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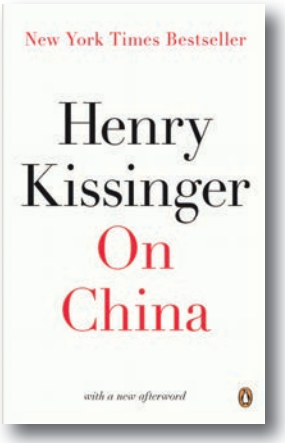

IDEAS AND ISSUES

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GEN ROBERT E. HOGABOOM LEADERSHIP WRITING CONTEST

Gen Robert E. Hogaboom.

The Marine Corps Gazette's second annual Gen Robert E. Hogaboom Leadership Writing Contest is here. The contest honors the essay that is the most original in its approach to the various aspects of leadership. Authors should not simply reiterate the 11 Principles of Leadership or the 14 Leadership Traits of an NCO addressed in the Guidebook for Marines. Authors must be willing to take an honest, realistic look at what leadership, either positive or negative, means to them and then articulate ways and methods of being an effective leader of Marines.

DEADLINE: 31 January, 2023

E-mail entries to: gazette@mca-marines.org

Mail entries to: Marine Corps Gazette
Hogaboom Writing Contest
Box 1775
Quantico, VA 22134

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Background

The contest is named for Gen Robert E. Hogaboom, USMC(Ret), who served the Corps for 34 years. Upon graduating from the Naval Academy in 1925, Gen Hogaboom saw service in Cuba, Nicaragua, and China. Following action in a number of key Pacific battles in World War II, he later served first as assistant division commander, then division commander, 1st Marine Division, in Korea in 1954–55. Gen Hogaboom retired in 1959 as a lieutenant general while serving as the Chief of Staff, Headquarters, U.S. Marine Corps, and was subsequently advanced to the rank of general.

Prizes include $3,000 and an engraved plaque for first place; $1,500 and an engraved plaque for second place; and $500 for honorable mention. All entries are eligible for publication.

Instructions

The contest is open to all Marines on active duty and to members of the Marine Corps Reserve. Electronically submitted entries are preferred. Attach the entry as a file and send to gazette@mca-marines.org. A cover page should be included identifying the manuscript as a Gen Robert E. Hogaboom Leadership Writing Contest entry and include the title of the essay and the author's name. Repeat title on the first page, but author's name should not appear anywhere but on the cover page. Manuscripts are acceptable, but please include a disk in Microsoft Word format with the manuscript. The *Gazette* Editorial Advisory Panel will judge the contest during February and notify all entrants as to the outcome shortly thereafter. Multiple entries are allowed; however, only one entry per author will receive an award.

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MARINE CORPS Gazette
Professional Journal of U.S. Marines

SEPTEMBER 2022

Editorial: RXR and OIE

This year, our focus areas for the September *Gazette* is refined to examine intelligence and OIE in light of the impacts of emergent surveillance, detection, and targeting technologies in the current and future operating environments where Marines are faced with a peer adversary. The dynamic struggle between "hiders" and "finders" is currently referred to as the Reconnaissance–Counter-reconnaissance fight—or RXR. The holistic approach to organization, training, equipping, and managing talent across the intelligence, surveillance and reconnaissance communities is the RXR Enterprise, or RXRE. In the future, the success of naval operations will most likely be determined by Marines' capabilities and readiness to contribute to winning the RXR fight in congested maritime terrain across all domains. Starting on page 4, with an introductory message from the Director of Intelligence, MajGen W.H. Seely III, a total of twelve articles cover a broad range of Intelligence, RXR, and OIE-related topics. Of particular interest is "21st-Century Combined Arms" on page 6 by LtGen Matthew G. Glavy, the Deputy Commandant of Information and Mr. Eric X. Schaner. This timely article looks at our warfighting doctrine and examines employing the proven synergy of combined arms with new technologies and emergent weapons to force an enemy "onto the horns of a dilemma" in multiple warfighting domains.

Other highlights this month include two points of view on the implementation of *Force Design 2030.* On page 57, the Deputy Commandant for Plans Policy and Operation, LtGen David J. Furness, details the imperative need and challenges of modernizing the Corps' future Force Design in "Change is Hard, and No Less So in the Marine Corps." In "Machine Learning" on page 61, 2ndLt Hunter Keeley examines the vulnerabilities of EABO and Stand-in Forces presented by the proliferation and emergent capabilities of low-earth orbit satellite imagery and artificial intelligence.

This month we also present award winning essays from several recent writing contests. The two Honorable Mention winners of the MajGen Harold W. Chase Prize Essay Contest begin on page 63 with "There's No L in MAGTF" by Capt Margaret A. Mello, followed by" Preparing to Deceive" by Maj Bradley J. Mohr on page 66. Starting on page 74, in cooperation with Marine Corps University and the Brute Krulak Center for Innovation and Future War, we present the four winning essays in the "10 Years Outside" writing contest. This first of its kind contest challenged authors to select a conflict from the past ten years that did not directly involve the U.S. military and analyze the relevant aspects and implications of the conflict to the Marine Corps and force design. Of note, we have also re-published the winning essay from the annual *Leatherneck* Writing Contest. "Dissent Done Right" by 2ndLt Kyle Daly on page 93 is noteworthy for the caliber of writing and the importance of its message in today's increasingly divisive, polarized, and undisciplined environment.

Lastly, we present the final installment in the Maneuverist Papers series and reveal the identities of the authors writing under the pseudonym "Marinus." On page 102, Maneuverist Paper No. 23 "The Evolution of Maneuver Warfare Theory" lays out the players and the process of adopting the Corps' warfighting doctrine. Although this completes the Maneuverist Papers series, readers can expect follow-on articles as the professional debate regarding the continued relevance of maneuver warfare as the foundation of Marine Corps doctrine continues.

Christopher Woodbridge

DIRINT Message to the Marine Corps Intelligence Enterprise

Marines and sailors,

The fight for intelligence is as old as war itself, but every once in a while, new technology or capabilities will call for a new way of doing things. Belligerents across the world now operate in every domain and are increasingly engaged within the Information Environment. The dawning digital age, however, does not yet seem to have brought quite as much progress to fires, maneuver, and logistics as it has to information, command and control, and intelligence. These "intangible" functions, which once relied upon messages that moved at the speed of a running horse, are now driven by technologies that can store, process, and transmit data across the planet in the blink of an eye. These new realities require a technological and organizational paradigm shift, as well as new ways to organize, train, and equip the force for a bigger, faster fight, and unrelenting global competition.

Actionable intelligence derived from our Nation's maritime reconnaissance and counter-reconnaissance (RXR) force will drive all future Marine Corps, Navy, and Joint Force operations. It will require all our people, organizations, and networks to perform and support integrated intelligence, surveillance, and reconnaissance (ISR) functions, from the Marine rifle squad on up to the Service level, and beyond. Together, we provide all-domain knowledge and targeting data to decision makers to accelerate action, create advantages and opportunities, and mitigate operational risk.

Former Director of Intelligence then-BGen Vincent Stewart established the MCISRE to force disparate intelligence elements and functions to work together. He emphasized the need for consistent tradecraft, training, networks, and systems to support commanders as the Marine Corps shifted its focus to orient toward the Global War on Terror. Now, as the Marine Corps strives to implement the changes articulated in *Force Design 2030*, the entire Service must challenge itself to reconsider what it means to conduct ISR operations, and the MCISRE must evolve, expand, and integrate itself into a Service-wide RXRE. To succeed in this venture, all Marine units will have to develop 21st century, all-domain reconnaissance capabilities, and every Marine must rise to the challenge of becoming not just a collector, but a highly trained, fully engaged member of the maritime RXR force.

The push to develop, field, and support Stand-in Forces will require individuals, organizations, and networks throughout the naval force to communicate, coordinate, and align their efforts more closely with one another. Our Commandant pointed the way, publishing a new capstone concept for the Service, and the Deputy Commandant for Information tasked his Intelligence Division to give Marines the kind of intelligence, surveillance, and reconnaissance capabilities they will need to meet the demands of future competition and warfare. It will not just be about sensing, making sense, and taking action in combat, but also about the advantages of placement and access our Stand-in Forces can provide before, during, and after any sort of crisis or conflict. This issue of the *Gazette* will highlight some of our challenges, and apply tension to the line that connects where we are today to where we need to go.

Our Stand-in Forces and, by extension, our Corps, is part of a maritime RXR force that both requires, and exists to enable, the Joint Force. Together, we will enable our Nation to address problems that may begin as simple competition, but which can spiral into conflict at a moment's notice. We cannot afford to stand by while we wait for a demand signal; we must get to work now. We will continue to integrate with our maritime, joint, and coalition partners, and work with a spirit of aggressiveness to bridge the gaps that separate us.

This month's *Gazette* highlights many of your own concerns, observations, and ideas about intelligence. This discussion is critical—as professionals, we cannot shy away from difficult discussions. What lessons do you draw from your requirements in the fleet, or from conflicts around the world? What technologies are going to change the way we do business going forward? Only a learning organization can survive the destructive pace of modern life, so please, keep your ideas coming. We deeply appreciate the efforts of the many Marines, sailors, civilians, and industry partners who make up the RXRE, and look forward to forging our Corps' future together.

Semper Fidelis,

L.K. Gardner,
Assistant Director of Intelligence

MajGen W.H. Seely III,
Director of Intelligence

MGySgt L.A. Revell,
IID Senior Enlisted Advisor

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21st-Century Combined Arms

Gaining advantage through the combined effects of fires, maneuver, and information

by LtGen Matthew G. Glavy & Mr. Eric X. Schaner

>LtGen Glavy currently serves as the Deputy Commandant for Information.

>>Mr. Schaner serves as the Senior Information Strategy and Policy Analyst in the Plans and Strategy Division for the Deputy Commandant for Information.

Adapting and overcoming is a hallmark of Marines. The emergence of strategic competitors in China and Russia coincides with an evolving character of warfare driven by social, informational, and technological changes that require us to adapt our thinking to match the evolving circumstances of the current era.[1] As the Marine Corps pursues Force Design, we need to leverage wargames, analyses, experiments, and exercises, to examine and refine how we apply our most valued and time-tested warfighting theories and concepts to meet the challenges of 21st-century competition and warfare. The words of our 29th CMC, Gen Al Gray, say it best: "Like war itself, our approach to warfighting must evolve. If we cease to refine, expand, and improve our profession, we risk becoming outdated, stagnant, and defeated."[2] This article provides a way of thinking about one of our most important and enduring warfighting concepts—*combined arms*—as it should be applied in today's environment to create dilemmas for our competitors and enemies.

The Changing Character of Combined Arms

MCDP 1, Warfighting, states, "Combined arms is the full integration of arms in such a way that to counteract one, the enemy must become more vulnerable to another. We pose the enemy not just with a problem, but with a dilemma—a no-win situation."[3] These words from *Warfighting* capture why we conduct combined arms, and they remain as applicable today as in any previous century. In short, we follow the doctrine of combined arms to maximize combat power through the use of all available resources to best advantage.[4] Through combined-arms tactics, we integrate fires, maneuver, and information by using complementary forces to put a competitor or enemy in a no-win situation.

Current events show us that the character of combined arms is changing in three primary ways. First, continuing advancements in information and related technologies, particularly in the areas of cyberspace, space, and influence technologies like social media, provide a widening array of capabilities that can be combined to generate advantages. Integrating these information capabilities with maneuver and lethal fires to present a dilemma at the right time and place is key to 21st-century combined arms. To illustrate the expanding use of technology, consider the near-realtime view of the unfolding conflict in Ukraine that we have all witnessed through various media. The widespread use of social media to livestream battles was unfathomable 20 or 30 years ago, but today demonstrates the power of using information as a means of exploiting tactical events to mobilize public opinion and galvanize will on a national or global scale.

Second, the delivery of combined arms has changed a great deal due to the mature precision-strike regime (MPSR). Integrating this level of precision into combined arms is changing how competitors and enemies approach warfighting. The proliferation of the MPSR places a premium on winning the all-domain reconnaissance and counter-reconnaissance fight. The actor who wins this fight can apply combined arms, with the loser suffering the consequences. Furthermore, the actor who best exploits the massive amounts of data generated by the widespread proliferation of sensors gains a tremendous advantage in the reconnaissance and counter-reconnaissance fight. The side which can make sense of the data faster than the other will find and engage targets faster than the other. In this way, the reconnaissance and counter-reconnaissance fight, and therefore combined arms in the 21st century, presents a "big data" exploitation challenge.

The third change we are witnessing is the use of combined arms across the competition continuum. Understanding this change requires adopting an expanded concept of combined arms that makes it as applicable below the violence threshold as it is above. We see examples of this at work in places where

our competitors create dilemmas against their neighbors who are allied with the United States, and where the competitor seeks objectives without triggering a military response from the targeted nation, or the United States. For example, the People's Republic of China (PRC) is employing fishing boats and the coast guard to "seize" territory in disputed nearby seas while the People's Liberation Army Navy provides overwatch. The scheme presents a dilemma: choose to attack the encroaching fishing boats and risk war, or do not interfere and allow the PRC to establish positions that advance its claims and objectives.

Toward a Refined Model of Combined Arms

If our frame for understanding 20th-century combined arms involved combining supporting arms, organic fires, and maneuver, then our frame for 21st-century combined arms should involve combining supporting arms, organic fires, maneuver, and *information*. Information is added as a component of 21st-century combined arms because it underpins many of the changes underway in broader society, the global security environment, and in the Marine Corps. The digital transformation of our networked society and Marine Corps is characterized by hyper-connectivity, mass data storage and computational power, and the fusion and correlation of data to drive outcomes. These information-based changes introduce vulnerabilities and opportunities that were not possible in previous decades. In response to this new reality, the Marine Corps established the information warfighting function to formalize an approach to leveraging the power of information in campaigning, operations, and combined arms.

The specific purpose of the information warfighting function derives from our maneuver warfare theory and practice of combined arms as a key means of gaining *advantage*.[5] *MCDP 8, Information*, states "the purpose of the information warfighting function is to create and exploit *information advantages* as a means of achieving our objectives as effectively as possible."[6] Information, like all other warfighting functions, can be thought of as an activity that Marines perform to generate advantages and effects—no different than when Marines generate advantages and effects through fires and maneuver. Information activities encompass the four functions of information: *generation*, *preservation*, *denial*, and *projection*. All Marine Corps units can create and exploit information advantages by generating, preserving, denying, and projecting information more effectively than a competitor or enemy. Through combined arms, Marines integrate the functions of information, and associated capabilities, with fires and maneuver to create no-win situations for our competitors and enemies. To illustrate the discussion, Figure 1 provides a model of 21st-century combined arms.

A key feature of Figure 1 is the concept of information fires and information maneuver. Within combined arms, we can think about and apply information as a *form of fires* and as a *form of maneuver*. An example of information fires is conducting a cyberspace or electromagnetic attack to deceive the enemy or destroy the enemy's critical systems. An example of information maneuver is altering, suppressing, or manipulating electronic, digital, or physical signatures to deceive the enemy, reveal or conceal a capability or movement, or to slow the enemy's decision making. There are many examples of information fires and information maneuver. Table 1 provides a non-exhaustive list of examples for Marines to consider in planning. It is up to the creativity of Marines to combine all available capabilities and lethal and non-lethal actions to create 21st-century combined-arms dilemmas.

Implementing a refined model of combined arms requires the Marine Corps to continue learning through wargames, analyses, experiments, and exercises. The DOD, Joint Force, other Services, and the interagency are all developing new technologies, capabilities, and formations dedicated to long-range precision fires and a wide variety of information capabilities that fall into a range of categories (e.g., space, cyberspace, influence). What is eluding

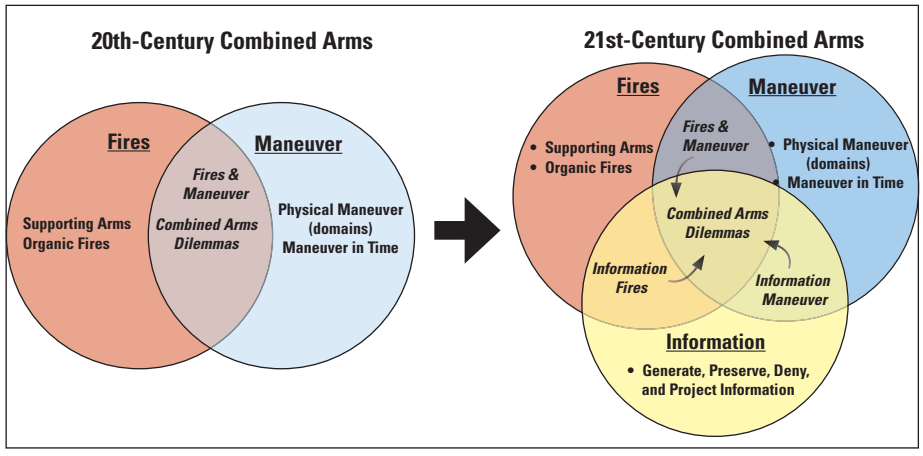

Figure 1. Moving from 20th-century to 21st-century combined arms. *(Figure provided by authors.)*

Information Fires	Information Maneuver
• Offensive Cyberspace Operations • Electromagnetic Attack • Radio Frequency Delivered Cyberattack • Defensive Cyberspace Operations Response Actions	• Signature Management • Operations Security • Military Information Support Operations • Communication Strategy and Operations • DOD Information Network Operations • Defensive Cyberspace Operations Internal Defensive Measures • Electromagnetic Support • Electromagnetic Protection

Table 1. Examples of Information Fires and Information Maneuver. *(Table provided by authors.)*

all parties, however, is a focus toward developing a coherent concept of combined arms, applicable across the competition continuum, which seamlessly fuses fires, maneuver, and information for maximum advantage and effect (i.e., to create dilemmas below or above the threshold of armed conflict).

A dedicated wargaming and experimentation effort must be pursued to develop a mature understanding of how this 21st-century model works. To focus our learning, the Marine Corps should wargame and experiment with this concept to inform all types of MAGTF missions, including missions envisioned for Stand-in Forces (SIF).

21st-Century Combined Arms and the MEU

The MEU is well trained and equipped to perform 21st-century combined arms. To illustrate how the MEU can perform 21st-century combined arms, consider a hypothetical MEU mission to strike and eliminate a high-value individual (HVI) (e.g., key leader, technical expert, financier) within a violent extremist organization (VEO). In this scenario, the MEU creates a combined arms dilemma by using one capability to deny the HVI use of a critical asset, another to track the HVI, and yet another to strike and eliminate the HVI when the individual attempts to access, use, or repair the asset. This technique of "herding" individuals to a specific location to address a problem exposes them to physical harm.

In this example, the MEU—working under the authority of the combatant commander, and in concert with applicable intelligence agencies and the Department of State—is assigned the mission to disrupt a VEO's online media operations. The VEO's core leadership group is located in a relatively small and geographically isolated area within the MEU's reach. However, its media operations, to include its propaganda and recruitment efforts, are highly sophisticated and effective at projecting an outsized image through a global online presence. This presence has proved effective at increasing the group's support, funding, and influence, and thus represents a growing threat.

For this mission, the MEU receives intelligence on the physical locations of the VEO's media production studio, primary server, and backup server. These three assets are located in two separate buildings approximately three miles apart. At the designated time, the MEU's cyber planner coordinated with USCYBERCOM, through the geographic combatant commander, to initiate the pre-planned denial of service attack (a form of information fires) against the VEO's servers. At the same time, the MEU's psychological operations detachment delivers tailored messages via cell phone (a form of information maneuver) to the VEO's chief of media operations (the HVI). These carefully crafted, pre-approved messages are consistent with the HVI's language, culture, and current events in the local area. This makes the HVI unsuspecting when notified of the malfunctioning servers.

As the cyber-attack and deceptive messaging occur, MEU reconnaissance teams occupy positions to observe and report on all relevant activity at the two locations. A cascade of rapidly unfolding events is triggered when the HVI arrives at the primary site to investigate the server issue. These events begin with the reconnaissance report notifying the MEU commander of the HVI's arrival. The commander's decision to strike unleashes two orbiting F-35's waiting to deliver ordinance on both locations. The no-win situation created by this scenario is either accepting disrupted media operations or attempting to repair and suffer physical harm and destruction. The strike results in eliminating the HVI, several support personnel, and destroys the buildings housing the studio and both servers.

21st-Century Combined Arms in SIF Sea Denial Operations

SIF deter our adversaries by establishing forces that persist forward alongside allies and partners within a contested area. These forces provide the fleet, joint force, interagency, and allies and partners more options for countering an adversary's strategy.[7] When directed, SIF perform sea denial operations to support fleet maneuver and operations.[8] SIF support sea denial through the application of both organic sensors and weapons and integration with naval and joint sensors and weapons.[9] Achieving this requires SIF that are capable of conducting combined arms in all warfighting domains and the electromagnetic spectrum.

To illustrate how SIF can combine fires, maneuver, and information to create dilemmas in sea denial operations, we use another hypothetical scenario where conflict erupts between the United States and a competitor turned enemy. The dilemma created in this scenario is the enemy's inability to counter a friendly force electromagnetic attack, which renders the enemy more vulnerable to precision strike.

In this scenario, a Marine Littoral Regiment (MLR) maritime fires element occupies key maritime terrain sufficient for conducting long-range precision fires in the vicinity of a critical chokepoint. While maneuvering to the objective (key maritime terrain) the fires element relies on combined arms to occupy the position undetected, and then again when conducting fires against the enemy.

Moving undetected is a result of winning the counter-reconnaissance fight. Prior to conflict, the SIF succeeded in uncovering and mapping out the enemy's collection methods, capabilities, and techniques in the area of and surrounding the key maritime terrain. Knowing how the fires element would be collected upon, the plan to maneuver is supported by tactical deception, astute timing to exploit known gaps in the enemy's collection windows, offensive cyber operations (OCO), and physical attacks to divert the enemy's attention away from the unit's maneuver to the objective.

In this example, the MLR has in place the plans to use OCO, which includes pre-approved authorities and permissions. The fires element coordinates with the MLR headquarters' cyberspace operations cell (a component of regimental fires and effects), to ensure that the timing of the OCO mission supports their movement. The OCO mission specifically targets the one remaining signals intelligence as-

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set the enemy had been collecting in the vicinity of the objective. The cyber planner at the MLR headquarters facilitates the OCO mission through pre-coordinated joint fires channels and through the combatant commander.

In occupying the firing position and in conducting the firing mission, the maritime fires element uses passive and active signature management techniques (which are a form of information maneuver) to suppress and manipulate their physical and electromagnetic signatures. Passive measures include the use of communications discipline, concealment, and camouflage. Active measures include the use of decoys to deceive enemy collection.

At the precise time, the firing unit executes long-range precision fires in combination with joint forces. The timing is critical to mass several different munitions from air, surface, and land-based systems against the enemy surface target. This joint combined-arms operation includes airborne electromagnetic attack from close-in unmanned aerial systems and from manned stand-off jamming aircraft to reduce the enemy's defenses against the MLR's strike. The inability of the enemy ship to counter joint force electromagnetic attacks reduces the ship's defenses and makes the ship vulnerable to precision strike.

Upon completion of the fire mission, the MLR unit immediately displaces from its position using combined arms to support movement to a predesignated hide position. Movement is facilitated by a pre-approved concept of operations that includes the use of joint electromagnetic protection and attack capabilities designed to screen the MLR's movement against known collection threats. In this scenario, the MLR unit coordinates with the MLR headquarters' electromagnetic spectrum operations cell to synchronize the timing of the joint screening action with diversionary attacks to cover the MLR's movement from the firing position to the hide position.

Combined Arms and Reconnaissance and Counter-reconnaissance

An operating environment characterized by the proliferating MPSR places a premium on gaining and maintaining contact with potential adversaries.[10] The actor who sees first can orient first, decide first, and attack effectively first, gaining a tremendous advantage. This idea is a core principle in the SIF's theory of success, and it establishes reconnaissance and counter-reconnaissance as a SIF enduring function that enables combined arms.

SIF provide the Joint Force with access to the host nation and perform all domain reconnaissance on every point of the competition continuum. These mutually supporting essential tasks help the fleet and joint partners establish target custody and develop an understanding of a potential adversary's activities and capabilities. This allows the Joint Force to identify and counter a potential adversary below the violence threshold, and if armed conflict does begin, allows the joint force to take the initiative and attack first. SIF conduct counter-reconnaissance to uncover potential adversary collection methods and capabilities. This is done to deny the potential adversary's ability to understand and locate SIF, thereby creating an operational problem for the competitor or enemy.

The reconnaissance and counter-reconnaissance fight is characterized primarily as a contest between two opposing systems each trying to observe and know what the other is doing while preventing the other side from doing the same. This means the reconnaissance and counter-reconnaissance fight is effectively a *battle for information and actionable intelligence*. The crux of SIF maritime reconnaissance is to help the fleet locate the potential adversary or the enemy sufficiently to deliver effective firepower.[11] The key to maritime reconnaissance is fusing all domain collection capabilities into a coherent realtime intelligence picture. This requires developing and executing an intelligence collection plan that employs a wide variety of collection capabilities, to include open-source intelligence, publicly available information, and ally and partner capabilities, to gain and maintain target custody and complete kill webs. All domain reconnaissance also requires fusing the MLR's organic human intelligence and signals intelligence from ground locations with combatant commander and national level collection capabilities employed via the space and cyberspace domains.

A requirement of any actor employing the MPSR is to conceal the capabilities of sensors and the exact methods of employing their kill webs. In support of counter-reconnaissance operations, SIF find opponent sensors and understand enemy kill webs oriented on the fleet. History provides many examples of using creative and deceptive tactics to cause the adversary to reveal sensors and expose capabilities. For example, during the Cuban Missile Crisis, the United States combined the use of a specialized transmitter from a Navy destroyer with the release of radar reflecting balloons from a Navy submarine to stimulate Cuban air defense radars. The mission successfully caused Cuba to employ their radar and subsequently revealed previously unknown characteristics and capabilities of the system to U.S. intelligence.[12]

Using similar creative tactics, SIF, working in concert with the Joint Force and allies and partners must devise ways of causing potential adversaries/enemies to reveal their methods and capabilities of collection. This begins with leveraging a persistent presence of SIF in ally and partner nations, which over time allows for the observation of patterns of life and patterns of collection used by a potential adversary in and around the host nation. Upon establishing a baseline understanding, SIF resolve gaps in understanding by stimulating the rival's sensors, causing them to reveal capabilities or collection techniques.

Actions may involve deliberately using SIF formations to conduct regular predictable movements and activities over an extended period of time to condition the potential adversary's expectations of friendly force patterns. This can include using exercises to integrate and coordinate with host nation forces, U.S. Coast Guard vessels, interagency organizations, or the MEU. To stimulate the potential adversary, SIF may conduct unexpected movements, or unexpected engagements with local

leaders, with the intent of observing changes in the opponent's collection activities and posture.

Counter-reconnaissance also involves activities by SIF to prevent the potential adversary or enemy from locating the fleet. If SIF are engaged in armed conflict, any manor of combined arms may be used to deny, defeat, or destroy the enemy's collection capabilities. This may include combining physical attack and maneuver with OCO or electromagnetic spectrum operations to engage and destroy critical enemy command and control nodes within their MPSR. The seeds of successful SIF counter-reconnaissance operations during armed conflict are sown well before conflict erupts. The proliferation of the MPSR means our competitors have developed robust, multi-layered, and redundant intelligence, surveillance, and reconnaissance networks to enable precision strike. SIF forces must be present and tasked to penetrate the potential adversary's MPSR and hold any segment of the kill web at risk, to include communications links, nodes, and weapons systems.

21st-Century Combined Arms in Competition Below Armed Conflict

The widespread improvement of intelligence, surveillance, reconnaissance, and targeting capabilities by peer competitors is a fundamental characteristic of the MPSR.[13] Rivals use the MPSR as a hedge against long-held U.S. power projection advantages. This provides potential adversaries cover to pursue coercive strategies against neighboring countries who are often allies or partners of the United States. There is no clearer example of this than the PRC's efforts to work under the protection of their MPSR to undermine U.S. strategy and change the balance of power in East Asia. Aside from the PRC, the United States is also challenged by other strategic competitors such as Russia, Iran, and VEOs—all of whom seek to present dilemmas that challenge the United States by using the MPSR as cover for coercive activities.

The MAGTF is by design an effective counter to competitors endeavoring to undermine U.S. objectives using the MPSR as cover. This is especially true when MAGTFs coordinate their actions with a host nation, other MAGTFs, joint forces, and interagency partners like the Department of State and the Coast Guard. To illustrate, we introduce another hypothetical scenario where a MEU coordinates action with the Amphibious Ready Group (ARG), host nation, combatant commander, Department of State, and the Coast Guard to stymy a potential adversary's illegal territorial claims over a key international trade route.

This potential adversary has been conducting a small boat harassment campaign targeting international cargo vessels transiting a narrow but heavily trafficked shipping lane. In this scenario, the potential adversary uses the cover of their MPSR to employ a network of fast small boats to conduct high-speed approaches and near misses to harass transiting vessels. The objective of the harassment campaign is to slow the movement of these vessels and disrupt trade. The specific dilemma is: engage the small boats and risk escalation or suffer the economic consequences of trade and supply chain disruptions. While this campaign results in international criticism, the lack of an effective response signifies an inability to oppose the potential adversary's long-term pursuit of a territorial *fait accompli*.

In response to this dilemma, the MEU is tasked for a period of 30 days to disrupt the small boat harassment campaign, without triggering armed conflict, to facilitate the free flow of trade through international waters. The goal of the MEU-led mission is to create a dilemma for the potential adversary, such that the more they pursue harassment, the more harmful it becomes to achieving their territorial ambitions. The mission involves the MEU planning and coordinating the effort to find, fix, track, interdict, disrupt, and then expose (through various media) the harassing swarms of small boats.

To accomplish this, the ARG vessels with embarked MEU, the Coast Guard cutter, and two host-nation coast guard vessels position themselves in the straits to demonstrate resolve through physical presence. The Coast Guard vessels patrol in international waters nearest the potential threat. ARG vessels patrol in international waters between the Coast Guard vessels and commercial ships transiting the straits. This highly visible presence coincides with a significantly ramped-up strategic messaging campaign that involves regular joint statements and press briefings held by senior U.S. and host nation government leaders. The messaging campaign highlights the strengthening ties between the U.S. and the host nation to ensure freedom of navigation in international waters.

For 30 days the MEU S-2 fuses intelligence from ARG sensors, Coast Guard sensors, theater and national assets, and organic MEU aviation assets to maintain maritime domain awareness in the contested zone. Integrating these assets provides a multi-layered network of sensors that gives indications and warnings of small boat swarm formation on the

near shores of the potential adversary. Early warning is key to tracking and interdicting the swarm. Upon finding, fixing, and tracking the swarm, the interdiction begins with the host nation coast guard and Coast Guard vessels moving to intercept the swarm formation before they can approach a commercial ship. As the coast guard vessels approach the swarm, a MEU UAS is piloted to fly over the small boat swarm. The UAS is equipped with video recording equipment and a radio frequency jamming payload.

Using a pre-approved concept of operations with authorities and permissions from the combatant commander, the UAS is used to record the swarm and jam its radio communications. Jamming disrupts the ability of the swarm commander to direct and coordinate action. The simultaneous arrival of host nation and Coast Guard vessels causes the harassing swarm to lose cohesion and abandon its mission. This interdiction concludes with the MEU releasing video footage of the harassing swarm, along with a combined public statement from the MEU, ARG, Coast Guard, and host nation coast guard commanders. This public statement is followed up and reinforced by additional public statements and press briefings by U.S. and host nation senior leaders.

To communicate additional resolve, the Coast Guard interdiction, disruption, and exposure operation is conducted against the backdrop of a MEU combined-arms demonstration exercise with the host nation. Images and videos from both the interdiction mission and the combined-arms demonstration are used to illustrate resolve in a multimedia campaign.

Conclusion

To compete and fight effectively in the 21st century, the Marine Corps must adapt to the evolving security environment by applying a modern approach to 21st-century combined arms. The combined arms approach is how the Marine Corps executes maneuver warfare. Rapid, flexible, and opportunistic maneuver can only be accomplished by a combined arms force and through a diversity of means that maximizes combat power, flexibility, and responsiveness.[14] The Marine Corps' success in the 20th century was characterized by mastery of combined arms. However, in today's ever-changing environment, there exist many more capabilities that must be combined. This includes a wide range of new information capabilities that we employ in all the domains of warfighting.

Current events show us that the character of combined arms changes as precision strike networks proliferate in a hyper-connected world. The MPSR provides U.S. competitors the cover they need to apply coercive strategies below the threshold of armed conflict. By deterring escalation, the MPSR helps competitors achieve their objectives incrementally, with the goal of imposing their will on targeted neighbors without triggering a response from the victim nation or the United States. Additionally, the MPSR makes it feasible to quickly find and strike targets across large swaths of geographic space. This requires gathering and exploiting huge quantities of data to achieve and maintain target quality tracks. Fusion and correlation of data through massed storage and computation establish decision speed, focus, and scale as key characteristics of 21st-century combined arms. Succeeding in data fusion and exploitation means the winning side will experience the faster decision speeds needed to focus a widening array of available capabilities that can be combined to generate advantages at scale over an opponent.

This challenge sits at the core of winning in all domains. Both our SIF and traditional MAGTFs must be manned, trained, and equipped to win this fight, across all points of the competition continuum. Creating combined-arms dilemmas, and then exploiting success to achieve decision in battle, is the foundation of maneuver warfare. In the 21st century, we must move toward a refined combined-arms model to ensure we do not become stagnant in our thinking and tactics. We must recognize that information, as a warfighting function, is a pillar of combined arms. We must employ every ounce of creativity and tactical acumen to combine every capability in new ways, to generate advantages and fulfill our role as the Nation's expeditionary force-in-readiness in the 21st century.

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The Networked Urban Littoral

The effects of emergent disruptive technologies

by Dr. James McGinley & Mr. Arthur Speyer

Recent Russian military operations in Ukraine demonstrate the continued challenges of urban warfare. These challenges are exacerbated by emerging and disruptive technologies, which are creating increasingly networked urban areas. These technological advances and population trends are converging to create a rapidly evolving networked urban littoral. Pairing technologies like 5G and artificial intelligence with low-cost sensors and unmanned systems will be the norm in the future operating environment. At the same time, population demographics such as increased urbanization and population shifts toward coasts are creating urbanized littorals.

"In your world, you're going to have to optimize yourselves for urban combat, not rural combat. That has huge implications for intelligence collection, vehicles, weapons design, development, logistics, camo, and all of the other aspects of our progression."
—Gen Mark Milley, Chairman of the Joint Chiefs of Staff, speech to the U.S. Military Academy Class of 2022

>Dr. McGinley is a Senior Analyst at the Marine Corps Intelligence Activity.

>>Mr. Speyer is a Senior Analyst at the Marine Corps Intelligence Activity.

Urban Littorals Are Key

The U.N. estimates that more than 600 million people (about 10 percent of the world's population) live in coastal areas that are less than 10 meters (about 33 feet) above sea level. Nearly 2.4 billion people (about 40 percent of the world's population) live within 100 kilometers (60 miles) of the coast with most of these concentrated in cities.[1] Worldwide, there are more functional cities than there are viable countries. In some cases, cities are the islands of governance and order within weak countries.[2] They are where leaders reside and where foreign embassies, transnational corporations, and humanitarian aid agencies gather. Most of the world's 100 largest cities in 2020 were national, state, or provincial capitals. Capital cities are symbols of national unity and power, but their symbolic importance means that they are targets for adversaries or are likely to experience social unrest during conflict.

The modern city is complex. It is composed of independent physical, social, informational, and functional systems. These systems have structures, connections, and feedback mechanisms that keep city services operating. Although these interdependencies create opportunities, they also create complexity and vulnerability to attack. Combined with the concentration of population, these factors make the urban littorals key to success in the future operating environment.

The Urban Human

The human terrain is key terrain in urban environments. About 55 percent of the world's population lives in urban areas. By 2050, it will increase to 68 percent, bringing the urban population to about 6.7 billion.[3] The urban population is also decreasing in age. By 2030, up to 60 percent of the world's urban population will be younger than 18.[4] The risk of internal conflict increases by 150 percent in countries where youths make up 35 percent of the population.[5]

Asia and Africa have the highest rates of urbanization. By 2050, Africa's urban population is likely to almost triple, and Asia's is likely to increase by more than half. Rapid increases in urban populations will strain urban infrastructure and social services as cities attempt to meet larger urban demands.

Many cities are not prepared to absorb increases in their population. This inability leads to the rise of informal settlements within and near cities. Worldwide, one in four urban residents lives in a slum. An estimated 80 percent of slum dwellers live in just three regions: eastern and southeastern Asia (370 million), sub-Saharan Africa (238

million), and central and southern Asia (227 million).[6] Projections estimate that the total number of slum dwellers worldwide will increase to 1.2 billion by 2030, with the largest proportional increase occurring in Africa.[7]

Conflict Puts Urban Populations at Risk

Conflict is more likely to occur in urban areas for the simple reason that more people live in urban areas than ever before. When warfare takes place in cities, civilians experience both direct and indirect harm, ranging from physical violence and injury to the disruption of vital services and the destruction of critical infrastructure.[8] When explosive weapons are used in cities, between 88 and 91 percent of those killed or injured are civilians; the percentages drop to between 16 and 25 percent when such weapons are used in non-urban areas.[9]

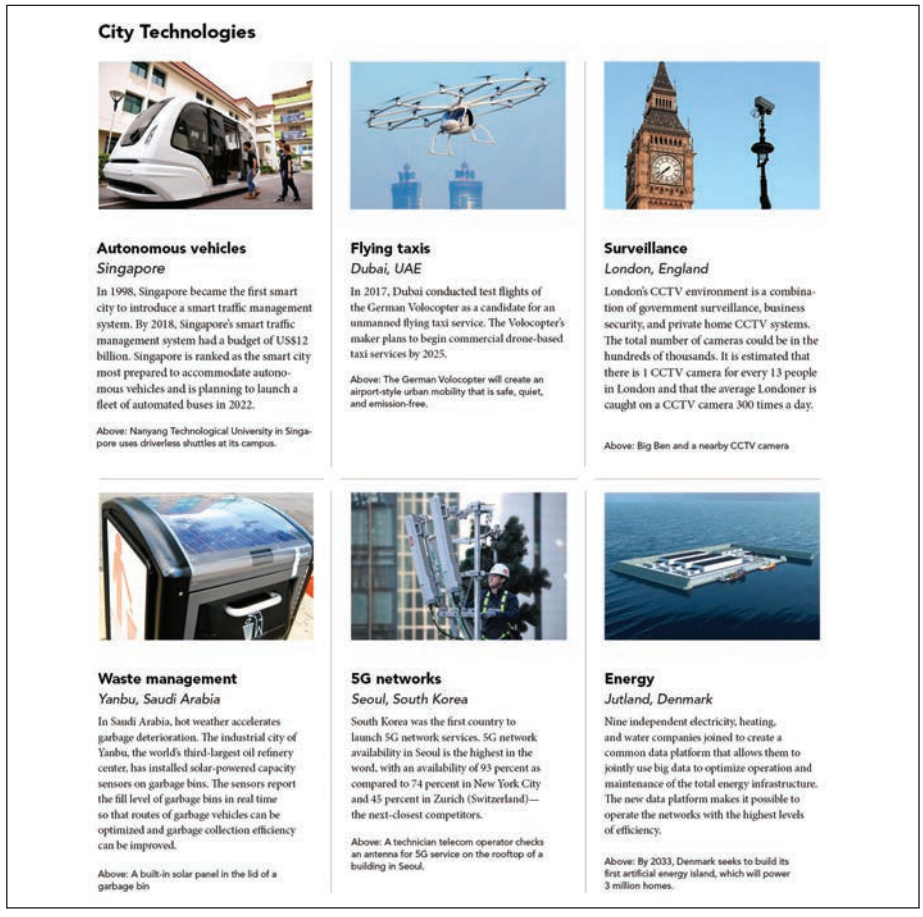
Conflicts displace millions of people, the majority of whom move to towns and cities. When Russia invaded Ukraine in 2022, more than six million left for neighboring countries, and eight million people were internally displaced.[10] In the past, most refugees were placed in rural settlements or camps far from city centers.[11] Now, most refugees live with family and friends in urban centers, usually in a neighboring country.

When conflict enters an urban area, cycles of conflict and instability occur. Civilian casualties and poor governance can lead to grievance, which can lead to mobilization and recruitment of aggrieved persons, which, in turn, lead to more violence and conflict.[12]

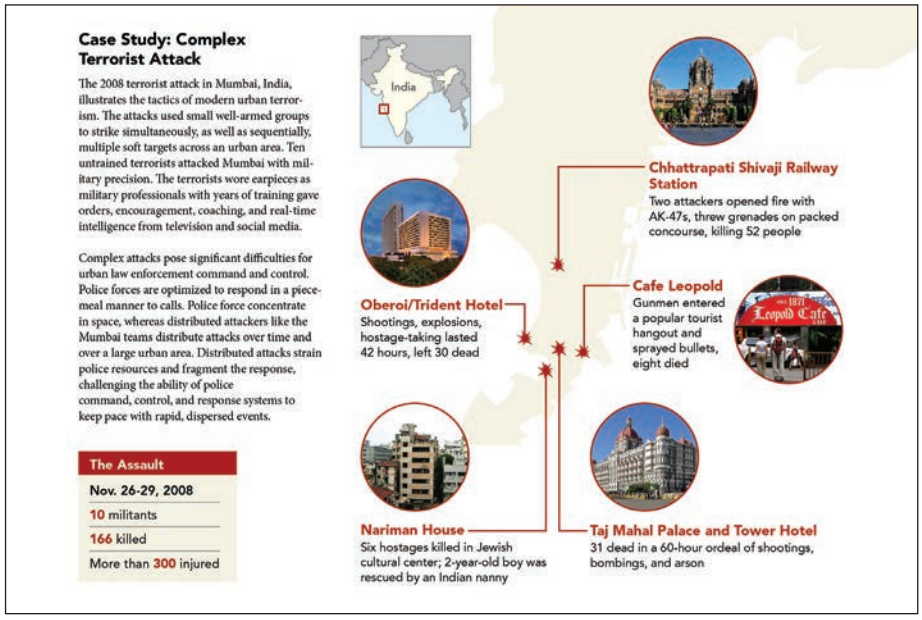
Cities Have Complex Physical Terrain

Typically, key nodes such as business and manufacturing districts and neighborhoods are arranged as defined zones around a central business district. However, zones can take different forms. For example, a developing country may have a modern central business district, a traditional business district, and a periodic market.[13]

Building heights vary by city sector; for example, most high-rise buildings are located in business districts. Urban canyons (the narrow space be-



Increasingly advanced urban technologies. *(Photo provided by authors.)*



Complexities of terrorist attacks in modern urban environments. *(Photo provided by authors.)*

tween tall buildings) limit movement, communication signal propagation, visual line-of-sight, and the trajectory of munitions. Additionally, above-ground communication and electrical lines can inhibit helicopter and UAV movement. Connectors such as rail lines, public transit, major roads, and rivers create urban corridors. Transportation lines and facilities shape land-use patterns. The nature of the physical terrain will have a direct impact on the conduct of operations in the urban terrain that can vary block by block.

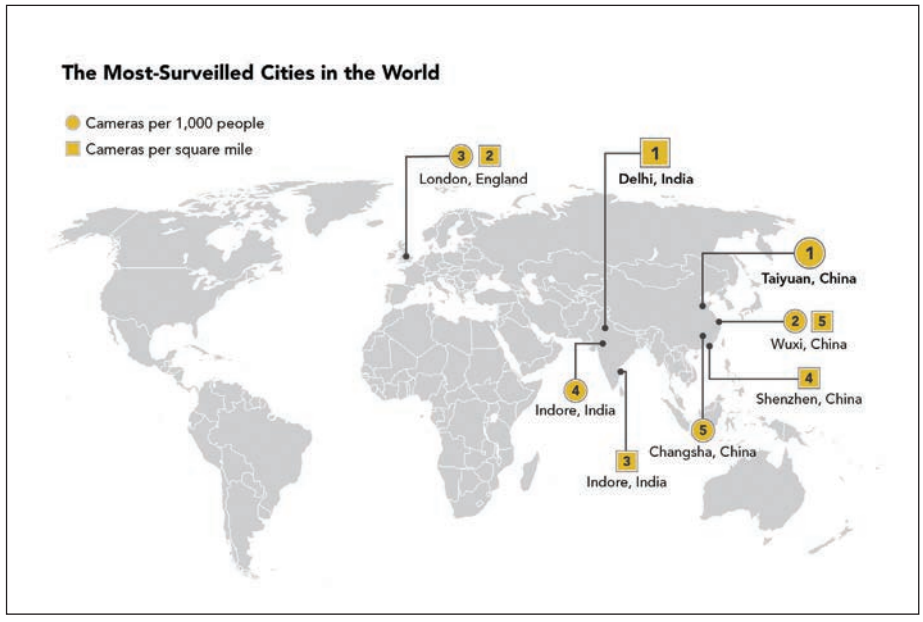
The Networked Global City

The massive increase in connectivity since the beginning of this century has created a networked urban littoral.[14] Urban environments are dense with people, information networks, and data-dependent systems. Governments use fixed-mobile communication infrastructure that takes advantage of the high data-transmission rates available in cities. New digital infrastructure is creating large-scale data layers at personal, network, and system (i.e., social, Service, governmental, and business) levels.

5G and the Internet of Things

5G provides improved speed (5G networks are more than 10 times faster than 4G networks), coverage, and reliability.[15] By 2025, 5G mobile phone network users will have increased from 1 million to 1.2 billion, and 5G networks will account for 20 percent of global mobile phone connections.[16] The convergence of advanced mobile phone networks and artificial intelligence-enabled applications will be evident in urban areas with high mobile-phone density.

The Internet of Things (IoT) consists of all the devices connected to the Internet. These devices have sensors and other software applications that sense and collect data so that they can monitor their environment. Internet-connected devices perform a variety of functions. As consumer devices, they enable smart speakers, watches, door locks, and personal assistants. As business devices, they enable medical devices, engine sensors, industrial robots, HVAC controllers, and security



An overwhelming majority of the most-surveilled cities reside in the Indo-Pacific region. ***(Photo provided by authors.)***

systems. As municipal systems, they enable systems for traffic, trains, water, power, and surveillance.[17]

In 2020, there were more IoT connections (e.g., connected cars, smart home devices, and connected industrial equipment) than there were non-IoT connections (e.g., smartphones, laptops, tablets, and computers). By 2025, there will be almost four IoT devices for every person in the world.[18] The driving operational security concern of having troops keep their cellphones off will pale in comparison with the networked sensor environment that the urban environment presents.

Urban environments are dense with people, information networks, and data-dependent systems.

Surveillance is Persistent in Urban Environments

More than 1 billion surveillance cameras are installed in cities. Half of these cameras are in China. China is also a leading adopter of facial-recognition technology, which provides the opportunity to identify a person instantly, including body language and if the location fits in their usual pattern.[19] Closed-circuit television (CCTV) cameras support crime prevention, traffic monitoring, and observation of industrial environments not suitable for humans. Cameras are getting better and cheaper, and live video streams can be remotely accessed and easily disseminated. Facial-recognition technology provides public and private entities the opportunity to instantly check the identity of anyone who passes by a CCTV camera as well as if any of their known associates are in the crowd. Based on the number of cameras per 1,000 people, 16 of the top 20 most surveilled cities are in China.[20]

Urban Protests Go High-Tech

The 2019 Hong Kong protests were an urban insurgent innovation lab. Protesters used anonymous online forums to hinder the ability to identify protest leadership. The protesters also used umbrellas and uniform clothing to reduce identifiable signatures and defeat facial-recognition software.

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The protesters used a meshed communication application as an ad hoc mobile network to communicate with less risk of interception or loss of communication.

Communications technology allows anyone with a smartphone and social media to conduct real-time observation, reporting, and live streaming of crisis events.

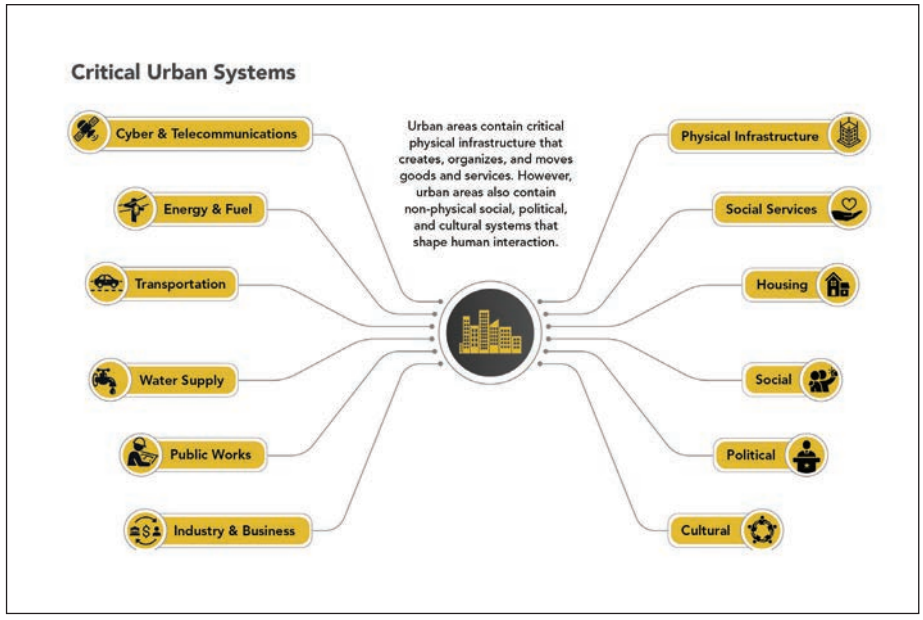
"Wars will increasingly be centered in large, poorly governed urban areas, and will be fought against well-armed and capable opponents who will most likely be nonstate or quasi-nonstate actors. All of this will take place under the unblinking stare of the camera, bringing the local to the global stage and the global to the local stage."

—David Betz

Cities Are Where the Future Happens First

Urban areas are test beds for the convergence of technology. Technology is being applied in cities to increase systems' efficiency and quality and citizens' quality of life. These applications are enabled by high-speed Internet availability and big data analytics, as well as advances in artificial intelligence, autonomous systems, surveillance, and monitoring systems.

The combination of low-power sensors that monitor urban environments and activities, high-speed wireless networks, and web- and mobile-based applications enables smart cities to use technology to increase municipal systems' efficiency and to improve the quality of services and life. Initiatives include power, transportation, streetlights, and trash collection. In 2019, there were 379 fully deployed smart-city projects in 61 countries.



Interconnectedness of critical urban systems. *(Photo provided by authors.)*

Intelligent Monitoring is Proliferating

A smart sensor is made of a sensor, a microprocessor, and communication technology. Smart sensors receive input from the physical environment around them and use internal processors to monitor the environment, detect changes, analyze data, and either communicate or make decisions and control processes. The urban environment is proliferated with sensors, allowing cameras to control traffic flow and security threats. Internet-connected devices, such as cameras that monitor movement and personal assistants that monitor sound, could represent a force-protection threat. In a networked world, using artificial intelligence-based tools, an individual's movements could be automatically tracked over time, database, and accessed from anywhere in the world.

Urban areas are test beds for the convergence of technology.

Unmanned Systems Will Be Revolutionary

To further complicate the urban environment, unmanned systems, including robots and drones, may revolutionize many industries and city services, especially those that involve hazardous conditions. Unmanned systems have applications in law enforcement and firefighting (e.g., as ambulances and for inspections, environmental monitoring, and disaster management) as well as more mundane tasks such as package delivery. These systems will have a degree of autonomy from simple collision avoidance to full navigation. Drones encountered may be executing innocuous tasks or conducting deliberate surveillance. But even the utility drone may be co-opted for surveillance by passive observation of its sensor and video feeds.

The march of human migration, demographics, and technology complicates the urban terrain in new and unexpected ways. The increased complexity of smart cities, connected infrastructure, coastal urban areas, and networked urban populations places a premium on understanding the networked urban littoral.

Urban Warfare Technology Watchlist

- *Wearable augmented human performance systems capable of extending human performance in urban environments.*
- *Sensing technology capable of seeing through buildings, beyond urban obstacles, and underground.*
- *Urban camouflage technology and tactics capable of lowering signature profiles for personnel and equipment.*
- *Development of munitions adapted to penetrating urban structures or capable of creating fatalities without destroying structures.*
- *Directed-energy weapons capable of controlling urban populations.*
- *Networked communications capable of effectively operating beyond-line-of-sight and meeting high-data requirements for ISR and command and control while overcoming urban limitations.*
- *The integration of artificial intelligence across combat and C4ISR systems, especially systems designed to operate independently without a man-in-the-loop protocol.*

>Authors' Note: The views expressed are those of the authors and do not reflect the official policy or position of the DOD or the U.S. Government.

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The Marine Corps' Third Amphibious Realignment

The reconnaissance counter-reconnaissance enterprise

by LtCol William Sumption & Mr. Ben Closs

>LtCol Sumption is an Intelligence Officer currently assigned as the Operations Officer for Intelligence Division, Deputy Commandant for Information.

>>Mr. Closs is a retired Marine Intelligence Officer, who currently works for ManTech International supporting Headquarters Marine Corps Intelligence Division.

The First Amphibious Realignment

LtGen John A. Lejeune's vision for the Marine Corps as an amphibious force, which sprung from his study of the Allied landing at Gallipoli, influenced the entire Corps' focus and activities in the years following World War One. Encouraged by the Marines' noteworthy performance in France, Lejeune was determined not to see the Corps relegated back to a lesser position within the nation's military structure. Throughout the 20s and 30s, Marines continued to conduct many of the same security-focused missions they had been tasked with before the war. Lejeune's vision and personal engagement energized a new focus on education and experimentation, however, which enabled and accelerated the development of revolutionary amphibious capabilities, all of which contributed to the pivotal role the Corps played a generation later during the Second World War.

The Second Amphibious Realignment

As our 29th CMC, Gen Al Gray, put it, "Every Marine is, first and foremost, a rifleman. All other conditions are secondary." His generation's experiences during the Vietnam War informed this perspective and, along with concepts like maneuver warfare, helped the post-Vietnam-era Marine Corps develop an amphibious operations capability that could truly project power ashore while also complementing and enhancing the Navy's fleet operations. Most of these operations Marines engaged in during the last 40 years, the Marine Corps' accepted role within our Nation's defense planning continued to center around its role as a "Phase III" forcible entry force.

The Third Amphibious Transformation

Today's Marine Corps once again finds itself at the tail end of an extended campaign ashore while the entire world is amid an epochal shift in military capabilities and global dynamics. The dawn of the Digital Age has come with explosive growth and a broad proliferation of information and information technologies. Nations, corporations, and other actors throughout the globe have multiplied their ability to affect social, political, and economic change without crossing the threshold of traditional armed conflict, using the information space those new data and technologies have helped them to create. The operating environment will never be the same. Recognizing the transformative nature of technological revolution, the Marine Corps has chosen to embrace the change, however disruptive it may be, and is pioneering the Joint Force's effort to adapt to it.

... other actors throughout the globe have multiplied their ability to affect social, political, and economic change without crossing the threshold of traditional armed conflict ...

This process had already begun when Gen Berger published his *Commandant's Planning Guidance* in 2019. Together, the follow-on *Force Design Annual Update(s), A Concept for Stand-in Forces*, and the recently published *Functional Concept for Maritime Reconnaissance and Counter-reconnaissance*

developments were focused on traditional wartime capabilities. Although the Cold War never escalated to true armed conflict between the United States and the Soviet Union, and despite the broad range of disaster relief, counterinsurgency, and other types of

outline the mandate for the Marine Corps' third amphibious realignment: *The Marine Corps as a maritime reconnaissance and counter-reconnaissance enterprise that both exist to enable, and requires essential support from, the Joint Force as a whole*.

In the years to come, competing and deterring conflict, let alone defeating our nation's adversaries, will require a joint and combined approach. None of the Services can hope any longer to achieve anything beyond fleeting, tactical-level success through independent operations. Going forward, Marine forces may be assigned zones of action in which to operate, but those zones will not, and cannot, exist in a vacuum; *there are no closed systems in the information space*. Today's great-power competition requires a whole-of-government approach, backed by fully integrated joint military capabilities, that can take advantage of our nation's inherent strengths, mitigate its vulnerabilities, and exploit new opportunities, all while overcoming the challenges posed by the ongoing changes in the weather, our adversaries, and the physical and human terrain throughout the globe. The Marine Corps' unique focus on combined arms, and its abilities to gather information and conduct reconnaissance and counter-reconnaissance activities throughout the littoral battlespace, will be vital to the future Joint Force.

The Reconnaissance Counter-reconnaissance Enterprise (RXRE)

Even today, every element of the MAGTF is capable of conducting reconnaissance: the ACE conducts aerial reconnaissance, the LCE conducts engineering and route reconnaissance, and the GCE conducts deep reconnaissance, ground reconnaissance, and light armored reconnaissance, among other operations. *A Concept for Stand-in Forces* and *Functional Concept for Maritime Reconnaissance and Counter-reconnaissance* describe an enterprise that brings all of these potentially disparate elements together and aligns them with the rest of the Service to support joint operational preparation of the operating environment. The RXRE must operate as an extension of the Joint Force.

Marine RXRE must provide flexible and unique capability to the Joint Force. *(Photo by Sgt Danny Gonzalez.)*

It will continue to generate local unit requirements, but it exists, first and foremost, to answer questions for the men and women who have both the ability and the authority to make theatre-level decisions: the combatant commanders**.** *Stand-in-Forces (SIF) must do more than persist within the adversary's weapon's engagement zone. They must diminish and complicate the strategic options available to our adversaries, enable theater and national decision making, and support the Joint Force*.

> ***The Marine Corps needs to provide … stand-in forces able to gather intelligence … in ways that other elements of the Joint Force cannot.***

The *Functional Concept for Reconnaissance and Counter-Reconnaissance* seeks to tie numerous present-day reconnaissance concepts together and apply them in a holistic manner. Engineering reconnaissance, aerial reconnaissance, scouting, patrolling, and patrol debriefs are nothing new, but they remain essential functions for any force. They may not influence our adversaries or other objectives directly, but they contribute to later successes by laying the foundation for battlespace awareness, targeting, combat assessment, and educated command decisions. Only an enterprise approach working together can build the collective awareness necessary to rise to the level of utility.

Military reconnaissance takes on even greater importance during competition. More than focusing on destroying the adversary, SIF may locate and close with the adversary in the interest of deterring, or influencing, their actions during steady-state competition. *The entire Marine Corps is shifting its focus from "destroy" to "locate and close with."* Most future Marine Littoral Regiment operations promise to be chiefly reconnaissance and influence operations, which all its maneuvers will be designed to support. The Marine Corps needs to provide the Joint Force with stand-in forces able to gather intelligence from locations and in ways that other elements of the Joint Force cannot.

It's About the Joint Force

A Concept for Stand-in Forces brings together all of these reconnaissance actions under the umbrella of maritime

reconnaissance and counter-reconnaissance operations. While these missions are not new, their focus is. While the Corps' first realignment turned it into a combined-arms amphibious force that worked under a naval commander, and the second one focused its combat operations within an assigned three-dimensional battlespace, the Corps' next evolution will necessitate its working in and through a joint/combined battlespace and force structure. SIF will accomplish its mission by locating and closing with its adversaries, forcing them to react, and then handing off appropriate intelligence or targeting data so the entire Joint Force can exploit the opportunities they have identified, and helped to create. *This is the essence of intelligence operations enabled by maneuver.*

To be useful, reconnaissance operations supported by maneuver need to answer questions about the level of command actually in a position to make decisions to influence the operational environment. In competition, that is not the MEF or the MARFOR commander; it is the combatant commander. The RXRE must, therefore, measure up to combatant commander requirements and expectations. The Marine Corps must operate and collect on behalf of the Joint Force.

As Marines, we are proud of our adaptability, a quality that has, historically, helped our forces to retain their operational flexibility and freedom of action when they need it most. It was this can-do attitude that forged the MAGTF into something that could do a bit of everything, even during the Global War on Terror. To succeed against our peer competitors, however, we will need to operate jointly with the other Services. Unity of command, especially during competition, will always boil down to the combatant commander's authorities and decisions.

All Exercises Are Live Fire in the Information Environment

Forward deployed Marine elements can exert influence on adversaries without firing a shot. In *The Defense of Duffer's Drift*, Lt Backsight Forethought learned that one need not actually occupy terrain to control it. *In the information environment, we need not attack the enemy in order to detect his actions, direct his attention, and pare down his options.* RXRE operations, activities, and investments can have a ripple effect beyond their immediate results, and actions short of armed conflict can achieve operational and strategic objectives. Likewise, if a partner nation exercise is fouled through an accident or incident, we will have no alibi. Our adversaries will take advantage of any negative event in the information space and use it to their advantage.

Marines need to train in environments that orients them to a changing and austere battlespace. *(Photo by LCpl Manuel Alvarado.)*

All RXRE operations, activities, and investments in competition must be focused to achieve some kind of advantage over our adversaries. The luxury of administrative movement is a thing of the past; we do not have anywhere near enough time, people, or resources to send Marines into theatre without a specific plan and purpose. Mere presence patrols, without a more specific message to send, promise to provide more opportunities for our competitors than for the United States. *Everything our SIF does must be a maneuver to gain advantage.* The Marine Corps is a global force, and every Marine is part of the maritime RXRE. Our forward-deployed elements have access to information that no other assets can collect and gather information vital to the Joint Force on a constant basis.

Conclusion

The nature and scope of the Marine Corps' future missions call for an enterprise approach to reconnaissance and counter-reconnaissance functions, which will demand a balanced mix of all-domain sensing and maneuver capabilities across the entire force. The entire RXRE will plan and conduct ISR operations supported by integrated fires, maneuver, and information functions, and every element of the SIF will have something to contribute toward the naval and Joint Force's understanding of the operating environment. The Reconnaissance Counter-reconnaissance Enterprise concept capitalizes on the fundamental nature of what makes Marines who they are while focusing on and facilitating the kind of adaptation our Service must undergo to orient toward a changing battlespace and new threats, all while competing effectively and consistently enough to gain real advantages over our adversaries.

USMC

Transiting the "Valley of Death"

Between concepts and fielded capabilities

by Maj Julia N. Weber

>Maj Weber is a Huey Helicopter Pilot turned Intelligence Officer who recently graduated from the Naval Postgraduate School with a Master of Science in Operations Analysis. She has deployed overseas multiple times, including to Afghanistan, Pakistan, and Guatemala. She is currently assigned to the I MEF G-2 at Camp Pendleton, CA.

There is growing impetus among senior DOD and Marine Corps leaders to improve the DOD's cyber capabilities, where cyber is defined to include items relating to information technology, computers/computing, and computer networking (to include data processing, artificial intelligence, and machine learning capabilities). Unfortunately, there are many hurdles that new cyber capabilities must overcome in order to move from the *proven concept phase* to the *fully fielded and sustained phase* in the DOD.[1] There are so many issues that this period in the innovation process between the acknowledgment of a capability and widespread adoption of the capability by the DOD has been deemed the "Valley of Death."[2] This article outlines four of these issues and provides recommendations for how the DOD (and the Marine Corps) might address them. The four issues are: (1) difficulty navigating DOD funding and acquisitions processes, (2) a lack of joint or DOD-common requirements, (3) the DOD's poorly defined cyber requirements, and (4) dependence on industry's ability to profit from transitioning the capability.

Critical Issue #1: Difficulty Navigating DOD Funding and Acquisitions Processes

In 1960, U.S. defense-related research and development (R&D) spending accounted for more than 33 percent of the total global R&D spending. By 2016, it had fallen to less than four percent of the global total.[3] Persons wishing to work in the R&D field today have many more options for funding sources and the DOD has a lot more competition when it comes to finding high-quality developers. In addition to the DOD controlling much less of the market share for R&D, navigating DOD funding processes is prohibitively difficult for all but the largest defense contractors.

As a product or service moves from concept development to fielding and then to sustainment, the type of DOD funding or "color of money" used to pay for the item changes from Research, Development, Test, and Evaluation (RDT&E) funds to Procurement (PROC) funds to Operations and Maintenance (O&M) funds.[4] The people and agencies that manage each of these categories of funds differ, and not only do they differ between categories but they also differ between Services. For example, the people that manage and decide how to spend the Air Force's RDT&E funds differ from those that manage and spend the Navy's RDT&E funds, which are different from those that spend the Navy's PROC or O&M funds.

Also, even though a concept may be proven, it usually requires some degree of tailoring to ensure it meets the DOD's requirements. As such, initial testing by the DOD of concepts is usually done with RDT&E funds. Often these testing timelines are flexible or get delayed, so there is uncertainty around when an item will no longer need/qualify for RDT&E funding and instead need/qualify for PROC or O&M funding. Once an item has been DOD-tested and approved, PROC (for materiel) or O&M (for services and parts/sustainment) funding is used to acquire and maintain the item for the operational forces.

To obtain PROC or O&M funding, however, DOD planners and financial managers must register the need for funding one to two years in advance of when they actually plan to spend it by either creating a new budget line item or adjusting the funding requested under an existing budget line item on their budget request, which is sent to Congress annually for approval via the President's budget. This budgeting and approval process occurs in the year prior to when the funds are expected to be spent. Because of the timing of the Congressional budget cycle, items can sometimes wait for up to two years between when their RDT&E funding runs out and when approval is granted to use PROC or O&M funds (assuming approval *is* eventually granted).

For the acquisition of substantial (*read: expensive*) items like a new fighter jet or ship, the Services will designate a team of people to ensure funding requests are made on time and appropriate hand-offs between sections occur. For items that do not meet major acquisition thresholds and which are not overseen

by a designated team (e.g. most cyber capabilities), management of these transitions between research and engineering teams, acquisitions teams, and sustainment and operations teams is left up to either the end-user or requestor (usually either an operational unit that requested the item or the capability analysts that initially championed the concept) or the contractor who expects to provide the item. In addition to the challenge of figuring out who you need to get money from and when, as military personnel rotate between assignments, many initiatives are forgotten or abandoned.[5] Large defense contractors often hire acquisitions experts to help ensure these transitions between phases/funding sources/management teams occur, but smaller contractors often cannot afford such help.[6]

Congress and the DOD have implemented a few means of addressing this issue. In 2016, as part of the National Defense Authorization Act, Congress granted the DOD permanent authority to use Other Transaction (OT) agreements instead of traditional contracts for research, prototyping, and follow-on production. OT agreements are exempt from certain federal acquisition laws and regulations so long as they involve either a nontraditional defense contractor, a small business, or a non-federal funding partner. Though the available data on the use of OT authority is incomplete, OT authority does not yet appear to have had a significant impact on the amount of funding awarded to nontraditional defense contractors. Reasons for this likely range from a lack of awareness by acquisitions officers on how to set up OT agreements to inefficient management of the consortiums that are supposed to foster competition for OT agreements.[7]

In addition to being able to establish OT agreements, in 2015, the DOD stood up the Defense Innovation Unit (DIU). It now has offices in Silicon Valley, CA; Austin, TX; Boston, MA; and Washington, DC. The DIU's purpose is to accelerate the military's "adoption of commercial technology" and grow the "national security innovation base."[8] It does this by helping the military describe requirements in "language familiar to the private sector rather than in language only the military would understand" as well as enabling "companies to participate in the selection process easily by responding with material they already have" such as a few slides or an info paper versus a long, formal proposal.[9] DIU also works "quickly to get to an answer [as] to whether the companies are selected for a prototype contract."[10] However, DIU is only focused on getting technology *to* the transition phase and not necessarily *through* the transition phase.

Some things the DOD should do to help address this issue are: (1) stand up a centralized office within the DOD to execute and oversee all OT agreements; (2) expand on the concept of the DIU and stand up an office or organization to help smaller vendors navigate the transition from proven concept through the various funding phases to fully fielded and sustained; and (3) set up a bridge or intermediate funding source (with little to no requirements/strings associated) to help companies continue to pay staff and maintain product lines when they face gaps between when their RDT&E funding runs out and when they can expect to receive PROC or O&M funding.

By standing up a centralized OT office, the DOD would be able to both maximize the employment of that portion of the workforce that is familiar with implementing OT agreements and develop institutional knowledge in OT agreement employment as well as better track OT agreement use and efficacy. By providing free expert funding and acquisition support to all vendors/developers and DOD units/capability requestors (akin to what the larger defense contractors purchase/hire), it would enable smaller projects to more easily navigate the DOD funding and acquisitions processes and receive at least some of the same support that the DOD and major defense contractors provide to major acquisitions projects. It would also ensure those products that the DOD really wants do make it to fielding vice just those that the vendor or developer wants to sell. Providing an intermediate funding option (to ensure developers and vendors receive a continual stream of funding) will allow those developers that only have a few products or that require reliable funding to consider the DOD as a customer instead of turning to other products and customers who can provide more reliable funding. Recent research indicates that guaranteed funding (as indicated by funds obligated) is the strongest predictor of whether or not an item will transition.[11]

Critical Issue #2: A Lack of Joint Requirements

For those that are not and have not been a part of the DOD, understanding the differences between its sub-components—the Services—is not easy. Despite the fact the Army, Navy, Air Force, and Marine Corps all fall under the DOD, there are very few DOD-wide cyber systems or capabilities (the only two that immediately come to mind are the Defense Travel System and the Defense Information System for Security). Each Service—and even some joint commands such as Special Operations Command—maintains its own computer networks, uses its own procurement and accounting systems/software, and maintains its own tactical and operational command and control programs.

Developers and vendors who may have cyber capabilities to offer the DOD will often be relegated to picking a single Service to work with. If they only work with one Service, the risk of the project failing is high as Service-specific requirements can change suddenly.[12] Working with multiple Services helps ensure transition since it is less likely that all stakeholders will pull out. However, if the vendor/developer wants to work with multiple Services to maximize their DOD customer base, they likely will have to develop different versions of their product to match the specific demands/networks of each Service, which eats into their profits. In addition to the operational problems caused by the lack of DOD-common networks and systems (such as an inability to share information in a timely manner between the Services), this bifurcation of cyber requirements further minimizes the DOD's already-diminished-of-late buying power by

splitting it among the Services. This can also drive up the price of DOD cyber solutions.

Service leaders, in particular the DOD chief data officers and chief technology officers, should make migrating the Services to common networks and systems a top priority. Not only would this improve information sharing and boost the DOD's buying power but it would also simplify cyber defense by reducing the number of systems and networks that the DOD must defend. Service leaders will likely be reluctant to migrate to common systems as it would require them to relinquish some control, so migration will have to be properly incentivized. A first step would be asking senior Service leaders who oversee systems that are ripe for migration (like moving the DOD to a common accounting system) what incentives would sway them to pursue migration.

Critical Issue #3: Difficulty Describing Requirements

When describing desired cyber capabilities or requirements for vendors and developers, DOD personnel often describe a total package solution rather than a problem, or more specifically a family of problems. Recently the Special Operations Command Chief Information Officer told industry to re-think their business models.[13] At the 2021 National Defense Industrial Association's Special Operations Forces Industry Conference, she stated, "Think about not necessarily always proposing a full stack solution, but instead focusing on providing infrastructure as a service, data as a service, algorithms as a service, and keeping those separate so that we can mix and match them for the next unknown mission."[14]

The problem though is not that industry is not offering these separate services, it is that the DOD is not requesting them. DOD requirements documents often describe a desired solution vice describing a problem that allows developers/vendors to be creative in the types of solutions or portions of a solution that they offer. For example, the DOD might request a counter-drone system that uses friendly drones to smash into/take out enemy drones. A solution for this will involve video, infrared or other sensor data collection, data processing, and data storage. It will also require an algorithm to detect drones, an algorithm to identify which are adversary drones, an algorithm to track drones, and all the algorithms required to launch and fly friendly drones. One company might have a great drone detection algorithm while another might have a great drone tracking algorithm. However, if the DOD does not publish separate requirements documents/requests for proposals for each of these, then they will not receive mix-and-match solution options. Vendors/developers will be required

to submit proposals that meet the full requirement for their proposal to even be considered. Similarly, the DOD does not have and has not published common network and data standards so as to enable companies to offer mix-and-match solutions that will work with current DOD cyber capabilities.

The DOD needs to break requirements up into all the component problems that comprise a larger problem set. The current DOD acquisitions and contracting workforce, for the most part, are not trained to help requirements generators do a root cause analysis/better cyber problem framing. Acquisitions personnel and contracting officers are only required to be familiar with federal and defense-specific contracting laws and regulations. There is no requirement for them to have a background in cyber in order to process cyber-related contracts. Finding and hiring people with backgrounds in both cyber and acquisitions is difficult, so the DOD will likely also need to hire more people with cyber experience and provide them with acquisitions training or vice versa. All cyber-related acquisitions should then have to go through a cyber acquisitions specialist.

Critical Issue #4: Dependency on Industry

The fourth issue is the DOD's dependency on industry for funding the *middle ground*. The Defense Advanced Research Projects Agency and Service Research Laboratories often fund and carry out the early phases of research and development, but the DOD is dependent on industry to either come up with their own inventions or pick up inventions initiated by DOD researchers and move them from the concept development phase to the production and sustainment phase. Some contractors "eat" these initial and middle ground costs because they know they will be able to recoup them in the production and sustainment phases by adjusting what they charge the DOD. However, not all contractors can afford to do this, or cannot afford to do it without venture capital support. So, the DOD is dependent on industry's desire to produce the items it wants, or in reverse, its ability to make the production of DOD-desired items attractive to industry or the commercial sector. There may be items that the DOD wants, but which industry is not interested in producing or which the DOD cannot offer a price for that would make it attractive for industry to produce.

This is not an issue to which there should necessarily be a resolution. I doubt you will find many who think the DOD should get into the business of producing, particularly when it comes to cyber solutions. The best cyber talent lies outside the DOD, and we should leverage that versus relying on the talent resident inside the DOD. Rather, this issue is just something that DOD requirements generators should keep in mind. The more likely they are to share/also make an item attractive to other Services or the commercial sector, the more likely it is that industry will want to produce it.

The issues outlined in this article are just some of the more general issues that affect the transition of cyber technology. There are many other reasons why an item may not survive the transition from the proven concept phase to the fully fielded and sustained phase. However, these four issues explain the majority of failed transition cases. Research for this article was primarily based on summary reports and analysis of projects that were initiated by DARPA and DIU, as studying the transition success rate of both of these organizations continues to be of interest to the DOD and Congress. However, there are a number of other ways the DOD can get to the proven concept phase, and from thence onto the fully fielded and sustained phase, but data on items that came through one of these other routes (e.g. a route other than DARPA or the DIU) is not systematically collected. So, making specific measurements of the transition success rate is difficult. Regardless, there is much work that can be done in the already identified areas which would have a great effect on the transition success of nascent capabilities.

Notes

1. There are a number of hurdles that capabilities can face during the concept development phase or between when the idea was initially generated and when it becomes a "proven concept." These issues, while important, are outside the scope of this article. We will only focus here on those issues that prevent "proven concepts" from becoming fully adopted by the U.S. military.

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3. Moshe Schwartz and Heidi M. Peters, *Department of Defense Use of Other Transaction Authority: Background, Analysis and Issues for Congress*, (Washington, DC: Congressional Research Service, 2019).

4. Defense Acquisition University, "Appropriated Funds to Support Contracts," *Acquipedia*, n.d., https://www.dau.edu/acquipedia/pages/articledetails.aspx#!2.

5. Matthew D. Shoemaker, "Analysis of the Factors that Correlate with Transition Outcomes of Commercial Technology Prototype Projects," (MS thesis, Air Force Institute of Technology, 2020).

6. *Department of Defense Use of Other Transaction Authority.*

7. Ibid.

8. Defense Innovation Unit, "Who We Are/Our Mission," *Defense Innovation Unit,* n.d., https://www.diu.mil/about.

9. U.S. Department of Defense, "DIU Making Transformative Impact Five Years In," *DefenseNews*, August 27, 2020, https://www.defense.gov/Explore/ News/Article/Article/2327021/diu-making-transformative-impact-five-years-in.

10. Ibid.

11. "Analysis of the Factors that Correlate with Transition Outcomes of Commercial Technology Prototype Projects."

12. Ibid.

13. Andrew Eversden, "SOCOM CIO to Industry: 'Re-think your business models,'" *C4ISRnet,* May 20, 2021, https://www.c4isrnet.com/battlefield-tech/it-networks/2021/05/20/socom-cio-to-industry-rethink-your-business-models.

14. Ibid.

What a COMMO Must Learn in Order to Survive

"The Eternal Truths"

by Maj Paul L. Stokes (Ret)

On day one of a newly designated Marine communications officer's (CommO, MOS 0602) journey into the dynamic world of command, control, communication, computers, cyber, intelligence, surveillance, and reconnaissance, it is not uncommon to have an overwhelming feeling of uncertainty on how to face, improvise, and overcome the myriad of challenges that lie ahead. This is a concern that CommOs have faced for millennia, and in response, a multitude of CommOs—past and present—have developed the following list of eternal truths that, if wholeheartedly embraced and violently executed, *will position that young officer for success* as his Marines plan, install, secure, operate, maintain, and assess transmission and information services to ensure Marine commanders at all levels have the ability to exercise command and control (C2) in any environment across the full range of military operations."

>Maj Stokes retired in August 2006 after 31 years of active-duty service. A former Gunnery Sergeant and Chief Warrant Officer 3, he has served in a variety of leadership and communications billets from the team to theater levels. Maj Stokes has served as the Marine Corps Communication-Electronics School's Operations Officer, Deputy Operations Officer, and Future Operations/Plans Officer since January 2007.

"The commander is responsible for the planning and employment of the MAGTF Communication System (MCS) within the command, although the authority to plan and employ communications and information systems may be delegated. The commander must provide the G-6/ S-6 adequate authority commensurate with the responsibilities expected or assigned, and adequate guidance, including necessary assumptions and constraints."

—MCS, MCRP 3-30B.2

A Smart CommO Learns:

- Be a leader, first and foremost.
- Honest, aggressive, clear-headed, and pragmatic leadership can overcome any obstacles.
- Take care of your Marines because they are your most important asset.
- Communications is 20 percent technical knowledge and 80 percent leadership.
- As a communicator, you are always a student.
- The better xx02 you are, the better 0602 you will be to support the commander.
- Respect is earned by sustained performance.
- Be familiar with all the equipment in your inventory. You will learn more by hands-on than by the book; however, do not forget the book and be familiar with all of the references.
- Know your tables of organization, MOSs, staffing goals, tables of equipment, and mission statement.
- Listen and interpret what is heard into communications terms.
- Plan methodically and completely.
- Always "what if" your plan.
- Use checklists.
- Always plan the worst case.
- Do not be intimidated and you will most often be the junior officer on the staff. Ask questions and state problems and concerns with solutions.
- Stay two steps ahead of the staff you interact with.
- Visualize the system and each of its components.
- Recognize the requirements of each component of every system.
- Be familiar with unit-level and

external inspection procedures, and checklists, and personally observe these inspections. Conduct your own in-house inspections prior to outside inspections. Ensure reconciliations are being conducted on schedule (i.e. PUBS, maintenance, and supply).
- Enthusiasm is contagious.
- Train in the rear on your time. When in the field in support of somebody, it is the time to perform. We must perform in order that others may train.
- Train as you will fight from the terminal device to the entire system.
- Be embark ready.
- Cross train your Marines.
- Be aggressive and innovative. *Make* positive things happen.
- Know what questions to ask and whom to ask.
- Organize subordinates and divide responsibilities.
- Recognize critical vulnerabilities of every system.
- Have an evaluation system i.e.
  1. Event (operation, inspection, training).
  2. Evaluation (written, oral).
  3. ID the problems (people procedures, equipment).
  4. ID solutions.
  5. Verify solutions with an event—evaluation—etc.
- Recognize the organization's absolute needs.
- Know how to document.
- Know how one organization interfaces with other organizations.
- Develop points of contact.
- Recognize what one can and cannot influence.
- Tell your subordinate "why" whenever possible.
- Know that one's Marines can do the things he thinks impossible.
- Be responsible. The praise for success goes to the Marines and the fault for failure belongs to you.
- Do not procrastinate.
- Just because it was done that way in the past does not necessarily make it the right way.
- Talk and listen to your Marines because they have great ideas.
- Tap the strengths of subordinates.
- Observe and use ideas that have worked while not using the ones that did not work.
- Lead by example, not by fear and intimidation.
- Learn from your own and others' mistakes.
- Use common sense, IT IS your most important ally.
- *Do what is right*, not what is necessarily easy!
- Accomplishing the mission is paramount.
- Know when you are aggravated. This is important when you talk.
- Use judicial and non-judicial punishment only as the final straw.
- Interview your Marines.
- People, planning, training—continue to build on the legacy of "Red Mike" Edson.

Immediately establish yourself as the commander of your platoon, operate within commander's intent and guidance, and what you say in your platoon goes.

- Training Schedules: four months out. Do not B.S. the boss because it will not work.
- Understand maintenance and accountability of equipment and the importance this plays on readiness. How to be a good, responsible officer.
- We live in a world of chaos, seek to solve it. Go to it!
- Understand the unit's mission and provide solutions to support the scheme of maneuver and commander's intent. This goes along with the Marine Corps Planning Proces.
- Understand systems vice services.
- Know the funding pipeline and the table of organization change request process. Furthermore, know how to get more or better gear and get rid of the old stuff.
- Immediately establish yourself as the commander of your platoon, operate within commander's intent and guidance, and what you say in your platoon goes.
- Immediately set the standard, set the bar high, and have zero tolerance for standards or your intent not being met. It is always easier to loosen the reins vice coming in easy and trying to tighten them up.
- Small unit leadership issues—uniform inspections, room inspections, and PT—are easy to let slip as a result of high op-tempo.
- Instill a sense of ownership of equipment in your Marines.
- Be the smartest Marine in your platoon; you must display a high level of proficiency to your Marines. Loyalty to your unit and chain of command is critical, and there is no room for error in this area.
- The sole reason you exist is to take care of Marines; you should view them as your children/family.
- Have fun. The best time of your career can be had as a platoon commander, and there is no better chance to have a direct influence on Marines.
- Find ways to make your boss' job easier.
- Be a good 03 or 08 to be a good CommO.
- Be aggressive; "fix" your customers' problems.
- Facilitate C2 decision making that ensures we kill the enemy.
- Marines will die—steel yourself to that fact. Now, continue the mission.
- Consolidated Memorandum Receipt.
- Budget.
- Maintenance/Accountability.
- Report-in alphas.
- Train before going to the field. In the field, others train. Communicators operate.
- Who am I?
- Become a master of re-prioritizing and working multiple concurrent actions.
- Always think, "How can I support that ... ?" Do not provide reasons as to why you cannot.
- You are a leader first, CommO second.

• Know your entire system and be able to troubleshoot it all.
• Evaluate and improve everything.
• Do not procrastinate, write it down, and keep lists—or else you *will* forget it.
• That electronic fire support systems (e.g., communications gear) are employed in the same manner as artillery, crew-served weapons, and close air support—the only difference is that they fire electrons, not steel.
• Become an expert in terrain appreciation from the tactical to strategic levels.
• Understand the command's mission, capabilities, and limitations and Marine Corps Planning Process.
• Create a toolbox of reference material and do not be afraid to bring it to an operational planning team.
• When reporting to an operational planning team, bring a good sense of humor, patience, and the discipline to stick to your guns when discussing why a particular course of action is unsupportable.
• Read as much as you can about battle leadership, tactics, and C2 from the tactical to strategic levels.
• Think, talk, and brief like an *operator*.
• Write and publish electronic fire support (i.e., communication) plans that are clear, concise, and easily adaptable to changes on the battlefield and/or scheme of maneuver.
• Become an integral part of the respective staff and focus not only on the immediate missions but also prepare for those that always seem to pop up when one least expects them.
• Be responsible, and do not blame others. *You* are the platoon commander! Praise them while you take the hits.
• There are some screwed-up people, but 99 percent of the Marines/units throughout our Corps are super. Do not let one sour you.
• Management is doing things right. Leadership is doing the right thing. Both are important but know the difference.
• Do right and fear no man!

For decades, these tenets have enabled countless CommOs to effectively support their commanders and are well worth the time to read, laminate, take to, disseminate, implement, and build upon in the field. In short, the tools and the mentorship are in place, and all a young leader of Marines has to do is reach out, pick them up, and employ them to their maximum capacity—ensuring successful mission accomplishment in any clime and place.

The Need for S-2s in Communications Units

Comm formations as maneuver units within global kill chains

by LtCol Dennis W. Katolin

***>LtCol Katolin is an 0602 and currently serving as the CO for Marine Wing Communications Squadron 28. He is an 0505 and his previous assignment was as the planner for the Deputy Commandant for Information. He was the initiator and co-author of* MCDP 8, Information.**

With the rise of great power competition, the Marine Corps has reminded itself that it is no longer fighting an insurgency. We are now focused on threats from peers who are seeking to compete with the United States below the threshold of armed conflict—principal adversaries who have legitimate capacity in space, cyber, and in the electromagnetic spectrum (EMS). Though we mention these three domains (for the purposes of this article, I will refer to the EMS as a domain) as areas that require more attention, the truth is the Marine Corps is simply falling too far behind the threats we face today. This is because no one is looking comprehensively at the adversary tactics, systems, formations, and capabilities within cyber, space, and the EMS. As the principal operator in all three environments, communication units must provide this capability for the Marine Corps. Comm formations see the entire kill chain. What they need to see next are threats to those kill chains to inform MAGTF commanders of threats in order to drive intelligence collection and targeting. This starts with establishing S-2s in comm formations.

The Operational Need: Commanders Need to Ask the Question

A mentor of mine once said, "the blue pen starts when the red pen stops." This means we do not generate our own plans until we understand (in an actionable way) what the enemy intends to do. Currently, comm formations are only concerned with one of three necessary questions all commanders should ask:

Question 1: "***How will you establish my C2?***" (See Figure 1.)

Comm formations did this with no regard to how the enemy attacks their networks. MAGTF commanders allow this because most of them are not interested in enemy threats to our networks. Before a communications unit plans to establish command and control (C2) for a commander, the commander must ask the second of three necessary questions:

Question 2: "***How will they attack my C2***?"

While our intelligence community does varsity work in incorporating threats from land, air, and sea, they have not been given many models (that are easily understandable) to present space, cyber, and EMS threats in a focused way. Most intelligence preparation of the operating environment (IPOE) focuses on threats from the air, land, and

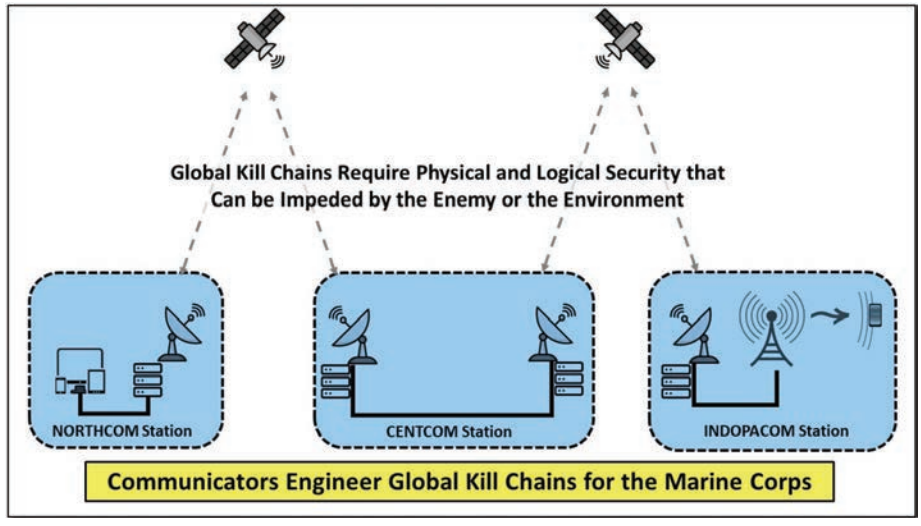


Figure 1. Communicators answering question 1 by establishing kill chains. *(Figure provided by author.)*

sea—mostly because we have models to show those threats. Unfortunately, this leaves cyber, space, and EMS relegated to vague activities and losses associated with them. When IPOE only presents an air, land, and sea problem set, they will drive a commander to an air, land, and sea solution. When it comes to a domain like cyber, we tell a commander that you can expect the enemy to be *very active* in this area.

These vague assessments and analyses defuse the threat to a commander and do not compel them to deal with them. MAGTF commanders need to start asking specific questions from IPOE that demand specific answers. The IPOE must force a commander to dedicate an intelligence asset of some kind to a specific area, leading to a specific response if the intelligence turns out to be accurate.

The Operational Answer: Intelligence for Communications

IPOE is not the S-2/G-2's job, it is everyone's job. No community has greater equity in the information domains than the 06XX occupational field (occ field), the communicators. They have to establish and monitor the entirety of our global kill chains. They are best suited to place the demand signal to the intelligence community to incorporate these domains into IPOE. The problem is that most comm formations view themselves as "supporting" rather than "supported." Establishing global networks that fuse space, cyber, and the EMS requires persistent awareness of global threats that would deny us our kill chains. Comm formations must establish networks that *anticipate specific actors* with *specific capabilities* that can target specific systems within our networks (both physically and logically).

Are there known actors trying to access our networks while we are deployed? Is there a jammer that can target my very small aperture terminal? Is there another jammer at the satellite base station that will impede their ability to receive our downlink? If so, what frequencies are vulnerable? Are our very small aperture terminals within range of enemy artillery? Are there enemy special operations forces that can infiltrate our base and begin cutting cables and fiber lines? Are there a lot of urban-based platforms radiating in our environment? This requires persistent intelligence and communicators absolutely need it! To achieve this, communications squadrons and battalions need to establish an S-2 in their units to ensure their operations are informed of the threats around them. (See Figure 2.)

Enemy fires capabilities need to inform the placement of retransmission sites and locations of antenna hills.

Knowledge of the enemy's ability to dazzle our satellites or use ground-based jamming against satellite transmissions informs us of vulnerabilities in space and helps engineer resilience and flexibility to this. What host nation fiber lines are we using and are they vulnerable to an attack by enemy special operations forces? Specific threats from cyberspace need to be part of network engineering to address the likelihood of attacks from viruses or spearfishing. It also motivates communication units and network users to work more diligently to ensure that the network information assurance practices are codified, established, and adequate to prevent an adversary's access to the network and the systems it provides. While people may think cyber forces exist to keep our networks online, the systems the network enables are often far more enticing for an adversary to attack. That is where we need cyber forces to focus. Why crash a Marine Corps server when you can manipulate fires data in the Advanced Field Artillery Tactical Data System or tracking data for the Common Aviation Command and Control System? It would be far more sophisticated to get us to shoot artillery on our own forces or

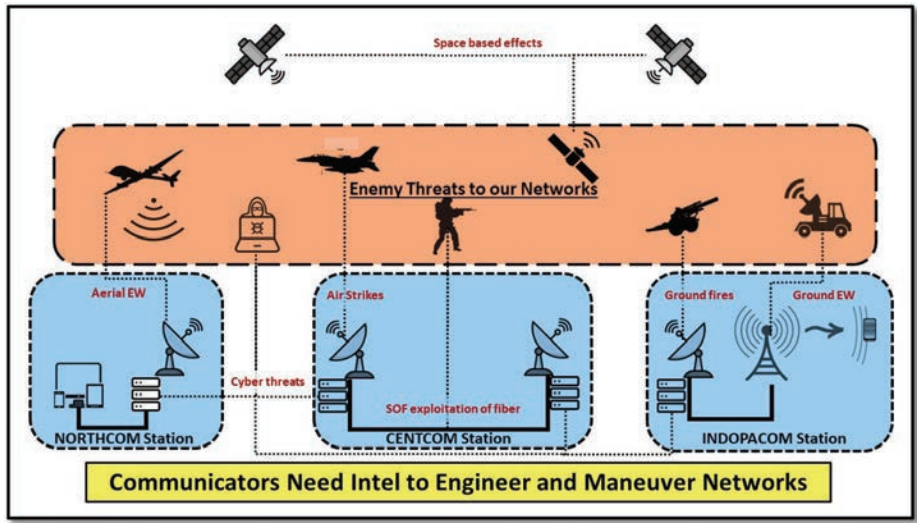


Figure 2. Comm Contributes to IPOE by maintaining global awareness of treats to kill chains.
(Figure provided by author.)

Once the intelligence is provided, once communicators (and their commanders) have an understanding of what the enemy and environment can do to our networks, then we can begin planning our networks to be more resilient to these threats, which will answer the third of three necessary questions: **Question 3: "*How do I assure my C2?*"**

Comm Formations as Sensors and Maneuver Units

A network can be attacked from both the physical and logical layers of cyberspace. The physical layers include the EMS as well as space-based assets. Engineering is the foundational element of establishing a strong defense (and one that can orient potential offensive capabilities in response). Awareness of the enemy's electromagnetic warfare systems should inform the placement of transmission terminals as well as what parts of the EMS we should seek to use.

have our aircraft crash into each other simply by accessing and exploiting our networks.

These questions compel comm formations to do more than just *establish networks, they must maneuver networks.* They must observe actions on networks as potential demand for shifting to alternate satellites, transmission terminals, or digital actions on our servers or routers. The enemy will move. We must anticipate them and be ready to counter those moves.

One way we can counter the enemy is to serve as a forward observer for "fires" in the IE. While comm formations are responsible for defending against threats, they are not (and should not be) responsible for the fires that may respond to those threats. Offensive cyber operations, responsive electromagnetic attacks, or even kinetic fires should all be available to the MAGTF as a counter to enemy attacks on our networks. Like any fires capability, it requires the 3DA targeting model (detect, decide, deliver, and assess). Communications formations must contribute to the 'detect' portion of the 3DA model. (See Figure 3.) Is someone attacking our networks? That information must go to the MEF Information Group for a decision on how to respond, deliver the right fires, and then help with assessments. In order for comm formations to be a forward observer, they must be aware of threats to immediately detect them. This requires intelligence.

Cyber Forces Are Not Enough

Some will say that these problems are solved with the Defensive Cyberspace Operations-Internal Defensive Measures companies. This is a short-sighted argument that does not understand the comprehensive look at vulnerabilities to our entire kill chains. Defensive Cyberspace Operations-Internal Defensive Measures companies are legally restricted to operations on Marine Corps networks. They cannot go outside the bounds of those networks.

This is a short-sighted argument that does not understand the comprehensive look at vulnerabilities to our entire kill chains.

What do we expect them to offer regarding threats from enemy artillery or SOF attacks? Is it appropriate to ask them to help with network resilience to enemy electromagnetic warfare threats or space-based activity? The answer is no. The intelligence we gather can absolutely help orient their capabilities of scanning, hunting, and forensics to help with a defense-in-depth approach to securing our networks. They are a vital and highly skilled portion of a comprehensive approach to kill chain defense, but they can only impact one link within that chain. Additionally, if we have to employ Defensive Cyberspace Operations-Internal Defensive Measures Marines to maneuver on adversaries in our networks, we have already failed because the enemy should not have gotten access in the first place.

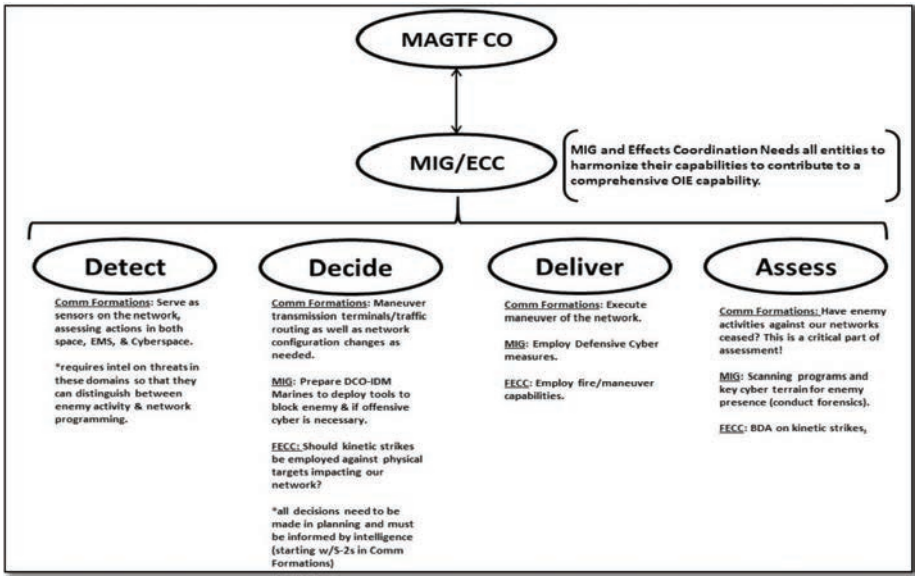


Figure 3. Comm formations in the 3DA construct. *(Figure provided by author.)*

What Do We Do Next? (The Low Cost to Start)

The solutions to this problem are not demanding, but they do require a paradigm shift for both the 06XX community as well as the MAGTF writ large.

1. Comm unit S-2s do not need to be 0202s: When I took command of Marine Wing Communications Squadron 28, I immediately turned to establishing an intelligence officer within the squadron. By the table of organization, my adjutant is an 0602, not an 0102. Guess what, our administration is running great! I decided to do the same with my intelligence officer. 1stLt Leanna Tacik has been doing an incredible job asking questions about threats to our networks and using web-based intelligence from within the MEF and the greater intelligence community to provide our team the necessary knowledge about the enemy and environment to inform our operations in the IE. Anyone with a SECRET clearance can access these web-based intelligence sites.

2. Commanders need to demand actionable IE intel in their IPB: Traditionally, aviation units have focused on the very dangerous threats of enemy aviation and anti-air capabilities; and they can never look away from those threats. However, the enemy's threat portfolio to the MAW has expanded into IE-based threats to the MAW CG's kill chain. We owe our commander awareness of

the specific actions within the IE that can inhibit his ability to launch sorties in support of the MAGTF. Marine Wing Communication Squadron 28 and Marine Air Control Group 28 writ large have taken on the responsibility of orienting on these threats and incorporating them into his overall threat assessment. It is no longer enough for us to establish C2, we must inform the CG of how we plan to assure his C2. The first step to this is accessing intel on what will threaten aviation C2.

3. Expeditionary Network Defense Operations Center (ENDOC): Traditionally, comm units were commanded through a SYSCON (Systems Control Center), which is a network monitoring station that identifies outages on the network and drives troubleshooting. This is no longer enough. While the SYSCONs are vital to the success of any organization, they are focused on administrative troubleshooting. They are not threat informed. Comm squadron or battalion commanders should not be running SYSCONs. Company commanders can do that. Comm formation commanders should be running an operations center that maneuvers networks. This requires an operations center that takes the SYSCON data and intelligence from the unit S-2 and orients choices for MAGTF and major subordinate command commanders to maneuver networks in the face of enemy threats. We have established this as the Expeditionary Network Defense Operations Center (ENDOC). Our ENDOC OIC, 1stLt Daniel Chisner has been running ours in Norway during exercise Cold Response with real-world results. For more on the ENDOC, read the *Gazette* article "Cyber in the Single Battle."

We need to start becoming threat informed.

4. Expansion of the 06XX skillsets: The Marine Corps produces very good communicators who plan and establish networks. This fundamentally requires a background in basic network engineering and an understanding of the Open Systems Interconnection model. What the community is very poor at is discussing the intelligence cycle, targeting, planning, or the MAGTF. Part of this is the paradigm that we are *only* a support MOS. Who are we to demand intelligence? That is for maneuver units! We need to start becoming threat informed. That means a persistent awareness of threats and establishing an S-2 that answers questions we must ask about threats to our units. We must also become relevant in talking about targeting and teaching about how we can be leveraged as forward observers in the IE to orient MAGTF, Joint Force, and interagency fires in this space. These require no new books to be written, it just requires us to pick up some old ones (specifically MAGTF fires, Marine Corps Warfighting Publication on Intelligence Operations, and Joint Pub on IPOE).

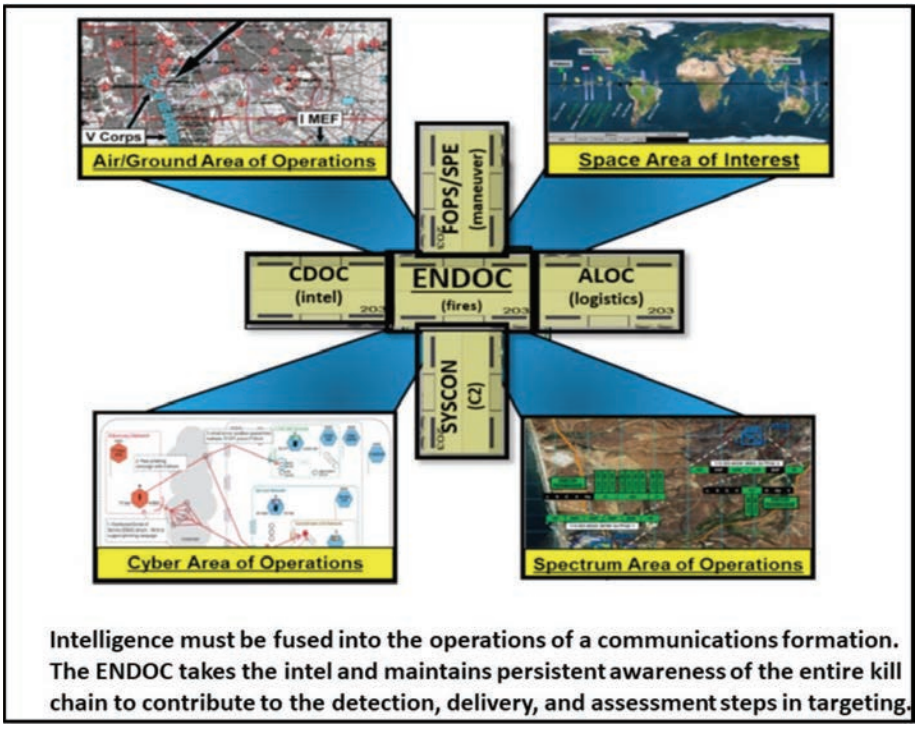


Figure 4. ENDOC consuming intel to anticipate threats and maneuver networks. *(Figure provided by author.)*

Conclusion

Talk is cheap. For too long the communications community has made statements about "abdicating its role" as a maneuver element within the IE. The time has come for us to act. As a Service, the Marine Corps talks a good game about being resilient to threats in this space, how we have developed a model of warfighting that has become reliant on space, cyber, and the EMS. We know these are no longer permissive domains but do not look at them holistically as a collective kill chain. The communications community is uniquely positioned to assess these links. In order to orient resources to protect them from vulnerabilities, communications formations must access intelligence on threats to the Corps' networks. While there are many layers to intelligence within the DOD, for communicators, this process must start in-house by establishing an S-2 within communications formations.

USMC

Chaos in Convergence

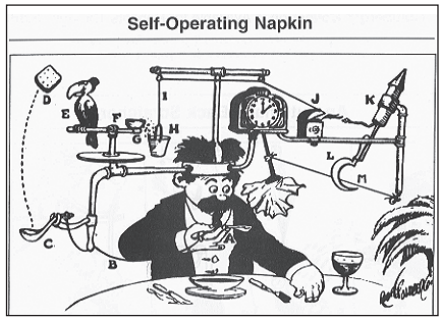
Enhancing the collective understanding and adding clarity to operations in the information environment

by Maj Jonathan P. Schoepf

A Rube Goldberg Machine is an overly complicated and complex mechanism that is effective in completing simple tasks and achieving the desired result. Anyone that has watched any of the hundreds of Rube Goldberg Machine videos on YouTube can attest that these machines are a form of chaos in action. The current Marine Corps, and DOD as a whole, approach to Operations in the Information Environment (OIE) resembles the functionality of a Rube Goldberg Machine—chaotic but results are being achieved. There are varieties of reasons why we are functioning in this way: it is a re-emerging concept with renewed emphasis, the information environment is boundless, and until recently, there was not a dedicated occupation field that focused on the warfighting function. As Marines, we have the innate urge to try and establish an advantage from chaos, sometimes that advantage is in the form of developing order, and sometimes that advantage is learning to deal with chaos. Chaos thrives when it comes to optimizing how the Marine Corps will conduct OIE. Chaos can bring convergence, but to do so, some variables need to change. We need to be specific when developing OIE tasks and we need better guidance, from the top down, regarding what actually needs to be done.

We can control this chaos by being specific on what it is we are trying to do (instead of saying *do OIE*, state the function, domain, and effect that is trying to be achieved or be as specific as feasible) and get rid of what does not work and develop a flexible design that mitigates information entropy.

>Maj Schoepf is the OIE Coordinator for the 22nd MEU.



A "Rube Goldberg Machine." *(Photo provided by author.)*

Recognize the Chaos

Is information an action? Is it a domain? Is it a function? Is it a capability? Is it bits of data? It is seemingly all of those things, to different individuals, and at different times. Within the Marine Corps, no single unit, group, organization, or individual knows what the right answer is—there may not ever be a right answer. OIE is not conducted by any one center or section. What works for one unit may not work for an adjacent unit. One of the key elements is that every unit and Marine must recognize that the operational environment has grown to include the factors (social, cultural, linguistic, psychological, cognitive, technical, and physical) that affect how humans and systems use information, these factors are the information environment. The information environment is a subsect of the overall operational environment and participation is not dependent on whether or not it is recognized that you are a participant in the information environment. There has been a lag in establishing a general understanding of OIE capabilities and purposes amongst the force, and the solution has been to use an ambiguous blanket term that has a wide meaning across meta-physical, technical, and cognitive layers: information.

Christian Brose states in his book, *The Kill Chain*, that "defense reforms tend to fail when they cease to be anything more than vague buzzwords ... If senior military leaders do not define their top problems more clearly, defense buzzwords actually become obstacles to real change because the bureaucracy simply rebrands everything it has long been doing using these new terms."[1] Information is an ambiguous term that is used as a verb, adjective, and noun interchangeably: "Conduct information operations with information in the information environment." At the macro and strategic level, information exists as an instrument of national power. At the operational, tactical, and micro levels, information is a warfighting function that was inducted in 2019. Inigo Montoya would kindly tell us that we keep using this word "information," but it does not mean what we think it means.

Between different publications and manuals, there are a variety of definitions and employment concepts that are proposed: Joint Memorandums, White Papers, *MCRP 1-10*, *TM-EABO*, and *MCWP 3-32* all vary in one way or another. *MCDP 8, Information*, will be released in the Summer of 2022 and

that publication will ideally level the collective understanding to a degree. The MEF Information Groups are all trying different methods to train, man, and equip the force. They are also exploring different employment concepts for Information Coordination Centers and All-Domain Effects Teams. The MEUs are also trying different concepts between each other, varying between OIE Sections, Information and Spectrum Warfare Coordination Centers, and scaled versions of Fires and Effects Coordination Centers. This is being done while trying to understand how to best employ the functions and capabilities of OIE with the Navy Information Warfare pillars. Along with the MEF Information Groups, Information Maneuver Division and Marine Corps Information Operations Command have their own experimentation occurring and at times these efforts seem contradictory. Strategic Communication professionals attend the Defense Information School for their training but are not under the Deputy Commandant for Information. Strong opinions exist on both sides of the aisle on how strategic communication should be integrated with other information professionals and OIE efforts. Expeditionary Warfare Training Group–Atlantic owns the training responsibility for the Marine Corps basic and advanced OIE training but only has informal relationships with Marine Corps Information Operations Command or the Information Science Department of Naval Postgraduate School. This is just within the Marine Corps—add a magnitude of ten when the other Services and the rest of the inter-agency partners are added into the equation. This has the appearance of utter chaos.

Chaos Theory is a scientific and mathematical construct that is comprised of grandiose, eccentric, and boundless principles that, when applied to complex, non-linear problems, can be used as a method to attempt to try and solve those types of problems. Nassim Taleb writes, "We know from chaos theory that even if you had a perfect model of the world, you'd need infinite precision in order to predict future events." A principle within chaos theory is that order is eventually derived from the chaos. Think of this as a Jackson Pollock painting: abstract and random actions independently but when combined the chaos elements cancel each other out, leaving order in the wake. Chaos becomes art.

Adding another layer and using another theory, we can leverage Claude Shannon's concept of information entropy from his Information Theory. Information entropy is the measure of uncertainty in a message. Shannon's theory defines a data communication system being composed of three elements: a source of data, a communication channel, and a receiver. The theory states that the fundamental problem in communication is that for the receiver to understand the source of the data, the receiver must recognize the signal that is generated through the communication channel. Information will naturally suffer entropy, but if the channel is inefficient, more uncertainty and chaos will be added. We are not principally concerned with an information environment but the perceptions about other subjects. The information environment and OIE are meaningless if not observed, and it is to the observers we are principally trying to send our message. We need to speak in specifics to avoid increased information entropy.

Being told to do OIE can feel chaotic, the institutional understanding is overly complex, unclear, and opinionated. The majority of the force knows that conducting OIE is important but lacks fidelity to know what actions need or should be done. As with most things, clear and specific guidance, tailored for scale and scope can alleviate much of the chaos. Simple approaches can achieve significant effects. In order to evolve from chaos, we need this clear and specific guidance on what is actually desired.

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Control and Thrive from Chaos

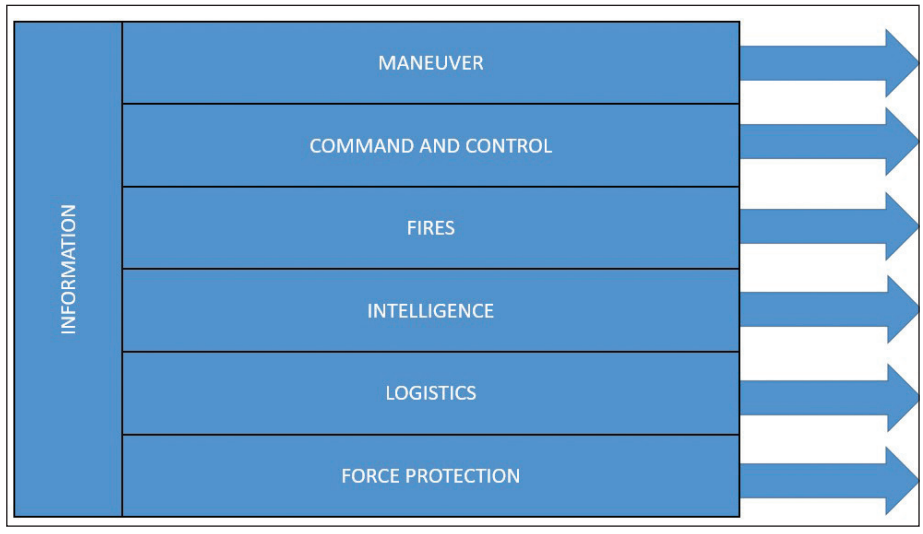
In ancient near-east stories, naming gives purpose. Naming fundamentally brings order out of chaos. It was the power of words and speech that fundamentally brought order. In the same way, operations in the information environment must be appropriately defined. If not, we leave ourselves in a state of chaos. It will not be clear what we are referring to or how. Information's purposes are, as a consequence of being capacity for purpose, fundamental to warfare, namely the functions of warfare. It is not distinct but fundamental to all of warfare. This brings about chaos because of everything we categorize underneath the term information. We blend the cognitive and the technical, the sophisticated and the simple, the clandestine and the overt. This approach may make sense in principle, but it is difficult to execute.

The emphasis on information, and military operations involving the application of information, as a standalone entity has re-emerged in recent years but that does not mean that the functionality of information was absent before it was officially defined as a warfighting function. Like Brose alludes, using the term information is just a rebranding of activities we have always been doing—consciously or subconsciously. Information is meta-physical, psychological, and technical—it relates to everything. Information is meaning. We do not see objects—we see purpose. Think of an object, and the best definition will not be a description of what it looks like but what purpose it serves. The only thing that has changed in recent years is the characteristics of how the DOD can apply information; new layers and expanses have emerged thanks to technology. That has been the case with other functions, but the nature of those

functions remained the same. By creating a warfighting function dedicated to information, we run the risk of isolating the effort and creating stagnation because we will be putting constraints on how dynamic we can adjust our understanding of warfare. Unlike the other warfighting functions, information should not be portrayed as its own linear, standalone function—it should be seen as a qualifier that can be added to the existing functions: information maneuver, information command and control, information fires, information intelligence, information logistics, and information force protection.

Adding information as a qualifier provides necessary context on how information should be applied while also using terms that have a wider understanding. Once the functions are better defined, then the domains must also be clarified. Conflation exists between environments, layers, and domains—all environment aspects can be captured using domains as the primary term. The land, air, maritime, and space domains are relatively straightforward and are primarily physical domains but do possess non-physical dimensions. Sub-domains, or layers, exist under these domains; the land domain will have a subterranean layer; the maritime domain will have subsurface and littoral layers; and the space domain will include the exosphere and outer space as layers. Technical and cognitive domains should be included in the standing domains, and they are primarily non-physical domains but will have physical dimensions. The technical domain would include cyberspace and the electromagnetic spectrum as layers, while the cognitive domain would include cultural and heuristic layers.

When the warfighting functions and the domains are combined, a clearer and more specific task can be conceptualized by the source to the receiver. This approach would provide better clarity on how to organize as a force and how-to information power in different domains. Information will not always be added as a qualifier but when it is, it represents the information environment. For example, maneuver warfare in the land domain represents the overall concept within the operating environment, and information maneuver in the land domain represents the information environment considerations within the operating environment.



The Seven Warfighting Functions. *(Photo provided by author.)*

Ambiguous tasks with buzzwords ... add little benefit.

This approach will not fully control the chaos, but it would be a start. This approach would provide commanders a better structure to help verbalize what it is they want to achieve. In the lack of explicit guidance, OIE efforts tend to be isolated and individually focused. When strong guidance is given, OIE efforts are coordinated amongst the other warfighting functions transparently.

Conclusion

At the micro-level, clear guidance from higher headquarters would go a long way. Ambiguous tasks with buzzwords like conduct multi-domain operations or integrate a layered-IO plan add little benefit. Explicitly say what it is that we are trying to achieve, otherwise some elements will plan OIE just to do OIE. If efforts are being coordinated well, warfighting function leads will include information environment considerations in with their overall plan. Ad-

Operating Environment **Information Environment		Warfighting Functions **Information (qualifier)					
		Maneuver	Command and Control	Fires	Intelligence	Logistics	Force Protection
Domains	Land	Example 1					
	Air						
	Maritime						Example 4
	Space				Example 3		
	*Technical**			Example 2			
	*Cognitive**						
*Technical domain consists of Cyberspace and EM Spectrum – Primarily non-physical							
*Cognitive domain is an addition to match the cognitive environment – Primarily non-physical							
Example 1: Information Maneuver in the Land Domain – Deception Operations							
Example 2: Information Fires in the Technical Domain – Offensive Cyber Operations							
Example 3: Information Intelligence in the Space Domain – Satellite Vulnerability Studies and Procedures							
Example 4: Information Force Protection in the Maritime Domain – Emission Control Procedures							

The interaction of Information with the other Warfighting Functions across all domains. *(Photo by author.)*

ditionally, personal biases and historic operating norms need to be mitigated; S-6 is no longer the only staff section that operates within the electromagnetic spectrum; Strategic Communication, Public Affairs, and OIE can be mutually supporting activities. *MCDP 8* will be a starting point to bring convergence to the chaos. At the macro level, re-establish the U.S. Information Agency. The U.S. Information Agency existed up until 1999. The responsibility of that agency was given to the Department of State. The Department of State is currently responsible for two of the four instruments of national power, diplomacy, and information. If the U.S. Information Agency was re-established or if the Department of State had its manpower capacity increased, there would be better guidance from the strategic level down. That guidance is especially important during competition.

We can rid ourselves of Rube Goldberg-ness by simplifying OIE. We have tried too hard to make it complex. It is the general perception that we are collectively moving in the right direction to better conduct operations in the information environment and information maneuver, but like the Rube Goldberg Machine, we are not efficient and our effectiveness is not maximized. As frustrating as our current practices can be at times, they are allowing us to find successes and failures at faster rates. With a *complete now mentality*, there is limited time to do proper experimentation with controls, variables, and evidence. To determine optimal informational-related standard operating procedures, force structure, employment concepts, and doctrine we must accept and embrace the chaos because the chaos is enabling the Marine Corps to better determine what works and what does not at a faster pace.

... we must accept and embrace the chaos ...

Notes

1. Christian Brose, *The Kill Chain: Defending America in the Future of High-Tech Warfare*, (New York: Hachette Books, 2020).

Through the Looking Glass

Sensing paradigm for 2030

by Col William Brei, USAF (Ret), MGySgt Aaron Hoffman (Ret) & Maj Stacey Rhody (Ret)

>Col Brei served as the Air Force's Imagery Functional Manager and as USEUCOM Imagery and MASINT Architect and Functional Manager, defining mission needs, requirements, concepts of operation, and operational employment for multi-billion-dollar sensing programs.

>>MGySgt Hoffman (Ret), a former SEA to the Director of Intelligence, currently serves as a Government and Military Facilitator.

>>>Maj Rhody (Ret) served as an Intelligence Systems Officer, Requirements Manager, and C5ISR Technologist.

New Era of Increasingly Complex Threats

While the U.S. military engaged in combating global violent extremist organizations since 9/11, the world was evolving at an unprecedented rate. Today, the proliferation of technologies by potential adversaries threatens the Joint Force's ability to access and maneuver within the maritime commons and challenges our unity of effort with partner nations. The *2017 National Security Strategy*, the *2018 National Defense Strategy*, and the *2021 Interim National Security Strategic Guidance* acknowledges this new era of competition in an increasingly complex and violent global security environment and directs a fundamental shift in the national security paradigm from countering global violent extremism to advancing toward rising and resurgent naval powers.

Because of this shift, the Marine Corps' current sensing capabilities and capacities are not able to provide the required situational awareness against pacing threats in a future operating environment characterized by:

1. Unbridled technology proliferation.
2. Return of global maritime competition.
3. Increased gray zone activities.
4. Legacy threats to global stability.[1]
5. Increased reliance on collective action.[2]

Today, the Marine Corps is not fully organized, trained, or equipped to sense, make sense, and provide timely battlespace awareness to decision-makers in an anticipated peer-to-peer operating environment by 2030. The *2019 Commandant's Planning Guidance* explains the CMC's vision for transforming the Marine Corps into a force organized, trained, and equipped to meet the demands of the rapidly evolving future operating environment, fulfilling its statutory and regulatory duties under *Title 10 U.S. Code*. The CMC envisions a force "optimized for naval expeditionary warfare in contested spaces, purpose-built to facilitate sea denial and assured access in support of the fleet."[3]

***All these concepts support the overarching naval concept for* Distributed Maritime Operations.**

One of the foundational concepts of the CMC's Future Force 2030 is described in *A Concept for Stand-in Forces* (SIF). The SIF and its interrelated concepts of Expeditionary Advanced Base Operations and Littoral Operations in a Contested Environment are Navy/Marine Corps concepts approved by the Chief of Naval Operations and the CMC. All these concepts support the overarching naval concept for *Distributed Maritime Operations*. The SIF calls for employing forces to deter potential adversaries by establishing the forward edge of a partnered maritime defense-in-depth presence that denies the adversary freedom of action. The SIF's enduring function will be to help the fleet and Joint Force win the reconnaissance and counter-reconnaissance battle at every point of the competition continuum.

Within these operating concepts, sensing and making sense are critical enablers of battlespace awareness, decision making, and mission success. The ability to observe, orient, decide, and act in faster cycles than the adversary and closure of kill webs is imperative for forces operating inside weapon engagement zones of a peer adversary. Maturing technologies that can be applied in the sensing and making-sense processes will enable more efficient workflows, quicker decision making, and operating concepts such as SIF. Technologies developed for commercial purposes, such

as the Internet of Things, along with low-cost, expendable sensors and platforms, will allow for rapid capabilities to saturate known and emergent areas of interest and generate the sensory data needed for quickly building context and supporting decision making.

Sensing Belongs to all Warfighting Functions

Sensing is not just an intelligence means, sensing is an integral part of and supports all warfighting functions. *Force Design 2030* and operating concepts like Reconnaissance and Counter Reconnaissance, SIF, Expeditionary Advanced Base Operations, Littoral Operations in a Contested Environment, and *Distributed Maritime Operations* constitute a shift in how the service is going to conduct operations, sense, and make sense across the warfighting functions. The change in times, environment, threat, and vision generates new requirements and therefore requires updated resourcing and doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) assessments. The key capabilities for sensing and making sense of collected data will span and impact all Marine Corps military operations by 2030.

The Venn diagram (Figure 1) shows that sensing is only one of the three interrelated aspects of a Service sensing strategy needed to enable *Force Design 2030* and future operating concepts. Inherent in *Force Design 2030* and Reconnaissance and Counter Reconnaissance is the merging of operations and intelligence to "fight for information."[4] Therefore, the capabilities needed in the current and future fight derive from the combination of operations, sensing, and making sense. In this construct, sensing not only serves the intelligence warfighting function but must also be a part of and support all domains and warfighting functions.

Few warfighting acts do not rely on some form of external input or data to be effectively employed. Actuation of influence and action requires an understanding of the mission objectives and the context, commonly referred to as the Five Ws. The context of the environment defines *how* you sense and make sense. Making sense or understanding *what* our sensors are collecting is just as important as the context of *why* a sensor is collecting at that specific *where* and *when* to answer *what* questions. The *who* associated with the emplacement of a sensor is less important than those *who* are using the information collected. The vast quantity of sensor data must be carefully managed to ensure it is authentic, timely, and globally available to sense makers, both human and algorithmic. Commander and user perspectives to these Five Ws are core inputs into DOTMLPF-P assessments.

Marine Corps Combat Development Command, Combat Development, and Integration is charged with developing future operational concepts and determining how to best organize and equip the Marine Corps of the future. CE–Intelligence oversees intelligence matters and contributes to DOTMLPF-P analyses in coordination with other elements. CE-Intelligence conducted a *Sensing 2030 Capabilities Based Assessment* to put critical thought into how the Service can prepare for the Future Force of 2030.

Sensing 2030 Capabilities Based Assessment looks broadly at all warfighting functions across various engagement domains. CMC's Force Design vision, employment concepts, and tactics will shape how the Service will organize, train, and equip operating forces, which must include sensing and sense-making. Well before 2030, Marine Corps Intelligence, Surveillance, and Reconnaissance (ISR) must be upgraded so that it can access and process data from all service and IC sources to gain and maintain situational awareness, develop context, and increase the decision-making tempo for the stand-in forces in the weapon engagement zones and the Expeditionary Advanced Base Operations forces in-depth. Achieving effective and efficient application of sensing and sense-making for the Future Force of 2030 will require an unprecedented level of technology and policy integration.

SENaaS: SENsing as a Service

Sensors simply make measurements and supply data. *Sensing* embeds the sensor and its data into our analytical and decision-making processes. The Marine Corps would benefit from the shift from a sensor paradigm (collect now, analyze later) to a sensing paradigm where sensors are embedded into a system of systems that directly provides meaningful information and automatically responds to needs. Examples of commercial implementation include

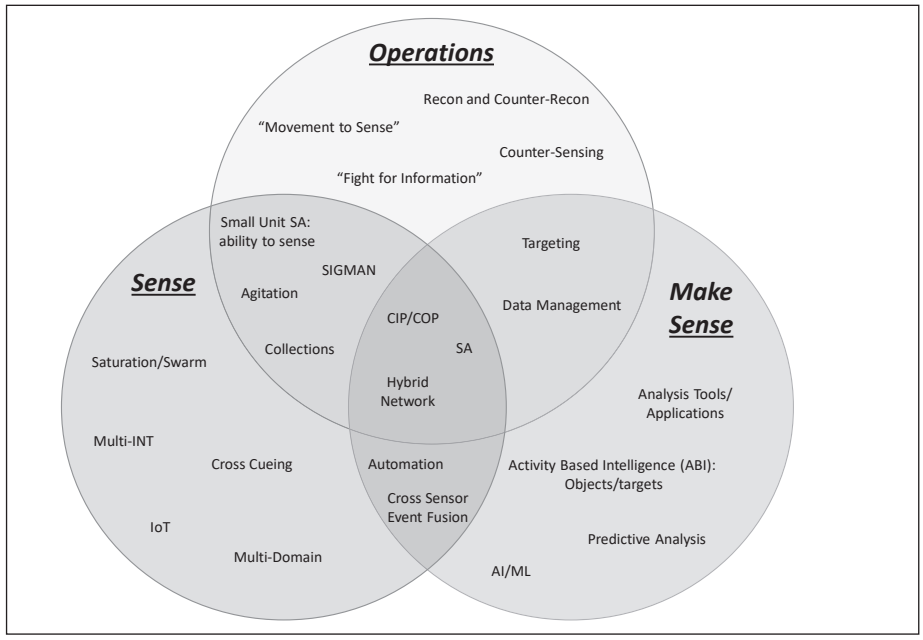


Figure 1. Operations, Sense, Make Sense Venn Diagram. *(Figure provided by authors.)*

Google Maps, Waze, and Apple Maps, in which the sensors are predominantly cell phones providing feedback to automated software status requests and then output contextualized, relevant decision-quality information in near-real-time.

SENaaS combines the concepts of *sensing* and *multi-user services*.[5] SENaaS changes the emphasis from increases in quantity and quality of sensors to the compression of decision loops, support for distributed teaming, and making relevant information discoverable by any authorized user who needs it.[6] Tenets of SENaaS include the embedding of sensors into closed-loop decision systems, automatically processing data with algorithms that output the information that users need, natively feeding AI/ML and streaming analytics, and metadata for accessibility and discoverability across domains.[7]

SENaaS requires multiple avenues for communication and data flow, sustained by redundant, accessible edge nodes that strengthen the sensor mesh and our overall situational awareness. All this information and data presents the opportunity for the sensors to support "sense, identify, attribute, and share," fundamentally fulfilling the processing and exploitation aspects of traditional PED.[8] SENaaS is achieved via multi-sensor integration across interoperable architecture, exchange formats, and flexible infrastructure—best described as a "lattice." While the term lattice can assist in visualizing the network that links numerous physical sensors, relay nodes, and data collection centers together, a critical building block of the sensing lattice concept is at the data level. The lattice differs from traditional architecture and networking because of the assimilation of metatag standards and data context—referred to as meta-cog attributes or metacognition.

Metacognition is generally defined as awareness or analysis of one's own learning or thinking processes.[9] These processes are used to plan, monitor, and assess one's understanding and performance. Machine learning algorithms have metacognition at their core, those of conditional (inferring/predicting) intelligence, procedural (error/loss) intelligence, and declarative (training/learning) intelligence.[10] A relevant example of the implementation of a metacognition-infused lattice includes self-awareness of changes to sensor performance that trigger information veracity metrics and a human-in-the-loop flag for situational review.

A meta-cog enabled lattice within the SENaaS paradigm assumes that all sensors and nodes in the network inherently "understand" their role in the network, with the processing capability to relay information, react to input, alert other sensors, cross-cue collection disciplines, and attempt to circumvent disruptions in communications and the network. However, some nodes will require the extra capability to manage the network more effectively and efficiently; hence the added concept of Digital Surveillance and Reconnaissance Centers (D-SARCs).

D-SARC Enabled SENaaS

Per the SIF concept, Marine forces may be deployed to remote island chains providing "eyes and ears" forward via organic ISR capabilities for the Joint Force. In support, elements of the Marine Littoral Regiment have deployed numerous multi-domain sensors within the environment. These sensors, which include airborne, surface, and subsurface emplacements, form an electronic "lattice." Intra communications between the sensors develop each sensor's "understanding" of placement and function within the network. They have the processing capability to select and relay information, react to input, alert other sensors, cross-cue collection disciplines, and attempt to circumvent disruptions in communications.

This sensor lattice is reinforced with sensor relay stations and nodes, such as floating buoys, to increase communication distances, relay data, and add survivability and redundancy (key aspects of reliability) to the lattice network. Nodes collectively take on the role of the former Surveillance and Reconnaissance Center (SARC) of the Marine Corps Intelligence Operations center as Digital Surveillance and Reconnaissance Cells or D-SARCs. The SARC, and now D-SARC, facilitates multi-INT, cross queuing, and cross-echelon collection operations by managing the network lattice.

SIF operational employment is a layered structure, with the most forward elements being unmanned and the middle layer being both manned and unmanned, characterized by human-machine teaming. D-SARCs would exist in the central layer managing edge collection management and oversight to SENaaS Base Operating Support–Integrator. The D-SARC uses AI to automate routine functions that formerly required a general-purpose tent full of Marines to accomplish. D-SARCs would enable Marines in the forward-most echelons to focus on situational awareness and decision-making.

Sensor-Specific Considerations

Sensors should become multi-purpose, multi-domain, and integrated. Integration of data from sensors with different characteristics offers significant performance benefits over what could be achieved from each sensor separately. Attempting to achieve comparable levels of performance by stove-piped, single-modality design and deployment sensor systems may dramatically increase costs, increase complexity, and might not be attainable.[11]

As a result of the challenges in logistically supporting SIF teams, sensors at the tactical edge must be maintenance-free, readily replaceable, resilient, dependable, and inexpensive on a per-unit basis. Types of sensors that support the implementation of the D-SARC could include micro-fliers. Developed by the academic community for climate studies, microfliers are nano-systems the size of a grain of sand that would provide a radically different approach to wide-area surveillance. When dispensed at high altitude, millions of micro-sensors would create an undetectable, wide-area sensing and low-power microwave communications mesh network drifting across thousands of miles on air currents spanning tens of thousands of feet of altitude. While reporting a variety of atmospherics, micro-sensors could also provide timely warning that aircraft have entered this airspace. Aircraft transiting the microflyer sensor mesh

would be detectable and trackable by the air turbulence along an identifiable vector, even for stealthy aircraft.

Another currently untapped maturing sensing capability is millimeter-wave imaging, which is proving to be a valuable adjunct to visible, Infrared (IR), and X-ray imaging systems. All terrestrial bodies emit millimeter-wave radiation, even "stealth" vessels, and these wavelengths are useful for surveillance imaging through obscuring conditions such as fog/clouds, smoke, dust, sandstorms, and clothing.[12] With this extended visibility, a wide range of military imaging missions would benefit, such as surveillance, precision targeting, navigation, search, and rescue.

Figure 2. Magnified microflyer example. The actual size is 1mm in diameter across the wingtips. *(Figure provided by authors.)*

A civilian industry-driven sensor capability that shows sufficient technical maturity for employment by 2030 is Light Detection and Ranging, also called Laser Detection and Ranging (LADAR) systems. LADAR cone-emanating systems on the ground and in the air create 3d images that can enable the discovery and identification of stealth aircraft, vehicles hidden under camouflage nets, submarines, and the presence of scuba divers from 0.5 meters to 40 meters under the surface, depending on water clarity.[13]

LADAR is effective at detecting and enabling the identification of shallow water submerged vehicles and obstacles, as well as hazards to aircraft with very small radar backscatter cross-sections such as cables and micro-UAVs.[14] LADAR sensing and processing capabilities already serve as candidates for near-term acquisition for integration into air surveillance networks, both ground-based and airborne.

The expeditious nature of the Marine Corps calls for unique service capabilities, but dependence upon Intelligence Community resources makes it imperative the Service embraces a commonly shared lexicon, ensures full data compatibility and accessibility, and eliminates dissemination bottlenecks. Common understandings of terms and requirements will allow the Marine Corps to leverage compatible innovations and incorporate standards developed by sister services and civilian industry. Attainment of SENaaS capabilities requires significant changes. It is vitally important to understand that simply increasing the quantity and quality of sensors being developed and fielded is not sufficient.[15] Certainly, new sensor technologies are needed for detecting signatures not currently detectable with current sensors, but the main line of effort should focus on redefining the sensing and sense-making processes and architectures to achieve vastly greater integration, resilience, and access by automated sense-making algorithms.

Change the Reflection "Through the Looking Glass"

CMC modernization concepts require paradigm shifts across key elements of our DOTMLPF-P. Of critical note is how the service plans to conduct operations, sense, and make sense in the future operating environment, especially operating inside the weapon engagement zones of a peer adversary with small, lethal, low signature stand-in forces. In a fight for information, these forces cannot operate effectively without a superior ability to sense and make sense of the environment. To win the reconnaissance and counter- reconnaissance battle for information, the Service needs disciplined signature awareness and management, multi-domain sensing capabilities, and sense making that reduces the human involvement in generating information for situational awareness and rapid decision making. As per the SIF, the Service must be able to gain and maintain custody of potential targets, complete

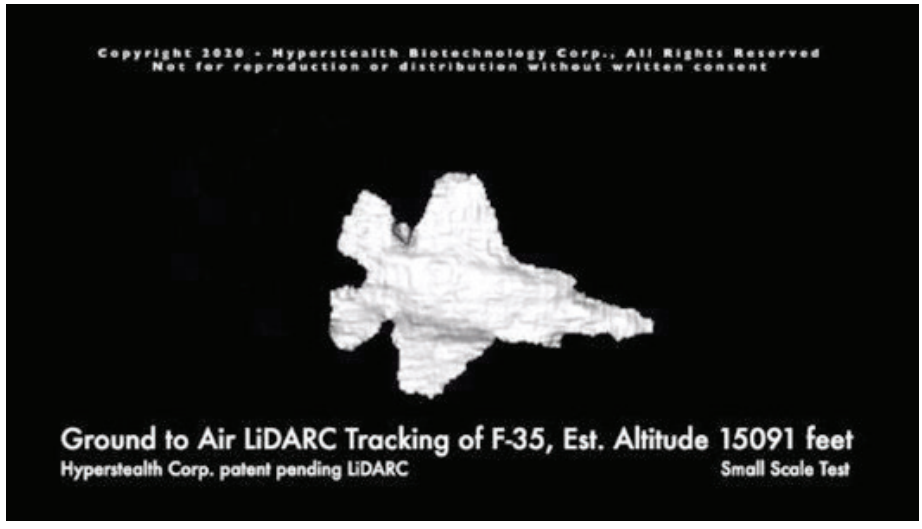


Figure 3. Ground-to-Air LADAR of F-35 at 15000 feet. Used with permission. *(Figure provided by authors.)*

kill webs, and become an important element of the Joint Force ISR.

The Marine Corps should not solely try to solve all the anticipated challenges but increase awareness of other relevant initiatives; seeking to integrate and adopt Joint Force standards. Large quantities of inexpensive but dependable sensors should be acquired rather than investing in costly, exquisite sensor platforms that cannot be readily replaced. The *Sensing Capabilities Based Assessment* identified sensing gaps and possible enhancements for Future Force 2030 and laid the foundation for follow-on acquisition documents to define requirements and identify solutions that can be acquired, adopted, and fielded prior to 2030.

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USMC

Joint All-Domain Effects

Developing capabilities in the Fleet Marine Forces

by LtCol Brian W. Schweers, Maj Nathan E. Diller &
Capt Christopher G. Gibeily

Intelligence reports indicate civil unrest in the vicinity of a U.S. embassy while simultaneously corroborating that a high-value target is moving towards the same location. Trained Marines are dispatched to conduct face-to-face engagements with the protesters, culling necessary information to form dynamic non-lethal effects by informing the local populace through social media and TV/radio broadcasts and dispelling negative sentiment within minutes. Simultaneously, the Marines utilize a sensor web to obtain and process critical targeting information while coordinating a lethal strike on the high-value target, and deliberate messaging is prepared to counter false narratives in anticipation of local sentiment trending negatively. The kill chain is closed with locally sourced sUAS providing intelligence, surveillance, and reconnaissance (ISR) to confirm the location of the high-value target, observe the strike, and provide battle damage assessment (BDA). The deliberate messages are disseminated to the local populace within minutes of the strike, limiting any adversaries' ability to capitalize on disinformation.

The above scenario was recently validated in an exercise incorporating a task-organized All-Domain Effects Team (ADET). The ADET is a future operating concept that was introduced by Maj Corl last September. GySgt Kofsky of 2d Intelligence Battalion also wrote an article in the April 2022 issue of the *Gazette* entitled MIG "(MEF Information Group) Coastwatchers," proposing a concept to combine various disparate MIG capabilities into teams to create more synergistic effects in the battlespace. Since the publishing of Major Corl's article, 2d ANGLICO has created ideas, expanded relationships, and immersed ourselves in experiments to refine the ADET concept, which is also in line with GySgt Kofsky's conceptual framework. This article's purpose is to describe how we have created an intellectual framework, organized for success, conducted experimentation, and developed a way ahead for the ADET.

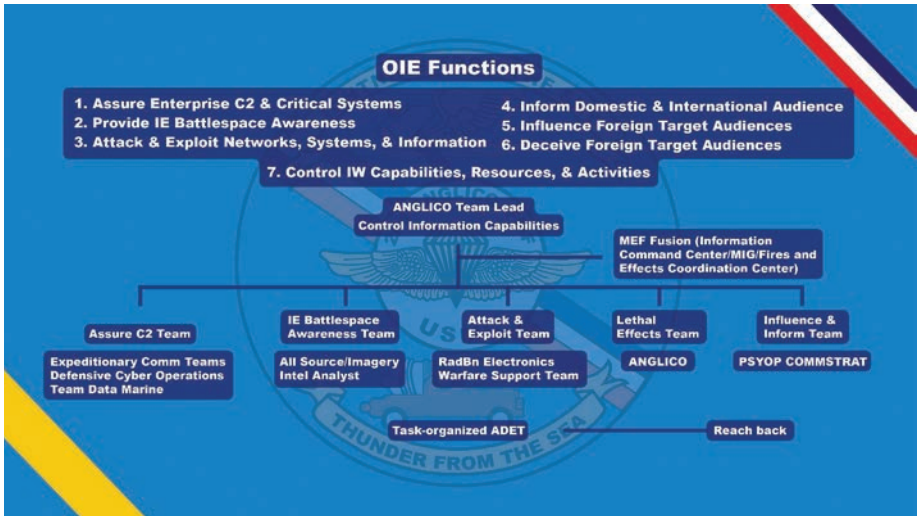
>LtCol Schweers is the Commanding Officer of 2d ANGLICO and a Field Artillery Officer aboard Camp Lejeune, NC.

>>Maj Diller is the Executive Officer of 2d ANGLICO and a Field Artillery Officer aboard Camp Lejeune, NC.

>>>Capt Gibeily is an MV-22 Pilot and Forward Air Controller serving as the 2d ANGLICO Future Plans and Experimentation Officer aboard Camp Lejeune, NC.

This article's purpose is to describe how we have created an intellectual framework, organized for success, conducted experimentation, and developed a way ahead for the ADET.

2d ANGLICO has made great strides in developing an ADET intellectual framework by defining the ADET and developing its basic structure: *ADETs are task-organized forces that integrate Operations in the Information Environment (OIE) with lethal fires to achieve effects across the competition continuum at the forward edge of the operating environment in support of joint, allied, and coalition forces.* We designed the ADET by combining II MIG and subordinate units' traditional mission and roles (seven functions of OIE) with ANGLICO capabilities. The ADET will be led by a 2d ANGLICO team leader or other MIG officer and may be comprised of the following five teams: inform and influence, lethal effects, attack and exploit, information environment (IE) battlespace awareness, and assured command and control (C2). The ADET's assured C2 team allows the ADET to reach back to the MEF fusion cell which consists of the Information Command Center (ICC), Fires & Effects Coordination Center (EEC), and MEF Intelligence Center.



ADET Construct based on integrating the seven OIE functions with lethal fires. *(Photo provided by authors.)*

This concept is a natural evolution from the outdated model of individual MEF Headquarters Group battalions providing stove-piped capabilities towards the MIG providing fully integrated enhanced capabilities. The more we have experimented within the MIG, the more we have realized how little we understand each other's capabilities and how truly asynchronous those capabilities were with the old construct.

2d ANGLICO restructured to incorporate attached informational forces for exercises, increase proficiency required to achieve all domain effects, and increase experimentation. We transitioned from two operational brigade platoons to a single operational brigade platoon and a training brigade platoon. The operational brigade platoon focuses on executing exercises while providing operational ADET leaders and lethal effects teams. The training brigade platoon focuses on training all incoming personnel by executing multiple ANGLICO Basic Courses, developing ADET leaders, and conducting experiments. Additionally, we created a new billet in the operations section dedicated to the ADET future operating concept. With their internally assigned All Domain Effects Team Experimental (ADET-E), this officer drives experimentation and will transition proofs of concepts to the operational brigade platoon.

The ability for officers to coordinate, integrate, and deconflict lethal fires with informational capabilities is the critical foundation to achieving all-domain effects. Recently, we evaluated an officer JTAC team leader versus an officer non-JTAC team leader against team-level ANGLICO Training and Readiness codes and found no difference in their ability to conduct fire support planning, integrate with maneuver forces, establish an observation post, patrol, operate organic C4 assets, or control an assault support platform into a marked landing zone. There were, however, significant differences in fire support coordination and execution, as JTAC team leaders had more difficulty maintaining overall situational awareness and controlling their teams because they were focused on controlling aircraft. Officer non-JTAC team leaders were more responsive in updating the maneuver commander, as well as coordinating and de-conflicting within the team in order to achieve combined arms effects, which resulted in an overall increase in team efficiency.

... JTAC responsibilities have shifted to the 0861 fire support Marines ...

With the above in mind, 2d ANGLICO artillery officers are no longer myopically focused joint terminal attack controllers (JTACs) but are training to be holistic ADET leaders. They now attend MAGTF Operations in the Information Environment Practitioners Course (MOPC), Joint Targeting Staff Course, and Joint Targeting Applications Course. Additionally, JTAC responsibilities have shifted to the 0861 fire support Marines, which naturally augments their career progression and falls in line with the future 0871 MOS, which will require fire support Marines to complete Tactical Air Control Party (TACP) School as a promotion prerequisite.

To increase the capabilities of the inform and influence team, 2D ANGLICO incorporated 24 Marines of Psychological Operations (PSYOP) Company, which had resided in the II MIG Command Element, into an additional brigade platoon. We are integrating these Marines into our training, exercise, and evaluation plan and determining their budget requirements to incorporate them into the company's Fiscal Year 2023 budget submission. Additionally, we have a permanent rotational Communications Strategy and Operations (COMMSTRAT) officer, who is currently developing the ADET inform plan to increase II MEF, Marine Corps, joint, and allied forces' understanding of the ADET concept. This officer is also creating a standard operating procedure to delegate release authority of inform products to the ADET team leader, which will drastically reduce the inform release timeline, and building multiple public affairs guidance products in support of ADET and ANGLICO spring and summer deployment for training exercises.

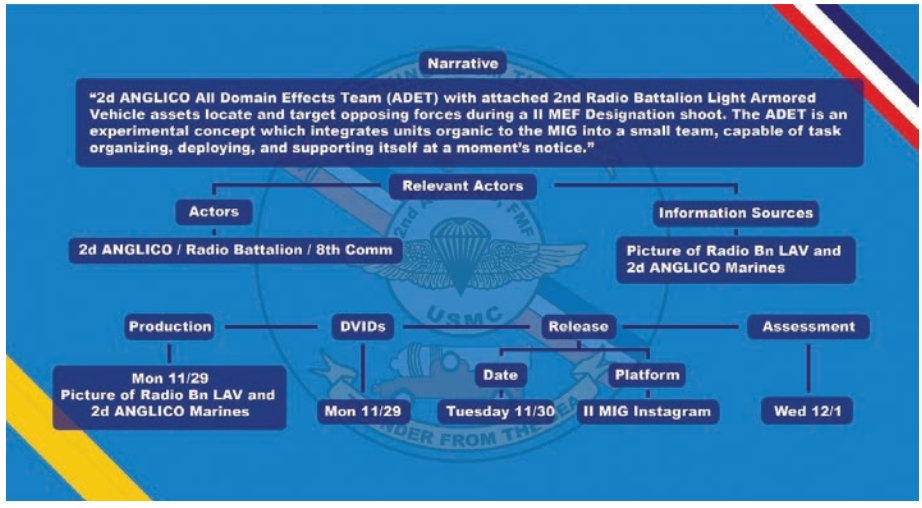
In addition to the above structural changes, we have had several opportunities to experiment with the ADET concept. Last September, exercise JOINT WARRIOR-21.2 validated II MIG's ability to form and deploy an ADET in support of an allied nation. We learned invaluable lessons about the complexities and difficulties in pushing informational capabilities to the forward edge of the operating environment, specifically in maintaining assured C2 and release chain timelines for

inform media products. We were able to quantify social media release chain timelines, integrate attack and exploit teams with lethal effects teams, establish a wideband data network that facilitated reach back to the II MIG ICC, and was then able to provide updated IE battlespace awareness. Additionally, we were able to leverage space support and conduct a Defensive Cyberspace Operations (DCO) Simulated Hacking Response immediate action drill.

In December, we applied the lessons learned from JOINT WARRIOR to a local exercise, in which a full ADET—minus the influence and IE battlespace awareness teams—conducted five days of training aboard Camp Lejeune. To support this exercise, the ADET created an inform plan (vice a full COMMSTRAT production plan), which significantly reduced the full release chain because of the pre-built narrative and timeline that synchronized multiple separate entities. As a result, our assessments of released inform products were significantly faster than during Joint Warrior 21.2.

The greatest achievement during the week was the integration of ADET capabilities into a kill chain. The ADET conducted the normal dynamic targeting cycle of find, fix, track, target, engage, and assess but added inform and influence by releasing the lethal effects results on social media. This was a major step in changing the traditional mindset of being solely focused on physical effects in the battlespace. The narrative is now much more relevant and applicable because of the advent of social media in the battlespace. A ground team observed the enemy battery while on the move which cued the attack and exploit team to locate the battery in a static location. Multiple Line of Bearings (LOBs) confirmed a general location of the battery which cued an sUAS that positively identified the battery. The lethal effects team coordinated attack aircraft and the sUAS was used to record the results of the attack. The pre-and post-attack pictures from the sUAS were quickly processed, loaded, and disseminated on social media with the use of data services established and maintained by the assured C2 team. Since this was

An attack and exploit team and lethal effects team operating together at Cape Wrath, Scotland, ISO JW 21.2. *(Photo provided by authors.)*

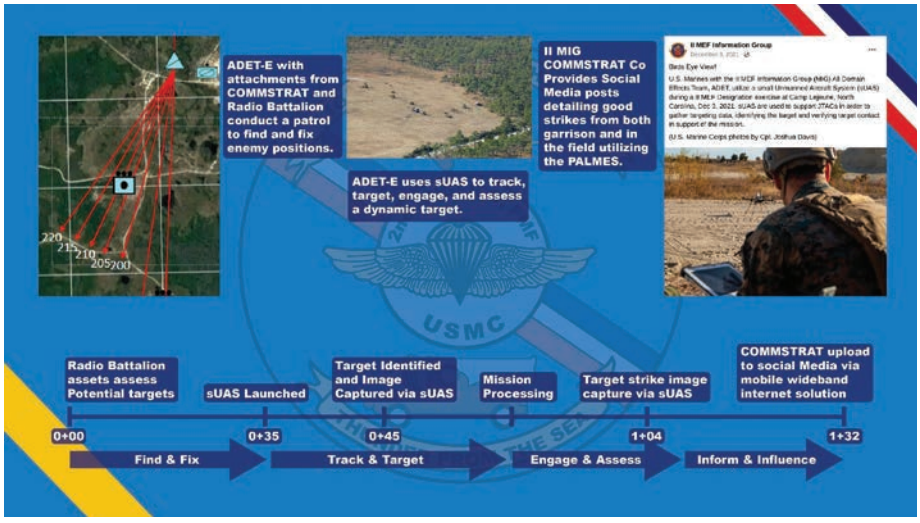


Example of an inform plan for a signal narrative. *(Photo provided by authors.)*

a training enviroment, the targeting process was done in multiple stages. Once the stages were placed together, we concluded that it took roughly 1.5 hours to complete the entire targeting chain, including the inform and influence chain. The attack pictures were released on social media within 27 minutes of the sUAS landing, which was a drastic improvement from previous iterations.

The greatest achievement ... was the integration of ADET capabilities into a kill chain.

The opening vignette of this article described the results of a training exercise coordinated by the 2D Intelligence Battalion and supported by an ANGLICO ADET. This exercise had numerous firsts for the ADET. With the new PSYOP brigade platoon, the ADET formed a full inform and influence team with II MIG COMMSTRAT Company support. The ADET utilized



ADET implementation aboard Camp Lejeune, NC, with Attack and Exploit and Inform and Influence teams. *(Photo provided by authors.)*

the Information Operations Network (ION) to create a simulated network and replicate websites, social media outlets, and news articles, which allowed the inform and influence team to increase proficiency and experiment with emerging tactics, techniques, and procedures. The ADET also worked with numerous 2D Intelligence and 2D Radio Battalion personnel to better understand the forces and equipment required to truly integrate lethal effects with informational capabilities.

Replicating an IE is one of the primary challenges for ADETs to conduct realistic training. There are tools and resources such as ION which utilizes simulated Facebook, Twitter, and traditional media site posts to allow for force-on-force training in a simulated IE. These platforms, however, have shortfalls that need to be addressed and funded to enhance operability and the degree of benefit to the user. Moreover, these tools are limited to simulated social media posting and do not provide opportunities to incorporate lethal fires or other informational capabilities. What is needed from the Service is a dedicated effort to foster experimentation by creating more realistic training environments focused on combining lethal fires with informational capabilities. At a lower level, additional training for ANGLICO radio operators should be sourced and funded, and seats to courses such as the MARSOF Network Operators Course should be opened to further enhance their ability to set up wideband networks and manage friendly force signatures. Finally, more opportunities for experimentation with lethal fires and informational capabilities should be built into unit training, exercise, and evaluation plans, identifying space and allocating resources to allow Marines to integrate with other units in an environment solely focused on experimentation.

This summer we will send the current model ADET-E to two joint exercises ...

Moving forward, one of our imperatives is increasing the speed of understanding of ADET capabilities. To increase the speed of learning we need to increase our experimental immersion within simulated informational environments while operationally validating those capabilities in live environments. To accomplish this we need to transition from the current experimentation model of informal working relationships with the II MIG battalions to establish a permanent ADET-E that is comprised of attached rotational personnel from the II MIG battalions. This ADET-E will be solely focused on experimenting to increase knowledge and understanding of potential ADET capabilities. Furthermore, we are exploring additional exercise opportunities and developing a deliberate experimental employment plan. This summer we will send the current model ADET-E to two joint exercises and are exploring opportunities to participate in events such as MAGTF Warfighting Exercise or exercises at the Joint National Training Center. We are also going to increase the operational employment of ADETs through participation in multiple overseas combined exercises with allies and partners. Finally, we are exploring opportunities to employ ADETs in support of Reconnaissance Counter-Reconnaissance and MEUs. While we continue to experiment, we will also begin to codify the core competencies, Mission Essential Task List, mission statement, and Table of Organization and Equipment to eventually present the ADET concept to HQMC.

Over the past five months, II MIG and 2D ANGLICO have made significant progress in advancing the ADET concept through creating an intellectual framework, structurally reorganizing, and putting the concept into practice through experimentation. Many lessons have been learned, and the results have thus far been encouraging. However, there is still much work to be done in order to validate and formalize the ADET as a true capability. If done right, future experimentation, along with additional structural changes and support for the concept from the service level and below, will demonstrate that the ADET is the Marine Corps' bid for success to achieve joint all domain effects at the forward edge of the operating environment and across the competition continuum.

USMC

Redefining Radio Battalion's Role in 2030

Extending enterprise operations

by Maj Allison Warwick & MSgt Joshua Caruso

The ever-changing character of war requires Marines to constantly overcome organizational challenges to outpace our enemies and prevail in great power competition (GPC). As GEN Mark Milley, Chairman of the Joint Chiefs of Staff, emphasizes: "failure to recognize, adapt, and capitalize on the changing character of war, and failure to see the future produces devastating consequences."[1] Considering the implications of modern-day warfare, current and future Signals Intelligence (SIGINT) force employment considerations require adaptation to the rapidly evolving modernization within the operating environment (OE). Marines remain a force-in-readiness to support combat and contingency operations; however, absent large-scale, long-term conflict, the Marine Corps needs to adjust to support operations in competition (Phase 0) with near-peer adversaries by defining, supporting, and applying appropriate force employment considerations. 2d Radio Battalion's operations in GPC require the extended Intelligence Community (IC) and the Marine Corps Intelligence Surveillance and Reconnaissance Enterprise (MCISRE) to understand the OE while seeking opportunities to influence or shape the OE in favor of the MEF CG's priorities, all while maintaining alignment with and support to the operationalization of MEF Information Group capabilities.

>Maj Warwick is a MAGTF Intelligence Officer and graduate of the Junior Officer Cryptologic Career Program. Following internship completion in 2020, she executed a follow-on assignment to 2d Radio Battalion, II MIG, II MEF where she is currently the Operations Officer.

>>MSgt Caruso is a Signals Intelligence, Electronic Warfare, and Cyberspace Operations Chief currently assigned to Information Warfare Company, 2d Radio Battalion, II MIG, II MEF. He has deployed multiple times, serving in billets ranging from Squad Leader of a Scout Platoon to a Signals Intel/Electronic Warfare Chief.

Characteristics of Modern Warfare

Technological advancements force decision makers at strategic, operational, and tactical levels to modernize, adapt, and overcome adversary innovations by increasing friendly, flexible response planning and employment options. As warfighting professionals, change is inherent in our nature. New social, cultural, political, and informational platforms offer innovative means of shifting the narrative, providing numerous methodologies to defeat the enemy's will to fight.[2] Understanding the implications of a data-rich, interconnected, global OE can help us identify opportunities for exploitation. An opportune prospect to leverage for manipulation against our enemies, our technological edge as tactical professionals—complemented by the appropriate balance of national-to-tactical integration, partner collaboration, and combatant command collaboration—assists us with expediting support to the warfighter. Modern warfare also calls for increased partner collaboration to extend global reach and influence, streamlining processes ahead of the next crisis or contingency response. Given processing and global reach limitations, partner force integration is essential to mitigate the challenges of modern warfare. More dynamically, mobilizing partner forces to deter similar adversaries buys down the risk to U.S. forces in support of the U.S. *National Defense Strategy*. Tacit in building partner capacity and strengthening military-to-military partnerships are effective command and control (C2), communications architecture, and information-sharing procedures.

Increase Flexibility with Extended Enterprise Operations in Competition

The current and future OE demands the utility of an extended enterprise and distributed operations. U.S. national intelligence agencies execute enterprise operations fluently; it is time the Marine Corps speaks this language and applies similar concepts to tactical SIGINT support operations to advance the MCISRE and expedite support to

the tactical warfighter. Extended enterprise operations require solidified communications architecture as well as C2 fundamentals for success. The footprint of actively engaged forward troops in a GPC fight shrinks to require only those necessary collections assets and personnel to execute mission support, dictated by theater- and national-level collection posture. Active troops within the respective geographic combatant command operate to satisfy the MEF CG's priority intelligence requirements; additionally, the Director of the National Security Agency/Central Security Service uniquely delegates tactical SIGINT authorities to Marines as a component of the overarching U.S. SIGINT System. Based on our placement and access, Marines also contribute to answering national security and foreign policy requirements, as dictated by theater- and national-level gaps in collection, processing, and analysis. As such, tactical SIGINT collection answers tactical, operational, and strategic priorities; warfighters should seek to fill collection gaps at all echelons of warfare in GPC to enhance national-to-tactical integration and improve interoperability standards. Further, clearly defined and codified relationships between the respective Joint Task Force and corresponding combatant command promote integrated, federated efforts to support the intelligence enterprise.[3] Deliberate and collaborative planning cycles outside of combat operations will ensure proper Marine Corps SIGINT integration with joint, theater, national, and partner forces, avoiding unnecessary redundancies or stove-piped efforts.

Complementing the need for a tailored forward-deployed presence in GPC SIGINT operations, there is a growing requirement for more remote processing power, which Marines can accomplish in a garrison environment. Applying greater emphasis on processing massive quantities of existing data within national-level databases will amplify our understanding of the adversary at the tactical level. In comparison to the Global War on Terror against unconventional adversaries, near-peer adversaries are increasingly sophisticated and leverage a significantly larger portion of the electromagnetic spectrum than SIGINT Marines are familiar with prosecuting. The Marine Corps must take advantage of the relative stability of current peacetime operations in competition to expand our analytics capabilities and improve our ability to leverage the current data-rich environment to prepare for combat operations.

Modernize SIGINT Support Employment in Competition

The force employment considerations of competition-focused tactical SIGINT collectors should prioritize integration with theater and national collection strategies to amplify the value of collection operations. Absent combat-driven, rapid timelines, operations in competition should seek opportunities to enhance partner collaboration and integration; improve joint communications and interoperability standards; and test new equipment and employment considerations ahead of the next major conflict. Integration and synchronization of sensors within the OE are vital to operations in competition and combat. The traditional mechanism of employing radio battalion collection elements needs to shift from practices established during counter-insurgency operations to practices that address GPC threats. In the counter-insurgency operations environment, commanders placed sensors within maneuver elements because the sensors provided positive identification of non-uniformed enemy combatants. As such, combat troops designated sensors to exploit communications aiding in the identification process of the targeting cycle. However, in the GPC radio battalion, collection elements provide two critical functions: contingency sensing capability in a communications-degraded environment and contribution to the Joint Force and the greater IC's understanding of the OE by filling collection gaps. In an environment where communications are stable, the radio battalion collection element should provide targeted, tailored collection on signals for which collection does not exist thereby enabling the MCISRE to compliment the Joint Force by leveraging placement and access to fill national collection gaps. To achieve this end state, radio battalion collection elements require sensors that are both capable of sensing signals that are otherwise uncollected and feeding targeting systems. To this end, the Marine Corps is pursuing a program of record capabilities within interoperability standards to enhance combat abilities. Defining, supporting, and applying force employment considerations in GPC will enhance theater-level partner and Joint Force relationships in peacetime—diminishing the learning curve for interoperability in combat.

The Marine Corps must take advantage of the relative stability of current peacetime operations in competition to … improve our ability to leverage the current data-rich environment …

Maintain Readiness of Combat Support Employment Mechanisms

Despite room for growth in employment methodologies in competition, we still need to remain postured to support operations in combat. The Infantry Battalion Experiment at II MEF is currently progressing critical combat SIGINT collection and support capabilities in practice, particularly adapting to degraded communications environments to condense the sensor to shooter timeline. In a communication-degraded environment, tactical radio battalion collection elements would fill a critical capability gap to enable targeting efforts with organic sensors. The ability to expeditiously enable "kill web tempo and agility" provides the commander

with an immediate and seamless transition from competition to combat operations.[4] In combat, a sensor-rich environment can offset losses or degradation in theater- and national-level collection. Just as in competition, combat operations require radio battalion collection elements to maintain sensors that are capable of sensing the same signals as theater- and national-level collection assets while also feeding the same targeting systems.

Collection management responsibilities within each MEF and corresponding intelligence-enabling functions are essential to providing force protection and support to lethal kinetic targeting efforts in combat. Effective SIGINT employment requires Marines to identify losses of or gaps in national or theater sensing capability, prioritize signals for which collection does not exist, and employ radio battalion elements in locations suitable for collection. This methodology presents a significant shift in how the Marine Corps traditionally mans, trains, and equips radio battalion collection and analytic elements for employment in combat. It forces radio battalion collection elements to fill gaps in collection at specified locations and not solely based on the locations of friendly maneuver elements. It also forces radio battalion analytic elements to employ a sensor-agnostic processing, exploitation, and dissemination process that satisfies mission requirements in the form of information needs, vice an organic-sensor processing, exploitation, and dissemination process, increasing the Marine Corps' reliance on partner mission elements to continue to processing, exploitation, and dissemination collection within the scope of their mission.

Essential Tenants for Future Success

An increased focus on technical training and education of the force will advance Marine Corps SIGINT support functions in modern-day warfare. A deep technical reserve allows the Marine Corps to swiftly navigate through the OE in crisis response and to integrate multi-domain activities essential for victory in competition. In today's fight, a Marine's ability to cull the right targetable information from a database is just as critical as the ability to fire an M4 in combat. Improving technical skills such as analysis, critical thinking, data management, and interoperability standards, along with corresponding enabling policies, will advance Marine Corps operations. Present and future adversaries will engage us across cyber, space, and information warfighting domains to degrade our abilities to operate in traditional warfare domains. Technical proficiency is the first step to enabling advanced interoperability, networked capabilities, and expedited threat response mechanisms. We should not only embrace remote capabilities, but we should look to develop, share, and sharpen correlated technical skills in order to assimilate capabilities into operational planning with the overall intent to support national strategy.

... our adversaries rapidly close the gap from a technological standpoint.

The commander's priority intelligence requirements and information needs, which assist intelligence Marines with sifting through immense quantities of data in support of the MAGTF commander, are essential variables of success for Marine Corps intelligence support entities. As we onboard unique information warfare capabilities within the MEF Information Group, defining requirements for collection, production, and targeting efforts will further refine specific areas of focus for application to the extended enterprise. Additionally, the MCISRE requires a centralized collection management cell to oversee requirements in operational mission parameters for the multitude of globally employed tactical SIGINT professionals. One potential solution at the MEF level is to employ a MEF Cryptologic Resource Coordinator (CRC) to manage all cryptologic resources, collection disposition, coverage, sanitization, requirements, and priorities.[5] Interoperable with theater and national level entities, the CRC (a traditional Navy construct) manages the planning, direction, and execution of SIGINT operations as the liaison between tactical, theater, and national agency coordination efforts. While remaining networked to the national level and combatant command SIGINT operations, the radio battalion commander or his delegated representative as the CRC would de-conflict SIGINT resource management to prioritize II MEF information needs in collaboration with the Intelligence Battalion Commander as the Intelligence Support Coordinator. The CRC would provide SIGINT collection management to the MEF to ensure proper employment of the radio battalion's organic assets. As we look to potential future conflicts, one overarching theme vocally prevails throughout our training, battle simulations, and exercises: our adversaries rapidly close the gap from a technological standpoint. Knowledge of this theme should drive a sense of urgency in our ability to educate, train, and retain Marine SIGINT professionals.

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Title 10 Versus Title 50

Authorities and permissions for persistent presence

by Col Matt Rau, Maj Dan Alcantara, & Mr. Jay Confer

>Col Rau is the Capability Portfolio Manager for Intelligence, Surveillance, and Reconnaissance at Combat Development and Integration.

>>Maj Alcantara is the Operational Law Advisor to the Deputy Commandant for Information.

>>>Mr. Confer is the Director of the Marine Cryptologic Office at Fort Meade.

If you missed the memo, the operational environment is changing, and the Marine Corps is designing a force to meet future challenges. Just consult the Commandant's May 2022 *Force Design Annual Report*: our adversaries and technology are rapidly advancing, but the policies governing how we counter and interact in this new environment are lagging. Though tagged onto the end of doctrine, organization, training, materiel, leadership and education, personnel, and facilities-policy (DOTMLPF-P), policy is by no means the least of the considerations for Force Design. The Functional Concept for Maritime Reconnaissance and Counter-reconnaissance (RXR) asserts a dependency on obtaining authorities and permissions to establish a persistent presence for conducting operations, activities, and investments as part of integrated deterrence. Commanders and operators in the maritime RXR force will have to navigate the shoals of overlapping statutes and policies. Continued transformation of the Marine Corps as well as success on missions across the globe and the competition continuum require demonstrated competency in current authorities and active collaboration with departments and agencies to modernize procedures and establish new policies.

This is not legal advice but a primer on a complex topic that should begin with whether or not a given unit has a mission to perform specified activities and who tasked the unit/to whom is due the information from the activities.

Title 10 and Title 50 come up regularly in many of Combat Development and Integration's integrated planning teams and synchronization sessions for Force Design. A common understanding of the fundamentals across the force sets the conditions for change.

Commanders and operators in the maritime reconnaissance–counter-reconnaissance force must understand overlapping authorities and policy. *(Photo by Lt Cmdr Donnell Evans.)*

What is Title 10? The aftermath of U.S. military failures in the late 1970s compelled a reorganization of the DOD structure. Relationships, authorities, and funding were reorganized in a seminal piece of legislation. The Goldwater-Nichols Department of Defense Reorganization Act of 1986, amended federal armed forces provisions to set forth the organization of the DOD, clarified the military's chain of command, and enumerated general military powers. This legislation also complemented defense authorities given to the DOD in the National Security Act of 1947 regarding authorities to conduct traditional military activities, including intelligence activities and operations.

What is Title 50? Where Title 10 is devoted to activities of the military,

Title 50 governs national intelligence. It is a statutory codification of the National Security Act of 1947, setting forth as law the reporting and oversight of covert and intelligence activities, including those of the Central Intelligence Agency, National Security Agency, National Geospatial-Intelligence Agency, National Reconnaissance Office, and the Defense Intelligence Agency. However, the military necessarily plays a role in national intelligence. The Secretary of Defense consults with the Director of National Intelligence to "(3) ensure that the tactical intelligence activities of the Department of Defense complement and are compatible with intelligence activities under the National Intelligence Program; (4) ensure that the elements of the intelligence community within the Department of Defense are responsive and timely with respect to satisfying the needs of operational military forces."

Whereas statutory authority is codified in Title 10 and Title 50, it is implemented by the Executive Branch in policy; hence, Executive Order 12333 articulates how the President as Commander in Chief and Chief Executive exercises his power. Generally, the Under Secretary of Defense for Intelligence and Security in coordination with the Director of National Intelligence and directors of the intelligence agencies listed previously implements the executive policy and statutes in local policy. That implementation is complicated and layered. However, Executive Order 12333 has as its goal the provision of the best intelligence to develop and conduct foreign, defense, and economic policies and the protection of U.S. national interests. It directs that all departments and agencies cooperate fully, even ensuring that national intelligence is disseminated immediately to appropriate government elements, including military commands. The aforementioned goal aligns with the focus of the Marine Corps as an RXR force.

With a fundamental understanding of the complementary aspects of Titles 10 and 50 as well as the shared goal of Executive Order 12333, and given that "the enduring function of the Stand-in Force (SIF) is to help the fleet and Joint Force win the RXR battle at every point on the competition continuum," consider the following implications:

- *Platforms or units operating under Title 50 authorities are collecting intelligence for intelligence's sake and are not satisfying commanders' requirements.* Not necessarily true and potentially even less true for integrated deterrence. To compete and be a credible deterrent, the SIF must collect intelligence to support tactical requirements. Given the placement and access of those forces, satisfying the tactical commanders' requirements under Title 10 will almost certainly meet national requirements, be they geospatial intelligence, human intelligence, or signals intelligence, for the various agencies in the Intelligence Community. This illustrates the complementary nature of the statutes.
- *To avoid issues with collecting information or conducting intelligence activities under either Title, units can employ non-intelligence members.* Intelligence collection is purpose-driven. If the purpose of the activity is intelligence or intelligence-related, it is similarly governed regardless of the collector. Moreover, the SIF risks encroaching on the mission or responsibilities of another organization that has such authorities for non-intelligence members and could result in denial of authorities, permissions, and even placement, for the SIF.
- *Intelligence often has no real strategic-military impact.* Not true. The CMC asserts that the SIF must be able to move fluidly back and forth across the conflict threshold of competition without culminating—able to escalate and deescalate. Intelligence allows dynamic and current information to flow to decision-makers, military and political alike, to move the Corps across the continuum. For example, if a force of small, widely dispersed units inside an adversary's weapons engagement zone has strategic deterrence value and could collect intelligence under either authority, then their tactical intelligence requirements have higher-level national intelligence value and could be collected under either authority. So, what is collected for intelligence preparation of the operational environment may span across Title 10 and Title 50 boundaries.
- *Processing Intelligence is irrelevant.* How intelligence is collected and processed may come under the purview of an agency for several good reasons—coordination, standardization, and veracity—to widely disseminate the best intelligence. As the SIF demonstrates competency and transparency with authorities and partner agencies, it gains trust. Competency and trust along with the value that the SIF offers will facilitate coordination or help transform policies to enable the force to conduct intelligence operations and collaborate in processing and production.

"Title 10 and Title 50 are mutually-reinforcing authorities, not mutually-exclusive authorities; these statutory authorities may even be exercised simultaneously by personnel under the command and control of the Secretary of Defense. Labeling some intelligence activities 'Title 50' activities while labeling similar activities 'Title 10' activities creates a distinction where the law does not. Importantly, the statutes make distinctions based on direction, control, and funding—not on nomenclature."

—Andru Wall

• *The SIF will not have a significant role in monitoring gray-zone activities.* The proposed 2022 Intelligence Authorization Act acknowledges the new forms of competition and threats from adversaries using tactics that fall on a spectrum between ordinary statecraft and open warfare. The Marines' SIF may be called upon in the future to serve as a forward-postured sensor to provide reporting on foreign adversary use of gray-zone activities to enable the greater IC's assessments. The same Act contains a provision mandating a National Intelligence Estimate that uses the IC's classified reporting to describe how foreign adversaries use gray-zone activities to advance their interests and assess what U.S. responses would cause our adversaries to escalate—or deescalate —that activity.

The list of issues is not exhaustive, and detailed examples will be classified. The purpose here is to begin the discussion and increase the education. You are the reconnaissance and counter-reconnaissance force of the near future. Know the policies; be conversant and train in their related procedures; ask questions, even if you may not want to hear the answer. (Asking permission, in this case, is better than begging forgiveness.) Consult your operational law experts and liaisons within the various agencies or country teams. For more information:

You are the reconnaissance and counter-reconnaissance force of the near future. Know the policies ...

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USMC

Intelligence Support to *FD2030*

Analysis of Azerbaijan's performance in the 2020 Nagorno-Karabakh War

by Sgt Tuvia Sokoloff

"Learn and adapt, or lose to those who do."[1]
—Dr. Alexander Kott

The Marine Corps has shifted its focus toward expeditionary naval warfare and is aligning with the *National Defense Strategy*. In doing so, the Corps has adopted *Force Design 2030 (FD2030)* as a ten-year modernization plan to restructure the force for competition.[2] While the current 2022 Russia-Ukraine conflict occupies the public's attention, much can be learned from a lesser-known war occurring in the latter half of 2020: the Second Nagorno-Karabakh War. This was a regional conflict fought between Armenia and Azerbaijan with potential strategic consequences, affecting the dynamic between Russia, Turkey—a NATO ally—and potentially, Iran.[3] Lasting only 44 days, it culminated in a decisive victory for Azerbaijan. On the surface, a regional conflict in the Southern Caucasus does not seem relevant to naval concepts like Expeditionary Advanced Base Operations or Littoral Operations in a Contested Environment. There are, however, significant lessons for intelligence and operations personnel that can be learned on the importance of *FD2030*, intelligence support to planning and targeting, and the need for forces to practice signature management (SIGMAN) and force protection in the validation of *FD2030*.

>Sgt Sokoloff is an 0231 Intelligence Specialist. He is currently on staff with the Advanced Training Department, Marine Corps Tactics and Operations Group in Twentynine Palms, CA, filling the billet of 0233 Intelligence Tactics Instructor.

Nagorno-Karabakh: A Primer

Nagorno-Karabakh is a mountainous region in West Asia contested by Armenia and Azerbaijan. Both countries, as well as Georgia, compose the South Caucasus Region. The South Caucasus is located between the Caspian and Black Seas and is bordered by the Greater Caucasus Mountain Range and Russia to the north and Turkey and Iran to the south. Prior to Armenia and Azerbaijan's incorporation into the Soviet Union, they fought over Nagorno-Karabakh in 1917 and then again in 1991 after the dissolution of the Soviet Union. While a part of the Soviet Union, Nagorno-Karabakh was administered as an autonomous region of Soviet Azerbaijan. From 1991–1994, Armenia and Azerbaijan engaged in direct conflict over Nagorno-Karabakh, resulting in Azerbaijan revoking Nagorno-Karabakh's autonomous status and the First Nagorno-Karabakh War.[4] This conflict culminated in an Armenian victory and the establishment of the independent Republic of Artsakh, although it was not formally recognized by any other nations, including Armenia.[5] The First Nagorno-Karabakh War resulted in Armenian/Nagorno-Karabakh forces controlling most of Nagorno-Karabakh, as well as several territories surrounding it, amounting to about fourteen percent of Azerbaijan's land area.[6] Azerbaijan's growing strategic relationship with Turkey, based on strong cultural, religious, and economic ties, would become crucial in the lead-up to the Second Nagorno-Karabakh War.[7]

While the current 2022 Russia-Ukraine conflict occupies the public's attention, much can be learned from a lesser-known war occurring in the latter half of 2020 ...

Force Design

Azerbaijan's force design prior to the 2020 conflict shows marked parallels to the changes advocated for by the CMC, Gen David Berger, in his 2019 *Commandant's Planning Guidance*.[8] This overhaul played a significant role in defining how Azerbaijan both prepared for combat and fought during the Second Nagorno-Karabakh War. From 2010–2020, Azerbaijan con-

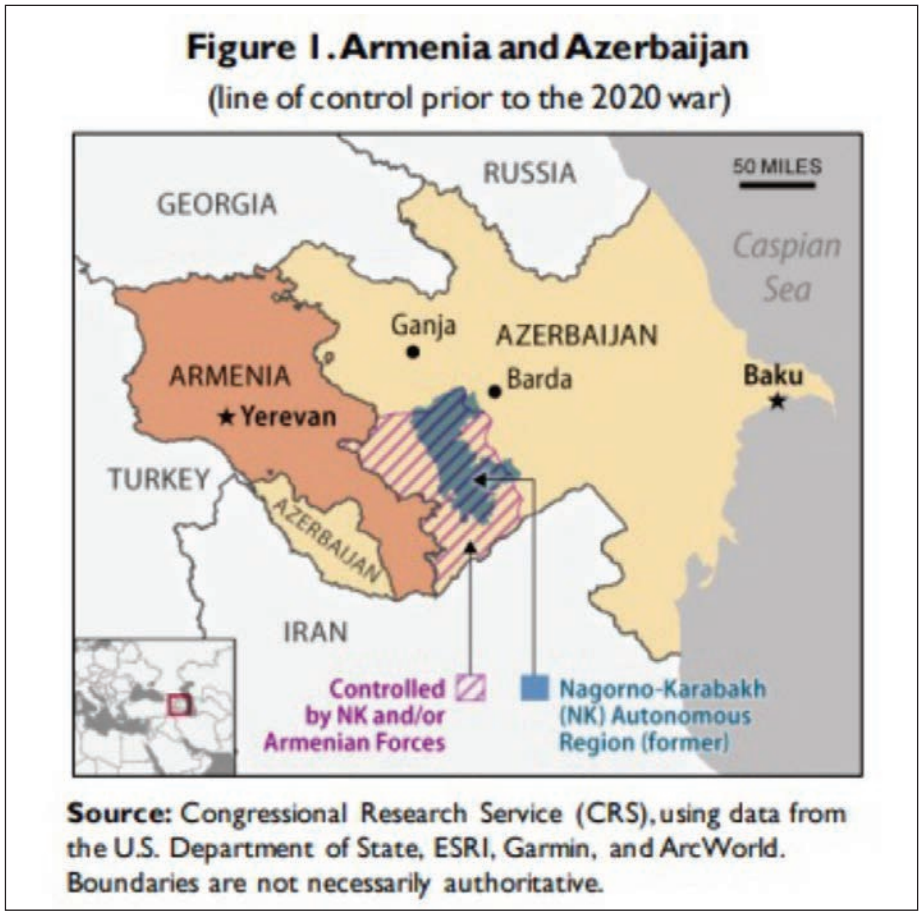

Figure 1. Reference: Cory Welt and Andrew S. Bowen, "Azerbaijan and Armenia: The Nagorno-Karabakh Conflict," 7 January 2022, Congressional Research Service, R46651. *(Photo provided by author.)*

ducted its own force design, spending at least 24 billion USD to modernize its armed forces.[9] Azerbaijani force design featured significant modernization in the intelligence, information, and fires warfighting functions—all designed to better feed its targeting cycle and suppress Armenian countermeasures. Azerbaijani investments focused on the acquisition of command and control systems, long-range precision strike capabilities—both loitering munitions and artillery—and layered air defense systems, as well as cyber and information warfare capabilities.[10] Azerbaijan sought to develop a hybrid warfighting doctrine, retaining the Russian emphasis on long-range fires and armor while also integrating modern tactics from their Turkish allies.[11] The Azerbaijanis invested in their personnel as well, professionalizing their officer corps by sending them to Turkish and Pakistani schools, and investing heavily in their Special Forces' (SF) training.[12] With assistance from Turkey, Azerbaijan conducted a decade-long restructuring of their force, in both personnel readiness and equipment to prepare for combat.

Azerbaijani force design featured significant modernization in the intelligence, information, and fires warfighting functions—all designed to better feed its targeting cycle ...

Aspects of Azerbaijan's force design are not far removed from the Marine Corps' own *FD2030*. Andrew Feickert, a specialist in military ground forces at the Congressional Research Service, identifies five focus areas for *FD2030*: the expansion of long-range fires; a lighter, versatile, and more mobile infantry; investments in unmanned systems; maritime mobility and resilience; and mobile air defense and counter-precision guided missile systems.[13] With the exception of maritime modernization—unnecessary in this landbased conflict—Azerbaijan invested in those same areas with devastating success, as evidenced by their ability to sense Armenian forces' signature and target critical capabilities. Conversely, the Armenians also invested in their defenses, with a focus on improving fixed defensive points along the line of contact, called the Bagramyan and Ohanyan Lines.[14] The Armenians were confident that the combination of extensive defensive positions in the mountains and holding key terrain and mobility corridors would stand against an Azerbaijani assault.[15] Azeri force design—specifically their successes in modernizing their doctrine, training, and technical capabilities—likely allowed them to achieve an asymmetric advantage against a prepared adversary in the defense.

While Azeri forces were highly successful, they suffered setbacks as well, and it was largely their force design that likely allowed them to successfully adapt. Though Azerbaijani forces would eventually envelop Armenian forces and secure key terrain along the Iranian border, the Azeri offensive stalled at Lachin when repelled by Armenian counteroffensives and artillery.[16] Azerbaijan shifted its focus to Shusha, a city of both tactical and cultural significance, capturing it around 8 November. This urban offensive incorporated a combined arms approach of SF and light infantry supported by armored formations

and precision strikes from unmanned aerial vehicles (UAV) and artillery.[17] This assault integrated aspects stressed in both Marine Corps and Azeri force design: light and mobile infantry, integrated with artillery, unmanned ISR, and precisions strike capabilities. On 9 November, Armenia, Azerbaijan, and Russia issued a joint statement halting the war.[18] The Shusha offensive stands as a prime example of the control of tempo and is a marked contrast to Armenian forces, who—often when disrupted—faltered or collapsed entirely. Azerbaijani planners evaluated their tactical failures of attacking a surface at Lachin and reoriented on their adversary, applying combat power to seize key terrain at Shusha and force Armenia to surrender.[19] Azeri focus on the professionalization of their officer corps and their modernization efforts in doctrine and training as part of their force design likely contributed to their reorientation and success at Shusha.

Azerbaijan exploited Armenia's critical vulnerabilities in force protection and SIGMAN by effectively sensing and targeting Armenian critical capabilities with combined arms …

Intelligence Support to Planning

The first area where intelligence likely could have assisted in Azeri success was in support of planning. In April of 2016, Armenia and Azerbaijan clashed along the line of contact. Azerbaijan employed both SF and unmanned precision strike capabilities, in what was likely their first use of the Israeli-produced Harop loitering munition (LM).[20] In addition to testing its SF and unmanned strike capabilities, this 2016 clash also allowed Azerbaijan to gauge Armenia's support from another power: Russia. Armenia is a member of the Russian-led Collective Security Treaty Organization (CSTO), and Russia maintains both treaty and bilateral security commitments to Armenia.[21] Because these security guarantees do not officially extend to Nagorno-Karabakh, observers speculated if and what kind of circumstances would warrant overt Russian intervention should the conflict resume.[22] This 2016 skirmish may have played a role in driving Azerbaijan's planning process, not only by testing their SF and LM capabilities but by gauging support to Armenia from Russia and the CSTO. The lesson here was Azerbaijan's deliberate use of SF and LM capabilities—essential elements of their force design—during small-scale engagements. The employment of these capabilities could likely have refined Azeri intelligence estimates in evaluating their adversary, as well as further validating their own force design.

Intelligence Support to Targeting

Azeri intelligence, surveillance, and reconnaissance (ISR) capabilities were also heavily utilized in support of targeting. When the war finally began in September 2020, Azerbaijan's technical investments in ISR platforms afforded them a considerable advantage in executing their targeting cycle against Armenian forces.[23] Fixed Armenian defenses along the Bagramyan Line and Armenian air defense assets were easily identified and targeted by Azerbaijani drones and artillery.[24] Open-source reporting indicates that UAVs and LMs successfully destroyed T-72 main battle tanks, armored fighting vehicles, artillery, and, according to Azerbaijan, advanced air defense systems such as the S-300.[25] The former secretary of the Artsakh Security Council, Samvel A. Babayan, stated, "On the morning of September 27th the Armenian side lost 50% of its anti-aircraft forces and 40% of its artillery in 15 minutes."[26] Azeri precision strike capabilities also could have impacted Armenian supply and logistics lines with their penetration deep into Nagorno-Karabakh.[27] Azeri ISR provided both accurate and timely battlefield intelligence in support of targeting, which—as *MCDP 2, Intelligence,* notes—is essential for success in warfare.[28]

Force Protection and Signature Management

Azerbaijan's targeting cycle was successful in stifling the Armenian forces' tempo for the duration of the conflict due to the Azeri neutralization of critical capabilities. SIGMAN, and by extension, force protection, were areas overlooked or underutilized by Armenian tactical formations. In another parallel to *FD2030*, in his 2019 planning guidance, Gen Berger repeatedly mentions the importance of a low-signature force to complement the low signature of Expeditionary Advanced Bases.[29] Armenian forces likely did not properly manage their signature, accounting for catastrophic losses in critical systems and personnel. While Armenian forces utilized traditional physical camouflage, they would still have been vulnerable to sensors targeting thermal and electronic signatures.[30] The Azeri strategy appeared to account for the clear Armenian advantage in controlling key terrain and mobility corridors, as *MCDP 2* emphasizes the importance of avoiding enemy strengths while exploiting critical vulnerabilities.[31] Azerbaijan exploited Armenia's critical vulnerabilities in force protection and SIGMAN by effectively sensing and targeting Armenian critical capabilities with combined arms, disrupting their ability to mass combat power and maneuver.

Azerbaijan was, in part, successful in its targeting cycle not only because of the lack of Armenian SIGMAN practice but also its lack of layered air defense capabilities. In just one example, open-source videos show Armenian Multiple Rocket Launchers being filmed by TB2 Bayraktar UAVs returning to staging areas after firing and then being targeted by both LMs and armed UAVs.[32] Like many examples of the Azeri targeting cycle from this war, this indicates both poor management of their physical signature and also that Armenian forces

did not appear to properly employ effective air defense systems or counter-small unmanned aircraft systems. These assets would have been critical requirements for their force protection, and necessary to effectively counter Azeri UAVs and LMs. The lack of these countermeasures allowed Azerbaijani ISR and fires assets to systematically negate Armenian force protection, and thereby, their ability to maneuver.

Armenian deficiencies in force protection and SIGMAN also likely contributed to the degree to which information warfare was integrated during the conflict by Azeri planners. The same UAVs and loitering munitions that played an important role in sensing and targeting Armenian forces were also integral in supporting Azerbaijan's information war. The same lack of air defense and counter-sUAS capabilities which made Armenian critical capabilities vulnerable to Azeri targeting meant that they could not counter the unmanned systems Azerbaijan utilized in support of information warfare. During the short July 2020 skirmish along the line of contact prior to the start of the war, Azerbaijan utilized UAVs and LMs to record realtime video that was then used in the information war they were engaged in through social media.[33] Realtime video was able to enhance Azeri information operations because of the vulnerabilities Azerbaijan exploited in Armenian force protection and SIGMAN practices.

Conclusion

During the 2020 Nagorno-Karabakh War, Azeri forces, through effective force design, embraced friction and adopted a flexible battle plan which allowed them to reorient after tactical failures. Armenian planners failed to account for Azeri military modernization, doctrine, and training, resulting in a series of intelligence failures, ultimately rendering them unable to recover. In skirmishes prior to the war, the Armenian military faced Azeri Special Forces, loitering munitions, persistent ISR coverage, and a relentless information campaign. In spite of this, Armenian doctrine did not significantly adapt, nor did they acquire the necessary air defense and counter-small unmanned aircraft systems capabilities to counter these threats. Azeri force design provided a qualitative edge in combat power, while the integration of intelligence in support of planning and targeting allowed Azerbaijani forces to exploit Armenia's lack of force protection and SIGMAN to target critical capabilities, and ultimately ensure decisive success.

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Change is Hard, and No Less So in the Marine Corps

The imperative to modernize

by LtGen David J. Furness

"There's historically been resistance to change in any large organization, particularly an organization that has been so successful as the Marine Corps."[1]

—Gen Charles C. Krulak, 10 October 1997

>LtGen Furness is currently the Deputy Commandant for Plans, Policy and Operations, Headquarters Marine Corps. An Infantry Officer, he has commanded at every level in the Marine Corps from platoon to division and commanded the Combined Joint Task Force, Horn of Africa.

Every rifleman knows you are always checking out the next firing position, terrain feature, and axis of advance. Similarly, the Marine Corps continues to look beyond its current position to identify future challenges, potential missions, and likely adversaries across the globe. This constant probing allows the Service to see and understand a new strategic environment as well as significant changes in the character of war. Every Marine also knows that when the strategic situation changes, concepts and capabilities ought to follow suit. As Marine warfighting doctrine states, "war is both timeless and ever changing. While the basic nature of war is constant, the means and methods we use evolve continuously."[2] The vision and courage to change is how we keep our sacred promise to be "most ready when the Nation is least ready."[3] *Force Design 2030* serves as the main effort of our transformation to confront the changing operating environment. It is informed by the rapid advancements of America's potential adversaries, the proliferation of sensors and long-range precision strike weapons, and information-related capabilities that present challenges to the Naval Services.[4] *Force Design 2030* embraces the naval character, expeditionary nature, crisis response mindset, and warfighting ethos of the Marine Corps. It forces change where needed most while maintaining sufficient capability to ensure the Service meets the challenges of the present.

While the United States fought simultaneous wars in Afghanistan and Iraq, China, amongst numerous other potential foes, made major advancements in their military capabilities and developed concepts designed to counter U.S. military strengths. As a result, the Marine Corps has a brief window of opportunity and a moral obligation to our Nation to transform itself for future warfare. The Service is leveraging its most important asset—the tough, creative, and initiative-driven Marine—along with advances in technology to prepare for these looming challenges. Accordingly, new concepts and tactics must reflect new battle-changing technologies and, ultimately, the changing character of war. Thus, we are in the midst of a long-overdue transformation rooted in our combat history and traditions.

Our History of Change

The history of the Marine Corps is filled with inspiring examples describing how the Service became the fighting force that America has grown so fond of.[5] The Continental Marines manned guns, participated in boarding and landing parties, and ensured good order and discipline aboard Navy ships. Before the Civil War, the Marine Corps honed its amphibious capabilities at Vera Cruz and fought in the Halls of Montezuma during the Mexican War (1846). For the first three decades of the 20th century, the Marine Corps fought small wars in Asia, Central America, the Caribbean, and Latin America to protect American foreign interests. In World War I, Marines fought in Belleau Wood (1918) and on the plains of Western Europe as infantry battalions. By then, our Corps had nearly 150 years of loyal combat service to the Nation, and our victories in World War I represented the birth of the "modern Marine Corps."[6]

In the 1920s, Army and Navy planners grew increasingly concerned over Japan's growing military strength and regional aggression.[7] Pete Ellis began writing the initial idea that informed the *Tentative Manual for Landing Operations* in 1921. In 1925, the 13th commandant, Gen John A. Lejeune, foresaw the need for change and suspended the Marine Corps Officers' Schools in Quantico so that its student officers could participate in joint Army and Navy studies, war games, and maneuvers on landing operations.[8] Later in 1927, a document called the *Joint Action of the Army and Navy* defined the Marine Corps mission as "land operations in support of the fleet for the initial seizure and defense of advanced bases ... essential to the prosecution of the naval campaign."[9] Seven years later in 1934, the Marine Corps published the *Tentative Manual of Landing Operations* (later published as a U.S. Navy Landing Operations Doctrine Publication).[10] It was another eight years, in August 1942, before the Marine Corps finally demonstrated its amphibious combat capability on the beaches of Guadalcanal. The Marine Corps' first amphibious assault cost nearly 1,200 men over six months, but its success marked the start of America's strategic offensive in the Pacific.

We must never forget that the Marine Corps succeeded at Guadalcanal and in many other amphibious landings over the next three years because it started thinking, planning, and adapting to a changing military environment long before war erupted. Still, that period of transformation gives me pause. Seventeen years passed from Lejeune's actions in 1925 until the Service's first amphibious landing in combat using its new doctrine. Change is hard, and it takes time, but the Marine Corps today does not have the luxury of seventeen years to develop transformative changes.

Change is the norm in our Service. Despite the demonstrated success of amphibious operations in World War II, this would not be the last time the Service underwent a dramatic change. Marines in the 1970s and 1980s fought traditionalists and enacted a change to answer claims that the Service was "an under-gunned, slow-moving monument to a bygone era in warfare."[11] Forward-thinking leaders, leveraging the Soviet threat and U.S. Navy *Maritime Strategy*, adopted pre-positioning strategies and created the doctrine of *Warfighting*.[12] When the strategic environment changes, our Service has always answered the call, and this is where we are today.

Change Feels Hard Because It is Hard

When Marines, as well as any student of war, look back on the Marine Corps' transformations with the benefit of hindsight, it is easy to forget how difficult the process was at the time. This is not unique to the Marine Corps. For instance, the Navy's nascent aviation community faced skepticism from the surface community during the interwar period. Moreover, the Army did not appreciate the value of strategic bombing during the same period. During the Cold War, the Air Force questioned the value of intercontinental ballistic missiles and submarine-launched nuclear weapons as they remained locked in a World War II paradigm, "the bombers will always get through," and felt bombers provided an adequate strategic capability for the Nation.[13]

Change is the norm in our Service.

Why is change hard? There are at least two common-sense reasons why.

We get too comfortable. Fundamentally, military organizations, in the most practical sense, will strive to hold onto the ideas and technologies that succeeded in the past, unless jolted by catastrophic events. In World War II, the loss of Navy battleships during the Pearl Harbor attack propelled aircraft carriers to the forefront of battle. More recently in 2020, in the disputed region of Nagorno-Karabakh, Azerbaijan's forces used Turkish unmanned air combat systems and Israeli loitering munitions to overwhelm Armenian military forces. Azerbaijan wanted to avoid another war of attrition with Armenia—similar to the one they lost two decades earlier—so they employed new tools and tactics to exploit the seams and gaps of their opponent. In contrast, the Armenians reinforced many of the same capabilities that helped them achieve victory years earlier and suffered those consequences on the modern battlefield.[14] For too many, the old way of war seems like the right way of war, and past combat experiences often cause a mental lag that stymies adaptation to the changing character of warfare. If we just keep doing more of the same, we will incur costly battlefield adjustments that will be paid in blood, treasure, time, and credibility. We must avoid this fate.

It is hard to get it right. Former Secretary of Defense, Robert M. Gates once said, "Our [U.S.] record of predicting where we will use military force since Vietnam is perfect—we have never once gotten it right."[15] Historically, the French paid the price during the interwar period as they expected another drawn-out war of attrition with Germany. They developed a "methodical battle" system that kept artillery and tanks at the division level and above, and they only advanced forces in a lockstep fashion so it could centrally manage and concentrate its most deadly weapon systems. However, this approach stifled the initiative of its lower maneuver elements and played into German hands. In contrast, the Germans emphasized rapid action, offense, and small-unit leadership to prosecute a lightning war against any weakness in French defensive lines. The French made significant changes in the interwar period, but they got it wrong, and the Germans would capture France within six short weeks in the summer of 1940.[16]

Secretary Gates was correct. The Marine Corps will not predict the next battle with complete certainty so there is always tension during organizational change. The Marine Corps is clear-eyed as it conducts analysis, wargaming, testing, experimentation, and major refinements to our force for a potential high-end engagement against a near-peer opponent. The Chinese military poses extreme challenges to our past way of naval warfare and our previous understanding of combined arms. Vast ocean distances, militarized islands, anti-access/area-denial systems, new

warfighting domains, and the natural advantages gained from their defensive posture and tight interior lines of communication are establishing a future combat environment that necessitates new ways and means. If today's Marine Corps is going to win tomorrow's fight, it cannot idle along or only make superficial changes on the margins. Not for the type of fight we see ahead of us.

I joined the Marine Corps in 1987 and have had the privilege to command infantry formations at all levels from platoon to division and have seen the Marine Corps undergo significant change in the 90s and then again in the early 2000s. From my perspective, the changes the Marine Corps is experiencing in *Force Design 2030* are indicative of the culture the Service fosters—that of a learning organization. I am encouraged by the ongoing debate surrounding Force Design, the work done in our military classrooms, and the many legions of thinkers and doers making this happen. Major changes in our combat organization should always spark a healthy and respectful discourse inside and outside of our Service. Debate is healthy. Debate demonstrates we are invested and care deeply about ensuring the Marine Corps' future success. I would be more concerned with an absence of spirited debate. I cannot recall any consequential decision during my service that did not include impassioned disagreement. Through a healthy discourse, we learn, we change, and we do it again until we get it right. The discourse is ongoing and will continue. This is how we become more lethal, mobile, survivable, and agile as a fighting force.

The Contemporary and Future Environment

The People's Republic of China—the Marine Corps' pacing challenge—is the threat by which the Service will not only measure its capabilities but also its rate of adaptation. Combined arms, a skill that served our Marines so capably in the past, is evolving into domains once considered science fiction. Marines are combining traditional arms with effects in space and cyberspace, the electromagnetic spectrum, and the information environment. Marines must now learn how to integrate these arms on battlefields saturated by sensors, where technology accelerates kill chains, decreases decision space, and increases the number of attack avenues. While China remains the pacing challenge, it is not the only threat. The proliferation and diffusion of technology allow states with relatively meager resources to field capabilities that were once only the purview of great powers including deep strike unmanned aerial systems, loitering munitions that leverage artificial intelligence, and offensive cyber capabilities.

In a world of accelerating change, the Marine Corps' rate of adaptation matters. Our processes were designed in an earlier era where speed of adaptation mattered less and the U.S.'s technological superiority remained unchallenged. The Joint Capabilities Integration and Development System defines requirements, the Planning, Programming, Budgeting, and Execution process provides funding, and the Defense Acquisition System manages programs through a series of milestones and reviews. These processes are designed at *getting it right* instead of *getting it fast*. As a consequence, their inflexibility is poorly suited to "Competing in Time" against adversaries unencumbered by similar bureaucracies who transform at the pace of commercial innovation. Today, our commercial sector is driving technological advancements, and innovating at speeds that outpace defense acquisitions by years. Incremental defense solutions no longer set the speed of U.S. commercial innovation, nor are they pacing with the People's Liberation Army. Given where the Marine Corps stood in 2019, bold course corrections were required.

Enablers of Change

The Marine Littoral Regiment (MLR) represents just one key aspect of the Marine Corps' transformation as it represents a major bid for success in the Indo-Pacific arena. While critics of the MLR claim it represents an ill-informed detour from the proven Marine air-ground task force, this simply is not the case.[17] The 3d MLR will lead Service experimentation efforts and inform the development of subsequent regiments. It is a logical outgrowth of years of concept development and wargaming, and it will continue to increase in lethality as we refine its missions and capabilities. The MLR is a standing formation, purposefully organized to support sea control, postured to win the reconnaissance and counter-reconnaissance battle, and ready to impose a range of challenges against the People's Liberation Army. Its story is far from over, and this formation is getting better every day through the hard work and dedication of Marines on the ground.

While the MLR is tailored for high-end maritime combat with peer competitors, we continue to enhance our MEUs and MEFs to provide flexible, amphibious combat units ...

The challenge that the People's Liberation Army offers, and the speed with which they pursue advantage, denies the Marine Corps the luxury of building a less specific formation or maintaining this force in any lower state of readiness.[18] While the MLR is tailored for high-end maritime combat with peer competitors, we continue to enhance our MEUs and MEFs to provide flexible, amphibious combat units that can operate across the entire spectrum of conflict.

The MEU and the MEF

Carefully structured to respond to a broad range of missions, MEUs continue to respond to our Nation's security demands even as they too transform.[19] MEUs combine ground, aviation, and

logistics elements under a single commander, embarking this force aboard three of the Navy's amphibious warfare ships, known as an amphibious ready group. MEUs deploy worldwide to perform missions including amphibious assaults, raids, embassy reinforcements, humanitarian assistance, and noncombatant evacuation operations. Marine expeditionary units, consisting of about 2,200 personnel, form the smallest of the Marine Corps' MAGTFs. The Marine Corps is in the midst of deploying its first MEU with the Amphibious Combat Vehicle, and we will continue to experiment and transform these units for other future combat scenarios.

MEFs are the largest of the MAGTFs. The MEF exceeds 40,000 personnel with its command, ground, aviation, and logistics combat elements. The MEF will remain ready to respond to crisis, and in the future, they will incorporate MLRs into their concept of operations. Often with less fanfare than the MLR, our MEFs are transforming in subtle yet consequential ways to support the naval and Joint Force.

This includes well known shifts such as the divestment of tanks, prioritization of longer-range precision-guided fires over cannon artillery, and greater investment into the skills of our infantry Marines. We do not yet have it right. Our current infantry battalion experimentation, called IBX30, is showing us that we may need to make further adjustments to the infantry battalion; including novel combined arms formations that equip Marines with beyond-line-of-sight precision strike capabilities and requisite sensors.[20] Our traditional understanding of combined arms employs organic mortars, supporting artillery fires, rotary and fixed-wing aviation assets, all in support of infantry Marines maneuvering onto the objective—to locate, close with, and destroy the enemy. The 202X battlefield demands a refinement of the traditional employment of combined arms. Marine learning and experimentation are iterative and there is a long way to go before we are done.

Conclusion

As recently demonstrated during the difficult and tense withdrawal from Afghanistan, the Marine Corps remains America's premier crisis response force. The Service's warfighting ethos is constant, and it is an essential source of strength. Accordingly, the Marine Corps grounds its force design efforts in its naval heritage and focuses on supporting the "broader naval campaign" just as it did a hundred years ago. *Force Design 2030* recognizes that the character of war is drastically changing and is driving us to re-conceptualize the future maritime battle. As our former commandant, Gen Alfred M. Gray eloquently wrote, "our approach to warfighting must evolve. If we cease to refine, expand, and improve our profession, we risk becoming outdated, stagnant, and defeated."[21] We must change to remain the most ready when the Nation is the least ready.

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Machine Learning

A death knell for EABO?

by 2ndLt Hunter Keeley

In 2017, the United States dropped the GBU-43/B MOAB on an ISIS-held cave system in Syria. The "Mother of All Bombs," as it is known, is the largest non-nuclear bomb in the U.S. arsenal, weighing in at 21,600 pounds. Perhaps it is because the People's Liberation Army (PLA) DF-21 "Carrier Killer" missile is over 10,000 pounds heavier than the MOAB that its unveiling has been termed a "Sputnik Moment" for the PLA Navy.[1] Whatever the case, the Carrier Killer is a culmination of decades of investment by the PLA in anti-access and area-denial capabilities.

It is this anti-access and area denial capability that the Marine Corps' Expeditionary Advanced Base Operations (EABO) seeks to contravene. The EABO concept pushes the Marine Corps to operate within and disrupt the pacing threat's weapon engagement zone, which will set conditions for the Navy to safely project power. It is an eerie repeat of the Island-Hopping Campaign against the Japanese Imperial Army.

As the Marine Corps prepares to operate stealthily in our adversaries' backyards, signature management is now in vogue. The June 2020 Signature Management Camouflage SOP elaborates that "to be detected is to be targeted is to be killed [and therefore] units must ruthlessly reduce their signature."[2] The urgency to reduce operational signatures has permeated training at all levels, but a better appreciation for the sophistication of observation and signature collection techniques available to a modernized adversary is still needed. Indeed, such an understanding may prompt novel ways of improving signature management. In this article, I argue that the proliferation of low-orbit satellites and geospatial imaging systems in conjunction with advancements in machine learning pose a unique challenge to the EABO concept.

>2ndLt Keeley is currently a student in Bravo Co at The Basic School on Camp Barret, MCB Quantico. After graduating, he will attend Infantry Officer's Course in hopes of becoming an 0302 Infantry Officer.

Regarding satellites, it is clear that after a several-decade break in the action, the space race is back on. In 2019 the United States established the Space Force—the first new branch of the military since the Air Force's introduction in 1947. In the years since, the need for a Space Force has been evinced time and time again. In 2021, a Chinese spacecraft reached the moon.[3] Some estimates suggest that between 2019 and 2021 the number of active satellites more than doubled to 4,877.[4] Domestically, the private sector has thrown its hat in the ring. Jeff Bezos and Elon Musk have tussled for NASA's contracts, and each has their eyes set on Mars.[5] While many satellites exist purely to enable communications, others have geographic information system (GIS) imaging capabilities. The earthly consequences of advanced GIS are already being felt. A litany of crimes has been solved thanks to Google Earth.[6] Satellites are only one GIS asset class; UAS also increase their owner's situational awareness and are also proliferating in their number and power.

... the proliferation of low orbit satellites and geospatial imaging systems in conjunction with ... machine learning pose a unique challenge to the EABO concept.

Significantly, denial of these GIS assets to an adversary in the present operating environment is a steep ask. The technology driving GIS follows Moore's Law. The equipment keeps halving in size, halving in price, and doubling in power. Furthermore, satellites occupy the vastness of space, making them dubious targets. Shooting down satellites in the name of signature management may strike policymakers as asymmetric. As GIS assets proliferate, so too does the data they generate. Gone are the days when Google's lone GIS satellite gradually stitched together granular images of the Earth's surface. Particularly in contentious areas of Earth (think: the Spratly Islands), the 21st century has heralded near-continuous geospatial surveillance of the planet's surface.

Paired with the data created by GIS assets, advances in machine learning (ML) may be ruinous for EABO's signature management ambitions. The black box of advanced ML can detect signatures that transcend human comprehension. Already, we have examples of predictive algorithms, which can efficiently key in on relatively traditional signatures. Algorithms trained on

Google trends' geographic search data were able to better predict the spread of COVID-19 than models trained on epidemiological data. In medicine, ML promises to bring the precision of big data to diagnostic and prognostic processes.[7] In advertising, ML has rapidly become ubiquitous, being the impetus for the targeted ads we all receive nowadays. The human experience with ML over the past decade suggests that it ought to be able to, with devastating efficiency, complete the relatively simple task of identifying concealed troops and military installations via satellite imagery. Marines executing EABO may be imperceptible to human detection but avoiding detection by ML is an entirely different matter.

There are two prerequisites to developing effective anti-EABO diagnostic tools with GIS and ML. First, our adversaries require robust, ongoing inputs. That is, to take advantage of the hypothetical detective capabilities of ML, current GIS images are needed. To meet this requirement, our adversaries will need to maintain surveillance of the area of operations, with satellites or drones always on site. Second, our adversaries require training data. Before ML can diagnose cancer, it needs human input on thousands and thousands of PET scans, tagging each as *showing a cancer* or *not showing a cancer*. So long as the human inputs are generally correct, ML can build arcane strategies to detect cancer, keying off signatures incomprehensible to the human mind and yielding much greater accuracy. ML used to diagnose the presence of an expeditionary advanced base from an image taken by a low orbit satellite requires a training data set of past images of such bases, with the disposition of EABs identified by humans. In peacetime, there is little we can do to prevent our adversaries from collecting satellite imagery on our equipment and training exercises. It is likely that our adversaries have rooms upon rooms of analysts parsing images of training exercises identifying what U.S. military equipment looks like from low orbit. These images will be used to train ML that can be employed in the decisive moment to locate expeditionary advanced bases.

Taken as a given that the enemy will have access to these tools, there are a few ways to limit this advantage and enable EABO. First, there is the notion of attacking the dataset. The United States could build similar algorithms and then through experimentation identify markers that fool the ML—telling the AI that the piece of equipment is not, in fact, itself. A HIMAR covered in ferns and painted green may still be identified as a HIMAR, but perhaps if the HIMAR is painted orange and has a forklift attached to the front, it will no longer be identified by the AI as a HIMAR. Such a strategy may increase the HIMAR's signature to the human eye, but dispersed on islands thousands of miles apart, the ability of a human to identify the HIMAR from the deck is much less significant than that of detection from above.

Being able to beat the ML has the added benefit of creating absolute surprise. If the enemy puts faith in ML to detect our presence and said ML informs the enemy that there is no U.S. presence on a given island, despite the existence of a FARP or an EAB, then the ultimate condition will be more favorable to the United States than if the enemy never evaluated the island. Rather than identifying the island as potentially containing U.S. forces, the island will be deemed to be free of U.S. forces, granting an added layer of stealth.

Second, denying the enemy continuous data for the ML to evaluate (i.e. knocking GIS satellites and assets out of the sky) will cripple ML assets trained on GIS data. In a hot war, this will be the last on a laundry list of reasons to target enemy satellites. It is in the build up to conflict and in cold wars where the enemies' GIS satellites will continuously prod and observe, evaluating our positions and inhibiting the ability of the Corps to begin emplacing concealed EABs.

The word of the day is signature management, but without an adequate understanding of the ability of the enemy to observe signatures, efforts to reduce our signature will be misguided. In the modern Pacific theatre, signatures will be collected by low orbit satellites and evaluated by ML as often as they are collected by the human eye and evaluated by the human mind. If EABO is to succeed, Marines across the board should need to accept, understand, and address the *GIS plus ML reality*, else it spells a death knell for EABO.

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2022 MajGen Harold W. Chase Prize Essay Contest: Honorable Mention

There's No L in MAGTF

Organic support for distributed forces

by Capt Margaret A. Mello

>Capt Mello is a Logistics Officer serving as the Assistant Operations Officer with Marine Corps Logistics Operations Group in Twentynine Palms, CA.

In the Commandant's annual update regarding *Force Design 2030*, one of the Campaign of Learning's three highlights regarding the LCE stated the design team "examined options for LCE capability/capacity redesign" without delving into proposed solutions or deeper guidance. I propose to examine not just capability and capacity for logistics but also how the Marine Corps might more effectively employ its combat service support and logistics throughout the force. Currently, the majority of reshaping the Marine Corps for expeditionary amphibious operations consists of eliminating unnecessary units, manpower, and materiel that do not support the vision of the *Commandant's Planning Guidance*. For example, tanks required vast personnel and material support and were difficult to operate in a decentralized manner or get on and off ships. The decision to remove tanks from the Marine Corps' table of equipment allowed for funding to be allocated to platforms that will benefit from a lighter and leaner manpower and equipment set.

To execute the Commandant's new vision, the Marine Corps needs to be able to support decentralized small units capable of organic support, decision making with minimal guidance from higher, and communicating to higher and adjacent units with the smallest signature possible. The MLG facilitates none of these requirements. The separate LCE under the current MAGTF construct sustains an enormous manpower and digital footprint, requires large quantities of heavy equipment and classes of supply on hand to provide support, and relies on the supported entities such as the GCE for security and ACE to move manpower and equipment from ship to shore. Additionally, thanks to the MAGTF game plan in use since the 1960s, the GCE has become too reliant on the MLG to plan its logistics needs. These factors combine to create unnecessary barriers toward accomplishing the Commandant's vision of a more agile force ready to face a peer threat untethered from large quantities of logistical support. With this requirement in mind, I propose that the Marine Corps should move to dissolve the MLG construct entirely.

When independent commands exist, they require their own staff. Having a flag command that exists to provide logistics to the MEF means that multiple redundant commands exist within that structure. These staffs then tend to develop their own processes and products that end up inhibiting the

To best support distributed Stand-in Forces, the author proposes dissolving the MLG. *(Photo by LCpl Alexander Quiles.)*

rapid and effective request for gear, maintenance, and life support that units should be practicing organically. With independent staffs such as the MLG, logisticians end up working for their own commanders instead of the units who rely on them for support. A good logistician will develop a strong working relationship with their combat arms counterparts and ensure the Marines in their charge serve the needs of the supported unit before the needs of their own. Under the current MAGTF construct, however, this relies almost entirely on the happenstance of separate command personalities (most often between LCE and GCE). Although not always, often the needs of the supporting unit work against promoting better relationships. While many Marine logisticians care greatly for supporting their combat arms counterparts, these individuals also must respond to the wills and needs of the people who write their fitness reports. The chain of command within the MLG is outside of the chain of support, which means effort will continue to be expended on work that does not help anyone close with and destroy the enemy. If a platoon commander has to decide between providing support to tracks in the field or meeting a deadline for her battalion commander, what incentive does she have to prioritize the people who will never see her fitness report? If a logistics regimental commander's metric for success for his battalion commanders is measured by meeting annual training requirements and avoiding vehicle or heavy equipment accidents, where does the success of a supported unit factor in recognizing the real benefit that battalion commander gave to the Marine Corps? We should never work for a FitRep, but as the system stands right now, there is not an institutional incentive for logistics units to provide the best support possible to the ground portion of the MAGTF. Under the current MAGTF construct and routing requirements, logistics requests must go from the GCE company to battalion, regiment, division, over to the MLG, down to the regiment, logistics battalion, and finally to the appropriate company or platoon level requested to support. This system inherently facilitates communication delays and needlessly stretches response time. The desert units in Twentynine Palms have developed strong bonds of support that develop informal request methods while waiting for the required formal channels to catch up. Requests for support languish in the routing requirements of the transportation capacity planning tool between a Combat Logistics Battalion (CLB) and Combat Logistics Regiment. Meanwhile, the motor transportation company has already established direct communication with the infantry battalion asking to move 180 Marines to the range. During larger exercises, such as Steel Knight, the desert units watch rapid request response times stretch and information gets distorted as more and more layers insert themselves between the Marines that need help and the people with the means to provide it. To accomplish the Commandant's goal of responsive and independent actions against a peer threat, the Marine Corps must shed this excess bureaucracy and redistribute the talented individuals to where they can provide the most responsive and capable support to combat arms units.

The Combat Littoral Regiment already addresses this problem by placing the CLB directly under the supported O-6 commander. By adopting this process on a much wider scale, the Marine Corps will get better use of the personnel and equipment it already has. The many hard-working and dedicated Marines who currently serve in the MLG should be moved to the division, as well as the equipment. These units and materials will be best utilized if they spread out throughout the entire division, down to the company level. More logisticians, supply, communications, and other combat support Marines would provide a greater understanding and employment of new capabilities in combat arms units. The best example of how this already works, albeit unofficially, is the Twentynine Palms construct. Isolated from 1st MLG, CLB-7 has an enviable working relationship with 7th Marine Regiment. Placing the CLB directly under 7th Mar would increase efficiency and remove layers between the units requesting and units providing support. Replicate this with every infantry regiment, and they would have the capabilities that reside at a CLB. The division would hold some of the larger capabilities such as maintenance and low-density high demand capabilities like explosive ordnance disposal.

This change in structure will also force combat arms planning staffs to integrate organic logistics into their exercise and deployment planning. Too often, logistics support is deemed non-essential and treated with the same administrative mindset as range clearance or evaluators; however, as many Marines have found at the wrong time, logistics is not and cannot be notional. Marines who require constant water resupply in the heat of the Mojave Desert during Integrated Training Exercise will undoubtedly require water in the humid tropical islands surrounded by non-potable sea water that Marines of the future will occupy. Whether it is scheduling to drop-off of a water trailer or developing a plan to have a lightweight water purification system within a company's position, the self-sufficient combat arms unit of the future needs to understand how to engage that resource. This is especially true when the implicit tasks of engagement mean keeping said resources undetected. When executing orders in distributed operations in an amphibious environment, if the company commander under or overestimates the requirements for systems used to keep his Marines alive, there will not be a rapid resupply coming to the rescue.

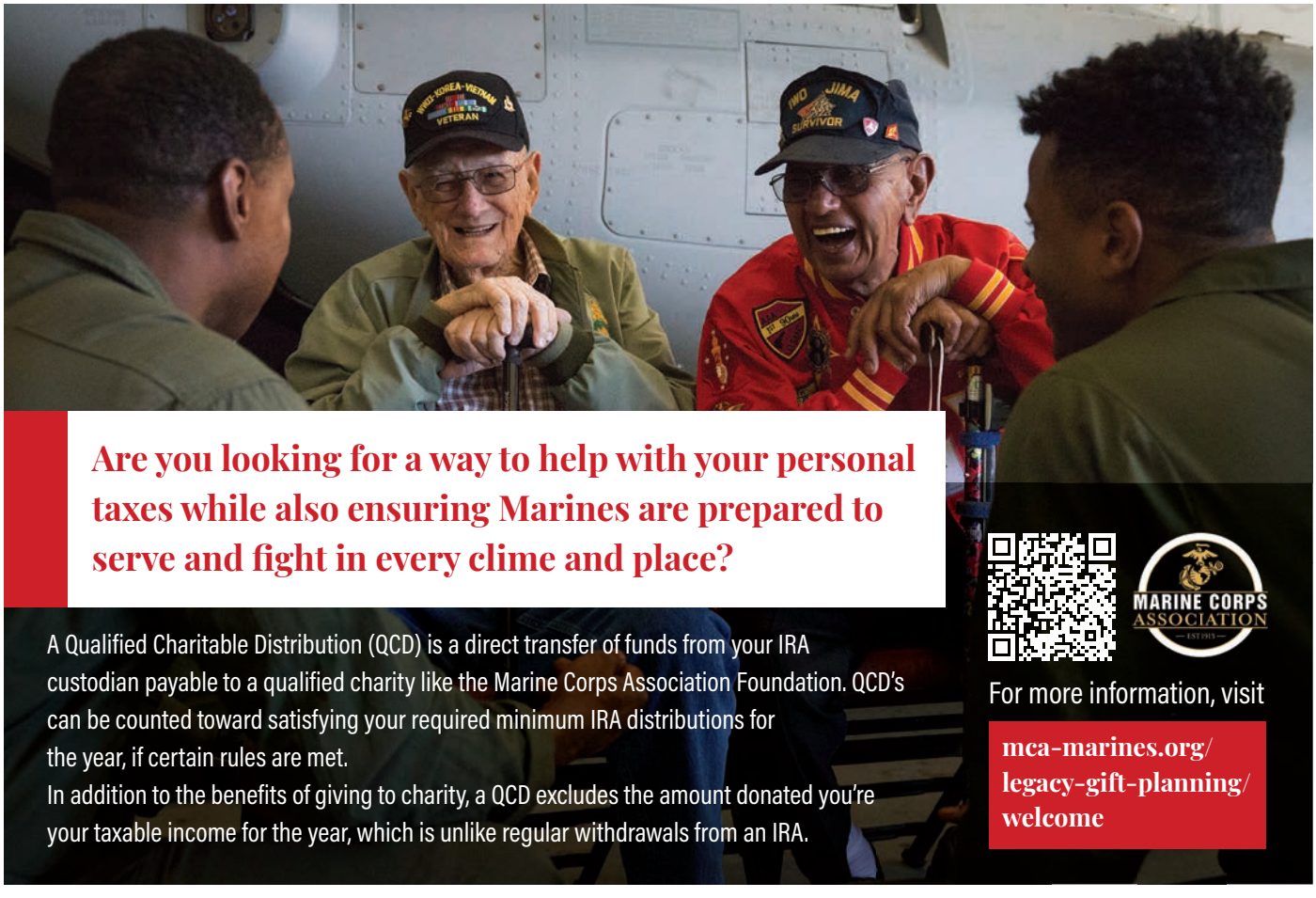
Ignorance of how logistics can be integrated will not suffice for the warfighters trying to make themselves hard to find. The lightweight water purification system makes potable water but is also very loud, has many large and non-mobile parts, and requires fuel to operate. If small unit leaders are unfamiliar with this equipment, they could fail to plan for the requirements and put their Marines at risk. Attaching Marines from another unit, especially a unit in an entirely different chain of command, degrades the tight cohesion and trust that distributed operations will require. The sooner combat arms professionals

have more direct control over the equipment and personnel they need to sustain distributed amphibious operations, the sooner they can master the employment of these capabilities and engage them in the realistic force-on-force training upon which the Marine Corps is expanding. Commanders can no longer think of logistics as an administrative function. This is a critical vulnerability that an enemy commander will not hesitate to exploit. If a group of Marines in a force-on-force engagement run out of water, they should be marked as combat losses, forcing commanders to resupply them or figure out how to fight with fewer Marines. Logistics should never be someone else's problem. On the other side of this coin, logisticians must be deeply versed in the tactical situation of those whom they support. Planners will have to tailor and adjust combat support services of every function to fit fluid and dynamic environments. Individuals providing this support to their own battalion will have an inherently better understanding than those coming from a different unit with an entirely different command structure reaching up to a separate general.

The force of the future will push smaller units farther away from their higher headquarters for longer periods of time and with less communication. While many commanders will rightly focus on developing a more coherent commander's intent, they also need to ensure their Marines can survive long enough to carry out a mission. The Marine Corps is already encouraging innovative small unit leadership, especially through force-on-force exercises. The Marine Corps must also convince these leaders that they must leave and breathe logistics as much as they do tactics. The best way to accomplish this is to take the capabilities currently held throughout the MLG and spread them throughout the division and the wing, allowing units at smaller levels to incorporate them into their training and exercises.

Force Design 2030 challenges Marines to "think, write, debate, innovate, and adapt" in order to survive these uncertain and changing times. If we want the warfighter to be able to operate as independently as possible, we need to relegate logistics support to the lowest level we can. If the Marine Corps wants to take a serious look at creating a lithe and lethal fighting force, cut the MLG.

USMC



2022 MajGen Harold W. Chase Prize Essay Contest: Honorable Mention

Preparing to Deceive

Harnessing the art and science of deception for action in the littorals

by Maj Bradley J. Mohr

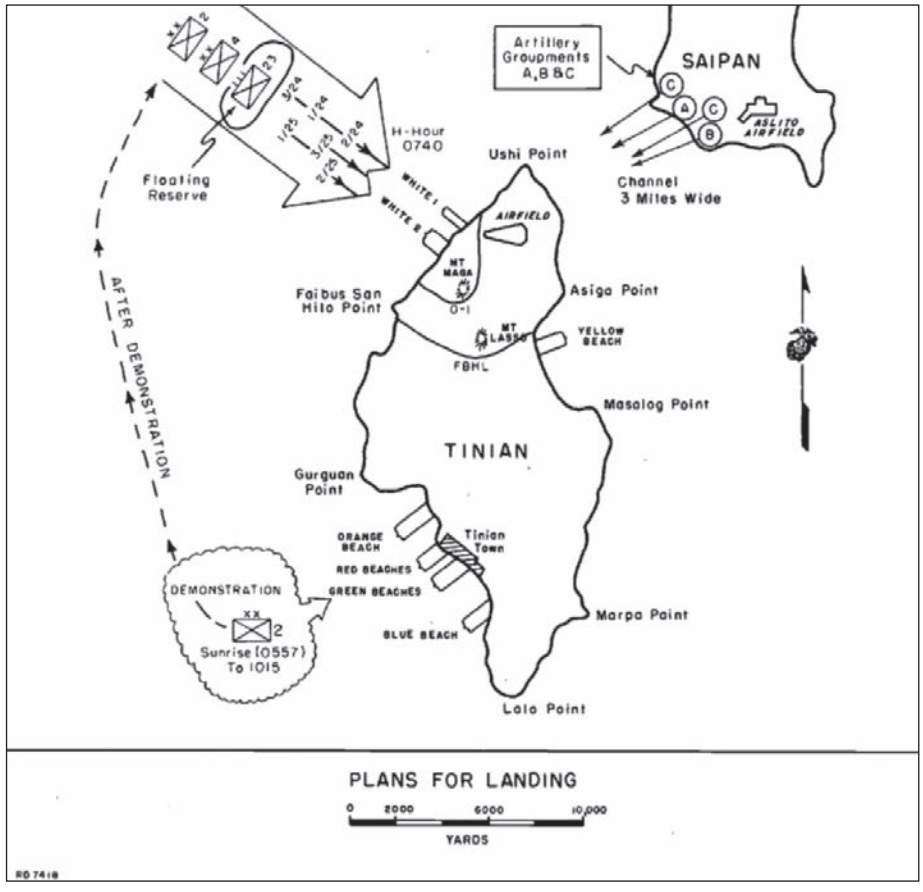
>Maj Mohr is an Infantry Officer currently serving in III MEF. He previously served at the Joint Information Operations Warfare Center as an Information Operations Planner.

On today's battlefield, it is hard to imagine anyone arguing that the Marine Corps should not be using all resources available in a fight against a peer adversary. However, current planning practices routinely overlook military deception as a mainstay to help set conditions for success. So, why does this happen? Blaming the country's nineteen-year asymmetric war effort or a heavy focus on the primacy of combined arms is a possibility. While the reason for the current underutilization of deception is debatable, what matters most is changing the Marine Corps' practice of planning without incorporating deception into our efforts. This article calls for the return to the use of doctrinal deception. Whether using deception at the large- or small-unit level, with deliberate or hasty executions, the goal is to use deception to make it more challenging for adversaries to operate effectively against our forces. Simply put, to help meet the 21st-century military challenges posed by peer militaries, there is a need for doctrinal deception at the forefront of Marine Corps planning.

Leveraging Our Heritage to Inform the Future

Deception was skillfully interwoven throughout all aspects of Marine Corps operations in World War II. Success within these operations was not a given. The Marine Corps faced an exceptionally determined enemy, a highly resourceful nation, and some of the most challenging circumstances imaginable. Deception proved to be essential in mitigating risks and generating options. Certainly, no capability can mitigate all risks. However, deception proved to be a critical enabler within high-stakes battles. Deception's value was strikingly evident within the historic Battles of Saipan and Tinian as the capability shifted the fate of Marine Corps landing forces that initially teetered between setting the conditions for ultimate success and disastrous failure.

Saipan was a violent 25-day battle that resulted in 3,225 killed or missing and 13,061 wounded amongst the Marine Corps and Army divisions that faced heavily entrenched Japanese defenders.[1] As bloody as the battle was, it would have likely been far worse without the effective integration of deception.



Tinian map. *(Map provided by author.)*

Marine Corps forces conducted an effective demonstration near Tanapag Harbor that generated ambiguity amongst Japanese Army decision makers.[2] This caused enemy commanders to slow the commitment of the garrison's regimental reserve toward the actual American landing sites on the southern end of the island. Although the enemy was not entirely fooled by the American demonstration, the deception proved effective enough that the false story it conveyed could not be entirely dismissed by Japanese forces. The delayed Japanese response almost certainly reduced American casualties while ensuring the establishment of the beachhead.

Deception served an even more prominent role in the Battle of Tinian. Enemy planners believed the Americans would land on the southern portion of the island. The 2d MarDiv reinforced this misbelief by conducting an amphibious demonstration directed toward Tinian Town in the south. The enemy decision maker was entirely persuaded by the American deception. Col Kiyochi Ogata, commander of the Japanese defenders, sent a message to his headquarters in Tokyo declaring that his defenders had thwarted an invasion force of more than 100 landing barges.[3] Col Ogata then ordered his critical reserve forces to remain in place in the south, preventing their employment against the actual landing force in the north. Deception enabled bold decision making that resulted in a decisive American victory. The Americans landed two Marine divisions on each of two northern beaches that were only 160 and 60 yards wide. Japanese planners believed that landing on these beaches was implausible. Indeed, without the effective deception operation, Japanese forces may have repulsed the American landing force from these beaches. In reality, the misdirected Japanese forces left the northern beaches largely undefended. The surprised Japanese garrison was then rapidly eliminated in what Marine Corps LtGen Holland M. Smith later called "the perfect amphibious operation." The contribution of deception to the Battle of Tinian speaks for itself. The Japanese suffered more than 5,000 killed while the Marine Corps sustained 317 killed and 1,755 wounded.[4]

Challenges

No matter how large or small a force, operating in the littoral environment is challenging, especially against a peer adversary. Moreover, modern combat exposes forces to threats from the point of embarkation all the way to an objective, and the idea of having to fight to get to the fight, no matter where the force is located, may require deception to be successful.[5] Additionally, adversary capabilities are not the only challenge that must be overcome. Shortfalls in deception experience mean that fewer personnel are available to teach, plan, and execute doctrinal deception. Any leader who is not familiar with deception is either less likely to utilize it or more likely to use it incorrectly. This is not different than any other capability, but most Marines do not realize that deception requires a doctrinal understanding to execute effectively. Finally, leaders should ask themselves: how knowledgeable do I think my Marines are in deception, and when was the last time deception was part of our planning process? Understandably, most deception efforts are not revealed to those not directly involved. However, at best, deception has become an afterthought, and it is often forgotten or ignored altogether.

Comprehensively Reinvigorating Deception

Deception must be reemphasized to ensure the success of Marine Corps forces in the littorals within the prosecution of an enduring maritime campaign. Adversaries are capable of striking American forces at any point from tactical outposts to strategic throughput nodes, or force flow between. Casualties sustained from such strikes could eliminate critical capabilities that cannot be easily regenerated. The American military can no longer rely upon massive technical overmatch to mask its intentions and overwhelm enemy forces. Deception must once again become an essential element of risk reduction and ensuring the Marine Corps successfully uses deception only requires three adjustments.

First, leaders must stop the practice of creating plans and *then* look for ways to use deception. Accordingly, planners need to think about deception efforts early to set successful conditions in combat. When a commander gives initial guidance for planning, it is as essential for the deception planner to be a part of this process as it is for the operations officer. Units can only realize the strength of deception when it is integrated into planning from the beginning, which requires planners to develop deception as the planning process begins, not midway through or after the planning process is complete.

Second, leaders must start learning how to employ deception techniques, specifically feints and demonstrations, to prevent an adversary from quickly and correctly determining their true intentions in combat.[6] This can be as simple as drawing the adversary's focus into an area where a demonstration is conducted, then attacking in another area that is less well defended. Any effort that helps successfully misrepresent the true intentions of the friendly force and causes an adversary decision-maker to misuse assets will help save lives and preserve combat power. A further takeaway is that although the examples of deception from Saipan and Tinian showcase large efforts, Marines should not limit themselves to thinking deception can only be utilized at the highest level of command. Deception can be implemented by a division to prevent a regimental reserve from being properly committed to battle as well as a platoon to cross a lightly defended danger area. Regardless of the size of the unit, deception can be used doctrinally by all to help set conditions for successful mission accomplishment.

Third, Marines outside the intelligence field should attend deception courses. Understanding doctrinal deception is critical to success and should not be understood solely by those in the intelligence field. One Marine, ideally a field grade officer, from a regiment can be selected to attend two weeks of deception training. Although this Marine will not return as a subject-matter expert, he will be able to teach other Marines about what opportunities doctrinal deception has to offer. Additionally, the more comfortable Marines

become with employing deception, the better they will be at detecting an adversary's deception efforts. Since deception plays a part in the way peer adversaries operate, the Marine Corps needs personnel less susceptible to its effects. The good news is that these solutions do not require the Marine Corps to make organizational changes, create a new modern deception method, or commit major amounts of money to employ. Schools have quotas and increasing the discussion about how to incorporate deception into planning can occur to help stimulate interest. As soon as leaders commit to implementing doctrinal deception at the initial planning stages, the sooner its effects can be leveraged.

The Imperative of Deception

The successful use of deception has historically proven its worth. It is an often-overlooked tool that commanders possess to preserve combat power and save lives. As discussed in *Force Design 2030* and *A Concept for Stand-In Forces,* CMC Berger has directed follow-on planning efforts to further develop the service's deception abilities.[7] Commanders and planners need to be comfortable developing deception efforts into operations against adversary forces, and this change cannot wait. If Marines fail to recognize the importance of deception, they will fight an adversary on equal footing. The Marine Corps has never sought a fair fight and cannot start now. By utilizing deception early in the planning process, training personnel in deception, and renewing the understanding of our leaders on how it is employed, the Marine Corps can more successfully protect the force against threats. Deception has proved successful since the dawn of time, and the Marine Corps cannot proceed in an increasingly complex world without it. Simply put, an operation without deception is like movement without fire. It is an unacceptable risk.

… the more comfortable Marines become with employing deception, the better they will be at detecting an adversary's deception efforts.

Notes

1. Capt John C. Chapin, *Breaching the Marianas: The Battle for Saipan, Marines in World War II Commemorative Series,* (Quantico, VA: Marine Corps Historical Center, 1994.

2. Ibid.

3. Richard Harwood, *A Close Encounter: The Marine Landing on Tinian, Marines in World War II Commemorative Series,* (Quantico, VA: Marine Corps Historical Center, 1994).

4. Ibid.

5. Megan Eckstein, "Neller: Marines Must Prepare to 'Fight to Get to the Fight' in High-End Littoral Warfare," *USNI News*, September 21, 2017, https://news.usni.org/2017/09/21/neller-marines-must-prepare-fight-get-fight-high-end-littoral-warfare.

6. Joint Staff, *JP 3-13.4, Military Deception,* (Washington, DC: February 2017).

7. Headquarters Marine Corps, *Force Design 2030,* (Washington, DC: March 2020); and Headquarters Marine Corps, *A Concept for Stand-in Forces*, (Washington, DC: December 2021).

The Philippines 1942

A failure to orient on the adversary

by Mr. Jason Burgan

As the Marine Corps moves forward with the concept of Expeditionary Advanced Base Operations (EABO), the 1942 fall of the Philippines provides an excellent case study of how forces cut off from re-supply and reinforcement can be defeated in detail. Though EABO's objective is to place distributed forces within the adversary's weapon's engagement zone, the fundamentals of warfighting must continue to apply. Coherent operational and tactical plans that integrate all warfighting functions must be developed and instituted to ensure Marine Corps forces are properly employed and adequately supported to achieve ultimate success.

To begin, it is important I acknowledge that the delay achieved by the United States and Filipino forces against the Japanese in the Philippines was valuable to Allied efforts in the Pacific. The U.S. defense stalled Japanese momentum and allowed the United States time to develop an effective campaign plan. In fact, LtGen Homma, commander of the Japanese 14th Army, was relieved for the slow, substandard performance of his force in the Philippines and was subsequently recalled to Japan to command reserve units for the duration of the war.[1] The bottom line is the tenacious actions by the defenders of Bataan and Corregidor led to a strategic victory for the Allied cause.

Yet, U.S. and Filipino forces were tactically defeated in the Philippines. The reasons for this defeat are numerous. Many authors focus on the lack of resourcing for the U.S. Army forces in the Philippines and the ill-trained, ill-equipped Filipino forces under U.S. command. Others point to the strategic environment: the Japanese had secured their sea lines of communication to Japan and handicapped the U.S. Pacific Fleet with the surprise attack on Pearl Harbor while U.S. civilian and military leaders discussed the futility of trying to defend the Philippines—especially in light of the Allied Germany-first policy. John Gordon, author of *Fighting for MacArthur*, concludes that nothing could have been done to save the forces on Bataan and Corregidor from certain defeat.[2] I argue that decisions by GEN Douglas MacArthur contributed to a speedy military defeat. Therefore, the focus of this article is on the planning and preparation shortcomings of the CG of U.S. Army Forces in the Far East (USAFFE). The purpose is to demonstrate how U.S. and Filipino forces may have been able to gain a tactical advantage in 1942 had GEN MacArthur's focus been on his opponent and with proper planning for the integration of all warfighting functions.

>Mr. Burgan's bio was unavailable.

War Plan Orange-3 and MacArthur's Plan

GEN MacArthur did not adequately plan and prepare for a fight against a peer threat. He became the military advisor to the President of the Commonwealth of the Philippines in 1935, following his tour as U.S. Army Chief of Staff. By the time the Japanese first attacked his aviation capabilities on 8 December 1941, MacArthur had been in the Philippines for six years. In his *Reminiscences*, MacArthur states that he envisioned a ten-year defense plan, one he expected to be fully instituted at the time of the 1946 Philippine independence. Having officially retired from the army in 1937, he was recalled to active duty on 26 July 1941.[3] He notes that in 1939, "I had been back in Manila nearly four years, but Washington had not, during this time, offered any meaningful assistance to Filipino defense plans."[4]

Planning for the defense of an archipelago nation is clearly a substantial undertaking. According to current Marine Corps doctrine,

> two of the most difficult things to do in war are to develop a realistic understanding of the enemy's true character and capabilities, and to take into account the way that our forces and actions appear from his viewpoint.[5]

This perspective of a focused orientation on the adversary is critical to the successful development of a coherent plan to achieve operational and strategic end states. Though Japan demonstrated a significant threat during MacArthur's tenure as military advisor for the Philippines, he lacked a clear understanding of how Japan could catastrophically derail his defensive plans. Furthermore, GEN Wainwright, who as a major general arrived in the Philippines in 1940 to command the Philippine division, states that he and MacArthur rarely discussed the question of war with Japan.[6]

The U.S. contingency plan for hostilities with Japan, War Plan Orange-3 (WPO-3), last updated in April 1941, envisioned a main Japanese attack on the island of Luzon. This expected enemy course of action led Army planners to recommend all U.S. forces be stationed on Luzon Island to counter the enemy offensive. The concept of operations called for a six-month delaying action with the main objective being to hold the entrance to Manila Bay by defending the Bataan Peninsula. This delaying action was meant to allow time for U.S. reinforcements to reach the Philippines.[7]

However, GEN MacArthur did not like the defeatist tone of WPO-3 and successfully advocated GEN George C. Marshall, U.S. Army Chief of Staff, for an updated plan for the Philippines, one which would enable him to employ an "active defense" across the entire Philippine archipelago.[8] However, this concept spread his already understrength forces across the archipelago and did not allow for quick massing of forces or for a reserve to support operations.

To enable an active defense, GEN MacArthur foresaw extensive use of aviation, supporting ground forces to deny enemy landings at the beachhead. He was able to secure significant support from Gen H.H. "Hap" Arnold, Chief of the Army Air Forces, who approved air reinforcement for the Philippines.[9] Likewise, the November 1941 revised Rainbow 5 plan added the following tasks to MacArthur:

1. Support the Navy in raiding Japanese sea communications and destroying Axis forces.
2. Conduct air raids against Japanese forces and installations within tactical operating radius of available bases.
3. Co-operate with the Associated Powers in the defense of the territories of these Powers in accordance with approved policies and agreements.[10]

These tasks were a nod to the air resources supplied to MacArthur. Unfortunately, these resources were primarily parked wingtip to wingtip on their airfields on 8 December 1941, making excellent targets for the Japanese heavy bombers, dive bombers, and fighters.

The 4th Marines: From China to the Philippines

The unfortunate series of events for the 4th Marine Regiment highlight the impact operational decisions, as well as indecisions, have on tactical formations. Their story is used to demonstrate how quickly circumstances on the ground can change for battalions and regiments and to emphasize the importance of a unit's preparation for combat—a solid training philosophy with nested training strategy and plan. They went to war with the personnel, equipment, and level of training possessed at the outset of hostilities.

In Shanghai, China, the 4th Marine Regiment guarded U.S. interests within the International Sector of the city. Growing tensions between Japan and the United States led to tense situations between the two country's security forces within the sector. With an understrength regiment of two battalions, with two companies each, Col Samuel L. Howard, the regiment's commanding officer, knew he lacked the necessary combat power to withstand a Japanese assault in Shanghai. Ironically, in September of 1941, Col Howard requested the evacuation of the 4th Marines. In November 1941, his regiment was evacuated to the Philippines.[11]

The Japanese and USAFFE Intelligence

GEN MacArthur did not adequately integrate the function of intelligence into his operations. The three objectives for the Japanese invasion of the Philippines were strategic in nature. First, they sought to deny American military forces' "use of the Philippines as an advanced base of operations." Second, they desired to "secure the line of communications" to their occupied areas in the south. Third, they needed to "acquire intermediate staging areas and supply bases needed to facilitate operations in the southern area."[12] These objectives were a natural progression of the expansionist policies being pursued by the Japanese government.

LtGen Masaharu Homma, the "Poet General," commanded the Japanese 14th Army and would be the commander responsible for seizing the Philippines. He was known as the poet general because of his affinity for writing poetry during the heat of combat.[13] LtGen Homma's career was diverse, with several postings overseas that led to a fluency in English. He had served as a military attaché on several occasions with the British military, once with British Expeditionary Forces at the Western Front in World War I and then with a regular British unit following that war. He also spent time in New Delhi, India, as the Japanese resident officer.[14]

First, there is no clear evidence that MacArthur studied his potential Japanese enemies. Therefore, it is unlikely he knew who was in command of the 14th Army tasked with invading the Philippines. In addition, at no point during the months of battle when MacArthur commanded forces at Bataan did he seek to learn about his enemy's vulnerabilities and attempt to exploit them. If MacArthur had studied his opponent to understand his background, military thinking, and motivations, he may have been able to ascertain a method for gaining an advantage over his English-speaking, cultured foe.

The Japanese first shaped the battlespace with air raids on key airfields in the Philippines on 8 December. The results of this shaping operation were disastrous for the Army Air Corps. Beginning the month of December with 277 aircraft stationed in the Philippines, by December 15th, "the air strength in the Philippines had been reduced to a handful of fighters."[15] Next, a series of amphibious landings began on 12 December, culminating with LtGen Homma landing the main ground combat elements of his force at Lingayen Gulf and Lamon Bay on the Philippine island of Luzon on 22 December 1941. The forces under his command, two divisions, numbered approximately 43,000. The primary tactical objective of his force was to capture the capital city of Manila, with the purpose of "eliminating American bases threatening Japan's advance" and exerting psychological influence on Filipinos, thereby demoralizing attempts at resistance.[16]

The North Luzon Force was unable to achieve its mission to deny enemy landings at the beachhead. On 22 December, landings of the Japanese divisions forced a precipitous withdrawal to temporary defensive positions. At no point during this withdrawal by the North Luzon Force is there any evidence of updated assessments of the enemy force composition or disposition. In addition, there are no known updates on the enemy's most likely course of action. Ironically, the Japanese were executing the course of action envisioned in the writing of WPO-3.

Second, GEN MacArthur did not have any intelligence requirements tied to his plan for the defense of the Philip-

pines, nor did he properly account for, or have collections associated with any expected enemy actions. The withdrawal of the North Luzon Force influenced MacArthur's decision to enact WPO-3, re-tasking the North Luzon Force to delay the Japanese to allow time for the South Luzon Force to make it to the Bataan Peninsula.[17] The absence of intelligence assessments and overall lack of an intelligence collection plan rests clearly on the shoulders of the commander: "creating effective intelligence is an inherent and essential responsibility of command."[18]

Conversely, the Japanese intelligence collection apparatus was fully developed and provided beneficial assessments to assist LtGen Homma's decision making. The Japanese had correctly assessed the disposition of forces across the archipelago, highlighting a weakness in the U.S. ability to counter a landing on Luzon. On 17 December, Homma had an accurate estimate of the situation, noting the disposition and strength of American/Filipino ground and air forces.[19] The Japanese were also providing up-to-date assessments on the status of the city of Manila—the primary objective of the operation—with the assessed disposition of defending forces.[20]

The 4th Marines: Naval Installation Security

Upon arrival to the Philippines, ADM Hart of the Asiatic Fleet directed Col Howard to get his Marines to the field for training. Needless to say, the preparations were frantic.[21] ADM Hart recalled, "We all knew, […] that they had been cooped up in Shanghai through all those years where conditions for any sort of field training were very poor—and we thought that not much time remained."[22]

This desire for quick training demonstrates two points. First, as noted by ADM Hart, the information environment indicated imminent hostilities with Japan. By the end of November, MajGen Wainwright had taken command of the North Luzon Force and preparations were underway for a Japanese attack.[23] Therefore, the evacuation of the regiment from Shanghai was less a decision to simply remove the Marines from a potential kinetic situation but more a decision to buy time and space in preparation for impending Japanese actions. Second, the Marines were unprepared for combat operations. The occupation duty in Shanghai was not conducive to training under field conditions. However, officers and staff noncommissioned officers should have, and very well may have, ensured their Marines were in the right mindset through table-top exercises and gun drills.

Beginning on 3 December (approximately two days after arrival in the Philippines), the Marines were placed under the operational control of RADM Francis Rockwell, commanding the 16th Naval District. The regiment was tasked to enhance the security posture at naval installations, specifically Olongapo naval station. On 8 December, 2nd battalion was tasked to secure the station at Mariveles.[24]

Already in the Philippines was the 1st Separate Marine Battalion, formed on 1 May 1941, and located at Cavite Navy Yard. The command's primary mission was anti-aircraft defense and was reinforced with 4th Marine Regiment replacements intentionally withheld from going to China.[25] On 10 December 1941, the Japanese attacked Cavite Navy Yard, effectively destroying the installation. A foreshadowing of more struggles to come, the anti-aircraft weapons employed by the Marines were inadequate, unable to reach the altitude of Japanese aircraft due to World War I vintage fuses.[26]

Conclusion

This initial article segment highlighted USAFFE's failures to orient on the adversary, plan, conduct force preparations, and integrate intelligence and operations. The 4th Marine Regiment, evacuated from occupation duties, was hastily employed to reinforce the protection of naval stations. A follow-on segment will demonstrate the culminating impacts of failing to integrate warfighting functions and failing to make any attempts to gain an advantage.

Notes

1. Louis Morton, *The Fall of the Philippines*, (Washington, DC: U.S. Army Center of Military History, 1953).

2. John Gordon, *Fighting for MacArthur*, (Annapolis: Naval Institute Press, 2011).

3. *The Fall of the Philippines.* Prior to Gen MacArthur's recall to active duty, MajGen Grunert had been the senior U.S. Army commander in the Philippines, commanding the Philippine Department.

4. Douglas MacArthur, *Reminiscences*, (New York: McGraw-Hill Company, 1964). In the *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific, Vol I*, (Washington, DC: U.S. Government Printing Office, 1966), he states, "In a desperate race against time, [MacArthur] had attempted to stem the tide by initiating preparations for the defense of the Philippines. Working against almost insuperable political and administrative obstacles, he had commenced in 1935 to create a modern Philippine Army of ten divisions to counter the Japanese attack that he knew would soon come from the north, swiftly, fiercely, and without warning."

5. Headquarters Marine Corps, *MCDP 1-2*, *Campaigning*, (Washington, DC: August 1997).

6. Jonathan Wainwright, *General Wainwright's Story*, (New York: Doubleday, 1986). The idea that MacArthur's "understanding of Japanese military policy and aggressive intentions had induced him to voice repeated warnings of the shape of things to come" (*Reports of General MacArthur*, 3), is interesting given that he did not seriously invest in preparations for WPO-3 and reportedly only rarely discussed the potential of war with Japan.

7. *The Fall of the Philippines*. Morton goes on to say that instead of six months, "Informed naval opinion estimated that it would require at least two years for the Pacific Fleet to fight its way across the Pacific."

8. Ibid; and *General Wainwright's Story*. MacArthur organized his forces, completing the organization in December 1941, into a North Luzon Force led by MajGen Wainwright, a South Luzon Force led by MajGen Parker, and a Visayan-Mindanao Force led by BGen Sharp.

9. Hanson Baldwin, "The Fall of Corregidor," *American Heritage* Vol 17, no. 5, (August 1966).

10. *The Fall of the Philippines*. From extract copy of Changes in Joint Army and Navy Basic War Plan, RAINBOW 5.

11. J. Michael Miller, *FROM SHANGHAI TO CORREGIDOR: Marines in the Defense of the Philippines*, (Washington, DC: Marine Corps Historical Center, 1997).

12. Douglas MacArthur, *Reports of General MacArthur: Japanese Operations in the Southwest Pacific Area, Vol II, Part I*, (Washington, DC: U.S. Government Printing Office, 1966).

13. Hampton Sides, "The Trial of General Homma," *American Heritage* 58, no. 1, (February/March 2007).

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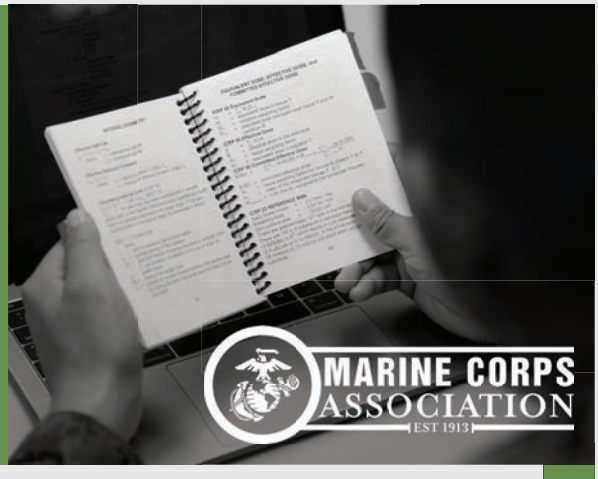

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MCU "10 Years Outside" Writing Contest Winners: First Place

Operating Under the Umbrella

Learning from the Houthis

by Maj Sean Ford

>Maj Ford is the Company Commander for Company A, BLT 1/4, 15th MEU. His previous deployments include Operation Enduring Freedom 13.1 and Black Sea Rotational Force 15. He also previously served as the Headquarters and Services Company Commander for 1/4 Mar during MWX 1-20.

In April 2022, two of the wealthiest nations from the oil-producing Persian Gulf countries agreed to a U.N.-brokered two-month ceasefire with what used to be a rag-tag guerrilla movement in Yemen.[1] With military forces built from all the money that oil could buy, Saudi Arabia and the United Arab Emirates were forced into an embarrassing and humbling action that provided legitimacy to their foe on the international stage. With virtually no way to combat the Saudi-led coalition's control of the skies, the enemy persevered through uncanny discipline and grit. Outnumbered against the Yemen government backed by the combined strength of nine other countries, the rebels continued to persist through stand-off tactics and a willingness to survive.[2] The Houthis' rebellion has racked up impressive achievements to include a successful three-year running border war with Saudi Arabia, medium-range ballistic missile strikes on Riyadh and Yanbu, the destruction of the United Arab Emirates-leased *HVS Swift*, and the damaging of Saudi oil infrastructure through the use of bomb-laden UAVs.[3] Interestingly enough, the Houthis' string of accomplishments were attained through methods similar to those written about in the *Tentative Manual for Expeditionary Advanced Base Operations*.

While the Marine Corps has been wargaming and experimenting to arrive at the Expeditionary Advanced Base Operations (EABO) operating concept, the Houthis in Yemen have been practicing EABO-type tactics from 2015 to the present.[4] Although far from the "original gangsters" of EABO (the Coast Watchers of Guadalcanal lay claim to the title), the Houthis' prowess throughout their struggle in Yemen provides valuable lessons for the Corps in the current era of Force Design. Readers should not confuse the Houthis' prowess on the battlefield for a worthy cause. The Houthis are an evil organization with a warped ideology. Regardless, students of war must learn from them but not adopt their beliefs.

On paper, the Houthis are overmatched in all categories by a coalition mainly composed of the Yemeni government forces, Saudi Arabia, and the United Arab Emirates. Yet, through persistence and healthy support from Iran, the Houthis have been able to thwart the combined efforts of their regional rivals. By studying the Yemen Civil War and looking at the Houthi's tactics, techniques, and procedures, capabilities, and limitations, Marines can derive valuable lessons with implications for EABO publications, Force Design, and the EABO operating concept at large.

To understand why they shifted to tactics similar to those espoused by EABO believers, one must know the Houthis' history. After rising to prominence in the 1980s through promoting a fringe form of Islam called Zaydism and voicing their discontent with the Yemeni government over the administration of Yemen's northern regions, the Houthis expanded their operation through intermarriage with tribal families and a robust social campaign. Their discontent erupted into the first Houthi War, which they fought from June to September 2004, resulting in a loss.[5] Through improvement of Houthi soldierly skills and consistent Yemen government incompetence, the Houthis steadily waged five more guerilla campaigns against the Yemeni government from 2005 to 2010—culminating in seizing portions of the city Sa'ada from government forces.[6]

Yemen's President Ali Abdullah Saleh then became a victim of the Arab Spring in 2011. With his ouster, the Houthis took advantage of the situation by establishing control of Northern Yemen, capturing the city of Sa'ada, and suppressing dissent throughout areas under their control. Additionally, they adopted a formal name, Ansar Allah (which means "Partisans of God") and created a television station with the help of Hezbollah. From 2012 to 2014, Ansar Allah continued their territorial ex-

pansion, courted Iran and Hezbollah to help their cause, and leveraged the support of the ousted former president Saleh and his loyal forces to pull off a coup in the country's capital of Sana'a. Ansar Allah's takeover of the Yemen capital led to a windfall of military equipment and armament. [7]

After the fall of Sana'a, the Yemeni government fell back to Aden. Hot on the Yemeni government's heels in March 2015, Ansar Allah conducted a 180-mile attack to capture Aden, forcing the head of the Yemen government, President Abdrahbbuh Mansur Hadi, to flee to Saudi Arabia.[8] Hadi pled for support from the international community to assist in the destruction of Ansar Allah. Subsequently, Saudi Arabia formed a coalition to intervene in Yemen, restore the Hadi regime, and dislodge Ansar Allah from Yemen.[9] Backed by the Saudi-led coalition, pro-Hadi forces conducted a counter-attack to evict Ansar Allah forces from Aden in July 2015.[10] Since then, a war of grinding attrition has continued, replete with humanitarian crises and the rise of Al-Qaeda in the region.[11]

After Aden switched hands back to pro-Hadi forces, Ansar Allah changed its warfighting approach. They consolidated their gains and defended their newly acquired territory through a sea denial campaign, effective signature management, winning the reconnaissance/counter-reconnaissance fight, leveraging the civilian populace to their advantage, and innovative use of modern technology.[12] The new approach adopted by the Houthis should sound familiar to Marines studying EABO. In fact, the Marine Corps' publication, *A Concept for Stand-In Forces,* uses a vignette detailing Houthis' tactics as a case study for the employment of EABO. The Houthis' ability to bring a regional military juggernaut to heel speaks to the effectiveness of their approach to war. Their accomplishments also warrant further examination to find valuable lessons.

In his article "The Houthi War Machine: From Guerilla War to State Capture," Michael Knights points out that "another factor that supports the sustainment of so many battlefields simultaneously is the very low force-to-space ratio that Ansar Allah employs, in part to mitigate the effects of total enemy air superiority." Knights further describes how, as of 2015, the Houthis have shifted from traditional military formations such as platoons and companies to units of action as small as three to five fighters. On the frontline, Ansar Allah employs these smaller units as pickets to defend frontages as extensive as one to three kilometers using minefields, trip wires, booby traps, and complicated trench systems with multiple fallback positions. Houthis also use small operations centers to manage frontline troops and dispatch reinforcements to troubled areas. The Houthis split their reinforcements into "tiny, largely autonomous cells, which are never bigger than the passenger capacity of a normal civilian car or frequently a two-man trail bike." While traveling to reinforce a sector, reinforcements are usually indistinguishable from the civilian populace. When in desperate need, national-level Houthi leaders can launch a more significant reserve quick-reaction force to assist troubled sectors.[13]

Knights suggests that since changing its approach to waging war in 2015, Houthis are "less capable of advancing against enemy defensive positions that are covered by airpower" and that Houthis had "a poor record of dislodging alerted enemy defenses."[14] Knights also notes that since 2015, Ansar Allah has been more successful in raid and ambush-type tactics focusing on Saudi Arabian border forces. EABO advocates can take away multiple lessons from Knights' article. First, commanders should get comfortable with units of action being the size of fire teams. Right now, the *Tentative Manual for EABO*, states that units of action are typically going to be reinforced platoons.[15] A reinforced platoon as a unit of action assigned to a sector should not be an issue, but platoon commanders need enough freedom from their higher headquarters to distribute fire team-sized elements to dispersed areas. Second, commanders need to understand that raids and ambushes will be the preferred type of offensive operations for EABO. Third, if EABO forces wish to conduct a major offensive campaign, units will need to find a way to aggregate back into a larger unit before going on the offensive. This third implication means that EABO forces will require lift (whether from the populace or organic) to rendezvous. Also, this reconstituted force needs to be comfortable operating under a foreign country's command and control structure until U.S. Forces can come to the region and assume operations.

Moreover, the Marine Corps can take the Houthi's reinforcement method a step further. Instead of reinforcing endangered sectors, commanders need to think through reinforcing sectors with firepower when a target of opportunity presents itself. If a target of opportunity exists in a fire team's sector, the operations center needs to be able to vector firepower and resources to that sector. In the meantime, reserve firepower and resources should remain mobile behind the frontline, within communication range of the operations center, but not co-located with the operations center. For example, before a target of opportunity presents itself, the frontline troops are hard to detect because they operate in small teams and practice good signature management. Meanwhile, wheeled and mobile anti-access/area denial missiles travel in a holding pattern in the area around the operations center. When an enemy target ship presents itself, frontline troops report back to the operations center, which routes the mobile anti-access/area denial missile to the frontline troop's sector. The anti-access/area denial missile then travels to the appropriate sector, launches its missile, and departs the area. In summary, the Marine Corps needs to begin addressing different methods of firepower concentration in EABO publications or risk an incomplete operating concept.

In addition to the ever-increasing dispersion of its forces, Knights further notes the Houthis' uncanny ability to hide their signatures. Out of necessity, Houthis are good practitioners of emissions control through low-powered cell phones. Furthermore, because of their lack of air superiority, Houthis minimize their exposure to Saudi pilots by limiting their movements, remaining stationary for long periods, and over-

loading their frontline troops with ammunition and supplies to reduce logistics movements. Remarkably, Houthis have developed the ability to "use special rocket-assisted canisters to deliver food to outposts."[16] Although the Marine Corps has placed a renewed emphasis on the signature management aspect of warfighting, there are still steps that the Corps could put in place to ensure good execution.

The Marine Corps should consider making Electromagnetic Spectrum (EMS) or signals assessment Operational Support Teams (OSTs) available to fleet units for field training. In a field exercise, EMS OSTs would be co-located with a combat operations center, identify units that break signature management discipline, and report violating units to the combat operations center for remediation during a field exercise. This measure will significantly increase the lethality of all FMFs and ensure that friendly critical vulnerabilities can conceal themselves from the enemy. EMS OSTs could potentially be located with each base's training support division/center when not in the field. When a unit goes to the field, an EMS OST could be requested via a base's Training support division/center and will accompany the unit to the field based on availability. Additionally, the Marine Corps should work with the artillery community and the Navy to consider developing a rocket-assisted canister that delivers logistics to isolated units via artillery tube or naval gunnery. This innovation would be an excellent alternative to logistics delivered by drone should the enemy have the ability to track a drone's flight and point of origin.

Knights also explains how the Houthis recruiting efforts have been successful. Although they punish tribes who do not provide enough children fighters for their cause, the Houthis have a robust recruiting program that leverages various means to attract followers.[17] Since the 1990s, the Houthis have "built a powerful, cross-cutting social network around the Zaydi revivalist movement that included inter-marriage with tribal families ... summer camps and social programs, and a political party."[18] Specifically, since 2015, the Houthis have retained their recruiting edge through "group solidarity reinforced by chanting and sermons at a proliferating series of festivals, workplace gatherings, summer camps, and classroom indoctrination sessions."[19] Their grassroots campaign to maintain control of the populace in which they live is impressive and will become difficult to defeat should the Houthis successfully brainwash an entire generation of Yemenis.

Arguably, the Marine Corps has improved at operations in the information environment. There is a renewed emphasis on messaging to a broader audience with every action. Unfortunately, in the nations that host Marine forces as they execute EABO, messaging alone will not be enough. Comprehensive plans where action in conjunction with messaging will need to be employed at the lowest levels of command to combat nefarious actors in the populations which host Marine Forces. This implies that the Marine Corps should ensure each unit of action has an information operations and civil affairs capability to ensure that units execute the proper measures when considering the local population. Actions and messaging need to reflect pure intentions regarding friends and allies. Additionally, commanders need to get comfortable with Marines living among the populace and embracing their culture. Too often are U.S. forces labeled with terms like "imperialist" because a unit decided to isolate itself and become standoffish from the very population they were seeking to protect. A civil affairs expert (civilian or military) would provide a much-needed backstop to unfriendly behavior. Similarly, an information operations expert would combat any counter-narrative the enemy provides to the local populace.

Finally, as the Yemen government was collapsing from 2011 to 2014, the Houthis extended "a network of forces across Northern Yemen to neuralgic locations that one Houthi field commander termed 'hegemony points.'"[20] As their tactics and campaigns changed in 2015, the Houthis would slowly seize these already identified "hegemony points" from the Yemen government.[21] By identifying, early on, key locations they wished to control in the future, Houthis were able to conduct concentrated long-term shaping actions on the areas they wanted to control.

The Marine Corps should learn from this same concept but not in a fashion where U.S. Forces wish to control or "rule as sovereign" over a foreign land. A simple rule to abide by would be that "if one is not welcome, show yourself the door." Messaging, and genuine intentions, should reflect the United States' desire to preserve foreign cultures that wish to practice their way of life freely. In friendly areas that would be ideal for EABs, the Marine Corps should begin establishing a presence. Something as simple as a person (site lead) interacting with the populace in that area. In line with ideas mentioned in *A Concept for Stand-In Forces*, site leads would be able to locate potential indigenous sources of supply, infrastructure, and logistics for future EAB sites. This way, when the time comes to stand up a site, the local sourcing of logistics is already figured out. The reality is that for EABO to be effective, operating under the enemy's umbrella now will pay dividends should a conflict were to erupt in the future.

When the operating environment surpasses the threshold of armed conflict, Marines executing EABO, no matter how well established, will be outnumbered by a competent foe in an unfamiliar land. They will be the underdog. They will be the proverbial David to an INDOPACOM Goliath, or, a more contemporary example, Nick Foles up against a Tom Brady. The Houthis provide a practical historical and modern example of a similar scenario. Their use of dispersion, trust at the lowest levels, signature management, community coercion and engagement, and early shaping actions have led to a successful campaign thus far. For the Marine Corps, as the Houthis keep experimenting in terms of EABO tactics, the Corps should continue to watch the struggle with pen and paper in hand.

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USMC

MCU "10 Years Outside" Writing Contest Winners: Second Place

The Cat's Meow in North Africa

Lessons from Operation SERVAL, Mali 2013

by Capt Michael A. Hanson

The conduct of warfare is an ever-evolving phenomenon. Recent conflicts around the world have indicated that the character of modern warfare has moved past a precipice, behind which most modern armies are organized and equipped to fight. Beyond this precipice lies a daunting new age in warfare, an age that many modern military forces are ill-prepared to confront. The Marine Corps is one of these fighting forces. Recently, the Corps has identified that it is not currently systematized for this new character of modern warfare and has embarked on an ambitious, and controversial, plan to modernize itself to effectively meet this new operating environment. In anticipation of this deadly future, new weapons systems such as loitering munitions, long-range missiles, and new organizations such as the Infantry Battalion Experimental manning construct are being heralded as the way to stay relevant in the future operating environment. As the character of war continues its everchanging march, the Marine Corps is absolutely correct to evaluate its prospects and make the appropriate changes in its tables of organization and equipment to remain able to fight and win in this new environment.

However, the Marine Corps must also be prepared to fight future campaigns against old enemies that were never truly defeated and remain a threat that can force an American response at any time. Radical militant jihadists, emboldened by their victory in a twenty-year struggle against the combined forces of the United States and its NATO allies, are still a threat to regional security in many countries across several continents. Weak local governments with immense ungoverned spaces have been the traditional tinderboxes awaiting the destructive spark of these movements. These fertile breeding grounds will remain an undeniable aspect of the future operating environment. Though the People's Republic of China is the pacing threat and the greatest risk to regional stability in the Western Pacific and the current rules-based world order, that is not the only enemy America is likely to fight. The United States and its crisis response force—the Marine Corps—need to be prepared to respond to the threat of fanatical militant jihadism as well. Before divesting of much versatile equipment and radically altering its structure, the Marines should examine a recent example of when a modern and sophisticated Western military was called to halt a rout and liberate the vastness of a large, rugged, and austere country from the hordes of 21st-century savagery. Operation SERVAL in Mali offers many valuable lessons for the Marine Corps to remain a credible crisis response force in any clime and place, even in ones that the country's gaze seems to have moved on from.

>Capt Hanson is the Weapons Company Commander at 3/4 Mar, Twentynine Palms, CA.

The United States and ... the Marine Corps—need to be prepared to respond to ... fanatical militant jihadism ...

In January of 2013, the world watched in shock as extremist Islamist forces stood poised to topple Bamako, the capital of Mali, and create a caliphate in North Africa. The previous year had seen a small, backwater insurgency achieve catastrophic success and seize much of the country. What began as a rebellion by a marginalized ethnic group in Northern Mali, the Tuaregs, was exploited by jihadist groups, such as Ansar Dine, the Movement for Oneness and Jihad in Africa, and al-Qaeda in the Islamic Maghreb. A fortuitous military coup in March 2012 left a vacuum that the jihadists quickly filled as the weak and fractured Malian army fled southward. By 10 January 2013, Mali's largest Northern cities, Kidal, Timbuktu, Gao, and Konna, along with roughly two-thirds of the country had fallen. As the black flags of jihadism went up over Northern Mali, strict Sharia law came down on its inhabitants. Sensing an opportunity to capitalize on the chaos and

usurp the reeling Malian government in Bamako, the jihadists dispatched two columns of technical vehicles and fighters towards the city of Mopti. As the column moved Southward, the beleaguered President of Mali, Dioncounda Traore, submitted a formal request for military assistance to Mali's former colonial master: France.[1]

On 11 January 2013, French President Francois Hollande issued the order to commence Operation SERVAL. Within six hours, French rotary wing assets from neighboring Burkina Faso were on the attack. At the cost of one French pilot killed and an attack helicopter shot down, the jihadist column was halted and its scattered remnants in flight.[2] This was to be the highwater mark of the insurgency, but a daunting task still lay ahead: the expulsion of the jihadists and liberation of the territory they had conquered. With the initiative firmly seized, French forces wasted no time exploiting it. As French forces arrived in Mali and aggregated into combat groups, the operation's military commander urged patience, possibly for as long as a month, for the build-up to be complete with adequate supplies and logistical means. However, President Hollande overruled this and ordered a swift reconquest of the main population centers in the North.[3]

The liberation began shortly after French, Malian, and forces of a coalition of African partner states known as AFISMA (African-led International Support Mission to Mali) crossed North of the Mali River bend. On 21 January, French and Malian ground forces recaptured Diabaly and Douentza. By now, the French-led offensive had branched out in a two-prong advance with one axis directed at Timbuktu and the other at Gao. By 27 January, a combined effort by French special forces, paratroopers, and motorized task forces had seized Gao and reinforced it with Malian and AFISMA forces. The leapfrog technique saw the special forces seize a bridge at Wabaria, quickly followed by another special forces helicopter insert at the airport at Gao, and be immediately reinforced by a paratrooper air landing in four airplanes on the airstrip to secure it. With the bridge at Wabaria and the airport at Gao in friendly hands, the French and African motorized force then arrived to secure the city. Simultaneously, French special forces and airborne troops parachuted around Timbuktu to cut off enemy escape routes. Later that day French and African motorized forces arrived to secure the city. By 28 January, the cities of Gao and Timbuktu, comprising 95 percent of the population of Northern Mali, were liberated.[4]

Sustaining the tempo thus gained, the French once again employed airmobile special forces to seize the airport at Kidal on 31 January. Shortly thereafter, Malian Tuareg militia and 1,800 Chadian troops entered and secured Kidal.[5] The leapfrogging one-two combination of special forces and airborne was repeated to out cycle the jihadists one more time. This time, the special forces and paratroopers parachuted onto the airport at Tessalit in the far North of Mali and were soon reinforced by another air mobile element landing on the runway to debark troops. With these airborne maneuvers completed and reinforcements arrived in Kidal and Tessalit, jihadist forces were isolated in the remote Adrar des Ifoghas mountains.[6]

Up to this point, most of the jihadist forces retreated to the North as the French swiftly collapsed their urban sanctuaries around them or melted into the population. The fighting was sporadic as most militants chose to fight another day rather than resist a rapidly disintegrating situation with which they could not cope. However, this changed in the Adrar des Ifoghas, the heartland of Mali's insurgency near the border of Algeria. Here, the jihadists had nowhere else to go and had no civilians to blend in with. In this mountainous region, operations slowed significantly as French troops had to get out of their vehicles and trek into the rugged terrain to hunt down jihadist holdouts in caves, crevices, boulders, and other natural bunkers. This would be a task reserved primarily for France's paratroopers who would have to fight the jihadists in close quarters in the oppressive heat. Though French infantrymen shouldered the main burden of this fight, they were supported by a small complement of supporting arms assets, namely two Caesar self-propelled howitzers, two Gazelle, two Tiger, and three Puma helicopters.[7] These significantly increased French combat power and were used to good effect. In the Ammetettai Valley, the jihadists put up a fanatical fight that cost the lives of 26 Chadian troops. But the French, Malians, and Chadians persisted. After a month-long operation, the area had been systematically cleared of jihadist redoubts and nearly 400 militants had been killed.[8]

By May, the situation in Mali changed from a mobile campaign of liberating the Northern Malian cities and countryside from the grip of militant jihadists to a stability operation to hold what was seized and prevent it from falling to the wayside again. Soon, it would evolve even further into a counterinsurgency campaign as French troops attempted to simultaneously suppress guerrillas and build up local security forces. This phase of Operation SERVAL is beyond the scope of this paper and does not reflect the lessons this piece highlights. It is debatable whether France's Operation BARKHANE, which succeeded Operation SERVAL, to control jihadist militants in the region was a success. What is not debatable is whether Operation SERVAL was a success. Operation SERVAL was a smashing success of maneuver warfare to halt an insurgent advance that threatened to topple a government and found a caliphate, and furthermore, to liberate oppressed Malian citizens from the harsh grip of jihadist-imposed sharia law.

President Hollande had set forth the following objectives before committing his troops to this operation: "Stop the Jihadi advance, assist the government of Mali in retaking the country, destroy the terrorists, seek and secure the [French and other international] hostages."[9] The scope and pace of the French effort to achieve these objectives are nothing short of remarkable. What the French military achieved in barely three months, with only 4,000 French troops and 3,000 African troops stands as feats worth emulating by the Marine Corps. Indeed, there are many

useful lessons Marines can take from this lightning campaign in the desert.

The first, and greatest lesson of Operation SERVAL is the speed with which the French were able to respond effectively and deploy forces into the theater of operations. As previously stated, within six hours of President Hollande issuing the order to commence the operation, French helicopters were conducting attacks. On the very same day, French troops began to arrive in Bamako via airlift. These were a company-sized element of infantry from neighboring Chad that departed with less than 24 hours' notice.[10] The next day, French fixed-wing aircraft began strikes against jihadist troop concentrations and logistic sites in Northern Mali. These French fighter aircraft were also based in Chad.[11] Another company-sized ground combat element departed Abidjan, Ivory Coast twelve hours after it received orders and arrived in Bamako to reinforce the first company within 48 hours.[12] Each of these actions were performed by forces forward deployed to African countries in the region. Additional French forces came from Senegal, Gabon, Djibouti, and the Central African Republic.[13] Like Mali, much of the rest of North Africa was under the control of France during its colonial era. This history continues to the present, as France still harbors interests in the region and maintains agreements with some of its former colonies to garrison troops. France was undoubtedly able to strike militants and reinforce Bamako within hours because it had troops forward deployed to the region. However, the French also rapidly deployed troops based in France to Operation SERVAL.

"Guepard," or Cheetah, is the French military's crisis response mobilization system. This is a contingency operation alert system that earmarks units at the peak of their training cycle. Should the need arise, France has trained troops, ready to act.[14] A French Marine company garrisoned in France was in Bamako within eight hours of being activated.[15] Guepard also embarked a France-based battalion-sized force aboard the amphibious ship *Dixmunde* in Toulon on 21 January and began disembarkation on 28 January in Dakar, Senegal before driving on to Bamako.[16] Additionally, the French flew Guepard-aligned airborne units into the theater to build up its forces, as well as a squadron of armored vehicles to Niamey, Niger, where it began a road march into Mali's interior.[17]

The next great lesson of Operation SERVAL is the task organization of the French units involved.

The next great lesson of Operation SERVAL is the task organization of the French units involved. As disparate units arrived in theater, they were quickly organized into combined-arms organizations structured to leverage their unique capabilities. Platoon-sized elements were joined into what the French call, Sous-Groupement Tactique Inter-Armes (SGTIA), or "Combined Arms Tactical Sub Group." The SGTIA is a company-sized task force consisting of "three infantry or armor platoons and one platoon from the other arm (i.e. three infantry and one armor, or vice versa,) with some associated support elements and a company level command capability."[18] The French combined these units in battalion-sized configurations as well, known as the Groupement Tactique Interarmes (GTIA), or "Combined Arms Tactical Group."[19] The GTIA "has the same structure as the SGTIA, only its component parts are companies, not platoons. Thus, the basic GTIA has three infantry companies and one armor company (or three armor and one infantry), a variety of support elements, and a battalion level headquarters capability."[20] Henceforth, the company team construct will be referred to as "Subgroups" and battalion task forces as "Groups."

In the French military, brigades exist essentially to provide units for employment. As the company-sized Subgroups are "the basic building block of expeditionary forces. … By no means are all the participating units drawn from the same brigade."[21] This structure of modular units, able to be pieced together to build rapidly deployable ad hoc combined arms task forces, proved essential to quickly introducing units ready to fight into the theater. In such a configuration can exist Marines, paratroopers, and Legionnaires all in the same formation. As an example, the Subgroup that deployed from Chad "primarily consisted of two companies of the 21st Marine Infantry Regiment … a squadron from the 1st Foreign Legion Cavalry Regiment. … And a battery of howitzers and mortars from the 3rd Marine Artillery Regiment."[22] Thus, interoperability between Services was key to success.

One especially poignant lesson of Operation SERVAL for a self-described "middleweight force" as the Marine Corps is in the types of vehicles employed. Northern Mali lies in the Sahel, a large expanse of North Africa known for its generally flat and wide-open desert spaces. This is an ideal country for motorized operations, and the French specifically task-organized their Groups and Subgroups into mainly motorized forces that were exceptionally suited to this type of terrain. Making up the armored units of the Groups and Subgroups was the 8.9-ton ERC 90 Segais, a six-wheeled light tank mounting a 90mm main gun and the 17-ton AMX-10RC, another six-wheeled light tank that mounted a 105mm main gun. The infantry rode in the venerable VAB, a four-wheeled 13-ton Armored Personnel Carrier with a crew of 2 and room for 10 infantrymen, and the VBCI, an 8-wheeled, 28-ton Infantry Fighting Vehicle mounting a 25mm main gun and carrying a crew of 3 and 8 additional infantrymen akin in size and appearance to the Amphibious Combat Vehicle. Other vehicles that supported the Groups and Subgroups were the 4.2-ton VBL and 5.3-ton PVP, both wheeled 4x4s similar to the HMMWV or Joint Light Tactical Vehicle. The larg-

est indirect fire asset employed was the Caesar, a self-propelled 155mm howitzer mounted on a six-wheeled truck weighing 17.7 tons.[23] Though some vehicles are clearly larger and heavier than others, they are significantly light by comparison to vehicles serving similar roles in other Western militaries. Among the advantages of this are that the vehicles fielded in Operation SERVAL were much easier to deploy, as all were capable of air transportation by C-130 and C-160, and their lighter weight and wheeled simplicity made them much easier to maintain in the field, especially in the austere environments of SERVAL.[24]

The performance of this wheeled vehicle fleet offers much for the Marine Corps to consider as it fields new vehicles like the Joint Light Tactical Vehicle and Amphibious Combat Vehicle, and considers purchasing the Advanced Reconnaissance Vehicle, the most pertinent lessons being in the performance of these platforms on poor roads, in the countryside, the maintenance required to keep them running, and how far these vehicles operated in such austere conditions. First, the various motorized formations had to drive far to get to the combat zone. The vehicles that had been forward deployed to Abidjan, Cote d'Ivoire drove 1,300 km over 3 days just to get to Bamako.[25] Likewise, the formations that debarked the *Dixmunde* in Dakar, Senegal drove over 1,000 km to Bamako as well.[26] From Bamako, it was another 700 km to Timbuktu and 950 km to Gao.[27] An officer in the formation that started in Abidjan, Cote d'Ivoire, summed up the feats of mobility his unit achieved in "six weeks of operations 'in the zone of operations, near or in contact with the enemy, without returning to base, without technical pauses, and without conducting repairs. … Each vehicle traveled 2,500 to 5,000 kilometers off-road and in difficult terrain."[28]

The salient lessons for Marine Corps vehicular mobility are in the depth of logistical mobility. The French motorized forces operated beyond expectation and broached the limits of sustainability, but they accomplished the mission. Most of the vehicle variants the French used in Mali date back to the 1970s and 80s and were due to be replaced soon. However, some French sources "say that their outdated equipment proved less delicate than newer equipment and easier to fix in the field."[29]

The sheer size and austere nature of the environment imposed serious challenges on the French effort. "Troops were often out of communications for up to 10 hours a day. They carried only one day's supply of fuel, water, and food. This put significant strain on logistics. … The size of the force (over 5,000 by February), the distance between the theater command post and the advanced units (up to 1,800 kilometers), the extreme climate, the poor conditions of the roads, and the lack of local resources made it particularly challenging to provide 4,500 daily rations, 45,000 liters of water, 10 tons of ammunition, 30,000 liters of gas, and 200,000 liters of kerosene. In Mali, logistics constrained maneuver. Several operations had to be cancelled, rescheduled, or modified to accommodate the logistical requirements."[30] Despite these shortcomings, the French continued to operate and kept up the pressure on the jihadists.

The French military's logistical achievements in Operation SERVAL are nothing short of impressive. However, the operation revealed the limits of France's strategic mobility. During the rapid transport and build-up of forces into Mali, France simply did not have enough aircraft to move its troops and equipment into the theater in accordance with the speed and tempo President Hollande sought:

> Between January 10 and February 11, 2013, 362 flights carried 10,000 tons of freight in theater. Some 75% of these flights were contracted out to civilian transporters. British, Canadian, Swedish, Hungarian, and American allies flew most of the remaining 25%. The situation was similarly dire in terms of in-flight refueling capacity. France had an aging fleet of refuelers that could not meet mission requirements, so allies again filled the gaps. By January 27, after some procedural delays, the U.S. military provided three air tankers. In the end, Americans, Spaniards, Germans, and British provided 30% of the refueling missions.[31]

The fact that France alone could not logistically support the operation and the figures regarding the difference made up by outside entities demonstrates the necessity of utilizing allies and partners. That France assumed the logistical burden to transport and supply the forces of multiple African partner nations compounded their logistical dilemma, though their African partners were absolutely worth the effort to move and sustain. Without a doubt, these 6,040 AFISMA troops acted as a force multiplier to French operations by relieving French forces in recently captured areas and enabling these freed-up forces to move on to another objective.[32]

Another crucial area where the French received outside support was in the realm of intelligence. At the outset of the operation, American MQ-1 and MQ-9 unmanned reconnaissance aircraft operating out of Niamey, Niger, were sent to support French efforts in Mali. Members of American intelligence agencies were also tasked to work with the French, to the point that French and American intelligence efforts were consolidated in a joint center where they could both leverage and streamline their assets and energies. Much of this work resulted in assessments of enemy unit locations for immediate targeting.[33] Though American intelligence support directly contributed to the defeat of the militants, France's own intelligence estimates, gathered from decades of presence in the region, contributed vitally to success as well. Basically, the French were already familiar with the human terrain. They understood the dynamics of the diverse tribal, ethnic, and religious stratifications and knew how to navigate it.[34] This understanding is evident in how the French employed partner nation forces without upsetting the sensitivities of diverse identity groups. The fact the French worked with their African partner forces so effectively in Mali was the product of decades of operational deployments in the region and continued training with the militaries of their former colonies.[35]

It is, perhaps, no coincidence that the formations deployed to Operation SERVAL, predominantly Marines, paratroopers, and Foreign Legionnaires

among others, are the units with a history of service in low-intensity conflicts in austere environments including the Sahel. These units share an expeditionary culture where they are ready to deploy at a moment's notice and operate with few amenities beyond the basic needs of survival, which, due to the stretched nature of SERVAL's logistical support, was all that France could provide them as they pressed deeper into the Malian hinterlands.[36] They performed expertly, constantly on the move, enduring extreme heat, surviving on field rations, and living without toilets, showers, or air conditioning.[37] These troops did not expect much and likewise did not receive much either, but this dynamic is actually a source of pride among these troops who are accustomed to doing more with less and demonstrated this once again with impressive results.[38]

Furthermore, this French expeditionary culture that is comfortable in austerity is also comfortable with risk. To say that French leadership in Mali accepted great risk at multiple levels is simple in the least because they had no other choice but to. For example, in contrast to many other Western militaries, the French chose mobility over protection. The vehicles France built much of its combined-arms task forces around were wheeled and relatively light, though they provided adequate firepower they lacked the protection that most Western militaries crave.[39] Additionally, French communication equipment was insufficient to cover the enormous distances between units, nor could their limited satellite communications equipment operate on the move.[40] The ad hoc task organization of varied units from disparate parent units and diverse locations revealed gaps in networkability and inability to communicate between units.[41] Furthermore, the French simply could not maintain the so-called "Golden Hour" of medical care, where wounded troops need to be transported to an adequate level of medical capability to receive lifesaving care.[42] The French could not meet this standard, yet they accepted it. The French leadership from President Hollande put enormous faith and confidence in the abilities of junior leaders at the extent of operating lines with limited assets and few resources. Though again, this was not unique to Operation SERVAL, as the French military has an established culture and history of this.

One could ask if the contemporary Marine Corps would accept these levels of risk and most would agree the Marines would not. The French have a theory about this, in their view, the "American way" of war is going to combat under ideal conditions. They note that U.S. forces have lots of resources and sophisticated assets, from intelligence, to logistics, to firepower, and typically will try to leverage all of these things to locate and destroy the enemy at long range. Thus the U.S. military fights luxuriously, which it can do because it can afford to, while the French military must often make do with scarcity. Likewise, French planning for Operation SERVAL entailed blunt prioritization of efforts, allocation of resources, and acceptance of risk in situations that could not be effectively mitigated with material solutions.[43] So it seems the French military more so than other Western forces is prepared to assume more risk when committing its forces.[44] However, it must be acknowledged that the French did not face a very organized nor a well-equipped enemy and acceptance of risk against several disconnected groups of jihadist militants is not the same as that against a trained and structured military with sophisticated weapons systems. The reason the French were able to accept as much risk as they did is largely because of the low-quality enemy they faced.[45] Now that being said, hypothetically, would the Marines accept similar risks as the French in a similar environment against a similar enemy? Many would say no.

In many ways, the French victory can be attributed to their "maneuverist spirit." Perhaps then, the French have a lot to teach the Marine Corps about its own warfighting doctrine.

The fusion of France's expeditionary culture and willingness to accept risk lent perfectly to the practice of maneuver warfare, and without a doubt Operation SERVAL makes for a brilliant case study in maneuver warfare, as surely, Operation SERVAL provides a clear example of a "rapidly deteriorating situation with which the enemy could not cope."[46] The French insisted on a plan that used speed and tempo as weapons to break the enemy's cohesion, and prevent them from regrouping and establishing hardened positions.[47] The French deployed quickly and responded faster than anyone could have expected. When President Hollande committed his nation to war, his enemies had the initiative. However, French forces quickly seized the initiative and did not relinquish it. Their blitzkrieg across the Malian countryside demonstrates their advantage was pressed "relentlessly and unhesitatingly."[48] The French were certainly "ruthlessly opportunistic." When the "decisive opportunity arrived, [they] exploit[ed] it fully and aggressively, committing every ounce of combat power [they] could muster and push[ed themselves] to the limits of exhaustion," of both man and machine.[49] Boldness, or audacity ("audace," in French parlance) is a common virtue in French military culture and was a common feature of Operation SERVAL.[50] In many ways, the French victory can be attributed to their "maneuverist spirit."[51] Perhaps then, the French have a lot to teach the Marine Corps about its own warfighting doctrine.

The Marine Corps can take a lot away from the French and their brilliant execution of the crisis response and offensive phases of Operation SERVAL. From tangible things such as

the logistics of rapid deployment into the theater of operations, the generation and task organization of forces, the tables of equipment of vehicles and the characteristics of their sustainment and operational capabilities, the benefits accrued by leveraging years of investment in security force assistance to partner nation forces, the unique and vital contributions of allies and partners, to the less tangible elements such as the expeditionary culture, audacity, and the spirit of maneuver warfare in the French military. Operation SERVAL should pique the interest of the Marine Corps most especially among the branches of the U.S. military. This is because if a contingency like this were to occur again and the United States committed to respond, the Marine Corps is the Service best aligned to respond quickly and efficiently, like the French did. As a result of the Marine Corps' own boldness, expeditionary culture, forward deployed posture, and similar equipment density lists, many of the aforementioned lesson points are areas of specific interest to the Marine Corps, as America's self-proclaimed "middleweight" crisis response force. The only questions that remain are not if but when will a crisis like this erupt again and what shape will the Marine Corps be in to respond, as it inevitably will.

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12. *France's War in Mali: Lessons for an Expeditionary Army*; and "Operation Serval: Another Beau Geste of France in Sub-Saharan Africa?"

13. *Routledge Handbook of U.S. Counterterrorism and Irregular Warfare Operations*

14. *France's War in Mali: Lessons for an Expeditionary Army*

15. "Operation 'Serval'."

16. *France's War in Mali: Lessons for an Expeditionary Army*

17. Ibid; and "Operation 'Serval'."

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30. *Routledge Handbook of U.S. Counterterrorism and Irregular Warfare Operations.*

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MCU "10 Years Outside" Writing Contest Winners: Third Place

The 2020 Nagorno-Karabakh War

Implications for the Marine Corps

by Capt Francisco Garza

The 2020 Nagorno-Karabakh War has many implications for the implementation of the Marine Corps *Force Design 2030*. In this article, I will explain my reasoning for choosing this conflict, the implications of drone use, the implications for Reconnaissance and Counter Reconnaissance (RXR), and an analysis of a potential future conflict. Through the lens of these topics, the Nagorno-Karabakh War validated many concerns of the CMC regarding the ability to utilize small, desegregated units with drones and indirect fires to achieve battlefield success against an entrenched enemy with conventional capabilities.

>Capt Garza is a Reconnaissance Officer currently assigned to the Defense Intelligence Agency.

Why Nagorno-Karabakh War

This conflict is particularly useful because of the incredible complexity of the problem that is faced in this region. Considering the risks associated with direct great power conflict, it is likely that before engaging directly, great powers will first use proxy forces in smaller conflicts to gain an advantage. In the Nagorno-Karabakh War, we have such a regional conflict; it is a nexus of religion, politics, ethnicity, geopolitical spheres of influence, and remnants of empire playing into an intricate web of entangling priorities that at first glance might be overlooked. Armenia and Azerbaijan are both countries in the South Caucasus, both are former Soviet satellite states, and before that, both were part of the Russian Empire. Yet, these two countries are opposites in many respects. Armenia is an old country that some say is descendant of the people of Colchis mentioned in the Greek epic: Jason and the Argonauts. Additionally, the Roman Emperor Leo the V, also called Leo the Armenian, reigned in Constantinople from 813–820 AD and highlighted the prominence of ancient Armenian aristocracy. Armenia adopted Orthodox Christianity as its primary religion in 301 AD—one of the first to do so. Armenia continued to be influential in the region through the medieval period, with ethnic enclaves in Lebanon and an Armenian Quarter in the old city of Jerusalem. After the decline of the Armenian state with the rise of the Ottoman and Persian Empires, Western Armenia suffered through the Armenian Genocide as a part of World War I while Eastern Amenia was acquired by Russia in 1828 and they ruled over the area until the collapse of the Soviet Union in the early 1990s. Azerbaijan, on the other hand, can trace its origin to the military might of nomadic Turkic peoples that burst into the region post Battle of Manzikirt in 1071 when the waning Eastern Roman Empire lost control of the Anatolian plateau. What we now know as Azerbaijan was occupied by Turkic peoples and fell under the sway of various empires that rose and fell in the region until the Treaty of Gulistan of 1813 when Russia assumed control of the area from Persia. Azerbaijan is a predominantly Shia Islam country with deep ties to the wider Muslim world, including Turkey, which is predominantly Sunni. Russia occupied the area up until the collapse of the Soviet Union in the early 1990s. Adding the complex mountainous geography of the area, we see how traditional borders delineated by prominent terrain features become impossible to enforce in the broken landscape of the southern caucuses resulting in a messy patchwork of populations with various identities. Although this brief history does not due the peoples of these two countries justice, it brings us close enough to the present,

> In autumn 2020, a six-week war in the South Caucasus reshaped the dynamics of a decades-old conflict between Azerbaijan and Armenia. The dispute centers on the predominantly Armenian populated region of Nagorno-Karabakh (or Mountainous Karabakh, also known in Armenian as Artsakh) and surrounding territories internationally recognized as part of Azerbaijan.[1]

The CMC wants the Marine Corps to be ready to engage in near-peer competition and see two equally matched modern militaries in a complex region with both sides having complicated ties to Russia and Turkey, a NATO member, fighting in difficult and contested terrain is a great laboratory for future

conflicts. "The autumn 2020 war was a short but brutal conflict that ultimately did not resolve the disputed political status of Nagorno-Karabakh."[2] We see that the platforms and technology both sides deployed were complex and new in many ways, but ultimately the conflict was a bloody and up-front fight: "Armenians in Nagorno-Karabakh have gained a new sense of insecurity, tempered by the presence of Russian forces, and many remain displaced. A new balance of power exists between Azerbaijan and Armenia, and regional powers Russia and Turkey have increased their influence."[3] This synopsis of the post-war realities is the reason why this war is so relevant to *Force Design 2030*. Two near-peer competitors utilizing proxy countries to fight an incredibly complex small war fighting in broken terrain in a patchwork land of ethnic, religious, and linguistic layered identities will be the most likely battle space of the future.

The Implications for Drones

The implication for drone warfare from this conflict is a mixed bag. Ultimately, a relatively low-cost Turkish-made drone, the Byraktar TB2, was able to provide an incredible amount of lethality to the Azerbaijani armed forces and give them the maneuver space to succeed on the battlefield. Yet, the Byraktar did not win the war, it was able to attrite enemy forces, knock out command and control (C2), and enabled infantry units to close with and destroy the enemy. The specifics of this drone are important, "The Bayraktar TB2 can operate at an altitude of 8,000 meters (about 26,250 feet) which makes it difficult to detect, and can fly for up to 27 hours, with a payload of four missiles."[4] The relative safety at its operational altitude, combined with its time on station and payload make it a general-purpose tool that doesn't compare to the more advanced U.S. UAVs, but its cost makes it highly accessible to countries operating under a budget. One of the more surprising findings in studying this conflict was how ineffective Russian-made air defense systems used by the Armenian armed forces were in detecting and destroying enemy drones. This ineffectiveness has led some countries to experiment with older ideas of air defense, particularly some members of the Singapore armed forces going so far as to say, "Singapore should consider reintroducing the old-fashioned AAA (Anti-Aircraft Artillery)"[5] This argument presumes precision air defense is not worth the investment in anti-drone warfare and that accuracy by volume gives the defending force a higher chance of survival. The problem this creates for the defenders is that by massing forces to defend them with concentrated AAA assets, they then become an easier target to attrite with other fires, thus allowing drones to achieve their goals through other means. Although in this conflict the drone gave a distinct advantage to the offense, it is logical to infer that aggressive drone use in the defense could be equally disruptive and be utilized to harass troop movements, attack assembly areas, destroy supply points, and disrupt formations. In *Force Design 2030*, we as a Corps are inclined to keep this mentality, "As a "stand-in" force of the future, the Marine Corps requires a family of UAS capabilities. We need to transition from our current UAS platforms to capabilities that can operate from ship, from shore, and able to employ both collection and lethal payloads."[6] As a stand-in force for future operations, the Marines will learn from this conflict that drones are a cost-effective means to deny freedom of movement in the near and deep battle space, but with this adaptation of drone warfare, we cannot neglect the defense. Low Altitude Air Defense will need to develop tactics techniques and procedures to unravel the gordian knot of defeating enemy drones without becoming an easier target for other types of fires. From the Nagorno-Karabakh War, we know that versatile easily accessible drones can be a key strength in empowering the offense; the Marine Corps must now apply an offensive mindset to our future role as stand-in forces spread out across INDOPACOM to increase our lethality in the defense.

The Implications for RXR

The implications for RXR are closely tied to the evolving nature of combined arms maneuver warfare. The Nagorno-Karabakh War showed the world, "Images of armoured vehicles being destroyed, regardless of attempts at camouflage, flooded Western media outlets as Armenian tanks were swiftly targeted by armed drones. Azerbaijan has been steadily building up its force of UAVs."[7] These vivid images became a feeding frenzy for futurists of every nation to begin hypothesizing how future combined arms maneuver warfare would be conducted. One of the more colorful depictions of how an information age army would be structured and fight includes using UAVs to prep the battlespace and ground "robots" to screen ahead of main battle tanks supported by infantry to clear enemy-held areas. *Force Design 2030* addresses near-peer competitors and operating in a contested environment, which would imply that the Marine Corps would have to deny this futurist army in a contested battle space. In light of manueverist warfare getting an overhaul thanks to ever more advanced drones becoming more available to every country, the way *Force Design 2030* addresses this in a unique way: we are abandoning our tanks and traditional artillery. Although this seems counterintuitive, the CMC has made it clear RXR is a part of this shift: "The hider-versus finder competition is real. Losing this competition has enormous and potentially catastrophic consequences. This makes success in the reconnaissance/counter-reconnaissance mission an imperative for success."[8] Within the Marine Corps,

The hider-versus finder competition is real. Losing this competition has enormous and potentially catastrophic consequences.

we routinely task our air assets with reconnaissance missions, including our growing drone assets in both air and ground components. When it comes to the reconnaissance mission, the assessment from this conflict is clear: "During the war, Azerbaijan relied heavily on the use of drones, including equipment purchased from Turkey and Israel, to identify, target, and attack Armenian defensive positions and armored units."[9] The air defense systems of the Armenian Armed Forces were older Soviet models that proved ineffective in modern war. *Force Design 2030* asks us to prepare for the near-peer fight; therefore, we must assume that we will be operating in contested airspace, even with our most advanced drones. Thus, the assumption is that we cannot rely on drones alone. In a contested air space, the Marine Corps must rely on its other forms of reconnaissance. Internal to the Corps' ground component we have multiple units that can provide RXR to the battlespace, they include but are not limited to Force Reconnaissance, Amphibious Reconnaissance, Light Armored Reconnaissance (LAR), Air Naval Gunfire Liaison Company, and scout snipers. These units each have unique histories, traditions, and capabilities the Marine Corps should maintain and nurture, but for the purposes of this article, we will talk about three groups. The first group is the Wing and LAAD; for group two, I will combine Force and Amphibious Reconnaissance and refer to both as Recon, and group three is LAR. These three groups are most relevant to the hider vs finder problem set. The Nagorno-Karabakh- War showed that tanks and other slow-moving, high-value assets are easily targeted in the modern battlespace using affordable unmanned assets. Recon needs to innovate to find and neutralize assets that can disrupt larger formations while not being found themselves. The average Recon team is six Marines, which makes it relatively harder to find compared to almost any other Marine Corps asset that can operate independently. Recon teams also have the internal capacity to call for precision long-range fires. Therefore, our RXR approach should be a combined arms effort, first using Air and LAAD assets we can create a contested airspace that denies enemies the advantage the Azeri forces had. Second, we combine Recon's survivability and fires assets to find and destroy enemy C2 nodes and heavy assets with precision long-range fires achieving similar effects to the Azeri forces. Third, we leverage LAR's speed and firepower to conduct reconnaissance in force, finding and fixing enemy forces with fires long enough to allow the infantry time to close with and destroy the enemy. A caveat to LAR is that without tanks it would be beneficial to consider potentially bringing back a light armored mobile artillery vehicle like the Marine Corps M50A1 Onto. This Vietnam-era platform had 6x 106mm M40A1C recoilless rifles on a small, tracked vehicle. LAR supported by such a platform would fill a critical gap with our divestment of tubed artillery and tanks by creating a "horse artillery" concept for highly maneuverable forces that could quickly apply artillery support to maneuver elements, then withdrawal to positions that would be more advantageous to survivability.

Movement would be much slower in this type of warfare to ensure that in the hider versus finder game we remain the finder.

A Hypothetical Future War

For our scenario, a fictional island nation in the South China Sea known as Ryu has existed for the past several hundred years as either a client state or close allied territory of Imperial China. Post-World War II it gained independence and went through several decades of low-intensity conflict with various ethnic/religious/political conflicts but emerged in the early 90s as a democratically governed regional economic power. Ryu is an oval-shaped island that has two mountain ranges that run along its eastern and western shores creating gently sloping shorelines that meet in a large central valley in the center. The island is ethnically diverse with coastal cities being majority Chinese but with a mix of Han, Cantonese, and Hakka. Within the cities, there is also a small but economically influential Muslim population. The central valley is less populated with aboriginal peoples who mainly practice agriculture. During a particularly contentious election, the Pro-Beijing Party lost the election but claimed the election was invalid and took control of the northwest quadrant of the island and asked China to intervene on their behalf to protect the rights of ethnic Han Chinese citizens. China has supplied war material and volunteer units are being fed into the conflict to give the Pro-Beijing government an advantage. The Ryu democratic government has begun withdrawing forces to the south where they have greater support from the population; at this point, the United States and its allies agree to send in military forces to help re-take control of the island. The Marines utilize LAAD and air power embedded with Ryu military forces to contest airspace and create gaps in the enemy collection. This would allow us to identify named areas of interest to be passed to ground units that can exploit windows of opportunity in the contested airspace to maneuver. This would facilitate Recon teams to insert and infiltrate positions on good cover and concealment to observe enemy forces in their rear areas. Movement would be much slower in this type of warfare to ensure that in the hider versus finder game we remain the finder. Recon must be aware of ground sensors, small tactical drones employed by enemy small units, and enemy security patrols, but ultimately, they identify a gap in the enemy lines that can be exploited by LAR to penetrate and fix an enemy company defending key terrain. Utilizing a night movement, LAR conducts route recon and assumes an attack by fire position that allows them to suppress the en-

emy company with direct fire weapon systems long enough for a battalion of Ryu military forces to follow in trace and close with and destroy the enemy. While we consolidate our gains, our recon elements will immediately turn to counter reconnaissance and utilize LARs' advanced optics to penetrate the terrain in search of enemy recon units seeking to disrupt friendly units as we transition to the defense. U.S. Recon elements will move to new positions that would provide them advantages views of enemy avenues of approach, and LAAD assets would move forward with the main units to provide protection from enemy air assets.

The Nagorno-Karabakh has many lessons for the Marine Corps as we seek to implement *Force Design 2030.* We need to embrace drone warfare capabilities without becoming obsessed with a particular platform. LAAD and drone assets must work in concert with each other to contest air space and facilitate the maneuver of friendly units. Recon must become adept at avoiding ground sensors, sUAS systems, and advanced optics—and LAR must be prepared to assume a more aggressive role in conducting reconnaissance in force by leveraging its direct fire assets. These concepts if applied correctly throughout the chain of command can produce great results in the RXR space and can lead to greater lethality in the Marine Corps. Azerbaijan leveraged technology and training to close with a destroy the enemy to great effect, the Armenians relied on legacy systems and training to their detriment. The Marine Corps must embrace new methods to produce the benefits of maneuver warfare in the future.

Notes

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MCU "10 Years Outside" Writing Contest Winners: Honorable Mention

The Paradigm Shift

Comparing the *Force Design 2030* initiatives to the war in Yemen

by SgtMaj Daniel N. Heider

The Marine Corps, throughout its history, has always been fighting for existence. This constant struggle for survival gave rise to a force-in-readiness culture that morphs, adapts to, prevails over the Nation's enemies—whatever the form may be. That innovative spirit divulged from a constant perpetual state of re-invention and adaption that is rooted in a strong cultural heritage. Charles Darwin captures the importance of adaptability in the following quote, "It is not the strongest of the species that survives, nor the most intelligent. It is the one that is most adaptable to change."[1] The Marine Corps exemplifies the notion of adaptability and is always rising to the occasion to defeat new enemies.

The Transition from Small Wars to Attrition Warfare

Leading up to World War I, the Marine Corps was small-scale and focused on guard duty aboard ships, protecting Navy yards, and keeping order in nearby cities (if called upon). The expeditious mindset was ingrained early on, and the Marine Corps evolved into a military arm of the State Department with a heavy focus on small wars. Small wars are operations tasked under executive authority, which combines military and diplomatic pressure to stabilize the state to preserve life and the interest of the United States.[2] This focus on small wars shaped the Marine Corps' reputation as a force-in-readiness and highlighted their versatility. The Marine Corps capitalized on its naval roots and maneuver warfare acumen to set conditions to be an expeditionary quick reaction force. Their reputation as fierce warriors would be shaped by triumphant battles during the Barbary Wars, War of 1812, Mexican War, Spanish-American War, and the Boxer Rebellion (just to name a few). However, the United States' entry into World War I would require the Marine Corps to quickly transform into a large-scale land-locked warfighting organization. Leading up to World War I, the Marine Corps had to significantly shift its structure, training, and mindset to prepare for a land-locked war that emphasized trench and attrition warfare.

>SgtMaj Heider's bio was unavailable.

The Marine Corps exemplifies the notion of adaptability ...

The style of warfare in France (trench warfare) was contrary to the Marine Corps' previous experiences. They had to urgently create a suitable strategy, or they would be relegated to irrelevancy. Gen John A. Lejeune noted, "We had no organized regiments in the United States. All our organized forces, except a few small companies, were in Haiti, Santa Domingo, and eastern China."[3] In short, this was a no-fail opportunity for the Marine Corps; if they missed this chance, it may have led to their demise.

The Marine Corps was not structured in a way that would support such a large commitment. They had four small regiments, and only one of them was stationed in the United States. These regiments went through no structural changes since the Civil War and were not at their full strength.[4] Considering this, the Marines had to quickly re-organize, train in a unique style of warfare, and compete with the Army for resources.

After intense political maneuvering and wrangling, the Commandant of the Marine Corps, George Barnett, was directed by the Secretary of the Navy to "organize a force of Marines to be known as the Fifth Regiment of Marines for service with the Army as part of the first expedition to proceed to France."[5] This basic order would change the Marine Corps forever.

As of April 1917, the Marine Corps' total strength was 13,725 and they would have to grow the force quickly without losing their unique culture, discipline, and warrior spirit.[6] Despite the odds, they were able to keep their high standard and create a training regimen that was oriented toward the war in Europe. This adaptability was remarkable and made a significant difference during the war. Their legacy would forever be cemented and the individuals that earned their stripes on the battlefields of World War I would go on to lead the Marine Corps through World War II, which was another example of the Marine Corps' exceptional malleability. This historical context is one of many examples of how the Marine Corps'

unique culture of adaptability is an essential element in fighting the Nation's battles.

Yemen, a Flash Point (Recent Conflict that Occurred Within the Past Ten Years)

In 2014, a civil war broke out between the Houthi Shiite rebels and the Sunni-led government. The Houthi rebels successfully occupied the capital and demanded that a new government be instituted. After a series of negotiations, the rebels took control of the presidential palace and forced the resignation of the President and his government.[7] This set-in motion a proxy war between a coalition of Gulf States (primarily Saudi Arabia) and Iran, which was a power struggle between the two different Muslim sects, the Sunni and Shia.

The Yemen War has regional implications because Iran was supplying the Houthis with weapons and support, while Saudi Arabia was attempting to restore and strengthen the Sunni leadership. According to the UN, it is estimated that 377,000 people died because of the conflict.[8] Iran's strategy was to increase its influence and the method chosen was irregular warfare. Their indirect approach is effective because it allows them to attack key infrastructure like the oil and gas industry through a third party, which gives them deniability. In the case of Saudi Arabia, gas and oil account for 50 percent of their gross domestic product, and cyberattacks and sabotage have a dramatic impact on their national interests.[9] Moreover, Iran is a direct competitor to them in this market, which gives them further motivation to weaken Saudi Arabia's oil production capacity. The United States, China, Europe, and the rest of the world are impacted by international affairs that affect the global oil market. This conflict increased instability in the oil markets and generated a humanitarian crisis, which has a considerable effect on the United States' interests.

The Evolution of Houthi's Tactics

The Houthi Rebels started by employing crude tactics, but nonetheless, they were able to fight the Yemeni government to a stalemate in four key provinces, seize strategic towns, and established tactical positions near the Saudi Arabia border.[10] Their tactics evolved from rudimentary acts to sophisticated tactics such as ballistic missiles and drone attacks.[11] Their tactical advantage stemmed from their strategic alliances, intelligence from the local tribes, and their established network of checkpoints and patrols of the areas.[12] The Houthi Rebels developed into a highly capable fighting force. They concentrated on obtaining capabilities that gave them a competitive advantage; at the same time, they attacked their enemy's critical vulnerabilities. Their ability to align themselves with powerful international allies and successful battlefield exploits fueled their recruiting efforts and increased their will to fight. Moreover, their military training program and military structure became much more organized and sophisticated.[13] Overall, the Houthi Rebel's rise to prominence demonstrates how a non-state faction can quickly gain power and destabilize a government/region.

The Houthi Rebels are an example of a non-state actor that achieved power militarily, politically, and even orchestrated alliances with international nation-states.

The Houthi Rebel military capability makes them a difficult adversary. Their forces blend in well with the local population because they do not wear formal uniforms and carrying weapons is common in Yemenis culture. They maintain an extensive human intelligence network that gives them the advantage of surprise and seizing the initiative.[14] This network of informants provides information to Houthi commanders on movements or potential targets and the Houthi commanders then launch drones to track their enemy's movements. Then, their combat forces flock to the target in an ambush-style attack, using combined arms and speed, which tends to overwhelm the target. This network of units is loosely affiliated and operates semi-autonomous, which gives them a significant advantage because it is difficult to intercept communication and gather intelligence on them.[15] It also reduces their reliance on electronic communication and allows them to operate linearly. Flat organizations have the advantage of decentralization, which makes them extremely unpredictable. They can achieve this level of synergy because they do not have contracts or force rotations, and they operate on their own land. Another factor is that the Saudis bankroll the Yemen government's war machine, which sets conditions for corruption because they tend to focus on money and do not have the same level of fervor to defeat the enemy.[16] The Houthi Rebels are an example of a non-state actor that achieved power militarily, politically, and even orchestrated alliances with international nation-states. They threaten to destabilize the region and the oil market and potentially could obtain weapons of mass destruction, which would intensify their threat posture.

The United States fought two protracted insurgency-driven wars, which can be compared to the war in Yemen. The United States has the most powerful and capable military in the world but facing this type of adversary goes well beyond tactical and technological advantages. The 2018 *National Defense Strategy* directed the Marine Corps to focus on peer-level competition in the Indo-Pacific region. To succeed, the Marine Corps must make significant changes to shift focus from inland to littoral and from non-state actors to peer competitors.[17] Once the Marine Corps makes this change, can they succeed in a situation like the war in Yemen?

Implications-the Marine Corps and Force Design

The first area to analyze is the reduction in the Marine Corps' size and capacity. A protracted war with the

Houthi Rebels would result in a heavy toll on manpower. The Houthis' lack of reliance on technology and their vast network of human intelligence place them at a significant advantage on their turf. The assumption that the Marine Corps will not receive additional resources, forced the Marine Corps to divest infantry battalions and the proportional reduction in related supporting organizations.[18] In addition, the Marine Corps is shifting its primary focus to the Indo-Pacific region, which will require expertise in naval operations. This shift requires the Marine Corps to restructure in a way that maximizes its efficiency in joint, naval, and in littoral operations in a contested environment. This type of approach will require the Marine Corps to be lighter, more decentralized, and more capable to leverage technology. The Houthi Rebel's military structure is reliant on archaic tactics, minimal technology, and human intelligence. They use their human intelligence to eliminate the enemy's center of gravity and destroy their morale. Their type of maneuver warfare can pose a particularly complicated problem for militaries that rely on conventional and technological methods of warfare. To maintain relevancy in an irregular-style war, the Marine Corps would have to maintain its Regional and Culture Studies Program and possibly establish reserve units that focus solely on irregular warfare. This would give the Marine Corps a baseline if they were directed to engage an enemy like the Houthi Rebels.

From a tactical standpoint, the expeditionary advanced base operations (EABO) style of warfare may be ineffective in destroying the Houthi Rebel's formal military structure. The EABO concept does create a culture of independent, dispersed, and decentralized operations; however, this would not place the Marine Corps at a strategic advantage over the Houthis. For one, it is centered on naval expeditionary operations, and two, it does not provide the logistical or manpower footprint required to wage a protracted landlocked fight against a dug-in and motivated insurgent force. Moreover, the EABO concept appears to be heavily contingent on small teams that have years of training in emerging technologies, vast in-depth training in critical thinking, and years of team-oriented training. The Marine Corps' current turnover rate and deployment ratio do not increase the chances of EABO success. To counter this, the Marine Corps must follow its guidance in the *Talent Management 2030 Plan*, manpower managers must view continuity as, "a vehicle for improving training, increasing unit stability, and reducing the stresses we place on our families.[19] This has a direct correlation with aging the force, retaining talent, and improving unit proficiency.

The Force Design places the Marine Corps at a competitive advantage as it pertains to naval-oriented operations. For instance, the force design calls for increased capability in asymmetrical advantage in maritime gray zone operations. The Houthi Rebels fuel their insurgency by receiving weapons and support from Iran. One method that Iran employs is to ship weapon caches via the Arabia Sea through deceptive fishing vessels.[20] The Marine Corps improved tactical capability in maritime gray zone operations could significantly impair Iran's ability to get weaponry to the Houthi Rebels. This would allow the land portion to focus on other areas of approach to effectively interrupt their re-supply. This would also take a heavy footprint of human intelligence coupled with improved maritime gray zone operations. Enhancement in the area would give a significant capability to the Marine Corps and improve maneuver warfare when the sea/ocean is a factor.

The Force Design campaign calls for minimization of attachments and increased unit cohesion with organic capability. The goal is to increase implicit communication, which would have many benefits. The current Marine Corps culture tends to be a hierarchical organization that relies on effective command and control. The Marine Corps does capitalize on enlisted leaders and junior officers to have the confidence to act in extreme conditions with certainty; however, the proposed change discussed in the Force Design would take a radical departure from the current approach to warfighting. For instance, to achieve the level of implicit communication, it would require that the force be aged appropriately, and units stay together for a much longer period. The current manpower structure, policy, and processes result in a critical flaw in accomplishing this level of synergy. This, however, is exactly what would be required to battle the Houthi Rebels. To achieve success in the Houthi Rebel scenario, the Marine Corps would have to be prepared to maintain the same personnel in the region for an extended period. This would take a psychological commitment that would only be successful if the Marines felt they were truly defending their family, homeland, or way of life. The ability to build human networks, intelligence networks, and sustain combat that demoralizes the enemy takes a considerable amount of time, treasure, and blood. The six-month rotation method hinged on successful turnovers; however, the high rate of turnover diminishes trust and gives the local populace the sense that Marines are there temporarily. On the other side, the Marines may focus on returning home and getting through the deployment vice establishing key relationships. There is no staying power established, which would make the entire effort to defeat the Rebels futile.

The ability to build human networks, intelligence networks, and sustain combat that demoralizes the enemy takes a considerable amount of time, treasure, and blood.

Furthermore, the American people would quickly lose patience, which translates to Congressional pressure to return home. Immersing units into the local population comes with heavy risk but can only be achieved through trust. This level of trust would require the Marine Corps to demonstrate to the population that they will be there for the long haul, but once the impression of occupation is established, it will all come crumbling down.

The main question is if the Marine Corps transitions from a typical conventional capability to a capability focused on technology, will they be able to pivot to a land-locked, counterinsurgency-style war. The Marine Corps is making considerable changes to manpower, training, and equipment, which will undoubtedly affect the organizational culture. The Marine Corps is moving away from artillery such as howitzers and mortars to a more sophisticated long-range precision weaponry. The HIMARS and the Ground/Air Task-Oriented Radar System supply a sizeable capability in Indo-Pacific operations. HIMARS is an improved capability that can be effective in both types of contested environments. There is an ability to load it on a transport plane and quickly set it up to conduct a fire mission. To exemplify this point, HIMARS was used in Afghanistan in 2018 to destroy a strategic compound used by the Taliban.[21] In addition, the Ground/Air Task-Oriented Radar System is designed to be expeditiously employed. This upgraded capability in artillery and radar systems can be effective in both styles of warfare. This capability would possess the speed and efficiency to destroy targets in a near-peer conventional scenario and a counterinsurgency environment.

The next area of contention is the Marine Corps' decision to divest tanks. Tanks have many benefits; however, the Marine Corps is moving towards a more nimble and quicker force. Tanks require heavy maintenance and a logistical footprint. The logistics requirements become vulnerable in an insurgent environment. The Houthi Rebel's ability to swarm vulnerable convoys would pose a significant risk to tank operations. In addition, this capability would be even less effective in the Indo-Pacific Theater. To maintain the potential to effectively use tanks, the Marine Corps will have to increase training with the Army. The Marine Corps must maintain tactical training scenarios that include joint forces, specifically with the tank capability of the Army. Overall, the benefits of having tanks are outweighed by the need to be quick and nimble. The Marine Corps' new Amphibious Combat Vehicle does provide fire support, necessary speed (ship to shore), and armored protection, which will give some tank-related capability.

The *Force Design 2030* plan does require that the Marine Corps improve their UAS package to have the capability to have a collection and lethal payloads.[22] The Houthi Rebels demonstrated the effectiveness of UAS operations in their environment. The Marine Corps improved UAS could also be highly effective in a ship-to-shore scenario and a land-locked style warzone. The Marine Corps' UAS upgrade also includes capabilities for a small unit (down to the squad level), which will be highly effective in the Littoral Operations in a Contested Environment and a situation like the war in Yemen. In addition, cyberwarfare capabilities will be essential in both types of environments. The Marine Corps must invest heavily in this capability because all future wars will involve cyber and space. Developing and retaining personnel with the specialty will be key in establishing the versatility needed, but the Marine Corps must always remember the lessons learned from World War I and maintain its high level of discipline and warrior culture and stay true to its legacy.

People are inherently resistant to change ...

Managing Change

The Marine Corps *Force Design 2030* plan will drastically improve the Marine Corps' posture to defeat enemies in a complex digital environment grounded in technology and will also preserve the Marine Corps foundation of adaptability and the first to fight mantra. The capabilities gained far outweigh the capabilities lost and will modernize the force to fight wars of the future. The core principles laid out in the *Force Design 2030* plan will also provide versatility in counterinsurgent environments similar to the war in Yemen. The key to success is to continue to remind Marines of the Corps' rich history and tradition. This tradition is riddled with examples of being bold, looking ahead vice fighting wars of the past, and having the mindset that sets conditions for quick adaptation to new threats. The change management process is what will make or break the successful employment of the new initiatives. This is a change that can take a generation of Marines and the change requires a complete belief and trust in the policies and the leadership. People are inherently resistant to change, so consistent and frequent communication will mitigate potential change management shortfalls.

To close out, Niccolò Machiavelli's quote on change accurately captures the challenges facing the Marine Corps. Despite these challenges, the Marine Corps must stay the course and constantly look for ways to adapt and innovate to face new threats:

> It ought to be remembered that there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions and lukewarm defenders in those who may do well under the new. This coolness arises partly from fear of the opponents, who have the laws on their side, and partly from the incredulity of men, who do not readily believe in new things until have had a long experience of them.[23]

Ultimately, the success of the Marine Corps is rooted in the individual Marine, the culture of excellence, and the remembrance of their proud legacy. The Marine Corps is duly suited to take

on this momentous change and keep a culture of adaptability. Whether it is going from sea-based maneuver warfare to trench warfare, to the island-hopping campaign of the Pacific, to the cold weather mountain environment of Korea, to the jungles of Vietnam, to the land-locked insurgent war in Iraq and Afghanistan, the Marine Corps has always adapted and used its culture of fierce warfighting to win the Nation's battles.

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Dissent Done Right

Military leaders, doctrine encourage criticism

by 2ndLt Kyle Daly

When a Marine Corps lieutenant colonel was relieved of his command in August 2021 for publicly criticizing military leadership on social media, Maj Brian Kerg received a message from one of his best Marines.

Kerg, a communications officer and operational planner, had written more than a dozen articles for a military journal. Some of the articles were critical of military practices.

The first lieutenant who messaged Kerg wanted to know why LtCol Stuart Scheller was facing negative consequences for his public criticism of senior leaders, while Kerg had never been in trouble for his writings.

"He messaged me and he had that question," Kerg told *Leatherneck*. "'Hey sir, what's going on here? You write articles that are critical of things, and sometimes, pretty assertively so. Meanwhile, this guy comes along, and he's being critical as well, but he's getting canned. His career is over.'"

Kerg initially wrote the Marine a lengthy response, trying to answer all his questions and concerns. But then he realized, that if one person had this concern, others did as well.

That lengthy response morphed into an article that was published in the September issue of the U.S. Naval Institute's monthly journal *Proceedings*. The article, "How Active-Duty Officers Should Criticize Policy and Practice," explained that criticism is not only allowed in the sea services but encouraged. However, Kerg writes, it must be done appropriately and in a professional manner.

"There is a fine line between honest critique and undermining faith in the chain of command," Kerg writes in his article. "On one side, servicemembers are given wide latitude to vigorously debate policy and practice. On the other, members risk conflating private opinion for official policy, can abuse the privilege of their office, and set bad examples to those they are charged to lead. This issue is simultaneously simple and complex."

The "fine line" that Kerg writes about in his article seemed to fuel confusion and debate among veterans and civilians who commented on LtCol Stuart Scheller's first video post, which was uploaded on Facebook and LinkedIn.

Scheller, a seventeen-year infantryman and the commanding officer of Advanced Infantry Training Battalion-East, posted the video just hours after news broke that thirteen servicemembers—eleven of them Marines—had died in a bombing at the Hamid Karzai International Airport in Kabul, where the U.S. military was engaged in efforts to evacuate personnel from the country. Scheller filmed himself talking into the camera, wearing his uniform that showed his rank insignia, name, and branch of Service. Scheller criticized the way in which top military leaders handled the Afghanistan withdrawal and were not admitting to possible mistakes.

"People are upset because their senior leaders let them down, and none of them are raising their hands and accepting

>2ndLt Daly is a former journalist who enlisted in the Marine Corps in 2016. He commissioned in 2021 and is currently stationed in San Antonio, TX, undergoing training as a UAS officer.

A non-commissioned officer leadership discussion aboard Camp Lejeune, NC. During the class, the non-commisioned officers were given various situations involving moral/ethical dilemmas and asked how they would handle them, such as if they caught a fellow Marine drinking underage. *(Photo by Sgt Melissa Latty.)*

accountability or saying, 'We messed this up,'" Scheller said in the video.

Scheller would go on to make other video posts despite instruction from his command not to do so. He was eventually court-martialed and at a hearing in October, pleaded guilty to various charges, including conduct unbecoming an officer and a gentleman. In social media posts in August, he said he resigned his commission. By December, he was out of the Marine Corps. Scheller wrote a book called *Crisis of Command: How We Lost Trust and Confidence in America's Generals and Politicians*. It was published by Knox Press and will be distributed by Simon and Schuster in September 2022.

On Simon and Schuster's website, a description of the book states: "Scheller spoke out, and the generals lashed out. In fact, they jailed him to keep him quiet … Now Scheller is free from the shackles of the Marine Corps and can speak his mind."

According to *Stars and Stripes*, the first video Scheller made received more than 300,000 views, 22,000 shares on Facebook and LinkedIn, and more than 4,000 comments within the first 24 hours.

One commenter, who identified himself as a medically retired gunnery sergeant, wrote "you do not help troops by showing you have no confidence in the leadership. He's harming the Marines who will have to deploy to this combat zone to unscrew this disaster, because if you don't follow orders, you can have no discipline … I do not disagree with what he said at all. But he needs to hang up the uniform and then say it."

Another commenter, who also identified as a veteran, had a different take: "This LtCol put his neck out on the line for the Marines. He should not be punished or chastised for doing so. We should see leaders who are willing to sacrifice everything for their Marines, and far too often we see leaders who would sacrifice their Marines for everything."

Kerg read the comments on Scheller's video post and received questions from people he knew. In his article, he wrote that an analysis of the viewpoints revealed confusion about "the essential issue." Kerg summed up that issue in one question: "Is honest, frank critique of policy and practice truly permitted?"

His answer: "Yes, it is!"

Members of the military, including junior enlisted and young officers, are allowed to openly disagree with their superiors and express criticism of policies and practices. In the decision-making process at the tactical level, young officers are taught to listen to their subordinates' concerns. And with major policies and practices drawn up by commanders who operate at the strategic and operational levels, forums, such as military journals, exist for individuals of all ranks to voice their ideas and concerns in a public setting.

Members of the military, including junior enlisted and young officers, are allowed to openly disagree with their superiors and express criticism of policies and practices.

Dissent—specifically, loyal dissent, or being critical while remaining loyal to the institution—is encouraged.

This encouragement has come in the form of doctrinal publications as well as public writings and speeches by senior military leaders. Numerous articles and essays—including Kerg's—have been written about how to engage in that dialogue in a professional manner.

During a lecture at West Point in 2008, then-Secretary of Defense Robert Gates told future Army officers that he was impressed with how the Army's professional journals allow officers to critique their leadership.

"I believe this is a sign of institutional strength and vitality," Gates said. "I encourage you to take on the mantle of fearless, thoughtful, but loyal dissent when the situation calls for it. And, agree with the articles or not, senior officers should embrace such dissent as a healthy dialogue and protect and advance those considerably more junior who are taking on that mantle."

LtCol Michelle Macander cited Gates' comment on loyal dissent in her essay published in the online national security publication *War on the Rocks* in December 2021. Macander said the inspiration for the article, "How to dissent without losing your career, or your Republic," came from the Scheller episode and a media narrative that the military was stopping servicemembers from being allowed to dissent.

"That's not the case at all," Macander told *Leatherneck*. "You just have to do it within a certain manner. And you have to be professional while you're doing it. I think the more people that say that, the better. And the more venues that are publishing it, the better."

As a commander, Macander, a combat engineer officer, said she encouraged honest opinion and feedback up to the point when a decision was made. "And then once a decision is made, you step out smartly," she said. Macander, who was assigned as a military fellow at the Center for Strategic and International Studies, said this form of dissent is taught at the tactical level, but she believes it transcends up.

Marine Corps doctrinal publications describe this type of loyal dissent.

MCDP 1, *Warfighting*, states that until a commander has reached a decision, "subordinates should consider it their duty to provide honest, professional opinions even though these may be in disagreement with the senior's opinions." But once that decision is reached, "juniors then must support it as if it were their own."

Warfighting also states that senior leaders must encourage candor among subordinates and that compliance for the purpose of personal advancement will not be tolerated. *MCDP 7*, *Learning*, goes a step further, saying that "all Marines prepare themselves to become leaders by exercising humility and being open to constructive feedback."

Marines officers are given the opportunity to interact with senior leaders starting at The Basic School. Here the former Secretary of the Navy, Ray Mabus, speaks to new lieutenants about the future of the Marine Corps. *(Photo by Sgt Cuong Le.)*

A "Precious Mechanism"

MCWP 6-10, *Leading Marines,* references an article written in 1986 by then-retired LtGen Victor H. Krulak. Krulak's essay, "A Soldier's Dilemma," published in the *Marine Corps Gazette*, lays out a set of rules for subordinates on how to dissent and rules for commanders on how to accept criticism.

In the essay, Krulak emphasizes multiple times the importance of using the chain of command. Krulak describes the chain of command as "the precious mechanism by which all military activity is driven."

"The dissenter should use it," he writes.

The dissenter should put their idea on paper and take to it to their immediate superior. However, Krulak acknowledges, a superior might not be interested in adopting the idea that a dissenter sets forth. In that case, the dissenter should seek the highest authority involved in the issue but with his immediate supervisor in the know.

"But the key point is this: The idea is now in the open, well-developed and well-expressed," he writes. "And somewhere in the chain of command there may just be someone with the interest and perception to take up the cause—if it's a good one."

Deciding to make a public social media post instead of using the chain of command to air a grievance was one point brought up several times by commenters on Scheller's video post. One subject of contention among commenters was whether to trust the chain of command since senior leadership was the target of Scheller's grievances.

"The chain is fractured," one commenter said. "I have never seen such loss of confidence in my adult life."

Having faith in the chain of command is a piece of advice offered in a 1998 article written by Marine Corps LtCol Mark E. Cantrell. The article, published in *Marine Corps Gazette*, was titled "The Doctrine of Dissent." In the essay, Cantrell suggested that the military "develop a doctrine for dealing with dissent and the mistakes that inspire it."

Like Krulak, Cantrell was writing about the loyal dissenter, or a person who has a disagreement with an idea but remains loyal to the institution and his command. Also like Krulak, Cantrell writes that if the dissenter is unable to the change their superior's mind, and if the issue is important enough, then they should go to the next person in the chain of command while having the courage to inform their immediate superior that they are taking this route.

"Stick to your chain of command," Cantrell writes. "Right or wrong, you'll make few friends by going to the press or Congress to resolve a problem that could have been corrected by Marines. If you are right, there is a Marine somewhere in that chain who will see it."

Cantrell's article is mentioned in another article written by George E. Reed, a former Army officer and currently the dean of the School of Public Affairs at the University of Colorado Colorado Springs. The essay, "The Ethics of Followership and the Expression of Loyal Dissent" was presented at the International Leadership Association's annual conference in 2012. Reed holds a doctorate in public policy analysis and administration and is an expert on the subject of leadership.

He writes that Cantrell's essay seemed to be aimed at junior Marines since a person of a higher rank has fewer people to appeal their concerns to. "His faith that a Marine somewhere in the chain will recognize a position as right might strike some of us as hopeful at best and quite possibly naïve, yet the respect for the better nature of the organization that his approach connotes seems commendable," Reed writes.

Reed's essay, which did not exclusively focus on dissent in the military, states that the military might be unique in that it puts great emphasis on expressing dissent within the organization before one decides to take an idea or concern public. "Few other organizations emphasize the chain of command to such an extent, but most would agree that one should give the existing authorities a full opportunity to address a problem before taking it over their heads," he writes.

In speaking with *Leatherneck*, Reed, a retired Army colonel, said if a person is dissenting in the military because they think they have a better idea than a superior or they are critical of a superior's decision, one of the problems they might face is "rank perspective."

"The world I saw as a second lieutenant and my concerns and what I cared about were in many respects limited by my role and my experience," Reed explained. "My perspectives as a colonel were very different. And I'm sure the

perspective of the Secretary of Defense were very different from the one I had."

While researching the topic of loyal dissent, Reed recalls coming across literature written by a service member who advised the dissenter to begin with the assumption that their senior leadership is privy to information that they are not. "You need to start with that assumption," Reed said. "That they may know something that you don't because of the limitations of your perspective."

That does not necessarily mean that is the end of the story, Reed explained. But it should be the starting point for the dissenter.

In a written statement Scheller gave at his court martial, Scheller said he believed that addressing his concerns "within the chain of command would be ineffective."

"I knew my complaints would never be heard by the Commandant, the SECDEF, the Chairman of the Joint Chiefs, or the American people if I went through the proper channels," he stated.

In early June, *Leatherneck* reached out to Scheller via a private message on LinkedIn to gain his perspective on how he delivered his initial message and whether there was another way to make an impact and have his concerns addressed. Scheller responded by criticizing the focus of this article, and then posted a screenshot of his response on his public LinkedIn and Facebook pages, which, as of the publication of this article, can still be viewed.

Scheller, however, did expand on his views in a February video interview with *Marine Corps Times*, stating his belief that the proper channels are "broken."

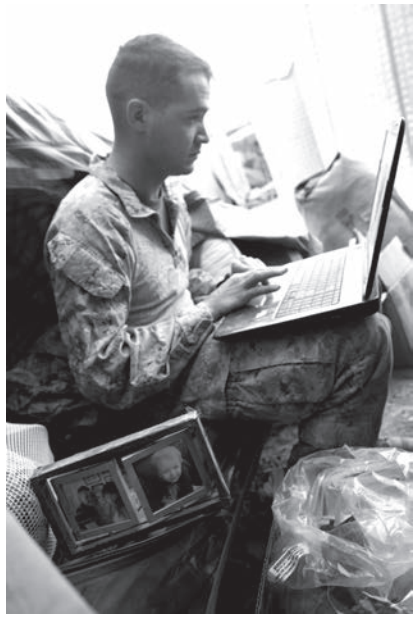
"I thought about this beforehand," Scheller said. "Does going through the system, via IG complaint, request mast, all of these processes, would that be effective? And I came to the conclusion that it wouldn't be, based on my experiences of watching these processes before. And so everyone wants to talk about these processes, but they don't address why they're broken."

"Emotions in the Background"

LtCol Macander's *War on the Rocks* article offers several criteria servicemembers must follow to achieve what she calls "allowable dissent." Two of those criteria are to remain professional and to avoid personal attacks.

To remain professional, Macander writes the person should "avoid disrespectful language, focus on the institution or policy being criticized, and use objective analyses to bolster the argument." In her article, Macander said that Scheller used "emotional and unprofessional language," and that such language should not be used in a public forum when the goal is to change or improve the institution.

Cantrell's "The Doctrine of Dissent" states that "even rational arguments sound suspect if delivered with too much feeling."



Ethical behavior, tact, and military courtesy are just as important when using social media and the internet for professional discourse. *(Photo by Cpl James W. Clark.)*

"Although important issues will often be emotional, you'll want to keep those emotions in the background if you wish to be persuasive," Cantrell writes.

When Scheller posted his first video, the lieutenant colonel said he had a "growing discontent and contempt for my perceived ineptitude at the foreign policy level." In Macander's opinion, these words from Scheller were both "emotional" and "unprofessional." Those who cross the line of professionalism in the military—especially commissioned officers—could face legal consequences. Some of the charges that were brought against Scheller were related directly to the lack of professionalism he showed in his first and subsequent video posts.

Among the charges that Scheller pleaded guilty to at a court martial last fall were contempt toward officials and disrespect toward superior commissioned officers. In his first video, Scheller called out several high-ranking officials, including Secretary of Defense Lloyd Austin and CMC Gen David Berger. In her essay, Macander asserts that "had Scheller not focused on personal attacks, he may have avoided those charges."

A Case for Professional Writing

Maj Kerg has encouraged both peers and junior Marines to write for professional journals. In his essay about dissent, Kerg wrote that professional journals present a good place for a servicemember to express criticism since the publishers "know the profession and serve as guard rails that can protect authors and speakers from themselves."

LtCol Macander said the original version of her essay—a more opinion-based version— was rejected by *War on the Rocks*. She rewrote the essay and pitched a version that was more "fact-based." They accepted it. But that was not the end. "I think we went through three rounds of editing," she said. The editor had questions for her that she did not think of, and she was forced to answer arguments that readers might have had if one of the drafts were published.

The medium in which one delivers their dissent is as important as the message, Macander writes. Social media—where Scheller decided to deliver his message—could be that medium, but it presents some challenges. "While [social media] is appealing in its power to quickly disseminate an idea to a broad audience, the ability for a dissenter to post on impulse could more easily result in an unacceptable message," Macander states in her essay. A professional journal, on other hand, requires one to go through an editing process and a peer review.

Military journals also present disclaimers that are required by the DOD.

When publishing a written work on a topic related to the department and its activities, DOD employees must have a disclaimer that states that the views expressed are those of the writer and do not necessarily represent the views of the DOD or its components. Kerg writes that professional military journals generally have disclaimers printed in every issue and on their websites.

In the same month that Kerg's article on dissent was published, *Proceedings* also published a piece by Kerg titled "Dare to Write." In this article, Kerg writes that every leader in uniform has ideas that should be shared, and that professional writing is one of the most effective ways to do this.

His article quotes former Chief of Naval Operations ADM John Richardson, who, in 2016, coauthored an essay that encouraged naval service members to develop habits of reading and writing. Richardson encouraged service members to not only write their ideas but to expose those ideas to public scrutiny.

"An argument properly conceived and defended can be of great value to our profession," Richardson writes.

Kerg told *Leatherneck* that junior leaders in the Marine Corps are well-positioned to identify problems with ideas that have been conceived by senior leaders since those junior members—enlisted and officer—are the ones implementing the concepts from higher up. And if that junior member identifies a way to fix that problem, that idea will be wasted if it's not shared with the people that can implement the solution.

Kerg acknowledges that there are several channels a junior Marine and a young officer can take to have their ideas heard, from simply utilizing their chain of command to writing information papers or after-action reports. "That's all great and those have their place, but professional writing … it will get your ideas in front of other leaders, in other positions who probably have a greater ability to put the idea into greater application," Kerg said. "If you develop an idea and get it into one of those (professional journals), it will be seen by people with the power to execute."

"If You Try, You Will Fail"

LtCol Macander's essay in *War on the Rocks* compared Scheller's first video post with a 2007 essay written by then-Army LtCol Paul Yingling. Paul Yingling's article "A Failure in Generalship," published in the *Armed Forces Journal*, accused senior military leaders of failing to prepare U.S. armed forces for the Iraq war. The essay was not only critical of an institution—the general corps—but it also proposed solutions on how Congress could change the officer promotion system.

One line from Yingling's article is still often cited in academic journals and by columnists today: "A private who loses a rifle suffers far greater consequences than a general who loses a war."

In their essays on dissent, both Macander and Kerg point to Yingling as an example of someone who was critical of senior leadership but did not face any serious reprisals because of that criticism. Although he received much media attention because he was an active-duty officer who was critical of his senior leadership, Yingling eventually was promoted to colonel, and he was never charged with any crime under the Uniform Code of Military Justice.

Macander puts Yingling's essay in the category of acceptable dissent.

"The military establishment may not like hearing that it is not holding its general officer ranks accountable, but its treatment of Yingling shows that an assertion's unpopularity alone does not make the dissent unacceptable," Macander writes.

When *Leatherneck* contacted Yingling, who retired from the military in 2012 to pursue teaching, he stated in an email that some have recently used his experience to claim that an active-duty officer could "criticize the military without serious consequences."

"Based on both my personal experience and the broader historical record, I can state with confidence that such a claim is false," Yingling said. Yingling did not wish to state the specifics of those consequences other than the irony that by 2009, the Army was teaching his work at the Army War College, but he was not selected to attend the institution.

"I've never before discussed the personal consequences of my writing," Yingling said. "I'm reluctant to do so now, as there are tens of thousands of Americans, and hundreds of thousands of Iraqis, who have suffered incalculably more from our misguided war efforts than I ever have or will from calling out those blunders." While Yingling's essay did not mark the end of his career—something he fully expected to happen—it did not achieve the outcome he intended.

"I'm not sure I'm the right person to ask for advice about expressing dissent, as I neither changed the system nor advanced within it," Yingling said. "Nevertheless, it's a fair question, and here's my answer to aspiring dissenters: Don't do it. You can't change the system, and you shouldn't try. If you try, you will fail, and you and your family will suffer, emotionally, socially, financially. … I failed, and you'll fail too. You are not different. You are not special. You are not 'the one.'"

Yingling warned that dissenting, or speaking truth to power, is not like "Mr. Smith goes to Washington," "where the plucky idealist speaks truth to power, gets the job, gets the girl, and lives happily ever after."

"After hearing all that, most of you aspiring dissenters will decide to get along and go along within the system, as you should," he said. "However, a couple of you will persist nevertheless, speaking truth to power without considering cost or consequence. Maybe you believe the issue is too important to remain silent. Maybe you just can't live with yourself if you do something less than the full measure of your duty. Maybe you are the one.

"As Henry Ford said, 'Whether you think you can or think you can't—you're right.'"

>*Editor's Note: This article was was originally written for* Leatherneck *magazine.*

Before You Write, Know Your Rights

by 2ndLt Kyle Daly

Service members have a lot of leeway when it comes to the publishing world. However, if this is your first time driving through this territory, there are several rules of the road you should be aware of. The following is a summary of the various rules for active-duty members of the military and DOD employees when it comes to publishing in print or online. *Leatherneck* encourages service members to seek their own resources and speak to their command before engaging in personal or professional publishing.

Disclaimer for Speeches and Writings Devoted to Agency Matters (*DOD 5500.7-R: 2-207*)

A DOD employee who uses or permits the use of his military grade or who includes or permits the inclusion of his title or position as one of several biographical details given to identify himself in connection with teaching, speaking or writing ... shall make a disclaimer if the subject of the teaching, speaking or writing deals in significant part with any ongoing or announced policy, program or operation of the DOD employee's Agency ... and the DOD employee has not been authorized by appropriate Agency authority to present that material as the Agency's position.

The disclaimer shall be made as follows:

a. The required disclaimer shall expressly state that the views presented are those of the speaker or author and do not necessarily represent the views of DOD or its components;

b. Where a disclaimer is required for an article, book or other writing, the disclaimer shall be printed in a reasonably prominent position in the writing itself;

c. Where a disclaimer is required for a speech or other oral presentation, the disclaimer may be given orally provided it is given at the beginning of the oral presentation.

Acceptable Political Activities by Members of the Armed Forces (*DOD Directive 1344.10*)

A member of the Armed Forces on active duty may:

- Register, vote, and express a personal opinion on political candidates and issues but not as a representative of the Armed Forces.
- Write a letter to the editor of a newspaper expressing the member's personal views on public issues or political candidates, if such action is not part of an organized letter-writing campaign or a solicitation of votes for or against a political party or partisan political cause or candidate. If the letter identifies the member as on active duty (or if the member is otherwise reasonably identifiable as a member of the Armed Forces), the letter should clearly state that the views expressed are those of the individual only and not those of the Department of Defense (or Department of Homeland Security for members of the Coast Guard).

Social Media Guidelines (*U.S. Marine Corps 2021 Social Media Handbook*)

- Do not post classified or sensitive information.
- Be the first to respond to your own mistakes.
- Do not post defamatory, libelous, vulgar, obscene, profane, threatening, racially and ethnically divisive, or otherwise offensive or illegal information or material.
- Identify to readers or personal social media accounts that the views expressed are yours alone and that they do not necessarily reflect the views of the Marine Corps.
- Discussing issues related to your personal experiences is acceptable, but do not discuss areas of expertise for which you have no background or knowledge.
- Marines may generally express their personal views about public issues and political candidates on internet sites, including liking or following accounts of a political party or partisan candidate, campaign, group, or cause. If the site explicitly or indirectly identifies Marines as on active duty (e.g., a title on LinkedIn or a Facebook profile photo), then the content needs to clearly and prominently state that the views expressed are the Marine's own and not those of the U.S. Marine Corps or Department of Defense.

>2ndLt Daly is a former journalist who enlisted in the Marine Corps in 2016. He commissioned in 2021 and is currently stationed in San Antonio,TX, undergoing training as a UAS officer.

Where should I submit my work?

Marines and other servicemembers have many options when it comes to getting their ideas and opinions published. Here's a list of some online and print publications they can consider.

Marine Corps Gazette

Founded in 1916, *Gazette* is known as the "Professional Journal of U.S. Marines" and its purpose, as stated in each issue, is to "provide a forum for the exchange of ideas that will advance knowledge, interest, and esprit in the Marine Corps." Have an opinion about Expeditionary Advanced Base Operations? How about *Force Design 2030*? These Marine Corps-specific topics probably fit best in a Marine Corps-specific journal. The Marine Corps Association publishes the monthly journal, which also includes a blog and social media presence. More information can be found at mca-marines.org

Leatherneck

While the *Gazette* is considered a professional journal, *Leatherneck* is the "Magazine of Marines." Think of the *Gazette* as checking into a new unit in your Alphas, and *Leatherneck* as checking out of the barracks in your civilian attire. Have a funny sea story to share? This is the place to do it. New to writing? The "Sound Off" section features short letters that provide the perfect opportunity to work on your craft. *Leatherneck* is also an outstanding forum for articles on all aspects of Marine Corps history from Marines in the Civil War to today's veterans of Iraq and Afghanistan and welcomes submissions from Marines whether active, reserve, veteran, or retired. And don't forget about the annual *Leatherneck* writing contest, which provides Marines the opportunity to have a feature article published. More information can be found at mca-marines.org

Proceedings

Founded in 1876, the United States Naval Institute publishes this magazine for readers interested in topics about the sea Services, which includes the Navy, Marine Corps and Coast Guard. Writers include veterans, civilians, and active-duty personnel. More information can be found at usni.org

War on the Rocks

Arguably the national security website for the current generation, *War on the Rocks* began in 2013 as a podcast and is described as a "community focused on strategy, defense and foreign affairs." Writers include civilians and active-duty service members. Be prepared to break out some credentials though. They seek to publish the work from "the most authoritative, experienced, and authentic voices on defense, foreign policy and national security."

Armed Forces Journal

Described as the "leading joint-service journal of commentary and ideas for U.S. military officers and leaders," the aim for the publishers is to "provoke thoughtful debate," according to its website. *Armed Forces Journal* describes most of its readers as field-grade and flag officers. The journal is published by Sightline Media Group. Go to armedforcesjournal.com for more information.

Midway Solitaire

The Principle of Mass in Naval-Air Operations

by Mr. Joseph Miranda & Dr. Christopher R. Cummins

Joint Publication 3-0, Joint Operations, comments about the military principle of *mass*: *"(1) The purpose of mass is to concentrate the effects of combat power at the most advantageous place and time to produce decisive results."*

The principle of Mass is demonstrated in wargame design largely by the assignment of combat strength to individual units. The stronger units are then amplified by stacking rules that provide for the concentration of the strongest units into the strongest stacks. In some games, combat support elements or doctrinal advantages provide further enhancements via shifts in the combat ratio (e.g. a 2-1 combat strength attack receives two shifts and becomes a 4-1).

As a player of wargames, review your forces to determine the strongest units, note any enhancements that can be added, and keep these units together as a potent force for attack or counterattack. Be wary of dissipating strong units across the front as they are likely to picked off or be unable to bring their strength to bear.

The principle of mass is demonstrated in Decision Games' Midway Solitaire wargame. The game covers the campaign in the Pacific Theater of Operations running from April to June 1942. The campaign began with the Japanese taking the offensive in the Coral Sea and then with the Midway operation. In the first operation, the Imperial Japanese Navy (IJN) moved into the South Seas. The objective was to support landings on the Solomon Islands and New Guinea. The result was the first great aircraft carrier battle of World War II. While the IJN came out ahead tactically in terms of sinking U.S. Navy (USN) tonnage, Coral Sea turned into an Allied victory because Japanese amphibious forces were forced to turn back.

At Midway, ADM Yamamoto launched a multi-pronged offensive into the central and north Pacific. Yamamoto's primary objective was to draw in the U.S. fleet and fight a decisive battle he believed would turn the tide in the Pacific War. But near the U.S. island base of Midway, ADM Nimitz pulled off an ambush, sinking four IJN carriers for the loss of one of his own. Yamamoto was forced to turn back, and the initiative began to shift to the United States in the Central Pacific.

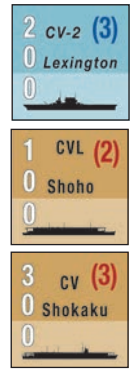
For the Midway Solitaire game, the player takes command of USN and Allied naval, air, and land forces. The game system controls IJN forces. The reason for designing the game as solitaire goes back to the intelligence situation. The Allies, through the use of their ULTRA signals intercept program, were reading coded Japanese communications. The result is the USN had a fairly good picture of both IJN fleet movements and intentions. The Japanese were operating with limited intelligence.

>Mr. Miranda is a prolific board wargame designer. He is a former Army Officer and has been a featured speaker at numerous modeling and simulations conferences.

>>Dr. Cummins, PhD, MBA, is the publisher of* Strategy & Tactics Press *and CEO of* Decision Games. *He has led a team in publishing over 400 board wargames and 600 magazine issues over the past 32 years. He is a former Army psychologist and continues to practice part-time specializing in assessing, testing, and treating individuals with stress disorders.

Another factor was the IJN operational doctrine called for dispersal of effort. In both their Coral Sea and Midway operations, the Japanese divided their fleet into several task forces, each with divergent objectives. The idea was to move dispersed and then strike from multiple directions, but this assumed their foe was not aware of their intended target.

Thus, at Coral Sea, they attempted to land forces in both New Guinea and the Solomons, with the former south of their main bases at Rabaul and Truk, and the latter to the southeast with the axes increasingly moving out of mutual support range. They also maintained separate carrier and support task forces. The result was the USN could concentrate its own carrier task forces. While the ensuing carrier battle of the Coral Sea saw the sinking of the USN *Lexington* (a fleet carrier or CVA) and the IJN *Shoho* (a light carrier, CVL), the IJN CVA *Shokaku* was damaged and taken out of action until repairs could be effected and air squadrons rebuilt. The result was the IJN withdrew its Port Moresby invasion force.



Similarly for Midway, Yamamoto divided his fleet into several task forces, outside of mutual support. One task force headed for Midway, a second for the Aleutians, while others were sailing on detached support missions. While the IJN had more carriers as well as considerable battleship power, naval-air power was not concentrated to provide overwhelming force at a single point. Nimitz, on the other hand, concentrated his three aircraft carriers and, further operated within radius of Midway, the latter providing bases for landbased airpower.

Therefore, the USN was able to mass its forces by attacking along a selected axis. The result was a decisive American victory with the sinking of four IJN carriers for the loss of one USN carrier.

3-0 also states: "(2) To achieve mass, appropriate joint force capabilities are integrated and synchronized where they will have a decisive effect in a short period of time. Mass must often be sustained to have the desired effect. Massing effects of combat power, rather than concentrating forces, can enable even numerically inferior forces to produce decisive results and minimize human losses and waste of resources."

Operations for the IJN in the Midway Solitaire game are generated by the random pick of various Operations markers. These markers activate Japanese naval and air forces for movement and combat along one of the four map axes (representing the New Guinea, Solomons, Midway, and Aleutians lines of operations). This mechanism models the Japanese fragmentation of effort. Effectively, the IJN was not synchronizing its efforts. Had they massed all their forces along any one of their operational axes, they would (probably) have overwhelmed Allied forces.

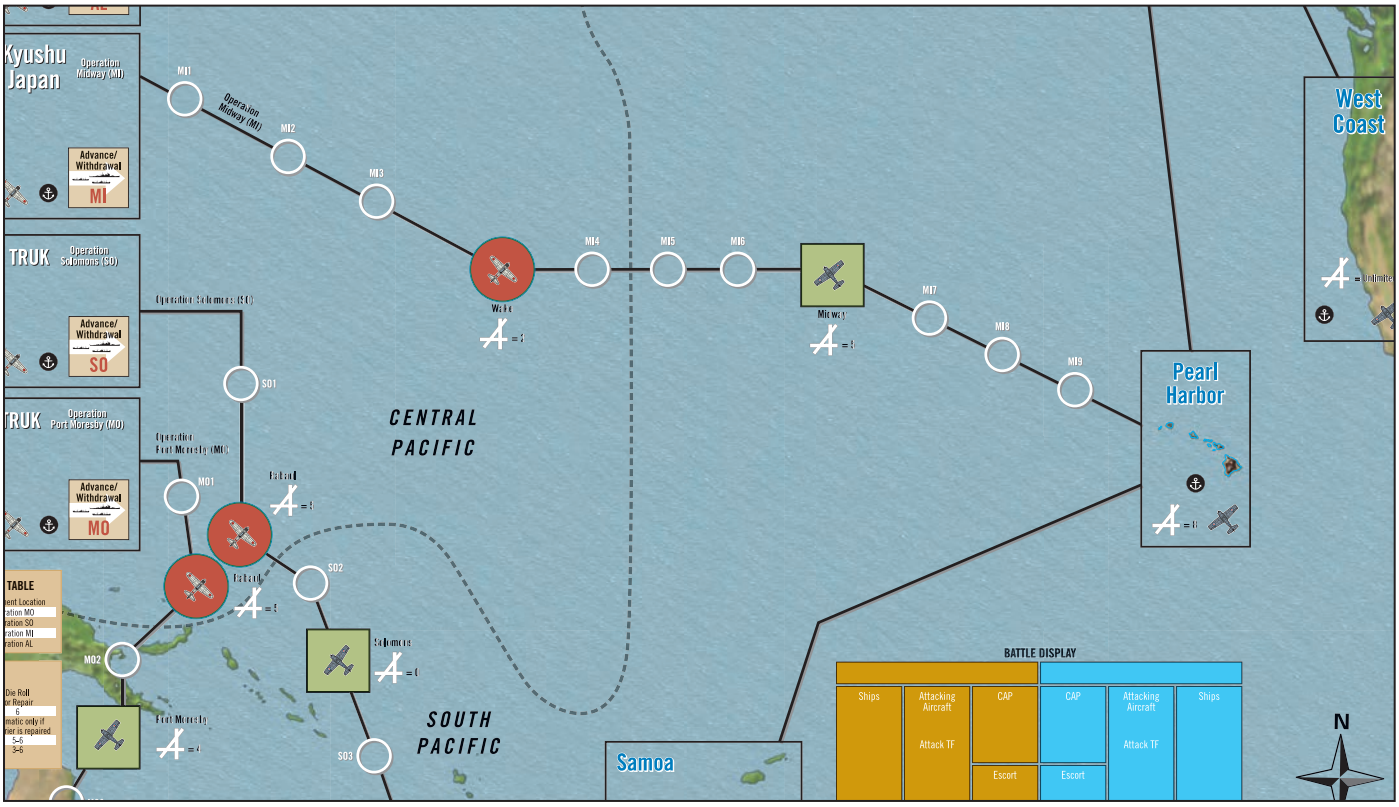
This went back to divisions in IJN naval command. The Naval General Staff wanted the New Guinea operation while ADM Yamamoto with the Combined Fleet was headed for Midway. The result was a division of forces and defeat in detail.

Another factor was the IJN fleet units were sailing at the extreme limits of their landbased airpower for Coral Sea and beyond it at Midway. In both operations, the USN was operating within its own landbased airpower. This proved especially critical at Midway where the United States could synchronize its naval and air forces. Bear in mind that airpower is not just about airstrikes on enemy ships or airfields but also air cover for fleet units and aerial reconnaissance, especially critical in finding enemy fleet units in the vast expanses of the Pacific.

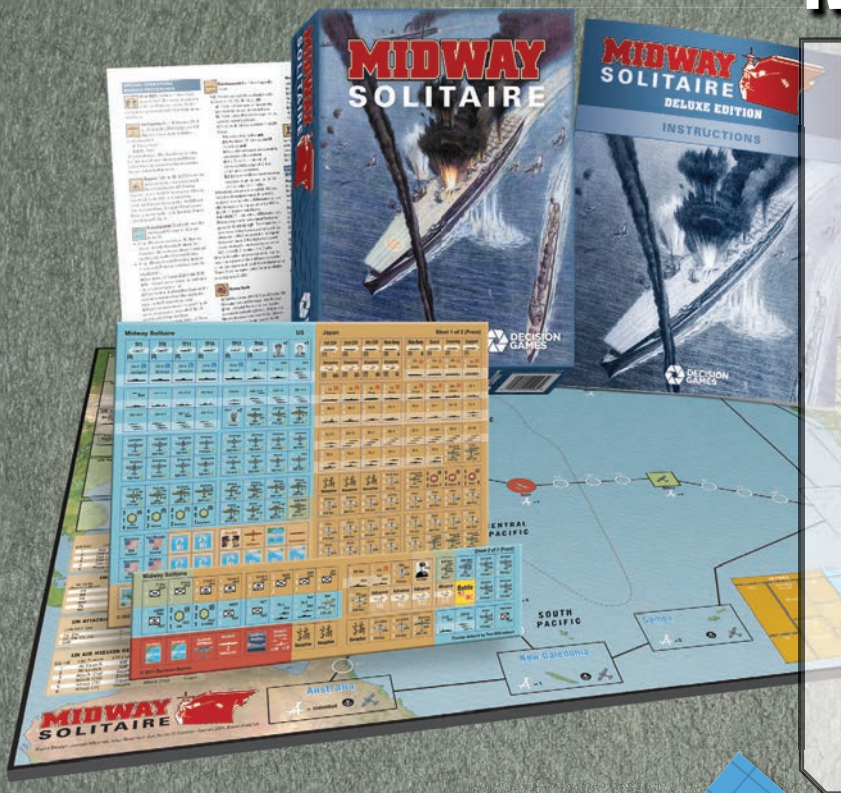
In the bigger picture, once the USN gained an operational level victory at Coral Sea, it maintained the overall initiative with the carrier ambush at Midway. One of the events in the game is *Victory Spirit*. If the IJN has sunk a certain minimum of USN capital ships, then its initiative is enhanced and more operations are generated. If the USN is ahead, then the IJN loses operations. *Victory Spirit* brings in the human dimension of morale as well as the effects of winning or losing the decisive battle. By clever play, one can sustain the effort.

The USN player in *Midway Solitaire* is placed on the command deck with a force inferior in numbers to the opposing IJN but superior in terms of ability to mass forces. It is up to you to seize the victory in the Pacific.

USMC



Midway Solitaire



Midway Solitaire follows the campaign in the Pacific Theater of Operations from April to June 1942. This period saw the Japanese take the offensive in two major campaigns including the battles of the Coral Sea and Midway—both decided by aircraft carrier actions.

You command the United States Navy and Allied forces while the game system controls the Imperial Japanese Navy. You take on the role of Adm. Nimitz in terms of the options available and decisions you can make to repel the Japanese Navy's drive across the Pacific. You must defeat multiple naval offensives, each possessing superior numbers.

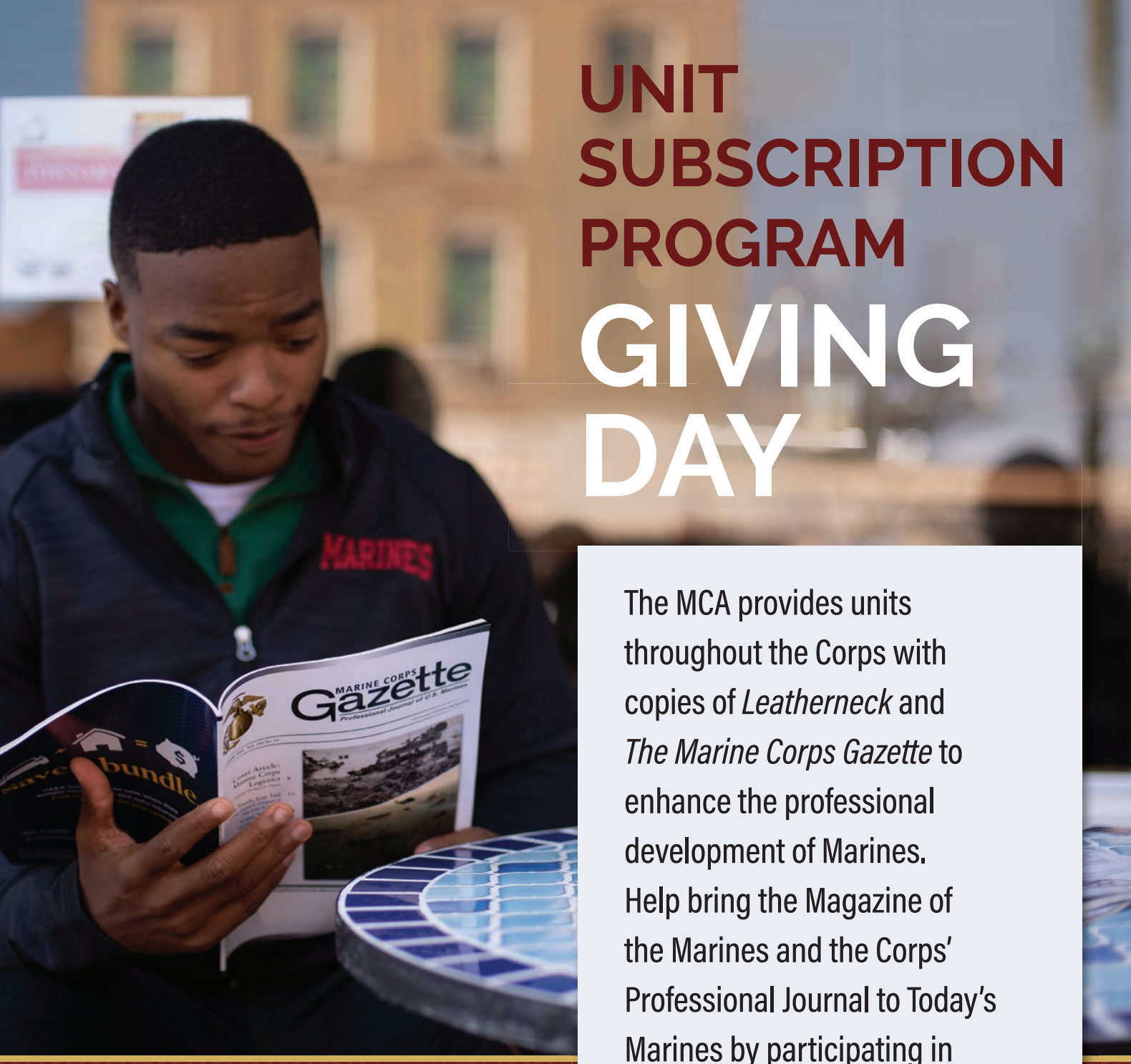
The key to winning is to balance your limited assets to meet the threats presenting themselves over the course of the game. The course of the war in the Pacific is at stake.

Cactus Air Force

Cactus Air Force is part of the *Air Wars* mini-game series. Each player has a deck of Campaign Cards. They generate a range of events, including major naval battles such as Eastern Solomons, to which players can commit their air units. Certain cards can be played in combination to gain operational advantage, leading to tense decision making. There are special rules for Henderson Field, fighter-bombers, and the Tokyo Express.

DECISION GAMES

Special Offer for Marines:
DECISIONGAMES.COM/WPSITE/MCAF



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The MCA provides units throughout the Corps with copies of *Leatherneck* and *The Marine Corps Gazette* to enhance the professional development of Marines. Help bring the Magazine of the Marines and the Corps' Professional Journal to Today's Marines by participating in the Unit Subscription Program Giving Day on Wednesday, September 21st, 2022. For more information, visit the link below.

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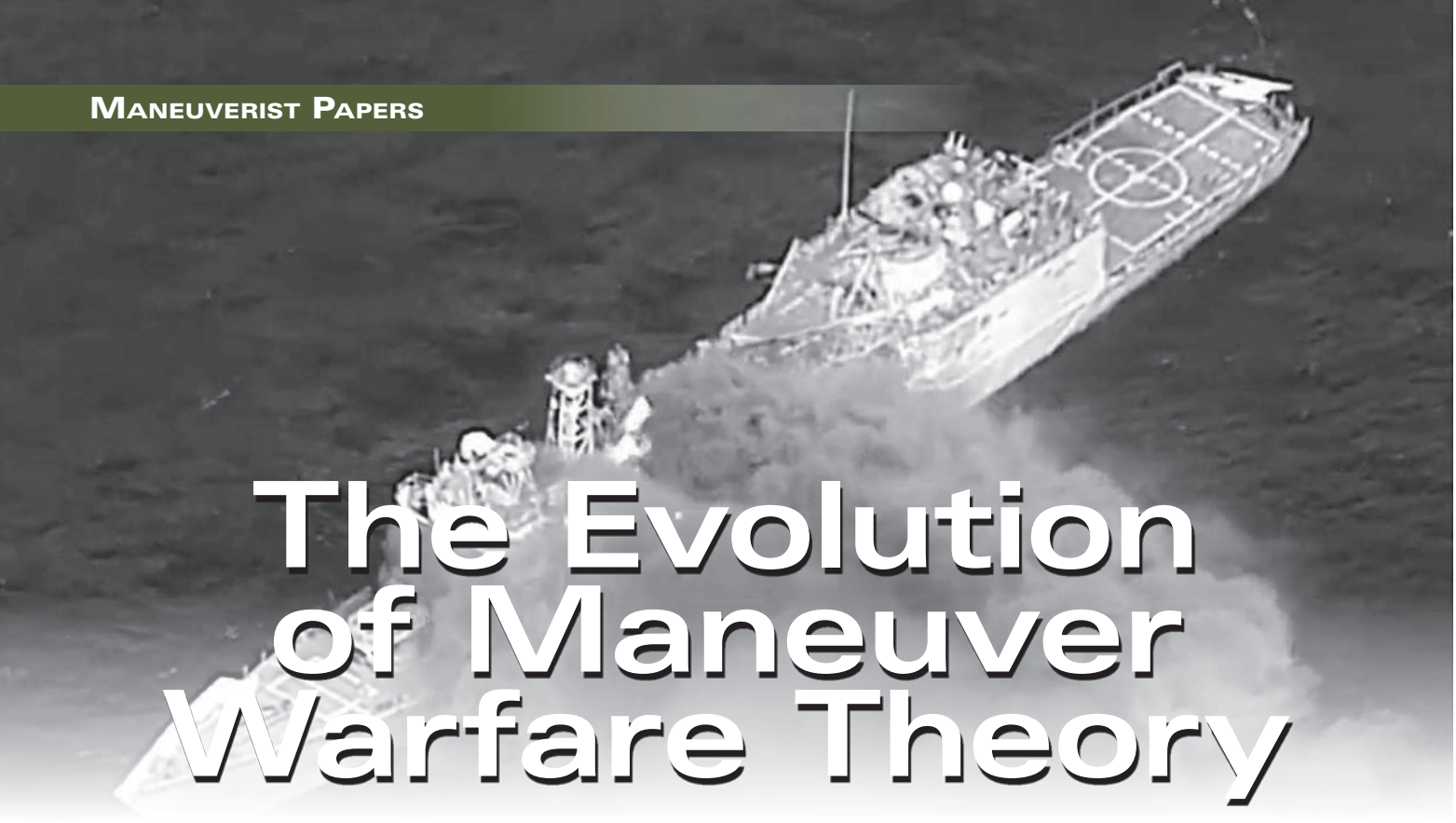


The Evolution of Maneuver Warfare Theory

Maneuverist Paper No. 23

by Marinus

>Marinus is a group of retired or former Marines interested in the past, present, and future of Marine Corps doctrine. The group includes John F. Schmitt, Bruce I. Gudmundsson, LtGen P.K. Van Riper, Col Eric M. Walters, and Col James K. Van Riper.

Most Marines will agree that *Warfighting*'s presentation of maneuver warfare theory is mature, logical, and mostly coherent. It is tempting to assume that such was always the case, that maneuver warfare theory was developed logically and systematically according to some master design, starting with John Boyd's OODA Loop as its theoretical foundation and progressing logically from there. The reality, however, is very different and far more complex. Maneuver warfare theory evolved organically from several different sources that emerged contemporaneously.

We have established that the maneuver warfare movement was a response to the dysfunction of U.S. military performance in the Vietnam War. (See Maneuverist No. 1, "Marine Corps Maneuver Warfare: The Historical Context," *MCG*, Sep20.) That response was a grass roots movement that emerged simultaneously and spontaneously among several individuals and groups. It pursued several intellectual threads that interconnected organically and only later were woven together in a concerted way.

The best historical description of this evolution is Ian T. Brown's excellent *A New Conception of War: John Boyd, the U.S. Marines, and Maneuver Warfare*.[1] Brown's primary interest is Boyd's contribution to the movement (more about which later), but he treats the entire evolution in some detail.

The Intellectual Threads

The first thread was an early, pragmatic line of reasoning and exploration that did not follow any particular ideology or historical precedent but sought to restore Marine Corps tactics to a sound practical footing. It was put forth by Vietnam War veterans like Col Michael D. Wyly as well as by young officers, like Stephen Miller, William Woods, and Gary I. Wilson, who may not have borne the brunt of the Vietnam War dysfunction but certainly experienced the aftermath of it. A prime example is Miller's 1975 *Gazette* article "Camouflage and Deception," which includes this

Forces from Australia, Canada, Malaysia and the U.S., fired upon and sunk the decommissioned ex-USS **Rodney M. Davis** *(FFG 60), 12 July 2022 to gain proficiency in tactics, targeting and live firing against a surface target at sea as part of Rim of the Pacific (RIMPAC) 2022. (Photo: courtesy U.S. Navy.)*

passage that could have come straight from Sunzi (or Boyd): "Time is the essence. Time to react, to gain surprise, to enhance our own survivability and increase the effectiveness of the combat power presented to the enemy."[2] These early ideas proved to be very compatible with what would become maneuver warfare theory—even prescient, as Brown points out.[3]

This thread also involved practical experimentation, most notably at 2d MarDiv under then-MajGen Alfred M. Gray in the early 1980s. The pinnacle of that experimentation occurred at several combined arms operations conducted annually under Gray at Fort Pickett, VA. The combined arms operations was a free-play, force-on-force exercise pitting battalions against each other. The exercise typically would halt late each afternoon, at which point all officers and staff non-comissioned officers would return to the base theater for a hotwash conducted personally by Gray, with Bill Lind, John Boyd, and *Marine Corps Gazette* editor Col John Greenwood sometimes in attendance.

In those days, Gray talked about "fighting smart" as often as he used the term "maneuver warfare." Other terms experimented with at various times were "infiltration tactics," "audacity warfare," "common-sense tactics," and "enemy-oriented operations."[4]

The second thread was mechanized operations. In the late 1970s, the Marine Corps engaged in a debate about whether to mechanize. The argument focused on equipment but ventured into operational conduct. In a letter to the editor of the *Marine Corps Gazette* in October 1979 on the topic of mechanized operations, William S. "Bill" Lind first introduced the term "maneuver warfare," which he defined as attempting "to achieve operational success directly, shattering the enemy command by maintaining an increasing tempo of operations deep in his rear area."[5] Two months later, the term "maneuver warfare" appeared again in the pages of the *Gazette* in an article by Capt Ronald C. Brown titled "Winning Through Maneuver."[6]

While maneuver warfare theory was never dependent on mechanized operations, mechanized operations provided a physical manifestation of maneuver warfare that Marines could readily see and understand. The Fort Pickett exercises were conducted by mechanized forces. In the deep penetrations and sweeping envelopments Marines could see the *maneuver* of maneuver warfare. The image of Gray wearing his desert goggles on his helmet Rommel-style became iconic.

The association of maneuver warfare with mechanized operations eventually faded away as Marines sought to apply maneuver warfare concepts to other operating environments. The physical trappings of maneuver warfare thus disappeared over time, and the Maneuverists came to understand maneuver in terms more fundamental than merely relational movement.[7] As the physical trappings of maneuver warfare faded, maneuver warfare theory became more abstract and more focused on mental and moral factors, which was convergent with Boydian theory (to be discussed shortly). But even so, the mechanized thread was integral to the early evolution of maneuver warfare theory.

The third thread was the German influence. The main proponent of the German thread was Bill Lind, although Wyly, Boyd, and others were well familiar with the German military history. German tactical and operational methods in the two World Wars *were* maneuver warfare for Lind, who sometimes seemed to see little need to adapt German methods to an American audience. In Lind's generational model, maneuver warfare belonged to the third generation of modern warfare, which, he argued, began with German infiltration tactics in the First World War and evolved through the *Blitzkrieg* in the Second World War to maneuver warfare by the late 20th century.

The German thread and the mechanized thread intertwined, as the best-understood example of German methods for many Marines was the mechanized *Blitzkrieg* of the Second World War. German terms found their way into the maneuver warfare lexicon: *Schwerpunkt* (point of main effort or center of gravity), *Auftragstaktik* (mission tactics), *Flaechen und Luekentaktik* (tactics of surfaces and gaps), and *Fingerspitzengefühl* (fingertips feeling). (This last term came courtesy of Boyd, who discussed it in his presentations.) German memoirs filled the Maneuverist canon: Rommel's *Attacks*, von Schell's *Battle Leadership*, Guderian's *Panzer Leader*, von Mellenthin's *Panzer Battles*, and von Manstein's *Lost Victories*. Timothy Lupfer's Leavenworth Paper, *The Dynamics of Doctrine: The Changes in German Tactical Doctrine during the First World War*, proved to be especially influential at the newly formed Marine Corps University, not only for its description of the German tactical innovations but also for its description of how an institution might undertake fundamental reform in the midst of upheaval.[8] Likewise, Bruce Gudmundsson's *Stormtroop Tactics: Innovation in the German Army, 1914–1918* became one of the most significant works of scholarship to come out of the formative maneuver warfare years.[9]

German terms found their way into the maneuver warfare lexicon: Schwerpunkt ... Auftragstaktik ... Flaechen und Luekentaktik ... *and* Fingerspitzengefühl ...

The German thread did not sit well with all Marines, some of whom openly wondered what Americans had to learn from the military they had defeated in two world wars. (See Maneuverist Nos. 4 and 5, "Learning from the Germans," Pts. 1 & 2, *MCG*, Dec20 and Jan21). Part of the resistance was probably also a reaction to Lind, who was a divisive figure (a role he seemed to relish).

The fourth thread was a renewed interest in classical military theory, especially in the works of Carl von Clausewitz and Sunzi. This was largely a rejection of the operations research methods adopted during the Vietnam War. Where

the pragmatists sought to put Marine Corps tactics on a solid practical footing, this thread sought to put Marine Corps thinking on a solid theoretical footing. The classical military theory thread did not entwine with the others so much as sit below them as a foundation.

Gray was known to be a student of Sunzi. Then-Capt John F. Schmitt, who would go on to author *FMFM 1*, was also an avowed Sunzian, purchasing every translation of *The Art of War* that he could find and reading them repeatedly. Meanwhile, the Prussian Clausewitz replaced Baron Antoine-Henri Jomini as the recognized foremost theorist of war, reflecting an important conceptual shift from a physical-Euclidian to a humanistic mindset. (See Maneuverist No. 8, "Maneuver Warfare and the Principles of War, *MCG*, May21.) Chapters 1 and 2 of *Warfighting*, on the nature and theory of war, are essentially distillations of Clausewitzian theory. All the leading voices of the maneuver warfare movement were well acquainted with both Sunzi and Clausewitz.

The final thread was the theoretical work of Col John R. Boyd, Air Force (Ret). In the early years of the movement, Boyd's work consisted of the essay "Destruction and Creation" and the five-hour briefing "Patterns of Conflict," a sweeping, if highly interpretive, survey of military conflict. By the time of *Warfighting*'s publication in 1989, Boyd's *Discourse on Winning and Losing* had expanded to contain mature versions of "Destruction and Creation," "Patterns of Conflict," "Organic Design for Command and Control," "The Strategic Game of ? and ?" and "Revelation." (With the exception of "Destruction and Creation," a written essay, one could never describe any of Boyd's works as "finished" because he was always modifying them. After "Destruction and Creation," he famously refused to commit any of his works to writing but created them in briefing form precisely so he could continue to develop them.) Even by the time of *Warfighting*, most Marines still had not experienced any of Boyd's presentations, but if they had it most likely would have been "Patterns of Conflict." Many, however, would have had at least passing familiarity with the central idea of Boyd's theory, the Observation-Orientation-Decision-Action loop, also called the OODA Loop or Boyd Cycle. It was the OODA Loop that found its way most prominently into the developing maneuver warfare theory, mainly within the context of generating superior tempo. The broader idea of OODA as a model of adaptation to maximize freedom of action in a hostile environment would come only later.

With Sunzi's *The Art of War* and Clausewitz's *On War*, Boyd's *Discourse on Winning and Losing* (mostly "Patterns" and "Organic Design") became the third primary source document that Schmitt referenced when writing *FMFM 1*.[10] *Warfighting* was largely an attempt to synthesize those three works.

Weaving the Threads Together

Those five intellectual threads cross-pollinated and began to interweave into a coherent body of thought through a self-organizing discourse that took place mainly on the pages of the *Marine Corps Gazette*. At some point later, however, Boydian theory was retroactively asserted as the theoretical foundation of maneuver warfare. Bill Lind was making this argument by at least 1985, when he wrote in his *Maneuver Warfare Handbook* that "the Boyd Theory … is the theory of maneuver warfare."[11] By "the Boyd Theory" Lind was referring specifically to the OODA Loop, and even more specifically to out-cycling the enemy with a superior operating tempo—an interpretation of the OODA Loop that fit very nicely with the German implementation of the *Blitzkrieg*.[12]

Gen Alfred M. Gray, Jr., the 29th Commandant of the Marine Corps, was instrumental in the development and adoption of maneuver warfare as the Corps warfighting doctrine and philosophy. *(Photo: Marine Corps History Division.)*

The idea of establishing Boydian theory as the foundation of maneuver warfare theory made sense, both conceptually and politically. It made sense conceptually because Boyd's theory cut across the other threads; in "Patterns," Boyd touched on Sunzi and Clausewitz, German methods in the World Wars, and mechanized operations, and his theory provided support to all the other threads. Boydian theory was in that sense the natural thread to tie the others together. The idea made sense politically because it strengthened the narrative to depict maneuver warfare as developing logically and coherently from a single, solid point of departure rather than evolving organically from several disparate sources.

By suggesting that Boydian theory was reverse engineered as the theoretical foundation of maneuver warfare theory, we do not mean to lessen the importance of Boyd's contribution, which was significant, but rather to reiterate the point that Boyd's theory was not the singular genesis of maneuver

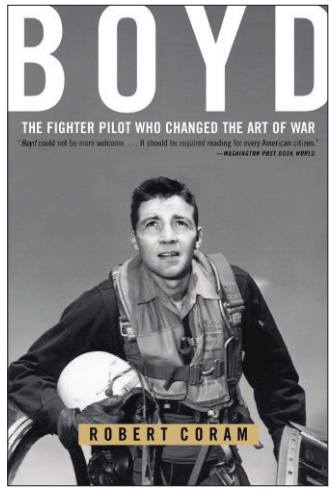
warfare. As with most systems of thought representing collective groups, the development of maneuver warfare was much more complex than that.

The Key Players

The Marines and others who contributed intellectually to the development of maneuver warfare theory are too many to list. But a relatively few were responsible for pulling the threads together into what became maneuver warfare doctrine.

As the senior active-duty Marine interested in what became maneuver warfare theory, Gen Al Gray obviously played a fundamental role. A dynamic leader and an intellect in his own right, Gray attracted other like-minded Marines to his orbit. Gray provided top cover and opportunity for other maneuverists. Moreover, the period of intensive experimentation at 2d MarDiv under Gray's watch was critical both to the development of maneuver warfare theory and practice and to spreading Maneuverists through the Marine Corps.

Much of the networking and pulling together of people and ideas was done by Wyly and Lind. In addition to being a tireless proselytizer of maneuver warfare during those years, Lind was also a target for the many opponents of maneuver warfare he irritated. In the late 1970s, Wyly had been assigned as the head tactics instructor at the Amphibious Warfare School in Quantico, where Capt Bill Woods was one of his students. Wyly and Lind met when MajGen Bernard Trainor, then director of the education command, invited Lind, who had been writing things critical of the Marine Corps, to observe one of Wyly's exercises at Amphibious Warfare School. (Trainor's role in promoting the post-Vietnam War reforms has never received the recognition it deserves.) Lind's visit began a years-long working relationship with Wyly, who collaborated with Lind on the latter's *Maneuver Warfare Handbook* in 1985. Lind, a Congressional staffer who was a member of the military reform caucus in Washington, DC, was already familiar with Boyd's work from briefings Boyd had given there. Lind connected Wyly and Boyd. Wyly brought Boyd to Quantico. Boyd subsequently mentioned to Wyly that a brigadier general named Al Gray had sat in on one of his presentations of "Patterns" at the Pentagon and seemed keenly interested. Upon graduation from Amphibious Warfare School, Woods was assigned to 2d MarDiv, where Gray was assuming command. Wyly instructed Woods to contact Gray, which connected Gray and Wyly. Thus, that key loop was closed.[13]



The theories of Col John Boyd USAF provided one fundamental "thread" in the development of maneuver warfare in the Marine Corps. (Photo:* Boyd: The Fighter Pilot Who Changed the Art of War *by Robert Coram. Little, Brown and Company, 2002, ISBN-10: 0316881465.)

The Role of the *Marine Corps Gazette*

For the better part of a decade in the 1970s and 80s, Marines argued over the merits of these various ideas on the pages of the *Marine Corps Gazette* in a candid and sometimes messy running debate. This argumentation served a critical function by forcing the Maneuverists to strengthen their argument and tighten their logic. The role of the *Gazette*'s editor at the time, retired Col John Greenwood, can hardly be overstated. Greenwood took an early personal interest in maneuver warfare, but by far his most important contribution was to ensure a free and open platform for debate. Greenwood had something of the natural agitator in him, and if *Gazette* editorial policy tilted in any direction at the time, it was in favor of articles that questioned the *status quo*.

***For the better part of a decade in the 1970s and 80s, Marines argued over the merits of these various ideas on the pages of the* Marine Corps Gazette ...**

Compared to the Army Process

The Army also undertook a vetting and socialization process for the development of its AirLand Battle doctrine in the 1970s and 80s. The Army process was commendably top-down and methodical. Responsibility for developing the new doctrine was assigned to U.S. Army Training and Doctrine Command, and working groups were established there and at various professional schools to explore the emerging ideas. These were then published in official pre-doctrinal documents, such as the Pamphlet 525 series, designed to vet those ideas broadly within the Army.

In contrast, the Marine Corps process more resembled the cafeteria food fight scene in *Animal House*, with Lind in the Bluto role. This probably should have surprised nobody, given the Corps' fractious and contrarian culture. But the result was the same: by the time the keystone doctrinal manual was published, whether *Field Manual 100-5, Operations*, in 1982 or *Fleet Marine Force Manual 1*, *Warfighting*, there was widespread support within the respective service. Not all Marines agreed with *FMFM 1*, certainly, but none could argue that they had not been given the chance to say their piece.

Warfighting and the Continued Evolution of Maneuver Warfare Theory

It fell to Capt John F. Schmitt, who had been a platoon commander in 2d MarDiv under Gray, to codify the different threads into a tightly cohesive document in 1989, but all the pieces were in place by that time. Among other things, *Warfighting* expanded the theory beyond purely operational

concepts to address the institutions required to support the execution of maneuver warfare on the battlefield.

Schmitt revised *Warfighting* in 1997 for Gen Charles C. Krulak as *Marine Corps Doctrinal Publication* (*MCDP) 1.* The manual did not change in any essentials. There were two main areas of modest changes. The first was to incorporate feedback from Boyd, who had phoned Schmitt shortly after *FMFM 1*'s publication with a list of comments. The second was to incorporate complexity theory, which Schmitt believed helped to explain the unpredictable, nonlinear dynamics of war. (See Maneuverist No. 3, "The Dynamic, Nonlinear Science Behind Maneuver Warfare, *MCG*, Nov20.)

... we believe the Marine Corps is overdue to have a conversation about its views on the nature and conduct of warfare going forward.

It should come as no surprise that maneuver warfare theory has continued to evolve, even though official doctrine has not been updated since 1997. The idea of Boyd as the oracle of maneuver warfare theory has only become more prominent over time, especially since his death in 1997 and the subsequent publication of several biographies and other works. But maneuver warfare theory itself has become more Boydian as well, as more Marines have become more familiar with his theories, not only "Patterns" and "Organic Design" but also his later, more abstract briefings, to include the final distillation of his body of work shortly before his death into a five-slide presentation called "The Essence of Winning and Losing"—a process Boyd himself called "The Big Squeeze."

Maneuver warfare theory has continued to become more abstract over the years, partly due to Boyd's increased influence and partly because Marines have continued to adapt it to a broad range of operational situations, including over a decade of counterinsurgency operations in Afghanistan and Iraq.

Despite this evolution, maneuver warfare theory has to this point remained true to the intellectual threads that were its origin. The key question, the question with which we began the Maneuverist series, is whether maneuver warfare will continue to be appropriate for the future. We have argued (Maneuverist No. 12, "On Decentralization," *MCG*, Sep21) that by maintaining a commitment to mission tactics the Marine Corps would be swimming against the current of present trends toward centralized, directive command and control through advanced technology. We have also proposed (Maneuverist No. 19, *MCG*, Apr22) that there is a disconnect between maneuver warfare and Expeditionary Advanced Base Operations (EABO). Others disagree. Three decades after maneuver warfare became doctrine, we believe the Marine Corps is overdue to have a conversation about its views on the nature and conduct of warfare going forward. Our hope is that the Maneuverist has helped to stimulate that conversation. We shall see.

Notes

1. Ian T. Brown, *A New Conception of War: John Boyd, the U.S. Marines, and Maneuver Warfare,* (Quantico: Marine Corps University Press, 2018).

2. 1stLt Stephen W. Miller, "Camouflage and Deception," *Marine Corps Gazette* 59, no. 12 (1975). As quoted in *A New Conception of War.*

3. *A New Conception of War.*

4. Phone conversation between author and G.I. Wilson on 23 June 2022; and LtCol Gary W. Anderson, "Enemy-Oriented Operations, What Makes Them Hard?", *Marine Corps Gazette* 73, no. 6 (1989).

5. William Lind, "Only a Beginning," *Marine Corps Gazette* 63, no 10 (1979).

6. Capt Ronald C. Brown, "Winning Through Maneuver," *Marine Corps Gazette* 63, no. 12 (1979).

7. For example, William S. Lind, *Maneuver Warfare Handbook* (Boulder: Westview Press, 1985); and Capt John F. Schmitt, "Understanding Maneuver as the Basis for a Doctrine," *Marine Corps Gazette* 74, no. 8 (1990).

8. Timothy T. Lupfer, *The Dynamics of Doctrine: The Changes in German Tactical Doctrine during the First World War* (Fort Leavenworth: Combat Studies Institute, 1981).

9. Bruce I. Gudmundsson, *Stormtroop Tactics: Innovation in the German Army, 1914–1918,* (New York: Praeger,1989).

10. Boyd was *incommunicado* while fighting cancer during much of 1989 when Schmitt wrote *Warfighting*, so Schmitt had access to Boyd's briefing slides but not to Boyd himself.

11. *Maneuver Warfare Handbook.*

12. Ibid.

13. Phone conversation between author and Michael D. Wyly on 11 July 2022.

The 120mm Mortar Platoon

by Capt Michael A. Hanson

In 2019, the Marine Corps initiated a major change in course, seeking to evolve to meet the requirements of the future operating environment as described in the *38th Commandant's Planning Guidance* and *Force Design 2030*. The threat posed by the People's Republic of China features prominently in these efforts, as the Corps adapts its character and structure to conduct Expeditionary Advanced Base Operations and function as "Inside Forces" operating from the First Island Chain. However, the proposed changes to the Marine Corps' fires architecture have opened large gaps in its indirect fires capabilities, and the Marine Corps must find something to fill that gap in the event that Marines are called on to conduct operations other than Expeditionary Advanced Base Operations. If the Marine Corps is tasked with conventional warfare missions similar to those it has executed over the past several decades, it will need more conventional indirect fire support.

As part of its efforts to reorganize for the most perceived future threat, the Marine Corps is divesting much of its current indirect fire assets. *Force Design 2030* calls for the elimination of sixteen batteries of towed artillery, leaving the Marine Corps with just five.[1] Though 155mm howitzers are not eliminated completely, this opens a sizable gap in the number of indirect firing agencies to support the infantry battalions.

The introduction of 120mm mortar platoons organized at the infantry regiment level can fill this gap. This is not a call for the return of the M327 Expeditionary Fire Support System (EFSS), a towed mortar with wheels organic to the system and crewed by artillerymen. Rather than bringing back that problematic weapon, this article proposes the Marine Corps adopt the bipod mounted M120, a reliable system proven after decades of service with the Army and employment with Marines in Afghanistan and Syria in recent years. This formation should also be manned by infantrymen.

With a max effective range of 7,200 meters, the M120 can shoot more than 1,400 meters further than the M252A1 81mm mortar, the largest indirect fire weapon system currently fielded within the infantry battalion.[2] Additionally, the M120 only shoots 1,000 meters shorter than the less mobile and less expeditionary M327 EFSS. Mobility is another key factor that distinguishes the M120 system. Weighing 320lbs with rounds weighing roughly 33lbs, the M120 is significantly heavier than the M252A1 81mm mortar system and cannot be hand-carried overland.[3] Despite this fact, it is much more mobile than the M327 EFSS or the M777 howitzer, and herein lies one of the opportunities offered by this system. It can be transported in Joint Light Tactical Vehicles in operations requiring emplacement and displacement following rapid movements or it can be air assaulted much easier than the aforementioned pieces when employed in static fire bases.

>Capt Hanson is Weapons Company Commander at 3/4 Mar, Twentynine Palms, CA.

120mm mortar platoons can reside in the infantry regiment and use the traditional 81mm mortar platoon table of organization of two sections consisting of four guns each. The 120mm mortar platoon can be used to support infantry battalions in need of more indirect fire support than they can provide organically with 81mm mortar systems. In the absence of, or in combination with, a towed artillery battery, the 120mm mortar platoon can support the infantry battalion with massed effects and the capability to prosecute special fire missions requiring more than two guns such as suppression of enemy air defense, quick smoke, range and lateral spread illumination missions, as well as providing a sheer volume of fire that makes a large sheaf of high explosive effects and establishing effective suppression over a wide area. A 120mm mortar platoon can support an infantry battalion with all eight guns or with a single section of four guns. If one 120mm mortar platoon is not enough to support the requirements of four battalions in an infantry regiment, then the regiment should field two 120mm platoons—or four sections.

The Marine Corps will probably not need 120mm mortar platoons to conduct Expeditionary Advanced Base Operations. In this case, these platoons can remain at the infantry regiments and the mortarmen of these platoons can be tapped as immediate combat replacements for battalions that need them. However, if the Marine Corps becomes involved in the more conventional operations that have been characteristic of its history going back to World War II, then its twenty-three infantry battalions will need much more indirect fire support than that offered by five towed artillery batteries and the 81mm mortars organic to the battalion. Herein lies the necessity for the 120mm mortar platoon.

Notes

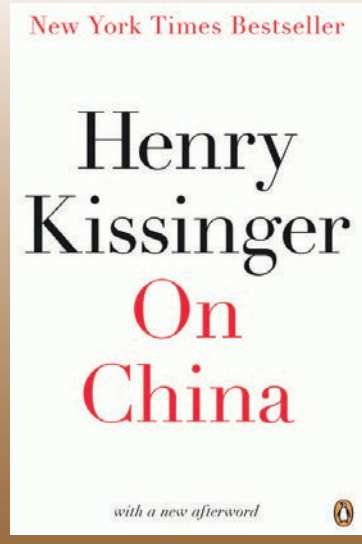
1. Gen David H. Berger, *Force Design 2030*, (Washington, DC: March 2020).

2. For information on the Expeditionary Fire Support System, see https://www.gd-ots.com/wp-content/uploads/2017/11/EFSS-Ammo.pdf

3. Headquarters Department of the Army, *ATTP 3-21.90, Tactical Employment of Mortars*, (Washington, DC: October 2019); and Headquarters Marine Corps, *MCWP 3-15.2, Tactical Employment of Mortars*, (Washington, DC: October 1992).

On China

reviewed by 2ndLt Peter Donovan



ON CHINA. By Henry Kissinger. New York: Penguin Press, 2012. ISBN 978-0143121312, 624 pp.

"Leaders cannot create the context in which they operate—they operate at the limit of what the given situation permits. If they exceed these limits, they crash, if they fall short, they stagnate." This is the wisdom of Henry Kissinger in his book *On China*.

President Nixon's "opening of China" is considered a monumental diplomatic achievement. Opening a previously closed society of now almost two billion was no easy task. Kissinger was credited with being at the helm of the process to open Beijing to the world, often involved in direct talks with important historical figures such as Zhou Enlai, Deng Xiaoping, and Mao Zedong—the latter of whom founded the Chinese Communist Party, still in power today. In his book, Kissinger outlines such conversations and how the United States and China differ in their perspectives of diplomacy. Heretofore, China regarded its neighbors as "tributaries" with itself at the center of the world ("China" literally translates to "Middle Kingdom"). It expected any foreign visitors to perform the kowtow (bowing) to their Chinese hosts. Regarding strategy, Kissinger says the Chinese stressed the long-term psychological versus the American pragmatism. Although China is now in many ways integrated into the U.S.-led, rules-based international order, its ancient precepts of world order are not lost on its contemporary leaders. Kissinger urges us to appreciate this difference in perspective which in turn will help the United States craft a strategy to prevent China from displacing the United States as the world's predominant power. As Marines, we may very well be called to prevent Beijing's march toward global governance. This may begin in the South China Sea, Taiwan, or elsewhere. Regardless of when, where, or how the next conflict may arise, Kissinger can help Marines understand Chinese intentions, strategy, and history in ways we may not otherwise be able to.

>2ndLt Donovan graduated from The Basic School with Alpha Company, 1-22, and is an 0203 Ground Intelligence Officer. He will be stationed in Okinawa, Japan, with 3d MARDIV.

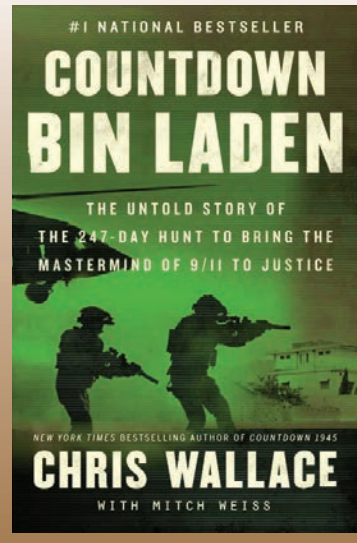
Chinese military strategy is often an enigma. Since it is important to understand the striking differences in how China and the United States think, we must appreciate Kissinger's experiences and analysis of Beijing's historical behavior. Kissinger relates Chinese military strategy to the board game *Wei qi* and U.S. strategy to the game of *chess*. *Wei qi* is a game where one player attempts to "surround" the other player using small marble-like pieces. To the untrained eye, it is unclear who has achieved victory. In chess, the victor is obvious. Kissinger says, "If chess is about the decisive battle, *Wei qi* is about the protracted campaign. The chess players aim for total victory. The *Wei qi* player seeks relative advantage." Beijing has an apathy to being surrounded on its periphery—politically, economically, or militarily. One of the more interesting patterns Kissinger brings up is that every time a coalition has been built on China's periphery, Beijing has gone to war (Korea in 1950, India in 1962, the Soviet Union in 1969, and Vietnam in 1979). He predicts that Beijing will "Reason, think ahead, and strike first before things gradually run out of hand ... launching some tiny scale battles that could deter provocateurs from going further—an application of the Chinese strategy in its Indian, Vietnamese, and Korean wars."

As the Marine Corps changes in accordance with *Force Design 2030*, we have much to learn from Kissinger. Perhaps the Chinese strategy will be to "strike before things gradually run out of hand ... launching tiny scale battles." These battles may be on isolated islands in the South China Sea, or elsewhere where China has a strategic interest, either in the Strait of Malacca, Hormuz, Latin America, or even the Arctic. It is important for Marine leaders to push boundaries and not crash but not fall short and stagnate. *On China* will help Marines understand *Force Design 2030*. Marines will learn about the significance of an island-based theatre of operations, a much-needed arsenal of knowledge as we prepare for the next fight. *On China* will help them answer the big questions as well as the small ones. It will help them understand the relevant terms from the importance of Expeditionary Advanced Base Operations to Chinese strategy and where exactly the Marine Corps fits into deterrence, power projection, and sea denial.

USMC

Countdown Bin Laden

reviewed by Maj Skip Crawley, USMCR (Ret)



COUNTDOWN BIN LADEN: The Untold Story of the 247-Day Hunt to Bring the Mastermind of 9/11 to Justice. By Chris Wallace with Mitch Weiss. New York: Avid Reader Press, 2021. ISBN: 978-1982176525, 368 pp.

A special operation is a tactical operation with strategic results.[1]

The above quote has remained with me all these years—probably because it defined "special operations" without mentioning any special operations forces. Operation Neptune Spear, the Seal Team 6 mission to capture/kill Osama bin Laden in Abbottabad, Pakistan on 2 May 2011, certainly qualifies. *Countdown Bin Laden: The Untold Story of the 247-Day Hunt to Bring the Mastermind of 9/11 to Justice* by Chris Wallace is the story of the Central Intelligence Agency (CIA) learning the location of bin Laden after years of false leads and the mission to capture/kill bin Laden. Wallace, the host of *Fox News Sunday*, has done an admirable job of presenting an exciting story, despite the reader already knowing the final outcome. In a sense, *Countdown Bin Laden* can be divided into three parts: Leon Panetta, the Director of the CIA, learning that bin Laden might be in the Abbottabad compound and the race to confirm it before bin Laden suspects what is happening and flees; the process leading to President Barrack Obama approving the mission; and finally, the planning and execution of Operation Neptune Spear by Seal Team 6.

"The Pacer"

After assuming the Presidency, President Obama felt, correctly, that lethargy permeated the hunt for bin Laden. Thus, he pushed "Panetta for more than a year to find bin Laden ... [CIA] analysts believed bin Laden was too smart to let al-Qaeda senior commanders know where his hideout was. So if he wanted to get his messages out, somebody had to carry them—someone whom bin Laden would trust with his life." In August 2010, after painstaking detective work, the CIA concluded that Ibrahim Saeed Ahmed, who lived "in an upscale neighborhood in Abbottabad" in a fortress-like "three-story house with twelve-foot-high concrete walls in the front [and] eighteen-foot-high walls in the back," was the "someone" who served as his communications conduit with the senior commanders of al-Qaeda. In addition, CIA analysts also believed he "was sheltering a high-value target" in his Abbottabad compound.

The CIA tried to ascertain who Ahmed might be sheltering. Two months of "scrutiny yielded up a significant discovery":

> the third family—including a man, a woman, and a teenage boy—lived upstairs in the main building. Almost every day, the man emerged from the house and strolled the courtyard for an hour or two. He walked back and forth, day after day, moving around the compound like an inmate in a prison yard. The analysts dubbed him "The Pacer."

The overriding question: was "The Pacer" bin Laden?

The CIA considered numerous ways to confirm if it was indeed bin Laden. This included tapping "into the sewage pipes leading from the compound and do DNA testing on the outflow" and "sending in a team at night to plant cameras in the trees overhanging a section of the yard where The Pacer exercised." Some of the more outrageous ideas were "throwing a stink bomb into the compound and taking photos when the occupants fled, or putting listening devices in groceries that were delivered to the compound."

Eventually, by December 2010, Panetta had enough confidence that "The Pacer" was bin Laden to brief President Obama that "'it is the CIA's judgment' that bin Laden resided in the Abbottabad compound." The result: "Obama ... asked him to explore options for an attack on the compound."

Obtaining Presidential Approval

Following the Presidential Brief, Panetta started,

> putting together a plan for how the CIA's special operations team would go after bin Laden, once they could prove he was The Pacer. But Panetta knew the CIA's paramilitary force could only go so far. They needed more people to advise on logistics—the experts at the Pentagon.

Enter VADM William McRaven, the Commander of Joint Special Operations Command, the higher head-

quarters of the Special Mission Units, Delta Force and Seal Team 6, and the other Tier 1 units that support them, such as the "Night Stalkers" of the 160th Aviation Special Operations Regiment (Airborne):

> McRaven was the perfect choice to lead this new kind of warfare. He had literally written the book on special operations ... During his long career, he had personally commanded or carried out more than a thousand special operations in some of the most dangerous places imaginable, mostly going after high-value targets in Afghanistan.

A little over 100 days after Panetta initially briefed President Obama on the possibility that they may have found bin Laden, McRaven was in the White House Situation Room to brief Obama on the mission plan he had spent "hundreds of hours of putting together" with his team of special operations subject-matter experts. The brief went well. But at the end of it, President Obama asked McRaven the obvious question: "Can you do the mission?"

> The national security advisor could tell that Obama was impressed by McRaven's honesty. When the president asked whether the mission was doable, McRaven could have said, "Yes sir, Mr. President. No problem." But he didn't. Instead, McRaven said he didn't know, but promised to come back later with an informed answer.

In approximately "3 weeks," Seal Team 6, the "Night Stalkers," and other elements of Operation Neptune Spear came up with a solid plan, rehearsed their various roles, and conducted a "full mission profile"[2] rehearsal before deploying to Afghanistan to await final approval from the President to "go."

Operation Neptune Spear

Most are familiar with the raid itself. Two specially modified "stealth" Black Hawk helicopters swooped down on the Abbottabad compound, inserting members of Seal Team 6 in and around the compound, who proceeded to clear the main three-story building in the compound. When they reach bin Laden, he is using a woman as a human shield with his head above her right shoulder. A Seal puts two bullets in bin Laden, "splitting his face open. Blood and skull spray[ing] the floor and walls." Bin Laden falls dead to the floor. The actual assault took about 15 minutes and another 25 minutes or so were spent on the ground gathering up a "ton of computers" and "seiz[ing] important al-Qaeda documents." After approximately 40 minutes on the ground, the raid force flew back to Afghanistan.

Wallace highlights some aspects of Operation Neptune Spear that are not well known.

Wallace highlights some aspects of Operation Neptune Spear that are not well known. To me, the most surprising thing Wallace points out is that there was not 100 percent certainty that bin Laden was in fact in the Abbottabad compound. It was only after he was killed that a definitive identification of him could be made. It was a bold decision to greenlight the operation without absolute certainty that it was bin Laden in the compound.

The reason one of the stealthy Black Hawks crashed was because in the mock-up of the compound in North Carolina they used for "rehearsals, they had substituted chain-link fences for the masonry walls. The air could flow through them instead of being trapped." In short, "the high compound walls [of the actual Abbottabad compound], which blocked the downwash of the rotor's blades" decreased lift, causing the specially modified Black Hawk to crash.[3]

Lastly, the CIA had a unique solution to buy time for the raiding force when the inevitable crowd of locals gathered around the compound when they saw and heard the raid:

> The CIA translation officer waded into the crowd. Several dozen people were gathered outside the compound. He calmly told them that this was a Pakistani military exercise. They needed to stand back, he said. For the time being, they bought the story. They started moving away from the walls. It bought them some time. But how much?

Winners and a Loser

President Obama. According to Wallace, Obama realized that the hunt for bin Laden had languished and insisted it be revitalized. Also, the weight of the decision to authorize the raid rested entirely with Obama. Despite less than 100 percent certainty that bin Laden was actually in the Abbottabad compound, President Obama approved the mission.

Leon Panetta, Director of the CIA. Panetta, the focus of the first half of the book, comes across very well. I especially appreciate how Panetta had the moral courage to disobey President Obama's direct order early on not to bring the key members of the House and Senate Intelligence committees into the loop. But Panetta, a former Congressman himself, "was thinking that if you bring Congress along, they become a partner. They'll be more supportive of the outcome—good or bad."

The CIA. Wallace does a great service showcasing the extraordinary dedication of the men and women of the CIA who spent years trying to bring bin Laden to justice. Their quest for justice for 9/11 took a great toll on their personal lives but they never gave up. It was interesting to read about all the methods the CIA considered to confirm if bin Laden was in the Abbottabad compound—the conventional methods and the not-so-conventional methods.

Then-Vice Admiral McRaven. He was another key player in *Countdown Bin Laden* who manifested moral courage. During one of the Presidential Briefings, Obama asked McRaven if the mission was viable. Many men, in the presence of the President of the

United States, would have said, "Yes" for fear of the potential consequences of any other answer. McRaven gave a qualified positive answer but asked for time to work out the details with key specialists before answering definitively.

Seal Team 6. Perhaps it should not have been a surprise, over nine years into the war on terror and hundreds of capture/kill raids in Iraq and Afghanistan, but the operators of Seal Team 6 conducted a raid of the highest national importance with only three weeks to rehearse before the actual mission. This is in contrast to the two and a half months it took the assault force to plan and rehearse the successful Son Tay prison camp raid in November 1970 and the several months it took to put all the disparate pieces together to execute Operation Eagle Claw, the unsuccessful attempt to rescue the American hostages in Tehran conducted in May 1980.[4]

Forces" when he should say "special operations forces." This is inexplicable given the subject matter of *Countdown Bin Laden*.

Secondly, Wallace inserts the story of Jessica Ferenczy—a New York police officer, who lost her fiancé, another NYPD officer, on 9/11. While a tragic tale—one of the thousands that came out of 9/11—Jessica Ferenczy's story has *absolutely* no connection whatsoever with the CIA finding bin Laden nor of Operation Neptune Spear. It was distracting to read the chapter of Panetta informing President Obama that "it is the CIA's judgment" that bin Laden was in the Abbottabad compound then to read the next chapter, which is Ferenczy taking a "road trip" to a place her and her fiancé once visited, before reading the next chapter where Panetta is informing key members of the House and Senate Intelligence committees that they may have located bin Laden.

... the operators of Seal Team 6 conducted a raid of the highest national importance with only three weeks to rehearse ...

Bin Laden. Apparently, bin Laden forgot the old adage about "not staying in one place too long" and wanted the comfort of a long-term home. On the night of 2 May 2011, this caught up with him.[5] Also, evidently, no one told bin Laden that the purpose of Seal Team 6, formed in 1980, was to kill terrorists and rescue hostages; therefore, their shooting skills were more than a match for him hiding behind a woman.

I do have three criticisms of how Wallace wrote *Countdown Bin Laden*. First, Wallace apparently does not know the difference between the generic term "special operations forces" and "Special Forces," aka "The Green Berets" whose primary mission at this time was Foreign Internal Defense (i.e., counterinsurgency). Throughout *Countdown Bin Laden*, Wallace repeatedly uses the term "Special

This happens throughout the book. Every chapter concerning Ferenczy could be edited out of *Countdown Bin Laden* without in any way being detrimental to Wallace's narrative.

Thirdly, Wallace—rightly so—never questions or impugns the patriotism and loyalty of Democrat Senators or Congressmen. The same cannot be said about his attitude toward Republicans:

> And now the November midterm election had put Republicans in charge of Congress, raising the stakes even higher. When Panetta got back to Washington, he'd have to tell a small but new group of senators and congressmen why he needed extra funding. People with political agendas, people who might not feel obliged to keep a secret. Republicans had already started fighting Obama over every piece of legislation. Would one of them scuttle months of work to score some political points?

Conclusion

Perhaps because I have read extensively about Joint Special Operations Command, Delta Force, and Seal Team 6, I did not find the latter part of *Countdown Bin Laden* which discusses the planning and execution of Operation Neptune Spear as interesting as I did the extraordinary efforts of the CIA to ascertain if bin Laden was actually in the Abbottabad compound. I imagine most readers will find both the hunt for bin Laden and the planning/execution of Operation Neptune Spear equally interesting. Despite my above criticisms of Wallace's writing, *Countdown Bin Laden* is well worth reading. Despite some flaws, Chris Wallace has taken a story of which we all know the final outcome and written a book that makes for interesting and enlightening reading.

Notes

1. From a publication I read when I attended The Basic School.

2. A Full Mission Profile is a "full-scale dress rehearsal" where you "simulate the entire raid from beginning to end." Every part of a special operations mission is rehearsed with all elements doing exactly what they will do in the actual mission.

3. Temperature also played a factor. At the time of the raid, the temperature was 4–9 degrees Fahrenheit warmer than forecast. Hotter temperatures decrease a helicopter's lift.

4. Son Tay was successfully executed but it took so long to plan, gather the forces for, and train, that by the time it was mounted, the POWs had been moved.

5. Though to be fair, bin Laden lived in the compound for years before the CIA realized he was there.

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