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MASTER OF MILITARY STUDIES

Sacred Ground: Technology Advancement at the Squad Level and Operational Realities

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

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Executive Summary

Title: Sacred Ground: Technology Advancement at the Squad Level and Operational Realities

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Thesis: Changes to the Marine rifle squad without the necessary adjustments to doctrine, training, people, and policy will lead to the ineffective and inconsistent implementation of the Marine Corp's base formation affecting it at the tactical and operational levels of war.

Discussion: Technology and the character of war have always played a significant role in determining how militaries organize their formations. In response to the increased range of weapons systems, armies began to fight with greater dispersion between forces eventually giving rise to rifle squad. The Marine Corps recently adopted several changes to the rifle squad to leverage technology and match it with a squad structure to achieve victory in a future conflict. However, merely adding on technology and reorganizing forces is insufficient. Updated doctrine is necessary to provide standardization and a baseline for training. Training is a challenge due to the increased number of systems and tasks placed on squads with expected mastery achieved in unrealistic periods. To overcome some of these difficulties, it requires the Marine Corps to recruit and retain higher quality people. Yet, outdated manpower policies make achieving changes to recruitment and retention difficult.

Conclusion: To achieve the victory in the next war the Marine Corps must be able to incorporate technology, have a realistic understanding of the character of warfare, and craft doctrine, training, and policy to create an organization capable of success on the battlefield.

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Preface

The genesis behind this paper was an attempt to grapple with the challenges I faced as a rifle company commander regarding how to balance all the existing training requirements. While this is not a simple challenge, the continual introduction of new systems exacerbates it. Often these systems came with minimal guidance on employment and commanders are left to determine the method of usage. While the Marine Corps has a history of experimentation and learning best practices from its small units, at some point there comes a time for a need to formalize the changes. This need becomes especially important when considering the numerous organization and systems changes recently adopted for the Marine Corps rifle squad. Institutionally, I believe the Marine Corps understands the critical role technology plays in determining success in war and continually matches this understanding with the fact that technology and the character of war together shape how militaries organize and fight. The organization struggles when it fails to take a holistic approach to ensure effective implementation of the proposed changes. The need to take a holist approach leads to the need to think about the impacts of doctrine, training, people, and policy.

I cannot thank enough my family for their support in this process. Raising a military family is a team sport, and my wife Jessica is the ultimate player. Our three amazing kids Caelen, Grace, and Owen are a testament to their mother and the support she provides. I also must thank my mother, Susan, who abused my writing from an early age and has always been a great advocate for me to continue my education. My father, Michael, is the reason I am a Marine today. His expectation of service and hard work made me the man I am. Lastly, I must thank Dr. Matthew Flynn and LtCol David Pinion who always made time for me during the writing process, made timely edits, and were always more concerned with quality over page count.

Introduction

The Marine Air Ground Task Force (MAGTF) serves as the basic framework for deployable units within the Marine Corps. Of the four main components of the MAGTF, the infantry unit is the principal component within the Ground Combat Element (GCE) and assembled around it is the remainder of the GCE. The base element of an infantry unit is the rifle company. According to the Marine Corps Reference Publication (MCRP) 3-10A.2, *Infantry Company Operations*, “The company is the base unit for creating mission-oriented task elements, which are employable across a range of military operations.”¹ Within the rifle company are three rifle platoons consisting of three rifle squads. The rifle squad is the heart and soul of the infantry company. The mission of the rifle squad according to MCRP 3-10A.4, *Marine Rifle Squad*, “...is to locate, close with, and destroy the enemy by fire and maneuver, or repel the enemy’s assault by fire and close combat.”² Since its inception, the rifle squad has always been of critical importance to the Marine Corps, and for the same reason it is the basic tactical unit of the GCE and serves as the bedrock for ground operations. Even the most complex operations are at the end of the day just a series of infantry squad actions. Putting the rifle squad on the objective is what the entire Marine Corps is built to accomplish. Thus, any changes to the rifle squad will reverberate beyond the infantry community and impact the whole Marine Corps.

The Commandant of the Marine Corps, General Robert Neller recently announced a change to the rifle squad reducing that unit from thirteen to twelve members. Currently, the rifle squad consists of three four-man fire teams and a squad leader. The new Marine Corps squad will comprise three three-man fire teams and a headquarters element consisting of a squad leader, assistant squad leader, and a systems operator. However, there is an option to bring the squad up to fifteen members by adding a rifleman back into each fire team when directed by

Headquarters Marine Corps. Along with the reduction of personnel, there are several technology and equipment capabilities additions: all squad members will now carry an M27 Infantry Automatic Rifle (IAR), three Marines designated as grenadiers will also have the M320 Grenade Launcher Module (GLM), additional Marines will carry squad equipment that includes the M3 Multi-Role Anti-Armor/Anti-Personnel Weapons Systems (MAAWS), Designated Marksman Rifle (DMR), a quad-copter, handheld tablet, and a range finder.

The overall changes in squad size are less significant as most rifle squads fail to deploy more than ten Marines regularly due to manning levels set below the table of organization (T/O), collateral duty assignments, injury, and other factors. The real impact of the size change is on the organization of the rifle squad. Further, the technology additions and new equipment offer significant challenges because of the increased time and complexity it will require to achieve effectiveness in training. Changes to the Marine rifle squad without the necessary adjustments to doctrine, training, people, and policy will lead to the ineffective and inconsistent implementation of the Marine Corp's base formation affecting performance at the tactical and operational levels of war. By extension, shortcomings in this respect could well adversely impact Marine efforts on the battlefield, impairing US national security objectives.

This paper is not meant to be an indictment of the changes proposed to the rifle squad. Innovation, experimentation, and development are critical for success on the battlefield. However, changing the structure and adding new technology alone will fail to achieve the Commandant's vision of the rifle squad of the future. Adding new technology is not a simple act and comes with a host of challenges for successful incorporation into a unit's repertoire of available tools. Failing to address these challenges adequately leads to divergent efforts on behalf of commanders, from the platoon to the battalion level, as they are forced to figure out

best practices on their own. Varying methods, differing levels of usage, and the commander's priorities set a precedent for the use of employment within units. At the tactical level, rapidly changing technology and increasing capabilities requirements of small units have led to numerous issues. These issues vary across a spectrum from overreliance on technology resulting in an erosion of basic Tactics, Techniques, and Procedures (TTP), all the way to the outright neglect of new technology as it overburdens an already packed training schedule. At the operational level, this jeopardizes interoperability as proficiency and usage of any given technology is different from unit to unit. Expectations of unit capabilities do not match reality, thus magnifying the complexity of military operations and with increased complexity comes increased risk for failure. Carl von Clausewitz reminds us, "Everything in war is very simple, but the simplest thing is difficult."³ The rifle squad has proven its place on the battlefield, and the Marine Corps cannot take organizational changes to its base unit lightly, and if done poorly the ramifications could be disastrous.

The Rise of the Squad

To understand the rise of the Marine infantry squad and its origins necessitates a historical background with a focus on the Western tradition of warfare. Focusing on the Western tradition is not an indictment against Eastern warfare. Chinese armies from ancient times used a squad-like structure consisting of three spearman and two archers. The focus on the Western tradition merely acknowledges that influence on the organization of the Marine rifle squad. The squad, as it is known today, is a modern invention that emerged in the late 19th century. Before this, man primarily fought battles in relatively dense and tightly packed formations. The closest formation to the modern squad was in the Roman Army. The contubernium was a group of eight men that shared a tent and a packhorse for transport of their equipment and supplies. These men spent

their lives together and likely developed a strong level of cohesion. Eight to ten of these formations would make up a centuria, command by a centurion. The Roman theory of command and control of the battlefield centered on a centurion being able to see his men and them being able to see him. However, once the legionnaires were in contact with the enemy, the centuria dispersed into small groups of fighting men. In the chaos of battle, it was easier for a group of eight men to stay in touch with one another and to mutually support each other. There is little evidence other Roman contemporaries used similar small unit formations, and this may have been a significant factor in the success of the Roman Army.⁴

Following the decline of the Roman Empire, there were few noteworthy tactical developments. During the Medieval period, the individual knight was the dominant force on the battlefield until the long-bowman overthrew him. While the rise in the prominence of the long-bowman on the battlefield does not relate to the advent of the squad, it is a significant event in military history worthy of consideration. The introduction of new technology, in the form of the long-bow, changed the way armies in Europe organized and fought and subsequently returned the foot soldier to prominence. Further, changes to the organization resulted in societal changes. The long-bow provided the peasants of England a pathway to upward mobility and increased their standing in society by depriving the wealthy and noble knights their preeminence.⁵ As the recognition of the long-bowman's importance increased, so too did their ability to participate in politics.

From the mid-15th to mid-19th centuries, due to the invention of firearms, armies developed the classic linear formation to bring about the superior firepower produced by volley fire from musket-bearing infantryman. Due to the inaccuracy of firearms, these formations typically were of the mass type, consisting of three ranks of men standing shoulder to shoulder.

These formations consisted of large companies or battalions, and while platoons existed for administrative purposes, they rarely maneuvered away from their parent organization. The key to success of the battlefield during this period was to break the enemy line, thus infantry organization centered on the need to form the line, control it in battle, renew it when decimated, and maneuver it to place the enemy at a disadvantage.⁶ Since all European armies during this period fought in a similar manner, war was a particularly gruesome affair. It required iron discipline, effective leadership, and rote training to overcome man's natural desire to flee or take cover. The role of both noncommissioned and junior commissioned officers became increasingly important to maintain and control of these formations in the din of battle. Thus, armies avoided dispersion into smaller groups as this provided adversaries an opportunity to break one's line.⁷

The greatest battlefield commander of this period, Emperor Napoleon Bonaparte, introduced several adaptive formations to exploit the lack of dispersion through his aggressive use of skirmishers and organizing his main force into columns. Skirmishers were not a new concept, existing since at least the time of the ancient Greeks. However, Bonaparte employed far more numerous skirmishers than his contemporaries and early in the Napoleonic Wars attempted to increase their speed by the development of Voltigeur companies. The conceived employment of Voltigeurs, or in English vaulters, was to ride into battle on the croup of cavalry horses and then vault from the horses once they closed with the enemy. The concept proved unworkable but demonstrated French thinking on how to mitigate the threat and exploit the vulnerabilities of linear formations. Voltigeurs companies, along with similar skirmisher formations, continued to operate throughout the Napoleonic wars though no longer from horseback. Skirmishers of all types were skilled at sharpshooting, using cover, and taking the initiative while operating in

dispersed formations designed to find enemy positions and engage the opposing front line. Once the enemy committed their troops to battle, Bonaparte attacked in columns to smash the opposing force's formations. Jacques Antoine Hippolyte Comte de Guibert first envisioned the use of column formations, but Bonaparte was the first to exploit the advantage in the mass the formation provided.⁸ Bonaparte's use of skirmishers and columns is noteworthy for his adaptiveness to successfully defeat linear formations, but it remained uncommon for his army to operate below the company level which made tactical flexibility difficult.

Starting in the mid-19th century, a gradual change in how Western armies fought and organized began to take shape and ultimately contributed to the emergence of the squad. One of the principal drivers of this change was technological developments. In 1849, Captain Claude Etienne Minie of the French Army unveiled his rifled musket. The rifled musket was more accurate and provided a greater range than smoothbore muskets; it also contributed to higher casualty rates as linear and even column formations were under more precise fire for longer distances as they attempted to close and break an enemy's formation.⁹ In 1853, expanding on the use of skirmishers as utilized by Bonaparte, the French began experimenting with their Chasseur battalions by having the men jog rapidly into the assault to close with the enemy more quickly. These were extremely novel concepts for the period as they moved further away from linear formations and Chasseurs trained to be individually independent and a master of their own fire. These contributions also furthered the rise in the decentralization of tactical command. While these units proved to be unsuccessful because men cannot outrun bullets and they could not coordinate fires once within range of the enemy, it demonstrated that men were still willing to close with the enemy without being under the strict control of an officer.¹⁰ Like the rise of the long-bow, the rifled musket, a technological development, served as a driver of change beyond

the battlefield. It too impacted society as it eventually gave rise to noncommissioned officers responsible for leading men on an increasingly dispersed battlefield.

Meanwhile, in the United States, similar experiments were ongoing during the American Civil War. Both sides began the war using the tactics of European armies and in particular that of the French Army. However, heavy casualties, failed attacks, and concentrated rifle fire forced both sides to innovate. To overcome these challenges, commanders developed three tactical innovations: successive lines, short rushes, and offensive trenches. While each of these innovations attempted to increase maneuverability and decrease the effectiveness of enemy fire, they largely failed because units operated in division and regiment sized units and held fast to the belief in the superiority of linear formations. They lacked flexibility and were prone to falling into disorder as they attempted to close with their adversary.

Out of this failure rose the creation of the first squad. In 1867, American general Emory Upton, based on his experiences from the Civil War, rejected linear formations and instituted a new form of tactical employment. The new system of loose-order infantry tactics based on the movement of two ranks of four, in effect, created the first eight-man infantry squad. These tactics continued to be refined and developed in wars with various Native American tribes.¹¹ While these units were essentially administrative rather than combat elements, it was this small-unit structure developed by General Upton that the US Army and Marine Corps utilized upon its entry into WWI.¹²

Before US entry into WWI, there was a tremendous amount of experimentation with tactical formations to overcome the hazards of trench warfare and break through the static positions. The German Army led the way in this endeavor with the development of stormtroop tactics. During the Boer War, Germans fighting as irregulars found they could decimate British

troops fighting in a column of platoons, a tactic the British took from the Germans. Despite initial enthusiasm for the new tactics, German interest waned as they found it nearly impossible for a platoon commander to control his forces stretched out over great distances, requiring a change in how the German infantry trained. Thus, by the start of WWI, Germany completely returned to close order formations.¹³ As the realities on the battlefields of Europe quickly demonstrated, close order formations no longer proved successful, and gradual conversion to Boer tactics occurred. The changes in tactics allowed the German infantry a means of crossing “no man’s land” without suffering the devastating casualties they experienced earlier in the war.¹⁴ The critical component to this success was the introduction of squads which allowed for greater flexibility, survivability, and control. While the German tactics had less influence on US formations at that time, militaries tend to adopt best practices from their adversaries, and the French and British indeed developed similar squad structures influenced by those of the Germans.

Upon entry into WWI, the US Army, including the Marine Corps, fell under the influence of the French Army considered to be at the cutting edge of small unit tactics. This influence led American squads to evolve into a sixteen-man section comprised of two squads. The section was the smallest combat element, and while the squad leader remained responsible for the administrative matters of the squad, it was the section leader who bore responsibility for control and movement. The movement proved to be a critical challenge for the section due in part to its large size, and following WWI the US military returned to the eight-man squad.¹⁵ At this point the US Army and Marine Corps began to diverge in their opinions on the appropriate size of the rifle squad based upon their institutional experience, theories of what the next war would look

like, and testing. While beyond the scope of this paper, the changes to the Army's squad structure over time offer an interesting comparison to that of the Marine Corps.

Following WWI, the Marine Corps became involved in a series of "small wars" in places like Nicaragua and Shanghai. Units in Nicaragua found themselves in a jungle war conducting anti-bandit activities. During these operations, Marine units found it necessary to devise methods to achieve better infantry control and accuracy under fire due to the hit-and-run and ambush tactics preferred by their adversaries. Further, due to a lack of mobility from operating in a jungle, firepower became the key to success with the automatic rifle serving as the base of fire.

Practical experience gained from using automatic weapons significantly influenced the development of the fire team. Though not officially, most leaders chose to increase the number of automatic rifles within the squad and build a fire group, the accepted term for fire teams at the time, around it.¹⁶ Further development of the fire group occurred based on the experience in China where a four-man fighting team proved ideal in conducting riot control because it emphasized decentralized control. Decentralization of command and independent coordination proved necessary in both the jungles of Nicaragua and the crowded streets of Shanghai.¹⁷

This period was a time of great innovation for the Marine Corps as it developed its amphibious doctrine. Field testing further demonstrated to the Marines the need to project maximum firepower as far forward as possible, thus leading to the official adoption of the automatic rifleman bringing the total number of Marines in a squad to nine.¹⁸ Interestingly, the Marine Corps moved away from the fire group concept during its testing of amphibious operations. It is an interesting parallel to the Marine Corps' experience following WWI in small wars, much like the German Army operating in the Boer Wars, units operating below the squad

level did not find favor for “conventional operations.” The move away from fire groups is likely because such formations derived more out of individual unit experimentation than purposefully built structure and, as already suggested, small war tactics had no place in a conventional fight. However, the experience of leveraging fire groups and individual unit experimentation would remain a part of many officers who would carry it forward into WWII.

By the beginning of WWII, a Marine infantry platoon comprised a seven-man headquarters, an eight-man automatic rifle squad, and three nine-man rifle squads. The rifle squad consisted of a squad leader, an automatic rifleman, six riflemen, and a grenadier armed with a grenade launcher.¹⁹ The problem with this organization was the squad became the lowest component of a triangular organization and could not be broken down into a smaller tactical unit. The squad leader was the lowest echelon for maintaining control and fire supervision.²⁰ During the Battle of Guadalcanal, the nine-man squad quickly proved unsuccessful for jungle fighting as the issue of maintaining control over difficult terrain became problematic, thus making it necessary for a complete reorganization of the platoon. To facilitate the change, it required the removal of the automatic rifle squad from the platoon resulting in freed manpower used to create a twelve-man rifle squad consisting of a squad leader, assistant squad leader, six riflemen, two automatic riflemen, and two assistant automatic riflemen. This structure allowed the squad to be broken down into two six-man units each with an automatic rifle and led by a squad leader or assistant squad leader.²¹

Throughout the war, unit experimentation proved critical in preparation for upcoming operations and is proof the Marine Corps was seriously thinking about squad organization. Two noteworthy unit experiments conducted by the 1st Parachute Battalion and the 24th Marines had tremendous effects on the future organization of the rifle squad. In 1941, while at Camp

Lejeune, 1st Parachute Battalion experimented with and eventually organized their squads into three three-man teams each with an automatic rifle which organized the squad into the more familiar triangular formation of higher echelons. Under the test of combat operations at Bougainvillea in late 1942, the fire team organization demonstrated it possessed the firepower, mobility, and control necessary for combat operations in a jungle environment. In July 1943, while at Camp Pendleton, 24th Marines conducted experiments of their own utilizing various formations before settling on a twelve-man squad broken up into four three-man teams. Major General Harry Schmidt, commander of the 4th Marine Division, was so impressed by this formation he recommended to the Commandant of the Marine Corps, General Thomas Holcomb, that the Marine Corps experiment with squads organized along these lines. General Holcomb did just that and ordered the Marine Corps School at Quantico to conduct the organization's first headquarters directed experiment on squad formations.²²

Marine Corps Experiments: The Griffith Board

The senior member of the board established to oversee the experiment was Lieutenant Colonel Samuel B. Griffith II. Early in 1944, the Griffith Board, as the experiment came to be known, utilized a rifle platoon from Training Battalion, Marine Corps School, and organized the squads into the recommended four three-man teams construct. The examiners oriented the platoon on the purpose of the experiment with a two-hour lecture and blackboard talk. The following day, the squads would conduct several formations and "plays" under the observation of the board.²³ The board would eventually test three different squad variations: the recommended squad with four three-man fire teams, a thirteen-man squad with two automatic rifles, and a thirteen-man squad with three four-man fire teams.²⁴

Along with the study, the board examined after-action reports and leveraged their own combat experience to assist in shaping their decision. Griffith's board deemed the squad with three four-man fire teams as the most optimal because it was easier to control, it was better able to absorb casualties, and it preserved the Marine infantry triangular formation.²⁵ The recommendation for a triangular formation meant each combat element of the Marine Division now had three subordinate units operating underneath it. Additionally, the board recommended, "From the psychological point of view the use of the word 'team' infers a unit of effort and a spiritual cohesiveness that the term 'group' does not."²⁶ Thus, the board gave birth to the term fire team. In March 1944, following the endorsement of the board's findings by Headquarters Marine Corps, the Marine Corps officially adopted the thirteen-man squad with three four-man fire teams.²⁷

During the latter stages of WWII, Marine losses continued to rise on the gruesome battlefields in the Mariana and Palau Islands, Iwo Jima, and Okinawa. However, the new look rifle squad proved itself by providing flexibility previous squad formations lacked. Without the changes made to the squad, losses could have been much worse. This battle-tested formation, with the exception in changes to armament, became the bedrock of the Marine Corps into the Korean and Vietnam Wars. The one impact from changes to armament is the automatic rifleman, who served as the centerpiece of the fire team organization, was done away with as fully automatic versions of the M14 and M16A1 became available and distributed to every member of the squad starting in the mid-1960s. The only exception within the squad to carrying a fully automatic weapon was the introduction of a grenadier armed with an M79 grenade launcher.²⁸

Marine Corps Experiments: Infantry Organization and Weapons Systems, 1973-1977

Following the Vietnam War and with the Marine Corps facing significant cuts to its personnel and budget, the Commandant of the Marine Corps, General Leonard F. Chapman Jr., directed an extensive internal review of the entire infantry organization.²⁹ In an exhaustive study that lasted from 1972 to 1973, known as the Infantry Organization and Weapons Systems (IOWS) 1973-1977, the Marine Corps examined every aspect of infantry formations from the squad to battalion level as well as its weapons systems, training, and doctrine. A joint effort of the Marine Corps Development and Education Command (MCDEC), Marine Corps Operations Analysis Group, and an element of the Center for Naval Analyses (CNA), conducted the test. The purpose of the study was to determine the most combat-effective organization and weapons systems of the infantry battalion within imposed constraints. The constraints placed on the evaluation were serious, the first of which was the study was only looking at the near future. Additionally, due to necessary personnel cuts, the infantry battalion could contain no more than 45 officers and 1,118 enlisted personnel as well as weaponry limited to that expected to be available for production by the end of the fiscal year of 1975. Any weapons systems not expected to be available by 1975, therefore, had to be additive or replace currently utilized weaponry and could not result in future additions of personnel to infantry organizations.³⁰

The conduct of the study was principally through a series of troop tests of organizational alternatives. Utilizing elements of the First and Second Marine divisions, evaluators used a building block approach starting at the squad level and working up to the battalion. The test included a series of tightly controlled live fire tactical tests of each echelon and a variety of tests on various weapons systems.³¹ Examiners established five measures of effectiveness for the evaluation of each candidate organization based on firepower, load carrying, survivability, sustainability, and controllability.³² Specifically, regarding the squad, the examiners started with

six alternative squad organizations based on ten, eleven, and thirteen man squad configurations.

Captured in the table below are the tested squad organizations.

Organization	Squad Size	Number/Type of Teams	Weaponry
Control	13	3 Fire Teams	12 M16A1 1 M79
A	13	2 Fire Teams 1 Support Team	12 M16A1 3 M203 1 M60 1 Pistol
B	11	2 Fire Teams	9 M16A1 (with burst control) 2 HBAR (heavy barreled M16 capable of fully automatic) 2 M203
C	11	2 Fire Teams	9 M16A1 2 CMG-2 (Colt light machine gun) 2 M203 2 Pistol
D	13	3 Fire Teams	10 M16A1 (with burst control) 3 HBAR (heavy barreled M16 capable of fully automatic) 3 M203
E	10	3 Fire Teams	7 M16A1 (with burst control) 3 HBAR (heavy barreled M16 capable of fully automatic) 3 M203

Table 1: Alternative Rifle Squad Formations, IOWS, 1973-1977

After ten days of offensive scenarios and four days of defensive scenarios, the examiners eliminated all but two of the six alternative squads. Moving forward for consideration were the control group consisting of the present thirteen-man three team squad and organization B comprising the eleven-man squad broken up into two teams.³³

Following the reduction to two squad organizations, the examiners continued to evaluate the squads in a variety of offensive and defensive scenarios as well as assessing their capabilities in operating as part of larger troop formations. After the exercise it was determined that both squad size formations worked stating:

The troop tests conducted under this project consistently showed almost no problems in controllability, maneuverability, or mobility with either organization. Each squad has fire teams, which provides for the advantages of small-group cohesion, leadership training, leader progression and replacement, and controlled tactical flexibility...Each squad had just one type of fire team, giving both simplicity and flexibility. Each is suitable over the entire spectrum of ground warfare, being maneuverable enough for low-level warfare and large enough for higher levels. In short, the choice is between acceptable alternatives.³⁴

With the shared acceptability, both squad formations had distinct advantages. The thirteen-man squad had served as the standard for the Marine Corps since 1944; it was battle proven and there already existed proven tactics and formations. The thirteen man squad also proved superior in the defense as it physically covered more terrain, it could absorb more casualties before losing its ability to function, and it offered greater flexibility due to having three maneuver elements.³⁵ The eleven man squad, on the other hand, was more comfortable for a squad leader to control as they only had two subordinate elements which resulted in better fire control and increased accuracy. Beyond that, while more susceptible to casualties due to its smaller size, the eleven-man squad was less likely to require reorganization due to the fire teams containing an additional Marine. Interestingly, squad leaders also preferred the two team concept as it facilitated better intra-squad competition and in the opinion of the evaluators proved better for control, mobility, fire and maneuver, and combat effectiveness.³⁶

For the examiners, what set the two squad configurations apart had little to do with the measures of effectiveness they established. Instead it was manpower and rank structure that served as the deciding factors. They found the rank structure to be more favorable because it would prove easier to develop and resource two corporals vice three once accounting for all the squads in the Marine Corps. From a manpower perspective, the two-team squad was a better match for current and foreseeable manning levels and was more compatible with expected future requirements.³⁷ Arguably, the determining factor in the study's decision to recommend an eleven-man squad was not squad organization, squad size, or success in the tests, but, instead, it

was necessary due to available manpower. Regardless of the ultimate underlying reason for the recommendation of an eleven-man squad, it, along with numerous other changes to infantry organization, was forwarded to the Commandant of the Marine Corps for approval by the Commanding General of MCDEC, Lieutenant General R. P. Keller in December 1973.³⁸

In a somewhat telltale story of the inefficiencies of bureaucracies, it would take over two years for Headquarters Marine Corps to respond to the recommendations proposed by the study. In a letter dated 26 February 1976, Assistant Commandant of the Marine Corps, General Robert H. Barrow, lauded the efforts of the study and approved a number of their recommended changes. However, Headquarters Marine Corps disapproved of the first recommendation from the study which called for many structural changes to the infantry battalion to include a reduction in squad size.³⁹ There was no additional reason for the disapproval given. In what is merely a matter of speculation, the Commandant of the Marine Corps had twice turned over since the initiation of the study by General Chapman, and it had likely failed to find favor with his successors, General Robert E. Cushman, Jr. and General Louis H. Wilson, Jr. Further, it was probably not the squad formations that deterred them from endorsing the changes but recommended changes to the overall structure of the infantry battalion that they found disagreeable. Evidence of this is when General Wilson ordered a new study in his final months as Commandant.

Marine Corps Experiments: The Marine Infantry Battalion, 1980-1990

In May 1979, General Wilson ordered MCDEC, in conjunction with Fleet Marine Force (FMF) Commanders and the Commanding General of 4th Marine Division, to once again study and develop an optimum infantry battalion organization for the 1980s. The Commandant's guidance directed that the infantry battalion structure have approximately 900 officers and enlisted

Marines that effectively utilized the personnel, weapons, equipment, and technology of the eighties.⁴⁰ Like the previous IOWS study, evaluators needed to look at cutting down the size of the infantry battalion, and this would play a significant role in their initial assumptions and future recommendations. Additionally, the new study would heavily weigh the armament of the infantry battalion. One of their initial assumptions from this was a reduction to battalion size would require a substantial increase to available organic firepower. However, the difference is the Marine Infantry Battalion study had greater flexibility in looking at new weapons systems.⁴¹ This change is significant because it shows the new research had an eye on the future.

There were also some other notable differences in the approach used in the new study. Unlike the previous squad studies, which following a brief planning phase that went directly into field testing, the Marine Infantry Battalion study spent a significant amount of time analyzing the problem and attempting to conceptualize the future operating environment. MCDEC dedicated a substantial portion of the study to examine the most likely threat, the Soviet Union and its allies, and how the Marine Corps could fight and win against this adversary it would most likely face on the battlefield.⁴² Further, the study recognized that technology was changing and would have a significant impact on future Marine operations. This recognition led the research team to make four critical assumptions about the effect of technology on the battlefield:

- 1) Increased lethality, mobility, and target acquisition capabilities of modern weapons systems will produce a high intensity of conflict.
- 2) To reduce their vulnerability to improved weapons, and concomitant with their own improved firepower, combat units will be smaller.
- 3) Firepower must be maneuverable as improved target acquisition and precision delivery make it more effective to concentrate firepower from supporting arms than to shift the positions of combat units.
- 4) Combat operations and force structure must be adjusted in conjunction with technological and/or tactical changes, i.e., forces must be structured to increase their chances to exploit tactical/technological innovation and to limit their vulnerability to it.⁴³

Coupling these assumptions with the analysis of the enemy threat painted for the examiners a new vision of maneuver warfare, one where units would operate in widely dispersed relatively

small units to capitalize most effectively on the technology of the eighties.⁴⁴ For the rifle squad, it meant having to reconsider command and control systems seriously. The IOWS study did not use radios at the squad level because they were not part of the equipment set at the time, though their addition was recommended and approved.⁴⁵ In conclusion, the Marine Infantry Battalion study had significantly greater freedom to think about the character of war and all the elements that can influence it.

The Marine Infantry Battalion study then took this analysis and assumptions to conduct wargaming. In what was likely a first for the Marine Corps, it used contractors to provide computer modeling in support of this effort. One of the things computer modeling provided was the ability to test how many casualties a unit could sustain before becoming combat ineffective. Out of these results, examiners began to look at infantry battalions having four vice three rifle companies. Rifle battalions having four rifle companies was not a new concept as the Marine Corps had continually oscillated between three and four rifle companies depending on force structure or their operating environment. However, with computer modeling, four rifle companies meant greater dispersion on the battlefield and lower casualty rates.⁴⁶ Couple this gain with the manpower cap placed on the study by the Commandant, and it naturally led to a need for reducing the size of the squad to facilitate the expansion of the number of companies. After the wargame, it was determined, “The Marine infantry battalion should be a highly maneuverable and mobile force that can create an engagement and remain survivable for the greatest duration of time.”⁴⁷ In other words, the Marine Corps needed smaller and faster units that could survive longer on the future battlefield.

Following a series of weapons systems tests by November 1979, the Marine Battalion Study was prepared to conduct the field evaluation. Unlike previous studies, the field evaluations

were to take place over only three days instead of the several weeks typically allotted for these types of experiments. Further, units evaluated were limited to the rifle squad and crew-served weapons units. As eluded to previously, the analysis and assumptions of the study shaped what it saw as a necessary reduction to squad size. Therefore, evaluation of the rifle squad would only consist of a comparison of two eleven-man squad formations, one with three and the other with two fire teams.⁴⁸ The breakdown of the two configurations is in the table below.

Organization	Squad Size	Number/Type of Teams	Weaponry
A	11	Headquarters Team of two Marines 3 Fire Teams of three Marines	4 M16 4 M16/M203 3 M16/Auto
B	11	2 Fire Teams of five Marines	5 M16 4 M16/M203 2 M16/Auto

Table 2: Alternative Rifle Squad Formations, Marine Battalion Study, 1980-1990

Using six rifle squads a day from 1st Battalion, 6th Marines, and these broken down into one of the two configurations, the evaluators conducted a series of attacks either using a frontal assault or single envelopment. The study looked at a total of twenty-four attacks centered around the ability of the fire team leaders and squad leaders to control their unit during the various phases of the attack that included the effectiveness of their ability to changes formations, firepower available between the elements, and their ability to process casualties.⁴⁹

After the rifle squad evaluation, the two-fire team formation significantly outperformed the three-fire team formation. The two-team formation demonstrated a greater control at the squad level, but less flexibility. On the other hand, the three-team formation offered greater flexibility at the team level, more firepower, more formations, but a slightly less degree of control. The two-fire team squad was also better at conducting casualty evacuation with better security and was the clear favorite by squad leaders, fire team leaders, and evaluators. This view

took hold though they recognized that both formations lacked the firepower they were accustomed to with a thirteen-man squad.⁵⁰ The following year in October 1980, the Commanding General of MCDEC submitted to the Commandant the final report endorsing multiple changes to the organization of the infantry battalion. Many of the changes focused on increasing the organic firepower of the battalion, but to accomplish this end it also recommended a reduction to the size of the rifle squad and transition to the two fire teams.

By March 1981, the Commandant of the Marine Corps, General Barrow decided the recommended force structure changes required additional analysis.⁵¹ It is unclear how General Barrow felt about the reduction to the rifle squad, but it is important to remember that the Marine Infantry Battalion study was more about the operation of the battalion, not merely that of just the squad. However, the guidance, assumptions, and recommendations to get to a smaller infantry battalion and increase organic firepower would require a reduction in the size of the rifle squad. During the review period, the Marine Corps made several alternations to the initial plan, one of which was the determination the rifle squad would need an automatic weapon capability thus leading to the adoption of the M249 Squad Automatic Weapon (SAW). By January 1982, the Commandant made his final determination on the changes to the infantry battalion and the Marine Corps would begin transitioning to the new formation in October 1982. The most notable difference to the battalion was the adoption of the eleven-man two-team rifle squad, an adoption which was necessary for freeing up manpower to support several additional weapon assets added to the battalion.

In July 1983, the Marine Corps would have a new Commandant, General Paul X. Kelley. By 1984, General Kelley and the FMF Commanders began discussing the “fine-tuning” of the approved structural changes which included a return of the thirteen Marine squad.⁵² Within a

year they made their final determination and would transition the rifle squad back to thirteen Marines by reducing some of the recently acquired firepower additions, though not all of it. The eleven-man squads lasted less than two years and were never fully implemented. In a *Marine Corps Gazette* article in October 1985, a young General Neller applauded the return of the thirteen Marine squad though he advocated for changes to the organization. In a telling closing sentence to his article, he stated, “Let us not become slaves to tradition when technology and reality make it apparent that another solution is at hand.”⁵³ It would be more than thirty-five years before the Marine Corps would once again look at squad structure during its Sea Dragon 2025 experiments.

Marine Corps Experiments: Sea Dragon 2025

In January 2016, shortly after assuming the mantle of Commandant, General Neller issued FRAGO 01/2016: Advance to Contact. In it, he directed a comprehensive review of the Marine Corps’ force structure to develop and evolve the MAGTF to operate in the five domains. The purpose of the review was to shape the Marine Corps to address the challenges of the future operating environment.⁵⁴ The effort, known as Marine Corps Force 2025 (MCF 2025), leveraged input from across the service to develop a T/O and the equipment to meet the Commandant’s vision of the future. Concurrently, Marine Corps Warfighting Lab (MCWL) was responsible for accessing options for MCF 2025 under an experiment known as Sea Dragon 2025 and make additional recommendations. The first phase of the experiment, lasting from April 2016 to November 2017, focused on the organization and equipping of the infantry battalion and specifically that of the size and configuration of the rifle squad. Like the Marine Infantry Battalion study, MCWL started by first working to define the problem and create a common understanding of the future operating environment.⁵⁵

Much of MCWL's work derives from several emerging concepts regarding the future operating environment. The *Marine Corps Operating Concept* (MOC) serves as the capstone concept for the institution and attempts to describe in broad terms how it will operate, fight, and win in 2025 and beyond. It is also meant to shape the actions as the Marine Corps designs and develops the capabilities of the future force. The MOC identifies five key drivers of change: complex terrain, technology proliferation, information as a weapon, a battle of signatures, and increasingly contested maritime domain.⁵⁶ A subsequent concept put out by the Navy and Marine Corps, *Littoral Operations in a Contested Environment* introduces two related theories on how to overcome the challenges and drivers of change identified in the MOC. While the publishing of the littoral operations concept occurred after the Sea Dragon 2025 experiments began, it highlights the current thinking by the Navy and Marine Corps for their role in future warfare. Additionally, it is MCWL that is responsible for writing the Marine Corps portion of the concept. Thus these ideas directly affected evaluators of Sea Dragon 2025.

The first concept introduced is the Navy's concept of Distributed Lethality described as, "An initiative in which the offensive capacity of the entire surface fleet would be increased and the surface force would be employed in 'dispersed' offensive formations known as "hunter-killer" surface action groups."⁵⁷ Closely related to the Navy's concept is the Marine Corps' concept of Expeditionary Advanced Based Operations (EABO). The concept of EABO is to seize and hold key terrain to "further distribute lethality" and provide "land-based options for increasing the number of sensors and shooters" capable of supporting follow on actions.⁵⁸ Based on these concepts and MCWL's analysis, their starting hypothesis offers insight into what it viewed as the challenge of the future operating environment:

Given proper naval support, a sea-based MAGTF with GCE based on an infantry battalion manned and equipped in accordance with MCF 2025, can successfully conduct maneuver warfare, ship to objective maneuver (STOM), against a near-peer adversary in an anti-access/area denial (A2AD) environment.⁵⁹

Following the assignment of 3d Battalion, 5th Marines to support the experiment, the battalion was then manned to 100 percent of their T/O, sent a significant portion of their leadership to formal schools, and reorganized their companies based on the various squad formations.⁶⁰

Each rifle company configured their squads into either eleven, twelve, or fourteen Marine formations. Like previous squad studies, weaponry tests were critical. Thus, at the start of the experiment, all Marines not in the headquarters element carried an M27 IAR unless assigned as grenadier which carried an M16A4 with an M320 GLM attached. Further, the two larger formations had an M3 MAAWS available for use based on the mission. By the conclusion of the exercise, all Marines carried an M27 IAR and the grenadiers employed a stand-alone version of the M320 GLM. With all Marines now operating an M27 IAR, it reduced the need for an automatic rifleman as all squad members now had a weapon capable of firing fully automatic, something the institution last used in the 1980s.

All three formations utilized an assistant to the squad leader who in theory was responsible for technology employment and received training for qualification as a Joint Fires Observer (JFO). The discretion given to the squad leaders allowed them to determine the role of the assistant to the squad leader, leading to various methods of employment including serving as a second in command, as a technology operator, and as an administrative assistant. Over time, the preferred manner of employment was as the second in command. The eleven-man squad consisted of three three-man fire teams, a squad leader, and assistant to the squad leader. The twelve-man squad had two five-man fire teams, a squad leader, and assistant to the squad leader. The biggest formation, the fourteen-man squad, consisted of three four-man fire teams, a squad

leader, and an assistant squad leader. A breakdown of the tested compositions and their weaponry is below.

Organization	Squad Size	Number/Type of Teams	Weaponry
A	14	Headquarters Team of two Marines 3 Fire Teams of four Marines	14 M27 3 M320 1 M3
B	12	Headquarters Team of two Marines 2 Fire Teams of five Marines	12 M27 2 M320 1 M3
C	11	Headquarters Team of two Marines 3 Fire Teams of three Marines	11 M27 3 M320

Table 3: Alternative Rifle Squad Formations, Sea Dragon 2025

Assigned to each rifle platoon testing the eleven and twelve-man formations was a four-man weapons team designed to alleviate the lost firepower at the squad level by providing the platoon commander additional assets. The weapons teams carried two M27 IARs, two M249 SAWs, and two M3 MAAWS. These teams were commonly assigned separate tasks or distributed as individuals vice direct attachment to a squad and consequently provided little additional support. Additionally, 3d Battalion, 5th Marines also proposed future experimentation of a fifteen-man squad concept containing three four-man fire teams, a squad leader, assistant squad leader, and a technology integrator.⁶¹

MCWL then utilized six experimental events consisting of exercises, focused experiments, and experimental technology training to evaluate each formation.⁶² Throughout the testing, the fourteen-man squad consistently demonstrated superior combat capabilities. Like previous studies, squads with only two teams lacked the flexibility of the those organized in the triangular formation. The eleven-man squads with three smaller fire teams demonstrated greater flexibility but were unable to utilize the “buddy” concept and tasks often required two teams to accomplish what one larger four-man team could complete. Additionally, like the previous two

squad studies, the three-man fire team had a higher difficulty absorbing casualties and thus were more likely to become combat ineffective. The four-man fire teams in the fourteen-man squad allowed for the use of two-Marine buddy-teams which demonstrated greater firepower, retained the combat capabilities the Marines were accustomed to, and could more easily absorb casualties. The addition of the assistant squad leader to the larger troop formations allowed for greater flexibility and the ability to incorporate emerging technologies and capabilities.⁶³ Overall, the findings regarding squad employment offered little new insight from previous studies to the size of the squad. Beyond the addition of the assistant to the squad leader, there was nothing drastically different from previous studies or their findings and the changes recommended were more evolutionary vice revolutionary and therefore a radical change was not needed. This conclusion came to fore no matter the outgrowth of technology.

The unique aspect of Sea Dragon 2025 and where there was potential for a revolutionary change to the rifle squad was the series of experiments infusing technology not previously available down to the squad level. Provided to each squad was a PRC-117G radio capable of linking a handheld device offering more enhanced and reliable communications with additional situational awareness tools. The system is designed to increase situational awareness of the squad, provide a common operating picture, and simplify the coordination of fires. While the remainder of the technology requires further development and testing, it offers a glimpse of what capabilities a rifle squad soon may have available. The first item recommended for further development and particularly useful in urban environments was a Small Unmanned Ground Vehicle (UGV) to provide remote reconnaissance and breaching of walls or doorways. Also approved for additional development was a Cargo UGV that provided squads assistance in carrying heavier equipment and aided in the movement of injured Marines. Additionally,

Marines endorsed an armed variation of the UGV, though of all the UGVs tested it needed the most refinement.⁶⁴

What is likely to have a more significant impact on squad level operations is the incorporation of small unmanned aerial assets (sUAS). Squads employing sUAS is not a new concept; Marine infantry units utilized a variety of different sUAS platforms since early in the ‘Global War on Terror.’ The change is to the quantity and capability; previously a rifle platoon or company may have only one to two such systems. While units welcomed the added ability for surveillance and reconnaissance, many underutilized the platforms for fear of losing them, added them too late in the training cycle for successful incorporation, or just dismissed the systems because they slowed down operational tempo. To counter these past trends, Sea Dragon 2025 looked at sUAS with the following characteristics: dependability, high quality optical/night/low light sensors, low cost, disposable craft, ability to operate in typical military environmental conditions, man-portable in hardened cases, and can link sensory data to another headquarters.⁶⁵ Further, sUAS was available and required for incorporation at the squad level by six squads to offer a test-run.

To facilitate sUAS incorporation, training provided by the vendors enabled the Marines assigned to operate and employ the UAS to gain proficiency with the systems and rapidly provide tactical capabilities. These systems acted as extended binoculars for target identification, spotting of indirect fire weapons, route reconnaissance, and selection of breach points. Those squads with the additive capability noted the tactical advantage the systems provided.⁶⁶ Further, three additional systems previously not offered to infantry units were counter unmanned aerial assets, sUAS with electronic warfare (EW) capabilities, and lethal miniature Aerial Munitions (LMAM). While the proliferation of UAS platforms on the

battlefield continues to increase, the ability for units to counter these systems has not. Increasingly requested by small units are a counter-sUAS and an EW capability to regain the initiative lost to enemy forces able to observe and interdict their movements via UAS technology. While tested systems proved desirable at the platoon or company level, incorporation at the squad level proved more difficult.

Like counter-sUAS, LMAMs demonstrated a significant potential for future development specifically due to their accuracy and ability to reduce hardened structures with the potential for providing a systemic advantage for small units. However, due to limited availability, the operators for these systems were held at the company level and assigned to squads based on mission requirements.⁶⁷ In summation, unmanned systems created a significant advantage for the rifle squad by providing it with the capability to employ strike assets, extend the range of squad operations, reduce risk, among other factors. The challenge, even for a heavily resourced and supported exercise force, was the need for a squad member dedicated to operating the numerous systems. Several observers noted the requirement of the assistant to the squad leader to serve as the JFO and manage the integration of fires, digital communications, intelligence, surveillance and reconnaissance, electronic warfare, and other emerging technology, as a significant responsibility for one individual. Further, the lingering question of how the squad will manage all the additive weight from the new equipment needs addressing.⁶⁸

By February 2018, Brigadier General Christian Wortman, Commanding General, MCWL endorsed the findings of Sea Dragon 2025 for a fourteen-man rifle squad.⁶⁹ Before this in August 2017, the noncommissioned officers and officers of 3d Battalion, 5th Marines, endorsed a separate recommendation of a fifteen-man squad. In a lengthy article submitted to the *Marine Corps Gazette*, they expressed a desire to add two additional billets to the traditional rifle squad,

that of the assistant squad leader and a squad systems operator. These billets would absorb some of the information overloads from the new technology and ease command and control of the squad.⁷⁰ Squad studies continuously cited command and control concerns of large squads. Unlike his predecessors, General Neller did not waste time deciding and announced a change to the size of the rifle squad in May 2018. However, instead of accepting the proposed recommendations, and to achieve other force restructure initiatives, he chose to combine them.⁷¹ As noted in the introduction, the new rifle squad formation will comprise three three-man fire teams and a headquarters element within the squad consisting of a squad leader, assistant squad leader, and a systems operator. The Marine Corps plans to fully staff the twelve-man squad for most units with an option to increase to fifteen-man squads when mission dependent starting in 2020. In November 2018, the Commandant announced 2d Battalion, 8th Marines will test and deploy with the fifteen-man squad as part of their upcoming Marine Expeditionary Unit (MEU) deployment. The purpose of the recent change is to see if the larger formation adds additional lethality and adaptability while also handling the increased technological capabilities.⁷²

Impacts of Adding Technology

At the heart of the squad experiments of Sea Dragon 2025 were an effort to determine the appropriate size squad that could handle not only the traditional mission of the rifle squad, to close with and destroy the enemy, but also determine the size needed to manage the increased technological requirements. Throughout history, militaries sought an advantage over their adversaries by leveraging technology. The United States, in particular, favors leveraging technology to maintain its lead on the battlefield. However, the increasingly rapid development of new technology and its introduction to the force is not without significant challenges.

There is a significant amount of literature discussing the challenges of adding technology to an organization and the negative results. Most of the research and writings on the topic addresses the creation of an overreliance on technology and this is because the topic of overreliance transcends all organizations. While technology creates efficiency, it can also create an organization that is overly dependent upon it. The dependency on technology then becomes a vulnerability and not an enabler.⁷³ For the military, this means it can inhibit performance, reduce individual effectiveness, thwart initiative, and detract from skill on the battlefield.⁷⁴ Further, it can lead the institution to believe that by merely applying technology the problem will cease to exist.

There are other challenges to introducing new technology not commonly faced outside the military and can be particularly challenging for deploying units. Deploying units often face lengthy and repetitious deployment cycles, and in between these cycles commanders are expected to meet specific training milestones and objectives in preparation for deployment. Units also have the added challenge of more training tasks to complete than time to meet the requirements, and this forces a commander to prioritize training. Further, new technology is often introduced intermittently throughout the lead up to deployment and sometimes after the unit has already departed. Overburdened commanders who lack the full understanding of what the new technology provides often choose to ignore the added capability. Those that decide to embrace the technology must then determine the best way to employ it. While experimentation has always been at the heart of the Marine Corps' success on the battlefield, at some point it chooses to institutionalize best practices for the overall good of the organization.

The rifle squad for most of its history largely avoided the burden of additional technology. Most of the concerns for the squad were what weapons systems would be added or

taken away as new capabilities became available. However, over the last thirty years, the introduction of new systems created numerous additional training requirements for squads. Scopes, infrared lights, lightweight thermal optics, and night vision goggles all require extra time to master. Many of the approved changes to the rifle squad add to this trend with the introduction of increasingly complex systems while taking none of the squad's traditional mission requirements away. The rifle squad will now have to maintain proficiency in all its currently assigned TTPs while adding new capabilities and systems with more on the way. Merely changing the organization of the squad and providing it with numerous new systems will not be enough for it to succeed.

Today, mankind is standing on the verge of the Fourth Industrial Revolution. Previous industrial revolutions liberated humankind from animal power, made mass production possible, and brought digital capabilities to the world. The fourth industrial revolution promises to deliver a range of new technologies together, fusing the physical, digital, and biological worlds.⁷⁵ These impacts will affect all disciplines, warfare not the least of them. Just as previous industrial revolutions have changed the character of war, the fourth will deliver changes as well. Simply embracing new technology and attempting to force it into existing formations will likely not produce the desired effect especially as the latest industrial revolution continues to unfold. Sea Dragon 2025 laid a foundation for the enhanced rifle squad, but it will take changing doctrine, training, people, and policy for the Marine Corps to find success with the changes.

Doctrine

Joint Publication 1-02 defines doctrine as the “fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives.”⁷⁶ Dennis Drew and Donald Snow, professors from the School of Advanced Air and Space Studies at Air

University, simplify it further stating, “doctrine is what we believe about the best way to do things.”⁷⁷ The word *belief* implies doctrine is the result of an examination and interpretation of available evidence, and interpretation is subject to change with the introduction of new evidence. The word *best* describes a standard for military actions.⁷⁸ Doctrine, therefore, serves as the link between history, theory, experimentation, experience, and practice.⁷⁹ Debatably, the success of the thirteen-man squad is it features all five of these elements and the doctrine to back it up. The previous attempt to change the squad structure following the Marine Infantry Battalion, 1980-1990 study failed to account for and fully appreciate these elements when trying to make an institutionally impacting change.

The challenge for the military is that as technology changes and the interpretation for success changes so too must doctrine. The problem for the Marine Corps is procurement and changes in technology far outpace its ability to develop the appropriate doctrine to support it. The Marine Corps lacks organizations solely responsible for writing doctrine; instead, it relies on its school houses and centers of excellence such as Marine Corps Tactics and Operations Group to update and write its doctrine. Finished products are then consolidated by Doctrine Division, Combat Development and Integration. The result often leads to doctrine becoming stagnate or an afterthought that the organization will catch up as time permits. Nowhere is this more evident than the Marine Corps Training Publication (MCTP) 3-10A, *Marine Infantry Battalion*, last updated in 1978, a shockingly outdated publication for one of the Marine Corps most crucial formations.⁸⁰

With the changes to the rifle squad only recently approved, it may be too early to start changing the Marine Corps’ doctrine. However, there remains a need to balance the changes in added technology with the doctrine going forward. Dr. Richard P. Hallion, a professor at the

Army War College, explains the relationship by saying, “Neither is independent of the other; rather, each generates a synergistic impulse that encourages and strengthens the other. The lagging of one is necessarily injurious to the other.”⁸¹ The last time the Marine Corps attempted to change the rifle squad, many of the complaints regarding the change centered on a lack of understanding of how best to employ the new formation. As the Marine Corps continues to experiment with the new organization and technology, it must capture best practices and institutionalize it through doctrine. Capturing best practices is critical as concepts like EABO continue to shape how the Marine Corps anticipates it will fight in the future. If the rifle squad is expected to operate in increasingly dispersed formations with companies filling the role once held by battalions, the need for updated doctrine becomes increasingly apparent. Further, if the character of war is changing, as suggested in documents like the MOC, doctrine will play an essential role in training.

Another way to view doctrine is as the officially approved methods taught to carry out a military objective.⁸² With doctrine, commanders will be in a better position to develop training based on established principles. It also provides commanders with a common base of thought and common ways to handle problems through general guidance. In other words, it increases interoperability amongst units as there is a common understanding of what capabilities an organization brings and how that organization operates. For the squad leader, who may find themselves operating without communication with superiors, it helps shape the course of action development and aids in decision making that supports higher’s mission. In summation, doctrine is what moves concepts from theory to institutional practice. If the changes to the rifle squad are going to become permanent, then doctrine to support the changes will prove essential, one that establishes a baseline for operations and sets a standard expectation for training.

Training

General Douglas MacArthur once stated, “In no other profession are the penalties for employing untrained personnel so appalling or so irrevocable as in the military.”⁸³ Training has long served as an essential element for success on the battlefield. The infantry Marine of today trains for many of the tasks required of a Marine who went ashore on Guadalcanal in August 1942. A Department of Defense (DoD) study in 2001 highlighted that training superiority had an equal contribution to the success of the military in the 1990s, specifically in the Gulf War as technological superiority.⁸⁴ However, today’s Marine also carries an expectation to conduct key leader engagements, coordinate with civil authorities, conduct stability operations, and train partnered nation security forces.⁸⁵ As mentioned previously, there is a trend over the last several decades that adds to these requirements with the introduction of numerous new systems meant to increase the lethality of Marines on the battlefield. Each new piece of equipment requires additional time to master, and the increasingly rapid upgrade and replacement of items make maintaining mastery even more difficult.

The changes to the rifle squad will only compound these issues with the introduction of additional weapons and systems as it only further complicates the task of training squads to an adequate level of proficiency. Colonel James Schirmer, a United States Army armor officer, noted there are several interrelated trends spawned by technology growth that hinder unit performance and agility. First, the equipment issued today is more complicated than the equipment it replaced. Second, training skills decay and require refresher training. Third, the amount of equipment per Marine is growing, amplifying the previous trends. Colonel Schirmer concludes, “A reasonable outcome from these three trends is to either crowd out collective training to the detriment of unit effectiveness or force commanders to take shortcuts on

individual and crew training on equipment.⁸⁶ For Sea Dragon 2025, vendors provided squads with all the necessary training to gain rapid proficiency in familiarly with test systems. MCWL and contractors, not unit leadership, determined the appropriate amount of time to train on a system. Once the requirement for training is put back in the hands of the squad leader, platoon commander, or company commanders, how much time is spent training on a system or task will primarily be a matter of their judgment. For the rifle squads, this translates to units with varying levels of proficiency even within the same battalion.

Not only was vender training leveraged by MCWL, but also a significant portion of the leadership participated in advanced training at the School of Infantry for their assigned billet.⁸⁷ MCWL recommended all unit leadership in the future attend advanced training. Interestingly, this recommendation directly opposes the one made by the previously mentioned DoD study which found unit training more important than schools. While the advanced training received by squad leaders is undoubtedly beneficial for the individual, resident instruction can be highly disruptive to units and personnel rotations. A significant downside to advanced schools is it takes away the squad leader from the unit they are responsible for training. Further, the instruction may not be sufficient if there are not enough experts to teach and to lead squads as is frequently the case.⁸⁸ The Marine Corps is already well aware of this as it attempts to fix some of these issues with the 0365 Infantry Squad Leader Program and Squad Leader Development Program. However, these programs are still in their infancy and have yet to demonstrate tangible results. Regardless, advanced schools training is not a replacement for unit training though it is hard to argue against the benefits it provides to the individual Marine.

Ultimately, the problem with training boils down to a lack of time to gain proficiency with all the assigned tasks, weapons, capabilities, and recommend schooling. The simple

solution to the problem is recommending the Marine Corps increase its time between deployments. Trouble is this suggestion is not realistic as the Marine Corps finds itself still deploying units at an exhaustive pace. Further, it is unrealistic to believe the squad will divest some of the capabilities it acquired as this would fly in the face of the current trend of continually layering on additional technology. Subsequently, training becomes an ever more difficult challenge as units are not going to receive more time to train but will also face continually increasing training requirements. Continuing to operate with the status quo will only lead to increasingly more extensive variations in unit capabilities, leading to decreasing interoperability. If the Marine Corps cannot realistically expect to increase training time, it will have to look for other ways to make what training time it does have more effective. The most impactful way to do that is to look at the Marines the organization is recruiting and retaining.

People

In a statement to the House Armed Services Committee, General James Amos stated, “We have always known our greatest asset is the individual Marine.”⁸⁹ The Marine Corps is a people organization, and the institution is only as good as the Marines filling its ranks. The best aircraft, vehicles, and weaponry alone will not keep the institution strong; as part of the world's most professional and technologically-advanced military it needs competent, healthy, and educated individuals to fill its ranks.⁹⁰ People are a finite resource, and in an all-volunteer force, the military faces several challenges. These challenges include a shrinking population of potential candidates caused by large portions of the target recruiting age not meeting eligibility requirements due to not meeting the physical fitness standards, other disqualifying health problems, having criminal records, or failing to demonstrate the required mental aptitude. The result, based on Pentagon data, is between 71 to 75 percent of Americans age seventeen to

twenty-four are not eligible to join the military.⁹¹ These problems are further compounded by a decreasing propensity among the populace to enlist in the armed services. The result is the pool of eligible candidates for military service is dwindling, leaving the services scrambling to find qualified personnel.

The Marine Corps faces additional challenges as it tries to shape the future force. The Marine Corps sees the lowest retention rate among the services of first-term enlistments. The service retains only seventeen percent of enlisted Marines on their first enlisted contract.⁹² This low retention rate requires a continual refocus on basic skills training. For a service that is infusing increasing amounts of technology and mission requirements on the small unit level, poor inductees make it extremely difficult for individuals to gain mastery of their military occupation specialty (MOS) before being jettisoned from the force. For commanders, the low retention rates mean they must continually focus on retraining the unit's most basic skills. As the changes to the rifle squad have brought in more technology and weapons to the formation, it has also brought additional time requirements to train the Marines to proficiency. With low retention rates, the unit is continually cycling through a process of assigning Marines a task, preparing them for it, deploying, and then starting the process over again as Marines change assignments, leave the force, and new members join the unit. The result is while the unit may gain a certain level of proficiency, it is unlikely ever to gain mastery. At the least, it cannot expect to achieve mastery in all its assigned tasks, weapons, and systems. The lack of time puts an additional burden on commanders to determine where they will spend their units precious training time before deployment to achieve some level of competency and where they are willing to accept risk. The disparity between commanders on what is a priority is a potential friction point in future interoperability.

Beyond low retention rates, which are a service-wide issue for the Marine Corps, saddling the infantry community is a general technical (GT) score which is the lowest in the service. While the lowest current score for most enlisted infantry assignments is a 90, the basic infantry Marine score is 80.⁹³ This difference in scores allows for recruiters to assign potential recruits scoring below 90 to the infantry military occupation specialty (MOS) via waiver. What this translates to for the infantry is it faces the challenge of training and leveraging the capabilities of some Marines with the lowest aptitude in the organization. There is an ability to overcome some of the difficulties presented with low GT scores. A Center for Naval Analyses study in 1991 found experience, as measured by time in service, rank, and recency of task performance had a significant and positive influence on infantry performance. Despite this finding, experience was not able to overcome the considerable performance differentials found between low- and high-aptitude personnel, and it takes more than three years of service to offset the deficient.⁹⁴ When coupling this finding to low retention rates, just about at the point an infantry Marine with a low GT score reaches a level of proficiency equal to that of infantry Marine with a higher GT score, they are likely not retained by the service thus exacerbating the training challenges already highlighted.

Previously mentioned programs, 0365 Infantry Squad Leader Program and Squad Leader Development Program, are attempts to get quality infantry Marines to stay in the Marine Corps while also facilitating a training pipeline to prepare them for their future leadership billets. Again, the jury is still out on the success of these programs, but even if they achieve their purpose, they are only managing the problem at the margins. While better leadership at the squad leader level is critical, it is a lofty expectation that improved quality at that leadership position alone will fix the issues. The changes to the rifle squad raise the requirement for

leadership in the squad with the addition of the assistant squad leader. Due to low GT standards and retention rates, anecdotal evidence suggests most units will struggle to find three good team leaders per squad, and now there is an added expectation they will have to find and develop an additional leader within the formation. Exacerbating the problem is its sheer size when multiplied twenty-seven times for each squad across just one battalion within the Marine Corps. The assistant squad leader is expected to be the best corporal within the squad, preferably one with team leader experience.⁹⁵ When is this corporal supposed to gain the experience as a team leader in time to be the assistant squad leader when most Marines leave the force after their first term? Also, now the squad is expected to function better with its best corporal not leading Marines, but instead managing the squad's systems? And all Marines in the unit are now responsible for more weapons, systems, and tasks than at any point in the history of the rifle squad. The only way to honestly address these issues is the Marine Corps needs to recruit and, more importantly, retain the best Marines. To achieve this requires the Marine Corps to take a more in-depth look at policy.

Policy

The DoD *Dictionary of Military and Associate Terms* states: "Policy directs and assigns tasks, prescribes desired capabilities, and provides guidance for ensuring the Armed Forces of the United States are prepared to perform their assigned roles."⁹⁶ Policy shapes nearly every action associated with military affairs from strategy to structure. Any major changes to how the military desires to organize, train, and fight must start with changing the policy from which it derives its authority. Today's manpower policies began to take shape following WWII. During the early days of the Cold War, political and military leaders within the United States recognized the need to maintain a substantial and globally deployable force, a force larger than any previous

standing military during peacetime. Additionally, they recognized that the nation could not sustain, nor does it need a massive force on the scale required to fight the Soviet Union. Caught between these two paradoxes, leaders determined they needed a force that was quickly scalable in the event of conflict. To achieve this, required retaining a larger number of midgrade officers prepared to command units in case of another large war. Policymakers and military leaders believed enlisted and junior officers could grow in size quickly, but more experienced commanders needed extra time to prepare, thus necessitating the need to retain more mid-grade officers. Further, due to the physically demanding fighting of the 1940s, the Cold War military needed to be perpetually “young and vigorous.”⁹⁷

To oversee a bigger standing military, lawmakers passed a series of laws to create greater uniformity amongst the services. Two such examples are the passing of the National Security Act of 1947 and the implementation of the Uniform Code of Military Justice in 1951. Specifically addressing manpower was the Officer Personnel Act signed in 1947, which created uniform personnel policies across the four services, developed a standardized career plan also known as the “up-or-out” and “one-size-fits-all” policies to keep the force younger, and provided the military the capability to mobilize for large scale war quickly. While the purpose of the act focused on the officer corps, for enlisted service members, although never mandated by statute, the Defense Department essentially mimicked the officer system for career enlisted personnel policy.⁹⁸ Thus, the real resistance to change regarding personnel policy for the enlisted corps is military culture, not national policy.

Following the Vietnam War, the next manpower policy shaping today’s enlisted force emerged when the All-Volunteer Force was adopted by President Richard Nixon 1973. This policy ended conscription for the enlisted force and shifted it to a volunteer-based system. To

attract individuals to military service over the next decade, Congress authorized large pay increases and bonuses for enlisted members.⁹⁹ The passing of this law had numerous benefits for the services, most notably the increased professionalization of the military. Since the passing of the All-Volunteer Force, Congress continued to pass laws addressing military policy. While many made a significant impact on the military, such as the Defense Officer Personnel Management Act signed in 1981, and the Goldwater-Nichols Act signed in 1986, they also each subsequently reinforced grade controls, promotion opportunity and timing objectives, up-or-out, and consistency across the services.¹⁰⁰

The manpower policies shaping today's military are a relic of the Cold War. When policymakers and military leaders crafted the laws, they correctly identified the type of force needed to fight a conventional war against the Soviet Union. However, today's policymakers and military leaders are calling for a military that is more experienced, older, and more diverse. Outdated laws cannot manage the challenges of recruiting, managing, promoting, and retaining service members with the necessary talents to confront the strategic threats facing the United States today. If the Marine Corps truly desires to achieve its vision of the rifle squad of the future, it must address its enlisted manpower policies. There are several plans in the works to begin to solve this problem, such as the squad leader retention campaign, the requirement to stabilize squad leaders a year out from deployment, the introduction of six-year contracts for qualified recruits, and the high performer track—all of which are a step in the right direction. However, even with these changes, which are new programs and their success has yet to be determined, they primarily focus on creating more qualified squad leaders. Perhaps if they prove successful, the Marine Corps can expand these types of policy to other positions within the rifle squad. The challenge will remain as the Marine Corps cannot consider the rifle squad in

Conclusion

The initial intent of this analysis was to focus on the areas the Marine Corps needed to address to institutionalize a significant change to its squad structure by analyzing and explaining the impact of doctrine, training, people, and policy on ensuring a successful completion to the approved changes. However, the historical analysis demonstrates that while these factors are essential for solidifying change, introducing technology alone is not enough to achieve success on the battlefield. This reality is not a suggestion that technology does not influence actions on how militaries develop their structure. Throughout history technology impacted the way man organized and fought wars with projectile weapons likely the most significant contributor to determining unit organization. As the range and accuracy of weapons systems increase so too must dispersion. The image from Trevor Dupuy captures the impact.



The rise of the rifle squad was a natural evolution to manage men on the battlefield operating at increasingly greater distances. However, technology alone is not the only determinant of how men fought. The age-old reality is that as the character of war changes it will drive things as much or maybe more than technology. Technology and the character of war impact the reality of what occurs on the battlefield; following the Boer War the German Army failed to apply lessons of operating in dispersed formations to WWI. Similarly, the Marine Corps failed to apply lessons learned from the small wars in Latin America and China of using fire groups to WWII. The realities of the battlefield during both World Wars demonstrated that the old way of doing things would only result in further loss of treasure and blood. The Marine Corps is now in danger of making the same mistake from its own recent experiences in Iraq and Afghanistan by believing technology is the solution without considering that perhaps the character of war changed. Predominately, changing technology and conflict character, have always marched together, and tracking both will create a greater understanding of the formations necessary to determine success for the rifle squad in the future.

The history of the rifle squad offers a key window to man's history with warfare. It serves as a testament to the critical role the squad plays in modern war as witnessed by the Marine Corps' continual revisit to its most base formation. Indeed, the Marine Corps reached some unique views on the appropriate size and role of the rifle squad. At thirteen Marines, it already is one of the largest squad formations in the world. Further, analysis of the squad over time is likely needed to create greater understanding. This paper begins this key work; a more involved look at the squad formations used by the ancient Chinese and those used by the US Army following WWI would enhance the analysis. However, it will likely just continue to

contribute to the evidence of the importance of technology and the character of war play in determining how militaries organize for war.

It is important to remember the rifle squad can only achieve tactical success, but it is the accrual of these successes that lead to operational victories. If a military lacks confidence in its ability to achieve victories at the tactical level, it will undoubtedly find its operational choices limited. Tactical superiority provides more operational choices that lead to a solid strategic foundation. Conversely, no amount of tactical success will redeem a flawed strategy. Dominance on the battlefield is critical so long as it is tethered to sound national policy. Proposed changes to the Marine rifle squad are an attempt by senior personnel to ensure continual tactical success, to create operational choices, and achieve strategic victories.

Despite attempting to embrace both technology and the changing character of war, today the changes to the rifle squad may not have gone far enough. The United States tends to place a greater emphasis on technology and leans on its technological advantage to gain and maintain superiority on the battlefield. As the range of weapons systems and the proliferation of UAS change the way adversaries organize and fight, there may come a time when a radical change to the mission and capabilities of the rifle squad will become more critical to mission success than just continuing to layer on additional technological capabilities. Further, if the Marine Corps accurately adopted the right technology and achieved a close enough understanding of the future character of warfare, it must account for doctrine, training, people, and policy to employ the systems in a complex multi-domain environment.

Admittedly this study at present advances preliminary recommendations after clearly identifying some deep-set problems. Each of the last four sections merely introduces the myriad of issues facing every one of those respective topics. However, there already exists extensive

literature in the form of studies and reports done by think-tanks and research groups, not to mention a host of master's level projects, that address every one of the issues highlighted in this paper and often do so in far greater detail. Each effort contains a host of recommendations that the authors believe will begin to fix the problems. Additionally, the last four sections of this study do not offer a comprehensive list of what the Marine Corps needs to consider when making changes to the rifle squad. One could easily argue for adding another requirement, such as logistics, because all these additional technological systems require an increased logistical tail for support. The logistical challenges will become increasingly more complicated when factoring in the disbursed nature of operations on the battlefield. Despite this need for additional research, the point remains: to successfully achieve change, the Marine Corps must go beyond adding additional weapons systems and adjusting the squad structure. The thirteen-man squad has achieved near mystical status and remains 'sacred ground' within the institution. But technology and a fluctuating environment impact the warfighter and could necessitate change. An organization that is unwilling to embrace change just because it is different is likely doomed to failure; however, change for the sake of change can be equally devastating.

If the Marine Corps is serious about making changes it cannot look at the highlighted problems in this study in isolation. Instead, the issues require a holistic examination. A solution must advance with a firm understanding of the impact of technology on the character of war to ensure that changes made are sufficient for addressing future conflict, while also noting the requirements necessary to achieve the desired changes. As technology and the character of war change, how militaries organize and fight must evolve as well. Marine Corp Doctrinal Publication 1 highlights Clausewitz's belief of the necessity for equilibrium between the nature and character of war, and that these two elements must always remain in balance for success.¹⁰²

For the modern military, particularly one like the US military heavily consumed with leveraging technological advantages, to maintain equilibrium means the doctrine, training, people, and policy must also evolve. To achieve victory in the next war, the Marine Corps must be able to craft doctrine, training, and policy to create an environment that fully leverages the benefits of changing technology with a realistic understanding of the evolving character of warfare.

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