

# ***Our Army at War, Relevant and Ready***



**United States Army  
Weapon Systems 2004**



## To The Reader:

As this handbook goes to the press, the Army today—Active and Reserve Components—is fully committed, with more than 320,000 Soldiers deployed in some 120 countries around the globe, of which more than 160,000 are in Iraq, Afghanistan, and Kuwait.

The Army is simultaneously providing ready, relevant, responsive, and dominant land power to the Joint Force, aggressively pushing ahead with transformation from Current Force to Future Force, and fulfilling its nonnegotiable contract with the American people to fight and win our Nation's wars. The Army's transformation has already produced specific and concrete results, and the accomplishments of the Army in these battles and missions have validated the importance of previous investments in modernizing and recapitalizing the force. Much must be accomplished in the next two decades to ensure the Army's unquestionable agility and dominance in the face of new and changing threats.

The systems described in the following pages represent investments in the present and the future. Many—if not the majority—of these systems are in active use today, while others point to the future. We hope that you find this handbook a valuable and informative resource. Please provide us feedback so we may improve this handbook. We have a short survey for you to complete at <https://webportal.saalt.army.mil>.



A handwritten signature in black ink that reads "Claude M. Bolton, Jr." with a stylized flourish at the end.

**Claude M. Bolton, Jr.**

Assistant Secretary of the Army  
(Acquisition, Logistics and Technology)



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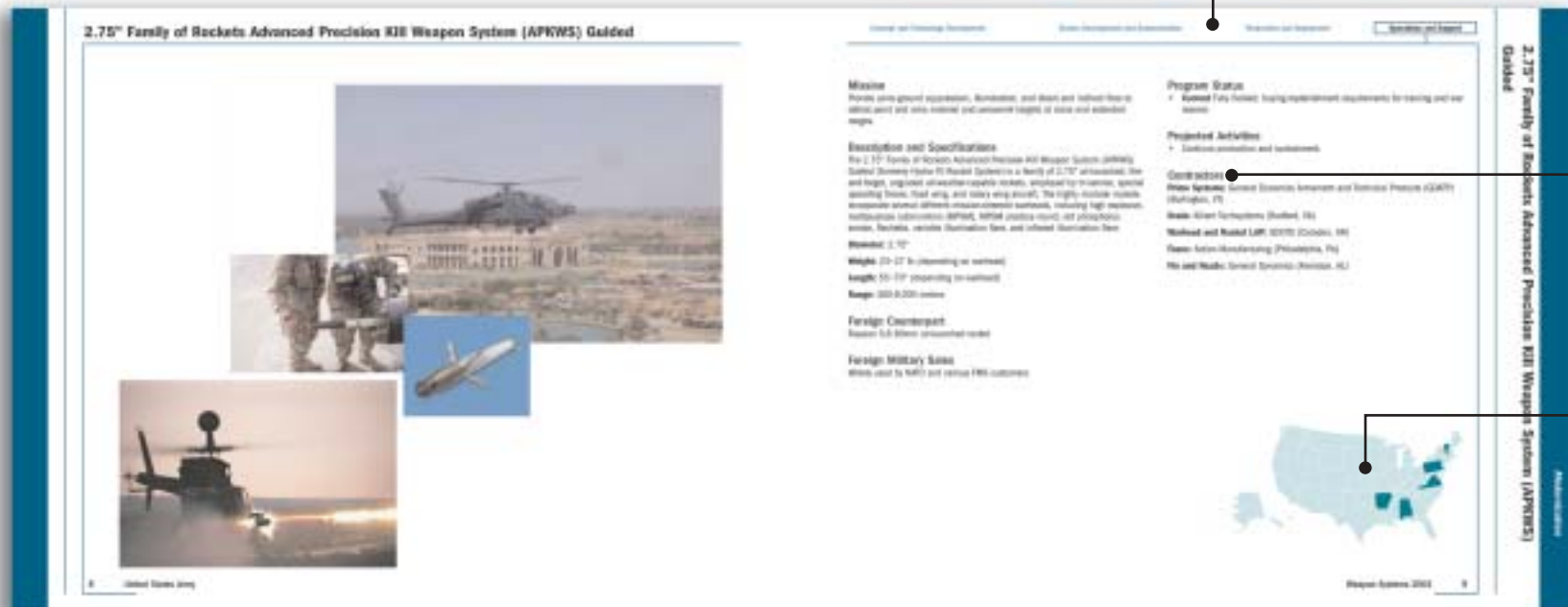
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# How to Use This Book



Each system's **Acquisition Phase** is highlighted. Terms are explained in the glossary.

The **US Outline** map highlights those states where the top five contractors develop the components of the program.

The top five **Contractors**, in terms of value of the program, are listed with the localities in which the program is executed. Generally, the prime contractor is listed first.





## Introduction: Relevant and Ready Power to Protect the United States

The United States Army is fully committed as part of the joint team abroad and at home in fighting the nation's wars and preserving its security. More than 320,000 Soldiers are deployed in some 120 countries around the globe. Almost 160,000 are in Iraq, Afghanistan, and Kuwait, most of whom are directly engaged not only in securing and building a new and stable democracy in Iraq but also in the global war on terrorism. In addition, tens of thousands of other Soldiers are deployed in Korea, Bosnia, and Kosovo, along with additional thousands actively engaged in domestic security at home.

The United States Army stands ready to fulfill all assigned missions, even as it continues to transform itself into a force that can field new capabilities and be an even more ready and responsive member of the Joint Force—today and in the future. The challenge to adapt and change while simultaneously fighting the nation's wars and confronting our enemies is daunting, but it is one that the Army accepts and is intent on achieving.

The security environment the United States faces in next two decades will contain a perplexing array of challenges. Expanding webs of economic and information architectures may allow some regional powers to emerge with considerable influence. Regional power structures are likely to be altered by regional conflicts, civil wars, and transnational actors. New global actors may emerge upon the world scene. Emerging powers may form alliances in an attempt to limit or hinder the global influence of the United States. High population growth, cultural, ethnic and religious factors, coupled with increased migration, will cause potential unrest and increased pressure for scarce resources. Increasing globalization, the spread of transnational business, and technology in the form of widely available, advanced systems that are very user-friendly could alter power relationships within regions and create an intensified globalization process. It is almost a given that during this period, state or non-state actors will employ or threaten violent force as a means to pursue their interests. That violence will not be limited to the interests of the United States or facilities abroad, but may also occur in the United States, as September 11, 2001 demonstrated.

### The Army's Role in National Security and Defense Strategies

In September 2002 the White House published a new National Security Strategy to serve as the foundation for future United States actions and responses. This new strategy specifically emphasized that the defense of the United States is the military's highest priority. It also introduced a new shift in emphasis on preemption and preventive uses of force in response to the catastrophic threats from terrorist attacks. Additionally, it stressed the need for transforming the military to overcome the new operational challenges and to provide the President with a wider range of capabilities and options to discourage and defeat any enemy. The Army's plans and transformational efforts, as well as the plans and efforts of sister Services, will be measured in terms of fulfilling these strategic imperatives.

In response to the demands of the new strategic environment and subsequent guidance from the National Security Strategy, a new Defense Strategy has emerged—first previewed in the Quadrennial Defense Review in 2001—that directs the Services to transform to meet future challenges and to preserve military preeminence. This strategy identifies four major mission areas to guide the Services and serve as a benchmark to guide respective force planning. These include missions to:

- Defend the United States (enduring first priority)
- Deter aggression and coercion forward in critical regions (Europe, Northeast Asia, the East Asian littoral, and the Middle East/Southwest Asia)
- Swiftly defeat aggression in two overlapping major conflicts while preserving for the President the option to call for a decisive victory in one of those conflicts—including the possibility of regime change or occupation
- Conduct a limited number of smaller-scale contingency operations.

Providing the necessary capabilities to fulfill these missions guides the Army's efforts, but also constrains the Army's ability to simultaneously transform rapidly.



Balancing these objectives—for fulfilling near-term missions and longer-term change—is both a constant challenge and an essential requirement for the Army.

In addition to identifying four mission areas, the Defense Strategy also includes four broad policy goals—Assure, Dissuade, Deter, Defeat—and six critical operational goals to focus respective Service transformation efforts. These six goals encompass the following:

- Protecting the U.S. homeland and our bases overseas
- Projecting and sustaining power in distant theaters
- Denying our enemies sanctuary
- Protecting our space capabilities from enemy attacks
- Using information technology to link U.S. forces
- Protecting our information networks from attack.

The Army's comprehensive plan to transform itself has already set in motion specific and concrete support for achieving these goals by ensuring the Army has the requisite capabilities to provide relevant, responsive, and dominant land power to the Joint Force. Through the continuous support and upgrade of the Current Force as well as the development of the evolving Future Force, the Army will provide significant support to accomplish these goals by preserving key existing capabilities, such as that for forced-entry and tactical assault, and adding major improvements that will capitalize on new technologies to enhance the overall effectiveness of the force, today and into the future.

## A Critical Member of the Joint Force

The Army's decision to transform itself into a more responsive and capable force reflects an appreciation of an altered and rapidly changing strategic environment. The end of the Cold War had already rearranged the broad shape of the requirements facing the U.S. military, and subsequent trends and events reinforced the need for substantive change. This new environment also included the realization of a revolution in information technology that presented an opportunity to adapt organizations and equipment to meet the challenges of the 21st century. While the recognition of this need for change was acknowledged in recent years, the dramatic events that occurred in late 2001 and in subsequent military operations have vividly reinforced the nature of the new strategic environment and the associated urgency for effective and innovative responses now and in the future. The war on terrorism, which has been fought globally by U.S. and allied forces, is a current reality as well as a future challenge for the Army and other members of the joint team. The nation and its military forces are indeed at war and engaged in a demanding and vitally important endeavor. This environmental reality influences all Army efforts regarding preservation of essential readiness for the Current

Force and transformation to the Future Force.

Considerable lessons have been learned in Operations Enduring Freedom and Iraqi Freedom, which have been major undertakings by the United States and have involved a significant commitment of Army forces. These operations have demonstrated the critical importance of effective joint operations and the value of highly trained and balanced forces. The Army's Special Operations Forces (Rangers, Special Forces, Special Operations Aviation, Psychological Operations, and Civil Affairs units) played a major role in Operation Iraqi Freedom, just as they had in Afghanistan the year before. In both operations there was a particularly effective fusion of these unique capabilities with those of joint conventional forces. In addition, the array of conventional Army forces all combined to form key elements of the Joint Force in Iraq in March-April 2003.



In recognition of the expanded need for effective jointness, the Joint Staff has recently initiated a new system—the Joint Capabilities Integration and Development System (JCIDS)—to increase oversight of emerging new capabilities and ensure they will serve common joint operating goals. The Army is fully committed to this approach and will work diligently to harmonize the goals and results of internal Army transformation with the requirements of joint operations in the future. The Army's mission remains providing the most capable land power to the Joint Force and the supported Combatant Commanders, and this involves a commitment to readiness and jointness today and well into the future. In addition, the Army also continues to train and equip its Soldiers and grow leaders who will embody a joint, expeditionary mindset and enable the campaign-quality Army, which will remain a critical member of the joint team of forces.

To successfully prosecute the global war on terrorism and ensure our nation's security, the Army must provide the Joint Force with relevant and ready capabilities and forces to support the National Security and Defense Strategies—a campaign-quality Army with a joint and expeditionary mindset. The Army provides the Joint Force with the campaign-quality combat, combat support, and combat service support capabilities necessary to conduct sustained land warfare; this is our unique contribution to the joint team and it will be maintained. The challenge we must address is how to transform our organizations, processes, doctrine, and culture so that we are better able to provide this contribution to the Joint Force in a more prompt and rapid manner. True jointness in the future will require not only better interoperability in systems, but also an enhanced ability for full and mutual support among the Services.

A joint and expeditionary mindset recognizes that we are an Army at war, engaged in ongoing operations, and ready to rapidly respond to the next crisis as it evolves. It is an attitude and spirit—infused across all Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities activities—that embraces a forward leaning, modular, joint interdependent, and capabilities-based Army led by aggressive, intelligent, and empowered Soldiers who recognize opportunities and confidently apply the appropriate capabilities of the Joint Force in support of the Combatant Commander.

## The Current Force

The Current Force is the operational Army of today; its mission is to provide needed land power capabilities to the Joint Force Commander for use across the spectrum of military operations. It is this force that is carrying out the vital missions in Iraq and Afghanistan and other key locations around the world. The accomplishments of the Army in these battles and missions have validated the importance of previous investments in modernizing and recapitalizing the force as well as the benefit of inserting the emerging new technologies found in such equipment as unmanned aerial vehicles, friendly force tracking systems, precision munitions, and key Soldier systems such as night vision devices and body armor.

Preservation of an essential balance between enduring and critical current capabilities and promising new capabilities has never been more important than in the midst of these demanding missions. It is this force that must be ready and able to respond to the orders of the President and Secretary of Defense and support the Combatant Commanders as part of the Joint Force. As such, it is imperative that the Army continues to devote those resources necessary to support and equip the Soldiers in today's Army to ensure their success and safety in all possible missions.



Modernization and recapitalization of the Current Force is at the heart of addressing readiness. Army transformation timelines clearly show elements of the Current Force remaining within the Army's force structure for the next 25-30 years. Within that context, the Army will continue to rely on the Current Force to fight and win conflicts well into the fielding of the Future Force, which will begin by the end of this decade. For that reason, sufficient resources must be devoted toward the recapitalization and limited modernization of the Current Force while the Army successfully transforms itself.

An important element of the Current Force is the requirement for an offensive or counteroffensive capability for use in a major conflict. Assembling the ground force required for decisive operations anywhere in the world calls for a three-division corps, with an armored cavalry regiment. To meet this need, the Army is selectively modernizing and recapitalizing portions of III Corps including the 3rd Armored Cavalry Regiment and two Active Duty heavy divisions: the 1st Cavalry Division and the 4th Infantry Division. Also included are those Echelons Above Division (EAD) units assigned to III Corps, including Reserve Component units.

The insertion of new information technologies and better knowledge management systems will provide Current Force organizations the warfighting capability to see the battlefield, anticipate requirements and handle transitions that will characterize the Future Force. Therefore, with the upgrade of the Current Force, the Army's overall modernization strategy begins to develop future leaders who can employ the Future Force in ways that maximize its potential.

The forward-deployed and early deploying contingency forces will be recapitalized and modernized with the insertion of new technologies as needed to implement the National Security Strategy. Reserve Component forces will maintain capabilities compatible with the units they support through the selective cascading of equipment from the Active Component. Limitations in the Current Force recapitalization and modernization effort, resulting from difficult decisions made to fully fund Future and Stryker Force programs, may delay the modernization of the Reserve Component forces that rely on cascading. This delay, however, is a necessary risk required in order to meet the Army's objective of a future transformed force to support overall DoD transformation goals while still preserving and upgrading the readiness of the Current Force.

## Stryker Brigade Combat Teams

Establishing the Stryker Force fills a strategic near-term operational requirement for current Army forces. Stryker Force units are designed to be operationally effective at both the low end of the spectrum—peacekeeping, security-building, and smaller scale contingencies—as well as at the high end of the spectrum—major combat operations. In addition, they will serve as an indispensable vanguard for





the Future Force by validating operational and organizational concepts, training and leader development initiatives, and deployment scenarios.

Stryker Brigade Combat Teams (SBCTs) are the Army's first truly network-centric units, and provide Combatant Commanders a rapid response force that conducts distributed and dispersed operations, especially suited for operations in complex and urban terrain, with significant enhancements in combat power empowered by situational awareness. A unique asset, Stryker Brigades can follow forced entry operations conducted by Special Operations Forces and/or the 82d Airborne Division, with a mobile, lethal, and survivable early entry force. Prior to the formation of SBCTs, this was not possible; the Army's follow-on forces were either additional light forces that lacked lethality, tactical mobility, and protection; or heavy mechanized and armored forces which were not rapidly deployable, required a large logistics tail, and faced potential mobility challenges once deployed in environments where bridges could not handle heavier vehicles, as experienced in Kosovo.

**SBCTs and the Future Force.** Transforming the Current Force to the Future Force introduces an operational risk associated with unit conversion, training, and attainment of a Future Force operational capability. The enhanced warfighting capabilities of SBCTs greatly reduce that risk by providing a capability that is optimized for asymmetric crises we will most likely face this decade. SBCTs also provide the Army with other considerable benefits that will assist in the transformation to a Future Force design.

First, converting units to an SBCT design has required the Army to develop and produce advanced warfighting doctrine that fully supports the rapid, distributed, and dispersed knowledge-based operational qualities of the SBCT. These qualities

will be magnified in the Future Force Unit of Action (UA) and will require the development of additional supporting doctrine. By producing SBCT doctrine now, the Army has successfully laid a strong foundation for future doctrinal work.

Second, the application of SBCT doctrine at unit level has led SBCT forces to develop new tactics, techniques, and procedures that are unlike those associated with the Army's Current Force. An example of this is found in reachback operations, where Soldiers assigned to SBCTs use their joint information network, enabled by links to higher headquarters, to obtain and access required resources from home station or outside the operational area. This capability will continue to evolve and refine as the Army moves toward a Future Force capability.

Third, the combined effects of rapid system procurement (Stryker armored vehicles), accelerated development of advanced warfighting doctrine and associated tactics, techniques, and procedures, distributed and dispersed operations enabled by networked capabilities, all integrated into a combined arms design down to company level, has caused a profound and needed cultural shift within the Army. This cultural change is a critical first step in the development of Soldiers and leaders who will fight in Future Force units designed to excel in the nonlinear, asymmetric battlefield of the future. Although SBCTs are an important bridge to the Future Force, and will assist in Future Force design and doctrine, they do not possess Future Force qualities.

## The Future Force: Enhanced Capabilities for the Joint Force Tomorrow

The Future Force is the Army's future full-spectrum force—organized, manned, equipped, and trained to be more strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable across the entire spectrum of military operations from major combat operations through counterterrorism to homeland security. Future Force units will:

- See first, understand first, act first and finish decisively at the strategic, operational, and tactical levels of war
- Conduct operational maneuvers from strategic distances, and arrive at multiple points of entry, both improved and unimproved
- Arrive immediately capable of conducting simultaneous, distributed and continuous combined arms, air-ground operations, day and night, in open, close, complex, and all other terrain conditions throughout the battlespace
- Dominate land operations, providing the decisive complement to air, sea and space operations
- Create synergy within the Joint Task Forces by controlling the ground, where people and political authorities reside.

The presence of Future Force leaders and Soldiers, dispersed across the battlespace yet operationally integrated through an information network, provides the Joint Force Commander situational dominance in applying lethal and non-lethal effects with unprecedented precision across the spectrum of military operations.

Information superiority is a key enabler for achieving the Army's transformation goals and its modernization into the Future Force. Army Knowledge Management (AKM) is the Army's strategy to achieve this objective by transforming itself into a network-centric, knowledge-based force. The technologies that support this sort of warfare must be augmented by appropriate changes in doctrine, organization, training, leadership, and education to exploit the power of knowledge management and to achieve a capabilities-based Army. This effort is an integral part of Army transformation, and AKM will vastly improve information superiority for our warfighters and business stewards—in the battlespace, in our organizations, and in our mission processes supporting logistics; intelligence, surveillance and reconnaissance; personnel management; medical services; and the training and education of Army personnel worldwide. The Army has recently activated the Network Enterprise Technology Command (NETCOM) as the Army's single authority to operate, manage, and develop the Army Knowledge Enterprise (AKE). NETCOM is now implementing the Army's enterprise concept for voice, data, and video networks, improving network capacity, performance, and security across the AKE. Accordingly, NETCOM has assumed technical control of all Army networks including those of the Army National Guard and Army Reserve.

### **Future Force units will make significant contributions at all three levels of warfare: strategic, operational and tactical.**

At the strategic level, Future Force units will continue to meet the Army's nonnegotiable contract with the American people to fight and win our nation's wars. Future Force units will also continue to provide the Army's unique contribution to national security: sustained land dominance across the range of military operations and spectrum of conflict. Army Units of Action (UA) will form the tactical warfighting echelons of the Future Force, filling the same role as today's brigades and lower echelons.

At the operational level, the Army provides headquarters that act as integrating agents within joint, interagency and multinational teams. Designated



Future Force headquarters and major commands (or Units of Employment at what is now equivalent to corps and division levels) will act as Joint Task Force Headquarters, Joint Force Land Component Commands, and/or Army Forces command headquarters. Army headquarters at all levels will also be integral parts of any Joint Task Force that may be formed by the respective Combatant Commanders to provide seamless joint command and control. For land campaigning, the Future Force will provide operational-level decision and information superiority to Joint Force Commanders, enabling them to gain and maintain operational initiative. Information superiority will be gained through operational level intelligence, surveillance, and reconnaissance; information management; and information operations. Information superiority enables Joint Force Commanders to see first, understand first, and act first at the operational level when coupled with Future Force land campaign planning expertise.

At the tactical level, the Army's ability to dominate the short-sword warfight—upon which operational and strategic success is built—is essential for Joint Force success on land. Future Force units will be optimized to win on the offensive, to initiate combat on their terms, to gain and retain the initiative, build momentum quickly and win decisively. They will be capable of mastering the transitions in warfare—from fort to foxhole, from offense to defense, from warfighting to support operations—to maintain operational momentum and tempo. Future Force units will see first, understand first, act first, and finish decisively as the means to tactical success. Operations will be characterized by developing situations out of contact; maneuvering to positions of advantage; and engaging enemy forces beyond the range of their weapons; destroying them with precision fires and, as required, by tactical assault at times and places of our choosing. Commanders will accomplish this by maneuvering distributed and dispersed tactical formations equipped with Future Combat Systems and Future Force Warrior for the dismounted Soldier and his leader, and enabled by networked battle command capabilities for common situational awareness.

### **Conclusion**

The first priority of the Army is clear: we are at war. Our nation, the Joint Force, and our Army are engaged in one of the most challenging periods in our history. Adapting our forces to meet the challenges of the global war on terrorism, as well as other, evolving challenges, will require a capabilities-based, modular, flexible and rapidly employable Joint-Army team, capable of dominating any adversary and controlling any situation across the full range of military operations. This United States Army Weapon Systems 2004 handbook provides a view into the investments being made today—and that must be made tomorrow—in order to provide our Soldiers with the equipment they need now in their efforts to fulfill their responsibility to the nation, and those that will be needed to bridge the Current and Future Forces, for the challenges that face us in the future.

# Modernization





Modernization is a continuous process of integrating new Doctrine, Organizations, Training, Materiel, Leader development, Personnel, and Facilities (DOTMLPF). The goal is to develop and field warfighting capabilities for the Army to provide to the Joint Force in executing the National Security and Defense Strategies and all assigned missions. Modernization activities are facilitated and optimized by sound modernization and investment strategies that are specifically designed to implement the Army's transformation process.

The overall Army Modernization Strategy remains focused directly on providing those necessary capabilities for the Current Force, which remains the foundation of the Army's readiness to fight and win decisively against any threat, while simultaneously supporting a transformation process to ensure that those capabilities essential for the future are being developed.

The investment strategy in support of modernization describes the process used in deciding how to allocate monies across competing priorities in order to obtain the best capability for each dollar spent.

In support of the overall goal of maintaining and enhancing current readiness and transformation into a more responsive and capable force for the future, the Army has developed a coordinated and comprehensive strategy of integrating all its efforts and programs across DOTMLPF toward the goal of equipping and organizing forces. This strategy can be described best as one of “balanced modernization,” which seeks to develop and field combat-capable units through an appropriate mix of selective procurement and fielding of new equipment (modernization); rebuilding and upgrading of key existing equipment (recapitalization); and preserving needed elements of current equipment (maintenance). Modernization programs are placed into three basic categories and are then sub-categorized based upon the force they are fielded to support.

These Modernization Strategy categories are:

- Modernization - the development and/or procurement of new systems with improved warfighting capabilities.
- Recapitalization - the rebuild and selected upgrade of currently fielded systems to ensure operational readiness and a zero-time/zero-mile system.
- Maintenance - the repair or replacement of end items, parts, assemblies, and sub-assemblies that wear out or break.

As an instrument for the most efficient implementation of these strategies, the Army has an important process—Unit Set Fielding—which is designed to ensure achievement of the greatest combat capability across the force throughout the overall modernization process while maintaining the highest level of readiness and the lowest feasible expenditure of resources. The Army established the Unit Set Fielding (USF) process in 2001. This process expanded on the single- system modernization policies and procedures by focusing on building unit combat capability packages of equipment. USF integrates and synchronizes resourcing, planning, preparation and fielding of the package to a designated unit during a single modernization window.



## 2.75" Family of Rockets Advanced Precision Kill Weapon System (APKWS) Guided



## Mission

Provide air-to-ground suppression, illumination, and direct and indirect fires to defeat point and area materiel and personnel targets at close and extended ranges.

## Description and Specifications

The 2.75" Family of Rockets Advanced Precision Kill Weapon System (APKWS) Guided (formerly Hydra-70 Rocket System) is a family of 2.75" air-launched, fire-and-forget, unguided all-weather-capable rockets, employed by tri-service, special operating forces, fixed wing, and rotary wing aircraft. The highly modular rockets incorporate several different mission-oriented warheads, including high explosive, multipurpose submunition (MPSM), MPSM practice round, red phosphorus smoke, flechette, variable illumination flare, and infrared illumination flare.

**Diameter:** 2.75"

**Weight:** 23–27 lb (depending on warhead)

**Length:** 55–70" (depending on warhead)

**Range:** 300–8,000 meters

## Foreign Counterpart

Russian S-8 80mm air-launched rocket

## Foreign Military Sales

Widely used by NATO and various FMS customers

## Program Status

- **Current** Fully fielded; buying replenishment requirements for training and war reserve.

## Projected Activities

- Continue production and sustainment.

## Contractors

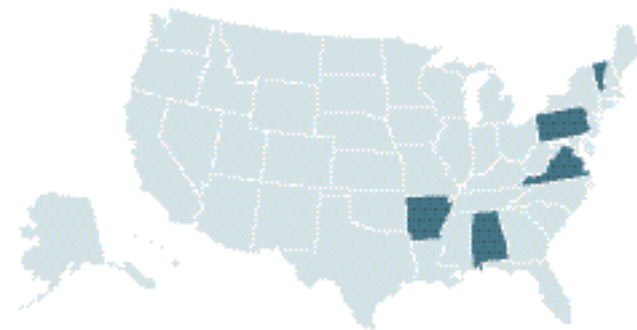
**Prime Systems:** General Dynamics Armament and Technical Products (GDATP) (Burlington, VT)

**Grain:** Alliant Techsystems (Radford, VA)

**Warhead and Rocket LAP:** GDOTS (Camden, AR)

**Fuzes:** Action Manufacturing (Philadelphia, PA)

**Fin and Nozzle:** General Dynamics (Anniston, AL)



## Advanced Field Artillery Tactical Data System (AFATDS)



## Mission

Provide automated fire support command, control and communications for Army, Navy, and Marine Corps including target-weapon pairing for optimum use of fire support assets and automated planning, coordination, and control of all fire support assets.

## Description and Specifications

The Advanced Field Artillery Tactical Data System (AFATDS) performs the attack analysis necessary to determine the optimal weapon-target pairing to provide maximum use of the fire support assets (field artillery, mortars, close air support, naval gunfire, attack helicopters, and offensive electronic warfare).

AFATDS will automatically implement detailed commander's guidance in the automation of operational planning, movement control, targeting, target value analysis, and fire support planning. This project is a replacement system for the Initial Fire Support Automated System, Battery Computer System, and Fire Direction System. AFATDS will interoperate with the other Army Battle Command Systems (ABCS); current and future Navy and Air Force command and control weapon systems; and the German, French, British, and Italian fire support systems.

AFATDS will perform the fire support command, control, and coordination requirements at all echelons of field artillery and maneuver, from echelons above corps to battery or platoon in support of all levels of conflict. The system is composed of common hardware/software employed in varying configurations at different operational facilities (or nodes) and unique system software interconnected by tactical communications in the form of a software-driven, automated network.

## Foreign Counterpart

France: Atlas; Germany: Adler; Italy: SIR; Norway: Odin; United Kingdom: Bates

## Foreign Military Sales

Egypt, Greece, Bahrain, Portugal, Turkey

## Program Status

- **3QFY02** AFATDS 6.3 Materiel release.
- **1QFY03** AFATDS 6.3.1 Materiel release.
- **2QFY04** AFATDS 6.3.2 Materiel release and fielding.

## Projected Activities

- **3QFY04** AFATDS 6.4 limited user test.
- **1QFY05** ABCS 6.4 system of systems test and materiel release.

## Contractors

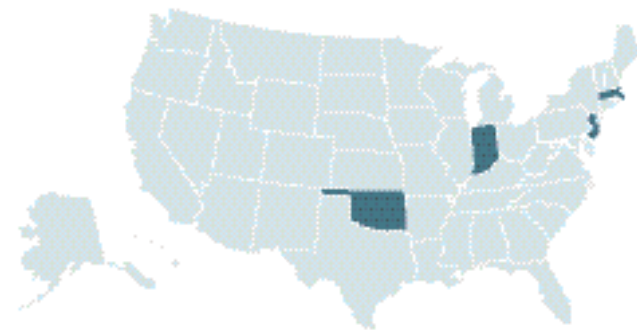
**Software:** Raytheon (Ft Wayne, IN)

**Hardware:** General Dynamics (Taunton, MA)

**Technical Support:** Computer Sciences Corporation (Tinton Falls, NJ)

**New Equipment Training:** Engineering Professional Services (Lawton, OK)

**Testing:** Titan Systems (Lawton, OK)





## Advanced Threat Infrared Countermeasures (ATIRCM)



## Mission

Provide missile warning and electronic countermeasures against infrared (IR) guided missiles.

## Description and Specifications

The AN/ALQ-212 Advanced Threat Infrared Countermeasures (ATIRCM) is a modular system consisting of the AN/AAR-57 Common Missile Warning System (CMWS), IR jam head, laser, control unit, improved countermeasure dispenser, and improved countermeasure munitions.

CMWS provides automatic, passive missile detection, threat declaration, crew warning, software reprogramming, false alarm suppression, and cues to other on-board systems, such as dispensers, which may be used for flare decoys. ATIRCM adds active, directional countermeasures via a laser, an arc lamp, and an improved countermeasures dispenser (ICMD).

As a modular system, the ATIRCM/CMWS can be installed in various configurations:

- With the CMWS only, to provide missile warning
- With the CMWS and the ICMD, to decoy/defeat threat missiles
- With the laser and arc-lamp jam head, to create a complete multi-response system to defeat the full threat array.

System weight: CMWS and ICMD only - 55.7 lb; with ATIRCM - 130.1 lb

Current plans include integration and deployment of selected configurations on MH-60, MH-47, AH-64, UH-60 and CH-47 platforms beginning in FY04 to Special Operations Aviation (SOA).

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **2QFY04** Low-rate initial production of ATIRCM/CMWS.
- **2QFY04** Special operations aviation CMWS first unit equipped.

## Projected Activities

- **2QFY05** ATIRCM/CMWS operational testing.
- **4QFY05** Full-rate production of ATIRCM/CMWS.
- **4QFY05** SOA ATIRCM/CMWS first unit equipped.

## Contractors

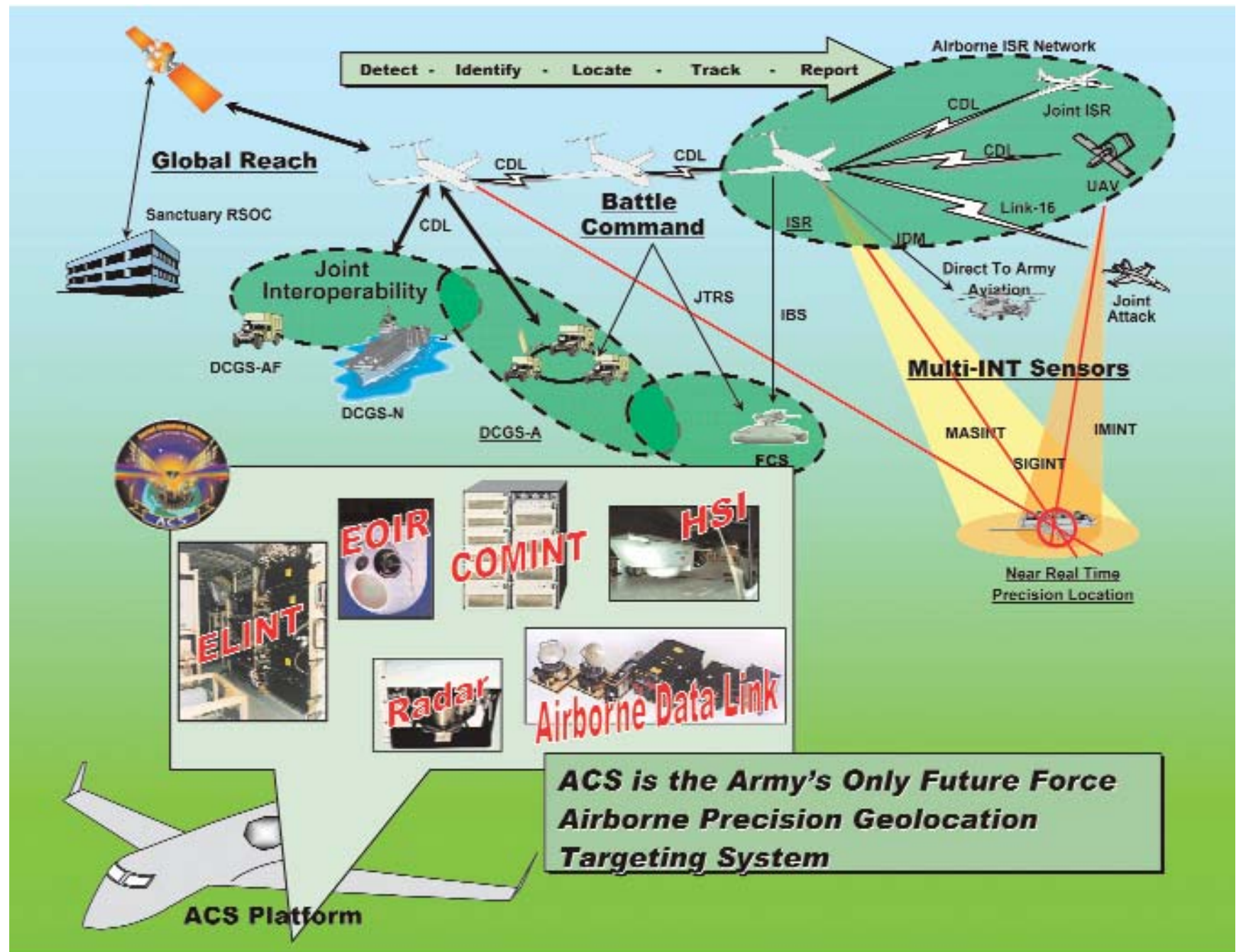
**ATIRCM/CMWS, ICMD:** BAE Systems (Nashua, NH; Austin, TX)

**Laser:** Northrop Grumman (Winter Haven, FL)

**Tracker:** Raytheon (Fullerton, CA)



## Aerial Common Sensor (ACS)





## Mission

Merge and enhance the sensor capabilities of current intelligence, surveillance, and reconnaissance (ISR) platforms (Airborne Reconnaissance Low and Guardrail Common Sensor) into a single, multi-intelligence, manned, airborne system to provide rapid and responsive ISR coverage to meet Army and Navy transformation goals.

## Description and Specifications

Aerial Common Sensor (ACS) is the Army-led, joint future force airborne ISR system that meets Army and Navy requirements for a worldwide, self-deployable asset capable of operation immediately upon arrival into theater. ACS provides distributed, wide area, persistent surveillance; multi-intelligence precision targeting; and uses the Distributed Common Ground System (DCGS) for the ground station component. Via robust sensor-to-shooter and reachback links, ACS provides commanders at every echelon tailored, multi-sensor intelligence required for dominant maneuver, precision engagement, and decision superiority throughout a non-linear framework and non-contiguous battlespace. On-board battle command and communications relay packages ensure uninterrupted, joint integrated command, control, communications, and intelligence (C3I). ACS will replace all five current Aerial Exploitation Battalions beginning in FY09. The Navy will replace the current EP-3 fleet with ACS beginning in 2012.

The ACS acquisition strategy is to leverage commercial and government off-the-shelf (COTS/GOTS) technologies into an open systems architecture reducing total ownership cost while meeting the future ISR needs of the Army and Navy. The ACS will:

- Provide a multi-intelligence—signals intelligence (SIGINT), imagery intelligence (IMINT), and measurement/measuring and signature intelligence (MASINT)—system to support warfighter requirements across the full spectrum of operations, from early/denied entry through crisis resolution.
- Provide critical intelligence and combat information to/from the unit of employment/unit of action and the component commander, via the DCGS-Army.
- Provide a critical precision SIGINT linkage into the Joint ISR Network.
- Be fully interoperable with joint and national collectors, ground processing facilities and dissemination systems, meeting transformational, joint net-centric situational awareness requirements.
- Utilize an open architecture, ensuring paced technology growth with Future Combat System (FCS) and against emerging threat capabilities.
- Provide a larger area of coverage supporting Future Force operational geometries and the greater lethality ranges of new weapons systems.

- Transform Army airborne ISR from a strategic-lift-intensive, maximum-deployment-time asset to a minimum-lift, minimal-deployment-time, global asset.
- Be mission tailorable and scalable, providing real-time sensor-to-shooter information “in the crew seat.”

## Foreign Counterpart

Numerous countries possess airborne electronic warfare systems, but none achieve the multi-INT, timeliness, assured support, and direction-finding (targeting) accuracy capabilities of ACS.

## Foreign Military Sales

None

## Program Status

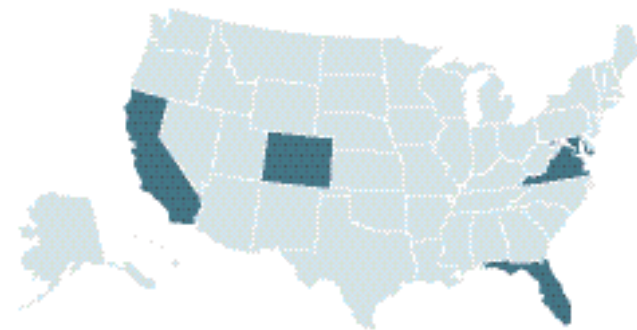
- **4QFY03** Completing concept and technology development phase.
- **2QFY04** Milestone B decision review.

## Projected Activities

- **3QFY04** Source selection/contract award.
- **3QFY04** Begin systems integration.

## Contractors

Lockheed Martin (Denver, CO); Northrop Grumman (Baltimore, MD; Melbourne, FL; McClellan, CA); Argon (Fairfax, VA)



## Air Warrior (AW)



Flotation Collar



Over Water Gear Carrier



Primary Survival Gear Carrier



Body Armor



Cooling Garment



## Mission

Improve the lethality, survivability, mobility and sustainment of Army aircrew in combat; integrate all aviation life support equipment (ALSE) and mission equipment into an aircrew ensemble that enhances aircrew cockpit synergy and aircraft mission capability.

## Description and Specifications

Previous development and application of ALSE resulted in a layered, non-integrated assemblage of protective/survival gear normally carried or worn by the aircrew member. Air Warrior (AW) is a new generation aircrew ensemble that provides advanced life support; ballistic protection; and nuclear, biological, and chemical (NBC) protection in rapidly tailorable, mission-configurable modules. AW addresses interoperability and has leveraged several joint service technology efforts. The system consists of components effectively integrated to maximize safe aircraft operation and human performance while not encumbering the aircrew. These components include the microclimate cooling system, NBC protection, body armor, survival items for escape and evasion, overwater survival items, digital connectivity and situational awareness, and an interface to the aircraft platform.

Improvements to the AW system are being provided via a “block” approach (a three-phased, evolutionary acquisition program) to solve equipment shortcomings. The AW Modular Integrated Helmet Display System (MIHDS) will be a Block 3 Advanced Capabilities program. The AW system is the key ingredient to closing the performance gap that exists today between the aircrew and the aircraft. AW is answering the aviation warfighter challenges of today and tomorrow, by developing affordable, responsive, deployable, versatile, lethal, survivable, and sustainable aircrew equipment.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

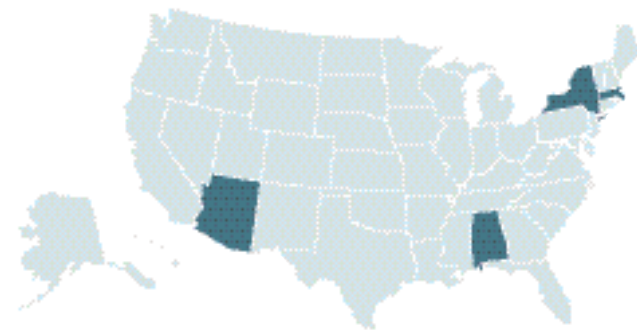
- **1-3QFY03** Key Block 2 technologies, Electronic Data Manager and Aircraft Wireless Intercom System, began system development and demonstration.
- **2QFY03** Microclimatic Cooling System (MCS) production contract awarded.
- **3QFY03** Milestone C full-rate production decision.
- **4QFY03** Clothing and Individual Equipment (CIE) production contract awarded.
- **2QFY04** Block 1 fielding began.

## Projected Activities

- **FY04** Key Block 2 technologies, Electronic Data Manager and Aircraft Wireless Intercom System, system development and demonstration continues.
- **3QFY04** Block 3 prime integrator contract award.

## Contractors

Carleton Technologies, Inc. (Orchard Park, NY); Simula (Phoenix, AZ); Raytheon (Huntsville, AL); Westwind (Huntsville, AL); Foster-Miller (Waltham, MA)





## Air/Missile Defense Planning and Control System (AMDPCS)



## Mission

Provide a fire control system; common air and missile defense (AMD) planning; battlespace situational awareness; and joint, interoperable battle management/command, control, communications, computers, and intelligence capability.

## Description and Specifications

The Air/Missile Defense Planning and Control System (AMDPCS) is the backbone of Army air defense. It consists of sheltered systems with integrated communication equipment that provide Air Defense Artillery (ADA) brigades with a fire control system for monitoring and controlling engagement operations by subordinate battalions via the Air Defense System Integrator (ADSI). AMDPCS provides a common air and missile defense staff planning and battlespace situational awareness tool to achieve a common tactical and operational air picture via the Air and Missile Defense Workstation (AMDWS). The AMDWS is fielded to AMD units at all echelons of command: battery through theater. The AMDPCS provides interoperability for Army AMD forces with the standard Army Battle Command Systems (ABCS), providing the air situation input to the Common Operational Picture. The AMDWS also provides interoperability with Joint Theater Air and Missile Defense (JTAMD) forces. AMDPCS enables active, passive, and attack operations coordination with the joint forces.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **3QFY97** Approved operational requirements document and designated as acquisition category III program.
- **FY99** Deployment of 1st ADA brigade (partial), AAMDC update, ADA school update.
- **3QFY00** AMDWS V1.1 formal delivery.
- **1QFY01** First delivery to Interim Brigade Combat Team (IBCT).
- **4QFY01** ADSI V11 certified for tactical digital information link (TADIL) A, TADIL B, and TADIL J message set implementation.
- **3QFY02** Deployment of 263d SCARNG AAMDC tactical configuration.
- **3QFY03** Second delivery to Stryker Brigade Combat Team (SBCT-2).
- **3QFY03** Complete force fielding of AMDWS V1.1c with interoperability patch.

- **4QFY03** AMDWS V1.1 Materiel release.
- **1QFY04** ADSI V12 Service level test.
- **1QFY04** AMDWS V1.1E fielding to OIF-2 units.
- **2QFY04** Force fielding of AMDWS V1.1E.
- **2QFY04** 3-265 Florida Army National Guard (ARNG) new equipment training.

## Projected Activities

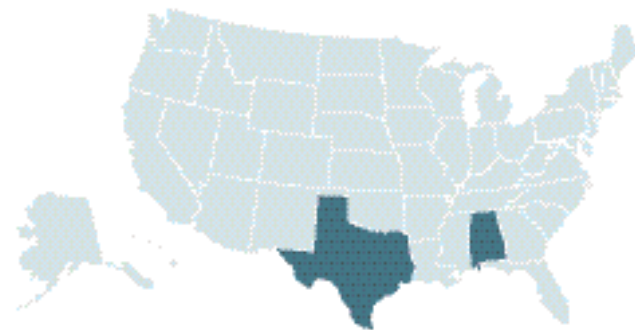
- **3QFY04** AMDWS V6.4 Delivery to Central Technical Support Facility.
- **3QFY04** SBCT-3 delivery.
- **4QFY04** Fielding to 2-263d South Carolina ARNG.
- **1QFY05** Materiel release of AMDWS V6.4 and force fielding "Good Enough."
- **3QFY05** Milestone C decision.
- **4QFY05** 31st Brigade AMDPCS fielding.

## Contractors

**Sheltered Systems:** Northrop Grumman Mission Systems (Huntsville, AL); Brown International (Huntsville, AL)

**AMDWS Software:** Northrop Grumman Mission Systems (Huntsville, AL)

**ADSI Software and Hardware:** APC (Austin, TX)







## Mission

Detect, locate, and report threat activities using a variety of imagery, communications-intercept, and moving-target-indicator sensor payloads.

## Description and Specifications

The Airborne Reconnaissance Low (ARL) is a self-deploying, multi-function, day/night, all-weather, reconnaissance, intelligence, echelons-above-corps asset. It consists of a modified DeHavilland DHC-7 fixed-wing aircraft equipped with communications intelligence (COMINT), imagery intelligence (IMINT), and synthetic aperture radar/moving target indicator (SAR/MTI) mission payloads. The payloads are controlled and operated via on-board open-architecture, multi-function workstations.

Intelligence collected on the ARL can be analyzed, recorded, and disseminated on the aircraft workstations in real time and/or stored on board for post-mission processing. During multi-aircraft missions, data can be shared between cooperating aircraft via ultra high frequency (UHF) air-to-air data links allowing multi-platform COMINT geolocation operations. The ARL system includes a variety of communications subsystems to support near-real-time dissemination of intelligence and dynamic retasking of the aircraft. There are currently two configurations of the ARL system:

- The ARL-COMINT (ARL-C) configuration with a conventional communications intercept and direction finding (location) payload.
- The ARL-Multifunction (ARL-M) configuration equipped with a combination of IMINT, COMINT, and SAR/MTI payload.

## Foreign Counterpart

Numerous countries possess airborne signals intelligence (SIGINT) and/or IMINT systems, but none provide the robust multi-intelligence capability of ARL.

## Foreign Military Sales

None

## Program Status

- Eight ARL systems have been fielded to date (C1, C2, M1, M2, M3, M4, M5, I)\*.
- Two ARL-Ms and both ARL-Cs are stationed at Ft Bliss, TX, and primarily support Southern Command requirements; three ARL-Ms provide support to PACOM (Korea).

\*ARL-I (IMINT-only system) crashed in 4QFY99.

- Demonstrated hyperspectral imager applications and multi-INT data fusion capabilities.
- One ARL-M (#6) is currently in production, to be fielded in 3QFY04.

## Projected Activities

- **3QFY04** Field M6.
- **3QFY04** Government acceptance of M6.
- **3QFY04** Complete standardization of cockpit configurations on the two ARL-C platforms.
- **4QFY04** Install aircraft survivability equipment (ASE) upgrades on C1, C2, M4 and M5.
- **2QFY05** Install ASE upgrades on M1, M2, M3 and M6.
- **4QFY05** Field COMINT upgrades on M5 and M6.

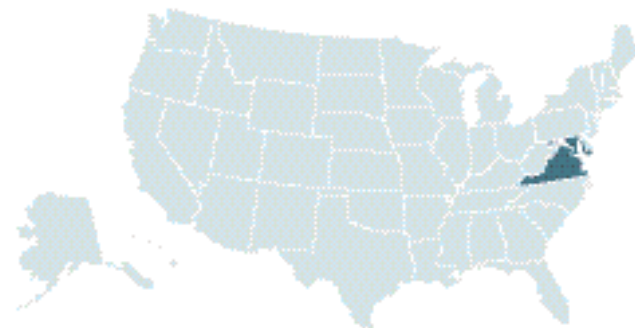
## Contractors

**Payload Integration:** Northrop Grumman (Belcamp, MD)

**Aircraft Survivability:** Litton Advanced Systems (Gaithersburg, MD)

**Engineering Support:** CACI (Berryville, VA)

**Aircraft Modifications:** Northrop Grumman (Hagerstown, MD)





## All Source Analysis System (ASAS)



**ASAS Remote Workstation**



**ACT Enclave**



**ASAS Light**



**ASAS Remote Workstation Training**



**Communications Control Set**

## Mission

Provide combat leaders the fused intelligence needed to view the battlefield and more effectively conduct the land battle from battalion to echelons above corps.

## Description and Specifications

The All Source Analysis System (ASAS) encompasses a family of systems that includes the compartmented all source workstation in the Analysis Control Element (ACE) found at division, corps, and echelons above corps; the collateral remote workstation (RWS) desktop and laptop configuration; ASAS-light, issued down to battalion level; the High Mobility Multipurpose Wheeled Vehicle (HMMWV)-mounted RWS with integrated communications Analysis Control Team-Enclave (ACT-E) at brigade level; and the Communications Control Set (CCS).

ASAS processes and analyzes all-source intelligence including non-structured threat data; automates intelligence preparation of the battlefield; produces correlated ground pictures; disseminates intelligence products; provides target nominations; manages intelligence and electronic warfare and intelligence, surveillance, and reconnaissance collection; provides counterintelligence and electronic warfare mission support; provides interim capabilities for intelligence fusion to Distributed Common Ground System-Army (DCGS-A); supports predictive intelligence analysis; and interoperates with Army Battle Command System (ABCS), joint, theater, and national sources. It supports all echelons and functions in all phases of military operations across the full spectrum of conflict. ASAS supports current operations and future planning.

ASAS receives and correlates information from strategic and tactical intelligence sensors and sources. It automates sensor-to-shooter linkage by providing target nominations directly to the Advanced Field Artillery Tactical Data System. A mission-critical system-of-systems, it is built upon the common hardware platform and is tactically deployable. It operates at compartmented top-secret security levels and fuses signals intelligence, imagery intelligence, counter-intelligence/human intelligence, measurement and signature intelligence, and open sources.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **3QFY03-2QFY04** Continued fielding Block II ASAS light and ACT-E.
- **3QFY03-2QFY04** Fielded the ASAS-light Version 6.3 to units deploying to Operation Iraqi Freedom.
- **1QFY04** Began applying CCS Modification Work Order (MWO) IV.

- **1QFY04-2QFY04** Develop ASAS-light capabilities to satisfy ABCS 6.4 "Good Enough" requirements.
- **1QFY04** Achieved enhanced joint interoperability between Global Command and Control System (I3) and ASAS-light.
- **3QFY03-2QFY04** Continued developing and began testing downsized Block II ACE.

## Projected Activities

- **3QFY04-2QFY05** Continue fielding ASAS Block II ASAS-light.
- **3QFY04** Begin applying ACT-E MWO to replace HCU-based RWS computers with Intelligence Fusion Server computers.
- **3QFY04-2QFY05** Continue applying CCS MWO IV.
- **3QFY04-2QFY05** Continue developing and testing downsized Block II ACE.
- **4QFY04** Provide interim capabilities for intelligence fusion to DCGS-A.

## Contractors

**Prime, SW Development for Analysis Control Element:** Lockheed Martin (Denver, CO)

**Hardware:** General Dynamics (Taunton, MA)

**SETA Support:** Sytex, Inc. (McLean, VA)

**SW Development for ASAS-Light:** Austin Information Systems (Austin, TX)

**Fielding/Maintenance Support:** MANTECH (Killeen, TX)





## Mission

Provide the National Guard Weapons of Mass Destruction – Civil Support Teams (WMD-CST) with a mobile laboratory capability that enables the CST commanders to conduct presumptive analysis of unknown samples on-site in support to the First Responder Incident Commander.

## Description and Specifications

The Analytical Laboratory System (ALS) is a mobile analytical laboratory capable of providing the CST a presumptive analysis for the presence of chemical, biological, or radiological contamination. The ALS is a System Enhancement Program (SEP) to replace the current Mobile Analytical Laboratory System and interim Dismounted Analytical Platform.

The ALS provides advanced technologies with enhanced sensitivity and selectivity in the detection and identification of biological and chemical warfare agents and toxic industrial chemicals and materials.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **3QFY03** Milestone C - full rate production.
- **4QFY03** Production and fielding.
- **4QFY03** Upgrade technology screening.
- **1QFY04** Completed product verification test and initial operational testing.
- **2QFY04** Conditional materiel release ALS-SEP.

## Projected Activities

- **3QFY04** Component testing ALS Block I.
- **4QFY04** Complete fielding ALS-SEP.
- **2QFY05** Prototyping vehicle installation.

## Contractors

Wolf Coach, Inc., and L-3 company (Auburn, MA)





## Army Airborne Command and Control System (A2C2S)



## Mission

Provide commanders, from maneuver brigades to echelons above corps, with an airborne tactical command post that affords continuous situational awareness, robust communications, and battlefield mobility.

## Description and Specifications

The Army Airborne Command and Control System (A2C2S) is the Army's premier airborne command and control (C2) system, supporting echelons above corps, corps, division, and maneuver brigade commanders. The A2C2S supports missions ranging from low intensity humanitarian assistance to deep operations in high-intensity conflict. Hosted in a UH-60 Blackhawk, this highly mobile tactical command post enables the maneuver commander to gain and maintain situational awareness and common operational picture for effective C2 in both air and ground modes in the following operational roles:

- Airborne Battle Command On-the-Move Platform
  - Brigade through Army service component commander
- Ground Tactical Command Post (extended operations)
  - A2C2S can rapidly reposition in the battlespace and assume control of current operations.
- Jump Tactical Operations Center (TOC)
  - Temporarily assume control of current operations while the main command post displaces; A2C2S quickly transitions to follow-on mission.
- Early Entry Command Post
  - Self-deployable intra-theater capability
- Homeland Defense/First Responder (National Disaster Relief)
  - Early response airborne command and communications platform supporting Civil Support Teams (CST).

The A2C2S hosts selected Army Battle Command System programs and, through the Tactical Internet, allow commanders to access, manipulate, store, manage, and analyze situational awareness information and intelligence data and mission plans. In addition to line-of-sight combat net radios, including Single Channel Ground Airborne Radio System (SINCGARS), Advanced System Improvement Program, and HAVEQUICK II, the A2C2S capabilities support deep operations with non-line-of-sight radios high frequency and Demand Assigned Multiple Access and Satellite Communications System Satellite Command.

These capabilities enable warfighters to exercise C2 of assigned and attached elements and to coordinate with adjacent, supported, and supporting forces via voice and data equipment with battlefield information processing and connectivity. The A2C2S is critical to enhance the battle command group's ability to effectively

perform combat unit operations and serve as a force multiplier in the future force.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **2QFY03** In-system demonstration (Block I) sub-phase of system development and demonstration phase.
- **2QFY03** Completed integration of a developmental test system.
- **2QFY03** Fabricated and delivered three preproduction systems in support of Operation Iraqi Freedom.
- **2QFY04** Milestone C and low-rate initial production.

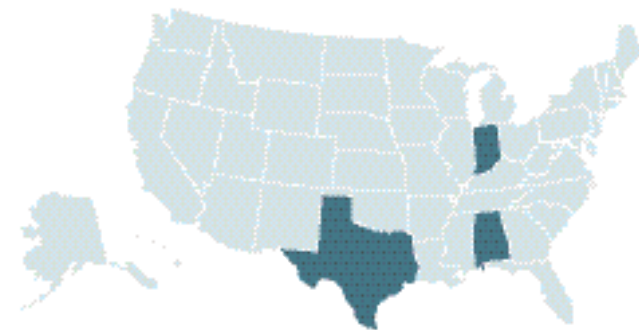
## Projected Activities

- **3QFY04** Demonstration of Homeland Defense Civil Communications interface module.

## Contractors

Raytheon (Huntsville, AL; Waco, TX; Ft Wayne, IN)

**Program Support:** CAS (Huntsville, AL)





## Army Ammunition Program





### Mission

Provide U.S. forces with modernized, highly capable munitions to support Current, Stryker, and Future Forces.

### Description and Specifications

The Army’s ammunition program supports Army readiness by resourcing 100 percent of Standards in Training Commission (STRAC) strategy and munitions modernization efforts. The program provides centralized management of the organic and commercial munitions industrial base, optimizing the preparedness of the national technology and industrial base. In addition, it enhances readiness by improving storage efficiency, reducing DoD’s demilitarization liability, and providing a source of critical components.

STRAC determines the quantities and types of munitions for soldiers, crews, and units to attain and sustain weapon proficiency relative to Army’s readiness levels. Major elements are training-unique items and training-standard items, which support both training and war reserve requirements. Systems include small and medium-caliber mortars, tank, artillery, and other munitions.

War reserve modernization ammunition is essential to the success of Army fire support, mobility, and maneuver forces. These items support deployment stocks for the Stryker Brigade Combat Team and support the Transformation Campaign Plan.

The production base support (PBS) program ensures that investments and acquisitions are strategically aligned and fosters increased operating efficiencies and responsiveness in the national technology and industrial base, which produces more than 200 end items and more than 300 components. Readiness in active and inactive ammunition plants is maintained through replacement of worn and obsolete equipment, correction of infrastructure deficiencies, environmental remediation, asset modernization, and reduction of operating overhead.

The conventional ammunition demilitarization program funds the disposal, demilitarization, and resource recovery and recycling of conventional ammunition. This program also funds movement of ammunition and technical support for demilitarization projects at various installations, and the commercial contracts for resource recovery and demilitarization of excess, obsolete, and unserviceable ammunition. Funding is allocated for the demilitarization of ammunition assets that have become unsafe for continued storage.

### Foreign Counterpart

A wide variety of foreign counterparts exist.

### Foreign Military Sales

Numerous foreign countries purchase U.S. ammunition.

### Program Status

Program Executive Office, Ammunition (PEO Ammo), Picatinny, NJ, is responsible for life cycle acquisition management of conventional ammunition, including integrating budget,

acquisition strategies, research and development, and life cycle management across all ammunition families. PEO Ammo organizations include Program Manager (PM)-Combat Ammunition Systems, PM-Maneuver Ammunition Systems, PM-Close Combat Systems, and PM-Joint Services.

Congress maintains an interest in near-term readiness requirements, sustaining the production base, and maintaining an adequate level of ammunition for training and war reserve.

### Projected Activities

- **FY04 XM1002** (120mm Tank) Multi-purpose Anti-tank Training Cartridge – begin low-rate production.
- **FY05 M910E1** (25mm) Training Cartridge – begin low-rate production.

### Contractors

**Small Caliber Ammo:** Alliant Techsystems (Independence, MO)

**120mm Tank Ammo:** General Dynamics Ordnance Tactical Systems (St. Petersburg, FL); Alliant Techsystems (Hopkins, MN)

**Hydra:** General Dynamics (Burlington, VT)

**MACS:** ARMTEC (Coachella, CA); Alliant Ammunition & Powder Co. (Radford, VA); DeIFasco (Greenville, TN); CONCO (Louisville, KY)

**Government-Owned, Contractor-Operated Army Ammunition Plants (AAP):** Holston AAP (Kingston, TN); Iowa AAP (Middletown, IA); Kansas AAP (Parsons, KS); Lake City AAP (Independence, MO); Lone Star AAP (Texarkana, TX); Milan AAP (Milan, TN); Radford AAP (Radford, VA); Riverbank AAP (Riverbank, CA); Scranton AAP (Scranton, PA)

**Government-Owned, Government-Operated Army Ammunition Plants:** Crane Army Ammunition Activity (Crane, IN); McAlester AAP (McAlester, OK); Pine Bluff Arsenal (Pine Bluff, AR)





## Mission

Provide a mobile wireless data communications backbone for the Army's Tactical Internet; embedded situational awareness/position navigation; and a common system for Army, Air Force, Navy, and Marine Corps warfighters.

## Description and Specifications

The Enhanced Position Location Reporting System (EPLRS) supports the Army's digitized divisions and Stryker Brigade Combat Teams (SBCT). EPLRS is the backbone of the Army's Tactical Internet. EPLRS provides data distribution and position/navigation services in near-real-time for the warfighter at brigade and below level, in support of Army Battle Command Systems and the Force XXI Battle Command Brigade-and-Below (FBCB2) program. EPLRS consists of a network control station and the EPLRS radio, which can be configured as a manpack unit, a surface vehicle unit, and an airborne vehicle unit. EPLRS uses a time-division, multiple-access communications architecture to avoid transmission contention. In addition, it uses frequency hopping, error detection, and correction with interleaving. Spread spectrum technology provides jamming resistance.

EPLRS is interoperable with Air Force, Marine Corps, and Navy. Improvements to EPLRS include message reliability, more efficient available bandwidth, and field-programmable software.

## Weight

**Vehicular:** 40 lb (as shown)

**Manpack:** 25 lb

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **4QFY01** EPLRS participated in the Division Capstone Exercises (DCX-1 and -2) with 500 radios in the network.
- **1QFY02** EPLRS participated in FBCB2's limited user test (Limited User Test 2a).
- **4QFY02** EPLRS Network Manager (ENM) progressed through several development milestones including critical design review. An ENM government operational test was conducted 4QFY02. ENM fielding began in FY03.
- **3QFY03** Contract award for 1,046 EPLRS radios.

- **2QFY04** Contract award for 711 EPLRS radios.
- **2QFY04** Fielding ongoing to the 3rd SBCT.

## Projected Activities

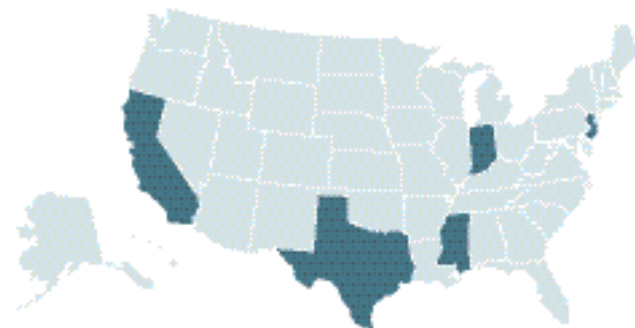
- **FY04-06** Continue fielding to SBCTs 3-6, 3 ACR, and II Corps Troops.
- **FY04-05** field EPLRS retro-fit kits ( increases throughput to 288 Kbps) to 1st Cav, 4th Infantry Division, and 3rd Infantry Division.
- **3QFY04** Support FBCB2 tests through 3QFY04.

## Contractors

**Radio Design/Production:** Raytheon (Fullerton, CA; Forest, MS; Ft Wayne, IN; Garland, TX)

**Engineering Support:** British Aerospace Engineering (BAE) Systems (W. Long Branch, NJ)

**Fielding:** Innolog (Wall Township, NJ); Engineering Professional Services (EPS) (Shrewsbury, NJ)



## AKMS



**Ruggedized Laptop**



**Ruggedized Laptop**



**NSA Key Processor**



**Data Transfer Devices**



## Mission

Automate the functions of communications security key management, control, and distribution; electronic protection generation and distribution; and signal operating instruction management to provide planners and operators with secure communications at both the theater/tactical and strategic/sustaining base levels.

## Description and Specifications

The Army Key Management System (AKMS) automates the functions of communications security (COMSEC) key management control and distribution, electronic counter-countermeasures generation and distribution, and signal operating instructions management. AKMS will electronically generate and distribute Army key, thereby limiting adversarial access to and reducing vulnerability of Army command, control, communications, computers, and intelligence (C4I) systems. AKMS is made up of three vital elements:

- Local COMSEC Management System (LCMS), which performs COMSEC accounting, is the media for Electronic Key Distribution and short title key generation.
- Automated Communications Engineering Software (ACES) is the frequency management portion of AKMS, and has been designated by the Military Communications Electronics Board as the joint standard for use by all services in development of frequency management and crypto net planning. ACES will replace the legacy Revised Battlefield Electronic Communications-Electronic Operating Instructions System (RBECS) and will become the joint electronic interface to all spectrum management, Integrated System Control, Spectrum XXI, RBECS, Operational Tasking Command, Air Tasking Order (ATO), and Space ATO workstations.
- The Simple Key Loader (SKL) will replace the Data Transfer Device (DTD). The small design allows easy key transfers and provides the interface between LCMS, ACES, Data Management Device (DMD), Common User Application Software (CUAS), and Fill/CT3 DTDs.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **2QFY03** Conversion of LCMS to Phase 4 software.
- **3QFY03** Completion of ACES fielding, with the exception of USAEUR and I Corp.

## Projected Activities

- **2QFY04** Award SKL production contract.
- **3QFY04** LCMS Tier 1 initial operational capability.
- **3QFY04** Completion of ACES fieldings.
- **3QFY04** ACES V1.7 Block II.
- **3QFY04** Begin new equipment training and fielding of SKL.
- **4QFY06** ACES Block III.

## Contractors

**Software:** Science Applications International Corporation (SAIC) (San Diego, CA); Information Systems Support, Inc. (Tinton Falls, NJ); Technical and Management Services Corporation (W. Long Branch, NJ); Titan Systems (Shrewsbury, NJ)



## Army Tactical Missile System (ATACMS)





## Mission

Provide long-range, surface-to-surface fire support for the Future Force and Joint Forces Commander.

## Description and Specifications

The Army Tactical Missile System (ATACMS) is a Legacy-to-Future Force Program. Blocks I and IA are ground-launched missile systems consisting of a surface-to-surface guided missile with an anti-personnel/anti-materiel (APAM) warhead. The ATACMS Quick Reaction Unitary (QRU) engages point targets with minimal collateral damage, at ranges comparable to the ATACMS Block IA. The ATACMS with APAM attacks soft targets at extended ranges. Targets include:

- Surface-to-surface missile sites
- Site defense systems
- Logistics elements
- Command, control, and communications complexes.

The ATACMS missile is fired from the M270A1 Multiple Launch Rocket System launcher and the High Mobility Artillery Rocket System to engage targets at ranges well beyond the capability of existing cannons and rockets. The ATACMS Block IA, with enhanced Global Positioning System accuracy, has approximately twice the range of the ATACMS Block I. The ATACMS includes the following components: M39 guided missile and launching assembly; M68 trainer, launch pod container; M165 training set, guided missile; M78 trainer, test device, guided missile; modified M270 launcher; and ATACMS missile facilities.

## Foreign Counterpart

Afghanistan, Bulgaria, China, Egypt, France, Iran, Iraq, Libya, North Korea, Poland, Romania, Russia, Slovakia, Syria, Vietnam, Yemen

## Foreign Military Sales

Bahrain, Greece, South Korea, Turkey

## Program Status

- **FY03** Begin deliveries of ATACMS QRU missiles.
- **FY03** Begin deliveries of ATACMS Block IA FMS to Korea.
- **FY03** Award ATACMS QRU contract and FY03 Operation Iraqi Freedom supplemental.

## Projected Activities

- **FY04** Award ATACMS QRU contract.
- **FY04** Take deliveries of ATACMS QRU missiles.

## Contractors

**Prime:** Lockheed Martin (Dallas, TX; Horizon City, TX)

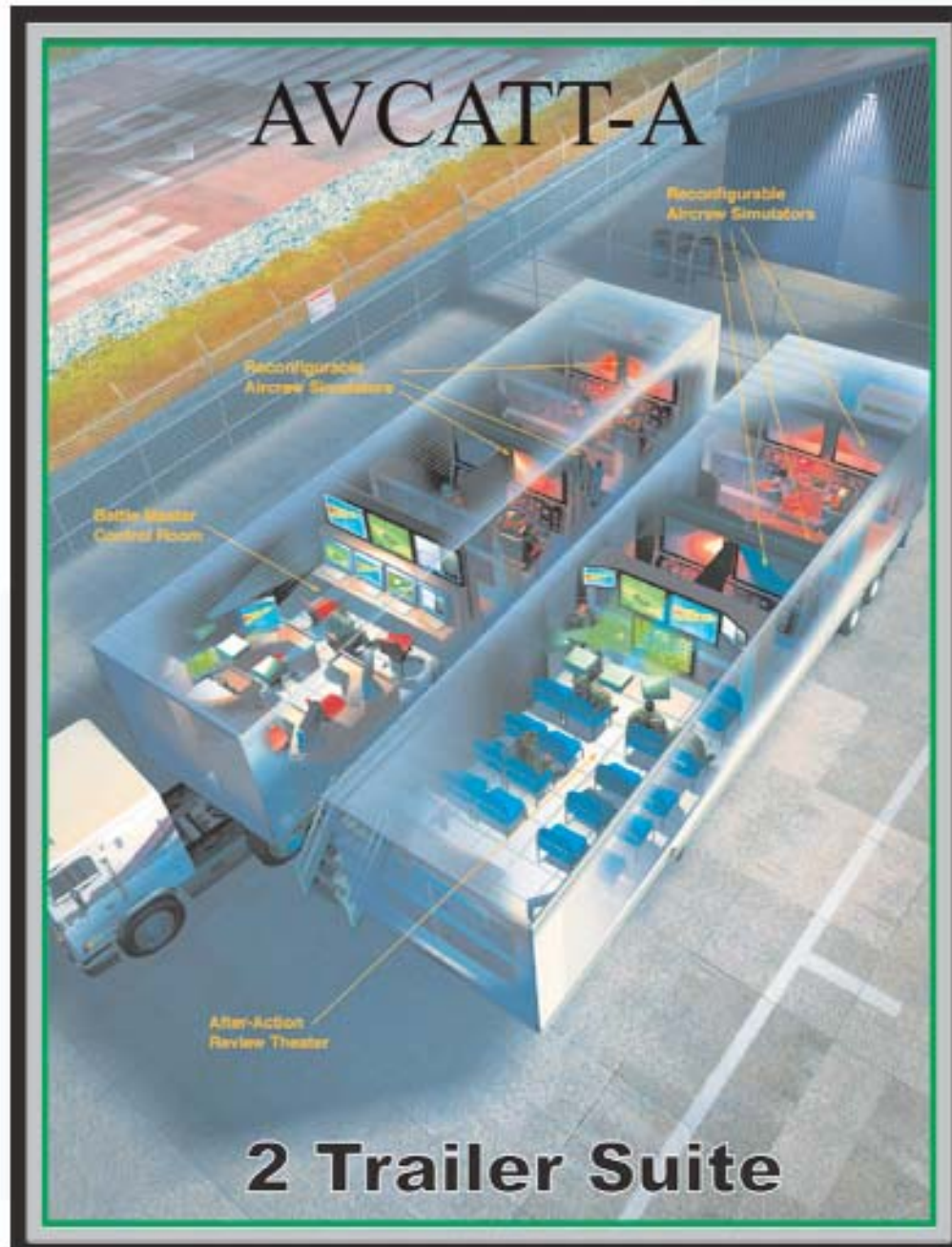
**PM Support:** SETA (Huntsville, AL)

**Guidance Section/Improved Guidance Section:** General Electric (Clearwater, FL)

**Rocket Motors:** Aerojet (Camden, AR)

**Control Actuator Section:** BFG (Vergennes, VT)





AVCATT-BMC



AVCATT-AAR

## Mission

Provide collective training system to meet institutional, organizational, and sustainment aviation training requirements for Active and Reserve Army aviation units worldwide in combined arms collective training and mission rehearsal.

## Description and Specifications

The Aviation Combined Arms Tactical Trainer – Aviation Reconfigurable Manned Simulator (AVCATT-A) is a dynamic, alternative instructional concept to rehearse and participate, through networked simulation, in a unit-collective and combined-arms, simulated battlefield environment. AVCATT-A is a critical element of the Combined Arms Training Strategy, interoperating with the Close Combat Tactical Trainer by local area network connection, and it supports institutional, organizational, and sustainment training. AVCATT-A is an Army aviation training system for both the Active and Reserve Components. AVCATT-A will be Distributive Interactive Simulation-compliant and compatible and interoperable with other Synthetic Environment systems.

A single suite of equipment consists of two mobile trailers housing six reconfigurable networked simulators that currently support the Apache, Kiowa Warrior, Chinook, and Blackhawk. Comanche and Longbow platforms will be added in the future. AVCATT-A supports role-player and semi-automated blue and opposing forces. After-action-review theater is also provided as part of each suite. AVCATT-A is fully mobile, capable of utilizing commercial and generator power, and is transportable worldwide. The AVCATT-A system will permit various aviation units to conduct collective task training on a real-time, computerized battlefield in a combined arms scenario. Elements that are present on the modern, high-intensity battlefield, such as the combat support and combat service support elements, are an integral part of the simulation database. AVCATT-A is designed to provide realistic, high-intensity collective and combined arms training to aviation units in the following core tasks (not all inclusive):

- Armed reconnaissance (area, zone, route)
- Deliberate attack
- Downed aircrew recovery operations
- Hasty attack
- Aerial passage of lines
- Movement to contact
- Screen
- Covering force operations
- Joint air attack team
- Air assault operations
- Air movement operations

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **3QFY03** Milestone C decision.
- **4QFY03** Successful initial operational test and evaluation.
- **1QFY04** First unit equipped.
- **1QFY04** Full-rate production decision.

## Projected Activities

- **4QFY04** Limited user test for Longbow.

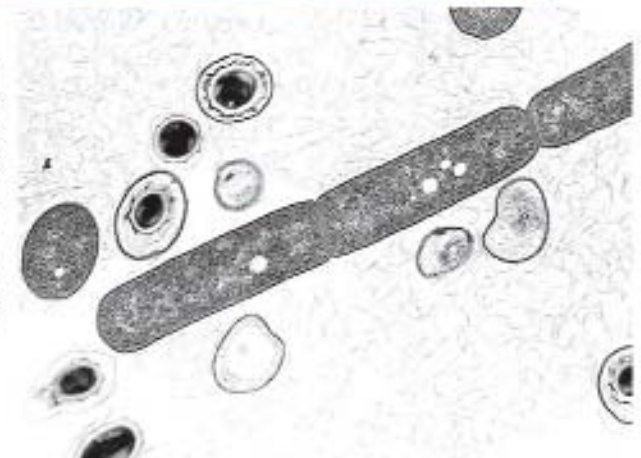
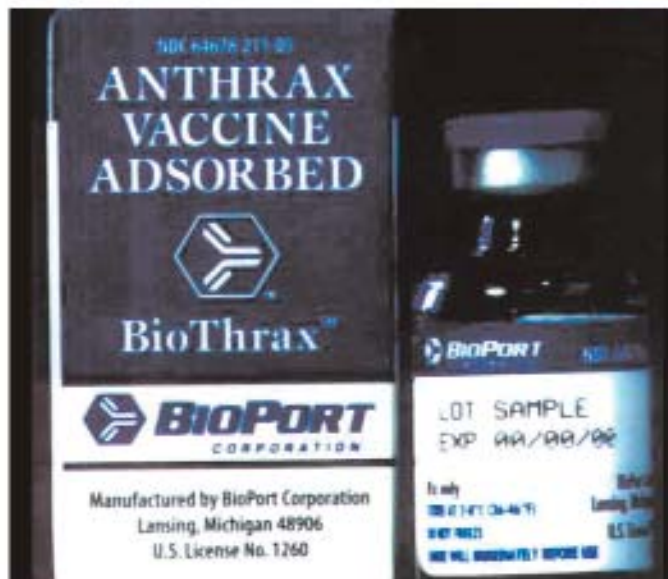
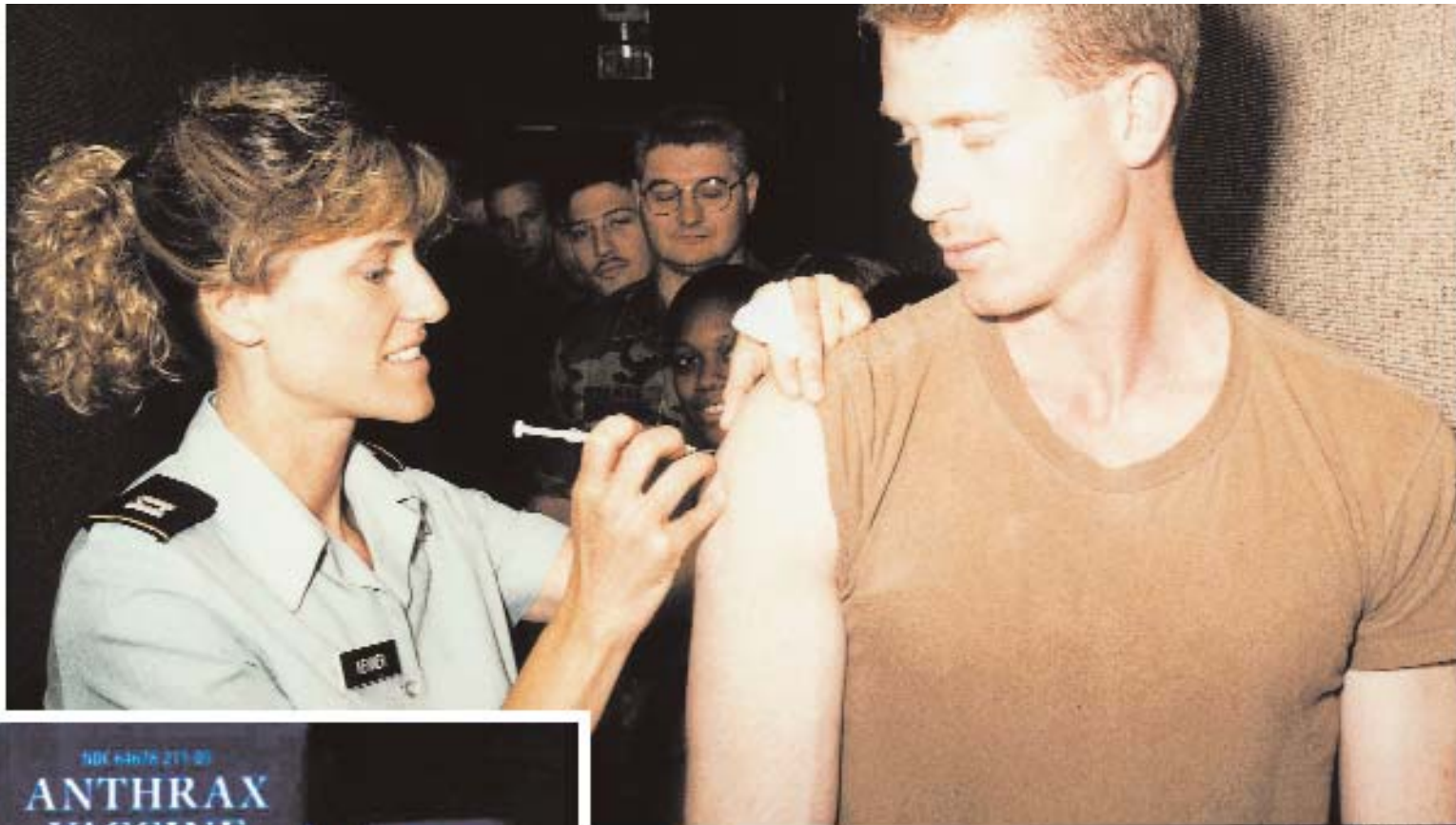
## Contractors

L-3 Communications (Arlington, TX)





## Biological Vaccine Program - Anthrax Vaccine Absorbed (AVA)



## Mission

Protect and enhance the warfighter's capability to operate in a biological warfare (BW) environment through the development, testing, licensure, production, and storage of anthrax vaccine.

## Description and Specifications

The Anthrax Vaccine Absorbed (AVA) production program is the only U.S. Food and Drug Administration (FDA) licensed vaccine available for protection against anthrax. Immunization of US forces will protect each soldier against anthrax exposure thereby allowing commanders to continue operations in a BW environment. The program provides an FDA-licensed vaccine against a validated biological threat.

Total immunization protection requires a six-shot regimen over 18 months.

## Foreign Counterpart

UK Center for Applied Microbiology and Research Anthrax Vaccine

## Foreign Military Sales

Sold to US Allies in FY03, no sales pending in FY04.

## Program Status

- Production to meet Department of Defense (DoD) Anthrax Vaccine Immunization Program requirements.
- Re-award of production contract to Bioport.

## Projected Activities

- Continue producing AVA vaccine to meet DoD requirements.

## Contractors

BioPort Corporation (Lansing, MI)





## Chemical Biological Protective Shelter (CBPS)



## Mission

Provide U.S. forces with a highly mobile, easy-to-use, and self-contained, chemical-biological (CB) hardened facility that allows medical personnel to treat casualties without the encumbrance of individual protective clothing and equipment.

## Description and Specifications

The Chemical Biological Protective Shelter (CBPS) is a highly-mobile, self-contained system designed to replace the M51 Collective Protection Shelter. It consists of a Lightweight Multi-purpose Shelter (LMS) mounted on an Expanded Capacity High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) variant (ECV) and a 300-square-foot airbeam supported soft shelter. The CBPS provides a contamination-free, environmentally-controlled working area for medical, combat service, and combat service support personnel to obtain relief from the continuous need to wear chemical-biological protective clothing for 72 hours of operation.

All ancillary equipment required to provide protection, except the generator, is mounted within the shelter. Medical equipment and crew gear are transported inside of the LMS and by a towed High-Mobility Trailer. The CBPS will be assigned to the trauma treatment teams/squads of the maneuver battalions, the medical companies of the forward and division support battalions, non-divisional medical treatment teams/squads, division and corps medical companies, and the forward surgical teams (FST).

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

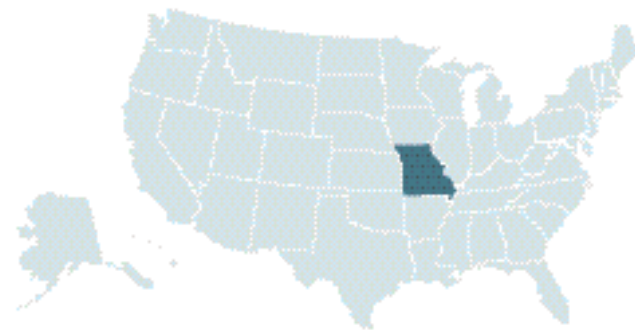
- In production.
- Fielded systems in support of Operation Enduring Freedom.
- **1QFY04** a Non-Hydraulic Integrated Product Team was formed to develop an engineering change to eliminate the hydraulic system that powers the environmental support system.

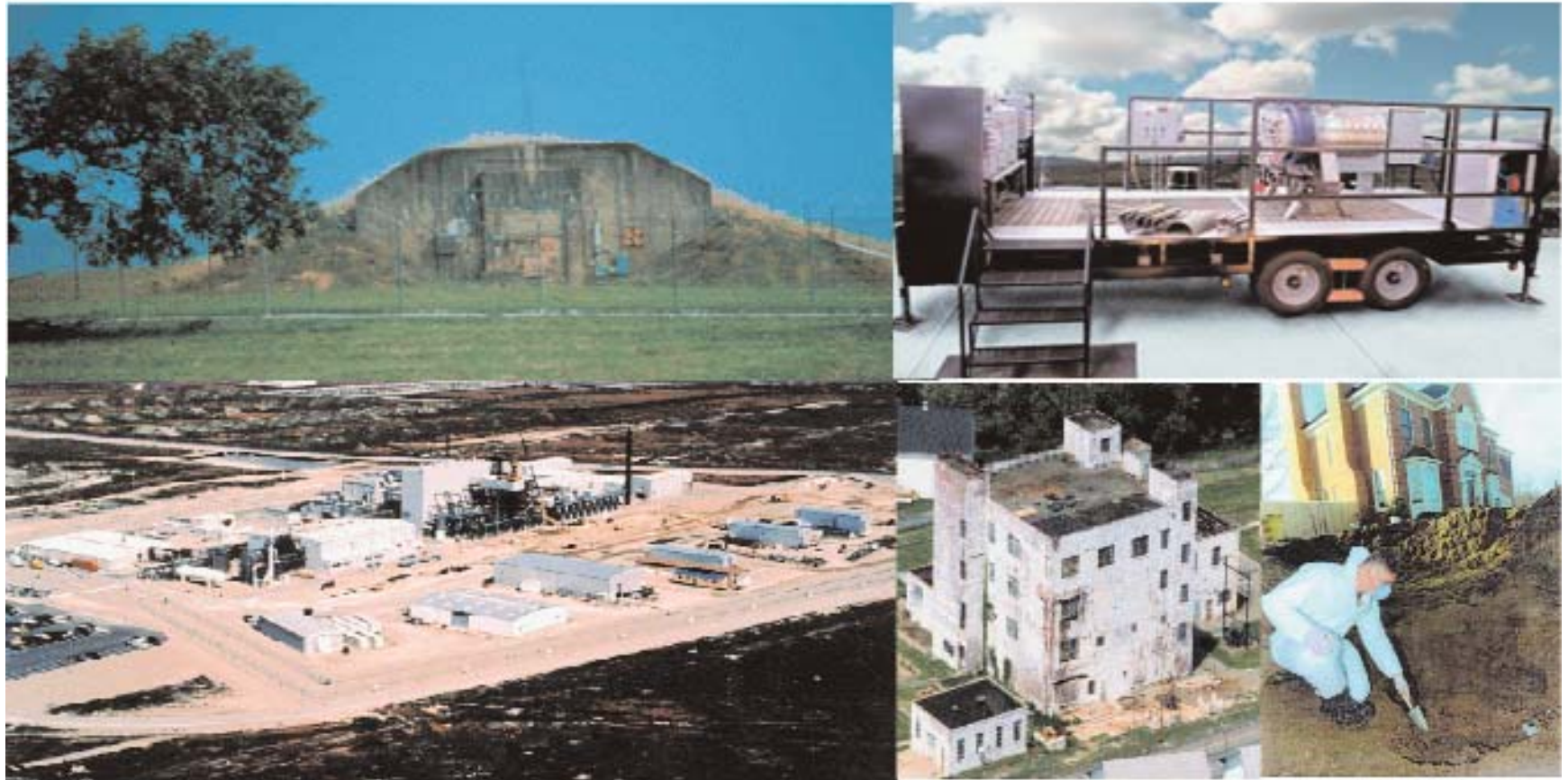
## Projected Activities

- Procure and field systems.

## Contractors

Engineering Air Systems, Inc. (St Louis, MO)







## Mission

Securely store the US chemical stockpile and safely destroy all chemical warfare and related materiel, while ensuring maximum protection for the public, workers, and environment; provide specialized chemical/biological (CB) defense and ammunition products and services at Pine Bluff Arsenal (PBA).

## Description and Specifications

The Chemical Materials Agency includes storage of chemical agents and munitions; disposal facility design, construction, systemization, operations, and closure; and emergency preparedness activities at chemical weapons storage depots; as well as disposal of binary chemical munitions and non-stockpile chemical materiel; destruction of former chemical weapons production facilities; assessment and destruction of recovered chemical materiel; and provision of all Department of Defense-approved support to international chemical demilitarization programs. PBA is responsible for production, storage, supply, and maintenance of ammunition and CB defense items.

## Foreign Counterpart

Countries that have active chemical weapons destruction programs include Russia and Japan.

## Foreign Military Sales

PBA produces smoke and pyrotechnic munitions and select CB defense items.

## Program Status

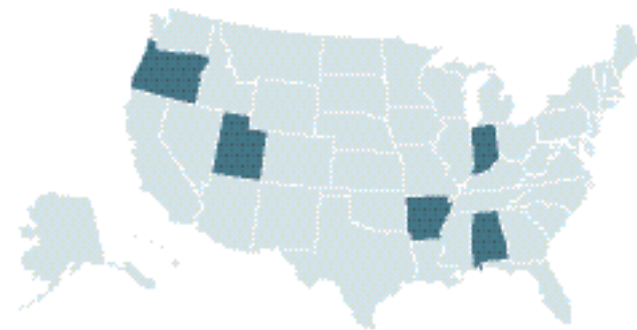
- **3QFY03** Explosive Destruction System destroyed 15 recovered munitions at Spring Valley, Washington, DC.
- **3QFY03** Began chemical agent disposal operations at Aberdeen, MD.
- **4QFY03** Rapid Response System destroyed recovered chemical warfare materiel at Fort Richardson, AK.
- **4QFY03** Began chemical agent disposal operations at Anniston, AL.
- **1QFY04** Completed closure of Johnston Island facility.
- **2QFY04** Began operation of the Pine Bluff Munitions Assessment System.

## Projected Activities

- **3QFY04** Begin chemical agent disposal operations at Pine Bluff, AR, and Newport, IN.
- **4QFY04** Begin chemical agent disposal operations at Umatilla, OR.
- **2QFY05** Begin operation of the Munitions Assessment Processing System in Edgewood, MD.

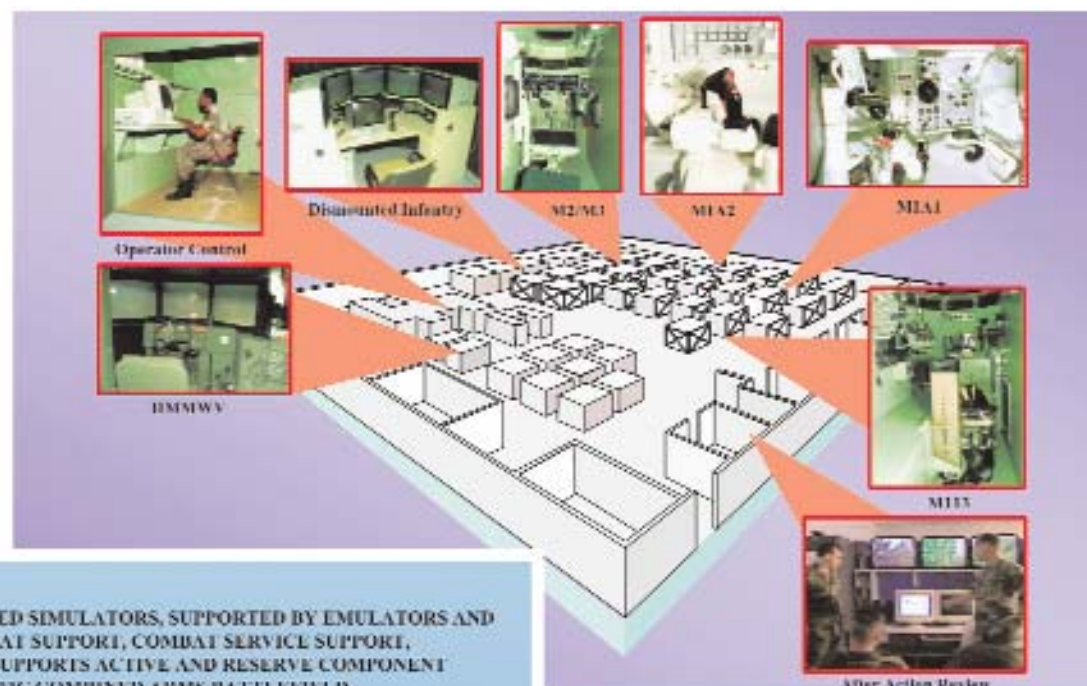
## Contractors

EG&G (Tooele, UT); Washington Group International (WGI) (Umatilla, OR); Parsons Infrastructure & Technology (Newport, IN); WGI (Anniston, AL; Pine Bluff, AR)





## Close Combat Tactical Trainer (CCTT)



CCTT IS A NETWORKED SYSTEM OF HIGH FIDELITY MANNED SIMULATORS, SUPPORTED BY EMULATORS AND SEMI-AUTOMATED FORCES THAT PROVIDE COMBAT SUPPORT, COMBAT SERVICE SUPPORT, AND BOTH FRIENDLY AND OPPOSING FORCES. CCTT SUPPORTS ACTIVE AND RESERVE COMPONENT COLLECTIVE TASK TRAINING ON A SYNTHETIC COMBINED ARMS BATTLEFIELD.

### CCTT SYSTEM CONFIGURATION

#### HIGH FIDELITY MANNED SIMULATORS



#### AFTER ACTION REVIEW



#### INITIALIZATION & MAINTENANCE

- MAINTENANCE CONSOLE (MC)
- MASTER CONTROL CONSOLE (MCC)

#### TACTICAL WORKSTATIONS

- MOTAR FIRE DIRECTION CENTER
- UNIT MAINTENANCE COMMAND POST
- COMBAT TRAIN (LOG) COMMAND POST
- TACTICAL AIR COMMAND POST
- HEAVY ARTILLERY COMMAND POST
- COMBAT ENGINEER SUPPORT
- BRIGADE HQ
- BATTALION HQ

#### SEMI-AUTOMATED FORCES (SAF) WORKSTATIONS



#### TERRAIN DATABASES

- Desert (NTC)
- Temperate (Germany)
- Ft Hood, TX
- Kosovo
- Korea

## Mission

Provide armor, mechanized infantry and cavalry crews, units, and staffs with a virtual, collective training capability.

## Description and Specifications

Close Combat Tactical Trainer (CCTT) is the first member of the Combined Arms Tactical Trainer (CATT) family of virtual, distributed interactive simulations for collective training. It supports training of armor, mechanized infantry, and cavalry units from platoon through battalion/squadron echelon, including the staff. The primary training audience operates from both full-crew simulators and mock-up command posts. Crewed simulators—M1A1, M1A1D, M1A2, M1A2SEP, M2/3A2, M2/3A2ODS/D, M2/3A3, FIST-V, BFIST, M113A3, M93 Fox, Dismounted Infantry Manned Module (DIMM), and HMMWV—are of sufficient fidelity for individuals and crews to accomplish their collective missions.

Infantry platoon and squad leaders can also exit the Bradley Fighting Vehicle and move to dismounted infantry manned modules with control of virtual dismounted elements. Ft Hood CCTTs are equipped with Force XXI Battle Command Brigade-and-Below (FBCB2) in support of III Corps Digitized Division. The training audience uses computer workstations located in mock-up command posts to provide artillery, mortar, combat engineers, and logistics units to the synthetic battlefield.

Semi-automated forces workstations provide additional supporting units (i.e., aviation and air defense artillery) and all opposing forces. Thus, while maneuver units (combat crews and battalion-level staff members) constitute the CCTT primary training audience, all battlefield operating systems are represented in the simulation to ensure effective simulation within a combined arms training environment that encompasses daylight, night, and fog conditions. CCTT's visual and terrain databases currently support desert (National Training Center); temperate (Germany); Ft Hood, TX; Kosovo; Korea; Grafenfels, Germany; and Ft Riley, KS. Mobile versions of CCTT are fielding to Army National Guard units and units in US Army, Europe. CCTT is fully interoperable with the Aviation Combined Arms Tactical Trainer (AVCATT). CCTT is operational at nine fixed sites: Ft Hood (two); Ft Knox, KY; Ft Benning, GA; Ft Stewart, GA; Ft Riley, KS; Ft Carson, CO; Grafenwoehr, Germany; and Camp Casey, South Korea. Mobile Platoon sets have been fielded to the Army National Guard at Knoxville, TN (two), Leesburg, SC (two), Beauregard, LA (two), and Los Alamitos, CA (one). Mobile Platoon set has been fielded to Friedberg, Germany.

## Foreign Counterpart

The United Kingdom Ministry of Defence is developing a counterpart system called UK CATT. The United States and the United Kingdom have a memorandum of understanding that covers cooperative development of CCTT and UK-CATT.

## Foreign Military Sales

None

## Program Status

- **3QFY03** Continued fifth year of full-rate production. Contract awarded February 5 2003.
- **2QFY04** Awarded contract for sixth year of production.

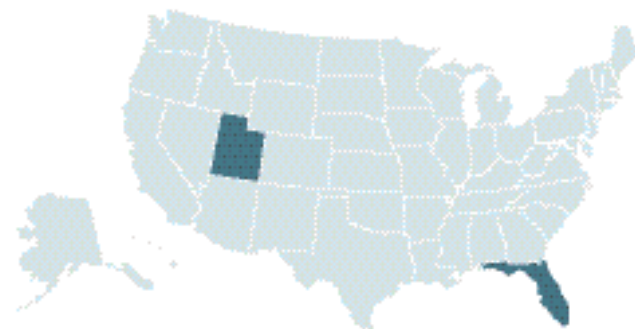
- **2QFY04** Improvement of close air support and joint interoperability capabilities in CCTT to support Joint Close Air Support training.
- **2QFY04** Began development of the Mobile Theater After Action Review Station, Enhanced After Action Review, and development of a generic manned module.

## Projected Activities

- **3QFY04** Continue full-rate production of CCTT modules (continental US and outside continental US) and additional mobile sets. Begin the full-rate production of digitizing the CCTT sites.
- **3QFY04** Continue upgrades to Dismounted Infantry Manned Modules.
- **3QFY04** Support live, virtual, and constructive training at Grafenwoehr and Camp Casey.
- **3QFY04** Continue improvement of close air support and joint interoperability capabilities in CCTT to support Joint Close Air Support training.
- **4QFY04** Complete development of Ft Stewart, Ft Carson, and Pinon Canyon, CO, homestation terrain databases.
- **4QFY04** Complete development of the Mobile Theater After Action Review Station, Enhanced After Action Review, and begin development of a generic manned module.
- **FY05 and beyond** Continue CCTT weapons systems currency and interoperability efforts and continue CCTT trainer unique performance improvement (technology refreshment) upgrades.

## Contractors

Lockheed Martin (Orlando, FL); Evans and Sutherland (Salt Lake City, UT); Advanced Systems Technology, Inc. (Orlando, FL)







## Mission

Provide common hardware systems for the Army Battle Command System programs, which include the tactical operations centers/air and missile defense command and control systems (PM TOCs/AMDCCS) as well as other Army and joint programs for use in system development and fielding.

## Description and Specifications

The Common Hardware Systems (CHS) program improves interoperability and connectivity and lowers life-cycle costs by standardizing battlefield command and control automation through centralized purchases of computing hardware, standardized protocols, and reusable commercial common software. The program provides CHS to more than 80 Army and Department of Defense customers. The contractor provides worldwide repair, maintenance, and logistics support through strategically located regional support centers established to meet the needs of tactical military units. The CHS-2 contract provides the following hardware: rugged handheld computer (RHC); standalone computer unit (SCU); compact computer unit (CCU-2); versatile computer unit (VCU-2); color flat panel displays; rugged Pentium workstation (RPW); and notebook computer unit-rugged (NCU-R); plus high-end servers. This program provides commercial, ruggedized, and near MIL-SPEC hardware versions of computers, peripherals, and networking devices. It also provides commercial, industry-based logistics support that meets the unique requirements of the tactical military units.

**CHS software:** Communications Protocols, Graphical Kernel System (GKS), Programmer's Hierarchical Interactive Graphics System (PHIGS), Protocol Extensions (PEX); Ada Bindings; Distributed Computing Environment (DCE); Digital Data Network/Message Packet Network (DDN/MPN) X.25; C/C++ Compiler; Disk Operating System (DOS); Purging Software.

	CHS-2(RHC)	CHS-2(SCU)	CHS-2(CCU-2)	CHS-2(R-PDA)
<b>Processor:</b>	Pentium III	Pentium III	UltraSPARC III/Axi	Motorola 68328
<b>MHz clock:</b>	500	1GHz	440	20
<b>RAM:</b>	128MB	2GB	1GB	16-64MB
	CHS-2(VCU-2)	CHS-2(RPW)	CHS-2(NCU-R)	
<b>Processor:</b>	UltraSPARC	Pentium III	Pentium IV	
<b>MHz clock:</b>	440	1.26	1.4GHz	
<b>RAM:</b>	1GB	1.5-2GB	1GB	

CHS-2 hardware can be procured in Version 1 (commercial workstations), Version 2 (ruggedized workstations), and Version 3 (near MIL-SPEC rugged handheld unit).

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

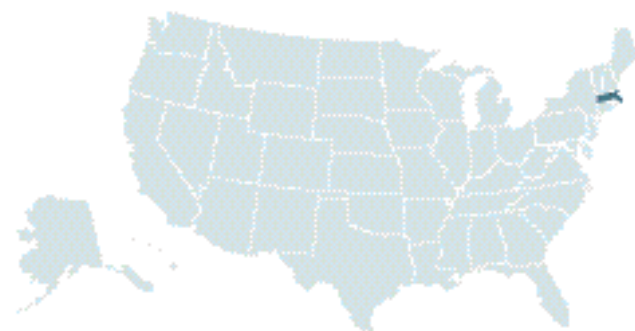
- **April 10, 1995** General Dynamics (formerly GTE) awarded CHS-2 contract, a follow-on to the CHS-1 contract.
- **September 2001** CHS-2 systems were successfully utilized during DCX-II at Fort Hood, TX.
- **February 2002** Opened the first repair facility at Fort Lewis, WA, solely dedicated to the repair of CHS equipment.
- **August 2002** Millennium Challenge 02, NTC Rotation, Fort Irwin, CA.
- **May 31, 2003** General Dynamics (GDC4S) awarded CHS-3 follow-on contract.
- **2QFY04** CHS-3 V1 hardware deliveries commence.

## Projected Activities

- **3QFY04** Commence CHS-2 program year 10.
- **3QFY05** CHS-3 V2 hardware deliveries commence.
- **3QFY05** CHS-2 contract expires.

## Contractors

**CHS-2 & 3 Hardware:** General Dynamics (Taunton, MA)





## Construction Equipment



**Mission**

Provide base and camp construction and improvements to combatant commanders and tactical commanders; provide a full range of mobility, counter-mobility, survivability, sustainment, and logistical support by Army engineers in support of the total Army force in constructing, repairing, and maintaining fighting positions, tank ditches, mine clearing, excavation, roads, airfields, and trails; and develop and sustain lines of communication to support strategic and tactical maneuver of the warfighter.

**Description and Specifications**

Construction equipment is typically state-of-the-art, commercially available, multi-purpose equipment with military modifications required to meet the warfighter’s needs. Construction equipment is fielded within the full spectrum of the Army’s engineer forces. The equipment includes dozers, scrapers, road graders, water distributors, excavators, scoop loaders, engineer cranes, quarry equipment, paving, and compaction equipment.

**Foreign Counterpart**

No known foreign counterpart

**Foreign Military Sales**

None

**Program Status**

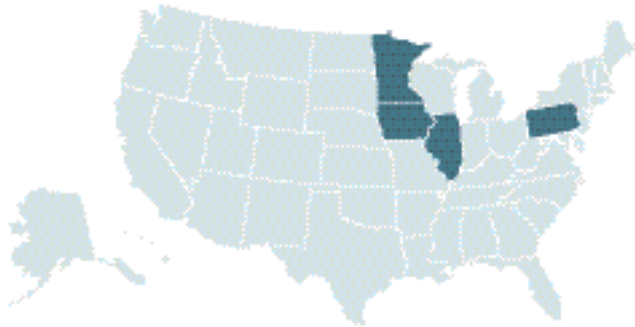
- There are numerous on-going construction equipment programs in different stages of lifecycles including research and development, production, deployment, fielding, sustainment, and service life extension programs.

**Projected Activities**

- Continue on-going contract awards, testing, production, and fielding efforts.

**Contractors**

Grove North America (Shady Grove, PA); John Deere Forestry and Construction Equipment (Moline, IL); Caterpillar Defense Products (Peoria, IL, Minneapolis, MN); Cedarapids Inc. (Cedar Rapids, IA)





## Countermines



## Mission

Provide a full range of mine detection, clearance, and breaching capabilities to the maneuver force, allowing commanders to achieve assured mobility on the battlefield and provide immediate solutions for the most pressing countermine needs facing US soldiers in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF).

## Description and Specifications

The Countermine system comprises several components:

**Airborne Standoff Minefield Detection System (ASTAMIDS)** detects and locates minefields and obstacles from aerial platforms.

**Handheld Standoff Mine Detection System (HSTAMIDS)** is a handheld multi-sensor mine detector. Has been deployed both in OEF and OIF.

**Ground Standoff Mine Detection System (GSTAMIDS)** is a vehicle-mounted detection and neutralization system. GSTAMIDS Block 0 is being used in OEF and OIF. GSTAMIDS Future Combat Systems (FCS) is under development for integration into the FCS unmanned ground and aerial vehicles.

**Explosive Standoff Minefield Clearer (Mongoose)** is a rocket-deployed array of shaped-charge munitions launched across minefields and then command-detonated to clear a lane for mounted troops.

**Anti-Personnel Obstacle Breaching System (APOBS)** is a rocket-propelled line charge. In production and use with the Current Force.

The following equipment is in use in OEF/OIF:

**Aardvark Mk IV Medium Flail** is a half-track vehicle with a mechanical flail system that beats mines out of the ground.

**Berm Sifter** is a mechanical sifter mounted on a military front-end loader and sifts mines from soil.

**Checkmate Mine Safety Shoes** are distributed-pressure designed shoes that will not detonate anti-personnel mines.

**MineLab F1A4 Handheld Mine Detector** is an Australian-built handheld mine detector that detects metal components of a mine.

**Mine Clearing Armor Protection (MCAP)** kit is used to protect the D9 dozer being used for mine removal.

**Interim Vehicle Mounted Mine Detector (IVMMD)** protects vehicles with metal detectors and proofing trailers used against mines and improvised explosive devices (IEDs).

**Buffalo Heavy Mine Protected Vehicle** has a hydraulic arm used for removal of detected mines and IED's.

**Alvis RG-31 Medium Mine Protected Vehicle** is used for command and control of clearance operations.

## Foreign Counterpart

Norway: Aardvark Mk IV Medium Flail; Australia: Minelab; South Africa: IVMMD, RG31, Buffalo hull, GSTAMIDS Block 0 mine detection vehicle

## Foreign Military Sales

None

## Program Status

- **4QFY03** ASTAMIDS development contract awarded.
- **2QFY04** Complete fielding of GSTAMIDS Block 0 in OIF.

## Projected Activities

- **3QFY04** Select the GSTAMIDS FCS development contractor.
- **1QFY05** Begin full rate production for HSTAMIDS.

## Contractors

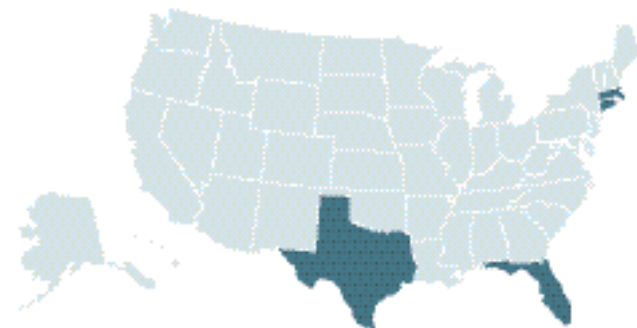
**ASTAMIDS:** Northrop Grumman (Melbourne, FL)

**GSTAMIDS FCS:** To be selected in FY04

**HSTAMIDS:** CyTerra Corp. (Waltham, MA; Orlando, FL)

**Mongoose:** BAE Systems (Austin, TX)

**APOBS:** Ensign Bickford Aerospace and Defense (Simsbury, CT)





## Defense Satellite Communications System (DSCS)



## Mission

Provide strategic military satellite terminals, baseband, satellite network, payload control systems, and related equipment required to satisfy long haul communications requirements of warfighters and Joint Chiefs of Staff (JCS)-validated command, control, communications, and intelligence requirements in support of the President and the Combatant Commanders.

## Description and Specifications

The Defense Satellite Communications System (DSCS) provides super-high-frequency beyond-line-of-sight communications and provides a critical conduit for intelligence information transfer to deployed forces worldwide. DSCS also provides reachback capability to sanctuary for deployed forces (teleport and standard tactical entry point sites). DSCS provides the equipment US Army Space Command uses to perform its payload and network control mission on wideband satellites. DSCS also provides an anti-jam and anti-scintillation capability for key strategic forces.

Beginning in FY06, the DoD will begin to launch Wideband Gapfiller Satellites (WGS) to provide warfighters with greatly increased capacity and a new Ka-band capability. The DSCS program includes modernization of enterprise terminals, baseband, and payload and network control systems required to support warfighter use of these satellites.

In addition, the Army enterprise requirements of the objective Transformation Communications (TC) satellite system proposed by the Office of the Secretary of Defense are included in this program. These modernization efforts support the Army's mission of payload and network control on wideband communications satellites and warfighter requirements for enterprise terminals, ensuring deployed warfighters access to the world's most capable military satellite communications.

## Foreign Counterpart

NATO Communications Satellite System (NATO IV and NP2K); British Military Communications Satellite System (SKYNET 5). Various other nations (France, Italy, Spain, and Turkey) have launched or plan to launch X-band satellites. These systems will have limited coverage areas compared to DSCS's worldwide coverage.

## Foreign Military Sales

None

## Program Status

- **3QFY03** Currently deployed worldwide. Modernization efforts to support WGS and TCM continue.

- **3QFY03** Continue modernization of DSCS Operations Control System (DOCS) into Objective DOCS (ODOCS) and field equipment for over 112 facilities.
- **3QFY03** AN/GSC-52 modernization program continues to extend life for these terminals to 2015.
- **4QFY03** Installations, deinstallations, and relocations of fixed strategic ground terminals and baseband continue as required by combatant commanders and validated by Joint Staff.
- **1QFY04** Initiated National Command Authority Special Communications Link upgrades.

## Projected Activities

- **4QFY04** Begin installation of fixed Ka-Band Terminals.
- **4QFY04** First Article Test Enhanced Bandwidth Efficient Modem. Begin fielding of AN/TSC-85/93 D model upgrades.

## Contractors

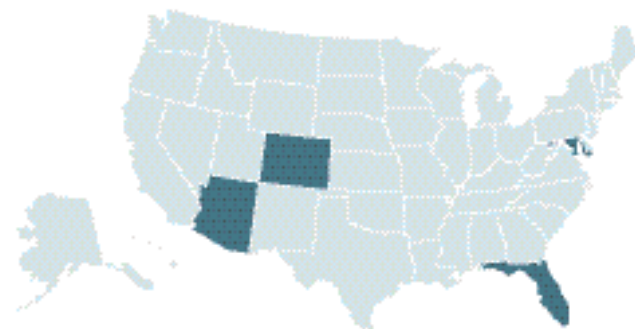
**Satellite Equipment:** International Telephone and Telegraph Company (Colorado Springs, CO)

**Installation Kits:** Harris Corporation (Melbourne, FL)

**DIMS and ODOCS Software:** John Hopkins University/Applied Physics Laboratory (Laurel, MD)

**Engineering Support:** US Army Information Systems Engineering Command (Ft Huachuca, AZ)

**Software:** Northrop Grumman (Orlando, FL)







## Mission

Enable the commander to achieve situational understanding by leveraging multiple sources of data, information, and intelligence to synchronize the elements of joint and combined arms combat power (maneuver, maneuver support, and maneuver sustainment support).

## Description and Specifications

A single, integrated intelligence, surveillance and reconnaissance (ISR) ground processing system, Distributed Common Ground System-Army (DCGS-A) provides access to threat, weather, and terrain data, information, and intelligence to assist in building the Common Operational Picture. DCGS-A consolidates the Current Force ISR ground processing capabilities and enables persistent ISR through increased joint interdependency and distributed automated fusion. DCGS-A provides reach and split-based operations to improve data access, reduce forward footprint, and increase interoperability via a network-enabled system that is modular and tailorable in fixed, mobile, and embedded configurations. DCGS-A supports the commander's ability to execute battle commands, synchronize fires and effects, rapidly shift battle focus, achieve situational understanding, and protect the force.

## Foreign Counterpart

Numerous countries possess ISR ground systems, but none achieves the multi-intelligence, distributed, network-enabled capabilities of DCGS-A.

## Foreign Military Sales

None

## Program Status

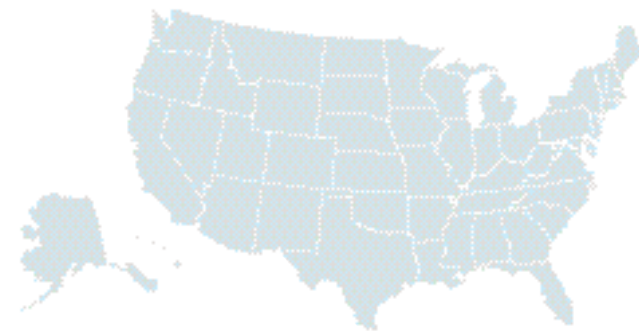
- **1QFY04** Multi-Service DCGS Defense Advisory Board.
- **1QFY04** DCGS-A Army Requirements Oversight Council.

## Projected Activities

- **3QFY04** DCGS-A Joint Requirements Oversight Council.
- **4QFY04** Milestone B.

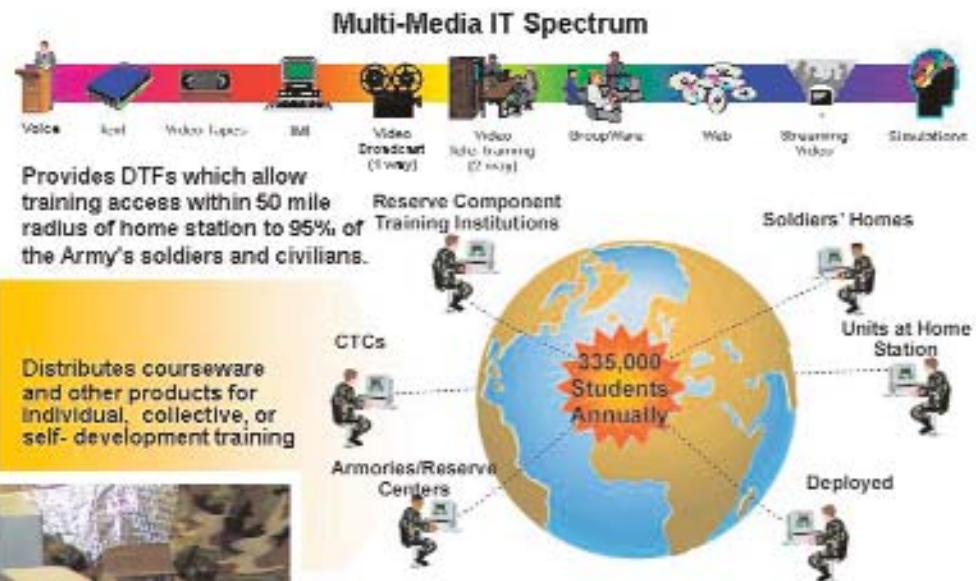
## Contractors

TBD





### The Distributed Learning Vision



## Mission

Acquire and sustain hardware, software, and services enabling student access to distributed training products at the right time and place.

## Description and Specifications

Distributed Learning System (DLS), formerly The Army Distance Learning Program (TADLP), was officially established in October 1997. DLS is dedicated to providing a quality distributed learning system to all Army components in the most expeditious and cost-effective manner possible. DLS also provides the Army with a capability for obtaining the state of readiness necessary to accomplish the Army mission as well as providing an economical force multiplier. Additionally, the availability of distributed learning contributes to quality of life by increasing stability for both soldiers and civilians in their personal and professional lives.

In addition to using digital training facilities (DTFs), Army personnel can access the globally-networked training environment from anywhere they have access to an on-line computer. In the near future, more capabilities and features will be added as technology matures.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- 261 DTFs have been fielded worldwide.
- Completed initial operational test (IOT) on 1 August 2003.
- Briefed the HQDA Cost Review Board on the CARD 30 June 2003.
- DLS Acquisition Strategy approved by AAE on 18 August 2003.
- Completed Stage 3 staffing of the C4ISP with Army CIO/G-6. Document in DOD Review.

## Projected Activities

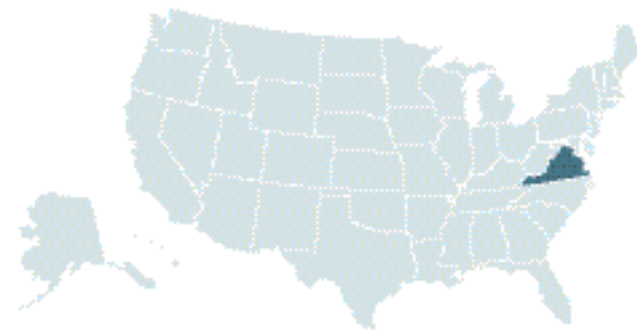
- LUT for Increment 3 Learning Management System (LMS) scheduled for May - June 2004.

## Contractors

**DTF Managers, LMS, and Enterprise Management:** International Business Machines, Inc. (Fairfax, VA)

**Communications:** Sprint (Herndon, VA)

**Integration/Fielding:** ACS (Virginia Beach, VA)



## Dry Support Bridge (DSB)



## Mission

Provide Multi-Role Bridge Companies (MRBCs) with an enhanced tactical bridging capability.

## Description and Specifications

The Dry Support Bridge (DSB) fills all 40-meter or less dry gap bridging roles from the brigade rear to the ports in a variety of tactical situations. It replaces bridges currently in service, including the M3 Medium Girder Bridge (MGB), and supports the Current to Future Force. The DSB is a highly mobile, truck-mounted, rapidly erected, MLC 96(w)/70(t) capable, modular bridging system. The system consists of a palletized load system (PLS)-based launch vehicle and a modular bridge with a 4.3-meter road width that can span gaps up to 40 meters. Modular loads are palletized onto seven flat racks that can be transported by equipment organic to the MRBC. The DSB utilizes a crew of eight soldiers that can deploy a 40-meter bridge in 90 minutes.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **3QFY03** Type Class/full materiel release and Milestone C approval.
- **1QFY04** Complete fielding to 50th MRBC.

## Projected Activities

- **FY04** Continue fielding activities.
- **1QFY05** Award new multi-year contract.

## Contractors

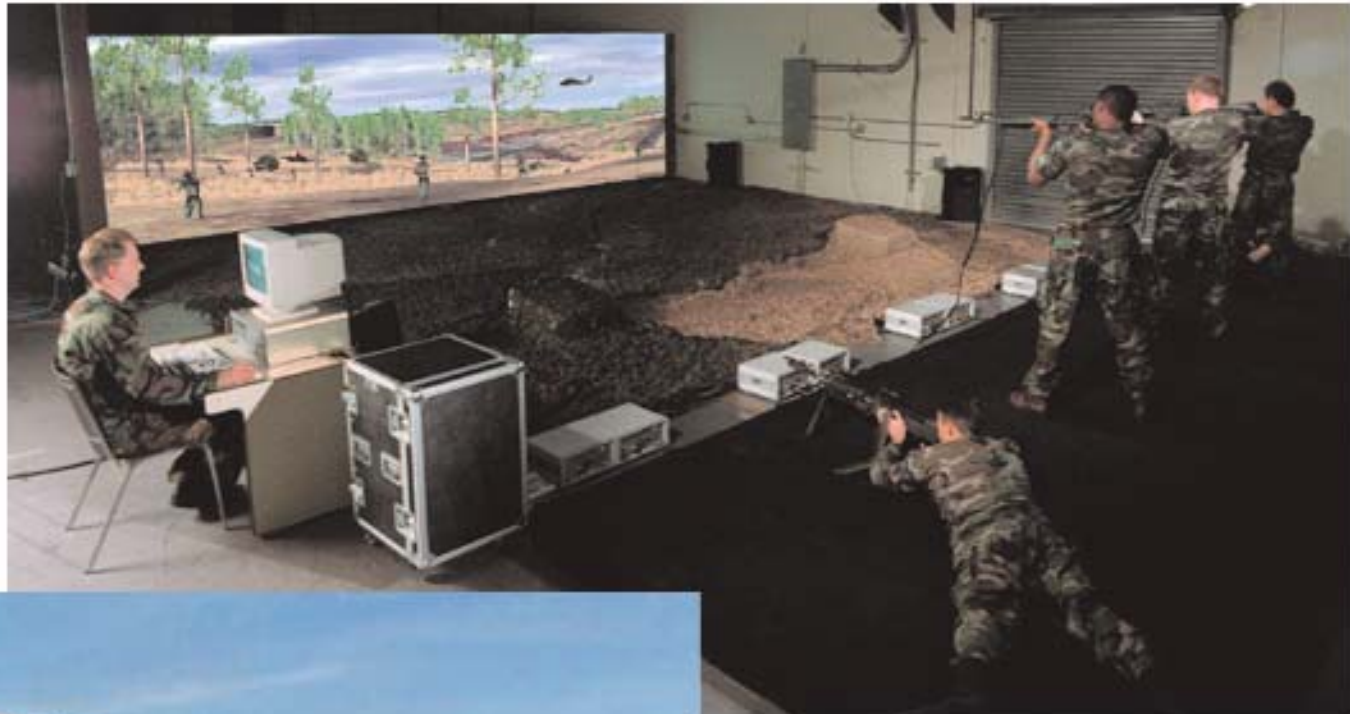
**Manufacturer:** Williams Fairey Engineering Ltd (Stockport, United Kingdom)

**PLS Chassis:** Oshkosh Truck (Oshkosh, WI)

**Logistics:** XMCO (Madison Heights, MI)







## Mission

Simulate weapon training events that lead to live-fire individual/crew weapon qualification and training events currently not resourced under Standards in Training Commission (STRAC).

## Description and Specifications

The Engagement Skills Trainer (EST) 2000 is a unit/institution, indoor, multipurpose, multi-lane, small arms, crew-served, and individual anti-tank simulator. The EST 2000 provides individual and crew-served weapons marksmanship training, collective marksmanship training, and "Shoot Don't Shoot" training. EST 2000 saves current required ammunition resources, operation and personnel tempo, travel time, and cost to and from ranges.

Squad leaders are able to control and evaluate individual, fire team, and squad performance. The EST 2000 simulates the following weapons: M16A2 rifle, M4 carbine, M9 pistol, MK19 grenade machine gun, M249 Squad Automatic Weapon, M240 machine gun, M136 (AT4), M1200 shotgun, M2 machine gun and M203 grenade launcher. At the request of other programs, efforts are in process to model other weapon systems to be part of EST 2000: XM8 carbine, XM307/XM312 crew-served weapon, Precision Guided Mortar Munitions, Land Warrior, and Javelin. Three EST 2000 subsystems equal one system. The system is covered by an approved Operational Requirements Document (ORD) last amended in May 1997.

## Foreign Counterpart

None. A distinguishing feature of EST 2000 is the accuracy of modeling the external ballistics and point of impact of rounds fired, which is currently unequalled by any production system.

## Foreign Military Sales

Israel

## Program Status

- **2QFY04** Award of Lot V production contract (236 subsystems).
- **2QFY04** Field 18 subsystems to three National Guard brigades mobilized for Iraq.
- **2QFY04** Start fielding of Lot IV subsystems (54 subsystems) awarded April 22, 2003.
- **2QFY04** Model the XM8 carbine for integration into EST 2000 as a new simulated weapon.

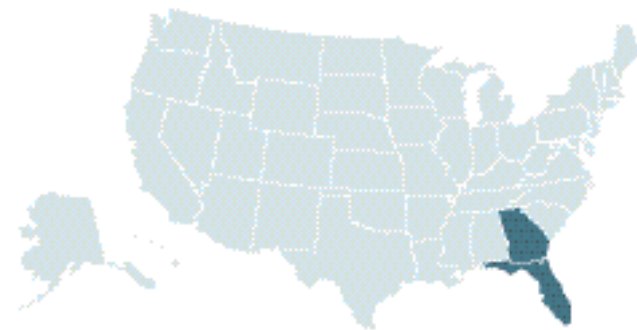
## Projected Activities

- **3QFY04** Complete fielding of Lot IV, 54 subsystems.
- **2QFY05** Award of Lot VI production option (123 subsystems).

## Contractors

**Systems Design and Integration:** Cubic Simulation Systems (formerly ECC International Corporation) (Orlando, FL)

**Simulated Weapons:** FATS, Inc. (Suwanee, GA)





## Mission

Load, transport, and distribute non-potable water through a number of outlets.

## Description and Specifications

The 1,750-gallon XM9 Engineer Mission Module – Water Distributor (EMM-WD) supports the Tactical Fire Fighting Truck (TFFT) as a component of the Tactical Firefighting Team concept. The 3,000-gallon XM10 is used for adding moisture for soil compaction operations, soil stabilization, and dust control. The dismountable platform can be transported and operated on the M1075 Palletized Load System (PLS) truck, the M1076 PLS Trailer (PLS-T), or the M1120 Heavy Expanded Mobility Tactical Truck - Load Handling System (HEMTT LHS). When not in use, it can be stored on the ground, freeing prime movers for other missions.

The XM9 and XM10 will replace on a two-for-one basis (one on truck and one on PLS Trailer) the aging 6,000-gallon semi-trailer mounted Water Distributor which has poor mobility, safety issues when transported with partial loads, and maintenance problems.

- 1,750 (XM9) and 3,000-gallon (XM10) capacity
- Corrosion resistant tank and piping
- Self-powered by diesel engine
- Self-loading, 600 gallons per minute pump
- 5-60 ft. sprinkler spray width
- 150 ft. hose reel and nozzle
- Water cannon w/125 ft. spray range
- 150-gallon additive reservoir on the XM10

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- Awaiting final ORD approval.

## Projected Activities

- **1QFY05** XM9 request for proposals released.
- **3QFY06** XM9 production award.
- **3QFY07** XM9 product verification test/operational testing.
- **2QFY08** XM9 first unit equipped.
- **FY09** XM10 will enter production and deployment.

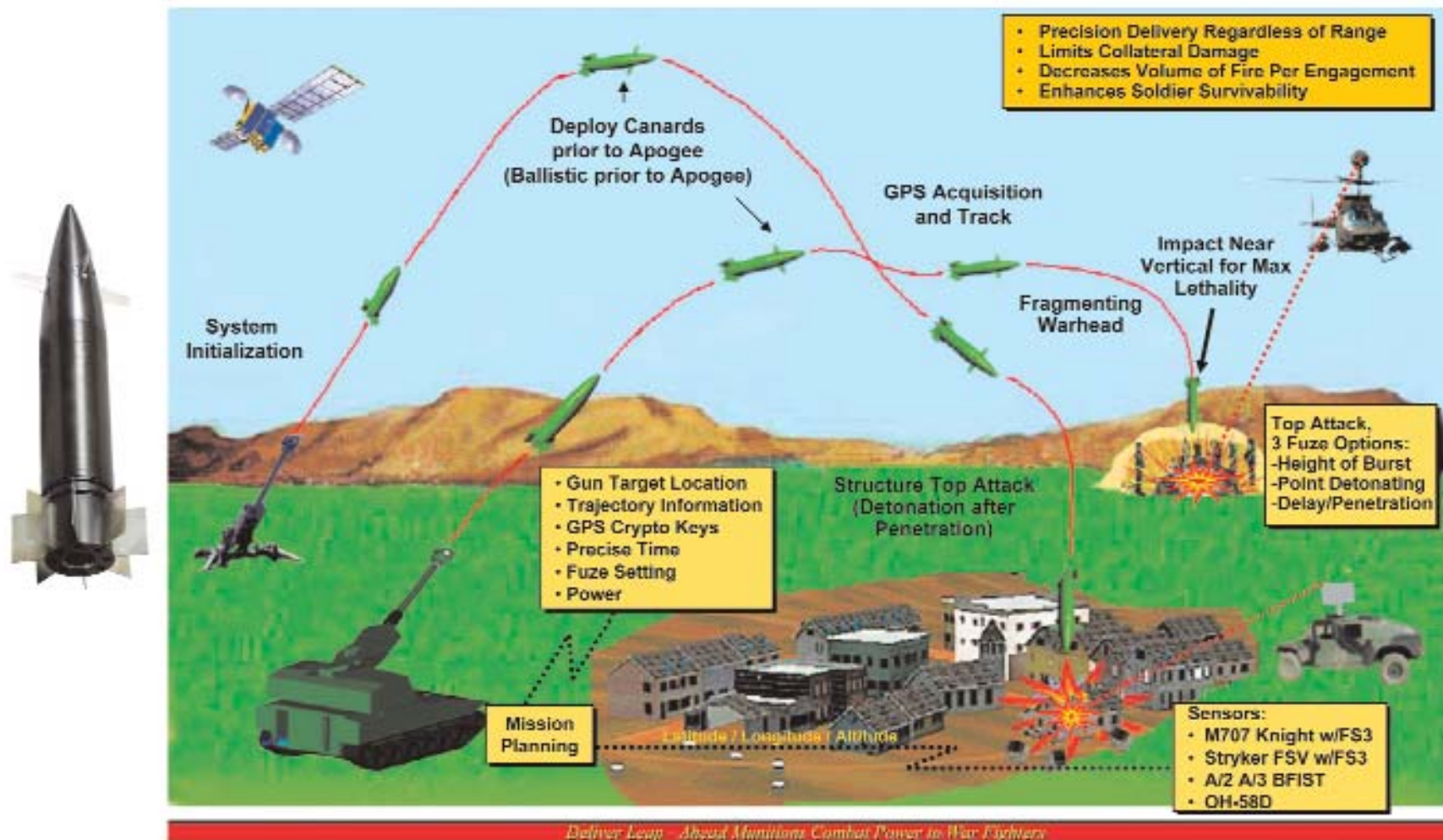
## Contractors

To be determined





## Concept of Operations



## Mission

Provide the maneuver force with improved fire support through a precision-guided, extended range, collateral damage-reducing, more lethal family of artillery projectiles.

## Description and Specifications

The Excalibur XM982 is a family of 155mm, Global Positioning System (GPS)-based, fire-and-forget projectiles being developed as the Army's cannon artillery precision munition. The program uses a spiral development approach and will field three unique variants. The initial block will contain a unitary high-explosive warhead effective against point targets as well as personnel targets such as dismounted infantry, weapon crews, and light materiel targets including air defense rockets, radars, and wheeled vehicles. Future block improvements will include smart and discriminating munitions. Smart munitions will be designed to search, detect, acquire, and engage fleeting and short-dwell targets common to open-terrain battlefields. Discriminating munitions are expected to add the capability to selectively identify and engage individual vehicular targets by distinguishing specific target characteristics.

Excalibur will use a jam-resistant internal GPS receiver to update the inertial navigation system, providing precision guidance and dramatically improving accuracy regardless of range. The target, platform location, and GPS-specific data are inductively entered into the projectile's mission computer through an enhanced portable inductive artillery fuze setter or automated system on the Future Combat System (FCS) – Non-Line-of-Sight Cannon (NLOS-C). Excalibur is effective in all weather and terrain. The current program develops Excalibur for fielding to the digitized Joint Lightweight 155mm (JLW155) howitzer, Paladin, and the Future Force indirect fire weapon, NLOS-C.

**Caliber:** 155mm

**Weight:** 106 lb

**Max Range:** 35 km (Threshold) 40km (Objective)

**Number of Submunitions:** one unitary/projectile in Block I. Block II TBD.

## Foreign Counterpart

**FY99** Congress directed the US Marine Corps to pursue an international cooperative program with the government of Sweden to explore a trajectory-correctable munition (TCM) concept proposed by Bofors and their US partner, Science and Applied Technologies, Inc. In November 2001 the Army Acquisition Executive directed the merger of the Excalibur and the TCM programs in order to achieve efficiency and reduce program risks.

**May 2002** Selected the merged projectile design, featuring the best technology from each program.

**December 2002** Contract definitized for the merged program.

## Foreign Military Sales

None

## Program Status

- **1QFY03** Awarded contract for merged program (Excalibur-TCM).
- **3QFY03** Completed system requirements review.

- **1QFY04** Completed preliminary design review.

## Projected Activities

- **2QFY05** Critical Design Review.
- **4QFY05** Early fielding decision point.
- **1QFY06** End-to-end demonstration.
- **3QFY06 Excalibur** – JLW155 limited user test.
- **4QFY06** Milestone C. The program management office is pursuing an acceleration of development, testing, and fielding of an initial capability to the JLW155 howitzer as early as FY06.
- **4QFY06** Initial capability to JLW155.
- **1QFY08** Initial operational test and evaluation.
- **4QFY08** Achieve initial operational capability.
- **1QFY09** Award full-rate production contract.

## Contractors

**Systems Integration:** Raytheon (Tucson, AZ)

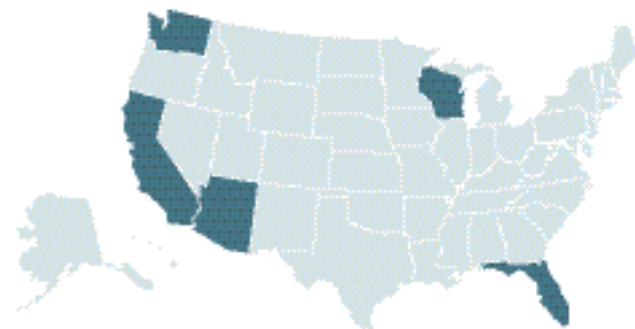
**Systems Engineering:** Bofors Defence (UDLP) teamed with Raytheon Corporation (Karlskoga, Sweden)

**Warhead:** General Dynamics Ordnance and Tactical Systems (St. Petersburg, FL)

**Control Actuator:** General Dynamics Versatron (Healdsburg, CA)

**Soft Recovery System:** General Dynamics Ordnance and Tactical Systems (Redmond, WA)

**Inertial Measurement Unit:** Honeywell (Minneapolis, MN)





## Family of Medium Tactical Vehicles (FMTV)



**FMTV A1 with Armor Kit**

## Mission

Fill the Army's medium tactical-wheeled vehicle requirements.

## Description and Specifications

The Family of Medium Tactical Vehicles (FMTV) is a key enabler for Army transformation. It provides unit mobility, resupply, and transportation at all organizational levels using a series of vehicles based on a common chassis, which vary by payload and mission requirements. The Light Medium Tactical Vehicle (LMTV) has a 2-1/2 ton capacity (cargo and van models). The MTV has a 5-ton capacity (cargo and long-wheelbase-cargo with and without materiel handling equipment, tractor, van, wrecker, and dump truck models). Three truck variants and two companion trailers, with the same cube and payload capacity as their prime movers, provide air drop capability. It operates worldwide in all weather (-50F to +120F) and terrain conditions. It serves as the weapons system platform for the High Mobility Artillery Rocket System (HIMARS) and resupply vehicle for PATRIOT and the HIMARS. FMTV enhances crew survivability through the use of hard cabs, three-point seat belts, and central tire inflation capability. It provides enhanced tactical mobility and is strategically deployable in C5, C17, C141 and C130 aircraft. FMTV reduces the Army's logistical footprint by providing commonality of parts and components, reduced maintenance downtime, highest reliability, highest operational readiness rate (more than 90 percent for last 50 months), incorporates a vehicle data bus and Class V Interactive Electronic Technical Manual, and significantly lower operating and support costs than older trucks. Units are equipped with FMTVs at more than 68 different locations worldwide, and more than 19,000 trucks and 1,700 trailers have been fielded as of 1 February 2004. Approximately 4,200 FMTVs have been deployed to Operations Iraqi Freedom and Enduring Freedom.

	LMTV A1 Cargo	MTV A1 Cargo
<b>Payload:</b>	5,000 lb	10,000 lb
<b>Towed load:</b>	12,000 lb	21,000 lb
<b>Engine:</b>	JP8 fuel	JP8 fuel
<b>Transmission:</b>	Automatic	Automatic
<b>Horsepower:</b>	275	330
<b>Drive:</b>	4 x 4	6 x 6

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

Greece, Macedonia, Saudi Arabia, Taiwan, Thailand

## Program Status

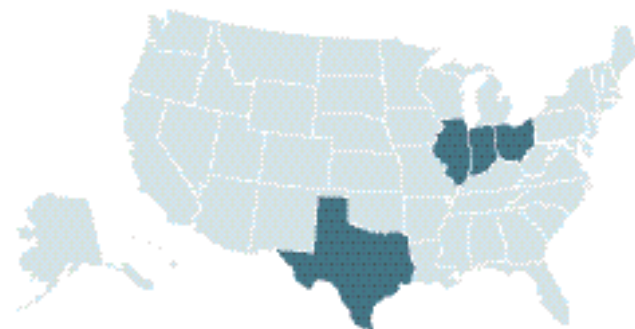
- **April 17, 2003** Rebuy contract awarded to Stewart & Stevenson.
- **December 2003** Standard Cab Armor kit testing ended.
- Fielding to 1st and 2nd Stryker Brigade Combat Team (SBCT) completed.
- Fielding to 3rd SBCT (Alaska), Ft Hood, TX; Ft Bragg, NC; National Guard, and Korea in process.
- **November 2003** First HIMARS production launcher shipped.
- **March 2004** A1 Rebuy production test start.

## Projected Activities

- Fielding will continue for the Army's highest priority first-to-fight units.
- New variant test, 10-ton dump and 8.8-ton load handling system ongoing

## Contractors

Stewart & Stevenson TVS, LLC (Sealy, TX); Caterpillar (Moline, IL); Allison (Indianapolis, IN); Rockwell/Meritor (Newark, OH); Scott Manufacturing (Lubbock, TX)





## Fifth Wheel Towing Device (FWTD)



## Mission

Enable vehicle evacuation by transforming a truck tractor into a recovery vehicle capable of lift-towing, or flat-towing, a disabled tactical vehicle.

## Description and Specifications

The Fifth Wheel Towing Device (FWTD) is a system that attaches to a tractor's fifth wheel, converting it into a towing/recovery vehicle. It is a heavy duty under-lift towing device that utilizes the fifth wheel coupling as a pivotal connection between the pulling tractor and the truck in tow. The weight of the disabled vehicle is distributed among all axles of the towing tractor. The front axle of the towing tractor actually gains weight as the vehicle is lifted. It can be attached to or detached from a tractor in less than two minutes. It is capable of lifting up to 30,000 lb and towing up to 120,000 lb. When the FWTD is not in use, it can be dismantled and the tractor can perform its normal trailer-towing mission.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

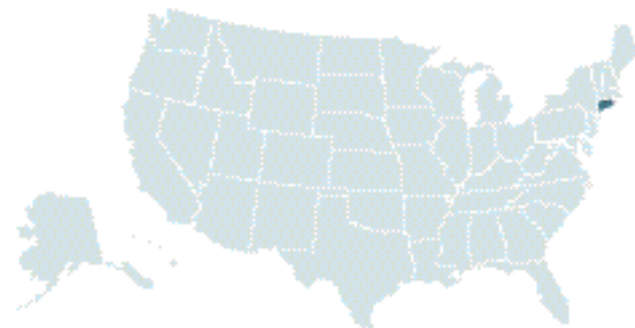
- **Current** In production.

## Projected Activities

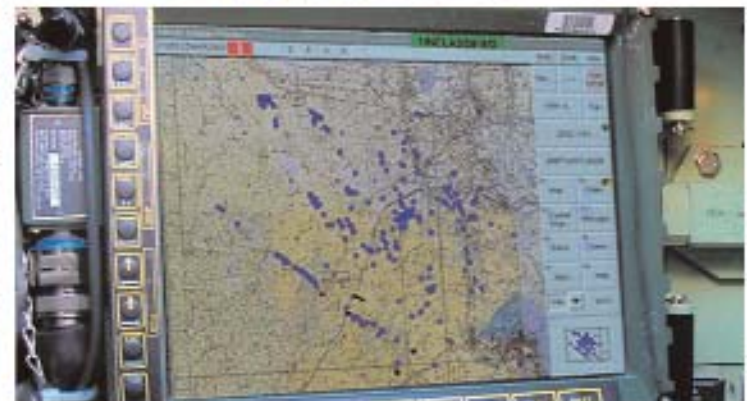
- Continue fielding.

## Contractors

Tru-Hitch (Barkhamstead, CT)



## Force XXI Battle Command Brigade-and-Below (FBCB2)



## Mission

Provide an integrated, on-the-move, timely, relevant battle command information capability to tactical combat leaders and soldiers from brigade to platform across the brigade task force.

## Description and Specifications

The Force XXI Battle Command Brigade-and-Below (FBCB2) forms the principal digital command and control system for the Army at brigade levels and below. It provides increased situational awareness (SA) on the battlefield by automatically disseminating throughout the network timely friendly force locations, reported enemy locations, and graphics to visualize the commander's intent and scheme of maneuver.

FBCB2 is a key component of the Army Battle Command System (ABCS). Appliqué hardware and software are integrated into the various platforms at brigade and below, as well as appropriate division and corps slices necessary to support brigade operations. The system features the interconnection of platforms through two communication systems: FBCB2-Enhanced Position Location Reporting System (EPLRS) supported by the Tactical Internet and FBCB2-SATCOM (BFT) supported by L-band satellite.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **1QFY03** Awarded low-rate initial production contingency option.
- **3QFY03** Supported Stryker initial operational test and evaluation (IOTE).

## Projected Activities

- **1QFY04** IOTE.
- **FY04** Full-rate production decision review.
- **1QFY05** ABCS 6.4 operational evaluation.

## Contractors

**Prime:** Northrop Grumman (Redondo Beach, CA)

**Training:** AERA (Carson, CA)

**Computer Hardware:** L-3 (San Diego, CA)

**Hardware:** DRS Technologies (Palm Bay, FL)

**Software:** Raytheon (El Segundo, CA)





## Forward Area Air Defense Command and Control (FAAD C2)



## Mission

Collect, digitally process, and disseminate real-time target tracking and cueing information, common tactical air picture, and command, control and intelligence (C2I) information to all Short Range Air Defense (SHORAD) weapons.

## Description and Specifications

The Forward Area Air Defense Command and Control (FAAD C2), a battle management/command, control, communications, computers, and intelligence (BM/C4I) system, provides critical command and control, automated air track information (friendly and enemy aircraft, cruise missiles, and unmanned aerial vehicles), to support air defense weapon systems engagement operations. It provides air situation awareness to other Army Battle Command Systems (ABCS) and weapons, such as Avenger, Bradley Linebacker, Man-portable Air Defense Systems (MANPAD), Joint, and Combined Arms. Provides joint C2 interoperability and horizontal integration with all other ADA systems (Surface Launched Advanced Medium Range Air-to-Air Missile, PATRIOT, Theater High Altitude Area Defense, Medium Extended Air Defense System, Joint Tactical Air Ground Station, Mobile Tactical High Energy Laser, etc.). Unique FAAD C2 software provides mission capability by integrating FAAD C2 Engagement operations software and interfacing with the following systems:

- Joint Tactical Information Distribution System (JTIDS)
- Single Channel Ground and Airborne Radio System (SINCGARS)
- Enhanced Position Location Reporting System (EPLRS)
- Global Positioning System (GPS)
- Airborne Warning and Control System (AWACS)
- Sentinel
- Army Battle Command System (ABCS).

FAAD C2 is the first system to digitize for the Fourth Infantry Division and III Corps.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

Approved FMS case with Egypt

## Program Status

- **3QFY93** Completed Block I.
- **4QFY95** Completed Block II; awarded Block III contract.

- **3QFY99** Completed Version 5.1 software system certification test (SCT).
- **4QFY00** Completed fieldings for 10 divisions, an armored cavalry regiment, a National Guard corps Avenger battalion, and a training base set; completed version 5.2 software integration, assembly, and test.
- **2QFY01** Materiel release of FAAD C2 version 5.1 software.
- **3QFY01** Completed version 5.2 software SCT.
- **1QFY02** Participated in Division Capstone Exercise 2 at Ft Hood, TX.
- **2QFY02** Completed version 5.2 software Limited User Test (LUT).
- **4QFY03** Version 5.3 delivery to government with Beyond Visual Range Engagement (BVRE).
- **FY03** Version 5.2. upgrade to homeland defense units.

## Projected Activities

- **2QFY04** Fielding to 3-265 Florida Army National Guard (ARNG).
- **3QFY04** Materiel release version 5.2.
- **4QFY03** Initial version 5.4a Initial BVRE capability delivery.
- **4QFY04** Fielding to 2-263d South Carolina ARNG.

## Contractors

**Software:** Northrop Grumman Mission Systems (Redondo Beach, CA)







## Mission

Repair battle-damaged combat systems “on-site,” up through the Direct Support level, in the forward battle area.

## Description and Specifications

The Forward Repair System (FRS) is a high-mobility, forward-maintenance system that reduces man-hours for maintenance personnel. It will replace the M113A2/A3 Armored Personnel Carrier (APC) “Maintenance Track” in its current maintenance role in Force XXI Divisions and Stryker Brigade Combat Teams (SBCTs).

The FRS is a mobile maintenance/repair module mounted to a flatrack, transported by Palletized Load System (PLS) Trucks in Force XXI Divisions or Heavy Expanded Mobility Tactical Truck - Load Handling System (HEMTT-LHS) in SBCTs.

- Dimensions: 8'W x 8'H x 20'L
- Weight: 24,600 lb
- Air Transportability: C-130, C-141
- Crane capacity up to 10,000 lb with 14 ft radius
- Generator provides 35kW at 60Hz
- Air compressor: 175psi @ 50cfpm, 80 gal capacity
- Welding and cutting equipment (shielded metal arc “stick” welding, Metal Inert Gas “MIG” welding and exothermic cutting/brazing)
- Industrial grade hand/pneumatic/power tools, tool load is “functional equivalent” to #1 common tool kit
- Contains a canvas tarp and heater that provides shelter/protection from the weather yet preserves access to welding, air, and accessory tools
- Equipped with two Kevlar air jacks/bags, each capable of lifting 40,000 lb up to 15"
- 690 line items on the hand receipt.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

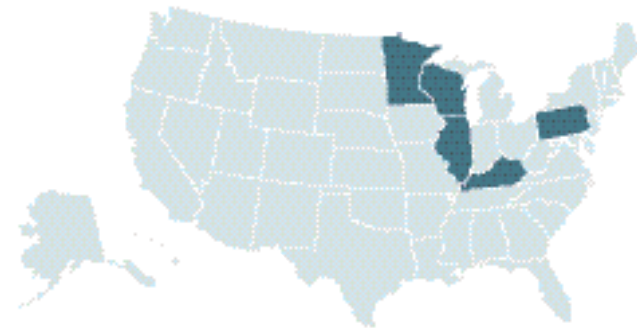
- **Current** In production.

## Projected Activities

- Field to 4th Infantry Division (Ft Carson, CO) and III Corps.

## Contractors

Oshkosh Truck (Oshkosh, WI); Rock Island Arsenal (Rock Island, IL); Grove Worldwide (Shady Grove, PA); Cummings Power (Minneapolis, MN); Ingersoll-Rand (Campbellsville, KY)

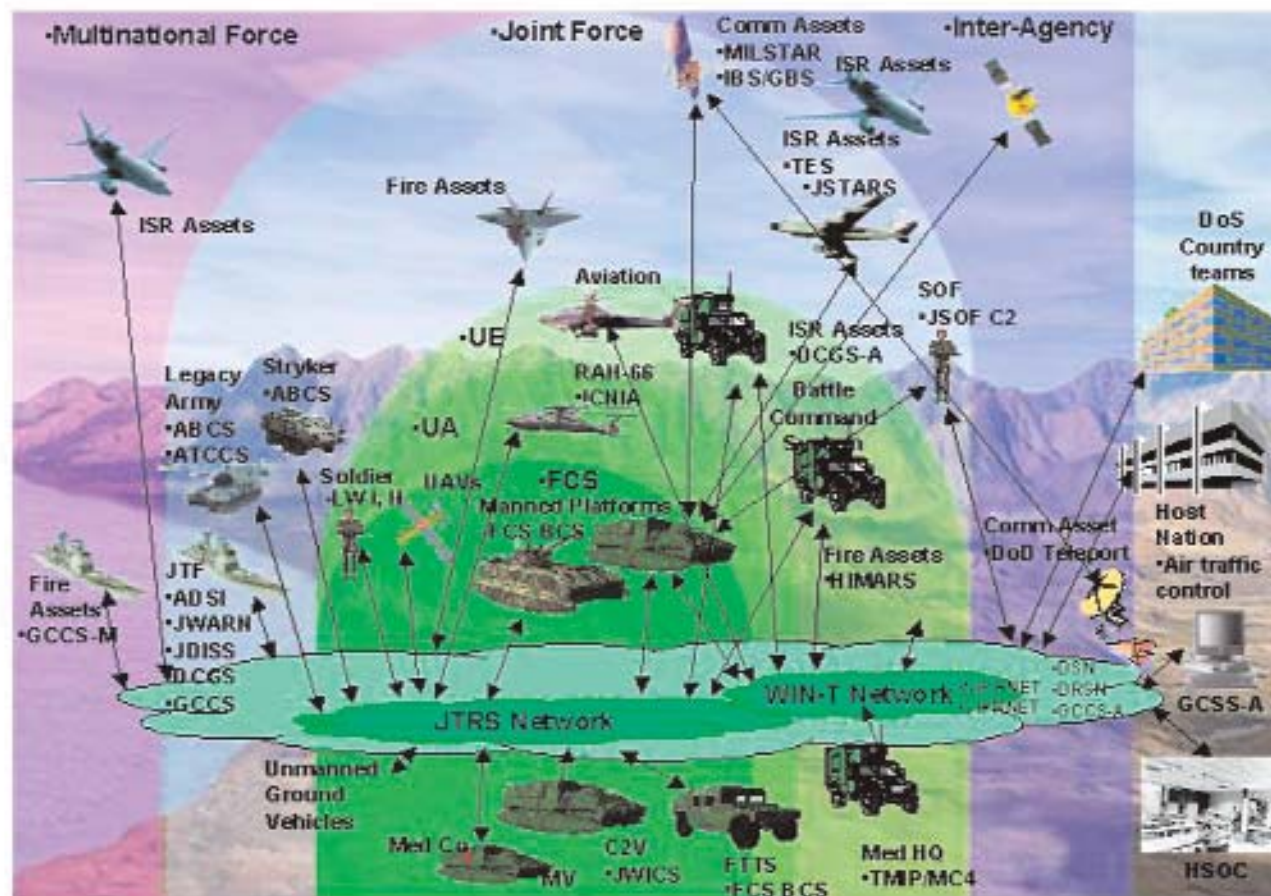




# *FUTURE COMBAT SYSTEMS*

# **FCS**

*One Team-The Army/Defense/Industry*



## Mission

Provide unit of action (UA) echelons with overmatching combat power, sustainability, agility, and versatility necessary for full spectrum operations, including integration into joint warfighting environment; to see first, understand first, act first, and finish decisively—in support of joint and combined operations.

## Description and Specifications

Future Combat Systems (FCS) is the Army's top developmental program. A joint, network centered "system of systems" that is multi-functional, multi-mission, and reconfigurable, FCS networks soldiers with commanders as well as manned and unmanned air and ground vehicles. FCS will serve as a core building block of the Army's Future Force. Within all maneuver UA echelons, FCS will develop over-matching combat power, while maintaining sustainability, agility, and versatility. By integrating mission capabilities, including direct and indirect fire, reconnaissance, troop transport, counter-mobility, nonlethal effects, secure, reliable communications, and joint interoperability, FCS enables soldiers to operate as a coordinated part of a distributed, networked force. These capabilities enable innovative operational behaviors and organizational structures. The UA will demonstrate enhanced force effectiveness in executing tactical operations consisting of mounted, mounted-supported-by-dismounted, dismounted, and dismounted-supported-by-mounted. FCS will enable soldiers in the Future Force to perform a wide range of military activities and operations, from small-scale contingencies to stability and support operations, to major theater war. FCS operates as part of a light-weight, overwhelmingly lethal, strategically deployable, self-sustaining, and survivable combat and combat support force.

FCS leverages advanced technologies with the capability to incorporate future advances. This versatility will be realized through emphasis on an open architecture system concept, with an easily upgraded and tailored design approach to enable the system-of-systems to engage in different missions as needed. The program uses key promising technologies and techniques in areas such as survivability, lethal and non-lethal effects, supportability, propulsion, mobility, structures, robotics, human factors, training, and modeling and simulation. Such technologies combined with innovative concepts of operations and an open systems architecture approach support the fielding of FCS-equipped combat formations this decade.

FCS provides a secure command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) battle command network to harness advances in the distribution and effective use of information power. FCS also provides direct-fire, indirect-fire, non-lethal, and troop transport capabilities. FCS will consist of a combination of manned and unmanned air and ground and unattended elements.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **May 30, 2003** The Army awarded another transaction (OT845) agreement to Boeing, and their partner SAIC, to serve as Lead Systems Integrator (LSI).

## Projected Activities

- **FY05** Milestone B update.
- **FY08** Initial production decision.
- **2010** Initial operational capability.
- **2012** Full operational capability.

## Contractor

**Lead Systems Integrator:** Boeing (St. Louis, MO); Science Applications International Corporation (McLean, VA)



## Future Tactical Truck System - Maneuver Sustainment Vehicle (FTTS-MSV)



## Mission

Provide direct support to the unit of action (UA) brigades in the transportation and distribution of cargo, equipment, and personnel.

## Description and Specifications

Future Tactical Truck System - Maneuver Sustainment Vehicle (FTTS - MSV) is the Future Force sustainment vehicle system and a Future Combat System (FCS) complementary system in the UA.

FTTS - MSV will include new technologies/capabilities such as:

- Embedded diagnostics and prognostics
- Embedded training and simulation
- Advanced/integrated command, control, communications, computers, and intelligence (network-centric with FCS)
- Enhanced mine and ballistic protection
- Unparalleled deployability with a 13-ton payload and transportability with up to 6 tons of cargo aboard the C-130 without preparation
- An enhanced crane/loading handling system (enables direct off-load from the C-130)
- Shares significant commonality with FTTS-Utility Vehicle
- Logistics-reducing technologies (on-board power and water generation, increased fuel efficiency)
- Advanced suspension to keep pace with FCS
- Increased fuel efficiency (+100-200 percent).

## Foreign Counterpart

No known counterpart

## Foreign Military Sales

None

## Program Status

**March 2003:** FCS analysis of alternatives decision recommended rescheduling of FTTS fielding until sometime after UA Increment 1 fielding.

## Projected Activities

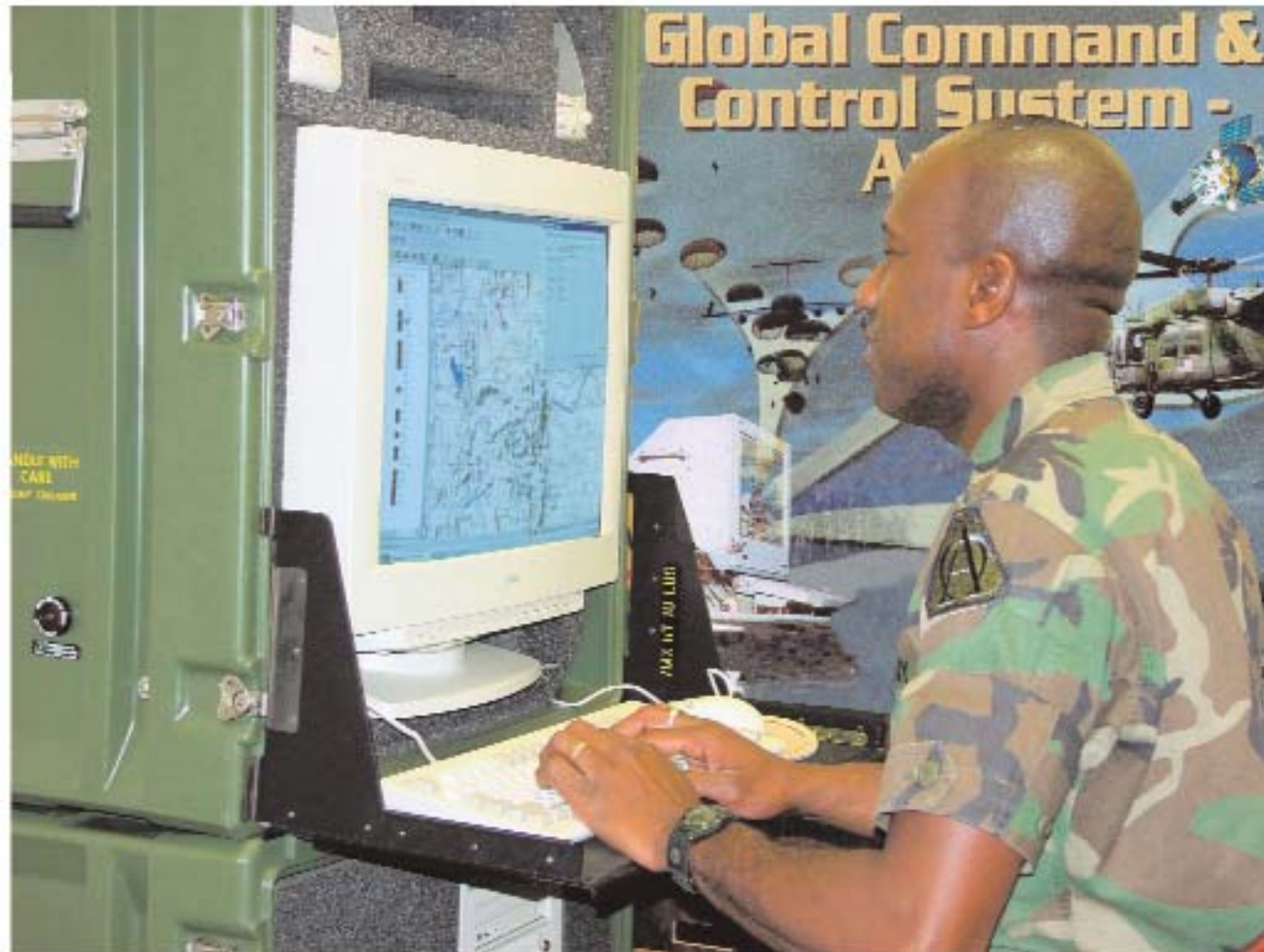
- **2QFY03-4QFY08** Advanced Concept Technology Demonstration (ACTD) planned to reduce risk and assess technology maturity and refine requirements.
- **2QFY06** ACTD demonstration.

## Contractors

TBD







## Mission

Provide the primary logistics system enabler to achieve the Army transformation vision of a technologically advanced, enterprise resource planning (ERP) system, capable of managing the flow of the logistics combat support/combat service support (CS/CSS) resources and information, to satisfy the Army's logistics modernization requirements.

## Description and Specifications

Global Combat Support System-Army (GCSS-Army) will provide automation products needed to re-engineer field Army logistics business processes to conform to industry best practices. As a corollary benefit, it will replace 13 legacy Army logistics systems and interface/integrate with applicable command and control (C2) and joint systems to enhance CS/CSS transformation and modernize the CS infrastructure.

GCSS-Army provides commanders with the capability to anticipate, allocate, and synchronize the flow of CSS resources to equip, deploy/project, sustain, reconstitute, and re-deploy forces in support of the National Military Strategy. It will provide rapid, coordinated, and sustained CSS support to the Army, joint services, and allied forces within a reduced footprint.

As an enabler of near-real-time logistics management, the web-based (Defense Reform Initiative #54) system, supported by lightweight mobile applications, provides essential functionality for limited disconnected operation, and robust deployable communications capable of providing reachback to a centralized data repository regardless of location—i.e., sustaining base or deployed theater—for all users at all echelons.

GCSS-Army will meet the needs of the warfighter by re-engineering field Army logistics business processes to provide the right materiel at the right place and at the right time while anticipating warfighter requirements for asset visibility and control, along with timely and accurate management information. GCSS-Army is the field Army (tactical) component of the Army's single integrated logistics solution capable of supporting rapid force projection and battlefield functional areas of manning, arming, fixing, fueling, moving, and sustaining deployed forces.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **1QFY03** Program adopted SAP's ERP application suite for its technical solution and is currently in the project preparation phase of its implementation.
- **2QFY04** Continuing through the processes of implementing a commercial, off-the-shelf, ERP solution in compliance with the Single Army Logistics Enterprise (SALE) architecture.
- **Current** Program is currently in the Blueprinting phase of the Enterprise Resource Planning implementation, modeling current and to-be business processes.

## Projected Activities

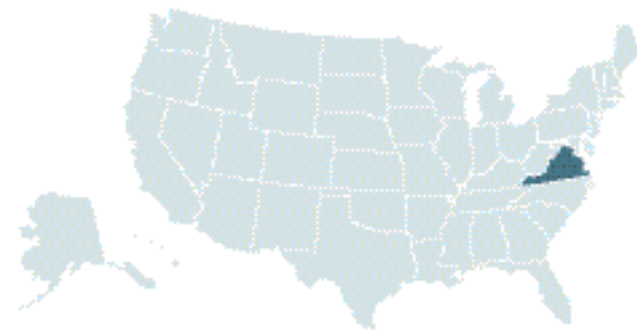
- **FY05** Upon successful Milestone B decision in FY05, program will enter the Realization phase and begin configuring the software to execute the business processes.
- **FY07** Milestone C decision is expected.

## Contractors

**Lead System Integrator:** Northrop Grumman Mission Systems (Chester, VA)

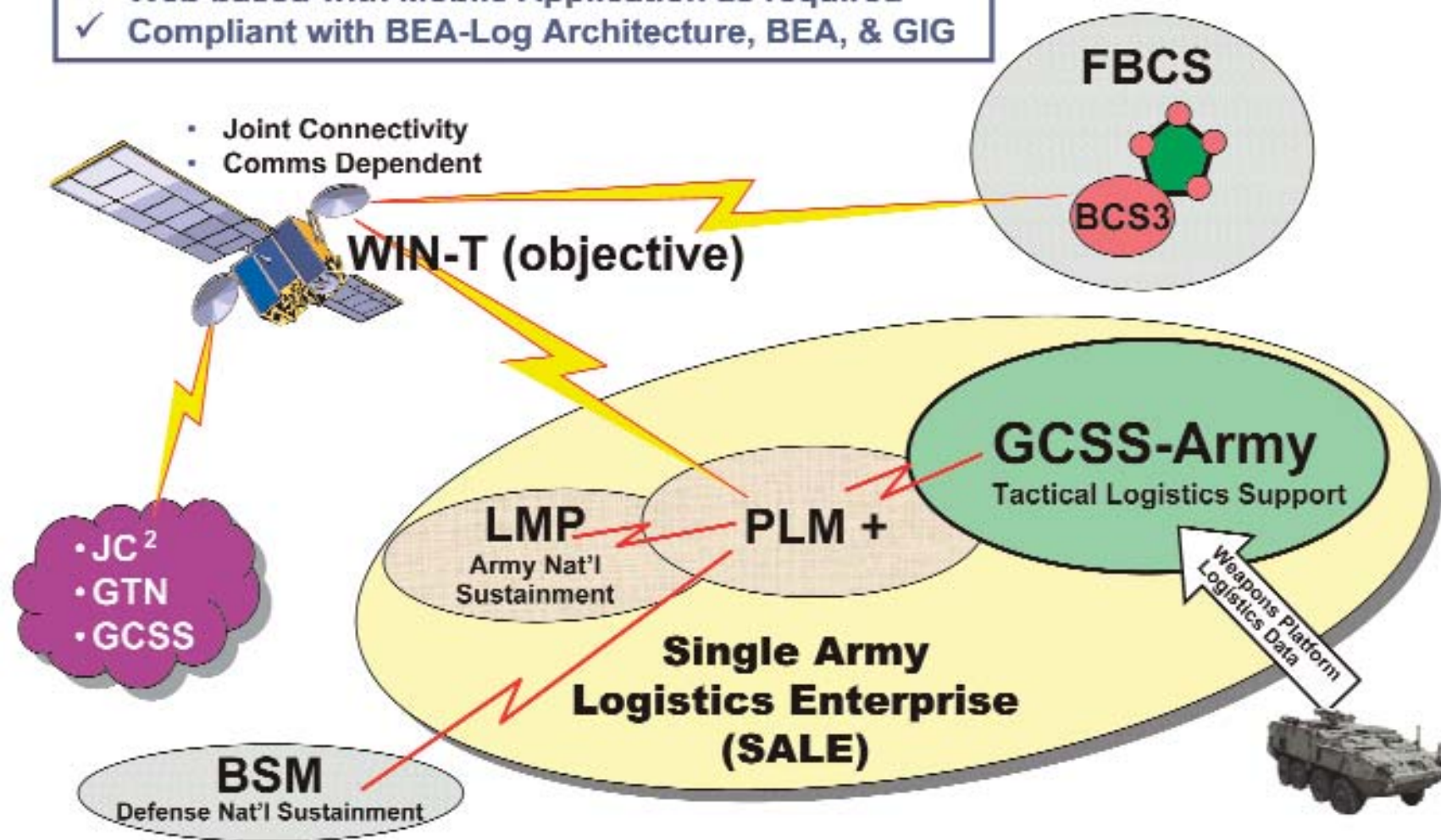
**Laptop Computers:** GTSI (Chantilly, VA)

**Program Support:** EER Systems (Chester, VA)



## ***GCCS-Army in the Logistics Operational Architecture***

- ✓ The tactical component of SALE
- ✓ Web based with Mobile Application as required
- ✓ Compliant with BEA-Log Architecture, BEA, & GIG





## Mission

Provide automated command and control (C2) tools for Army strategic and operational commanders to enhance warfighter capabilities throughout the spectrum of conflict, during joint and combined operations, in support of the National Command Authority.

## Description and Specifications

The Global Command and Control System-Army (GCCS-A) is the Army's strategic and operational C2 system. It provides readiness, planning, mobilization, and deployment capability information for strategic commanders. For theater commanders, GCCS-A provides the following:

- Common operational picture and associated friendly and enemy status information
- Force-employment planning and execution tools (receipt of forces, intra-theater planning, readiness, force tracking, onward movement, and execution status)
- Overall interoperability with joint, coalition, and the tactical Army Battle Command Systems (ABCS).

The GCCS-A supports Army units from the strategic commanders, regional combatant commanders in the theater, and down through the joint task force commander. As part of ABCS, GCCS-A provides a seamless Army extension from the joint GCCS system to echelons corps and below. Compatibility and interoperability are achieved by building the GCCS-A applications to operate on the common operating environment (COE) and through interfaces with other C2 systems within the Army as well as with other services.

COE specifies a common system infrastructure for all C2 systems in accordance with the joint technical architecture guidelines, which provide common support architecture and modular software for use by the services/agencies in developing mission specific solutions to their C2 requirements. The hardware platform is based on commercial, off-the-shelf hardware and the products in the common hardware software II contract. The system architecture links users via local area networks in client/server configurations with an interface to the Secret Internet Protocol Router Network (SIPRNET) for worldwide communication.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **3QFY03** GCCS-A Block IV acquisition decision memorandum signed allowing continued efforts to support synchronization with GCCS.
- **3QFY03** GCCS-A Block IV fielding decision delegated to PEO C3T.

- **1QFY04-4QFY04** Support for Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF I/II).
- **4QFY03-2QFY04** Development of JC2-Army Annex to the JC2 operational requirements document.
- **4QFY04** Fielding of GCCS-A Block IV to support GCCS fielding.

## Projected Activities

- **1QFY04-4QFY04** Modify strategic and operational architectures to support joint GCCS updates.
- **3QFY03-2QFY05** Continue the spiral development process in support of Army digitization and program requirements and develop program documentation for Joint Command and Control System – Army (JC2-A) Block I.
- **1QFY05-4QFY05** Continue directed fieldings and prepare for required support for OEF/OIF/II.
- **2QFY04** Continue integration and testing of GCCS-A Block IV.

## Contractors

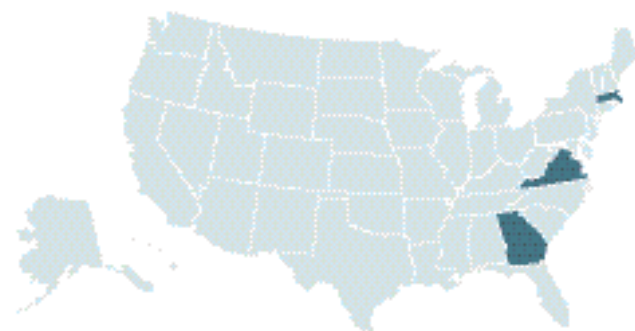
**Prime:** Lockheed Martin (Springfield, VA)

**Hardware:** General Dynamics (Taunton, MA)

**Fielding Support:** FC Business Systems (Springfield, VA)

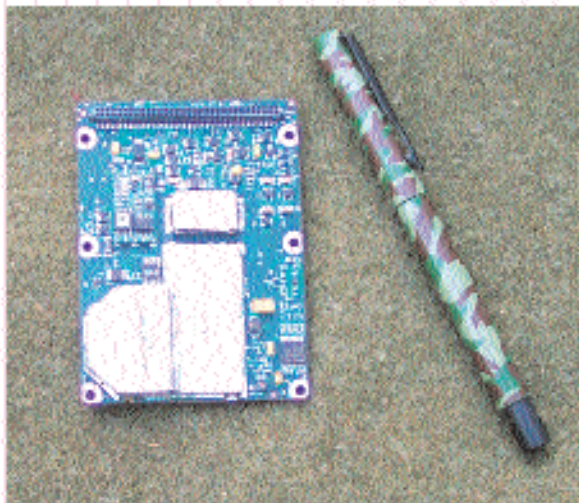
**Software Fielding:** Getronics (Springfield, VA)

**Software Training:** Science Applications International Corporation (Atlanta, GA)





## Global Positioning System (GPS)



## Mission

Provides real-time position, velocity, and timing (PVT) data to tactical/strategic organizations.

## Description and Specifications

The Global Positioning System (GPS) is a space-based joint service navigation program, led by the Air Force, that distributes PVT data. It has three segments: a space segment (nominally 24 satellites), a ground control segment, and a user equipment segment. User equipment consists of receivers configured for hand-held use, ground, aircraft, and watercraft applications. Military GPS receivers use the Precise Positioning Service (PPS) signal to gain enhanced accuracy and signal protection not available to commercial equipment. The primary GPS receiver in the Army today is the Precision Lightweight GPS Receiver (PLGR) with more than 100,000 in handheld, installed, and integrated applications. Future GPS user equipment will be both handheld (Defense Advanced GPS Receiver [DAGR]) and platform-embedded (Ground-Based GPS Receiver Applications Module [GB-GRAM]). The Army represents more than 80 percent of the requirement for user equipment.

## Foreign Counterpart

Russia: GLONASS; Europe: GALILEO (still in planning stage)

## Foreign Military Sales

PPS-capable GPS receivers have been sold to 28 authorized countries.

## Program Status

- **FY03** Supplemental PLGR fieldings continued to support Army digitization and transformation.
- **1QFY03** DAGR production contracts awarded.
- **3QFY03** GB-GRAM production contract awarded.
- **1QFY04** DAGR prime contractor selected.

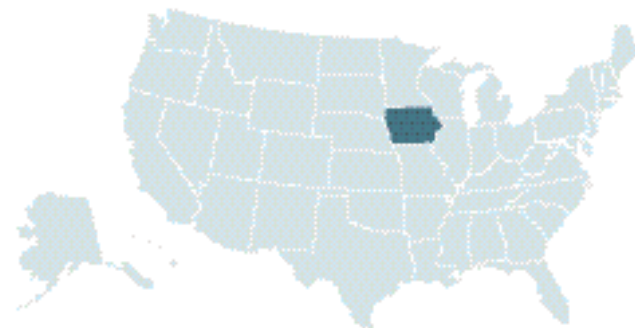
## Projected Activities

- **FY04** Supplemental PLGR fielding continues to support Army digitization and transformation.
- **FY04** Volume production deliveries of GB-GRAM begins.
- **3QFY04** Initial GB-GRAMs delivered.
- **FY05** GB-GRAM fielded as a component part of host systems.
- **FY05** DAGR first unit equipped and subsequent fieldings.

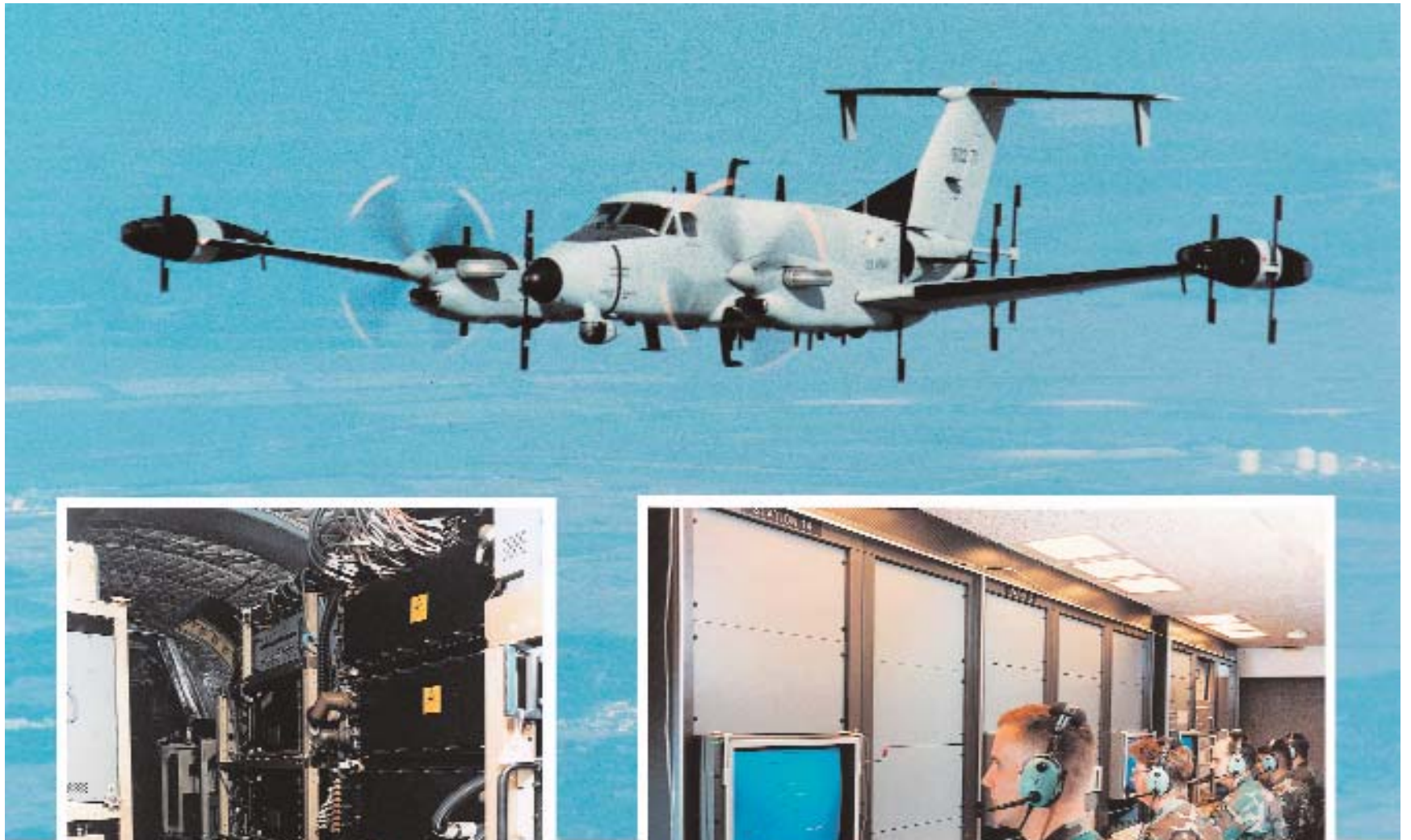
## Contractors

**DAGR Acquisition and PLGR Support:** Rockwell Collins (Cedar Rapids, IA)

**GB-GRAM Acquisition:** Rockwell Collins (Cedar Rapids, IA)







## Mission

Provide signal intercept and precision target location of threat communications and non-communications electronic emitters.

## Description and Specifications

The Guardrail/Common Sensor (GR/CS) is a corps-level, fixed-wing, airborne, signals intelligence (SIGINT) collection and precision targeting location system. The GR/CS system supports corps, division, and joint land force component commanders by detecting, identifying, exploiting, and precisely locating threat communications, radars, and other electronic emitters throughout the corps/joint task force (JTF) area of interest. It provides information dominance to the tactical commander.

One GR/CS system is authorized per aerial exploitation battalion in the military intelligence brigade at each corps. A standard system consists of eight to 12 RC-12 aircraft that fly operational missions in sets of two or three. Ground processing is conducted in the Integrated Processing Facility (IPF). Interoperable data links provide microwave connectivity between the aircraft and the IPF or the modernized Guardrail Information Node (GRIFN), which is a downsized version of the IPF. GR/CS systems provide near real-time SIGINT and targeting information to tactical commanders throughout the corps/JTF area via the Commander's Tactical Terminal (CTT), Tactical Related Applications Broadcast System (TRAPS), Tactical Reconnaissance Intelligence Exchange System (TRIXS), Tactical Information Broadcast Service (TIBS), and Integrated Broadcast Service (IBS). Key features include:

- Integrated communications intelligence (COMINT) and electronic intelligence (ELINT) collection and reporting
- Enhanced signal classification and recognition, and precision emitter geolocation
- Near real-time direction finding
- Advanced integrated aircraft cockpit
- Tactical Satellite Remote Relay System (Systems 1, 2, and 4).

Planned product improvements include greater mobility, deployability and system upgrades. Guardian Eagle (GE) upgrades increase GR/CS capability to exploit a wider range of signals. The GR/CS shares technology with the Airborne Reconnaissance Low (ARL) and other joint systems.

## Foreign Counterpart

Numerous countries possess airborne electronic warfare systems, but none achieves the direction-finding accuracy of the Guardrail system.

## Foreign Military Sales

None

## Program Status

- **Fielded:** Reporting shelter and conducted accreditation testing to GR/CS System 2; Transportable Medium Earth Terminal (TMET) for remote relay capability for System 4; Advanced Quicklook X-Wing diagnostics system capability to all systems; Guardian Eagle, Enhanced Signal Exploitation, to Systems 2 and 4; and Triband SATCOM Terminal (TST) to System 4 to support remote relay operations.
- Completed final TIBS capability to all GR/CS systems.
- Received full materiel release for GR/CS System 2.
- **2QFY04** Completed GRIFN upgrade on System 1.

## Projected Activities

- **4QFY04** Complete Interference Cancellation System (ICS) upgrade on System 3.
- **1QFY05** Install Airborne Tactical Common Data Link (ATCDL) on System 1.
- **1QFY05** Provide additional GE capability to System 1.
- **1QFY05** Install ATCDL on System 4.

## Contractors

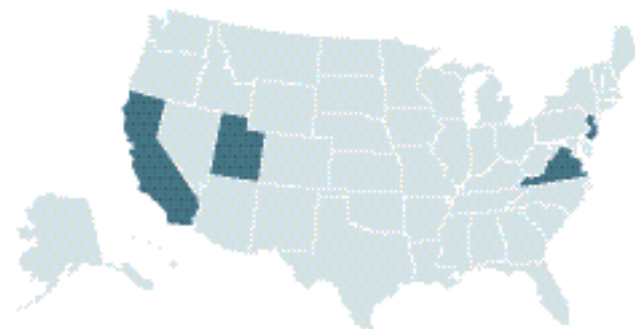
**Guardian Eagle Upgrades:** Northrop Grumman (Sacramento, CA)

**Data Links:** L-3 Communications (Salt Lake City, UT)

**Radio Relay Sets:** Raytheon (Falls Church, VA)

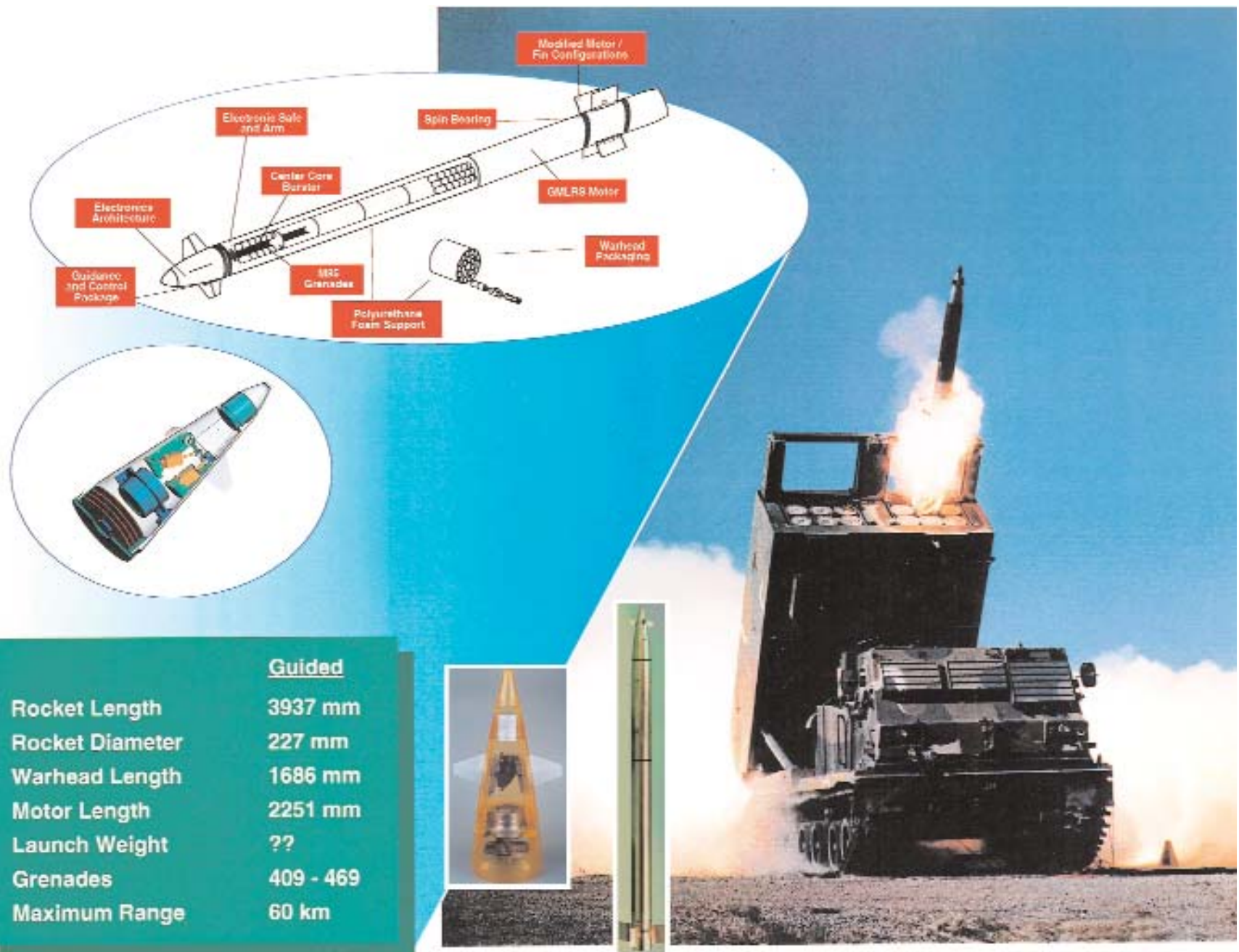
**SIGINT Support:** CACI (Eatontown, NJ)

**X-Midas Software:** ZETA (Shrewsbury, NJ)





## Guided Multiple Launch Rocket System (GMLRS)



## Mission

Provide longer-range, greater precision Multiple Launch Rocket System (MLRS) fires while reducing hazards to friendly maneuver forces.

## Description and Specifications

The Guided Multiple Launch Rocket System (GMLRS) supports Army transformation as a Legacy-to-Objective Force precision-guided munition with increased overmatch capabilities and reduced logistics throughput over current freeflight rockets. GMLRS will be employed with the M270A1 upgraded MLRS tracked launcher and the High Mobility Artillery Rocket System (HIMARS) wheeled launchers. GMLRS is an international cooperative development program with the United Kingdom, Germany, France, and Italy.

GMLRS munitions have greater accuracy with a resulting higher probability of kill, smaller logistics footprint, minimized collateral injury, and minimized damage to unintended or non-military targets. There are two variants of the GMLRS: the dual-purpose improved conventional munitions (DPICM) variant (warhead consists of 404 small anti-personnel and anti-materiel grenades that are dispersed over the specific target); and the unitary variant (warhead consists of a single, 200 lb class high explosive charge that provides blast and fragmentation effects on, above, or in a specific target). These complementary capabilities cover many of the target types and target conditions expected in future conflicts.

**Rocket Length:** 3937 mm

**Rocket Diameter:** 227 mm

**Warhead Length:** 1686 mm

**Motor Length:** 2251 mm

**Maximum Ballistic Range:** 60 km

## Foreign Counterpart

The Israeli Ministry of Defense is developing a ground-commanded, trajectory-correcting MLRS variant.

## Foreign Military Sales

None

## Program Status

- **1994** Commenced the advanced technology demonstration (ATD) phase.
- **3QFY98-2QFY99** Conducted five ATD flight tests.
- **4QFY98** Completed development phase international memorandum of understanding with France, Germany, Italy, and the United Kingdom.

- **4QFY00** Demonstrated DPICM dispense threshold; completed rocket motor pre-flight readiness tests.
- **1QFY01** Restructured program with new guidance set; successfully completed the first ballistic flight test.
- **1-2QFY02** Conducted successful early development test.
- **4QFY02-1QFY03** Conducted production qualification test.
- **3QFY03** Low-rate initial production (LRIP) decision and LRIP I contract award.
- **4QFY03** FY03 Operation Iraqi Freedom supplemental contract award.

## Projected Activities

- **4QFY04** Initial operational test.
- **FY05** Full-rate production decision.
- **FY06** Initial operational capability.

## Contractors

**Prime Munitions Integrator:** Lockheed Martin (Dallas, TX)

**Rocket Assembly:** Lockheed Martin (Camden, AR)

**Motor Assembly:** Aerojet (Camden, AR)

**G&C Section:** Honeywell (Clearwater, FL)

**Motor Case/Warhead Skins:** Aerojet (Vernon, CA)



## High Mobility Artillery Rocket System (HIMARS)





## Mission

Provide current and future early-entry/contingency forces with 24/7 near-all-weather, surface-to-surface, deep attack, precision Multiple Launch Rocket System (MLRS) and Army Tactical Missile System (ATACMS) firepower, to a range of 300km, in order to conduct destructive, suppressive, and counter-battery fires against high-payoff, high-value, and time-sensitive targets.

## Description and Specifications

The High Mobility Artillery Rocket System (HIMARS) supports Army transformation with a rapidly-deployable, lethal fire support system for early entry/contingency forces. HIMARS is mounted on a modified Family of Medium Tactical Vehicles (FMTV) five-ton chassis and can be transported by C-130 or larger aircraft. The wheeled chassis allows for faster road movement, lower operating costs, and requires 30 percent fewer strategic airlifts (via C-5 or C-17) to transport a battery than the current tracked M270 MLRS launcher unit. The HIMARS can fire all current and planned suites of MLRS family of munitions, including ATACMS and GMLRS. The HIMARS carries either six rockets or one ATACMS missile, has a self-loading and self-locating capability, and is manned by a three-man crew protected during firings by a reinforced man-rated cab.

## Foreign Counterpart

There are several foreign, wheeled, multiple-rocket-launch systems on the international market; none, however, has the mobility and munitions suite capabilities of HIMARS.

## Foreign Military Sales

None

## Program Status

- **CY98** Three HIMARS prototypes were built as part of the Rapid Force Projection Initiative (RFPI) Advanced Concept Design Technical Demonstration (ACTD).
- **September 2000** ACTD prototypes completed a two-year extended user evaluation with XVIII Airborne Corps. Positive user feedback was used to make design changes in system design and development (SDD) and low-rate initial production. XVIII Airborne Corps received Army approval, in November 2000, to retain the prototypes (which provide a limited "go-to-war" capability) until first unit equipped (FUE) in FY05. The HIMARS ACTD prototype launchers successfully deployed and fought in Operation Iraqi Freedom.
- **1QFY00** The HIMARS SDD phase began with a maturation contract award. Six Army and two Marine Corps launchers were produced for testing.

- **2QFY03** Completed Milestone C. Fielding plan includes FY05-06 XVIII Airborne Corps Artillery and FY06-09 III Corps Artillery.
- **1QFY04** Second LRIP production contract.
- **2QFY04** Life cycle contractor support contract.

## Projected Activities

- **3QFY04** First delivery following ongoing LRIP. The Army plans to procure 45 HIMARS battalions to meet current force structure requirements, plus assets for Training and Doctrine Command (TRADOC) and follow-on testing (888 total HIMARS launchers).
- **FY03-05** Continue developmental testing/operational testing of planned upgrades and improvements identified in SDD.
- **4QFY04** Conduct initial operational test.
- **2QFY05** Battalion-level first unit equipped.

## Contractors

**Prime and Launcher:** Lockheed Martin (Dallas, TX; Camden, AR)

**Improved Weapons Interface Unit:** Harris (Melbourne, FL)

**Position Navigation Unit:** Allied Signal (Teterboro, NJ)

**Family of Medium Tactical Vehicles:** Stewart & Stevenson (Sealy, TX)

**Pump and Motor:** Vickers (Jackson, MS)





## Improved Ribbon Bridge (IRB)



## Mission

Provides a continuous roadway or raft capable of crossing military load classification 100(w)/80(t) vehicles over non-fordable wet gaps.

## Description and Specifications

The Improved Ribbon Bridge (IRB) system is designed to replace the Standard Ribbon Bridge (SRB), which has exceeded its service life.

IRB uses modular, aluminum bays with integral superstructure and floating supports to provide a continuous floating roadway operable in currents up to 10.5 ft per second.

Fielded to Multi-Role Bridge Companies (MRBCs), the bridge modules are mounted on M15 Bridge Adapter Pallets (BAP) and transported using M1977 Common Bridge Transporters (CBT) and M1076 Palletized Load System (PLS) Trailers. A 100m bridge can be built in less than 60 minutes (daytime).

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **3QFY03** Type classification standard and full materiel release approved.
- **1QFY04** Complete fielding to 50th MRBC, 341st Army Reserve, and 299th Army Reserve.

## Projected Activities

- **FY04** Continue fielding activities.

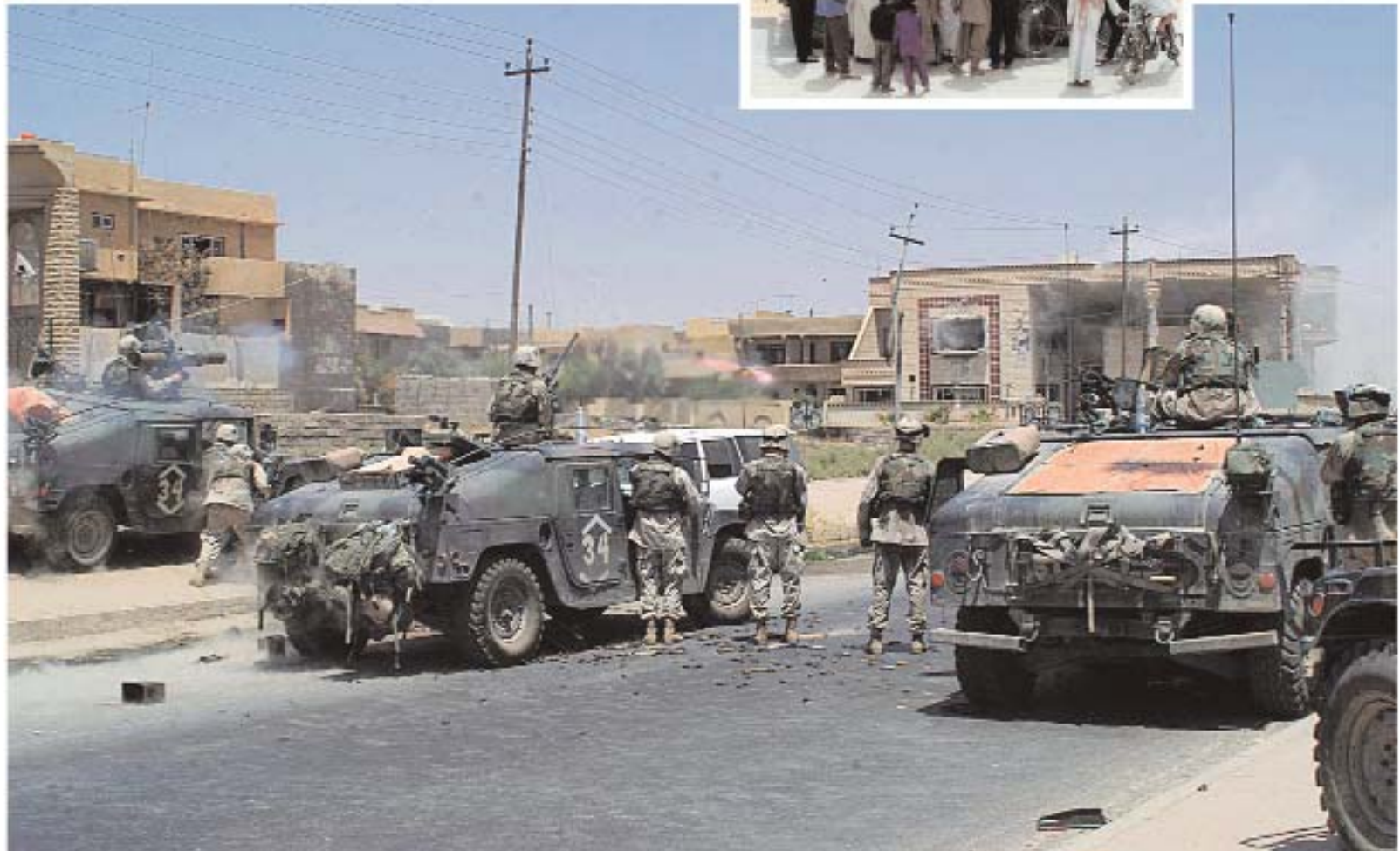
## Contractors

**Manufacturer:** General Dynamics (Santa Barbara, CA); Sistemas (Kaiserslautern, Germany)

**Logistic Support:** AM General (Livonia, MI; South Bend, IN)

**Retrofit & Engineer:** LSI (Red River, TX)







## Mission

Provides a multi-mission weapon system that defeats threat armored vehicles at extended ranges in all battlefield conditions, precision fires capability in military operations in urban terrain (MOUT), and assault scenarios.

## Description and Specifications

The TOW (Tube-Launched, Optically-Tracked, Wire Command-Link guided missile) Improved Target Acquisition System (ITAS) is critical to the Current and Future Forces. ITAS is the Reconnaissance, Intelligence, Surveillance, and Target Acquisition (RISTA) platform for light, airborne, air assault, and Stryker Brigade Combat Team (SBCT) forces.

ITAS is a major product upgrade modification to the light infantry's existing M220 TOW 2 system. The ITAS modification kit consists of an integrated (day/night sight with laser rangefinder) target acquisition subsystem, fire control subsystem, lithium-ion battery power source, and a modified traversing unit.

ITAS is a multi-mission weapon system used not only as a tank killer, but as the task force's long range surveillance asset. With the PAQ-4/PEQ-2 Laser Pointer, it is used for .50 caliber or Mk-19 grenade engagements. TOW 2B Aero (extended range) provides an extended maximum range to 4,500 meters for long range engagement of armored vehicles and TOW Bunker Buster is designed for MOUT/bunker engagements during assault operations.

ITAS has second-generation infrared sensor technology and provides gunners with more than double the detection and recognition range of the AN/TAS TOW sight. ITAS also provides improved probability of hit through aided target tracking, improved missile flight operations, and an elevation brake to minimize launch transients.

ITAS has an improved design that greatly reduces its number of components, minimizing logistics support and equipment requirements. Built-in-test (BIT) diagnostics and improved man-machine interfaces will greatly improve target engagement performance. The performance based logistics support contract will reduce ITAS support costs to 50 percent of the TOW 2 support costs.

ITAS will replace TOW 2 in light infantry units and operate from the High Mobility Multipurpose Wheeled Vehicle (HMMWV), the dismount tripod platform, and light armored vehicles.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

NATO Maintenance and Supply Agency, and Canada

## Program Status

- **1998** First unit equipped completed to 1-17th Cav, 82nd Airborne. Since then, ITAS has been fielded to: 82 Airborne Div, SBCT and ATGM; the 101st Air Assault Division; 2nd Infantry Division and 10th Mountain Division; 25th Infantry Division, and 39th Engineer Support Battalion (ESB).
- Marine Corps selected ITAS as its AAWS-H choice to replace all Marine Corps heavy anti-tank/assault systems.
- Hardware fieldings to active and National Guard units nine months ahead of schedule per requests from deploying units.
- ITAS system is being considered as a Future Combat System acquisition system.

## Projected Activities

- **2QFY04** Lithium-ion qualification testing to be completed.
- **3-4QFY04** Fielding to 101st Air Assault Division.
- **FY05-06** Integration of far target location and radio frequency transfer of forward-looking infrared imagery.
- **FY06-11** Production will procure 630 systems.
- **FY09** Army production continues.

## Contractors

**Prime:** Raytheon (McKinney, TX)

**Training Devices:** BAE Systems (Austin, TX)



## Integrated Family of Test Equipment (IFTE)



**Maintenance Support Device**



**AN/TSM-191(V) 5  
Electro-Optics  
Test Facility**



**AN/TSM-191(V) 6  
Base Shop  
Test Facility**



## Mission

Provide mobile, general purpose, off-platform automatic test systems and rugged, compact, lightweight, man-portable, general purpose, and at-platform automatic test equipment to verify the operational status of Army weapon systems and components and isolate, diagnose, and repair faults.

## Description and Specifications

The Integrated Family of Test Equipment (IFTE) is the Army standard modular test, measurement, and diagnostic equipment consisting of three interrelated, integrated, mobile, tactical, and man-portable systems. These systems allow weapon system fault isolation to the line replaceable unit at all maintenance levels, both on and off the weapon system.

The Electro-Optics Test Facility (EOTF) (AN/TSM-191(V)5) is capable of testing the full range of Army electro-optical systems including laser transmitters, receivers, spot trackers, forward looking infrared systems, and television systems. It is fully mobile with VXI instrumentation, touch-screen operator interface, and an optical disk system for test program software and electronic technical manuals.

The IFTE Base Shop Test Facility (BSTF) (AN/TSM-191(V)6) is the follow-on reconfigurable, rapidly deployable ATE capable of supporting joint operations, reducing logistical footprint, and replacing/consolidating obsolete, unsupportable ATE in the Army inventory.

The Maintenance Support Device (MSD) is a multi-purpose ruggedized software loader, verifier, and at-system automated piece of test equipment used throughout DoD to test and diagnose complex electronics, engines, transmissions, central tire inflation systems, anti-lock brake systems, and other missile, aviation, and vehicular subsystems.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

Bahrain, Djibouti, Egypt, Ethiopia, Jordan, Korea, Kuwait, Lithuania, Macedonia, Morocco, Poland, Saudi Arabia, Taiwan, United Arab Emirates, Uzbekistan, Yemen

## Program Status

- **1QFY04** BSTF proof of principle demonstration.

## Projected Activities

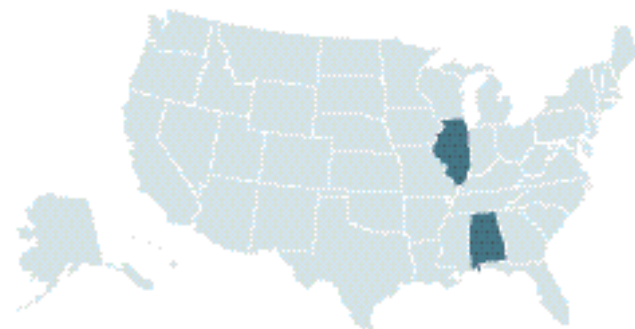
- **2QFY04** Proof of principle, phase II.

## Contractors

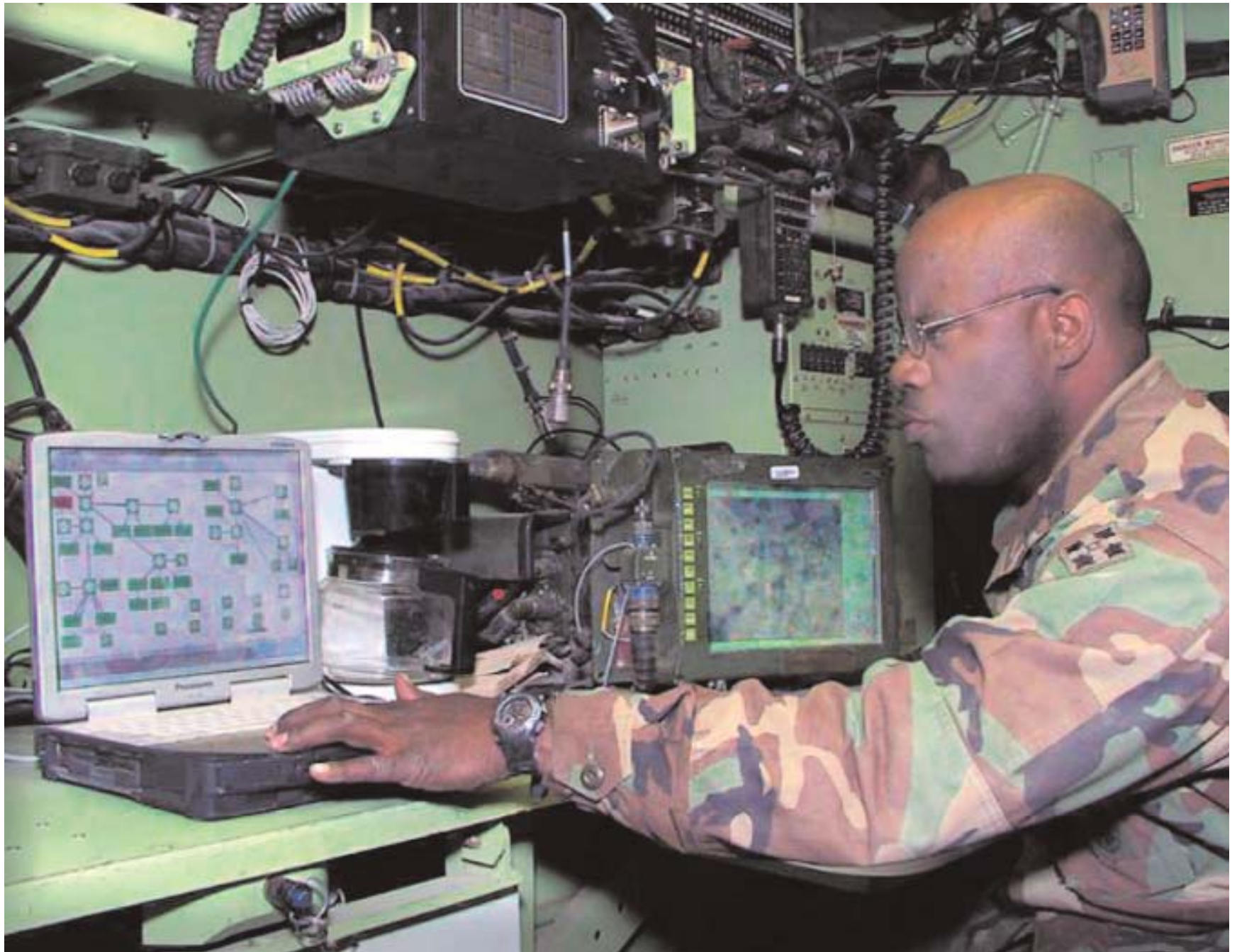
**EOTF:** Northrop Grumman (Rolling Meadows, IL)

**MSD:** Miltope Corporation (Hope Hull, AL)

**BSTF:** DRS Technologies (Huntsville, AL); Northrop Grumman, (Rolling Meadows, IL)







## Mission

Provide command and control, planning, and engineering of the Army's tactical networks, from battalion through theater, in support of joint and combined operations.

## Description and Specifications

The Integrated System Control (ISYSCON) (V)4/Tactical Internet Management System (TIMS) is a software system that resides on the Force XXI Battle Command, Brigade-and-Below (FBCB2) system located in the S6/G6 sections of the digitized force architecture. The ISYSCON (V)4/TIMS reuses FBCB2 software as a foundation and adds developmental and commercial, off-the-shelf (COTS) software to plan, configure, initialize, and monitor the Tactical Internet. The ISYSCON (V)4/TIMS enhances the FBCB2 system management capability.

TIMS is a C2 enabler that will support the full spectrum of military operations and the seven mission areas described in the Army Planning Guidance sections of The Army Plan FY02-10. The ISYSCON (V)4/TIMS will be developed and implemented in increments by incorporating blocked enhancements to the key performance parameter threshold baseline.

The ISYSCON (V)4/TIMS is expected to evolve into new hardware and software baseline blocked enhancements. As new systems are added to the Tactical Internet, such as aviation platforms, the ISYSCON (V)4/TIMS will provide a network management interface capability. The ISYSCON (V)4/TIMS is currently scheduled for fielding to the active duty components and 15 enhanced separate brigades.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **1QFY03** Issued V2.5.2 Stryker Brigade Combat Teams 1 and 2.
- **2QFY03** Deployed with 4th Infantry Division Operation Iraqi Freedom.
- **3QFY03** Stryker initial operational test and evaluation (IOTE).
- **4QFY03** Stryker Brigade Combat Team 2 fielding complete.
- **4QFY03** 1st Cavalry Division fielding complete.
- **1QFY04** Deployed with Stryker Brigade Combat Team 1 Operation Iraqi Freedom.

## Projected Activities

- **2QFY04** Issue to Stryker Brigade Combat Team 3.
- **2QFY04** Field to Fort Gordon, GA, classroom.
- **3QFY04** V6.4 Software release.
- **4QFY04** Central Technical Support Facility Certification of V6.4.
- **1QFY05** IOTE.
- **2QFY05** Stryker Brigade Combat Team 3 fielding complete.
- **3QFY05** Materiel release.

## Contractors

**Software:** Northrop Grumman Mission Systems (Carson, CA)

**Integrated Logistics Support, Software Maintenance:** Madentech (Eatontown, NJ)

**Software:** Mitre (Eatontown, NJ)

**Integrated Logistics Support:** Mantech (Norfolk, VA)





# Interceptor Body Armor (IBA)

**IBA = Outer Tactical Vest (OTV) + Ballistic Inserts (set)**



Ballistic Inserts are either the 4lb product containing Spectra-Shield or slightly heavier plates made from Kevlar or like products



## Mission

Provide ballistic and fragmentation protection for individual soldiers in a light-weight, modular body armor package.

## Description and Specifications

Interceptor Body Armor (IBA) is the model name for modular, multiple-threat ballistic and fragmentation protection. IBA is a joint service item designed and developed to incorporate the requirements of the Army and Marines and to replace the Interim Small Arms Protective Overvest (ISAPO) and the Personal Armor System Ground Troops (PASGT) vests.

A set of IBA consists of an Outer Tactical Vest (OTV), a set of ballistic inserts, and attachable throat and groin protectors for increased protection. The OTV without plates weighs 8.4 lb (size medium) and provides protection against fragmentation and up to 9mm ball (pistol) ammunition. The Small Arms Protective Insert (SAPI) plates (two at four lb each) can withstand multiple small arms hits and increase protection up to 7.62mm ball ammunition. Total IBA weight is 16.4 lb, a reduction in weight of 9 lb from the previous body armor.

Five sizes of the Interceptor, including front and back ergonomically designed plates, are being fielded. Each set includes webbing attachment loops on the front of the vest, which accommodate the same pockets from the Modular Lightweight Load-Carrying Equipment (MOLLE). These features allow each individual soldier to tailor loads to meet mission needs.

## Foreign Counterpart

All NATO nations have similar capabilities for clothing and individual equipment unique to their environment and mission.

## Foreign Military Sales

None

## Program Status

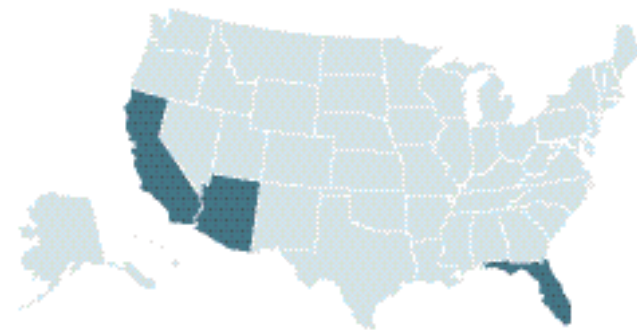
- **Current** In production and being deployed.
- **September 2003** 272,844 OTVs and 271,722 SAPI have been fielded.

## Projected Activities

- Continue fielding.

## Contractors

Point Blank Body Armor (Oakland Park, FL); Armor Works (Tempe, AZ); Ceradyne, Inc. (Costa Mesa, CA); Simula Safety Systems, Inc. (Phoenix, AZ)



## Javelin



## Mission

Provide a man-portable, highly lethal and survivable, medium anti-tank weapon system to the infantry, scouts, and combat engineers.

## Description and Specifications

Javelin is the first fire-and-forget shoulder-fired anti-tank missile now fielded to the Army and Marine Corps, replacing Dragon. Javelin's unique top-attack flight mode, self-guiding tracking system, and advanced warhead design allows it to defeat all known tanks out to ranges of 2,500m.

Javelin's two major modular components are a reusable command launch unit (CLU) and a missile sealed in a disposable launch tube assembly. The CLU's integrated day/night sight provides target engagement capability in adverse weather and countermeasure environments. The CLU also may be used by itself for battle-field surveillance and reconnaissance.

The Javelin missile and CLU together weigh 49.5 lb; its maximum range is in excess of 2,500m. Its fire-and-forget capability enables gunners to fire and then immediately take cover, greatly increasing survivability. Special features include a selectable top-attack or direct-fire mode (for targets under cover or for use in urban terrain against bunkers and buildings), target lock-on before launch, and a very limited back-blast that enables gunners to fire safely from enclosures and covered fighting positions.

The Javelin preplanned product improvement program provides lethal performance essential to the current and objective forces by aligning the CLU and missile performance for maximum effectiveness at extended ranges. The Javelin Weapon System is the dismounted weapon of choice for the Future Combat System (FCS) Unit of Action Complementary Systems. Javelin P3I-Block I is available to begin FCS integration in FY06.

Javelin has been fielded to over 90 percent of active duty units, and fielding has begun to National Guard units.

## Foreign Counterpart

The Israeli Spike/Gill is being promoted as having fire-and-forget capability. Other medium range systems currently fielding or in development include the Russian AT-7, the Swedish Bofors Bill, the French MILAN 2T, and the Euro Missile TRIGAT.

## Foreign Military Sales

United Kingdom, Australia, Ireland, Jordan, Lithuania, Taiwan, Norway, and New Zealand. Other international sales are pending.

## Program Status

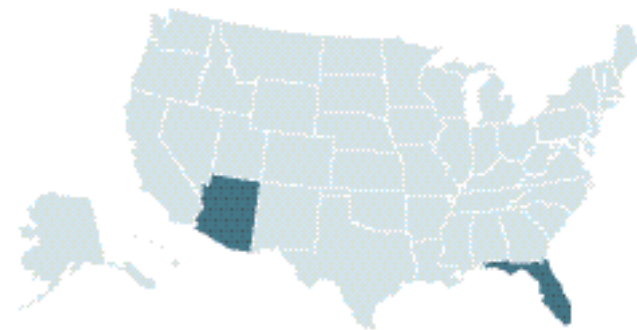
- **Current** Hardware deliveries and fielding to the Army continue on schedule.
- Marine Corps fully fielded.
- **2QFY04** Field to 172d Brigade (3d Stryker Brigade Combat Team).

## Projected Activities

- **FY04** Field to 3rd Brigade 1st Artillery Division, 76th Infantry, 1-509th Infantry, 4th Stryker Brigade Combat Team, 32nd Infantry, 45th Infantry, and 53rd Infantry.
- **3QFY04** Field to 19th and 20th Special Forces Groups.
- **4QFY04** Field to XVIII Corps Engineers.
- **FY04-08** Multi-year III procurement activity is underway.

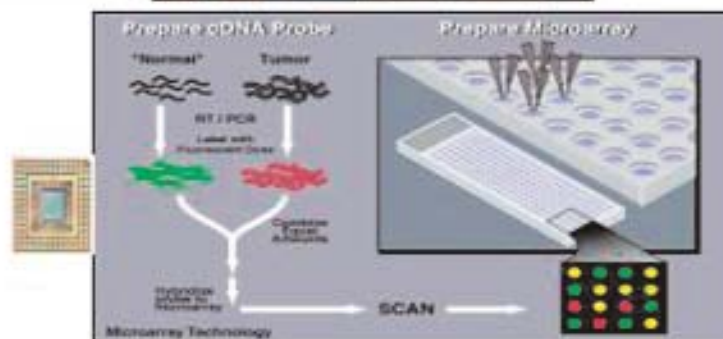
## Contractors

**Javelin Joint Venture:** A joint venture between Raytheon (Tucson, AZ) and Lockheed Martin (Orlando, FL)





## Joint Biological Agent Identification Diagnostic System (JBAIDS)



## Mission

Rapidly identify low levels of biological warfare agents and other pathogens in a variety of patient and environmental samples that may be encountered in field and hospital clinical laboratories.

## Description and Specifications

Joint Biological Agent Identification Diagnostic System (JBAIDS) includes a clinical instrument based upon commercial, off-the-shelf/non-developmental item technology requiring limited modification to meet operational requirements. Integrated with this instrument will be reagent test kits for pathogen identification and protocols for sample preparation that when used together can be cleared by the Food and Drug Administration (FDA) as a diagnostic test.

JBAIDS can identify biological agents in environmental and clinical samples at or below 1,000 colony-forming units or 10,000 plaque-forming units per milliliter.

**Detection Sensitivity:** Equal to or better than 85 percent for identification of target agents at specified limit of detection concentrations.

**Detection Specificity:** Equal to or better than 90 percent for identification of target agents at specified limit of detection concentrations.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

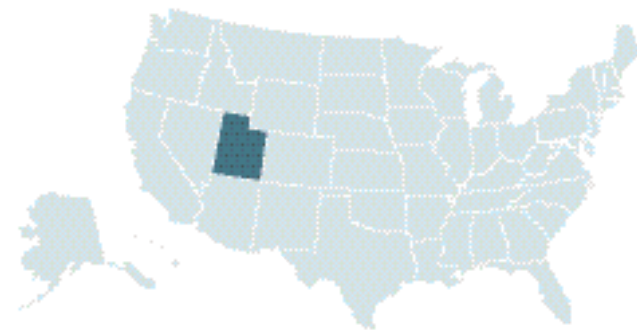
- **September 2003** Contract award.
- **January 2004** Critical design review.
- **March 2004** Developmental testing.

## Projected Activities

- **August 2004** Operational assessment.
- **September 2004** Milestone C.

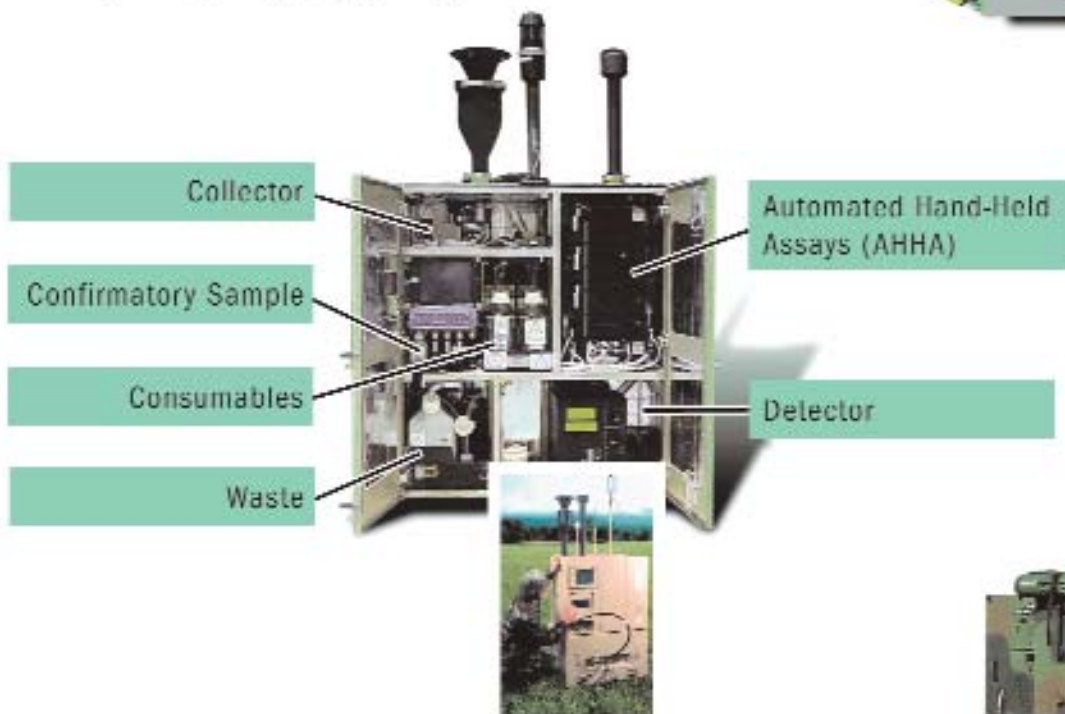
## Contractors

Idaho Technologies (Salt Lake City, UT)

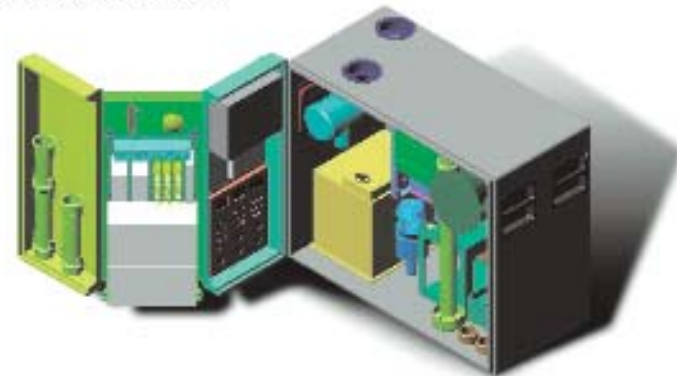


## Joint Biological Point Detection System (JBPDS)

JBPDS Bio Suite Block I



JBPDS Block II



JBPDS BIDS





## Mission

Provide rapid and fully automated detection, identification, warning, and sample isolation of high threat biological warfare (BW) agents.

## Description and Specifications

The Joint Biological Point Detection System (JBPDS) is the first joint BW agent detection program. It consists of a common biosuite that can be installed on vehicles, ships, and at fixed sites to provide biological detection and identification to all service personnel. JBPDS is also portable and may be used in support of bare-base or semi-fixed sites. The system is fully automated and is Joint Technical Architecture (JTA)-compliant. JBPDS will presumptively identify 10 BW agents simultaneously. It will also collect a liquid sample for confirmatory analysis and identification. Planned product improvements will focus on reducing size, weight, and power consumption while increasing system reliability and the number of agents presumptively identified—up to 26 agents simultaneously.

JBPDS can operate remotely via hardwire, fiber optic cable, or radio modem. A single command station can operate up to 35 JBPDS systems. JBPDS is designed to meet the broad spectrum of operational requirements encountered by the services. JBPDS meets all environmental, vibration, and shock requirements of its intended platforms, as well as requirements for reliability, availability, and maintainability. JBPDS includes both military and commercial global positioning, meteorological, and network modem capabilities. The system will interface with the Joint Warning and Reporting System. JBPDS is the first biological warfare detection system capable of meeting all operational requirements across the entire spectrum of conflict.

## Foreign Counterpart

Canada: Integrated Biological Agent Detector System; United Kingdom: Integrated Biological Detection System.

## Foreign Military Sales

None

## Program Status

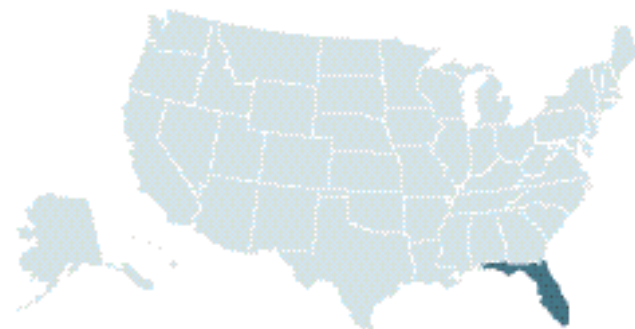
- **4QFY03** Completed fielding of 35 M31A2 JBPDS Biological Integrated Detection Systems (High Mobility Multipurpose Wheeled Vehicle [HMMWV]-mounted) to 375th Chemical Company.
- **1QFY04** Completed the Army and Air Force portion of multi-service operational test and evaluation (phases II, III, and V).

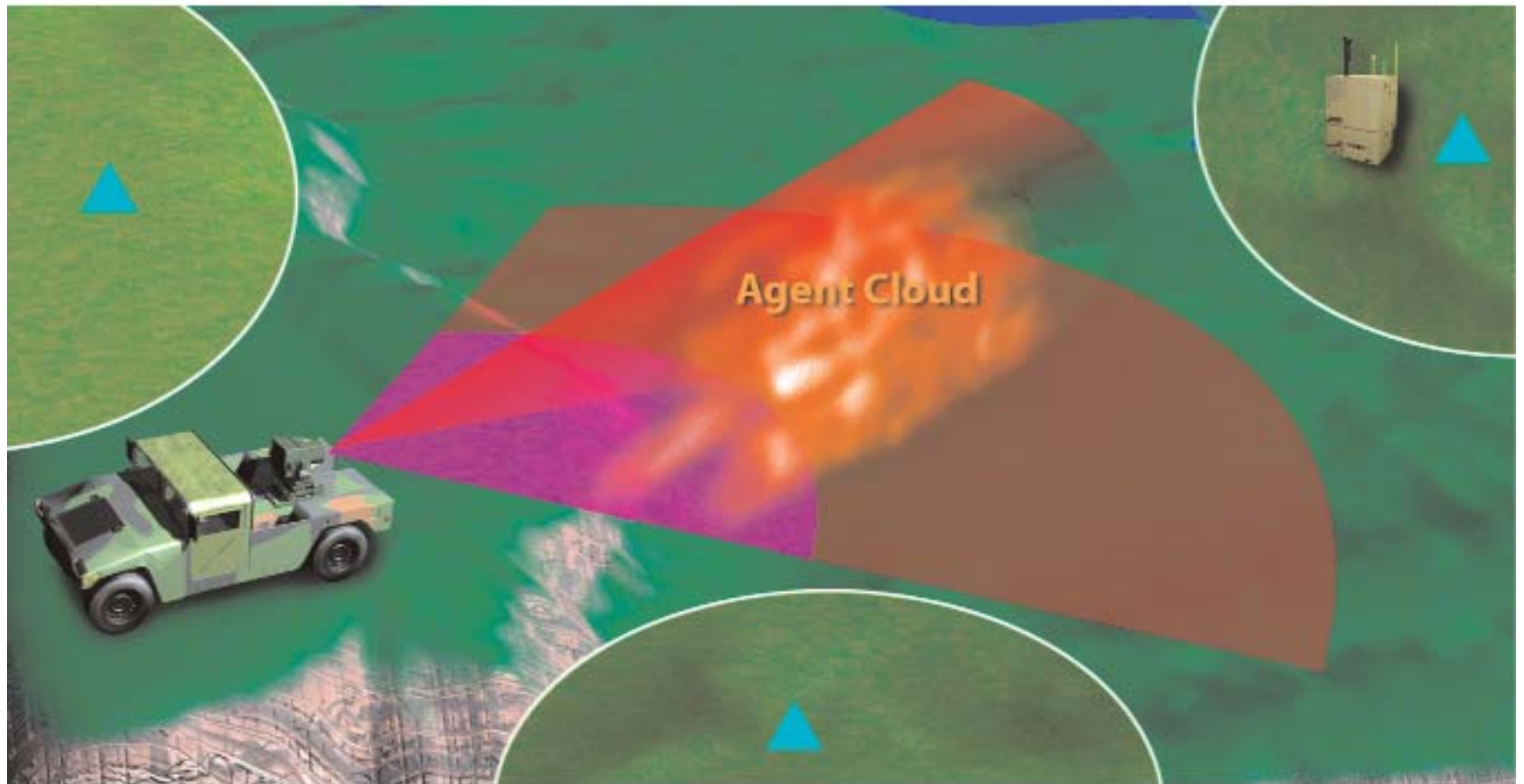
## Projected Activities

- **3QFY04** Complete fielding of JBPDS to European Command Air Force Bases.
- **3QFY04** Conduct Milestone C.
- **4QFY04** Initiate fielding of the M31A2 JBPDS Biological Integrated Detection Systems (HMMWV-mounted) to 332nd Chemical Company.

## Contractors

General Dynamics ATP Division (Deland, FL)





## Mission

Augment and integrate with existing biological detection (BD) systems to provide a BD network capable of near-real-time detection and warning theater-wide to limit the effects of biological agent hazards against US forces at the tactical and operational levels of war.

## Description and Specifications

Joint Biological Standoff Detection System (JBSDS) is the first joint biological standoff detection program. JBSDS can be employed in support of various areas: fixed sites (Aerial Port of Debarkation/Sea Port of Debarkation [APODs/SPODs], amphibious landing sites, etc.); or on platforms (ships, aircraft, or ground vehicles) including nuclear, biological, and chemical reconnaissance platforms. It will be capable of providing standoff detection, ranging, tracking, discrimination (man-made vs. natural occurring aerosol) and generic detection (biological vs. non-biological) of large-area biological warfare aerosol clouds for advanced warning, reporting, and protection. JBSDS will pass detection information and warnings through existing and planned communications networks (e.g. Joint Warning and Reporting Network).

Commanders may integrate JBSDS outputs with information from intelligence, meteorological, radar, medical surveillance, local area operations, and other available assets to increase force protection, mitigate the consequences of biological hazards, and maximize combat effectiveness.

- Provides early warning to commanders supporting timely decision-making.
- Detects and tracks aerosol clouds out to 15 km.
- Discriminates biological from non-biological particles in aerosol clouds out to 3 km.
- Operates at fixed site or in stationary mode from mobile platform.
- Operationally skin and eye safe.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

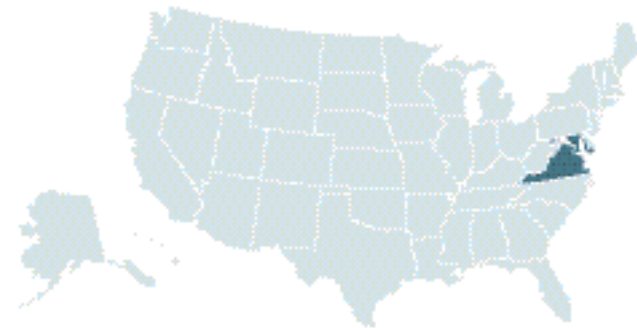
- **1QFY03** JBSDS Block I low-rate initial production request for proposal.
- **4QFY03** Initial JBSDS Milestone B.
- **2QFY04** Initial JBSDS Milestone C.

## Projected Activities

- **1QFY06** Initial JBSDS first unit equipped.
- **2QFY06** Next generation JBSDS system development and demonstration.
- **3QFY08** Next generation JBSDS Milestone C.

## Contractors

SESI (Burtensville, MD); Fibertek (Herndon, VA)





## Joint Chemical Agent Detector (JCAD)



## Mission

Detect, identify, quantify, alert, and report the presence of nerve, blister, and blood agents, as well as replace all current chemical point detection systems in the US inventory.

## Description and Specifications

The Joint Chemical Agent Detector (JCAD) is a multi-mission, chemical agent point-detector currently in development for the U.S. military. Equipped with a pre-concentrator, it will be capable of accumulating and reporting miosis-level concentrations of one chemical agent while still providing a rapid alert response indication to high concentration exposures from multiple agents.

JCAD will store up to 72 hours of cumulative dosages and chemical alarms in its on-board memory for hazard-level reporting or download. JCAD may be used as a surface contamination survey instrument to pre-sort vehicles, equipment, and personnel to determine decontamination requirements and verify the effectiveness of decontamination operations. It will also be used to monitor terrain during chemical surveys. JCAD will be mounted in rotary and fixed-wing aircraft to monitor the cargo/cockpit areas and cargo during on/off load operations. In aircraft configurations, JCAD will alert prior to miosis levels to allow sufficient time for protective measures.

JCAD can be hand held or worn in a pouch that attaches to a warfighter's load-bearing equipment. JCAD will be installed in/on military ground vehicles, aircraft, naval ships, and military installations, and can be operated from various external platform power sources.

JCAD interfaces to the user with a digital/graphic liquid crystal display, a user-selectable audio, and LED alert mechanism. JCAD provides for external data interface via an RS-232 port. Its communication protocol complies with the Joint Technical Architecture and the Joint Warning and Reporting Network interface requirements specification. The JCAD detector unit will weigh less than two lb (0.9 kg), including the internal battery weight. JCAD will operate on internal battery power using rechargeable or non-rechargeable cells. It will operate under a variety of external power sources as well as in a wide range of temperatures, altitudes, and environmental conditions, including blowing sand, rain, freezing rain, salt fog, and salt spray.

## Foreign Counterpart

Similar systems are currently in development in the United Kingdom and Finland.

## Foreign Military Sales

None

## Program Status

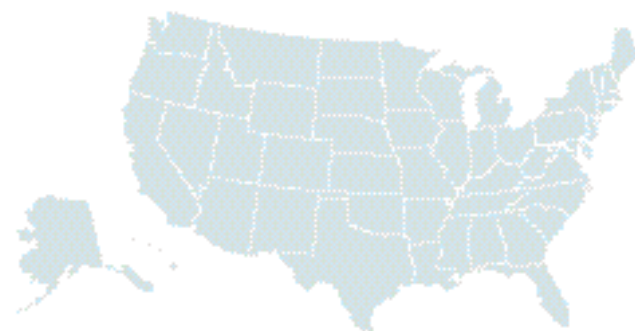
- **FY03** System development and demonstration.

## Projected Activities

- Evaluation of current technology for commercial chemical agent detectors.

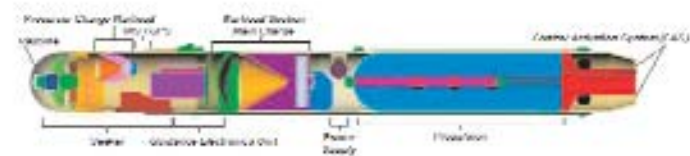
## Contractors

TBD





## Joint Common Missile





## Mission

Provide joint and international, rotary and fixed-wing aircraft and Future Combat Systems (FCS) ground components with an advanced line-of-sight and beyond line-of-sight, anti-armor and anti-materiel engagement capability; provide precision strike and fire-and-forget technologies with increased range and lethality while greatly enhancing operational effectiveness and soldier/aircraft survivability.

## Description and Specifications

Expanding regional threats, joint/international operations, and missile stockpile shortages requires a single missile to accomplish both air-launched (rotary and fixed-wing) and ground-launched missions while providing flexibility during combat operations, and leveraging the best use of limited development funds. The Joint Common Missile (JCM) will be initially fielded to the U.S. Army Apache Longbow (AH-64D) and Comanche (RAH-66), the U.S. Navy Super Hornet (F/A-18E/F) and Seahawk (MH-60), and the Marine Corps Super Cobra (AH-1Z). Subsequently, JCM, as a Current-to-Future Force system, is destined for use on a wide variety of joint and international platforms including the United Kingdom's Harrier II Plus (AV-8B), FCS Increment 2 Armed Robotic Vehicle – Assault (ARV-A), Apache (AH-64A), Kiowa Warrior (OH-58D), Joint Strike Fighter, Multi-mission Maritime Aircraft, special operation forces MH-60DAP and Little Bird (AH-6), and unmanned aerial vehicles. The modular design will reduce life-cycle costs, including demilitarization, and allow for continuous technology insertion to ensure improvements against evolving threats. JCM will effectively engage and destroy a variety of targets, including stationary and moving or re-locatable, high-value threat targets as well as bunkers and other structures on the digital battlefield well into the future. It will be designed and tested to achieve the following:

- Fire-and-forget and precision strike
- Increased stand-off range
- Increased survivability (both missile and platform)
- Multi-purpose warhead for increased lethality (military operations urban terrain structures, heavy armor, and patrol ships)
- Multi-mode seeker for increased performance given adverse weather or countermeasures
- Modularity to enable technology insertion for capability enhancement and shelflife extension, and to facilitate demilitarization.

**Diameter:** 7"

**Weight:** ~ 108 lb

**Length:** ~ 70"

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **FY02-03** Tri-mode seeker development, controllable propulsion development, warhead development, system design and integration.
- **2QFY04** Increment 1 Milestone B.
- **2QFY04** Joint Requirements Oversight Council (JROC) validated capability development document.
- **4QFY03** JROC validated initial capabilities document.
- **4QFY03** System development and demonstration (SDD) request for proposal released.

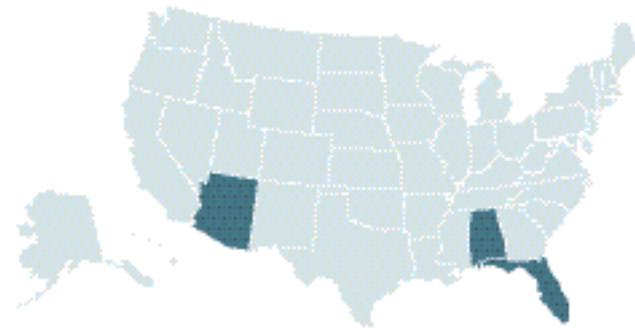
## Projected Activities

- **FY04-08** Increment 1 SDD.
- **FY08-09** Increment 1 low-rate initial production.
- **FY09-12** Increment 2 SDD.
- **FY10** Increment 1 full-rate production.

## Contractors

Three contractors are competing for the Increment 1 SDD contract with award projected in FY04:

- Boeing (Huntsville, AL)
- Lockheed Martin (Orlando, FL)
- Raytheon (Tucson, AZ).



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## Mission

Support defense against nuclear, biological, and chemical (NBC) and toxic industrial chemical (TIC)/toxic industrial material (TIM) weapons, devices, and incidents. JEM (unclassified version) will also support homeland defense through use by civil authorities.

## Description and Specifications

The Joint Effects Model (JEM) is a general-purpose, accredited model for predicting hazards associated with the release of contaminants into the environment. Once fielded, JEM will be the standardized Department of Defense NBC hazard prediction model. JEM will be capable of modeling hazards in a variety of scenarios including: counterforce, passive defense, accident and/or incidents, high altitude releases, urban NBC environments, building interiors, and human performance degradation.

The JEM program will use a three-block evolutionary acquisition approach for the design, development, testing, and fielding of JEM Blocks I, II, and III. Upon completion of an independent model analysis, JEM interface, credibility, and performance requirements will be refined in an iterative process through a series of design reviews, using cost-effective graphical storyboarding prior to actual implementation of the algorithms and data harvested from the legacy NBC models.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **1QFY03** JEM Block I - Milestone B.
- **3QFY03** Block I - award system development and demonstration (SDD) contract.
- **3QFY03–3QFY04** JEM Block I - software development.

## Projected Activities

- **1QFY05** JEM Block I - conduct full-rate production (FRP) review.

## Contractors

Northrop Grumman Information Technology (San Diego, CA)





## Joint Land Attack Cruise Missile Defense (LACMD) Elevated Netted Sensor System (JLENS)



## Mission

Provide over-the-horizon detection, tracking, and classification of stressing cruise missiles and other air threats; provide extended engagement ranges to support the air-directed surface-to-air missile (ADSAM) and air-directed air-to-air missile (ADAAM) engagement concepts for current and future air defense weapon systems.

## Description and Specifications

The Joint Land Attack Cruise Missile Defense (LACMD) Elevated Netted Sensors System (JLENS) is a Future Force, Unit of Employment (theater-level) system that addresses the goals of Army transformation. A joint interest program, JLENS is a low-cost, long-duration airborne sensor suite providing over-the-horizon land-attack cruise missile defense. JLENS uses advanced sensor and networking technologies to provide 360-degree, wide-area surveillance and precision tracking of land-attack cruise missiles. JLENS surveillance provides a long-range air picture enhanced by identification of friend or foe. This information, distributed via the Joint Data Network and Joint Composite Tracking Network (presently LINK 16 and Cooperative Engagement Capability), contributes to the single integrated air picture (SIAP). The JLENS radar is a steerable, lightweight array capable of tracking multiple targets in a sector. The JLENS prioritizes remote and local tracks autonomously or accepts external requests for precision tracking and engagement support. JLENS also performs as a multi-role platform to enable extended range command and control linkages, communications relay, blue force tracking, and battlefield situational awareness. A key element of the Army Future Force, SIAP, JLENS integrates data from multiple sensors and command, control, communications, and intelligence networks, and provides correlated data to battle management, command, control, communications, computer, and intelligence (BMC4I). JLENS provides battlefield commanders the following capabilities:

- 3-D situational awareness and situational understanding
- Detection and tracking of low-altitude threats (cruise missiles and aircraft) that may go undetected by surface-based sensors due to terrain masking and line-of-sight locations of targets
- Empowers a complete, unambiguous distributed air picture
- Supports operational maneuver from strategic distances
- Detection and tracking of surface moving targets.

These technologies provide a low-cost, long-endurance capability to protect US troops and assets in foreign lands, and provide a significant contribution to the defense of the continental US and its population from cruise missile and low-flying aircraft attacks.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

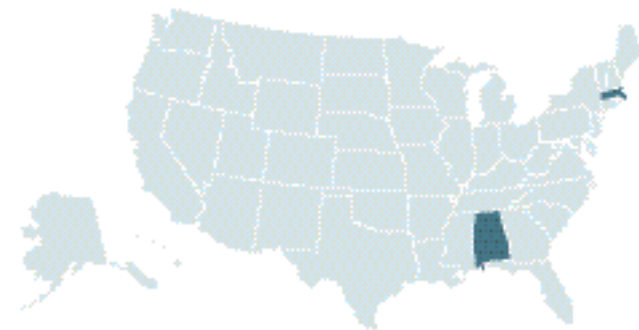
- **1996** In 1996 the Department of Defense and the Joint Chiefs of Staff directed the Army to establish an Aerostat Joint Program Office (now known as the JLENS Project Office) consisting of Army, Navy, and Air Force personnel. As a result, the US Army Space and Strategic Defense Command, predecessor of the US Army Space and Missile Defense Command, activated the office in Huntsville, AL. In 1997 the program was renamed the JLENS Project Office.
- **Current** The JLENS is an Acquisition Category II (pre-Major Defense Acquisition Program) program and is currently in the concept and technology development phase of the acquisition cycle. JLENS is assigned to the Program Executive Office, Air, Space, and Missile Defense.
- **2QFY04** JLENS Joint Requirements Oversight Council.

## Projected Activities

- **FY05** Milestone B.
- **FY10** First unit equipped.

## Contractors

Raytheon (Bedford, MA); CAS-SETA Support (Huntsville, AL)







## Mission

Promote force-level situational awareness; provide enhanced flexibility to support the commander's intent; improve management of scarce spectrum resources; and provide increased security of critical systems and networks.

## Description and Specifications

The Joint Network Management System (JNMS) is a combatant command, Commander Joint Task Force joint communication planning and management tool. JNMS is an automated software system that will provide communications planners with a common set of tools to conduct high-level planning, detailed planning and engineering, monitoring, control and reconfiguration, spectrum planning and management, and security of systems.

The JNMS will be developed and implemented in increments based on incorporating key performance parameter (KPP) threshold requirements, non-KPP threshold requirements, and objective requirements.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **2QFY01** Contract award.
- **4QFY01** System requirements review.
- **1QFY02** Preliminary design review.
- **1QFY03** Critical design review.
- **4QFY03** Functional qualification testing.
- **2QFY04** Milestone C decision.
- **2QFY04** Operational testing.

## Projected Activities

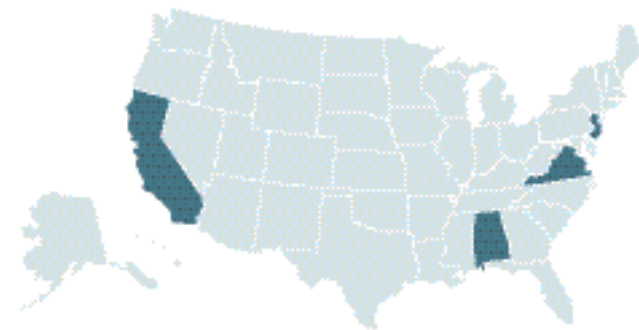
- **4QFY04** Full-rate production decision.
- **4QFY04** Materiel release/initiate fieldings.

## Contractors

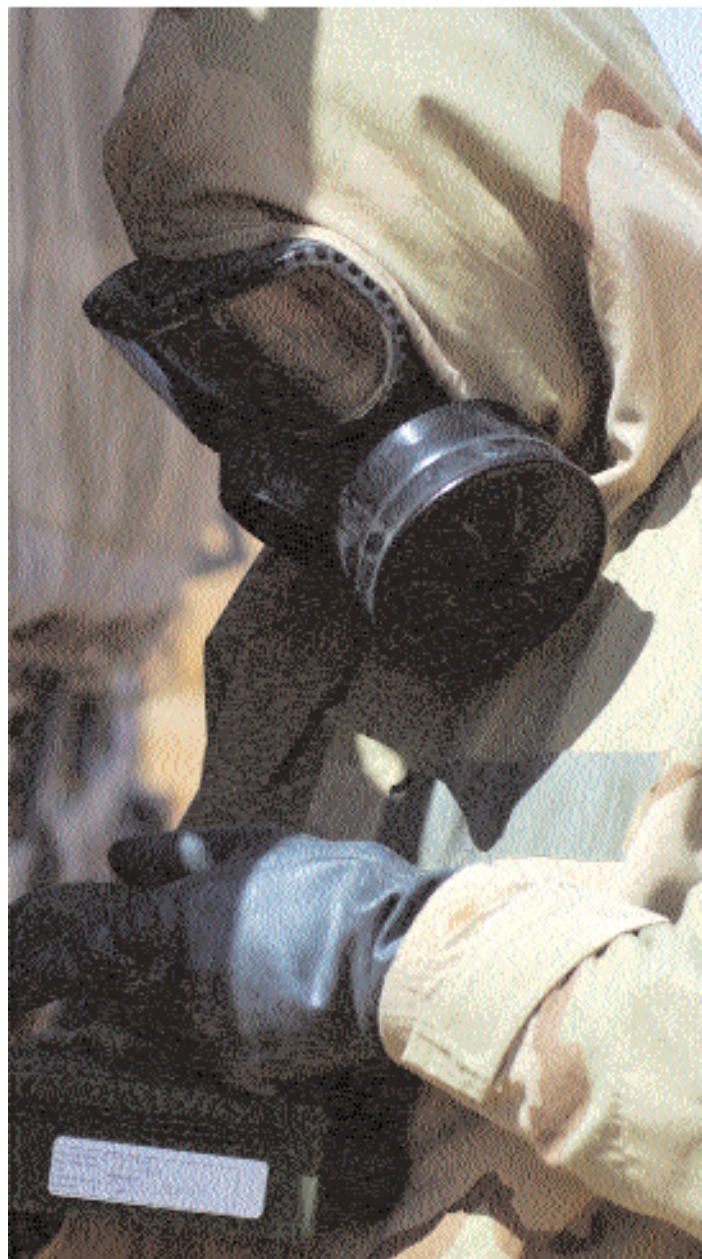
**Software Development:** Science Applications International Corporation (SAIC) (San Diego, CA; Huntsville, AL)

**Training and Logistics:** SAIC (McLean, VA)

**Testing Support:** SAIC (Piscataway, NJ)



## Joint Service Lightweight Integrated Suit Technology (JSLIST)





## Mission

Provide a joint service chemical and biological (CB) protective clothing ensemble that can be tailored to the diverse operational needs of the individual soldier, sailor, airman, and marine and is compatible with existing and emerging individual protective equipment.

## Description and Specifications

The Joint Service Lightweight Integrated Suit Technology (JSLIST) system will consist of lightweight CB protective garments, multi-purpose overboots, gloves, and multi-purpose protective socks. The Army will adopt each component as needed to accommodate various user needs. Each component is based on state-of-the-art materiel technologies that have undergone extensive user evaluation and field and laboratory testing. This system provides the highest level of protection against current CB threats, while reducing heat stress, weight, and bulk to an absolute minimum. Balancing CB protection and heat stress management with service-defined mission requirements optimizes user performance.

The main thrust of the JSLIST program is to develop the next-generation CB protective system. There is also considerable focus on ensuring full compatibility and integration with equipment such as developmental masks and body armor and developmental systems such as Land Warrior. Under management of the Joint Program Executive Officer for Chemical and Biological Defense, JSLIST has joint participation in every aspect of the program, including management, system planning, system and component design, materiel selection, test execution, and data assessment. The program structure and approval processes have been configured to assure full user participation and to meet common and service-unique requirements.

## Foreign Counterpart

Many countries have similar products.

## Foreign Military Sales

Egypt

## Program Status

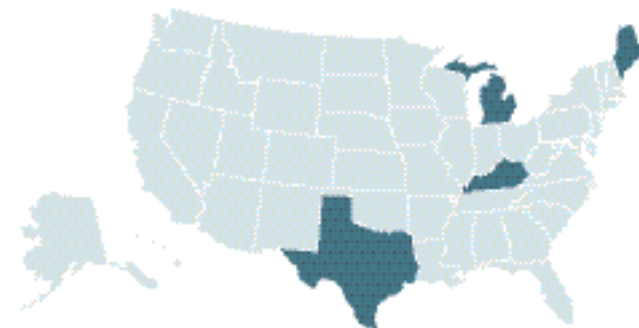
- **4QFY03** JSLIST Block I glove upgrade Milestone C decision.
- **1QFY04** Contract award to Cloutier to produce JSLIST Block I gloves for urgent requirements.
- **2QFY04** JSLIST Block II glove upgrade Milestone B decision and initiation of system development and demonstration.
- **2QFY04** JSLIST alternative footwear solutions Milestone B decision and initiation of system development and demonstration.

## Projected Activities

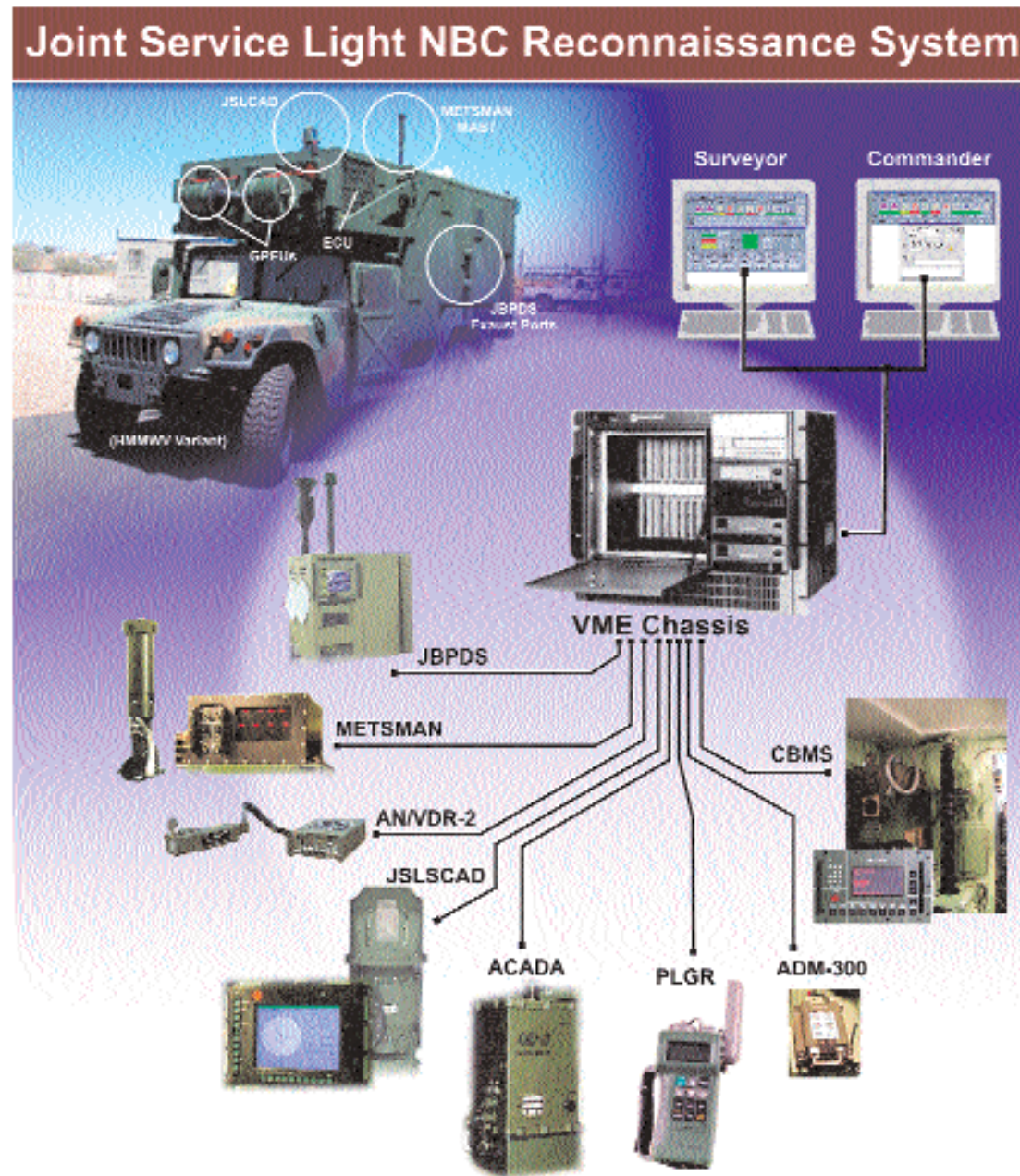
- **3QFY04** JSLIST multipurpose protective sock Milestone C decision.

## Contractors

**Chemical and Biological Protective Overgarments:** Creative Apparel Associates (Belfast, ME); Group Home Foundation/Belfast Industries, Inc. (Belfast, ME); South Eastern Kentucky Rehabilitation Industries (Corbin, KY); Peckham Vocational Industries, Inc. (Lansing, MI); National Center for the Employment of the Disabled (NCED) (El Paso, TX)







## Mission

Provide field unit commanders with real-time point and standoff intelligence for assessment of chemical, biological, radiological, nuclear (CBRN), and toxic industrial materials (TIM) hazards on the integrated battlefield as well as provide information reports and warning to follow-on forces.

## Description and Specifications

The Joint Service Lightweight Nuclear Biological Chemical Reconnaissance System (JSLNBCRS) is a CBRN and TIM detection and identification system. It will consist of a base vehicle equipped with hand-held, portable and mounted, current and advanced detection and identification equipment (both government-furnished equipment, non-developmental items, and parallel development). The vehicle will be equipped with collective protection, an environmental control system, an auxiliary power supply system, a navigation system, a meteorological data processing system, internal and external communication systems, and surface samplers. There will be two variants of the JSLNBCRS: the High Mobility Multipurpose Wheeled Vehicle (HMMWV) and the Light Armored Vehicle (LAV).

JSLNBCRS will provide on-the-move reconnaissance and surveillance to combat, combat support, and combat service support forces. It will provide accurate and rapid intelligence by detecting, sampling, identifying, marking, and reporting the presence of CBRN and TIM hazards within the unit's area of responsibility.

## Foreign Counterpart

China: NBC reconnaissance vehicle; Russia: BRDM-ZRKH, MTLB, RKHM, UAZ-469RKH; Germany: ABC Reconnaissance System

## Foreign Military Sales

None

## Program Status

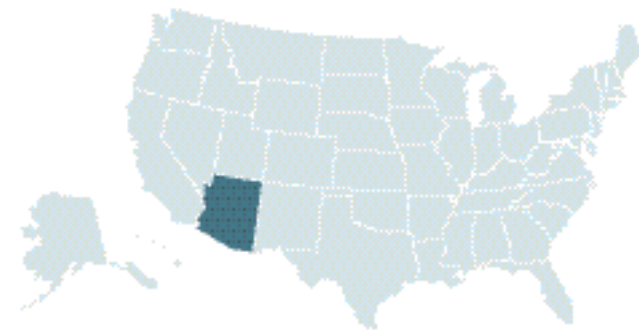
- **1QFY04** Milestone C low-rate initial production decision.

## Projected Activities

- **4QFY05** Multi-service operational test and evaluation.
- **3QFY06** Award full production contract.
- **4QFY06** HMMWV variant initial operational capability.

## Contractors

Northrop Grumman Mission Systems (Sierra Vista, AZ)





## Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD)





## Mission

Identify chemically contaminated battlespaces and provide enhanced early warning to joint forces.

## Description and Specifications

The Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD) is a lightweight, passive, and standoff chemical agent detector. It will provide on-the-move detection, identification, mapping, and reporting of nerve, blister, and blood agent vapors. The JSLSCAD communicates warning messages automatically through the Joint Warning and Reporting Network (JWARN). It will provide 360 x 60 degree coverage, from a variety of tactical and reconnaissance platforms, at distances of up to five kilometers. Warfighter protection and maneuver unit combat capabilities will be increased with the JSLSCAD through enhanced early warning for contamination avoidance. When avoidance is not possible, JSLSCAD will provide extra time for warfighters to don full protective equipment (i.e., mission oriented protective posture [MOPP] gear).

Intended applications include various ground-vehicle, aerial, shipboard, and fixed-emplacement platforms such as the following: M93A1 Fox Block II; Light NBC Reconnaissance System (JSLNBCRS); unmanned aerial vehicle; C130 aircraft; CH53 helicopter; ships; and fixed-site installations. The JSLSCAD detector and the operator display unit weigh approximately 55 lb. The power adapter used for shipboard and fixed-site applications weighs approximately 10 lb. The detector is approximately 1 cubic foot and the total of all 3 components is approximately 1.5 cubic feet.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

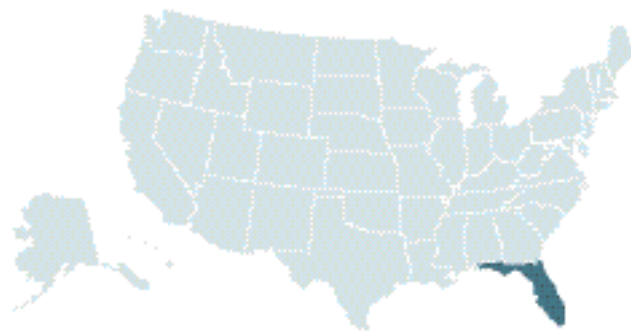
- **4QFY03** Joint Program Executive Officer for Chemical and Biological Defense directed program restructure.
- **4QFY03** Conducted production readiness review.
- **1QFY04** Increment I Acquisition Program Baseline submitted for approval.

## Projected Activities

- **3QFY06** Milestone C.

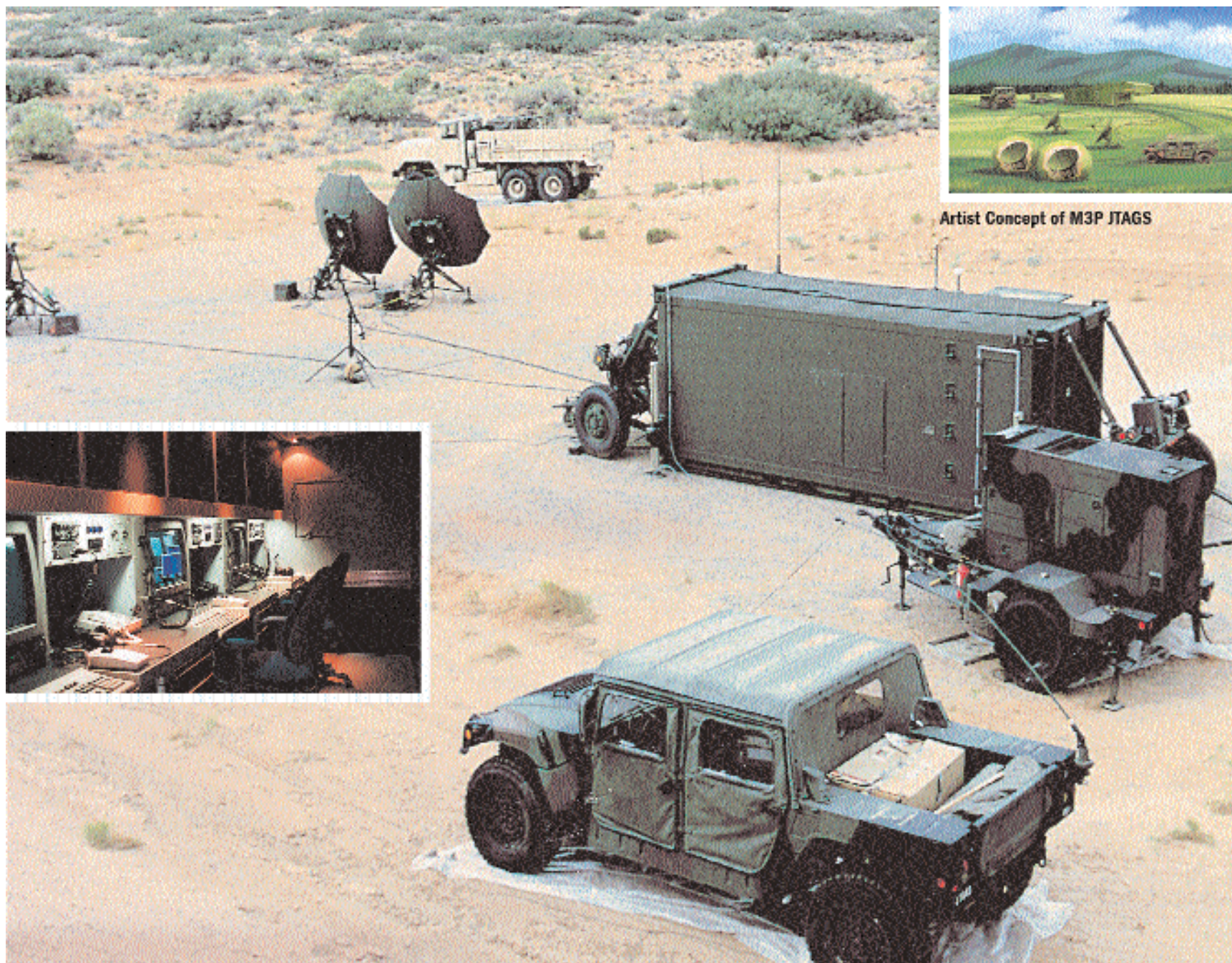
## Contractors

General Dynamics (Deland, FL)





## Joint Tactical Ground Stations (JTAGS)





## Mission

Provide theater commanders with real-time, space-based, infrared warning, alerting, and cuing information on theater ballistic missiles and other tactical events.

## Description and Specifications

The Joint Tactical Ground Station (JTGS) is a transportable information processing system that receives and processes in-theater, direct, downlinked data from defense support program (DSP) and follow-on space-based infrared system (SBIRS) satellites. JTGS disseminates warning, alerting, and cuing information on theater ballistic missiles and other tactical events throughout the theater, using existing communications networks.

A JTGS unit consists of a standard 8 x 8 x 20 ft. shelter with mobilizer, external collapsible high-gain antennas, standard military generator, and standard five-ton trucks as prime movers. JTGS can be deployed worldwide. The system is transportable by C-141 aircraft and can be made operational within hours. For enhanced reliability and survivability during contingency situations, the system will deploy in pairs. Whether under peacetime conditions or during crisis situations, the system conducts joint operations.

JTGS preplanned product improvement (P3I) Phase I upgrades, completed in FY00, provide Joint Tactical Information Distribution System (JTIDS) integration and data fusion with other sensors. The P3I Block 1 (FY98-06) upgrades JTGS to the SBIRS common DSP Only Multi-Mission Mobile Processor (DM3P). The P3I Block II (FY06-10) upgrades the DM3P to the SBIRS common Geosynchronous M3P (GM3P). A memorandum of agreement between the Army and Air Force Program Executive Offices implemented the joint program development of the SBIRS M3P between the Army JTGS Product Office and the Air Force SBIRS System Program Office. JTGS M3P is an Acquisition Category III joint interest program under the Program Executive Office Air, Space, and Missile Defense.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **FY97** Fielded five production units to the European Command, Pacific Command, and Army Space Command Continental United States.
- **1QFY97** Initiated JTGS P3I phase I.
- **4QFY98** Initiated P3I Block I JTGS to M3P upgrade to permit operation with SBIRS and DSP satellites and provide coverage for both Army theater and Air Force strategic missions.
- **4QFY99** Conducted M3P preliminary design review.

- **4QFY00** Completed P3I phase I upgrades: sensor fusion and JTIDS integration; conducted M3P critical design review.
- **1QFY01** Conducted M3P integrated baseline review.
- **2QFY01** Completed M3P software design review.
- **1QFY03** Completed DSP software detailed design.
- **4QFY03** Completed component integration testing.
- **4QFY03** Completed integration on units 1, 2, and 3.

## Projected Activities

- **1QFY05** Conduct DM3P developmental test.
- **2QFY05** Conduct DM3P operational test.
- **FY06** Complete DM3P fielding.
- **FY06** Begin upgrade of DM3P to the GM3P configuration.
- **FY10** Complete GM3P fielding.

## Contractors

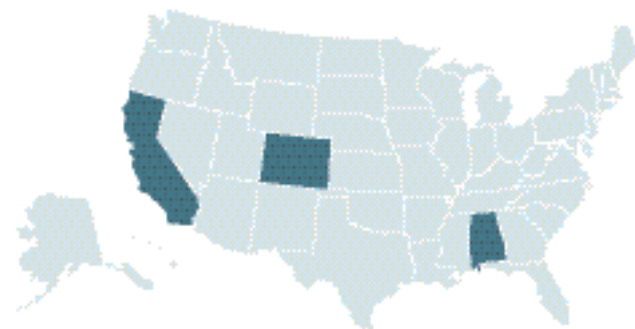
**Deployment, Production, and P3I Phase I:** GenCorp (Azusa, CA; Colorado Springs, CO)

**Support:** Mevatec (Huntsville, AL)

**P3I Block I:** Lockheed Martin (Sunnyvale, CA; Boulder, CO); Northrop Grumman (Azusa, CA)

**Support:** BAE Systems (Huntsville, AL)

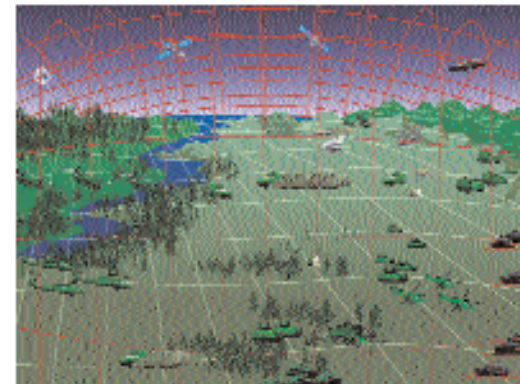
**P3I Block II:** Lockheed Martin (Sunnyvale, CA; Boulder, CO); Northrop Grumman (Azusa, CA)







**JTRS Cluster 1**



## Mission

Provide the warfighter with a software-reprogrammable, multi-band/multi-mode capable, networkable system that provides simultaneous voice, data, and video communications to increase interoperability, flexibility, and adaptability in support of varied mission requirements.

## Description and Specifications

### Waveform:

The Joint Tactical Radio System (JTRS) Waveform Program, managed by the JTRS Joint Program Office (JPO), is responsible for the development of software waveform applications and software representations of associated cryptography, evolving the Software Communications Architecture (SCA), certifying compliance of both hardware (with system software) and software waveforms with the SCA, and ensuring overall joint interoperability. JTRS software products are developed for use by all services.

### Cluster 1:

JTRS Cluster 1 is a materiel solution for the JTRS operational requirements document-mandated, multi-channel, SCA-compliant hardware system hosting SCA-compliant software waveforms. Program goals include: joint and coalition interoperability; independently developed hardware and software; SCA-compliant multi-mode, multi-channel software defined radios; SCA-compliant portable waveforms; long-term-growth-through-technology insertion; and long-term competition. JTRS Cluster 1 will be interoperable with specified current tactical radios permitting an orderly and cost-effective transition from current systems to the multifunctional JTRS. JTRS Cluster 1 is slated for fielding to select rotary-wing aviation platforms, Future Combat Systems, Stryker Brigade Combat Team, Tactical Operations Centers, Army Airborne Command and Control System, and Special Operations Forces. Additionally, Cluster 1 will be used by the Air Force Tactical Air Control Party and the Marine Corps Advanced Amphibious Assault Vehicle.

**Weight:** TBD

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

### Waveform Program:

- **4QFY03** JTRS Technology Laboratory initial operational capability.
- **2QFY04** Initiation of Cornfield crypto algorithm development.

### Cluster 1 Program:

- **3QFY03** Software preliminary design review.
- **4QFY03** Critical design review.
- **4QFY03** B-kit specifications delivery.
- **2QFY04** Aviation form fit model delivery.

## Projected Activities

### Waveform Program:

- **3QFY04** Single Channel Ground Airborne Radio System waveform delivery.
- **3QFY04** Joint Task Force Wide Area Relay Network delivery to the services.

### Cluster 1:

- **1QFY05** Prototype delivery.
- **1QFY05** Test readiness review.
- **1QFY05** Contractor development testing.
- **2QFY05** Early operational assessment.

## Contractors

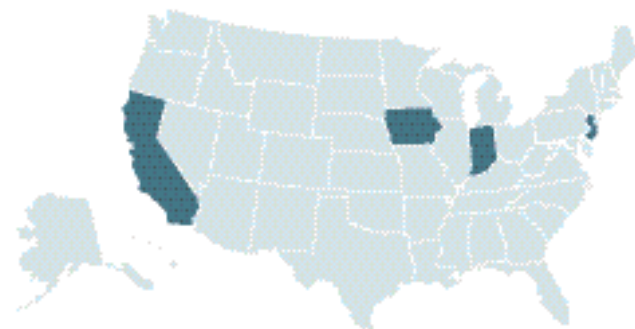
**Prime/System Integration:** Boeing (Anaheim, CA)

**Hardware Design (Ground):** BAE Systems North America (Wayne, NJ)

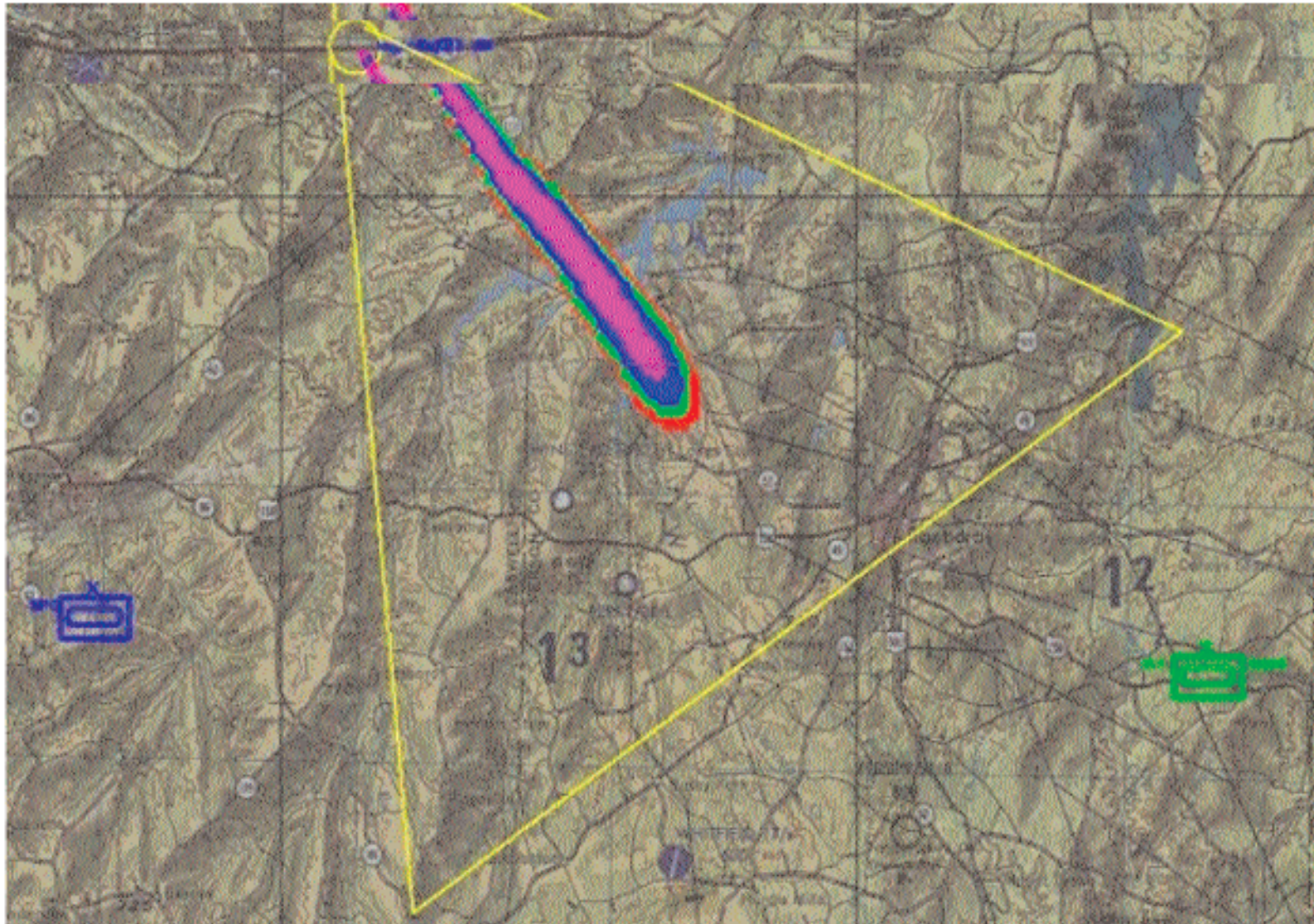
**Hardware Design (Air):** Rockwell Collins (Cedar Rapids, IA)

**Network Management/Logistics:** Northrop Grumman (Carson, CA)

**Software Development:** Raytheon (Ft Wayne, IN)









## Mission

Provide the joint forces with the capability to report, analyze, and disseminate nuclear, biological, and chemical (NBC) agent detection, identification, location, and warning information; accelerate the warfighter's response to an enemy NBC attack.

## Description and Specifications

The Joint Warning and Reporting Network (JWARN) system employs NBC-warning technology to collect, analyze, identify, locate, report, and disseminate information on NBC threats. JWARN software and hardware will be compatible and integrated with joint service command, control, communication, computers, and intelligence surveillance reconnaissance (C4ISR) systems. JWARN will be located in command and control centers and employed in making decisions about warning dissemination down to the lowest level on the battlefield. JWARN is being developed for deployment with NBC detectors in the following battlefield applications: combat and armored vehicles, tactical vehicles, vans, shelters, shipboard application, area warning, semi-fixed sites, and fixed sites. JWARN will provide additional data processing, as well as plan and report production and access to specific NBC information, all of which will improve the efficiency of NBC defense personnel assets.

JWARN is a two-block program plus a preplanned product improvement (P3I) (planned for FY06-07). Block I (interim capability) consisted of commercial-off-the-shelf (COTS) and government off-the-shelf (GOTS) NBC warning and reporting software, immediately satisfied many of the required capabilities outlined in the Joint Operational Requirements Document (JORD), and was fielded during FY98. Existing computers are to be used to run the Block I software.

Block II will provide full JWARN capability to provide the commanders with automatic reporting on NBC data from sensor/detector to C4ISR systems. For Block II, JWARN will use a commercial contractor to integrate COTS and/or GOTS, NDI components. In addition to Block II development, a JWARN initial capability (JIC) will be developed and provided to warfighters in order to support refinement of Service CONOPS and provide feedback to the JWARN developer.

The JWARN-Full Capability (JWARN-FC) system will be developed as a single increment. The development phase will be followed by a P3I effort. P3I will include artificial intelligence modules for NBC operations, an upgrade to match future C4ISR systems, and standard interfaces for use with future detectors.

## Foreign Counterpart

**United Kingdom:** The BRACIS (Biological, Radiological, and Chemical Information System) software system has been developed for the United Kingdom Armed Forces. BRACIS is a system for computerized NBC hazard prediction and warning, in accordance with the NATO standard ATP-45 (A).

## Foreign Military Sales

None

## Program Status

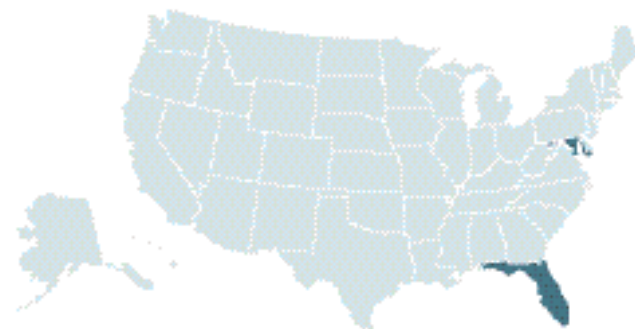
- **Current** Completed fielding of the COTS NBC analysis software pack and GOTS models; integrate COTS software (with battlefield management functionality) with the maneuver control system and the Windows 32-bit environment.
- **3QFY03** Award JWARN Block II system design and development contract.

## Projected Activities

- **4QFY03–4QFY05** JWARN Block II and JIC development.
- **3QFY05–4QFY05** JWARN Block II developmental testing operational assessment.
- **2QFY06** JWARN Block II Milestone C.
- **2QFY06** JWARN Block II low-rate initial production contract award.
- **3QFY07** JWARN Block II full-rate production.

## Contractors

Bruhn Newtech (Ellicott City, MD); Northrop Grumman Information Technology (Winter Park, FL)



## Land Warrior (LW)





## Mission

Provide significant improvement in soldier lethality, survivability, battle command, mobility, sustainment, tactical awareness, and training/mission rehearsal.

## Description and Specifications

Land Warrior (LW) is a first generation, modular, integrated fighting system for dismounted, infantry soldiers and soldiers in support of the close fight that combines up-to-date commercial, off-the-shelf (COTS) and government, off-the-shelf (GOTS) technologies with newly developed components and technologies to create a lethal, survivable, soldier system linked into the digitized battlefield. LW combines computers, lasers, geolocation, and radios with soldiers' mission equipment to achieve the Army Vision of enhancing the individual soldier's close combat lethality, survivability, and tactical awareness. LW will be interoperable with other Army systems and platforms as well as other US forces and allied military systems. The system's approach optimizes and integrates these capabilities, without adding to the soldier's combat load.

LW-Stryker Interoperable (LW-SI/Block II) will meet specific Stryker Brigade requirements, such as on-board recharging from the Stryker vehicle and expanded situational awareness.

LW-Advanced Capability (LW-AC/Block III) will leverage Future Force Warrior advanced technology demonstration technologies for weight reduction and extended mission duration. LW-AC will be fielded to the Future Force.

## Foreign Counterpart

The French FELIN Soldier System is the closest competitor to the LW; however, it is several years behind LW in development.

## Foreign Military Sales

LW has been demonstrated to more than 40 foreign countries. Many of these countries, including the United Kingdom, Australia, Canada, and the Netherlands, have expressed continued interest in LW technology. Panel III NATO has approved the NATO Soldier Modernization Plan, which includes a requirement for the LW.

## Program Status

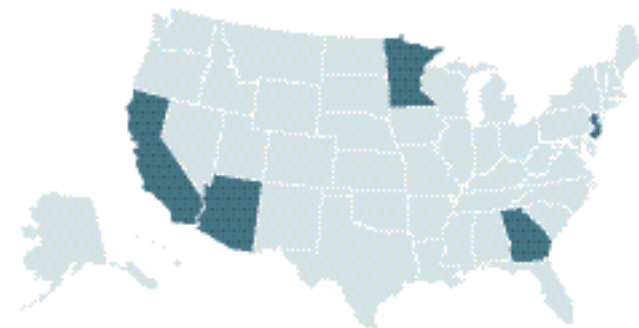
- **3QFY03** LW-SI system functional review.
- **4QFY03** LW-SI system preliminary design review.

## Projected Activities

- **3QFY04** LW-SI critical design review.
- **3QFY05-2QFY06** LW-SI developmental testing.
- **3QFY06** LW-SI Milestone C; LW-AC Milestone B.
- **1-3QFY07** LW-SI operational testing.
- **3QFY07** LW-SI first unit equipped.
- **1QFY08** LW-SI full-rate production decision.
- **4QFY08** LW-AC Milestone C.

## Contractors

General Dynamics C4 Systems (Scottsdale, AZ); Computer Sciences Corp. (Eatontown, NJ); Pemstar Pacific Consultants (San Jose, CA); Pemstar (Rochester, MN); Omega Training Group (Columbus, GA)







## Mission

Tow the M870 40-ton trailer and haul heavy engineer equipment in support of construction missions.

## Description and Specifications

Light Equipment Transport (LET) features a Detroit Diesel Engine Corp. (DDEC) IV diesel engine, an electronic transmission and 6x4 wheel drive. The M916A3 adds electronic diagnosis, Antilock Braking System (ABS) brakes, Central Tire Inflation System (CTIS), and is transportable by highway, rail, marine, and air worldwide. Can tow at 50 mph with full payload. Specifications include:

- 68,000 lb gross vehicle weight (GVW)/130,000 lb gross cargo vehicle weight (GCVW)
- 3-1/2 inch, 40,000 lb kingpin
- 40,000 lb rear winch
- Aluminum cab

### Special Features:

- Air conditioning
- Collision warning system (CWS)
- Hub piloted wheels
- Heated mirrors and air ride seats
- Reusable oil filter
- Light emitting diode (LED) lights

## Foreign Counterpart

No known counterpart

## Foreign Military Sales

None

## Program Status

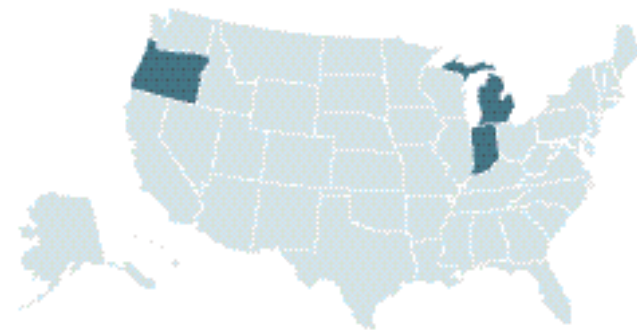
**September 2003** Production verification test completed.

## Projected Activities

- **April 15, 2004** Materiel release.
- **May 30, 2004** First unit equipped.
- **3QFY04** Fielding to War Reserves (Kuwait), Military District of Washington, and newly activated National Guard Fire Truck and POL supply companies.

## Contractors

Freightliner LLC. (Portland, OR); Detroit Diesel (Detroit, MI); Allison Transmissions (Indianapolis, IN); Meritor (Troy, MI); Holland Hitch (Holland, MI)





## Lightweight 155mm Howitzer (LW 155)





## Mission

Provide direct, reinforcing, and general support fires to maneuver forces and direct support artillery for Army Stryker Brigade Combat Teams (SBCTs).

## Description and Specifications

The M777 Lightweight 155mm Howitzer (LW155) replaces the M198 howitzer as the general support artillery for light forces in the Army. M777 is a jointly managed program with the Marine Corps as the lead agency for development of the howitzer and the Army as the lead agency for development of Towed Artillery Digitization (TAD), the digital fire control system for the M777. The M777 incorporates innovative designs to achieve lighter weight without sacrificing the range, stability, accuracy, or durability of the current system. The lighter weight is achieved through lower trunnion height and the use of high-strength titanium, a primary component of the lower carriage and cradle assembly. Two M777's can be transported in a C130 aircraft. The M777 can also be dropped by parachute. The M777's lighter weight, smaller footprint, and lower profile provide improved strategic deployability, tactical mobility, and survivability. The automatic primer feeding mechanism, loader-assist, digital fire control, and other automation enhancements will improve survivability, lethality, and combat reliability, as well as provide light artillery with a semi-autonomous capability that is currently found only in self-propelled howitzers.

**Weight:** 10,000 lb or less

**Emplace:** Three minutes or less

**Displace:** Two minutes or less

**Maximum range:** 30 km (assisted)

**Rate-of-fire:** Four rounds per minute maximum; two rounds per minute sustained

**Ground mobility:** Family of Medium Tactical Vehicles, Medium Tactical Vehicle Replacement, current five-ton trucks

**Air mobility:** Two per C-130; six per C-17; 12 per C-5; CH-53D/E; CH-47D; MV-22

**155mm compatibility:** All fielded and developing NATO munitions

**Digital fire control:** Self-locating and pointing; on-board firing data computation (TAD Block 2); digital and voice communications; self-contained power supply. These capabilities are being developed under the TAD program.

## Foreign Counterpart

No known foreign counterpart for the Lightweight 155mm Howitzer. Several countries (United Kingdom, Germany, South Africa, etc.) have TAD-like digital fire control systems.

## Foreign Military Sales

The LW 155 development was a cooperative effort with both the United Kingdom and Italy. Future cooperative production agreements with both allies are currently being negotiated and would provide 65 - 70 systems to each of those countries.

## Program Status

- The M777 is currently in low-rate initial production for 94 Marine Corps guns (FY03-04) with conventional fire control.
- Developmental testing of howitzers equipped with digital fire control has been very successful and is near completion.
- Project manager has synchronized the digital fire control program with the basic howitzer.
- Once type classified, the digital fire control equipped howitzer will be designated the M777A1. All Army howitzers will be procured in the M777A1 configuration.

## Projected Activities

- **3QFY04** Operational test for howitzer and digital fire control system.
- **1QFY05** Joint Milestone C for digital fire control and full-rate production decision.
- **4QFY06** Army initial operational capability of M777A1 (howitzer with digital fire control).

## Contractors

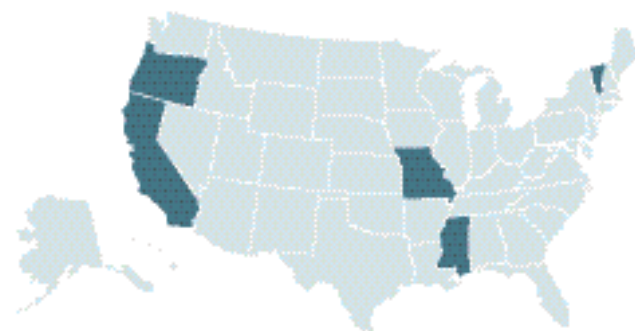
**Howitzer and TAD:** BAE Systems (United Kingdom and Hattiesburg, MS)

**Towed Artillery Digitization:** General Dynamics (Burlington, VT)

**Howitzer Body:** Hydro-Mill (Chatsworth, CA)

**Castings:** Precision Castparts Corporation (Portland, OR)

**Optical Fire Control:** Seiler Instrument and Mfg. (St. Louis, MO)





## Lightweight Laser Designator Range Finder (LLDR)





## Mission

Provide Army fire support teams and forward observers with a man-portable capability to observe and accurately locate targets, digitally transmit target location data to the tactical network, and laser-designate high priority targets for destruction by precision munitions.

## Description and Specifications

The Lightweight Laser Designator Range Finder (LLDR) is a man-portable, modular, target location and laser designation system. The two primary components are the target locator module (TLM) and the laser designator module (LDM). The TLM can be used as a stand-alone device or in conjunction with the LDM. Total system weight to conduct a 24-hour mission is 35 lb.

The TLM incorporates a thermal imager, day camera, electronic display, eye-safe laser range finder, digital magnetic compass, Global Positioning System (GPS) electronics, and digital export capability. The TLM has an integral capability for bore sighting with the LDM, allowing the operator to see the laser spot and align the system. At night and in battlefield conditions, the operator can recognize vehicle-sized targets at greater than 2.5 km. During day operations, targets can be recognized at greater than 7 km. At a range of 10 km, targets can be located to less than 40m. The LDM emits coded laser pulses compatible with Department of Defense and NATO laser-guided munitions. Targets can be designated at ranges greater than 5 km.

## Foreign Counterpart

Although several countries have man-portable target location and/or target designation systems, there are no other existing systems providing all of the capabilities of the LLDR within a 35 lb package.

## Foreign Military Sales

None

## Program Status

- **4QFY97** Milestone I/II (engineering and manufacturing development).
- **4QFY01** Milestone C (low-rate initial production [LRIP]).
- **1QFY02** LRIP contract award.
- **1QFY04** Full-rate production/type classification standard decision.
- **2QFY04** First unit equipped.

## Projected Activities

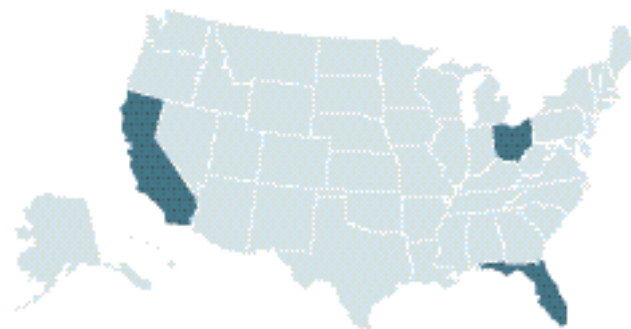
- **3QFY04** Full-rate production contract award.
- **3QFY04** First unit equipped.

## Contractors

**Prime:** Northrop Grumman Electronic Systems, Laser Systems Division (Apopka, FL)

**Thermal Imager:** CMC Electronics, Cincinnati (Mason, OH)

**Thermal Imager:** Indigo Systems (Santa Barbara, CA)





## Line Haul Tractor



## Mission

Tow the M872 34-ton flatbed trailer, M967 5000 gallon bulk fuel tanker, and M969 5000 gallon automotive refueling tanker; haul containers, break-bulk cargo, water, and fuel payloads over primary and secondary roads.

## Description and Specifications

The M915A3 Line Haul Tractor features a Detroit Diesel S60 (DDEC) IV diesel engine (430 HP, 1450 lbft. torque), Allison HD4560P (6-speed automatic) electronic transmission, aluminum cab, and 4x6 wheel drive. Specifications include:

- 52,000 lb gross vehicle weight/ 105,000 lb gross cargo vehicle weight
- 2 inch, 30,000 lb kingpin
- Electronic diagnosis
- Antilock brake system brakes
- Transportable by highway, rail, marine, and air worldwide
- 65 mph towing speed w/full payload

### Special Features:

- Air conditioning
- Collision Warning System
- Hub piloted wheels
- Heated mirrors and air ride seats
- Reusable oil filter
- Light Emitting Diode (LED) lights
- Low-lube fifth wheel

## Foreign Counterpart

No known counterpart

## Foreign Military Sales

None

## Program Status

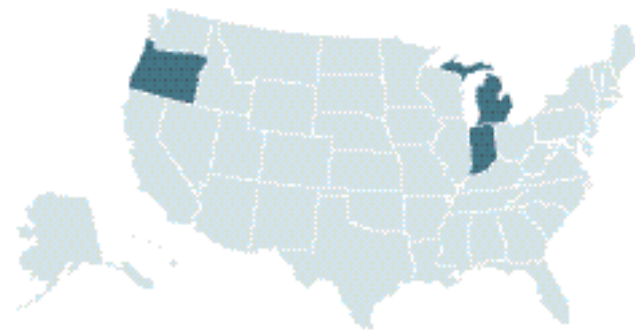
- **September 2003** Production verification test completed.

## Projected Activities

- **FY04** Fielding to War Reserves (Kuwait), Military District of Washington, and newly activated National Guard fire truck and POL supply companies.

## Contractors

Freightliner LLC (Portland, OR); Detroit Diesel (Detroit, MI); Allison Transmissions (Indianapolis, IN); Meritor (Troy, MI); Holland Hitch (Holland, MI)





## Line-of-Sight Anti-Tank (LOSAT)





## Mission

Provide highly lethal, accurate missile fire, effective against heavy armor systems and field fortifications at ranges exceeding tank main gun range, thus reducing the light infantry force lethality shortfall against heavy armor.

## Description and Specifications

The Line-of-Sight Anti-Tank (LOSAT) weapon system is an integral component of the Army Vision. LOSAT consists of four hypervelocity kinetic-energy missiles (KEM) and a second generation forward looking infrared (FLIR)/TV acquisition sensor, mounted on an air-mobile High Mobility Multipurpose Wheeled Vehicle (HMMWV) chassis. Key LOSAT advantages include the following:

- KEM overmatch lethality, which defeats all anticipated future armored-combat vehicles and hardened high-value targets, including bunkers and reinforced urban structures
- Extended range greater than all armor gun systems
- Deployability, including UH-60L sling load and C-130 air drop
- Compatibility with early-entry forces.

LOSAT also provides increased survivability and countermeasure effectiveness and will operate to the maximum range of direct-fire combat engagements, providing dramatically increased rates of fire and enhanced performance under day and night, adverse weather, and obscured battlefield conditions.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- All prototype fire units and missile hardware delivered.
- Completed missile environmental test qualification.
- Continuing conduct of system qualification tests.
- Beginning preparation for Milestone C and low-rate initial production.
- User evaluations and deployability demos production.

## Projected Activities

- Complete system hardware and system software qualification.
- Complete system “manrating” tasks.
- Begin fire unit design updates to correct any design deficiencies.
- Complete fire unit and missile airworthiness certification.
- Complete training device development and begin soldier training for Dismounted Battlespace Battlelab demonstrations.
- **3QFY04** Milestone C (low-rate initial production)
  - Low-rate initial production contract
- **FY06** Initial operational test and evaluation (CERTX)
  - First unit equipped first battalion

## Contractors

**Missiles and Fire Control:** Lockheed Martin (Grand Prairie, TX)

**Electro-Optical System:** Raytheon (Plano, TX)

**Inertial Measurement Unit:** Honeywell (Minneapolis, MN)

**C02 Pulsed Laser and Field Tactical Trainer:** BAE Systems (Austin, TX; Long Island, NY)

**Altitude Control Motors:** ARC (Gainesville, VA)



## Longbow Hellfire





## Mission

Provide the warfighter an air-to-ground precision missile system to engage and defeat individual advanced-armor hard point targets while increasing aircraft survivability.

## Description and Specifications

The Longbow Hellfire missile (L-Model) is a fire-and-forget version of the Hellfire missile that uses radar-aided inertial guidance. It is part of the AH-64D Longbow Apache attack helicopter system that includes a mast-mounted fire control radar (FCR) and launcher. The Longbow FCR will locate, classify, and prioritize targets for the Longbow Hellfire missile. The Longbow Hellfire missile incorporates a Ka-band-millimeter-wave radar seeker on a Hellfire II missile aft-section bus.

The primary advantages of the Longbow missile include:

- Adverse weather capability (rain, snow, fog, smoke, and battlefield obscuration)
- Millimeter-wave countermeasures survivability
- Fire-and-forget guidance that allows the Apache to launch and then immediately remask, thus minimizing exposure to enemy fire
- An advanced warhead capable of defeating all projected armor threats into the 21st century
- Reprogrammability to adapt to changing threats and mission requirements.

The combination of Longbow Hellfire's fire-and-forget capability and Hellfire II's semi-active laser precision guidance will provide the battlefield commander with flexibility across a wide range of mission scenarios. This permits fast battlefield response and high mobility not afforded by other anti-armor weapons.

Specifications include:

**Diameter:** 7"

**Weight:** 108 lb

**Length:** 69.2"

**Range:** 0.50 - 8 km

## Foreign Counterpart

United Kingdom: Brimstone

South Africa: Mokopa, ZT6

## Foreign Military Sales

Singapore, Israel, Kuwait

Direct Commercial Sale: United Kingdom

## Program Status

- **November 2002** Awarded fifth and final increment of multi-year program.
- **4QFY03** Delivered a total of more than 8,900 Longbow Hellfire missiles into inventory.

## Projected Activities

- Continue fielding.
- Complete full-rate production.

## Contractors

Longbow LLC (Orlando, FL)

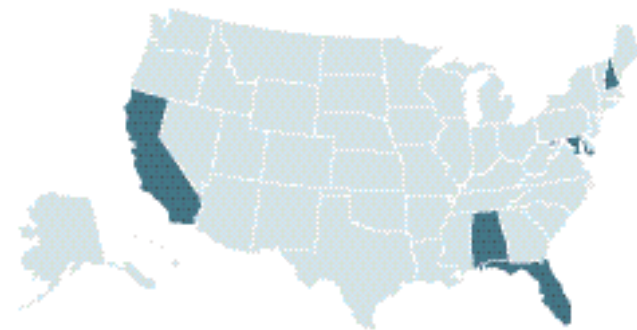
**Guidance Section:** Northrop Grumman (Huntsville, AL)

**Sensor Group:** Lockheed Martin (Orlando, FL)

**Electronics and Chips:** Northrop Grumman (Baltimore, MD)

**Transceiver:** BAE Systems (Nashua, NH)

**Transmitter:** M/A Com (San Jose, CA)







## Mission

Provide automated, on-line, near-real-time capability for planning, coordinating, monitoring, and controlling tactical operations on the battlefield.

## Description and Specifications

The Maneuver Control System (MCS) automates the creation and distribution of the common tactical picture of the battlefield and creates and disseminates operations plans and orders for combined arms maneuver commanders. MCS provides timely, accurate status information, as well as the common tactical picture software supporting a battlefield situation display for all the Army Tactical Command and Control System battlefield functional areas.

MCS Block IV software has as its foundation the Common Operating Environment software and will be compliant with the joint technical architecture. MCS software development is synchronized with the Army Battle Command System (ABCS) and software integration efforts at the Central Technical Support Facility (CTSF) in Ft Hood, TX. MCS will be fielded on common hardware.

## Foreign Counterpart

The MCS is designed to interoperate with the respective command and control systems of Canada, France, Germany, Italy, and the United Kingdom as well as the other nations involved in the Multilateral Interoperability Program (MIP), an international initiative to define interoperability between C2 systems at echelons corps through battalion. The MIP implementation is based upon NATO standardization agreements and Australia, Britain, Canada, and America Quadripartite Standardization Agreements and, therefore, can be extended to other coalition partners.

## Foreign Military Sales

None

## Program Status

- **1QFY04** MCS initial operational test and evaluation (IOT&E) schedule rebase-line approved in Acquisition Program Baseline dated October 9, 2003. IOT&E is currently being planned for 1QFY05.
- **2QFY04** MCS software development is being realigned and requirements documents are being revised based on Army decisions on ABCS "Way Ahead" and a "Good Enough" solution.
- **2QFY04** Support Army units currently utilizing MCS in support of Army test objectives.

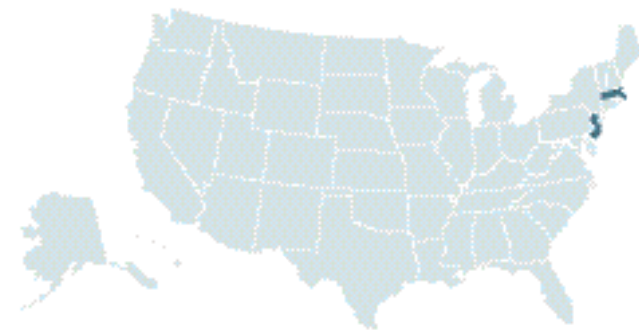
## Projected Activities

- **3QFY04** MCS Version 6.4 (Good Enough) software delivery to CTSF planned for April 2004.
- **1QFY05** Tentative test plans are being coordinated to commence IOT&E in 1QFY05.

## Contractors

**Software Development:** Lockheed Martin (Tinton Falls, NJ); CECOM Software Engineering Center (Fort Monmouth, NJ)

**Notebook Computer Unit (NCU):** General Dynamics (Taunton, MA)





## Material Handling Equipment (MHE)





## Mission

Provide International Organization for Standardization (ISO) container-handling and materiel-handling capability critical to the worldwide deployment and support of the Army in cargo transfer companies, transportation companies, quartermaster units, and ammunition platoons.

## Description and Specifications

The systems that fall into the Materiel Handling Equipment (MHE) category include:

- All-Terrain Lifter, Army System (ATLAS) - C-130 transportable, used for handling palletized loads, Air Force 463 L pallets, and for loading/unloading ISO containers
- Rough Terrain Container Handler (RTCH) - moves and stacks 20 ft and 40 ft ISO containers weighing up to 53,000 lb
- Rough Terrain Container Crane (RTCC) - augments a unit's materiel handling capability in addition to handling 20 ft and 40 ft ISO containers
- 6,000 lb Variable Reach Rough Terrain Forklift (6K VRRFL) - used to handle palletized loads, to stuff containers, and to handle missile pods
- 4,000 lb Rough Terrain Forklift (4K RTFL) - an air-droppable vehicle used forward on the battlefield to unload ISO containers and handle palletized loads.

## Foreign Counterpart

Sweden: Kalmar Industries (RTCH)

## Foreign Military Sales

Australia and United Kingdom: RTCH

Egypt and Turkey: ATLAS

## Program Status

- All MHE programs at different stages of the life cycle, including research and development, production, deployment, fielding, sustainment, and service life extension programs.

## Projected Activities

- RTCH and ATLAS are currently being fielded.
- RTCC currently under SLEP program.

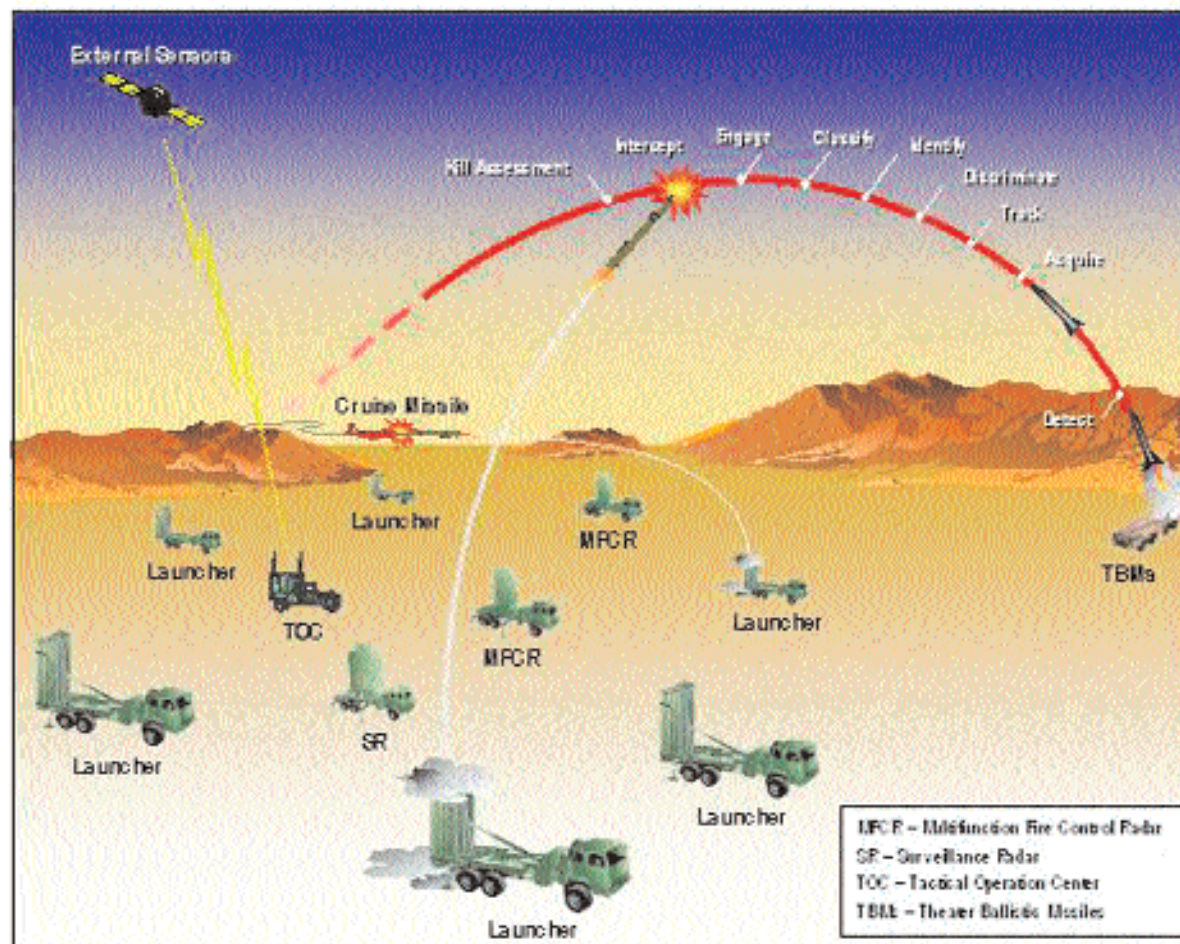
## Contractors

**RTCH:** Kalmar RT Center (Cibolo, TX)

**ATLAS:** JLG (McConnellsburg, PA)



## Medium Extended Air Defense System (MEADS)



## Mission

Provide low-to-medium altitude and allied theater air and missile defense to maneuver forces and other land component commanders' designated critical assets throughout all phases of tactical operations.

## Description and Specifications

The Medium Extended Air Defense System (MEADS) will use its netted and distributed architecture to ensure joint and allied interoperability, and to enable a seamless interface to the next generation of battle management command, control, communications, computers, and intelligence (BMC4I). MEADS' improved sensor components and its ability to link other airborne and ground-based sensors facilitates the employment of its battle elements.

This provides a robust 360-degree defense using the PAC-3 hit-to-kill missile against the full spectrum of theater ballistic missile (TBM), anti-radiation missile (ARM), cruise missile (CM), unmanned aerial vehicle (UAV), tactical air-to-surface missile (TASM), rotary, and fixed wing threats. MEADS will provide:

- Defense against multiple and simultaneous attacks by short range ballistic missiles, low radar cross-section cruise missiles, and other air-breathing threats
- Immediate C-130 and C-17 deployment for early entry operations, add lift capability by CH-47 helicopters and Marine Corps Landing Craft Air Cushion and Landing Craft Utility (LCAC/LCU)
- Mobility to displace rapidly and protect maneuver force assets during offensive operations
- Netted, distributed, and open architecture and modular components to increase survivability and flexibility of employment in a number of operational configurations
- A significant increase in firepower with the PAC-3 missile with greatly reduced requirements for manpower, maintenance, and logistics.

Given these characteristics, MEADS can rapidly respond to a variety of crisis situations and satisfy the needs of the joint and allied operational and tactical commanders.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

MEADS is a cooperative development program with Germany and Italy. The cost share arrangement for the program is: US-55 percent; Germany-28 percent; and Italy-17 percent.

## Program Status

- **3QFY03** A Defense Acquisition Board Review (DAB) approved the Army's plan to pursue a combined program for evolution of the Patriot configured fire units to an integrated PAC-3/MEADS full capability. Acquisition Decision Memorandum (ADM) signed 30 Apr 03.
- **4QFY03** Combined Patriot/MEADS program DAB included a combined acquisition approach and a management structure that would incrementally increase the air and missile defense capabilities through spiral development. ADM signed 12 Aug 03.
- **4QFY03** Critical Technologies Executive Committee.

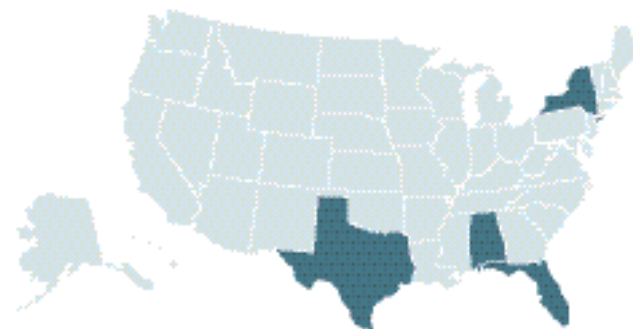
- **4QFY03** Memorandum of Understanding (MOU) negotiations with partner nations started.
- **1QFY04** Design and development (D&D) proposal negotiations started.

## Projected Activities

- **FY04-12** MEADS is currently scheduled to enter its design and development phase.
- **1QFY04** DAB for combined aggregate PATRIOT/MEADS program.
- **1QFY04** Risk Reduction Effort (RRE) Modification (RREM) development.
- **2QFY04** RRE phase scheduled for completion. At that time the program will be ready to enter D&D, an 84-month phase.
- **2QFY04** Army System Acquisition Review Council (ASARC).
- **2QFY04** MOU, D&D, RREM, DAB, FPR, RRE final system demo.
- MEADS International, NATO Medium Extended Air Defense System Agency (NAMEADS-MA), and the partner nations continue baselining the program to reflect their PAC-3 missile integration.
- NAMEADSMA and the partner nations continue developing their international cost and schedule consensus to support the national decision processes of each partner nation and developing overall acquisition strategy for the entire program.
- The PATRIOT and MEADS programs are to be managed in a combined aggregate program (CAP) to leverage PATRIOT experience and MEADS technology to form a system-of-systems architecture.

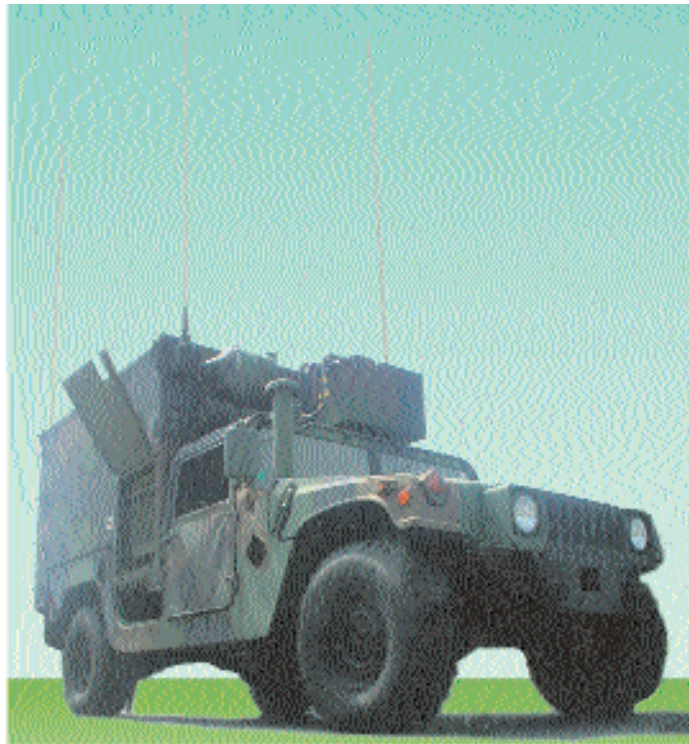
## Contractors

MEADS International, Inc. of Orlando, FL, a joint venture corporation composed of Lockheed Martin (US) and EuroMEADS, a consortium of European Aeronautics Defense and Space (EADS) Company (Germany); MBDA (Italy); MEADS International, Inc. (Syracuse, NY; Orlando, FL; Huntsville, AL; Dallas, TX); CAS, Inc. (Huntsville, AL)

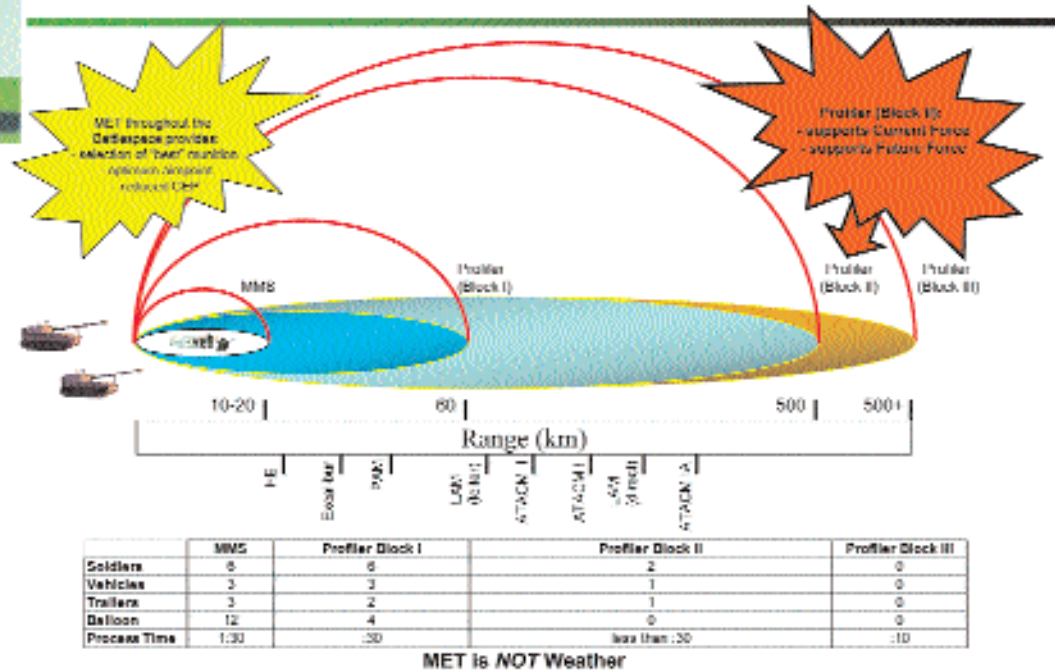




## Meteorological Measuring Set - Profiler (MMS-P)



### Profiler Impact on Battlefield MET



## Mission

Provide modern, real-time meteorological (MET) data over an extended battlespace. For the first time, this produces vital target area MET information for the employment of smart munitions, ensures proper munition selection, and determines optimal aim point calculation.

## Description and Specifications

The Meteorological Measuring Set-Profiler (MMS-P) is a suite of computers and MET sensors that builds a four-dimensional MET model (height, width, depth, and time) that includes terrain effects. This "Gridded" MET (METGM) output can then be used to literally fly projectiles through a virtual space, apply MET effects along the entire trajectory, and refine the technical fire solution.

The system is housed in a Standard Integrated Command Post System (SICPS) Rigid Wall Shelter and transported on an M1113 Expanded Capacity Variant High Mobility Multipurpose Wheeled Vehicle (HMMWV). The system uses common hardware, software, and operating systems. The initial configuration provides METGM throughout a 60km x 60km battlespace, while the follow-on variant extends coverage to a 500km x 500km battlespace. For the first time, the artillery community and the Army will have the capability of applying MET from the firing platform to the target area.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

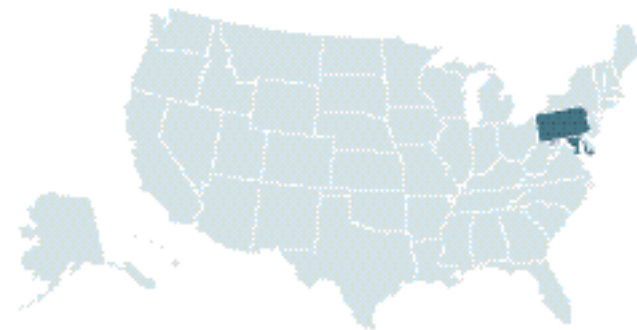
- **FY03** Awarded low rate initial production (LRIP) contract for three systems.
- **FY04** Option exercised for the production of 10 additional systems.

## Projected Activities

- **4QFY04** Initial operational test and evaluation.
- **1QFY05** Full rate production decision.
- **2QFY05** First unit equipped.

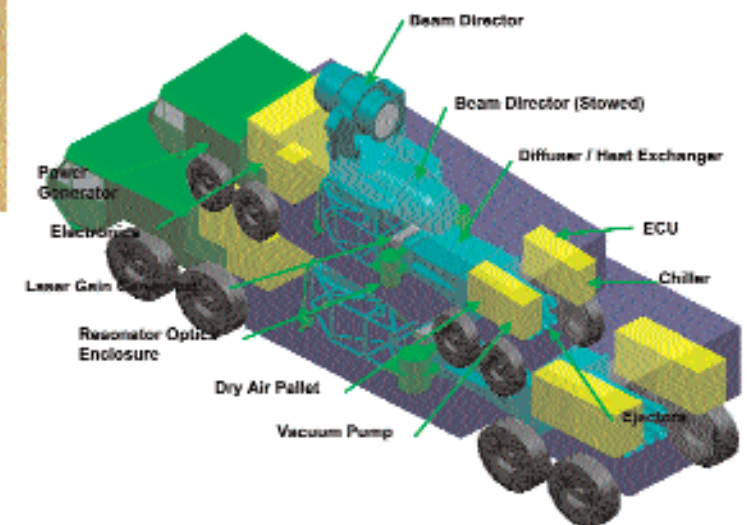
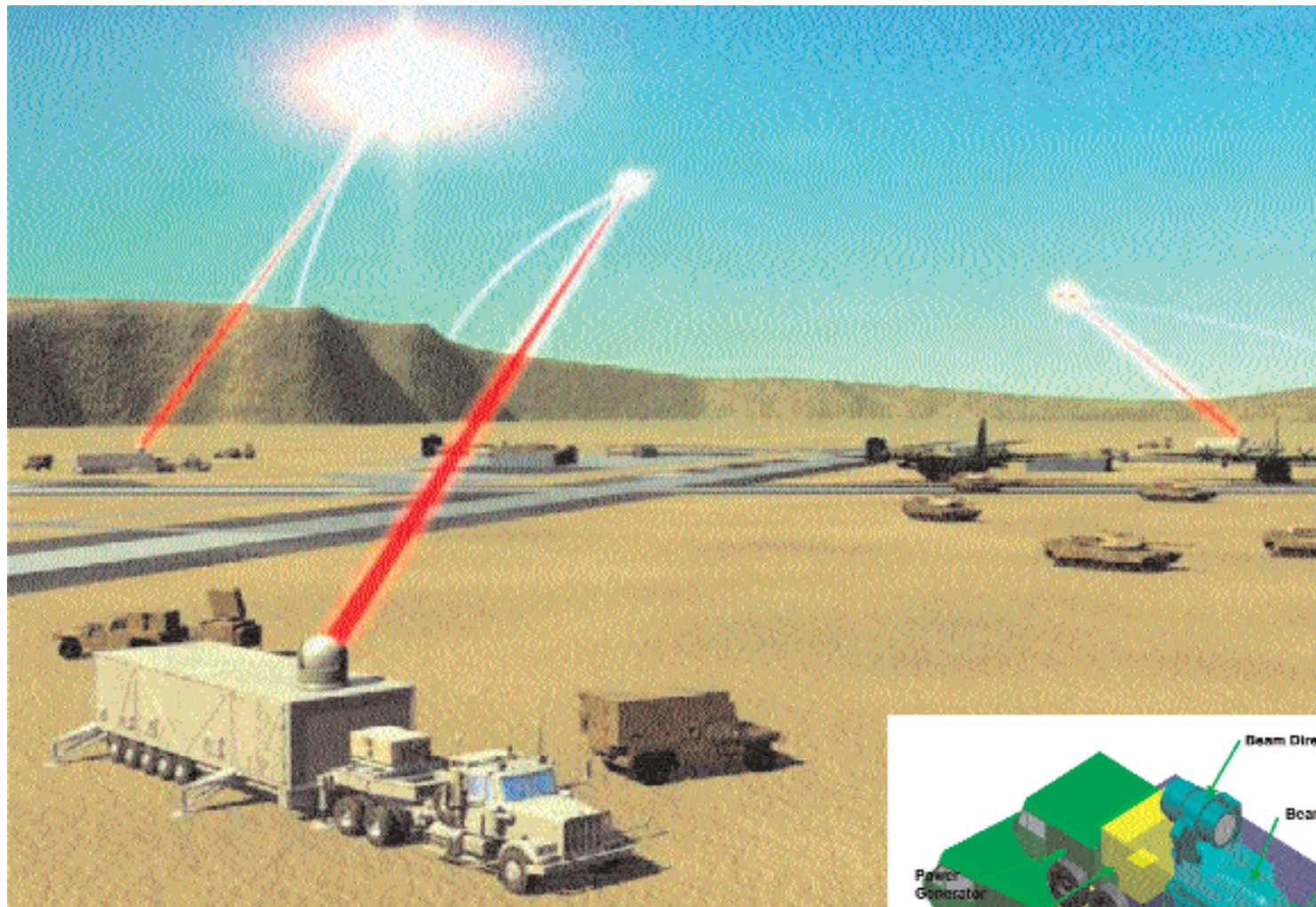
## Contractors

Smiths Detection (Edgewood, MD); Penn State University (University Park, PA)





## Mobile Tactical High Energy Laser (MTHEL)





## Mission

Provide improved survivability of defended assets against attack from rocket, artillery, and mortar (RAM) projectiles, unmanned aerial vehicles, cruise missiles, tactical air to surface missiles, and other evolving threats using a laser weapon system that is highly lethal and cost-effective.

## Description and Specifications

The objective Mobile Tactical High Energy Laser (MTHEL) Laser Weapon system elements integrated into a common air and missile defense architecture will use common air defense sensors all mounted on mobile platforms:

**Laser Weapon Command and Control element:** The MTHEL program will develop a laser weapon command and control (LWC2) element that will interface with and support existing command and control systems as an integral element of the AMD Integrated Fire Control System. The LWC2 controls and monitors the system; provides battle management, including target acquisition through the fire control radar, engagement control, kill assessment, and communications; and provides operator interfaces.

**MTHEL Laser Weapon System element:** The MTHEL program will develop, integrate and test a weapons grade laser on a mobile platform. The MTHEL laser weapon system element consists of a controller subsystem, optics and beam control subsystem, laser gain generator subsystem, fluid supply (including re-supply) subsystem, and the primer mover. The laser gain generator subsystem generates the high power beam. The optics and beam control subsystem uses information from the LWC2 and external BMC4I systems to provide the capability to steer the beam such that the system tracks the threat objects and directs the lethal laser beam to the target. The MTHEL will use proven high-energy deuterium fluoride chemical laser technologies to provide the capability for cost-effective kill mechanisms.

**Common Integrated sensor element:** MTHEL will use common tactical radar capable of meeting requirements. Primary cueing system is expected to consist of a radar antenna array assembly subsystem, electronics, and control assembly subsystem to provide target acquisition and tracking. The sensor element array may include an adjunct optical sensor subsystem if needed to meet target saturation performance requirements.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

Collaborative development program with Israel

## Program Status

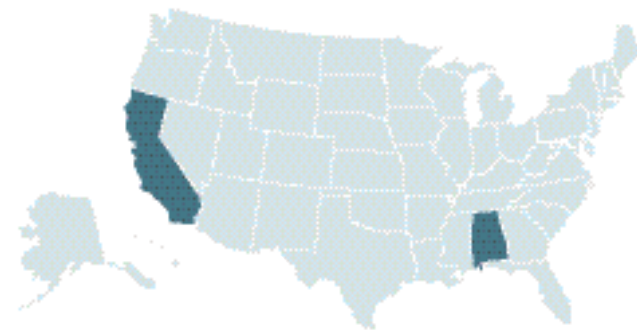
- **FY00** THEL Advanced Concept Technology Demonstration (ACTD) successful single and multiple rocket shoot downs.
- **FY01-02** System engineering trade studies to define system architecture and configuration and identify critical technologies for risk reduction activities.
- **4QFY02** MTHEL test bed successful shoot-down of 152mm artillery projectile. Thirty-three successful intercepts to date.
- **FY03** Development of system technical requirements, extended lethality testing, and risk reduction culminating in a Milestone B decision in early FY04.
- **3QFY03** Alternative systems review - concept selection.
- **4QFY03** System requirement review - final performance requirements.

## Projected Activities

- **2QFY04** Contract award for system development and demonstration phase.
- **4QFY07-4QFY09** Prototype delivery and testing.

## Contractors

Northrop Grumman (Redondo Beach, CA); Mevatec (Huntsville, AL); Science Applications International Corporation (Huntsville, AL); CSC (Huntsville, AL)



## Mortar Systems



## Mission

Provide organic indirect-fire support to the maneuver unit commander.

## Description and Specifications

**120mm Mortar System:** The 120mm mortar system is a conventional, smoothbore, muzzle-loaded mortar system used in mechanized infantry, motorized, armored, and cavalry units. It is employed in towed (M120) and tracked carrier versions (M121) and in the Stryker Brigade Combat Team (SBCT) wheeled mortar carrier.

**Range:** 7240 m

**Rate of fire:** 16 rounds/min for the first minute; four rounds/min sustained

**Weight:** 319 lb

**Crew:** Four M121 carrier-mounted on the M1064; five M120 towed

**Ammunition:** High explosive, smoke, illumination (visible light and infrared), full-range practice

**M252 81mm Mortar System:** The M252 is a smoothbore, muzzle-loaded weapon that replaced the M29A1 mortar in the mid 80's. It features a high rate of fire, extended range, and improved overall system characteristics. Both the Army and Marine Corps use the ground-mounted version of the 81mm. The Marine Corps also uses the Light Assault Vehicle (LAV) as an 81mm platform for a carrier version.

**Range:** 5935 m

**Rate of fire:** 30 rounds/min for the first two minutes; fifteen rounds/min sustained

**Weight:** 90 lb

**Crew:** Three

**Ammunition:** High explosive, smoke, illumination (visible light and infrared) and practice

**M224 60mm Mortar System:** The 60mm weapon system is a lightweight, smoothbore, man-portable, muzzle-loaded mortar with improved rate-of-fire capabilities over the M19 60mm mortar system it replaced. The M224 can be drop-fired from the standard baseplate or handheld and trigger-fired.

**Range:** 3489 m

**Rate of fire:** 30 rounds/min for the first four minutes; twenty rounds/min sustained

**Weight:** 46.5 lb (conventional), 18.0 lb (handheld)

**Crew:** Two

**Ammunition:** High explosive, smoke, illumination (visible light and infrared) and practice

**M95/M96 Mortar Fire Control System (MFCS):** MFCS provides Paladin-like (M109A6) fire control capability that greatly improves mortar lethality, responsiveness, and crew survivability. MFCS links mortar fires with the digital battlefield. It integrates a fire control computer with an inertial navigation and pointing system, allowing crews to fire in less than one minute.

## Foreign Counterpart

Many countries have similar systems

## Foreign Military Sales

None

## Program Status

**120mm Mortar System:** Initial fielding of the 120mm mortar system is complete; M120 version was issued to the Initial Brigade Combat Team, 10th Mountain Division, 82nd Airborne Division, 75th Ranger Battalion, 101st AASLT, 173rd Airborne Division and was successfully used in Operations Enduring Freedom and Iraqi Freedom.

**M252 81mm Mortar System:** Fielded during the late 1980s.

**M224 60mm Mortar System:** Fielded during the late 1970s to early 1980s.

**M95/M96 MFCS:** Successfully completed initial operational testing and evaluation (IOT&E) in November 2002 leading to type classification in April 2003. MFCS received a conditional materiel release (CMR) in May of 2003 which led to accelerated fielding to the 1st Cavalry Division, Fort Hood, TX in May 2003.

### Mortar Fire Control System (Heavy):

- **1QFY04** Version 2 M95 to support Stryker Brigade Combat Team Mortar Carrier B initial operational testing.

## Projected Activities

### Mortar Ballistic Computer:

- **3QFY03-1QFY04** Achieved materiel release and fielded to 1st Cavalry Division guns, 1st Infantry Division (R), 1st Artillery Division (R), 2nd Infantry Division (F), and 11th Armored Cavalry Regiment.

### Light Handheld Mortar Ballistic Computer:

- **3QFY05** Type classification.
- **3QFY05** First unit equipped.

## Contractors

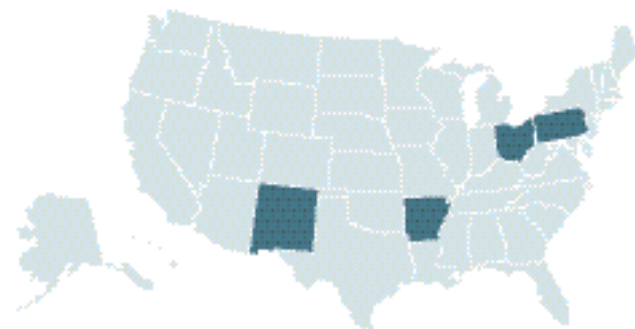
**M734A1 Multi-Option Fuze and M783 PD Fuze:** L-3 Communications (Cincinnati, OH)

**120mm Shell Bodies:** Chamberlain Mfg. (Scranton, PA)

**LAP of Smoke and Illumination:** Pine Bluff Arsenal (Pine Bluff, AR)

**MFCS Hardware Integration:** Honeywell (Albuquerque, NM)

**120mm HE/FRPC LAP:** SNC (Montreal, Canada)







## Mission

Provide soldiers the ability to engage and execute close combat, combat support, and combat service support operations in all light levels, adverse weather, and battlefield obscurant conditions.

## Description and Specifications

The AN/PVS-7D Night Vision Goggle and the AN/PVS-14 Monocular Night Vision Device are head or helmet-mounted passive devices used by the individual soldier that amplify ambient light and very near infrared (IR) energy for night operations. The systems are designed for use in conjunction with rifle mounted aiming lights. AN/PVS-14 can be mounted to the M16/M4 receiver rail.

	PVS-7	PVS-14
<b>Field of View</b>	≥ 40 degrees	≥ 40 degrees
<b>Weight (maximum)</b>	1.5 lb	14 oz
<b>Magnification</b>	1 x	1 x
<b>Range</b>	150 m	150 m
<b>Operational Time</b>	≥ 15 hr	≥ 15 hr
<b>Power</b>	AA (or BA-5567/U)	AA
<b>Reliability</b>	200 hr	200 hr

Enhanced Night Vision Goggle (ENVG) is a helmet-mounted passive device for the individual soldier that incorporates image intensification and long wave infrared sensors into a single, integrated system. ENVG allows the soldier to carry out missions during daylight, darkness, and degraded battlefield conditions. ENVG improves the soldier's situational awareness by providing the capability to rapidly detect and recognize man-sized targets while simultaneously maintaining the ability to see detail and to use rifle-mounted aiming lights.

<b>Image Intensification Detection Range</b>	150 m
<b>Infrared Sensor Detection Range</b>	150 m
<b>Total System Weight</b>	2 lb
<b>Operational Time (with one battery set change)</b>	15 hrs

## Foreign Counterpart

Numerous for AN/PVS-7 and AN/PVS-14, but none with comparable performance to US military systems. None for ENVG.

## Foreign Military Sales

Numerous foreign countries purchase AN/PVS-7 and AN/PVS-14. None for ENVG.

## Program Status

- **Current** In production and being fielded.

- **FY2003** 11,762 Night Vision Goggles (NVG), AN/PVS-7, and AN/PVS-14 fielded.
- **Current** NVGs, AN/PVS-7, and AN/PVS-14 are in full rate production.
- **September 2003** Fielding completed for active divisions and enhanced brigades.

## ENVG:

- **Current** Undergoing test and evaluation to support Milestone (MS) Decision and type classification (TC) low-rate initial production (LRIP) in FY05.

## Projected Activities

### AN/PVS-7 and AN/PVS-14:

- Continue planned procurement.
- Continue fielding in support of OEF/OIF deployments.
- Continue fielding to echelons above division, National Guard, and Reserve.

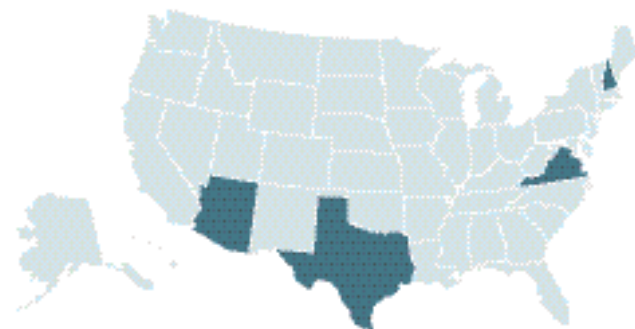
## ENVG:

- **2Q04** Contract award for test systems.
- **3Q04** Developmental testing and user evaluation.
- **1Q05** MS C and TC-LRIP.
- **2Q05** LRIP contract award.

## Contractors

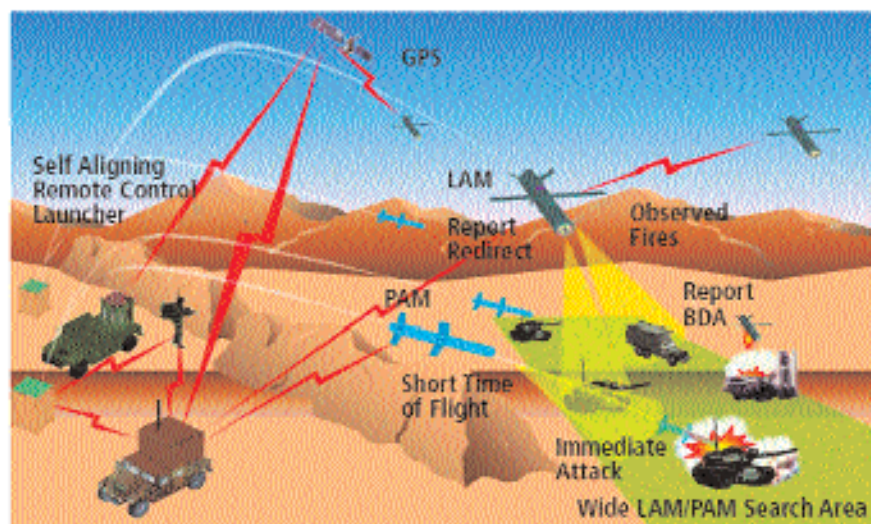
**AN/PVS-7D and AN/PVS-14:** Northrop Grumman (Tempe, AZ; Garland, TX); ITT Industries (Roanoke, VA)

**ENVG:** Northrop Grumman (Tempe, AZ; Garland, TX); ITT Industries (Roanoke, VA); Insight Technologies, Inc. (Londonderry, NH)





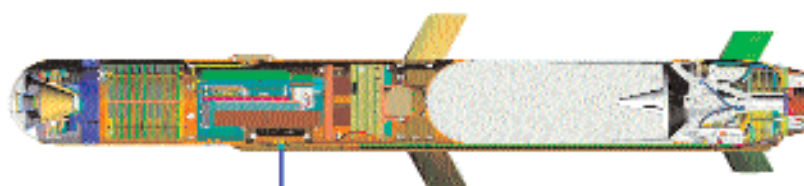
## Non Line of Sight Launch System



*NLOS-LS Operational Concept*



**Missile Computer & Commo System**



**Precision Attack Munition (PAM)**

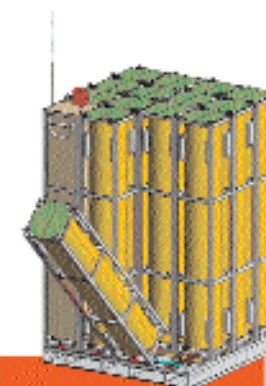


**Loiter Attack Munition (LAM)**

### PM UA Networks / LSI Efforts

- Tactical Fire Control
- Network Development and I/F
- Mission Planning

## Container/Launch Unit



### PEO-TM Efforts

- Development of PAM, LAM, and CLU w/ MCCA
- Technical Fire Control
- Network Interfaces for CLU and Missiles
- Platform Interfaces with LSI and PM FCS



## Mission

Provide responsive and precise non-line-of-sight lethal fires for the Future Combat Systems (FCS) unit of action (UA), thereby enhancing UA combat effectiveness and survivability. Operate principally autonomously, thus reducing requirements for dedicated fire-support operational and support personnel.

## Description and Specifications

The Non-Line of Sight-Launch System (NLOS-LS), a core system within the FCS, consists of a pair of precision guided missile types loaded into a highly deployable, platform-independent Container Launch Unit (CLU) with self-contained technical fire control, electronics, and software for remote and unmanned fire support operations.

The NLOS-LS CLU will contain a total of 15 missiles and will launch Precision Attack Missiles (PAMs) focused on defeating hard targets and Loitering Attack Missiles (LAMs) against fleeting, high-value targets. The LAM will also search, survey targets, verify and assess battle damage, and serve as an airborne radio transmission platform for other FCS systems. Either a PAM and/or LAM will automatically launch vertically from the CLU when in receipt of fire mission orders received via the FCS UA network. Each missile will be responsive to in-flight target updates via their on-board Joint Tactical Radio Set Cluster 5 radios, and will possess limited automatic target recognition capability. Both the PAM and LAM will possess multi-capable warheads effective against armor and soft targets. Future missiles in follow-on FCS increments may include air defense and non-lethal capabilities.

Key FCS NLOS-LS advantages include the following:

- Real-time battlefield surveillance
- Remote fire control
- Remote emplacement
- Enables extending-range target engagements and battle damage assessment
- Jam-resistant Global Positioning System.

**Weight:** CLU with 15 missiles, approximately 3,000 lb

**Dimensions:** 45" width x 45" length x 69" height

**Range:** PAM approximately 40 km; LAM approximately 70 km + 30 minutes loitering time

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

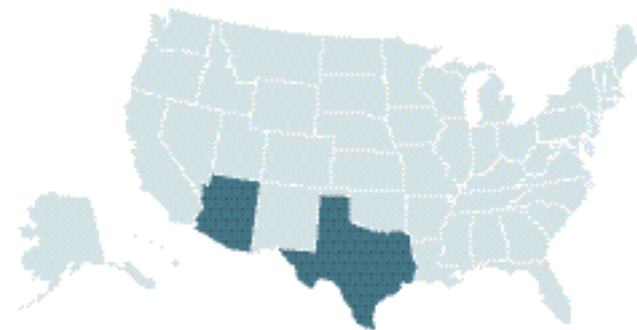
- Defense Advanced Research Projects Agency "NETFIRES" demonstration program concluding.
- **2QFY03** Pre-system development and demonstration (SDD) contract awarded.
- **2QFY04** SDD contract award planned.

## Projected Activities

- **FY04-FY10** Increment 1 72-month SDD.
- **4QFY08** Complete Milestone C.
- **FY09** Begin low-rate initial production.
- **CY10** Limited operational capability, Increment 1.
- **CY12** Final operational capability, Increment 1.

## Contractors

NETFIRES Limited Liability Company between Raytheon and Lockheed Martin (Tucson, AZ; Dallas, TX)







## Mission

Provide friendly forces with accurate, rapid combat information by detecting, sampling, identifying, marking, and reporting the presence of chemical, biological, radiological and nuclear (CBRN) and toxic industrial materiel (TIM) hazards.

## Description and Specifications

The Nuclear Biological and Chemical Reconnaissance Vehicle (NBCRV) - Stryker is the CBRN reconnaissance configuration of the infantry carrier vehicle in the Stryker Brigade Combat Team (SBCT). It will be the Army's principal manned, automated reconnaissance, surveillance, monitoring, marking, reporting and sampling system in corps and division elements and echelons above corps. It will operate in all geographical areas, adverse weather, and under all types of battle-field conditions, throughout the depth of the battlefield.

NBCRV uses government off-the-shelf military hardware and some systems still in development. Its sensor suite represents the next generation CBRN reconnaissance system, providing overmatching capability on a common platform through the use of a single, integrated reconnaissance and surveillance system. The Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD), Chemical Biological Mass Spectrometer Block II (CBMS II), and Force XXI Battle Command Brigade and Below (FBCB2) are examples of programs currently in development. Some are in production, such as the Joint Biological Point Detection System (JBPDS), M22 Automatic Chemical Agent Alarm, AN/VDR-2 radiation, detection, indication and computation (RADIAC), AN/UDR 13 pocket RADIAC, and other non-nuclear, biological, and chemical (NBC) equipment such as the Precision Lightweight GPS Receiver.

NBCRV will have the capability to detect and collect CBRN contamination in its immediate environment on the move through point detection (CBMS and JBPDS), and at a distance through the use of a standoff detector (JSLSCAD). It automatically integrates contamination information from detectors with input from on-board navigation and meteorological systems and automatically transmits digital NBC warning messages through the Maneuver Control System to warn follow-on forces.

NBCRV may replace the need for separate M93A1 Fox NBC Reconnaissance Systems and Biological Integrated Detection Systems.

## Foreign Counterpart

China: NBC reconnaissance vehicle; Russia: BRDM-ZRKH, MTLB, RKHM,UAZ-469RKH; Germany: ABC Reconnaissance System

## Foreign Military Sales

None

## Program Status

- **1QFY04** Completed limited user test.
- **2QFY04** Initial production review.

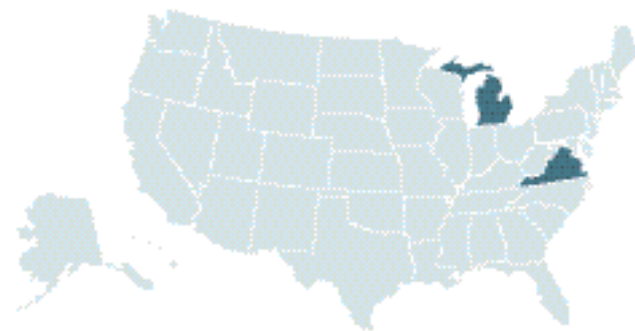
## Projected Activities

- **3QFY05–1QFY06** Product verification test.
- **3QFY05–4QFY05** Live fire test and evaluation.
- **2QFY06–3QFY06** Initial operational test and evaluation.

## Contractors

**Prime Vehicle:** General Dynamics Land Systems (Sterling Heights, MI)

**Sensor Software Integrator:** CACI Technologies (Manassas, VA)







## Mission

Rapidly move combat configured loads of ammunition and all classes of supply, shelters, and containers.

## Description and Specifications

The Palletized Load System (PLS) truck models are the M1075 and the M1074 with Materiel Handling Crane. The system also includes the PLS Trailer (M1076), a PLS Container Handling Unit (CHU) for transporting 20 ft International Standards Organization (ISO) containers, and the M3 Container Roll-in/Out Platform (CROP). Specifications are as follows:

- **Payload:** 33 tons (truck and trailer)
- **Speed:** 55 mph on road / 5-15 mph cross-country
- **Curb weight:** 48,845 lb
- Self-load/off-load capability with demountable cargo bed (CROP)
- Central Tire Inflation System (CTIS) to enhance mobility
- Air transportable via C-141, C-5, and C-17
- **Deployability:** deployable by rail, sea, and air
- **Sustainability:** PLS RAM equal to or better than previous systems (or +90 percent)
- **Versatility:** CROP is NATO interoperable
- **Lethality:** Rapid movement of ammunition, on and off road; supports decisive fires
- **Mobility:** CTIS provides improved mobility not found in the Heavy Expanded Mobility Tactical Truck
- Capable of one person operation
- Trailer capacity equal to truck
- CROP fits inside ISO container
- Transports ISO containers with use of the CHU.

## Foreign Counterpart

United Kingdom: Demountable Rack Off-Loading and Pick-Up System (DROPS);  
Germany: MAN

## Foreign Military Sales

None

## Program Status

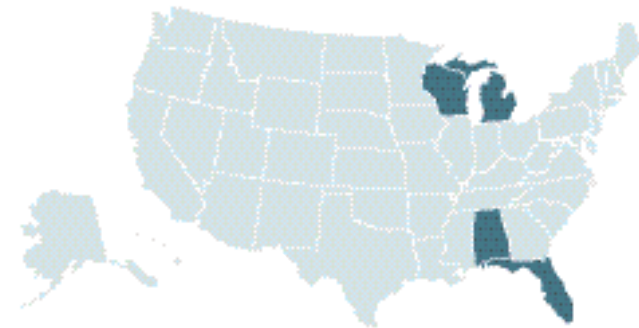
- **Current** In production.

## Projected Activities

- **September 2006** M1076A1 PLS-T low-rate initial production.
- **January 2007** Milestone C.
- **March 2007** First unit equipped.

## Contractors

Oshkosh Truck (Bradenton, FL; Oshkosh, WI); Summa Technology (Cullman, AL);  
Oshkosh Truck Keweenaw Fabrication LLC (Keweenaw, WI); Detroit Diesel (Detroit, MI)









## Mission

Provide next-generation weapons-locating radar to detect and locate enemy artillery, rockets, and missiles quickly and accurately enough to permit immediate engagement.

## Description and Specifications

The Phoenix Battlefield Sensor System (PBS2) will replace the AN/TPQ-37 artillery locating radar. The PBS2 system will increase the current AN/TPQ-37 artillery range performance while improving accuracy and target throughput. The PBS2 will also provide a new capability for missile and rocket detection at ranges out to more than 300 km.

The system will use the standard Army light medium tactical vehicles in a highly mobile, transportable, and survivable configuration that reduces crew size from 12 to 9. The system will be capable of roll-on/roll-off from a single C-130 aircraft for rapid deployment. The program will further leverage the AN/TPQ-36 (V)8 electronics upgrade program by using the same operations central shelter currently being fielded.

## Foreign Counterpart

European Consortium-Sponsored EuroArt Cobra; Ukraine: 1L220-U

## Foreign Military Sales

None

## Program Status

- **3QFY03** Continue system build.
- **4QFY03** Began contractor acceptance test.
- **1QFY04** Began development test.

## Projected Activities

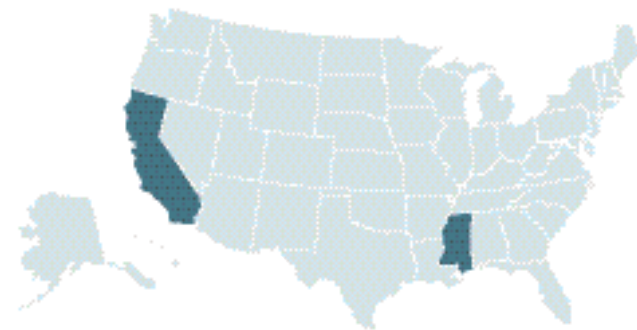
- **3QFY05** Conduct limited user test.
- **1QFY06** Low-rate initial production contract.

## Contractors

**Radar/Hardware:** Thales/Raytheon (El Segundo, CA; Forest, MS)

**Shelter:** Northrop Grumman (Dominguez Hills, CA)

**Technical Support:** Malibu (Calabasas, CA)



# Precision Guided Mortar Munitions (PGMM)

## Platforms

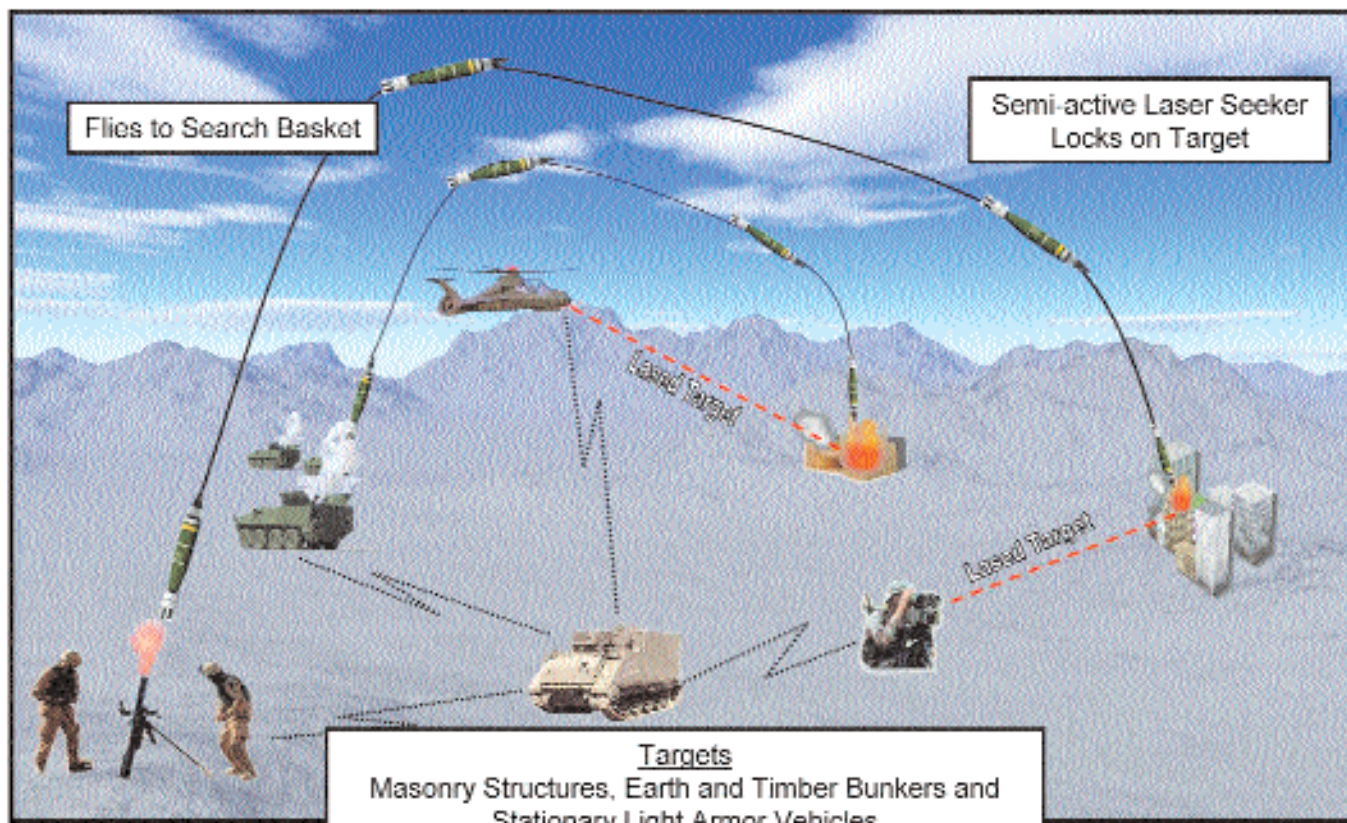


**Current**



**Future**

## PGMM Increment 1



Earth and Timber Bunkers



Brick over Block Masonry Structures



Stationary Lightly Armored Vehicles

## Increment 1 Targets

## Mission

Provide a precision strike munition for the Current and Future Forces that will defeat personnel within high value point targets such as earth and timber bunkers, masonry structures, light armored vehicles, and command and control centers.

## Description and Specifications

The 120 mm Precision Guided Mortar Munition (PGMM) fully supports the Army Vision as it provides organic precision strike capability to the maneuver commander. The ability to hit point targets is especially valuable in urban environments and low intensity conflicts, avoiding collateral damage and reducing the potential for civilian casualties. PGMM increases the number of stowed kills and reduces the overall logistics burden (critical goal for early entry forces).

**Precision:** Two rounds or less to defeat the target (semi-active laser designation for precision strike)

**Range:** Provides lethality at extended ranges with incremental upgrades (7.2 km to 15 km)

**Lethality:** Provides high lethality against personnel protected by earth and timber bunkers, lightly armored vehicles, and masonry structures

**Shelf Life:** 10 years

**Weapon System:** Compatible with all current and future 120 mm US mortar systems.

## Foreign Counterpart

Sweden produced and fielded an anti-tank 120 mm mortar munition (Strix) with a fire-and-forget infrared sensor. It is not compatible with the US 120 mm mortar system, PGMM's operational concept, or target set.

## Foreign Military Sales

None

## Program Status

- PGMM has completed component advanced development (CAD), completing its component demonstration technical requirements (guidance and control, extended range, warhead, fuze) and program documentation for a Milestone B Decision (4QFY03) to proceed to the system development and demonstration phase.
- Competitive source selection is underway for the next phase through low-rate initial production (LRIP).

## Projected Activities

- 4QFY03** Milestone B.
- 2QFY04-2QFY08** System development and demonstration phase.
- 3QFY08** Production qualification tests and evaluation.
- 3QFY09-4QFY09** Operational tests.
- 2QFY08** Milestone C (Increment I).
- 3QFY08-3QFY09** LRIP.
- 2QFY10** Materiel release for Future Combat Systems.
- 2QFY10** First unit equipped.

## Contractors

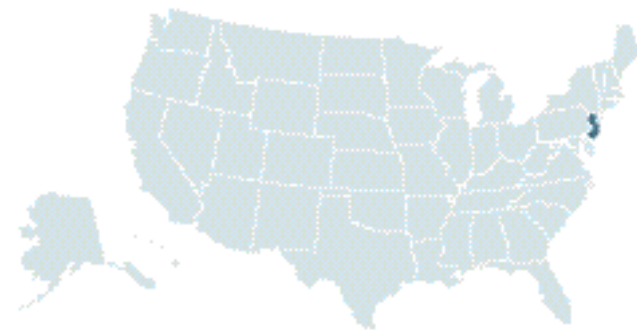
**Program Management:** OPM Mortar Systems (Picatinny Arsenal, NJ)

**Prime System:** TBD (ongoing competitive source selection)

**Seeker Subsystem:** TBD (ongoing competitive source selection)

**Guidance Subsystem:** TBD (ongoing competitive source selection)

**Control Actuation Subsystem:** TBD (ongoing competitive source selection)







## Mission

Provide a near-real-time picture of the brigade/armored cavalry regiment battlespace through the use of communications intelligence (COMINT) sensors to include the capability to detect, identify, and electronically attack selected emitters.

## Description and Specifications

Prophet detects, collects, and exploits conventional and modern military emitters. A secondary mission will be electronic attack against selected enemy emitters to interrupt, spoof, disrupt, and/or disable target command and control nodes.

Prophet is mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV), with a quick-erect seven-meter antenna mast. Prophet also has a dismounted man-pack version, which supports airborne, early entry, and urban operations. Both configurations provide intelligence support to a division, Stryker/heavy/light brigade, regiment, or task force. This intelligence support provides indications, warning, location, tracking, and identification of threat emitters. Prophet will cross-cue other battlefield sensors (e.g. tactical unmanned aerial vehicles, PBS2 radars, etc.) as well as provide additional data that may confirm indications and detections from the other battlefield manned and unmanned sensors.

Prophet will replace the current tactical Signals Intelligence (SIGINT) legacy systems, which include the AN/TSQ-138 Trailblazer, the AN/TRQ-32 Teammate, the AN/TLQ-17A Trafficjam, and the AN/PRD-12 lightweight man-transportable radio direction finding set. Prophet employs open systems architecture, modular design, and nonproprietary industry standards which support evolutionary growth and expansion via circuit card assemblies and software versus wholesale hardware replacement. This open system architecture supports the insertion of off-the-shelf technology to meet unique theater collection requirements. This has proven effective in both Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). The Prophet system will be procured under a blocked acquisition approach, which will ensure reduced footprint, reduced logistics, standardization, enhanced sustainability, smaller and lighter force structure, and improved mobility. Prophet's impact will be felt by the Future Force as the Block III technologies will be leveraged by the Future Combat System.

## Foreign Counterpart

The United Kingdom, Australia, Canada, and France either have or are actively pursuing a comparable vehicular systems.

## Foreign Military Sales

None

## Program Status

- **1QFY03** Conducted first Prophet Block I production system accelerated fieldings; fielded three divisions; completed accelerated development and testing of the Prophet control; completed follow-on foreign comparative testing (FCT II).

- **2QFY03** Block II/III MS B decision; awarded contract for Block II/III system development and demonstration (SDD); completed accelerated development and testing of Prophet digital reporting; fielded Prophet Block I systems to two SBCTs units, two divisions, and one Armored Cavalry Regiment (ACR).
- **3QFY03** Fielded Prophet Block I systems to one ACR and to US Army Intelligence Center, Ft Huachuca, AZ.

## Projected Activities

- **1QFY04-4QFY05** Continue Prophet Block I fieldings.
- **4QFY04** Conduct Prophet Block II/III initial operational test and evaluation.
- **1QFY05** Receive favorable Milestone C decision.
- **4QFY05** Conduct Prophet Block II/III first unit equipped.

## Contractors

**Prophet Block I Production:** Titan Systems (San Diego, CA)

**Prophet Block II/III Development:** General Dynamics Decision Systems (GDDS) (Scottsdale, AZ)

**Prophet Block II/III Development:** Raytheon – subcontractor to GDDS (Falls Church, VA)

**Prophet Block I AN/PRC-150 Radios:** Harris Corporation (Rochester, NY)

**Prophet Block II/III Development:** Eclipse Electronic Systems - subcontractor to GDDS (Richardson, TX)





## QuickFIX Program – Combat ID Devices

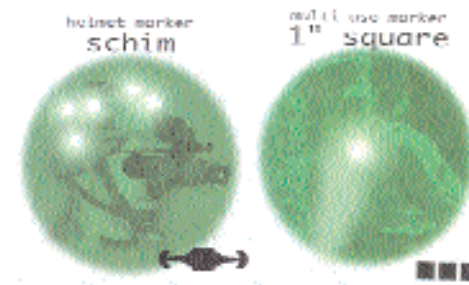
Combat Identification Panels (CIPs)



Thermal Identification Panels (TIPs)



GLO Tape IR Reflective Material



Phoenix IR Light





## Mission

Provide a cost-effective proven means to positively identify friendly ground forces on the battlefield in order to minimize fratricide incidents and to enhance combat effectiveness.

## Description and Specification

The Quick Fix program consists of Combat Identification Panels (CIP), Thermal Identification Panels (TIP), Phoenix Infrared (IR) Lights, and Glo-Tape. CIPs are aluminum panels covered with a thermal film that produces a “cold” spot on a hot background when viewed through thermal sights. CIPs provide ground-to-ground and limited air-to-ground identification. TIPs are cloth panels covered with a thermal film. TIPs provide air-to-ground and a limited ground-to-ground identification by providing a “cold” spot similar to CIPs when viewed through aircraft or vehicle Thermal Sights. Phoenix Lights are IR blinking strobes visible through night vision goggles (NVG), which provide ground-to-ground and air-to-ground ID. Glo-Tape is reflective material visible through NVG when illuminated by an IR source and provides soldier identification.

## Foreign Counterpart

The United Kingdom has produced systems.

## Foreign Military Sales

None

## Program Status

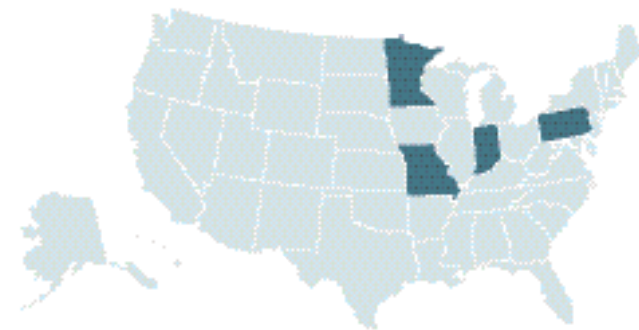
- **Current** Production and fielding; reducing the number of unique CIP kits and changing to one color to streamline the support requirements.

## Projected Activities

- **FY2004** Support to Operation Iraqi Freedom; production for National Guard units; foreign military sales to Portugal and Australia.

## Contractors

Crossroads Industrial Services (Indianapolis, IN); Night Vision Equipment Company (Emmaus, PA); Eagle Industry (St. Louis, MO); Brosi Sign Systems (St. Paul, MN)







### Requirement List Summary

#### Force Protection/Mobility

Advanced Combat Helmet w/  
Cover  
Improved Hot Weather Desert  
Boot  
Infantry Combat Boot Type II (AF  
Desert)  
Knee/Elbow Pads

#### Soldier Mission Essential Equipment

Black Fleece Bibs  
Combat Belt  
COTS Socks (4 per)  
Fleece Cold Weather Cap  
Goggles, ESS-Low Profile  
Goggles, Wiley-X  
Modular Lightweight Load  
Carrying Equipment Accessories  
Hydration System  
Silkweight Underwear  
Wick-Away Sportsbras (4 per)  
Wick-Away T-Shirts (4 per)

#### Specialized Equipment Sets

35# Door Ram  
Assault Ladder  
Double Keyed Cuffs  
Grappling Hooks  
Modular Entry Tools  
Quickie Saw  
Vietnam Tactical Tomahawk

#### Optics

Advanced Combat Optic  
M68 Close Combat Optics  
Fiber Optic Viewer (Vision 300)  
Mark VII Target Locator  
M145 Machinegun Optic  
Undergun Light  
M24 Small Binoculars

#### Communications

Modular Integrated  
Communications Helmet System  
ICOM Repair Parts (sets)

#### Lethality

9 MM Magazines  
Back-Up Iron Sights  
M4 Bipod Adapter  
M4 Bipod Legs  
M4 Forward Rail Kit  
M4/M16 Magazines  
M4 Single Point Sling  
M122A1 Tripod  
M203 Day/Night Sight  
M240 Ammo Storage Bag  
M240B Forward Rail System  
M240B Soft Ammo pack  
M249 Forward Rail System  
M249 Soft Ammo pack



## Mission

Reduce equipment shortages and procurement deficiencies and provide necessary equipment to conduct combat operations worldwide to the American soldier when needed.

## Description and Specifications

Rapid Fielding Initiative (RFI) is a program to expedite the process of acquiring and fielding up-to-date, government off-the-shelf (GOTS) and commercial off-the-shelf (COTS) individual equipment and weapons technology to support soldiers engaged in combat operations, including Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF). Treating the soldier as a system, RFI aims to ensure that soldiers and the equipment necessary to their success are fielded together. Then it aims to ensure that they have the most current technology available as rapidly as possible through Army supply channels to enhance mission accomplishment without having soldiers purchasing commercially available but potentially inferior equipment.

RFI evolved from after-action reports (AAR) from units deployed to Afghanistan that cited a lack of mission-essential clothing and individual equipment (CIE) needed to perform assigned missions, in addition to reports that soldiers were purchasing COTS items prior to deployment to alleviate those deficiencies.

Initial funding for RFI beginning in November 2002 was provided largely through internal reprogramming of \$11 million in Program Executive Officer (PEO) Soldier funds. Subsequent funding was contained in supplemental bills for the purchase of brigade combat team (BCT)-equivalent packages. For planning purposes, G-8 currently allocates \$14.8 million per BCT (Operations and Maintenance, Army [OMA], Other Procurement, Army [OPA], and Weapons and Tracked Combat Vehicles [WTCV]) and \$9.1M per associated echelon above brigade (EAB).

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **October 2002** Vice Chief of Staff of the Army directed PEO Soldier to develop RFI based on AAR information from operations in Afghanistan.
- **November 2002** First RFI, consisting of 15 items, selected in coordination with the Commander, 82nd Airborne Division. Its success prompted the VCSA to direct RFI for additional brigades deploying to OEF/OIF.

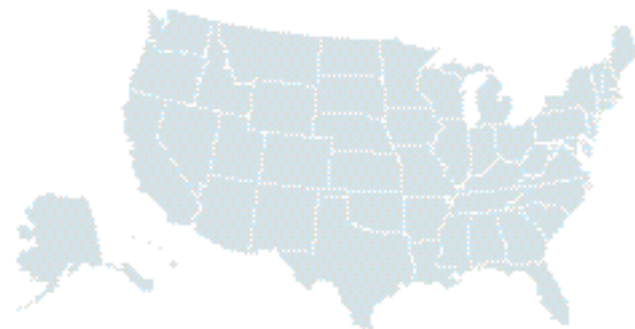
- **CY03** RFI list of equipment refined based on soldier feedback gained by the Training and Doctrine Command Soldier-as-a-System ICT, Task Force Soldier, and the Infantry School at Fort Benning, GA.
- **Current** RFI list contains more than 40 items for BCTs in the categories of force protection/mobility, lethality, soldier mission essential equipment, and individual weapons/optics. A smaller list has been developed for the EABs associated with the BCTs.
- As of December 31, 2003, RFI has been fielded to 11 BCT-equivalents.

## Projected Activities

- **FY04** Fielding of RFI items to 29 BCT-equivalent units.
- POM budgeting for RFI continuation, replenishment and sustainment through FY-11.
- Continental United States (CONUS) fielding to deploying units at home stations and mobilization stations.
- Outside CONUS (OCONUS) fielding to units deployed in-theater for OIF/OEF.
- Enhanced warehousing, transportation and inventory control procedures to achieve maximum flexibility, positive control and efficiency of operations.
- Continued coordination with the Soldier-as-a-System ICT, the Infantry School, and Task Force Soldier to further refine RFI equipment item selection and acquisition processes.

## Contractors

Multiple







## Mission

Achieve end-to-end connectivity to meet the requirements of the Joint Chiefs of Staff for command, control, communications, computers, and intelligence (C4I) to support the President, Secretary of Defense, combatant commanders, military departments, and other government departments and agencies.

## Description and Specifications

The Secure Mobile Anti-Jam Reliable Tactical-Terminal (SMART-T), mounted on a standard High Mobility Multipurpose Wheeled Vehicle (HMMWV), provides range extension for current and future tactical communications networks. The maximum rate for data and voice communications at low data rate is 2.4 Kbps and at medium data rate is 1.544 Mbps. It will be the only protected wideband satellite capability at echelons corps and below (ECB). Development is underway to upgrade terminals to advanced extremely high frequency (AEHF) at a maximum data rate of 8.192 Mbps.

## Foreign Counterpart

A memorandum of understanding (MOU) was signed with Canada, the United Kingdom, and the Netherlands for cooperation and participation in the development, production, and operational and support phase of the AEHF satellite program.

## Foreign Military Sales

None

## Program Status

- **3QFY03-2QFY04** 35 terminals fielded to Army, Marines, Department of Defense (DoD), and special users.
- **3QFY03-2QFY04** Support up to 55 milestone decision review (MDR) terminals in Southwest Asia (SWA); positive feedback received.
- **4QFY03** AEHF critical design review (CDR) (less info assurance requirements).
- **1QFY04** Full materiel release.
- **2QFY04** Full-rate production contract option award. As of 30 Sep 03, 210 procured/141 fielded.

## Projected Activities

- **3QFY04** AEHF info assurance CDR.
- **3QFY04-2QFY05** 78 terminals fielded to Army, Marines, DoD, and special users.
- **3QFY04-2QFY05** Continue AEHF development awarded Mar 01.
- **3QFY04-2QFY05** Continue to support MDR terminals in SWA.
- **2QFY06** Award AEHF production contract.

## Contractors

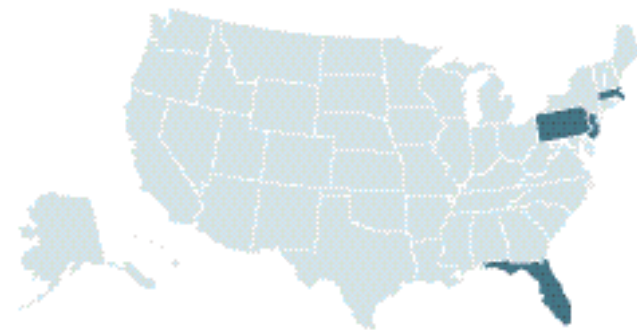
**AEHF Development:** Raytheon (Marlborough, MA)

**Production:** Raytheon (Largo, FL)

**Engineering Support:** Lincoln Labs (Lexington, MA)

**Hardware:** Sechan Electronics (Lititz, PA)

**Admin/Tech:** British Aerospace Engineering (BAE) Systems (W. Long Branch, NJ)







## Mission

Provide critical air surveillance of maneuver and geo-political areas; automatically detect, track, classify, identify, and report targets (cruise missiles, unmanned aerial vehicles [UAV], rotary and fixed-wing aircraft) to air defense weapons systems and battlefield commanders.

## Description and Specifications

The Sentinel is used with the Army's Forward Area Air Defense Command and Control (FAAD C2) system and provides key target data to Stinger-based weapon systems and battlefield commanders via FAAD C2 or directly, using enhanced position location reporting system (EPLRS) or the Single Channel Ground and Airborne Radio System (SINCGARS).

Sentinel consists of the M1097A1 High Mobility Multipurpose Wheeled Vehicle (HMMWV), the antenna transceiver group (ATG) mounted on a high mobility trailer, identification friend-or-foe (IFF) system, and FAAD C2 interface. The sensor is an advanced three-dimensional battlefield X-band air defense phased-array radar with an acquisition range of 40 km.

Sentinel can operate day and night, in adverse weather conditions, and in battlefield environments of dust, smoke, aerosols, and enemy countermeasures. It provides 360-degree azimuth coverage for acquisition and tracking and moves at speeds supersonic to hovering and positions from the nap of the earth to the maximum engagement altitude of short-range air defense weapons. Sentinel acquires targets before they can engage, improving air defense weapon reaction time and allowing engagement at optimum ranges. Sentinel's integrated IFF reduces the potential for fratricide of friendly aircraft.

Sentinel modernization efforts fund enhanced target range and classification (ETRAC) upgrades to engage non line-of-sight targets; increase the detection and acquisition range of cruise missiles, UAVs as well as fixed/rotary wing targets; enhance friendly force situational awareness; and classify cruise missiles and UAVs.

Sentinel has been critical in providing mobile air surveillance of the National Capital Region (NCR) and other areas as a part of ongoing homeland defense efforts.

## Foreign Counterpart

Italy: Contraves LPD-20; Switzerland: Skyguard Improved; Russia: Hot Shot 2S6; Germany: Siemens DR-641; France: Rodeo, RA-20S and El Dorado

## Foreign Military Sales

Egypt, Lithuania, Turkey

## Program Status

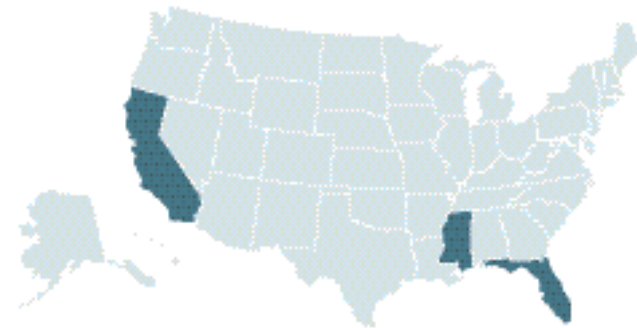
- **3QFY02** Complete Florida National Guard fielding (2-265 ADA).
- **3QFY02** Fielding 2nd LCR.
- **4QFY02** Award ETRAC Phase 1B production contract.
- **1QFY03** Contractor delivery system logistic and maintenance support contract.
- **1QFY03** Completed last Sentinel fielding to South Carolina National Guard Battalion (2-265 ADA).
- **2QFY03** Established homeland defense mission at NCR and other locations.
- **2QFY03** Completed New Mexico National Guard – 4 radars (4-200 ADA).
- **2QFY03** Established daily call to units within AOR.
- **3QFY03** Awarded ETRAC production contract.
- **4QFY03** ETRAC production contract was awarded on July 23, 2003. It was definitized on January 15, 2004

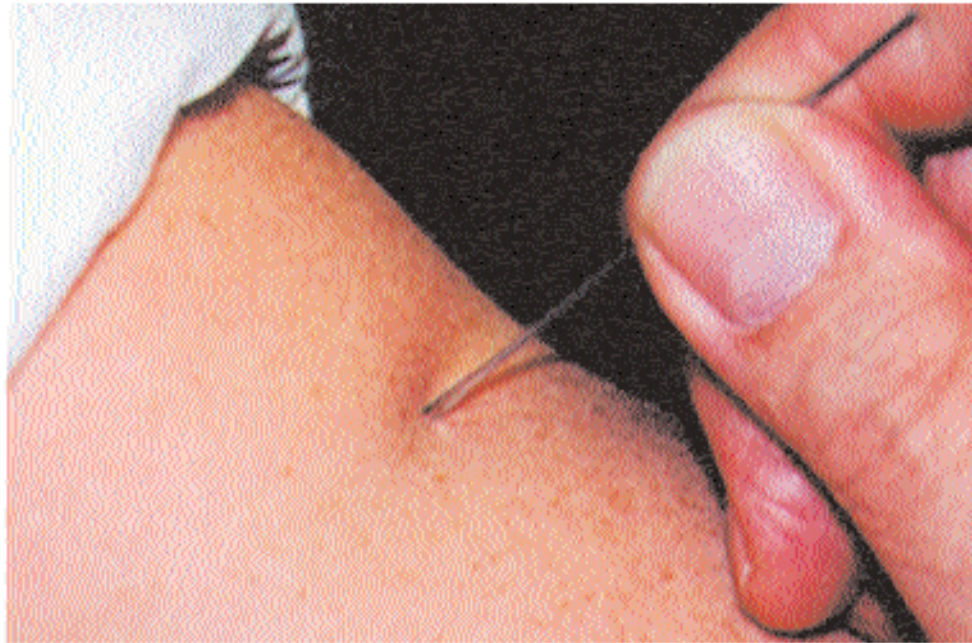
## Projected Activities

- **4QFY04** First ETRAC upgrade available for training.
- **2QFY05** First unit equipped at Ft Hood, TX, with 6 ETRAC systems.
- Army Procurement Objective: 140 ETRAC upgrades.

## Contractors

Thales Raytheon Systems (El Segundo, CA; Forest, MS; Largo, FL)





## Mission

Protect and enhance the warfighter's capability to operate in a biological warfare environment through the development, testing, licensure, production, and storage of vaccinia virus (smallpox) vaccine.

## Description and Specifications

A limited supply of Wyeth smallpox vaccine has been relicensed. Wyeth will not manufacture any additional vaccine. No other licensed product exists for the protection of smallpox. Immunization of US forces will protect each soldier against smallpox exposure thereby allowing commanders to continue operations in a biological warfare environment.

To achieve total immunization protection requires "one shot" using a special bifurcated needle.

Two smallpox vaccine programs are currently in development and not yet licensed: Acambis (Department of Health Services [DHS]-sponsored) and Dynport Vaccine Company (DVC) (DoD-sponsored). Vaccinia Immune Globulin (VIG), which is required to treat adverse reactions to the smallpox vaccine, is also being developed in conjunction with the DHS and DoD efforts.

## Foreign Counterpart

Collaborating with Canada under a DoD/Department of National Defence of Canada Project Arrangement.

## Foreign Military Sales

None

## Program Status

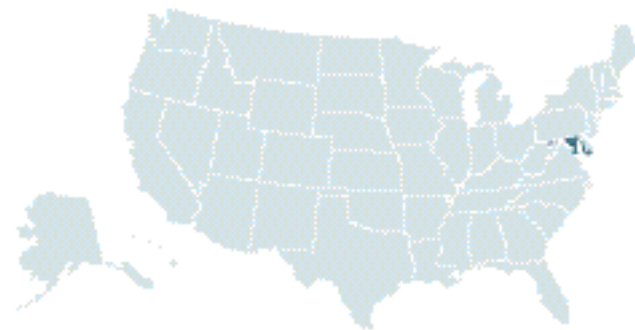
- **Current** DoD smallpox vaccine development is terminating due to lack of funding. DoD will procure licensed vaccine when available.

## Projected Activities

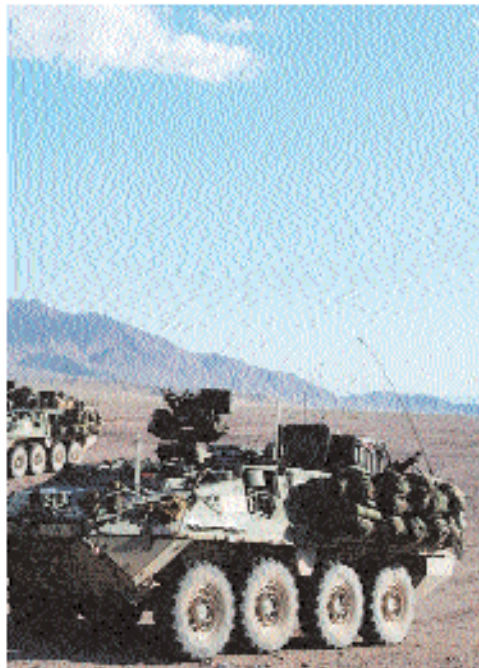
- The only activities planned are those needed for program termination.
- **FY04** VIG component of the DoD program will continue with a Biologics License Application submission.

## Contractors

DVC (Frederick, MD)









## Mission

Provide the primary combat and combat support platform of the Stryker Brigade Combat Teams (SBCT) to enable a strategically deployable (C-17/C-5) and operationally deployable (C-130) brigade capable of rapid movement anywhere on the globe in a combat-ready configuration.

## Description and Specifications

Stryker supports the Army vision and transformation and fulfills an immediate requirement with equipment that is highly deployable, lethal, survivable, mobile, and reliable.

The Stryker is a family of eight-wheeled vehicles powered by a 350hp diesel engine. It incorporates a central tire inflation system, run-flat tires, and a vehicle height management system. Stryker consists of two variants: the infantry carrier vehicle (ICV) and the mobile gun system (MGS). The ICV is a troop transport vehicle capable of carrying nine infantry soldiers, their equipment, and a crew of two consisting of a driver and vehicle commander. The MGS is designed to support infantry. It incorporates a 105mm turreted gun and autoloader system designed to defeat bunkers and breach double-reinforced concrete walls. There are eight other configurations based on the ICV that provide combat and combat support capabilities. These are the reconnaissance vehicle (RV), mortar carrier (MC), commander's vehicle (CV), fire support vehicle (FSV), engineer squad vehicle (ESV), medical evacuation vehicle (MEV), anti-tank guided missile vehicle (ATGM), and Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV).

The ICV family (other than the MEV, ATGM, FSV, and RV) is armed with a remote weapons station that supports an M2 .50 caliber machine gun or MK19 automatic grenade launcher, the M6 countermeasure device (smoke grenade launcher), and an integrated thermal weapons sight. The Stryker is capable of supporting a communications suite that integrates the Single Channel Ground and Airborne Radio system (SINCGARS) radio family; Enhanced Position Location Reporting System (EPLRS); Force XXI Battle Command Brigade-and-Below (FBCB2); Global Positioning System (GPS); and high frequency and near-term digital radio systems. The Stryker provides 360 degree protection against 14.5mm armor piercing threats.

The Stryker is deployable by C-130 aircraft and combat-capable upon arrival. The Stryker is capable of self-deployment by highway and self-recovery. It has a low noise level that reduces crew fatigue and enhances survivability. It moves about the battlefield quickly and is optimized for close, complex, or urban terrain. The Stryker program leverages non-developmental items with common subsystems and components to quickly acquire and field these systems. Where appropriate, Strykers will integrate existing government furnished materiel subsystems.

The Stryker family of vehicles stresses performance and commonality that reduces the logistics footprint and minimizes sustainment costs.

Each SBCT requires 330 Stryker variants. The current program acquires more than 2,000 Strykers to field six SBCTs, one of which will be configured as a cavalry regiment.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

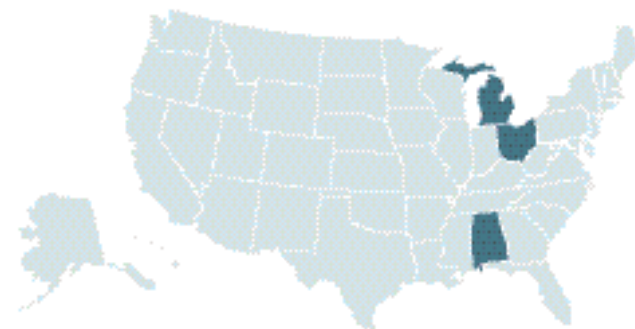
- **2QFY03** First unit equipped.
- **1QFY04** Initial operational test and evaluation complete.
- **1QFY04** Initial operational capability (IOC) first SBCT.
- **2QFY04** Full-rate production decision.
- **2QFY04** IOC second SBCT.

## Projected Activities

- **4QFY04** MGS and NBCRV low-rate initial production.
- **CY05** The MGS and NBCRV are in development and will be delivered beginning in CY05. Development, testing, and fielding will proceed concurrently in order to minimize fielding time lines.

## Contractors

General Dynamics Land Systems (Sterling Heights, MI; Lima, OH; Anniston, AL; London, Ontario)



## Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM)





## Mission

Provides networked Air and Missile Defense (AMD) optimized for cruise missile defense, pooled at the unit of employment (UE) and task organized to the unit of action (UA) to protect the maneuver force and geo-political assets from aerial threats.

## Description and Specifications

Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM) is a net-centric weapon system consisting of a Launcher on an Army Common Platform (HMMWV), four service Advanced Medium Range Air-to-Air Missiles (AMRAAM), an organic sensor (Sentinel ETRAC Radar), other joint external sensors (PATRIOT, AWACS, etc), and Integrated Fire Control Stations (IFCS) providing battle management command, control, communications, computers, and intelligence (BMC4I) for air and missile defense forces supporting the UA/UE maneuver forces and homeland defense (HLD). SLAMRAAM system will be fully integrated and compatible with existing Army AMD (Patriot, SHORAD) and the Future Combat Systems (FCS) networks.

SLAMRAAM is a highly mobile and transportable system consisting of a slew-able launcher that supports 360° engagement capability. Command and control of the SLAMRAAM system is supplied by the IFCS, which provides integrated BMC4I and Force XXI Battle Command Brigade-and-Below (FBCB2) capability for ground and air operational and situational awareness. SLAMRAAM provides a critical beyond line-of-sight (BLOS) and non-line-of-sight (NLOS) overmatch capability against rapidly evolving air threats against UA/UE and HLD to defeat cruise missiles (CM), aerial reconnaissance, surveillance, and target acquisition (RSTA) unmanned aerial vehicles (UAV), unmanned combat aerial vehicles (UCAVs), rotary-wing (RW), and fixed-wing (FW) aircraft. SLAMRAAM is a robust, day or night, adverse weather system, and is extremely effective against low radar cross-section targets in high clutter environments.

The platform stores, transports, loads, aims, launches, provides in-flight updates, and reloads multiple AMRAAMs. Primary means of engaging targets is via centralized fire control orders from an IFCS (battalion, battery, or platoon) using integrated fire control networks. However, in periods of degraded operations, targets can be engaged at the launcher (decentralized) using a remote fire control console. SLAMRAAM communications consist of digital data and voice radio frequency (RF) connectivity with its parent platoon/battery command post, the Sentinel/sensor command and control (C2) node and FBCB2, as well as connectivity with global positioning system (GPS) to obtain positioning data.

## Foreign Counterpart

Norwegian NASAM

## Foreign Military Sales

None

## Program Status

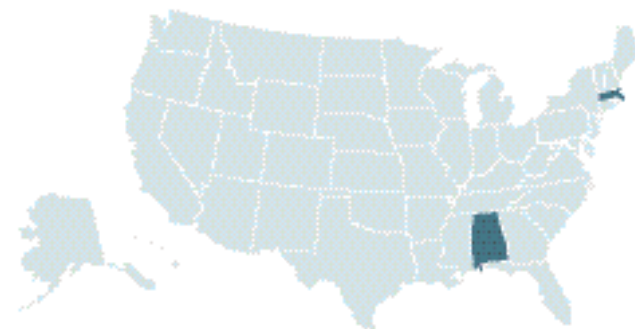
- **June 5, 2002** SLAMRAAM operational requirements document recommended for validation by Army Requirements Oversight Council.
- **April 9, 2003** SLAMRAAM validated by Headquarters, Department of the Army.
- **September 16, 2003** Milestone B approved by the Army Acquisition Executive.

## Projected Activities

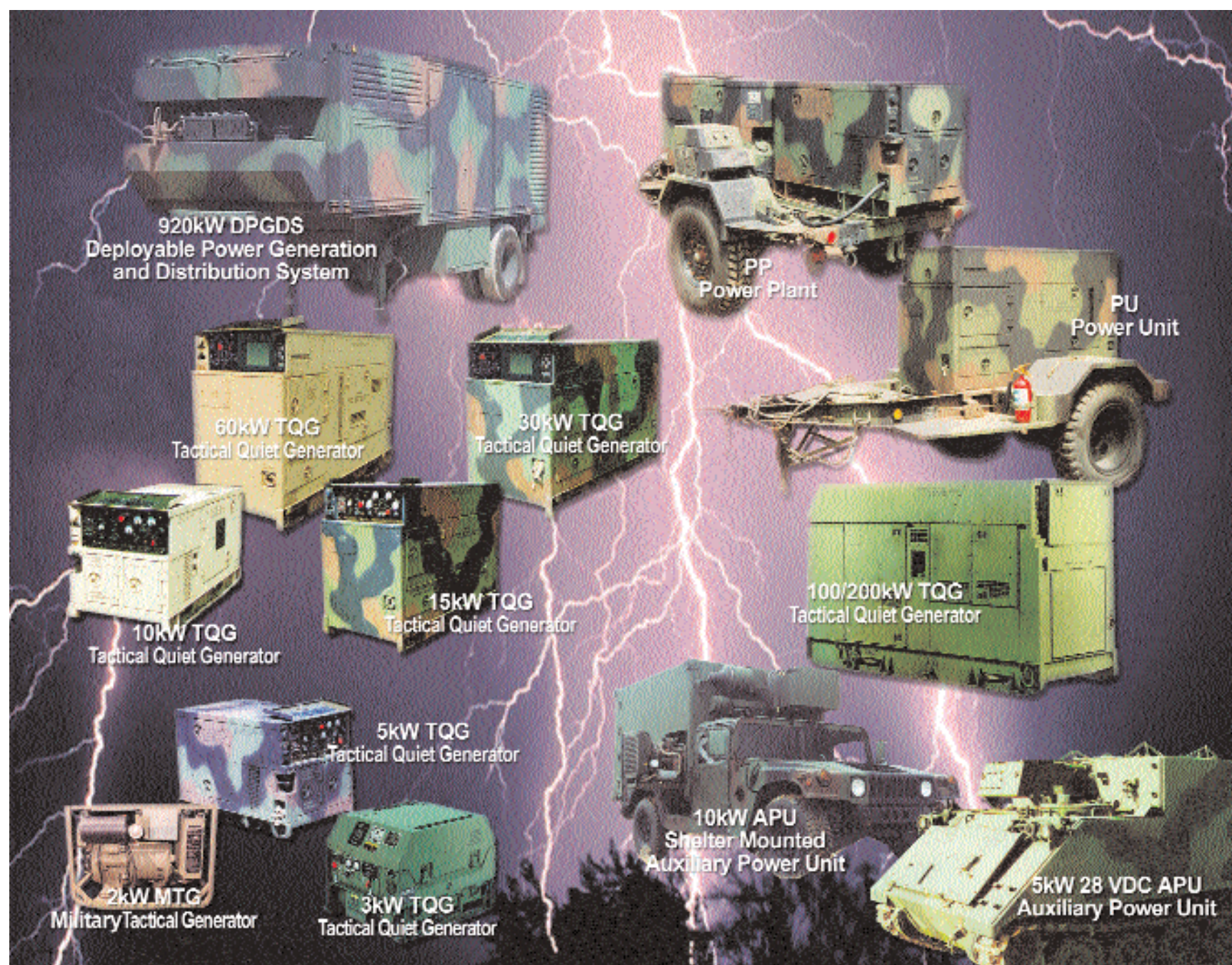
- **2QFY04** Contract award expected.
- **4QFY07** Milestone C.
- **4QFY08** Initial operational capability.

## Contractors

**Projected:** Raytheon (Tewksbury, MA); Boeing (Huntsville, AL)









## Mission

Provide a modernized standard family of mobile electric power sources for all services in accordance with Department of Defense Directive (DoDD) 4120.11, through a coordinated inter-service effort to develop, acquire, and support mobile electric power sources from small, 0.5kW man-portable generators to large, 920kW prime power generating systems.

## Description and Specifications

The Tactical Electric Power (TEP) program, consists of small, medium, and large power sources; power units and power plants (PU/PP); and auxiliary power units (APU). It provides the DoD with "single fuel" (diesel/JF-8) electrical generator systems that are much better than older fielded systems. The power units:

- Are more reliable (500 - 600 hours mean time before failure)
- Reduce weight/cube for enhanced mobility/transportability
- Reduce infrared (IR) signature and noise (to 70 dBA @ 7 m)
- Are survivable in chemical, biological, and nuclear environments
- Provide quality electric power for command posts, command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems; weapon systems; logistics and maintenance functions; medical and base support activities; and other battlefield support equipment.
- Comply with Environmental Protection Agency guidelines.

## Foreign Counterpart

No known foreign counterpart meets Army requirements. However, the 2kW MTG was originally manufactured in Canada and bought by the Canadian Ministry of Defense. It is now adapted by DoD.

## Foreign Military Sales

Tactical quiet generators (TQGs) have been purchased by: Bahrain, Brunei, Canada, Colombia, Egypt, Greece, Honduras, Israel, Korea, Kuwait, Portugal, Spain, Saudi Arabia, Taiwan, Thailand, Tunisia, Turkey, United Arab Emirates, and New Zealand.

## Program Status

- **FY02** The 920kW Deployable Power Generation and Distribution System (DPGDS) has entered production and fielding.
- **Current** The 2kW MTG, 3kW, 5kW, 10kW, 15kW, 30kW, and 60kW TQGs are in production and fielding is on-going.
- **Current** Assembly of PU/PP (trailer mounted generator sets) and procurement of 5kW 28 Volt DC and 10kW shelter mounted APUs.

## Projected Activities

- **3QFY04** Milestone C is scheduled for 100kW TQG and 200kW TQG with production award following.
- **2QFY04** Request for proposal (RFP) for Advanced Medium Mobile Power Sources (AMMPS) program, the next generation Tactical Electric Power Sources, is scheduled for release.
- **FY08** AMMPS production scheduled to begin.

## Contractors

**3kW, 5kW, 10kW, 15kW, 100kW and 200kW TQG:** Fermont (Bridgeport, CT)

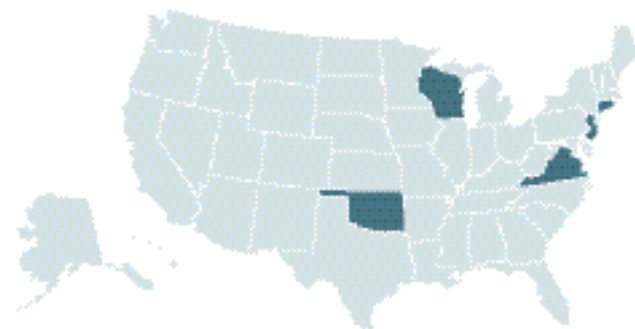
**30kW, 60kW TQG:** MCII (Tulsa, OK)

**DPGDS:** Radian (Alexandria, VA)

**2kW MTG:** Dewey Electronics (Oakland, NJ)

**Trailers for Power Units and Power Plants:** Phoenix Coaters LLC (Berlin, WI)

**Support/Engineer Contractor:** MTC Technologies (Springfield, VA)





## Tactical Fire Fighting Truck (TFFT)



## Mission

Provide the Tactical Fire Fighting Team with aircraft and vehicle rescue capability; limited capacity for structural fires, hazardous materiel (POL/ammo storage areas) and wild fires; and a dramatic improvement over existing military adaptation of commercial item (MACI) firetrucks.

## Description and Specifications

The M1142, Tactical Fire fighting Truck (TFFT) is a part of the tactical fire fighting team concept which consists of: one M1142 TFFT, one M1120 HEMTT-Load Handling System (LHS), one M1076 Palletized Load System (PLS) Trailer, and two 1,750-gallon XM-9 Engineer Mission Module - Water Distributors. TFFT can carry an entire tactical fire fighting team, a 1,000-gallon on-board water tank, and has all-wheel drive. Other features include:

- Accommodates the six person tactical fire fighting team
- Roof and bumper turrets
- Class A and B aqueous film forming foam (AFFF) tanks
- C-17 transportability
- Far greater mobility than that of currently fielded MACI firetrucks through the use of the Heavy Expanded Mobility Tactical Truck (HEMTT) chassis
- Common HEMTT chassis
- Capable of performing multiple missions with one vehicle.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

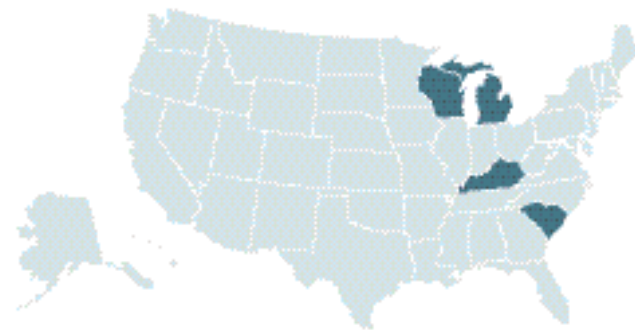
- **February 1, 2003** Production contract awarded.

## Projected Activities

- **March 2004** Materiel release and first unit equipped.

## Contractors

Pierce Manufacturing (Appleton, WI); Oshkosh Truck (Oshkosh, WI); Michelin (Greenville, SC); Detroit Diesel (Detroit, MI); Dana Corporation (Glasgow, KY)





## Tactical Operations Center (TOC)





## Mission

Provide Standard Mobile Command Posts for warfighters from battalion to echelons above corps with a fully integrated and digitized physical infrastructure to execute battle command and achieve information dominance.

## Description and Specifications

The Tactical Operations Center (TOC) program integrates Army Battle Command Systems (ABCS), communications equipment, intercoms, and local area networks into standard Army platforms (vehicles and shelters) and tents. Based on the new Standard Integrated Command Post System Operational Requirements Document, a new family of shelters, kits, tents and trailer-mounted support systems will be developed and fielded to future units. TOCs are digitized, tactically mobile, and fully integrated. Military off-the-shelf, non-developmental items, commercial off-the-shelf, and emerging technologies are incorporated into TOCs in accordance with Department of the Army approved system architectures. The TOCs program also provides the commander and his staff with a digitized command information center, where information is exchanged, displayed, and fused, and where courses of action become orders.

TOCs are interoperable across all Army mission areas and joint/allied command and control nodes, and provide a common operational picture to the warfighter. TOCs are also modular and provide a “jump,” or split-based, operations capability. Operations are revolutionized through a combination of state-of-the-art data processing, communications, and information transport methods, using the Tactical Internet and the latest networking capabilities. Information dominance is achieved through the orderly evolution of capabilities demonstrated during advanced warfighting experiments. These include collaborative planning, improved large screen displays, new data radios, and the Tactical Internet.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **2QFY97** Established TOC program.
- **1QFY01** Completed fielding of digitized TOCs to the 4th Infantry Division (ID).
- **3QFY01** Completed fielding of shelter of the early entry mobility module for Third U.S. Army.
- **3QFY01** Completed fielding of digitized TOCs to Stryker Brigade Combat Team (SBCT) -1.
- **FY02** Completed fielding of the early entry mobility module and Lucky Theater Army Command for Third US Army.
- **FY02** Completed fielding of digitized TOCs to SBCT-2.
- **1QFY03** Completed training and handover of all TOCs to SBCT-2.
- **1QFY04** Completed fielding of digitized TOCs to 1st Cavalry Division (1CD).

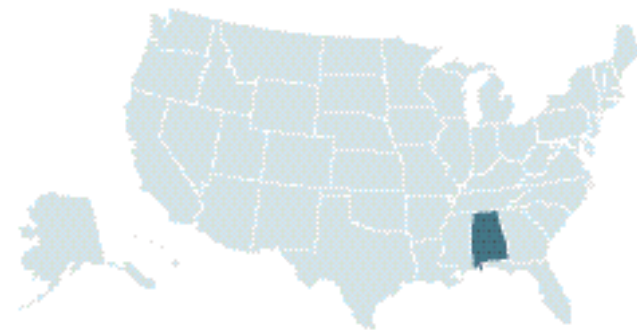
## Projected Activities

- **FY03** Complete fielding of digitized TOCs to SBCT-3.
- **FY04-06** Complete fielding to 3rd Brigade, 4ID, 3rd Armored Cavalry Regiment, and 4th, 5th, and 6th SBCTs.
- **FY07-12** Field Command Post platform-based command posts to remainder of Army.

## Contractors

**Hardware Integration:** General Dynamics (Huntsville, AL)

**Hardware Design and Support:** Northrop Grumman (Huntsville, AL)



## Tactical Unmanned Aerial Vehicle (TUAV)





## Mission

Provide commanders enhanced tactical reconnaissance, surveillance, target acquisition (RSTA), and battle damage assessment (BDA) in support of tactical maneuver commanders.

## Description and Specifications

The Commander of the 4th Infantry Division in Iraq requested more Shadow Tactical Unmanned Aerial Vehicles (TUAV) in a letter to Headquarters, Department of the Army in November 2003, noting that:

- Shadow 200 is a winner that provides critical intelligence to prosecute the fight.
- Minimizes casualties by reducing the need to have “a man in the loop” or to send manned aircraft into vulnerable areas to collect information.
- Supports Operation Iraqi Freedom (OIF) Brigade Combat Team (BCT) commanders in locating, identifying, and defeating high value targets in their area of operations.
- OIF Shadow TUAV units are flexible, durable, and have been used to support tactical raids down to the company-level.
- Enhances force protection and mitigates potential terrorist strikes against coalition forces.

The RQ-7A TUAV has a wingspan of 13 ft and a payload capacity of approximately 60 lb. Gross takeoff weight is just over 300 lb and endurance is more than four hours on-station at a distance of 50 km. The system is compatible with the All Source Analysis System, Advanced Field Artillery Tactical Data System, Joint Surveillance Target Attack Radar System Common Ground Station, Joint Technical Architecture-Army, and the Defense Information Infrastructure Common Operating Environment. The system ground control station (GCS) is also the only joint certified GCS in DoD. The RQ-7A TUAV system can be transported by three C-130 transports.

The RQ-7A TUAV system configuration, fielded in platoon sets, consists of:

- Four air vehicles with electro-optic/infrared imaging payloads
- Two GCS shelters mounted on High Mobility Multipurpose Wheeled Vehicles (HMMWV) and their associated ground data terminals
- One air vehicle transport HMMWV towing a trailer-mounted hydraulic launcher
- One HMMWV with trailer for personnel and equipment transport
- One portable GCS and one portable ground data terminal.

The system (platoon) configuration includes a maintenance section multifunctional (MSM), consisting of two HMMWVs, one with mounted shelter and trailer, and one with personnel and equipment, manned by soldiers, transporting spares and providing maintenance support. In addition, a mobile maintenance facility manned by contractor personnel is located at the Divisional Military Intelligence Battalion to provide sustainment maintenance and supply support to the MSM including “off system support” and “maintenance by repair.”

The system also has an early entry configuration of 15 soldiers, 1 GCS, the air vehicle transport HMMWV, and the launcher trailer, which can be transported in 1 C-130. All components can be slung under a CH-47 or CH-53 helicopter for transport. Platoon operational tempo personnel requirement is: 12 air vehicle operators, one platoon sergeant, one platoon leader, and one UAV warrant officer. The maintenance section comprises four electronic warfare system repairs and three engine mechanics.

## Foreign Counterpart

United Kingdom: Phoenix; Israel: Searcher and Searcher II; France: Fox AT, Sweden: Ugglan. Denmark, Belgium, and the United Kingdom are developing requirements or acquiring TUAV class systems.

## Foreign Military Sales

None

## Program Status

- **3QFY02** The Army Shadow TUAV successfully completed initial operational test and evaluation (IOTE), the first UAV in DoD to accomplish this objective.
- **1QFY03** Awarded contract for nine RQ-7A (Shadow 200) TUAV systems, six attrition air vehicles, ground control and maintenance equipment, and initial spares.
- **3Q and 4QFY03** Fieldings include: 1st Cavalry Division and 2d Infantry Division.
- **FY04** Twelve systems on the fielding schedule, with priority to OIF-bound units.
- **FY03-Nov '03** Shadow has flown more than 750 sorties and more than 3,000 hours in support of the OIF ground forces.
- **Current** Fielding aggressively. A major acquisition success story, TUAV went from Milestone B to full-rate production decision in just 33 months and is the only DoD UAV to pass IOTE. Four systems are now supporting ground forces in OIF.

## Projected Activities

- Continue fielding for a total of 41 systems, including 1st ID, 1st Cav, 82d Airborne. Twelve total systems in FY04.
- Continue soldier training at Ft Huachuca, AZ.

## Contractors

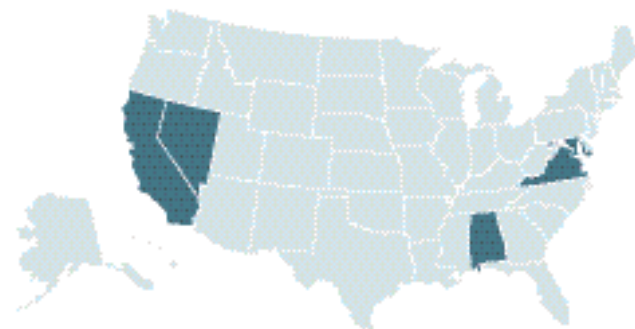
**Air Vehicle/Ground Data Terminal:** AAI Corporation (Hunt Valley, MD)

**GCS, Portable GCS:** CMI (Huntsville, AL)

**Auto-land System:** Sierra Nevada Corp (Sparks, NV)

**Ground Data Terminal Pedestal:** Tecom (Chatsworth, CA)

**Training and Tech Manuals:** DPA (Arlington, VA)





## Tactical Water Purification System (TWPS)



## Mission

Provide mobile, tactical water purification capable of purifying a broad range of water sources to meet water support requirements within the division support area.

## Description and Specifications

The 1,500-gallon per hour (GPH) Tactical Water Purification System (TWPS) utilizes the latest state-of-the-art reverse osmosis technology to produce 1,500-GPH of potable water from any water source including salt water and nuclear, biological, and chemical (NBC) contaminated sources. This system will replace older 600-GPH reverse osmosis water purification units (ROWPU) on a one-for-two basis. TWPS includes a pretreatment system, chemical injection, high-pressure pump, reverse osmosis elements, control panel, valves, piping, cold weather protection, wastewater collection, five 3,000-gallon onion tanks, and ocean intake system. In addition, it includes distribution equipment to fill canteens or 20-liter water cans.

The Army's configuration is mounted on a Load Handling System (LHS) compatible flat rack, while the Marine Corps version is skid mounted. The system is set up by three people and operated by one. Either TWPS platform can be efficiently transported by any of the following: truck, train, marine vessel, or fixed-wing aircraft. Since each TWPS replaces two 600-GPH ROWPU, employment of the TWPS will reduce operator manpower requirements at each water point by 25 percent, providing substantial reductions in the combat service support footprint.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

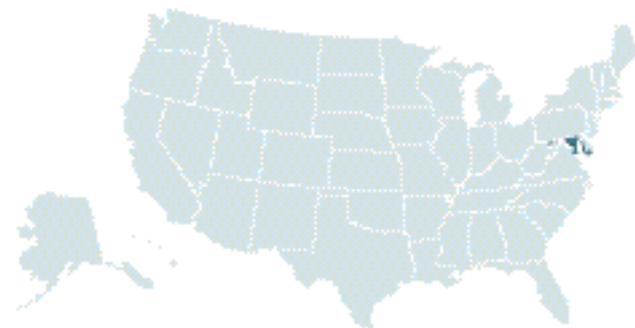
- **2QFY04** Full-rate production decision.

## Projected Activities

- **Current-FY07** Production and fielding.
- **4QFY04** First unit equipped Stryker Brigade Combat Team.

## Contractors

SFA Frederick Manufacturing (Frederick, MD)





## Tank Ammunition





## Mission

Provide direct-fire tank ammunition for use in ground combat weapons platforms and Mounted Combat System variant of the Future Combat System (FCS) of Systems.

## Description and Specifications

The 120mm family of tank ammunition consists of two primary types of ammunition: kinetic energy (KE) ammunition and multipurpose ammunition. KE ammunition lethality is optimized by firing a maximum-weight projectile at the greatest velocity possible. The 120mm-series of KE ammunition (M829A1/A2/E3) uses depleted uranium penetrators of increased mass and length, lighter sabots, and more energetic propellants.

Multipurpose ammunition uses a high explosive (HE), shaped-charge warhead to provide blast, armor penetration, and fragmentation effects. The M830A1 multi-purpose, anti-tank (MPAT) cartridge's sub-caliber, discarding-sabot projectile gives it a higher velocity, decreased drag, and increased accuracy over the M830 cartridge. Its fuze includes a selectable proximity sensor to provide an anti-helicopter capability. The XM908 HE obstacle-reduction cartridge reduces concrete buildings, bunkers, and light armor. It is identical to the M830A1 except that the fuze and proximity sensor are replaced with a steel nose. Fielding for the XM908 has been limited to US forces in Korea.

The shotgun shell-like XM1028 canister cartridge will provide the Abrams tank with effective, rapid, lethal fire against massed assaulting infantry.

For FCS, smart, precision munitions will enable precision strikes against high-value targets at extended ranges. The medium range munition (MRM), whether 120mm or 105mm, will expand the FCS engagement zone beyond 8 km.

To support the Stryker Force, 105mm Mobile Gun System (MGS) ammunition comprises new HE and canister cartridges. HE ammunition (M393A3) will destroy hardened enemy bunkers, machine gun, and sniper positions, and create openings in walls through which infantry can pass. Canister (XM1040) ammunition will provide rapid, lethal fire against massed assaulting infantry at close range. The Army has serviceable stocks of 105mm KE, M900 cartridges that will provide MGS with the capability to destroy a variety of armored vehicles through the T-62 tank in a self-defense role; a high explosive, anti-tank (HEAT), M456 cartridge provides a capability against a multitude of thin-skinned targets, infantry fighting vehicles, and light tanks.

## Foreign Counterpart

NATO tanks employ KE, MPAT, and HEAT ammunition, but only France and the United Kingdom use depleted uranium KE penetrators. NATO countries use tank ammunition with composite sabots or proximity switches.

## Foreign Military Sales

M829: Kuwait, Saudi Arabia; M830: Kuwait, Egypt; KE-W/A1 and KE-W/A2: Egypt

## Program Status

- **FY03** M829A2, M830A1 and M908: Fielded. M829A3 entered full-rate production.
- **FY04** Low-rate production begins for 120mm XM1002 MPAT Trainer and the XM1028 and XM1040 canister cartridges.

## Projected Activities

- **FY04** Materiel release for M829A3. Transition to production for XM1028, XM1040, and XM1002. Full rate production for M939A3 and M467A1.
- **3QFY04** Milestone B decision and begin system development and demonstration for MRM.

## Contractors

**XM1002 and XM1040:** Alliant Techsystems (New Brighton, MN)

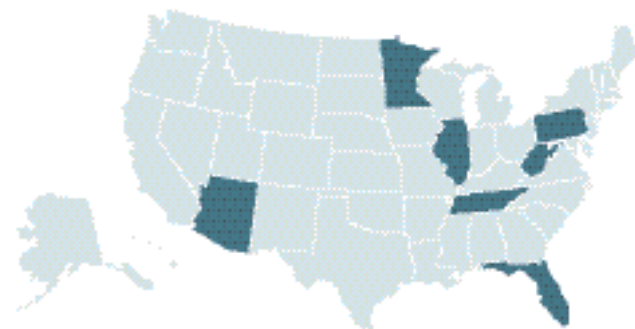
**XM908 and XM1028:** General Dynamics-Ordnance and Tactical Systems (St. Petersburg, FL; East Alton, IL)

**M829A3:** Alliant Techsystems (Hopkins, MN; Rocket City, WV); AOT (Johnson City, TN)

**MRM-KE:** Alliant Techsystems (Clearwater, FL)

**MRM-CE:** Raytheon (Tucson, AZ)

**M393A3 and M467A1:** L3 (Lancaster, PA)





## Theater Support Vessel (TSV)





## Mission

Provide high-speed intra-theater transport of troops and cargo.

## Description and Specifications

The Theater Support Vessel (TSV) represents the next-generation Army watercraft to support the Army's doctrinal intra-theater lift mission. Utilizing commercial technology, it will self-deploy to the theater of operations at speeds greater than 40 knots through sea state 5+ (winds of 21 knots or greater), while capable of transporting more than 350 soldiers plus gear and up to 1,250 short tons of cargo. Capable of operational maneuver from standoff distances and into five times as many ports, the TSV will provide rapid, intra-theater lift for ready-to-fight combat forces together with their equipment. As a result, TSV will minimize the need for large-scale reception, staging, onward movement, and integration of soldiers, vehicles, and equipment within the battlespace. It offers the joint force commander a multi-modal and multi-purpose platform to support joint operations that complements C-17 and C-130 airlift capabilities. The vessel will have the following additional features:

- En route mission planning and rehearsal
- Joint interoperable, command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR)
- Movement tracking system
- Electronic navigation
- Integrated materiel handling.

## Foreign Counterpart

Royal Australian Navy - HMAS Jervis Bay.

## Foreign Military Sales

None

## Program Status

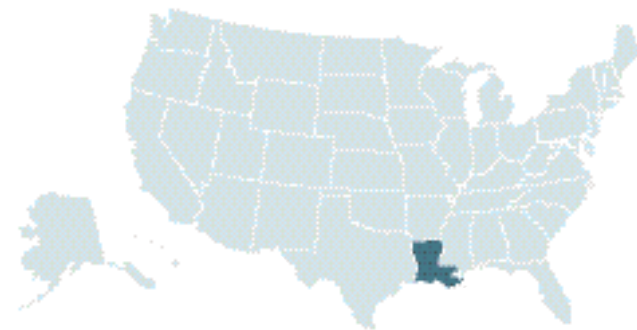
- **Current** Advanced Concept Technology Demonstrator (ACTD) program continues for both HSV-X1 Joint Venture and TSV-1X, Spearhead.
- **Current** TSV-1X continues to support Operations Iraqi and Enduring Freedom. HSV-X1 supports PACOM area of responsibility.

## Projected Activities

- **Prior to FY06** Complete ACTD program.

## Contractors

Bollinger/Incat USA (Lockport, LA)





## Thermal Weapon Sight



## Mission

Enable combat forces to acquire and engage targets with small arms, command, and control at squad leader level under day, night, obscurants, no-light, and adverse weather conditions.

## Description and Specifications

**AN/PAS-13(V)1 Light Thermal Weapon Sight (LTWS):** The LTWS is a silent, lightweight, compact, durable, battery-powered thermal sight with a recognition range of 550 m. The primary battery is a set of eight, non-rechargeable 1.5-Volt AA lithium batteries. The training battery is a set of eight rechargeable 1.2-Volt AA nickel metal hydride batteries. The LTWS is used on the M16/M4 series rifles and carbines as well as the M136 Light Anti-Armor Weapon. The LTWS weighs 2.7 lb (with batteries) and has a 15 degree field of view.

**AN/PAS-13(V)2 Medium Thermal Weapon Sight (MTWS):** The MTWS is a silent, lightweight, compact, durable, battery powered thermal sight with a recognition range of 1,100 m. The primary battery is non-rechargeable 6-Volt BA-5347/U. The training battery is the rechargeable 6-Volt BB-2847A/U. The MTWS is used on the M16/M4 series rifles and carbines as well as the M249 and M240 series medium machineguns. The MTWS weighs 5.0 lb (with battery) and has a 6/18 degree dual field of view.

**AN/PAS-13(V)3 Heavy Thermal Weapon Sight (HTWS):** The HTWS is a silent, lightweight, compact, durable, battery powered thermal sight with a recognition range of 2,200 meters. The primary battery is non-rechargeable 6-Volt BA-5347/U. The training battery is the rechargeable 6-Volt BB-2847A/U. The HTWS is used on the squad leader's weapon, M24 Sniper Rifle, M107, M2 HB, and MK19 machineguns. The HTWS weighs 5.3 lb (with battery) and has a 3/9 degree dual field of view.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

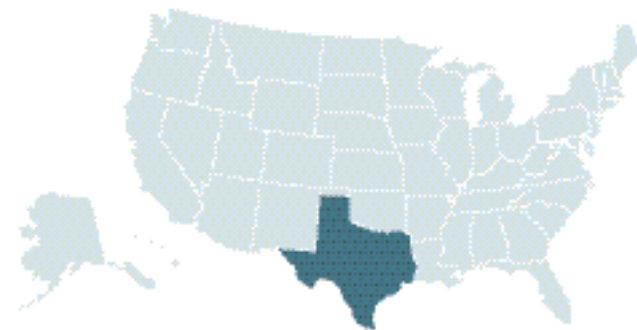
- **Current** LTWS, MTWS, and HTWS in production.

## Projected Activities

- Continue planned procurement.
- Continue fielding and new equipment training.

## Contractors

Raytheon Systems (Dallas, TX)





## Trailers



M989A1 Heavy Expanded  
Mobility Ammo Trailer



M871A3 22 Ton Semi-Trailer



M870A3 40 Ton Transporter Trailer



M872A4 34 Ton Semi-Trailer



M969A3 5K Gallon Tanker



M967A2 5K Gallon Tanker



M1101/M1102 Light Tactical Trailers



## Mission

Carry cargo such as ammunition, fuel, wheeled and tracked vehicles, materiel handling equipment, engineer/construction equipment, and containers for various missions.

## Description and Specifications

The trailer program consists of the following programs:

- M1101/M1102 Light Tactical Trailers (LTT) are the companion trailers for the High Mobility Multipurpose Wheeled Vehicle (HMMWV).
- M989A1 Heavy Expanded Mobility Ammo Trailer (HEMAT) is an 11-ton, 4-wheel trailer that provides ammunition and fuel resupply for Army combat vehicles, missile systems, rotary-wing aircraft, and 55-gallon fuel bladders.
- M967A2 5K Gallon Tanker performs bulk fuel hauling. It has a four-cylinder diesel engine and a four-inch centrifugal pump.
- M969A3 5K Gallon Tanker performs automotive refueling and bulk fuel hauling. It is equipped with a self-priming pump assembly and a filter separator assembly for automotive fuel.
- M870A3 40 Ton Transporter Trailer transports engineer equipment, tracked vehicles, and containerized and bulk cargo on highways.
- M871A3 22 Ton Semi-Trailer transports 20 ft International Standard Organization (ISO) Containers.
- M872A4 34 Ton Semi-Trailer performs local/line haul of breakbulk and ISO containers.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- M967A2 5K Gallon Tanker, M969A3 5K Tanker, M870A3 Transporter Trailer, M871A3 Semi-Trailer, M872A4 Semi-Trailer currently in production.
- M989A1-Production to end 3QFY05.
- M872A4 34 Ton-Production Verification Testing (PVT) 2QFY04.
- M1101/M1102-Projected contract award in 2QFY04.

## Projected Activities

- **1QFY04-4QFY04** Continue production and fielding of trailers.

## Contractors

**M1101/M1102:** To be determined

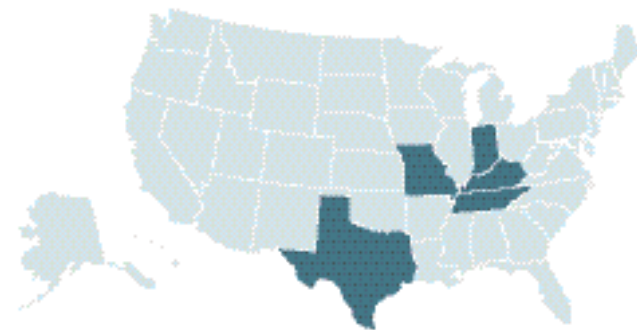
**M989A1:** Systems and Electronics Incorporated (West Plains, MO)

**M967A2/M969A3:** Heil Trailer International (Athens, TN)

**M870A3:** Kalyn Siebert, LLP (Gatesville, TX)

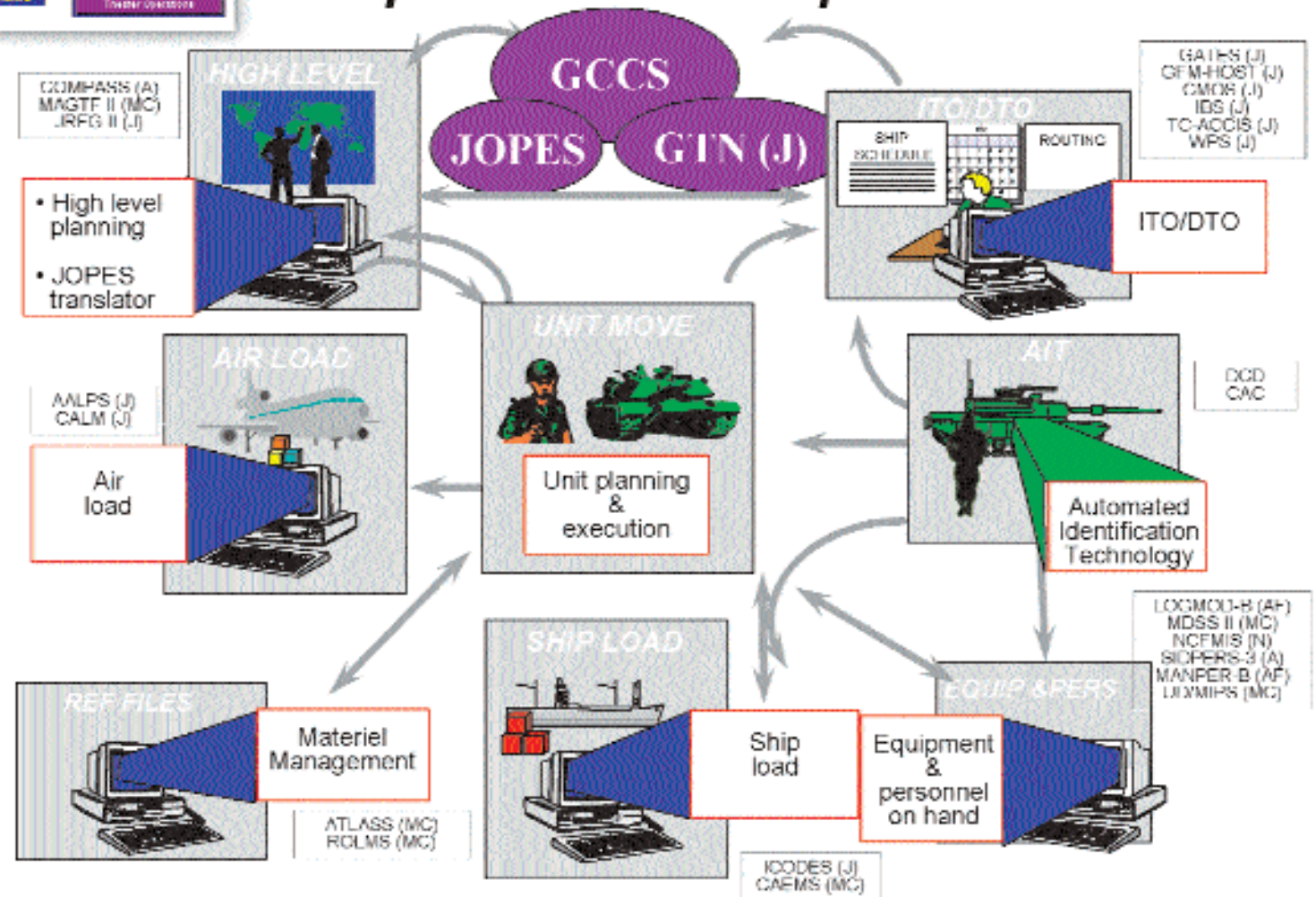
**M871A3:** Fontaine Trailer Company (Princeton, KY)

**M872A4:** Talbert Manufacturing (Rensselaer, IN)





## Required TC-AIMS II Capabilities



## Mission

Facilitate movement management of personnel, equipment, and supplies from home station to the conflict and back, while providing source in-transit visibility data.

## Description and Specifications

Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II) is a joint service migration system. Characteristics include:

- Source feeder system to joint force requirements generation (JFRG) II, joint planning and execution system (JOPES), global transportation network (GTN), and services' command and control systems
- Joint transportation system supporting chairman's 72-hour, time-phased force and deployment data initiative
- Common user interface to facilitate user training and operations
- Commercial off-the-shelf hardware architecture
- Net-centric, enterprise architecture
- Incremental, block upgrade developmental strategy
- Distributed computing application.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **1QFY03** November 4, 2002, Office of the Secretary of Defense (OSD) command, control, computers and intelligence (C3I) Milestone (MS) III fielding decision rendered for Block 1.
- **4QFY03** Complete development and testing of Block 2 in preparation for MS III fielding decision. Block 2 will provide a Web-based capability to all users.
- **2QFY04** Block 2 MS B and Block 3 MS C decision expected.
- **2QFY04** After Block 2 – 3 OSD Overarching Integrated Product Team/Information Technology Advisory Board begin fielding Block 2 to Army and Navy and proceed with development of Block 3.

## Projected Activities

- **4QFY04** Planning for Marine Corps fielding decision.

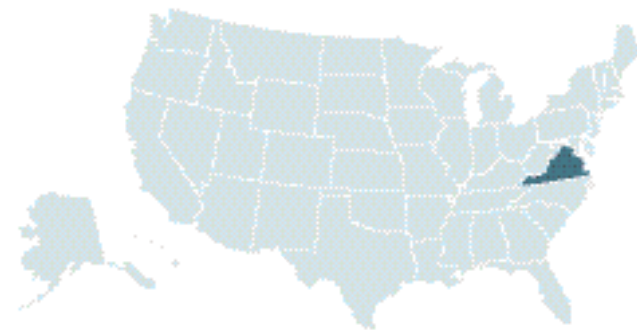
## Contractors

**System Development/Maintenance:** Computer Sciences Corporation (Falls Church, VA)

**Training:** SRA (Fairfax, VA)

**Program:** Titan Incorporated (Newington, VA)

**Facilities:** Smart Technologies (Alexandria, VA)





## Tube-Launched, Optically-Tracked, Wire-Guided Bunker Buster Missile (TOW Bunker Buster)



## Mission

Provide the Stryker Brigade Combat Team (SBCT) with a precision guided missile for urban and contingency force operations.

## Description and Specifications

The TOW (tube-launched, optically-tracked, wire-guided) Bunker Buster Missile System incorporates a newly developed warhead onto the existing, reliable TOW 2A missile airframe. The TOW BB missile provides a precision guided capability to breach eight-inch thick, double reinforced concrete walls and provides a structural overmatch against earth and timber bunkers and field fortifications.

TOW BB is a heavy, precision guided, anti-fortification, and breaching weapon system, consisting of a launcher and a missile. The gunner defines the aim point by maintaining the sight cross hairs on the target. The launcher automatically steers the missile along the line-of-sight toward the aim point via a pair of control wires, which physically link the missile and the launcher. The missile impact is at the aim point. The TOW BB has an impact sensor (crush switch) located in the main-charge glove and a pyrotechnic detonation delay to enhance warhead effectiveness.

TOW BB is optimized for performance against urban structures, earthen bunkers, field fortifications, and light skinned Armor threats. TOW BB 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. The missile is fired directly from the case. Range is 65 to 3,750 meters. The TOW BB missile weighs 45.2 lb. The missile is nominally 6 inches in diameter and 49 inches in length. Encased, the missile weighs 63.7 lb, and the diameter is 8.6 inches. The missile has a 91 percent reliability and shelf life of 17 years.

TOW BB fits all launcher and stowage racks currently in the inventory and requires no modification to the current TOW platforms to fire. TOW BB missile is fired from the Stryker Anti-Tank Guided Missile Vehicles and Bradley Fighting Vehicles.

## Foreign Counterpart

Foreign weapon systems with comparable characteristics to the TOW BB include: Russian Khrizantmea (AT-15); Kornet (AT-14); Metis-M (AT-19); and Chinese Red Arrow 8 and 9.

## Foreign Military Sales

More than 43 allied nations have purchased the TOW weapon system over its life.

## Program Status

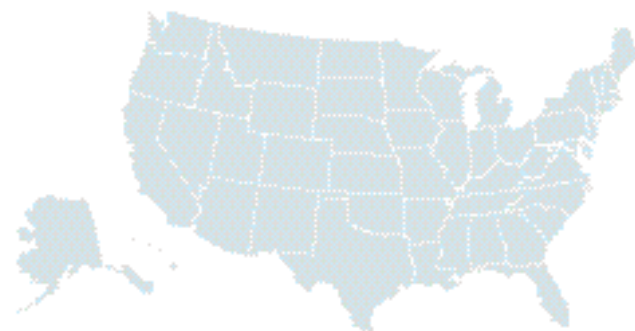
- **Aug 2003** Insensitive munitions waiver approved.
- **2QFY03** TOW BB missiles produced at Anniston Army Depot.
- **1QFY04** TOW BB missiles sent to Iraq in support of Stryker Brigade Combat Team Operations.

## Projected Activities

- Continue deployment.

## Contractors

US Army development and production.





## Unified Command Suite (UCS)





## Mission

Provide reachback communications to the National Guard Weapons of Mass Destruction – Civil Support Teams (WMD-CST) for connectivity with higher authority and technical support agencies, enabling CST commanders to assess the incident scene, advise response, and facilitate access to DoD information in support to the First Responder Incident Commander.

## Description and Specifications

The Unified Command Suite (UCS) vehicle is a self-contained, stand-alone C-130 air mobile communications platform intended to provide both voice and data communications capabilities to CST Commanders.

UCS consists of a combination of commercial off-the-shelf and existing government off-the-shelf communications equipment (both secure and non-secure data) to provide the full range of communications necessary to support the CST mission. It is the primary means of reachback communications for the Analytical Laboratory System (ALS) for the CSTs and acts as a command and control hub to provide a common operational picture for planning and executing an incident response. It provides:

- Digital voice and data over satellite network
- Non-secure Internet Protocol Router Network (NIPRNET), Secure Internet Protocol Router Network (SIPRNET)
- Radio remote and intercom with cross banding
- Over the horizon communication interoperable interface with state emergency management and other military units.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

- **Current** The Maneuver Support Center and the National Guard Bureau began preparing the requirements documents to support upgrades in Increments I and II.

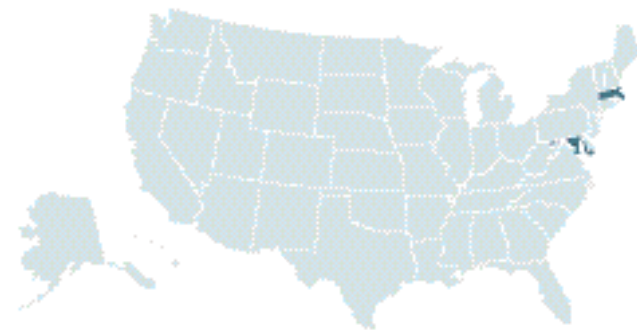
## Projected Activities

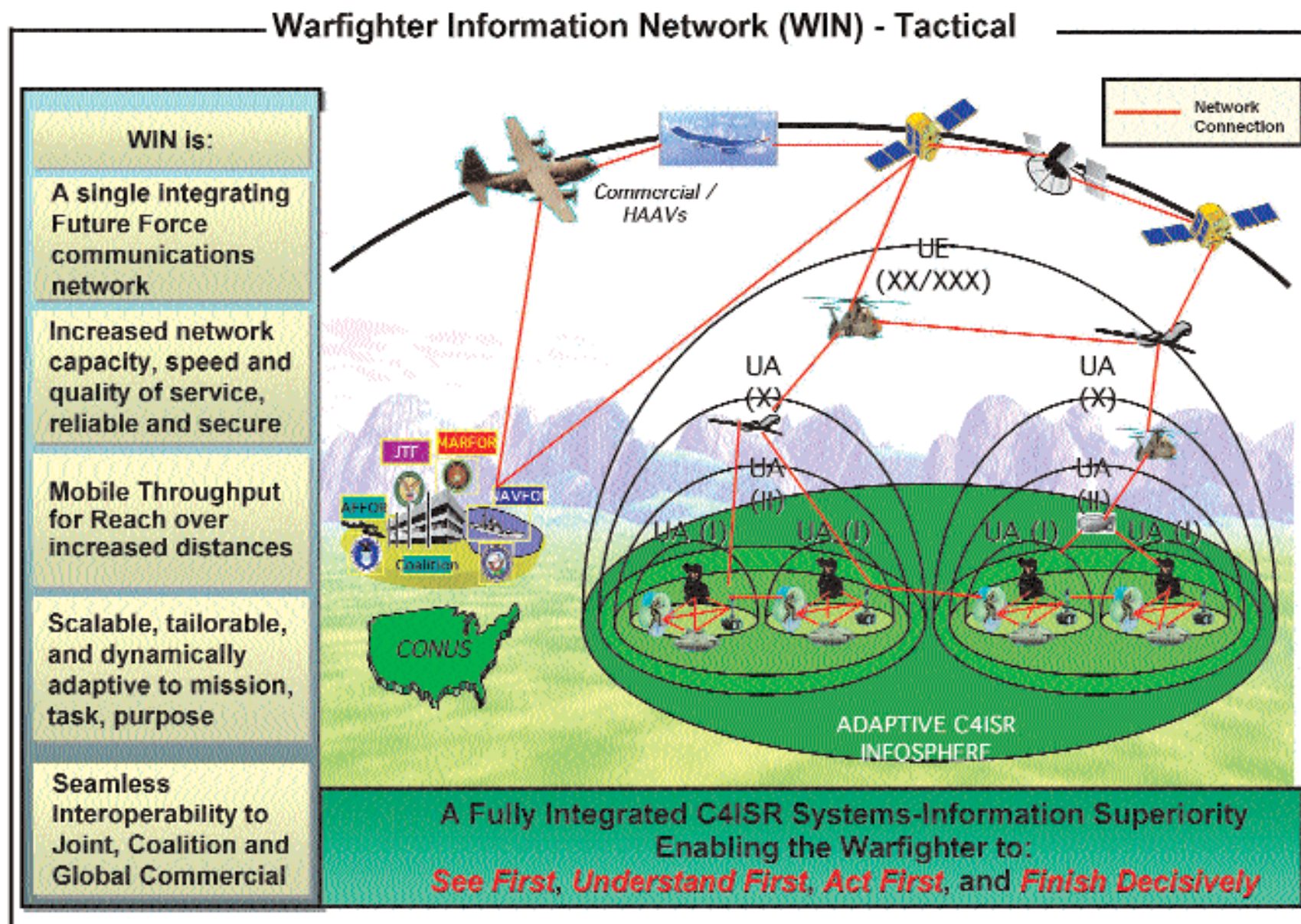
- Continue development of requirement documents.
- The Program Manager will adjust the schedule for the testing, production, and fielding of the UCS incremental enhancement.
- **2QFY05** Developmental testing.

## Contractors

**Vehicle:** Wolf Coach, Inc., an L3 Company (Auburn, MA)

**Communications System Integrator:** Naval Air Warfare Center Aircraft Division (Patuxent River, MD)





## Mission

Provide integrating, high speed, and high capacity backbone communications network for the Future Force.

## Description and Specifications

Warfighter Information Network (WIN)-Tactical is The Army's communications system for reliable, secure, and seamless video, data, imagery, and voice services that enables decisive combat actions. It will be focused on moving information in a manner that supports commanders, staffs, functional units, and capabilities-based formations – all mobile, agile, lethal, sustainable, and deployable. It will be optimized for offensive and joint operations so that the theater combatant commander will have the capability to perform multiple missions simultaneously with campaign quality. WIN-Tactical will establish an environment in which commanders at all echelons will have the ability to operate with virtual staffs and analytical centers that are located at remote locations throughout the battlespace.

As a key system supporting The Army's Future Force, WIN-Tactical meets the pressing need for efficient battlefield bandwidth utilization, optimal data throughput, on-the-move critical information exchange, and rapid infrastructure modernization. It will operate as the principal means to frame the tactical infosphere that encompasses both the Unit of Employment (UE) and Unit of Action (UA) areas of influence. This tactical infosphere will operate while mobile, via its robust networking, and be able to pass relevant information for system of systems combined arms capabilities in all terrain and under all environmental conditions.

WIN-Tactical also supports the Current Force, in that it will outmode the present communications infrastructure (Mobile Subscriber Equipment / Tri-Services Tactical), which is force structure intensive, has multiple subsystem assemblages, and has networking limitations.

WIN-Tactical will consist of ground, airborne, and space layers that will enable constant connectivity throughout units in theater, as well as to sustaining base, Joint, Allied, and Coalition forces. Its prominent feature will be providing this capability while on the move.

Major components of WIN-Tactical include switching/routing and subscriber access nodes (network service provider, on a single vehicle, targeted for UE echelons); Personal Communications Devices (PCD) (cell phone-like capability) that can provide voice and data connectivity; Information Assurance (IA) (provides an integrated Defense in Depth approach to protect sensitive and classified information); Information Dissemination (information on demand, according to assigned level of precedence); Transmission Systems (provides network connectivity); and Network Management (NM) (provides a means to plan, configure, monitor and manage the network). It will be focused on moving information in a manner that supports commanders, staffs, functional units, and capabilities-based formations – all mobile, agile, lethal, sustainable, and deployable. This system will place state-of-the-art technologies and their enabling capabilities into the hands of the Warfighter

WIN-Tactical is currently synchronized with Future Combat Systems (FCS) and will provide that system's baseline communications transport and networking requirements.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

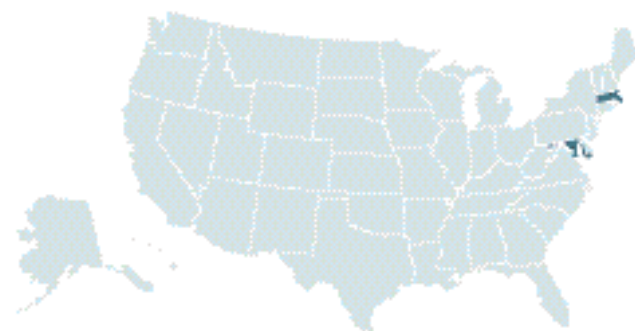
- **4QFY02** Pre-Milestone B contract award - two prime contractors.
- **3QFY03** Joint Requirements Oversight Council (JROC) validates WIN-T Operational Requirements Document.
- **4QFY03** Milestone B approval.
- **4QFY03** System Development and Demonstration contract option award.

## Projected Activities

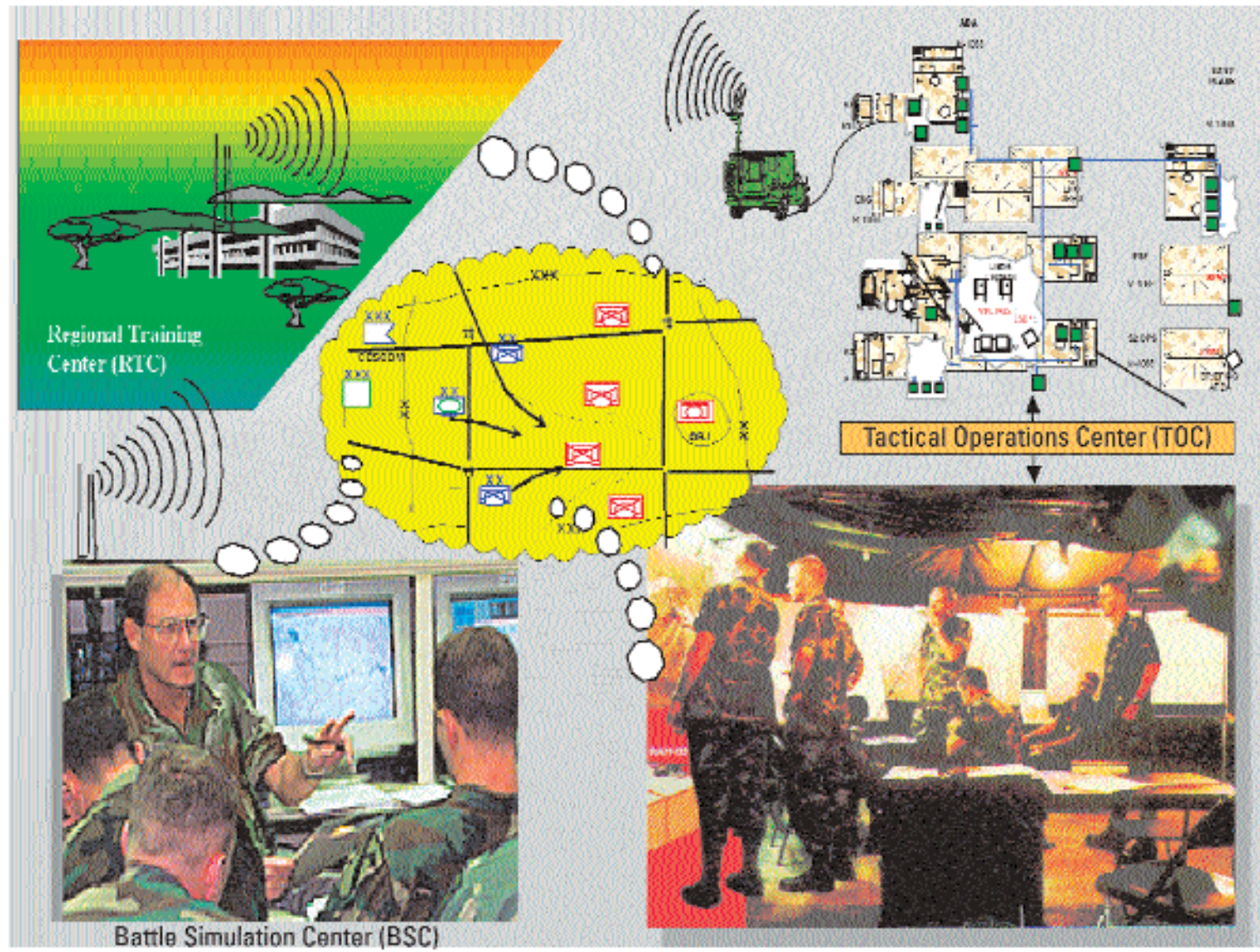
- **4QFY04** Preliminary Design Review.
- **3QFY05** Developmental Test / Operational Test.
- **1QFY06** Milestone C approval.
- **1QFY06** Production contract award.
- **4QFY08** Initial Operational Test.
- **3QFY09** Full Rate Production.
- **2QFY10** Initial Operational Capability.

## Contractors

General Dynamics (Taunton, MA); Lockheed Martin Mission Systems (Gaithersburg, MD)







## Mission

Train unit commanders and their battle staffs from battalion (through seamless interoperability with OneSAF) through theater level; and provide training at educational institutions and support joint training.

## Description and Specifications

Warfighters Simulation 2000 (WARSIM) is the next-generation computer-based command and control constructive training simulation system for readiness of the 21st century warfighter. WARSIM is being developed to train service Title 10 requirements for division through echelons above corps and support joint task force training.

WARSIM will provide a single simulation system to train for the full spectrum of mission operations—from stability and support operations to mid/high intensity battlefield. WARSIM allows commanders and staffs to train as they will fight—through direct stimulation of their organic command, control, communications, computers, and intelligence equipment in an operational environment. WARSIM fosters leader development by providing sufficient simulation fidelity to permit doctrine, tactics, techniques, and procedures to be utilized in training agile leaders.

WARSIM employs data-driven flexible behaviors allowing dramatically improved representation levels (i.e., rules of engagement, cooperation levels by groups of non-combatants, etc.) and supports the use of multiple databases including National Imagery and Mapping Agency products.

## Foreign Counterpart

Several foreign governments are developing command and control simulations. The United Kingdom is in concept formulation. Germany has developed GUPPIS. Korea has CHANG 21.

## Foreign Military Sales

None

## Program Status

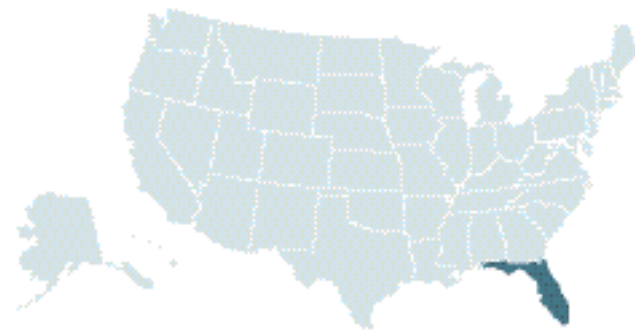
- **FY04** Continue development of WARSIM to increase scalability and improve system performance.

## Projected Activities

- **FY05** Execute WARSIM proof of principle and continue support of the Army Constructive Training Federation.

## Contractors

Lockheed Martin Information Systems (Orlando, FL)





## XM25 Airburst Weapon System





## Mission

Provide the infantry soldier with an improved capability to engage and defeat defilade personnel targets.

## Description and Specifications

The XM25 Airburst Weapon System is the single barrel air-bursting munitions component of the XM29 Integrated Airburst Weapon System. It fires 25mm air-bursting munitions out to 500 m range point targets or 700 m range area targets. The XM25 incorporates a target acquisition fire control that integrates powered direct view optics, thermal sighting, an electronic compass (bearing, tilt, cant), a laser range finder, a fuze setter, a ballistic processor, and an internal display.

Total system weight is under 12 lb. The XM25 will provide the lethality upgrade for the Land Warrior program.

## Foreign Counterpart

Israel, Sweden, France, Australia, and Japan are pursuing similar weapon systems.

## Foreign Military Sales

No known foreign counterpart

## Program Status

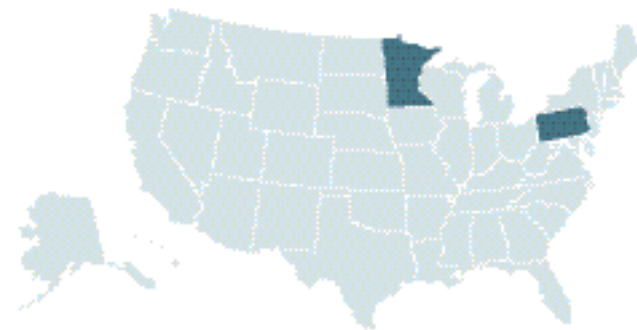
- **Current** Continue development.

## Projected Activities

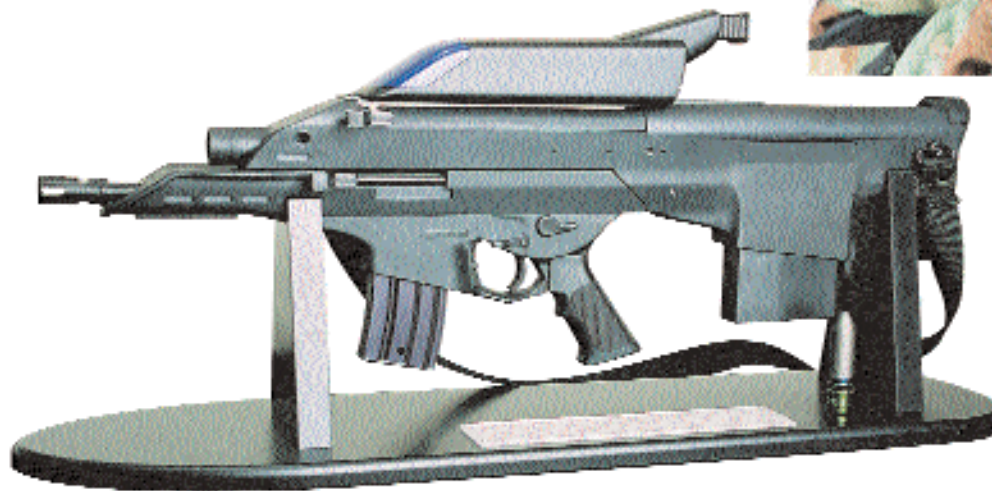
- **3QFY04** Government developmental testing begins.
- **3QFY05** Milestone B.
- **4QFY08** Milestone C.
- **2QFY10** Full-rate production decision.
- **4QFY10** First unit equipped.

## Contractors

Alliant Techsystems (Plymouth, MN); Brashears LP (Pittsburgh, PA); H&K (Oberndorf, Germany)



## XM29 Integrated Airburst Weapon System



## Mission

Provide the infantry soldier with an integrated combat weapon system coupling air bursting munitions and kinetic energy projectiles for enhanced lethality over the full spectrum of military operations.

## Description and Specifications

The XM29 Integrated Airburst Weapons system will combine the capabilities of the XM8 and XM25 into a dual barrel weapon system that fires air-burst and kinetic energy ammunition. The target acquisition fire control integrates powered direct view optics, thermal sighting, an electronic compass (bearing, tilt, cant), a laser range finder, a fuze setter, a ballistic processor, and an internal display.

## Foreign Counterpart

Israel, Sweden, France, Australia, and Japan are pursuing similar weapon systems.

## Foreign Military Sales

None

## Program Status

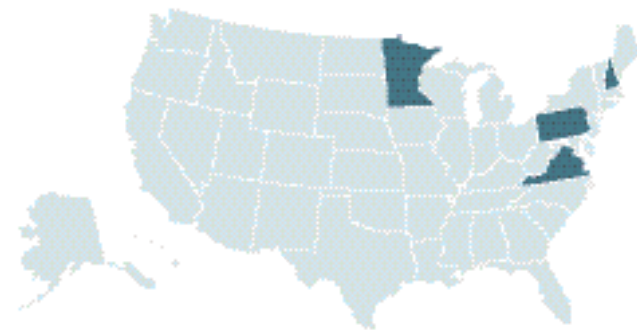
- Program is progressing to Milestone B in FY06.

## Projected Activities

- **3QFY04** Government developmental testing begins.
- **4QFY06** Milestone B.
- **4QFY08** Milestone C.
- **2QFY06** Production prove-out testing to be completed, immediately followed by user assessment.
- **1QFY10** Full-rate production decision.
- **3QFY10** First unit equipped.

## Contractors

Alliant Techsystems (Plymouth, MN); Brashears LP (Pittsburgh, PA) ; H&K Defense (Sterling, VA); H&K (Oberndorf, Germany); Insight Technologies, Inc. (Londonderry, NH)





# XM8 Modular Assault Weapon System

## XM8 BASELINE CARBINE



- 12.5" barrel
- various module accessories



- 40mm launch-40mm grenade launcher

XM8 Carbine with add-on XM320 grenade launcher

## COMPACT CARBINE



- short 9" barrel
- fold up receiver cover
- personal defense applications

## SHARPSHOOTER VARIANT



- 20" barrel
- advanced optical sight (all variants)

## AUTOMATIC RIFLE



- heavy 20" barrel for sustained fire
- integral folding bipod
- 100 round drum magazine



## Mission

Provide the Soldier with an improved capability to engage exposed personnel targets and unarmored vehicle targets with accurate long range and lethal fires.

## Description and Specifications

The XM8 Modular Assault Weapon system is the 5.56mm kinetic energy (KE) subsystem of the XM29 Integrated Airburst Weapon System. The XM8 will provide the following capabilities:

- Performance equivalent to the M4 at 300 and 500 m.
- Improved reliability/barrel life/magazine.
- Decreased maintenance time and training time.
- Factory bore sight.
- Multi-configurable variants: changeable barrels and accessories tailor weapon for mission requirements.
- The baseline Assault Rifle incorporates a collapsible buttstock, a 12.5" barrel, an integrated baseline sight, improved magazines, and has a weight of 6.99 lb with optic.
- The Compact incorporates a fixed buttstock or folding or telescoping stock, a 9.5" barrel, an integrated baseline sight, improved magazines, and has a weight of 6.2 lb with optic.
- The Sharpshooter/Auto-Rifle incorporates a collapsible buttstock, a 20" barrel, an integrated 4x sight, improved magazines, an integrated bipod, a high capacity magazine for Auto-Rifle, and has a weight of 8.0 lb with optic.
- Dedicated optic integrates infrared pointer, infrared illuminator, reflex sight, and back up sight (sharpshooter sight incorporates 4x magnification).
- Under-barrel mounted lightweight, 40mm grenade launcher or shotgun. Grenade launcher attaches to the XM8 without tools and incorporates a pivoting barrel design that accepts all 40 mm rounds, an integrated leaf or digital sight, single shot capability, and has a weight of 9.01 lb with optic.

## Foreign Counterpart

No known foreign counterpart

## Foreign Military Sales

None

## Program Status

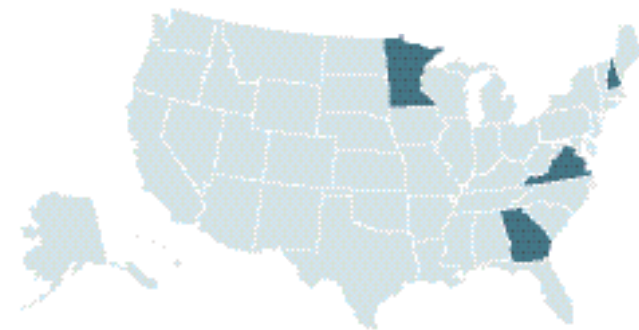
- Progressing to Milestone C in FY05.

## Projected Activities

- **4QFY04** Milestone C.
- **2QFY05** First unit equipped.

## Contractors

Alliant Techsystems (Plymouth, MN); H&K Defense (Sterling, VA); Insight Technologies, Inc. (Londonderry, NH); Heckler & Koch (Columbus, GA)



# Recapitalization





Recapitalization is the rebuild and selected upgrade of currently fielded systems to ensure operational readiness and a near zero-time/zero-mile system. The goals of recapitalization are to improve unit effectiveness and warfighting capability; extend service life; stabilize operating and support cost growth; and improve reliability, safety, and maintainability. When operationally necessary and financially prudent, the Army will recapitalize selected systems.

The Army's requirement to recapitalize all of its systems is significant, and the requirement is clearly unaffordable given the current fiscal constraints and planning guidance. The Army, therefore, has decided to focus its resources on only those systems and units that are essential to maintaining today's warfighting readiness while taking risk with other systems and other parts of the force. To develop an affordable and executable recapitalization program, the Army has focused its resources on selected units within III Corps, taking risk in the Army's remaining units.

While the recapitalization program approval process has helped the Army focus its resources, reduce requirements, and develop cost effective, funded programs, the Army must still remain aware of the inherent risk in this program. Even for prioritized systems, the Army still has significant unfunded requirements for systems that reside in other units beside III Corps. As a result of its recapitalization strategy, the Army has provided critical combat capability to portions of III Corps, accepted risk in its remaining units, and established a process that will help free up resources for the Future Force. The Army will continue to review the scope of its recapitalization efforts and make adjustments as appropriate.

## Abrams Upgrade



## Mission

Provide mobile protected firepower for battlefield superiority.

## Description and Specifications

The Abrams tank modernization strategy supports the Army vision and transformation by providing the Abrams tank the lethality, survivability, and fightability necessary to defeat advanced threats well into the future. The Abrams tank closes with and destroys enemy forces on the integrated battlefield using mobility, firepower, and shock effect. The 120mm main gun on the M1A1 and M1A2, combined with the powerful 1500 hp turbine engine and special armor, make the Abrams tank particularly suitable for attacking or defending against large concentrations of heavy armor forces on a highly lethal battlefield.

Features of the M1A1 modernization program include increased armor protection; suspension improvements; and a nuclear, biological, and chemical (NBC) protection system that increases survivability in a contaminated environment. A modification consisting of an integrated applique computer and a far-target-designation capability can be incorporated on the tank.

The M1A2 modernization program includes a commander's independent thermal viewer, an improved commander's weapon station, position navigation equipment, a distributed data and power architecture, an embedded diagnostic system, and improved fire control system. The M1A2 System Enhancement Program (SEP) adds second-generation thermal sensors and a thermal management system. The SEP includes upgrades to processors/memory that enable the M1A2 to use the Army's common command and control software, enabling the rapid transfer of digital situational data and overlays. The Abrams modernization strategy also includes a new engine program, the Abrams Integrated Management (AIM) Overhaul program, and parts obsolescence program, which will reduce the operational and support costs and logistical footprint associated with the Abrams.

	M1/IPM1	M1A1	M1A2	M1A2 SEP
<b>Length:</b>	32.04 ft	32.04 ft	32.04 ft	32.04 ft
<b>Width:</b>	12.0 ft	12.0 ft	12.0 ft	12.0 ft
<b>Height:</b>	7.79 ft	8.0 ft	8.0 ft	8.0 ft
<b>Top speed:</b>	45.0 mph	41.5 mph	41.5 mph	42 mph
<b>Weight:</b>	61.4/62.8 tons	67.6 tons	68.4 tons	69.5 tons
<b>Armament:</b>	105mm	120mm	120mm	120mm
<b>Crew:</b>	4	4	4	4

## Foreign Counterpart

France: Leclerc; Germany: Leopard 2; Israel: Merkava Mk. 3; Italy: C1 Ariete; Russia: T-64, T-72, and T-80; United Kingdom: Challenger 2

## Foreign Military Sales

Egypt: 1005 M1A1 Kits; Kuwait: 218 M1A2s; Saudi Arabia: 315 M1A2s

## Program Status

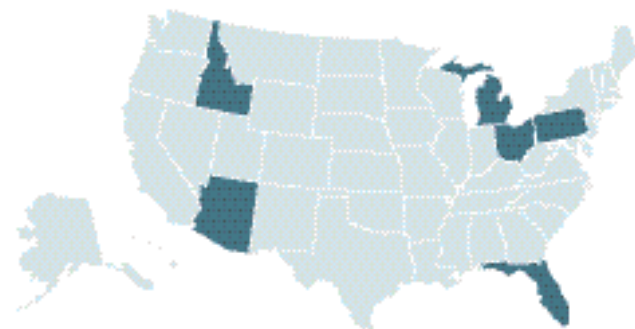
- Continue M1A2 SEP Upgrade (M1 to M1A2SEP) production through FY04 and complete retrofit of the M1A2 to M1A2SEP for a total of 717 M1A2SEP tanks. The 4th Infantry Division, 1st Cavalry Division, and the 3rd Armored Cavalry Regiment will be equipped with M1A2SEP tanks.
- FY99-07** AIM program recapitalizes the hi-optempo of the M1A1 tank fleet. M1A1 AIM vehicles will be fielded to the 1st Infantry Division, 2nd Infantry Division, and the 1st Armored Division.

## Projected Activities

- FY04** M1A2 SEP production continues. The Army's M1A2 SEP fleet requirement is 717 vehicles.
- FY04** Continuation of fielding of the M1A2 SEPs to the 4th Infantry Division.
- FY04** Continuation of fielding of the M1A1 AIM to the 2nd Infantry Division.

## Contractors

General Dynamics (Sterling Heights, MI; Warren, MI; Muskegon, MI; Scranton, PA; Lima, OH; Tallahassee, FL); Honeywell (Phoenix, AZ); Bechtel (Idaho Falls, ID)





## Apache



## Mission

Conduct rear, close, and deep operations and deep precision strikes; provide armed reconnaissance and security when required in day, night, and adverse weather conditions.

## Description and Specifications

The AH-64D Longbow Apache is the Army's heavy attack platform for both the Current and Future Force. The Apache is a highly mobile and lethal aerial weapons platform able to destroy armor, personnel, and materiel targets day or night and under obscured battlefield and/or adverse weather conditions. The fleet includes the A and D (Longbow) models. The Longbow remanufacturing effort inducts the A model and incorporates a millimeter wave fire control radar, radar frequency interferometer, fire-and-forget, radar-guided Hellfire missile and numerous cockpit management and digitization enhancements. Both models are programmed for recapitalization to address Task Force Hawk lessons learned, such as upgrading to second generation, forward-looking infrared technology with the Modernized Target Acquisition Designation Sight/Pilot Night Vision Sensor (MTADS/PNVS), non-line-of-sight communications, video transmission/reception, etc., and to reduce maintenance cost drivers. Apache is fielded to active, National Guard, and Army Reserve attack battalions and cavalry units in accordance with the 2003 Army Modernization Plan. Two hundred and three A models will be retained and fielded to National Guard units.

The Longbow Apache adds significant warfighting capability to the combined arms team on the battlefield through increased survivability, lethality, versatility, and long-term reliability improvements.

**Combat mission speed:** 167 mph

**Combat range:** 300 miles

**Combat endurance:** 2.5 hours

**Maximum gross weight:** 20,260 lb

**Armament:** Hellfire missiles, 2.75" rockets and 30mm chain gun

**Crew:** 2 (pilot and co-pilot gunner)

## Foreign Counterpart

The Tiger Eurocopter is produced by a Franco-German consortium under the European Aerospace and Defense Systems (EADS).

## Foreign Military Sales

Egypt, Greece, Israel, Kuwait, Netherlands, Saudi Arabia, Singapore, United Arab Emirates

Direct commercial sales: Japan and the United Kingdom

## Program Status

- **FY02** completed first contract of Army program to convert 501 A models to the Longbow Apache—232 Longbows delivered.
- **FY03** Fielded two attack battalions bringing the total to eight.
- **2QFY04** The multi-year contract for 227 wave fire control radar, radar frequency interferometer deliveries completed.

## Projected Activities

- **FY04** Field two additional attack battalions.
- **FY05** Fielding of the MTADS/PNVS to the Apache fleet (704 Apaches) begins.
- **FY05** Begin initial development of Open System Architecture for Block III Life Extension Program.
- **FY07** Finish second multi-year conversion contract; deliver an additional 269 Longbows.
- Fully integrate current and projected warfighting capabilities into the Army's Future Force.

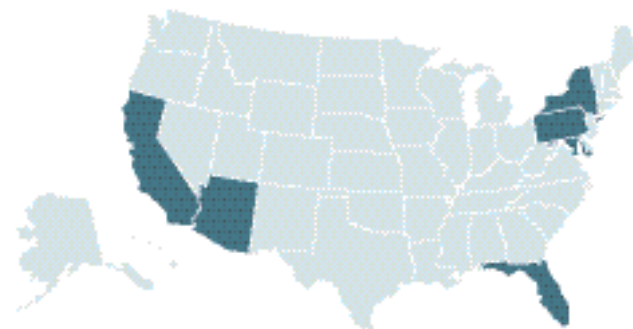
## Contractors

**Airframe/Fuselage:** Boeing (Mesa, AZ; Philadelphia, PA)

**Fire Control Radar:** Northrop Grumman (Linthicum, MD); Lockheed Martin (Owego, NY; Orlando, FL)

**MTADS/PNVS:** Lockheed Martin (Orlando, FL); Boeing (Mesa, AZ)

**Rotor Blades:** Composite Structures (Monrovia, CA)





## Black Hawk





## Mission

Provide air assault, general support, aero-medical evacuation, command and control, and special operations support to combat, stability, and support operations.

## Description and Specifications

The Black Hawk (UH-60) is the Army's utility tactical transport helicopter. The versatile Black Hawk has enhanced the overall mobility of the Army, due to dramatic improvements in troop capacity and cargo lift capability, and will serve as the Army's utility helicopter in the Future Force. On the asymmetric battlefield, it provides the commander the agility to get to the fight quicker and to mass effects throughout the battlespace across the full spectrum of conflict. An entire 11-person, fully equipped infantry squad can be lifted in a single Black Hawk, transported faster than in predecessor systems and in most weather conditions. The Black Hawk can reposition a 105mm howitzer, its crew of six, and up to 30 rounds of ammunition in a single lift. The aircraft's critical components and systems are armored or redundant, and its airframe is designed to progressively crush on impact to protect the crew and passengers. The Army has put into place programs to extend the life of the UH-60, while providing it with the capabilities needed on the future battlefield. The UH-60M recapitalization/upgrade program will incorporate a digitized cockpit, improved handling characteristics, and will extend the service life of the system. To gain immediate reliability improvements and slow the fleet aging process, the Army has put into place a UH-60A-A recapitalization/rebuild program that will be applied to a number of older aircraft while they are awaiting induction into the UH-60M recapitalization/upgrade program.

	UH-60A	UH-60L	UH-60M
<b>Max gross weight:</b>	20,250 lb	22,000 lb	22,000 lb
<b>Cruise speed:</b>	149 kt	150 kt	152 kt
<b>Rate climb (fpm):</b>	814	1,315	1,646
<b>Engines (2 ea):</b>	GE-700	GE-701C	GE-701D
<b>External load:</b>	8,000 lb	9,000 lb	9,000 lb
<b>Internal load (troops/lb):</b>	11/2,640	11/2,640	11/3,190
<b>Crew:</b>	Two pilots, two crew chiefs		
<b>Armament:</b>	Two 7.62mm machine guns		

## Foreign Counterpart

France: Puma, NH90; Russia: HIP series aircraft; United Kingdom: Lynx, EH-101

## Foreign Military Sales

Bahrain, Colombia, Egypt, Israel, Saudi Arabia

**Commercial Sales:** Argentina, Australia, Bahrain, Brazil, Brunei, China, Greece, Hong Kong, Japan, Jordan, Malaysia, Mexico, Morocco, Philippines, Spain, Taiwan, Thailand, Turkey, Austria

**Co-production:** Republic of Korea

## Program Status

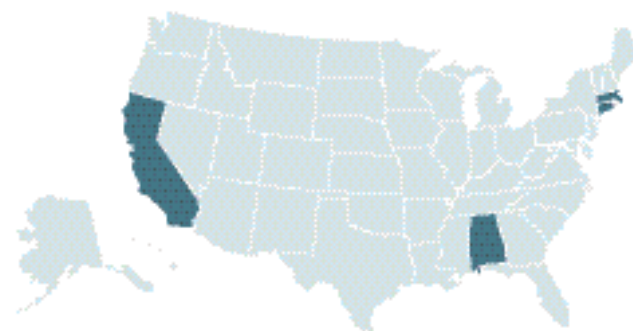
- **3QFY03** Conducted successful UH-60M system critical design review.
- **4QFY03** First UH-60A-A recapitalization/rebuild aircraft delivered to Fort Rucker, AL.
- **4QFY03** Successful UH-60M first flight.
- **1QFY04** Successful UH-60M program restructure decision received.
- **2QFY04** Award of modification to UH-60M integration/qualification contract to develop four production representative prototypes.

## Projected Activities

- **2QFY05** UH-60M Milestone C production decision Defense Advisory Board.
- **2QFY05** Award low-rate initial production contract; FY05 lot will be five aircraft.
- **3QFY07** UH-60M full-rate production (FRP) in-process review and FRP contract award.
- **2QFY08** UH-60M first unit equipped.

## Contractors

United Technologies (Stratford, CT); General Electric (Lynn, MA); GNK Westland (Tallahassee, AL); Parker Hannifin (Irvine, CA); SSSI (Troy, AL)



## Bradley Upgrade



## Mission

Provide infantry and cavalry fighting vehicles with digital command and control capabilities, significantly increased situational awareness, enhanced lethality, survivability, and improved sustainability and supportability.

## Description and Specifications

The Bradley M2A3 Infantry/M3A3 Cavalry Fighting Vehicle (IFV/CFV) is configured as follows:

**Length:** 21.5 ft

**Width:** 11.83 ft with armor tiles; 10.75 ft without armor tiles

**Height:** 11.8 ft

**Weight:** 67,000 lb combat loaded

**Power train:** 600 hp Cummins VTA-903T diesel engine with GM-Allison HMPT-500-3EC hydro-mechanical automatic transmission

**Cruising range:** 250 mi

**Road speed:** 38 mph

**Crew:** M2A3: 10 (3 crew; 7 dismounts); M3A3: 5 (3 crew; 2 dismounts)

**Vehicle armament:** 25mm Bushmaster cannon; TOW II missile system; 7.62mm M240C machine gun

**Vehicle features:** Two second generation forward looking infrared (FLIR) sensors in the Improved Bradley Acquisition System (IBAS) and Commander's Independent Sight (CIV) provide "hunter-killer target handoff" capability with ballistic fire control system; embedded diagnostics; integrated combat command and control (IC3) digital communications suite hosting Force XXI Battle Command Brigade-and-Below (FBCB2) package with digital maps, messages and friend/foe situational awareness; position navigation system with Global Positioning System and inertial navigation system; and enhanced squad situational awareness with squad leader display integrated into vehicle digital images and IC3.

Current models/variants: Bradley M2/M3 A0, A2, A2 ODS (Operation Desert Storm), OIF (Operation Iraqi Freedom), A3 IFV/CFVs, M7 Bradley Commander's Vehicle (BCV), Bradley Fire Support Team (BFIST) Vehicle, Bradley Linebacker, and MANPADS Under Armor (MUA).

## Foreign Counterpart

China: Type 90, WZ-503; Commonwealth of Independent States: BMP 1, 2, and 3; France: AMX-10P, AMX VCI; Germany: Marder 1; United Kingdom: MCV-80 Warrior, FV-432

## Foreign Military Sales

Bradley M2A2s: Saudi Arabia

## Program Status

- **FY99** The Bradley Program Office completed upgrading all Bradley A1s to the A2 configuration.
- **FY01** Bradley A3 was approved for full-rate production; first year of a three-year multi-year contract was awarded.
- **1QFY03** Bradley A3 fielded to the 1st Cavalry Division.
- Fieldings to the 1st Cavalry Division and the 4th Infantry Division. The 3rd Armored Cavalry Regiment will be issued M3A2 OIF with second generation FLIR and FBCB2.
- Current Bradley A2 to A2 ODS modification for the active Army continues, as well as the conversion of Bradley A0 to A2 ODS for the Army National Guard (ARNG) and the A2 to A3 remanufacture effort; Bradley A3 in full-rate production.
- **FY03** Continued modification of Bradley A2s to A2 ODS and fielding; continued ARNG A0 conversion to A2 ODS.
- **FY03** Awarded the last year of the A3 multi-year contract (March 2003).
- **FY03** Continued A3 fielding to 1st Cavalry Division.

## Projected Activities

- Quantity of A3s reduced from 1,037 to 595 during the FY04-09 POM.
- **FY04** Congressional plus will purchase the M3A2 OIF (Operation Iraqi Freedom) variant for the 3rd Armored Cavalry Regiment.

## Contractors

United Defense, LP (San Jose, CA; Fayette, PA; York, PA); Raytheon (McKinney, TX); DRS Technologies (Palm Bay, FL); EFW (Ft Worth, TX); General Dynamics (Tallahassee, FL; Muskegon, MI)







## Mission

Transport ground forces, supplies, ammunition, and other battle-critical cargo in support of worldwide combat and contingency operations.

## Description and Specifications

As the Army's only Future Force heavy-lift helicopter capable of intra-theater cargo movement of payloads up to 16,000 lb in a high, hot environment, the CH-47 Chinook/Improved Cargo Helicopter (CH-47F) is an essential component of the Army Vision. The CH-47F program will remanufacture 301 of the current fleet of 424 Chinooks, install a new digital cockpit, and make modifications to the airframe to reduce vibration. Additionally, the program will remanufacture the Army's MH-47D/E fleet to the MH-47G configuration.

The CH-47F upgraded cockpit will provide future growth potential and include a digital data bus that permits installation of enhanced communications and navigation equipment for improved situational awareness, mission performance, and survivability. Airframe structural modifications will reduce harmful vibrations, improving operation and support (O&S) efficiency and crew endurance. Other airframe modifications reduce by ~60 percent the time required for aircraft tear down and build-up after C-5/C-17 deployment. These modifications significantly enhance the Chinook's strategic deployment capability.

More powerful and reliable T55-GA-714A engine improves fuel efficiency and enhances lift performance by ~3,900 lb. An improved, crashworthy, extended range fuel system (ERFS) will enable Chinook self-deployment and extend its operational radius. A program is also underway to reduce O&S costs through the joint development with the United Kingdom of a low-maintenance rotor hub.

**Max gross weight:** 50,000 lb

**Max cruise speed:** 170 knots/184 miles per hour

**Troop capacity:** 36 (33 troops plus 3 crew members)

**Litter capacity:** 24

**Sling-load capacity:** 26,000 lb center hook; 17,000 lb forward/aft hook; 25,000 lb tandem

**Minimum crew:** 3 (pilot, co-pilot, and flight engineer)

## Foreign Counterpart

Russia: MI-26; United Kingdom: EH-101.

## Foreign Military Sales

Australia, Egypt, Greece, Taiwan. Direct Sales: Korea, Netherlands, Singapore, Spain, and United Kingdom.

## Program Status

- **3QFY98** Awarded the engineering and manufacturing development (EMD) contract completed in FY03. Two CH-47F prototype aircraft delivered to the Army.

- **1QFY03** Awarded 1st low-rate initial production (LRIP) for seven aircraft (one CH-47F/six MH-47G).
- **1QFY04** Awarded 2nd LRIP contract for 16 aircraft (MH-47G).

### T55-GA-714A Engine:

- **1QFY98** Commenced LRIP.
- **1QFY00** First unit equipped (FUE).
- **2QFY00** Initiated fielding of the CH-47D/MH-47D/MH-47E.
- **2QFY00** Full materiel release.
- **3QFY01** First flight (EMD).

## Projected Activities

- **4QFY04** First LRIP CH-47F delivery.
- **3QFY07** FUE.

### T55-GA-714A Engine:

- **2QFY08** Scheduled completion.

## Contractors

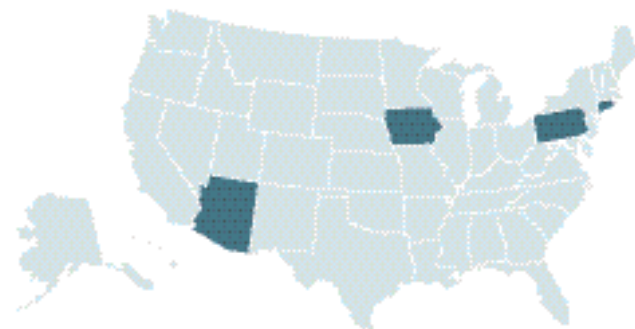
**Aircraft:** Boeing (Philadelphia, PA)

**Cockpit Upgrade:** Rockwell Collins (Cedar Rapids, IA)

**Engine Upgrade:** Honeywell (Phoenix, AZ)

**ERFS II:** Robertson Aviation (Tempe, AZ)

**Engine Controls:** PECS (Hartford, CT)





## Heavy Expanded Mobility Tactical Truck (HEMTT)/HEMTT - Extended Service Program (HEMTT/HEMTT-ESP)





## Mission

Perform line and local haul, unit resupply, and related missions in a tactical environment (brigade/battalion areas of operation) in support of currently equipped, digitized, and transformation force combat units.

## Description and Specifications

The Heavy Expanded Mobility Tactical Truck (HEMTT) is a 10-ton, 8-wheel drive truck developed for cross-country military missions up to 11 tons. HEMTT transports ammunition, petroleum, oils, and lubricants, and is a prime mover for certain missile systems such as the PATRIOT. The M984A1 Wrecker is a recovery vehicle for other vehicle systems. The M978 Tanker is a 2,500-gallon fuel transporter. The M977/M985 HEMTT cargo is the ammunition transport prime mover for the Multiple-Launch Rocket System (MLRS). The M1120 Load Handling System (LHS) transports palletized materiel and 8 x 8 x 20 ft International Standards Organization (ISO)-containers. LHS is the newest variant with an integrated system that provides self-load/unload capability. LHS provides the soldier with an efficient and economic system with capabilities similar to that of the Palletized Load System (PLS) and is a major enabler in the Army's drive to achieve a distribution-based logistics system.

HEMTT extended service program (ESP) recapitalizes (RECAP) old/high mileage trucks. The trucks are disassembled and rebuilt with improvements. The completed ESP truck is configured the same as a new production unit (zero miles/zero hours condition), complete with new vehicle warranty.

**Truck payload:** 11.0 tons

**Trailer payload:** 11.0 tons

**Flatrack dimensions:** 8 x 20 ft

**Engine type:** Diesel

**Transmission:** Automatic

**Number of driven wheels:** 8

**Range:** 300 mi

**Air transportability:** C-130, C-17, C-5

## Foreign Counterpart

United Kingdom: Demountable Rack Off-Loading and Pick-Up System.

## Foreign Military Sales

Most significant recent sales have been to Korea, Turkey, Saudi Arabia, Egypt, and Israel.

## Program Status

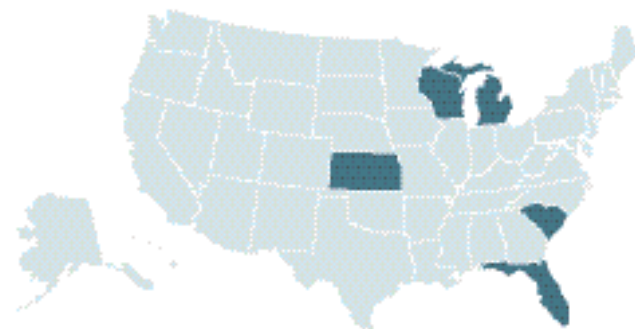
- **October 31, 2002** Materiel release/type classification for HEMTT new production (A2) interim and ESP/RECAP (A2R1) completed.
- **1QFY03-3QFY04** Prototype development of the LHS-based Theater High-Altitude Area Defense (THAAD) missile launcher.
- **FY04** HEMTT A2 fielding to 3-43 ADA (PATRIOT) Fort Bliss; 1-117 FA Battalion; 1-111 FA Battalion; and III Corps.

## Projected Activities

- **2QFY07** HEMTT A3 fieldings.

## Contractors

Oshkosh Truck (Oshkosh, WI; Bradenton, FL); Detroit Diesel (Emporia, KS; Redford, MI); Michelin (Greenville, SC)



## High Mobility Multipurpose Wheeled Vehicle (HMMWV)



## Mission

Provide a common light tactical vehicle capability.

## Description and Specifications

The High Mobility Multipurpose Wheeled Vehicle (HMMWV) is a light, highly mobile, diesel-powered, four-wheel-drive vehicle that uses common components and kits to enable its reconfiguration as a troop carrier, armament carrier, S250 shelter carrier, ambulance, TOW missile carrier, and a Scout vehicle. The heavy variant, with a payload of 4,400 lb, is the prime mover for the light howitzer, towed Vulcan system, and heavier shelter carriers. A tri-service program, HMMWV also provides vehicles to satisfy Marine Corps and Air Force requirements. Since its inception, the HMMWV has undergone numerous design and configuration updates, including technological, environmental, operational, and safety improvements. These include higher payload capability, radial tires, 1994 Environmental Protection Agency emissions update, commercial bucket seats, three-point seat belts, four-speed transmissions, and, in some cases, turbocharged engines and air conditioning.

An up-armored HMMWV was developed to provide increased ballistic (up to 7.62mm NATO AP) and blast protection (12-lb mine, front; 4-lb mine, rear), primarily for Military Police (MP), Special Operations, and contingency force use. The A2 configuration and the expanded capacity vehicle (ECV) were introduced in 1995. The A2 incorporates the four-speed, electronic transmission, the 6.5-liter diesel engine, and improvements in transportability. The A2 serves as a platform for other Army systems such as the Ground-Based Common Sensor. The payload of the ECV is 5,100 lb, including crew. ECV chassis is used for the M1114 up-armored HMMWV and serves as a platform for mission payloads and for systems that exceed 4,400 lb.

HMMWV Modernization is a block engineering change program (ECP) that will modernize the vehicle. It utilizes the existing A2/ECV series production platform and will become the baseline vehicle configuration with production planned for 4QFY05. The modernized HMMWV will integrate an electronically controlled turbo diesel engine that will meet the 2004 emissions requirements, anti-lock brake and traction control system, as well as other platform-standard safety enhancements. The goal of this program is to increase commonality across variants, reduce the overall operations and support costs, and increase the service life to 21 years.

## Foreign Counterpart

Certain models of the HMMWV have counterparts such as the Swiss MOWAG, the French PANHARD, and the German UNIMOG.

## Foreign Military Sales

Argentina, Bahrain, Bolivia, Chad, Colombia, Djibouti, Ecuador, Egypt, Ethiopia, Honduras, Israel, Kuwait, Luxembourg, Mexico, Oman, Philippines, Saudi Arabia, Sudan, Taiwan, Tanzania, Tunisia, and Uganda.

## Program Status

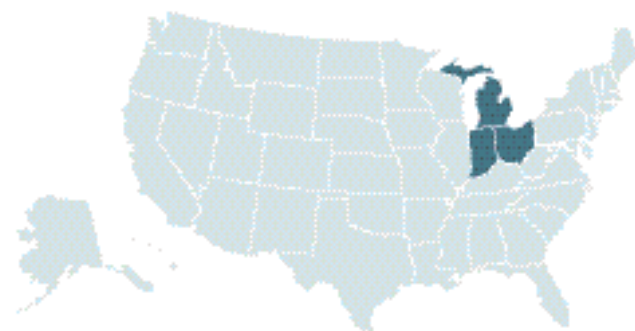
- Continued fielding of A2 HMMWVs and M1114 HMMWVs to Army, Marine Corps, Air Force, and foreign military sales customers.
- Continued development of HMMWV Modernization program.

## Projected Activities

- **2QFY06** Production cut-in for HMMWV Modernization .

## Contractors

AM General (South Bend, IN); O'Gara-Hess & Eisenhardt (Fairfield, OH); GEP (Franklin, OH); Defiance (Defiance, OH); GM (Warren, MI)





# Maintenance



The Army will maintain the systems already in place through repair and/or replacement of end items, parts, assemblies, and subassemblies that wear out or break. This category includes equipment whose useful life is being extended through continued maintenance, though not receiving further upgrades or recapitalization.

## Fixed Wing





## Mission

Perform operational support missions for the Army, joint services, national agencies, and multinational users in support of intelligence and electronic warfare (IEW), transporting key personnel, and providing logistical support.

## Description and Specifications

The Fixed Wing fleet consists of eight aircraft platforms and nearly 300 aircraft that allow the Army to perform day-to-day operations in a more timely, cost efficient manner without reliance on commercial transportation alternatives. The fleet provides timely movement of key personnel to critical locations throughout the theater of operations, and transports time-sensitive/mission critical supply items and repair parts needed to continue the war fight. Special electronic mission aircraft provide commanders with critical intelligence and targeting information, enhancing their lethality and survivability on the battlefield.

The fleet includes the RC-7B Aerial Reconnaissance Low (ARL); C-12 Utility; RC-12 Guardrail/Common Sensor (GRCS); C-20/C-37 executive jets; C-23 cargo; C-26 utility; and UC-35 utility aircraft. The RC-7B and RC-12 are classified as special electronic mission aircraft and provide real-time intelligence collection in both peace and wartime environments. The C-12, C-23, C-26, and UC-35 are classified as operational support aircraft and provide direct fixed-wing support to warfighting commanders in chief worldwide. The C-20 and C-37 stationed at Andrews Air Force Base are classified as senior support aircraft for designated support of the Chief of Staff and Service Secretary.

	RC-7	C-12/RC-12	C-20/37	C-23	C-26	UC-35
<b>Platform:</b>	DeHavilland Dash 7	Beech King Air 200	Gulfstream	Sherpa	Metro Liner	Cessna Citation
<b>Propulsion:</b>	PT6A-50	PT6A-41/42/67	Rolls Royce	PT6A-65AR	Garrett TPE331-12	JT15D or PW535A
<b>Ceiling:</b>	25,000 ft	31,000/35,000 ft	45,000 ft	20,000 ft	25,000 ft	45,000 ft
<b>Speed:</b>	110 (loiter) kts 220 (Cruise) kts	260 kts	459 kts	180 kts	260 kts	415 kts
<b>Max Weight:</b>	47,000 lb	12,500/16,500 lb	74,600/95,000 lb	25,600 lb	16,500 lb	16,500 lb
<b>Range:</b>	1500nm	1454/1000nm	4220/5500nm	900nm	1500nm	1500nm
<b>Passengers:</b>	N/A	6-8	12-14	30	20	8

## Foreign Counterpart

All Army fixed-wing aircraft are commercial, off-the-shelf (COTS) products or developed from COTS products.

## Foreign Military Sales

Egypt: Beechcraft-200 (C-12) maintenance services; Greece: two Beechcraft-200s (C-12), plus modifications; Israel: eight Beechcraft-200s (C-12), plus modifications, with a four-additional-aircraft option.

## Program Status

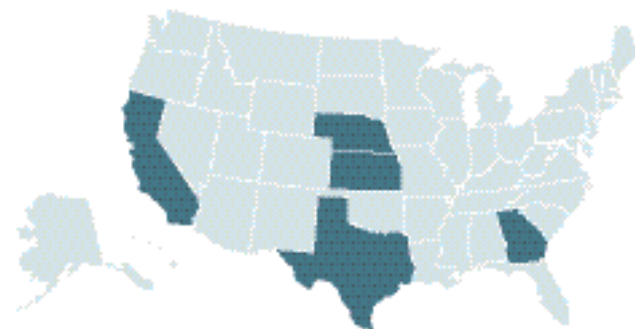
- C-37 and UC-35 are the only aircraft in production. All C-37s and UC-35s purchased to date with congressional plus-up funding.
- C-12, RC-12, and UC-35 aircraft utilizing a life cycle contractor support (LCCS) maintenance contract (DynCorp).
- C-23 aircraft utilizing an LCCS maintenance contract (Duncan).
- C-37, C-20, and C-26 aircraft utilizing Air Force LCCS maintenance contracts.
- RC-7 aircraft utilizing USAF LCCS maintenance contract (AVTEL).

## Projected Activities

- Headquarters Department of the Army-directed hub-and-spoke effort that will locate aircraft at centralized locations to increase efficiency to the Army.

## Contractors

Cessna Aircraft (Wichita, KS); Raytheon-Beechcraft (Wichita, KS); Shorts Brothers (Belfast, Ireland); Fairchild (San Antonio, TX); DeHavilland Aviation (Canada); Gulfstream (Savannah, GA); DynCorp (Ft Worth, TX); Duncan (Lincoln, NE); AVTEL (Mojave, CA); M7 Aerospace (San Antonio, TX)



## Kiowa Warrior



## Mission

Conduct armed reconnaissance, security, target acquisition and designation, command and control, light attack, and defensive air combat (defensive) missions in support of combat and contingency operations.

## Description and Specifications

The Kiowa Warrior is the Army's rapidly deployable, lightly armed reconnaissance helicopter. The Kiowa Warrior includes advanced visionics, navigation, communication, weapons, and cockpit integration systems. The mast-mounted sight (MMS) houses a thermal imaging system, low-light television, and a laser rangefinder/designator. These systems allow target acquisition and engagement at stand-off ranges and in adverse weather conditions. The Kiowa Warrior's highly accurate navigation system provides precise target location that can be sent digitally to other aircraft or artillery via its advanced digital communications system. Battlefield imagery can be transmitted to provide near-real-time situational awareness to command and control elements.

The Kiowa Warrior is rapidly deployable by air and can be fully operational within minutes of arrival. The armament systems combine to provide anti-armor, anti-personnel, and anti-aircraft capabilities at stand-off ranges. Although Kiowa Warrior fielding is complete, the Army is currently installing a series of safety and performance modifications to keep the aircraft safe and mission-effective until it is retired.

**Max gross weight:** 5,200 lb

**Max speed:** 118 kt clean; 108 kt armed

**Crew:** 2

**Armament:** Air-to-air Stinger (ATAS) (two-round launcher); .50 caliber machine gun (500 rounds); Hydra 70 (2.75 in) rockets (seven shot pod); Hellfire missiles (two round launcher); currently qualifying the XM322 Gatling gun (GAU-19) as .50 caliber replacement

## Foreign Counterpart

France: Gazelle, Alouette; Germany: BO-105; Russia: Hind, Hip, Hoplite; Italy: Augusta A129.

## Foreign Military Sales

Taiwan: Delivery of 39 Kiowa Warriors (not system enhancement program [SEP] configuration) completed.

## Program Status

- **1QFY00** Completed initial Kiowa Warrior fielding.
- **2QFY03** Awarded contract for SEP Lot VI (24 aircraft).

## Projected Activities

- **FY04** Reset/Operation Iraqi Freedom support.
- **2QFY04** Award SEP contract for FY04-FY08 (maximum 149 aircraft).
- **FY04-FY07** Weight reduction program (non-recurring engineering and production).
- **FY09** Begin retirement of Kiowa Warrior as the Army fields RAH-66 Comanche.
- **QFY09** Return last SEP-modified aircraft to the field.

## Contractors

Bell Helicopter, Textron (Ft Worth, TX); Westar (St. Louis, MO); Honeywell (Albuquerque, NM); Simula (Phoenix, AZ); Smiths (Grand Rapids, MI)





## Paladin



## Mission

Provide the primary artillery support for armored and mechanized infantry divisions.

## Description and Specifications

The M109A6 (Paladin) howitzer is the most technologically advanced self-propelled cannon system in the Army. The "A6" designation identifies several improvements to the standard model.

The fire control system is fully automated, providing accurate position location, azimuth reference, and on-board ballistic solutions of fire missions. The howitzer has a servo-driven, computer-controlled gun drive with manual backup. Paladin uses state-of-the-art components to achieve dramatic improvements in the following:

**Survivability:** "Shoot and scoot" tactics; improved ballistic and nuclear, biological, and chemical protection

**Responsive fires:** Capable of firing within 45 seconds from a complete stop with on-board communications, remote travel lock, and automated cannon slew capability

**Accurate fires:** On-board position navigator (POSNAV) and technical fire control

**Extended range:** 30 km with high explosive rocket-assisted projectile (HE RAP) and M203 propellant

**Increased reliability:** Improved engine, track, and diagnostics

**Upgrades include:** Global positioning system-aided self-location; M93 muzzle velocity system; and commercial, off-the-shelf-based computer processor

Other Paladin specifications include the following:

**Max unassisted range:** 22000 m

**Max assisted range:** 30000 m

**Min range:** 4000 m

**Max rate of fire (ROF):** Four rounds/minute for three minutes

**Sustained ROF:** One round/minute (dependent on thermal warning device)

**Max speed:** 38 mph (61.1 Kph) (highway)

**Crew size:** Four (five more in the accompanying M992 Field Artillery Ammunition Supply Vehicle [FAASV])

**Weight empty (approx.):** 56,400 lb (25,605.6 Kg)

**Weight combat loaded (approx.):** 63,615 lb (28,881.21 Kg)

## Foreign Counterpart

Germany: PzH-2000; Britain: AS-90; France: Truck-mounted Caesar, F-77; China: PLZ-45.

## Foreign Military Sales

M109A6 Paladin: none. Numerous sales of older M109 models.

## Program Status

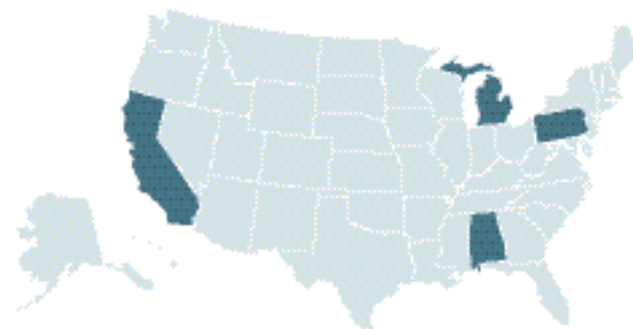
- Completed production of 18 Paladins for Pennsylvania Army National Guard (PANG).
- FAASV recapitalization line in progress.
- Completing Paladin Digitized Fire Control System (PDFCS) development with TRW. Entering production.

## Projected Activities

- Develop and field V.7 software improvements.
- **FY04** fielding of 18 Paladins equipped with PDFCS to 1-109 PAANG.
- **FY04** begin field retro-fits of PDFCS, MACS storage racks and other improvements.

## Contractors

United Defense, LP (York, PA); TRW (Carson City, CA); Anniston Army Depot (Anniston, AL); Detroit Diesel (Detroit, MI); Camber (Huntsville, AL)



## PATRIOT (PAC-3)





## Mission

Provide defense of critical assets and maneuver forces belonging to the corps and to echelons above corps against aircraft, cruise missiles, and tactical ballistic missiles (TBMs).

## Description and Specifications

The combat element of the PATRIOT missile system is the fire unit, which consists of a phased array radar set (RS), an engagement control station (ECS), an electric power plant, an antenna mast group (AMG), a communications relay group (CRG), and eight launching stations (LS).

The RS provides all tactical functions of airspace surveillance, target detection, identification, classification, and tracking, and missile guidance and engagement support. The ECS provides the human interface for command control. Each LS contains four ready-to-fire PAC-2, guidance enhanced missiles (GEM, GEM+) sealed in canisters that serve as shipping containers and launch tubes. PATRIOT's fast-reaction capability, high firepower, ability to track numerous targets simultaneously, and ability to operate in a severe electronic countermeasure environment, are significant improvements over previous air defense systems.

The PATRIOT Advanced Capability-3 (PAC-3) program significantly upgrades RS and ECS, and adds the new PAC-3 missile, which utilizes hit-to-kill technology for greater lethality against TBMs armed with weapons of mass destruction. Up to 16 PAC-3 missiles can be loaded per launcher, increasing firepower and missile defense capabilities. The primary mission of the PAC-3 missile is to kill maneuvering and non-maneuvering TBMs, as well as countering advanced cruise missile and aircraft threats. The PAC-3 upgrade program comprises system improvements to increase performance against evolving threats, meet user requirements, and significantly enhance joint interoperability.

MEADS will be the successor system to PATRIOT, using the PAC-3 missile as the baseline interceptor. The Army elected to combine the PATRIOT and MEADS program due to common components and missions in FY03.

## Foreign Counterpart

Russia: a combination of the SA-10 and SA-12.

## Foreign Military Sales

Germany, Greece, Israel, Japan, Kuwait, Saudi Arabia, Taiwan, and the Netherlands are currently participating in PATRIOT acquisition programs.

## Program Status

- **2QFY03** The Undersecretary of Defense for Acquisition, Technology, and Logistics approved transfer of PATRIOT from Missile Defense Agency to the Army.
- **2Q/3QFY03** Deployed in support of Operation Iraqi Freedom (OIF).

- **3QFY03** A Defense Acquisition Board (DAB) approved the Army's plan to pursue a combined program for evolution of the PAC-3/GEM/GEM+ configured fire units to an integrated PAC-3/MEADS full capability. Acquisition decision memorandum (ADM) signed April 30, 2003.
- **3QFY03** The Army Acquisition Executive granted Limited Procurement type classification (TC) for the PAC-3 Missile Segment. This TC action covered the PAC-3 Launcher Station, Missile Round Trainer, and 372 PAC-3 missiles.
- **4QFY03** Combined Patriot/MEADS Program DAB included a combined acquisition approach and a management structure that would incrementally increase the air and missile defense capabilities through spiral development. ADM signed August 12, 2003.
- **4QFY03-2QFY04** First full battalion to be recapitalized along with receiving the PAC-3 Configuration-3 ground system upgrades. DAB for combined aggregate PATRIOT/MEADS program.
- **2QFY04** Award the FY04 Block 2002 PAC-3 missile production contract. Conduct PAC-3 follow-on testing.

## Projected Activities

- **3QFY04-4QFY05** Continue PAC-3 follow-on testing. Continue PAC-3 evolutionary development program. Provide cost reduction initiative hardware for missile integration.
- **4QFY04** Production decision for Block 2004 for PAC-3 missile configuration (FY05-07).

## Contractors

**PAC-3 Missile, PAC-3 Missile Assembly, PAC-3 Missile Sub-Assembly:** Lockheed Martin (Grand Prairie, TX; Camden, AR; Lufkin, TX)

**PATRIOT Modifications, Recapitalization Program:** Raytheon (Andover, MA; Bedford, MA)

**PAC-3 Missile Seeker:** Boeing (Huntsville, AL)



## Small Arms



M16



M4



M240B



MK19



M249

## Mission

Deter and, if necessary, compel adversaries by enabling individuals and small units to engage targets with accurate, lethal, direct fire.

## Description and Specifications

**M16A2 rifle:** A lightweight, air-cooled, gas-operated rifle. The M16A2 enhances accuracy over its predecessor by incorporating an improved muzzle compensator, three-round burst control, and a heavier barrel; and by using the heavier NATO-standard ammunition, which is also fired by the squad automatic weapon.

**M16A4 rifle:** An M16A2 rifle with a flat-top upper receiver accessory rail and a detachable handle/rear aperture sight assembly.

**M4 carbine:** A compact version of the M16A2 rifle, with a collapsible stock, a flat-top upper receiver accessory rail, and a detachable handle/rear aperture sight assembly. It achieves more than 85 percent commonality with the M16A2 rifle and replaces all .45 caliber M3 submachine guns, selected M9 pistols, and M16 series rifles.

**Modular weapon system (MWS):** The MWS is a system of accessory rails mounted in place of the forward hand guards on M16A4 rifles and M4 carbines. These permit no-tools, field attachment of day or night sights, aiming lights, flashlights, ancillary weapons, and other accessories, based upon mission specific requirements.

**M249 squad automatic weapon (SAW):** The M249 is a lightweight, gas-operated, one-man-portable automatic weapon capable of delivering a large volume of effective fire at ranges up to 800 meters. Two M249s are issued per infantry squad.

**M240B medium machine gun:** The M240B is a ground-mounted, gas-operated, crew-served machine gun. This 7.62mm machine gun delivers more energy to the target than the smaller caliber M249 SAW. It is issued to infantry, armor, combat engineer, special force/rangers, and selected field artillery units.

**MK19-3 40mm grenade machine gun:** A self-powered, air-cooled, belt-fed, blow-back-operated weapon, the MK19-3 is designed to deliver decisive firepower against enemy personnel and lightly armored vehicles. It is the primary suppressive weapon for combat support and combat service support units.

	M4	M16A2/A4	M249	M240B	MK19-3
<b>Caliber:</b>	5.56mm	5.56mm	5.56mm	7.62mm	40mm
<b>Weight:</b>	7.7 lb*	*8.8 lb	16.5 lb	27.6 lb	72.5 lb
<b>Max Effective Range:</b>	600 m at**	800 m/600 m at	1000 m at	1800 m at	2200 m at
	500 m pt**	550 m pt	600 m pt	800 m pt	

\*Loaded weight with sling and one magazine only.

\*\***(at:** area target, **pt:** point target)

## Foreign Counterpart

Numerous

## Foreign Military Sales

Numerous foreign countries purchase US small arms.

## Program Status

- **MWS** In production.
- **M16A2** Procurement complete.
- **M16A4** FY03 final year of procurement.
- **M4** In production.
- **M240B** In production.
- **Mk19** FY03 final year of procurement.
- **M249** Executing FY03 Congressional Plus-up.

## Projected Activities

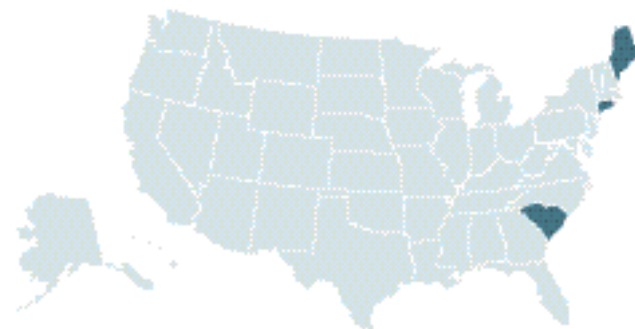
- Continue planned procurement.

## Contractors

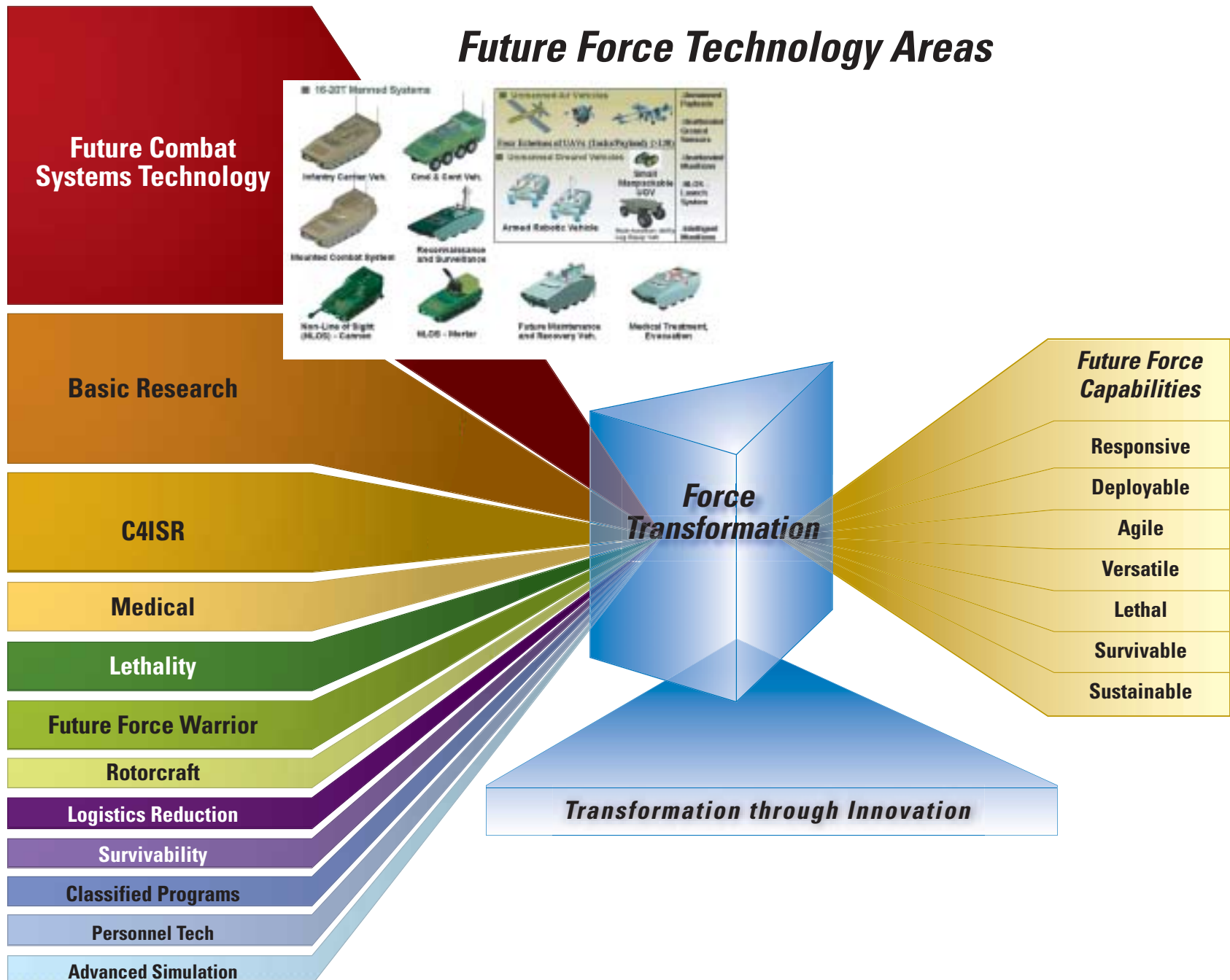
**M4 Carbine:** Colt's Manufacturing (Hartford, CT)

**M16A4, M249 Squad Automatic Weapon, and M240B Medium Machine Gun:** FN Manufacturing (Columbia, SC)

**MK19-3 Grenade Machine Gun:** General Dynamics (Saco, ME)







**The Army Science and Technology (S&T) community is pursuing technologies to enable the Future Force and enhance the capabilities of the Current Force.**

The most important S&T programs are designated by the Headquarters of the Department of the Army (HQDA) as S&T Objectives (STOs). STOs are co-sponsored by the warfighter's representative, Training and Doctrine Command (TRADOC). STOs lead to the development of S&T products within the cost, schedule, and performance metrics assigned when they are approved.

Representative STOs and some other key efforts are included here to relate S&T program opportunities to systems development and demonstration and acquisition programs. The larger and more complex STOs—those associated with significant warfighter payoff—may also be designated as Army Advanced Technology Demonstrations (ATDs) or Office of the Secretary of Defense (OSD)-approved Advanced Concept Technology Demonstrations (ACTDs). The ATDs and ACTDs are major systems and component-level demonstrations designed to “prove” the technical feasibility and military utility of advanced technology. The ACTDs also provide a limited leave-behind capability for continued evaluation and use while a determination is made regarding whether a formal acquisition program should be pursued.

The Army's S&T investments have been articulated in terms of technology areas. The illustration at left depicts these technology areas in color bands that are relatively proportional to the Army investment in each area. The S&T section of this handbook is organized according to these technology areas, beginning with the Future Combat Systems (FCS) and ending with Advanced Simulation. Representative STOs will be described within each area of technology. For FY04 there are 181 Army STOs.

The Army Materiel Command (AMC), through the Research, Development and Engineering Command (RDECOM) centers and laboratories, executes nearly 70 percent of the Army's S&T program. Three other Major Commands (U.S. Army Medical Research and Materiel Command [MRMC], Corps of Engineers [COE], and Space and Missile Defense Command [SMDC]) and the Army Research Institute for Behavioral and Social Sciences execute the remainder of the Army S&T program.

## Future Combat Systems (FCS)

Since 2000, Future Combat Systems (FCS) has been the Army's top priority S&T. In May 2003, FCS passed Acquisition Milestone B, transitioning from S&T to System Development and Demonstration (SDD). FCS will be a multi-functional, multi-mission, reconfigurable family of manned and unmanned systems designed to maximize joint interoperability; strategic and tactical transportability; and integration of mission capabilities, including direct and indirect fire, reconnaissance, troop transport, countermobility, nonlethal effects, and secure, reliable communications. FCS will provide these advanced warfighting capabilities while significantly reducing logistics demands.

FCS is a system of systems, an ensemble of fighting capabilities that meets the weight and volume constraints for C-130 transportability. The Program Manager FCS continues to use the Boeing/SAIC lead systems integrator to identify and integrate Army, Defense Advanced Research Projects Agency (DARPA), and industry technology programs to develop a system of systems that will satisfy the capabilities described in the JROC approved Operational Requirements Document (ORD). FCS will use mature Army technologies to provide revolutionary lethality through advanced direct and indirect weapon systems and increased agility using integrated advanced propulsion technologies such as electronic controlled suspension and hybrid electric propulsion.

FCS will provide revolutionary survivability for 20-ton class vehicles using a combination of innovative lightweight armors, active protection systems, signature management, and new structural designs. FCS will seek to significantly reduce logistic/sustainment demands compared to current systems by effectively integrating technolo-

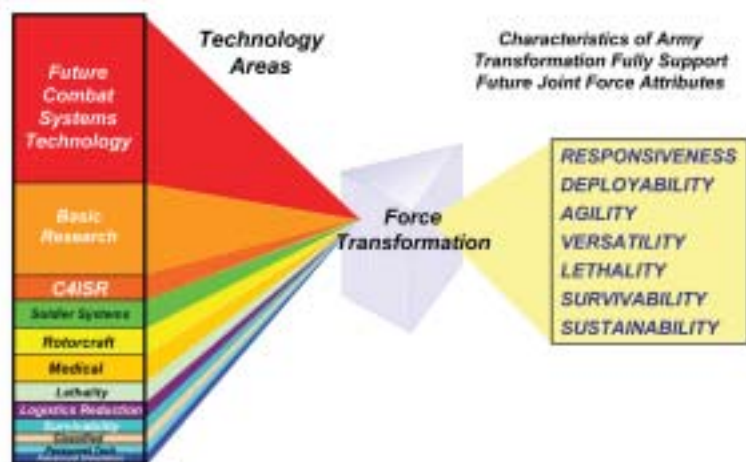
gies to reduce fuel consumption, and manning requirements. FCS will incorporate manned and unmanned air and ground platforms and integrate effectively these technology-enabled capabilities into the system-of-systems design. FCS will also feature embedded training and battle rehearsal capabilities to provide the commander with several new means to train the soldier.

FCS has adopted an "evolutionary acquisition strategy" that will enable the Army to increase the capabilities of the system-of-systems over time through spiral and incremental development processes. The initial version of FCS (Increment 1) will be designed to provide certain "threshold" capabilities. The subsequent versions will deliver increased functionality.

Army S&T continues to play an important part in the FCS program by providing certain critical technology solutions for FCS Increment 1, as well as capability-enhancing technologies for Increment 1 spirals and for Increment 2. Following are some of the other Army STOs that will enable FCS capabilities.

## 120mm Line-of-Sight and Beyond Line-of-Sight (LOS/BLOS) System ATD

The objectives of this STO are to develop and demonstrate a 120mm Line-of-Sight (LOS) and Beyond Line-of-Sight (BLOS) armament system components and ammunition suite in support of the FCS Increment I Mounted Combat System (MCS) and to enhance the effectiveness of the Mid-Range Munition (MRM) by adding a second seeker mode. The STO will provide an integrated, lightweight MCS armament system components and ammunition suite that will defeat the ORD threat 0-12 km. Products of this STO, including a lightweight, reduced-impulse cannon with ElectroThermal



### FCS 120mm LOS/BLOS System ATD

#### Purpose:

To develop and demonstrate 120mm Line-of-sight (LOS) and beyond line-of-sight (BLOS) armament system components and ammunition suite in support of the FCS Increment I Mounted Combat System (MCS)



Mid Range Munition

Advanced KE

#### Product:

- Integrated, lightweight MCS armament system components and ammunition suite that will defeat the ORD threat 0-16km
- Lght/reduced impulse launcher w/ET igniter, Advanced KE, Mid Range Munition, Fire Control and Ammunition Handling



igniter, an advanced novel penetrator kinetic energy and MRM munitions, and the fire control and the ammunition handling system, will be transitioned to Program Executive Office Ground Control Systems and Program Manager Ammunition in FY04-05. This effort provides a solution to one of the critical technology elements for FCS Increment I.

### Compact Kinetic Energy Missile (CKEM) Technology ATD

The Compact Kinetic Energy Missile (CKEM) will provide FCS and other Future Force systems with a revolutionary hypervelocity kinetic energy weapon. The CKEM weapon system is being designed to provide overwhelming lethality against present and future threats at almost half the mass and size of the current KE missile to significantly improve versatility in the Future Force. CKEM will defeat explosive reactive armor (ERA) 1–3 and threat active protection systems by using a lighter, smaller, faster, KE missile that will significantly increase the number of KE stowed kills. CKEM's system-level performance goals include the following:

- Missile length: Less than 5 ft
- Missile weight: Threshold: less than 100 lb; objective: 65 lb
- Range: Overwhelming lethality at 0.4–5 km, with greater percentage kill than any current KE weapon at close-in engagements of fewer than 200 meters to ranges out to 8 km
- Penetrator energy exceeding 10 MJ at all ranges of interest.



The following technologies are critical to successfully accomplishing the system performance goals and objectives: high-energy density, insensitive propulsion, enhanced lethality and hypervelocity guidance technology, advanced propulsion technology, miniaturization of guidance and control technologies, and qualification of lethality damage mechanisms.

### Robotic Follower ATD

The Robotic Follower ATD will develop, integrate, and demonstrate control and perception technology required to achieve unmanned follower capabilities for future land combat vehicles, e.g., Future Combat Systems (FCS). This technology supports a wide variety of FCS/Future Force unmanned ground vehicles applications such as Ruck Carrier, Supply Platoon, NLOS/ BLOS Fire, and Rear Security. A key tenet for the robustness and speed of the follower systems is the “assistance” of the manned leader (whether an individual soldier or a manned vehicle) providing a high-level proofing of the follower’s path, avoiding areas that would impede or confuse the unmanned followers, which operate with minimal user intervention. This cooperative effort between Tank Automotive Research and Development Center (TARDEC) and Army Research Laboratory (ARL) focuses on a series of demonstrations that successively increases the follower mobility performance and improves the maturity of the software algorithms, soldier/machine interface, and sensor technology for transition to FCS.



### Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)

Research and technology in the areas of C4ISR are designed to enable comprehensive situational awareness for network-centric operations. This technology area includes advanced sensors and sensor processing, intelligence and electronic warfare systems and techniques, militarized and special-purpose electronics, countermine technologies, and C4 system technologies. Following are some of the Army STOs that will enable C4ISR capabilities.

#### Adaptive Joint C4ISR Node (AJCN) Advanced Concept and Technology Demonstration (ACTD)

The AJCN ACTD demonstrates communications relay and signals intelligence/electronic warfare (SIGINT/EW) capability in a multi-functional, modular, scalable, and reconfigurable airborne payload. The ACTD will provide two Army payloads (less than 200 lb) integrated into Hunter-class unmanned aerial vehicles and two payloads integrated into Air Force RC-135/KC-135 aircraft.

The mission payload's primary function is to relay multiple types of communications waveforms. The payload also provides the capability to perform SIGINT, information warfare, and electronic attack missions simultaneously. The AJCN payloads are Joint Tactical Radio System (JTRS) compliant and will host JTRS software waveforms. An equally important product of the ACTD is the development of the concept of opera-

tions and tactics, techniques, and procedures for a multi-function payload and aerial communications relays.

The AJCN ACTD is a joint Army, Air Force, DARPA, and Joint Forces Command (JFCOM) technology program. The Army is the lead service with the Communications Electronics Research Development and Engineering Center as the technology manager. The JFCOM is the operational manager. The ACTD program began in FY03 and will end with a military utility assessment in FY05. Funding for the four mission payloads' "residuals" support is provided through FY07 by the ACTD program.

#### Networked Sensors for the Future Force ATD

The objective of the Networked Sensors for the Future Force ATD is to develop and optimize sensor suites for small unmanned platforms, such as unmanned ground vehicles, small unmanned aerial vehicles, and unattended ground sensors. These sensor suites will incorporate robust (secure, jam-resistant, stealthy, self-organizing, self-healing) communications products.

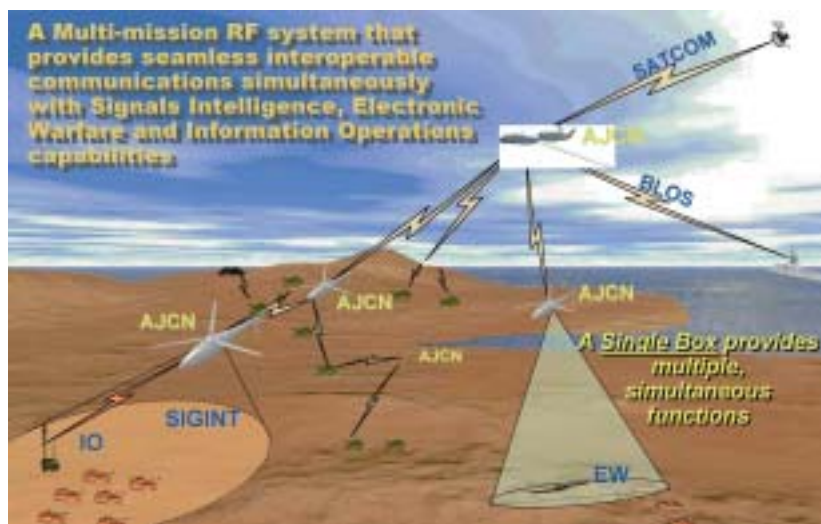
A sensor hub links the networked sensors information to higher echelon communications and provides reachback, command and control, sensor planning, and data management tools. The networked sensors will be developed to operate in complex terrain (including military operations in urban terrain) and demonstrate a system-of-systems capability.

This capability will provide commanders with organic unmanned networked sensors assets to provide beyond line-of-sight (BLOS) situational awareness (SA) picture and targeting information for direct and indirect fire weapons and threat avoidance. The networked sensors will:

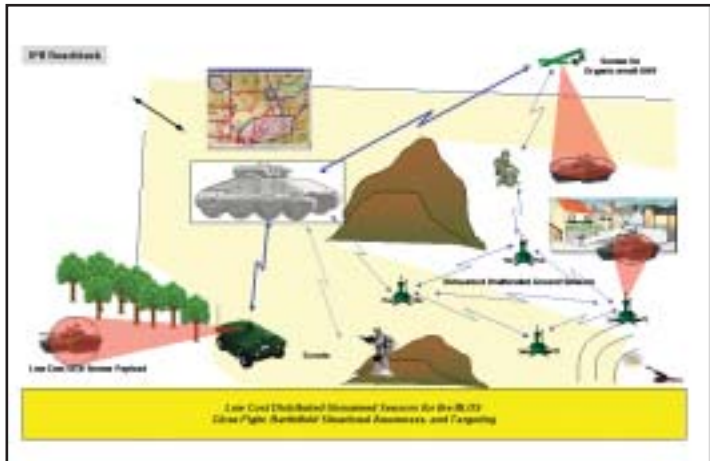
- Provide remote monitoring out to ~10 km without placing soldiers in harm's way
- Increase a unit's area of coverage
- Provide near-real-time BLOS SA data for early warning to speed decision making and reaction time.

Low-cost sensor technology, such as uncooled infrared imaging, flash laser with short-wave infrared focal planes, and acoustic, seismic, and magnetic sensors, will be integrated on small unmanned platforms to demonstrate the day and night capability of these platforms to provide faster target identification and reaction time with reduced false alarms. The use of intelligence reachback and tools to aid in sensor deployment along with smart data management will also be developed.

Mounted and dismounted virtual simulations and live experiments with Training and Doctrine Command (TRADOC) Battlelabs in warfighter operational environments will be used to address hardware and operational integration issues; investigate new



operational concepts, tactics, techniques, and procedures; and validate component and system technology readiness levels.



### Battlespace Terrain Reasoning and Awareness (BTRA)

The BTRA STO seeks to develop a comprehensive suite of physical combat environment decision-support tools that generate the geospatial information necessary to support the decision and execution process across command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems of the Future Force.

This STO will develop technology to improve the current static decision aids by providing dynamic tactical execution aids. These analytical tools will model the inter-relationships of terrain, weather, force/threat behavior, and the influence of dynamic state environment changes. BTRA will ensure that the products of this analysis are “smart, interactive products” and have a content and structure capable of being imported and further evaluated by application-specific decision support tools of other C4ISR systems.

### Geospatial Information Integration and Generation Tools

This STO will deliver tools to integrate, manage, and exploit multi-source imagery, features, and elevation data in order to present only the best set of relevant terrain information. The generation and integration of high-resolution, accurate, timely, multi-source data into lightweight terrain networks are required to make the common relevant operational picture (CROP). The capabilities developed will provide small unit tactical operations with accurate, timely, up-to-date digital terrain information. Geospatial data mining tools will be developed to gather spatial data from

traditional and non-traditional sources and automatically identify relationships and patterns that are not readily apparent to the warfighter. Additionally, software tools will be developed to generate terrain features and attributes from multi-source data in an autonomous or semi-autonomous mode to fill the gap between tactical geospatial information requirements and the strategic/operational information provided by the National Imagery and Mapping Agency (NIMA).

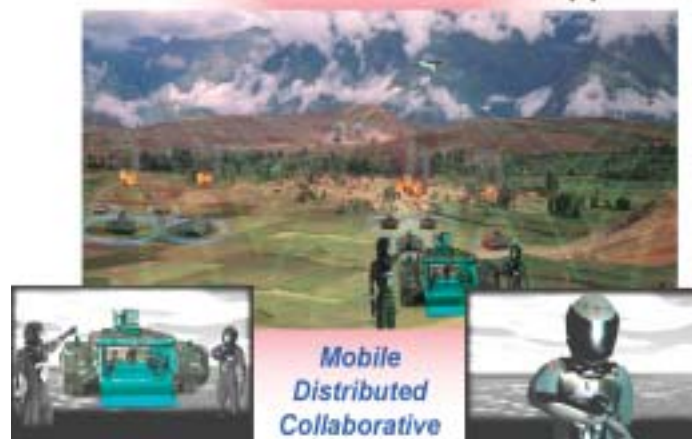
### Agile Commander ATD

The Agile Commander ATD develops software tools that enable faster course of action (COA) development and analysis for all echelons with improved quality and reproducibility. This effort focuses on improving the combat capabilities of the Future Force by providing a framework for both interactive and collaborative planning and execution while on the move. In addition, the Agile Commander ATD provides a capability to rapidly war-game and critique multiple courses of action.

The major products developed under the Agile Commander ATD include:

- The DaVinci (or “distributed analysis and visualization infrastructure for C4I”) tool set. DaVinci is an advanced suite of decision aid software tools that will enable execution-centric, mobile command and control (C2) ground-based operations. In partnership with DARPA PM for FCS C2, the DaVinci was provided as the base tool for the development of the commander’s support environment (CSE).

### Execution-Centric Decision Support





- The Combined Arms Planning and Execution-Monitoring System (CAPES), which was developed and transitioned to PM Army Tactical Command and Control System (ATCCS)/Global Command and Control System (GCCS) in FY02.
- Follow-on software development will provide a fully integrated prototype C2 system linked to netted sensors/fires effects that will be demonstrated in the Command, Control, and Communications (C3) On-the-Move Technology Demonstration. The prototype C2 system will showcase a full spectrum, combined arms capability, rooted in the use of collaborative decision aids supportive of operations on-the-move (OTM).

### C3 OTM Demonstration

The program provides early and continuing demonstrations of enhanced survivability and lethality of FCS platforms through the effective employment of integrated C3 OTM systems supported by ISR assets and networked fires. This effort will leverage and integrate a variety of S&T, PM, and DARPA technology programs into a cohesive, integrated C3 system of systems.

In FY03, the initial demonstrations supported the FCS Milestone B decision by providing an understanding of the technology maturity and payoffs from C3 on-the-move technologies to enable FCS Unit of Action capabilities. These demonstrations integrated real, surrogate, and simulated sensors, along with surrogate FCS communications, and state-of-the-art command and control equipment to provide a baseline assessment of C3 technologies for the FCS and the lead systems integrator (LSI).

In FY04-05, the test bed demonstration will assist the FCS LSI and Unit of Action Battle Lab to evaluate evolving FCS architectures. During these demonstrations, 20 percent of the sensors/systems will be simulated. Throughout the program, functionality and complexity of the C2 systems will be expanded to understand the limits of



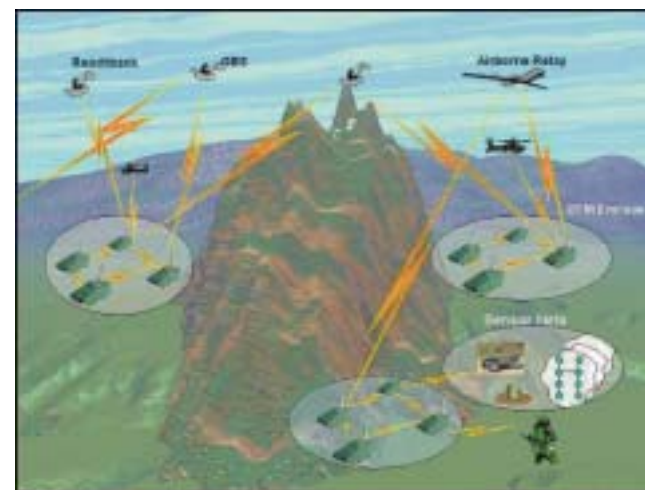
technology as capability is added. These demonstrations also provide operational testing information for tactics, techniques, and procedures (TTPs).

### Multi-Functional OTM Secure Adaptive Integrated Communications (MOSAIC) ATD

The MOSAIC ATD will enable OTM maneuver net communications for the mobile, dispersed battle force in the Future Force/FCS concepts. MOSAIC develops and demonstrates technologies to provide OTM capabilities required by Joint Tactical Radio System (JTRS) and Warfighter Information Network - Tactical (WIN-T) programs for C3 OTM and networking solutions. In turn, MOSAIC provides integrated network solutions for FCS Block I.

This ATD will focus on integrating a highly adaptive communications infrastructure to support the seamless flow of multi-media services across terrestrial and space-based platforms. MOSAIC will leverage leading-edge technologies developed by government and commercial research programs. Its wireless communications architecture will support multimedia applications; quality of service for mobile/multi-hop networks; adaptive and ad-hoc mobility protocols; bandwidth management; and horizontal/vertical handoff in a mobile wireless environment. The MOSAIC ATD will demonstrate:

- Connectivity between 15–20 nodes in a field environment
- Mobile communications that enable commanders to effectively lead during dynamically changing and offensive operations anywhere on the battlefield, whether stationary or OTM, and to maintain situational understanding at all times



- Dynamic, extended range, redundant communications through a network that is:
  - Open, featuring a multi-layered architecture with multiple paths that provides a level of redundancy for assured communications that can be quickly diagnosed and is self-healing
  - Improved, reliable, redundant Non-Line-of-Sight (NLOS) communications to optimize connectivity through automatic link establishment to support operations in varied environments
  - Self-organizing and extendable—seamlessly adds entities to the network.

### Overwatch ACTD

The Overwatch ACTD objective is to mature algorithms and integrate a staring sensor into a packaged system for mounting on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) and an Unmanned Ground Vehicle (UGV) and demonstrate the system's capability to detect, locate, and identify (by type) weapons being fired in real time. The ACTD will demonstrate the capability to detect, classify, and locate small arms, mortars, and rocket-propelled grenades in complex terrain at stand-off ranges to enable rapid, precision engagement of enemy shooters. The sensor package will consist of a fast-framing Midwave Infrared sensor, a Long Wave Infrared imaging sensor, a laser ranger/designator, and an on-board processor. The HMMWV-mounted Battlefield Ordnance Awareness Sensor System will be modular in design to aid in migrating to other platforms.



By the end of FY03, the program had specified and acquired initial system hardware and developed and integrated the real-time system software.

In FY04, the signature databases and classification algorithms will be developed and integrated into a prototype sensor system on the HMMWV and the initial full scale test 1 will be performed.

In FY06, the sensor system will be integrated into the UGV and a major system demonstration will be performed. The final product is a validated system mounted on an HMMWV and a UGV that supports dismounted forces by providing real-time detection, classification, location, and designation of small caliber weapons fire.

### Joint Intelligence, Surveillance, and Reconnaissance (JISR) ACTD

The JISR ACTD is designed to provide timely top-down/bottom-up ISR and operational information for enhanced battlespace visualization for the Central Command's (CENTCOM) early entry force commander. This includes the need to share that picture with joint task force (JTF) and coalition partners. The program's goal is to implement an Internet Web technology-based, system of systems that integrates existing C4ISR sensors and processors to establish a joint tactical sensor grid. This sensor grid will seamlessly integrate with the existing theater command and control, intelligence (C2I) architecture to provide timely and relevant sensor data and other intelligence information to early entry forces and their supporting headquarters.

The JISR sensor grid has four major components:

- "Information Agent" technology to enable smart data and product retrieval across disparate legacy sensors and databases
- Joint Technical Architecture (JTA) standard sensor link protocol (SLP) to plug additional tactical sensors into the grid
- Distributed Geospatial Meta Database Management System to organize, archive, and serve sensor data and other intelligence information to user friendly Web-based visualization tools
- Thin Client Web Browser technology allowing users remote access from any existing joint or combined C2I workstation.

### Counter Terrorism - Cave/Urban Assault ACTD

The Counter Terrorism - Cave/Urban Assault ACTD will demonstrate, with a Special Operations Forces (SOF) sponsor, an optimized suite of prototype lightweight, soldier-borne sensors that provide a decisive overmatch for dismounted assault in restricted/covered environments – caves, tunnels, and urban environments.

Current sensors are too large, too heavy (not soldier-portable), lack the range needed for identification and the sensitivity for operations in “true dark” (interior spaces) and restricted terrain.

The prototype sensor capabilities introduced in the ACTD use micro uncooled infrared (UCIR), short wave infrared (SWIR) imaging, urban unattended ground sensors (UGS), and through-the-wall sensing (TTWS) technologies. The ACTD program also provides TTPs to achieve decisive capabilities in difficult/restricted terrain, day or night. The ACTD is structured in two vignettes, Cave/Tunnel Surveillance and Assault (Operational Demo I) and Urban Assault (Operational Demo II).

In FY03 the ACTD program acquired a sensor suite of approach sensors and cave assault sensors and conducted component performance evaluations to develop initial TTPs. In FY06 the military utility assessment (MUA) will be completed and field residuals will be provided to USASOC to equip two SOF "A Teams" and transition development to designated Special Operations Command (SOCOM) Program Executive Office/Program Manager (PEO/PM) for acquisition. The ACTD program will fund these residuals through FY08.

## Joint Tactical Radio System (JTRS) Squad-Level Communications

This STO will provide multi-band, multi-mode squad-level tactical radio communications as a JTRS Cluster 5 gap-filler for Future Combat System Block I first unit equipped (FUE) limited user test (LUT) in FY07. The STO will ensure that user size, weight and power consumption (SWAP) and unit cost objectives are met, and critical soldier radio wideband networking waveform (WNW) technologies are optimized for transition to the Land Warrior and JTRS Cluster 5 acquisition programs through tech-

nical collaboration with Future Force Warrior ATD. Wideband networking waveform and radio technologies emerging from the DARPA Small Unit Operations Situation Awareness System (SUO SAS) Phase 3 program will be matured to support network-centric operations for the dismounted soldier while mitigating risk for JTRS Cluster 5. This STO will provide squad-level voice and data communications with connectivity to upper echelon C2/maneuver and unattended networks.

In FY00-02, DARPA developed and demonstrated SUO SAS prototype tactical radio communications in laboratory and field environments supported by networking modeling and simulation analysis. In FY03 the Army conducted SUO SAS prototype tactical radio communications performance trade-off and affordability analyses to provide a SWAP-reduced design and develop communications reference architecture to support hardware and software portability to JTRS. The SUO SAS prototypes were included in the C3 OTM demonstration in FY03 to evaluate heterogeneous quality of service in mobile ad-hoc networks.

In FY04-05 the STO program will develop SWAP-reduced scalable (multi-band, multi-channel) radio frequency (RF) front-end and programmable radio modem and link-layer intranet processor WNW hardware and software components with JTRS-compliant application programming interfaces and begin laboratory integration and technical demonstrations of a squad-level tactical radio. In FY05-07, the STO program will integrate WNW with the JTRS platform to demonstrate portability, complete ruggedized Future Force Warrior soldier tactical radio mechanical packaging design, and integrate with Future Force Warrior system for wearable application. Functional prototypes will be provided for the Future Force Warrior ATD operational user demonstrations and support FCS Block I FUE LUT.

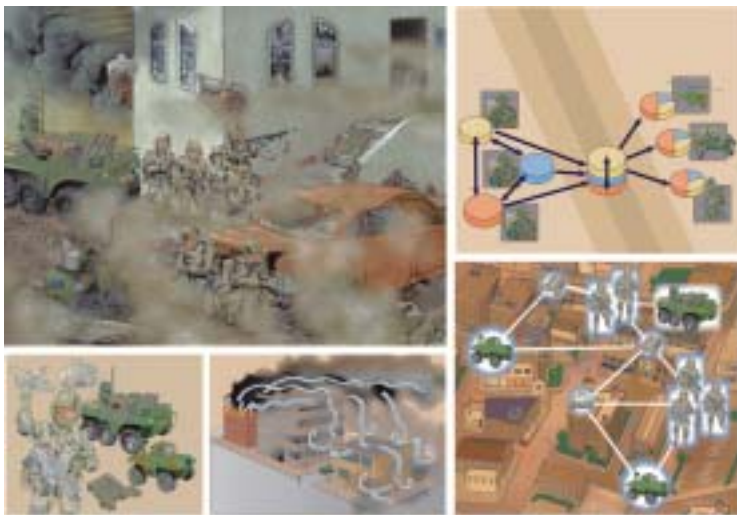




## C2 in Complex and Urban Terrain

The purpose of this STO is to develop a suite of command and control tools for Future Force dismounted and mounted commanders, leaders, and soldiers to employ during close combat in complex and urban terrain. Objectives will include experiments with an ensemble of tactical decision aids, unattended ground sensor clusters, air vehicles, ground robots, and human platforms including their organic sensor assets. These tools will be used to identify and fuse critical decision information day and night in any combat situation. The result will be enhanced survivability and increased combat effectiveness enabled by providing Future Force dismounted/mounted commanders/leaders/soldiers with enhanced collaboration, reachback, autonomous asset management, and seamless situational understanding capabilities.

A modeling and experimentation effort will identify critical information filters for the commander. ARL will develop human performance models to quantify the effects of uncertainty on dynamic decision-making. The work will be a collaborative effort with the Mounted Maneuver Battle Lab - Fort Knox KY; the Dismounted Battlespace Battle Lab - Fort Benning GA; the Battle Command Battle Labs - Forts Leavenworth KS and Huachuca AZ; and the Depth and Simultaneous Attack Battle Lab - Fort Sill OK. A suite of C2 system tools (decision aids to manage cognitive load and uncertainty) for complex/urban terrain will also be demonstrated at these installations.



## Soldier System Technologies

Soldier System technologies enable a paradigm shift in future infantry soldier capabilities including enhanced ballistic protection, clothing and equipment, dismounted warrior C4, compact power and power management, nutritional enhancements, soldier weapons, and warrior technology integration, all at reduced weight.

### Future Force Warrior (FFW) Advanced Technology Demonstration (ATD)

The FFW ATD will demonstrate revolutionary lethality, survivability, and agility for the dismounted soldier and small teams through an integrated system-of-systems approach. The goal is to provide the dismounted soldier the same combat overmatch, skip-a-generation capability that the Future Combat Systems (FCS) brings to the maneuver portion of the Future Force.



FFW will employ open system architectures and high risk/high payoff technologies to yield a lightweight, multi-threat, protective combat suite integrated with multi-function sensors, weapons, and medical capabilities. The soldier system of systems will allow the soldier to operate for extended periods under arduous conditions, with minimal loss in physical capabilities from fatigue, stress, and hardship. A network-centric communications/sensor/power suite will provide connectivity with other dismounted personnel, unmanned air/ground platforms, and FCS to form adaptive, distributed sensor networks for better situational understanding of

local environments and threats. FFW connectivity will enable the soldier and small teams to network and mass fires, and generally access the power of the Future Force.

Key performance goals include: 50 lb maximum fighting load per warfighter; 24-hour individual and 72-hour autonomous team operations; full networked communications; and compatibility with Warfighter Information Network-Tactical (WIN-T)/Joint Tactical Radio System (JTRS). A competitive concept exploration phase is being followed by design and demonstration phases to provide integrated system-of-systems soldier demonstrators for FY07 field experiments and demos. Concurrent maturation of technologies will be performed to ensure system-of-system affordability, with reduced sustainment costs.

### Portable and Mobile Power

This STO develops, demonstrates, and transitions component power technologies leading to higher energy, lighter weight, quiet, and more fuel-and cost-efficient power sources, generators, silent mobile power sources, chargers, and power management systems. This effort will provide technology advancements leading to:

- Fuel-efficient, quiet, tactical, mobile power generation and silent watch for mobile platforms
- Smart rapid field chargers for recharging higher energy density batteries
- Portable hybrid power sources
- Power management for soldier systems.

Specific power solutions and goals will include component-level development of high-energy-density hybrid power sources that provide at least 50 percent power reduction through the operating system level of Land Warrior. Specific mobile power solutions will include development of logistic fuel cell components for a 1–2 kW mobile power source for scout vehicle silent watch.

This effort will also mature and test advanced catalytic ignition technology, control electronics, and lightweight composites to provide for 10 kW power generators with reduced fuel consumption and 50 percent less volume and size.

### Rotorcraft

Rotorcraft research and technology is designed to enhance the performance and effectiveness of future rotorcraft, including rotors and structures, propulsion and drive systems, avionics and weapons, and human systems integration (e.g., crew station) technologies. The Army has reoriented the Aviation S&T strategy to focus on unmanned aerial vehicles (UAV) to support FCS (dominant situational awareness and

UAV). The strategy seeks creative and innovative approaches to integrate technological advances in aeronautics as well as mission equipment for UAVs. This approach focuses on advances that are achievable by designing the UAV systems from the ground up, without the limitations that a manned platform imposes and that takes advantage of the warfighting synergy gained when manned and unmanned systems combine to accomplish a common objective.

The strategy also takes advantage of not having a “man in the cockpit” and the unique ability of the UAV to accomplish “dull, dirty, and dangerous” missions. The intent of the Army strategy is to conduct research to mature technologies that result in UAV products that represent leap-ahead capability for the warfighter and are technically ready to transition to production. Following are some of the Army Science and Technology Objectives (STOs) that will enable rotorcraft capabilities.

### Hunter Standoff Killer Team (HSKT) ACTD

HSKT ACTD (FY01-FY06) will demonstrate advanced precision targeting, manned and unmanned vehicle teaming, and battlefield cognitive decision aiding. These advanced warfighting capabilities will be integrated from mature technologies. The elements will be linked with other service assets as part of a joint maneuver task force to show the utility of teamed airborne reconnaissance, surveillance, targeting, and attack operations in a joint environment. The HSKT ACTD will also demonstrate the tactics, techniques, and procedures (TTPs) and concept of operations (CONOPS) while conducting a joint military utility assessment (JMUA). The combatant commander sponsor for this ACTD is Pacific Command (PACOM)/US Forces Korea (USFK).



The HSKT will improve the ability to mass fires and effects while increasing force effectiveness in lethality, survivability, and operational tempo. HSKT will also improve intelligence and battle command situational awareness. This ACTD enables Future Force lethality capabilities by integrating and demonstrating the following technologies and tools:

- Cognitive Decision Aiding (CDA)
- Teaming UAVs with AH-64D Longbow Apaches and the Army Airborne Command and Control UH-60 Black Hawk (manned/unmanned teaming will allow the AH-64D Longbow Apache to use UAVs as wingmen, extend shooter eyes-on-target, increase situational awareness within current cockpit workload, and produce a more lethal, survivable, and responsive manned platform.)
- Precision targeting sensor on UAVs
- Upgraded accuracy of Joint Standoff Weapons (JSOW) engagements from Navy F/A-18
- Exploitation of overhead theater surveillance assets.

### A-160 Hummingbird

The A-160 Hummingbird, a DARPA/ARMY STO, is a rotary-wing UAV. Performance goals include 2500 nautical mile range; 40 hours endurance; 30,000 ft ceiling; and out-of-ground-effect (OGE) hover performance of 15,000 ft. The vehicle is designed as either an extended range, multi-purpose or medium altitude, long endurance UAV to support the Future Force units in primarily a C4ISR role. Other roles include tactical deployment of unattended ground sensors (UGSs), UGVs, and micro air vehicles (MAVs).

The A-160 relies on numerous advancements in technologies to achieve these unprecedented characteristics. First is a patented optimum speed rotor (OSR) control that allows the rotor to operate over a wide range of operating speeds. OSR allows the A-160 to operate at an optimum lift over drag (L/D) point for the specific flight conditions using high L/D airfoils. To allow the rotor to operate over this wide range, it needs to be very stiff and light. The rotor blades are composed of graphite fiber composites that satisfy both requirements. Second, the hingeless rigid main rotor system allows the vehicle to be very responsive, and combined with high speed electrical actuators, allows for precision control, higher harmonic control, and improved performance in gusty conditions. Third, the A-160 has a high fuel fraction and an efficient power plant.

Designed payload weight will be a minimum of 300 lb, which can be significantly increased by sacrificing range and endurance. Current maximum payload is 1,000 lb. Projected aircraft-integrated payloads include electro-optic/infrared (EO/IR) surveillance systems, laser rangefinder/designators, synthetic aperture radar, ground

moving target indicator radar, foliage penetration radar, electronic intelligence (ELINT) systems, communications network relays, net-centric communication nodes, satellite communication links, and electronic countermeasures payloads. Many payloads will give a maneuver commander added situational awareness and increased situational understanding. There are also numerous payloads for remote delivery to include unmanned sensors and tactical resupply.

The A-160 Hummingbird is being developed by Frontier Systems, Inc., located in Irvine, CA.

### Unmanned Combat Armed Rotorcraft (UCAR)

A highlight of the Army UAV S&T strategy is the on-going collaborative effort between the Army and DARPA on the A-160 Hummingbird and the Unmanned Combat Armed Rotorcraft (UCAR).

The UCAR program is a four-phase, eight-year program to design, mature, and demonstrate a vertical takeoff and landing, armed and lethal, unmanned rotorcraft for the Future Force. UCAR will be designed for survivability, with optimal mobility and agility, and capable of going deep into the battlespace and performing attack and armed reconnaissance missions. UCAR will have the ability to function autonomously or as part of a manned/unmanned team with other Future Force Systems, such as FCS. UCAR will enable the soldier of the Future Force to See First, Understand First, and Act First while remaining out of harm's way.

The UCAR program was initiated in FY02 with an Army-DARPA Memorandum of Agreement. The program is currently in Phase I (concept development and system trades) with four contractor teams: Sikorsky/Raytheon; Northrop Grumman; Lockheed Martin/Bell; and Boeing. In mid-year FY03, Phase I was complete, and with Army-DARPA approval, the program will proceed into Phase II (preliminary design) with two contractor teams.





### Medical

Biomedical research and technology provide new opportunities to protect and treat warfighters to ensure worldwide deployability, increase warfighter availability, and reduce casualties and loss of life. Research efforts are managed by the US Army Medical Research and Materiel Command (USAMRMC), and include Army and Department of Defense (DoD)-funded programs for which the Army is executive or DoD lead agent. Health hazards addressed include endemic infectious diseases (i.e., diseases naturally common to a specific geographic area), chemical and biological warfare agents, environmental injuries, operational stress, and trauma resulting from enemy weapons. The major goals of the Army biomedical science and technology program are to provide technologies in the following three investment areas:

- Combat casualty care (prevent and treat casualties under field conditions)
- Infectious diseases (prevent or treat illness and injury)
- Military operational medicine (sustain optimum military effectiveness).

The primary goal is for medical, chemical, and biological defense S&T development research leading to the identification and characterization of medical countermeasures that have the potential to protect and sustain the joint service warfighter force in a chemical and/or biological warfare environment. Following are some of the Army STOs and other efforts that will enable new force health protection and combat health support technologies.

### Combat Casualty Care

#### Field Medical Monitoring and Therapeutic Devices for Casualty Care STO

The Army is developing smaller and lighter diagnostic life support and surgical systems that are compatible with far-forward field operations, in which factors such as high noise, vibration, dirt, moisture, and electromagnetic interference can render many medical devices unusable. These systems will fill a current gap in far-forward treatment capability and enable effective casualty care to be provided in the logistically constrained, highly mobile battlefield of the Future Force. Systems being developed include a two-person portable stretcher system for medical evacuation that integrates improved technologies in power, patient monitoring, and delivery of medication and oxygen.

Other efforts will exploit micro-impulse radar patient-monitoring for medic use, and will use ceramic oxygen-generator technology to provide medical grade oxygen and eliminate logistically burdensome compressed gas cylinders. Other efforts focus on enhancing the current military field anesthesia delivery system to provide repro-

ducible drug delivery and greater patient safety and achieve US Food and Drug Administration (FDA) approval of the system. The latter will enable peacetime training and use of the device. Together, these systems will enhance the capability of medics and far-forward surgeons to initiate and sustain essential critical care at the front lines and during evacuation.

### Hemorrhage Control STO

Army medical researchers are working on a variety of products that can save lives by quickly stopping blood loss from severe battlefield wounds. Excessive bleeding is the most common cause of death for wounded soldiers. Even in hospitals, the major causes of early death among those who die of wounds are central nervous system injury and uncontrolled bleeding. The Army is pursuing drugs, devices, and techniques that slow or control bleeding and are usable far forward on the battlefield, since these have the greatest potential to save lives.

Two varieties of hemostatic bandages are currently under investigation. Designed to stem blood flow at the point of wounding, these bandages can be applied immediately and provide the soldier with an increased capability to stop bleeding.



Fibrin Dressing



Chitosan Dressing

Army researchers have worked in coordination with Israeli investigators to explore the use of recombinant-activated human clotting factor VII (rFVIIa) in stopping internal bleeding. The protein rFVIIa binds to injured tissue and stimulates blood clot formation in the vicinity of the injury. The protein has been used successfully to treat bleeding episodes in hemophiliacs. Army medical researchers are also developing expandable foams derived from fibrinogen, a protein involved in human blood clotting that is converted into fibrin, the major constituent of clots. These foams could be injected as a liquid into an inaccessible deep-cavity wound of a casualty (e.g., chest, abdomen), where they would be activated and expand to contact injured internal organs and control bleeding. High Intensity Focused Ultrasound (HIFU) is the third method being explored to stop internal bleeding. It uses ultrasound to locate the

point of bleeding and then focuses a high-energy ultrasound beam on that point which cauterizes the bleeding vessel.

### Soft Tissue Trauma Care STO

The Army is evaluating methods to effectively treat soft-tissue (flesh) injuries on the battlefield. New spray-on, flexible wound dressings provide pain relief, anti-infective protection, and auto-cleaning of wounds, while also providing protection from further battlefield contamination. These dressings will preclude further and secondary tissue injury or damage and may allow wounded soldiers to either continue operating, or will at least minimize their care requirements pending evacuation. Other devices include a new, servo-controlled tourniquet for potential incorporation into advanced combat uniforms and a lightweight system for wound cleaning and removal of dead tissue from the wound.

### Battlefield Treatment of Fractures STO

The Army is evaluating methods of effectively treating bone fractures that occur on the battlefield. New lightweight splint materials that can be effectively applied by the combat medic may, for upper extremity fractures, permit limited or full battlefield functionality of injured warfighters. For lower extremity fractures, these materials may permit sufficient mobility to reduce the number of unit personnel required to move the casualty pending battlefield evacuation. Other devices include new pins for surgical stabilization of fractures that incorporate anti-infectives to prevent subsequent bone infection, and new bone replacement material for surgical repair of bone injuries that incorporates anti-infectives to prevent subsequent infection complications.

### Blood Products STO

The Army seeks to develop freeze-dried plasma for use in treating bleeding in combat casualties. Current supplies of plasma must be refrigerated and are logistically demanding for use on the battlefield. Successful development and licensing of freeze-dried plasma will make plasma available as a lightweight powder that can be reconstituted when needed. No special storage will be required and shelf-life will be much longer. This STO also seeks a new method to rapidly sterilize blood products. This will allow medical treatment facilities to remove blood from one soldier, sterilize it, and then put it immediately into another soldier without the worry of spreading infections such as HIV.

### Warfighter Physiological Status Monitor (WPSM)

The proposed warfighter system will provide remote situational awareness information to warfighters and warrior medics. The WPSM will monitor soldier hydration status, internal temperature, and sleep status. It will also detect ballistic impacts

on the soldier and the presence of a pulse and respiration. The final deliverable will be an integrated warfighter-worn prototype compatible with the Land Warrior and Future Force Warrior battlefield ensembles. The information provided from each soldier will enable medical and tactical decision-making at a distance. This will allow the warfighter to maintain readiness through preventive health interventions (e.g. warning that a certain soldier is close to becoming a heat casualty or so tired that he can't think straight) and the warrior medic to direct his resources (time, equipment, supplies) to the casualties that will most benefit (triage).



### Military Operational Medicine Research Program

The Military Operational Medicine Research program provides biomedical "skin-in" solutions that protect soldiers and enhance their performance in the face of multiple stressors in operational and training environments. It is a unique biomedical research program with relevant core capabilities, a problem-solving orientation, and a human physiology research focus. The program's biomedical research products have diverse applications that transition to Army planners, doctrine and materiel developers, and the Army medical community. These products also find service-specific applications elsewhere in DoD. The program's research products include physiological response and injury prediction tools, biomedically-based equipment design guidelines, behavioral models and mental status assessment measurement techniques, and weapon system health hazard assessment methods.

### **Optimization of Visual Performance with Optical and Electro-Optical Systems and Materials STO**

The Army equips soldiers with advanced imaging and display systems to solve many problems on the battlefield, including operations in smoke, fog, and low light. If these systems are not designed to match human vision capabilities, they will be ineffective and mission success may be jeopardized. This research effort will provide biomedically-based design guidelines and test methods for imaging and display systems to enable the development of effective systems that are compatible with human visual performance capabilities.

### **Rapid Analysis of Food and Water for Chemical and Microbial Contaminants STO**

Current field drinking water testing procedures take a minimum of 24 hours to complete, require a long logistics tail to support, and provide limited information on the myriad chemical and microbial contaminants that can seriously degrade the medical readiness of soldiers. This research integrates existing technologies with novel gene amplification detection techniques to produce an easy-to-use field test kit capable of rapidly detecting bacterial and chemical contamination in drinking water and food. The test provides results within four hours and requires a minimal logistics tail for support.

### **Head-Supported Mass (HSM) - Warfighter Health and Performance STO**

Head-supported devices (HSDs), such as protective helmets and weapon sighting and communication systems, are critical components of combat systems; however, HSDs increase the weight supported by the head and neck and may place soldiers at risk of degraded performance or neck injury. System developers and health hazard assessors lack biomedically-based design guidelines and health hazard assessment methods to support the development of effective HSDs that won't degrade performance or injure soldiers. This research effort will use epidemiological studies, biomechanics and injury studies with human cadavers and manikins, and advanced biofidelic neck models to develop and validate neck injury criteria. The research products will include biomedically based HSD design guidelines for system developers and a health hazard assessment method for HSDs.

### **Body Armor Blunt Trauma Assessment STO**

Soldiers need effective and lightweight body armor, but future body armor systems made with effective, lightweight ballistic materials are likely to fail the current, overly conservative body armor performance standard for blunt trauma protection. This research effort employs novel force characterization techniques, advanced human

and animal finite element models, and animal injury validation studies to correlate measured forces behind body armor to blunt trauma injury. The research product will be a biomedically valid, user-friendly, and cost-effective body armor blunt trauma performance standard and testing method for body armor developers.

### **Medical Countermeasures for Laser Eye Injury STO**

The human eye is extremely vulnerable to the directed energy from military lasers. In an instant, and without warning, temporary or permanent visual impairment can be produced at tactical ranges and beyond. In the absence of proven medical countermeasures, the threat of visual impairment can seriously degrade force effectiveness. The Army needs effective diagnostic tools and treatments to rapidly evaluate and treat laser eye injuries on the battlefield to mitigate long-term damage, and laser eye exposure limits to guide the development of advanced laser systems that pose reduced risks of injury to soldiers who use them. This research will produce exposure limits for a new generation of frequency-agile laser systems, and a laser eye injury field therapy kit containing comprehensive laser eye injury diagnostic tools and advanced genomic and proteomic derived treatment strategies to enable combat medics to rapidly diagnose and treat laser eye injuries on the battlefield.

### **High-Altitude Warfighter Readiness Strategies (HWRS) STO**

The Future Force must be able to rapidly deploy and effectively fight in any environment, including high altitude environments; however, rapid deployment of unacclimatized troops to high altitudes can cause debilitating effects on performance and health. Current acclimatization techniques can take 6-14 days of continuous exposure to high altitude, and available medications that reduce acute mountain sickness (AMS) also impair work performance and have other adverse effects. This research will use advances in the understanding of altitude acclimatization and AMS pathophysiology to develop strategies to protect and sustain soldier performance and decrease AMS susceptibility during rapid deployments to altitude. The research products will include specifications for performance enhancing nutritional supplements for high-altitude rations; procedures to induce and time-compress altitude acclimatization prior to deployment; prediction models of military work performance and altitude illness; and a decision aid to plan and manage unit task performance, altitude illness, and logistical needs.

### **Infectious Disease Research**

The Military Infectious Diseases Research program is an Army-funded and directed program that involves Army and Navy scientists deployed in a worldwide Army-Navy network of laboratories and field sites in the United States and overseas. The program focuses on developing drugs, vaccines, and vector-control products to prevent the operational impact of endemic infectious diseases in the battle area, the most



common cause of military casualties during combat deployments. Recent emphasis is on developing diagnostic devices to assist the field medic in evaluation, management, and other decision-making relative to infected warfighters.

### **An Intravenous Drug to Treat Severe and Complicated Malaria Caused by Multi-Drug-Resistant Malaria**

This STO addresses a need for a new intravenous drug to treat severe and complicated malaria caused by multi-drug-resistant malaria parasites. The STO will demonstrate efficacy and safety sufficient to obtain FDA approval for human studies and warrant transition of the candidate drug to advanced development.

### **Anti-Malarial Drug Discovery**

The feasibility of using genomic approaches, such as DNA microarray technology, to identify a new malarial parasite target will be explored. Targets will be used to develop assays for drug discovery. The goal is to identify two new unknown targets and two drugs for each target to carry on to development for either treatment and/or prophylaxis of malaria.

### **Congressionally Directed Medical Research Programs**

The USAMRMC Office of Congressionally Directed Medical Research Programs (CDMRP) manages targeted biomedical research programs mandated by Congress. The mission of the CDMRP is to provide hope by promoting innovative research, recognizing untapped opportunities, creating partnerships, and guarding the public trust in these target areas. Although not all of these programs have direct war-zone relevance, the potential benefits of the research realized by the civilian population will extend to warfighters and their dependents. Since its inception in FY92, the CDMRP has managed approximately \$2.3 billion to support peer-reviewed research, spanning 26 programs. The five core programs managed by the CDMRP focus on breast, prostate, and ovarian cancer, neurofibromatosis, and military health. More than 4,180 contracts and grants have been awarded and are managed by the CDMRP. The USAMRMC will continue to manage peer-reviewed research programs in its five core programs and other areas as specified by Congress.

## **Lethality**

FCS and the Future Force will require a complementary mix of weapon systems to accomplish the flexible, layered lethality necessary for the full range of missions. The focus of the weapon systems development programs is to provide overwhelming lethality for line-of-sight (LOS), non-line-of-sight (NLOS), and beyond-line-of-sight (BLOS) with enhanced precision. Not only will these systems contribute to survivability of the FCS forces, but they will also reduce the sustainment requirements associated with delivering vast quantities of ammunition, missiles, or mortars to the battlefield. The following programs are key technologies in this area and the associated area of target detection/identification/designation.



### **Objective NLOS-M Cannon Technology**

This is a breech-loading mortar armament system that provides improved maximum rate of fire and improved sustained rate of fire in a lightweight 120mm mortar system. The program will demonstrate a breech-loaded mortar system able to receive digital threat information and engage targets out to 8 km.

### **Solid State Laser (SSL) STO**

In FY01, the Army resumed investments in high energy laser (HEL) technologies to support advanced weapon technology development efforts for the Future Force. The Army S&T budget for HEL technology is supporting the development and demonstration of a high-average power (15–25 kilowatt) SSL laboratory breadboard by FY04. In FY04, the Army will evaluate the SSL concept against competing

SSL efforts being supported by the High Energy Laser Joint Technology Office (HEL-JTO) High-Power Solid-State Laser program. The most promising technology will then be upgraded into a 100 kw SSL laboratory device, scheduled for completion in FY07.

This STO addresses related technical issues such as high average power output from compact and more efficient lasers; precision optical pointing and tracking; laser fluence degradation due to atmospheric effects; lethality; and effectiveness against low-cost laser countermeasures. To date, the Army has demonstrated the nation's highest average power, solid-state, flash-lamp pumped laser (10 kW) as part of the SSL STO. The characteristics of SSL technology—such as efficient, all-electric operation, light-weight and compact packaging, and good beam propagation—show promise for deployment on a small, mobile weapon platform as an element in the FCS. The SSL STO is leveraging technological development and lessons learned from other on-going laser programs, such as the Department of Energy National Ignition Facility, the combined US/Israeli Tactical High Energy Laser Advanced Concept Technology Demonstration, the US Air Force Airborne Laser program, and efforts supported by the DoD HEL JTO.

### Micro Electro-Mechanical Systems (MEMS), Inertial Measurement Unit (IMU) STO

The Army is using MEMS technology to develop affordable, precision guidance systems for missiles and munitions. The low-cost, high gravity (high-G), MEMS IMU program is developing small, reliable MEMS-based IMUs and inertial navigation systems (INS) in order to address the Army's concern over the high cost of traditional IMU systems, such as spinning mass, ring laser, and fiber-optic gyroscope-based systems. Army/Navy guided munitions and missiles require improvements in fire support (FS) capabilities for both close range and over-the-horizon missions. All extended range munitions require an inertial navigation system to achieve the required delivery accuracy.

A critical component of this system is the IMU. Today the IMU is costly and cannot survive the high-G setback acceleration experienced by projectiles; it cannot provide

tactical accuracies; and it cannot be produced in quantity. Accordingly, the Army is focusing on development of a common MEMS-configured IMU product. Although the specific application requirement varies among munitions, which need high-G capability, and missiles, which need high accuracy, the same processing and manufacturing technologies are necessary for high-yield, low-cost MEMS devices for both weapon systems.

These MEMS-based guidance systems will enable the development of faster, smaller, lighter, lower cost, and more precise munitions and missiles. MEMS technology also provides inherent cost savings and size reduction, making it ideal for application to navigation and control systems for small missiles and munitions and other applications. In addition to the size and weight savings, the new MEMS IMUs are being designed to meet the requirements for more than 90 percent of the DoD tactical weapons; therefore, economies of scale in production will also result in major cost savings for DoD.

### Logistics Reduction

Logistics reduction technologies enhance deployability and reduce logistics demand. Examples include precision roll-on/roll-off air delivery, technologies for airfields and pavements to support force projection, and 21st century trucks and robotics to support resupply and demand for food, fuel, and water. For convenience, environmental programs managed by the US Army Corps of Engineers are also included in this section. Following are some of the Army programs and STOs that will enable logistics reduction and environmental technologies.

### Joint Rapid Airfield Construction (JRAC) STO

This STO will produce engineering tools that will vastly improve the military's capability to rapidly construct contingency airfields in the theater of operations. The primary objectives of this program are to:

- Integrate advanced terrain analysis technologies and performance prediction modeling to optimize contingency airfield site selection
- Exploit advanced construction technologies to enhance airfield construction productivity
- Utilize emerging commercial soil stabilization technologies to rapidly provide contingency airfield surfaces capable of sustaining mission operations.

Rapid deployment of the Future Force will require airfields in theater to sustain intense aircraft traffic associated with the stability and support operations and small-scale conflict scenarios. In many force projection operations, in theater airfields are either nonexistent or severely deteriorated. Currently, light and medium military engi-



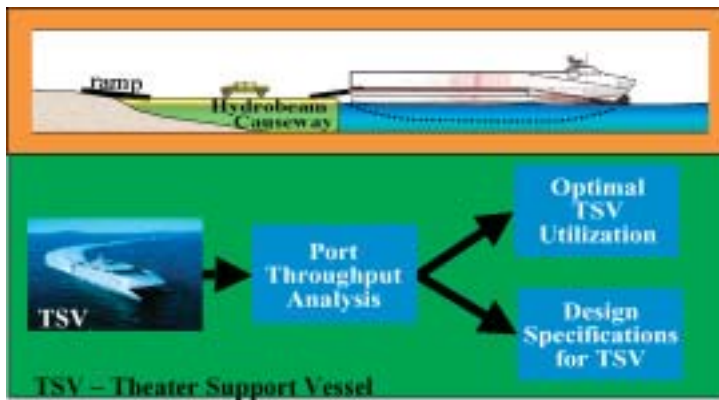
neer units do not have the capability to rapidly upgrade existing airfields or to construct contingency airfields to support Future Force mission requirements.

The objectives of this STO will bring together technologies that will assist the Interim and Future Forces in achieving optimal force projection throughput. This effort will create a rapid and effective site selection process, enhance construction productivity by 30 percent using computer assisted methods, and develop innovative stabilization techniques that will reduce required additive amounts by 50 percent and improve material cure times by as much as 96 percent.

### Rapid Port Enhancement for the Theater Support Vessel (TSV) STO

This STO will develop rapidly installed causeways for offloading TSVs at small ports, utilizing high strength fabric technologies. The program also will develop objective tools for evaluating existing port throughput capacity, port upgrade potential, and potential power projection throughput.

The product of this STO will be a TSV-transportable causeway system that will build upon technologies produced by the Enhanced Coastal Mobility and Sea-State Mitigation ATD. This work will lead to a dramatic increase in the ability of the TSVs to accomplish required discharge rates, even in locations where the port infrastructure is extremely limited. Analytical tools will also be developed for identifying potential bottlenecks and predicting TSV throughput at small ports.



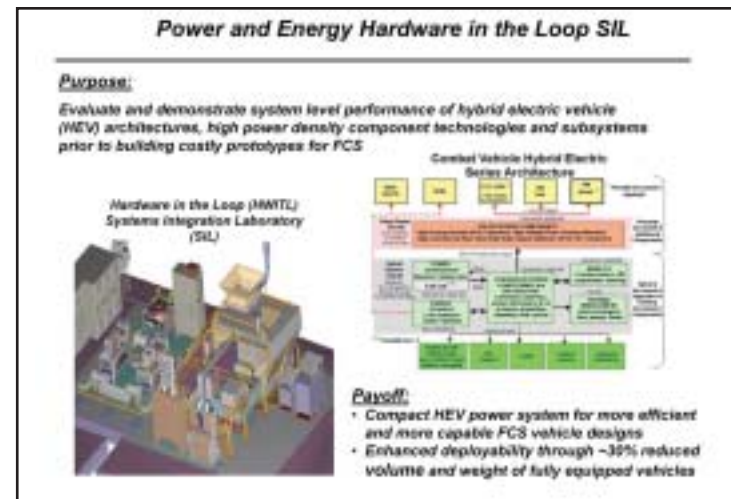
In FY04, an analytical modeling capability to predict causeway motions/responses will be developed and technologies for continued development and demonstration of the causeway system will be evaluated and down-selected. By FY06, modeling and simulation tools for bottleneck identification and prediction of TSV throughput

capabilities at small ports will be completed and validated and a rapidly installed lightweight causeway system will be transitioned to system development and demonstration.

### Power and Energy Hardware-in-the-Loop Systems Integration Laboratory (P&E SIL)

The Power and Energy Hardware-in-the-Loop Systems Integration Laboratory (P&E SIL) provides a cost-effective, enhanced development environment for evaluating and demonstrating performance of the enhanced technologies for a compact, reduced weight hybrid electric (HE) power system for FCS-class ground vehicles. The program utilizes, leverages, and enhances the SIL developed under the Combat Hybrid Power Systems program to develop, characterize, and demonstrate advanced architectures, system controls, power and energy generation, intelligent management and compact components, and subsystems through TRL 5. The P&E SIL environment provides system reconfiguration capability to evaluate variable bus voltages, component upgrades, and multiple controls in a highly instrumented laboratory. The P&E SIL will be used to iteratively evolve the vehicle design and configuration of FCS Increment I and II HE propulsion systems.

Compact, lightweight HE continuous and pulse power subsystems will be matured for FCS ground vehicles. CHPS set modules and ARL power budget tools will be utilized in development of a real-time power and energy (P&E) system of systems modeling and simulation tool.





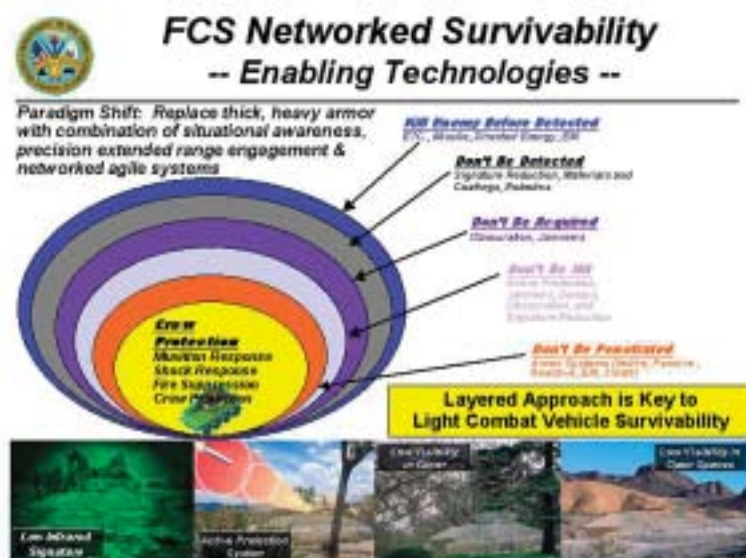
## Survivability

In FCS, the traditional notion that survivability equates to heavily armored vehicles is no longer valid. Survivability of the force and of individual platforms will be achieved with many layers of protection. The basic notion behind this concept is to “See First, Understand First, Act First and Finish Decisively.”

For FCS to be significantly more deployable and sustainable than current heavy forces, much lighter ground platforms will be needed. While survivability in FCS will be enhanced significantly through superior situational awareness and remote fires, the challenge for S&T is to provide sufficient platform protection for soldiers to perform their missions with confidence while keeping the systems light and agile. Following are some of the Army STOs that will enable survivability technologies.

### Integrated Survivability (IS) ATD

The FCS Ground Combat Vehicle IS ATD matures, integrates, and demonstrates selected survivability technologies from several different research, development, and engineering centers (RDEC's) and the Army Research Laboratory (ARL) to address FCS platform threats.



Technologies include: passive/active threat sensors; electronic warfare (EW) countermeasures; chemical energy/kinetic energy (CE/KE) active protection; advanced

armors; signature management (SM) (testing of treated SM armor panels only); decision control hardware and software; vehicle interface provisions; and soldier/machine interface provisions. This program identifies and addresses the integration issues associated with upgrading FCS baseline survivability capabilities to meet FCS objective system survivability requirements, while maturing individual technologies for direct transition to the FCS SDD program. This ATD will also characterize responsiveness, repairability and durability of armor modules, and maintainability and transportability of the survivability suite.

### FCS Mine Detection and Neutralization

The FCS mine detection and neutralization effort will enhance warfighter operational tempo (rates of advance) during route clearance and mine avoidance missions, increase vehicle survivability, and enhance soldier survivability. The objective of this effort is to investigate, develop, and evaluate forward-looking sensor technologies, signal processing techniques, and mine neutralization techniques applicable to detecting and neutralizing on/off-route surface and buried anti-tank mines. Forward-looking mine detection goals involve detecting and locating mines at distances of 10–30 meters in front of the host vehicle, at speeds of 15–20 kph. Mine neutralization goals include the following:

- Probability of kill: 90–95 percent
- Standoff: 10–50 meters
- Rate of advance: 10–20 kph with low-order detonation.



FCS mine detection and neutralization will be designed as a modular system for bolt-on integration onto FCS vehicle platforms, avoiding the need for specialized overpass vehicles and following confirmation sensors. This program also will pay particular attention to total life cycle costs, sustainability, and maintainability. Sensor and neutralization technology will transition to advanced development and insertion into demonstration and acquisition programs. The program supports FCS, the Mounted Battle Lab, the Maneuver Support Battle Lab, and the Engineer School and Center.

## Personnel

Personnel technologies include advanced training tools and methods to enhance warfighter and commander abilities and performance; advanced human engineering concepts to ensure human system physical compatibility; and cognitive engineering concepts to avoid information overload and optimize task allocation to enhance warfighting effectiveness. Following are some of the Army STOs that will enable personnel technologies.

### Methods and Measures of Commander-Centric Training STO

This STO will develop and assess training methods for Future Force commanders and operators and formulate principles of effective training and measurement in the Army's future environment. This STO will provide changes in unit behavior associated with digitization, identify key skills for digital system operators, identify key commander and operator skills, and develop measures of performance with defined levels of proficiency.

It will also describe requirements for automated measurement tools in realistic, simulated environments; employ controlled research environments for assessing training methods; and formulate and assess training principles for key command, control, communications, computers, intelligence, surveillance, and reconnaissance skills to provide to materiel, training, doctrine, and training device developers.

### Selection, Classification, and Performance Metrics for the Future Force STO

This STO will develop and test methods for identifying knowledge, skills, and attributes needed for effective future performance and for validating predictor measures needed for selecting and classifying soldiers in 2008 and beyond.

This STO will identify common demands for future Army initial-entry jobs, identify selected future demands for two job groups, and identify the knowledge, skills, and attributes needed to effectively perform future jobs in these groups. The

knowledge, skills, and attributes will include those linked to Army-wide demands as well as those unique to these groupings. The STO will develop predictors and measures of future performance, then link predictors and performance measures to provide recommendations for future enlisted selection and classification.

### Embedded Combined Arms Team Training and Mission Rehearsal

The goal of embedded training research is to develop simulation technology that will be embedded within Future Force systems to provide training and mission rehearsal capabilities that are available anytime, anywhere. Research is being conducted to support embedded training for both mounted and dismounted warfighters. Embedded training will provide individuals, crews, and leaders with realistic training, skill development, and mission rehearsal capabilities that will be an integral part of their Future Combat Systems and Future Force Warrior systems. When fielded, it will permit soldiers to train with their "go to war equipment" anytime, anywhere.

Embedded training will integrate constructive and virtual simulations with actual warfighter machine interfaces, creating an "on-board" environment that will allow individuals and crews to use sensors, displays, and controls to interact with virtual terrain and computer-generated forces. The research will also explore the feasibility of using tactical C4ISR network and communications systems for net-based embedded training.



### Advanced Simulation

Advanced Simulation tools provide increasingly realistic environments and systems to support acquisition, requirements, and training. This includes technologies for networked simulations, embedded training, constructive simulations, virtual environments, and range systems for live use.

Following is one of the Army STOs that will enable Advanced Simulation leading to immersive virtual training.

### Modeling Architecture for Technology, Research and Experimentation (MATREX) STO

The Army's ability to examine the questions related to Army transformation is limited by: (1) the lack of interoperability between key DoD simulations; (2) inconsistent data and algorithm representations in Army simulations; and (3) modeling and simulation (M&S) expertise that is geographically distributed, thus difficult and costly to bring together for simulation needs throughout the acquisition process. This STO will evolve a component-based architecture to address fundamental deficiencies in the integration of current simulation systems. It will also develop new techniques to support high fidelity, distributed, and secure wide-area networked simulation that includes Army, other services, and industry.

### Institute for Creative Technologies (ICT)

The ICT at the University of Southern California is an innovative partnership with the private sector to exploit advances in the entertainment and game industries to achieve unprecedented realism in Army training. It is a Department of the Army-sponsored, university-affiliated center for research, application, and education in M&S technologies. Advances in M&S will revolutionize how the Army develops doctrine and requirements, designs equipment, trains soldiers, and rehearses missions. ICT represents an unprecedented collaboration between the Army and the entertainment industry.

ICT has already successfully collaborated with several Army organizations to speed products from research into practical applications. It has worked with the Training and Doctrine Command's (TRADOC) Infantry School at Fort Benning, GA, to develop cognitive leadership training aids that leverage both "gamer" PCs (Full Spectrum Commander) and Microsoft's X-Box game console (Full Spectrum Warrior). This game won two prestigious Game Critics Awards – Best Original Game and Best Simulation Game – after its debut at the 2003 Electronic Entertainment Expo in Los Angeles, CA. Both training aids feature Explainable Artificial Intelligence developed at ICT. The Critical Leadership Analysis System, developed for the Army Research Institute at Fort Leavenworth, KS, combines coordination architecture, a machine learning approach to natural language processing, and a novel algorithm for automated ani-

mation of rendered human faces in an application designed for interactive learning of leadership skills.





## Appendices

Army Combat Organizations

Glossary of Terms

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## Army Combat Organizations

Army organizations are inherently built around people and the tasks they must perform. Major combat organizations are composed of smaller forces as shown here.

### Squad

Leader is a sergeant

Smallest unit in Army organization

Size varies depending on type—Infantry (9 men), Armor (4 men), Engineer (10 men)

Three or four squads make up a platoon

### Platoon

Leader is a lieutenant

Size varies—Infantry (40 men), Armor (4 tanks, 16 men)

Three or four platoons make up a company

### Company

Commander is a captain

Usually up to 220 men

Artillery unit of this size is called a battery

Armored Cavalry or Air Cavalry unit is called a troop

Basic tactical element of the maneuver battalion or cavalry squadron

Normally five companies make up a battalion

### Battalion

Commanded by a lieutenant colonel

Tactically and administratively self-sufficient

Armored Cavalry and Air Cavalry equivalents called squadrons

Two or more combat battalions make up a brigade

### Brigade

Commanded by a colonel

May be employed on independent or semi-independent operations

Combat, combat support or service support elements may be attached to perform specific missions

Normally three combat brigades are in a division

### Division

Commanded by a major general

Fully structured division has own brigade-size artillery, aviation, engineer, combat support and service elements

Two or more divisions make up a corps commanded by a lieutenant general





**Acquisition Categories (ACAT):** ACAT I programs are Milestone Decision Authority Programs (MDAPs) or programs designated ACAT I by the Milestone Decision Authority (MDA). ACAT I programs have two sub-categories:

1. ACAT ID, for which the MDA is USD (A&T). The “D” refers to the Defense Acquisition Board (DAB), which advises the USD (A&T) at major decision points.
2. ACAT IC, for which the MDA is the DoD Component Head or, if delegated, the DoD Component Acquisition Executive (CAE). The “C” refers to Component. The USD (A&T) designates programs as ACAT ID or ACAT IC.

**ACAT IA** programs are MAISs or programs designated by the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD [C3I]) to be ACAT IA. A MAIS is an AIS acquisition program that is:

1. Designated by the ASD (C3I) as a MAIS, or
2. Estimated to require program costs in any single year in excess of \$30 million in FY96 constant dollars, total program costs in excess of \$120 million in FY96 constant dollars, or total life-cycle costs in excess of \$360 million in FY96 constant dollars.

ACAT IA programs have two sub-categories:

1. **ACAT IAM**, for which the MDA is the Chief Information Officer (CIO) of the Department of Defense (DoD), the ASD (C3I). The “M” (in ACAT IAM) refers to Major Automated Information System Review Council (MAISRC). (Change 4, 5000.2-R)
2. **ACAT IAC**, for which the DoD CIO has delegated milestone decision authority to the CAE or Component CIO. The “C” (in ACAT IAC) refers to Component.

**ACAT II** programs are defined as those acquisition programs that do not meet the criteria for an ACAT I program, but do meet the criteria for a major system, or are programs designated ACAT II by the MDA.

**ACAT III** programs are defined as those acquisition programs that do not meet the criteria for an ACAT I, an ACAT IA, or an ACAT II. The MDA is designated by the CAE and shall be at the lowest appropriate level. This category includes less-than-major AISs.

**Acquisition Phase:** All the tasks and activities needed to bring a program to the next major milestone occur during an acquisition phase. Phases provide a logical means of progressively translating broadly-stated mission needs into well-defined system-specific requirements and ultimately into operationally effective, suitable, and survivable systems. The acquisition phases for the systems described in this handbook are defined below:

**Concept and Technology Development:** Concept and Technology Development refers to the development of a materiel solution to an identified, validated need. During this phase, the Mission Needs Statement (MNS) is approved, technology issues are considered, and possible alternatives are identified. In this phase, the initiation concept is approved, a lead Component is designated, and exit criteria are established. The leader of the concept development team will work with the integrated test team to develop an evaluation strategy that describes how the capabilities will be evaluated once the system is developed.

Major components of this phase are Concept Exploration, Decision Review, and Component Advanced Development. Concept Exploration evaluates the feasibility of alternative concepts and assesses the merits of these concepts. This phase ends with a Decision Review, at which the preferred concept for technologies available is selected. The Decision Review may also determine whether additional component development is necessary before key technologies can enter System Development and Demonstration. Component Advance Development occurs when the project leader has a concept for the needed capability, but does not yet know the system architecture. The project exits Component Advanced Development when a system architecture has been developed and the component technology has been demonstrated in the relevant environment or the Milestone Decision Authority (MDA) decides to end this effort. This effort is intended to reduce risk on components that have only been demonstrated in a laboratory environment and to determine the appropriate set of subsystems to be integrated into a full system.

**System Development and Demonstration:** System development and demonstration is the process of developing concepts into producible and deployable products that provide capability to the user. The purpose of this phase is to develop a system, reduce program risk, ensure operational supportability, design for producibility, ensure affordability, and demonstrate system integration, interoperability, and utility. The major components of this phase are System Integration, System Demonstration, and Interim Progress Review. Development is aided by the use of simulation-based acquisition and guided by a system acquisition strategy and test and evaluation master plan (TEMP). System modeling, simulation, and test and evaluation activities are integrated into an efficient continuum planned and executed by a test and evaluation integrated product team (T&E IPT).

The independent planning, execution, and evaluation of dedicated Initial Operation Test and Evaluation (IOT&E), as required by law, and Follow-on Operational Test and Evaluation (FOT&E), if required, are the responsibility of the appropriate operational test activity (OTA). The program enters System Integration when the Project Manager has an architecture for the system, but has not yet integrated the subsystems into a complete system. This effort is intended to integrate the subsystems and reduce system-level risk. The purpose of the Interim Progress

Review is to confirm that the program is progressing as planned or to adjust the plan to better accommodate progress made to date, changed circumstances, or both. The program enters System Demonstration when the Project Manager has demonstrated the system in prototype articles.

**Production and Deployment:** The purpose of the Production and Deployment phase is to achieve an operational capability that satisfies mission needs. In this phase, software has to prove its maturity level prior to deploying to the operational environment. Once maturity has been proven the system or block is baselined and a methodical and synchronized deployment plan is implemented to all applicable locations. A system must be demonstrated before DoD will commit to production and deployment. For DOT&E Oversight programs, a system cannot be produced at full-rate until a Beyond Low-Rate Initial Production Report has been completed and sent to Congress, the Secretary of Defense, and the USD(AT&L).

The components of this phase include Low-Rate Initial Production (LRIP), the Full-Rate Production Decision Review, and Full-Rate Production and Deployment. LRIP is intended to result in completion of manufacturing development to ensure adequate manufacturing capability and to produce the minimum quantity necessary for initial operational test and evaluation. The Full-Rate Production Decision Review considers the cost estimate, manpower, results of test and evaluation, compliance and interoperability certification. Following the completion of a Full-Rate Production Decision Review, the program enters Full-Rate Production and Deployment.

**Operations and Support:** The objective of the Operations and Support phase is the execution of a support program that meets operational support performance requirements and sustainment of systems in the most cost-effective manner throughout their life-cycle. The sustainment program includes all elements necessary to maintain the readiness and operational capability of deployed systems. The scope of support varies among programs but generally includes supply, maintenance, transportation, sustaining engineering, data management, configuration management, manpower, personnel, training, habitability, survivability, safety, IT supportability, and environmental management functions. This activity also includes the execution of operational support plans.

Programs with software components must be capable of responding to emerging requirements that will require software modification or periodic enhancements after a system is deployed. A follow-on operational test and evaluation program that evaluates operational effectiveness, survivability, suitability, and interoperability, and that identifies deficiencies is conducted, as appropriate.

**Acquisition Program:** A directed, funded effort designed to provide a new, improved or continuing weapons system or AIS capability in response to a validated operational need. Acquisition programs are divided into different categories that are

established to facilitate decentralized decision-making, and execution and compliance with statutory requirements.

**Advanced Concept Technology Demonstrations (ACTDs):** ACTDs are a means of demonstrating the use of emerging or mature technology to address critical military needs. ACTDs themselves are not acquisition programs, although they are designed to provide a residual, usable capability upon completion. If the user determines that additional units are needed beyond the residual capability and that these units can be funded, the additional buys shall constitute an acquisition program with an acquisition category generally commensurate with the dollar value and risk of the additional buy.

**Automated Information System (AIS):** A combination of computer hardware and software, data, or telecommunications, that performs functions such as collecting, processing, transmitting, and displaying information. Excluded are computer resources, both hardware and software, that are physically part of, dedicated to, or essential in real time to the mission performance of weapon systems.

**Commercial and Non-Developmental Items:** Market research and analysis shall be conducted to determine the availability and suitability of existing commercial and non-developmental items prior to the commencement of a development effort, during the development effort, and prior to the preparation of any product description. For ACAT I and IA programs, while few commercial items meet requirements at a system level, numerous commercial components, processes, and practices have application to DoD systems.

**Demilitarization and Disposal:** At the end of its useful life, a system must be demilitarized and disposed of. During demilitarization and disposal, the PM shall ensure materiel determined to require demilitarization is controlled and shall ensure disposal is carried out in a way that minimizes DoD's liability due to environmental, safety, security, and health issues.

**Developmental Test and Evaluation (DT&E):** DT&E shall identify potential operational and technological capabilities and limitations of the alternative concepts and design options being pursued; support the identification and description of design technical risks; and provide data and analysis in support of the decision to certify the system ready for operational test and evaluation.

**Division Capstone Exercise (DCX):** DCX I and DCX II demonstrated the progress made in modernizing and digitizing Army heavy forces. The 4th Infantry Division (Mechanized) faced the world-class opposing force (OPFOR) of the National Training Center at Fort Irwin, in DCX I to emphasize digitization and continuous operations. This exercise demonstrated the degree to which the command and control of these forces has been enhanced through the advanced information technology. DCX II, at Fort Hood, TX, demonstrated the future potential of the Army's modernization and recapitalization efforts—made possible by embedding advanced technologies, espe-



cially information technology, within the 4th Infantry Division. The technologies enable the division to operate in an expanded battlespace in which they see first, understand first, act first and win decisively. These systems are programmed for fielding to the Army's Counteroffensive Corps, III Corps, and the Interim Brigade Combat Teams.

**Joint Program Management:** Any acquisition system, subsystem, component or technology program that involves a strategy that includes funding by more than one DoD component during any phase of a system's life cycle shall be defined as a joint program. Joint programs shall be consolidated and collocated at the location of the lead Component's program office, to the maximum extent practicable.

**Live Fire Test and Evaluation (LFT&E):** LFT&E must be conducted on a covered system, major munition program, missile program, or product improvement to a covered system, major munition program, or missile program before it can proceed beyond low-rate initial production. A covered system is any vehicle, weapon platform, or conventional weapon system that includes features designed to provide some degree of protection to users in combat and that is an ACAT I or II program. Depending upon its intended use, a commercial or non-developmental item may be a covered system, or a part of a covered system. (Change 4, 5000.2-R) Systems requiring LFT&E may not proceed beyond low-rate initial production until realistic survivability or lethality testing is completed and the report required by statute is submitted to the prescribed congressional committees.

**Low-Rate Initial Production (LRIP):** The objective of this activity is to produce the minimum quantity necessary to: provide production configured or representative articles for operational tests, establish an initial production base for the system; and permit an orderly increase in the production rate for the system, sufficient to lead to full-rate production upon successful completion of operational testing.

**Major Automated Information System (MAIS) Acquisition Program:** An AIS acquisition program that is (1) designated by ASD (C3I) as a MAIS, or (2) estimated to require program costs in any single year in excess of \$30 million in FY96 constant dollars, total program costs in excess of \$120 million in FY96 constant dollars, or total life-cycle costs in excess of \$360 million in FY96 constant dollars. MAISs do not include highly sensitive classified programs.

**Major Defense Acquisition Program (MDAP):** An acquisition program that is not a highly sensitive classified program (as determined by the Secretary of Defense) and that is: (1) designated by the Under Secretary of Defense (Acquisition and Technology) (USD [A&T]) as an MDAP, or (2) estimated by the USD (A&T) to require an eventual total expenditure for research, development, test and evaluation of more than \$355 million in FY96 constant dollars or, for procurement, of more than \$2.135 billion in FY96 constant dollars.

**Major Milestone:** A major milestone is the decision point that separates the phases of an acquisition program. MDAP milestones include, for example, the decisions to authorize entry into the engineering and manufacturing development phase or full rate production. MAIS milestones may include, for example, the decision to begin program definition and risk reduction.

**Major System:** A combination of elements that shall function together to produce the capabilities required to fulfill a mission need, including hardware, equipment, software, or any combination thereof, but excluding construction or other improvements to real property. A system shall be considered a major system if it is estimated by the DoD Component Head to require an eventual total expenditure for RDT&E of more than \$135 million in FY96 constant dollars, or for procurement of more than \$640 million in FY96 constant dollars, or if designated as major by the DoD Component Head.

**Milestone Decision Authority (MDA):** The individual designated in accordance with criteria established by the USD (A&T), or by the ASD (C3I) for AIS acquisition programs, to approve entry of an acquisition program into the next phase.

**Modifications:** Any modification that is of sufficient cost and complexity that it could itself qualify as an ACAT I or ACAT IA program shall be considered for management purposes as a separate acquisition effort. Modifications that do not cross the ACAT I or IA threshold shall be considered part of the program being modified, unless the program is no longer in production. In that case, the modification shall be considered a separate acquisition effort. (Added from 5000.2-R)

**Operational Support:** The objectives of this activity are the execution of a support program that meets the threshold values of all support performance requirements and sustainment of them in the most life-cycle cost-effective manner. A follow-on operational testing program that assesses performance and quality, compatibility, and interoperability, and identifies deficiencies shall be conducted, as appropriate. This activity shall also include the execution of operational support plans, to include the transition from contractor to organic support, if appropriate. (Added from 5000.2-R)

**Operational Test and Evaluation (OT&E):** OT&E shall be structured to determine the operational effectiveness and suitability of a system under realistic conditions (e.g., combat) and to determine if the operational performance requirements have been satisfied. The following procedures are mandatory: threat or threat representative forces, targets, and threat countermeasures, validated in coordination with DIA, shall be used; typical users shall operate and maintain the system or item under conditions simulating combat stress and peacetime conditions; the independent operational test activities shall use production or production representative articles for the dedicated phase of OT&E that supports the full-rate production decision, or for ACAT IA or other acquisition programs, the deployment decision;

and the use of modeling and simulation shall be considered during test planning. There are more mandatory procedures (9 total) in 5000.2-R.

**For additional information on acquisition terms, or terms not defined, please refer to:**

AR 70-1, Army Acquisition Policy, or DA PAM 70-3, Army Acquisition Procedures.

#### **AAI Corporation**

Tactical Unmanned Aerial Vehicle (TUAV)

#### **ACS**

Distributed Learning System (DLS)

#### **Action Manufacturing**

2.75" Family of Rockets Advanced Precision Kill Weapon System (APKWS) Guided

#### **Advanced Systems Technology, Inc.**

Airborne Reconnaissance Low (ARL)

#### **AERA**

Force XXI Battle Command Brigade-and-Below (FBCB2)

#### **Aerojet**

Army Tactical Missile System (ATACMS)  
Guided Multiple Launch Rocket System (GMLRS)

#### **Alliant Techsystems**

2.75" Family of Rockets Advanced Precision Kill Weapon System (APKWS) Guided  
Army Ammunition Program  
Tank Ammunition  
XM25 Airburst Weapon System  
XM29 Integrated Airburst Weapon System  
XM8 Modular Assault Weapon System

#### **Allied Signal**

High Mobility Artillery Rocket System (HIMARS)  
Tube-Launched, Optically-Tracked, Wire-Guided Bunker Buster Missile (TOW Bunker Buster)

#### **Allison**

Family of Medium Tactical Vehicles (FMTV)  
Light Equipment Transport (LET)  
Line Haul Tractor

#### **AM General**

High Mobility Multipurpose Wheeled Vehicle (HMMWV)  
Improved Ribbon Bridge (IRB)

#### **Anniston Army Depot**

Paladin

#### **ARC**

Line-of-Sight Anti-Tank (LOSAT)

#### **Argon**

Aerial Common Sensor (ACS)

#### **Armor Works**

Interceptor Body Armor

#### **ARMTEC**

Army Ammunition Program

#### **Austin Information Systems**

All Source Analysis System (ASAS)

#### **AVTEL**

Fixed Wing

#### **BAE Systems**

Advanced Threat Infrared Countermeasures (ATIRCM)  
Army Data Distribution System (ADDS)/Enhanced Position Location Reporting System (EPLRS)  
Countermines  
Improved Target Acquisition System (ITAS)  
Joint Tactical Ground Stations (JTAGS)

Joint Tactical Radio System (JTRS)  
Cluster 1 and Waveform  
Lightweight 155mm Howitzer (LW 155)  
Line-of-Sight Anti-Tank (LOSAT)  
Longbow Hellfire  
Secure Mobile Anti-Jam Reliable Tactical - Terminal (SMART-T)

#### **Bechtel**

Abrams Upgrade

#### **Bell Helicopter, Textron**

Kiowa Warrior

#### **BFG**

Army Tactical Missile System (ATACMS)

#### **BioPort Corporation**

Biological Vaccine Program - Anthrax Vaccine Absorbed (AVA)

#### **Boeing**

Apache  
Chinook  
Future Combat Systems (FCS)  
Joint Common Missile  
Joint Tactical Radio System (JTRS)  
Cluster 1 and Waveform  
PATRIOT (PAC-3)  
Surface Launched Advanced Medium Range Air-to-Air Missile (SLAM-RAAM)

#### **Bofors Defence**

Excalibur (XM982)

#### **Bollinger/Incat USA**

Theater Support Vessel (TSV)

#### **Brashears LP**

XM25 Airburst Weapon System  
XM29 Integrated Airburst Weapon System

#### **British Aerospace Engineering (BAE) Systems**

Advanced Threat Infrared Countermeasures (ATIRCM)  
Army Data Distribution System (ADDS)/Enhanced Position Location Reporting System (EPLRS)  
Countermines  
Improved Target Acquisition System (ITAS)  
Joint Tactical Ground Stations (JTAGS)  
Joint Tactical Radio System (JTRS)  
Cluster 1 and Waveform  
Lightweight 155mm Howitzer (LW 155)  
Line-of-Sight Anti-Tank (LOSAT)  
Longbow Hellfire  
Secure Mobile Anti-Jam Reliable Tactical - Terminal (SMART-T)

#### **Brosi Sign Systems**

QuickFIX

#### **Brown International**

Air/Missile Defense Planning and Control System (AMDPCS)

#### **Bruhn Newtech**

Joint Warning and Reporting Network (JWARN)

#### **CACI**

Nuclear Biological and Chemical Reconnaissance Vehicle (NBCRV) - Stryker  
Airborne Reconnaissance Low (ARL)  
Guardrail/Common Sensor (GR/CS)



**Camber**  
Paladin

**Carleton Technologies, Inc.**  
Air Warrior (AW)

**CAS, Inc.**  
Army Airborne Command and Control System (A2C2S)  
Joint Land Attack Cruise Missile Defense (LACMD) Elevated Netted Sensor System (JLENS)  
Medium Extended Air Defense System (MEADS)

**Caterpillar**  
Construction Equipment  
Family of Medium Tactical Vehicles (FMTV)

**Cedarapids Inc.**  
Construction Equipment

**Ceradyne, Inc.**  
Interceptor Body Armor

**Cessna Aircraft**  
Fixed Wing

**Chamberlain Manufacturing.**  
Mortar Systems

**CMC Electronics**  
Lightweight Laser Designator Range Finder (LLDR)

**CMI**  
Tactical Unmanned Aerial Vehicle (TUAV)

**Colt's Manufacturing**  
Small Arms

**Composite Structures**  
Apache

**Computer Sciences Corporation (CSC)**  
Advanced Field Artillery Tactical Data System (AFATDS)  
Mobile Tactical High Energy Laser (MTHL)  
Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II)

**CONCO, Inc.**  
Army Ammunition Program

**Creative Apparel Associates**  
Joint Service Lightweight Integrated Suit Technology (JSLIST)

**Crossroads Industrial Services**  
QuickFIX

**Cubic Simulation Systems**  
Engagement Skills Trainer (EST) 2000

**Cummings Power**  
Forward Repair System (FRS)

**CyTerra Corporation**  
Countermines

**Dana Corporation**  
Tactical Fire Fighting Truck (TFFT)

**Defiance**  
High Mobility Multipurpose Wheeled Vehicle (HMMWV)

**DeHavilland Aviation**  
Fixed Wing

**DeFasco**  
Army Ammunition Program

**Detroit Diesel**  
Heavy Expanded Mobility Tactical Truck (HEMTT)/HEMTT - Extended Service Program (HEMTT/HEMTT-ESP)  
Light Equipment Transport (LET)  
Line Haul Tractor  
Paladin  
Palletized Load System (PLS)  
Tactical Fire Fighting Truck (TFFT)

**Dewey Electronics**  
Tactical Electric Power

**DPA**  
Tactical Unmanned Aerial Vehicle (TUAV)

**DRS Technologies**  
Bradley Upgrade  
Force XXI Battle Command Brigade-and-Below (FBCB2)  
Integrated Family of Test Equipment (IFTE)

**Duncan**  
Fixed Wing

**DVC**  
Smallpox Vaccine

**DynCorp**  
Fixed Wing

**Eagle Industry**  
QuickFIX

**Eclipse Electronic Systems**  
Prophet

**EER Systems**  
Global Combat Support System - Army (GCSS-Army)

**EFW**  
Bradley Upgrade

**EG&G**  
Chemical Demilitarization

**Engineering Air Systems, Inc.**  
Chemical Biological Protective Shelter (CBPS)

**Engineering Professional Services**  
Advanced Field Artillery Tactical Data System (AFATDS)  
Army Data Distribution System (ADDS)/Enhanced Position Location Reporting System (EPLRS)

**Ensign Bickford Aerospace and Defense**  
Countermines

**Evans and Sutherland**  
Close Combat Tactical Trainer (CCTT)

**Fairchild**  
Fixed Wing

**FATS, Inc.**  
Engagement Skills Trainer (EST) 2000

**FC Business Systems**  
Global Command and Control System - Army (GCCS-A)

**Fermont**  
Tactical Electric Power

**Fibertek**

Joint Biological Standoff Detection System (JBSDS)

**FN Manufacturing**

Small Arms

**Fontaine Trailer Company**

Trailers

**Foster-Miller**

Air Warrior (AW)

**Freightliner LLC**

Light Equipment Transport (LET)  
Line Haul Tractor

**GDOTS**

2.75" Family of Rockets Advanced Precision Kill Weapon System (APKWS) Guided

**GenCorp**

Joint Tactical Ground Stations (JTAGS)

**General Dynamics**

2.75" Family of Rockets Advanced Precision Kill Weapon System (APKWS) Guided  
Abrams Upgrade  
Advanced Field Artillery Tactical Data System (AFATDS)  
All Source Analysis System (ASAS)  
Army Ammunition Program  
Bradley Upgrade  
Common Hardware Systems (CHS)  
Excalibur (XM982)  
Global Command and Control System - Army (GCCS-A)  
Improved Ribbon Bridge (IRB)  
Joint Biological Point Detection System (JBPDs)

Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD)  
Land Warrior (LW)  
Lightweight 155mm Howitzer (LW 155)  
Maneuver Control System (MCS)  
Nuclear Biological and Chemical Reconnaissance Vehicle (NBCRV) - Stryker  
Prophet  
Small Arms  
Stryker  
Tactical Operations Center (TOC)  
Tank Ammunition  
Warfighter Information Network (WIN) - Tactical

**General Electric**

Army Tactical Missile System (ATACMS)  
Black Hawk

**GEP**

High Mobility Multipurpose Wheeled Vehicle (HMMWV)

**Getronics**

Global Command and Control System - Army (GCCS-A)

**General Motors Corp.**

High Mobility Multipurpose Wheeled Vehicle (HMMWV)

**GNK Westland**

Black Hawk

**Group Home Foundation/Belfast Industries, Inc.**

Joint Service Lightweight Integrated Suit Technology (JSLIST)

**Grove North America**

Construction Equipment

**Grove Worldwide**

Forward Repair System (FRS)

**GTSI**

Global Combat Support System - Army (GCSS-Army)

**Gulfstream**

Fixed Wing

**Harris Corporation**

Defense Satellite Communications System (DSCS)  
Prophet

**Heckler & Koch**

XM8 Modular Assault Weapon System  
XM25 Airburst Weapon System  
XM29 Integrated Airburst Weapon System

**Heil Trailer International**

Trailers

**Holland Hitch**

Light Equipment Transport (LET)

**Honeywell**

Abrams Upgrade  
Chinook  
Excalibur (XM982)  
Guided Multiple Launch Rocket System (GMLRS)  
Kiowa Warrior  
Line-of-Sight Anti-Tank (LOSAT)  
Mortar Systems

**Hydro-Mill**

Lightweight 155mm Howitzer (LW 155)

**Idaho Technologies**

Joint Biological Agent Identification Diagnostic System (JBAIDS)

**Indigo Systems**

Lightweight Laser Designator Range Finder (LLDR)

**Information Systems Support, Inc.**

Army Key Management System (AKMS)

**Ingersoll-Rand**

Forward Repair System (FRS)

**Innolog**

Army Data Distribution System (ADDS)/Enhanced Position Location Reporting System (EPLRS)

**Insight Technologies, Inc.**

Night Vision Devices  
XM29 Integrated Airburst Weapon System

**International Business Machines, Inc. (IBM)**

Distributed Learning System (DLS)

**International Telephone and Telegraph Company**

Defense Satellite Communications System (DSCS)

**ITT Industries**

Night Vision Devices

**Javelin Joint Venture**

Javelin

**JLG Industries, Inc.**

Material Handling Equipment (MHE)

**John Deere**

Construction Equipment

**John Hopkins University/Applied Physics Laboratory**

Defense Satellite Communications System (DSCS)

**Kalmar RT Center**

Material Handling Equipment (MHE)

**Kalyn Siebert, LLP**

Trailers

**L-3 Communications**Aviation Combined Arms Tactical Trainer (AVCATT)  
Guardrail/Common Sensor (GR/CS)  
Mortar Systems**Lincoln Labs**

Secure Mobile Anti-Jam Reliable Tactical - Terminal (SMART-T)

**Litton Advanced Systems**

Airborne Reconnaissance Low (ARL)

**Lockheed Martin**All Source Analysis System (ASAS)  
Apache  
Army Tactical Missile System (ATACMS)  
Close Combat Tactical Trainer (CCTT)  
Global Command and Control System - Army (GCCS-A)  
Guided Multiple Launch Rocket System (GMLRS)

High Mobility Artillery Rocket System (HIMARS)

Javelin

Joint Common Missile

Joint Tactical Ground Stations (JTGS)

Line-of-Sight Anti-Tank (LOSAT)

Longbow Hellfire

Maneuver Control System (MCS)

Medium Extended Air Defense System (MEADS)

Non-Line of Sight-Launch System

(NLOS-LS)

PATRIOT (PAC-3)

Warfighter Information Network (WIN) - Tactical

Warfighters Simulation 2000 (WARSIM)

**Longbow LLC**

Longbow Hellfire

**LSI**

Improved Ribbon Bridge (IRB)

**M/A-COM (search for M/A Com)**

Longbow Hellfire

**M7 Aerospace**

Fixed Wing

**Madentech**Integrated System Control (ISYSCON)  
(V)4/Tactical Internet Management System (TIMS)**Malibu**

Phoenix Battlefield Sensor System (PBS2)

**ManTech**All Source Analysis System (ASAS)  
Integrated System Control (ISYSCON)  
(V)4/Tactical Internet Management System (TIMS)**MCII**

Tactical Electric Power

**MEADS International, Inc.**

Medium Extended Air Defense System (MEADS)

**Meritor**

Light Equipment Transport (LET)

Line Haul Tractor

**Mevatec**

Joint Tactical Ground Stations (JTGS)

Mobile Tactical High Energy Laser (MTHL)

**Michelin**Heavy Expanded Mobility Tactical Truck (HEMTT)/HEMTT - Extended Service Program (HEMTT/HEMTT-ESP)  
Tactical Fire Fighting Truck (TFFT)**Miltope Corporation**

Integrated Family of Test Equipment (IFTE)

**Mitre**Integrated System Control (ISYSCON)  
(V)4/Tactical Internet Management System (TIMS)**MTC Technologies**

Tactical Electric Power

**National Center for the Employment of the Disabled (NCED)**

Joint Service Lightweight Integrated Suit Technology (JSLIST)

**Naval Air Warfare Center Aircraft Division**

Unified Command Suite (UCS)

**NETFIRES**

Non-Line of Sight-Launch System (NLOS-LS)

**Night Vision Equipment Company**

QuickFIX

**Northrop Grumman**Advanced Threat Infrared Countermeasures (ATIRCM)  
Air/Missile Defense Planning and Control System (AMDPCS)  
Airborne Reconnaissance Low (ARL)  
Aerial Common Sensor (ACS)  
Apache  
Countermines  
Defense Satellite Communications System (DSCS)  
Force XXI Battle Command Brigade-and-Below (FBCB2)  
Forward Area Air Defense Command and Control (FAAD C2)  
Global Combat Support System - Army (GCCS-Army)  
Guardrail/Common Sensor (GR/CS)  
Integrated Family of Test Equipment (IFTE)  
Integrated System Control (ISYSCON)  
(V)4/Tactical Internet Management System (TIMS)  
Joint Service Lightweight Nuclear Biological Chemical Reconnaissance System (JSLNBCRS)  
Joint Tactical Ground Stations (JTGS)  
Joint Tactical Radio System (JTRS)  
Cluster 1 and Waveform  
Lightweight Laser Designator Range Finder (LLDR)  
Longbow Hellfire  
Night Vision Devices  
Phoenix Battlefield Sensor System (PBS2)



Tactical Operations Center (TOC)

**O'Gara-Hess & Eisenhardt**

High Mobility Multipurpose Wheeled Vehicle (HMMWV)

**Omega Training Group**

Land Warrior (LW)

**Oshkosh Truck**

Dry Support Bridge (DSB)  
Forward Repair System (FRS)  
Heavy Expanded Mobility Tactical Truck (HEMTT)/HEMTT - Extended Service Program (HEMTT/HEMTT-ESP)  
Palletized Load System (PLS)  
Tactical Fire Fighting Truck (TFFT)

**Parker Hannifin**

Black Hawk

**Parsons Infrastructure & Technology**

Army Ammunition Program  
Chemical Demilitarization

**Peckham Vocational Industries, Inc.**

Joint Service Lightweight Integrated Suite Technology (JSLIST)

**PECS**

Chinook

**Pemstar**

Land Warrior (LW)

**Pemstar Pacific Consultants**

Land Warrior (LW)

**Penn State University**

Meteorological Measuring Set - Profiler (MMS-P)

**Phoenix Coaters LLC**

Tactical Electric Power

**Pierce Manufacturing**

Tactical Fire Fighting Truck (TFFT)

**Point Blank Body Armor**

Interceptor Body Armor

**Precision Castparts Corporation**

Lightweight 155mm Howitzer (LW 155)

**Radian**

Tactical Electric Power

**Raytheon**

Advanced Field Artillery Tactical Data System (AFATDS)  
Advanced Threat Infrared Countermeasures (ATIRCM)  
Air Warrior (AW)  
Army Airborne Command and Control System (A2C2S)  
Army Data Distribution System (ADDS)/Enhanced Position Location Bradley Upgrade  
Reporting System (EPLRS)  
Excalibur (XM982)  
Fixed Wing  
Force XXI Battle Command Brigade-and-Below (FBCB2)  
Guardrail/Common Sensor (GR/CS)  
Improved Target Acquisition System (ITAS)  
Javelin  
Joint Common Missile  
Joint Land Attack Cruise Missile Defense (LACMD) Elevated Netted Sensor System (JLENS)  
Joint Tactical Radio System (JTRS)  
Cluster 1 and Waveform

Line-of-Sight Anti-Tank (LOSAT)

Non-Line of Sight-Launch System (NLOS-LS)

PATRIOT (PAC-3)

Phoenix Battlefield Sensor System (PBS2)

Prophet

Secure Mobile Anti-Jam Reliable Tactical - Terminal (SMART-T)

Sentinel

Surface Launched Advanced Medium Range Air-to-Air Missile (SLAM-RAAM)

Tank Ammunition

Thermal Weapon Sight

**Robertson Aviation**

Chinook

**Rockwell Collins**

Chinook  
Global Positioning System (GPS)  
Joint Tactical Radio System (JTRS)  
Cluster 1 and Waveform

**Rockwell/Meritor**

Family of Medium Tactical Vehicles (FMTV)

**Science Applications International Corporation (SAIC)**

Army Key Management System (AKMS)  
Future Combat Systems (FCS)  
Global Command and Control System - Army (GCCS-A)  
Joint Network Management Systems (JNMS)

**Scott Manufacturing**

Family of Medium Tactical Vehicles (FMTV)

**Sechan Electronics**

Secure Mobile Anti-Jam Reliable Tactical - Terminal (SMART-T)

**Seller Instrument and Mfg.**

Lightweight 155mm Howitzer (LW 155)

**SESI**

Joint Biological Standoff Detection System (JBSDS)

**SETA**

All Source Analysis System (ASAS)  
Army Tactical Missile System (ATACMS)  
Joint Land Attack Cruise Missile Defense (LACMD) Elevated Netted Sensor System (JLENS)

**SFA Frederick Manufacturing**

Tactical Water Purification System (TWPS)

**Shorts Brothers**

Fixed Wing

**Sierra Nevada Corp.**

Tactical Unmanned Aerial Vehicle (TUAV)

**Simula**

Kiowa Warrior

**Sistemas**

Improved Ribbon Bridge (IRB)

**Smart Technologies**

Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II)

**Smiths**

Kiowa Warrior  
Meteorological Measuring Set - Profiler  
(MMS-P)

**SNC**

Mortar Systems

**South Eastern Kentucky  
Rehabilitation Industries**

Joint Service Lightweight Integrated Suit  
Technology (JSLIST)

**Sprint**

Distributed Learning System (DLS)

**SRA**

Transportation Coordinators' Automated  
Information for Movement System II  
(TC-AIMS II)

**SSSI**

Black Hawk

**Stewart & Stevenson**

Family of Medium Tactical Vehicles  
(FMTV)  
High Mobility Artillery Rocket System  
(HIMARS)

**Summa Technology**

Palletized Load System (PLS)

**Systems and Electronics Incorporated**

Trailers

**Sytex, Inc.**

All Source Analysis System (ASAS)

**Talbert Manufacturing**

Trailers

**Technical and Management Services  
Corporation**

Army Key Management System (AKMS)

**Tecom**

Tactical Unmanned Aerial Vehicle  
(TUAV)

**Titan Systems**

Advanced Field Artillery Tactical Data  
System (AFATDS)  
Army Key Management System (AKMS)  
Prophet

**Tru-Hitch**

Fifth Wheel Towing Device (FWTD)

**TRW**

Paladin

**United Defense, LP**

Bradley Upgrade  
Paladin

**United Technologies**

Black Hawk

**Vickers**

High Mobility Artillery Rocket System  
(HIMARS)

**Washington Group International**

Chemical Demilitarization

**Westar**

Kiowa Warrior

**Westwind**

Air Warrior (AW)

**WGI**

Chemical Demilitarization

**Williams Fairey Engineering Ltd.**

Dry Support Bridge (DSB)

**Wolf Coach, Inc.**

Analytical Laboratory System - System  
Enhancement Program (ALS-SEP)  
Unified Command Suite (UCS)

**XMCO**

Dry Support Bridge (DSB)

**ZETA**

Guardrail/Common Sensor (GR/CS)

## Alabama

SSSI  
Anniston Army Depot  
BAE Systems  
Boeing  
Brown International  
CAS, Inc.  
Camber  
CSC  
CMI  
DRS Technologies  
General Dynamics  
General Dynamics Land Systems  
MEADS International, Inc.  
Mevatec  
Miltop Corporation  
Northrop Grumman  
Northrop Grumman Mission Systems  
Raytheon  
Science Applications International Corporation (SAIC)  
Summa Technology  
Washington Group International  
Westwind  
GNK Westland

## Arizona

Simula Safety Systems, Inc.  
US Army Information Systems Engineering Command  
Raytheon  
Boeing  
Robertson Aviation  
Honeywell  
Armor Works  
Raytheon-Lockheed Martin Javelin Joint Venture  
Northrop Grumman Mission Systems  
General Dynamics C4 Systems  
NETFIRES Limited Liability Company between Raytheon and Lockheed Martin  
General Dynamics Decision Systems

Boeing

## Arkansas

General Dynamics Ordnance Tactical Systems  
Raytheon  
Pine Bluff Arsenal  
Washington Group International  
Aerojet  
Lockheed Martin

## California

AERA  
Aerojet  
ARMTEC  
Boeing  
Tecom  
Ceradyne, Inc.  
General Dynamics Versatron  
Hydro-Mill  
L-3  
AVTEL  
United Defense, LP  
Thales Raytheon Co.  
Malibu  
Northrop Grumman  
Northrop Grumman Information Technology  
Northrop Grumman Mission Systems  
Pemstar Pacific Consultants  
Raytheon  
Riverbank AAP  
Science Applications International Corporation (SAIC)  
Indigo Systems  
TRW  
Parker Hannifin  
Titan Systems  
Composite Structures

## Colorado

Lockheed Martin  
International Telephone and Telegraph Company

## Connecticut

Boeing and Sikorsky Team  
Ensign Bickford Aerospace and Defense  
Tru-Hitch  
Fermont  
Colt's Manufacturing  
PECS  
United Technologies

## Florida

Advanced Systems Technology, Inc.  
Alliant Techsystems  
Cubic Simulation Systems (formerly ECC International Corporation)  
CyTerra Corp.  
DRS Technologies  
General Dynamics  
General Dynamics ATP Division  
General Dynamics Ordnance and Tactical Systems  
General Electric  
Harris  
Harris Corporation  
Honeywell  
Lockheed Martin  
Longbow LLC  
MEADS International, Inc.  
Northrop Grumman  
Northrop Grumman Electronic Systems, Laser Systems Division  
Northrop Grumman Information Technology  
Oshkosh Truck  
Point Blank Body Armor  
Lockheed Martin Information Systems  
Raytheon

Raytheon-Lockheed Martin Javelin Joint Venture  
Thales Raytheon Co.  
General Dynamics  
DRS Technologies

## Georgia

FATS, Inc.  
Science Applications International Corporation (SAIC)  
Omega Training Group  
Gulfstream  
Heckler & Koch

## Idaho

Bechtel

## Illinois

John Deere Forestry and Construction Equipment  
Caterpillar Defense Products  
Caterpillar  
Rock Island Arsenal  
Northrop Grumman

## Indiana

Raytheon  
Crane Army Ammunition Activity  
Parsons Infrastructure & Technology  
Light Helicopter Turbine Engine Company (LHTEC), Honeywell/Rolls-Royce Team  
Allison  
AM General  
Allison Transmissions  
Crossroads Industrial Services  
AM General

## Iowa

Iowa AAP  
Cedarapids Inc.  
Rockwell Collins



**Kansas**

Kansas AAP  
Raytheon-Beechcraft  
Cessna Aircraft

**Kentucky**

CONCO  
Ingersoll-Rand  
South Eastern Kentucky Rehabilitation Industries  
Dana Corporation  
Fontaine Trailer Company

**Louisiana**

Bollinger/Incat USA

**Maine**

Creative Apparel Associates  
Group Home Foundation/Belfast Industries, Inc.  
General Dynamics

**Maryland**

Northrop Grumman  
Litton Advanced Systems  
John Hopkins University/Applied Physics Laboratory  
SESI  
Smiths Detection  
SFA Frederick Manufacturing  
DVC  
AAI Corporation  
Lockheed Martin Mission Systems  
Northrop Grumman

**Massachusetts**

General Dynamics  
Foster-Miller  
Wolf Coach, Inc., an L3 Company  
CyTerra Corp.  
Raytheon  
Lincoln Labs  
General Electric

**Michigan**

BioPort Corporation  
XMCO  
AM General  
Peckham Vocational Industries, Inc.  
Detroit Diesel  
Meritor  
Holland Hitch  
General Dynamics  
General Dynamics Land Systems  
Smiths  
GM

**Minnesota**

Alliant Techsystems  
Caterpillar Defense Products  
Honeywell  
Cummings Power  
Pemstar  
Brosi Sign Systems

**Mississippi**

Raytheon  
Vickers  
BAE Systems  
Thales Raytheon Co.

**Missouri**

Alliant Techsystems  
Lake City AAP  
Engineering Air Systems, Inc.  
Seiler Instrument and Mfg.  
Eagle Industry  
Systems and Electronics Incorporated  
Westar

**Nebraska**

Duncan

**Nevada**

Sierra Nevada Corp

**New Hampshire**

BAE Systems  
Insight Technologies, Inc.

**New Jersey**

Allied Signal  
BAE Systems  
CACI  
CECOM Software Engineering Center  
Computer Sciences Corporation  
Dewey Electronics  
Engineering Professional Services  
Information Systems Support, Inc.  
Innolog  
Lockheed Martin  
Madentech  
Mitre  
OPM Mortar Systems  
SAIC  
Technical and Management Services Corporation  
ZETA

**New Mexico**

Honeywell  
New York Carleton Technologies, Inc.  
BAE Systems  
MEADS International, Inc.  
Harris Corporation  
Talbert Manufacturing  
Lockheed Martin

**Ohio**

Rockwell/Meritor  
CMC Electronics, Cincinnati  
L-3 Communications  
General Dynamics Land Systems  
O'Gara-Hess & Eisenhardt  
Defiance  
GEP  
General Dynamics

**Oklahoma**

Engineering Professional Services  
Titan Systems  
McAlester AAP

**Oklahoma**

MCII

**Oregon**

Washington Group International (WGI)  
Freightliner LLC  
Precision Castparts Corporation

**Pennsylvania**

Action Manufacturing  
Scranton AAP  
SETA  
United Defense, LP  
Boeing  
Grove North America  
JLG  
Chamberlain Mfg.  
Penn State University  
Night Vision Equipment Company  
Sechan Electronics  
L3  
Brashears LP

**South Carolina**

Michelin  
FN Manufacturing

**Tennessee**

DelFasco  
Government-Owned, Contractor-Operated Army Ammunition Plants (AAP): Holston AAP  
AOT  
Heil Trailer International  
Kalyn Siebert, LLP

**Texas**

BAE Systems  
 Austin Information Systems  
 MANTECH  
 Lone Star AAP  
 Raytheon  
 Lockheed Martin  
 L-3 Communications  
 Stewart & Stevenson TVS, LLC  
 Scott Manufacturing  
 LSI  
 National Center for the Employment  
 of the Disabled (NCED)  
 Raytheon  
 Kalmar RT Center  
 MEADS International, Inc.  
 NETFIRES Limited Liability Company  
 between Raytheon and Lockheed  
 Martin  
 Bell Helicopter, Textron  
 M7 Aerospace  
 AVTEL  
 EFW  
 Fairchild  
 DynCorp

**Utah**

EG&G  
 Evans and Sutherland  
 L-3 Communications  
 Idaho Technologies

**Vermont**

General Dynamics Armament and  
 Technical Products  
 General Dynamics  
 BFG

**Virginia**

ACS  
 Alliant Ammunition & Powder Co.  
 Alliant Techsystems  
 Argon

SRA  
 CACI  
 MTC Technologies  
 H&K Defense  
 EER Systems  
 Computer Sciences Corporation  
 FC Business Systems  
 Getronics  
 Titan Incorporated  
 GTSI  
 Smart Technologies  
 International Business Machines, Inc.  
 Lockheed Martin  
 Mantech  
 Northrop Grumman Mission Systems  
 Radford AAP  
 Radian  
 Raytheon  
 Sprint  
 Sytex, Inc.  
 Fibertek  
 CACI Technologies  
 Science Applications International  
 Corporation (SAIC)  
 ARC  
 ITT Industries  
 DPA

**Washington**

General Dynamics Ordnance and  
 Tactical Systems

**West Virginia**

Alliant Techsystems

**Wisconsin**

Oshkosh Truck  
 Oshkosh Truck Kewanee Fabrication  
 LLC  
 Miller USA  
 Pierce Manufacturing





**2.75" Family of Rockets Advanced Precision Kill Weapon System (APKWS) Guided**

ARM Project Office  
ATTN: SFAE-MSL-ARM-MM-F  
Redstone Arsenal, AL 35898-8000

**Abrams Upgrade**

6501 E. 11 Mile Road  
ATTN: SFAE-GCS-CS-A  
Warren, MI 48397-5000

**Advanced Field Artillery Tactical Data System (AFATDS)**

Product Manager  
Fire Support  
ATTN: SFAE-C3T-IE-E  
Building 457  
Ft Monmouth, NJ 07703-5404

**Advanced Threat Infrared Countermeasures (ATIRCM)**

PM IRCM  
Building 5678  
Hick Road  
Redstone Arsenal, AL 35898-5000

**Aerial Common Sensor (ACS)**

PM ACS  
Building 288  
Ft Monmouth, NJ 07703

**Air Warrior (AW)**

PM Air Warrior  
ATTN: SFAE-SDR-AW  
Redstone Arsenal, AL 35898

**Air Missile Defense Planning and Control System (AMDPCS)**

145 Research Boulevard  
Building 12  
Madison, AL 35758

**Airborne Reconnaissance Low (ARL)**

ATTN: SFAE-IEWS-SG  
Building 288  
Ft Monmouth, NJ 07703

**All Source Analysis System (ASAS)**

PMO, Intelligence and Effects  
10115 Duportail Road  
Ft Belvoir, VA 22060-5812

**Analytical Laboratory System - System Enhancement Program (ALS-SEP)**

ATTN: SFAE-CBD-NBCCA  
5183 Blackhawk Road  
APG, MD 21010-5424

**Apache**

Apache  
Product Manager  
ATTN: SFAE-AV-AAH  
Building 5681, Room 208  
Redstone Arsenal, AL 35898-5000

**Army Airborne Command and Control System (A2C2S)**

Project Manager, Tactical Operations Centers/Air and Missile Defense Command and Control Systems (PM TOCs/AMDCCS)  
ATTN: SFAE-C3S-AD-A2  
145 Research Boulevard  
Madison, AL 35758

**Army Ammunition Program**

ATTN: SFAE-AMO-P  
Picatinny Arsenal, NJ 07806-5000

**Army Data Distribution System (ADDS)/Enhanced Position Location Reporting System (EPLRS)**

Building 456  
Ft Monmouth, NJ 07703

**Army Key Management System (AKMS)**

PM, CMS  
ATTN: SFAE-C3T-TRC-CMS  
Ft Monmouth, NJ 07703

**Army Tactical Missile System (ATACMS)**

Precision Fires Rocket and Missile Systems Project Office  
ATTN: SFAE-MSL-PF-AT  
Building 5250  
Redstone Arsenal, AL 35898

**Aviation Combined Arms Tactical Trainer (AVCATT)**

Air and Command Tactical Trainers, Product Manager  
ATTN: SFAE-STRI-PM CATT-AC  
12350 Research Parkway  
Orlando, FL 32826-3276

**Biological Vaccine Program - Anthrax Vaccine Absorbed (AVA)**

ATTN: SFAE-CBD-CBMS  
64 Thomas Johnson Drive  
Frederick, MD 21702-5041

**Black Hawk**

Utility Helicopters  
Project Manager  
ATTN: SFAE-AV-UH  
Building 5308  
Redstone Arsenal, AL 35898

**Bradley Upgrade**

6501 East Eleven Mile Road  
ATTN: SFAE-GCS-CS  
Warren, MI 48397-5000

**Chemical Biological Protective Shelter (CBPS)**

Commander  
Naval Sea Systems Command  
ATTN: SEA 05P5  
1333 Isaac Hall SE  
Washington Navy Yard  
Washington, DC 20376-5150

**Chemical Demilitarization**

Chemical Materials Agency (CMA)  
ATTN: AMSCM-D  
5183 Blackhawk Road  
APG-EA, MD 21010-5424

**Chinook**

PM Cargo Helicopters  
ATTN: SFAE-AV-CH-ICH  
Building 5678  
Redstone Arsenal  
Huntsville, AL 35898

**Close Combat Tactical Trainer (CCTT)**

12350 Research Parkway  
Orlando, FL 32826-3276

**Common Hardware Systems (CHS)**  
Project Manager, Tactical Operations  
Centers (TOCs)/Air Defense Command  
& Control System (AMDCCS)  
Project Manager  
ATTN: SFAE-C3T-AD-TOC  
145 Research Boulevard  
Madison, AL 35758

**Construction Equipment**  
ATTN: SFAE-CSS-FP-C/MS401  
76501 E. 11 Mile Road  
Warren, MI 48397-5000

**Countermine**  
PM-CCS  
ATTN: SFAE-AMO-CCS  
10205 Burbeck Road  
Ft Belvoir, VA 22060-5811

**Defense Satellite Communications  
System (DSCS)**  
ATTN: Project Manager  
Defense Communications and Army  
Transmission Systems  
Building 209  
Ft Monmouth, NJ 07703-5509

**Distributed Common Ground System -  
Army (DCGS-A)**  
ATTN: SFAE-IEWS-DCGS-A  
Building 550  
Saltzman Avenue  
Ft Monmouth, NJ 07703-5301

**Distributed Learning System (DLS)**  
PM DLS  
ATTN: SFAE-PS-DL  
11846 Rock Landing Drive  
Newport News, VA 23606

**Dry Support Bridge (DSB)**  
Product Manager, Bridging  
ATTN: SFAE-CSS-FP-G  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**Engagement Skills Trainer (EST) 2000**  
PEO STRI  
ATTN: SFAE-STRI-PM-CATT-GC  
12350 Research Parkway  
Orlando, FL 32826-3276

**Engineer Mission Module - Water  
Distributor (EMM-WD)**  
Product Manager  
Petroleum and Water Systems  
ATTN: SFAE-CSS-FP-P  
Warren, MI 48397-5000

**Excalibur (XM982)**  
Combat Ammo Systems  
ATTN: SFAE-AMO-CAS-EX  
Building 171  
Picatinny Arsenal, NJ 07806

**Family of Medium Tactical Vehicles  
(FMTV)**  
ATTN: SFAE-CSS  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**Fifth Wheel Towing Device (FSTD)**  
Product Manager for Trailers  
ATTN: SFAE-CSS-TV-T  
Warren, MI 48397-5000

**Fixed Wing**  
Product Manager  
Fixed Wing  
ATTN: SFAE-AV-AS-FW  
Building 5308  
Redstone Arsenal, AL 35898-5000

**Force XXI Battle Command Brigade-  
and-Below (FBCB2)**  
ATTN: SFAE-C3T-FB-BMD  
Ft Monmouth, NJ 07703

**Forward Area Air Defense Command  
and Control (FAAD C2)**  
145 Research Boulevard  
Building 12  
Madison, AL 35758

**Forward Repair System (FRS)**  
ATTN: SFAE-CSS-HT  
Mail Stop 423  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**Future Combat Systems (FCS)**  
SFAE-GCS-FCS-A, TACOM  
Warren, MI 48397

**Future Tactical Truck System -  
Maneuver Sustainment Vehicle (FTTS-  
MSV)**  
ATTN: SFAE-CSS-HT  
Mail Stop 423  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**Global Combat Support System - Army  
(GCSS-Army)**  
PM LIS  
800 Lee Avenue  
Ft Lee, VA 23801-1718

**Global Command and Control System  
- Army (GCCS-A)**  
PEO C3T  
ATTN: SFAE-C3T-GC  
Building 2525  
Ft Monmouth, NJ 07703-5404

**Global Positioning System (GPS)**  
ATTN: SFAE-IEW&S-NS-GPS  
2420 Vela Way, Suite 1866  
El Segundo, CA 90245

**Guardrail/Common Sensor (GR/CS)**  
SFAE-IEWS-SG  
Building 288  
Ft Monmouth, NJ 07703

**Guided Multiple Launch Rocket  
System (GMLRS)**  
Precision Fires Rocket and Missile  
Systems Project Office  
ATTN:SFAE-MSL-PF-PGM/R  
Building 5250  
Redstone Arsenal, AL 35898

**Heavy Expanded Mobility Tactical  
Truck (HEMTT)/HEMTT - Extended  
Service Program (HEMTT/HEMTT-ESP)**  
ATTN: SFAE-CSS-HT  
Mail Stop 423  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**High Mobility Artillery Rocket System  
(HIMARS)**  
Precision Fires Rocket and Missile  
Systems Project Office  
ATTN: SFAE- MSL- PF-FAL  
Building 5250  
Redstone Arsenal, AL 35898

**High Mobility Multipurpose Wheeled Vehicle (HMMWV)**

Product Manager Light Tactical Vehicles  
SFAE-CSS-TV-L  
Warren, MI 48397-5000

**Improved Ribbon Bridge (IRB)**

Product Manager, Bridging  
ATTN: SFAE-CSS-FP-G  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**Improved Target Acquisition System (ITAS)**

Project Manager, CCWS Project Office,  
ATTN: SFAE-MSL-CWS  
Building 4505  
Redstone Arsenal, AL 35898-5750

**Integrated Family of Test Equipment (IFTE)**

Product Manager – Test,  
Measurement and Diagnostic  
Equipment  
Building 5300  
Redstone Arsenal, AL 35898-5000

**Integrated System Control (ISYSCON) (V)4/Tactical Internet Management System (TIMS)**

PdM, CMS  
ATTN: SFAE-C3T-TRC-CMS  
Ft Monmouth, NJ 07703

**Interceptor Body Armor**

ATTN: SFAE-SDR-EQ  
10170 Beach Road  
Building 325  
Ft Belvoir, VA 22060-5800

**Javelin**

Project Manager, Close Combat  
Weapon Systems Project Office  
ATTN: SFAE-MSL-CWS-J  
Redstone Arsenal, AL 35898

**Joint Biological Agent Identification Diagnostic System (JBAIDS)**

ATTN: SFAE-CBD-CBMS  
64 Thomas Johnson Drive  
Frederick, MD 21702-5041

**Joint Biological Point Detection System (JBPDS)**

ATTN: SFAE-CBD-NBC-J  
5183 Blackhawk Road  
APG, MD 21010-5424

**Joint Biological Standoff Detection System (JBSDS)**

Joint Project Manager  
NBC Contamination Avoidance  
5183 Blackhawk Road  
Building E4465  
APG, MD 21010-5424

**Joint Chemical Agent Detector (JCAD)**

ATTN: SFAE-CBD-NBC-D  
5183 Blackhawk Road  
APG, MD 21010-5424

**Joint Common Missile**

Joint Common Missile Project Office  
ATTN: SFAE-MSL-CM  
5250 Martin Road  
Redstone Arsenal, AL 35898-8000

**Joint Effects Model (JEM)**

Space and Naval Warfare Systems  
Command  
4301 Pacific Highway  
San Diego, CA 92110  
858-537-0135

**Joint Land Attack Cruise Missile Defense (LACMD) Elevated Netted Sensor System (JLENS)**

PEO Air, Space and Missile Defense  
ATTN: SFAE-ASMD-JLN  
P.O. Box 1500  
Huntsville, AL 35807-3801

**Joint Network Management System (JNMS)**

PdM, CMS  
ATTN: SFAE-C3T-TRC-CMS  
Ft Monmouth, NJ 07703

**Joint Service Lightweight Integrated Suit Technology (JSLIST)**

Marine Corps Systems Command  
(MARCORSYSCOM)  
NBCD Systems  
2033 Barnett Avenue, Suite 315  
Quantico, VA 22134-5010

**Joint Service Lightweight NBC Reconnaissance System (JSLNBCRS)**

ATTN: SFAE-CBD-NBC-R  
5183 Blackhawk Road  
APG, MD 21010-5424

**Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD)**

ATTN: SFAE-CBD-NBC-D  
5183 Blackhawk Road  
APG, MD 21010-5424

**Joint Tactical Ground Stations (JTAGS)**

PEO Air, Space and Missile Defense  
ATTN: SFAE-ASMD-AMD-JTG  
P.O. Box 1500  
Huntsville, AL 35807-3801

**Joint Tactical Radio System (JTRS) Cluster 1 and Waveform**

Waveform: 1777 N. Kent Street  
Suite 2000  
Arlington, VA 22209  
Cluster 1: PM WIN-T  
Building 739  
Ft Monmouth, NJ 07703

**Joint Warning and Reporting Network (JWARN)**

Space and Naval Warfare Systems  
Command, 4301 Pacific Highway  
San Diego, CA 92110

**Kiowa Warrior**

Product Manager  
ATTN: SFAE-AV-AS-ASH  
Building 5308  
Sparkman Center  
Redstone Arsenal, AL 35898

**Land Warrior (LW)**

ATTN: SFAE-SDR-SWAR  
Building 317  
10125 Kingman Road  
Ft Belvoir, VA 220260-5820

**Light Equipment Transporter (LET)**

SFAE-CSS-HT  
Mail Stop 423  
6501 E. 11 Mile Road  
Warren, MI 48397-5000



**Lightweight 155mm Howitzer (LW 155)**

Project Manager  
ATTN: SAFE-GCSS-LW  
Picatinny Arsenal, NJ 07806-5000

**Lightweight Laser Designator  
Rangefinder (LLDR)**

ATTN: SFAE-SDR-EQ  
10170 Beach Road  
Building 325  
Ft Belvoir, VA 22060-5800

**Line Haul Tractor**

ATTN: SFAE-CSS-HT  
Mail Stop 101  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**Line-of-Sight Anti-Tank (LOSAT)**

Project Manager, CCWS Project Office  
ATTN: SFAE-MSL-CWS-A  
Building 4505  
Redstone Arsenal, AL 35898-5750

**Longbow Hellfire**

RM Project Office  
ATTN: SFAE-MSL-ARM-MM-F  
Redstone Arsenal, AL 35898-8000

**Maneuver Control System (MCS)**

PM GCC2  
ATTN: SFAE-C3T-GC-B  
Ft Monmouth, NJ 07703

**Materiel Handling Equipment (MHE)**

ATTN: SFAE-CSS-FP-C/MS401  
76501 E. 11 Mile Road  
Warren, MI 48397-5000

**Medium Extended Air Defense System  
(MEADS)**

Program Executive Office  
Air, Space and Missile Defense  
ATTN: SFAE-ASMD-LT-MEADS  
P.O. Box 1500  
Huntsville, AL 35807-3801

**Meteorological Measuring Set -  
Profiler (MMS-P)**

Target Identification & Meteorological  
Sensors (PM TIMS)  
ATTN: SFAE-IEWS-NS-TIMS  
Avenue of Memories (563)  
Ft Monmouth, NJ 07703

**Mobile Tactical High Energy Laser  
(MTHL)**

PEO Air, Space and Missile Defense  
ATTN: SFAE-ASMD-SHO-DE  
Redstone Arsenal, AL 35898-5000

**Mortar Systems**

ATTN: SFAE-AMO-CAS-MS  
Building 162 South  
Picatinny Arsenal, NJ 07806

**Night Vision Devices**

PM Sensors and Lasers  
ATTN: SFAE-SDR-SEN  
10170 Beach Road  
Building 325  
Ft Belvoir, VA 22060

**Non-Line of Sight-Launch System  
(NLOS-LS)**

Director, NLOS-LS Task Force  
ATTN: SFAE-MSL-NL  
Building 5250, Room B300  
Redstone Arsenal, AL 35898-5750

**Nuclear Biological and Chemical  
Reconnaissance Vehicle (NBCRV) -  
Stryker**

ATTN: SFAE-CBD-NBC-R  
5183 Blackhawk Road  
APG, MD 21010-5424

**Paladin**

Paladin/FAASV  
Product Manager  
ATTN: AMSTA-DSA-PF  
Picatinny Arsenal, NJ 07806-5000

**Palletized Load System (PLS)**

ATTN: SFAE-CSS-HT  
Mail Stop 101  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**PATRIOT (PAC-3)**

Program Executive Office  
Air, Space and Missile Defense  
ATTN: SFAE-ASMD-LT-PM-RM  
P.O. Box 1500  
Huntsville, AL 35807-3801

**Phoenix Battlefield Sensor System  
(PBS2)**

ATTN: SFAE-IEW&S-NV-FF  
Building 2525  
Ft Monmouth, NJ 07703

**Precision Guided Mortar Munitions  
(PGMM)**

ATTN: SFAE-AMO-CAS-MS  
Picatinny Arsenal, NJ 07806-5000

**Prophet**

PM SW  
ATTN: SFAE-IEWS-SG  
Building 288  
Sherrill Avenue  
Ft Monmouth, NJ 07703

**QuickFIX**

ATTN: SFAE-IEWS-NS-TIMS  
Avenue of Memories (563)  
Ft Monmouth, NJ 07703

**Rapid Fielding Initiative (RFI)**

Program Executive Office Soldier  
5901 Putman Rd.  
Building 328  
Ft Belvoir, VA 22060-5422

**Secure Mobile Anti-Jam Reliable  
Tactical - Terminal (SMART-T)**

PM WIN-T  
ATTN: SFAE-C3T-WIN-ESS  
Ft Monmouth, NJ 07703-5508

**Sentinel**

PEO Air, Space and Missile Defense  
ATTN: SFAE-ASMD-SHO  
Redstone Arsenal, AL 35898-5000

**Small Arms**

Small Arms U.S. Army Armament  
Research, Development and Product  
Manager  
ATTN: AMSTA-DSA-SA  
Picatinny Arsenal, NJ 07806-5000

**Smallpox Vaccine**

ATTN: SFAE-CBD-CBMS  
64 Thomas Johnson Drive  
Frederick, MD 21702-5041

**Stryker**

ATTN: SFAE-GCS-BCT MS 325  
6501 East 11 Mile Road  
Warren, MI 48397-5000

**Surface Launched Advanced  
Medium Range Air-to-Air Missile  
(SLAMRAAM)**

PEO Air, Space and Missile Defense  
ATTN: SFAE-ASMD-SHO  
Redstone Arsenal, AL 35898-5000

**Tactical Electric Power**

10205 Burbeck Road.  
Ft Belvoir, VA 22060-5863

**Tactical Fire Fighting Truck (TFFT)**

ATTN: SFAE-CSS-HT  
Mail Stop 423  
6501 E. 11 Mile Road  
Warren, MI 48397-5000

**Tactical Operations Center (TOC)**

145 Research Boulevard  
Building 12  
Madison AL 35758

**Tactical Unmanned Aerial Vehicle  
(TUAV)**

Product Manager  
Unmanned Aerial Vehicle Systems  
ATTN: SFAE-AV-UAVS  
Restone Arsenal, AL 35898

**Tactical Water Purification System  
(TWPS)**

Product Manager  
Petroleum and Water Systems  
ATTN: SFAE-CSS-FP-P  
Warren, MI 48397

**Tank Ammunition**

Project Manager  
Maneuver Ammunition Systems  
Picatinny Arsenal, NJ 07806

**Theater Support Vessel (TSV)**

Product Manager  
Army Watercraft Systems  
ATTN: SFAE-CSS-FP-W  
Warren, MI 48397-5000

**Thermal Weapon Sight**

PM Sensors and Lasers  
ATTN: SFAAE-SDR-SEN  
10170 Beach Road  
Building 325  
Ft Belvoir, VA 22060

**Trailers**

ATTN: SFAE-CSS-TV-T  
Warren, MI 48397-5000

**Transportation Coordinators'  
Automated Information for  
Movement System II (TC-AIMS II)**

8000 Corporate Court  
Springfield, VA 22153

**Tube-Launched, Optically-Tracked,  
Wire-Guided Bunker Buster Missile  
(TOW Bunker Buster)**

TOW 2B Aero  
Project Manager, CCWS Project Office  
ATTN: SFAE-MSL-CWS-F  
Building 4505  
Redstone Arsenal, AL 35898-5750

**Unified Command Suite (UCS)**

ATTN: SFAE-CBD-NBCCA  
5183 Blackhawk Road  
APG, MD 21010-5424

**Warfighter Information Network  
(WIN)-Tactical**

Project Manager, WIN-Tactical  
ATTN: SFAE-C3T-WIN  
Building 744  
Ft Monmouth, NJ 07703-5506

**Warfighters Simulation 2000 (WAR-  
SIM)**

PEO STRI, PM Constructive Simulation  
12350 Research Parkway  
Orlando, FL

**XM25 Airburst Weapon System**

ATTN: SFAE-SRD-SW  
Building 151  
Picatinny Arsenal, NJ 07806

**XM29 Integrated Airburst Weapon  
System**

ATTN: SFAE-SRD-SW  
Building 151  
Picatinny Arsenal, NJ 07806

**XM8 Modular Assault Weapon  
System**

ATTN: SFAE-SRD-SW  
Building 151  
Picatinny Arsenal, NJ 07806





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**Prepared by:**

OASA (ALT)

SAAL-Strategic Communications

103 Army Pentagon

Washington, DC 20310-0103

**Cover Illustration & Design:**

Integrated Communications Team, SAIC

