# Army Guide monthly

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Term of the day

## Anti-Tank Guided Missile

An anti-tank guided missile (ATGM) or anti-tank guided weapon (ATGW) is a guided missile primarily designed to hit and destroy heavily-armored tanks and other armored fighting vehicles.

ATGMs range in size from shoulder-launched weapons which can be transported by a single soldier, to larger tripod mounted weapons which require a squad or team to transport and fire, to vehicle and aircraft mounted missile systems.

The introduction of smaller, man-portable ATGMs with larger warheads to the modern battlefield has given infantry the ability to defeat even heavily armored main battle tanks at great ranges, usually with the first shot. Earlier infantry anti-tank weapons such as anti-tank rifles, anti-tank rockets and magnetic anti-tank mines had limited armor-penetration abilities and/or required a soldier to approach the target closely.

First-generation manually command guided MCLOS missiles like the AT-3 Sagger require input from an operator using a joystick or similar device to steer the missile to the target. The disadvantage is that the the operator must be well trained and must remain stationary during the flight time of the missile (and is therefore vulnerable to counter attack ).

Second-generation semi-automatically command guided SACLOS missiles require the operator to only keep the sights on the target until impact. Automatic guidance commands are sent to the missile through wires or radio, or the missile relies on laser marking or a TV camera view from the nose of the missile. Examples are the American TOW and Hellfire I missiles. Again the operator must remain stationary during the flight time of the missile.

More advanced third-generation guidance systems rely on a laser or a camera, on the nose of the missile. Once the target is identified the missile needs no further guidance during flight ( i.e it is "fire-and-forget" ) and the operator is free to retreat. Examples include the American Javelin and Indian Nag.

Most modern ATGMs have shaped-charge high explosive (HEAT) warheads, designed specifically for penetrating armour. Tandem-charge missiles attempt to defeat very heavy or spaced vehicle armour by employing two separate warheads. Top-attack weapons are designed to focus the explosion down through an armoured fighting vehicle's thinner turret-roof or upper-hull armour.

Countermeasures against ATGMs include spaced, perforated, and composite armour, explosive reactive armour (ERA), jammers like the Russian Shtora, and active protection systems (APS) like Drozd and Arena. Traditionally the most effective countermeasure was to open fire at the location where the missile was fired from : either the operator would be forced to take cover or he would be killed.

Anti-tank weapons like bazookas and RPGs are not considered ATGMs since the projectile is unguided.

Contracts

## Armor Holdings, Inc. Receives $345 M Order for Family of Medium Tactical Vehicles

Armor Holdings, Inc., a leading manufacturer and distributor of military vehicles, vehicle armor systems and life safety and survivability systems serving military, law enforcement, homeland security and commercial markets, announced the receipt of a $345 million order for production of additional Family of Medium Tactical Vehicle (FMTV) trucks and trailers from the U.S. Army Tank-automotive and Armaments Command (TACOM).

The Company advised that the order is made under the existing multi-year FMTV production contract, with work to be performed in 2007 and 2008 by the Armor Holdings Aerospace & Defense Group at its facilities located in Sealy, Texas.

Robert Schiller, President of Armor Holdings, Inc., said, "This new order gives Armor Holdings the opportunity to continue providing the most reliable tactical vehicles to our soldiers. We are extremely proud to support the Army's deployed and home-based missions with the FMTV."

Defence Industry

## Gibbs Technologies and LM to Develop High Speed Amphibious Vehicles for Military Use

Lockheed Martin and Gibbs Technologies have agreed to develop a family of high speed amphibious vehicles designed specifically for military operations.

The militarized High Speed Amphibians (HSAs) will use technology from a fleet of prototype amphibious

vehicles developed by Gibbs Technologies for consumer use, including the Gibbs Aquada, a three-person sports car, Gibbs Humdinga, a four-wheel military vehicle, and Gibbs Quadski, an amphibious all terrain vehicle.

Gibbs' technology enables amphibians to travel at speeds over 45 mph on water and over 100 mph on land - and to transition from water-to-land or land-to-water in five seconds. These features provide a much needed capability for military littoral, riverine and special operations.

HSAs are high performance craft on the water, and high performance vehicles on the ground and the transition between the two is seamless. These are true amphibians, combining the best of both worlds.

Gibbs and Lockheed Martin are developing three military concept vehicles, representing a scalable capability to meet various missions:

The Amphibious Combat Craft - Expeditionary (ACC-E) is a 20-foot amphibian capable 45 mph on the water and 80 mph on land;

- The Amphibious Combat Craft - Riverine (ACC-R) is a 35-foot amphibian capable of 40 mph on the water and 65 mph on land; and,
- The Terraquad, capable of over 55 mph on the water and 50 mph on land.

Gibbs and Lockheed Martin will advance the development by integrating expeditionary command and control capability, armor and weapons systems. The military version will have network ability to share and distribute information from onboard and remote sensors. The craft will be able to accommodate a variety of weapons systems, based on specific mission needs.

Until now, Navy and Special Forces have taken on great risk with sea-to-shore insertions, largely due to a transition period that can last an hour or more in vulnerable areas. HSA minimizes that risk, allowing forces to move safer and faster - and with capabilities that make it a powerful asset in a net-enabled force.

Term of the day

## Shrapnel

Shrapnel is the term commonly used to describe the metal fragments and debris thrown out by any exploding object, be it a high explosive (HE) filled shell or a homemade bomb wrapped with nails or ball bearings.

The word shrapnel is derived from the name of Major-General Henry Shrapnel (1761–1842), an English artillery officer, whose experiments—initially conducted in his own time, and at his own expense—designed a shell specifically for the purpose. The term 'Shrapnel' originally referred only to the the spherical shot or musket balls dispersed when a shrapnel shell bursts, and this is still the technical meaning of the term, although it is now used to describe all types of high velocity debris thrown out from an explosion, and makes no differentiation to the process which created or produced the debris. The Oxford English Dictionary documents that the term Shrapnel is often used to describe fragments or shot intentionally included in explosive devices, such as pipe casings, nails, or ball bearings. For shells, bombs or other munitions, the technical term for these particles is fragments, splinters or shards, fragments being the preferred name in scientific documents on the subject. Another term which can be used to describe a particle other than a bullet which causes a wound is 'bomb fragment' or 'bomb shard'. These terms also include items which were not part of the original explosive device, but which are propelled as projectiles by the force of the explosive or impact.

Defence Industry

## Australian Defence Force Deploys RFID 'Track & Trace' Capability to the Middle East

Representatives from the Defence Materiel Organisation (DMO) and Lockheed Martin Australia today farewelled the first active Radio Frequency Identification (RFID) Tag from Australia into the Middle East Area of Operations.

The 'Track and Trace' network for Defence logistics systems will revolutionise Defence's in-transit visibility of stores and equipment transported throughout the Defence supply chain.

Defence is rolling out a leading edge 'Track and Trace' system to enable automated tracking of stores and equipment through the supply chain anywhere in the world.

Track and Trace' will provide near real time automated tracking from the time the stores are consigned in the warehouse until they are delivered to the area of operations.

The Deployment of RFID Technology through 'Track and Trace' is a foundational element of the Joint Project (JP) 2077 programme that will culminate in the delivery of a world-first Military Integrated Logistic Information System (MILIS) to the Australian Defence Organisation over the next three years.

JP2077 2C represents an important step towards the delivery of a purpose-built Integrated In-Transit

Visibility system.

Defence Industry

## DRS Technologies Receives $52 M Contract to Produce Battlefield Digitization Systems for the U.S. Army

DRS Technologies, Inc. announced today that it has received a $52 million contract to provide rugged Applique Computer Systems and peripheral equipment for the U.S. Army's Force XXI Battle Command, Brigade and Below (FBCB2) program.

The order was received by DRS from the U.S. Army's Communications-Electronics Life Cycle Management Command (CELCMC) at Fort Monmouth, New Jersey.

The company's DRS Tactical Systems unit in Melbourne, Florida will produce the FBCB2 computer systems, including more than 5,700 processors, 5,800 display units, 5,300 keyboards, 6,700 hard disk drives and 1,400 rugged, solid-state hard disk drives.

DRS's Applique Computer Systems are installed on more than 40 U.S. Army and Marine Corps wheeled and tracked vehicles, at tactical operations centers and at other command post platforms. The computer systems support the Army's Blue Force Tracking requirements, which include beyond line-of-sight reporting and tracking, and vertical and horizontal information integration that is incorporated into the military's overall battlefield visualization efforts.

This additional order reflects DRS's strong track record for providing America's military with the most innovative and reliable products of the highest quality. Applique computer systems have been successfully fielded for FBCB2, and this contract ensures they will continue to serve as crucial assets for the Army's network-centric communications infrastructure.

Defence Industry

## NBC reconnaissance vehicle - type choice in favour of Thales/MOWAG

Zurich - After an evaluation process that lasted several months the Chief of Armament has, in agreement with the Chief of the Armed Forces, made his choice for the NBC reconnaissance vehicle type in favour of Thales Suisse with MOWAG GmbH Kreuzlingen.

This concerns a project in procurement planning which will provide a basis for the future application for the procurement of twelve systems in total. The contract for a pre-series vehicle was signed on December 15th 2006 between armasuisse, the procurement and technology centre of the Federal Department of Defence, Civil Protection and Sport DDPS, and Thales.

Thales in Zurich is prime contractor for the project and in addition responsible for the NBC sensor-, analysis- and interpretation solution. Further, Thales ensures the overall functionality of the fully integrated solution within the vehicle. With MOWAG GmbH in Kreuzlingen, another renowned Swiss company, is taking part in the project. MOWAG will build the carrier vehicle Piranha IIIC and integrate the NBC solution.

The NBC reconnaissance vehicle shall enable the specialists their on-site mission in a protected environment in a nuclear (N), biologically (B) or chemically (C) contaminated area in case of threats or catastrophes. It has the ability to sample and analyze test samples from the soil, in the water and in the air, transmit the results, mark contaminated areas, generate prediction maps and thus support the forecast process.

The vehicle shall guarantee towards the crew a mission autonomy of twelve hours and can, thanks to its modern conception, in addition to its military tasks, be used for industry-related incidents or in connection with terrorist threats in advantage to civil authorities.

Defence Industry

## BAE Systems Fires First Round from Nlos Mortar Firing Platform

Minneapolis -- BAE Systems has successfully fired the first round from the Future Combat Systems (FCS) Non-Line-of-Sight (NLOS) Mortar Firing Platform.

The FCS program is managed for the U.S. Army by Boeing and Science Applications International Corporation (SAIC) and consists of 14 systems and a network to tie all the sensors, manned and robotic platforms and weapons to soldiers.

The NLOS Mortar Firing Platform features an automated, single-tube, breech-loaded 120-mm smoothbore turreted mortar mounted on a test stand. With a mission to provide short to midrange indirect fire support for manuever forces, the NLOS Mortar is one of eight Manned Ground Vehicles being designed and built as part of FCS - the Army's premier modernization program comprising a networked, fully integrated family of manned ground vehicles, unmanned ground and air vehicles, and sensors.

"As proven in Iraq, responsive fire support and enhanced mortar crew protection are combat essentials," said Jim Unterseher, vice president of Army Programs at BAE Systems in Minneapolis. "The successful test firing is a testament to the ingenuity of the BAE Systems design team and its commitment to provide soldiers with greater protection, safety and performance on the battlefield through the development of the Army's first-ever breech-loaded mortar."

The first shot was fired using a M931 Training round, at a special NLOS Mortar test range built by BAE Systems. The successful firing was the first in a series of tests being conducted to confirm the reliability of the NLOS Mortar's unique breech-loading system and its other advanced armament technologies that enable greater rates of fire and firing angles, as well as the ability for Soldiers to fire the weapon under armor - a capability mortar crews don't have today.

BAE Systems will continue NLOS Mortar Firing Platform tests, including those for Multiple Round Simultaneous Impact (MRSI) missions, during the coming weeks. Following a series of successful tests, the Firing Platform will be upgraded with an early prototype of the entire mission module equipment suite, which will have 80 percent commonality with the NLOS Cannon, and then delivered to the Army for additional testing.

BAE Systems is committed to delivering the first NLOS Mortar prototypes to soldiers by 2011.

Training And Simulators

## BAE Systems Receives $12.6 M Order for Bradley Advanced Training Systems

Orlando, Fla. -- BAE Systems has received a delivery order worth up to $12.6 million for 17 Bradley Advanced Training Systems (BATS) from the U.S. Army Program Executive Office of Simulation, Training and Instrumentation.

The contract calls for BAE Systems to produce and install the BATS devices at U.S. Army bases.

The work will be performed at BAE Systems' Orlando facility with delivery set for December 2007 through August 2008. This works follows a $19 million contract awarded to BAE Systems in 2006 to upgrade 66 Conduct Of Fire Trainer (COFT) training devices, and 24 BATS devices, build 10 new BATS devices and add "urban operations" to the BATS and COFT training devices.

"The BATS training is an important part of training for soldiers going to Iraq," said Mark Russell, Training Systems Manager for BAE Systems. "BATS is unique in that it offers more realism and incorporates a random target feature that better prepares the soldier for real life fighting scenarios."

Defence Industry

## QinetiQ subsidiary Foster-Miller announces additional $26M funding for 151 more TALON robots

Foster-Miller Inc, a wholly owned QinetiQ subsidiary, announced today that it has received an additional $26 million from the Naval Explosive Ordnance Disposal Technology Division (NAVEODTECHDIV) in Indian Head, MD, for 151 more TALON® EOD robots and spare parts.

This brings the total funding actually released to $109 million against the six-year, $257 million IDIQ (indefinite delivery/indefinite quantity) contract Foster-Miller initially announced in September 2005.

"The Government has ordered the additional TALON® MTRS (man-transportable robotic system) robots as part of its ongoing effort to get this lifesaving equipment into the hands of our soldiers as rapidly as possible," said Dr William Ribich, president and CEO of Foster-Miller. "We just shipped them our 1,000th TALON® robot at the end of March. Foster-Miller will begin filling the new order for 151 more TALON® robots this month and expects to complete the order during the summer."

NAVEODTECHDIV is the single service manager for Explosive Ordnance Disposal (EOD) and purchases EOD robots for the Air Force, Army, Navy and Marines. Countless lives have been saved through the use of these robots, and they are now viewed as essential equipment in the ongoing struggle to defeat IEDs (improvised explosive devices).

Contracts

## General Dynamics Awarded $22 M in Medium-Caliber Ammunition Contracts

General Dynamics Ordnance and Tactical Systems, a business unit of General Dynamics, has received multiple contract option awards totaling $22 million for 20mm ammunition from the U.S. Army Joint Munitions Command.

Under these awards, General Dynamics will deliver ammunition in the following configurations: the PGU 27 A/B TP Bulk Pack; the PGU 27 A/B TP and the PGU 30 A/B TP-T Functional Pack; the PGU 28 A/B SAPHEI combat round; and the M940 MPT-SD combat round.The U.S. Air Force and Navy use the 20mm PGU 27 A/B Training Practice (TP) ammunition, ballistically matched to the PGU 28 A/B combat cartridge, as an essential training solution for the F-15, F-16 and F-18 fighter aircraft. The traced PGU 30 A/B, linked 1-to-4 with the PGU 27 A/B, provides an illuminated signature that allows the gunner to visually track the round to the target.

The PGU 28 A/B Semi-Armor Piercing High Explosive Incendiary (SAPHEI) combat cartridge has a pyrotechnically initiated fuze that provides a slight delay, allowing for target penetration to ensure maximum lethality and combat effectiveness. Historically used by the Navy and Marine Corps, the Air Force has also recently begun using the PGU 28 A/B in combat missions.

The M940 Multi-Purpose Traced Self-Destruct (MPT-SD) combat round is qualified on the Phalanx MK 15 Block 1B and Vulcan gun systems and is extremely effective against lightly armored vehicles and airborne targets. Used with the ground-based Phalanx, the M940's accuracy and ability to penetrate the target prior to detonation provides intercept and destruction of incoming enemy rockets, artillery and mortars out to

2,000 meters. Its self destruct feature ensures the M940 avoids collateral damage.

Robots

## Boeing and iRobot Team to Develop New Reconnaissance Robot for Military, Civil and Commercial Use

Boeing and iRobot Corp. announced they have signed a teaming agreement to design and develop a next-generation, small unmanned ground vehicle (SUGV) called the SUGV Early. The vehicle will provide military, civil and commercial users with unprecedented reconnaissance and secure, real-time intelligence capabilities.

The SUGV Early will be a smaller, lighter version of the iRobot PackBot, which is used daily in Iraq and Afghanistan to safely disarm Improvised Explosive Devices (IEDs) and search buildings, caves and tunnels for hostile forces. To date, iRobot has delivered more than 900 PackBot robots to a broad range of military and civilian customers worldwide. The robots have performed tens of thousands of missions in Iraq and Afghanistan and are credited with saving soldiers' lives.

The remotely operated and highly maneuverable SUGV Early will feature a video camera and commercial electro-optics, infrared sensors mounted on an articulated manipulator arm and a track-driven chassis that will allow it to negotiate rough terrain and stairs. The 30-pound backpackable unit is designed for use in a wide range of hazardous situations, such as bomb disposal and disaster relief operations. The system, which utilizes commercial off-the-shelf technology and employs the basic design of future networked robotic systems currently under development for the U.S. Army, will be ready for delivery in 2008.

This partnership allows Boeing and iRobot to combine their expertise, capabilities and resources to provide customers with a small robotic vehicle that can perform a variety of surveillance missions and assist soldiers, law enforcement officials and rescue workers performing high-risk operations. The SUGV Early builds on lessons learned from users of the combat-proven iRobot PackBot, as well as experimentation using next-generation prototypes, to provide a solution that meets immediate warfighter, civilian and commercial needs.

Exhibitions

## China Internatinal Defence Electronics Exhibition in Beijing

The growing interconnections between domestic and international factors and interconnected traditional and non-traditional factors have made maintaining national security a more challenging task. China is endeavoring to make its border and coastal defense unified, effective, solid and informationized.

Since the early 1990s, China has gradually increased its defense expenditure on the basis of its economic development to safeguard its sovereignty, security and unity, and to keep pace with the global revolution in military affairs.

China's Parliament approves 14.7 percent increase in defense budget for 2006, hitting 283.8 billion yuan, or about 35.1 billion U.S. dollars (Xinhua News Agency). The momentum of double-digit increase will continue over the next few years along with China's economic growth.

### Why CIDEX?

- China, the fourth largest economy in the world, with enormously unexploited market room for your high-tech products. First-mover advantage secures your lion's market share in the future.
- The most professional and authoritative electronics event in China, covering both military and civilian applications.
- Strong endorsement from General Equipment Headquarters of PLA, Commission of Science, Technology and Industry for National Defense, Ministry of Information Industry.
- Sole Exhibition approved by military authorities in Defence related realms in China.
- Strategically staged in Beijing, home to major buyers from military sources.
- Widespread Network of Trade Visitor in China.

Nowadays, improvement and update of weaponry and equipment has become the important physical and technical foundation for acceleration of PLA reform with Chinese characteristics. To meet the requirements of national security, it is urgently to speed up the modernization of weaponry and equipment depending on the economic development and technical progress. With the extensive application in national defence, electronic technology has become one of the dominant elements of a war. Therefore, the modernization of electronic equipment is the one of key missions for PLA. Many foreign companies with advanced technology and abundant experience are now searching for any possible chance into Chinese market. In this case, CIDEX, the only defence electronics exhibition approved by military authorities offers the right opportunity for you to contact consumers, display your images and cooperate with local companies and agents.

### Profile of CIDEX

Sponsored by PLA General Equipment Headquarter, Commission of Science, Technology and Industry for National Defence, Ministry of Information Industry, China Electronics Corp. (CEC), China Electronics

Technology Group Corp. (CETC), and organized by China National Electronics Import & Export Corp. (CEIEC) and Beijing Xinlong Electronics Technology Co., Ltd., the 6th China International Defence Electronics Exhibition (CIDEX 2008) is going to stage on April 2-5, 2008 at Beijing Exhibition Center, China. Meanwhile, the 2nd China Defence Electronics Application Forum will be held during the exhibition, with sessions touching on test and measurement, power supply, embedd systems etc.

**CIDEX 2006**

Through one decade's development, CIDEX grows steadily and expands year by year. CIDEX 2006 witnessed the participation of 300 exhibitors including 35 from abroad. These exhibitors were from 16 countries and regions, namely, China, United State of America, Russia Federation, Israel, Republic of Korea, Unite Kingdom, Canada, Germany, Norway, Italy, Bulgaria, Austria, Switzerland, Singapore and Hong Kong SAR.

Exhibitors from home and abroad presented us with telecommunication electronics, information system, command and control system, security products for computer information systems, military electronic components, avionics, air traffic control, radar-system,electronic-support/intelligence-reconnaissance-system, counter-terrorism equipment, vision equipment, lasers & optoelectronics products, embedded system, military power supply, testing instruments and RF & Microwave. Taking advantage of the indispensable platform, players of defence electronics industry were showing their advanced technologies and products, exploring new clients and trade opportunities. As co-organizer, big names in China's defence industry, such as China North Industries Group Corporation, China Shipbuilding Industry Corporation, China Aviation Industry Corporation I, China Aviation Industry Corporation II, China Radar Industry Association, CETC International Co., Ltd, the Sub-Council of Aviation Industry, and the Sub-Council of Aerospace Industry of CCPIT organized their respective subsidiaries to participate in CIDEX 2006. Their cooperation made this event a more comprehensive one reflecting achievements of Chinese defense electronics in different aspects. CIDEX 2006 had aroused great interest from various circles, with over 20,000 visitors during the four-day's exhibition. Overseas visitors were from 28 countries and regions, including foreign delegations, military attaches, and counselors of foreign embassies to China, foreign corporations and their representatives. Visitors were mostly from armed forces, research institutes, and manufacturers of electronic products, service contractors for technical projects and sales agents. Senior officers and leaders from General Equipment Headquarters, PLA, Commission of Science, Technology and Industry for National Defense, Ministry of Information Industry and PLA Land, Navy, Air force and the Second Artillery also visited the exhibition and showed great interest. Exhibitors were very happy to have so many professional visitors.

For better exchange of technologies among manufacturers, traders and end-users, "China International Defence Electronics Technical Application Seminar" and "The First International Forum on Application of Testing and Instrument" was held in conjunction with the exhibition, touching on the topics of defence electronics technical development as well as its applications.

Defence Industry

## Inertial Stabilization Module for Air, Ground, and Sea


BURLINGAME, California. April 25, 2007 -- Directed Perception, Inc. announced the availability of its Inertial Stabilization Module (ISM) as an option on its popular PTU-D300 pan-tilt family.

The ISM delivers breakthrough cost/performance in stabilizing any type of payload for land mobile, airborne, and maritime applications. The ISM dramatically improves video imagery, allows the use of narrower fields-of-view, and enables tracking and detection while on-the-move. The PTU-D300 with ISM provides a rugged, low-cost solution for stabilized pointing on a wide range of boats, ground, and air vehicles including UAVs.

The ISM actively controls the pan-tilt to compensate for boat/plane/vehicle motion, keeping your point of interest always in the field-of-view. The ISM allows persistent line-of-sight pointing during large vehicle maneuvers, freeing the operator from tedious manual control. Inertial stabilization does not suffer from the same limitations as electronic video stabilization and allows for stabilization of all payload types for a wide range of military, homeland security, and industrial and scientific applications.

The ISM is an advanced strapdown design and consists of a precision 3-axis gyro embedded in the pantilt unit, and a small 3"x4" processing module. It works with existing pan-tilt applications to provide a drop-in solution for improving mobile camera and antenna applications. A software API is included to allow fast and simple integration with OEM applications. The API allows applications real-time control of the pan-tilt during stabilization. This enables joystick control, video tracking, radar integration, slewto-queue,

and other uses. A built-in Ethernet interface and webserver provide simple configuration and control of the module and attached pan-tilt unit.

The ISM has been developed and refined over 2 years. It has been fielded with select OEMs and is now available as a standard option on the PTU-D300. The ISM is the latest addition to Directed Perception's portfolio of rugged, precision pan-tilt products with advanced features such as geo-pointing.

### Price and Availability

The Inertial Stabilization Module (ISM) is available now as an option on the PTU-D300 family of pan-tilt units. U.S. pricing is $6000 (Quantity 1) for the option.