

APPLICATION WHITEPAPER

MANET MESH DATA RADIOS FOR MARITIME SECURITY OPERATIONS

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SUMMARY

End-to-end control of Maritime Interdiction Operations (MIOPS) with connectivity between mothership, boat (RHIB), Boarding Officer and the boarding party can be a challenge for traditional communications links. Broadband and High-Speed communications in the maritime domain are difficult to achieve without an existing fixed communications infrastructure e.g. SATCOM.

Existing communications links are typically low data rate (voice only with some IP data), highly expensive, unreliable or insecure. DTC's MeshUltra™ waveform offers MANET IP connectivity with secure, seamless exchange of data with the additional capability to stream live HD video (Full Motion Video [FMV]) and audio. Thus, OTC MeshUltra™ capability provides operators with real-time situation awareness feedback and enables quick decision making for successful and safe operations.

INTRODUCTION

Maritime Boarding Operations and Maritime Interdiction Operations (MIOPS) benefitting from the recent significant advances in secure data communications technology. With the introduction of wireless IP mesh radios and, unmanned vehicles and platforms (UxVs), the array of digital soldier solutions and ISR systems available, the decision-making process can now be shortened by providing real-time situational awareness to the Commander. These robust communication capabilities are imperative for mission success, evidential purposes and the preservation of life.



Combining the market-leading MeshUltra™ waveform and an array of different size radios and power outputs, DTC provides a complete and scalable solution for multi-asset connectivity in the maritime domain. Using the propriety COFDM waveform DTC excels in reflective RF environments such as those found in a ship's superstructure. The excellent Non-Line Of Sight (NLOS) properties of DTC's MeshUltra™ waveform means that the RF signal can penetrate all decks of a vessel, reflecting off the decks, bulkheads and deckheads as well as between decks. The MANET characteristic of the waveform enables each radio worn by the boarding party to act as a repeater and providing excellent RF connectivity throughout the target vessel.

DTC Mobile Adhoc Network (MANET) Mesh data radios are proven and deployed on numerous Naval Unmanned Surface Vessels (USVs), ships, drones and UAVs in multi-platform environments around the world.

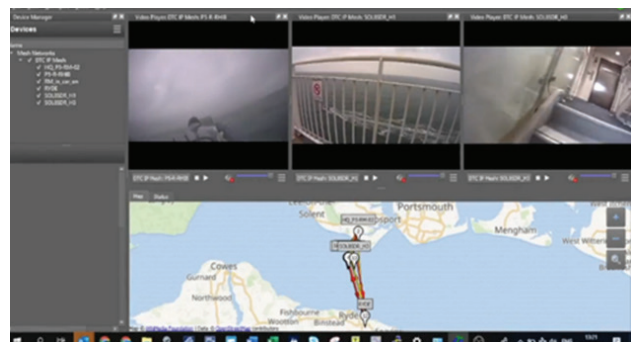
DTC's Handheld Enhanced SDR-H MANET radio is deployed with soldiers and special forces for assault team operations where real-time, mission-critical monitoring and sharing of the situation is key to the safety of life.

Each boarding team member radio is a repeater, relaying in real-time the video, audio and data, enabling Shared Situational Awareness (SSA) from onboard and inside the target vessel to all team members and the commander on the Mothership.

DTC radios allow an array of sensor, video and voice data to be assessed by all units in the boarding operation, both informing and expediting the decision-making process and providing vital intelligence to the boarding team at the tactical edge.

OPERATIONAL DEPLOYMENT

The boarding party can be equipped with body-worn IP Mesh radios to provide real-time video (from a helmet or body-worn cameras) and GPS location as required to the Boarding Officer and the Ops Room / Bridge of the Command Ship. A range of tactical enhancements such as Pan Tilt Zoom (PTZ) camera and/or Repeater Nodes called 'drop bags' can be deployed to provide extended range and unattended coverage.



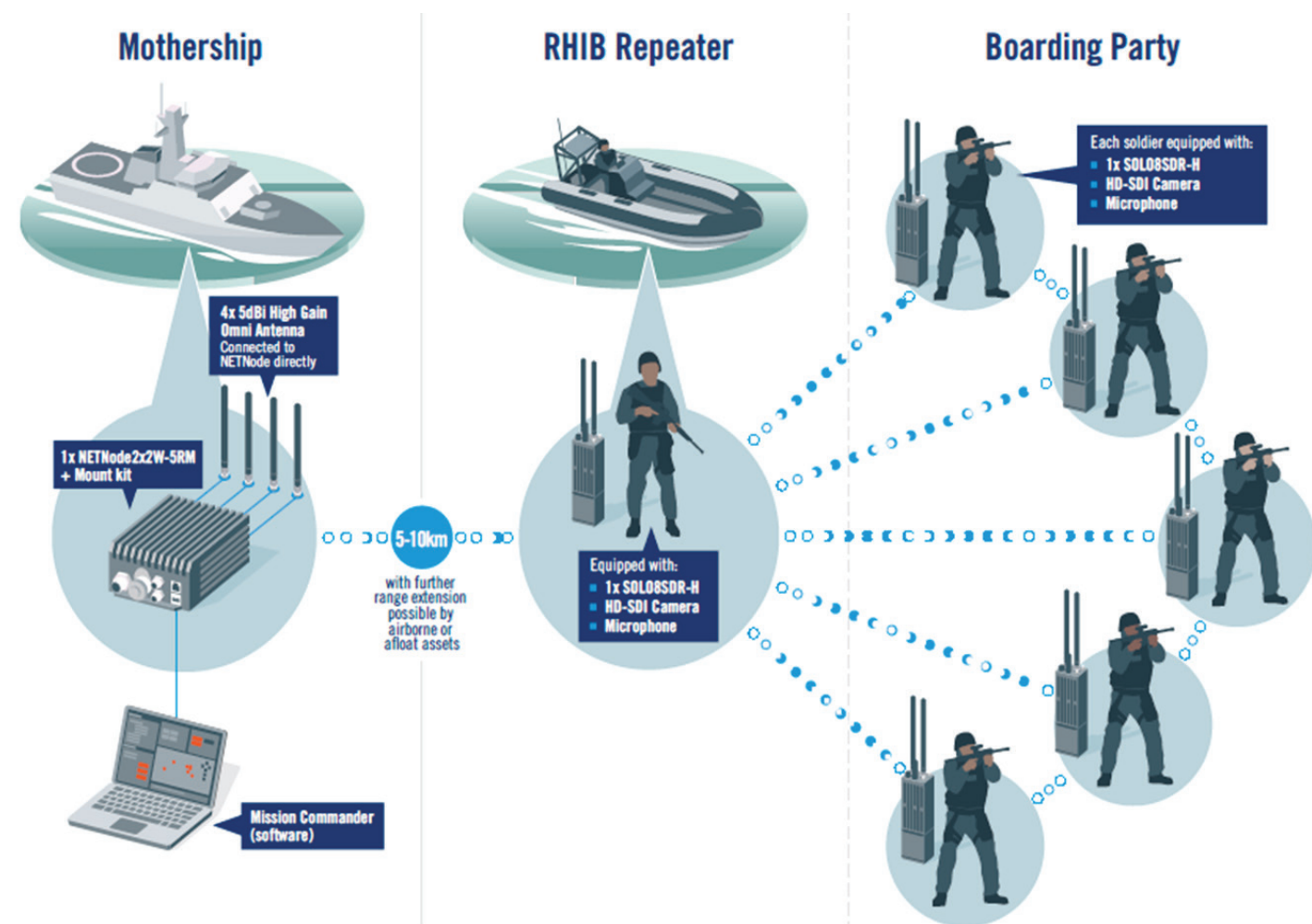
If interdiction operations are conducted within territorial coastal waters then real-time SSA can be transmitted to a land-based mesh radio receiver site if required to support multi-agency operations.

Further out at sea, range extension can be delivered by either another maritime asset or air asset e.g. ship, UAV, helicopter / fixed-wing aircraft, acting as a repeater. For deployed operations, the mesh network can be securely connected to third party backhaul bearers such as SATCOM, allowing multi-agency commanders on ashore to monitor in near real-time maritime operations.

CONCLUSION

DTC's MeshUltra™ waveform has excellent RF properties that can penetrate all decks and is not degraded by reflecting of bulkheads and deckheads. Each radio is a transceiver that enables each member of the team to be a repeater, relaying in real-time Video, Audio and IP data between the Commander and boarding party. With modern communications, the situation awareness between the deployed boarding party and Commander ensures a safe and efficient mission.

MARITIME BOARDING PARTY KIT



RHIB Equipment	Description	QTY
SOL8SDR-H2	Enhanced Special Role Radio 2x1W	1
AP010166	SOL8SDR-H MBITR AN/PRC148 Battery 7.0Ah	1
AP010278	2.1dBi Omni 1.00-1.50GHz, Half Wave Dipole, TNC (m), Flexi Gooseneck	2
SDRAPP-MESH	MESH APPLICATION BUNDLE FOR SOL8SDR	1
AES256NN	AES Transmitter 256 Bit Encryption	1
Mothership Equipment	Description	QTY
NETNode 2x2W-5RM	IP Mesh Node Phase 5 Robust Mobile 2x2W	1
ANT4.5N	4.5dBi High Gain Omni N-Type (m) (for NETNode-R)	4
CA0649	External 12V 6.67A 80W Desktop Power Supply Unit Assembly	1
AES256NN	AES Transmitter 256 Bit Encryption	1
TBC	Transit Case to carry 4 x SOL8SDR-H2 and 1 x NETNode RM	1

Boarding Party Equipment	Description	QTY
SOL8SDR-H2	Enhanced Special Role Radio 2x1W	5
AP010166	SOL8SDR-H MBITR AN/PRC148 Battery 7.0Ah	5
CA3807	SOL8SDR-H2 ODU Cable Mic ONLY, DTC	5
CA3754	VT500WATER - VT Miniature Microphone with Audio Jack	5
CAMBWHD-WIL	Camera Body Worn, HD-SDI, White Illumination	5
AP010278	2.1dBi Omni 1.00-1.50GHz, Half Wave Dipole, TNC (m), Flexi Gooseneck	10
SDRAPP-ENC-PLATINUM	PLATINUM ENCODER APPLICATION BUNDLE FOR SOL8SDR	5
SDRAPP-MESH	MESH APPLICATION BUNDLE FOR SOL8SDR	5
AES256NN	AES Transmitter 256 Bit Encryption	5
AP009604	MBITR battery charger 4-way	1

ABOUT CODAN COMMUNICATIONS

Codan Communications is a global technology company that develops robust technology solutions to solve customers' communications, safety, security and productivity problems in some of the harshest environments around the world.

We provide tactical communications solutions that enable our customers to be connected, ultimately to support critical missions worldwide. With almost 60 years in the business, we have garnered a reputation for quality, reliability and customer satisfaction, producing innovative and industry-leading technology solutions.

Codan Communications is a member of the Codan group of companies.

ABOUT DTC, DOMO TACTICAL COMMUNICATIONS

DTC is the leading MIMO MESH provider in the world. DTC radio solutions provide short range high bandwidth communications suitable for the wireless transmission of video and other data applications. DTC is an established provider to customers including Military and Special Forces, Intelligence Agencies, Border Control and First Responders. DTC is headquartered in the US with locations in the UK and Denmark, with over 140 employees.

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