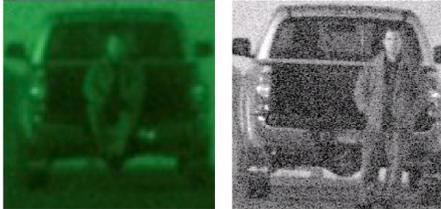




# USSOCOM SBIR Transition Success Story



Night imaging FrogEye (right) compared to Canon Single Lens Reflex (SLR) with GEN4 intensifier (left)



FrogEye at sea with FL-400 long-standoff lens

## Innovative Technology

**Topic Number** | SOCOM99-006

**Topic Title** | Ruggedized Digital Camera

Operational requirements to successfully carry out surveillance and reconnaissance missions specify the need for a ruggedized digital camera that is capable of operation both underwater at depths to 100 feet and on land to elevations of 15,000 feet Mean Sea Level (MSL). In addition, the digital camera must be capable of operating while subjected to the severe environmental conditions often encountered during surveillance and reconnaissance missions. To meet this need, Desert Star Technologies developed its FrogEye reconnaissance camera. Designed as a rugged and easy-to-use, long-standoff image reconnaissance system, FrogEye performs as a handheld digital camera, and has remote capabilities including wireless data transmission over tens of kilometers, and wired transmission without detectable Radio Frequency (RF) signature. Autonomous capabilities of the system include time and sensor trigger. The camera is optimized for long-standoff day and night imaging, from land or by surfacing divers at sea. The Electron Multiplier Charge-Coupled Device (EMCCD) provides superior spatial resolution (detail) at night as compared to conventional systems. A co-located color CCD provides similar long-standoff capabilities for daytime imaging. The camera is compatible with standard Canon EF and Nikon lenses, as well as the unique FrogEye FL series telephoto lenses. The camera can be transported underwater, and is immune to dust, dirt, mud, and rain, while also shock and impact resistant, with a modular design that supports future upgrades.

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## Military and Commercial Significance

Optimized for use by the military, Coast Guard and Law Enforcement, FrogEye is used by military teams throughout NATO (National Stock Number 6720-01-538-8744) and in the Far East.

Customers of the system have included the Department of Defense (DoD), the Dutch Marines, who have used the system in Iraq and Afghanistan, the Swiss Army, and the Navy of the Republic of Korea.

In its commercial SharkEye version for autonomous operations, the camera is primarily used for underwater observation stations and in Autonomous Underwater Vehicle (AUV) applications.

The electron multiplier CCD (EMCCD) is a key feature for underwater imaging, as it provides a capability to observe with ambient light in turbid waters.

Forward looking, FrogEye/SharkEye technology can provide an architectural foundation for any speciality camera system targeting detailed long-standoff imaging day or night in rugged environments underwater and on land.

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