



# Saving Lives

## one mission at a time

The Gyrocam Systems now deployed in Iraq provide a technological solution to identifying roadside bombs and enemy insurgent activity utilizing a gyro-stabilized, multi-spectral, optical sensor gimbal, installed on a pneumatic mast and attached to an armor-protected vehicle.

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By Tony Springs with Geoffrey Moreland, Michael Bergeron, and Warren Kennedy

**I**n late 2004, coalition forces in Iraq and Afghanistan were beginning to feel the effects of continual, unrelenting encounters with roadside bombs and enemy insurgent activity. Since the liberation of Iraq from Saddam Hussein, insurgent factions dedicated to a non-democratic Iraqi form of government were busy fighting the efforts of coalition forces to stabilize the nation. With the influx of Iranian weapons, technology, funding, and ideological support to Iraq, this brought the need for protecting U.S. military personnel to an agonizingly high level.

The Joint Improvised Explosive Device (IED) Task Force, a precursor to the Joint IED Defeat Organization or JIEDDO, was established to proactively locate, develop, test, and quickly provide technological countermeasures for U.S. Forces facing the deadly threat of Improvised Explosive Devices in theater. Still, the question remained ... "How can Combat Engineers, Soldiers, and Explosive Ordnance Disposal (EOD) Technicians be provided with the ability to detect and defeat roadside bombs from a safe, standoff distance, under combat environments and circumstances?"

The answer came from a company, **Gyrocam Systems, LLC** located in Sarasota, Florida, which directly addressed the immediate need to meet the deadly threat. In sum, they provided the technological answer to identifying roadside bombs and enemy insurgent activity in a gyro-stabilized, multi-spectral, optical sensor gimbal installed on a pneumatic mast and attached to an armor-protected vehicle.

The continual and pervasive threat of IEDs and enemy insurgents encountered throughout Operation Iraqi Freedom (OIF) is no secret, and IEDs have caused a very high percentage of battle casualties. However, one of the lesser known aspects in the effort to defeat this threat may be the contribution of Gyrocam Systems. As such, this presentation will address the developmental, testing and evaluation work of the company.



**TOPMOST:** The Gyrocam System, extended on its mast on RG-31 armor protected vehicles, is supporting a wide range of military missions in Iraq. **LEFT:** The camera system in a non-deployed position on an RG-31. **TOP:** The armored Buffalo vehicle also utilizes the system, as it removes explosive and other potential threats during route clearance missions. (All photographs courtesy of Gyrocam Systems, LLC)

Gyrocam System's revolutionary approach immediately brought together four significant, tactical advantages:

- With the ability to magnify up to 100 times what the human eye can detect, warfighters now have the ability to locate booby traps that, up to this point, had remained hidden—without having to come into direct physical contact with the dangerous and deadly explosive devices.
- Since the gimbal is mounted atop an extendable mast, the optical system can be raised to view questionable objects and situations from an unrestricted "high ground" advantage. This gives the Soldiers the ability to see over impediments from a reasonably safe standoff distance.
- By employing the benefits of "rock steady" gyro-stabilization, the optical sensor system gives the Combat Engineer the ability to detect potentially deadly situations while the MRAP is on the move.
- Through the use of night vision and infrared cameras mounted inside the gimbal, Soldiers no longer are limited to daytime route clearance missions—smoke, fog, darkness, and haze are no longer hampering factors they once were in the fight against IEDs and enemy insurgent activity.

With all of these advantages realized at the same time, they greatly multiplied the ability to locate and track hostile surveillance targets.

### *The Road to Opportunity*

Gyrocam Systems, LLC was formed in 2003 when a private firm used investment capital to acquire assets and Intellectual Property from a small manufacturer of gyro-stabilized cameras. Pressing forward with the acquired properties and new research & product development, Gyrocam Systems was introduced as a full-service defense contractor.

Combined with its development and implementation of a mast-mounted, vehicle-based, mobile application concept and its durable, highly stable camera systems, the company realized an immediate appeal to law enforcement and military Intelligence, Surveillance and Reconnaissance (ISR) customers.

With the incidents of IED encounters on the rise, the Department of Defense created the Mine Hunter/Killer Advanced Technology Demonstrator program as a U.S. Army effort with the objective of demonstrating current technological capabilities for an effective route clearance mission.

Led and managed by the Product Manager for Countermine & EOD, with members of the IED Task Force, Rapid Equipping Force, Night Vision Laboratory, Intelligence and Information Warfare Directorate at Fort Monmouth, the Army Engineer School, and the Explosive Ordnance Disposal School, this integrated product team met and selected vehicles and technologies that could meet a rapid procurement, integration and testing timeline of just four months.

Army Engineer and Explosive Ordnance Disposal representatives worked together to develop the Tactics, Techniques and Procedures for deployment of a five-vehicle group of route clearance teams that included two RG-31s equipped with Gyrocam Triple Sensor camera systems. Triple Sensor camera systems contain color, NightVision, and infrared (IR) cameras inside a single, gyro-stabilized gimbal.)

The camera systems arrived at Aberdeen Proving Ground, in late November 2004 and were integrated into the various platforms. The suite of vehicles and camera systems went through rigorous and extensive automotive, electromagnetic interference, and electromagnetic compatibility testing in December 2004.

Subsequent camera system testing was performed at Yuma Proving Ground, where individual and collective training began in early January 2005 with Soldiers from the 20th Engineer Brigade. At the completion of testing and training, the camera systems were then turned over to the Soldiers themselves.

Given that U.S. military personnel are known to press systems to the edge of their capabilities, those involved during initial testing lived up to that expectation. Despite a thorough safety brief and warnings about a power line that crossed the driving course, participating Soldiers failed to identify the power line and struck it with the Gyrocam gimbal. This caused severe damage to the gimbal, the vehicle-mounted mast assembly, and knocked electrical power to the airfield at Marine Corps Air Station Yuma as a result of the collision. However, this was not all bad news.

While certainly not a part of the equipment test plan, the incident gave Gyrocam Systems an opportunity to demonstrate a rapid response capability to an immediate user need. For example, on the day of the mishap, the company readied a new camera system to replace the one that had been damaged and flew it out to Yuma. It was installed and the vehicle was fully operational by the next afternoon. Consequently, the Soldiers' downtime was minimized and Gyrocam proved to the U.S. military that—when it came to rapid response time—it, too, could “press the edge of the envelope”.

### The Biggest Test of All

The Army Test and Evaluation Command evaluated the camera system in late January 2005. Upon completion of a successful evaluation, the system was shipped to support Operation Iraqi Freedom, arriving in Kuwait in early February, 2005. Soldiers from the 891st Engineers began camera system training, along with Soldiers from the 20th Engineer Brigade, who had completed training and testing in Yuma.

After a two-week period, a team from the 891st was trained and ready to go, and a “Hunter Killer” package was prepared to move into theater. By the end of February, the equipment was shipped to forward positions in Iraq, and Soldiers with Gyrocam camera systems began sweeping routes in early March, with considerable success. As an outgrowth of this initial route



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**LEFT:** Soldiers involved in the initial evaluation of the Hunter-Killer Project teams using the Gyrocam System. **BOTTOM:** The camera system fully extended, while the vehicle’s mechanical arm probes alongside the roadway. (All photographs courtesy of Gyrocam Systems, LLC)



clearance project, an Urgent Operational Need Statement requesting more systems was generated—and a new program was begun.

The Hunter Killer Project played a significant role in saving lives. The entire program went from concept to in-theater operation in less than four and a half months. It also proved that smaller organizations such as Gyrocam, with innovative, highly useful products and ideas have opportunities to actively participate in serving America’s armed forces.

In 2007, a new collaboration with PM Countermines & EOD generated a Request for Proposal (RFP) for the Vehicle Optics Sensor System (VOSS) program, to be used for Explosive Ordnance Disposal and route clearance vehicles in Iraq and Afghanistan. Gyrocam Systems won the contract award in May 2008, in part due to their experience and success with the Hunter Killer system, other projects with the U.S. Marine Corps and for the best value to the Government.

The VOSS program provides greater standoff detection and interrogation capabilities from within a blast-protected vehicle than what were previously achievable. It is a gyro-stabilized triple sensor camera system mounted on a telescoping mast integrated onto the vehicles.

According to Colonel Ray Nulk, Program Manager for Close Combat Systems, there are plans to field hundreds of VOSS systems during the life of the contract. In addition, the VOSS was recognized as a major component to the RECCE Vehicle and an Army Top 10 Greatest Invention of 2007.

### Salute to the Warfighter

While Gyrocam Systems’ optical sensors have been successfully implemented through the Hunter Killer Project and the VOSS Program, these solutions are meaningless without the highly trained and dedicated Soldiers that use and operate them on a daily basis. Courageous men and women in uniform are one of our greatest assets and we at Gyrocam recognize the remarkable sacrifices they make. As such, we salute you for your service. **AE**

*Tony Springs is vice president of business development for Gyrocam Systems, LLC. In this position, he is responsible for leading all aspects of the corporate business development function. He joined the company in August, 2008 and is interested in your feedback for any Gyrocam system. You are invited to send your comments to [feedback@gyrocamsystems.com](mailto:feedback@gyrocamsystems.com).*