO/RO) current military air transport (C-5 and C-17 aircraft) and will be road mobile. The system will deploy on roads using Army common mobile platforms to defend fixed and semi-fixed assets including airbases, ports, command and control nodes, choke points (such as bridge crossings), Forward Operating Bases (FOB), Forward Area Refueling Points (FARP) and Refuel On the Move (ROM) points. It will have limited cross-country capability. Having arrived at its assigned area, an IFPC Inc 2-I Platoon (PLT) will emplace and establish communications with the Engagement Operations Cell (EOC). A PLT's complement of equipment will provide 360-degree protection of at least 16 square kilometers (km<sup>2</sup>) while enforcing keep-out zones beyond this defended area for both troop and asset protection. The EOC will provide C2, target tracks from existing sensors on the network, defense planning, airspace control data, rules of engagement, air picture development, threat identification and cueing.

**SENSOR/SEEKER:**

Can utilize data from multiple radars (e.g., Sentinel A3, PATRIOT).

**WARHEAD:**

Multiple Interceptor.

**TARGET SETS:**

Cruise Missiles, Unmanned Aircraft Systems, Rockets, Artillery and Mortars.

**CONTRACTOR:**

Not Applicable.

**ACQUISITION PHASE:**

Technology Maturation and Risk Reduction.

**MILESTONES:**

MS A .....	2QFY14
MS B .....	4QFY16
MS C .....	1QFY19

**FIELDING:**

IOC..... 3QFY20

**POINTS OF CONTACT:**

PM.....	256-842-7198
DPM .....	256-313-3661
ASA(ALT) DASC.....	703-545-0817



## SENTINEL

### SYSTEM DESCRIPTION:

The AN/MPQ-64 Sentinel is an advanced three-dimensional battlefield X-band, air defense, phased array radar, manned by a crew of two and equipped to support beyond visual range engagements. The Sentinel system is used with the Forward Area Air Defense Command and Control (FAAD C2) system, and the Integrated Air and Missile Defense (IAMD) Battle Command System to provide air defense and surveillance of forward areas. Sentinel track data is provided to Stinger based weapon systems. The system is tactically mobile, but is often employed in overseas and Homeland Defense 24/7 fixed site missions. Sentinel provides air track awareness for prevention of fratricide in Counter-Rocket, Artillery, and Mortar missions. Sentinel consists of the M1097A1 HMMWV or M1083 FMTV, the antenna transceiver group mounted on a high-mobility trailer, an Identification Friend or Foe (IFF) system, and both hardwire and radio based communication interfaces.



### SYSTEM CHARACTERISTICS:

The AN/MPQ-64 Sentinel provides 360-degree air surveillance and acquisition tracking, day or night, in adverse weather conditions, and in battlefield environments of dust, smoke, aerosols and enemy countermeasures. The Sentinel contributes to the digital battlefield by automatically detecting, classifying, identifying and reporting cruise missiles, unmanned aerial systems, rotary and fixed wing threats. The system's Anti-Radiation Missile and Electronic Countermeasures resistant performance supports Air Defense operations across the full spectrum of conflict. Current Sentinel modernization efforts include the new AN/TPX-57 Mode 5 IFF, a modernized Radar Control Terminal, and a router for increased communications flexibility and information assurance. Sentinel has produced 56 new radars for divisional support. Fifty of these radars have been integrated onto the M1083 platform and corresponding trailer. Six of the new radars will be used as repair cycle floats to support a depot overhaul capability.

**SENSOR/SEEKER:**

X-band, phased-array radar.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Cruise Missiles, Fixed & Rotary Wing and UASs.

**CONTRACTOR:**

Raytheon.

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

MS B .....	Jun 1991
MS C .....	Apr 1995
FUE.....	Aug 1997

**FIELDING:**

Sentinel is fielded to the U.S. Army (Active Component and National Guard) and Foreign Military Sales customers.

**POINTS OF CONTACT:**

PM.....	256-876-4927
DPM .....	256-876-6193
ASA(ALT) DASC.....	703-545-0817



## STINGER REPROGRAMMABLE MICROPROCESSOR (RMP) BLOCK I MISSILE



### SYSTEM DESCRIPTION:

The FIM 92 Stinger RMP BLOCK I missile, the fourth generation Stinger missile, is an advanced, fire-and-forget, short-range, man-portable, air defense weapon system. It provides low-altitude defense for ground forces against attack or aerial observation by low-flying Unmanned Aircraft Systems (UASs), cruise missiles, rotary and fixed-wing aircraft. Stinger is passive, emitting no signals, and employs an infrared (heat seeking)/ultraviolet seeker to guide to the target. Stinger RPM BLOCK I has extensive infrared counter-countermeasure capabilities and can engage targets from any aspect, including head-on. The missile utilizes a high-explosive, hit-to-kill warhead. The Stinger weapon system also employs an IFF device to assist the gunner in identifying friendly aircraft. Stinger can be fired from the shoulder or from a variety of platforms to include vehicles, helicopters, and UASs. The missile is delivered as a certified round and requires no field testing or maintenance. The basic Stinger missile was first fielded in 1981; since then there have been multiple missile configurations and upgrades culminating in the advanced RMP Block I missile upgrade.

### SYSTEM CHARACTERISTICS:

The Stinger RMP Block I adds a new roll sensor and improved hardware which significantly enhances the missile's performance. Stinger uses a solid-propellant, dual-thrust, flight rocket motor with separable launch motor. It is 60 inches in length and the diameter is 2.75 inches. The weight is 35 lbs when ready to fire in MANPADS role. The Stinger Service Life Extension Program (SLEP) will utilize expiring missiles from existing inventory and replace missile components susceptible to degradation due to aging.

**SENSOR/SEEKER:**

Optical aiming with infrared and ultraviolet homing.

**WARHEAD:**

High explosive, blast over-pressure, contact fuse (Hit-to-Kill).

**TARGET SETS:**

Low-altitude UAS, cruise missile, rotary and fixed-wing threat aircraft.

**CONTRACTOR:**

Raytheon.

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

- STINGER Basic Missile FUE ..... Feb 1981
- STINGER RMP Missile FUE ..... Nov 1989
- STINGER RMP Block 1 Missile FUE..... Aug 1998
- Sustainment Readiness Review..... Sep 2005

**FIELDING:**

STINGER has been fielded to U.S. Army, Air Force, Navy, and Marine Corps forces. In addition, the system is employed by 18 allied countries.

**POINTS OF CONTACT:**

- PM..... 256-876-4927
- DPM ..... 256-876-6193
- ASA(ALT) DASC..... 703-545-0817





**MISSION:** Responsible for the overall life cycle management of automated Air and Missile Defense (AMD) command and control (C2) systems, force protection systems-of-systems, and counterfires/counter target acquisition radars. C-RAM programs include Forward Area Air Defense Command and Control (FAAD C2); Air and Missile Defense Planning and Control System (AMDPCS); Rocket, Artillery, Mortar (RAM) Warn; C-RAM Intercept (Land-based Phalanx Weapon System [LPWS]); Firefinder (AN/TPQ-36/37); AN/TPQ-53, which replaces the Firefinder; Lightweight Counter Mortar Radar (AN/TPQ-50); and the Range Radar Replacement Program (RRRP). The C-RAM Program Directorate also manages C-RAM system-of-systems capabilities in theater, providing force protection against the indirect fire threat. This responsibility includes enhancement of the existing C-RAM C2 for netting and integration of systems for a holistic solution, ensuring effective interfaces are developed and maintained between the Air Defense C2 and C-RAM systems and the Mission Command Networks and Systems, other services, and allied nations.

**VISION:** Serve as the leader in rapidly delivering quality and operationally effective Air Defense C2, counterfires/counter target acquisition radars, and unit/force protection systems-of-systems, supporting PEO Missiles and Space, Department of the Army, and Joint Service programs for our Soldiers.

**PROGRAM EXECUTIVE OFFICE MISSILES AND SPACE**



# AIR AND MISSILE DEFENSE PLANNING AND CONTROL SYSTEM (AMDPCS)



## SYSTEM DESCRIPTION:

AMDPCS is an Army Objective Force system that provides integration of Air and Missile Defense operations at all echelons. AMDPCS shelter systems are centered on a single baseline shelter known as Air Defense and Airspace Management (ADAM) Cells. Depending on echelon, ADAM Cells are fielded in different configurations at Corps, Divisions, Brigade Combat Teams (BCT), and Multi-functional Support Brigades (MFSB). The ADAM Cell provides Commanders at Divisions and BCTs with air defense situation awareness and airspace management capabilities. AMDPCS configurations are also deployed with Air Defense units including Army Air and Missile Defense Commands, Air Defense Artillery (ADA) Brigades, and ADA Battalions (BN). AMDPCS provides two major software systems used in air defense force operations and engagement operations - the Air and Missile Defense Workstation (AMDWS) and the Air Defense System Integrator (ADSI). The AMDWS operates on a staff laptop and is a staff planning and battlespace situational awareness tool that provides commanders at all echelons with a common tactical and operational air picture.

## SYSTEM CHARACTERISTICS:

The AMDPCS Family of Systems (FoS) provides a type classified and materiel released solution for Army Air Defense command and control requirements. The FoS is based on a common set of equipment (shelter, carrier, power generation, tentage, environmental control, etc.), configured with standard communications suites, processors, and display systems, depending on the capabilities required and the echelon. AMDPCS systems provide common and real time air/ground situation awareness to ADA and maneuver force commanders. AMDWS interoperates with Army AMD and Army Battle Command Systems, as well as joint and allied force air defense systems. ADSI provides access to tactical and strategic communications as well as tactical and intelligence data links.

**SENSOR/SEEKER:**

Not applicable.

**WARHEAD:**

Not applicable.

**TARGET SETS:**

Not applicable.

**CONTRACTOR:**

Northrop Grumman.

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

Approval as Warfighter Rapid Acquisition Program (WRAP)	Mar 97
AMDPCS ORD	May 97
MS C - for ADAM Variants	Jul 05
AMDPCS ADAM CPD	Aug 07
FRP - AMDPCS ADAM	Oct 08

**FIELDING:**

- ADAMs and AMDPCS Shelter Systems - fielding continues as planned.

**POINTS OF CONTACT:**

PD	256-876-9100
DPD	256-876-9101
ASA(ALT) DASC	703-545-4760



## AN/TPQ-53 RADAR



### SYSTEM DESCRIPTION:

The AN/TPQ-53 Counterfire Target Acquisition Radar System is a highly mobile radar set that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It meets close combat range coverage requirements by providing a 90 degree search sector (stare mode) as well as 360 degree coverage (rotating) and will ultimately replace the current AN/TPQ-36 and AN/TPQ-37 Firefinder Radars. The AN/TPQ-53 system interoperates with battle command systems (BCS) to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-53 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for sense and warn force protection capability.

### SYSTEM CHARACTERISTICS:

The AN/TPQ-53 is a modern Active Electronically Steered Array (AESA) with flexible communications interfaces, redundant 60kw generators, and a crew of five. Mounted on a Family of Medium Tactical Vehicle (FMTV) platform, the system can emplace and transition from road march to full operation in five minutes. Adaptable system operating modes include rotating and sector. The AN/TPQ-53 System includes two configurations: "Mission Essential" and "Sustainment." The Mission Essential configuration is for rapid insertion and operation for up to 72 hours. The Sustainment configuration is for mid to long term operation and includes an operations control shelter providing radar control, electronic communication, and environmental conditioning - all powered by a 10kw generator. System production is underway. Upgrade plans include expanded target sets and increases in effective target location accuracy and ranges.

**SENSOR/SEEKER:**

Counterfire Target Acquisition Radar.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Rocket, Artillery, and Mortar Weapons.

**CONTRACTOR:**

Lockheed Martin Corporation.

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

- Full Rate Production Decision Review ..... 4QFY15
- Materiel Release ..... 2QFY16
- First Unit Equipped ..... 3QFY16
- Full Rate Production Contract Award ..... 4QFY16

**FIELDING:**

The AN/TPQ-53 will replace AN/TPQ-36 and AN/TPQ-37 radars in all U.S. Army (Active Component and National Guard) units.

**POINTS OF CONTACT:**

PM..... 256-876-9100  
 DPM ..... 256-876-9101  
 ASA(ALT) DASC.....703-545-4760



## AN/TPQ-50 (LCMR)



### SYSTEM DESCRIPTION:

The AN/TPQ-50 Lightweight Counter Mortar Radar (LCMR) is a highly mobile radar that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It meets close combat radar coverage requirements by providing 360 degrees of azimuth coverage from ranges of 500 meters to 10 kilometers and is capable of being deployed in two configurations, standalone or vehicle mounted. The AN/TPQ-50 system interoperates with battle command systems (BCS) to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-50 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for sense and warn force protection capability. The AN/TPQ-50 is currently fielded to multiple Continental United States (CONUS) and Outside Continental United States (OCONUS) locations, to include support to Operation Inherent Resolve (OIR) and Operation Freedom's Sentinel (OFS).

### SYSTEM CHARACTERISTICS:

The AN/TPQ-50 LCMR is a man-portable, lightweight system that identifies indirect fire weapon systems. The AN/TPQ-50 conducts continuous 360 degree surveillance using electronically scanned antennas, and it can be set up and operational in 20 minutes and disassembled in 10 minutes. The AN/TPQ-50 is capable of being deployed in two configurations, standalone or vehicle mounted. The AN/TPQ-50 is a critical sensor to the Rocket, Artillery, Mortar (RAM) Warn and C-RAM Intercept systems.

**SENSOR/SEEKER:**

Counterfire Target Acquisition Radar.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Rocket, Artillery, and Mortar weapons.

**CONTRACTOR:**

SRCTec Inc.

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

**FIELDING:**

The AN/TPQ-50 program is currently fielding to U.S. Army (Active Component, Special Operations, and National Guard) units.

**POINTS OF CONTACT:**

PM.....	256-876-9100
DPM .....	256-876-9101
ASA(ALT) DASC.....	703-545-4760



## AN/TPQ-37 (V) FIREFINDER RADAR



### SYSTEM DESCRIPTION:

Firefinder is a highly mobile counter fire radar designed for automatic first round location of weapons firing projectile type rounds. Firefinder operates in a hostile mode by tracking enemy fire, then the weapon's location coordinates are interfaced to a tactical fire control system that will direct counter fire. Firefinder also tracks friendly weapons, providing impact prediction, registration, and fire adjustment information to the fire control center. The radar will detect in-flight projectiles, determine and communicate firing point locations of mortars, artillery, and rockets with a high degree of accuracy and will classify the hostile fire weapon's location. It provides early warning of incoming fire and allows for the direction of counter fire when providing sense and warn in the Counter-Rocket, Artillery, Mortar (C-RAM) construct.

### SYSTEM CHARACTERISTICS:

The Firefinder system locates mortars, artillery, rocket launchers, and missiles; performs high burst, datum-plane, and impact registrations; adjusts for friendly fire.

- Maximum range: 50km
- Effective range: Artillery: 30km - Rockets: 50km

**SENSOR/SEEKER:**

Counterfire Target Acquisition Radar.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Locates mortars, artillery, rocket launchers, and missiles.

**CONTRACTOR:**

Thales-Raytheon Systems (TRS).

**ACQUISITION PHASE:**

Operation and Support.

**MILESTONES:**

– De-fielding commences.....3QFY16

**FIELDING:**

The AN/TPQ-37(V) is fielded to the U.S. Army (Active Component and National Guard), and Foreign Military Sales customers.

**POINTS OF CONTACT:**

PM.....	256-876-9100
DPM .....	256-876-9101
ASA(ALT) DASC.....	703-545-4760



## AN/TPQ-36 (V) FIREFINDER RADAR



### SYSTEM DESCRIPTION:

#### System Description

Firefinder is a highly mobile counter fire radar designed for automatic first round location of weapons firing projectile type rounds. Firefinder operates in a hostile mode by tracking enemy fire, then the weapon's location coordinates are interfaced to a tactical fire control system that will direct counter fire. Firefinder also tracks friendly weapons, providing impact prediction, registration, and fire adjustment information to the fire control center. The radar will detect inflight projectiles, determine and communicate firing point locations of mortars, artillery, and rockets with a high degree of accuracy and will classify the hostile fire weapon's location. It provides early warning of incoming fire and allows for the direction of counter fire when providing sense and warn in the Counter-Rocket, Artillery, Mortar (C-RAM) construct.

### SYSTEM CHARACTERISTICS:

The Firefinder system locates mortars, artillery, rocket launchers, and missiles; performs high burst, datum-plane, and impact registrations; adjusts for friendly fire.

- Maximum range: 24 km.
- Effective Range Mortars: 750m to 18km - Rockets: 8-24km

**SENSOR/SEEKER:**

Counterfire Target Acquisition Radar.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Locates mortars, artillery, and rockets.

**CONTRACTOR:**

Thales Raytheon Systems (TRS).

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

- De-fielding commences ..... FY17

**FIELDING:**

The AN/TPQ-36(V) is fielded to the U.S. Army (Active Component and National Guard), U.S. Marine Corps, and Foreign Military Sales customers.

**POINTS OF CONTACT:**

PM.....	256-876-9100
DPM .....	256-876-9101
ASA(ALT) DASC.....	703-545-4760



## COUNTER-ROCKET, ARTILLERY, MORTAR (C-RAM)



### SYSTEM DESCRIPTION:

The primary mission of the C-RAM program is to develop, procure, field, and maintain a system-of-systems (SoS) that detects RAM launches; provides localized warning to the defended area, with sufficient time for personnel to take appropriate action; intercepts rounds in flight, thus preventing damage to ground forces or facilities; and enhances response to and defeat of enemy forces. The C-RAM capability is comprised of a combination of multi-service fielded and non-developmental item sensors, command and control (C2) equipment, warning systems, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System (LPWS)). The Forward Area Air Defense Command and Control (FAAD C2) system, also under the management of the C-RAM Program Directorate, has been enhanced to integrate the sensors, weapons, and warning systems to provide C2 for the C-RAM SoS. Future versions will integrate directly with the Advanced Field Artillery Tactical Data System (AFATDS) within the Brigade Fires Cell to facilitate Dynamic Clearance of Unplanned Fires (DCUF) capabilities.

### SYSTEM CHARACTERISTICS:

The currently fielded capability uses existing, netted Field Artillery and Air Defense sensors (Firefinders, Lightweight Counter Mortar Radars (LCMR), and Sentinels), a commercial industry-produced warning system, a modified U.S. Navy-developed interceptor (LPWS), and U.S. Air Force Base Defense security systems. It is tied to various response systems via U.S. Air Force, U.S. Marine Corps, and Army Mission Command. C-RAM C2 software correlates the RAM sensor data, evaluates that threat, provides early warning, directs engagements, and cues counter-fire systems and reaction forces. The current C-RAM capability continues to be enhanced to address evolving threats, including the development and deployment of Ku band Radio Frequency Systems (KuRFS), to provide detection, track, and ballistic determination of all types of incoming RAM targets.

**SENSOR/SEEKER:**

Multiple Ground Based Radars.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Rockets, Artillery, and Mortars.

**CONTRACTOR:**

Multiple.

**ACQUISITION PHASE:**

Not a formal acquisition program.

**MILESTONES:**

ONS 306-04 Validated (S&W in OIF).....4QFY04  
 Sense & Warn (S&W) Fielded to Initial OIF FOB.....2QFY05  
 Intercept Capability Fielded to Initial OIF FOB.....3QFY05  
 1st Combat Intercept.....2QFY06  
 OEF JUON CC-0362 Validated (S&W in OEF).....4QFY09  
 Initial Ku Radar Fielding to OEF.....1QFY13  
 ONS 13-18507 Approved (Intercept in OEF).....2QFY13  
 OEF Intercept Initial Operational Capability (IOC).....4QFY13  
 Multiple ONS Approved for SW&I in OFS and OIR ... FY15/FY16

**FIELDING:**

- Afghanistan (OFS).
- Iraq (OIR).
- Egypt (TFS).

**POINTS OF CONTACT:**

PD ..... 256-876-9100  
 DPD..... 256-876-9101  
 ASA(ALT) DASC..... 703-545-4858



## COUNTER-ROCKET, ARTILLERY, MORTAR (C-RAM) INTERCEPT



### SYSTEM DESCRIPTION:

C-RAM Intercept provides counter-RAM protection to the Indirect Fire Protection Capability (IFPC)/Avenger composite battalions, 5-5 and 2-44 Air Defense Artillery (ADA), to defend against and defeat the enduring indirect fire (IDF) threat. It was originally developed and deployed to Forward Operating Bases (FOB) in Iraq in support of Operation Iraqi Freedom (OIF), and some systems are currently deployed to Afghanistan in support of Operation Freedom's Sentinel (OFS). In 2013, the Army Acquisition Executive designated C-RAM Intercept an Army acquisition program and authorized the fielding of existing C-RAM Intercept assets and support equipment to ADA battalions.

### SYSTEM CHARACTERISTICS:

The primary component for the C-RAM Intercept program is the Land-based Phalanx Weapon System (LPWS), a modified U.S. Navy Phalanx Close-In Weapon System (CIWS) mounted on a commercial semi-trailer for land-based operations. The 20mm Gatling gun is capable of on-board target acquisition and fire control. LPWS barrels are optimized for use with self destruct ammunition to minimize collateral damage. Integrated search and track radars detect and engage a wide range of IDF threats. Forward Area Air Defense Command and Control (FAAD C2) software, also under the management of the C-RAM Program Directorate, is the backbone of the C-RAM system. FAAD/C-RAM C2 nets and correlates sensor inputs and alerts the intercept system and the Sense and Warn elements of an impending RAM attack.

**SENSOR/SEEKER:**

Multiple Ground Based Radars.

**WARHEAD:**

Not applicable.

**TARGET SETS:**

Rockets, Artillery, and Mortars.

**CONTRACTOR:**

Raytheon.

**ACQUISITION PHASE:**

Deployment, Operations and Support.

**MILESTONES:**

C-RAM Intercept (LPWS) Capability Production .....	4QFY13
Document (CPD) Approved	
Program Establishment (Post Milestone C) .....	4QFY13
C-RAM Intercept (LPWS) Materiel Release .....	3QFY16

**FIELDING:**

- Fielding continues as planned.

**POINTS OF CONTACT:**

PD .....	256-876-9100
DPD .....	256-876-9101
ASA(ALT) DASC .....	703-545-4858



## FORWARD AREA AIR DEFENSE COMMAND AND CONTROL (FAAD C2)



### SYSTEM DESCRIPTION:

The Forward Area Air Defense Command and Control (FAAD C2) System-of-Systems (SoS) hardware and software provide the engagement operations interface between the Sentinel and Avenger/Man-Portable Air Defense Systems (MANPADS). FAAD C2 software collects, digitally processes, and disseminates real-time target cueing and tracking information; displays the common 3-dimensional air picture; and provides command, control, and intelligence information to the Avenger and the MANPADS. FAAD C2 software, as a key component of the Air Defense and Airspace Management (ADAM) Cell, provides Maneuver commanders at all echelons with air battle management and airspace situational awareness data. Division and Brigade commanders also receive a single, correlated low altitude air picture from FAAD Sensor C2 nodes. Additionally, FAAD C2 software provides command and control for the Counter-Rocket, Artillery, Mortar (C-RAM) system. The FAAD C2 processor, and other software processors and communication suites, are housed in standard Army shelters.

### SYSTEM CHARACTERISTICS:

FAAD C2 provides interoperability between Air and Missile Defense (AMD) systems and a host of sensors, including the Sentinel radar. Real time engagement operations data is passed from the Sentinel to Avenger and MANPADS. Types of airspace situational awareness information provided include Air Attack Early Warnings and cueing of Air Defense Artillery weapons. Other system characteristics include improving target engagements at maximum range, reducing the possibility of fratricide by positive target identification, and automatically integrating with the Army Battle Command System to synchronize and optimize air defense operations.

**SENSOR/SEEKER:**

Not applicable.

**WARHEAD:**

Not applicable.

**TARGET SETS:**

Not applicable.

**CONTRACTOR:**

Northrop Grumman.

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

Full Scale Development Decision .....	Jul 86
Low Rate Initial Production Decision .....	May 93
Operational Requirements Document .....	Mar 95
MS III Full Rate Production Decision .....	Mar 95
Block III Initial Operational Capability .....	Dec 08
Block IV Initial Operational Capability .....	Nov 10

**FIELDING:**

Maneuver AMD BNs.  
Composite AMD BNs.  
Sensor C2 Nodes.

**POINTS OF CONTACT:**

PD .....	256-876-9100
DPD.....	256-876-9101
ASA(ALT) DASC.....	703-545-4760



## ROCKET, ARTILLERY, MORTAR (RAM) WARN



### SYSTEM DESCRIPTION:

RAM Warn is a horizontal technology insertion, using current C-RAM Warning equipment to provide early, localized warning to the Maneuver Brigade Combat Teams (BCT). It interfaces with the Air Defense Airspace Management (ADAM) Cell already resident in the BCT Headquarters for Command and Control (C2); uses existing radars in the Target Acquisition Platoon of the Fires Battalion; and adds enhanced warning devices, controllers, and dedicated communications devices between the existing radars, the ADAM Cell, and warning systems.

### SYSTEM CHARACTERISTICS:

RAM Warn meets the immediate needs of the Maneuver forces, by providing an early, localized Warning capability to the BCTs via integration of existing standard systems, with minimal investment in new systems and no impact on personnel. Existing radars at the BCT will Sense incoming RAM, as well as other air and ground threats; additional Warn equipment (e.g., speakers and masts) will Warn localized affected areas via a commercial industry-produced warning system. Integration of this equipment along with a wireless Local Area Network (LAN) and Forward Area Air Defense Command and Control (FAAD C2) system already existing in the BCT's ADAM Cell provides a Warn capability to BCTs for detection of threat RAM rounds, transmission of the detection data to the C2 element for correlation and determination of predicted Point of Impact (POI), passage of the POI information to audio and visual alarms for localized or full area warning over the defended area, and passage of the Point of Origin (POO) information to other systems for enhanced Response. Timely warning will enable BCT personnel in the hazard area to seek cover or a prone position prior to impact, thus reducing casualties.

**SENSOR/SEEKER:**

Not Applicable – Employs existing ground based radars.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Rockets, Artillery, and Mortars.

**CONTRACTOR:**

Northrop Grumman.

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

RAM Warn Capability Production.....	4QFY10
Document (CPD) Approved	
Program Establishment.....	2QFY12
Milestone C Low Rate Initial Production.....	1QFY13
(LRIP) Decision Review	
First Unit Equipped (FUE).....	2QFY14
Full Rate Production (FRP) Decision.....	3QFY14

**FIELDING:**

- Army Acquisition Objective (AAO)
- 61 BCTs - Warn capability to all BCTs.
  - 28 Army Prepositioned Stock (APS) Sets.

**POINTS OF CONTACT:**

PD .....	256-876-9100
DPD.....	256-876-9101
ASA(ALT) DASC.....	703-545-4858





**MISSION:** Develop, acquire, field and sustain the Army's Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) within an overarching Joint IAMD construct to support integration of current and future sensors and weapons providing an effective IAMD capability at all echelons.

**VISION:** A highly efficient, agile and effective organization responsible for developing a mission command and fire control system that integrates sensors and weapons into a cohesive warfighting capability.



## ARMY INTEGRATED AIR AND MISSILE DEFENSE (AIAMD)



### SYSTEM DESCRIPTION:

The Army IAMD Program represents a shift from a traditional system-centric weapon systems acquisition to a component-based acquisition approach which will provide the most efficient way to acquire and integrate the components of the incremental AIAMD architectures. The AIAMD Program is structured to enable the development of an overarching system-of-systems capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD Program achieves this objective by establishing the incremental AIAMD architecture and developing the following: the IAMD Battle Command System (IBCS) that provides the common AIAMD Mission Command (MC) capability; and Common Plug and Fight (P&F) Interface Kits that will network-enable multiple sensor and weapon components. An Integrated Fire Control (IFC) Network, with established communications protocols, standards, and interface control documents that allow joint access, provides fire control connectivity and enables distributed operations.

### SYSTEM CHARACTERISTICS:

The IBCS provides the basis for the overall program lifecycle status. The major end items of the IBCS are the IBCS Engagement Operations Center (EOC) and the IBCS Common Plug and Fight Interface Kits. The IFC-Net consists of the transport layer (radios) and associated net management software resident in the IBCS EOC and the Plug and Fight Interface Kits. The IBCS Program also includes the integration of Plug and Fight Interface Kits into AIAMD components through A-Kits developed with the appropriate programs of record.

**SENSOR/SEEKER:**

Not applicable.

**WARHEAD:**

Not applicable.

**TARGET SETS:**

Not applicable.

**CONTRACTOR:**

Northrop Grumman and Raytheon.

**ACQUISITION PHASE:**

Engineering and Manufacturing Development.

**MILESTONES:**

ASARC Program Approval.....	9 Feb 2006
MS B .....	15 Dec 2009
MS C .....	1QFY17

**FIELDING:**

IOC.....September 2018

**POINTS OF CONTACT:**

PM.....	256-313-3576
DPM .....	256-842-1376
ASA(ALT) DASC.....	703-545-4760





**MISSION:** Develop, field, and sustain versatile air-launched weapon systems for the U.S. Army, Joint, and Coalition Warfighters that provide a Decisive Advantage.

**VISION:** Be a high performance and efficient team of innovative, world class experts in air-launched lethality.



## JOINT AIR-TO-GROUND MISSILE (JAGM)



### SYSTEM DESCRIPTION:

The Joint Air-to-Ground Missile (JAGM) System provides an improved air-to-ground missile capability for Rotary Wing aircraft and Unmanned Aircraft Systems. The JAGM is an aviation launched, precision-guided munition for use against high value stationary, moving, and relocatable land and naval targets. JAGM utilizes a multi-mode seeker to provide Precision Point and Fire and Forget targeting day or night in adverse weather, battlefield obscured conditions, and against a variety of countermeasures. A multi-purpose warhead provides lethal effects against a range of target types, from armored vehicles, thin-skinned vehicles and maritime patrol craft, to urban structures and field fortifications. JAGM delivers the Joint services a single air-to-ground missile with improved lethality, operational flexibility, and a reduced logistics footprint.

### SYSTEM CHARACTERISTICS:

JAGM's first increment incorporates a dual mode guidance section capable of Precision Point targeting using a Semi Active Laser (SAL) sensor, Fire and Forget targeting using Millimeter Wave (MMW) radar, and a targeting capability that leverages both radar and laser targeting capabilities for maximum operational flexibility. JAGM leverages the fielded and combat proven HELLFIRE II Romeo (AGM-114R) propulsion, warhead, and control sections. The JAGM system will be compatible with all Joint Rotary Wing and Unmanned Aerial Systems that are compatible with the HELLFIRE II missile. JAGM Increment 1 will have an 8 km range, be 70 inches in length, and have a weight of 115 lbs. JAGM Increment 2 adds increased range and terminal aim point targeting, as well as passive lock-on-after-launch capability. JAGM Increment 3 adds passive lock-on-before-launch targeting capability and increases to a 16km range.

**SENSOR/SEEKER:**

JAGM Increment 1 provides a multi-mode seeker with a Semi-Active Laser (SAL) for Precision Point targeting and Millimeter Wave (MMW) radar for Fire and Forget targeting.

**WARHEAD:**

A multi-purpose warhead consisting of a shaped-charge packaged within a fragmenting case.

**TARGET SETS:**

Combat vehicles (Tanks and Armored Personnel Carriers), Air Defense Units, Transporter Erector Launchers, Buildings, Bunkers, Maritime Patrol Craft (Fast Intercept Attack Craft), and Command, Control, Communications, and Intelligence Nodes.

**CONTRACTOR:**

Lockheed Martin/ Orlando, FL

**ACQUISITION PHASE:**

Engineering and Manufacturing Development.

**MILESTONES:**

MS B..... 3QFY15  
 System Critical Design Review..... 2QFY16  
 Production Qualification Testing.....4QFY16-2QFY17  
 Ground Launched Flight Tests  
 MS C..... 4QFY17

**FIELDING:**

Threshold Platforms: U.S. Army Apache AH-64 and U.S. Navy AH-1Z Viper.

Army IOC.....4QFY18

**POINTS OF CONTACT:**

PM..... 256-876-1141  
 DPM ..... 256-876-1142  
 ASA(ALT) DASC..... 703-545-0752



## HELLFIRE: AGM-114K (HELLFIRE II)



### SYSTEM DESCRIPTION:

HELLFIRE II (AGM-114K Model) incorporates many improvements over basic HELLFIRE, including electro-optic countermeasure hardening, increased warhead lethality, electronic fusing, and software-controlled digital seeker and autopilot electronics. HELLFIRE II is the primary armament for the U.S. Army's AH-64 Apache and the U.S. Marine Corps' AH-1 Super Cobra Helicopters. HELLFIRE II has also been qualified for use on the UH-60 Black Hawk, MH-6, and the OH-58D Kiowa Warrior helicopters.

### SYSTEM CHARACTERISTICS:

HELLFIRE II is a laser-guided, anti-armor weapon which homes on a laser spot that can be projected by ground observers, the launching aircraft, or other aircraft. HELLFIRE's ability to engage single or multiple targets directly or indirectly and to fire single, rapid, or ripple (salvo) rounds gives combined arms forces a decided battlefield advantage. Starting with the FY95 buy, an Insensitive Munitions (IM) warhead was incorporated, which improves helicopter survivability. Laser HELLFIRE II is 64 inches in length and weighs 100 lbs. Weapon range is approximately 8 km.

**SENSOR/SEEKER:**

The seeker is designed to acquire and track targets with laser energy by using the energy reflected from the target.

**WARHEAD:**

The High Explosive Anti-Tank (HEAT) warhead is a tandem warhead design consisting of a smaller, precursor shaped-charge warhead and a main shaped-charge warhead.

**TARGET SETS:**

Primary - Tanks. Secondary - Radar installations, communications posts, bunkers, buildings, air defense units, armored personnel carriers, oil rigs, and bridges.

**CONTRACTOR:**

HELLFIRE Systems Limited Liability Company.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

MS III .....	Mar 1993
FUE.....	FY 1994

**FIELDING:**

Currently fielded to U.S. Army Aviation and international customers from inventory.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0736



## HELLFIRE: AGM-114L (LONGBOW)



### SYSTEM DESCRIPTION:

The Longbow HELLFIRE (LBHF) missile is a Fire-and-Forget missile which uses radar-aided inertial guidance. It is part of the Apache AH-64D Longbow system which also includes mast-mounted, millimeter-wave, fire control radar with associated electronics designed to greatly increase the survivability of the host helicopter. LBHF provides the capability to conduct battle both day and night, in adverse weather conditions, and with battlefield obscurants present.

### SYSTEM CHARACTERISTICS:

The Longbow HELLFIRE (LB HF) missile utilizes millimeter-wave, radar-aided, inertial guidance to provide a Lock-On-Before Launch (LOBL) or Lock-On After Launch (LOAL) capability, depending on target range and velocity. Starting with the FY97 buy, an Insensitive Munitions (IM) warhead was incorporated, which improves survivability. LB HF is 69.2 inches in length and weighs 108 lbs. Weapon range is approximately 8 km.

**SENSOR/SEEKER:**

The Longbow HELLFIRE missile incorporates a Ka-band millimeter-wave seeker comprised of a transmitter/receiver, inertial measurement unit, and digital signal processing electronics.

**WARHEAD:**

The High Explosive Anti-Tank (HEAT) warhead is a tandem warhead design consisting of a smaller, precursor shaped-charge warhead and a main shaped-charge warhead, each with an insensitive munition explosive fill.

**TARGET SETS:**

Primary - Tanks, infantry combat vehicles, and air defense units.

**CONTRACTOR:**

Longbow Limited Liability Company (Joint Venture between Lockheed Martin Corp. and Northrop Grumman Corp.).

**ACQUISITION PHASE:**

Out of Production.

**MILESTONES:**

IOC.....Oct 1998

**FIELDING:**

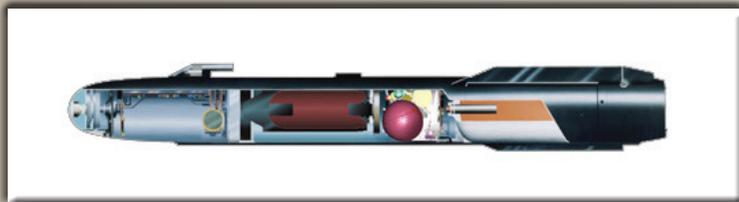
Currently fielded to the U.S. Army Aviation and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0736



## HELLFIRE: AGM-114M (BLAST FRAGMENTATION WARHEAD)



### SYSTEM DESCRIPTION:

The Blast Fragmentation (Blast Frag) Warhead Missile incorporates many improvements over the basic HELLFIRE, including electro-optic countermeasure hardening, electronic digital fusing, and a penetrator warhead. The Blast Frag is a supplemental armament for the AH-1 Super Cobra, AH-64A/D, OH-58D, MH6 Helicopters and the Euro Tiger aircraft.

### SYSTEM CHARACTERISTICS:

HELLFIRE Blast Frag Missile is a laser-guided, penetrator weapon which homes on a laser spot that can be projected by ground observers, the launching aircraft, or other aircraft. The missile's ability to engage single or multiple targets directly or indirectly and to fire single, rapid, or ripple (salvo) rounds gives combined arms forces a decided battlefield advantage. The Blast Frag Missile incorporates an IM Warhead, which improves helicopter survivability. The HELLFIRE Blast Frag Missile is 64 inches in length and weighs 106 lbs. Weapon range is approximately 8 km.

**SENSOR/SEEKER:**

The seeker is designed to acquire and track targets with laser energy by using the energy reflected from the target.

**WARHEAD:**

The blast fragmentation is a penetrator warhead design consisting of a hardened casing, zirconium incendiary pellets with an insensitive explosive fill. The warhead has a hardened-steel casing with scoring that provides a very-effective target penetration and fragment saturation.

**TARGET SETS:**

Ships, patrol boats, radar and communications installations, bunkers, air defense units, armored personnel carriers, oil rigs, and bridges.

**CONTRACTOR:**

HELLFIRE Systems Limited Liability Company.

**ACQUISITION PHASE:**

Out of Production.

**MILESTONES:**

FUE..... FY 2001

**FIELDING:**

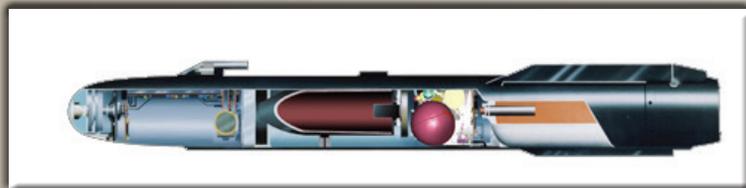
Currently fielded to the U.S. Army Aviation, U.S. Navy and international customers.

**POINTS OF CONTACT:**

PM..... 256-876-1141  
DPM ..... 256-876-1142  
ASA(ALT) DASC..... 703-545-0736



## HELLFIRE: AGM-114N (METAL AUGMENTED CHARGE)



### SYSTEM DESCRIPTION:

The Metal Augmented Charge (MAC) Warhead Missile improves upon the Blast Frag Missile by incorporating a metal fuel to enhance the blast overpressure effects inside bunkers, ships, and multi-room facilities and minimizing any degradation to the fragmentation effects obtained in the Blast Frag missile.

### SYSTEM CHARACTERISTICS:

HELLFIRE MAC Missile is a laser-guided penetrator weapon which homes on a laser spot that can be projected by ground observers, the launching aircraft, or other aircraft. The missile's ability to engage single or multiple targets directly or indirectly and to fire single, rapid, or ripple (salvo) rounds gives combined arms forces a decided battlefield advantage. The HELLFIRE MAC Missile is 64 inches in length and weighs 106 lbs. Weapon range is approximately 8 km.

**SENSOR/SEEKER:**

The seeker is designed to acquire and track targets with laser energy by using the energy reflected from the target.

**WARHEAD:**

The MAC warhead is a sub-caliber, penetrating warhead consisting of a hardened casing, aluminum fuel, and PBXN-112 primary explosive. The lethal mechanisms formed after target penetration consist of blast, overpressure, and fragmentation.

**TARGET SETS:**

Larger, multi-room facilities; bunkers, ships, patrol boats, radar and communications installations; air defense units, armored personnel carriers, oil rigs and bridges.

**CONTRACTOR:**

HELLFIRE Systems Limited Liability Company.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

FUE..... FY 2006

**FIELDING:**

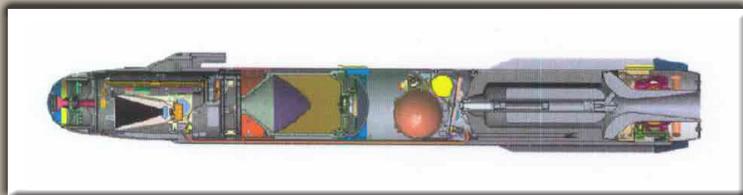
Currently fielding to U.S. Army Aviation, U.S. Navy, U.S. Air Force units and international customers.

**POINTS OF CONTACT:**

PM..... 256-876-1141  
DPM ..... 256-876-1142  
ASA(ALT) DASC ..... 703-545-0736



## HELLFIRE: AGM-114R (MULTI-PURPOSE WARHEAD)



### SYSTEM DESCRIPTION:

HELLFIRE II (AGM-114R Model) Multi-Purpose Warhead Missile provides the Warfighter with the flexibility to carry one multi-purpose missile providing the anti-armor, anti-personnel, and Military Operations on Urban Terrain (MOUT) lethality of the previous HELLFIRE missile variants. Improvements over legacy HELLFIRE II models include variable-delay fuse settings, target-specific flight trajectories, and a Micro Electro Mechanical System (MEMS) Inertial Measurement Unit (IMU) for increased navigation and flight controls. The AGM-114R provides the U.S. Army with a Multi-Purpose Warhead, Fully Qualified Rotary Wing and UAS HELLFIRE II Missile that is also backwards compatible with currently fielded aircraft.

### SYSTEM CHARACTERISTICS:

HELLFIRE II AGM-114R is a laser-guided, anti-armor weapon which homes on a laser spot that can be projected by ground observers, the launching aircraft, or other aircraft. HELLFIRE's ability to engage single or multiple targets directly or indirectly and to fire single, rapid, or ripple (salvo) rounds gives combined arms forces a decided battlefield advantage. The HELLFIRE II AGM-114R Missile is 64 inches in length and weighs 108 lbs. Weapon range is approximately 8 km.

**SENSOR/SEEKER:**

The seeker is designed to acquire and track targets with laser energy reflected from the target.

**WARHEAD:**

The Multi-Purpose warhead is a dual mode warhead consisting of a shaped-charge packaged within a fragmenting case. The hardened case provides structural penetration capability and fragmentation against personnel in the open.

**TARGET SETS:**

Primary: tanks, personnel in the open, buildings and structures; Secondary bunkers, ships, patrol boats, radar and communication installations, air defense units, armored personnel carriers, oil rigs, and bridges.

**CONTRACTOR:**

HELLFIRE Systems Limited Liability Company.

**ACQUISITION PHASE:**

Production/Operational Support.

**MILESTONES:**

Full Material Release Aug 2013.

**FIELDING:**

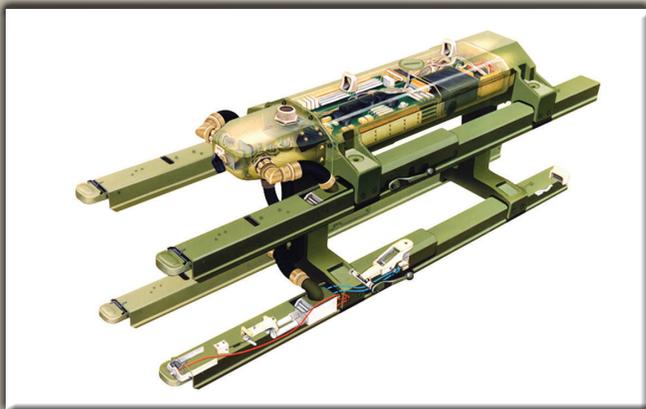
Fielding will begin in FY 2013 to U.S. Army UAS and Aviation Units. Future fielding international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC .....	703-545-0736



## HELLFIRE LAUNCHER M299



### SYSTEM DESCRIPTION:

The M299 Longbow HELLFIRE Launcher is a Military Standard (MIL-STD)-1760 compatible mission store tailored for carriage and launch of all configurations of the AGM-114 HELLFIRE missile. It provides carriage and launch capability of any combination of up to four AGM-114 HELLFIRE missiles. The launcher provides electronic functions required for the missile and launcher to communicate with the platform with multiple bus commands, missile launch sequencing, missile Built-In-Test (BIT) capability and sequencing, seeker type identification, missile "Hangfire/Misfire" determination and seeker coding, activation of missile environmental (de-ice) covers, and missile Direct Current (DC) power. The launcher also contains an embedded Longbow HELLFIRE training missile emulator.

### SYSTEM CHARACTERISTICS:

The empty M299 Launcher weight is 145 lbs. The Launcher dimensions are: 57.5 inches in length, 20 inches in width, and 21.5 inches in height.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

Lockheed Martin.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

FUE.....FY 1998

**FIELDING:**

Fielding on-going to support the U.S. Army, U.S. Navy, U.S. Marine Corps, U.S. Air Force and international customers' requirements.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0736



## HELLFIRE LAUNCHER M299A1 / M310A1



M299A1 LAUNCHER

M310A1 LAUNCHER

### SYSTEM DESCRIPTION:

The Modernized M299 Launcher is a technology refresh to the currently fielded M299 HELLFIRE Launcher used on the AH-64 Apache aircraft. The launchers, designated the M299A1 (4 rail) and M310A1 (2 rail), maintain the same form, fit and function as the legacy launcher. The launchers, contain a redesigned launcher electronics assembly (LEA), four rails with wheel lock trigger detent mechanism, two upper and two lower rail harnesses, a hardback, and two lower rail supports. The LEA consists of a launcher controller circuit card assembly (CCA), a built-in-test relay CCA, a direct current power module CCA, four flex harness CCAs, and a power conversion unit which provides power transformation and power distribution for launcher electronics power and missile operating power.

### SYSTEM CHARACTERISTICS:

The weight of the M299A1 is 51.8 kg (114 lbs) and the length is 168.3 cm (66.3 in). The weight of the M310A1 is 34.4 kg (76 lbs) and the length is 168.3 cm (66.3 in).

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

Lockheed Martin

**ACQUISITION PHASE:**

EMD

**MILESTONES:**

1st Quarter FY 2019

**FIELDING:**

Fielding ongoing to support US Army, US Navy, US Marine Corps US Air Force, and international customer's requirements.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## HYDRA-70 ROCKET LAUNCHERS



M261 LAUNCHER

M260 LAUNCHER

### SYSTEM DESCRIPTION:

The U.S. Army 2.75 Inch Light Weight Rocket Launchers (LWLs) are the M260 (7-Tube) and the M261 (19-Tube) launchers. The launchers provide for the firing of point detonating and cockpit settable fuzed 2.75 Inch folding fin aerial rockets using either the MK 40 or the MK 66 rocket motors. The aluminum launchers are inexpensive enough to be disposable yet durable enough to be reused after multiple firings. The weight savings over the previous Army 2.75 inch rocket launchers allows for longer mission time and / or an increase in the amount of stores supporting greater attack helicopter effectiveness.

### SYSTEM CHARACTERISTICS:

The empty M260 launcher weight is approximately 35 lbs. The empty M261 launcher weight is approximately 82 lbs. The M260 and M261 rocket launchers are configured with a strongback incorporating 14-inch spaced suspension mounting lugs designed to interface with aviation suspension racks and sway braces.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

Arnold Defense and Electronics LLC.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Not Applicable.

**FIELDING:**

U.S. Army and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## HYDRA-70 ROCKET SYSTEM



### SYSTEM DESCRIPTION:

The family of Hydra-70 rockets performs a number of roles, including anti-materiel, anti-personnel, and air-to-ground suppression missions. The rockets also provide smoke-screening and illumination functions. The family of Hydra-70 rockets are fired from Apache and Kiowa Warrior helicopters by the U.S. Army and are fired from various other fixed and rotary-wing platforms by Special Operations Forces, the U.S. Marine Corps, the U.S. Navy, and the U.S. Air Force.

### SYSTEM CHARACTERISTICS:

The 2.75-inch rocket is a free-flight rocket that has become the standard ground-attack rocket and was used extensively in the Korean War, Vietnam, and Desert Storm. The warheads contained on the Hydra-70 rocket fall into three categories: (1) Unitary warheads with an impact-detonating fuze or a remote-set, multi-option fuze; (2) Cargo warheads with an airburst, range-settable fuze using the "wall-in-space" concept or a fixed-standoff fuze; and (3) Practice warheads.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

M151 HEPD - Anti-personnel, 10 lbs ..... M423, M427  
 M151 HERS - Canopy/soft bunker, 10 lbs ..... M433  
 M229 HEPD - Anti-personnel, 17 lbs ..... M423  
 M274 Smoke Signature - Practice .....M423 S and A  
 M257 Illumination - Battle target illumination ..... M442  
 M264 Smoke (RP) - Air-to-Ground ..... M439  
 M255A1 Flechette - Air-to-Air, Air-to-Ground..... M439  
 M278 Illuminating IR Flare-Battle target illumination..... M442  
 M156 Smoke(WP) - Air-to-ground..... M423,M427  
 M282 HEI - Light Armor/reinforced mout .... M243 w/modified S8A  
 MK149 Flechette ..... WDU-4 N/A  
 WTU - 1/B Training.....N/A

**FUZE:**

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Not Applicable.

**FIELDING:**

Fielded to U.S. Army, U.S. Navy, U.S. Marine Corps, U.S. Air Force and international customers.

**TARGET SETS:**

Anti-materiel, anti-personnel, air defense systems (mobile and fixed), and light armor (wheeled and track).

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**POINTS OF CONTACT:**

PM..... 256-876-1141  
 DPM ..... 256-876-1142  
 ASA(ALT) DASC..... 703-545-0752



## ADVANCED PRECISION KILL WEAPON SYSTEM (APKWS) II



### SYSTEM DESCRIPTION:

The WGU-59/B APKWS II Guidance Section (GS) is comprised of a Semi-Active Laser seeker, control actuation system and guidance electronics. Threads at the fore and aft ends of the GS allow it to be assembled in theater between the M151/M423 warhead/fuze and Mk66 rocket motor of a legacy, Hydra-70 M151 unguided rocket or other qualified rocket types. Addition of the GS to the legacy rocket requires no modification of the warhead/fuze, the rocket motor, the Hydra-70 M261 rocket launcher or the delivery platform.

### SYSTEM CHARACTERISTICS:

An M151 rocket integrated with an APKWS II GS provides an All-Up Round (AUR) capability against soft and lightly-armored point targets at ranges of 1.5 to 5.0 kilometers. Total length and weight of an APKWS II AUR with the M151/M423 warhead/fuze are approximately 74 inches and 33 pounds respectively. The GS acquires reflected energy from a laser-designated (remote or autonomous) target and directs the guided rocket to an impact point at the target location. The apertures for the laser seeker are located on the leading edges of the GS wings, which remain stowed and are unable to receive reflected laser energy until the rocket has been launched and the wings deploy; therefore, the weapon operates in a Lock-On-After-Launch mode only. Because the APKWS II GS does not communicate with the aircraft, the laser code is preset by the ground crews into the GS manually before the rocket is loaded into the launcher. The Designator (remote or autonomous) must designate with the code entered. There are two fielded domestic variants, differentiated by software only that supports rotary wing and fixed wing employment. An additional rotary wing variant is fielded for FMS countries, again differentiated by software only.

**SENSOR/SEEKER:**

Semi-Active Laser.

**WARHEAD:**

The system is qualified for use with the Army M151 (10lb high explosive point detonating), M156 (White Phosphorous Smoke Warhead), M274 (Signaling Practice Warhead), and WTU-1/B (Practice Warheads) from the AH-64 Apache helicopter. The system is also qualified for use with the Navy Mk152 (10lb high explosive point detonating) on AH/UH-1, MH-60, and AV-8B and the Air Force A-10 and F-16.

**TARGET SETS:**

Soft and lightly armored targets (moving and stationary).

**CONTRACTOR:**

BAE Systems.

**ACQUISITION PHASE:**

Production/Operations and Support (Navy is lead Service for the WGU-59/B).

**MILESTONES:**

Fielded.

**FIELDING:**

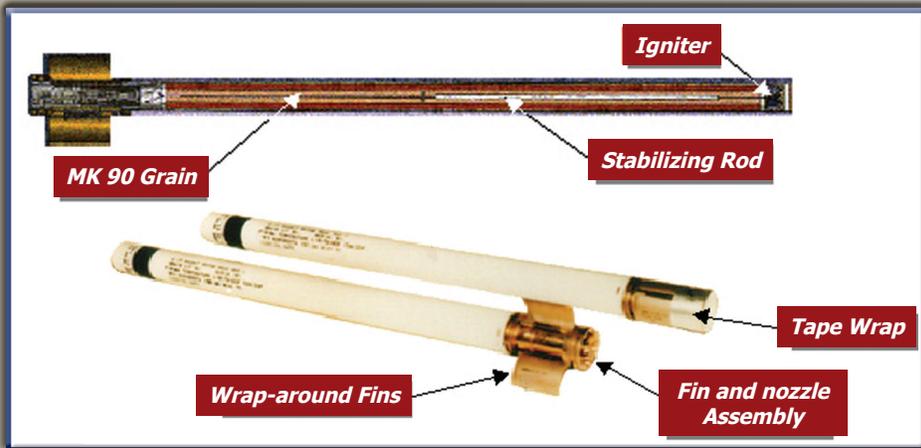
U.S. Army, U.S. Navy, U.S. Marine Corps, U.S. Air Force and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## HYDRA-70 ROCKET MOTOR, MK66



### SYSTEM DESCRIPTION:

The MK66 motors have a substantially higher thrust at 1,335 lbs and a longer range (8.8 km) with a 10 lb warhead. The Hydra-70 rocket system currently uses the MK66 motor. The current motor version is the MK66 MOD 4. It is used by all of the services. Earlier versions of the MK66 motor remain in the inventory. When compared to the older MK40/MK4 motors, the MK66 motors use a longer motor tube that is comprised of a different aluminum alloy and utilizes a new fin and nozzle assembly. The fins are a spring-loaded, wrap-around design. The propellant grain burns outward radially from the inside bore facilitated by a 8-point star pattern.

### SYSTEM CHARACTERISTICS:

The MK66 motors use a longer motor tube (than the MK40/MK4) made of a different aluminum alloy and assembled with a new fin and nozzle assembly. The fins are of a spring-loaded, wrap-around design and are attached around the circumference of the single nozzle. Upon exit from the launcher, the fins lock in place. The propellant grain is longer and of a different formation than for the MK40/MK4.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Anti-materiel (command and control facilities, logistics facilities), anti-personnel, air defense systems (mobile and fixed), and light armor (wheeled and track).

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

U.S. Army, U.S. Navy, U.S. Air Force, U.S. Marine Corps, and the international customer.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## M151 HIGH EXPLOSIVE POINT DETONATING (HEPD)



### SYSTEM DESCRIPTION:

The M151 HEPD is a 10 lb high-explosive, anti-personnel, anti-material warhead and is traditionally referred to as the 10-Pounder. The bursting radius is 10 m; however, high-velocity fragments can produce a lethality radius in excess of 50 m. This warhead is normally employed against personnel, materiel, and lightly armored vehicles.

### SYSTEM CHARACTERISTICS:

The nose section is constructed of malleable cast iron that is threaded to receive the fuze. The base section is constructed of steel or cast iron and is threaded so that it can be attached to the rocket motor. Total weight of the loaded, unfuzed warhead is 8.7 lbs of which 2.3 lbs are composition B4. The M151 warhead weighs 9.3 lbs when fuzed with the M423/M427 point detonating fuze. Rocket live weight is 23 lbs while the fired weight is 15.7 lbs. The total rocket length is 55.1 inches.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The M151 typically uses the M423 Fuze for helicopter applications and the M427 Fuze for fixed-wing applications. The M151 uses 2.3 lbs of composition B-4 High Explosive. The 10 lb warhead gains lethality from the nose section, which is fabricated using nodular, pearlitic malleable or ferritic malleable cast iron.

**TARGET SETS:**

Anti-materiel (command and control facilities, logistics facilities), anti-personnel, air defense systems (mobile and fixed), and light armor (wheeled and track).

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

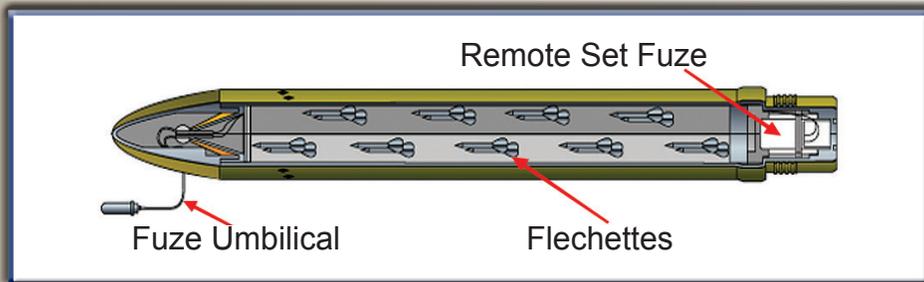
U.S. Army, U.S. Navy, U.S. Air Force, U.S. Marine Corps and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## M255A1 (FLECHETTE)



### SYSTEM DESCRIPTION:

The M255A1 flechette warhead is used primarily against antipersonnel targets; this warhead contains 1,179 sixty-grain, hardened-steel flechettes and uses the M439 fuze. At fuze time, the fuze functions at a point before the target (optimized for flechette pattern) and the expulsion charge is initiated. At expulsion, 1,179 flechettes separate and form a disk-like mass which breaks up with each flechette assuming an independent trajectory and forming a repeatable dispersion pattern. The flechette uses kinetic energy derived from the velocity of the rocket to produce the desired impact and penetration effect on the target.

### SYSTEM CHARACTERISTICS:

The M255A1 Warhead is a cargo warhead consisting of a nose cone assembly, a warhead case, an integral fuze, 1,179 sixty-grain flechettes, and an expulsion charge assembly. The primary warhead fuze (M439) is remotely set with the Aerial Rocket Control System (ARCS), Multi-function Display (MFD), or Rocket Management System (RMS) to provide range (time of flight) from 500 to 7,200 m. The warhead weight is 13.9 lb. When mated to the MK66 motor, the live weight is 27.5 lb while the fired weight is 20.3 lb. The overall M255A1 Rocket length is 66.10 inches.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The warhead is functionally equivalent to the M261 cargo warhead. Initial forward motion of the rocket at firing initiates fuze timing.

**TARGET SETS:**

Anti-materiel (command and control facilities, logistics facilities), anti-personnel, air defense systems (mobile and fixed), and light armor (wheeled and track).

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

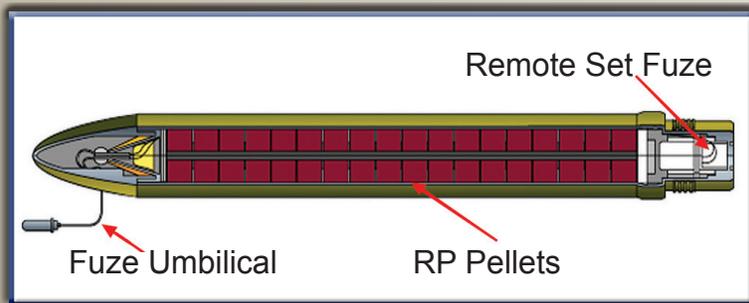
U.S. Army, U.S. Navy, U.S. Air Force, U.S. Marine Corps and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM.....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## M264 RP (SMOKE)



### SYSTEM DESCRIPTION:

The M264 Warhead is used for smoke obscuration in the visible light spectrum. The pellets can be easily modified for fill content to obscure Infrared (IR) and millimeter-wave spectrums should a requirement materialize. The warhead is used as a Red Phosphorus (RP) filled smoke rocket propelled by the MK66 motor and functions at a remote settable range from 1,000 to 6,000 m. Upon functioning, the M439 Fuze ignites the BKNO<sub>3</sub> expulsion mix which, using a vented pusher plate, simultaneously ignites and ejects the 5 lb RP payload through the shear-pinned nose cone. The burning RP drops to the ground, producing a voluminous cloud of white smoke. Fourteen M264 rockets will screen a 300 to 400 m front with a 5 to 10 kt wind from the unaided eye for a minimum of 5 minutes.

### SYSTEM CHARACTERISTICS:

The RP pellet stack assembly consists of 72 RP pellets arranged in 18 rows of 4 each and are separated by felt pieces impregnated with a phosphine gas-adsorbent mixture comprised of manganese dioxide cuprous oxide. The warhead weight is 8 lbs. The M264 Rocket weight is 21.6 lbs live and 14.4 lbs fired. Overall length of the rocket is 66.1 inches.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The M264 RP Smoke is also a cargo warhead.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**PRODUCTION:**

Production on-going.

**MILESTONES:**

Fielded.

**FIELDING:**

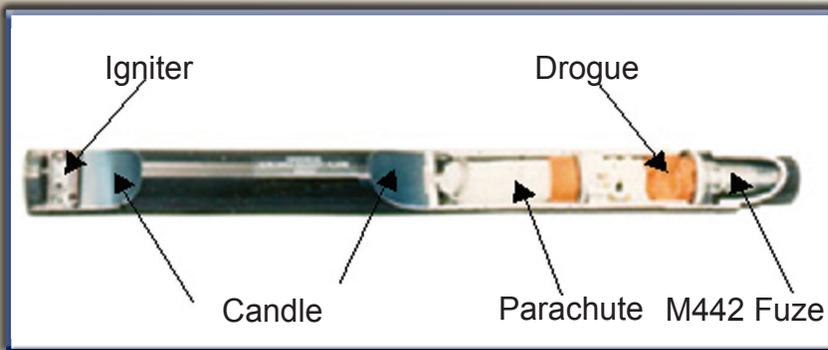
U.S. Army, U.S. Navy, U.S. Air Force, U.S. Marine Corps and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## M257 AND M278 (ILLUMINATION AND IR FLARE)



### SYSTEM DESCRIPTION:

These warheads were designed for battlefield target illumination; the M278 in conjunction with IR goggles. The only difference between the warheads is the candle composition. The flare warheads are assembled to the MK66 Rocket Motor in the field. The flare rockets can be launched from either fixed-wing or rotary-wing aircraft. The M442 motor burnout fuze functions after a 9 second delay.

### SYSTEM CHARACTERISTICS:

The M278 provides an average near IR light output of 250 watts per steradian (w/sr) and less than 2 K candle power of visible light with a desired goal of 1 K candle power. The IR flare will provide IR light for 3 minutes. Time to candle ignition from launch is 13.5 seconds. The M257 candle descends at 15 ft/sec. and burns for approximately 100 seconds, with a minimum light output of 1 M candle power. Warhead weight is 10.6 lbs. M278 Rocket weight is 24.2 lbs live and 17 lbs fired. Overall rocket length is 70.4 inches.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Illuminant.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

U.S. Army, U.S. Navy, U.S. Air Force, U.S. Marine Corps and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## M156 SMOKE (WP) – AIR - TO - GROUND M423/M427 FUZE



### SYSTEM DESCRIPTION:

The M156 White Phosphorous (WP) warhead is primarily used for target marking and incendiary purposes. It is a ballistic match to the M151 and is of similar construction. The M156 WP warhead provides a smoke marking signal for approximately 2 minutes depending upon wind conditions. The warhead can be used effectively for target marking in an open dry terrain and in jungle terrain.

### SYSTEM CHARACTERISTICS:

The M156 WP warhead consists of a steel body, a base, and an adapter, brazed together. The body is shaped at the forward end to form the ogive. The base is an extruded steel cup threaded for attachment to the rocket motor. The steel adapter, at the forward end of the warhead, is threaded to receive the fuze and also serves to retain the burster charge tube. The approximate weight of the fuzed warhead is 9.7 lbs. The M156 WP warhead uses both M423 and M427 point detonating fuzes.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The M156 typically uses the M423 fuze for helicopter applications and the M427 fuze for fixed wing applications. Filler for the M156 is 2.2 pounds of white phosphorous. A burster tube, with a charge of 85 grams of Composition B, extends into the white phosphorous charge. A lead-in explosive in the fuze, consisting of a 97 mg pellet of RDX, ignites the booster pellet, also in the fuze. The booster pellet, in turn, detonates the burster charge. On detonation, the high explosive ruptures the warhead, dispersing the white phosphorous, generating a white smoke cloud.

**TARGET SETS:**

Target marking and incendiary purposes.

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

U.S. Army, U.S. Air Force and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM.....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## M274 SMOKE SIGNATURE (TRAINING) WARHEAD



### SYSTEM DESCRIPTION:

The M274 smoke signature training warhead provides a ballistic match for the M151 HE warhead. The M274 is utilized by the Army for training.

### SYSTEM CHARACTERISTICS:

The M274 weighs 9.3 pounds. The casing is a modified WTU-1/B with vent holes. A modified M423 fuze mechanism is integral to the warhead. A cylindrical cartridge assembly in the forward section of the casing contains 40 grams of potassium perchlorate and aluminum powder that provides a "flash, bang and smoke" signature.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

U.S. Army training round for the M151.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

U.S. Army, U.S. Air Force and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM .....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## M282 HEI – LIGHT ARMOR AND REINFORCED MILITARY OPERATION IN URBAN TERRAIN (MOUT) TARGETS, M423 WITH MODIFIED S&A FUZE



### SYSTEM DESCRIPTION:

The M282 High Explosive Incendiary (HEI) warhead is considered a 'bunker buster' and is used for engaging light armored vehicles, bunkers, and reinforced MOUT targets. The fuze has a delay feature, and the warhead detonates with both blast fragment and incendiary effects. The M282 contains plastic vent plugs, which improve the Insensitive Munitions (IM) response.

### SYSTEM CHARACTERISTICS:

The M282 warhead is proprietary design by Norwegian Ammunition Company (NAMMO) and uses a M423 modified S&A. The base section is constructed of steel and is threaded so it can be attached to the rocket motor. Total weight of the fuze warhead is 13.71 lbs and is 14.34 inches long. Body color is yellow with black markings and a light red band.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The M282 High Explosive Incendiary (HEI) warhead is considered a 'bunker buster' and is used for engaging light armored vehicles, bunkers and reinforced Military Operations on Urban Terrain (MOUT) targets. The fuze has a delay feature, and the warhead detonates with both blast fragment and incendiary effects.

**TARGET SETS:**

Light armored ships, vehicles, and bunkers, and reinforced MOUT Targets.

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

U.S. Army, U.S. Air Force and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM.....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## MK 149 FLECHETTE –ANTIPERSONNEL WARHEAD DISPENSING UNIT (WDU) 4 A/A FUZE



### SYSTEM DESCRIPTION:

The MK149 Flechette is the Navy variant of the M255A1 flechette warhead. The warhead is primarily used against antipersonnel targets; this warhead contains 1,179 sixty-grain, hardened-steel flechettes and uses the WDU4 A/A fuze. At expulsion, 1,179 flechettes separate and form a disk-like mass which breaks up with each flechette assuming an independent trajectory and forming a repeatable dispersion pattern. The flechette uses kinetic energy derived from the velocity of the rocket to produce the desired impact and penetration effect on the target.

### SYSTEM CHARACTERISTICS:

The MK149 warhead is a cargo warhead consisting of a nose cone assembly, a warhead case, an integral fuze, 1,179 sixty-grain flechettes, and an expulsion charge assembly. The primary warhead fuze functions at motor burnout.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Cargo round.

**TARGET SETS:**

Enemy personnel or lightly armored targets.

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

U.S. Army, U.S. Air Force and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM.....	256-876-1142
ASA(ALT) DASC.....	703-545-0752



## WARHEAD TRAINING UNIT (WTU)-1 /B – TRAINING NO FUZE



### SYSTEM DESCRIPTION:

The WTU-1/B provides a ballistic match for the M151 High Explosive (HE) warhead. The WTU-1/B is utilized by the U.S. Navy and U.S. Air Force for training.

### SYSTEM CHARACTERISTICS:

The WTU-1/B weighs 9.4 lbs. It has an iron body and is blue with white markings. It has no fuze.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

U.S. Navy and U.S. Air Force training round for the M151.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

General Dynamics Ordnance and Tactical Systems.

**ACQUISITION PHASE:**

Production/Operations and Support.

**MILESTONES:**

Fielded.

**FIELDING:**

U.S. Army, U.S. Air Force and international customers.

**POINTS OF CONTACT:**

PM.....	256-876-1141
DPM.....	256-876-1142
ASA(ALT) DASC.....	703-545-0752





**MISSION:** Provide superior air and missile defense to US and International interests against current and evolving threats while maintaining high readiness levels while continuously improving integration with Integrated Air & Missile Defense (IAMD) and Ballistic Missile Defense (BMD) systems.

**VISION:** Be the leader of excellence for lower tier air and missile defense systems providing affordable, results-oriented, and warfighter focused capabilities.



# PATRIOT

## SYSTEM DESCRIPTION:

The PATRIOT system is an extremely capable, long-range air defense guided missile system, which provides protection of ground combat forces and high-value assets. The PATRIOT system can conduct multiple simultaneous engagements in all weather conditions and environments against tactical ballistic missiles, cruise missiles, and high-performance aircraft. The PATRIOT system is deployed by Fire Unit organized within a Battalion. Each Fire Unit consists of the Engagement Control Station (ECS), a Radar Set (RS), an Electronic Power Plant (EPP), Launching Stations (LSs), and the Battery Command Post (BCP), including ancillary support equipment. The PATRIOT Battalion is organized by a Headquarters and Headquarters Battery (HHB), exercising command and control through the Information and Coordination Central (ICC) vehicle, with communications support enabled through the Communications Relay Group (CRG) and Antenna Mast Group (AMG). Both the Fire Unit and the Battalion have dedicated support, communications, and maintenance vehicles, with missile reload trailer transport capability.

## SYSTEM CHARACTERISTICS:

The combat element of the PATRIOT missile system is the Fire Unit, consisting of the phased-array RS, ECS, EPP, and typically six LSs, or more as required. The RS executes tactical functions of airspace surveillance, target detection, identification, classification, tracking, and missile guidance/engagement support. The ECS provides the human interface for command and control. The M901 LS (Configuration 2) supports PAC-2 through Guidance Enhanced Missile (GEM)+ missile variants while the M902 LS (Configuration 3) with Enhanced Launcher Electronics System (ELES) supports either PAC-2 or PAC-3 missiles. Each M902 LS has a load out capacity of up to either four pre-PAC-3 missiles or 16 PAC-3 missiles sealed in canisters that serve as shipping containers and launch tubes. The M903 LS supports Pre-PAC-3 and PAC-3 MSE missiles.



**SENSOR/SEEKER:**

- Ground support radar performing surveillance and fire control functions.
- "PAC-3 and PAC-3 MSE Missiles uses on-board Ka-band seeker.

**WARHEAD:**

PAC-2/GEM Missile configurations use a blast fragmentation warhead; PAC-3 Missile lethality is achieved through guidance as kinetic interceptor with Lethality Enhancer.

**TARGET SETS:**

Tactical Ballistic Missiles (TBM), Cruise Missiles, and high performance aircraft.

**CONTRACTOR:**

Fire Unit (Ground Support Equipment): Raytheon.  
PAC-3 Missile Segment: Lockheed Martin Missiles and Fire Control.

**ACQUISITION PHASE:**

Operations and Support

**MILESTONES:**

MS I.....	May 1967
MS II.....	Mar 1972
MS III .....	Sep 1980
FUE.....	Jun 1983

**FIELDING:**

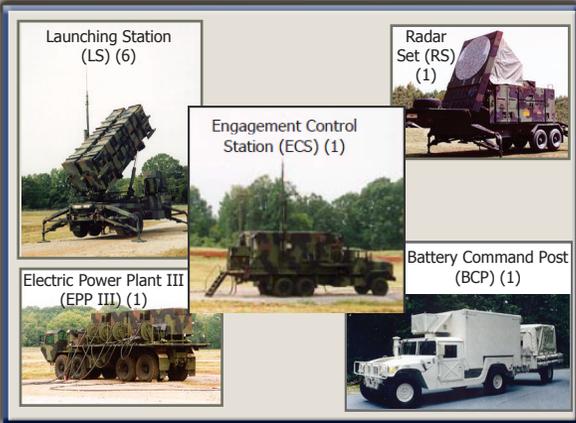
A total of fifteen PATRIOT Battalions have been fielded to CORPS and Echelons above Corps (EAC). Fielding to the U.S. Army and international customers.

**POINTS OF CONTACT:**

PM.....	256-955-3240
DPM .....	256-955-3242
ASA(ALT) DASC.....	703-545-0836



# PATRIOT GROUND SUPPORT EQUIPMENT



## SYSTEM DESCRIPTION:

At the Fire Unit level, the PATRIOT missile system consists of an Engagement Control Station (ECS), a Radar Set (RS), an Electric Power Plant (EPP), typically six Launching Station (LS)s, or more per requirement, and the Battery Command Post (BCP) coordinated among associated communications equipment of the Battalion. A Fire Unit is also composed of ancillary support equipment: the small and large repair parts trailer (one each), one Battery Maintenance Center (BMC) vehicle, and nine Heavy Expanded Mobility Tactical Trucks (HEMTT). The ECS is the operational control center of the PATRIOT Fire Unit. The ECS contains the Expanded Weapons Control Computer (EWCC), man/machine interfaces, various data and communications terminals, and controls the RS and LS. The RS provides the tactical functions of airspace surveillance, target detection, identification, classification, tracking, and missile guidance and engagement support, with the capacity to track numerous targets and provide missile guidance data among one or more launching stations. The LS performs transport, point, and missile launch functions and is remotely operated from the ECS which provides missile pre-launch data and fire command signal.

## SYSTEM CHARACTERISTICS:

The RS is automatically controlled by the ECS, providing the human interface for control of automated operations. The radar is capable of low and high altitude surveillance, classifying incoming targets at ranges sufficient for early warning, engagement and missile guidance. The ECS EWCC determines targets to be tracked, and once an engagement decision is made, one or more LSs are selected for missile firing. Pre-launch data, transmitted to the PAC-3 missile, assists in target acquisition. Once in flight, the missile is acquired by the RS, and communications downlink permit flight path monitoring/commands via the ECS until on-board missile end-game target acquisition is initiated.

**SENSOR/SEEKER:**

Ground Support Equipment with airspace (radar) surveillance enabling target detection/acquisition to perform missile fire control functions.

**WARHEAD:**

Not applicable.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

Fire Unit and Battalion Ground Support Equipment: Raytheon.

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

FUE (Configuration 3) ..... Dec 2000

**FIELDING:**

Fielding to the U.S. Army and international customers.

PATRIOT Pure-Fleet and Grow-The-Army Initiatives Completed;  
All current Battalions converted to the PAC-3 Configuration.

**POINTS OF CONTACT:**

PM..... 256-955-3240  
DPM ..... 256-955-3242  
ASA(ALT) DASC..... 703-545-0836



## PATRIOT MIM-104C PAC-2 MISSILE



### SYSTEM DESCRIPTION:

The PAC-2 is long range, all-weather air defense missile. The PAC-2 is equipped with a track-via-missile (TVM) guidance system and carries a high explosive warhead. Propulsion is provided by a single stage solid fuel rocket motor. The MIM-104C is an upgrade of the earlier version of the PAC-2 missile with an improved (blast fragmentation) warhead and pulse-doppler proximity fuze. The pulse-doppler subsystem optimizes target acquisition by discriminating among the widely varying incoming velocities characteristic of the objective target set. The MIM-104C Engineering Change Proposal (ECP)/Production Decision was approved on 19 December 1988 with FUE on 1 September 1990. Fielding is complete to the U.S. Army and international customers.

### SYSTEM CHARACTERISTICS:

The PATRIOT PAC-2 missile guidance is achieved through the missile command uplink and the TVM downlink between the PATRIOT missile and the phased array AN/MPQ-65 radar. This guidance method allows the missile's flight to be continuously monitored and controlled by the AN/MSQ-104 ECS's Weapon Control Computer which transmits mid-course guidance corrections. As the missile approaches the target, TVM is employed and is used to steer the missile to an intercept point whereupon the proximity fuze detonates the missile's warhead and destroys the target.

**SENSOR/SEEKER:**

Monopulse seeker, radar-proximity fuze.

**WARHEAD:**

High-Explosive, Blast Fragmentation.

**TARGET SETS:**

Low-flying aircraft, cruise missiles, and short-range ballistic missiles.

**CONTRACTOR:**

Raytheon.

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

Production Decision .....	Dec 1988
FUE MIM-104C.....	Sep 1990

**FIELDING:**

Fielding is complete to the U.S. Army and international customers.

**POINTS OF CONTACT:**

PM.....	256-955-3240
DPM .....	256-955-3242
ASA(ALT) DASC.....	703-545-0836



## PATRIOT MIM-104D AND MIM-104E (GEM/GEM+) MISSILES



### SYSTEM DESCRIPTION:

The MIM-104D GEM (Guidance Enhanced Missile) represents a further improvement of the MIM-104C. The MIM-104D missile was approved for production through an ECP, effective 1 September 1993. The First Unit Equipped (FUE) date was 28 February 1995 and production and fielding are complete to the U.S. Army. The MIM-104E, the "GEM+", (designated as the MIM-104E and MIM-104-D1/GEM+) ECP/Production Decision was approved on 12 July 2001 with an FUE date of 30 November 2002. Fielding of the GEM+ missile is complete to the U.S. Army.

### SYSTEM CHARACTERISTICS:

The MIM-104D GEM missile is an improvement to the earlier PAC-2 and MIM-104C missiles. The MIM-104D GEM missile incorporates an upgraded fuze and an upgraded receiver primarily oriented toward improving performance against Tactical Ballistic Missiles (TBMs). A subsequent improvement to the GEM missile, GEM-T, further enhances performance against stressing TBM and cruise missile threats.

**SENSOR/SEEKER:**

Monopulse seeker, proximity fuze.

**WARHEAD:**

High-Explosive, Blast Fragmentation.

**TARGET SETS:**

Low-flying aircraft, cruise missiles, and short-range ballistic missiles.

**CONTRACTOR:**

Raytheon.

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MIM-104D FUE .....	Feb 1995
MIM-104E FUE .....	Nov 2002

**FIELDING:**

Fielding is complete to the U.S. Army and international customers.

**POINTS OF CONTACT:**

PM.....	256-955-3240
DPM .....	256-955-3242
ASA(ALT) DASC.....	703-545-0836



## PATRIOT M91A SERIES ADVANCED CAPABILITY - 3 (PAC-3) MISSILE



### SYSTEM DESCRIPTION:

The PAC-3 missile is a high velocity hit-to-kill, surface-to-air missile capable of intercepting and destroying tactical ballistic missiles (TBMs) and air-breathing threats. The PAC-3 missile provides the range, accuracy, and lethality to effectively defend against TBMs armed with weapons of mass destruction. The PAC-3 missile's leading edge technology uses kinetic energy to engage targets through its hit-to-kill capability. The combination of a fast missile airframe response and high impulse side thrusters generates a more rapid missile angle of attack than is possible with actuator-driven aerodynamic control surfaces alone. The PAC-3 Cost Reduction Initiative/PAC-3 MSE missiles provide defense against evolving threats and are currently being fielded.

### SYSTEM CHARACTERISTICS:

The PAC-3 missile uses a solid propellant rocket motor, aerodynamic controls, attitude control motors (ACMs), and inertial guidance to navigate. The missile flies to an intercept point specified by its ground-based fire solution computer embedded in the ECS. Target trajectory is updated during missile flyout through means of a radio frequency uplink/downlink. Shortly before arrival at the intercept point, the missile's on-board Ka-Band seeker acquires the target and initiates terminal homing guidance. The PAC-3 missile's destructive capability is significantly increased against air-breathing threats through employment of a Lethality Enhancer.

**SENSOR/SEEKER:**

High resolution Ka-Band active seeker.

**WARHEAD:**

Not Applicable. Direct missile to target Hit-to-Kill lethality.

**TARGET SETS:**

Tactical Ballistic Missiles (TBM), Cruise Missiles, and high performance aircraft.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

MS II.....	May 1994
MS III .....	Oct 1999
FUE.....	Sep 2001

**FIELDING:**

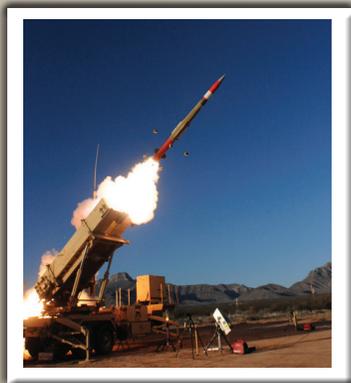
Ongoing. The PATRIOT System, fielded with the PAC-3 Missile, is deployed worldwide in defense of U.S. Forces and FMS partners.

**POINTS OF CONTACT:**

PM.....	256-955-3240
DPM .....	256-955-3242
ASA(ALT) DASC.....	703-545-0836



# PATRIOT XM400 ADVANCED CAPABILITY-3 (PAC-3) MISSILE SEGMENT ENHANCEMENT (MSE)



## SYSTEM DESCRIPTION:

The PAC-3 MSE represents the next generation PAC-3 missile which provides expanded battlespace performance against evolving threats and has been fully integrated into the PATRIOT system. The PAC-3 MSE improves upon the current PAC-3 Cost Reduction Initiative (CRI) missile capability with a higher performance solid rocket motor, modified lethality enhancer, more responsive control surfaces, upgraded guidance software, and insensitive munitions improvements. The PAC-3 MSE is an evolution from, and has a high degree of commonality with, the PAC-3 CRI design as the current production variant of the fielded PAC-3 missile. Commonality includes compatibility with the PATRIOT M902 Launching Station (LS) of Configuration-3 capability. The PAC-3 MSE incorporates a logistical flexibility over that of PAC-3 through a modular single canister. Full PAC-3 MSE compatibility with the M902 LS requires the addition of Launcher Mod Kits (LMKs)/Heater Kits. An M902 LS reconfigured to be PAC-3 MSE capable is designated as an M903 LS.

## SYSTEM CHARACTERISTICS:

The PAC-3 MSE single canisters will originally be kitted as a two-pack for both the shipping and tactical configuration. Additionally, the PAC-3 MSE single-pack canister design modularity enables field replacement of spent/failed missile(s). PAC-3 MSE missiles can be shipped as single canisters, as required, then rekit into a missile two-pack in the field. There will be no anticipated increase in PATRIOT operations or maintenance personnel as a result of integrating the PAC-3 MSE enhancements into PATRIOT. PAC-3 MSE design compatibility with the M902 LS, also PAC-2 missile compatible, allows a mixed PAC-3 CRI missile and PAC-3 MSE missile load-out (on the M903 LS), as will be initially required during PAC-3 MSE production ramp-up.

**SENSOR/SEEKER:**

High resolution Ka-Band active seeker.

**WARHEAD:**

Not Applicable. Direct missile to target Hit-to-Kill lethality.

**TARGET SETS:**

Tactical Ballistic Missiles (TBM), Cruise Missiles, and high performance aircraft.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Production & Deployment

**MILESTONES:**

MS B .....	Aug 2004
MS C .....	Mar 2014
FUE .....	Dec 2015

**FIELDING:**

Fielding to the U.S. Army.

**POINTS OF CONTACT:**

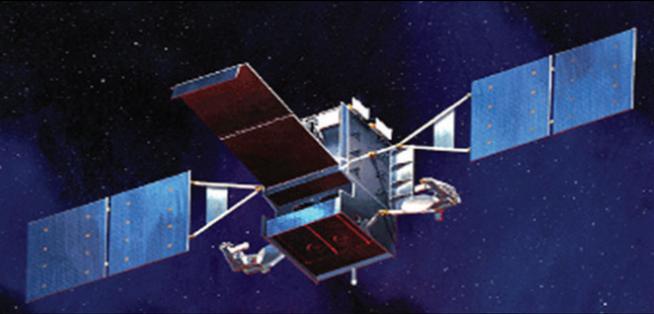
PM.....	256-955-3240
DPM .....	256-955-3242
ASA(ALT) DASC.....	703-545-0836





**MISSION:** To Provide Acquisition Support for Upper Tier Missile Defense and Space Systems for the U.S. Army, Joint and Coalition Warfighters that Provide a Decisive Battlefield Advantage.

**VISION:** To be an organization that is Engaged and Responsive. To be a Highly Efficient, Effective, Agile, and Innovative Warfighter - Focused Organization for Supporting Upper Tier Missile Defense and Space Systems.



## JOINT TACTICAL GROUND STATION (JTAGS)



### SYSTEM DESCRIPTION:

JTAGS is a theater deployed, transportable missile warning system that receives and processes space based infrared satellite data directly from U.S. Air Force geosynchronous sensors. Once processed, soldiers release ballistic missile warning messages and other infrared events to theater warfighters over multiple communications systems. Ongoing JTAGS upgrades include: adding data from the Space Based Infrared System (SBIRS) Sensors, use of commercial antennas, improved communication methods, and relocating operations out of JTAGS shelters to integrate with theater command and control centers in a Block 2 configuration.

### SYSTEM CHARACTERISTICS:

The JTAGS Block 1 system consists of a standard 20-foot military shelter, housing three operator workstations, several racks of computer processing and communication equipment, and a variety of support hardware. Externally, JTAGS includes three satellite downlink antennas, other communication and GPS antennas, as well as other support and power equipment. JTAGS operators are soldiers from the U.S. Army Space & Missile Defense Command.



**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Not Applicable.

**CONTRACTOR:**

Northrop Grumman.

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MS II.....	Mar 1994
MS III .....	Oct 1996

**FIELDING:**

Fielded.

**POINTS OF CONTACT:**

PM.....	256-842-2401
DPM .....	256-313-3443
ASA(ALT) DASC.....	703-545-0836





**MISSION:** Through effective program management and a professional workforce; develop, produce, field and sustain the Precision Fires family of launchers and munitions to fulfill the long-range artillery requirements of the U.S. Warfighter and Allies.

**VISION:** Be a values based team providing the best long-range precision fires capability to the U.S. Warfighter and Allies.



# M142 HIGH MOBILITY ARTILLERY ROCKET SYSTEM (HIMARS)

## SYSTEM DESCRIPTION:



The M142 High Mobility Artillery Rocket System (HIMARS) is a full spectrum, combat proven all-weather, 24/7, lethal and responsive, wheeled precision strike weapons system organic/assigned to Field Artillery Brigades (FAB) supporting Brigade Combat Teams (BCT). HIMARS is a C-130 air transportable wheeled launcher mounted on a 5-ton Family of Medium Tactical Vehicles (FMTV) XM1140A1 truck chassis. The current HIMARS includes an increased crew protection (ICP) armored cab. HIMARS supports an expeditionary, lethal, survivable, and tactically mobile force. It will launch all Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM) rockets and missiles. HIMARS integrates into the same command, control, and communications (C3) network as the M270A1 launcher. The HIMARS carries one launch pod containing either six Guided MLRS (GMLRS)/MLRS rockets or one Army Tactical Missile System (ATACMS) missile. HIMARS is designed to support Joint Early and Forced Entry Expeditionary Operations with high volume destructive, suppressive, and counter-battery fires. When firing GMLRS-Unitary precision rockets, HIMARS can achieve ranges of 70+ kilometers, attacking the target with with low-collateral damage, enabling danger- close fires (within 200 meters) in support of friendly Troops in Contact (TIC), as well as engaging high valued point targets in open, urban and complex environments.

## SYSTEM CHARACTERISTICS:

The combat loaded HIMARS weighs 16,103 kg (35,500 lb). It is transportable by C-130, C-17, and C-5 transport aircraft and ready to operate within minutes of landing. The HIMARS fleet was retrofitted with ICP Armored Cabs in FY12. Recent upgrades include the Driver's Vision Enhancement, Blue Force Tracker, Long Range Communications Modifications, the Crew Chief Restraint Systems, and SAFirE Glass transparent armor. The launcher has an on-board self-loading and self-locating capability. The HIMARS launcher has a maximum speed of 94 km/hr with a range of 483 km (300mi).

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Time sensitive targets reported by Troops in Contact (threat-network targeting, prosecution-based targeting, and urban time-sensitive targeting including insurgents emplacing IEDs) Also: Counterbattery, Enemy Air Defense, Logistics Sites, Command and Control Sites, High Payoff Targets, light material and personnel, etc.

**CONTRACTOR:**

Lockheed Martin Missile Fire Control (LMMFC) - Launcher.

BAE Systems Land & Armaments/Global Tactical Systems - Chassis.

Letterkenny Army Depot (LEAD) - Overhaul

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MS II / Maturation..... Nov 1999  
 MS C ..... Mar 2003  
 FUE..... 2QFY05  
 Full Rate Production decision..... 3QFY05

**FIELDING:**

Complete. HIMARS launcher units are organic and assigned to modular Field Artillery Brigades supporting Brigade Combat Teams (BCT). HIMARS Battalion sets have been fielded and serve both active and reserve forces.

**POINTS OF CONTACT:**

PM..... 256-876-1195  
 DPM ..... 256-876-8121  
 ASA(ALT) DASC..... 703-545-0787



## M270A1 MULTIPLE LAUNCH ROCKET SYSTEM (MLRS)



### SYSTEM DESCRIPTION:

The M270A1 Multiple Launch Rocket System (MLRS) is a full spectrum, combat proven all-weather, lethal and responsive, tracked Precision Strike weapons system organic/assigned to Field Artillery Brigades (FAB) supporting Brigade Combat Teams (BCT). The M270A1 program consists of a modified M993A1 Bradley Carrier mounted with the M269 Launcher Loader Module. The A1 incorporates the Improved Fire Control System (IFCS) and the Improved Launcher Mechanical System (ILMS) modifications. The M270A1 fires all current MLRS and Guided MLRS (GMLRS) rockets and all Army Tactical Missile System (ATACMS) variants. The M270A1 is air transportable by C-5 and C-17 aircraft. Recent upgrades include Driver's Vision Enhancement, Blue Force Tracker and Long Range Communications modifications. The Improved Armored Cab (IAC) program for enhanced crew survivability is in development. The IAC program completed developmental testing in FY16 and will award a production contract in FY17. A Fire Control System – Update (FCS-U) modification is in development to mitigate the electronic component obsolescence and ensure future MLRS Family of Munitions (MFOM) capability. The FCS-U is currently in development testing and will enter into production in FY18.

### SYSTEM CHARACTERISTICS:

The combat loaded M270A1 weighs 26,101 kg (57,544 lbs). It is air transportable by C-17 and C-5 transport aircraft. The M270A1 carries two launch pods, each pod containing either six GMLRS/MLRS rockets or one ATACMS missile. It can fire a 12-rocket ripple within one minute. The M270A1 engagement range is 8 to 300 km. The M270A1 Launcher has a maximum speed of 65 km/hr and maximum range of 640 km (400 mi). It is capable of climbing a 60-deg slope and a 1 m wall.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

Not Applicable.

**TARGET SETS:**

Time sensitive targets reported by Troops in Contact, Counterbattery, Enemy Air Defense, Logistics Sites, Command and Control Sites, High Payoff Targets, light material and personnel, etc.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC) - Launchers and Rockets.  
BAE Systems Land & Armaments/Global Tactical Systems - Chassis.  
Red River Army Depot (RRAD) – Overhaul.

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MS III ..... 2QFY02  
FUE..... 2QFY02

**FIELDING:**

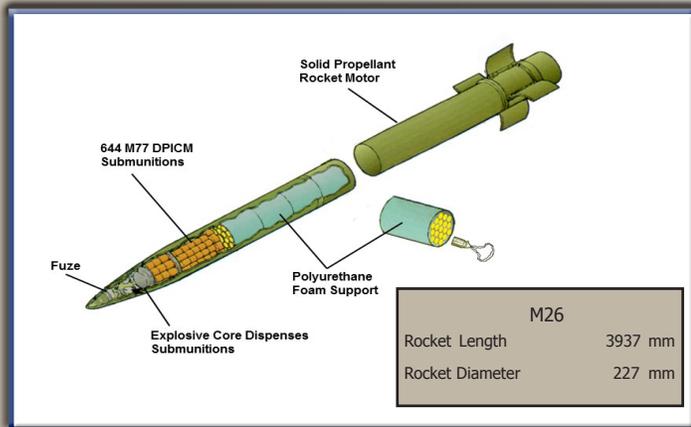
Complete. M270A1 launcher units are organic and assigned to modular Field Artillery Brigades (FAB) supporting Brigade Combat Teams (BCT). Currently, M270A1 Battalion sets are fielded and serve both active and reserve forces.

**POINTS OF CONTACT:**

PM..... 256-876-1195  
DPM ..... 256-876-8121  
ASA(ALT) DASC..... 703-545-0787



# M26A2 DUAL PURPOSE IMPROVED CONVENTIONAL MUNITION (DPICM) MLRS Rocket



## SYSTEM DESCRIPTION:

The M26A2 DPICM rocket is an unguided, free-flight, munition that provides all-weather, 24/7, indirect fire capability designed to complement cannon weapons in the tactical fires arena. Initially fielded in 1983, it produces devastating effects by rapidly attacking critical and time-sensitive targets with large volumes of fire. Dubbed 'Steel Rain' by Iraqi soldiers, it had a major impact in the Desert Storm and OIF ground wars. It was the primary munition for the older, MLRS M270 rocket launcher. Each launch pod/container (LP/C) holds six rockets.

## SYSTEM CHARACTERISTICS:

The M26 rocket has folding fins that open during the boost phase to spin stabilize the rocket in flight. Initially fielded in 1983, the shelf life has been extended to 27 years. Minimum range: 8 km. Maximum range: 32 km.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The warhead contains 644 individual submunitions. Each submunition has a steel fragmentation case and a shaped charge. A ribbon stabilizes the submunition during free fall to arm the fuze. The armed submunition detonates upon impact.

**TARGET SETS:**

Targets include Artillery, Air Defense, Logistics Sites, Command and Control Sites, light materiel and personnel, etc.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

IOC..... FY83

MS III ..... FY83

**FIELDING:**

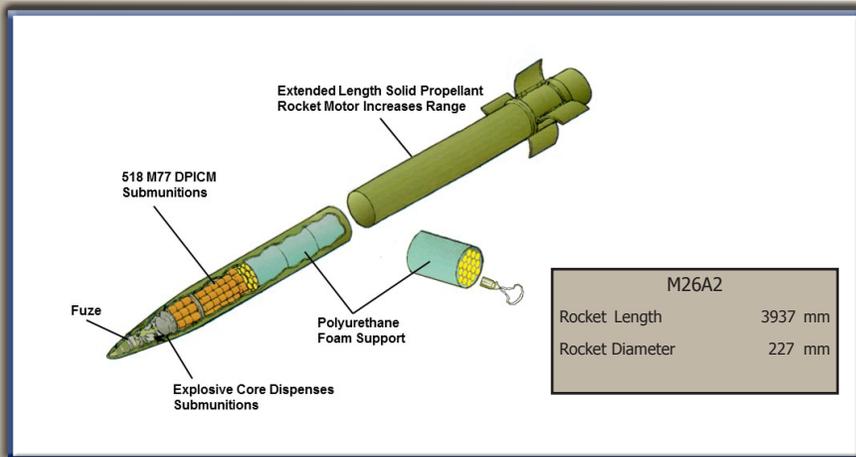
The Army Acquisition Objective (AAO) has been met and production of the MLRS M26 rocket is complete. It is fired from M270, M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM.....	256-876-1195
DPM .....	256-876-8121
ASA(ALT) DASC.....	703-545-0787



## M26A2 EXTENDED RANGE MLRS (ER-MLRS) DPICM ROCKET



### SYSTEM DESCRIPTION:

The M26A2 Extended Range MLRS (ER-MLRS) rocket is an all-weather, unguided free-flight munition. Compared to the M26 rocket, ER-MLRS has a lengthened rocket motor and smaller warhead section with fewer submunitions. Each launch pod/container (LP/C) holds six rockets. ER-MLRS was procured in a very limited quantity.

### SYSTEM CHARACTERISTICS:

The ER-MLRS rocket is an unguided ballistic munition which is similar in design to the M26 MLRS rocket. Greater range was obtained by lengthening the motor section to accommodate more propellant and higher-altitude flight is attainable with improvements to the nose fuze. Accuracy was optimized and the size of the submunition pattern on the ground was increased, enhancing effectiveness. Minimum range: 13 km. Maximum range: 45 km.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The M26A2 ER-MLRS warhead section contains 518 M77 DPICM submunitions, the same submunitions used in the older M26 rocket.

**TARGET SETS:**

Targets include Artillery, Enemy Air Defense, Logistics Sites, Command and Control Sites, light materiel and personnel, etc.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

Materiel Release.....	FY99
IOC.....	FY99

**FIELDING:**

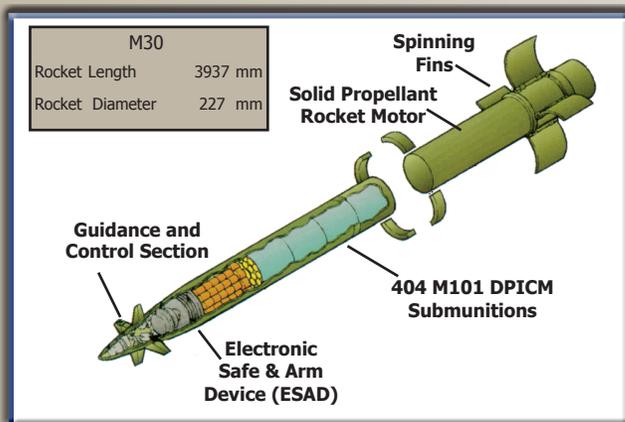
M26A2 production has been completed. It is fired from M270, M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM.....	256-876-1195
DPM .....	256-876-8121
ASA(ALT) DASC.....	703-545-0787



## M30 GUIDED MLRS (GMLRS) DPICM ROCKET



### SYSTEM DESCRIPTION:

The M30 Guided Multiple Launch Rocket System (GMLRS) Dual-Purpose Improved Conventional Munition (DPICM) rocket is an all-weather, 24/7, precision-guided, area munition. M30 GMLRS increases engagement range with a higher level of accuracy at all ranges. Better accuracy reduces the number of rockets and associated logistics burden required to defeat current target sets by 80% while greatly reducing collateral damage. Each launch pod/container (LP/C) holds six rockets.

### SYSTEM CHARACTERISTICS:

M30 GMLRS integrates a Guidance and Control (G&C) package and a new rocket motor to achieve greater range and precision accuracy. Guidance is performed by an Inertial Measurement Unit (IMU) aided by a GPS receiver; required accuracy can be met by the IMU independent of the GPS. In-flight control is accomplished by four canards. Minimum range: 15 km. Maximum range: 70+ km. M30 cannot be fired from older MLRS M270 launchers.

**SENSOR/SEEKER:**

None.

**WARHEAD:**

The M30 GMLRS warhead contains a reduced payload of 404 M101 DPICM submunitions.

**TARGET SETS:**

Representative targets include cannon, rocket, and missile artillery; enemy air defense; light armor, materiel and personnel; command and control positions; logistics sites; and other high value and high payoff targets.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MS B / SDD.....	FY99
MS C / LRIP I.....	FY03
LRIP II .....	FY04
LRIP III .....	FY05
IOC.....	FY05
FRP.....	FY06

**FIELDING:**

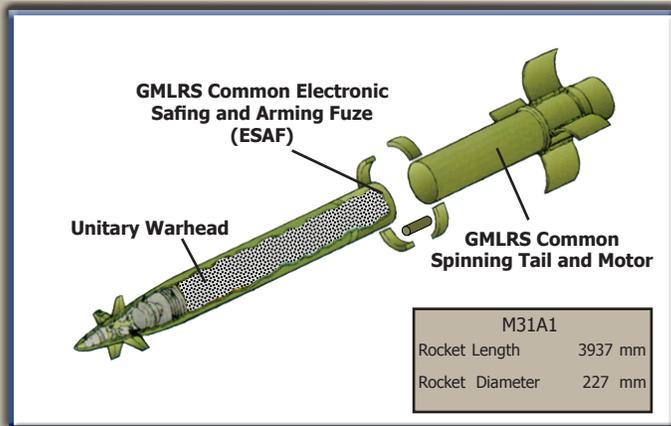
M30 production has been completed. It is fired from M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM.....	256-876-1195
DPM .....	256-876-8121
ASA(ALT) DASC.....	703-545-0787



## M31A1 GUIDED MLRS (GMLRS) UNITARY ROCKET



### SYSTEM DESCRIPTION:

The GMLRS Unitary rocket is a highly accurate, all-weather, low collateral damage, precision point munition which expanded the MLRS target set to include targets within urban and complex environments. It integrates a multi-mode fuze and high explosive warhead while retaining the same dimensions of the MLRS family of rocket munitions. GMLRS Unitary is the Army's primary guided rocket, capable of near-pinpoint accuracy. The Unitary rocket was utilized extensively in OIF/OEF, and continues to provide field artillery support in Overseas Contingency Operations. As of June 2016, over 3,900 rockets have been fired by U.S. Army/Marines, and United Kingdom forces. Each launch pod/ container (LP/C) holds six rockets.

### SYSTEM CHARACTERISTICS:

Guidance is performed by an Inertial Measurement Unit (IMU) aided by a GPS receiver. Required accuracy can be met with the GPS independent of the IMU. Control is accomplished by four canards. Multi-mode fuzing options include airburst, point detonation, and delay. Minimum range: 15 km. Maximum range: 70+ km.

**SENSOR/SEEKER:**

Proximity Sensor.

**WARHEAD:**

The GMLRS Unitary warhead is a 200 lb class, insensitive munitions compliant design, high-explosive unitary warhead with fragmentation effect.

**TARGET SETS:**

Targets include enemy Artillery, Air Defense, High Payoff and Collateral Damage sensitive Point Targets.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

ORD Approved .....	FY01
MS B / SDD.....	FY03
MS C / LRIP .....	FY07
IOC.....	FY09
FRP.....	FY09

**FIELDING:**

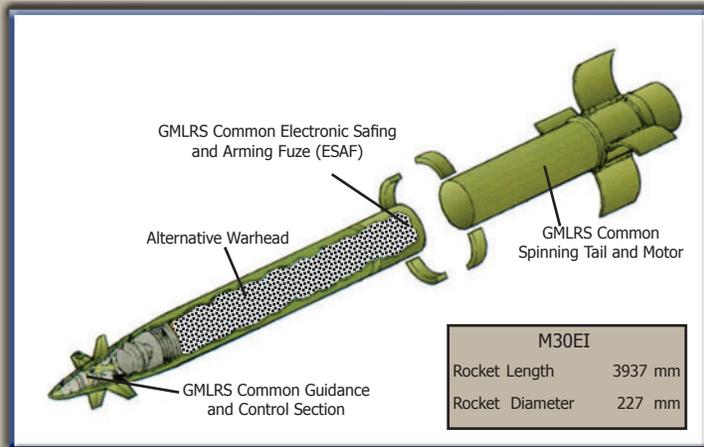
The M31A1 is currently in Full Rate Production. It is fired from M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM.....	256-876-1195
DPM .....	256-876-8121
ASA(ALT) DASC.....	703-545-0787



## M30E 1 GUIDED MLRS ALTERNATIVE WARHEAD (AW)



### SYSTEM DESCRIPTION:

The M30E1 Guided Multiple Launch Rocket System (GMLRS) Alternative Warhead (AW) rocket was designed to service the same target set as the M26, M26A2, and M30 Dual Purpose Improved Conventional Munition (DPICM) rockets. The AW rocket is effective against area and imprecisely located targets while meeting Unexploded Ordnance (UXO) constraints (no more than 1% UXO (Objective: 0%)) in accordance with Department of Defense (DoD) policy). Each launch pod/container (LP/C) holds six rockets.

### SYSTEM CHARACTERISTICS:

GMLRS AW builds upon the technology improvements incorporated in the M31A1 rocket system. The warhead is a unitary design combined with lethality enhancing preformed fragments. Due to commonality in the GMLRS system, all other rocket characteristics remain the same as the Unitary rocket.

**SENSOR/SEEKER:**

Proximity Sensor.

**WARHEAD:**

The GMLRS M30E1 AW warhead is a 200-pound class fragmentation assembly filled with high explosive (HE). Upon detonation, the explosion accelerates target- optimized preformed penetrators. The warhead design incorporates Insensitive Munition (IM) compliance features.

**TARGET SETS:**

Targets include material, personnel, command posts, and other high value and high payoff targets.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC) (Prime Integrator).

**ACQUISITION PHASE:**

Production and Deployment.

**MILESTONES:**

MS A .....	FY09
MS B .....	FY12
MS C/FRP .....	FY15
IOC .....	FY16

**FIELDING:**

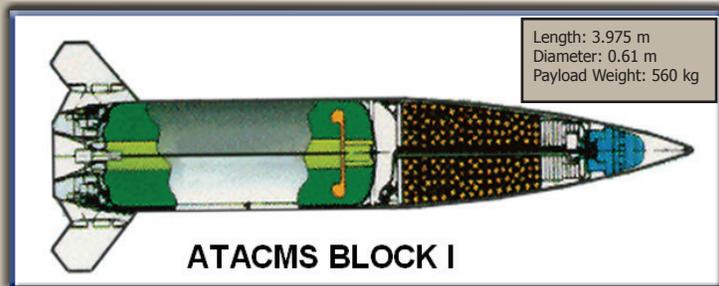
M30E1 is currently in Full Rate Production. It is fired from M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM.....	256-876-1195
DPM .....	256-876-8121
ASA(ALT) DASC.....	703-545-0787



## M39 BLOCK I ARMY TACTICAL MISSILE SYSTEM (ATACMS)



### SYSTEM DESCRIPTION:

The M39 Block I ATACMS is a 24/7, all-weather, surface-to-surface, inertially-guided missile used to engage targets in the Corps/Army area of influence. This munition was used extensively in both Desert Storm (1991) and in OIF (2003) ground wars for shaping operations by the Joint Force, Joint Special Operations Forces (SOF), and Army Land Component Command operational levels. There is one missile per launching assembly (missile pod) with two missiles per launcher load in the M270/ M270A1 MLRS and one missile in the M142 HIMARS launcher.

### SYSTEM CHARACTERISTICS:

The M39 Block I ATACMS missile delivers an Anti-Personnel, Anti-Materiel (APAM) warhead that contains approximately 950 bomblets. Thrust is provided by a solid-propellant rocket motor. Shelf-life has been extended to 22 years. Minimum range: 25 km. Maximum range: 165 km.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The M39 Block I warhead contains approximately 950 APAM fragmentation bomblets.

**TARGET SETS:**

Targets include air defense artillery sites, surface-to-surface missile units, logistics sites, command and control complexes, and helicopter forward operating bases.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MS II.....	FY86
IOC.....	FY90
MS III .....	FY91

**FIELDING:**

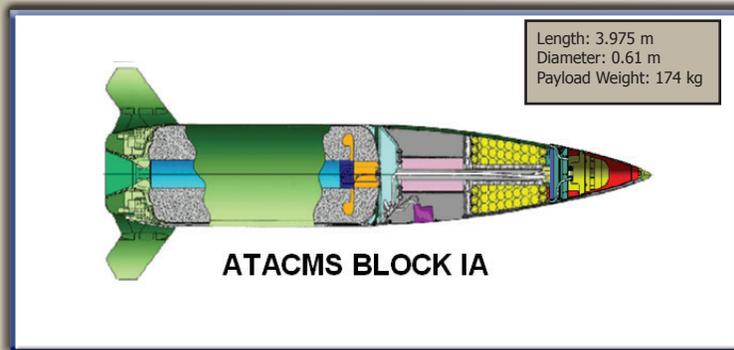
Production has been completed. Fired from M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM.....	256-876-1195
DPM .....	256-876-8121
ASA(ALT) DASC.....	703-545-0752



# M39A1 BLOCK IA ARMY TACTICAL MISSILE SYSTEM (ATACMS)



## SYSTEM DESCRIPTION:

The M39A1 Block IA ATACMS is a 24/7, all-weather, more accurate, extended range variant of the Block I ATACMS missile. The Block IA ATACMS was used extensively in 2003 at operational and strategic levels to conduct shaping operations during the Operation Iraqi Freedom (OIF) ground war. There is one missile per launching assembly (missile pod) with two missiles per launcher load in the M270A1 MLRS and one missile in the M142 HIMARS launcher.

## SYSTEM CHARACTERISTICS:

The M39A1 Block IA ATACMS uses the guided missile control and propulsion systems and a majority of the Block I warhead components. The reduced payload of 300 anti-personnel/anti-materiel (APAM) bomblets extends its range. Block IA uses an improved Missile Guidance Set which increases navigational accuracy by integrating GPS signal data into the inertial guidance scheme. Thrust is provided by a solid-propellant rocket motor. Minimum range: 70 km. Maximum range: 300 km. Shelf life has been extended to 19 years.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The M39 Block IA contains approximately 300 APAM M-74 bomblets.

**TARGET SETS:**

Targets include air defense artillery sites, surface-to-surface missile units, logistics sites, command and control complexes, and helicopter staging areas.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

MS II..... FY94  
 IOC..... FY98  
 MS III ..... FY98

**FIELDING:**

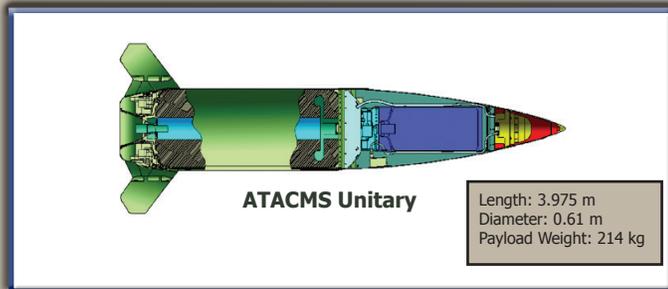
U.S. production has been completed. Fired from M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM..... 256-876-1195  
 DPM ..... 256-876-8121  
 ASA(ALT) DASC..... 703-545-0752



# M48/M57 ARMY TACTICAL MISSILE SYSTEM (ATACMS) UNITARY



## SYSTEM DESCRIPTION:

The ATACMS Unitary variants are 24/7; all-weather, precision missiles that expand the current ATACMS target set to include stationary point targets and targets within urban and complex environments. Instead of the ATACMS Block IA missile's payload of bomblets, a high explosive (HE) unitary warhead is used to achieve effectiveness against point targets while limiting collateral damage. The ATACMS Unitary was used in 2003 at operational and strategic levels to conduct shaping operations during the Operation Iraqi Freedom (OIF) ground war. There is one missile per launching assembly (missile pod) with two missiles per launcher load in the M270A1 MLRS and one missile in the M142 HIMARS launcher. The M48 is commonly referred to as Quick Reaction Unitary (QRU) and the M57 as TACMS 2000 (T2K).

## SYSTEM CHARACTERISTICS:

The ATACMS Unitary variants use the same propulsion system as the Block IA ATACMS missile. The M48/M57 Missile Guidance Set improves navigational accuracy by integrating GPS signal data into the inertial guidance scheme. The latest variant, the M57 Unitary, has a near vertical target engagement capability. Thrust is provided by a solid-propellant rocket motor. Minimum range: 70 km. Maximum range: 270 km (M48); 300 km (M57). Shelf life is 10 years for M57 and has been extended to 15 years for the M48.

**SENSOR/SEEKER:**

Not Applicable.

**WARHEAD:**

The ATACMS Unitary warhead has a total weight of 214 kg (473 lb) of which 98 kg (215 lb) is high explosive.

**TARGET SETS:**

Targets include petroleum, oil, and lubricant (POL) sites, multistory buildings, electrical transformers, surface-to-air missile units, time sensitive and high value targets.

**CONTRACTOR:**

Lockheed Martin Missiles and Fire Control (LMMFC).

**ACQUISITION PHASE:**

Operations and Support.

**MILESTONES:**

Directed Production Decision.....	FY01
IOC.....	FY02
ORD Approved .....	4QFY06

**FIELDING:**

U.S. production has been completed. Fired from M270A1 MLRS and M142 HIMARS launchers.

**POINTS OF CONTACT:**

PM.....	256-876-1195
DPM .....	256-876-8121
ASA(ALT) DASC.....	703-545-0752



# ABBREVIATIONS AND ACRONYMS



# ABBREVIATIONS & ACRONYMS

AAMDC.....	Army Air and Missile Defense Command
AAO .....	Army Acquisition Objective
ACM .....	Attitude Control Motor
ADA .....	Air Defense Artillery
ADAM.....	Air Defense Airspace Management
ADSI .....	Air Defense System Integrator
ADU .....	Air Defense Unit
AESA.....	Active Electronically Steered Array
AGM.....	Air-to-Ground Missile
AH .....	Attack Helicopter
AI3.....	Accelerated Improved Intercept Initiative
AIAMD.....	Army Integrated Air and Missile Defense
AMD .....	Air and Missile Defense
AMDPCS .....	Air and Missile Defense Planning and Control Systems
AMDWS.....	Air and Missile Defense Workstation

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

AMG.....	Antenna Mast Group
APAM .....	Anti-Personnel/Anti-Materiel
APEO.....	Assistant Program Executive Officer
APM .....	Assistant Program Manager
APS.....	Army Prepositioned Stock
APU.....	Auxiliary Power Unit
ARCS .....	Aerial Rocket Control System
ASA (ALT) .....	Assistant Secretary of the Army (Acquisition, Logistics and Technology)
ASARC.....	Army Systems Acquisition Review Council
ATACMS.....	Army Tactical Missile System
ATGM .....	Anti-Tank Guided Missiles
ATK.....	Alliant Techsystems, Inc
AW.....	Alternative Warhead
AZ.....	Arizona
BAE.....	British Aerospace

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

BCP.....	Battery Command Post
BCT.....	Brigade Combat Team
BDE.....	Brigade
BIT .....	Built-In-Test
BITE .....	Built-In-Test Equipment
Blast Frag .....	Blast Fragmentation
BMC .....	Battery Maintenance Center
BMD.....	Ballistic Missile Defense
BN .....	Battalion
BST.....	Basic Skills Trainer
C.....	Celsius
C2.....	Command and Control
C3.....	Command, Control, and Communications
C3I .....	Command, Control, Communications, and Intelligence
CCWS.....	Close Combat Weapon Systems

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

CIWS.....	Close-In Weapon System
CEP.....	Circular Error Probable
CLS.....	Contractor Logistic Support
CLU.....	Command Launch Unit
CM.....	Cruise Missiles
CMDS.....	Cruise Missile Defense Systems
Corp.....	Corporation
COTS.....	Commercial-Off-The-Shelf
CPD.....	Capability Production Document
CPG.....	Command and Processing Group
C-RAM.....	Counter - Rocket, Artillery, Mortar
CRI.....	Cost Reduction Initiative
CRG.....	Communications Relay Group
DAB.....	Defense Acquisition Board
DASC.....	Defense Armed Services Committees

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

DASC.....	Department of the Army Systems Coordinator
DC .....	Direct Current
DEG .....	Degree
DoD .....	Department of Defense
DPD .....	Deputy Product Director
DPEO .....	Deputy Program Executive Officer
DPICM .....	Dual-Purpose Improved Conventional Munition
DPM .....	Deputy Project Manager
DR .....	Directed Requirement
DSARC .....	Defense System Acquisition Review Council
EAC.....	Echelons Above Corps
ECP .....	Engineering Change Proposal
ECS.....	Engagement Control Station
ECU.....	Environmental Control Unit
EFP .....	Explosively Formed Penetrator

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

ELES .....	Enhanced Launcher Electronics System
EMD .....	Engineering Manufacturing and Development
EO .....	Engagement Operation
EOC .....	Engagement Operations Center
EPBST .....	Enhanced Producibility Basic Skills Trainer
EPP .....	Electric Power Plant
ER-MLRS .....	Extended Range Multiple Launch Rocket System
ERA .....	Explosive Reactive Armor
ESAF .....	Electronic Safe, Arm, & Fuse
EWCC.....	Expanded Weapon Control Computer
F.....	Fahrenheit
FAAD.....	Forward Area Air Defense
FAAD C2.....	Forward Area Air Defense Command and Control
FARP .....	Forward Area Refueling Points
FCS .....	Fire Control Subsystem
FDV.....	Fault Detection Verification

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

FL .....	Florida
FLIR .....	Forward Looking Infrared
FMS .....	Foreign Military Sales
FMTV .....	Family of Medium Tactical Vehicles
FOB.....	Forward Operating Base
FoS .....	Family of Systems
FPA .....	Focal Plane Array
FRP .....	Full Rate Production
FTT .....	Field Tactical Trainer
FUE.....	First Unit Equipped
FY .....	Fiscal Year
G/g .....	Gram
G&C .....	Guidance and Control
GA .....	Georgia
GDOTS .....	General Dynamics Ordnance and Tactical Systems
GEM .....	Guidance Enhanced Missile

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

GMLRS .....	Guided Multiple Launch Rocket System
GPS .....	Global Positioning System
GPSi .....	GPS Receiver Interface Board
GSE.....	Ground Support Equipment
HAWK.....	Hercules Airborne Weapons Kit
HE .....	High Explosive
HEAT .....	High Explosive Anti-Tank
HEI .....	High Explosive Incendiary
HEMTT .....	Heavy Expanded Mobility Tactical Truck
HEPD .....	High Explosive Point Detonating
HHB .....	Headquarters and Headquarters Battery
HIMARS .....	High Mobility Artillery Rocket System
HMMWV .....	High Mobility Multi-Purpose Wheeled Vehicle
HOB .....	Height of Burst
IAC .....	Improved Armored Cab

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

IAMD.....	Integrated Air and Missile Defense
IBCS.....	IAMD Battle Command System
IBCT .....	Infantry Brigade Combat Teams
ICC .....	Information and Coordination Central
ICP.....	Increased Crew Protection
IDF .....	Indirect Fire
IFC.....	Integrated Fire Control
IFCS .....	Improved Fire Control System
IFF .....	Identification Friend or FOE
IFPC.....	Indirect Fire Protection Capability
IFS.....	Impact Fuze Sensor
IIR .....	Imaging Infrared
ILMS .....	Improved Launcher Mechanical System
IM.....	Insensitive Munitions
IMU .....	Inertial Measurement Unit

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

IN/in. ....	Inches
INS .....	Inertial Navigation System
IOC.....	Initial Operational Capability
IR .....	Infrared
ITAS .....	Improved Target Acquisition System
JAGM .....	Joint Air-to-Ground Missile
JAMS.....	Joint Attack Munition Systems
JROC.....	Joint Requirements Oversight Council
JTAGS .....	Joint Tactical Ground Station
JUON .....	Joint Urgent Operational Needs
K.....	Thousand
Ka .....	Radar Band Designation (Millimeter Wave)
KG/kg.....	Kilogram
KM/km .....	Kilometer
KT.....	Knots

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

KW/kw .....	Kilowatt
LACM .....	Land Attack Cruise Missile
LAN .....	Local Area Network
LB/lb .....	Pounds
LBHF .....	Longbow HELLFIRE
LCMR .....	Lightweight Counter Mortar Radar
LCRs .....	Large Caliber Rockets
LLC .....	Limited Liability Company
LMMFC .....	Lockheed Martin Missiles and Fire Control
LOAL .....	Lock-On-After Launch
LOBL .....	Lock-On-Before Launch
LP/C .....	Launch Pod/Container
LPS .....	Lithium-Ion Power Source
LPWS .....	Land-based Phalanx Weapon System
LRF .....	Laser Range Finder
LRIP .....	Low Rate Initial Production

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

LS .....	Launching Station
LSS .....	Launch Support System
LTA .....	Launch Tube Assembly
LTPO .....	Lower Tier Project Office
LWL .....	Light Weight Launcher
M .....	Mile
M .....	Million
MAC .....	Metal Augmented Charge
MANPADS .....	Man-Portable Air Defense System
MC .....	Mission Command
MDAP .....	Major Defense Acquisition Program
MDD .....	Materiel Development Decision
MDSS .....	Missile Defense & Space Systems
MEFP .....	Multiple Explosively Formed Penetrator
MEMS .....	Micro Electro Mechanical System
MFD .....	Multifunctional Display

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

MFOM .....	MLRS Family of Munitions
MFRFS.....	Multi-Function Radio Frequency System
MFSB.....	Multi-Functional Support Brigade
MIL-STD .....	Military Standard
MLRS .....	Multiple Launch Rocket System
MM/mm.....	Millimeter
MMS.....	Mobile Mooring Station
MMW .....	Millimeter Wave
MOD .....	Modification
MOUT.....	Military Operations on Urban Terrain
MS .....	Milestone
MS .....	Missiles and Space
MSE .....	Missile Segment Enhancement
MSR .....	Missile Simulation Round
N/A .....	Not Applicable

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

NAMMO .....	Norwegian Ammunition Company
NDI .....	Non-Developmental Item
O&S .....	Operations and Support
OCONUS.....	Outside Continental United States
ODS .....	Operation Desert Storm
OEF.....	Operation Enduring Freedom
OIF .....	Operation Iraqi Freedom
OND.....	Operation New Dawn
ONS .....	Operational Needs Statement
ORD .....	Operational Requirements Document
OSD .....	Office of the Secretary of Defense
OTH .....	Over-the-Horizon
P&F.....	Plug and Fight
PAC-2.....	PATRIOT Advanced Capability-2
PAC-3.....	PATRIOT Advanced Capability-3
PADS.....	Position Altitude Determination Subsystem

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

PD .....	Product Director
PEO .....	Program Executive Office/Program Executive Officer
PEO MS .....	Program Executive Office Missiles and Space
PFRMS .....	Precision Fires Rocket and Missile Systems
PM .....	Program Manager/Project Manager/Product Manager
POI .....	Point of Impact
POL.....	Petroleum, Oil and Lubricants
PoR.....	Program of Record
Q .....	Quarter
QRU .....	Quick Reaction Unitary
RAM .....	Rocket, Artillery, Mortar
RF.....	Radio Frequency
RMP .....	Reprogrammable Microprocessor
ROM.....	Refuel On the Move
RP.....	Red Phosphorus
RMS .....	Rocket Management System

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

RS.....	Radar Set
S&W.....	Sense and Warn
SAL.....	Semi-Active Laser
SBCT.....	Stryker Brigade Combat Team
SBIRS.....	Space Based Infrared System
SCLU.....	Simulated Command Launch Unit
SEC/sec.....	Second
SDD.....	System Development and Demonstration
SDF.....	Self-Destruct Fuse
SMT.....	Surface Moving Targets
SOCOM.....	Special Operations Command
SOF.....	Special Operations Forces
SoS.....	System of Systems
STC.....	Slew-to-Cue
SuR.....	Surveillance Radar

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

SuS .....	Surveillance System
TacFC .....	Tactical Fire Control
TACMS .....	Tactical Missile System
TAS .....	Target Acquisition Subsystem
TBD .....	To Be Determined
TBM .....	Tactical Ballistic Missile
TC .....	Type Classified
TIC .....	Troops in Contact
TOW .....	Tube-launched, Optically-tracked, Wire-guided
TRS.....	Thales-Raytheon Systems
TU .....	Traversing Unit
TVM .....	Track-via-Missile
UAS.....	Unmanned Aerial System
UAV .....	Unmanned Aerial Vehicle
UH .....	Utility Helicopter

**ABBREVIATIONS & ACRONYMS (CONTINUED)**

U.S.....	United States
USF-I .....	U.S. Forces-Iraq
UXO .....	Unexploded Ordnance
WDU .....	Warhead Dispensing Unit
WP.....	White Phosphorous
WRAP.....	Warfighter Rapid Acquisition Program
w/sr .....	watts per steradian
WTU .....	Warhead Training Unit

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# PROGRAM EXECUTIVE OFFICE MISSILES AND SPACE



| ANY WARFIGHTER - ANYWHERE - ALL THE TIME |