

FUTURE TECHNOLOGY, SHARPENING THE WARRIOR'S EDGE

This chapter provides a brief overview of the military application of existing and developing technologies. In general it looks out 5 to 10 years, and covers a range of equipment programmed for fielding, some still in development. These technologies will enhance the capabilities of the light force in both war and operations other than war.

The emphasis of technology developments for infantry forces are: command and control, sensing, lethality, survivability, and human performance and endurance. This application of science and technology is designed to help light forces operate more efficiently for longer periods of time, and in adverse climatic conditions. It will make them more lethal without significantly increasing soldier load. It will enable them to detect a threat at much greater distances during periods of limited visibility. Finally, it will help them to survive the more lethal, high technology battlefield of the future, and afford leaders a much clearer picture of the battlefield.

COMMAND AND CONTROL

The revised Army tactical command and control system (ATCCS) automation concepts will allow command and control from anywhere on the battlefield. Commanders must be able to see and understand the battlefield, communicate intent, issue orders, and synchronize the fight. ATCCS provides the commander a tool for managing large amounts of data and the ability to track both friendly and enemy status on a near real-time basis. ATCCS also provides the ability to prepare, coordinate, and disseminate plans, orders, graphics, and reports much faster than ever before.

Horizontal and vertical integration across all functional areas (maneuver, FS, AD, CSS, IEW) will provide for force level information, a common friendly picture, and automated OPORDs and overlays. This integration adds significant combat power to light forces by providing access to joint FS systems.

Global positioning sensors with single channel ground and airborne radio systems (SINCGARS) will include small automated display terminals at platoon, company, and battalion levels. This greatly enhances situational awareness, which in turn assists in battle synchronization and fratricide prevention. GPS with SINCGARS, integrated into maneuver control system electronic map capabilities, will provide the commander with near real-time disposition of friendly forces on an automated electronic map.

An automated smart handset will enable the SINCGARS user to dial directly into the MSE circuit switch.

Improved SINCGARS data capability, integrated with MSE packet network, provides common data distribution capability at all levels and a seamless data distribution architecture.

Integrated broadcast intelligence information services, with common communications and data processor that distributes information over packet network to MCS, will allow users to provide a common enemy picture, correlated intelligence, and a single source distributed enemy display.

The soldier's computer is a fully portable, lightweight, hands-free computer system designed for the individual soldier. This system will extend C³ down to the soldier level. Components of the computer include:

- Helmet-mounted display, which provides nearly the same image resolution as a desktop computer monitor.
- Pocket-sized computer.
- Hand-held input device, which works similar to a mouse or joystick and requires the use of only one thumb.
- Radio local area network (LAN), which can transmit voice or data bits.
- GPS, which permits the soldier to view a map depicting friendly, enemy, and his own position on the battlefield.

SENSING

The diffusion through a membrane (DITAM) apparatus will provide soldiers with a fast, easy-to-use hand-held device that is capable of detecting several hazardous substances, such as chemical warfare agents and fungal toxins simultaneously. Several of the devices will fit in the pocket of the BDU.

The individual soldier-operated personal acoustic detection system (ISOPADS) extends the soldier's useful listening range during patrols or perimeter defense operations. The ISOPADS has no electronics or batteries, has a highly directional capability, is passive (no emission signals), and can be hand held.

The fluorescent target detection (FTD) system uses a laser-induced fluorescence to detect ground-based military equipment, and has the potential for detecting chemical substances. The FTD system can detect chemical-contaminated surfaces, mines and explosives, and weapons and motorized equipment. The system can be either aircraft-mounted, vehicle-mounted, or carried by the soldier.

The biological and chemical agents detector, when fielded, will give the Army its first true biological detection capability, sensing a variety of toxins and pathogens as well as the traditional chemical agents. The detector will be man-portable, modular in design to incorporate new technology, battery-powered, and capable of displaying both the hazard class and an estimate of concentration.

LETHALITY

The multipurpose individual munition (MPIM) is an individual soldier weapon that will augment the M72 series and AT4 light antiarmor weapons. The weapon will be shoulder-fired and have the ability to defeat armored personnel carriers and incapacitate enemy personnel entrenched behind masonry structures and inside bunkers.

The Javelin is a man-portable antitank system designed to provide high lethality against conventional and reactive armor and will be a direct replacement for the Dragon. The Javelin uses "fire and forget" technology, which allows the gunner to fire and immediately take cover.

Additional special features are the top-attack or direct-fire mode, integrated day/night sight, dual warhead, and imaging infrared seeker. The target lock-on and soft launch feature allows the Javelin to be fired from enclosures and covered fighting positions. The Javelin is scheduled for fielding in July 95.

The family of fuzes for mortars replaces some 20 fuzes in the inventory. This three-fuze family for all mortars simplifies battlefield logistics, provides dual safety arming features, and reduces production costs through commonality of parts. The three fuzes are ballistically similar and form a complete family of fuzes usable with all mortar ammunition (60 millimeter, 81 millimeter, 120 millimeter, and 4.2 inch). The family consists of the M734 multioption fuze, M745 point-detonating fuze, and electronic time fuze.

Efforts continue to increase the lethality of small arms for the individual soldier on the battlefield. Projects include improvements to the M24 sniper weapon system, a 30-millimeter semi-automatic grenade launcher, and the M16A3 rifle with optical sights.

FIRE SUPPORT

There are two FS projects under development that could have a significant impact on light forces. They are the lightweight, towed, 155-millimeter howitzer and the high-mobility artillery rocket system (HIMARS).

The lightweight howitzer will replace, in part, the M198 howitzer. The system will have a crew no larger than the M198 and will be capable of low- and high-angle fire in all directions (6400 roils). The howitzer will be air-transportable and air-droppable from USAF aircraft and lifted by the CH47 helicopter. The weapon will fire all current and developmental 155-millimeter ammunition and will use a prime mover from the family of medium tactical vehicles (FMTV). The howitzer is programmed for production in FY 98.

The HIMARS answers the need for a lighter-weight, more deployable rocket and missile launcher that can be sent anywhere in the world to provide the maneuver commander lethal, long-range fires at the beginning of a conflict. The HIMARS will be transportable by C-130 and larger AF aircraft. It will fire the MLRS family of

munitions and have a maximum crew of three. It should enter production in FY 99.

SURVIVABILITY

In response to the proliferation of friendly and enemy lasers on the battlefield, the Army has developed eye protection for use in magnified optical devices. The M22 binoculars have been fitted with laser protection filter assemblies. Filters will also be installed in the optical sights of a number of weapons systems. These filters do not significantly reduce image clarity. Other technology may soon be available to counter modern lasers.

The ultra lightweight camouflage netting system is made with a close-knit fabric that is virtually snag-free as opposed to the current lightweight camouflage screening systems (LESS). A garnish material is sewn on top of the fabric to give it the appearance of natural vegetation. The garnish material has the same visual and radar properties as the current LESS. This system offers effectiveness equal to or better than the current system with approximately a 50 percent reduction in weight and volume, and a 40 percent reduction in installation time.

Security and force protection enhancement resources is an assembly of components designed to enhance personnel security. These components provide equipment for the detection, assessment, delay, and response to security threats. A combination of military and commercial components have been integrated into a system specially designed for operations other than war. Components include passive infrared, seismic, active infrared, and rapidly deployable detection sensors; razor tape concertina; low-light intensified cameras for remote assessment; NVDs for manual assessment of intrusions; and secure hand-held radios.

HUMAN PERFORMANCE AND ENDURANCE

The soldier system represents the effective integration of the individual soldier with material, operations, training, environment, and leadership. The system consists of all items or equipment worn, carried, or consumed in the field, and all controllable factors that affect how well a soldier performs his mission. The major

components of the system are food, clothing and protective equipment, shelters, weapons, and communications devices. Weapons and communications will be covered in separate sections.

Current emphasis is on developing combat clothing and individual equipment (CIE) which will improve the soldier's capability to counter emerging battlefield threats. Research and development is focused on the design of lighter weight equipment, ballistic and laser eye protection, and improved chemical protective clothing.

The Army has recently developed two training devices that will interface with the multiple integrated laser engagement system (MILES). They are a hand grenade and an M18A1 claymore mine. These devices are nonexplosive and provide visual and audible indications of action. These are very cost-effective devices that will enable soldiers to learn the casualty-producing effects and capabilities of these weapons.

Ongoing efforts to improve quality of life for soldiers include improved kitchen, laundry, shower, and other collective support equipment. Efforts also focus on items for the individual which will enhance quality of life in the field. Several items were provided to the troops in Southwest Asia which improved both their effectiveness and quality of life, such as flameless ration heater, improved operational ration items, and the five-soldier crew tent.

The soldier integrated protective ensemble (SIPE) is a modular fighting ensemble for the soldier, expected to be fielded by the year 2000. The SIPE will include an integrated helmet with individual communication system, weapons interface, ballistic and laser eye protection, respiratory and aural protection, and microclimate conditioning and power unit. The advanced clothing system will include uniform, body armor, handwear, footwear, and load carrying equipment. The SIPE will enable the soldier to communicate when out of earshot, shoot from the hip, and encapsulate for NBC operations. SIPE will provide protection from multiple battlefield hazards, including ballistic, flame, directed energy, and biological and chemical threats.