

POTENTIAL MDARS UTILIZATION

- Patrol protected compound environments
- Patrol airports, seaports, docks
- Autonomous or teleoperated IED and OED missions
- On-the-spot detainment of identified intruders



As the prime contractor on major Army and Defense Advanced Research Projects Agency (DARPA) programs focused on developing autonomous mobility technology, GDRS is in the unique position of being able to transfer new technologies and capabilities to the MDARS program as they become available.

Supporting autonomous technology programs at GDRS:

- Demo III – a \$23 million Army program focusing on developing key technology for autonomous mobility cross-country navigation.
- Semi-Autonomous Robotic Technology Insertion for FCS (SARTI) – \$12 million sole source follow-on to the Demo III project.
- Tactical Autonomous Combat-Chassis (TAC-C) – \$4.3 million, designed to test advances in autonomous mobility being developed by the U.S. Army Research Laboratory (ARL) and GDRS.
- Robotics Collaborative Technology Alliance (RCTA) – \$64 million, eight-year program supported by ARL to develop and test the fundamental technology required to develop highly capable, near autonomous unmanned systems.

The world leader in tactical robotics, GDRS has successfully tackled all the issues of supportability, deployment, peripheral functions, interface requirements, and software systems, taking MDARS from concept through prototype to demonstration.

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MDARS

MDARS – 21ST CENTURY ROBOTIC SENTRY SYSTEM



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MDARS is a small and nimble robotic patrol force on wheels designed to relieve personnel of the repetitive and sometimes dangerous task of patrolling exterior areas that require some level of security.

General Dynamics Robotic Systems (GDRS) has been developing the MDARS concept since 1993.

The MDARS robot autonomously performs random patrols around inventory-sensitive warehouses, airfields, ammunition supply depots, and port facilities.

It detects intruders and determines the status of inventory, barriers, and locks. It can also be remotely teleoperated by its operator. Onboard sensors and real-time video allow human operators to see intruders or suspect activity as soon as the robot encounters it.

MDARS operates at speeds up to 20 miles per hour and can run for 16 hours without refueling. Using radio frequency identification tags, MDARS keeps track of inventory, as well as gates, locks and other barriers.

Using the MDARS control station, operators are able to manage up to 16 MDARS vehicles simultaneously. Its distributed control system makes it difficult to disrupt and its communications network of long-range relay/repeaters installed on the ground provides redundant RF coverage of the entire patrol area.

MDARS has been successfully tested for 3,000 hours over 20,000 miles



Brief History of MDARS

- GDRS won the MDARS System Development and Demonstration program in early 2002
- Customer: US Army JPEO-CBD, Product Manager-Force Protection Systems at Ft. Belvoir
- GDRS developed the brass board MDARS prototype from 1993 to 1998 under the previous Concept and Technology Demonstration contract
- Technical feasibility testing was successfully conducted in 2000
- Provided one unit to AFRL in 2000 for use in the REDCAR Program
- Early User Appraisal 2005, Hawthorne Army Depot, NV

CURRENT MDARS FEATURES

- Completes autonomous, scheduled random patrol missions or can be remotely operated by joystick
- Speeds of up to 20 mph
- Diesel fueled; runs for 16 hours without refueling
- Detects intruders within 300 meters
- Detects breached security locks
- Monitors RF-tagged inventory
- Control station allows operator to manage 16 MDARS vehicles simultaneously
- Equipped with real-time obstacle-avoidance systems and 360-degree sensors
 - Uses 3rd generation GDRS LADAR technology for high fidelity 3D ranging information at over 150,000 range pixels per second
 - Distributed control system
 - Enables the operator to "see" what the robot sees
 - Shares roadway with existing base operations traffic
 - Autonomously and safely navigates intersections and railroad crossings along its route

In limited use by the civilian operator guard force at Hawthorne Army Depot (HWAD)

since October 2004, MDARS is operated by regular HWAD security personnel who have been trained to manage the system as one of their normal daily activities. Initial feedback from base security administrators at HWAD indicates positive acceptance of MDARS and insight into additional ways the system can augment their standard operating procedures.

Other uses have also been identified for the MDARS system. MDARS could be deployed to support force protection efforts in the battlespace or for homeland security and border patrol efforts across the US and its territories.

Planned enhancements to the system will expand the capabilities of the MDARS vehicle, as well as improve its effectiveness. These enhancements include improved response speed of at least 30 mph, operator controlled non-lethal weapons with an engagement range of at least 30 meters, intruder detection while MDARS is moving, intruder detection out to 1500 meters, and JAUS compatibility of the operator control station.

MDARS will be the first tactical robotic system to enter production and will be deployed to guard high value assets in fixed installations. Anticipated enhancements extend the MDARS mission to peacekeeping/war zone applications and will improve its ability to operate in tactical environments.

