



# Antenna Solutions for Emergency Response in Malaysia.

**Barrett Communications Pty Ltd**

PO Box 1214

Bibra Lake

WA 6965

Western Australia

Australia

Tel: +61 8 9434 1700

Fax: +61 8 9418 6757

Email: [information@barrettcommunications.com.au](mailto:information@barrettcommunications.com.au)

The ability to successfully respond and manage an emergency situation is heavily reliant on the communication system in place. Effective communication systems will allow multiple parties to work together to achieve a successful outcome.

The Malaysian Civil Defence Department (MCDD), is responsible for public safety and disaster management in Malaysia. Prior to 2009, MCDD had used conventional VHF on a point to point and standalone repeater system. In 2009, the Malaysian Government launched the Government Integrated Radio Network (GIRN) based on a Terrestrial Trunked Radio (TETRA) system, which was introduced across 13 government agencies, including MCDD. It was identified that although GIRN meets the communication needs for most populated areas, an HF radio system would complement the GIRN in the rugged interior, and provides consistent and reliable communications across the entire country.

For this application, short range communications in mountainous terrain, the traditional mobile whip antenna is less effective due to their low radiation angles. The nature of MCDD's operations requires them to be constantly on the move, which results in the radiation angle changing and difficulties in receiving. For this application the Barrett 2018 Mobile magnetic loop HF antenna was identified as being more suitable for the purpose. The magnetic loop, when correctly tuned, is capable of achieving a 10-14 dB gain in efficiency over a mobile whip.

The Barrett 2018 is an auto tuning antenna consisting of a hinged arm (the loop) mounted to an aluminum vehicle roof-rack which provides an efficient ground plane for the system. RF and DC power is supplied through the transceiver working from the vehicle battery.

The antenna is fundamentally a parallel tuned LC resonant circuit with the radio attached to a feed-point in the inductive arm from the circuit. The capacitive component is variable and driven by a stepper motor under microprocessor control. Tuning is performed by identifying peak antenna current followed by a VSWR minimisation algorithm.

Together with a high Q, this antenna has low angle nulls towards the sides which helps to reduce noise from adjacent sources of interference, e.g. the vehicle itself and power lines in its vicinity. As the dominant radiation pattern is directed towards the ionosphere and is fundamentally NVIS (Near Vertical Incidence Sky wave) overcomes the dead zones, a common limitation of a typical mobile whip antenna. Due to its high efficiency this antenna is very effective over short distances. For the search and rescue operations of MCDD, typically the distance between the base and a 'disaster site' is around 50 km and is in mountainous terrain.

Currently MCDD have manpack radios spread countrywide, supported by mobile vehicle stations installed with the Barrett 2018 antenna and fixed base stations, using the Barrett 912 multi-wire broadband antennas. At some base stations the HF is also interfaced to the GIRN via a switch to allow interoperability, so an operator can talk to GIRN and relay to HF and vice versa.

Tactical Communications Sdn. Bhd. have provided local sales, training, maintenance and support to MCDD and Managing Director, Mr. Zakaria Dahili, commented that “the integration of a reliable HF system for MCDD has been significant. HF is MCDD’s backup to GIRN during remote search and rescue operations”.



The Barrett 2018 antenna offers NVIS capability and virtually continuous HF coverage out to 1000 km under the right conditions. Its rugged design is field proven in some of the most remote and hostile parts of the world. Barrett Communications are showcasing the tactical HF, VHF and interoperability solutions, including the Barrett 2018 Mobile magnetic loop HF antenna, in a tactical signals detachment scenario at DSA on stand 3146 in Hall 3. For further information on the Barrett Communications range of solutions, visit [www.barrettcommunication.com.au](http://www.barrettcommunication.com.au).

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