

The most important thing we build is trust



ADVANCED ELECTRONIC SOLUTIONS

AVIATION SERVICES

COMMUNICATIONS AND CONNECTIVITY

MISSION SYSTEMS

State-of-the-Art in GPR-Based Detectors and Future Roadmap, a Cobham-Vallon Partnership

Paul Curtis, Blair Graham, Anthony Lucas & Adrian Payne

COBHAM

OFFICIAL SPONSOR

VOLVO
OCEAN
RACE
ROUND THE WORLD

Dual Sensor Detectors

Background

- Ground Penetrating Radar (GPR) has emerged as the sensor of choice for Countering Explosive Ordnance
 - E.g. Mines and Improvised Explosive Devices
 - GPR does not replace, but it augments the MD
 - Providing size and depth information
 - Regardless of the material from which it is made
 - Minehound was the first dual sensor MD and GPR to reach the market place in 2007
1. Ability to detect improvised threats
 2. Powerful reduction in false alarm rate
 - Small metal fragments rejected by GPR
 - GPR can reduce 9 in every 10 alarms
 - Clearing a larger area for a given budget



- Cobham and Vallon collaborated to develop, build and market the Minehound Series of Dual Sensor Detectors
- There are a number of variants in the marketplace
 - Simple displays based solely on the LED
 - Alphanumeric displays
 - Graphical displays for the provision of GPR B-Scan data



- From operational use and feedback, we have identified three areas of overlap between **user need** and **technology progression**
 1. The nature of the IED being distributed, but connected components
 2. The need to identify the nature of the threat
 3. The need to be able to train and setup the detector with the lowest possible burden

- **User need** = improved* detection of wires
 - The rise in the use of the improvised threat
 - Devices are often split into several components
 - These components are usually connected together using wires
- **Technology overlap**
 - More complex antenna designs are now viable
 - Radio Frequency components which will allow the switching of antenna modes
- **Result**
 - Ability to find wires and mines simultaneously

*Minehound can find some wires

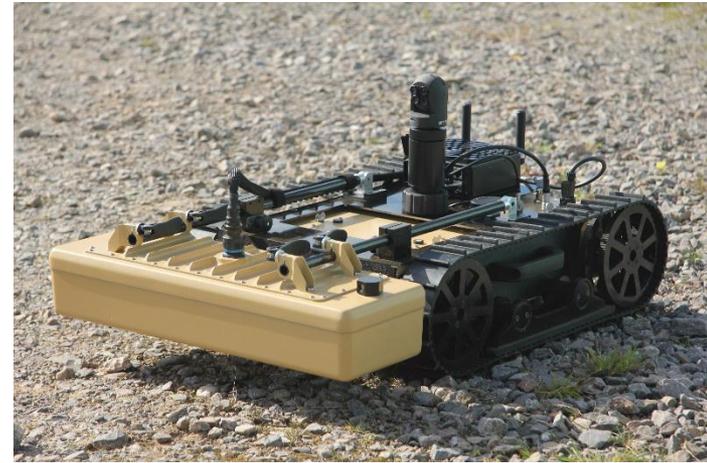
- **User need** = ability to identify threat
 - Once a detection has been made
 - Threats have become distributed and more complex in nature
- **Technology Overlap**
 - Accurate positioning systems based on GNSS can now position GPR data
 - Screens have developed to be low power and daylight viewable
- **Result**
 - Detector builds a map and shows you a picture of the threat



- **User need** = Simpler setup and training
 - Non-metallic threat detection and FAR reduction need optimal setup and technique
- **Technology Overlap**
 - MIDAS CMT being developed to recommend setup including soil type, subsurface layers, expected water content
 - Indoor (ITS) and outdoor (OTS) virtual training systems
 - ITS = Fully Immersive with VR headset
 - OTS = Non immersive
- **Result**
 - Detector is quicker to setup and train



- Cobham and Vallon continue to develop Minehound for both military and post conflict clearance
- We have a diverse and rich future roadmap to provide a more capable product
- The technologies developed under this roadmap also permit advances in the use of GPR on robotic Unmanned Ground Systems or Unmanned Air Systems



A signpost to MIDAS

Mine and IED Detection Augmented by Satellite



COBHAM

OFFICIAL SPONSOR

**VOLVO
OCEAN
RACE**

●●●●●●●●
ROUND THE WORLD

OFFICIAL SATELLITE & RADIO COMMUNICATIONS EQUIPMENT
SPONSOR OF THE VOLVO OCEAN RACE