



# HELIOS REMOTE SENSING SYSTEMS, INC.

W

hile modern Doppler radar continues to improve every year with the breakthrough of new innovations and weather predicting technologies, a need still existed for the U.S. Air Force to be able to detect weather patterns from a great distance. Baseline technologies could predict precipitation from 280 nautical miles, but that was where it maxed out.

**PHASE III SUCCESS**

\$3 million in revenues stemming from original Air Force SBIR-funded technologies.

**AGENCIES**

DOD, DOE

**SNAPSHOT**

New York-based Helios leveraged several DOD SBIR awards used to hone its weather predicting capabilities to begin new work with the Department of Energy which also utilize the company's patented radar technology.

**HELIOS REMOTE SENSING SYSTEMS, INC.**

52 Geiger Road, Suite 2  
Rome, NY 13441

[www.heliosensors.com](http://www.heliosensors.com)

Helios, through the Air Force Small Business Innovation Research (SBIR) program, took this challenge and designed a robust lightweight weather Doppler radar that could provide weather information from 580 nautical miles away. This portable, two person carry device could also predict wind information up to 50 knots anywhere up to 50 nautical miles.

“This portable Doppler radar solution combines existing state-of-the-art technology to go beyond current Air Force portable Doppler radar capabilities,” says Walt Szczepanski, President and Chief Scientist at Helios. “We began low-rate production of the units, and provided recommendations on logistics and maintenance that allowed for an affordable, efficient maintenance process.”

This technology came on the heels of another successful Air Force SBIR project which saw the development of an Airborne Passive Radar. Since combat aircraft require an accurate air surveillance picture in order to fulfill missions, radar has long been the go-to solution. However, the transmission of radar waveforms provides a signal which can be intercepted. Helios’ goal was to examine the benefits of bi-static radar and to create situational awareness without emitting any signals that could be intercepted.

The result was a passive radar air-to-air detection sensor system for aircraft installation that could passively detect and track other aircraft. A subcontract with Wright Patterson Air Force Base soon followed the Phase II effort, and Helios helped their personnel to set up a test range. The system allows aircraft to operate in silent mode, and is designed to use transmissions of opportunity such as televisions and radios.



Helios' new buoy-based, radar measurement project with the Department of Energy will provide reliable, robust all-weather operation at low cost.

“SBIR emphasizes topics that are incredibly interesting and innovative, and gives companies like ours the opportunity to showcase the cutting edge technologies we develop.”

**WALT SZCZEPANSKI**  
PRESIDENT & CHIEF SCIENTIST

For the U.S. Army, Helios used an SBIR Phase II contract to develop a helmet-mounted radar system that offers soldiers 360-degree situational awareness in both urban and rural settings. The device integrates the outputs of various types of technologies and sensors on the battlefield into one common visualization. Helios is currently working to migrate the radar products from the helmet to a Google-glasses type visualization screen that soldiers can wear over their eyes.

In evolving these sought-after technologies, it was only natural to explore other opportunities within government agencies that could also benefit from the staff's expertise in radar design and development.

“We were able to successfully leverage our long history with the DOD program and begin work with the Department of Energy on radar wind profiler efforts,” explains Janine Szczepanski, CEO of Helios. “There is a need to improve wind farm efficiency and we are doing that by providing a wind profiler which is a radar mechanism to measure things from sea level.”

This piece of equipment, called the Marine Atmospheric Radar for Boundary Layer Estimation or MABL, is a compact wind profiling radar measurement instru-

ment that provides MABL characterization for offshore wind applications, including profiles of wind speed and direction, and communication rates appropriate for advanced rapid refresh weather modeling. The device will be mounted on buoys and can measure up to a kilometer from sea level. Helios hopes the radar measurement technique will provide reliable, robust all-weather operation at low cost. The company feels there is a lot of commercial potential in working with DOE and is excited to be once again utilizing the SBIR program.

“There are so many values of the SBIR program,” says Walt. “One of the primary values is that it provides a mechanism for small companies to compete against other companies on an equal basis and not with large companies that may have unlimited resources. Also, the ability to go into a Phase II and a Phase III and possess the intellectual property rights is a major benefit. SBIR emphasizes topics that are incredibly interesting and innovative, and gives companies like ours the opportunity to showcase the cutting edge technologies we develop.”

In April, 2015, the NYS SBDC honored Helios as the 2015 Small Technology Business of the Year for New York State. The company is an Economically-Disadvantaged Woman-Owned Small Business, and employs over 40 individuals in upstate New York.

