NETFORCE

MILITARY SIGNIFICANCE OF MANET RADIOS DEPLOYED ON HELIKITE AEROSTATS

Presently data transfer between unmanned systems and troops is severely limited by both the radio-relay platforms and bandwidth. The bandwidth problem will largely be addressed by the introduction of Mobile Ad-Hoc Network (MANET) radios. Digital separation should allow numerous vehicles to be controlled within far smaller bandwidths and data to be sent accurately from person to person. However, the fielding of these radios will not solve the problem on their own because they are line-of-sight. They need to be lifted to significant altitude to work as envisaged. Present airborne platforms are unsuitable for the long-term raising of radio-relays and so the promise of these radios is restricted. Helikites allow MANET radios to be lifted to optimum heights for an indefinite time. The Helikite/MANET combination is Netforce.

Netforce Helikites can be of any size and payload depending upon cost and circumstances. As an example, using existing civilian COTS equipment, any person who can afford to buy a small car, can create Netforce over an area of more than 6000 square miles within a few minutes. One 5 cubic metre Helikite, two 12Kg helium bottles to fill it, plus a petrol motor winch with 1,500ft of tether-line can be fitted into two 130 litre Bergen backpacks. The Helikites can be inflated in 3 minutes and released to fly to 1000ft carrying a small MANET radio - in all weathers short of a severe storm. At 1000ft altitude the MANET radio has a radio line-of-site of 45 miles, which gives radio coverage of 6,362 miles over even terrain. This Helikite can be launched from the ground, roofs, small boats, moving vehicles, or out of the back of transport aircraft.

Netforce exploits information technology in a way that has been largely ignored by the military up to now. Presently, the UK military concentrates on creating highly secure, but bandwidth limited, point-to-point communications, between discrete groups of troops. Often it is unreliable or very low bandwidth. This is because the relays are ground-based and so very limited in range. Also the MOD seldom use the most capable MANET systems.

Netforce is an instant broadband network created over vast areas well before troops or ships venture into that area. Netforce goes first by exploiting Helikites ability to move rapidly upwards in altitude, thereby pushing MANET communications forward at hundreds of miles an hour - way ahead of troop movements. The aim is to have full broadband available over the vast majority of relevant terrain with the latest excellent high-performance, multi-hop, low-latency, MANET's. Netforce Communications between troops will be as good, or better, than in an office environment. Unmanned vehicles can be as numerous as Wi-Fi enabled laptops in a modern city. These unmanned vehicles, sensors and weapons can be controlled or monitored real-time via the internet from anywhere in the world, allowing critical decisions to be made by fresh, well informed people as opposed to unthinking, autonomous robots. Unmanned sensors such as those in the UGS programme can also be monitored from many miles away thus relieving tired troops on the ground. The ubiquitous nature of the world-wide-web can be used to exploit different time zones, so that soldiers in places such as Australia can take over night-time duties in the northern hemisphere saving cost and reducing fatigue. Maps, instructions, and orders can be relayed directly from every commander to every individual soldier instantly if required. Equally, soldiers can send unlimited streaming video or high resolution pictures anywhere they are allowed to. Every aircraft over the battlefield can communicate with every individual soldier on the ground to avoid friendly fire and to facilitate rescue operations. Full streaming broadband video on demand also allows instant battlefield diagnosis of wounds by specialist doctors thousands of miles away so treatment can be optimised. Faces of criminal suspects or the deceased can be linked immediately to mainframe computers in home countries for fast identification. High altitude Helikite relays provide good coverage into valleys and urban areas and reduce the number of hops between ad-hoc radios and base. This is important because reducing the number of hops increases the bandwidth available and reduces interference.

What is also very relevant, in regard to the long-term nature of many conflicts such as Afghanistan, is the very low cost of Netforce which can be afforded indefinitely over large districts. Other aerial vehicles are not affordable in the long-term and so are only temporary solutions to a permanent problem. The cost factor is easy to dismiss as not so important if someone else is paying the bill, however due to MOD overspend, the UK's only aircraft carrier has been decommissioned, Nimrod scrapped and 25,000 MOD personnel are being made redundant to pay for many fancy, expensive, ideas that have not worked in the long-term. Netforce is sustainable and cheap enough for anyone to operate indefinitely, let alone the military. Netforce is a force multiplier because it is not a significant drain on long-term resources.

CONCLUSION

Helikites plus MANET radios create Netforce. Netforce is a significant troop multiplier that can immediately reduce exposure to risk for personnel so reducing casualties. Ground based military personnel can instantly create a permanent internet protocol aerial architecture providing bandwidth limited only by the numbers of Helikites and radios available. Once deployed, Netforce looks after itself. No extra troops or inter-service co-operation are required.

Ultimately its greatest virtue is its ability to allow warfighters far removed from the battlefield to directly help their colleagues on the ground via the remote operation of unmanned vehicles and sensors. High altitude Helikites, lifting internet protocol ad-hoc network radios allow a vast worldwide network of untapped human and computer resources to be concentrated into the centre of the battlefield in an instant whenever required. This has not previously been possible.