DEPARTMENT OF DEFENSE
OSD TRANSITIONS SBIR/ STTR TECHNOLOGIES "OTST" PROGRAM SUCCESS STORY

Topic #: CBD09-108 **SBIR Investment**: $3.2 million **Phase III Funding**: $3.6 million

Contact Info: Spectrum Photonics, Inc.

POC: Mark Colgan

mark.a.colgan2.civ@army.mil

https://spectrum-photonics.com/

THE CHALLENGE

The U.S. Army issued a Small Business Innovation Research (SBIR) call in 2009 for the development of an inexpensive imaging spectroradiometer for hazard plume detection and early threat warning. The overall goal was the advent of low-cost, uncooled thermal imaging focal plane arrays based on microbolometer technology that could expand the use of thermal imagers in Government, industrial, and private applications.

THE TECHNOLOGY

Spectrum Photonics, Inc. leveraged pre-existing University of Hawaii-patented hyperspectral technology based on static interferometer and uncooled microbolometer detector technology. DoD SBIR-funded Phase II research focused on development of a hyperspectral sensor system in the 8-to-14-micron long wave infrared wavelength region (LWIR) capable of detecting chemical agents at a spectral resolution as high as 4 cm-1.

THE TRANSITION

OSD Transitions SBIR/STTR Technologies Program (OTST), DoD, and US. Army SBIR funding supported Spectrum Photonics' efforts from start to finish. During Phase I, Spectrum Photonics used SBIR funding to increase the spectral resolution of the sensors and miniaturize the data processing hardware.

Under SBIR Phase II funding, Spectrum Photonics applied the new sensors into a broader system capable of standoff detection of chemical and biological plumes. Currently, Spectrum Photonics is integrating the sensors into existing DoD platforms and working with other Government customers to apply the sensors to non-military missions.

THE BENEFIT TO THE U.S. ARMY

The use of active light detection and ranging (LIDAR) and passive LWIR hyperspectral imaging systems provide reliable standoff and remote sensing of hazardous plumes that enable U.S. Army personnel, researchers, analysts, and first responders to do their jobs effectively and safer. OTST, DoD, and U.S. Army SBIR-funded efforts, resulted in the successful development and demonstration of two sensors in airborne and ground based IED, landmine detection experiments.

THE FUTURE

The enhanced spectral resolution and reduced system costs can be translated into a range of additional military and civilian applications, such as detections of disturbed earth, narcotics manufacturing or gas leaks, camouflage defeat, emergency response, and precision farming. The sensor systems can be deployed on UAVs, hand-held units, tower-mounted or checkpoint station systems, and vehicles on-the-move, providing improved personnel safety and deployment flexibility.