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14. ABSTRACT The paper examines the composition of an Expeditionary Advanced Base (EAB) for the purposes of sea denial in a major conflict. The major proposition is that a specialized command element is necessary to locally control weapons and sensors in order to gain the full value from a sea denial EAB. The Marine Corps does not have currently have a command element which can execute the complex sea denial mission independently of connection to a high echelon. Current Marine Air Ground Task Force (MAGTF) configurations lack the technical capacity to integrate and control the multitude of weapons and systems required for effective sea denial and using the current MAGTF structures would be an inefficient use of resources.					
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FUTURE WAR PAPER

The Expeditionary Advanced Base Operations Command Element for Sea Denial

**SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF OPERATIONAL STUDIES**

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Disclaimer

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The 2012 Joint Operational Access Concept highlights the “dramatic improvement and proliferation of weapons and other technologies capable of denying access to or freedom of action within an operational area” as one of the dominant trends threatening American power projection.¹ The *Marine Operating Concept (MOC)* is the United States Marine Corps’ attempt to address some of these challenges and to support the Joint Force’s reach into contested areas. The *MOC* envisions a significant role for the Marine Air Ground Task Force (MAGTF) in power projection and sea control through littoral operations in contested environments and expeditionary advanced base (EAB) operations.² However, the Marine Corps lacks some specific capabilities for the sea denial fight and does not have a readily-deployable command element that can integrate future capabilities to execute the sea control mission in a decentralized manner. *Therefore, the Marine Corps needs a specialized Expeditionary Advanced Base command element with the ability to coordinate weapons and sensors in multiple domains, independent of communication to a higher echelon, to fully support the battle for sea control.*

This paper lays out an argument for why the Marine Corps needs to create a specialized command element to support sea denial EABs. It starts with a discussion of the future operating environment and many of the capabilities that will be required, and available, for a future sea denial fight. This is followed by a description of the importance of integrating these future capabilities and some current initiatives towards that end. The current shortcomings in MAGTF structures are followed by possible avenues for creating specialized command elements and implications for future conflicts.

The operating environment of the future will continue to grow in complexity and number of dynamic actors. The *MOC* highlights the increasingly contested nature of the maritime domain as one of the key drivers of change in the future operating environment. The *MOC*

describes an array of challenges across multiple domains but focuses primarily on actions below the “threshold of open conflict.”³ The implication is that Marine Corps contributions to sea control will be primarily focused on eliminating land-based threats. This implication holds for many scenarios, but in a large-scale conflict the initial EAB mission will be to turn the sea into mutually denied space; in this case, the primary targets within range will be air and maritime rather than on land. US actions will probably be reactionary, so an EAB must immediately be fully operational capable as it deploys into an area already contested or controlled by an adversary.

A formation operating for an extended period of time in a contested area is often referred to as an “inside force.” The Battle of Guadalcanal is frequently used as an example to describe how an EAB can be an “inside force.” The Marines’ capture of Henderson Field and the subsequent aviation operations from the field supported the Navy’s sorties into the surrounding waters, even though the Navy could not remain around the clock. The sea denial EAB envisioned in this paper focuses on the air and sea aspects of a force executing a similar mission. The initial foothold established by the EAB is far enough from adversary forces that the air and sea denial projected by the EAB prevents the introduction of ground forces as a significant threat. The EAB structure can change over time as an initial foothold is expanded or another one is established farther inside the contested area, but the EAB can fight on its own if the Navy or other components of the Joint Force cannot provide direct support.

The Marine Corps may face several situations where its operations are not focused on eliminating ground threats. The *MOC* acknowledges “projecting and sustaining power ashore requires establishing sea control in the adjoining seas and airspace.”⁴ *Littoral Operations in a Contested Environment (LOCE)*, a supporting concept to the *MOC*, requires “Ability to establish

expeditionary advance bases to support sea denial, sea control, power projection... in contested environments.”⁵ Similarly, execution of an “Offshore Control” or “war at sea” strategy such as those proposed by T.X. Hammes and retired Captains Wayne Hughes and Jeff Kline would orient the Marine Corps on air and maritime threats. Hammes’ “Offshore Control” envisions a distant blockade, isolating an adversary’s (in this case China) maritime lines of communications by controlling access through offshore islands and interdicting maritime shipping to disrupt China’s economy and achieve a strategic end. The “war at sea” construct limits US military actions to the maritime space, avoiding direct attacks against adversary infrastructure or forces on the mainland. The EAB supporting an “Offshore Control” or “war at sea” strategy will probably not have robust forcible entry capability and must maintain a small enough footprint to reduce vulnerability through mobility and signature management. Both of these strategies envision EAB employment to support sea denial and control by contesting enemy control of maritime areas to allow for the creation of a “bubble” which the Joint Force can exploit to conduct follow-on power projection operations.

An EAB is a forward node in the joint force’s reconnaissance-strike network that generates a “bubble” in two ways. The first way is the providing of targeting information to the global network of sensor and shooter platforms. The second way is the ability to control deployed platforms and externally sourced assets independent of a connection to any global network. Each of these ways provides a means to exert influence into contested area, and an EAB which can operate in both ways will be more effective and survivable. A sea denial EAB should be built around a specialized command element which has the intrinsic expertise and capacity to exercise control of multi-domain sensors and weapons. It should have basic Electronic Support Measures (ESM), a forward based (or staged) Airborne Early Warning and

Control (AEWC) platform, a minimal short range defensive system and at least one attached offensive anti-ship and anti-air weapon system. This minimal structure meets all the basic requirements for contesting control of the air and sea and supporting Joint Force operations.

As long as these basic requirements are met, an EAB can be augmented with as many additional attachments are available and prudent for the situation. Obviously, a greater array of sensors and weapons, like ground-based radar and unmanned systems increases the potency of the EAB. The command element's ability to effectively integrate and control each attachment so the EAB can support the Joint Force commander's intent is a critical capability. The assumption of control of long-range systems launched from outside an EAB's area of influence is an extension of that critical capability. This capability prevents the easy isolation and/or reduction of an EAB because local effectiveness is not dependent on global communications. This capability is challenged by the number of different weapons and sensors employed by an EAB.

The future EAB will employ many different systems to address current capability gaps. Specific systems which will be available include: 1) a medium or long-range air defense missile system, 2) an anti-ship missile system, 3) forward-staged fixed wing aviation, 4) Unmanned Aerial, Surface and Subsurface (underwater) Vehicles (UAV, USV, UUV), 5) Electronic Support Measures. These systems will have to be integrated by an effective command and control system(s) and employed by a command element which is proficient in sea denial operations.

The primary targets in an initial sea denial fight will be enemy aircraft and naval vessels. The Marine Corps lacks the weapons systems to prosecute these targets. As stated in MCTP 3-20C Antiair Warfare, "without a medium range, medium altitude radar SAM [surface to air missile], the [Marine Air Ground Task Force] MAGTF lacks the ability to destroy enemy aircraft and missiles at medium altitudes unless they are within weapons release parameters."⁶ The

limited, short-range air defense systems the Marine Corps maintains (Stinger missiles) will not influence the air aspect of a sea control fight. The EAB of the future will have a longer-range air defense system that will need to be incorporated into the command and control structure.

The Marine Corps also does not currently field any ground-based anti-ship weapons to address naval targets. The High Mobility Artillery Rocket System (HIMARS) provides a potential launch platform for new missiles or many existing anti-ship missile systems could fill the capability gap. Selection of a missile system(s) must balance range and capability against its operational and logistical footprint. Acquiring anti-ship missiles is listed specifically as a requirement in the *LOCE* concept, so just as with air defenses, the EAB of the future will have anti-ship missiles which must be integrated into the command and control structure.⁷

Manned, fixed-wing aviation provides some anti-air and anti-ship capabilities, but capacity and effectiveness are limited by the expeditionary nature of the environment and reliance on external support for air battle management. Establishment of EABs in contested areas makes their signature and survivability critical concerns. Since forward basing of aircraft requires a significant logistical footprint, it is likely that EAB aviation capabilities will be limited to a Forward Arming and Refueling Point (FARP). FARPs require a much smaller logistical footprint but restrict the availability of aircraft. In a major conflict, combat aircraft apportioned to an EAB will likely be only a small percentage of that available and the primary Navy and Air Force air battle management platforms (E-2 Hawkeye & E-3 Sentry) may be focused on other areas of the battlespace. Manned, fixed-wing aviation cannot be the sole offensive arm of an EAB because of the limited capacity of EAB aviation. While ground-based missile systems provide an obvious solution, unmanned vehicles (Aerial, Surface or Subsurface) provide additional possibilities for future sea denial assets to be employed by an EAB.

Emerging unmanned vehicle technology promises great potential for EAB operations. Unmanned vehicles provide platforms for EABs to extend influence into multiple domains with increased flexibility. Use of unmanned vehicles may also reduce the footprint and aid mobility of the manned portions of an EAB, an important survivability consideration. Unmanned vehicles also hold promise for solving some of the problems associated with distributed logistics. The plethora and rapid development of current unmanned systems will continue. This is both an advantage and potential disadvantage. A short design and production cycle allows for rapid adjustment of systems to address vulnerabilities and exploit enemy weaknesses. On the downside, an EAB is faced with employing a vast array of types, models, and series with differing performance characteristics and potentially different control mechanisms. The EAB command element must have the expertise and experience to quickly adopt new systems procedures and develop new tactics and techniques to employ the new systems effectively.

Unmanned vehicles also provide an avenue for providing an EAB with ESM capability, though they are not the only avenue. ESM is used to develop a picture of the electronic spectrum. This picture provides both attack warning and helps locate and identify enemy target platforms. Current ground-based systems are more focused on communications intelligence, but airborne and seaborne systems that detect threat emitters are plentiful. Most seaborne systems are integral to ships, but the Office of Naval Research has done work on Transportable Electronic Warfare Modules (TEWM) which may provide ground-based utility.⁸ The LR-100 Radar Warning Receiver is already incorporated into many unmanned airborne systems and is suitable for installation on land-based platforms.⁹ Any combination of these existing systems and future ones will meet the EAB's needs.

Most of the preceding deficiencies in EAB sea denial/control capabilities are already being addressed and will be available for future deployment. However, fixing individual capability gaps without developing the ability to effectively integrate and employ the sourced capabilities independently reduces the overall potential of EABs. Successfully executing a sea denial mission rests upon an EAB's capacity to provide basic self-defense and develop offensive capability. In a future operating environment with significant enemy anti-access/area denial (A2/AD) capability, basic self-defense for an EAB will be primarily air and missile defense. Many suggested capabilities for EABs, such as anti-ship missiles, anti-air missiles, and FARPs for staging/supporting strike aircraft, can provide independent offensive means. The value of these independent means is enhanced, however, if they are employed in concert with other capabilities within the EAB or within the larger global network.

Future US military actions will be faced with a complex array of threats from numerous directions; it is advantageous to create similar dilemmas for the enemy. Integrating offensive means gives an EAB the ability to disrupt the enemy in multiple ways, akin to combined arms. The Navy's Composite Warfare Construct (CWC) provides one method of employing EAB-based capabilities as part of a larger network, and integration of EAB platforms into the CWC is discussed in *LOCE*.¹⁰ This integration would provide a proven command and control framework for employing dispersed platforms but is dependent on robust communication links to the warfare commander. Integration into the CWC reduces the expertise necessary for the EAB command element; the command element would primarily provide support for "tenant" capabilities which are tasked by an external agency. The Navy and Marine Corps are already developing the next generation of integrated weapons and sensor systems which support this method of EAB employment.

The Navy Integrated Fire Control-Counter Air (NIFC-CA) architecture is designed to integrate new and existing platforms into a common network. NIFC-CA is based around the Aegis combat system and includes the Cooperative Engagement Capability (CEC) sensor network. The Navy conducted successful test of the CEC in September 2016 by using over-the-horizon targeting data from a Marine F-35B to guide an SM-6 missile engagement.¹¹ The Marine Corps recently began fielding the second phase of its new Common Aviation Command and Control System (CAC2S), which contains the Composite Tracking Network (CTN), a system compatible with CEC.¹² These systems create the potential for an EAB to operate effectively as a forward node of a larger network. An EAB with the communication architecture to support CWC integration could be tasked organized easily from many existing Marine Corps elements but provides little redundancy in a degraded communications environment.

Since NIFC-CA is based around the Aegis combat system, a communications environment which limits an EAB from connecting with an appropriately equipped ship would effectively negate the capability of many of the EAB's "tenants." A more specialized EAB command element with responsibility for action in an area of operation (with assigned airspace) reduces the span of control for (CWC) warfare commanders and provides redundancy in case of communication loss. An EAB configured in this manner would still have access to the sensor and shooter platforms dispersed throughout the battlespace but would be able to execute its mission (fires) based commander's intent and existing engagement criteria in the event of communication loss with the rear. This specialized EAB command element requires a higher level of expertise in coordinating fires and controlling aviation elements and requires platforms that are not currently fielded.

The effectiveness of both manned and unmanned aviation and other offensive EAB means is limited further by lack of an AEWC platform which can be operated from an EAB or through an EAB FARP. The US has not faced a significant air threat in decades and the Marine Corps has limited firsthand experience in conducting an air superiority fight, since this is primarily an Air Force mission. Likewise, identification and targeting of naval vessels is a Navy focus and not a Marine Corps one. An EAB AEWC element would support both the air and maritime domains through air battle management and the detection, identification and prosecution of naval surface targets. AEWC capability is a critical component of how the Air Force and Navy execute these types of operations. AEWC would be a significant force multiplier for any EAB and a critical component in any EAB that needs to operate effectively in a degraded communications environment because it aids in coordinating fires, controlling aviation and long-range sensing without the necessity of connection to a higher echelon.

The *LOCE* lists the need for “[the Marine Corps] to conduct expeditionary airborne early warning in support of littoral operations.”¹³ However, there is no official plan for an AEWC capability which will unlock the offensive potential of an EAB. Emerging systems like the G/ATOR (radar) and F-35 provide sensor links to CAC2S and facilitate offensive fires from an EAB, but are limited in range, scope and capacity. AEWC provides a mechanism for communication with and control of EAB assets when higher level communication is degraded. An airborne platform serves as a mobile communications and sensor link from the EAB’s dispersed platforms back to its command element, reducing the command element’s vulnerability and ensuring the offensive area denial bubble extends forward to the range limit of supporting weapons platforms. AEWC capability belonging to the EAB would ensure the EAB retains the ability to disrupt and deny enemy freedom of movement if access to the global network were

interrupted. None of the US military's current AEW/C platforms is capable of operating from a forward expeditionary environment.

Either a helicopter system like the forthcoming British Crowsnest or a conceptual system like the EV-22 could provide expeditionary AEW/C support. The British Crowsnest is a helicopter-borne system, and the EV-22 would be an add-on package to or variant of the MV-22 Osprey.¹⁴ Either of these platforms would be able to use EAB staging areas or FARPs to provide on-call and localized support. Using an airborne platform greatly increases the range of the associated radar and reduces vulnerability through a combination of intermittent usage and mobility. Expeditionary AEW/C capability would supply the EAB command element with the means to fully leverage the offensive platforms under its control and provide a measure of redundancy for higher level assets.

The multitude of systems and platforms being developed and fielded to create a more connected and open network of sensors and weapons requires some replication of the Aegis-based NIFC-CA capabilities. An isolated EAB must be able to replicate some of the functions, specifically the CEC, but must have a small enough footprint to be forward deployable and relatively covert and/or mobile. The command element must have the ability to control its assigned offensive and defensive platforms and assume control of autonomous/semi-autonomous platforms, which are sent forward into the area from higher echelons. If a ship-launched UAV or anti-ship missile were to come into the EAB's area, the EAB could identify the assets as they come in range and provide tasking or terminal guidance. This example is analogous to operations when the EAB is a connected forward node, except the assets are sent forward based on the higher command's assessment of the situation and the assumption that the EAB command element will employ the assets in accordance with commander's intent. The key to cross-domain

synergy and successful development of offensive capability is not the buildup of individual capabilities but the ability to command and control them effectively, independently or as a forward node in a larger network.

Being able to operate independently from a larger network is an essential element of a sea denial EAB. Operating as a forward node in a larger coordinated network is preferred to independent operation because of overall synchronization and capacity, but this network's connections will be a direct target in a major conflict. US adversaries have demonstrated the ability to target satellites and conduct effective jamming which may significantly degrade communication links. An EAB that cannot integrate and coordinate sensors and weapons from its forward position will be severely disadvantaged if cut off. The combined arms effect of multiple platforms across multiple domains will be reduced if those platforms are cut off from their control hub. An EAB command element that can take over control and coordination of local weapons and sensors still provides the means to achieve some cross-domain synergy, even if the EAB's capacity is less than a full ship-based AEGIS system or other rearward system.

Generating EAB capacity for integrating and coordinating multiple weapons and sensors requires some significant expertise and hardware infrastructure. The Marine Corps does not currently have a readily-deployable command element that can execute this integration and coordination for a sea denial fight. Marine Expeditionary Units (MEU) are the most likely responders to an immediate crisis. While employing elements of the MEU facilitates rapid response, it is also sub-optimal for sea denial and control for two principal reasons. First, the aviation command and control infrastructure inherent in a MEU is not robust enough nor tailored appropriately for sea denial and control. According to the Marine Corps Antiair Warfare publication "the MEU(SOC) relies on the NEF [Naval Expeditionary Force] to fill most of its

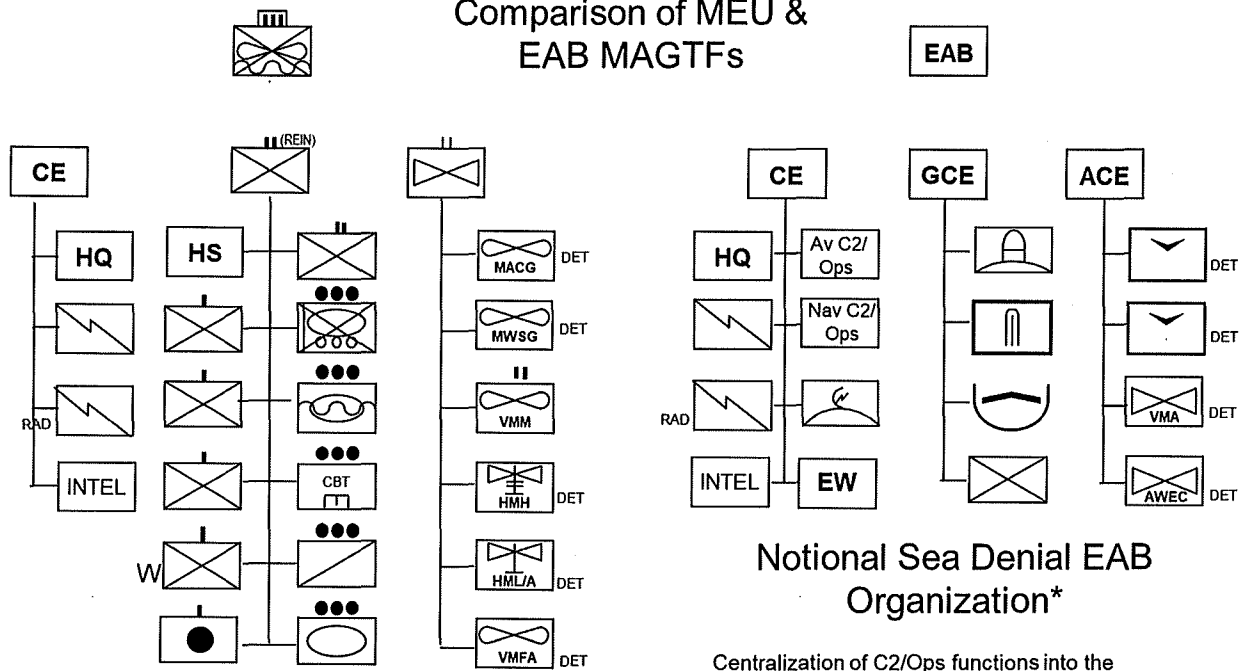
AAW [anti-air warfare] requirements.”¹⁵ Adding a naval (anti-ship) dimension to the current structure only exacerbates the problem. The wide array of systems that might be employed in a sea denial fight: anti-air missiles, anti-ship missiles, unmanned vehicles, manned aviation, radar, and other sensors present a significant challenge to smooth and effective integration. The type of information integration and command decision making is more akin to that exercised in a Navy Combat Information Center than a Marine air operations center or a ground combat operations center. Secondly, an EAB uses limited components of the MEU (e.g. artillery battery, aviation command & control detachment, communications assets, and a command element) while leaving excess capacity (e.g. infantry & vehicles), without key capabilities necessary to perform additional missions. These problems are not unique to the MEU; they apply to larger MAGTFs as well.

Larger MAGTF command elements have similar issues and have too many potential missions to develop the expertise necessary for immediate deployment for a sea denial/control mission into a contested area. The Marine Corps’ Marine Expeditionary Brigade (MEB) structure begins to approach the level of aviation command and control capacity necessary for executing a contested sea denial fight, but a standard MEB is a major maneuver element and is only a standing headquarters before activation. A MEB is a likely formation to execute the forcible entry operation which exploits the local operating bubble created by a sea denial EAB. Constituting the EAB from the MEB would again strip the larger formation of many of the low-density assets required to execute a complicated forcible entry operation. The multiple mission sets a MEB must prepare for also limits the technical expertise and capacity to train for sea denial operations.

A future sea denial EAB must effectively integrate the plethora of forthcoming weapons and sensors into a coordinated system. This system must have the capacity to process multiple sensor inputs and weapons feedback, even if it is cut off from the larger global network. An EAB employed during a large-scale conflict to contest sea control will not have the luxury of learning how to operate effectively over time; it must be fully capable as soon as it deploys. The Marine Corps' current MAGTF systems, organization and training do not provide the type of command element required for a sea denial EAB. This is why a specialized command element that is properly equipped and trained to handle the complexity of sea denial operations is necessary.

The sea denial EAB should centralize command and control capabilities of the traditional MAGTF to create a specialized command element. This would allow the command element to gain the capacity and proficiency necessary to execute short notice sea denial operations. The combat elements would function in a more administrative capacity, ensuring requisite platforms are functional and properly resourced, rather than exercising tactical control. In this model the combat elements become more like force providers, retaining actual platforms, but the system components (e.g. radar & physical C2 system terminals) and personnel are consolidated into a common operations center at the command element level (See diagram below for a notional example).

Comparison of MEU & EAB MAGTFs



Generic MEU Organization*

Notional Sea Denial EAB Organization*

Centralization of C2/Ops functions into the command element simplifies combat element responsibilities to functional components. In this example the GCE has responsibility for operating the air defense missile launchers and Unmanned Surface/Subsurface Vehicles- fire direction and tactical control is exercised directly by the command element.

*LCE Components are omitted for brevity

This allows the command element to gain experience in integrating and controlling the numerous different systems without suffering a loss of proficiency as supporting ground and aviation units are rotated or composited.

The Aviation Combat Element (ACE) is the logical place to start looking for initial structure for a sea denial EAB command element because of the predominance of the air domain in the sea control fight. The ACE also has many of the systems and capabilities required and much of the doctrine to build from. Whether sea denial command elements are stand-alone elements like the MEU Command Element or squadron-level headquarters that assume the mission and conduct specialized training is an avenue for discussion. The command element would train to employ the various capabilities it might find attached during an actual mission and ensure proficiency on the systems required to exercise control.

Since the Navy currently trains with integrated ESM, radar, aviation, air and missile defense and sea control assets, Navy doctrine and training should provide a solid foundation for building an EAB command element training program. It may also suggest a true naval service EAB, where the Marine Corps provides the forward capabilities, infrastructure and security while the Navy provides the tactical leadership and personnel expertise to man the key aspects of the command element. However it is constituted, a specialized command element will better support the Navy's sea control efforts and Joint Force's ability to project power, even if communication with echelons are interrupted.

The asymmetry between air and maritime domains will balance out as future unmanned surface and subsurface vehicles are added to the EAB's span of control. The trend towards miniaturization and unmanned systems will increase the number of systems integrated into a sea denial EAB and help to reduce the command and control footprint at the same time. Eventually, unmanned systems may become prolific enough to eliminate large ground-based and manned weapons and sensors. The Marine Corps should continue to seek new capabilities towards this end; continued specialization and centralization of the command element is a natural parallel progression. Continuing to reduce the footprint of an EAB allows for more of them to be generated from the same force structure and may eventually reduce the requirement for an EAB to be considered a MAGTF in the way they are currently conceived. Deploying multiple, capable forward command elements expands the range of denied sea space and reduces the risk to mission by creating redundancy and reduces the risk to force by allowing for mobility and intermittency as a result of that redundancy.

The EAB concept is a result of the US military's recognition of the limits of its current power projection capabilities and doctrine. EABs are a way to integrate Marine Corps

capabilities into the Joint area denial fight and, to be effective, many future capabilities will have to be integrated into the EAB structure. The complexity of coordinating these future capabilities is beyond current MAGTF capacity and being able to coordinate capabilities independent of connection to a higher echelon is essential for effective sea denial and EAB survivability. The technical nature and complexity of integrating sensors and weapons from multiple platforms and services requires a dedicated and specifically trained command element that can attach and employ different types of units in an expeditionary environment. The Marine Corps needs to consider how it will constitute future EAB command elements in order to successfully answer the call for a major sea denial mission.

¹ Joint Chiefs of Staff, *Joint Operational Access Concept*, Washington DC: Joint Chiefs of Staff, 2012, https://www.defense.gov/Portals/1/Documents/pubs/JOAC_Jan%202012_Signed.pdf, ii.

² Headquarters US Marine Corps, *Marine Operating Concept: How an Expeditionary Force Operates in the 21st Century*, (Washington, DC: Headquarters US Marine Corps, September 2016), 11-13.

³ *Marine Operating Concept*, 6.

⁴ *Marine Operating Concept*, 7.

⁵ Headquarters US Marine Corps, *Littoral Operations in a Contested Environment*, (Washington, DC: Headquarters US Marine Corps, September 2017), 17.

⁶ Headquarters US Marine Corps, *Antiair Warfare*, MCTP 3-20C (Washington, DC: Headquarters US Marine Corps, May 2, 2016), 3-9.

⁷ *Littoral Operations in a Contested Environment*, 16.

⁸ *Jane's C4ISR & Mission Systems: Maritime*, "AN/SLQ-32(V) (all variants)/Surface Electronic Warfare Improvement Program," <https://janes-ihs-com.lomc.idm.oclc.org/Janes/Display/jrew1067-jc4im>.

⁹ *Jane's C4ISR & Mission Systems: Air*, "LR-100 Radar Warning Receiver/Electronic Support/Electronic Intelligence System," <https://janes-ihs-com.lomc.idm.oclc.org/Janes/Display/jrew1115-jc4ia>.

¹⁰ *Littoral Operations in a Contested Environment*, 10.

¹¹ US Navy, "Navy Conducts First Live-fire NIFC-CA test with F-35," news release, September 13, 2016, www.navy.mil, Story #NNS160913-15.

¹² Megan Eckstein, "Marines at MCAS Cherry Point Demonstrate the Future of Air Command and Control," *usni.com*, July 26, 2017, <https://news.usni.org/2017/07/26/marines-mcas-cherry-point-demonstrate-future-air-command-control-operations#more-27047>.

¹³ *Littoral Operations in a Contested Environment*, 16.

¹⁴ Ben Ho Wan Beng, "Why the US Gator Navy Needs the EV-22," *The Diplomat*, June 18, 2016, thediplomat.com; <https://www.facebook.com/EV-22-Osprey-AEWC-Aircraft-926796214019494/>; Dave Majumdar, "The US Military's V-22 Osprey: Everything is an Option," National Interest Blog, March 30 2017, <http://nationalinterest.org/blog/the-buzz/the-us-militarys-v-22-osprey-%E2%80%9Ceverything-option%E2%80%9D-19949>.

¹⁵ *Antiair Warfare*, 6-2.

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