

Likely shape of future dismounted soldier communications

An Army has many roles not just war fighting. In the past year, the British Army was deployed to support the NHS with both Covid testing and vaccination. We regularly see the British Army engaged in humanitarian aid activities such as hurricane relief in the Caribbean and floods in the UK.

However, the most important role of the Army is to defend national territory and prevent conflict, typically within the construct of a wider international coalition such as NATO.



Equipment and training for any Army must be focused on its more demanding and complex warfighting roles. Even within warfighting there is a spectrum of conflicts to consider from asymmetric warfare, in which the military capabilities between adversaries differ significantly, to peer or near peer conflicts when each side has equal or similar military capabilities.

This paper considers the more demanding conflicts involving peer or near peer engagements and what this could mean for dismounted soldier communications.

A highly mobile dismounted force with lightweight weapons that can act quickly on intelligence can be a very effective way of striking key enemy targets. Arguably, this concept has been around for centuries and its effectiveness was seen in the North African desert in the early stages of World War 2.

The ability of a force to have a high degree of operational autonomy, move easily and remain covert with minimal resupply is important to ensure a higher readiness and tempo of operation. The use of more sophisticated, direct-fire weapons or, indeed, the ability to designate targets for other weapons systems makes such a force even more effective today. In some armies, multiple formations adopt these principles and this is referred to as a manoeuvrist approach.

The coordination of a number of surprise strikes against enemy Centres of Gravity can have a significantly debilitating effect on the enemy's ability to co-ordinate operations, resupply and troop cohesion.

With the increased lethality of modern, lightweight anti-armour weapons, this manoeuvrist approach could also be effective in countering an armoured push, especially when the armour is relatively unsupported by other weapons systems such as artillery or attack helicopters, or is spread over a large geographical area.

The effectiveness of this manoeuvrist approach could be significant as precision strikes on some key enemy targets – bridges, main supply routes, command posts, communications nodes – leaving units isolated, without



basic supplies of fuel and food, reducing the effectiveness and focus of their fighting force and making them vulnerable to further attack.

Where military lines of communication are extended or contested, radio comms can be unreliable, forcing forward units to revert to unsecure, voice-only military solutions or commercial communications such as smartphones. The use of unsecured communications can provide significant intelligence about troop movements, intentions, troop morale and are potentially subject to spoofing or misinformation attacks.

With a centralised command structure, typical of many conscript armies, the unreliability of radio communications in the battlefield has a significant impact on the ability of an army to act in a co-ordinated way and could result in senior commanders deploying further forward or risk units being left isolated or with outdated orders.

Many nations have been developing manoeuvrist tactics where a head-to-head confrontation with an overwhelming enemy is unlikely to be successful. This approach requires intelligence gathering to identify enemy plans, Centre of Gravity, and locations, amongst other things.

Intelligence comes from the use of surveillance drones, human intelligence, support from friendly nations and exploiting any lack of discipline from enemy forces to create an accurate picture of the enemy's intentions, locations and movements from which to plan targeted action.

A fundamental part of any manoeuvrist doctrine is the ability to deploy quickly, with minimal baggage and

sustainment, to deliver military effect. Timely dissemination of accurate information to support missions relies on dependable communication links. Security of information is important to ensure the enemy does not gain early warning of strikes or, by continued compromise, determine strategy or glean information on the make-up or organisation of forces. Intelligence is often fleeting and the ability to react quickly is critical to success.

The ability to deploy and sustain forward strike forces is essential to respond to enemy vulnerabilities as the intelligence to direct a strike emerges. However, these forward forces are likely to be the focus of enemy counter action and are more exposed if situated closer to the enemy, as they tend to be, to enable rapid action. Minimising the sustainment burden and contact with these forces is important in order not to alert the enemy to potential locations as a result of frequent resupply.

These forces need to be able to loiter in readiness, act and withdraw with a high degree of autonomy so their equipment needs to support this approach – high reliability, long endurance/battery life and ease of use, for example.

The threat of rapidly deployable teams with lightweight but effective anti-tank weapons will undoubtedly attract scrutiny, with systems and doctrine being developed to specifically counter this threat.

The use of UAVs with video and other sensors is making it difficult for any force structure to remain undetected. Operating in smaller groups makes detection harder, but specialist equipment and rigorous adherence to

military tactics to minimise visual, heat and RF signature is significantly more important in today's battlefield.

The use of image recognition systems, RF sensing and direction-finding equipment to cue other sensors, UAVs, spectrum denial technologies and programmable weapon systems is increasing. With the ongoing digitisation and integration of the battlefield these systems have the ability to deliver an almost instantaneous response to an unidentified UAV or radio traffic.

Reliable communications with a minimal RF signature are important in many operations, but with a manoeuvrist approach this can be key to ensure tactical success and to preserve strike capability for future actions. An effective solution requires a forward reach capability such as secure Satcom to pass intelligence, issue orders and co-ordinate wider operations across strike assets/units. Local dissemination and communications at the tactical level is typically delivered with a Personal Role Radio (PRR) or Soldier Radio.

The ability for soldiers fighting together to communicate is key and sometimes commercial waveform and radios are employed. However, commercial radios are not suitable for all areas of operation. Communications on these commercial radios can be received on other commercial radios as they use common waveforms often without any encryption on a pre-set frequency.

Commercial radios are often not robust or waterproof, nor do they have the appropriate ancillaries to support

the military users. However, despite these drawbacks the benefits of voice communications between dismounted soldiers to enhance co-ordination, plan, warn of enemy action, support comrades, relay orders etc. is invaluable and so are used by many nations.

Personal Military radios not only provide the required ruggedness and suitable military ancillaries but also the encryption to ensure Low Probability of Intercept (LPI) so communications are not passed to the enemy and military waveforms to minimise RF signature (often referred to as Low Probability of Detection (LPD)) so the enemy is less likely to be aware of a force operating in their area.

The military waveforms also provide additional capabilities such as MANET networking to ensure better coverage in difficult terrain where point to point range is limited and also data services such as regular and precise reporting of friendly and enemy locations is possible.

As previously mentioned, some military waveforms even provide bespoke capabilities to minimise detection on air, and to prevent spoofing and jamming of communications. Without these military capabilities, a radio can be ineffective in the face of difficult terrain or enemy jamming. It can be a security and a mission threat if instructions are intercepted, and even a danger to the user and team if the RF signature is easily detected and located.

In the past, these bespoke military capabilities came at a high cost – not only were they expensive but also when using these military modes other services such as





data, tracking or relay were not available. However, new waveform techniques combining narrowband multiplexing and frequency hopping enable all services (voice, location reporting, data sending and MANET networking) to be fully maintained while operating in the military LPD and LPI modes. Consequentially, users can benefit from the breadth of services but can be secure in the knowledge that transmissions are fully protected and difficult for the enemy to detect/locate.

In a scenario where a head-to-head engagement with a superior invading army is unlikely to be successful, a manoeuvrist approach is crucial. To maximise success, this approach needs to be supported with suitable equipment that is effective, lightweight, easy to use, requires minimal sustainment and low signature. Reliable and discrete communications enable dismounted soldiers to conduct more co-ordinated and effective attacks.

Thales understands that ground to ground communications is inherently challenging due to the terrain, the environment and obstacles. These issues are compounded for the dismounted soldier who is typically moving low to the ground for concealment. Added to this is the constant threat of compromise by RF sensors and direction-finding systems.

Peer or near-peer warfare underlines the need for equipment with the inherent characteristics to be effective

against more sophisticated adversaries in an evolving range of operations.

The Thales family of military radio products, with dedicated military waveforms, delivers the secure voice and data services required by the dismounted soldier but also deals with difficult terrain and minimises the possibility of detection – solutions designed for the threats we and our allies face today. ■