FTCN Replay: Answering Your EW Questions

In a recent episode of the FTCN podcast, *From the Crow's Nest* host Ken Miller, director of advocacy and outreach for the Association of Old Crows (AOC), explored listener-submitted questions on topics ranging from the fundamentals of electronic warfare (EW) to the role of AI in modern military operations. Together with producer Laura Krebs, they delved into the intricacies of electromagnetic spectrum operations (EMSO), providing insights for both new and seasoned listeners.

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Understanding Modern Electronic Warfare

The first question tackled the foundational elements of EW. When asked about the key components of a modern EW strategy, Ken explained: *"You have your electronic attack capabilities, your electronic protect capabilities, and electronic support,"* emphasizing that these are the three pillars of electronic warfare. He described electronic attack as radiating electromagnetic energy to disrupt adversary systems, while electronic protection focuses on shielding assets from external interference. Electronic support, which includes signals intelligence and data collection, is increasingly dynamic and vital to the modern battlefield.

One of the highlights of Ken's explanation was how these elements integrate into broader military operations. *"It has to start with electromagnetic spectrum superiority,"* he noted, underscoring that success in everything from cyber operations to intelligence gathering hinges on controlling the spectrum.

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The Role of AI and Machine Learning in EW

Next, the conversation shifted to the impact of artificial intelligence (AI) and machine learning on EW systems. The advances in AI, Miller said, are transforming how military forces gather, analyze, and act on intelligence data. *"The speed of battle today, the need to collect the information… it's just outpacing our ability to keep up,"* he remarked, highlighting how AI enables faster, more efficient decision-making than human operators can manage.

However, the conversation also touched on the challenges AI presents, including ethical concerns. As AI systems begin to take on roles traditionally filled by humans, *"the question now is not about the man in the loop, but rather the man on the loop,"* Miller said, referring to the role of human oversight in AI-led operations.

EW in Recent Conflicts

The podcast also addressed how EW has been employed in recent global conflicts, particularly in the Middle East and Ukraine. When asked about non-state actors in the Middle East, Miller acknowledged the classified nature of much EW-related activity but offered some general observations. *"What you're seeing is a heavy reliance on communications and the battle over secure communications,"* he said, pointing to the way EW has been used to jam signals and interfere with navigation.

In Ukraine, Miller noted the remarkable role EW has played since the start of the conflict with Russia. *"Ukraine's ability to jam signals and disrupt Russian systems has been critical,"* he said, while also emphasizing how the conflict has accelerated advancements in EW technology. The arrival of F-16s in Ukraine has highlighted the need for more robust electronic warfare support, as both Ukraine and Russia continue to adapt their capabilities in real-time.

China's Evolving EW Capabilities

As Miller points out, China's EW development is heavily focused on air defense, maritime dominance, and surface-to-air

and surface-to-sea capabilities. The Indo-Pacific region, with its vast maritime landscape, poses unique challenges compared to other theaters like the Middle East or Eastern Europe. China's investments in EW are designed to bolster their ability to control and dominate this strategic area, where their military objectives are centered around anti-access/area denial (A2/AD) strategies.

Miller emphasized the critical importance of the electromagnetic spectrum (EMS) in warfare, describing China's efforts as part of a broader goal to achieve superiority in communications, targeting, and satellite operations. "That conflict is going to be won or lost in the spectrum," he stated, highlighting that future conflicts with China are likely to be less about traditional ground force engagements and more about who controls the EMS. The push-and-pull nature of this spectrum dominance, especially in maritime regions, sets the stage for a new kind of military contest.

Congressional Oversight in EW Development

Moving back to domestic concerns, the conversation shifted to the role of Congress in shaping U.S. policies on EW technologies. With Miller's background in Capitol Hill, he provided valuable insights into how defense budgets are structured and the challenges in ensuring EW receives the attention it needs. The two-part process— appropriations and authorization — guides how the Department of Defense (DoD) is funded and how its programs are overseen.

Miller pointed out that Congress often approves the majority of the DoD's budget requests. However, when it comes to EW, there's a challenge: the complexity and obscurity of EW programs within the massive defense budget. "EW is buried deep within the budget documents," Miller explained. This is where the Association of Old Crows (AOC) comes in, helping Congress identify key EW programs that require more attention and funding.

Final Thoughts and Looking Ahead

The episode concluded with Miller encouraging listeners to submit questions and participate in future discussions. With China’s rapid advancements in EW and the Indo-Pacific’s importance as a strategic theater, this conversation underscores the urgent need for the U.S. and its allies to stay ahead in the electromagnetic domain.

Looking ahead, Miller predicted that developments in AI and machine learning will further revolutionize the EW landscape. Systems are becoming *“multi-functional, able to do more than one thing at a single time,”* which is rapidly changing the way military forces approach spectrum operations. As these technologies advance, the role of electronic warfare will only become more central to ensuring battlefield success.

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