

Man-Portable Quadrupole Resonance Based Landmine Detector



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An
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Company

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VENDOR DESCRIPTION

The Quadrupole Resonance Sensor provides transmission/excitation via quantum mechanics of specific material (Nitrogen) contained in all explosives. When excited the protons contained in Nitrogen react to the stimulus. On returning to stasis, the material generates a brief, unique RF signal which is detected and decoded by the system, allowing a declaration to be made as to whether an explosive is present or not.

As detected signals are in fact RF, it is necessary to provide RFI Mitigation to allow detection in the presence of the competing signals. Mitigation is provided by a combination of filtering and active processing. Significant technical challenges are also present in damping the transmitter quickly and in maintaining a suitable level of EMI control, allowing detection near the noise floor.

The system is presently in the Technology Development phase with a potential effort in GFY 2003-2005 to combine the system with existing ground-penetrating radar and metal detection sensor to make the Advanced Mine Detector (AMD). The configuration as planned resembles a conventional metal detector, with a transmission/receiving coil at the end of a handle, processing, computation and power conditioning electronics mounted on the handle, and a battery pack worn on the waist of the operator.

The system is presently under C&TD effort. The goal of the program is to develop a confirmation sensor that detects the presence of the explosives in mines over suspect spots.



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Magnetic

Power Source		Environmental
Transmitter	2 COTS BB390-A/U NiMH batteries	As a Technology Development unit, Environmental Requirements have not been included in the design, and are subject to the requirements developed for SDD.
Data Acquisition Board	1 COTS BB-2847 A/U Li-ion battery	
	Currently 3 hours continuous operation	

Sensor	Description	Detection	Size/Weight	Features
Radio Frequency	Detects signals returned by explosive-containing materials; TNT, RDX and Tetryl.	Tracked Vehicle TBD Wheeled Vehicle TBD Personnel TBD	Approximately 20 lbs. total system weight	<ul style="list-style-type: none"> All TBD; Personnel Safety has been considered a primary requirement.

Device	Description	Features
Monitor	A simple user interface provides positive hit, negative hit, or re-scan feedback.	<ul style="list-style-type: none"> Light weight Low power