

# This Wolf Has Claws — Quick Solutions Lead to Technologies That Protect Warfighters

MAJ John T. Niemeyer

**W**hen problems arise for Soldiers in the field, solutions have to be developed quickly to keep them safe. As enemies use a barrage of ever-changing weapons against U.S. forces, the people who support our Soldiers have to stay one step ahead in terms of protection development.

In response to a focused threat, the U.S. Army Tank Automotive Research, Development and Engineering Center's (TARDEC's) Mechanical Countermine Team (MCT) developed a Wire Neutralization System (WNS) that includes the Wolf Claw and Wolf Collar devices.

TARDEC's MCT, comprised of six engineers and one Army officer, supports Product Manager (PM) Improvised Explosive Device (IED) Defeat/Protect Force and other organizations by providing

Self Protective Adaptive Roller Kit (SPARK) technical and engineering support, component failure analysis support, and effectiveness testing and wire neutralization development. The team also works on wire neutralization, which is a PM IED Defeat/Protect Force-sponsored program, and they developed and transitioned surface-laid, command-wire IED defeat tools.

These developments' primary functions are to prevent limb loss or severe brain trauma, minimize

vehicle or equipment damage, improve overall crew survivability and limit battle losses to vehicles operating in *Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF)*. In a past Operational Assessment, the WNS products were the only engineered command wire IED defeat tool being used in either theater of operations.

"TARDEC supports PM IED Defeat/Protect Force in many ways, of which the SPARK and WNS are two examples," explained Andy

Scott, Project Officer, IED Defeat/Protect Force. "The SPARK has had many successes since its fielding in 2007 and continues to prove itself over and over. The WNS devices are also crucial, providing a temporary materiel solution to our Soldiers against an increasing threat in both *OEF* and *OIF*."

IEDs have been responsible for approximately 40 percent of all U.S. casualties in *OIF*, according to LTC Karl Borjes, PM for IED Defeat/Protect Force. "We've documented many IEDs

detonated by SPARKs, leading to many Soldiers saved by this program," said Borjes in a recent news release, whose office tracks every SPARK incident.

## WNS

The WNS's development was a response to increased attacks from IEDs. To minimize the damage from these attacks, the initial fielding of 75 WNS Wolf Claw devices to Iraq and Afghanistan began in May 2008. The Wolf Claw is the latest addition to the WNS's spiral development efforts

and showed great promise for use on tactical wheeled vehicle fleets. It is specifically designed to be highly effective against command and tripwire IEDs.

"The WNS products were developed quickly to meet a high-priority requirement from both *OEF* and *OIF*, where the specific threat that the WNS's were designed to counter was increasing," remarked Scott. "The WNS products were the only mechanical neutralization tool available to units to counter the command/

A convoy of MRAPs arrive at Joint Security Station Sa'ab al Bour. The vehicles are part of a 328th Brigade Support Battalion, 56th Stryker Brigade Combat Team, Deliberate Combat Logistics Patrol. (U.S. Army photo by SGT Doug Roles.)

tripwire threat. A quick acquisition turnaround was vital to get a tool into the users' hands to help counter this particular threat in a timely manner."



A team installs the Wolf Claw on an up-armored HMMWV in theater. The Wolf Claw attaches directly to the HMMWV and to any SPARK VCMB. Adjustable to various standoff lengths, it is a useful tool that is defeating IEDs. (U.S. Army TARDEC photo by Andy Scott.)

### Wolf Claw

The Wolf Claw includes a component that can be utilized in multiple ways during mission operations and is designed to be effective against both command and tripwire IEDs. Weighing approximately 75 pounds, the component can be deployed with the Wolf Claw, pulled behind a vehicle or operated in front of the SPARK roller. The component is comprised of a series of 24 hardened steel S-hooks and steel rollers. During testing, this configuration demonstrated high effectiveness and durability. The device has shown the ability to increase Soldiers' survivability in the field. This low-technology hardware attached to a vehicle's front



A Wolf Collar is attached to the front of an up-armored HMMWV's SPARK roller. (U.S. Army TARDEC photo by Andy Scott.)

end has test results indicating a very high success rate. The system is considered highly beneficial as an overall IED defeat mechanism. The Wolf Claw attaches directly to the High Mobility Multipurpose Wheeled Vehicle (HMMWV) and to any SPARK Vehicle Counter Measure Bracket (VCMB). Adjustable to various standoff lengths, the Wolf Claw is a useful tool used in both the *OEF* and *OIF* theaters of operation. It also is provided for use during pre-deployment training for Route Clearance Units at the U.S. Army Engineer School.



A SPARK roller sits attached to a vehicle at a forward operating base in Afghanistan. (U.S. Army photo.)

**The Wolf Claw is the latest addition to the WNS's spiral development efforts and showed great promise for use on tactical wheeled vehicle fleets.**

### Wolf Collar

The Wolf Collar kit is a system of chains that hooks easily onto the existing SPARK rollers, and it is another innovation derived by TARDEC engineers at the Joint Center for Ground Vehicle Enterprise at the Detroit Arsenal.

### VCMB

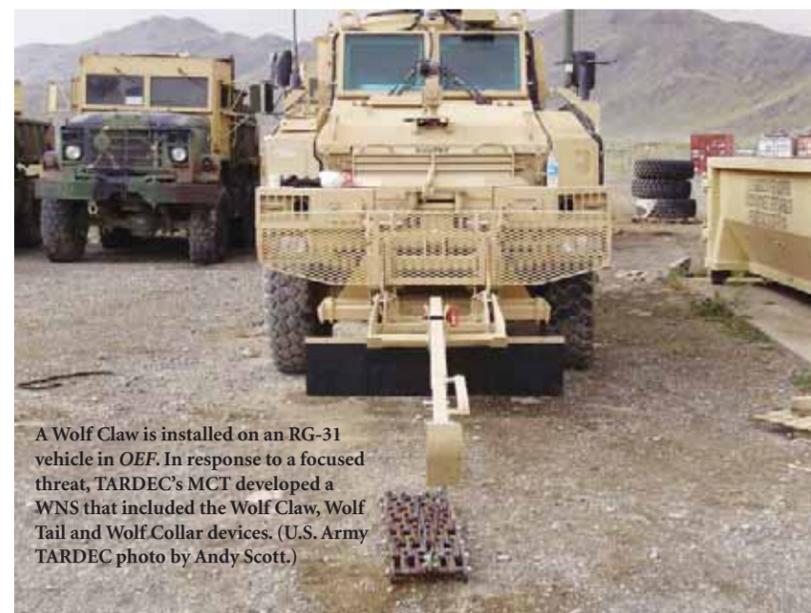
Another TARDEC-derived development that attaches to the SPARK is the VCMB. This allows a vehicle to be configured with a variety of IED defeat tools. The VCMB accommodates the SPARK roller, Cyclone Blower, Wolf Claw and Rhino. The VCMB's introduction on Mine Resistant Ambush Protected (MRAP) and Route Clearance vehicles also allows for increased flexibility. The VCMB gives a unit commander the option to attach and re-attach a variety of counter-IED tools depending on the mission and threat.

TARDEC associates were crucial in developing the VCMBs. TARDEC's work on the VCMB has largely increased protection against IED attacks. The VCMB design analysis and research is beneficial across Department of Defense as well as for North Atlantic Treaty Organization allies. The desired VCMB attachment is now incorporated into the MRAP All Terrain Vehicle and the Joint Light Tactical Vehicle specifications. In the future, vehicles in production will come prepared for simplistic VCMB attachment without requiring extensive post-production engineering work.

"The VCMB is an extremely important tool that provides versatility to commanders since different systems are and can be designed to be installed on to it," commented Scott. "If multiple vehicles in a unit are equipped with the VCMB, systems that are designed to be installed onto it can be easily swapped between them if necessary."

**TARDEC's work on the VCMB has led to a large increase in protection against IED attacks.**

TARDEC engineers also provided integrated tow-eyes onto the VCMB, adding towing capability to vehicles that were originally unable to be pulled with standard tow and recovery processes. Development of a tow and recovery bracket from VCMB concepts allowed for lifting and towing of MRAP vehicles that did not previously meet Standardization Agreement tow and recovery requirements. If a vehicle broke down, got stuck or rolled over, the new towing capability helped get Soldiers and their vehicles out of dangerous situations. "Integrating tow hooks onto the VCMB gives the units a way to recover



A Wolf Claw is installed on an RG-31 vehicle in *OEF*. In response to a focused threat, TARDEC's MCT developed a WNS that included the Wolf Claw, Wolf Tail and Wolf Collar devices. (U.S. Army TARDEC photo by Andy Scott.)



A Wolf Collar is installed on a SPARK roller. The Wolf Collar kit is a system of chains that hooks easily onto existing SPARK rollers to defeat a variety of IED threats. (U.S. Army TARDEC photo by Andy Scott.)

a vehicle quickly, reducing the amount of time that they are in harm's way," remarked Scott.

As Soldiers in Iraq requested that the roller or other items have the ability to be released quickly from the VCMB, an integrated VCMB with quick release was developed and tested on the Stryker platform. The quick release system allows a damaged roller to be removed seconds after an IED event.

The work done by TARDEC's MCT has gone a long way in keeping Soldiers safe in the line

of battle, and the work was completed quickly and efficiently. "All vehicles are different, and all require a different VCMB design. Typically, when we get a request to design and procure a new VCMB, it was needed yesterday due to the threat. It's not easy, but we work hard to get the equipment into the field as quickly as possible," Scott said proudly.

The ability to patrol through cities and towns with a reduced threat of damage from an IED attack thanks to the Wolf Claw and VCMB system has given Soldiers an increased sense of safety that would not be possible without the MCT's research, development and hard work. "The WNS and VCMB are just two examples where the MCT is supporting the Soldiers on the ground in *OEF* and *OIF*," remarked Scott.

**MAJ John T. Niemeyer** is the PM for TARDEC's MCT, which provides engineering support to PM IED Defeat/Protect Force and conducts research and development for improved counter-mine/IED technology. He holds a B.S. in aeronautical technology from Purdue University and is a U.S. Army Acquisition Corps member.