FTCN Replay: How Europe is Figuring Out its EMSO Challenge

In a recent podcast discussion, **Ken Miller** and **Dr. Tom Withington** delved into the critical role of the electromagnetic spectrum (EMS) in modern conflicts, highlighting the ongoing war in Ukraine and its implications for global military operations. With conflicts raging in Europe, the Middle East, and the Indo-Pacific, the control of the electromagnetic spectrum has become a decisive factor in achieving battlefield superiority.

Spectrum Superiority in Ukraine
The Ukrainian military's struggle to maintain spectrum superiority against Russian forces has been a focal point of the conflict. According to Dr. Withington, if Ukraine can secure control over the electromagnetic spectrum, it would significantly enhance their chances of victory.

> ***"The electromagnetic spectrum is as critical as air superiority was in World War II."*** *— Dr. Tom Withington*

The spectrum, which includes everything from communication systems to radar and satellite links, is a critical asset in modern warfare. One of the key developments in Ukraine's defense has been the delivery of F-16 fighter jets. These aircraft are crucial in the fight for air superiority, a component tightly linked to spectrum control. Without dominance in the air—and now the spectrum—it's nearly impossible to control the ground and seas effectively.

The Role of Training and Coalition Efforts
Miller raised concerns about how training on electromagnetic spectrum operations (EMSO) lags behind the pace of real-world

conflicts. While many military forces train extensively for air and ground operations, the complexities of spectrum warfare are often overlooked.

> ***"We are training for yesterday's wars, not tomorrow's battles."*** *– Ken Miller*

Dr. Withington echoed this sentiment, noting that while air forces have robust training regimes against realistic threats, the same cannot always be said for land forces. NATO and allied forces must ensure that they have the capability to replicate real-world spectrum threats in training environments.

In the context of Ukraine, this becomes even more urgent. The lessons learned from spectrum operations in Ukraine could be directly applicable to other regions, such as the Indo-Pacific or the Middle East. Sharing this knowledge among coalition partners is crucial to maintaining an edge in global conflicts.

Space and Cyber Operations

The conversation also touched on the critical importance of space and satellite operations, especially with regard to GPS and satellite communication (SATCOM). Russia has made several attempts to disrupt Ukraine's satellite capabilities, particularly with attacks on systems like Starlink and Viasat. However, the Russians have been relatively unsuccessful due to their lack of advanced Ka and Ku band jamming capabilities.

> ***"Space-based operations are yet another domain in which the control of the electromagnetic spectrum is pivotal."*** *– Dr. Tom Withington*

While Ukraine faces challenges in protecting its GPS systems, particularly due to a lack of access to NATO's secure PY-code, there are ongoing efforts to provide alternative methods of

resilience. These space-based operations are yet another domain in which control of the electromagnetic spectrum plays a pivotal role.

Global Implications and Future Directions
As the war in Ukraine continues, the lessons learned in spectrum warfare will likely shape future military strategies around the world. With conflicts brewing in regions such as the Middle East and the Indo-Pacific, the importance of EMSO will only grow.

> ***"Nations are now fighting to control not just the air and sea but also the invisible battleground of the spectrum."*** *– Ken Miller*

As Dr. Withington pointed out, Russia, China, and Iran are likely sharing both successful and unsuccessful strategies regarding spectrum warfare. NATO and its allies must stay ahead of the curve in both technology and training.

The **Association of Old Crows (AOC)** continues to provide a valuable platform for these discussions. The unclassified environment of AOC forums allows for vital knowledge-sharing among military and industry leaders on how to maintain an edge in the electromagnetic spectrum. As Miller and Withington emphasized, speaking "truth to power" about the strategic realities of spectrum warfare is essential, regardless of who is in leadership positions across the globe.

Conclusion
The ongoing war in Ukraine serves as a stark reminder of the critical role the electromagnetic spectrum plays in modern warfare. As nations continue to vie for control in various regions, spectrum superiority will remain a decisive factor in determining military success. With increased focus on training, collaboration, and innovation, NATO and its allies can ensure they remain prepared for the next era of electromagnetic warfare.

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