GMC

March/April 2017

Global Military COMMUNICATIONS

Homeland security - protecting against cyber threats

Radar technology

Q&A Intellian Americas

Meeting military and government requirements

Photo courtesy Billion Photos/Shutterstock

Sign-up now for your **FREE** digital copy...visit www.globalmilitarycommunications.com

World Leader of GaN based SSPAs/BUCs
Unmatched Reliability, Major OPEX Savings

Advantech Wireless

Editor
Amy Saunders
amy.saunders@dsairpublications.com

Sales
Christopher Ayres
chris.ayres@dsairpublications.com

Sales
Sam Baird
sam@whitehillmedia.com

Circulation Manager
Elizabeth George

Production
production@dsairpublications.com

Editorial Director
Richard Hooper
richard@dsairpublications.com

Managing Director
David Shortland
david@dsairpublications.com

No part of this publication may be transmitted, reproduced or electronically stored without the written permission from the publisher.

DS Air Publications does not give any warranty as to the content of the material appearing in the magazine, its accuracy, timeliness or fitness for any particular purpose. DS Air Publications disclaims all responsibility for any damages or losses in the use and dissemination of the information.

All editorial contents
Copyright © 2017 DS Air Publications
All rights reserved

DS Air Publications
1 Langhurstwood Road
Horsham
West Sussex, RH12 4QD
United Kingdom
T: +44 1403 273973
F: +44 1403 273972
admin@dsairpublications.com
www.globalmilitarycommunications.com

GMC

Photo courtesy Australian Border Force - see page 30

Contents

News review 4/5/27/35

Homeland security - Protecting against cyber threats 6

Q&A Edward Joannides, General Manager at Intellian Americas 10

Meeting the military's mobility and connectivity demands with VSAT 14

Q&A Philip Harlow, XTAR's President and COO 16

Transmit, reflect, detect 22

The UK military tendering process 26

Software defined radio adds a new dimension to military communication 28

Assured military communications while on-the-move 30

The state of satellite interference 32

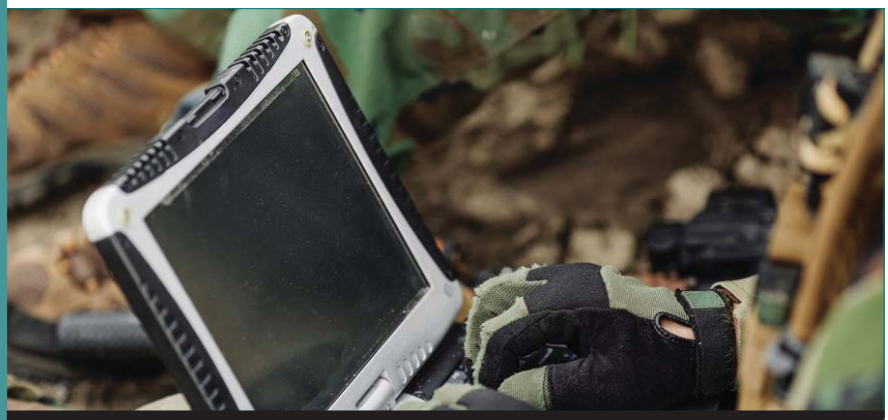

Photo courtesy XTAR

If you would like to supply information for future issues of GMC please contact Amy Saunders, Editor.

Swarm45 in action. Photo courtesy of Paradigm

Meeting the military's mobility and connectivity demands with VSAT

Secure and effective networks are key to a successful military communications system. The speed, security and coverage of satellite communications are continuously being improved by commercial solution providers to integrate new technologies and to meet government and military requirements. Here, Ulf Sandberg, Managing Director at Paradigm, outlines some typical field scenarios and how they have influenced product development at Paradigm.

Examining typical field scenarios, the first two scenarios are similar in that they both require a communication system which is mobile, able to handle high data rates, and quick to assemble and point, while the second two scenarios detail more specific requirements where size, weight and power (SWaP) is of the utmost import.

We can begin with the requirements of a first response team in an emergency environment. Frequently, the military are first on the scene in disaster-struck areas; whether man-made or natural. Rapid, reliable and ultra portable communication systems are vital for aiding the survivors, and need to be simple enough to be used by untrained operators who have other key tasks to focus on. Time taken to transport, assemble and point a system is critical and has to be kept to a minimum. The sooner the world can see pictures and receive up-to-the-minute information on the situation, the sooner the rescue and aid organisations can respond.

The second scenario describes a requirement for the reconnaissance of a remote desert area in the Middle East by a small advance team needing to feed information back to HQ, ahead of a larger scale base setup. On reaching each potential site, the advance team needs an ultra-portable satcom system which they can assemble in minutes, then point and acquire the satellite just as quickly. Travelling light is critical. There's no room for bulky and heavy auto-acquire motors and controllers. The information sent back about infrastructure, geographical features and identified risk areas needs a high throughput connection which can handle large quantities of data quickly and efficiently.

In another instance over in Africa, peace-keeping military operations have long faced the challenge of sabotage to their communications due to the very real threat of piracy in the region. Secure communications are consequently critical to the success of any mission or manoeuvre. Previous solutions to this have had to rely on the installation and setup of telecommunication hubs, which connect a satellite network to a terrestrial network for backhaul to other regions. Such a solution represents a major cost and time investment. Installation of a telecommunications hub involves lengthy logistical planning, licensing and

Ulf Sandberg, Managing Director at Paradigm

The ultra-portable Swarm45 VSAT terminal and mount fits easily into a manpack

transportation as well as a significant commitment of manpower. An alternative solution that would reduce any of these factors represents a substantial step forward in efficiency. However, the alternative would need to provide high enough throughput rates, ease-of-use and reliability of service.

Finally, a covert operation involves the close surveillance of a building in order to supply 24-7 visual records of personnel arriving and leaving. The site is located in a busy city environment with high volumes of vehicular traffic, high density, tall commercial buildings and a track record of volatility and insurgence. The satellite communication solution needs to be highly discreet; if a terminal or antenna is visible in this sort of unpredictable environment, it immediately becomes a target for hostile forces. Plus, the satellite terminal needs to be able to provide high enough data rates to handle the transfer of large video and photographic files. Consequently, this situation and many others like it need a communication solution which provides global coverage and answers the critical size, weight and power (SWaP) issues.

Developing innovative solutions for the defence market

Over time, these scenarios and many others like them have presented themselves to Paradigm. The company's many years of integration and development experience in satellite communications place it in an ideal position to respond. It was clear that the emergence of high throughput satellites (HTS) would provide VSATs with the bandwidth and cost reduction to become an option for these kinds of situations. However, the VSAT pointing process was still too complicated for it to be an ideal solution.

So, Paradigm's design engineers appraised the simplicity and portability of equipment already used in these situations, such as BGAN (provided by Inmarsat, where a laptop-sized terminal can be used to connect via a low data rate link from remote locations) and compared it with VSAT setup and SWaP. Of particular interest was the set-up, point and re-deploy process.

From this assessment, Paradigm has developed the Outdoor PIM (Paradigm Interface Module), a common terminal interface controller for many different types of VSATs. It minimises the need for training with simplicity by using audio and visual cues to point a VSAT terminal and control transmission – all achieved with three buttons and a cross-hair target of LEDs. No screen to smash or freeze. No heavy, bulky motors or controllers to weigh it down. The PIM is extremely rugged, weatherproof and very portable – all critical for global use in remote and demanding environments such as the ones outlined above.

Next, Paradigm took on the challenge of designing a VSAT terminal around the PIM which was ultra-portable, highly discreet and quick to deploy and stow; factors demanded by the scenarios outlined earlier. The aim was to design a VSAT terminal that could be carried as airline hand luggage, be setup and operational by an unskilled user in less than five minutes, and still deliver high data rates for video and image transmission. Better still, with Inmarsat's Global Xpress, provide a terminal which can be re-deployed anywhere in the world without the requirement to contact the service provider.

The Swarm45, released onto the market in 2016, meets all these requirements and more. It's a low-profile, 45cm flat panel terminal with performance comparable to a 65cm parabolic antenna. It is designed around the PIM for easy pointing and packs down into a lightweight manpack or hard case. Crucially, both packaging options are compliant as airline carry-on baggage. The flat panel design is reliable and greatly increases wet performance when compared to a parabolic design. This is due to the signal passing through the antenna only once. It also sheds water easily and avoids water pooling. It can operate in X, Ku-band or Ka-band, and is already compliant and used on many HTS (High Throughput Satellite) networks including Avanti, Inmarsat's Global Xpress and Telenor's Thor 7. This level of global coverage and band flexibility, coupled with the considerable reduction in the average cost per Mbps of HTS bandwidth over FSS (Fixed Satellite Services) means that a satcom terminal such as the Swarm45 is a straightforward, cost-effective and innovative solution for the defence market. **GMC**

Compact batteryDiscreet, low-profile Paradigm Swarm45 with manpack