Battlefield Communications Intelligence & Counter UAS trends and technologies in 2024

David Beckett, Business Development Director at Spectrum Battlespace (part of SPX CommTech), shares insight into the trends that will shape Communications Intelligence and the technologies that will allow teams to strengthen their capabilities in the new year.

Q: What's been the main development in COMINT during the past 12 months?

A: Throughout the year we've witnessed significant developments in the cross over of Communications Intelligence (COMINT) domain into the Counter Unmanned Air Systems (C-UAS) space in an effort to keep up with the proliferation of Unmanned Air Systems (UAS).

Technology, beyond its benefits, has also increased complexity across the battlefield due to its extended use on both sides of the conflict. Now, effective C-UAS solutions are needed to address the mass deployment of intelligence-gathering drones and their weaponisation by malicious agents, traditional COMINT capability is now supporting this effort.

From detecting the mere presence of malicious third parties to identifying the exact location of artillery operations, UAS COMINT has proven crucial in supporting Intelligence, Surveillance, and Reconnaissance (ISR) operations and target acquisition. What's more, we've seen commercial drones being deployed for the initial identification of targets before higher-value UAS provide precise targeting information allowing the right weapons system to counter the target. More specifically, the mass deployment of both these commercial and military drones has been a catalyst for the development of counter-UAS solutions. As the year comes to a close, threats will continue to extend beyond land to air and sea, with teams needing to spend more resources monitoring broader unmanned activity.

Q: What's a key trend that you believe will impact intelligence gathering in 2024?

A: One of the most significant outcomes in COMINT has been the speed at which commercial and military communication systems, drones and UAS are being deployed by troops at every level – in multiple roles from platoon to brigade level to ground-base air defenders. In this context, 2024 will see trends aimed at strengthening defence teams as well as making things harder for malicious actors.

One of the main trends, however, is the progression of multi-domain operations, which will allow modern defence teams to be more agile, flexible and coordinated in responding to threats across all land, sea and air. It involves bringing together the land, sea, air, electronic warfare and cyber domains into one coordinated activity. Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) is at the core of this as well as COMINT and UAS detection which provide critical access to real-time battlefield intelligence.

Q: Any other technology trends you expect to see?

A: AI will continue trending towards being omnipresent in all defence capabilities from communications, target acquisition and reconnaissance (ISTAR), COMINT to weapon systems. For example, recording the Radio Frequency (RF) profile of communication devices on the man, platforms and hostile UAS will allow defence teams to build a useful 'threat library' of data that feeds machine learning and AI to automate

future search and identification of unidentified systems. This analysis is crucial in determining the different level of threat a specific devices or platforms will pose in the future, and the best response options to counter it. As these libraries build up, the information they gather can be merged from various sensors to make more informed decisions, aided by AI. As an example, going forward we expect it will be much easier to approve the use of an AI application in a soft kill C-UAS, than it would be to include AI and remove the human element from a hard kill weapon system.

Q: In this context, what role will satellite-based communications play?

A: We expect to see a move away from the heavy reliance upon satellite navigation systems which provide position, navigation and timing information. Should the satellites not be available for this intelligence, for instance due a malicious interception, platform-based solutions such as atomic clocks and oscillators will become increasingly crucial on the battlefield to unlock the key information of UAS solutions.

In 2024 satellite communications will also continue to become more accessible through standards such as MUOS (Multiple User Objective System), a beyond-the-line-of-sight system that is much harder to detect, and much more resistant to interference. Most importantly, this system has a much greater capacity and availability to users on the ground than traditional satellite communications. We're also seeing mesh radios increase robustness of information delivery as they're less prone to interruption in communications.

Q: How are SPX CommTech's products positioned to strengthen teams?

A: This year we launched our next generation 953 COMINT RF Receiver for superior identification, direction-finding, and tracking of hostile RF signals to support COMINT and Counter-UAS tactical operations. It performs continuous, unmanned, remote, and real-time signal collection up to 80MHz bandwidth across a frequency of up to 40GHz for signal monitoring, collection, and direction-finding. This bandwidth delivers a sweet spot between monitoring sufficient signal breadth and amplitude to ensure quality and accuracy in identifying threats.

Additionally, the receiver is powered with removable hot-swappable batteries for round-the-clock use and has a new compact chassis with an IP-67 rating that's able to withstand temperatures up to 50°C, delivering full operational capability in extreme hostile climatic environments. It also boasts increased removable storage of up to 2 TB for enhanced data capture.

From a software perspective, the 953 COMINT RF Receiver is powered by SPX CommTech's Blackbird application, which detects, identifies, direction-finds and tracks signals of interest to support, find, fix and strike operations, and mitigate electronic warfare threats. It also tracks the RF emission of UAVs and their controllers or Data Links to support counter-responses. Blackbird can record the signal environment for look-back analysis without interrupting the current mission. It simplifies the collection task and can trigger automated actions and support unattended operations.

Q: What is SPX CommTech's approach for the new year?

A: In 2024, we'll continue to actively support defence teams and innovate technologies that ensure a smarter, more secure future for all. Key to this will be the evolution of our current BLACKTALON C-UAS

Solution we will be looking to broaden the sensor eco system, to provide greater flexibility to meet more of the current and evolving ConOps. We will also continue our monitoring of the evolving battlefield dynamics to better understand where enhanced capabilities are needed the most and work very closely with defence teams to keep up with their needs and develop new solutions alongside them where they will make the greatest impact. At SPX CommTech our fundamental goal is to introduce more software-defined functionality and performance which will allow users across the globe to upgrade their capability for a specific use, when needed, with the flexibility and agility to rapidly reroll or optimise equipment for future missions.

For more information visit www.tcibr.com