



UNITED STATES DEPARTMENT OF DEFENSE  
**HUMANITARIAN DEMINING R&D PROGRAM**

A lightweight, man-portable dual-sensor EMI/Magnetometer UXO detection system

**STATUS**

Scorpion was successfully tested in three test sites in the USA.

Scorpion systems undergoing operational field evaluations with the Mines Advisory Group in Cambodia, the HALO trust in Afghanistan and Kosovo, and with the Norwegian People's Aid in Vietnam have to date found more than 2,000 UXO items while searching over 5,514,300 square meters of land.

Scorpion is a man-portable unexploded ordnance (UXO) detection system that utilizes differential global positioning system (DGPS) for centimeter accuracy of target locations, navigation assistance, and ground mapping. Scorpion integrates a large-loop electromagnetic induction (EMI) sensor, a Cesium vapor total-field magnetometer, and a sunlight readable operator control unit onto a portable platform. Starting with a detection system used in U.S. UXO remediation, the HD R&D Program redesigned the electronics, cabling, power supply and mechanical structure to create the Scorpion. The redesign effort improved system maturity, ruggedness, performance, user interface and operability. Data is post-processed using a simple graphical



user interface (GUI) program that generates “dig sheets” via automated target recognition (ATR) algorithms. A new single sensor “Scorpion Lite” variant deletes the magnetometer, using the EMI sensor alone while shortening the system to improve handling over rough terrain. Following technical testing in the U.S. and Cambodia, Scorpion is undergoing an operational field evaluation with the Mines Advisory Group in Cambodia.

## FEATURES

- Lightweight man-portable platform
- Easy to operate
- Easy setup and transport
- GUI-based data processing to generate ‘dig sheets’
- Reliable, low maintenance & operating cost
- Detect munitions up to maximum conventional depths
- Can maneuver around obstacles such as large trees or craters



Operator Control Unit



Scorpion Lite

## SYSTEM SPECIFICATIONS

Geonics EM61 one meter wide EMI sensor

Geometrics Cesium vapor total field magnetometer

Detects sub-munitions greater than 30cm deep, and larger caliber rounds down to 1.5 meters

Differential GPS provides mapping capability and centimeter accuracy of sensor path and targets.

Built-in navigation system ensures 100% ground coverage with operator selectable overlap

ATR-based processing produces “dig sheets” almost instantly

Built-In-Test (BIT) provides system feedback and failures alert

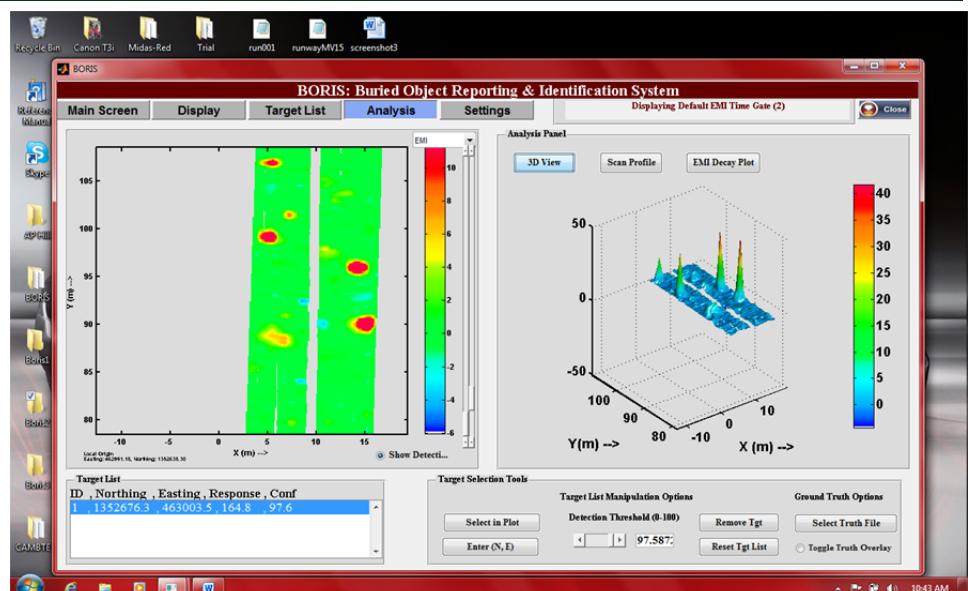
Easy setup and transport

Simple user interface, easy to operate

Modular design enables reliability and easiness in repair/maintenance

## APPLICATIONS

- Small to mid-size UXO site remediation
- Ideal for flat, open terrain free of vegetation



GUI Based Data Processing