

INDIVIDUAL EQUIPMENT AND WEAPONS

The soldier is the Army's most deployed combat system and the most essential weapon in the Army's arsenal. Program Executive Office (PEO) soldier was activated in October 2001 to equip the soldier as a system through centralized development, acquisition, fielding and sustainment of virtually everything the soldier wears or carries. The mission of PEO Soldier is to ensure that soldiers are lethal and survivable in any operating environment.

PEO Soldier views the individual soldier as the center of the Army, the cornerstone on which all Army operations are built. PEO Soldier is committed to meeting the needs of individual soldiers in order to support this larger view of the Army. To accomplish its mission, PEO Soldier solicits and uses soldier feedback to guide the development and fielding of new equipment.

As the demands of warfighting change and new technologies evolve in response, PEO Soldier stands ready to equip soldiers with the best gear, in the shortest time possible, to support the deployment of soldiers wherever our global interests dictate. The technologies PEO Soldier develops and the equipment PEO Soldier fields are crucial components in meeting the strategic, operational and tactical challenges of today's soldier and the soldier of the future. For all their wide-ranging technological capabilities, PEO Soldier products recognize that the soldier is, and will remain, the center of our strength.

Project Manager Soldier Warrior

Project Manager Soldier Warrior (PM SWAR) supports soldiers through the acquisition of integrated soldier systems. Current systems include Land Warrior, Ground Soldier, Mounted Soldier and Air Warrior. Project Manager Soldier Warrior product managers develop and integrate components into complete systems designed to increase combat effectiveness, decrease combat load and improve mission flexibility.

Product Manager Ground Soldier

Land Warrior is a first-generation, integrated, modular fighting system for soldiers engaged in close combat operations. Land Warrior combines computers, navi-



gation technology and radios with other mission equipment to substantially improve individual situational awareness. The systems approach optimizes and integrates multiple capabilities with minimal impact on combat load and logistical footprint. During the surge phase of Operation Iraqi Freedom, the 4th Battalion, 9th Infantry Regiment (4-9 IN), of the 4th Brigade, 2nd Infantry Division, was equipped with 229 Land Warrior ensembles, which were worn by the unit's leadership down to the team leader level, and 133 Mounted Warrior ensembles for Stryker crewmembers. The 4-9 IN became the first unit in the history of warfare to employ a digitally networked combat soldier in theater. The soldiers who used the system from May 2007 to June 2008 reported that the reliability in combat situations surpassed all expectations and that the added capabilities are invaluable. Since that time, a Stryker brigade combat team has taken the system to Afghanistan. They were to be replaced by another Land Warrior-equipped unit in mid-2010.

The **Ground Soldier System (GSS)**

builds upon Land Warrior as an integrated dismounted soldier situational awareness system for use during combat operations. The system will provide unparalleled situational awareness and understanding to the dismounted soldier, allowing for faster and more accurate decision making in the tactical fight. This translates into soldiers being at the right place at the right time with the right equipment, making them more effective and more lethal in the execution of their combat mission.

The centerpiece capability of GSS is the ability to graphically display the individual soldier location on a digital map. Additional soldier locations will also be graphically displayed through the Army battle command system connected via a secure radio that will send and receive information from one to another. The system also connects the combat soldier to higher-echelon data and information products to assist the soldier in decision making and situational understanding. All of this will be integrated on a graphic user interface that is user-defined, allowing soldiers to easily see, understand and interact in the method that best suits the user and his particular mission.

The physical subcomponents of GSS include a display to provide the soldier's information; a computer to process and populate the information on the screen; an interface device that allows user interaction with the system; a power source; an operating system to provide the system functionality, run tactical applications, and battle command; and a networked radio transmitter/receiver device to send and receive information. As a worn system on the combat soldier, size and weight must be kept to a minimum with the ruggedness for combat operations, including water immersion. The GSS must have a slim and flexible form factor that can accommodate the "shooter's preference" method of employing the system in accordance with the variety of different mission profiles and soldier personnel equipment configurations. GSS entered the technology development phase in February 2009. It is expected to achieve Milestone C in fiscal year 2011.

Product Manager Mounted Soldier System

The **Mounted Soldier System (MSS)** is the next generation of Mounted Warrior. It will provide combat vehicle crew members and platform commanders with increased mission effectiveness on the network-centric battlefield. Like its predecessor, MSS will focus on the areas of command and control, situational awareness, communications, force protection, survivability, mobility and sustainability. The MSS provides the combat vehicle commander increased capabilities to conduct offensive and defensive operations. MSS consists of three systems (cooling, cordless communications and dis-

play) that allow the crew member to reduce heat stress, communicate wirelessly with the vehicle's intercom and radios, and remotely display the vehicle's displays for Force XXI Battle Command Brigade and Below (FBCB²), remote weapon sight, driver's enhanced vision system and other platform-centric video assets.

Product Manager Air Warrior

Air Warrior (AW) is a modular, integrated, rapidly reconfigurable combat aircrew ensemble that saves lives and maximizes Army aircrew mission performance. More than 18,000 Army aircrew members have been equipped with the system. Air Warrior increases personal protection and mission performance while decreasing weight and bulk. The system consists of: a primary survival gear carrier that includes first aid, survival, signaling and communications equipment; body armor tailored for the unique requirements of the aircrew member; the aircrew integrated helmet system; over-water survival equipment, including an underwater breathing device and life raft; and the microclimate cooling system (MCS), which includes a cooling garment worn under chemical protective and duty uniforms that increases mission endurance under extreme heat by more than 350 percent. The MCS has been adopted for use by ground forces including Stryker, Abrams, Bradley, M9 ACE, Navy, Marine Corps and foreign militaries, with more than 16,000 systems fielded to date.

The **Electronic Data Manager (EDM)** is a touchscreen kneeboard computer that enables the aircrew member to quickly plan missions and react to mission changes in flight. The EDM, compatible with night-vision goggles and readable in direct sunlight, features a moving map via global positioning system (GPS), Blue Force Tracking-Aviation capability, and Windows-compatible software. More than 2,700 EDM systems have been fielded to Army, Navy, Marine Corps and foreign militaries.

The **Aircraft Wireless Intercom System (AWIS)** provides wireless aircrew communications. AWIS allows hands-free voice communication between crew members and provides the first true aircraft intercom capability for medical evacuation helicopter personnel during rescue hoist missions. The AWIS consists of an aircraft-mounted interface unit and mobile equipment units worn by each member of the aircrew. The AWIS enables omnidirectional simultaneous communications among crew members within the aircraft network out to approximately 200 feet of the center of the aircraft.

The **Portable Helicopter Oxygen Delivery System (PHODS)** is a soldier-worn oxygen system that delivers compressed oxygen from a lightweight steel oxygen bottle via a nasal cannula up to 18,000 feet and via a mask at altitudes above 18,000 feet. PHODS uses a pulse-demand oxygen



Air Warrior (AW)

regulator unit that automatically provides on-demand oxygen regulated to altitude based on detected barometric pressure. More than 1,800 PHODS have been fielded to Army aircrew members.

The **Survival Kit, Ready Access, Modular (SKRAM)** gives aircrews an airworthy and readily accessible carriage for a 72-hour suite of life-support equipment and mission water in a flame-retardant, modular and configurable backpack. The SKRAM components improve mission endurance by providing drinking water to the aircrew and supplemental survival gear for an escape-and-evade scenario. The SKRAM components are mounted on the aircraft, improving access to mandatory and mission-essential survival gear. During an emergency exit, the SKRAM components can be quickly released and retained for use in survival, evasion, resistance and escape situations.

PM Soldier Sensors and Lasers

Project Manager Soldier Sensors and Lasers (SSL) provides soldiers with improved lethality, mobility and survivability in all weather and visibility conditions.

Soldier-borne sensors and lasers enhance the soldier's ability to see in all battlefield and lighting conditions, to acquire objects of military significance before the soldier is detected, and to target threat objects accurately for engagement by soldiers or guided munitions. These systems provide critical, on-the-ground direct support to U.S. forces.

Product Manager Soldier Maneuver Sensors

Soldier maneuver sensors (SMS) is the branch of SSL responsible for the products that enhance the operational capabilities of soldiers with night-vision aiming devices.

The **AN/AVS-6 Aviator's Night-Vision Imaging System (ANVIS)** is a helmet-mounted, direct-view, third-generation image-intensification piloting device that enables flight operations under very low ambient light conditions. The latest version, AN/AVS-6(V)3, is capable of operating down to near-starlight conditions. The system incorporates 25 mm eye relief; dual-span adjustment knobs; gated power supply; either filmless or thin-film tube designs; fine-focus objective lens; and a low-profile battery pack. The low-light



AN/AVS-6 aviator's night-vision imaging system (ANVIS)

sensitivity is a 10 percent improvement over its predecessor and a 35 to 40 percent improvement over the earliest ANVIS.

The **AN/PVS-14 Monocular Night-Vision Device (MNVD)** is a lightweight head- or helmet-mounted image-intensification device that can also be mounted to the M16/M4 receiver rail. It is designed to be used in conjunction with rifle-mounted aiming lights. The AN/PVS-14 provides soldiers with the ability to conduct nighttime operations including driving, maneuvering, first aid, map reading and maintenance. The latest AN/PVS-14 operates on a single AA battery.

Multifunctional Aiming Lights (MFAL), including **AN/PEQ-2A**, **AN/PEQ-15** and **AN/PEQ-15A**, are used in conjunction with night-vision goggles to engage targets. MFAL devices contain infrared (IR) aiming lights and illuminators as well as visible pointers in a single, lightweight, compact package. When zeroed to the weapon, these devices provide an invisible, continuous infrared beam along the weapon's line of fire that is effective to the maximum firing range of the weapon.

The **AN/PEQ-14 Integrated Laser/White Light Pointer** adds the functions of a flashlight into a MFAL device for an effective small-arms lightweight integrated targeting system.

The **AN/PVS-10 Night-Vision Sniper Night Sight (SNS)** is a lightweight, weapon-mounted, passive image-intensification device designed primarily for use by snipers for day and night operations. A select lever permits the user to change the mode of operation between day and night. The SNS employs a black-line reticule that can be illuminated for night operation. A rail mounting interface allows quick mounting or dismounting from the weapon.

The **AN/PVS-26 Clip-On Sniper Night Sight** is a lightweight, clip-on, image-intensified night sight for the M110 Semiautomatic Sniper System that mounts in front of the day optic sight. The AN/PVS-26 employs a variable gain image tube that can be adjusted by the sniper depending on ambient light levels. The AN/PVS-26 provides the sniper the capability to accurately acquire and engage targets at low light levels without the need to remove the day optic.

The **AN/PSQ-23 Small Tactical Optical Rifle Mounted (STORM) Micro-Laser Rangefinder (MLRF)** is a lightweight, multifunctional laser system designed to operate on a variety of individual weapons, crew-served weapons and weapons plat-

forms including the M4/M16, the M107 sniper rifle, the M110 sniper rifle, the sniper tripod and the Stryker remote weapons station. It combines the functionality of a laser rangefinder, infrared aiming laser, infrared laser illuminator, digital compass and visible pointer into one package. STORM can be connected to an external GPS device to determine distance to targets. On crew-served weapons, STORM provides the critical range component to the fire control for achieving high probabilities of first-shot kills.

The **AN/PSQ-20 Enhanced Night-Vision Goggle (ENVG)** provides the soldier with enhanced mobility and situational awareness in all weather and battlefield obscurant conditions. ENVG is a helmet-mounted device that combines long-wave infrared sensor data with passive low-light-level image-intensification into an integrated display. The resultant image takes advantage of each sensor's strengths while minimizing individual sensor limitations.

The **AN/PAS-13 Family of Thermal Weapon Sights (TWS)** enables soldiers with individual and crew-served weapons to see deep into the battlefield, increase surveillance and target acquisition range, and penetrate obscurants day or night. The TWS uses forward-looking infrared technology and provides a standard video output for training, image transfer or remote viewing. Light, medium and heavy variants provide viewing to the maximum effective range of the designated weapon.

The **TWS Head Mounted Display (HMD)** integrates with the AN/PAS-13 TWS to provide a remote viewing capability for TWS and vehicle-mounted imagery. It allows a more comfortable firing position of the TWS on the M2/MK19 weapon systems. The HMD operates on four AA batteries and weighs less than 8 ounces.



AN/PSQ-23 small tactical optical rifle mounted (STORM) micro-laser rangefinder (MLRF)

The system is designed to operate with Army standard-issue protective eyewear, providing a minimal visual obscuration, thus maintaining or enabling the soldier's overall situational awareness.

Soldier-borne Sense Through the Wall (STTW) provides soldiers with the capability to detect, locate and "sense" person-



Soldier-borne sense through the wall (STTW)

nel with concealed weapons or explosives behind obstructions from a stand-off distance. Currently in development, STTW will be employed by soldiers in military operations on urban terrain and subterranean environments to locate and classify threats.

Gunfire Detection Systems (GFDS) are lightweight soldier-wearable sensors that accurately locate and engage enemy snip-



Gunfire detection systems (GFDS)

ers. The sensor locates the enemy gunfire through the acoustic signatures associated with the fired round to produce a range and bearing back to the threat. This information allows the soldier to conduct battle drills in response to the sniper's actual location.

The **Weapons Mounted Light (WML)** is one of the four components of the family of flashlights (FoF) that include the WML, the tactical handheld light, the hands-free helmet light and the crew-served weapons light. The WML is a small (7 inches or less), lightweight (10 ounces or less with batteries) white light that can be weapon-mounted or handheld. The WML is employed on small arms including the M16A4 modular weapons, M4/M4A1, M249 and M240B. The WML has dual activation controls, includes an IR capability and is designed to operate on two DL123 batteries.

Product Manager Soldier Precision Targeting Devices

Product Manager Soldier Precision Targeting Devices (SPTD) is the branch of PM SSL that supports the research and development of target designation systems.



(AN/PED1) Lightweight laser designator rangefinder (LLDR)

The AN/PED1 Lightweight Laser Designator Rangefinder (LLDR) enables fire-support teams and forward observers to accurately locate targets, digitally transmit target location data to the tactical network and laser-designate high-priority targets for engagement with precision munitions. 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. The TLM incorporates a thermal imager, day camera, electronic display, eye-safe laser rangefinder, digital magnetic compass, selective availability/antispoofing module, GPS electronics and digital export capability.

The Laser Targeting Locating Systems **Mark VII** and **Viper (V21)**, as well as the **Mark VII E** Laser Targeting Locating Module, provide fire-support teams and forward observers with daylight and limited night capability to observe and accurately locate targets for voice transmission of target data to the fire-support command, control, communications, computers and intelligence system. They can be handheld or tripod-mounted. Each incorporates an eye-safe laser rangefinder and a digital magnetic compass to determine range, azimuth and vertical angle from the

observer to targets of interest. The Mark VII and Viper systems can compute and display target location when connected to a GPS device. The Mark VII E has a built-in GPS device and an uncooled FLIR for improved night capability.

Project Manager Soldier Protection and Individual Equipment

Project Manager Soldier Protection and Individual Equipment (PM SPIE) develops and fields advanced soldier protection products, comfortable uniforms to enhance mission effectiveness and improved parachute systems. These products are designed to protect soldiers and allow them to operate in any conditions.

Product Manager Soldier Clothing and Individual Equipment

Product Manager Soldier Clothing and Individual Equipment (PM SCIE) supports soldiers in multiple operational environ-



ments and improves their survivability, health, safety, mobility and sustainability by providing safe, durable and operationally effective individual and unit equipment. PM SCIE enhances survivability through technologically advanced tactical and environmental protective clothing, individual chemical protective gear, load-carrying systems, and personnel parachutes and other airdrop equipment.

Modular Lightweight Load-carrying Equipment (MOLLE) provides today's soldier with a modular, flexible, load-carrying system that can be tailored to meet mission needs. MOLLE consists of a rucksack with removable pockets and a fighting load carrier that can accept removable pouches for the rifleman, pistol, grenadier, squad automatic weapon and medic items. For short-duration missions, there is an assault pack and a waist pack. For medium-duration missions, the Army is developing an additional pack. This modularity allows individuals or commanders to tailor the load to the needs of the mission.

The **Army Service Uniform (ASU)** is being introduced to provide a basic set of components that allows soldiers to dress from the lowest to the highest end of service uniforms with little variation required, thus reducing the need for numerous uniforms and reducing the clothing burden on soldiers. The ASU is based on the Army blue uniform, and the men's and women's coats from that uniform are unchanged.

The belted trousers and slacks with a traditional low waistline will be available for daily wear. The high-waist men's trousers traditionally worn with suspenders will be retained for wear with the Army blue mess uniform. The fabric of the coat, trousers, slacks and skirt is a 55 percent polyester and 45 percent wool blend that does not require special care. A new white herringbone shirt will be for daily wear, and a commercial white shirt will be worn for ceremonial and formal occasions. Officers and noncommissioned officers will wear gold stripes on the trousers/slacks. Junior enlisted soldiers (specialist and below) will have trousers/slacks without stripes on the legs. The beret will be the standard headgear worn with the ASU. Officers and noncommissioned officers (corporal and above) may wear the service cap as an optional item. Officers and enlisted soldiers will be authorized to wear overseas stripes on the right sleeve. Enlisted service stripes have been reduced in size and will be worn on the left sleeve. The new Combat Service Badge will be worn in place of the Former Wartime Service Shoulder Sleeve Insignia to represent combat service.

Several uniforms being fielded by PM SCIE now offer a fire-resistant capability. These include the **Fire Resistant Army Combat Uniform (FR ACU)**, the **Army Aircrew Combat Uniform (A²CU)**, the Im-

Mark VII E Laser targeting locating module

proved **Combat Vehicle Crewmember Coverall (iCVC)**, the **Army Combat Shirt (ACS)**, and the **Fire Resistant Environmental Ensemble (FREE)**.

Starting in summer 2010, PM SCIE also offered these uniforms, or elements of them, in an alternative camouflage pattern for soldiers serving in Afghanistan. Following

commodate a higher jumper weight than the T-10D it is designed to replace.

The **Maneuverable Canopy 6 (MC-6)** provides the airborne soldier with a new static line-deployed, steerable parachute system. The MC-6 has several improvements designed to reduce soldier injury rates. The MC-6 has a lower opening

12-component, versatile, multilayered system that soldiers can tailor to mission and environmental requirements. The GEN III ECWCS system consists of lightweight undershirt and drawers; midweight shirt and drawers; fleece cold weather jacket; wind cold weather jacket; soft shell jacket and trousers; extreme cold/wet weather jacket and trousers; and extreme cold weather parka and trousers. The new materials offer a greater range of performance and environmental protection and reduce overall bulk and weight, providing greater versatility in meeting soldiers' needs. GEN III ECWCS has proven to be a combat enabler in Afghanistan.

The **Fire Resistant Environmental Ensemble (FREE)** is a multilayered, versatile all-climate system that allows combat vehicle and aircrew members to adapt to varying mission requirements and environmental conditions. Most importantly, it is fire-resistant. The FREE is comfortable and ergonomically efficient for wear in the confines of aircraft and armored vehicles. The system consists of a lightweight base, fire-resistant layers, midweight underlayer, light weather outer layer, intermediate outer layer, and an extreme/wet weather parka. The tops and bottoms come in 15 sizes. The FREE also includes cold-weather gloves, a rigger belt and wool socks.

The FREE will replace the aviation cold-weather clothing system. The FREE is color-compatible with ground soldier uniforms. New materials offer a greater range of breathability and environmental protection, providing greater versatility in meeting soldiers' needs.

Product Manager Soldier Protective Equipment

Product Manager Soldier Protective Equipment (PM SPE) develops and fields state-of-the-art force-protection equipment that defeats ballistic and fragmentation threats in theater. PM SPE provides supe-



Fire resistant environmental ensemble (FREE)

a rigorous four-month period of in-theater assessment and soldier evaluation, the Army decided in February 2010 to provide soldiers in Afghanistan with fire-resistant uniforms in MultiCam, as an alternative to the standard universal camouflage pattern. The choice of camouflage improves soldiers' concealment in Afghanistan's highly variable environments and reflects PEO Soldier's ongoing commitment to providing soldiers with the best uniforms available. Other uniform initiatives include the FR ACU trouser product improvement program to provide soldiers with a more durable seat and crotch and integrated hard-shell knee pads.

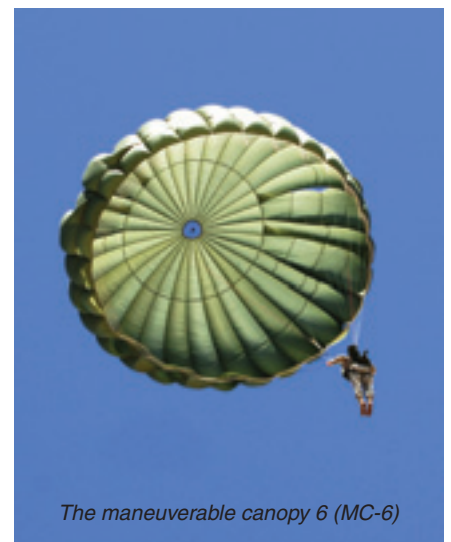
The **T-11 Personnel Parachute System** provides the airborne soldier with the next-generation tactical personnel parachute system and represents the first complete modernization of the tactical parachute system since the early 1950s. The T-11 parachute system includes a newly designed main canopy as well as a completely redesigned reserve parachute (T-11R) and an integrated harness assembly. The T-11 parachute system is designed to reduce soldier injury rates with a slower rate of descent, reduced opening shock and reduced oscillations. The T-11 can ac-

commodate a higher jumper weight than the MC1-1 series it is designed to replace.

The **Generation III Extended Cold Weather Clothing System (ECWCS)** is a



T-11 Personnel parachute system



The maneuverable canopy 6 (MC-6)

Concealable body armor (CBA)

rior body armor, helmets and other gear that greatly reduce the threat of serious injury.

Interceptor Body Armor (IBA) is a joint service item designed and developed to incorporate the requirements of the Army and Marine Corps. Interceptor is the model name for a modular, multiple-threat body armor system consisting of a base tactical vest and modular components, with small-arms protective inserts designed to defeat multiple ballistic hazards across the battlefield continuum. The **Outer Tactical Vest (OTV)** is a first-generation, center-opening vest that provides fragmentation and handgun protection. The OTV consists of a groin protector, back yoke and collar, and throat protector. In addition, it can accommodate the deltoid and axillary protectors. The OTV is functionally integrated with modular lightweight load-carrying equipment (MOLLE). The **Improved Outer Tactical Vest (IOTV)**, a replacement for the OTV, is donned over the head and has a cummerbund. The vest provides fragmentation and handgun protection. The IOTV consists of a groin protector, back yoke and collar, front yoke and collar, lower back protector and deltoid protector. The IOTV is functionally integrated with MOLLE and incorporates a quick release for emergency doffing. The IOTV, the Army's second-generation tactical vest, has been further improved in 2010 with more than a dozen enhancements to form, fit and function. The **Deltoid and Axillary Protector (DAP)** is a component of IBA that provides additional fragmentary and handgun protection to the upper arm and underarm areas. DAP was developed as an add-on to the OTV to protect soldiers from the threat of improvised explosive devices in current operations. This auxiliary protective capability is already integrated into the IOTV. The **Enhanced Small Arms Protective Insert (ESAPI)** plates provide multiple-hit protection to the chest and back against various small-arms threats. The **Enhanced Side Ballistic Insert (ESBI)** plates provide additional ballistic protection for the soldier's sides, which are not covered by ESAPI. The ESBI can withstand small-arms hits. ESBI plates are attached to the OTV with a carrier assembly that employs webbing on the front and back. ESBI plates can be further secured through incorporation with the DAP. The IOTV includes integrated ESBI plate carriers, which reduces redundant overlapping soft armor protection and decreases overall weight. The **X-Threat Small Arms Protective Insert (XSAPI)** plate was designed to meet near-term emerging threats and pro-



vide additional ballistic protection against more lethal small-arms rounds.

The **Soldier Plate Carrier System (SPCS)** is a new, lighter-weight form of body armor for use in certain missions in Operation Enduring Freedom where mobility is key. The plate carrier reduces the weight of fully equipped body armor by a little more than 9 pounds. The vest carries standard hard armor plates for vital ballistic protection, but covers less of the soldier's body than the interceptor body armor system. This allows the soldier to carry less weight yet maintain equal amounts of hard armor protection with less area of coverage of soft armor.

The **Concealable Body Armor (CBA)** is intended to be worn by soldiers in military police units, corrections, confinement and law-enforcement operations, Department of Defense investigative and security components, and other U.S. military forces. The CBA offers two protection levels: ballistics protection NIJ Level IIIA and stab/spike resistance NIJ Level 3. The CBA provides maximum torso coverage while maintaining comfort and concealability.

The **Advanced Combat Helmet (ACH)** comes in five shell sizes (small, medium, large, extra-large and extra-extra large) and includes a modular pad suspension system, retention system and nape pad. The modular pad suspension system improves blunt-force impact protection, stability and comfort. The cotton/polyester retention system, a four-point design, allows for quick adjustment for head size.

The nape pad attaches to the retention system, improving comfort and stability and providing protection against small-arms and fragmentation threats to the nape area of the neck. The ACH weighs 2.9 to 3.8 pounds, depending on size. The helmet cover is available in the universal camouflage pattern and in MultiCam for soldiers in Afghanistan.

The **Helmet Sensor (HS)** is a small, lightweight, low-power sensor suite that mounts to the advanced combat helmet or the combat vehicle crew-member helmet. The helmet sensor detects, measures, and records impact accelerations and blast overpressure associated with improvised explosive devices (IED) and other high-energy events that may cause concussions in an operational environment. The Army is analyzing data collected from nearly 7,000 helmet sensors deployed to Operation Iraqi Freedom and Operation Enduring Freedom. The sensors continuously and automatically collected data, recording peak overpressure from IED blasts, crashes, blunt impact and ballistic events. The helmet sensor program is continuing with a second-generation helmet sensor that expands the data gathered and introduces wireless capability as well as other functional improvements. The data gathered by the two gener-



Advanced bomb suit (ABS)

ations of helmet sensor will help the Army medical community to establish a body of knowledge for accelerated research in the development of an objective head exposure monitor and rapid head injury screening tool in order to support the diagnosis and treatment of mild traumatic brain injury.

The **Enhanced Combat Helmet (ECH)** enhances ballistic protection, stability and comfort without adding weight or degrading the soldier's field of vision and hearing. The ECH, which is in development, promises to provide increased protection against ballistic and fragmentation threats. The ECH uses advanced thermoplastic materials that require different manufacturing processes than those associated with resin-impregnated para-aramids. The materials are ultrahigh molecular weight polyethylene.

The **Military Combat Eye Protection (MCEP)** program is an umbrella program geared toward protecting soldiers' eyes from external threats/hazards such as ballistic fragmentation, lasers, electromagnetic radiation, sand, wind, and dust during daytime and nighttime missions. The MCEP provides eye protection for both prescription and nonprescription wearers in a variety of commercial styles and sizes. Given this variety of eyewear, soldiers can choose the best items for their needs while still maintaining military standards for eye protection.

The **Advanced Bomb Suit (ABS)** protects explosive ordnance disposal (EOD) soldiers against ordnance and improvised explosive devices. This system leverages new materials technology and design to provide protection, comfort and ergonomic efficiency. The ABS ensemble consists of the EOD 8 bomb suit and EOD 9 Generation 2 Bomb Helmet. The bomb suit is a full-body ensemble that protects from fragmentation, blast overpressure, impact, heat and flame. To minimize weight and maximize flexibility, fragmentation protection is provided at various levels specific to body regions, based on wounding potential. Blast overpressure protection is provided to the front of the thorax. Impact protection is provided to the head and spine. Heat and flame protection are provided by resistant materials. The suit includes an ice-based cooling system to extend mission duration. A hand-protection module provides increased protection. The system can be taken off in less than 30 seconds. All ballistic inserts are removable to facilitate laundering and repair. The system is equipped with provisions that allow for future communications, performance and capability upgrades.

Project Manager Soldier Weapons

Project Manager Soldier Weapons (PM SW) ensures that soldiers have overmatch in individual and crew-served weapons

capabilities on the battlefield. PM SW supports soldiers through the development, production, fielding, and sustainment of current and future weapons systems, and associated target-acquisition/fire-control products. As a result of PM SW's efforts, soldiers benefit from continuous improvement programs and are equipped with systems that enhance both survivability and lethality. Two product managers under PM SW drive the mission to provide soldiers battlefield superiority: Product Manager Individual Weapons and Product Manager Crew Served Weapons.

Product Manager Individual Weapons

Product Manager Individual Weapons (PM IW) is responsible for current and future rifles, carbines, pistols, shotguns, grenade launchers and related target-acquisition/fire-control products.

The **XM25 Counter Defilade Target Engagement System (CDTE)** is the Army's latest developmental weapon designed to address the problem of defeating enemies



XM25 Counter defilade target engagement system (CDTE)

behind cover and exposed targets at ranges and accuracies not seen with today's small arms. The XM25 fires 25 mm munitions including high-explosive airburst (HEAB), armor-piercing, nonlethal, training and breaching rounds. The XM25 incorporates full-solution target acquisition/fire control that integrates a thermal sight, 2x direct-view optics, a laser range-finder, compass, fuze setter, ballistic computer and internal display.

The **M4 5.56 mm Carbine** increases the lethality and operational flexibility of the soldier with a carbine-length version of the M16 rifle. Designed for lightness, speed, mobility and firepower, the M4 carbine replaces the M3 submachine gun, select M9 pistols and M16 rifles for operators who require a more compact weapon system. The weapon allows mounting of the latest generation of fire-control accessories with-



M4 5.56 mm Carbine

out tools as well as the M26 shotgun. More than 93 percent of soldiers rate the M4 as an effective weapons system in postcombat surveys. The weapon incorporates more than 62 refinements developed since its inception.

The **M16A2/A4 Series 5.56 mm Rifle** is the most prevalent combat rifle in the Army inventory. It is a gas-operated, air-cooled, shoulder-fired weapon that can be fired either in automatic three-round bursts or semiautomatic single shots. The M16A2 has an integral rear sight, while the M16A4 includes a mil-standard 1913 upper receiver and forward rail system with a backup iron sight. Both systems can accommodate modern optics and accessories as well as configurations that incorporate M203 and M320 40 mm grenade launchers.

The **M320 Grenade Launcher** enables soldiers to accurately engage the enemy in daylight or total darkness with 40 mm low-velocity grenades. The M320 will replace all M203 series grenade launchers mounted on the M16/M4 series of rifles and carbines. The weapon has a side-loading unrestricted breech that allows the system to fire longer 40 mm projectiles (NATO standard and non-



M320 Grenade launcher

standard) and also features the enhanced safety of a double-action trigger/firing system. The M320 can also be converted to stand-alone mode without the need of tools.

The **M26 12-Gauge Modular Accessory Shotgun System (MASS)** provides soldiers with a 12-gauge shotgun accessory attachment with lethal, less-than-lethal and door-breaching capabilities. The system attaches underneath the barrel of the M4 carbine and provides a capability equivalent to a stand-alone shotgun without carrying a second weapon. The M26 can also be converted without tools to operate in a stand-alone mode.

The **M107 Semiautomatic Long-Range Sniper Rifle (LRSR)** is a .50-caliber rifle that employs greater destructive force than other U.S. sniper rifles against light materiel and personnel targets. The LRSR is a

commercial off-the-shelf, countersniper, semiautomatic weapon. It can complete missions out to 2,000 meters that cannot be accomplished with current sniper rifles. The M107 improves sniper survivability by precisely engaging high-value targets with greater firepower at long standoff ranges.

The **M110 Semiautomatic Sniper System (SASS)** is the U.S. Army's latest medium-caliber sniper rifle that supplements the sniper's role to support combat operations with greater firepower and versatility. The 7.62 mm SASS brings a semiautomatic capability to sniper teams and is particularly effective in urban areas where there are multiple targets and frequent close-combat situations. The M110 comes with a suppressor and incorporates a 3.5x10 scope with illuminated mil-reticle. It also comes with the **M151 Enhanced Spotting Scope**, which allows recognition and identification of targets at long distances. With powerful and bright optics, the spotting scope has 12-40x magnification with a 60 mm objective lens diameter. The scope has a Leupold mil dot (round dot) reticle for both range estimation and tactical collaboration with the shooter. The scope is weatherproof and fog-proof.

The **M14 7.62 mm Enhanced Battle Rifle (EBR)** provides infantry squads with the capability to engage enemy targets beyond the range of M4 carbines and M16 rifles. The weapon is air-cooled, gas-operated and magazine-fed. It is a modern M14 rifle mated to an enhanced aluminum billet stock, tactical scope and cantilever mount. The rifle is effective in close-quarters combat and in the squad designated marksman role.

The **M9 9 mm Pistol** enhances lethality, survivability and situational awareness in close-combat situations via an improved pistol with rail-attachment capabilities. The weapon is a semiautomatic, double-action pistol that is lighter, more lethal and safer than its predecessors. It is the primary sidearm of crew-served weapon crew members and others who have a personal defense requirement, such as law-enforcement personnel, unit leaders and aviators.

The **M68 Close Combat Optic (CCO)** is a red-dot aiming device that enhances target acquisition speed, allowing soldiers to engage targets up to 300 meters with both eyes open to maintain situational awareness. The sight has no magnification and can be used with all current night-vision enhancements.

The **M150 Rifle Combat Optic (RCO)** is a rugged, battery free, 4x magnified optic that provides full mission profile optical capability for use on M4/M16/M249 weapon systems. Enhanced capabilities provided by the M150 RCO include range estimation, which, along with the bullet

drop compensated reticle, provides accurate target engagements out to 800 meters for trained operators.

Product Manager Crew Served Weapons

Product Manager Crew Served Weapons (PM CSW) is responsible for current and future light and heavy machine guns, grenade launchers, related target-acquisition/fire-control products and remote weapons systems.

The **XM153 Common Remotely Operated Weapon Station (CROWS)** provides soldiers with the ability to acquire and engage targets while protected inside an armored vehicle. CROWS is a stabilized mount that contains a sensor suite and fire-control software, allowing on-the-move target acquisition and first-burst target engagement. Capable of target engagement under day and night conditions, the CROWS sensor suite includes a daytime video camera, thermal camera and laser rangefinder. CROWS is designed to mount on any tactical vehicle and supports the MK19 grenade machine gun, .50-caliber M2 machine gun, M240B machine gun and M249 squad automatic weapon.

The **MK19 40 mm Grenade Machine Gun (GMG)** is an air-cooled, belt-fed, blow-back-operated, fully automatic weapon system. It has a maximum effective range of



MK19 40 mm Grenade machine gun (GMG)

2,200 meters for area targets and 1,500 meters for point targets. It fires standard high-velocity 40 mm grenade cartridges, including M383 high-explosive antipersonnel rounds, high-explosive dual-purpose (antipersonnel and armor-piercing) rounds and training practice rounds. The MK19 supports the soldier in offensive and defensive roles by delivering a heavy volume of accurate and continuous firepower against enemy personnel and lightly armored vehicles. It can be mounted on a tripod or on multiple vehicle platforms and is the primary suppressive weapon for combat support and combat service support units.

The **M2 .50-Caliber Machine Gun** is an automatic, belt-fed, recoil-operated and air-cooled weapon system that has been in service since the 1920s. It mounts on the M3 tripod and on most vehicles, while also

serving as an antipersonnel and anti-aircraft weapon. It is highly effective against light armored vehicles, low- and slow-flying aircraft, and small boats. The M2 provides automatic weapon suppressive fire for offensive and defensive purposes. The M2E2 quick-change barrel (QCB) kit currently in development will enhance the M2 with new features and design improvements that make the weapon easier and safer to use, including fixed headspace and timing, flash hider that reduces muzzle flash, and quick-change barrel with removable carrying handle.

The **XM806 Lightweight .50-Caliber Machine Gun** is a lightweight variant of the M2 .50-caliber machine gun. Weighing less than 70 pounds with tripod, the XM806 weighs approximately half as much as a similarly configured M2 and reduces the recoil by at least 60 percent. This lighter weight permits easy dismount and ground transportability when necessary, and the reduced recoil permits the mounting of an optic for greater lethality through increased first-burst accuracy and control. The XM806 can fire all of the .50-caliber ammunition in the current inventory and is capable of defeating personnel and lightly armored targets out to 2,000 meters. It is designed to augment the M2 .50-caliber machine gun but can also be used to replace the M2 in select operational locations.



M249 Squad automatic weapon (SAW)

The **M240B 7.62 mm Medium Machine Gun** is a ground-mounted, gas-operated, crew-served machine gun. The M240B delivers more energy to the target than the smaller caliber M249 SAW. The cyclic rate is 550 to 650 rounds per minute, and the weapon's maximum effective range against area targets is 1,800 meters. It comes with an accessory rail integrated with the top cover that is used to attach sighting devices. It is issued to infantry, armor, field artillery and combat engineer units that require medium-support fire.

The **M240L 7.62 mm Medium Machine Gun (Light)** reduces the weight of the existing M240B without compromising reliability. The M240L incorporates titanium construction and alternative manufacturing methods to achieve its weight savings. These improvements reduce the soldier's combat load while allowing easier handling and movement of the weapon. The

weapon meets all of the reliability and operational characteristics of the M240B. It is rugged and reliable and has a minimum 50,000-round receiver life.

The **M240H 7.62 mm Machine Gun (Aviation Version)** is designed for aviation application and demonstrates reliability equal to that of the M240B. It delivers two minutes of continuous suppressive fire and is removable for use in a ground role. It replaces the M60D machine gun for the UH-60 Black Hawk and CH-47 Chinook helicopters as part of their defensive armament systems.

The **M249 5.56 mm Squad Automatic Weapon (SAW)** serves as an automatic rifle and light machine gun for infantry squads, as well as providing light machine-gun capabilities in combat service and combat service support units. The M249 SAW is a lightweight, air-cooled, belt-fed 5.56 mm weapon with fixed headspace and a quick-change barrel. The weapon can be fired from the shoulder, bipod/tripod-mounted or vehicle-mounted positions. It replaced the M16 rifle in the designated automatic rifle role and the M60 machine gun in the light machine-gun role.