ARMY 2006

UNITED STATES ARMY
SBIR STTR
Programs

QUALITY AWARDS

Small Business
Innovation Research

Small Business
Technology Transfer

About the cover: Pfc. Jordan Williams, a UH-60 Black Hawk helicopter crew chief from the 207th Aviation Regiment, clears his helicopter for landing after a mission in Iraq. Photo courtesy of U.S. Army and Staff Sgt. Jacob N. Bailey.

UNITED STATES ARMY SBIR STTR Programs

Quality Awards

The Quality Awards Program recognizes exceptional Army SBIR and STTR projects. Each year, a distinguished panel of Army and industry experts selects the winning projects from nominations submitted from across the Army. Nominations are evaluated based on originality and innovation of research, relevance of the research to the Army mission, and immediate commercialization potential of the research.

The Army Quality Awards Program is very competitive. This year, 254 projects were eligible to compete for an award and 34 nominations were forwarded to the Quality Awards Selection Board. The Board selected six projects from across the Army that represent the best in small business research and development.

In recognition of this achievement, the winners and their projects are showcased at Army and small business conferences and symposia throughout the year via this Army SBIR and STTR Quality Awards brochure.

A Soldier from the 1-17th Infantry Regiment, 172nd Stryker Brigade Combat Team maintains security during a patrol in a dangerous neighborhood in Iraq.

21st Century Military Combat Tires

Soldiers from 3rd Platoon, K Troop, 3rd Squadron, 2nd Cavalry Regiment offload their Stryker vehicle from a C-5 Galaxy aircraft in South Korea in preparation for the joint and combined Exercise Foal Eagle.

Akron Rubber Development Laboratory, Inc.

Akron, Ohio

U.S. Army Tank Automotive Research, Development and Engineering Center

Army military operations rely on tactical wheeled vehicles and combat vehicles with run-flat inserts or devices to hold a punctured tire onto the wheel. A punctured tire leads to an immediate reduction in speed and range and threatens mission accomplishment and personal safety and security. Akron Rubber Development Laboratory, Inc. (ARDL) developed an inventive technology that incorporates the run-flat technology into the tire itself. This offers a huge weight savings and significantly reduces the logistics of requiring special tooling to remove or install the run-flat into the tire. The premise of the concept is that a circular set of composite hoop rings can be incorporated into a current proven pneumatic tire tread by retreading or integrating the technology into the tire mold. This unique wheel-tire concept is the most advanced tire technology in the world for military vehicles and one day will widen the technological advantage for our Soldiers over our adversaries.

Innovative Human Hydration Sensor

Soldiers from 1st Squadron, 32nd Cavalry Regiment and Iraqi security forces take a break on a hot day during a search for insurgents and weapons caches in Iraq.

Bay Materials, LLC

Menlo Park, California

U.S. Army Medical Research and Materiel Command

Proper assessment and maintenance of hydration is a problem for those responsible for the health and effectiveness of Soldiers. If a Soldier drinks too little or too much, electrolytic imbalance in blood plasma can cause minor physiological responses such as heat exhaustion and cramps or dangerous responses such as heat stroke and hyponatremia (“water intoxication”). Impairment of cognitive function, another symptom of critical concern, has produced documented instances where a dehydrated Soldier's poor decision-making resulted in loss of life. Bay Materials, LLC in cooperation with the U.S. Army, has developed an oral "Hydration Monitor" that is based on a combination of a hydro-gel that is responsive to biomarkers in saliva, and a microcantilever sensor platform. Bay Materials, LLC spun off Cantimer Incorporated to continue advancing the technology and to produce commercial products. In addition to the military, the biosensor has potential for use by athletes, medical caregivers, firefighters, and other professions requiring high levels of physical exertion.

Robotic Extraction and Evacuation of Casualties

Many Soldiers have been injured or killed while trying to save others under hostile conditions. Applied Perception, Inc. prototyped a pair of unmanned ground systems to extract and evacuate casualties while reducing exposure to Soldiers. A small unmanned vehicle with a robotic manipulator is intended for short-range casualty extraction, and a larger unmanned vehicle, containing two life-support systems, is designed for further evacuation. Both vehicles are equipped with numerous new sensing technologies. Their autonomous navigation system is compliant with DoD Joint Architecture for Unmanned Systems and has been transitioned to the Product Manager for Force Protection Systems, Family of Integrated Rapid Response Equipment (PM-FPS FIRRE) for perimeter security. The technology is immediately beneficial to critical Army tasks, including search and rescue; reconnaissance and security; logistics; and chemical, biological, and explosive detection. The Army's Tank Automotive Research, Development and Engineering Center is developing a modular, interoperable robotic platform to enable multi-mission capabilities under the Future Combat Systems (FCS) program.

Medics can treat injured soldiers in the patient bay of the Robotic EVacuation vehicle. The Robotic EXtraction vehicle is in the background, loaded in the marsupial bay.

Applied Perception, Inc.

Cranberry Township, Pennsylvania

U.S. Army Medical Research and Materiel Command

Equipping UAVs for Advanced Combat Identification

High operational tempo and rapidly changing conditions on the battlefield, combined with increased use of long-range weapons and emerging capabilities such as armed unmanned aerial vehicles (UAVs), are driving the need for improved beyond-line-of-sight situational awareness and advanced combat identification (CID) systems to minimize non-combatant casualties and to prevent fratricide. Scientific Applications & Research Associates, Inc. developed and demonstrated the CID Scout UAV system, which equipped a small UAV with acoustic and imaging sensors and a Radio Based Combat Identification (RBCI) system to detect, locate, identify, and classify targets at extended range. The CID Scout UAV operator software provides the user with a flexible, multiple-window interface that includes interactive map displays, live video, and system controls to maximize situational awareness. This system earned high praise as the RBCI interface during the multi-national Exercise Urgent Quest, the culminating operational demonstration of the Coalition Combat Identification Advanced Concepts Technology Demonstration.

The CID Scout UAV is shown during a developmental flight test at the Ragged Island test site located adjacent to the Chesapeake Bay in Maryland.

Scientific Applications & Research Associates, Inc.
Cypress, California

U.S. Army Communication-Electronics Research, Development and Engineering Center

Continuous Variable Aperture/Cold Stop for Night Vision Systems

An OH-58D Kiowa Warrior Armed Reconnaissance helicopter from the 1st Infantry Division takes off on a mission in Iraq utilizing a mast mounted site.

Opto-Knowledge Systems, Inc.

Torrance, California

U.S. Army Communication-Electronics Research, Development and Engineering Center

Continuously Variable Aperture/Cold Stop (CVA/CS) technology is an integral part of the Army's tactical night vision systems. The advantage of using a variable aperture cold stop is that the same infrared (IR) optical system can be used for both wide-field search and narrow-field long range identification without compromising the optimal image quality for either task. This technology is critical for aided and automated target recognition requirements of the Future Combat Systems (FCS) and other programs where long range identification is a priority. The CVA/CS technology developed by Opto-Knowledge Systems, Inc. (OKSI) works smoothly and reliably at liquid nitrogen temperatures in vacuum in a standard pour-fill dewars container. OKSI added a focal plane array and camera electronics into the IR system, and developed cold stop control software as an automatic brightness control for better image capture. The design was adapted to a closed cycle hermetically sealed dewars container used with Stirling engines for tactical applications.

Automated Classification of Remotely Sensed Imagery

This 3D map of the city of Seattle, Washington was produced by Visual Learning Systems, Inc. to support urban planning and Homeland Security requirements.

Visual Learning Systems, Inc.

Missoula, Montana

U.S. Army Engineer Research and Development Center

Urban warfare is often the bloodiest and most prolonged of all combat operations, since adversaries intimately understand their own local battlespace. Visual Learning Systems developed Feature Analyst® as a tool for automating the collection of information from remotely sensed images. The technology provides the Army with a complete toolset for extracting all features, such as roads and buildings, from imagery and scanned maps. Providing accurate timely geospatial information affords significant benefit to U.S. forces, essentially reducing the adversary's local advantage and saving lives. Easily integrated into existing Geographical Information Systems (GIS) and image processing software, the tool enhances but does not change current workflows. Several independent studies show Feature Analyst® can save 80-90% of the time currently spent by analysts on feature collection. Feature Analyst® is currently used by all U.S. military services as well as several U.S. intelligence organizations.

SBIR and STTR Programs

Congress established the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs to provide small businesses and research institutions opportunities to participate in government-sponsored research and development (R&D). SBIR was established in 1982 and has been reauthorized through 2008, while STTR was established in 1994 and has been reauthorized through 2009.

The goals of the SBIR and STTR programs are to: (1) stimulate technological innovation; (2) use small business to meet Federal R&D needs; (3) foster and encourage participation by socially and economically disadvantaged small business concerns (SBCs), and by SBCs that are 51 percent owned and controlled by women, in technological innovation; and (4) increase private sector commercialization of innovations derived from Federal R&D, thereby increasing competition, productivity and economic growth.

Both the SBIR and STTR programs use a three-phase program structure, reflecting the high degree of technical risk involved in developing and commercializing cutting edge technologies.

- Phase I is a feasibility study that determines the scientific, technical, and commercial merit and feasibility of a selected concept. Phase I projects are competitively selected from proposals submitted against solicitations. Each solicitation contains topics seeking specific solutions to stated government needs. The SBIR and STTR Phase I selection process is highly competitive, with about one out of ten submitted Phase I proposals receiving awards.

- Phase II represents a major R&D effort, culminating in a well defined deliverable prototype (i.e., a technology, product, or service). The Phase II selection process is also highly competitive. Successful Phase I contractors are invited to submit Phase II proposals as there are no separate Phase II solicitations.

- In Phase III, the small business or research institute is expected to obtain funding from the private sector and/or non-SBIR/STTR government sources to develop the prototype into a viable product or service for sale in the Government or private sector markets.

	SBIR	STTR
PHASE I	6 months $70,000 max	6-12 months $100,000 max
PHASE I Option	4-month option (Government's discretion), $50,000 max, to fund interim Phase II efforts	No option
PHASE II	2 years $730,000 max	2 years $750,000 max
PHASE II Plus	1 year $500,000 max (subject to third-party matching funds)	N/A
PHASE III	Unlimited time Non-SBIR funding	Unlimited time Non-STTR funding

Photos courtesy of U.S. Army and:
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