



SA Photonics' high end augmented reality head mounted display



SA PHOTONICS, INC.

If SA Photonics has one particular niche, it is enhancing situational awareness through the use of advanced photonics systems. For decades, the U.S. military has continually funded innovations that assist the warfighter in seeing a clearer, broader, and unobstructed picture and communicating that picture to others. Whether the need is for more effective augmented/virtual reality training systems, head-mounted displays that aide the warfighter in seeing a clearer picture in a degraded visual environment, or high bandwidth optical communications systems for transmitting data and imagery, SA Photonics has continually provided innovative solutions.

PHASE III SUCCESS

\$10 million in revenue from latest SBIR-funded technology; over \$40 million total from SBIR-derived projects.

AGENCIES

DOD

SNAPSHOT

Since 2002, SA Photonics has been providing solutions to the Department of Defense and the commercial industry in the areas of advanced photonics systems.

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This all began in 2002, when the founders of SA Photonics were sitting around a kitchen table and decided to bootstrap their company using funding provided via contracts from the Department of Defense (DOD) Small Business Innovation Research (SBIR) program. Fifteen years and many SBIR projects later, the Silicon Valley-based company has honed a broad product suite of advanced photonics systems for both its Vision Products and Communications and Sensing Divisions.

“Just watching the news, you see a lot of interest in augmented and virtual reality,” says SA Photonics General Manager of Vision Products Dr. Michael Browne. “Our employees have been working in this sector since 1991, and I started the Vision Products division in 2006 to address the need for military head mounted displays. We produce the world’s highest resolution virtual reality display and one of the highest resolution, wide field of view augmented reality displays to address training and flight hardware needs.”

The Navy has become SA Photonics’ largest customer, and the agency is currently exploring training applications for helicopters. Other applications are also being assessed, such as those for ground vehicles. Armored vehicles weren’t designed to navigate through small towns or on village roads, and they certainly weren’t designed with driver visibility in mind. One large customer is working with SA Photonics to outfit these vehicles with head mounted displays linked to external cameras – so operators can see what is outside just by using the head mounted displays, while remaining protected.



The Office of Naval Research's Augmented Immersion Team Training (AITT) is an augmented reality training system that displays virtual indirect fire effects, aircraft, vehicles, and/or role players onto actual terrain. Technology developed by SA Photonics through the DOD SBIR program is integrated into this system.

IMAGE COURTESY |
U.S. NAVY

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JIM COWARD
CEO

Other customers within the Army are concerned about troops in the back of vehicles, when they must jump out before having any knowledge of the local environment and what’s outside the vehicle. Head mounted displays and cameras on the outside of these vehicles can remedy this problem.

The military also has a desire to fly at night and in other degraded visual environments. Sand, snow, whiteouts, weather and dust should not be a factor. SA Photonics wants to enable pilots to see virtual imagery even when they can’t see anything at all outside the aircraft.

One of the company’s most notable successes was the development of LARS – short for Low-Cost Augmented Reality System. This technology provided the U.S. military with the ability to complete training without using live fire. By utilizing a high-resolution, full color augmented reality display, the system simulates lifelike targets and allows for realistic battle damage assessment, for more effective training at a lower cost.

In its Communications and Sensing Division, SA Photonics’ most recent Phase II SBIR with the Air Force is seeding the development of a fully integrated, broadband active hyperspectral imaging system that would greatly improve surveillance and reconnaissance. The “HyperFlash” system enables consistent image gathering from target areas regard-

less of time of day, weather conditions, and time of year, which can all affect passive images. Compatible with a range of medium and small UAVs, the system can be used for man-made target discrimination, searching for particular spectral signatures, or improved surveillance and change detection.

The Communications and Sensing Division is also developing cutting-edge photonics solutions in free-space optical communications. If there is a situation where you can’t run a cable underground, such as in a post-Hurricane Katrina environment where infrastructure is damaged, you can position optical transmitters to send and receive data. SA Photonics has done groundbreaking work in the area of high bandwidth optical communications, even in bad weather in order to transmit large data between regions. Applications for this technology extend far beyond the military and talks are in the works with several commercial consumers.

“Many of our projects have been bootstrapped using SBIR funding, dating back to 2002,” adds Browne. “In 2008, when the economy took a big hit, we were still successful in growing a company and we continued to hire people, all because of SBIR. Venture capital money couldn’t do that for a startup defense company.”

Jim Coward, SA Photonics’ CEO, explained the benefit of SBIR funding for creating jobs and innovation. “We started SA Photonics using SBIR contracts as our seed funding. This allowed us to grow into a company that is a five-time winner of INC Magazine’s 5000 fastest growing companies. We owe the success of our company to our hard working employees, our innovative designs and the SBIR program.”