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14. ABSTRACT
The Marine Corps communications community is in disarray and needs to establish unity of command and effort throughout five key areas – doctrine, acquisitions, training, expectation management, and simplification of communications architectures in order to meet the challenges of the future operating environment (FOE). Specific problems are: ability to operate in a denied and degraded environment, organizational inefficiency, and operational disarray. These problems are significantly impacting communicators' ability to enable command and control and, in turn, leading to systematic failure across all of the warfighting functions. The solutions to the problems are not found in costly technology, pitted against external threats, but rather, in simple decisions and actions, directed at internal problems. If these recommend solutions can be implemented now, the improvements will pay dividends in the FOE. Under a unified vision, the community can begin to create doctrine to address the challenges of the FOE, manage talent, training, doctrine, and acquisitions to be ready for the next fight against a near-peer enemy.

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*United States Marine Corps
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Marine Corps University
2076 South Street
Marine Corps Combat Development Command
Quantico, Virginia 22134-5068*

MASTER OF MILITARY STUDIES

TITLE:

**THE MARINE CORPS COMMUNICATIONS COMMUNITY IS NOT READY TO ENABLE
COMMAND AND CONTROL IN THE FUTURE OPERATING ENVIRONMENT**

SUBMITTED IN PARTIAL FULFILLMENT
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AUTHOR:

MAJOR MATTHEW A. KNOPP
UNITED STATES MARINE CORPS

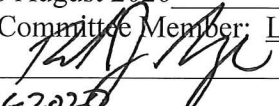
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Mentor and Oral Defense Committee Member: Anne Louise Antonoff PhD

Approved: //Anne Louise Antonoff//

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Oral Defense Committee Member: LtCol Ronald Rega

Approved: 

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EXECUTIVE SUMMARY

Title: The Marine Corps Communications Community Is Not Ready to Enable Command and Control in the Future Operating Environment

Author: Major Matthew A. Knopp, United States Marine Corps

Thesis: The Marine Corps communications community is in disarray and needs to establish unity of command and effort throughout five key areas – doctrine, acquisitions, training, expectation management, and simplification of communications architectures.

Discussion: The communications community is not prepared to face the challenges of the future operating environment (FOE) due to several significant problems: ability to operate in a denied and degraded environment, organizational inefficiency, and operational disarray. These problems are significantly impacting communicators' ability to enable command and control and, in turn, leading to systematic failure across all of the warfighting functions.

Conclusion: While the Marine Corps communication community is not ready for the FOE, it can be. The solutions to the problems it faces are not found in costly technology, pitted against external threats, but rather, in simple decisions and actions, directed at internal problems. If these recommend solutions can be implemented now, the improvements will pay dividends in the FOE. Under a unified vision, the community can begin to create doctrine to address the challenges of the FOE, manage talent, training, doctrine, and acquisitions to be ready for the next fight against a near-peer enemy.

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Preface

I would like to first thank my wife for allowing me to take on this additional challenge while attending the Marine Corps Command and Staff College, as well as tolerating my endless lamentations during the process. Additionally, my children for understanding the few and far between times that Dad couldn't come and play. Also, my friends, mentors, and other colleagues in the Marine Corps that encouraged me to work on this project.

I would also like to thank Doctor Antonoff for her hours of conducting a future war study group with myself and my peers, which significantly contributed to the development and refinement of this paper. Her insight, connections, resources, and encouragement were instrumental to its completion.

The Marine Corps communications community continues to struggle with effectively enabling command control. I do not doubt that the Marine Corps will be successful in its next fight; that said, there is no excuse not to be better than we are, and currently, there is much room for improvement in the communications community. I wholeheartedly believe C2, enabled by an effective communications system, will prevent unnecessary loss of life and ensure quick and decisive success on the battlefield in a future war I hope we never fight. It is my sincere hope that this effort will contribute to others' understanding of the problems we face and inspire solutions in the future.

This paper's goal is to highlight the opportunities, and necessity, of taking a more proactive approach to coping with the challenges the Future Operating Environment (FOE) presents. It is an open letter to Marine Corps leadership on the current state of the Marine Corps communications community from the perspective of an officer with twenty years of experience working within it. The purpose is a call to action for change to positively impact communications and ensure success in the future operating environment.

Introduction

“War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty.”¹ – Carl Von Clausewitz

In *On War*, Clausewitz explains that everything in war is uncertain, yet the US military has long been obsessed with the pursuit of a perfect and constant flow of information. Marines have built into their warfighting concepts an expectation of ample and adequate information at all times, enabled by reliable communications. This, of course, is an unobtainable goal. However, they can do a lot more to meet this challenge, not with technology alone, but more so by overcoming doctrinal, organizational, and operational problems. This is not to say that technology is not a critical part of the equation. New technology is available now and being developed each day that will enhance command and control (C2) and mitigate command and control denial and degradation (C2D2) threats. Before the Marine Corps can fully realize the potential of these new technologies, they must first ensure the processes behind them are sound. The purpose of this paper is to examine these processes and offer some recommendations of how the communications community can improve them.

To be victorious in war against a near-peer enemy and to prevent unnecessary loss of life, the Marine Corps communications community must focus on adapting to critical features of the likely future operating environment (FOE). To adapt to the FOE, the communications community must make changes; the status quo will not do. These changes need not be complex, expensive, or difficult; instead, they are simple adjustments that will have positive impacts on all of the warfighting functions, and above all, C2 in a Command and Control Denied and Degraded

Environment (C2D2E). Without meeting this challenge, there can be no successful execution of Expeditionary Advanced Base Operations (EABO) or, indeed, any other concept central to operational art in future war. Currently, however, the Marine Corps communications community is unready to operate in the FOE.

The role of the Marine Corps communicator is to enable C2. The communications equipment and the Marines who operate it are the backbone for all of the warfighting functions. Without efficient and effective communications, C2 cannot exist in the FOE. Many problems inhibit communicators from providing those efficient and effective communications means to enable C2. By identifying and correcting the problems within the Marine Corps communications community, its professionals can begin to address the implications of the FOE. This, in turn, will give the Corps a distinct advantage for communicating in the FOE within the concept of EABO and distributed operations as well as maneuver warfare and operational art.

A Probable Future

It is March of 2022. US forces are invading Iran, and the Marines of II MEF (reinforced) form a portion of the force on the march to Tehran. Before the initial phases of the campaign, the Marine Corps finds early successes, testing new competencies to enable the force. Expeditionary Advanced Bases established prior to the invasion provide initial logistical, air, and fires support for the landing at Jask. Special operations personnel already within Iran provide greater intelligence and targeting information to help shape the coming fight. Autonomous air and subsurface platforms mitigate the majority of the Iranian Area Access/Area Denial (A2AD) defensive measures.

As the three Regimental Combat Teams (RCTs) begin their ground assault, they quickly outrun their logistical trains, slowing their pace. The commanding generals of II MEF, Second Marine Division, Second Marine Logistics Group, and Second Marine Airwing all experience significant problems commanding and controlling their units. These problems arise from distances, fierce fighting from the Iranian military, and most of all, the C2D2 capabilities of Iran, which have been jamming communications and launching highly effective distributed denial of service (DDoS) attacks on their information networks. A communication failure during the initial invasion and attack on Jask leads a forward air controller to misidentify a Marine tank company as Iranian tanks, resulting in the loss of three tanks and the death of ten Marines from Company B, Second Tank Battalion. Two weeks into the push, communications failures similarly cause a convoy from Combat Logistics Battalion Two (CLB) to get lost *en route* to resupply RCT-8 and come under attack by Iranian forces, resulting in the loss of mission-critical equipment and supplies and the death of fourteen Marines. During RCT-Two's assault on Shiraz, several targets are miscommunicated to the division fire direction center, resulting in the death of over one hundred and fifty Iranian civilians. Finally, a well-coordinated Iranian cyber-attack cripples MEF supply and battlefield tracking capabilities for the critical assault on Tehran, leading to multiple instances of friendly fire and unnecessary delays in the resupply of food, water, ammunition, and casualty evacuation. While numbers are not precise, it is safe to say that at least twenty of the two hundred and forty-two Marines and sailors killed in action can be attributed to this incident as well as the deaths of hundreds of Iranian citizens throughout Tehran and its suburbs.

In the end, the Marines and the rest of the joint force accomplish their objectives in Iran, but not without unnecessary loss of life on both sides due to inadequate communications

capability to enable effective C2 through their attack from the line of departure (LOD) to the objective. Now the Marine Corps must wrestle with the preventable mistakes made and the lessons learned on the battlefield and explain to Congress what is needed to make the Marine Air-Ground Task Force (MAGTF) and EABO more effective in battle.

This hypothetical scenario demonstrates the integrated, systemic effects of communications failure across the warfighting functions, with degradation in each one compounding degradation in the others. These compounded failures in turn can be traced back to organizational dysfunction as well as operational inefficiency, both of which exacerbate the Marine Corps' unpreparedness to meet enemy C2D2E capability.

The Problems

There are three significant problems the Marine Corps communications community must overcome to be prepared to enable command and control in the FOE. The first problem is external, while the other two are internal. The first is the C2D2E threat America's near-peer adversaries are capable of producing and a lack of doctrine to address the challenge. The next problem set is organizational dysfunction. The third and final problem set is operational inefficiency. The two internal threats exacerbate the external threat, which is the most dangerous to the United States.

1. The C2D2E Threat

Understanding the challenges of future war begins with the FOE. C2D2E is a genuine part of the FOE and is the most significant threat to command and control. The community is not ready or capable of dealing with C2D2E.

Command and control is a feedback process that informs the commander by providing an accurate assessment of the battlefield across all warfighting functions. Through this process, a commander can make decisions and exercise authority and delegate to assigned forces to accomplish a mission. Modern technology enables C2 capabilities that facilitate these concepts. Any disruption, degradation, or denial of these capabilities can have severe impacts on a commander and his forces. Degradation or denial of these capabilities primarily occurs through means of offensive electronic warfare against communications systems that enable command and control. The US and most of its near-peer adversaries can jam, spoof, or otherwise degrade or deny communications. The *2018 US National Defense Strategy* directly addresses the concern and capabilities of near-peer enemies and acknowledges the challenges of command and control in a denied and degraded environment.² Many service and joint letters, memos, and other directives call upon the force to train to the same standard in meeting these challenges. The answer to date from the community has been to turn systems off for a small period of time and include that as training to this standard, while expressing an aversion to wasting valuable field training time. This training approach does not meet the mandate; the communications community must be willing to fight through the friction to discover real solutions to operating in the C2D2E.

Experts within the military communications community and those with a solid grasp of the theory of command and control all agree that near-peer enemies such as China and Russia have significant capability to degrade and deny command and control through electronic warfare and other means. Within these groups, there are three schools of thought: Those who believe it will so severely affect United States forces that they will be unable to carry out decisive operations, those who believe that the United States can mitigate the impacts with sound

processes and mission command, and finally, those who believe the United States has a distinct advantage in electronic warfare and that the consequences of denying or degrading our communications would result in a United States response in kind so substantial that this factor alone will act as a deterrent. Although the preponderance of experts agrees on the threat the C2D2E presents, there is no definitive doctrine that provides a path to threat mitigation. The three previously mentioned schools of thought reflect the uncertainty and challenges the FOE presents. With such disagreement, a common basis for doctrine does not exist. This finding provides a segue to the next point; a lack of relevant doctrine.

A. Lack of Relevant Doctrine

Not only is there uncertainty on how to create doctrine for communications in the FOE, but also, overall, doctrine writing within the communications community leaves much to be desired. There have been no significant updates to communications doctrine since the late nineties, over twenty years ago. The two seeming exceptions are *MCDP 6, Command and Control*, last updated in 1996³ and *MCRP 3-30B.2, MAGTF Communications System*, updated in 2016⁴. While the latter title's update seems to contradict the twenty-year argument, context is needed. *MCRP 3-30B.2* was formerly known as *MCWP 3-40.3 MAGTF Communications System* and was published in 2010,⁵ but this publication contained only minor updates to the even more dated *MCWP 3-40.3 Communications and Information Systems*, published in 1998⁶. With this contextual understanding, the argument for lack of up to date doctrine stands on more solid ground.

The fault for this lack of doctrine lies with three organizations, Training and Education Command (TECOM), Command, Control, Communications, and Computers (C4) and Marine Corps Communication-Electronics School (MCCES). These three organizations are tasked to

work together on the development and revision of communications-related doctrine⁷. As illustrated previously, these three organizations and the community at large are not actively writing new doctrine. That said, it is worth noting that these three supporting establishment organizations have been understaffed for well over ten years, typically around 60 percent of the Table of Organization (T/O) and around 70 to 80 percent of the approved staffing goal⁸. These manpower shortfalls, compounded with their primary missions, make it understandable as to why doctrine writing has not been a priority.

A lack of doctrine that addresses the challenges of the FOE results in systemic failure across the community to man, train, and equip to prepare for these challenges. At root, this lack of doctrine can be attributed to the fact that there is no central authority that has been demanding doctrinal updates from these organizations. This lack of accountability leads us into the next and most significant problem: systemic organizational dysfunction, starting at the top of the communications community.

2. Organizational Problems

Spearheading the development of new doctrine will require a new approach to understanding and leading communications as a community. In fact, organizational problems themselves constitute a set of challenges needing thorough reform. Primary among these is the absence of unity of command and unity of effort.

A. Lack of Unity of Command and Unity of Effort

The communications occupational field does not have a centralized command, ultimate authority, or lead advocate. Deputy Commandant for Information (DC, I), is the presumptive highest-level command for the Marine Corps community. However, Marine Corps Development

Command (MCCDC)/ and its subordinate unit, Training and Education Command (TECOM) also wield great authority over the community. Further complicating this division of power are two other organizations, Deputy Commandant for Manpower and Reserve Affairs (M&RA) and Combat Development and Integration (CD&I). These three offices have conflicting control over plans, policies, acquisitions, procurement, doctrine, training and education, manpower, and many other critical governing functions for the communications community. Marine Corps Command, Control Communications, and Computers (C4), directly under DC, I, manages some personnel matters, Marine Corps Enterprise Network (MCEN) issues, direction on tactical communications equipment, and communications training. But these matters are primarily managed by Manpower and Reserve Affairs (M&RA), the Marine Corps Cyberspace Operations Group (MCCOG), Marine Corps System Command (MARCORSYSCOM) and Training Command (Trng Cmd) respectively. This welter of acronyms with cross-cutting responsibilities underscores the problem. (See Appendix A⁹ for an HQMC Organizational Chart and Appendix B¹⁰ for these organizations' mission statements)

Lastly, along with the lack of unity of effort comes the additional lack of focus on supporting the warfighter. With DCI and C4 as, in the main, the accepted leads of the communications community, it is crucial to look at where their focus lies, or perhaps more importantly, where it does not. Twice a year DCI and C4 Operational Advisory Groups (OAG), the goal of these working groups is to develop recommendations to CD&I with respect to “multiple Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities and Policy (DOTMLPF-P) actions.”¹¹ On paper, this charge seems adequate to address all issues across the Marine Corps communications community, but in actuality, such a comprehensive approach does not occur at this level. A look at any of the recent agenda items for the OAGs

will reveal that the focus is squarely on MCEN issues and rarely strays to anything outside of that scope.¹² Further evidence of this lack of focus outside the MCEN is the publication *Marine Corps Strategy for Assured Command and Control*¹³. This document ascribes to establish reliable C2 for the future operating environment. A review reveals a 37-page MCEN-centric publication, with the word radio mentioned just once, MAGTF in eight instances, and no mention of the word combat.

As should be apparent from above, there is no single governing body or leading advocate for procurement of communications or command and control equipment. Instead, procurement involves several layers of communications professionals as well as representatives of all the warfighting functions, across all warfighting domains, independently researching, developing and procuring technology with no coordination across the force. As a result, there is no commonality in systems. Therefore, friction increases before the enemy even takes any action to degrade or deny command and control. The desired solution is for all of these competing interests to be screened, validated, and procured by one governing body that can ensure synergy across the command and control system. Without unity of effort, working towards commonality, technology will be a weakness, not a strength. However, this lack of unity of effort is not the only problem with acquisitions; the process itself is flawed, which brings us to the next issue.

B. Procurement and Acquisition Are Not Keeping Pace with Technological Advances

The procurement and acquisition processes are, at best, dysfunctional; they do not move at the pace of emerging technology. The Marine Corps acquisitions community needs a severe adjustment in both attitude and process. Too often, tenured bureaucrats forget they exist to support the warfighter with the right equipment, on time. Urgent needs go unfulfilled, and the process and fiscal constraints are used as excuses for failures to deliver. Program managers

become married to the equipment in their purview, rather than being open to dropping end items and seeking better solutions to support the warfighter's operational needs. The primary means to 'quickly' acquire much-needed communications equipment are the Information Technology Procurements Review and Approval System (ITPRAS) and Urgent Needs Process (UNP), managed by C4 and CD&I respectively. (See Appendix C¹⁴ for the ITPRAS and Appendix D for the UNP flow charts) The purpose of the ITPRAS is to provide oversight and validation of the purchase of all information technology procurement requests.¹⁵ The purpose of the UNP is "[t]o respond to urgent warfighting capability needs by providing the best available solutions to mission-critical capability gaps in a timeframe acceptable to operating force commanders."¹⁶ Both the ITPRAS and UNP require review at multiple, disparate levels throughout the Marine Corps and typically take months up to a year or more to be approved. While this true timeline does not seem to be representative of the Marine Corps' focus on supporting the warfighter, such is the current state of affairs within the communications community.

Seasoned communicator and frequent *Marine Corps Gazette* contributor Paul Stokes reinforces these issues and introduces others, pinpointing four contributing factors to the unresponsive system. First, rigid hierarchical systems ignore innovative suggestions from lower ranked or lower-level assigned Marines.¹⁷ The second issue is institutional risk aversion, or unwillingness to "accept failure, learn from it, and move on."¹⁸ Next, he points out the "dualistic, fickle, convoluted, and self-imposed bureaucracy"¹⁹ that upholds rigid processes instead of the commitment to supporting the warfighter. Lastly, he indicates that "innovation is rarely – if ever rewarded."²⁰ Marines who attempt to innovate typically do not take the traditional career paths and expose themselves to greater risk of a stunted career.

Other occupational fields and services as well as nearly every other nation's military have rapid and responsive Commercial Off the Shelf (COTS) procurement capability, allowing them to stay at or ahead of the pace of technological development. The Marine Corps communications community remains bogged down due to the lack of such a capability. These procurement and acquisition delays not only impact operational capability but also have an adverse effect on the next problem area: training. Within the occupational field's school house there is a terrible combination of insufficient and outdated equipment to handle the throughput of both entry-level and career-level training and education.

C. Inadequate Training and Education

For technology to be effective, training in the new capabilities is a must. Training of communicators, however, is not keeping pace with technological advances and is not meeting the demands of the fleet, which leads to Marines who are not appropriately trained in their military occupational specialty (MOS). Training and Education Command (TECOM) and Training Command (TrngCmd) play the role of governing MOS Training and Readiness (T&R) standards, with input from the school house at MCCES and its subordinate command, Communications Training Battalion (CTB).

Course Content Review Boards²¹ (CCRBs) are supposed to be held every three years, but sometimes happen less frequently. The purpose of the CCRBs are to review what is being taught in the school house (CTB, MCCES) and ensure it is meeting the needs of the occupational field. To validate that training is meeting demand, it is critical to get participation and input from the operating forces. Invitations for CCRB participation from the active MEFs, as well as the reserve component, are always included in the convening message, but just as with C4's OAGs, rarely do these units send representatives. This lack of participation means that MCCES and

CTB, with limited C4 and Trng Cmd participation, essentially plan within a vacuum, with no input from the operational forces; as a result, there is no evaluation of the value of the current curriculum.

Furthermore, the communications schoolhouse is not a priority for fielding new equipment, as it had been in the past. The school is typically the last to be issued “new” equipment to enable training, often lagging three to five years behind the fleet in equipment fielding. In turn, operational commands have to conduct on the job training (OJT), further taxing already burdened units.

Lastly, the schools are a low priority for manning, typically sitting at 70 to 80 percent of their staffing goals, and have been so for well over the last decade.²² This low number of permanent personnel leads to difficulty in managing instructor to student ratios and fatigue across the instructor cadre. The manning shortfall affects not only new Marines but also career Marines, who must be prepared to meet increasing responsibilities in architecture planning and management through advanced courses. Due to the lack of instructors, the courses themselves cannot be offered as frequently as they are needed, and so Marines are not fully trained in the increased responsibilities commensurate with their rank. CTB does have satellite schools that are collocated with each active MEF, and these Communications Training Centers (CTC) do lighten this burden and facilitate new equipment training. And yet, just as with their parent unit, they too are severely understaffed. Overall, new communicators are not efficiently trained, and career communicators are not meeting advanced training requirements in a timely manner.

The problems are not restricted to the upper echelons of the communications community. Dysfunction at this level propagates across the entire communications community, leading to the third and final set of problems, which are found within the operating forces.

3. Operational Problems

Within the operating forces, the communications community's problems continue. The following problems, while products of organizational disorder, are far more prolific and have the most adverse effects on MAGTF operations. As in the examination of organizational problems, one must first look at the hierarchical dysfunctions in order to appreciate the subsequent issues.

A. Broken Linkage Between Communications Units and the Chain of Command

Within the operating forces, communicators are organized under the S-6 or G-6, depending on the level of the command. Though they are staffed differently, the S-6 and G-6 staffs are both responsible for the communications requirements of their respective commands. Major commands with a commanding general have a G-6 communications staff, composed of a small group of communications officers, warrant officers, and enlisted personnel. At the regiment and group levels, down to the battalion and squadron levels, there is an S-6 communications staff. This staff is more robust than their higher echelon equivalents, with a platoon or more of multi-disciplined communicators, comprising one or two communications officers and enlisted personnel. Unlike their G-6 counterparts, the S-6 sections are self-supporting, as they are solely responsible for the communications requirements of their respective units. (See Appendix D for a list of these communications units' mission statements)

The G-6 staffs rely on subordinate communications units to plan, install, operate, secure, and maintain their respective communications systems. At the MEF level, the communications battalion is the unit that provides this manpower. At the air wing level, the communications squadron plays this role. Within the MLG and Division, the communications company supplies this support.

Further complicating these relationships are the headquarters elements within these units. At the MEF-level, there is the MEF Information Group (MIG), formally known as the MEF Headquarters Group (MHG). Similarly, the aforementioned communications squadron and communications companies also fall under respective headquarters battalions and squadrons (henceforth referred to as headquarters units). Herein lies one of the greatest faults in command organization and hierarchy. *MCRP 1-10.1 Organization of the United States Marine Corps* attempts to clarify the command relationships, stating the communications battalion is administratively controlled (ADCON)²³ by the MIG and operationally controlled (OPCON)²⁴ by the G-6. The communications squadrons and companies share this same ADCON and OPCON relationship with their headquarters units and G-6s, respectively. While seemingly clear, these lines often blur in both the garrison and deployed environments. As an example, if one asks a MEF Assistant Chief of Staff G-6 who the tasking authority for the communications battalion is, the most likely answer would be the MEF G-6. Asking the MIG commander would most likely lead to a similar answer, favoring the MIG itself. In practice this blurring of lines often happens in the field environment, and the communications unit is divided in effort between providing communications support and manpower to both their respective G-6s and headquarters units simultaneously. Further complicating this issue, the commanding officer for the headquarters unit at any level is always the reporting senior and direct commanding officer for the communications unit's commanding officer.

This arrangement breaks one of the fundamental principles of military hierarchical relationships: unity of command. These communications units serve two masters. This relationship does not work and causes multiple issues with training and readiness as well as manpower, with both senior organizations vying for control and rarely coordinating with one

another. Both the headquarters units and the G-6s have their own training plans, staff and camp taxes, as well as schedules to maintain, and both fully expect the subordinate communications units to comply with all directives from them. One other noteworthy relationship to point out is that the G-6s also fall under the command of these MIG and headquarters units at every level.

Another example of organizational dysfunction can be found between the various communications agencies within the MAGTF. During the planning process, it is critical to hold multiple planning meetings, build the network together, and establish working relationships between these communications agencies. These critical steps are accomplished at Technical Control (TechCon) conferences and accomplished in the build and testing of equipment known as 'Strap-Ex'. At the MEF-level, this typically means that the MEF G-6 is the lead Systems Command (SYSCOM) and designated the MEF Communications Control Center (MCCC). The other communications agencies from Major Subordinate Elements (MSE) (Communication battalions/companies) and Major Subordinate Commands (MSC) (Division, Wing, MLG) become subordinate SYSCOMs and Communications Control Centers. Due to conflicting priorities and hierarchical relationships, these agencies do not coordinate and plan in a unified manner, with many subordinate communications units not participating in the process at all.

Time and again, the communications after action reports (AAR) reflect the impact of these rigid requirements along with non-participation in planning and network construction as a significant contributing factor to delayed communications capability. One AAR example that resonates with common familiarity to all communicators as being the norm is provided below:

The [Authorization to Operate] was submitted a few days prior to the beginning of Strap-Ex. Normally the process would have taken about 30 days not two working days. The ATO was submitted late due to two major factors. The simplest being lack of cohesion within the G-6...The G-3 also made change to the exercise plan well past the dates by which Communications Company/G-6 were required to submit paperwork to receive an

ATO. Additionally, there were no TechCon conferences between the G-6, Communications Company, and participating units. These meetings are key to the entire Communications community being on the same page for the execution of an exercise this complex. Planning occurred in a vacuum with no realistic understanding of maintenance availability or unit capabilities.²⁵

The disorder within the operating forces obviously hinders operations, creates disorder in messaging, and removes the ability to manage expectations for communications up and down the MAGTF chain of command. This disorder is even greater in impact in light of EABO and the need for close coordination with the Navy. Until there is a consolidated operational authority, there is no hope of achieving a “single battle,” integrated Navy-Marine approach to C2.

B. Expectation Management is Difficult

The concept of command and control is not new: since the first groups of men fought other groups of men, there has been a leader, and he has had the same requirements to enable him to command his forces. What has changed is technological ability, and with that change has come greater capabilities, and a greatly increased appetite for information.

The Marine Corps, and specifically the current generation of senior leadership, has grown accustomed to the luxuries of the civilian-like enterprise service commensurate with that of major business corporations. This expectation has been shaped by our static positions in the long wars in both Afghanistan and Iraq, as well as a daily appetite for information and the services available in a garrison environment. Clearly, however, this expectation is unrealistic and does not fit the FOE and maneuver warfare. John McGrath, former army officer and war historian, stated in *Crossing the Line of Departure* that “[a] permanently static force could be controlled in a detailed, centralized manner, [but] such control in a dispersed force on the move would prove

to be virtually a recipe for disaster.”²⁶ The Marine Corps does indeed court disaster in near-peer conflict if it does not rectify this situation.

Further complicating expectation management is the constant ‘dog and pony’ shows put on by the companies that develop and sell military communications systems. These companies have a goal to sell the next system and parade new communications systems with bumper stickers like ‘net-centric warfare’ and ‘kill chain’. These systems are fielded to Marines during training exercises but fully manned and supported by the civilian systems engineers that designed the equipment and are proficient in their use. For example, one participant in a major naval communications exercise in Hawaii in 2018 observed the following:

[During the exercise they were linking] C2 to [the] tactical edge with bridging Link 16 and [the Marine Air-Ground Tablet] MAGTAB ANW2 through TSOA [Tactical Service Oriented Architecture] bridges. They had engineers from Penn State working with SPAWAR engineers to make it work.²⁷

These ‘wizards behind the curtain’ make the new systems appear to be flawless in action, but when the after-action publications are distributed, the narrative reflects the heavy support the equipment required and the lack of proficiency of the Marines using it. The problem with this situation is that the senior officers who observe the exercise do not observe how difficult it is to make these systems work. Instead, they are left convinced that this is the solution to all of their problems. Moreover, it muddies the water on what parts of the system are already in the inventory. In short, commanders and other non-communicators have no clear understanding of what is within the realm of possibilities.

C. Rigid, Unwieldy Technological Systems

As time has passed, the amount of information deemed essential to command and control has allowed battlefield communications systems to grow into a grand behemoth. The

requirements of modern C2 are born of the right concept, essentially ensuring “we can reach effective military decisions and implement effective military actions faster than an adversary in any conflict setting on any scale.”²⁸ While the intentions were good, the negative consequences have yielded an unwieldy system that slows operations and degrades capability. According to MCRP 3.30B.2, MAGTF Communications System, “Employment of [communications] systems must not adversely affect the MAGTF’s freedom of action and mobility, and they must be reliable flexible, responsive, and configurable to mission needs.”²⁹ This governing principle that communications systems should not adversely affect operations is cast aside in the name of assured and reliable communications.

Simply put, the communications architectures that the communications community plans today are far too complex in even a permissive environment, and nearly impossible to establish in a C2D2E.

Currently, there are over one hundred C2 systems that the various warfighting functions require in order to fully exercise their capability³⁰. (See Appendix C for this full list) Some systems may not *seem* critical to C2, but that judgment is shaped by one’s perspective and role as a manager of a specific warfighting function. The greatest challenge to future communicators as well as other MAGTF officers and planners is to distinguish what is truly essential from what is merely “nice to have”.

Further complicating the unwieldiness of MAGTF communications systems are the rigid standards governing the Department of Defense (DOD) Information Network (DODIN). These restrictions used to be limited to the computer systems of the corps, Marine Corps Enterprise Network (MCEN) and its predecessors. However, within the last decade, with the push to establish unified communications, the DODIN has truly grown to encompass all communications

systems. This is not to say the DODIN requirements are not necessary. From a cyber defense perspective, they certainly are. Nonetheless, full compliance with these standards amounts to significant delays in communications planning and implementation, and ultimately, operations.

Many of these standards are bogged down in bureaucratic review processes. Prior to using a communications architecture with DODIN connectivity, the communications unit has to prepare a robust set of documentation to prove compliance to these standards. The documents include a security Assessment Report, System Security Plan (SP), Satellite Access Request (SAR), Gateway Authorization Request (GAR), and finally, an Authorization To Operate (ATO) accreditation. Typically, the approval authority for these documents is limited to very few personnel and subject to varying levels of scrutiny; in short, it is a long and tedious process.

Even once the architecture is approved for operation, the MCCOG is reluctant to give network administrator permissions to the personnel who will be operating the tactical side of the network, making the systems less responsive to the needs of the commander on the ground. The same can be said of the encryption and timing requirements of communications systems. They too are complicated and difficult to coordinate, further delaying even initial operating capability (IOC) for a combat operations center (COC). Modern communications are difficult and slow; a typical MEF-level COC will take more than a week to establish FOC, with a regiment and battalion-level COC taking several days. The complexity, need for detailed coordination, and rigid requirements of the architectures require heavy troubleshooting and synchronization to operate.

In short, Marine Corps networks and equipment are far too complex to operate in a timely manner, and up to this point, the analysis has addressed only internal friction. These factors neither support the tenants of maneuver warfare, nor meet the challenges the FOE holds for us,

for this friction becomes exponential in a C2D2E. One of the greatest ways to eliminate this internal friction is to have a coherent chain of command, which brings us to the next operational problem: planning and coordination between communications units are disjointed.

Summary of the Problems

To summarize, the problems that exacerbate the community's readiness to address the challenges of the FOE start at the top. There is no definitive central authority for the community, and in turn, there is a lack of unity of command and effort, especially within the all-important realm of doctrine. This lack of central leadership also leads to a non-responsive acquisitions system that cannot keep pace with emerging technology and flawed training across the force. These top-level problems then cascade down into the operating forces. Messaging both within and beyond the communications community does not manage expectations well. Furthermore, our communications systems are rigid and unwieldy, and our communications agencies within the operating forces are not properly configured to plan and operate the architectures that are meant to enable C2. Instead, they act as a hindrance to that which they are supposed to ease. All of this internal friction increases exponentially when we are faced with a near-peer enemy that is working to degrade our ability to communicate.

In *Thinking About Revolutions in Military Affairs* Williamson Murray and Allan Millett examine the phenomenon of military revolution and conclude that technology requires organizational and doctrinal innovation concurrently for a real military revolution to occur.³¹ It is with this same mindset that we move into potential solutions to these problems. The solutions need not be as complex as the problems themselves. Just as each problem is systemic, moreover, "fixes" will positively affect other problem areas. While communication is technology-focused, the problems listed above are not, and the solutions follow suit.

Solutions

The solution for being ready to enable C2 in the FOE may be neither complicated nor expensive, but it will require selflessness and putting the community's interest above individual organizational loyalties. The key is a centralized decision-making authority for communications, which will lead to a new doctrinal focus that meets the demands of enabling C2 in the FOE. From these changes, additional solutions will flow in terms of acquisitions, training, expectation management, more wieldy technology, and unity of effort.

In its quest for a solution, the communications community needs to go back to first principles of basic warfighting doctrine: unity of command and unity of effort, without which no new community-specific doctrine can be either generated or implemented. Unity of command figures among the principles of war known colloquially as "MOOSEMUSS." MCDP 6, *Command and Control*, states the need for it explicitly.³² Above all, in the foundational publication of Marine Corps doctrine, MCDP 1, *Warfighting*, the concept of unity of effort threads its way throughout the text.

The first objective is to address the need for developing doctrine to meet the challenges of the FOE. This doctrinal effort will need to be co-evolved with the future operating concept of the operating forces, currently focused on EABO. Without going into the details of EABO itself, it is nevertheless essential to recognize the "single battle" premise at the heart of the concept: The Marine Corps and Navy must fight as one, with seamlessly integrated C2. For that to happen, the communications community of the Marine Corps itself must first get its own house in order.

1. DEVELOPING A C2D2E DOCTRINE

To solve the problem of lack of doctrine with respect to the FOE and C2D2E, Marines can look to contemporary FOE-centric literature, as well as other services and occupational fields that are addressing the challenges of the FOE to establish some guidelines to shape communications doctrine

First, it is necessary to define what challenges the communications community will face in the FOE. From this definition, one can begin to see their implications and allow the conditions to inform new operating concepts and doctrine. The FOE will require the force to execute distributed operations, currently addressed with the future operating concept known as EABO; with such operating concepts comes an essential need for “mission command”. All service and joint publications ascribe some form of mission command, basically ensuring that any commander can delegate appropriate responsibilities through solid commander's intent, sustained by the command and control process. The common demand in the FOE is based on a need to enable C2 in a distributed manner. The second challenge to the community in the FOE will be C2D2E; the expectation is that we will face a determined enemy who will be capable of creating such interference. Therefore a second charge to guide communications doctrine is to establish how to assure C2 in a C2D2E. The complicating factor here can be the emergent nature of communications itself, such that the enemy’s attempt at imposing C2D2E may be circumvented by resorting to newer technologies. However, the likely dynamic will be, as in an arms race, a counterpoint of capabilities and countermeasures. The ability to cope with C2D2E may therefore play a vital role at any time.

Another consideration for doctrine is the need to prioritize C2 capabilities on a dynamic basis. The current prioritization relies heavily on the extant state of large, robust communications systems that enable command and control. The military has an abundance of means of communications; by prioritizing these means and defending the prioritized capabilities, communications officers can ensure continuity of operations and sustainment of command and control. The focus should be on finding as many methods of communication as possible to utilize those priority C2 systems. Establishment of essential C2 systems and defense of those systems and nodes become central areas of focus for communications doctrine. Furthermore, this concept also can be used in the offense, for if these systems are invaluable to the United States, so too are they to the enemy. The enemy's means of degradation or denial, as well as his critical C2 systems, would, in turn, be priority targets for friendly forces.

Next, it is essential to focus on the already existent communications doctrinal tenet of resiliency. Robust diversity of spectrum will be essential to providing assured C2 in a C2D2E and must be foremost in communications architecture planning and design. We must be ready to exploit all means to communicate in the FOE, to include organic capabilities, commercial solutions, hiding below the local communications baseline, and even the potential for parasitic use of local infrastructure. Mainstays of this concept will be existing equipment, free-space optics, advanced waveforms, and use of host nation communications infrastructure. Updated communications doctrine must allow for continual adaptation to the environment.

The final specification is that the doctrine must allow communicators to be able to anticipate, and in turn, simulate the C2D2E in order to train against it. With this in mind, brilliance in the basics through the establishment of Standard Operating Procedures (SOP), which can become the basis for continuous training to common standards, must serve as an

essential component of C2D2E doctrine. C2 is enabled by refined systems, equipment, and people working across all domains and warfighting functions towards a common goal of mission accomplishment. By focusing on and refining the C2 processes across all warfighting functions in training, actions will become second nature; new and simple solutions will emerge to enhance C2. Furthermore, training to SOPs will lead to efficiency and paths to brevity through the reduction of data communications needs. Because it will flag problems and incentivize solutions, proper training based on solid doctrine will become an engine of modernization. The result of training based on SOP should be the spawning of new products and means to communicate critical information, as well as aiding in the development of new standard operating procedures.

With these guidelines to inform the development of new communications doctrine, the community can move on to the organizational changes that are needed to actualize the doctrine writing process.

2. Organizational Solutions

A. Establishing Unity of Command and Unity of Effort

There have been improvements toward consolidating decision making with the communications community. C4 now falls under The Deputy Commandant for Information (DC, I), which in theory should provide a direct advocate for the communications community. However, more improvement is needed, as DC, I also advocates for the intelligence, cyberspace, and information warfare communities, and this purview may prove to be too large to manage. This issue seems to be validated by the previously examined problems, namely: The

bureaucratic ‘slow roll’ and disconnect with respect to acquisitions, personnel management, doctrine, and other essential, long-overlooked needs of the communications community.

The solution to this problem is not so simple, as organizational politics between the various headquarters agencies will prove resistant to releasing or reducing the span of control over decision-making. This resistance to change makes it difficult to establish how the community will reach a unity of command and effort; it does however, simplify what the end state should be. The solution must result in the establishment of one single authority agency for the communications community. This governing agency needs to be appropriately staffed to liaison with the other agencies to maintain cognizance of doctrine, manning, training, and other communications-centric decision making. It must also have the final word on said decisions. The new organization should devote sufficient attention to improving the timelines related to procurement and acquisition, by first working to improve the processes behind the systems.

B. Improving Procurement and Acquisition

Centralization of ultimate authority is the first step towards rehabilitating the procurement and acquisition system. There needs to be a focus on making the processes responsive to the warfighter. Just as the bureaucracy and agency politics will be the most significant hurdle to bringing about positive change concerning the unity of command effort, so too will these same politics serve to stifle changing procurement and acquisition. But the latter may be far more difficult as it is more directly tied to funding, having wide organizational effects.

In an article published by the *Marine Corps Gazette*, Joshua Waddell, an infantry officer with significant acquisition experience, proposes just the changes that are needed to break

through this bureaucratic stasis. He opens with a strong condemnation: "[W]ell-meaning policies are hollow without the corporate environment in which they can be successful."³³ He continues, "By repeatedly espousing the need for innovation in the Marine Corps while refusing to foster [innovative practices]...we delude ourselves."³⁴ He then breaks down what changes are needed, starting with business practices.

Consolidation of major acquisition and capability development commands into a streamlined structure could eliminate key delays in the execution of this established process. Business process reengineering can eliminate common points of friction, whether they be people or processes.³⁵

He then continues to his overarching suggestion,

"We have focused on modernization through the lens of analogous programs...rather than expanding our conceptual realm of possibilities. We should employ what physicists would call 'first principles' and hypothesize what true modernization would look like for the Marine Corps outside of the framework of past assumptions."³⁶

And finally, he addresses the need to eliminate those that oppose positive change,

"Additionally, all funded programs should be audited for gross cost and schedule overruns and the program officers held accountable for their lack of performance."³⁷

Waddell's approach, coupled with Paul Stokes recommendation of fostering innovation, seems to be the best means to rehabilitate the procurement and acquisition system. Overcoming the hierarchal challenges and bureaucratic politics and rewarding innovation, will result in a responsive system that lives to serve the warfighter. Under a rehabilitated system, where the right gear gets to the right people, at the right time, training and education too will thrive.

C. Improving Training and Education

Once the previously examined organizational issues are resolved, the shortfalls with respect to training and education become the simplest to solve. Under a centralized

communications community authority, and more importantly, advocate, MCCES can be assured it will have full participation from the operating forces in their CCRBs. This participation will allow the school to adjust the curriculum to suit the needs of the operating forces. Furthermore, unity of command and efficient procurement and acquisition processes will ensure the right equipment is at the occupational field's school. The school can be placed back at the top of the priority line for receiving new technology, ensuring Marines are trained on the newest equipment and ready to operate it in their first fleet assignments. Following this prioritization of equipment will also ensure a right-sizing of the workforce at the schoolhouse, enabling MCCES to meet the demands of entry-level and career-level training. An additional benefit of the organizational fixes to the schoolhouse will be advocacy for modernization of training methods and facilities alike. Just as the organizational repairs will right the course for training and education, these improvements will begin to fix the problems in the operational context. Better trained entry-level Marines and officers, as well as career-level professionals, will infuse systemic improvement to the operating forces.

3. OPERATIONAL SOLUTIONS

With the organizational house in order, Marine communicators can begin to effect positive change in operational terms. Just as with the organizational issues, the problem and its solution begin at the top.

A. Fixing the Relationship Between Communications Units and the Chain of Command

The hierarchical dilemma described earlier – where communications units find themselves torn between two masters – needs to be addressed for both the organizational problems of the communications community and the operational challenges of communications

in the fighting force to be resolved. The only stopping point is some sense of tradition or “the way it is done”.

Onto the solution: the communications units should be made subordinate to the assistant chiefs of staff of the G-6s, to ensure a positive continuation of the proper level of leadership. This change would also require that the assistant chiefs of staff of the G-6 be selected in the same manner as the command screening board. By eliminating the unnecessary ‘admin’ chain of command of the headquarters units, the Marine Corps simplifies the command relationships and unifies OPCON and ADCON, simplifying tasking authority and human resources decisions. Opponents to this simplified chain of command will object that this is not a burden an assistant chief of staff should have to carry. The counter is that they are senior, experienced officers, and were selected because of their capability as leaders. Another objection will be that essential rear area functions such as security and camp commandant, traditionally overseen by headquarters units, will be vacant. Again, the solution here is to establish the lead role as a rotating responsibility of the general-level staff sections. This is already done for the role of the Brigade Headquarters Commander (BHG) within I MEF. Another option would be to continue to man the headquarters units and task them with this responsibility solely. If this is done across the board for all general-level staffs, not just communications, unity of command is solidly established. Furthermore, this change would allow the MIG staff to downsize and focus solely on information operations.

B. Managing Expectations

Like the solution to unity of command problems and the ensuing organizational disorder, the answer to the insatiable appetite of operational forces for information and communications starts with a re-grounding in foundational doctrine. According to MCDP 1, *Warfighting*,

“[S]ubordinate commanders must make decisions on their own initiative, based on their understanding of their senior’s intent, rather than passing information up the chain of command and waiting for the decision to be passed down.”³⁸ The Marine Corps’ central doctrine is an urgent call, in the interest of maneuver warfare, to limit communications systems requirements - or more specifically, to reduce substantially the information exchange requirements behind them. This principle is not an excuse for communicators to shirk responsibility; instead, it is a desire for commanders and their staffs to reduce their demands. Commanders must identify what is genuinely critical information versus what is “nice to have”.

As the doctrinal requirements indicate, moreover, competing imperatives will shape expectations about the availability of communications, particularly in circumstances susceptible to sudden imposition of C2D2E. When the situation allows, communicators should make their networks as robust as possible, enabling the plethora of C2 systems at their disposal. But in the future fight, especially in maneuver warfare against a near-peer enemy, such an expectation is not practical. Commanders must adapt to varying conditions.

Also critical to expectation management is the need to ensure leaders, planners, and staff know what the communications architecture is capable of, and perhaps more importantly, what it cannot do. Marines of all backgrounds are expected to have a basic understanding of their unit’s mission as well as the necessary capabilities of weapons systems and other unit-organic equipment. It is not that much more to expect Marines, especially senior leaders, to have a basic understanding of communications capabilities, capacities, and restraints. Just as an infantry officer or artillery officer is expected to know the max range of their organic weapons systems, so should they also know rough planning ranges of communications equipment. Often in training exercises as well as real-world operations, planners do not include ranges of

communications equipment as a planning factor, leaving the communications officer to solve a near-impossible task of enabling command and control. These very basic capabilities should be taught to Marines at their MOS schools, and leaders should familiarize themselves with the communications equipment on their respective units' Table of Organization and Equipment (TO&E). A common understanding of capability will help to manage the expectations of communications equipment.

Just as the communications community must educate as to reasonable expectations, it must also seek to ensure that communications architectures are flexible, reliable, and timely. Current systems are unwieldy and time-consuming, creating undue internal friction. In order to reduce this friction, Marines must be willing to think outside the contemporary box.

C. Relaxing Technological Systems

The systems solution to meet the FOE lies not in the latest high-tech equipment, although it does play a significant role. Instead, real solutions for the FOE and the C2D2E contingency may entail looking back, not forward, in time, and making good use of the equivalent of “terrain” for a comms officer.

First and foremost, the community must simplify when it can, in terms of both technology and processes. The communications architectures that the Marine Corps currently designs and implements are challenging to install, operate, and maintain. As previously mentioned, the time to achieve FOC is counted in days, not hours. This complexity and drawn-out timeline do not fit the maneuver warfare model, nor is it suited to the challenges of the FOE.

The policies and standards that govern these DODIN architectures and the bureaucracies behind them uphold the process rather than being responsive to the needs of the warfighter. The

communications community must find a way to help units that struggle with meeting their requirements due to inexperience or pressing real-world timelines. When a unit is struggling to implement their communications architecture, there should be an ‘all hands-on deck’ mentality to support them, rather than the current “not my problem” mentality. Furthermore, the need to encrypt every package of transmitted traffic can be overkill. Commanders need to establish what information must be kept secure from that which does not pose a threat, and even further, what traffic they might allow the enemy to intercept. By better assessing the level of classification of information, they can rely on “lesser” forms of encryption for some traffic, such as that already organic to COTS switches and routers. When faced with the challenge of getting a critical message between units, there are times where commanders would trade security for the ability to communicate urgent information; the Marine Corps must be open to this possibility.

Additionally, when units find themselves paralyzed by an enemy’s C2D2 capability, they should be willing to look to the past for tertiary solutions. Marines are no longer trained as couriers and in Morse code; yet these simple and practical skills can be and should be reimplemented as training requirements for communicators. They must also look to “out of the box” thinking, namely willingness to use parasitic means to utilize existing communications infrastructure within the area of operations. The use of local infrastructure also aides in signature management, providing the ability to hide below the civil baseline.

Tied both to expectation management as well as relaxing of systems requirements is the willingness of communications planners and commanders alike, to methodically phase in capabilities, rather than establish it all right away. Currently, communications planners at all levels approach the establishment of COCs as an “everything at once” race to establish Initial Operational Capability (IOC) and eventually Full Operational Capability (FOC). First and

foremost, they must instead work towards establishing simplistic radio communications. Only then, slowly and controlled, do they establish additional C2 systems in a logical and sequential manner. Furthermore, planners must be willing to speak in scope and scale of mission, rather than allowing staffs to dictate what services they want. They must get back to asking what they need and then planning to meet those requirements efficiently and simply, which maximizes efficiency and timeliness.

Finally, and reinforced by the recent Second Marine Division MAGTF Warfighting Exercise, the traditional communication paradigm is changing³⁹. Due to the threat capabilities of near-peer adversaries, especially concerning spectrum detection and targeting, the need for signature management is critical to survival in the FOE. The constant transmission of line-of-sight equipment and the longer transmission times for voice must give way to short burst packets of data. Marines must look to transmit pertinent data in a rapid and standardized manner. The Marine Corps is currently experimenting with this capability through the use of applications on the MAGTAB and other tablet solutions. Constant or prolonged transmission of information can be simplified to a preformatted one or two sheet template and quickly transmitted, far more efficiently than constant data connection or voice transmission. In other words, the Marine Corps must prepare commanders and staff to give up the comfort of continuous contact in exchange for efficient C2 that upholds signature management to increase their chances of survival and surprise against a near-peer enemy.

Summary of the Solutions

As previously mentioned, the recommended solutions are neither complicated nor expensive; they will, however, be incredibly challenging. This challenge will not come from a determined enemy; rather, it will be an internal struggle. Agency and institutional loyalty and

politics must be overcome to rehabilitate the communications community. If a true unified lead agency can be established, then the other organizational and operational issues will be easily remedied. It will require leaders at the top of the institution to be willing to compromise and relinquish control of their fiefdoms. But, if the Marine Corps communications community can overcome its own internal struggles, then it can truly prepare for the FOE.

Conclusion

The FOE will be challenging, especially to communications. With the external threat of the C2D2E, the problems within the communications community will prove to make it nearly impossible to successfully enable command and control. While the challenge must be met with the best technology the Marines can muster, it is far more important that they have the organizational and doctrinal innovation to go along with it in order for a real military revolution to occur. The Marine Corps communications community is not ready to enable C2 in the FOE, but it can be. Once the community addresses the organizational and operational dysfunction internal to it, then it will not only meet the challenges of the FOE, it will succeed.

A BRIGHTER FUTURE

In February of 2022, US forces invaded Iran, the Marines of II MEF (reinforced) form a portion of the force on the march to Tehran. Before the initial phases of the campaign, the Marine Corps found early successes, testing new competencies to enable the force. Expeditionary Advanced Bases established months prior provided initial logistical, air, and fires support for the landing at Jask. Special operations personnel already within Iran provided greater intelligence and targeting information to help shape the coming fight. Autonomous air and subsurface platforms mitigated a majority of the Area Access/Area Denial (A2AD)

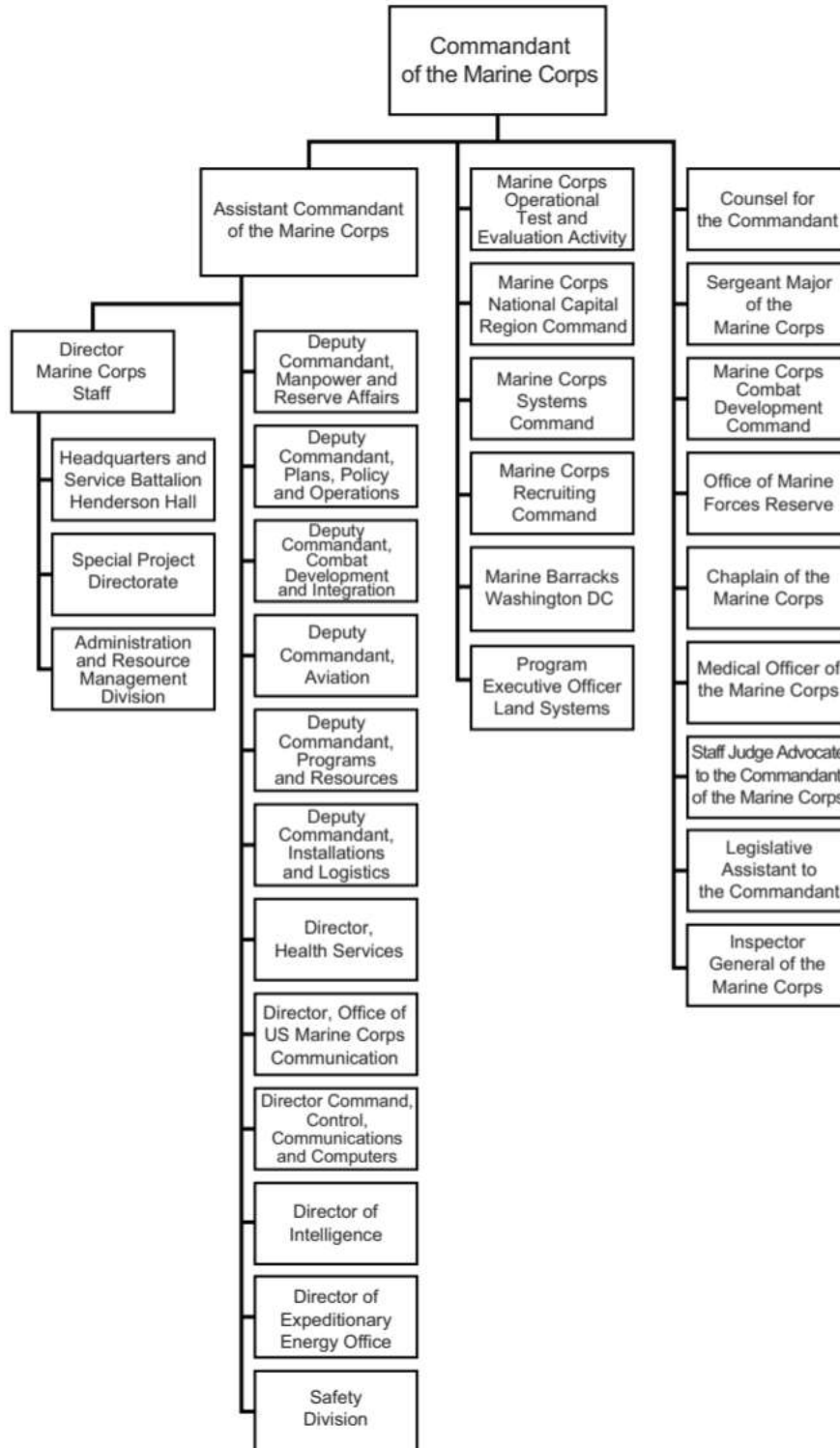
defensive measures of the Iranians. These concepts proved reliable and consistent throughout combat operations and beyond.

As the three Regimental Combat Teams (RCTs) began their ground assault, they were able to sustain a rapid tempo, outpace the enemy, and achieve overwhelming success in every engagement. Thanks to redundant and simplistic means to communicate, the logistics trains were able to keep the fighting force moving. The commanding generals of II MEF, Second Marine Division, Second Marine Logistics Group, and Second Marine Airwing all made remarks that they never expected to have such a reliable, common operational picture and ability to command and control their units. While the Iranian regime had multiple C2D2 capabilities, the force was ready and able to mitigate these challenges throughout every phase of the operation. Furthermore, in the three weeks it took to take Tehran only ten Marines were killed in action, and collateral damage was extremely low.

In the end, the Marines and the rest of the joint force quickly accomplished their goal with little loss of life on both sides. This decisive victory was directly attributed to the reliable and effective C2 architecture and outstanding performance across all warfighting functions. Now the Marine Corps has been asked to share with their sister services, as well as allied and partner nations, just what made them so successful in the operating environment.

Appendix A: HQMC Organizational

Chart



Appendix B: Organizational Agencies' Mission Statements

Deputy Commandant for Information (DCI) Mission Statement:

The mission of the DC for Information is to act on behalf of the CMC in matters relating to information environment operations and provide the Marine Corps with an all-Service approach to information environment operations policy and management. The DC for Information, who is a principal staff officer for the CMC, has a staff that includes the Director of Intelligence (DIRINT); the Director, C4 Department; and the Marine Corps Information Operations Center (MCIOC). Furthermore, the DC for Information is responsible for coordinating with DC CD&I for alignment and integration of information-related capabilities; developing and supervising plans, policies, and guidance for all information environment operations; identifying requirements for information environment operations doctrine, manpower, training, education, and materiel; coordinating with Service, naval, joint, interagency, intelligence community, and coalition partners; and advocating for the functions of MAGTF information environment operations to enable the Marine Corps to win in any information-contested environment.

Deputy Commandant Combat Development and Integration (CD&I) Mission Statement:

The mission of the DC CD&I is to develop future operational concepts and determine how to best organize, train, and equip the Marine Corps of the future. The DC CD&I is a principal staff officer for the CMC. Actions are coordinated with CG, MCCDC to ensure force development is integrated with training and education. The futures directorate assesses the security environment and develops, experiments, and wargames concepts that describe how Marines will execute likely missions in order to inform capability development. The Seabasing Integration Division advises and assists the DC CD&I in identifying, developing, and articulating Marine Corps seabasing, expeditionary, and amphibious warfare ship/connector requirements and related doctrine in order to facilitate MAGTF integration with naval expeditionary and amphibious forces. The Capability Development Directorate analyzes, develops, and integrates capabilities across doctrine, organization, training/education, materiel, leadership/strategic communication, personnel, facilities, and cost through the capabilities-based assessment process. The Joint Capabilities Integration Directorate assists in advising the ACMC on the priorities for joint capabilities. The Analysis Directorate executes and provides oversight for the Marine Corps on all matters pertaining to operations analysis and modeling and simulation.

Deputy Commandant for Manpower and Reserve Affairs (M&RA) Mission Statement:

The mission of the DC M&RA is to assist the ACMC and the Director, United States Marine Corps Staff in the execution of the human resources development process by planning, directing, coordinating, and managing the following: manpower assignment, planning, programming, and budgeting policies; manpower information systems; military and civilian manpower management and administration; equal opportunity policies, programs, and activities; civilian personnel policy; Marine and family programs; Semper Fit and exchange services; and assignment and distribution of Reserve Component military assets.

Director of the Command, Control, Communications, and Computers (C4) Mission Statement:

The mission of the Director of the Command, Control, Communications, and Computer (C4) Department is to plan, direct, and coordinate all staff activities relating to communications functions. The office of the director is located at HQMC. The department supports the CMC's role as a member of the JCS. As the chief information officer of the Marine Corps, the Director, C4 is responsible to the CMC for the leadership, strategic direction, guidance, and oversight of the MCENs to include IT, IT resources, and IT governance and policy. In coordination with DC PP&O and DC CD&I, the Director, C4 advises on operating and defending all Marine Corps networks related to cyberspace. The Director, C4 represents the Marine Corps at Federal, DOD, joint, and DON IT forums.

Marine Corps Combat Development Command (MCCDC) Mission Statement:

The mission of MCCDC, which is headquartered at MCB Quantico, is to assist the DC CD&I in the development and implementation of Marine Corps training and education. The CG, MCCDC is under the command of the CMC and coordinates with the DC CD&I for force development. The office of the commanding general shares general and special staff with DC CD&I.

Training and Education Command (TECOM) Mission Statement:

Part of MCCDC is the Training and Education Command (TECOM).

Its mission, as the Marine Corps proponent for MOS individual skill training, is to analyze, design, develop, resource, implement, and evaluate standards-based individual training in order to provide combat-capable Marines and Sailors to the operating forces. The CG, TECOM reports to CG, MCCDC. Training and Education Command consists of a headquarters staff, 27 MSEs, and 68 subordinate training units. It provides entry-level/skill progression training and individual augmentation to Marine Corps operating forces to meet operational contingencies.

Marine Corps Systems Command (MARCORSYSCOM) Mission Statement:

The mission of MARCORSYSCOM is to serve as the DON systems command for Marine Corps ground weapon and IT system programs in order to equip and sustain Marine forces with full-spectrum, current, and future expeditionary and crisis response capabilities. Specifically, it serves as the host systems command for Marine Corps expeditionary ground weapon and IT system programs and executes statutory and regulatory authorities in support of the Navy acquisition executive and the CMC.

Appendix C: Marine Corps C2 Systems Table

Name	Section Owner	COTS/ GOTS/ Network	Purpose	Description
3270	G-1	GOTS	Emulates the functions of a mainframe computer	Utilizes TCP/IP networks to communicate with a mainframe and duplicate the functionality of the mainframe computer.
Adobe Connect	IMO	COTS MCEN-S	Web conferencing, collaboration, chat, voice, and video.	Adobe Connect Pro is software used to create information and general presentations, The recommended database for backend support is Microsoft SQL Server.
AEMIT-EWRB	G-4	GOTS	Artillery asset record book	The Asset Enterprise Management Information Tool (AEMIT) is a decision support tool which houses the electronic version of the electronic weapons record book (EWRB).
AFATDS	G-3 FECC	GOTS MCEN-S	Supports fire support operations	Advanced Field Artillery Tactical Data System (AFATDS) provides a net-centric battle command to coordinate land, air indirect fire systems in support of maneuver operations. AFATDS operates with all current and planned U.S. fire support systems. AFATDS consists of an AFATDS Laptop with AFATDS hardware and software.
AHLTA	MED	GOTS	Electronic health records system	Armed Forces Health Longitudinal Technology Application (AHLTA) -provides interoperable, globally accessible health records for all members of the military.
AMHS	G-1	GOTS	Automated Message Handling System (AMHS)	Not specific to admin; Marine Corps-wide and used by all sections and echelons. Provides means to send and receive messages with other Government agencies, allies, tactical users, defense contractors and approved activities external to the Defense Message System (DMS) community.
A-PES	G-1	GOTS	Provides standard templates and processing for personnel evaluations. Web-based.	Automated Performance Evaluation System (A-PES) is accessed through Marine On Line and allows users to write and sign digital forms related to personnel performance and evaluation.
BAT-HIIDE	FP	GOTS	Collects and manages biometrics	Biometrical Automated Toolset/Handheld Inter-Agency Identification Detection Equipment (BAT/HIIDE) collects fingerprints, iris scans, facial photos and biographical information of persons of interest into a searchable data base. HIIDE is interoperable with BAT for biometrics data exchange to DoD biometrics Data Repository. The system includes a laptop with software, a fingerprint scanner, iris scanner, digital camera, and an ID card printer.

BCS3	G-4	GOTS MCEN-S	Integrates and visually displays information to manage sustainment operations	Battle Command Sustainment Support System (BCS3) is a logistics fusion center at all echelons for maneuver sustainment support. It is modular, tailorable, and scalable. BCS3 provides a graphical representation of the current logistics situation for the land Area of Operations (AO).
BFT / FBCB2	G-3	GOTS	Track friendly forces	Blue Force Tracking (BFT)/ Force Battle Command Brigade and Below (FBCBB).The BFT suite displays the location of the host vehicle on the computer's terrain-map, along with the locations of other platforms (friendly in blue, and enemy in red) in their respective locations. BFT is also used to send and receive text and imagery messages, and Blue Force Tracking has a mechanism for reporting the locations of enemy forces and other battlefield conditions.
BOL	MED	GOTS	CAC-enabled website for personnel-related administrative functions.	Bupers Online (BOL)-Manages administrative files and functions within the context of a web portal
C2PC	IMO	GOTS MCEN-S	Share and edit the COP	Command and Control Personal Computer (C2PC) facilitates the creation and visualization of the Common Tactical Picture (CTP) or Common Operational Picture (COP) in a Microsoft Windows environment. C2PC normally operates in a hierarchical network configuration, with many C2PC clients linked to a single IOS V1 server via the C2PC Gateway. This configuration enables visualization and management of the COP, track management functions, and related decision and planning aids. C2PC is a software application on JTCW and may be renamed JTCW-Client and JTCW-Gateway. The following MARCENT-identified C2 systems (C2PC-EMT, C2PC-TBMD, and CLC2S) are applications extensions within C2PC.
C2PC - EMT	G-3 FECC	GOTS MCEN-S	Limited functionality version of AFATDS	Effects Management Tool (EMT) provides an injector for C2PC, which provides track data enabling increased situational awareness to the commander and his staff. EMT is essentially a "thin" (limited functionality) version of AFATDS that can be run over C2PC.
C2PC - JWARN	FP	GOTS MCEN-S	Provides CBRN battlespace awareness	Joint Warning and Reporting Network (JWARN) is a computer-based application that integrates Chemical, Biological, Radiological and Nuclear (CBRN) defense data and facilitates sensor information into Joint and Service C2 systems for battlespace situational awareness. JWARN incorporates sensor alert information and CBRN observation reports from the field, generates a plot of the hazard area, displays it on the Common Operational Picture (COP), and generates the warning message to units. JWARN replaces the manual processes of incident reporting and hazard plot generation.
Chat IRC (IRCXPro)	IMO	COTS MCEN-S	Allows chat clients to connect to a computer	Internet Relay-Chat (IRC) protocol used with IRCXPro as the server allowing the IRC clients to connect to the chat server.

Chat IRC (mIRC)	IMO	COTS MCEN-S/ MCEN-N	Collaboration (text chat)	IRCXPro is a server that allows the IRC clients such as mIRC to connect to your computer as an IRC based chat server. mIRC is a low bandwidth IRC client with file sharing only authorized for the USCENTCOM AO.
Chat XMPP (MAKO)	IMO	COTS MCEN-S	Collaboration (text chat)	Chat technology developed as a transitional architecture for the Navy to increase security levels and to evolve to Extensible Messaging and Presence Protocol (XMPP)-based technologies.
Chat XMPP (OpenFire)	IMO	COTS MCEN-S	Secure instant messaging service	Chat systems that use XMPP include OpenFire, TransVerse, and MAKO. XMPP uses client-server architecture, is based on open standards, and allows anyone with a domain name and suitable internet connection to run their own Jabber server and talk to users on other servers. XMPP-based chat programs are the only type of chat programs authorized on the global information grid (GIG), except for mIRC in the USCENTCOM AO.
Chat XMPP (Transverse)	IMO	COTS MCEN-S	COC Communication Tool that permits real time reporting and notifications for time critical events.	Chat systems that use XMPP include OpenFire, TransVerse, and MAKO. XMPP uses client-server architecture, is based on open standards, and allows anyone with a domain name and suitable internet connection to run their own Jabber server and talk to users on other servers. XMPP-based chat programs are the only type of chat programs authorized on the global information grid (GIG), except for mIRC in the USCENTCOM AO.
CIDNE	G-2	GOTS ANY	Intelligence sharing database	Combined Information Data Network Exchange (CIDNE) serves as the primary bridge between disparate communities that need access to classified or unclassified civil materials from functions like human intelligence, explosive ordinance disposal, or civil affairs information. Allows structured operational and intelligence information to be shared vertically and horizontally as part of a flexible user-defined workflow processes that collect, correlate, aggregate and expose information as part of the end-user's individual lifecycle requirements.
CitiDirect	G-8	COTS	Personnel travel	Provide credit purchasing power for those eligible for Government Travel Cards.
CLC2S	G-4	GOTS MCEN-S	Logistics command and control planning and execution	CLC2S (Common Logistics Command and Control System) is comprised of four basic application components: Rapid Request Tracking System (RRTS+), Enhanced CSSOC System, Logistics Planning & Execution, and Engineer Planning & Execution (EP&E). A web based application that manages and tracks the status of personnel, supplies and equipment during all phases of MAGTF Operations. CLC2S can be used by all MAGTF Elements from Company Level Operations Centers and higher. CLC2S allows the user to initiate, monitor or process requests via the web-based portal
CPOF	IMO	GOTS MCEN-S	Collaboration tool across organization levels	Command Post of the Future (CPOF) is a collaboration tool that provides commanders near, real-time situational awareness information using a combination of graphical and textual displays. A shared workspace is the main interface, in which every interface element in CPOF is a shared piece of data in a networked repository.

CRANE	G-4	GOTS	Weapons Accountability System	Reporting system for the Marine Corps Serialized Small Arms/Light Weapons Accountability Program (MCSSAAP). It ensures accurate accountability and custodial records, by serial number, are mirrored in the Marine Corps Registry maintained by NSWC Crane.
DASHRS	G-9	GOTS	DASHRS is the automated process that collects and documents information on all formal equal opportunity complaints.	The web-based system is maintained by CMC (MPE) and uses the information gathered to generate statistics for reporting purposes and to keep CMC apprised of equal opportunity issues throughout the Marine Corps.
DEERS	MED	GOTS	Database for members to access Key Public Infrastructure and TRICARE	Defense Enrollment Eligibility Reporting System (DEERS) a computerized database for service members to access Key Public Infrastructure and TRICARE benefits. Provides enrollment services to identify and properly authorize service members, dependents and retirees who are allowed access to Key Public Infrastructure and TRICARE
DenCas	MED	GOTS	Provides active tracking and visibility of dental readiness	Dental Common Access System (DENCAS) is a web-based system used to track the Dental Productivity of all DoN Dental Providers
DFAS/ My Pay	G-1	GOTS	Provides financial management and accounting resources to government employees	Defense Finance and Accounting Services (DFAS) is a web-based system for providing payment and accounting services to service members and retirees
DMM	G-9	GOTS	Facilitates Drill Processing for Reserve Marines	Drill Management Module (DMM) Web-based system that provides the Marine Corps with the ability to schedule, manage, allocate, muster, report and pay Inactive Duty Training (IDT) drills.
DTAMS-L*	G-2	GOTS MCEN-S	Provides terrain support analysis	Digital Terrain Analysis Mapping System (DTAMS) a deployable laptop based configuration. DTAMS-L is a mobile terrain analysis system for support of forward deployed units. DTAMS-L produces, in hardcopy and softcopy, special mapping products and geographic intelligence in support of MAGTF Commanders. DTAMS-L provides support to MEUs.
DTMS	G-1	GOTS	Admin and disbursers application to track travel claims and capture historical documentation	Digital Training Management System (DTMS) A web-based portal accessed by users with appropriate accounts to plan travel, conduct risk assessments and receive Chain of Command feedback as well as reimbursement.
FltTemps	MED	GOTS		Fleet Training Management And Planning System (FltTemps) - A web system to track and record training completion.

GBOSS	FP	GOTS	Camera based, pole mounted, surveillance system	The Ground-Based Operational Surveillance System (G-BOSS) is an integration of COTS and Government-Off-the-Shelf (GOTS) sensors, integrated to provide a “beyond the fence” surveillance capability. It is used for surveillance and force protection purposes. Each system employs multiple detection and assessment technologies, all self-contained on a single mobile platform. This system has been contractor supported and is linked by a centralized network.
GBS*	G-6	GOTS MCEN-S/ MCEN-N	Receive only SATCOM system that pulls critical cross functional information	Global Broadcast System (GBS) is a smart-push/user-pull SATCOM system pulls information (usually intelligence) from a variety of sources and sends it into the Receive Broadcast Management Server. The info is then dispersed to different COC systems via an included Ethernet switch.
GCCS-J	IMO	GOTS ALL	Automated data processing system-of-systems providing C4I for joint operations	The Global Command and Control System (GCCS), AN/GYQ-92(V)1, -92(V)2 is a joint mandated C2 automated data processing “system-of-systems” providing C2, Communications, Computers and Intelligence (C4I) capabilities for Marine Corps commands participating in joint planning and execution.
GCSS-MC*	G-4	GOTS MCEN-S/ MCEN-N	Supports logistical decision making	GCSS-MC provides accurate, near real time integrated logistics information, enterprise wide visibility of data and enables logistics planners and operators to make decisions about the logistics chain commensurate with the operational tempo. GCSS-MC increment 1 provides five of the primary functional logistics capabilities of Request Management, Supply, Maintenance, Financial, and System Administration.
HBSS	G-6	GOTS MCEN-S/ MCEN-N	Network security device	Host Based Security System (HBSS) is a workstation security enforcement client/server tool that detects rogue devices, reports, and can automatically take policy based network action by isolating threats and notifying leadership. II MEF has both the server and client. It monitors, detects, and counters against known cyber-threats to Department of Defense (DoD) Enterprise. The HBSS solution is attached to each host (server, desktop, and laptop) in DoD. The system is managed by local administrators and configured to address known exploit traffic using an Intrusion Prevention System (IPS) and host firewall.
IAPS	G-1	GOTS	Allows for intuitive, efficient creation, distribution and approval of awards.	Improved Awards Processing System (IAPS) is a web-based system sponsored by HQMC and synchronized and maintained by the G-1.

IBS	G-4	GOTS	Supports movement of unit and sustainment cargo	Integrated Booking System (IBS) IBS is the SDDC execution system of the DTS for movement of military cargo by surface overseas. IBS provides a single, worldwide, automated booking system to support the peacetime and wartime movement of unit and sustainment cargo in an efficient and timely manner.
IBS CMM	G-4	GOTS MCEN-N	Allows container management services	Integrated Booking System-Container Management Module (IBS-CMM) is a web-based tool designed for easy entry and retrieval of container management information. It is also the program used to provide leaders with visibility of containers in the theater and throughout their life cycle.
ICODES	G-4	GOTS	Deployment embarkation and load planning tool	Integrated Computerized Deployment System (ICODES) is the Army is the lead service. ICODES is a decision-support system that applies the Integrated Cooperative Decision-Making (ICDM) framework to the area of Ship Stowplanning. It is designed to satisfy the focused stowplanning demand of the U.S. Army and the U.S. Marine Corps by assisting personnel at the port to react quickly and efficiently to changing transportation requirements.
IDMS	G-9	COTS	Manpower Management	Inventory Development and Management System (IDMS) is a manpower and inventory management system.
IGC	G-4	GOTS MCEN-N	Coordinate logistics with Joint units	IDE/GTN Convergence (IGC) is a single source for HQ Defense Logistics Agency and US Transportation Command (USTRANSCOM) to access common, authoritative data, business standards, and information. IGC's database provides a single source for integrating information. IGC can create customizable dashboards, queries, and alerts. II MEF users log into a web portal and can organize the data.
IIS	G-6	COTS MCEN-S/MCEN-N	Internet Access	Internet Information Services (IIS) is a web server software application that facilitates Internet Access when coupled with Server 2008/2012 domain services
IOS V1	G-3	GOTS MCEN-S	Primary MEF and Joint COP management node	Intelligence Operations System (IOS) facilitates dissemination of command and control information between adjacent, higher, and subordinate commands via a Wide Area Network (WAN). It is a fully self-contained UNIX based Sun Solaris operating system and can host chat services. It serves as a point of consolidation and exchange for the C2 information inputs that are critical to a comprehensive COP.
IOS V2	G-2	GOTS MCEN-S	All-source tactical intelligence system	A Global Command and Control System (GCCS) based server that provides Modernized Integrated Database (MIDB), map displays with overlays, friendly unit locations with status, and common tactical picture (CTP). IOS v2 is a team portable system designed to support intelligence operations at units subordinate to the MEF.
IOS V3	G-2	GOTS MCEN-S	All-source tactical intelligence system	A team portable system designed to support intelligence operations at MEF subordinate units. Provides analytical tools, can run chat applications like Openfire and IRCXpro, and can be used in areas of limited bandwidth.
JADOCS	G-3 FECC	GOTS MCEN-S	Provides Joint SA, targeting & fire coordination	Joint Automated Deep Operations Coordination System (JADOCS) is a Joint mission management system that provides an integrated set of functional capabilities for data analysis and management, mission planning, coordination and execution of joint tasks. JADOCS pulls and aggregates information from TBMCS, GCCS, and AFATDS, and differentiates itself from other fires applications by its use as a joint mission management software application that

				provides a suite of tools and interfaces for horizontal and vertical integration across battlespace functional areas.
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JBV	G-3	GOTS MCEN-S	Provides aerial representations of the battlefield	Joint Battlespace Viewer (JBV) is 3-D visualization program that provides the user with a whole earth representation. It provides visualization capabilities similar to C2PC, such as the display of map and terrain data, tracks and overlays in a 3-D environment. JBV also provides video exploitation capabilities, such as the ability to display geo-rectified video overlaid on a map. JBV pulls NGA or USGS info to display on a host platform.
JEM	FP	GOTS MCEN-S	CBRN prediction modeling	Joint Effects Model (JEM) is a tactical and operational hazard prediction model used in conjunction with JWRN. It is capable of providing common representation of CBRN and toxic industrial material hazard areas and effects. A web-based software program. It is the only accredited DoD computer-based tactical and operational hazard prediction model capable of providing common representation of CBRN and toxic industrial material hazard areas and effects.
JFRG II	G-3	GOTS MCEN-S	Joint Force Deployment planning tool	Joint Force Requirements Generator (JFRG II) is designed to provide the joint services with an integrated and deployable Automated Information System (AIS) that supports strategic force movements within the mandated 72-hour timeframe. JFRG II provides rapid force list creation and interfaces with JOPES, TC-AIMS II, MDSS II, and the WRS.
JRE	G-6	GOTS	Increases radio signal range	Joint Range Extension (JRE) receives and forwards data Beyond Line of Sight (BLOS) links. JRE includes both hardware and software and functions similar to a router.
JTCW	G-3	GOTS MCEN-S	Provides a shared picture of the battlefield	Joint Tactical COP (Common Operational Picture) Workstation is a Windows based suite of applications designed for the battalion and above to facilitate military C2 functions, SA and enhancing operational and tactical decision-making. JTCW includes multiple COTS (e.g. Microsoft Office) and GOTS [e.g. C2 Personal Computer (C2PC)] software applications and application extensions that provide additional functionality. JTCW is the core software load for the Intelligence/Operations Workstation (IOW).
Marine Net	G-1	GOTS	System used to provide online training and certifications to Marines	Marine Net is a training website sponsored by TECOM.
MCAAT	G-1	GOTS	Conduct administrative function reviews and analysis	Marine Corps Administrative Analysis Team (MCAAT) is a system of applications; one on MOL and the rest are sponsored by HQMC; conduct admin functions
MCAT	G-1	GOTS	Admin	Marine Command Action Tracker (MCAT) is an automated staffing tool.
MCEAS	G-1	GOTS	Electronic tracking for administrative separations	Marine Corps Electronic Administrative Separations (MCEAS) tool is accessed via MOL, this web-based application allows administrative professionals to track submitted packets for administrative separations through the approval process.
MCMEDS	G-9	GOTS	MCMEDS supports the Wounded Warrior Regiment (WWR)	Medical Entitlements Data System (MCMEDS) is used for processing and tracking of Line of Duty (LOD) benefits and medical hold cases for injured Marine Corps Reservists and Officer Candidates.

MCMPS	G-1	GOTS	Personnel sourcing tool for limited force generation	Marine Corps Mobilization Processing System (MCMPS) is a sourcing tool administrative personnel to locate and source reservists or other skill sets outside of the chain of command to generate appropriate billet fills
MCTFS	G-1	GOTS	Compensation for training expenses and basic pay	Marine Corps Total Force System (MCTFS) provides a holistic view of compensation paid to Marines, to include training reimbursements for TAD as well as BAH, BAS and Base Pay.
MDSS II	G-4	GOTS	Supports unit deployment logistics	MAGTF Deployment Support System II (MDSSII) A standalone system used by the Marine Corps Operating Forces to support Force Deployment Planning and Execution (FDP&E). It is the database and interface for unit deployment. Through the use of extensive reference files, the system provides data to JFRG II to create an executable TPFDD.
MERIT	G-4	GOTS	Ground equipment readiness system	Marine Corps Equipment Readiness Information Tool (MERIT) MERIT is a web-enabled ground equipment readiness management decision support tool. Pending replacement by TLCM-OST.
Microsoft Exchange	G-6	COTS MCEN-S/ MCEN-N	Mail	Microsoft exchange is the server on which Microsoft outlook runs. It provides email, calendar, and task support to all users on the domain.
Microsoft Windows 2008 Server	G-6	COTS MCEN-S/ MCEN-N	Domain Services	Server 2008 is the backbone of the network. It establishes the primary domain by name and allows user to login for other network access.
MISSA	G-1	GOTS	Provides references and troubleshooting for core applications such as MCTFS and MOL	Manpower Information Systems Support Activity (MISSA) -is responsible for the facilitation and generation of system enhancements for the Marine Corps Total Force Family of Systems consisting of MCTFS, UD/MIPS, Total Force Administrative System/MOL, Operational Data Store Enterprise, and MCEAS.
MOL	G-1	GOTS	Administrative visibility to both the individual Marine and the Command deck.	Marine On-Line (MOL) - Functions for the individual: view records and OMPF, change individual information, access to APES and Web Orders. For the Command: Morning reports, leave requests, closing reports, proficiency and conduct, training
MROWS	G-1	GOTS	Allows admin personnel to write orders activating or assigning Reserve Marines	Marine Reserve Order Writing System (MROWS) - Reserve system accessed through MOL to provide activated Marines with appropriate orders to ensure they are properly compensated for Active Duty service time.
MRRS	MED	GOTS	Tracking system for immunization and Individual Medical	Medical Readiness Reporting System (MRRS) - Web-based, real-time application that links to the authoritative data systems of NSISPS, RHS and MCTFS http://www.public.navy.mil/spawar/PEOEIS/SWP/Documents/FactSheets/FS_MRRS.pdf Used by the Navy, Marine Corps and

			Readiness.	Coast Guard.
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MS Office	G-6	COTS MCEN-S/ MCEN-N	Collaboration Suite	Microsoft (MS) Office is used for basic PowerPoint, Excel and Word functions of varying types.
NAVFIT98 B	Navy Personnel	GOTS	Naval Fitness Reports	Naval Fitness (NAVFIT) - NAVFIT98A is a Windows based software application that helps users create, store, organize and print fitness or evaluation reports. These reports are printed in hard copy and mailed to Navy Personnel Command. PERS-32 then scans the hard copy reports into the FITREP/EVAL (FE) Module of the Electronic Military Personnel Records System (EMPRS) creating an image of the report that will be placed on a member's permanent digitized record.
NAVMED	MED	GOTS	Navy Medicine and subordinate units within the Medical Command	Navy Medicine (NAVMED) - The official website of Navy Medicine, used to access policy and guidance, leadership information and information on Navy Medical facilities.
NFAAS	MED	GOTS	Personnel tracking	Navy Family Accountability and Assessment System (NFAAS) - CAC-enabled website allowing authorized users to track personnel and dependents, conduct accountability, case analysis and reporting. NFAAS standardizes a method for the Navy to account and monitor the recovery process for personnel and their families affected by a catastrophic event. (www.navyfamily.navy.mil)
NISPS	MED	GOTS	NSIPS is the Navy's single, field-entry, electronic pay and personnel system for all USN/USNR Sailors.	The Navy Standard Integrated Personnel System (NISPS) - This web-enabled, Enterprise Resource Planning (ERP) system offers Sailors 24-hour access to their Electronic Service Record (ESR), training data, and career counseling records.
NKO	MED	GOTS	Online Training and Information Access	Navy Knowledge Online (NKO) – System used to conduct and facilitate training of the US Navy, but may be used by other services as well.
NMCRS	G-1	GOTS	Temporary low or no-interest finance relief to Sailors and Marines	Accessed through MOL and typically initiated by a Marine's Chain of Command; additional information at www.nmcrs.org
OMPF	G-1	GOTS	Provides personnel information via MOL for all Marines	Official Military Personnel File (OMPF) - Provides individuals Marines and administrative personnel access to the entirety of a Marine's service records, including orders, awards and evaluations
Palantir	G-2	COTS MCEN-S	Advanced intelligence analytics platform	Palantir is a COTS program that is primarily used by law enforcement in CONUS. It has been adapted for use to detect IED placement trends as well as other intelligence meta-analysis.
PFPS	G-3 Air	GOTS	Air fires	Portable Flight Planning Software (PFPS) - An air fires mapping

(FalconView)		MCEN-S	mapping tool	tool for Windows that supports the display of aeronautical charts, satellite images and elevation maps. FalconView also supports a large number of overlay types that can be displayed over any map background. FalconView is currently incorporated into TBMCS.
PR Builder	G-8	GOTS	Used for purchasing and contracting	Purchase Request Builder (PR-Builder) - Web-based Procurement Request tool which makes it easy to generate, track, and process PRs and funding documents from anywhere in the world where internet access is available. (MCIEST Website)
PRISM	G-2	GOTS MCEN-S	Performs integrated intelligence collection management	Planning Tool for Resource Integration, Synchronization, and Management (PRISM) - A web-based application that provides users, at the theater level and below, with the ability to conduct Integrated Collection Management (ICM). PRISM integrates all intelligence discipline assets with all theater requirements.
PSS-SOF	G-3 FECC	GOTS MCEN-S	Allows precision strike abilities to remote units	Precision Strike Suite for Special Operations Forces (PSS-SOF) - Mission planners use PSS-SOF to automatically pull up appropriate stereo pair images of the target area. The operator locates the intended feature on both images, and PSS-SOF calculates and returns precision coordinates and elevation. This allows the observer on the front lines to determine precise coordinates. These software tools are typically used at the strategic level, however, and are not practical for use against time-sensitive targets.
Remedy	G-6	COTS ALL	Service Ticket Management	Service desk software that facilitates management of user and technician service requests for II MEF systems.
Reports Net Studio	G-1	GOTS	Finance reports that are used to analyze, reconcile, balance and report budget execution.	Software that may be accessed by authorized personnel via MOL
RF ITV	G-4	GOTS MCEN-S	Tracking materials	Radio Frequency In-Transit Visibility (RF ITV) - This application is accessed via a web-portal. The system uses Radio Frequency (RF) technology to track materiel in-transit. An RF tag on a shipment, materiel can be pinpointed when it passes through a checkpoint.
SABRS	G-8	GOTS	Finance	SABRS is used to process all funding received by USMC and to track and execute all financial transactions
SharePoint	IMO	COTS MCEN-S/ MCEN-N	Information Management	SharePoint is a Microsoft product that offers a browser-based collaboration and document-management platform. It can be used to host web sites that access shared workspaces and documents, as well as specialized applications like wikis and blogs from a browser.
SLDCADA	G-8	GOTS	Civilian Personnel Management System	Standard Labor Data Collection and Distribution Application (SLACADA) - Time-reporting and labor accounting system for DoN personnel
SMARTS	G-8	GOTS	Financial Management	SABRS Management Analysis Retrieval System (SMARTS) is a client/server database of financial information that Marine Corps administrative/financial management sections use to produce reports
SMS	G-4	GOTS	Logistics Management	Single Mobility System (SMS) - allows users to plan, track, and report on strategic moves throughout the DoD. This application

				draws information from JOPES, GDSS, WPS, IC3, the GTN and others. It also allows users to aggregate unit move data into graphical, drillable reports and filters that can be imported for ease of management and briefing.
Solar Winds	G-6	COTS MCEN-S/ MCEN-N	Network monitoring and troubleshooting	An IT management software for the USMC deployed network, servers, virtual machines, IP management, Log/Event analysis, as well as, network traffic analysis and bandwidth monitoring.
SRS	G-4	GOTS	Airlift request system	Special Assignment Airlift Mission (SAAM) Request System (SRS) - A web-based computer system that is used to request a SAAM.
StrikeLink	G-3 FECC	GOTS MCEN-S	Supports indirect fire and CAS missions	StrikeLink is the software component of the modular, man-portable and rugged Target Location, Designation, and Hand-Off System (TLDHS). StrikeLink gives the operator the ability to quickly acquire targets in day, night and near all-weather visibility conditions.
TAMIS	G-4	GOTS	Manages operational, training and test munitions	Total Ammunition Management Information System (TAMIS) is the official U.S. Headquarters, Department of the Army (HQDA), G-3/5/7 Ammunition Management Office accredited (unclassified) system for managing operational, basic load, and training munitions. TAMIS is a real-time, web-based enterprise information system.
TBMCS	G-3 Air	GOTS MCEN-S	Joint tool to conduct the air campaign	Theater Battle Management Control System (TBMCS) is the system "core" hardware and software application tools used by the Joint Forces Air Component Commander (JFACC) and staff to plan and execute theater air operations. WARP and ESTAT are applications within TBMCS. TBMCS is the theater air module of the Global Command and Control System (GCCS). The mission of TBMCS at the force level is to the automated tools necessary to effectively and efficiently plan, monitor, and execute the air campaign.
TCPT	G-4	GOTS MCEN-S	Allows viewing of MAGTF transportation capacity	Transportation Capacity Planning Tool (TCPT) provides a near-term transportation planning, management, and execution capabilities tool to the Operating Forces in a web-based environment. TCPT specifically focuses on transportation capacity planning capabilities at the resource allocation and assignment level, allowing MAGTF transportation planners to view transportation capacity in an online environment.
TCWS	G-6	GOTS ALL	Mobile network architecture	Tactical Collaborative Workstation System (TCWS) - A highly available, scalable, mobile, and redundant network and information architecture for supporting deployed collaborative & C2 requirements.
TDMS	G-6	GOTS ALL	Provides connectivity to DoD communications backbone	Tactical Data Management System (TDMS) - Provides connectivity to the DoD's overall communications backbone via secure satellite transmissions from remote locations, seamlessly integrating the Defense Message System (DMS) into their deployed operations.
TEG-M	G-2	GOTS MCEN-S	Manages theater imagery from	The Tactical Exploitation Group-Main (TEG-M) and Remote Workstation (TEG-RWS) provides tactical imagery capability that is deployable, mobile, modular, and scalable. The TEG

			reconnaissance sensors	receives, processes, stores, exploits and disseminates tactical and theater imagery from reconnaissance sensors. The TEG-M is a MEF level asset supporting the MEF and other MAGTF commanders.
TFSMS	G-1	GOTS	Web-enabled workflow application that integrates capability development processes across MCEN supports manpower & equipment requirements.	Total Force Structure Management System (TFSMS) is the single Marine Corps authoritative source for all official Marine Corps hierarchy, table of organization and equipment (TO&E), unit structure, unit identification codes, billets, unit equipment allowances, individual equipment allowances, TAMCNs, all equipment characteristics, and approved acquisition objectives (AAO) and utilizes COGNOS 8 for business intelligence (BI) reporting, ad hoc querying, and online analytical processing(OLAP) analysis.
TLCM-OST	G-4	GOTS	Equipment readiness and asset visibility tool	Total Life Cycle Management – Operational Support Tool (TLCM-OST) Pending replacement for MERIT as the ground equipment readiness and asset visibility tool.
TMS	G-1	GOTS	Evaluates and tracks individual Marine Training	Training Management System (TMS) - This system was coupled with Marine On Line and is not deprecated. Marine Corps Training Information Management System is the system currently in use.
UD/MIPS-W	G-1	GOTS	Reporting pay and personnel admin data into the MCTFS mainframe.	Unit Diary/Marine Integrated Personnel System (UD/MIPS) – Web accessed through MOL and provides the Commander visibility on Marines under his command and daily unit activities via a web-based diary. UD/MIPS contains a current Unit Diary of all Marines assigned to their respective units (www.globalsecurity.org)
VideoScout	G-2	GOTS MCEN-S	Video exploitation and management system	VideoScout is a family of interoperable video exploitation and management systems to capture video and telemetry from a wide variety of UAVs, receivers, sensors and intelligence network feeds. VideoScout allows users to create derivative video files and still images, and annotate, geo-reference, store and share the resulting intelligent video with others across the battle space.
WAWF	G-8	COTS		Wide Area Work Flow (WAWF) provides the technology for government contractors and authorized DoD personnel to generate, capture and process receipt and payment related documentation in a paperless environment.
Web ATLASS	G-4	GOTS	Tracks TAM controlled items	Web-based Asset Tracking Logistics and Supply System (Web-ATLASS) - Supported Activities Supply System (USMC) allows unit supply officers to track and manage locally assigned Table of Authorized Material (TAM) controlled items.

Appendix D: Operational Communications Unit's Mission Statements

III Marine Expeditionary Force (MEF) G-6 Communications Mission Statement:

G-6 provides the Commanding General with MAGTF command and control system (C2S) planning, management, and execution; liaises with external commands and agencies for C2S planning, training, and fielding; prepares to operate as JTF J6 and execute Joint Communications Control Center responsibilities.

Marine Expeditionary Force (MEF) Information Group (MIG) Mission Statement:

The mission of the MIG headquarters is to coordinate, integrate, and employ information warfare capabilities in order to ensure the MAGTF commander's ability to facilitate friendly forces maneuver and to deny the enemy freedom of action in the information environment. Each MEF has one MIG. The MIG headquarters consists of a headquarters company, communication strategy and operations company, and special staff. The MIG headquarters retains ADCON of the MSB, communication battalion, intelligence battalion, radio battalion, air/naval gunfire liaison company (ANGLICO), law enforcement battalion, communication strategy and operations company, and the expeditionary operations training group (EOTG). Operational command of these subordinate battalions is retained by the MEF CG, as exercised through the MEF CE staff.

Communications Battalion Mission Statement:

The mission of the communication battalion is to establish, maintain, and defend communication networks in support of MAGTF CEs (MEB CE or larger), Marine component headquarters, or combined/JTF headquarters in order to facilitate effective command and control of assigned forces. It provides communication detachments and teams as required to install, operate, and maintain beyond line of sight wideband transmission systems, tactical network services, cyberspace security, and telephone services in support of designated battalion direct support communication detachments and MEU CEs.

Marine Wing Communications Squadron Mission Statement:

The mission of the MWCS is to provide expeditionary communications for the ACE of a MEF, including the phased deployment of task-organized elements. The MWCS consists of a headquarters element and at least two MWCS detachments. It is employed in order to provide communications support for the ACE headquarters and Marine TACC. Each MWCS detachment may be independently deployed to provide external communications for up to two airfields and four FOBs.

Communications Company Mission Statement:

To install, operate and maintain the communications and information systems network infrastructure for the Marine Division Headquarters in order to provide a command and control capability for ground combat operations.

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