

**Product
White Paper**



**MRAY – The long
range LMR solution**

CODAN
RADIO COMMUNICATIONS



www.codanradio.com

MRAY – Long Range P25

The MRAY is a unique solution for linking multiple analog/P25 repeater sites. The solution integrates Codan's Envoy™ HF smart radio, an LMR VHF/UHF 30 W Repeater and 3031 Crosspatch™ to create an innovative product that enables long distance communications between two or more P25 repeater sites via a HF link.

The MRAY gives you the ability to rapidly deploy a communications system in minutes in a disaster affected area without the reliance on fixed infrastructure.



MRAY Overview

The MRAY is a transportable radio system that integrates a High Frequency (HF) radio with a VHF and/or UHF Land Mobile Radio (LMR) repeater or base station.

The interconnection between the HF and LMR radio systems allows for a wide variety of configurations that can meet your communications requirements.

HF radios are ideally suited to long range communications, as HF radio signals bounce off the atmosphere travelling long distances (1,000s of kilometres) without the use of repeaters or any infrastructure. VHF and UHF LMR radios are suitable for shorter range (40-60 km radius) communications, but with less noise, higher reliability and faster response times.

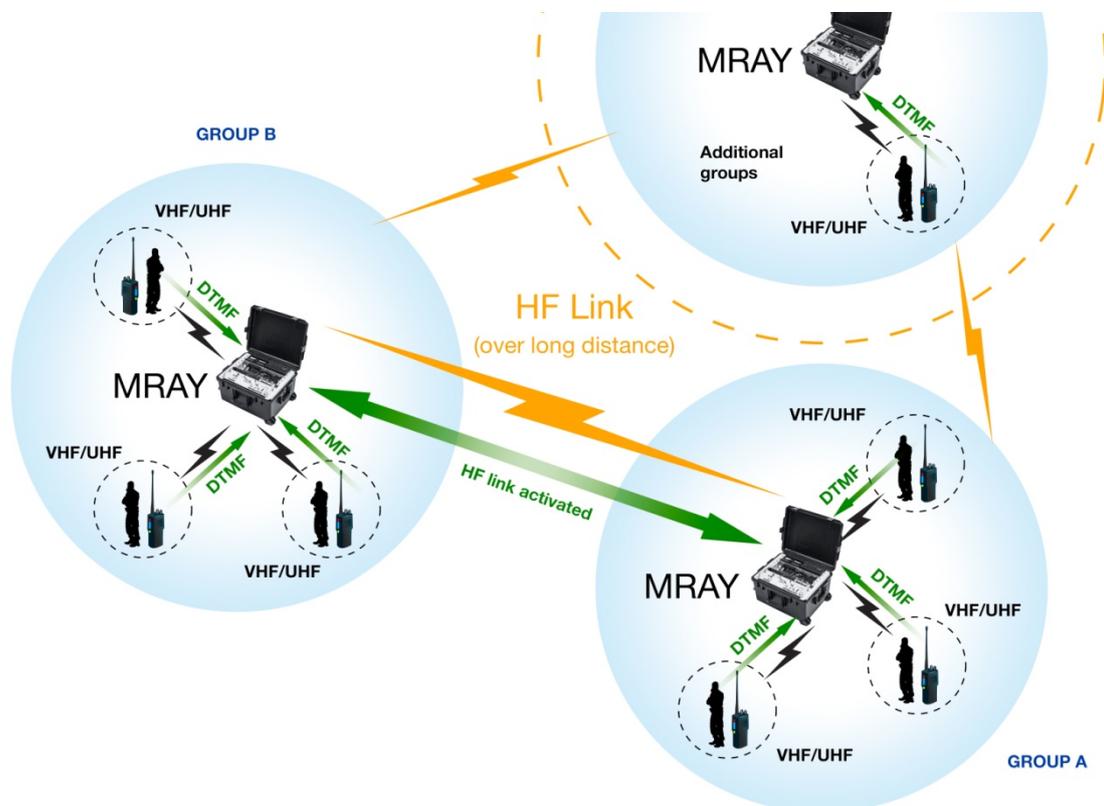
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MRAY Configurable Solutions

The MRAY system can be easily configured to operate in a large number of situations to meet your requirements. A few examples are:

P25 Network Extension

Requirement: Two groups of personnel are operating in two different areas separated by a large distance. Each group requires local communications within its own area and may also require communications between each group, either continuously, or on an as needed basis.



MRAY Solution: Deploy an MRAY transportable radio system with each group (A and B). The LMR equipment will provide reliable local communications configured as a VHF or UHF repeater system. The personnel can choose to activate (or de-activate) the HF radio system dynamically, using the Dual-Tone, Multi-Frequency (DTMF) touch tone pad on their handheld radios. Activating the HF radio link connects the two groups of HF radios, allowing the communications from one group to be automatically routed to the other group. If the groups need to relocate, the MRAY can easily be transported and re-deployed at each new area. Additional groups (Group C, D, E, etc.) can be added to the network of MRAY radio systems, allowing multiple groups to intercommunicate with each other.

P25 Communications Extension

Requirement: A command center, dispatch or central communications compound needs to keep continuous communications with a group of personnel in the field a long distance away.

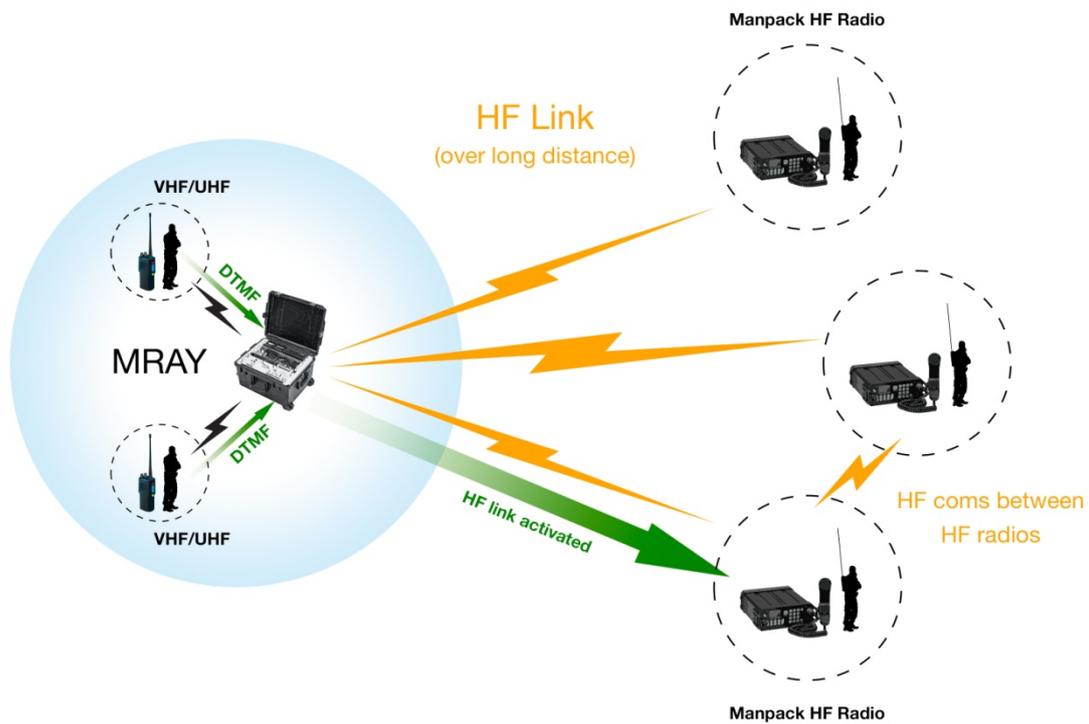


MRAY Solution: The field personnel deploy an MRAY transportable radio and use the HF link to communicate back to the command center. The command center can use an HF radio (or an MRAY) to create a link to the field personnel (via the MRAY) over long distance. The field personnel do not require HF radio equipment to communicate back with the command center, using less expensive and smaller LMR handheld radios.

The group in the field can use the MRAY to repeat local VHF or UHF communications to each other, and/or communicate directly with the command center.

Extended Communications Deployment Area

Requirement: A group of field personnel in a small area need to maintain local communications, while also expanding the network over long distances to other field personnel moving outside of the initial communications deployment area.



MRAY Solution: An MRAY transportable radio system is used to create a local communications area with LMR equipment while crosspatching to HF in order to extend long distance communications to other field personnel using HF “manpack” radios. The HF radios can also communicate directly with each other over HF radio links created from manpack to manpack.

MRAY Features and Benefits

Utilising leading HF and LMR technology from Codan, the MRAY has unique features and benefits unparalleled in the market. Features and benefits include:

- The MRAY uses the Codan Crosspatch™ to connect the HF Envoy and LMR MT-4E series radio systems, which are all housed in a rugged, water resistant Pelican Case for easy transportation and rapid deployment.
- The MRAY can operate directly from worldwide AC mains using its internal wide-range power supply. With an additional self-contained 100 Ah battery (in a Pelican Case), the MRAY can operate for up to 66 hours. Additional flexible solar panels can be added to the battery for solar recharging capability, or the battery can be recharged through AC power. The MRAY can be connected directly to a 12 Vdc vehicle battery and run directly from it.
- With a typical weight of 61.7 pounds (25.0 kg), a telescoping handle and wheels, the MRAY can be easily transported in passenger vehicles and commercial aircraft and can be deployed by a one- or two-person team in minutes.
- All AC / DC power connections and HF / LMR antenna connectors are easily accessible on the outside of the case.
- The MRAY can be programmed to be frequency flexible in the HF, VHF and UHF bands, with up to 1,000 HF channels and up to 32 LMR channels.
- The LMR equipment can operate in analog mode of operation or P25 digital mode with clear or encrypted (AES) voice capability. HF equipment can be encrypted with AES as well.
- With high power of 125 Watts on HF and 30 Watts on LMR, the MRAY can perform with exceptional radio coverage.
- The HF equipment can use SELCALL or CALM (ALE) calling.
- LMR handheld radios can be used to communicate to the MRAY, replacing HF “manpack” radios. LMR handhelds are typically smaller, lightweight, less expensive, more reliable “local” communications with a long battery life. LMR handhelds can operate in analog or P25 digital mode (clear or encrypted) in a variety of frequency bands. LMR handhelds are available from a wide variety of manufacturers, including waterproof and intrinsically safe radios.
- The MRAY is able to link multiple independent LMR (VHF/UHF) networks together using a HF backbone (beyond the horizon) without incurring satellite or telephone charges.
- DTMF codes can be pre-programmed allowing for simple one-touch operation.

Summary

The MRAY transportable radio system meets the requirements for most long distance and short range communications systems and is ideal for critical communications in emergency situations, disaster relief, humanitarian aid, search and rescue as well as multi-purpose use for the oil and gas industry.