

Future Combat Systems

**2002
Army SBIR
Phase II
Quality Awards**



Future Combat Systems

The Army is undertaking a transformation into a more responsive, deployable, and sustainable force, while maintaining high levels of lethality, survivability, and versatility. In unveiling this new strategy, GEN Eric Shinseki, Chief of Staff of the Army, stated, "Heavy forces must be more strategically deployable and more agile with a smaller logistical footprint, and light forces must be more lethal, survivable, and tactically mobile."

This new force is called the **Objective Force (OF)**, and is intended to meet the full spectrum of present and future Army missions. The cornerstone of the OF capability and the transformation is the **Future Combat Systems (FCS)** Program. This reconfigurable, adaptive **system of systems** will provide a common baseline capability that increases the Army's ability to conduct network/collaboration-centric warfare. The Army is working to develop and demonstrate the first generation of FCS, and all its enabling technologies, within this decade. This transformation has had, and will continue to have, a major impact on the entire Army Science and Technology enterprise — to include the SBIR Program. Since 2000, the SBIR Program has been aligned with FCS and OF technology categories — this will be an ongoing process as OF/FCS needs change and evolve.



Fuel Supply for Portable Power

Mesoscopic Devices, LLC
Broomfield, CO

Soldiers consume large quantities of single-use batteries which generate additional disposal costs. Portable fuel battery chargers could make use of rechargeable batteries in the field possible. Mesoscopic Devices, LLC has developed miniature pumps and atomizers that enable compact battery chargers by efficiently providing very small fuel flow rates in highly compact packages. Miniature generators using this Army SBIR technology would be up to ten times lighter than the single-use batteries they replace. The components also support portable power systems, including fuel cells, miniature diesel engines, and other advanced generators needed in Future Combat Systems.

U.S. Army Research Office



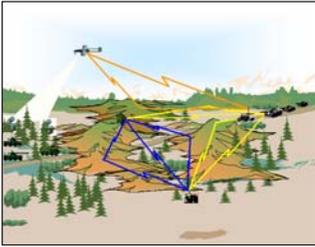
Secure, Distributed Decision Aids

Architecture Technology Corporation
Eden Prairie, MN

The Objective Force requires collaborative, distributed decision aids that will enable leaders to maintain uninterrupted situational awareness and make rapid tactical decisions. This capability requires interactive, open-standard multimedia collaboration tools that can operate securely over potentially bandwidth-constrained tactical networks. Architecture Technology Corporation has developed SecureIT!, a software module for commercially available H.323-based collaboration tools such as NetMeeting and CUSeeMe. SecureIT! augments collaboration tools with mechanisms for secure information exchange and bandwidth-efficient packet transport for use in future battlefield environments.

U.S. Army Communications-Electronics Command

ARMY SBIR PHASE II QUALITY AWARDS



Mobile Frequency Hopping Communication System

TrellisWare Technologies, Inc.
Poway, CA

Network-centric forces require high-capacity, power-efficient, secure communication systems that work in demanding propagation environments. TrellisWare Technologies, Inc. has designed and demonstrated a mobile frequency hopping system which requires no fixed networking infrastructure or power controls, and operates in the presence of strong interferers and severe multipath fading channels. This design delivers throughputs of 600 kbps, while providing robust connectivity for airborne platforms and terrestrial vehicles traveling at freeway speeds, even in dense RF scattering environments.

U.S. Army Research Laboratory



Snow Probe

Capacitec, Inc.
Ayer, MA

Avalanche fatalities have increased threefold in the past ten years as people pursue winter adventures and put themselves in harm's way. More people are being buried alive than in any other period in history. This is a challenge for today's soldiers who are increasingly being called upon to operate in these environments. Capacitec has developed a Snow Sounding Probe which works in conjunction with traditional avalanche forecasting methods to help to accurately predict snow slides. The system includes a penetration probe containing density, depth and temperature sensors that feed signals into a Palm Pilot. Stored in a backpack, the system allows soldiers operating in cold, mountainous terrain to better understand the science of snow, improve logistics, and reduce loss of life due to avalanches.

U.S. Army Research Office

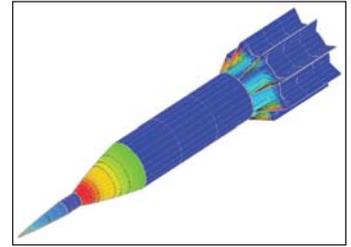


Nuclear Battery

TRACE Photonics, Inc.
Charleston, IL

TRACE Photonics has harnessed radioisotope power sources to provide very high energy density battery power to the warfighter. Nuclear batteries are much lighter than chemical batteries and will last years, even decades. No power cords or transformers will be needed for the next generation of microelectronics in which voltage-matched supplies are built into components. Safe, long-life, reliable, and stable temperature power is available from the direct conversion of radioactive decay energy to electricity. This distributed energy source is well-suited to active radio frequency equipment tags, sensors, and ultra-wide-band communications chips used on the modern battlefield.

U.S. Army Armaments Research, Development & Engineering Center



Missile Design Thermal Analysis

Mesa Associates, Inc.
Madison, AL

Mesa Associates modified existing software to develop an effective and easy-to-use analysis tool for generating the boundary conditions associated with supersonic and hypersonic flight. This design software analyzes nonaxisymmetric, three-dimensional configurations. It has been used by the U.S. Army Aviation and Missile Command (AMCOM) to analyze various missile designs. Once testing is complete, it will be fully commercialized and can support any missile and aircraft design.

U.S. Army Missile Research, Development & Engineering Center

Army SBIR Phase II Quality Awards

The Army SBIR Program sponsors an annual Quality Awards Program that recognizes top quality Army SBIR Phase II projects for their technical achievement, contribution to the Army, and dual-use commercialization potential. Each year, a distinguished panel of Army and industry experts selects the winning projects from nominations submitted across the Army. Throughout the year, the winners and their accomplishments are showcased at Army conferences and symposia.

2001 Winners

Electromagnetic Interference Shielding: Ormet Circuits, Inc.

Barrel Armor: TPL, Inc.

Increased Power: Lynntech, Inc.

Site-Specific Radio Communication: Remcom, Inc.

High Resolution Micro-Display: eMagin Corporation

The SBIR Program

Congress initiated the SBIR Program in 1982 to increase small business participation in federal research and development. Successful Army SBIR research efforts move through three phases:

- **Phase I:** Feasibility Study, which lasts up to six months and is funded for up to \$70,000 with a \$50,000 option available.
- **Phase II:** Research and Development, which lasts up to two years for up to \$730,000.
- **Phase III:** Commercialization, which requires funding from the private sector or non-SBIR program sources.

U.S. Army Research Office-Washington

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