Introducing MRead's advancements in magnetic resonance based sensing

Mine Action Symposium 2024

April 2024

MRead
ACCURATE DETECTION

MRead is building new detection capabilities for humanitarian demining

- MRead is an Australian startup founded in March 2023
- Commercialising CSIRO's advancement in Magnetic Resonance (MR) sensing
- Scientific, corporate and technical expertise within founding team
- Research partnership with HALO to guide development
- Building a confirmation sensor that resembles a metal detector
- Focussed on minimising the number of false positives that must be manually excavated

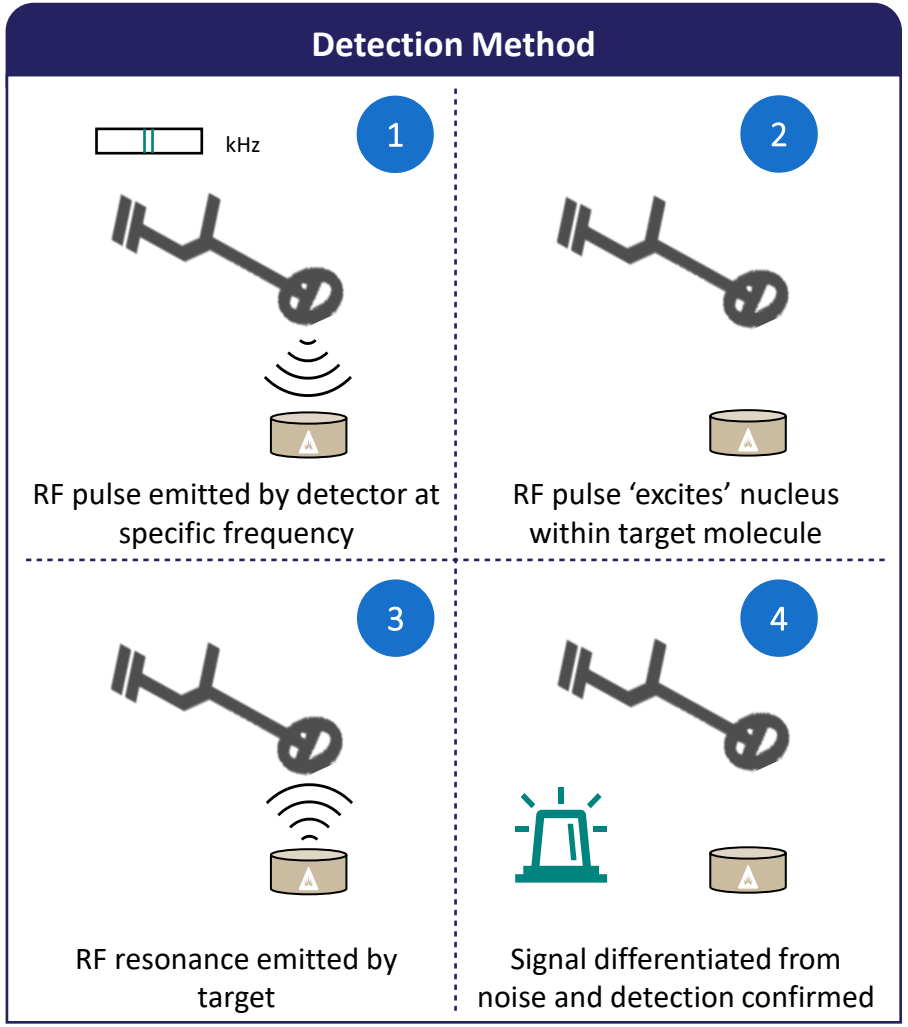
Supported by world leading organisations

The Statistics (HALO Cambodia)		
23,221,600	Signals detected	1 in 800
865,151	Detections excavated	1 in 30
25,935	Landmines found	

Our unique technology offers new explosive detection capability

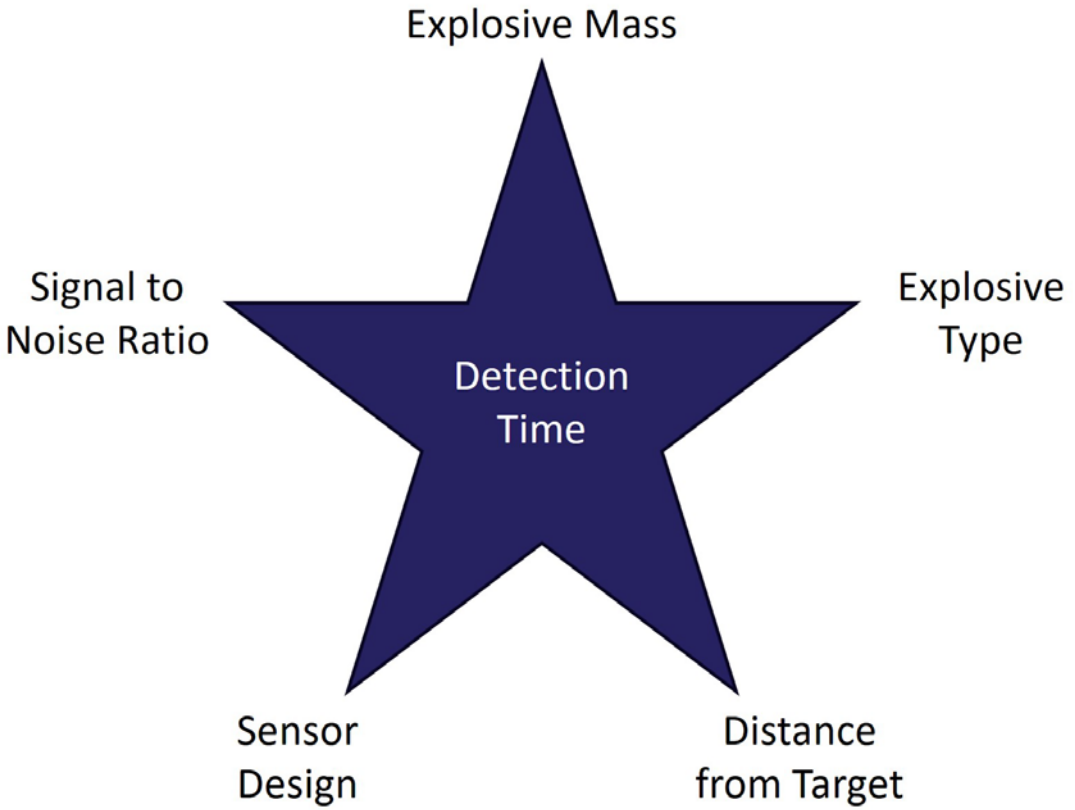
We detect explosives on a molecular level and won't detect clutter.

- Magnetic Resonance (MR) is closely related to Nuclear Quadrupole Resonance (NQR)
- A form of Radio Frequency spectroscopy that detects certain target elements in crystalline compounds
- The "resonance" at a particular radio frequency is extremely narrow; highly discriminating



Our sensor design is optimised for specific contexts

- Detection speed depends on several factors
- Faster detection is possible with:
  - Larger targets
  - Lower signal to noise ratio (accepting indeterminate detections)
  - Less distance to target
- Sensor diameter is optimised for depth of the target (larger is better for deeper detection)
- Some substances have weaker resonances than others
- Optimising for the context has size, weight and power implications



Rapid product development to adapt MR technology for demining context

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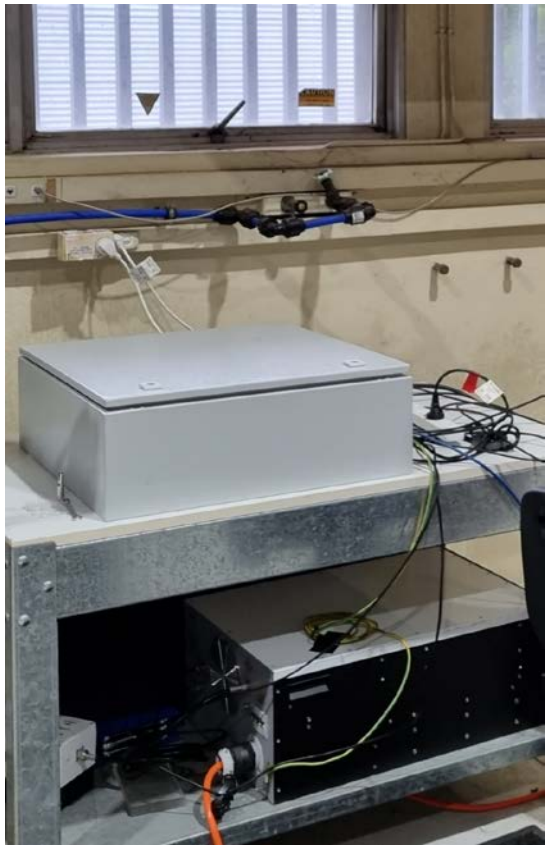
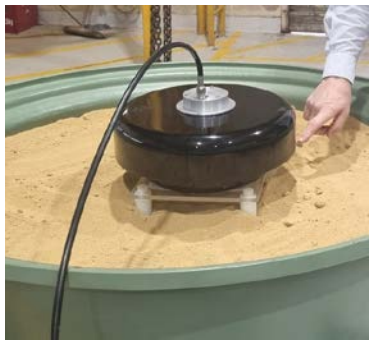
Lab system - March 2023





MVP (under development) - March 2024

Our product will undergo rigorous testing alongside demining operators

- Visits to HALO's Cambodian and Angolan operations have informed our product design
- Rigorous trials are planned for this year
- Product improvements will be informed by operator feedback
- Training methodology and operating procedures developed with operators

Indicative Test and Evaluation Plan	
May 24	Gen 1 target completion
Jun - Jul 24	Gen 1 laneway testing in Australia
Q3 24	Gen 1 field testing on location
Q3-Q4 24	Design improvements & user groups

Our unique sensor can be adapted for a variety of applications

- Prioritisation of product expansion and improvement will be influenced by customer demand
- Product design can be tailored for different applications

Technology	**MR Sensor & Electronics**						
Product	**Prospector**	Wand	Box	On-Belt	Walk-through	Vehicle Mounted	UAV / UGV
Application	**Demining**	Security	Quantification	Baggage & Mail	Personnel	Route Clearing	Route Clearing
Comparable Product							

First Priority

Future Applications

Contact Details

Building new detection capabilities for humanitarian demining

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