

Army Research, Development and Acquisition Projects in Support of NATO

Rita Hassinger and David Diamond

Since the end of the Cold War, NATO has redefined itself through the addition of new members from Eastern Europe and its increasing role as an operational military force in supporting peacekeeping and combat missions worldwide, most recently through its large-scale deployment to Afghanistan. This increasing operational footprint has prompted NATO to reexamine the key technology and interoperability and standardization (I&S) enablers that its national militaries require to operate effectively in NATO coalitions. Much effort has occurred under the auspices of the NATO Council of National Armaments Directors (CNAD), which comprises national level acquisition representatives from each member nation.

The first USAF/Army combat JPADS airdrop leaves a C-130 Hercules aircraft for U.S. Army warfighters on the ground in Afghanistan on Aug. 31, 2006. JPADS will allow conventional military aircraft to accurately drop sensors, munitions and a huge range of critical supplies to Soldiers on the battlefield while minimizing risk to the aircraft and aircrew, while also lessening the possibility of enemy detection of aircraft drop zones. This drop was made from 17,500 feet above sea level. (USAF photo by SRA Brian Ferguson.)



These representatives direct their work through Main Armaments Groups dealing with air, land and sea warfare. Through its participation in the CNAD and associated groups, the United States is able to both influence and respond to the requirements for the development of key enabling technologies and I&S initiatives. Within the CNAD, the NATO Army Armaments Group (NAAG) is focused on developing land force capabilities. The Deputy Assistant Secretary of the Army for Defense Exports and Cooperation (DASA(DE&C)) — within the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology — serves as the U.S. representative to the NAAG.

CNAD Defense Against Terrorism (DAT) Initiatives

CNAD initiated DAT projects in 2004 to better support the NATO coalitions in current and future operations. DAT's goal is to identify near-term solutions for technology challenges and rapid technological breakthroughs to counter specific forms of terrorist attacks, and provide coalition forces with new cutting-edge capabilities to detect, disrupt and pursue terrorists. Furthermore, at a 2005 NATO ministerial meeting, the U.S. Secretary of Defense agreed that DOD would take the lead on the NATO DAT initiative encompassing the Joint Precision Air Drop System (JPADS). The U.S. Army Natick Soldier Center (NSC) was designated the lead, and DASA(DE&C) and the U.S. Air Force's (USAF's) NATO Air Force Armaments Group (NAFAG) are coordinating its support. The U.S. has also been active in the DAT initiative for Defense Against Mortar Attacks (DAMA). The following sections describe these two efforts in greater detail.

JPADS

JPADS provides a range of capabilities to accurately and affordably resupply Soldiers on the ground by high-altitude parachute drops. JPADS has emerged as a key enabling capability for the ongoing global war on terrorism. Currently, the military primarily relies on low-altitude airdrops, helicopters or convoys to resupply U.S. troops and coalition forces. While these methods are all viable for many situations, convoys are often slow moving and leave the supplying forces vulnerable to insurgent attack by improvised explosive devices (IEDs), rocket-propelled grenades and small-arms fire, while low-altitude airdrops and helicopters are exposed to man-portable missiles (MANPADs) and small-arms fire. Recent combat operations illustrate the need to resupply forces via parachute, from aircraft that can rapidly reach their assigned areas and fly high enough to avoid most ground-based threats. In the U.S., the Army and USAF have collaborated on developing JPADS since 1993. Most of these efforts are currently managed and executed by a team from the U.S. Army Research, Development and Engineering Command; NSC; Office of the Secretary of Defense (Advanced Systems and Concepts); USAF Air Mobility Command and Air Mobility Warfare Center; U.S. Joint Forces Command; Program Manager, Force Sustainment Systems; U.S. Transportation Command; U.S. Marine Corps; U.S. Special Operations Command; and others.

The U.S. JPADS is a family of systems consisting primarily of "self-guided" cargo parachute systems and heads-up displays for military free-fall (MFF) systems all linked

wirelessly to a common JPADS mission planner that uses forecast and "in-situ" weather measurements to support accurate release points and update the "smart" systems with planned impact coordinates and best weather estimates just prior to deployment. While most of these systems are currently still in the concept development stage, the USAF and Army have been using rapidly fielded prototype systems for successful operational JPADS delivery in Afghanistan since August 2006. The JPADS Mission Planner is also being used to deliver ballistic parachute systems more accurately from high altitudes. The result has been exceptional, with more than 120 combat airdrop missions and over 1 million pounds of supplies delivered to U.S. and NATO forces between August 2006 and January 2007. Battlefield commanders are increasing their requests for more aerial resupply capability.

The U.S. is leading the way with a number of converging JPADS programs, but is also actively collaborating with NATO and coalition partners to encourage foreign investment in PADS to ensure that members of current and future coalitions will have interoperable resupply capability. The U.S. leads an ad hoc Joint Precision Airdrop Capability Working Group (JPACWG) to bring together subject matter experts from other NATO member nations

U.S. Army CPT Kenny Bierman, assigned to the 777th Expeditionary Airlift Squadron, programs JPADS software aboard a C-130 Hercules aircraft Feb. 16, 2007, at Balad Air Base, Iraq, in preparation for the first JPADS mission in support of Operation Iraqi Freedom (OIF). (USAF photo by TSGT Cecilio M. Ricardo Jr., Air Force News Service (AFNEWS).)



Six 1,200 pound bundles of water and food are dropped from a C-130 Hercules aircraft Feb. 16, 2007, to support the Army's 82nd Airborne Division. This mission is the first time the USAF employed JPADS in support of OIF. (USAF photo by TSGT Cecilio M. Ricardo Jr., AFNEWS.)



that are developing PAD systems, including the U.S., France, Germany, Italy, Netherlands, Norway, Spain and the United Kingdom (UK), among others. The JPACWG is producing the following:

- PAD technology road map and a matrix of national PAD capabilities/systems.
- A better understanding of this capability for NATO nation investments in PAD technology/systems.
- Concepts of operations for NATO use.
- Recommendations for NATO Standardization Agreements for PAD.
- Information sharing for national programs.

The JPACWG has executed two international demonstrations within the last 2 years. The first major event was a 16-nation Precision Airdrop Technology Conference and Demonstration (PATCAD) on Oct. 17-21, 2005, at Yuma Proving Ground (YPG), AZ, which exposed the NATO community to state-of-the-art PAD technologies, further fostering information exchange and cooperation. Another demonstration

was held in France July 3-7, 2006. The next PATCAD capability demonstration is scheduled to be held in the U.S. on Oct. 22-26, 2007, at YPG. For more information about JPADS, contact Richard Benney at richard.benney@us.army.mil.

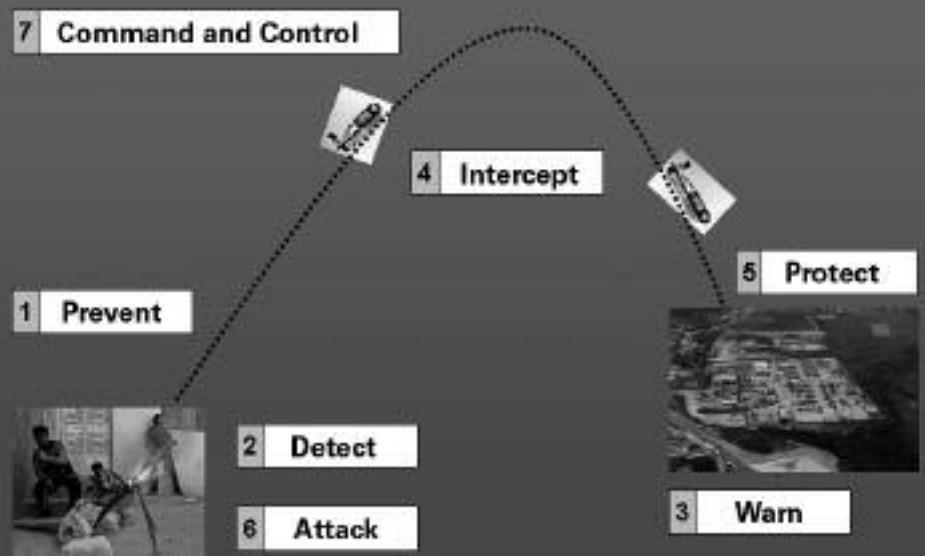
DAMA

DAMA is another key NATO DAT initiative. Terrorists working in small teams can launch mortar attacks from built up areas using improvised launchers. While these attacks are often inaccurate and involve poor-quality ammunition, they still have the potential to inflict casualties and damage equipment. The basic DAMA concept is shown in the figure below. Through demonstrations and cooperative efforts, member nations are exploring methodologies to integrate existing sensor command and control (C2) systems to help rapidly prevent, detect and counter mortar attacks during current and future combined operations. Once sensors detect an attack, the system should have the capability to warn personnel in the area — allowing them to protect themselves and their equipment — as well as to intercept the incoming

round. The integration task is particularly challenging because of the different technologies employed by each nation, which include radar, acoustic and wireless sensors.

The Netherlands is the lead NATO nation for DAMA, but the U.S. is providing leadership and actively participating through the U.S. Army National Proof of Concept (POC) Counter Strike Task Force (CSTF) from Fort Sill, OK. The CSTF and Fort Sill Fires Battle Lab hosted a NATO DAMA conference and experiment in April 2006, at Fort Sill, which demonstrated the ability to successfully integrate seven different NATO sensor systems from France, the UK, Netherlands, Denmark and Norway using the FireSim XXI simulation. FireSim uses a standard Ethernet interface to exchange variable format messages to provide a common operating picture between national C2 systems. The experiment also provided the opportunity to develop tactics, techniques and procedures for future NATO Command Post Exercises. DAMA WG members developed systems requirements criteria for future real-world

DAMA Conceptual Framework Model





U.S. and coalition forces are exploring new methodologies to rapidly prevent, detect and counter insurgent mortar attacks through DAMA and NATO DAT initiatives. Here, SPC Ricky Halterman, Alpha Co., 5th Battalion, 20th Infantry Regiment, begins loading a 120mm round to fire that will illuminate Mosul, Iraq. The unit is conducting illumination missions to deny the enemy the ability to mass indirect fire mortar attacks on Forward Operating Base Marez. (USAF photo by SSGT Cindy Haught, 1st Combat Camera Squadron.)

deployments. The DAMA WG also hosted a meeting in September 2006 at YPG in conjunction with U.S. Army testing of the Counter-Rocket, Artillery and Mortar program, to observe a limited view of the testing in preparation for the POC Demonstration that was hosted by Germany and the DAMA WG in March 2007.

Although challenging, the DAMA DAT efforts will help the U.S. gain insight into the capabilities and limitations of our coalition partners when deployed with U.S. forces, help limit

potential technical risks of system integration efforts and may provide the basis for a NATO Standardization Agreement for future DAMA system integration. Possible spinoffs from DAMA include defense against other types of indirect fires and the protection of slow-moving vehicles and convoys. For more information about DAMA, contact LTC Hayes Ellis at hayes-ellis@us.army.mil.

The Road Ahead

JPAD and DAMA project work each involve separate technologies and

address different interoperability capability shortfalls, but they are all part of ongoing efforts by the U.S. to ensure that NATO and its member nations can actively participate in coalition operations as a unified force. As these two examples demonstrate, the U.S. must take a multifaceted approach to improving NATO capabilities, by participating in international cooperation I&S initiatives and maintaining a high level of communication among all nations. U.S. capability demonstrations offer an opportunity for other NATO nations to view other national systems and equipment and how they can potentially contribute to critical key shortfalls for current and future operations. U.S. leadership in the CNAD provides a vehicle for implementing this 3-pronged strategy, and will provide a return on U.S. investment by allowing NATO to play an active role in conducting peace and stability operations around the world.

RITA HASSINGER was the Deputy for NATO and Europe, Office of the DASA(DE&C). She recently retired from government service. She has supported U.S. Army acquisition programs through international armaments cooperation for more than 20 years. She holds a B.A. in business administration and is pursuing an M.A. in international relations from Webster University.

DAVID DIAMOND is a Research Fellow at LMI Government Consulting, who supports DASA(DE&C) on international armaments cooperation activities and policy. He has a B.S. in mechanical engineering and an M.E. from Rice University, and he is a Ph.D. candidate in public policy at George Mason University. He is also a Lieutenant Commander in the U.S. Navy Reserve, currently assigned as Commanding Officer, Naval Submarine Support Center Reserve Detachment, New London, CT.



As technology matures and C2 systems are integrated, U.S. and coalition forces will be able to respond more quickly to potential or actual mortar attacks. Here, Soldiers from 3rd Squadron, 4th Cavalry Regiment, 25th Infantry Division, prepare to enter a compound in Tal Afar, Iraq, following a mortar attack on a local Iraqi Army post. (USAF photo by SSGT DeNoris Mickle, 30th Space Communications Squadron.)