

Staying the Course – Maintaining the Path to Advanced Marine Corps EMSO

By John Haystead

Ostensibly, the Marine Corps has a long history of appreciating the warfighting benefits provided by electronic warfare (EW) – particularly by airborne platforms, having flown the EA-6B Prowler in critical support of Joint Forces until its retirement in 2019. Ground-based capabilities, however, have always been extremely limited, and now with the Corps' decision to not replace its Prowlers with manned aircraft, such as the EA-18G Growler, the need to develop and implement an alternate approach and path for its AEA mission is even more critical and paramount in the near-term.

Despite many years of yeoman efforts by a dedicated cadre of Marine Corps EW advocates working to prepare for this exact eventuality, the process has been painfully slow to address the requirement with clear top-level direction and real funding. Today, however, this may be changing. With the emergence of "Marine Corps Force Design 2025 and 2030," and specifically the related Marine Air Ground Task Force (MAGTF) Information Environment Operations Concept of Employment (MAGTF IEOCO), there appears to be a broader appreciation and determination to significantly advance Marine Corps EW capabilities through its contribution to the overall doctrine and stated goals of Information Operations.

The MAGTF IEOCO was released in 2017, and according to LtCol Brian Ackerson, EW Branch Head at Marine Corps Deputy Commandant for Combat Development and Integration (CD&I), "It really shifted how we viewed the information environment and EW, allowing MAGTF-EW to begin taking a much more solid

shape.” Ackerson notes that the terminology was shifted to Operations in the Information Environment (OIE) but that, “this was the initial document that resulted in the creation of the Marine Expeditionary Force (MEF) Information Groups (MIGs) at each MEF HQ, who are ultimately responsible for all OIE activities.”

Under the MIGs is the Information Command Center (ICC) which also includes an Electromagnetic Spectrum Operations Cell (EMSOC) with overall responsibility for EMS-EW operations and coordination. Says Ackerson, “We have 2600s (Radio Battalion Signals Intelligence (SI)/EW Marines) for each infantry company and SI EW Warrant Officers at the battalion HQs and Marine Littoral Regiment (MLR) HQs, as well. These Marines will be responsible for EW planning at their level and will coordinate with the MIG EMSOCs for authorities and operations. Ultimately, we see EW and primarily Electronic Support (ES) as something the Marine Corps can provide to the Naval and Joint Force during competition to sense in and through the EMS and, in conflict, advanced Electronic Attack (EA) will enable our actions as the stand-in-force.”

In describing his own job and role at CD&I, Ackerson says, “My guys develop the requirements and work hand-in-hand with Marine Corps Systems Command (MCSC)(Quantico, VA) who ultimately develop and field the systems. We’re responsible for developing requirements for all EW systems – both aviation and ground EW requirements.”

Prior to Ackerson’s posting to the job, LtCol Jeff Kawada was in the slot at CD&I (2015-2019). As such, he was one of the people integrally involved in the preparation of the IE0C0E document, along with Eric Schaner, Senior Information Strategy and Policy Analyst, Plans and Strategy, Deputy Commandant for Information (DCI.) Schaner is also the primary author of the just-signed Marine Corps Doctrinal Publication (MCDP) 8, Information. Developed in coordination with Doctrine Branch, Policy and Standards Division, Training and Education Command

(TECOM), MCDP 8 is one of only eight such publications in the Marine Corps. It creates information as a warfighting function and translates the concept-of-operations to warfighting doctrine for the Marine Corps. It is comprised of four chapters describing: Nature of Information, Theory of Information, Effective Use of Information, and Institutionalizing Information. Said Schaner in a press release announcing the signing, "Any Service, or Service member, regardless of what their tactical implementation of information is can apply the core concepts outlined in MCDP 8, Information. Our intent is to increase overall understanding that information is a warfighting function that can be applied through combined arms and maneuver to support commander's objectives."

In the same press release, Lt. Gen. Matthew Glavy, Deputy Commandant for Information said, "MCDP 8, Information is written within the context of Force Design 2030: threat-informed, concept-based and accountable to a campaign of learning. To maximize the information warfighting function, we must make it a component of 21st Century Combined Arms – such that we generate, preserve, deny, and project information in full integration with fire and maneuver."



The ALQ-231(V)3 Intrepid Tiger II, seen above undergoing its first operational flight with MEU 22 aboard the USS Wasp in 2016, provides communications ES and EA. Newer versions will see it installed in an on-board configuration on MV-22 aircraft and as a roll-on/roll-off system on KC-130J aircraft. □USMC photo

SYSTEMS AND CAPABILITIES

In describing the EW systems and capabilities of the Marine Corps since the retirement of the Prowlers, there is one system that has become pretty much synonymous with the Corps' current EW capabilities. On the aviation side, the AN/ALQ-231 Intrepid Tiger II (IT II) family of systems started out as a rapid deployment capability (RDC) developed and built by the Marine Corps Spectrum Integration Lab (Point Mugu, CA) back when Operation Iraqi Freedom (OIF) (2003-2011 timeframe) was going on. As described by Ackerson, "We didn't have enough Prowlers available to support Marines, so the initial IT-II (V)1 EW pod was developed for initial fielding on Marine Corps

AV-8 Harrier aircraft and was also expected to go onto F-18 Hornets.” The (V)1 flew on Harriers with Marine Expeditionary Units (MEUs) essentially since it was developed in 2011, but the additional deployment on F-18 and KC-130 aircraft didn’t really advance as originally planned. Today, as with the Prowlers, Marine Corps Harriers are also being sundowned with the arrival of F-35 aircraft, with the Service likewise moving away from the IT II (V)1. There are no plans for IT II on the F-35, as it has its own inherent EW capabilities.

Says Ackerson, “As IT-II matured over time, it moved from an RDC to an official Program of Record (POR), with a new improved (V3) variant deployed on UH-1 ‘Huey’ helicopters.” The system is currently used by Marine Light Attack Helicopter (HMLA) Detachments that are now deploying with MEUs. Having achieved Initial Operational Capability (IOC), IT II (V)3 is expected to be full-up capable by the end of this year. According to Ackerson, “The (V)3 variant has more capability in terms of Direction Finding (DF) and Electronic Support (ES) than the (V)1 did, together with the inherent communication jamming Electronic Attack (EA) capability that was baked into the initial (V)1.”

Another variant, IT II (V)4, flew for the first time on an MV-22B Osprey aircraft in the summer of 2021. This was also the first time the capability was incorporated internally rather than as a pod. As described by Ackerson, “The (V)4 variant is a roll-on/roll-off kit variant of the system. It’s the newest variant, with Developmental Testing (DT) last year flying in an MV-22 Osprey and it’s going through Operational Testing (OT) over this summer-to-fall timeframe. We expect to deploy a decent number of those with the VMM Squadrons.” According to Ackerson, “the (V)4 has somewhat similar capability to the V3, with additional ES/DF capability.”

Going forward, the Marines are also developing a (V)5 variant of the IT II intended for KC-130 tanker aircraft. Although the IT II (V)1 pod was also intended to be flown on the KC-130,

the (V)5 version will be an actual aircraft modification program. Ackerman also reports that the Service is also currently researching various technologies, with a focus on an ES capability that could potentially go onto the proposed Marine Air-Ground Task Force (MAGTF) Unmanned Aerial System (UAS) Expeditionary for Medium-Altitude, Long-Endurance – or MUX/MALE platform. This is currently the MQ-9 Reaper. At one time, the Marines had looked at trying to put an EW pod on the RQ-21 Blackjack UAS, but it didn't go forward, and they are, in any case, now divesting the RQ-21.

Summing things up, Ackerson says, "So we've gone from the IT II's (V)1 original Comms-EA type mission to the (V)3, (V)4, and (V)5 variants, and onward onto UAS in the future. Overall, we intend to keep the same EA type capabilities it currently has, but shifting focus more towards an EW support/sensing type role."



The latest version of the Communication Emitter Sensing and Attack System II (CESAS II), shown above in an exercise at Camp Lejeune, NC, with 1st Battalion, 2d Marine Regiment (1/2), 2d Marine Division (MARDIV), achieved Initial

Operational Capability last year. □USMC photo

GROUND-BASED OPERATIONS AND SYSTEMS

As observed by Ackerson, there's also progress on the ground side of Marine Corps EW. "All of the things that have gone on in the force design are really looking at having high-density/on-demand type capabilities down to the infantry squad level, and we're looking at a mix of capabilities with things that will be operated by 2600s, our SIGINT/EW professionals (think of a Radio Battalion (RadBn) Marine), as well as a plethora of systems that are 'incidental-operator' focused. These would be a combination of back-pack or wearable systems carried by Marines, but not operated by them. It's kind of similar to IT-II in that we're not looking for systems to be operated by an aircraft pilot or crew chief. The expectation is that the mission planning, etc., will be done through a dedicated 2600 operator, either operating the pods or the system remotely from the ground, or from onboard the aircraft. Particularly when you're talking about a UH-1, MV-22 or KC-130, they can easily be in the back of the aircraft running the mission."

According to Ackerson, with the current force design, the Marines are looking at having SIGINT/EW teams in each infantry Company. "So, you'll have a team of 2600s – about a half-dozen in each Company – and they'll be your EW experts at the Company level. They would also be the people responsible for providing the mission planning, command and control and mission loading for the systems carried by the Marine incidental-operators at the Squad level."

The Company-level teams would also have the Service's Communication Emitter Sensing and Attack System II (CESAS II), which is currently being fielded. This is the Corps' sole high power, ground-mobile EA asset providing the MAGTF the capability to detect, deny and disrupt threat communications.

The CESAS II upgrade makes the new system lighter and doubles its frequency range. Ackerson says, "The latest variant of the system was IOCd last year, and we're planning on having each of those teams operating those as well as additional SIGINT gear. The focus on the EW side is sensing in the EMS to control it."

Moving forward, MCSC is developing the new MAGTF EW Family of Ground Systems (MAGFOS). As described by Ackerson, "This is the family of systems we're looking at for incidental operators, and will include a team-portable version (but one that operates largely like a fixed-site operation), which will have counter-UAS, counter-RCIED, counter-comms, and counter-C5ISR Center capability baked into it."

There will also be a vehicle-mounted variant which is intended to be carried on a wide range of wheeled vehicles, including the Marine Corps' Amphibious Combat Vehicle (ACV) and its Advanced Reconnaissance Vehicle (ARV). In addition, two dismounted MAGFOS variants are planned – a backpack system as well as a wearable system, such as a helmet-mounted capability or something worn on a flak vest. Ackerson says, "The focus for the infantry is having a sensing capability in the EMS where you can detect and target the enemy. Tying into the aviation side, the focus is on the ES piece, where the objective is domain awareness."

Emphasizing that the MAGFOS family is intended to be used against peer adversaries, Ackerson says the overall focus of the effort is that the different variants operate together to deliver a fully-robust capability. All of the systems are networked through the Electromagnetic Battle Management System (EMBS) spectrum services framework. "With one system, you won't have the full capability, but with multiple systems, you can have synergistic effects and networked EA/ES capabilities, all working together to give you an advanced capability. Starting with the wearable gear, we're looking at systems down to the Squad level that provide basic DF and threat

localization, then with the backpack variant, you'll have some basic level of defensive EA, and then as you move into the mounted or team-portable capability, you'll have more of the robust capabilities."

MAGFOS is also embracing the Army's C4ISR/EW Modular Open Suite of Standards (CMOSS) architecture. "It's a key part of the program," says Ackerson, "and we're looking at having a CMOSS chassis populated with carded solutions. It doesn't necessarily have to be just an EW system. As we look at software defined radios (SDRs), and advanced receivers, etc., your radio system can also be used to sense in the EMS and contribute to battlefield awareness. And, without the need for multiple boxes, you can put a host of system capabilities in a single vehicle – saving space while not being vendor locked."

Marine Corps Systems Command began developing MAGFOS in 2020, and it is currently going through mid-tier acquisition for the team portable element. The other capabilities are in development, with the goal being to have these systems delivered in the next five years. According to Ackerson, "As the new force design units – such as the Marine Littoral Regiments (MLRs) and new infantry battalions – come on line, these will be the some of the first to receive the systems. In the interim, we've divested our old CREW-type systems and are using multi-function EW (MFEW), which is currently the Modi II backpack and vehicle mounted (Modi Vehicle Power Adapter II – MVPA II) variants. The Modis are currently fielded, with the vehicle-mounted capability intended more for the MEU type mission, or more of a counter-insurgency role, being delivered over the past two years."



The Marine Corps wants to extend EW operations down to its smaller units. Late last year, 3d Battalion, 3d Marines; 3d Radio Battalion, III Marine Expeditionary Force Information Group, and 2nd Infantry Brigade Combat Team, 25th Infantry Division, conducted a joint EW training event at Schofield Barracks, HI, to learn how EW can enhance the lethality of small units. □ USMC photo

IT'S A PROCESS

The realization of an all-new, comprehensive EW capability for the Marine Corps is best described as an ongoing process that has already been decades in the making, and has not been without obstacles and challenges all along the way. Not the least of these challenges has been the institutional resistance to the adoption of such unfamiliar technology by the intended users, whose mission focus and training has long been on other priorities. With the exception of the Prowler community, the big-picture benefits and critical importance of EMSO was not fully appreciated or expounded across the Marine Corps. And, even that base of advocacy and expertise began to quickly disappear with the EA-6Bs' retirement.

One early example of these growing pains can be seen with the

initial deployment of the first Intrepid Tiger pods to the Corps' Harrier squadrons. Not surprisingly, Harrier pilots already saw themselves having a clear combat-mission profile delivering kinetic weapons, and they weren't really excited about this new role of providing communication-jamming support. Add to this, the fact that this strange pod, with invisible effects – as far as they were concerned – was disrupting their own friendly aircraft communications, and it wasn't seen as much of a match made in heaven. Overcoming this initial reticence was one of the main challenges for those tasked with building and fielding an effective airborne EW capability to replace that of the Prowlers.

Ackerson says that today, however, with better education and training, this early resistance has pretty much disappeared among all of the platform communities now flying with IT II. "As far as interference issues with own communications," he says "it's not seen as anything significant. You just have to develop the tactics, techniques and procedures (TTPs) to work around it. It's all things that can be dealt with through good mission planning."

On the ground side, the Marines found other issues to address. For example, it was the Corps' Radio Battalions (RadBns) that were now being tasked with a new, heretofore antithetical, EW mission. Having expertise in (and tightly intertwined with) the intelligence community signal-collection mission, RadBn units were trained to listen to, not disrupt, enemy communications. And the equipment they used, and were extremely familiar with, did not include EA systems.

Ackerson says the RadBns are now fully onboard with the EW mission. "As the capabilities have matured and been fielded, the 2600 community has kind of come in and said, 'yeah, this EW thing is actually important,' and they're are definitely supportive of all of this as they realize they will be an integral part in how we want to operate and what we're looking at the Marine Corp to bring to bear for the Joint and Naval

Force. It's this sensing capability, which isn't just SIGINT, but rather the EA piece as well in conjunction with SIGINT."

Ackerson notes that, in the initial stages, it will be the RadBns' responsibility to train the professional SIGINT/EW Marines, "but the real goal is that these SIGINT/EW teams belong to – and are fully integrated into – the infantry battalions and that they operate seamlessly and in full support of the Battalion."

Perhaps the most important lesson learned and the biggest obstacle needing to be overcome, in terms of truly and widely accomplishing the acceptance, adoption, and appreciation of the critical importance of EMSO in the Marine Corps, may have been self-inflicted. As Kawada observed, "The thing I think that is often overlooked is that the technology is kind of the easy part. Industry is going to build it, but it's the experience and expertise of the people needed to implement it and the DOTMLPF [doctrine, organization, training, materiel, leadership, personnel and facilities] that is the difficult part. This is what the Marine Corps may not have not gotten quite right with the retirement of the Prowlers. Maintaining the Marine Corps' EW expertise has been not been as deliberate as it could have been, and that is the piece that is going to require time."

NEXT PERSON UP

As already noted, the process of bringing advanced EW capabilities to the Marine Corps has gone through, and continues to go through, many stages of maturation. One thing that has not changed, however, is a continued focus on the need for a consistent overall strategy, and this has been steadily advocated for and advanced by a core group of Marine Corps EW leaders, such as those serving in the role of CD&I's EW Branch Head and other similarly-tasked, action-officer-level colleagues. As described by Kawada, "The goal has always

been to stay the course and remain consistent with the strategy – handing the torch to the next person and pushing ahead. Over the years, everyone has done their part to adhere to and advance this strategy. Rather than focusing on a particular technology, it is the architecture that is key to this strategy, with all the shiny objects that get plugged into that architecture coming and going. More recently, those of us tasked with the job have been involved with the development of capabilities, but the overall strategy was set by those that came before us.”

Among this group who “came before,” are LtCol Jason Schuette, USMC (Ret.) and Maj Matt Poole, USMC (Ret.) – both well-known names to the AOC and EMSO community at large. Prior to Kawada and Ackerson, Schuette had also served in the role of EW Branch Head, CD&I and later on doctrine and requirements development for Marine Corps EMSO. Among his postings, Poole served as the Spectrum Warfare Division Head, Marine Aviation Weapons and Tactics Squadron 1 (MAWTS-1), as well as two tours working Joint requirements at the Joint EW Center (JEWEC). Those interested in reviewing some of the foundational plans that now form the basis for today’s Marine Corp EMSO strategy and what is now known as the Electromagnetic Spectrum Operations Cell (EMSOC) are referred to their article, “Cyber Electronic Warfare – Closing the Operational Seams,” published in the August 2015 edition of *Marine Corps Gazette*. One prescient quote from that article is, “In order to properly coordinate, deconflict, and synchronize execution, the Marine Corps requires a focusing entity for holistic planning, integrating, and coordinating ‘spectrum warfare’ capabilities...”

Clearly the MAGTF IEOCOEE reflects and carries forth this view, and as Ackerson observes, “All the Services and across the DOD have really woken up in the last few years to the importance of Information Operations and spectrum operations and superiority. It’s not just a bunch of disparate things, which

is good.”

How this translates in terms of real-world budgeting and funding in future, of course, remains to be seen. As always, “The proof will be in the pudding.” For his part, Kawada says that, “The good news is that the Corps has built the MIGs and have stood up a 3-star Deputy Commandant for Information (Maj. Gen. Matthew Glavy), so, we’ve gained in the leadership area, as well as within the OIE organizational structure, as EMSO falls within this ‘bucket of Information’.”

In addition to the individuals cited or referenced in this article, the author would like to thank Lt. Col. Scott Cooper, USMC (Ret.) for his valuable insight and assistance with this article. With twenty years of service in the Marine Corps, including as an EA-6B Squadron Commander, Cooper is one of the early advocates and planners for Marine Corps EMSO.