MECHANIZATION AND THE MARINE CORPS: EFFECTIVE OR NOT?

A Monograph
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MECHANIZATION AND THE MARINE CORPS: EFFECTIVE OR NOT? by Major Michael D. Wykoff, USMC, 50 pages.

This monograph discusses the evolution of Marine Corps mechanized forces and their role in future conflicts. In a crisis, joint force commanders will likely request early insertion of a mechanized Marine Expeditionary Brigade, using assets forward deployed aboard a Maritime Prepositioning Force squadron, because the MEB promotes the rapid build up of combat power even in an austere environment. Joint planners should understand that an MPS resourced MEB, with equipment and force structure designed for amphibious operations, cannot be employed in the same manner as an Army mechanized brigade.

The monograph first examines whether the Marine Corps needs mechanized forces to fulfill assigned roles and missions. Since the National Security Act codified the Marine Corps' role as the nation's principle amphibious rapid response force, the evolving threat has forced the service to gradually increase its mechanized capabilities, largely through equipment modernization. The MPS resourced MEB is the end result of efforts to maintain a rapid insertion, amphibious-capable force that can deter opposing mechanized forces until heavier forces arrive.

Next, the monograph contrasts the MEB with an Army balanced heavy brigade. The MEB is a partially mechanized infantry force that relies on air power to make up for a shortfall in ground antiarmor weapons systems. These characteristics limit the flexibility of the MEB in offensive operations and complicate operational planning. Limited armored antiarmor systems hinder the execution of maneuver dependant operations, specifically the envelopment and the penetration. On the other hand, the MEB is well suited for defensive operations and for any operations in restrictive terrain.

The monograph concludes by analyzing how the Advanced Amphibious Assault Vehicle (AAAV) will improve mechanized operations in the Marine Corps. While the AAAV will provide the Marine Corps greater land mobility and firepower than the current mechanized infantry vehicle, its role as an efficient troop transport for an infantry-based force is unchanged. Future Marine forces will retain their amphibious role as well as capabilities in mechanized operations quite distinct from Army heavy units.

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ABSTRACT

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In October 1994, President Clinton announced that 36,000 soldiers and Marines would deploy immediately to Saudi Arabia and Kuwait to counter the threat posed by Iraqi Republican Guard divisions moving south toward the Kuwait border.[1] Within days the Iraqi forces withdrew to the north and the full deployment of American troops was cancelled. The President's actions, however, revealed that once again, our response to threats to our vital interests in the region involved rapidly deploying a mechanized Marine Air Ground Task Force (MAGTF, a generic name for the task-organized forces that actually deploy and fight), as part of a joint force.

Marine forces have often deployed ashore during crises, but the employment of Marine forces in sustained land operations during Operation Desert Storm has touched on sensitivities centering on the Marines becoming a second land army. Many critics of US defense policy argue that this nation can no longer afford redundancies among the services, and that the Marine Corps' mechanized capabilities should be eliminated and the service should be focused solely on amphibious operations.[2]

Whether it is desirable or feasible to limit the Marine Corps to only amphibious operations depends on the answers to three related questions. First, does the Marine Corps need mechanized forces to fulfill assigned roles and missions. If so, are its mechanized forces properly equipped and structured to carry out assigned tasks. Last, do planned improvements to the Marine Corps' mechanized forces adequately address observed tactical shortcomings and also enhance the service's capabilities to fulfill assigned missions.

Answering the first question requires an examination of the legal and historical

basis of the Marine Corps' role in the nation's defense. The Marine Corps' current role as an amphibious rapid response force evolved from the service's role prior to World War II. The Marine Corps' mechanized capability developed later, after the Korean War, as the service sought to retain its relevance when potential enemies adopted Soviet mechanized force structure, equipment and doctrine.

While potential enemies became larger and more mechanized, the size of the Marine forward deployed rapid response forces remained essentially the same. The Marine Corps response to the increased threat was the creation of heavier forces with equipment prepositioned aboard Maritime Prepositioning Force (MPF) squadrons. The first actual test of this concept was the Persian Gulf War, in which all three MPF squadrons were used to equip a corps-sized MAGTF. But the Persian Gulf War fails as a true test of the Marine Corps mechanized rapid response capability because the U.S. had months to build up its forces and to train for a deliberate attack. In the future, a single MPF squadron-resourced MAGTF should be prepared to conduct mechanized operations immediately as part of a joint force. Future enemies, well aware that Saddam Hussein had a much better chance to defeat the coalition if he had attacked their forces during their deployment into the theater, may decide to attack an opposing MAGTF before heavier U.S. Army forces arrive in theater.

Future joint force planners, already comfortable in their knowledge of U.S. Army mechanized forces, may assume that the MPF MAGTF can perform similarly. The MPF MAGTF is equipped and structured much differently because it remains primarily an amphibious force adapted for mechanized operations. The MAGTF may not be able to

perform tasks appropriate for an Army mechanized brigade. To understand the MPF MAGTF's mechanized capabilities it is important to begin by examining mechanized operations. How does one define "mechanized" warfare and forces? What are the purposes of mechanized vehicles? The answers to these questions will provide a common understanding of mechanized fundamentals that will prove useful in identifying how the Army and Marine Corps view mechanized operations. Though their doctrine appears similar, how the two services structure and employ their mechanized forces is very different.

Because the Marine Corps designed equipment to enhance its amphibious assault capability and then adapted it for mechanized operations, some of the equipment, especially the amphibious assault vehicle (AAV), is ill-suited for the mechanized battlefield. The Marine Corps plans to upgrade its equipment. Keeping in mind that amphibious operations are the primary function of the service, equipment improvements may not improve the service's tactical shortcomings in a mechanized environment. Doctrine and force structure also drive equipment design and can compromise potential improvements in mechanized operations. Is the net result a more capable mechanized force, or is there an operational gap between Marine forces and more specialized mechanized forces? Because modernization costs are growing while budgets are shrinking, the Marine Corps may be unable to close that gap and may lose its relevance on the mechanized battlefield.

Prior to World War II the Marine Corps was a small service, subordinate to the US Navy. U.S. Presidents often found it convenient to use Marines to intervene overseas

in support of U.S. interests. Marine forces deployed constantly from 1900 to 1940. Marines in Nicaragua and the Dominican Republic helped enforce law and order and sometimes supervised elections, with the expectations that a credible and popular government would repay foreign debts. Marines protected the Legation in China during a protracted civil war. While the President often preferred to send in the Marines instead of other forces, Marine forces were not always well suited for the mission. In the 1920's, the Marine Corps operated a military government in Haiti without any previous experience in associated civil tasks. The Marines never gained the respect of the Haitians nor did they persuade the Haitians to value a strong and stable government. Within a few years after the Marine Corps departure, Haiti reverted to anarchy.

During the 1920s and 1930s the Marines developed an amphibious assault capability. Recognizing that a war with Japan would very likely involve landing troops on defended island beaches, the Marine Corps invented its unique amphibious doctrine along with the techniques, procedures and equipment to support the doctrine.[3] The amphibian tracked vehicle, or amtrac, was a critical asset developed by the Marine Corps that later became a key component of the service's mechanized capability.

The amtrac was designed as a personnel and logistics vehicle, wholly owned and operated by Marines, to provide the assault waves protection and the ability to climb over reefs during the vulnerable transit from ship to shore.[4] Armored amtracs, mounting anywhere from a 37mm gun to a 75mm howitzer, were also built, and they provided critical fire support before artillery could come ashore.[5] The amtrac was seldom used inland, for the infantry could walk wherever they needed, and amtracs were best suited to

building up the logistics on the beach. Shortly after the war the Marines enclosed the amtrac's cargo/troop compartment and improved its seakeeping abilities, but they did not improve its sluggish performance on land.[6]

While equipment upgrades fell into the doldrums of post-war budget constraints, plans to restructure the military fanned heated debates among the executive branch, Congress and the military services. The struggle resulted in passage of the National Security Act of 1947. Recognizing the post-World War II security needs of the United States, the US Congress reorganized the military structure and redefined the functions of the military services. The Marine Corps was directed to:

> provide Fleet Marine Forces of combined arms, together with supporting air components, for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign.[7]

Rephrased, this function says that Marine forces are composed of ground and air forces, to serve with Navy fleets and conduct operations supporting naval campaigns. A naval campaign is an operation or series of operations designed to gain, maintain or extend control of the sea.[8] Implied in this function, and supported by separate references to primary interest in the development of landing force doctrine, was Marine Corps primacy in amphibious doctrine.

The Marine Corps was also instructed to, "perform such other duties as the President may direct," with the proviso that this and other additional duties were not to detract from or interfere with the primary Marine Corps mission.[9] The phrase, which originated in 1798, is unique among the various services' functions.[10] It reflects the

Presidents' historic use of the Marine Corps to intervene in other countries, without declaring war, when such action was deemed to be in the nation's interests. The Marine Corps names such actions political reinforcement operations. Political reinforcement operations can range from minor actions, such as rescuing American citizens, to preventing the overthrow of a friendly government.[11] These operations pose a dilemma for the President because the Constitution does not state who can authorize military use when war is not declared. Because Congress included the subject phrase in the Marine Corps' functions, the President's legal authority to intervene overseas is less questionable when he uses Marine forces.

The National Security Act of 1947 did not end actions to reorganize the military. During the Truman administration, Congress, the Department of Defense and the services bitterly disputed the authorized strength of the Marine Corps. Central to the discussion was whether a large Marine Corps usurped the Army as the principle force in sustained land combat. One proposed congressional bill, intended as an amendment to the National Security Act, capped the Marine Corps at 400,000 men (such specificity was not contemplated for the other services), preventing the service from becoming a "second" Army.[12] The President eventually signed into law a bill stating that the Marine Corps would consist of not less than three divisions and three air wings.[13] To mollify the U.S. Army and its proponents, another phrase was added to the Marine Corps' roles and missions. It states, "These functions do not contemplate the creation of a second land Army."[14]

Whether the Marine Corps could conduct sustained land operations was not the

issue in these debates, because Marine forces were already conducting sustained land operations in Korea. A decade later Marine forces conducted sustained operations ashore throughout the Vietnam conflict, furthering the US practice of using Marines alongside soldiers in land combat.

By the end of the Truman administration, the functions of the Marine Corps and the Army were, for the first time, established in law. The Army had primary responsibility for the conduct of large scale land operations, and the Marine Corps was to support naval campaigns and maintain forces for use by the President. To the Marines, the latter function meant the maintenance of rapidly deployable crisis response forces. The Marine Corps felt that its amphibious forces were well suited for this role. Because they embarked aboard ships, Marine amphibious forces could forward deploy in international waters for extended periods. They could position themselves near areas of concern, enabling them to insert ground forces into a crisis area within hours, or days at most. Amphibious forces also possessed a forcible entry capability with significant combat power and sustainability. The Army could insert airborne forces in a crisis, but once on the ground they had limited combat power and sustainability. Additionally, airborne forces were vulnerable until other forces could link up and reinforce them.

The Marine Corps reaffirmed its utility as a rapid response force when Marine forces conducted operations in the Middle East twice in the late 1950's. In 1956 a forward-deployed battalion evacuated over two thousand civilians from Alexandria, Egypt during the Egyptian-Israeli War.[15] In 1958, a Marine expeditionary brigade assembled at sea and landed unopposed in Lebanon to support the Chamoun government. In contrast

to the Marine forces' rapid deployability, an Army airborne unit sent in to reinforce the Marine brigade arrived five days late because of delays securing overflight rights.[16] At the time, long range in-flight refueling, a capability that can remove overflight impediments, was not an option.

Structurally, the Marine Corps of the 1950's strongly resembled the foot-mobile Marine infantry of World War II. By 1964, Marine mid-range planners believed that future landing force operations would require more mobile heliborne forces and the tactical flexibility provided by highly maneuverable ground forces landing over the beach.[17] The Middle East, where significant armored forces threatened regional stability, was already a major concern. The Marines, benefitting from their previous experiences in that region, feared that they did not have the tactical mobility needed for desert operations.[18]

The Marine Corps lack of mobility was due to its warfighting experiences, not its fiscal constraints. Its forces did not need mechanized forces in the Pacific islands and the mountainous terrain of Korea. Marines used tanks very effectively in Korea, but as fire support, not as a separate maneuver force. The service did not participate in the World War II European theater, where the modern concepts for using mechanized infantry germinated.

The experiences of the principle adversaries in the European theater of World War II displayed the value of mobile infantry accompanying tank forces. Mounted infantry helped protect tanks against anti-tank guns, cleared obstacles, and helped cover the dead space around the tanks. On the Eastern front, the Germans were very successful when their mobile infantry separated the Soviet infantry from their tanks, and then the Germans

destroyed the tanks with combined arms and armor counterattacks. Out of these experiences evolved the modern concepts for employing mechanized infantry.

One concept had infantry accompanying the tanks, mounted in lightly armed and armored personnel carriers (APCs), then deploying rapidly to fight on foot. Firepower consisted of organic weapons (machine guns, anti-tank weapons, mortars), artillery and air delivered fires. The APC provided mobility to keep up with the tanks, though the infantry had to give up their mobility to dismount and fight. Those still favoring this concept feel that APCs should remain lightly armored, otherwise commanders might be tempted to fight from them, placing the infantry at greater risk. In the defense, commanders might also try to position the vehicle to employ the weapons station, exposing the vehicle and risking the dismounted element's sole source of mobility.[19]

The second concept called for infantry to remain mounted in the close fight, fighting alongside the tanks, but deploying when necessary. Mounted in an infantry fighting vehicle (IFV), the infantry can allow tanks to concentrate on destroying enemy tanks and maintain their momentum by suppressing enemy infantry, destroying opposing IFVs and clearing obstacles. IFVs need a cannon effective against other IFVs and soft targets, an anti-tank capability and substantial armor protection. Firing ports allow the infantry to cover dead space without exposing the men. Since the dismount element seldom deploys or fights like traditional infantry, fewer infantry are needed, allowing more room internally per person and reducing fatigue.[20]

By 1964, many armies acquired APCs to give their infantry better mobility. The US Army began production of the M113 series APC in 1960, and it saw extensive use in

Vietnam.[21] The Soviet Union owned a tracked APC, the BTR-50, since 1954, but by the early 1960s, the Soviets were developing the BMP-1, a true IFV.[22]

The Marine Corps did not have a viable APC in 1964, but it was designing one. A new amtrac, called a Landing Vehicle Tracked Personnel-7, or LVTP-7, began reaching the fleet in the early 1970's. It sacrificed the waterborne performance of the previous amtrac for greatly increased land performance. The LVTP-7 provided better land mobility, a rear ramp to protect the infantry when debarking, a better weapons station, good communications and better visibility for the embarked infantry commander.[23] With a land speed comparable to the M60 tank, the vehicle gave the battalion landing team reliable ground transportation, better land mobility and the means to maintain momentum.[24]

Because the primary role of the Marine Corps remained amphibious assault, the LVTP-7 was designed with characteristics which detracted from its survivability on land. Transporting twenty-five Marines in the troop compartment, the box-shaped LVTP-7 was larger than any other APC. The large troop compartment meant fewer amtracs were needed to get the infantry ashore, providing room on the ships for other cargo. It had aluminum armor, not steel, which reduced both weight and corrosion from salt water, but aluminum suffers greater stress fatigue and is more difficult to repair than steel. The turret mounted an M85 .50 caliber machine gun that often jammed because of a poor ammunition feed chute design. The LVTP-7 kept the versatility of its predecessors by holding a jeep or two pallets of cargo in the troop compartment.[25] Unfortunately, the arrival of the LVTP-7 meant the loss of an assault gun variant and the ability to transport a

105mm howitzer internally, degrading the rapid buildup of firepower ashore.[26]

The Marines improved the LVTP-7 in the early 1980's by giving it a more powerful engine and more shock absorbers, improving its mobility on land. The amtrac, redesignated the LVTP-7A1, also received smoke grenade dischargers and a smoke generating system for protection on land and in the water. But the LVTP-7A1 was only an interim design to fulfill requirements during the 1984 to 1994 period.[27] The Marine Corps realized the vehicle needed better land performance. They began design of the LVT(X), a vehicle that could defeat Soviet IFVs and APCs, vehicles that potentially hostile nations possessed in significant quantities. They also wanted it to have an antitank capability and to survive VT fused artillery rounds of 152mm caliber.[28]

The LVT(X) never made it off the drawing boards, but the LVTP-7A1 continued receiving improvements, bringing it to its current form. Renamed the AAVP-7A1 (Amphibious Assault Vehicle, Personnel), the amtrac was upgraded with an M2 .50 caliber/MK19 40mm grenade launcher machine gun weapons station, armor protection against 14.5mm armor piercing rounds at 300 meters, 155mm artillery air bursts at 15 meters, and better swimming performance.[29] The AAVP-7A1 can survive almost all artillery fire, except a direct hit, providing good protection during Soviet-style artillery fires. The weapons station can defeat older model Russian APCs and IFVs, and it is very effective against deployed soldiers out to two thousand meters. But the vehicle will not survive gun duels with most IFVs, especially if they mount an ATGM system.

Besides upgrading the amtrac, the Marine Corps enhanced its mechanized capabilities with other firepower and mobility improvements. During the 1980's the

service purchased the Light Armored Vehicle (LAV-25), which provided a highly mobile screening force possessing firepower to defeat enemy mechanized assets. In the 1990's the service replaced its aging M60 tanks with M1A1 main battle tanks.

The Marine Corps improved its mechanized assets in large part because of continuing turmoil in the Middle East. The 1973 Arab-Israeli War, which occurred just as the Marine Corps was fielding the first LVTP-7s, proved that the modern mechanized battlefield required mobile, armored, combined arms forces capable of defeating enemy armor, ATGM-equipped infantry, and fixed wing aircraft. The forward deployed Marine battalion landing teams were not equipped properly nor were they large enough to operate successfully against potential opponents in this region.

Further events in the region would force the U.S. to modify its rapid response capability. The U.S. gas shortage following the 1973 war and a continuing series of crises in the Middle East resulted in President Carter declaring US intent to protect freedom of access to the Persian Gulf with force, if necessary.[30] The US established the Rapid Deployment Joint Task Force (RDJTF) in 1979 to support this policy.

Built around the usual rapid response forces, the RDJTF featured a Marine brigade and an Army airborne division. In a contingency, the airborne division and the ten thousand Marines of the brigade would be inserted into the crisis area by air. The equipment and fifteen days of sustainment for the Marine brigade were prepositioned on board commercial-type cargo ships staged at Diego Garcia.[31] The object was to unload the equipment at a friendly harbor near the crisis. Marines would then marry up with the equipment and prepare for further operations. Additional forces would arrive later,

transported by sealift.

The sea based assets, called the Near-Term Prepositioned Ships (NTPS) force, provided the US the heaviest force possible in a short period. Heavy mechanized divisions were preferred because they were better suited to the environment and the threat, but they would take too long to deploy in the region.[32] Afloat Marine forces positioned in the Mediterranean and the Western Pacific were too far away and too small to provide a credible response. Other options included drastically increasing strategic air assets or placing heavy Army units on the prepositioned ships. Neither option was feasible. The Air Force did not possess enough strategic aircraft to quickly move the heavy equipment, and an Army mechanized brigade required more ships than the lighter Marine brigade. The Marine brigade, with its 53 tanks, 95 amtracs and 36 howitzers, was the best deterrent force available until heavier forces could arrive.[33] However, the NTPS did not have a forcible entry capability. To succeed, the NTPS needed a protected port and airfield. Either a friendly nation near the crisis provided those or traditional crisis response forces, such as a MAGTF or airborne force, secured the port and airfield until the Marine Brigade could begin operations.

The crises in the Middle East underscored the problems Marine forces would face in a mechanized conflict. The Marine forces were more deployable than heavier Army forces but did not possess the mobility or direct firepower of the Army heavy brigades. They would be at a distinct disadvantage fighting the fully mechanized forces of the Soviets or one of its client states.

In the mid 1980s the Maritime Prepositioning Force (MPF) replaced the NTPS,

and was used in the initial response during Desert Shield. The MPF consists of three Maritime Prepositioning Squadrons (MPS), each containing equipment and thirty days' sustainment for a reinforced Marine expeditionary brigade. The four or five ship squadrons are based separately in the Atlantic, the Pacific and the Indian oceans, but together they can support a division-sized ground force and a reinforced air wing. When ready for operations ashore, each brigade has 17,300 Marines, 30 M1A1 tanks, 109 AAVs, 30 howitzers and about 124 rotary and fixed-wing aircraft.[34] Within a few years, when acquisition is nearly complete, the squadrons will have 58 M1A1s each, enough to field a complete battalion.[35] The MPF squadrons provide greater flexibility than the NTPS, because they can unload at unimproved beaches far from port facilities, and they can selectively off load to support a variety of contingencies.

The Army also uses maritime prepositioning to enhance the rapid buildup of a mechanized force. Since Operation Desert Storm, the Army has placed the equipment and supplies for a balanced heavy brigade and essential requirements for theater infrastructure aboard 16 ships stationed in the Indian Ocean and at Guam. The Army Prepositioning Afloat (APA) squadron is not a direct challenge to the rapid response capabilities of the MPF squadrons. Neither the APA nor the MPF has a forcible entry capability; their purpose is to enhance the build up of combat power. The APA has more limitations than the MPF squadrons, and therefore it is better suited as a building block for building large, heavy divisions. Because of ship design and a limited quantity of causeways, the APA ships must unload at deep draft ports, precluding deployment of the brigade across an austere beach. The APA ships are administratively loaded, not combat loaded, so

selective off loading is not an option. With only a few pierside berths available, it will take much more time to unload the Army brigade than the Marine brigade. Each MPF squadron is logistically practically self sufficient and each squadron contains over five million gallons of bulk fuel that can be pumped onto land from two miles offshore. The Army ships contain only one million gallons, which means the Army brigade will quickly need additional fuel for sustained operations.[36] In a contingency requiring the rapid buildup of combat power, joint force commanders will probably insert a MPF based MEB before off loading the Army's afloat brigade, because the Marine brigade can stand up faster and is self sustainable for thirty days.[37]

The Marine Corps mechanized capability resides in the squadrons of the MPF. MEUs (Marine Expeditionary Units), the Marine's forward-deployed crisis response forces, are organized around an infantry battalion and are too small for mechanized operations. The traditional Marine Expeditionary Brigade (MEB), the next larger MAGTF, require time to organize and load onto ships, not to mention time to travel to the crisis area. The 4th MEB, deploying from North Carolina to the Gulf of Oman during the Gulf War, took 38 days from the date of notification to arrival in theater.[38] MEBs also lack sufficient mobility and armor to be an effective mechanized force. The MEB only has one battalion fully mechanized out of three, and only one tank company.[39] MPS resourced MEBs will probably be used to face a mechanized threat because they have a more robust mechanized capability. The MPS resourced MEB has a tank battalion and AAVs to mechanize two infantry battalions. Further analysis of the Marine Corps' mechanized capability, and an understanding of what the Marine Corps means by mechanized, requires

closer examination of these afloat brigades. First, the term "mechanized" must be clearly defined and understood.

The Army and the Marine Corps use different terminology for mechanized operations. The differences reflect the distinct, though somewhat overlapping, functions of the two services, and the different concepts affect how they organize their forces and conduct operations.

When and where the term "mechanized" came from is hazy. One author suggests the term originated shortly after the British experimented with the newly developed tank in World War I. Nations had used trucks to move infantry behind the front lines in the Great War. After the war, Heinz Guderian experimented with using *mechanical* transport to move infantry into combat, thus giving rise to the term "mechanized."[40] The Germans demonstrated the value of mechanized infantry by their successes in World War II operating against Soviet tank forces on the Eastern front. Soviet offensives stalled repeatedly when their tanks were separated from the supporting infantry. The Germans would then attack and destroy both forces with combined arms.[41]

For clarification, mechanized terms generally revolve around infantry mounted in tracked vehicles with varying degrees of armor protection. The words "mechanized" and "armored" are used interchangeably when referring to forces with tanks and mechanized vehicles operating together.

The US Army's definition of "mechanized" can be deduced from doctrinal publications. The initial draft of FM 71-100 describes the heavy divisions as follows:

> The US Army's armor and mechanized divisions provide mobile,

> armor-protected firepower. [They] . . . are normally employed for their mobility, survivability, and psychological effect (shock) on the enemy . . . . These divisions destroy enemy armored forces and seize and control land areas and key terrain . . . Using mobility for rapid concentration to attack, armored and mechanized forces defeat an enemy while economizing forces in other areas.[42]

FM 71-3 states the mission of the mechanized brigade, " . . . is to close with and destroy enemy forces using its mobility, firepower, and shock effect. It defeats enemy assault by defensive fires, obstacles, and counterattacks."[43]

Furthermore, tank and mechanized brigades do not act independently. They conduct sustained operations in all environments, accomplish rapid movement and deep penetrations, and they exploit success and pursue as part of a larger formation.[44]

The preceding statements reflect well-known facts. The Army's mechanized forces are permanently structured units designed specifically for sustained, mobile operations against a mechanized enemy. Mechanized operations are conducted at the division level or higher. The Army does have separate mechanized brigades and cavalry regiments, but they normally operate in support of corps operations. Emphasis in the Army is on large numbers of tanks and mechanized vehicles to provide the combat power needed to defeat large enemy forces. Mechanized infantry are specially trained to fight alongside or integrated into pure tank forces.

The Marine Corps has a different view of mechanization. The service has defined certain mechanized terms as follows:

> Mechanized force - A task-organized, ground combat force of combined arms built around an infantry or tank unit, reinforced with substantial assault amphibious assets.

Mechanized infantry- A task-organized force of Marine infantry mounted in AAVs which are employed in conjunction with tanks.

Mechanized operations- A tactical operation designed to maximize the ground mobility, protection, shock action, and firepower of the force to concentrate combat power rapidly against the enemy. Combat power is generated by the massed employment of tanks and enhancing the mobility of other forces through the use of AAVs, or APCs and IFVs and other ground mobility means.[45]

The Marines organize into MAGTFs for operations. The MAGTF is not designed to fight a specific threat, rather to provide a general purpose force that can conduct a landing and address a wide range of threats. Mechanization is a temporary condition. Whereas the Army structured itself to fight sophisticated Soviet bloc forces in Europe, the Marines see potential opponents having varying degrees of mechanization, influenced by Soviet doctrine. As stated in FMFM 2-11, Marine expeditionary forces must trade off heavy armored forces to retain strategic mobility. The MAGTF commander knows he is likely to face a superior mechanized force, so he depends heavily on combined arms and the doctrine of maneuver warfare to defeat the enemy rather than on the combat punch of large armor formations.[46] Air power, especially fixed wing close air support, is, therefore, much more important to the Marine commander than to his Army counterpart. The Marine Corps' description of mechanized operations may be very similar to the Army's, but Marine forces are not structured or equipped to fight like the Army.

While the preceding comparisons yield distinct differences between the Army and the Marine Corps, the doctrine for employing those forces is very similar. Maneuver warfare, as defined by the Marine Corps, " . . . seeks to shatter the enemy's cohesion

through a series of rapid, violent, and unexpected actions which create a turbulent and rapidly deteriorating situation with which he cannot cope."[47] The US Army developed the AirLand battle doctrine to defeat Soviet forces in Europe. That doctrine is best expressed in the 1986 version of FM 100-5:

> "Air-land battle tactical offensives are rapid, violent operations that seek enemy soft spots, rapidly shift the main effort, and exploit successes promptly. The attacker creates a fluid situation, maintains the initiative and destroys the coherence of the enemy defense."

The underlining has been added to highlight similarities between the two doctrines. Both doctrines emphasize avoiding the enemy's strengths, and attacking his weak points with a tempo he cannot match. Both depend on superior mobility and intelligence collection while denying the enemy the same. How the two services carry out this doctrine depends on their equipment and their force structure. The ensuing analysis will examine an Army APA-resourced balanced heavy brigade and a Marine MPS-resourced MEB.

The Army's mechanized brigade is well suited for offensive operations because it has an abundance of mobile armored, tank killing systems, and is designed to destroy the enemy using organic, direct fires. The brigade's direct firepower resides in the M1A1 tanks and Bradley infantry fighting vehicles of the maneuver battalion task forces. The M1A1, with its rapid firing 120mm cannon and storage for 40 rounds of ammunition, is specifically designed to destroy mechanized vehicles. When fired, a tank rounds' time to impact is almost instantaneous. Once within firing range the M1A1 can quickly engage and destroy multiple targets while on the move. The M1A1 is hard to destroy unless it gets a direct hit from an antitank round.

The Bradley infantry fighting vehicle also contributes with direct firepower. The Bradley has a TOW ATGM system and a stabilized cannon for medium armored threats, and small arms ports for all around security. Six dismounts ride in the back. It keeps up with the M1A1 tank better than any other IFV or APC. Unfortunately, the Bradley has a relatively large signature compared to the Soviet BMP, making it an easy target to spot and hit when stationary. Because of its speed and armament, the Bradley is hard to engage when it is moving. The Bradley crew has a good chance of returning accurate and deadly fire with the 25mm chain gun, making the Bradley a good offensive mechanized vehicle, especially when employed alongside the M1A1 tank. The 3750-meter range of the TOW missile makes the Bradley an effective tank killer when the Bradley is outside the tank's main gun range, but TOWs have a long time of flight. If the targeted tank is within its own main gun range and fires back immediately after being engaged, the tank can kill the Bradley and deflect the TOW missile. The seven TOW rounds on board signify that the TOW is only a supplementary weapon meant to give the Bradley a limited antitank capability.

Indirect fires enhance the mobility and firepower of the brigade by suppressing defensive positions, destroying command and control assets and opposing batteries. The M109A2 155mm howitzer is armor protected and self propelled, allowing it to fire more rounds than towed artillery before displacing to a new firing position. The M109's mobility means that it can move close behind the maneuver forces, increasing its range and responsiveness over towed artillery. The Army also possesses the Multiple Launched Rocket System (MLRS), which provides accurate and lethal firepower well beyond the

standard range of 155mm artillery pieces.

The brigade does get some support from Air Force fixed wing aircraft. Since the Air Force prefers conducting interdiction beyond the fire support coordination line, not close air support (CAS) for the maneuver task forces, the brigade will not get many sorties. The AH-64 Apache attack helicopter may occasionally support the heavy brigade. A potent armor killer, the Apache has a very good night capability and can carry up to 16 Hellfire missiles. The fire and forget HELLFIRE has a range of 5000 meters and it is terminally guided to the target by laser. The Army normally uses the Apache as a separate maneuver element under control of the divisional aviation brigade, not divisional heavy brigades.

The maneuver battalions of a balanced heavy brigade include two tank battalions and two mechanized battalions. The brigade commander will normally task-organize by cross attaching companies between the tank and mechanized battalions. Figure 1 is an example of a task-organized brigade. All four task forces are fully mechanized with varying degrees of firepower. Three task forces have tanks for offensive operations against mechanized forces. The fourth battalion, because of the firepower of the Bradley, can also assault enemy mechanized infantry and has TOWs for protection against tanks.

Commanders use mechanized forces to execute one of the five forms of maneuver: the envelopment, the penetration, the turning movement, the frontal assault and the infiltration. The envelopment, the penetration, and the turning movement exemplify the tenants of AirLand battle doctrine, because these forms of maneuver depend on rapidly concentrating combat power at a point of relative enemy weakness to disrupt enemy

US Army balanced heavy brigade

Task Organized

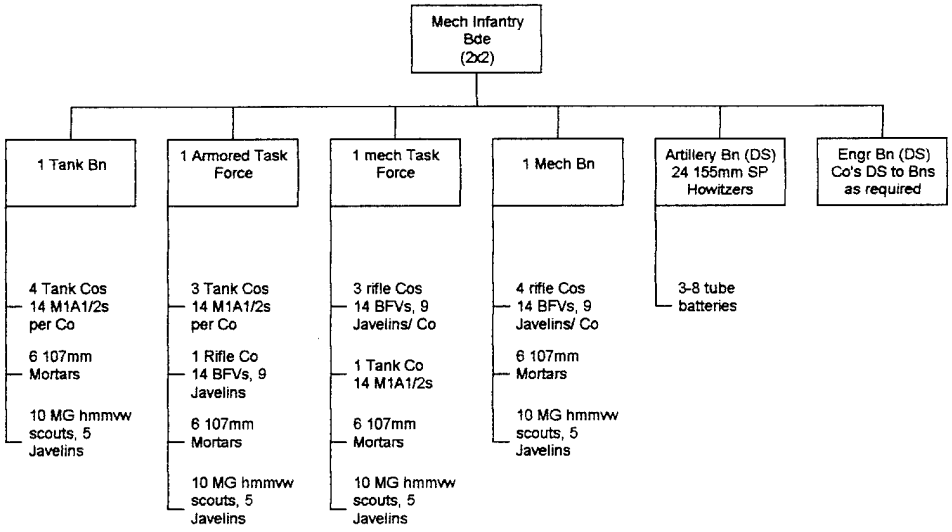

Figure 1.

defenses. The firepower, mobility and shock action of the four task forces make the brigade particularly well suited for the envelopment and the penetration. Only size hinders the brigade from executing a turning movement, a mission normally assigned to divisions or corps.[48]

In the envelopment, the brigade commander can weight the main effort with the preponderance of his tank firepower and still keep a mechanized task force, with its tank company, in reserve to respond to enemy counterattacks or exploit success. Bradleys help maintain the momentum by maneuvering against the enemy until tanks or long range ATGM fires force the Bradley to fire the TOWs. Even when stopped, the dismount element normally remains inside so the vehicles can move rapidly, avoiding enemy fires.

Because of the long range firepower of Bradleys and tanks, the task forces will try to defeat the enemy between 1500 and 3500 meters, before the enemy can mass his firepower.

A penetration requires a force to conduct a supporting attack, fires to isolate the point of penetration, a force to rupture the enemy defense and hold the shoulders, and a force to pass through to attack and seize the objective. The brigade commander might have the mechanized battalion conduct the supporting attack while the armored task force ruptures the enemy defense. He can then pass the tank battalion and the mechanized task force through the gap to assault the objective. Artillery fires and MLRS can help isolate the objective while the M1059 smoke generating M113 APC, found in the supporting smoke platoons, helps screen actions at the point of penetration. The brigade commander has enough combat power to increase his flexibility by forming a reserve of one tank company from one of the two armor heavy forces.

The brigade is not well suited to conduct an infiltration. This form of maneuver depends on covert movement of large forces by multiple routes through enemy lines, a task appropriate for traditional infantry, not mechanized vehicles. Dismounted, the mechanized infantry regain covert movement, but otherwise they lack the organization and organic firepower required for large scale, independent missions. Further on, the discussion defensive tasks will elaborate on the limitations of the dismount element.

Though fire support is important to the brigade, the brigade commander expects to defeat the enemy with his abundance of direct fire weapons systems. Artillery and mortar fires can help reduce enemy positions, isolate part of the battlefield by concentrating fires

at choke points, and provide smoke to screen operations. The brigade will use fixed wing aviation sparingly because priority for air is interdiction, not CAS. Neither artillery nor fixed wing aircraft will be the primary armor killer. The attack aviation battalions can be a decisive force on the battlefield, but they will normally not support a brigade.

In the defense, the brigade is a formidable opponent. Dug in, the mechanized vehicles are difficult to kill and can deliver accurate, sustained long range fires, making it difficult for the enemy to close within their effective weapons range. Dismounted infantry can protect the Bradleys from opposing infantry, and they also can fire Javelins and AT4s at mechanized vehicles. The brigade can often keep the tank battalion in reserve, since Bradleys can kill enemy tanks 1500 to 3500 meters distant, before receiving accurate counterfire. The task forces are particularly suited for delay operations, for they can pull back to alternate delay positions before becoming decisively engaged.

The brigade is not suited to operations in restricted terrain. Dismounted infantry is organized around the platoon, composed of two nine-men squads. The doctrinal manuals discuss dismounted operations only in terms of platoons; they do not contain recommendations for coordinating attacks by multiple platoons, or how to best structure the three platoons in an integrated defensive position.[49] The company commander does not own any other weapons beyond those of the squad or the vehicles, such as medium machine guns or mortars. A well organized enemy infantry battalion attacking over restricted terrain would be a serious threat to the fragmented defense of the dismounted platoons.

To summarize, the Army designed the mechanized brigade for mobile operations

that are at the heart of the AirLand battle doctrine. The brigade can effectively defend or delay, then quickly transition to offensive operations. The brigade is ill suited for operations in restrictive terrain. With the analysis of the mechanized brigade complete, the MEB can be examined, allowing for comparison of the two organizations.

As discussed earlier, the MEB's doctrine for mechanized operations, maneuver warfare, is similar to the Army's AirLand battle doctrine. But the similarity goes no further, for the Marine Corps executes maneuver warfare much differently than the Army executes the AirLand battle. The Marine equipment and organization for amphibious operations, distinct from Army heavy forces, present certain operational dilemmas that the Army brigade commander never faces. Whereas the brigade is totally mobile with an abundance of armored tank killing systems, the MEB lacks complete mobility and direct firepower. Marine commanders, with far fewer armored tank killing systems but with significant CAS sorties, will depend on the close integration of the latter to support maneuver much more than Army counterparts. The Marine commander also commands a sizable infantry force riding helplessly in inadequately armed AAVs, hindering the conduct of mobile offensive operations.

The one mobility asset that the MEB has in common with the brigade is the M1A1 tank. As in the Army, the M1A1 is the principle tank killer. Unlike the Army, the brigade cannot maximize on the M1A1's mobility because no other asset of the maneuver battalions can keep pace with the M1A1 traveling cross country. Additionally, the MEB commander can seldom mass his armor for offensive action. Because the mechanized battalions do not have a protected antiarmor weapons system, the MEB commander must

often disperse his tanks among the battalions. In Army mechanized battalions, the Bradley provides antiarmor firepower. The Marines do not possess a comparable asset. Instead, the infantry uses the AAV.

The AAV has already been partially described. It is clearly an APC, implying that mechanized Marine forces will frequently dismount to fight as traditional infantry, unlike soldiers riding in the Bradley. Because the AAV is an ocean-swimming vehicle adapted for use as an APC, and because it has an inadequate weapons station, it is a poor offensive mechanized vehicle. Amphibious design requirements resulted in a vehicle with design flaws not possessed by other APCs. The final drives, located at the front of the AAV instead of the rear, make it difficult for the driver to keep up with the tanks in rough terrain without damaging the drive system. Lacking mobility, mechanized vehicles depend on a low silhouette to maximize terrain masking for direct fire protection. Unfortunately, the AAV is larger than any other APC because it carries twenty Marines besides the crew.

The AAV weapons station seriously hinders the conduct of offensive operations. When the AAV is moving, the unstabilized turret can only engage area targets, not vehicles. The turret's weapons can only kill lightly armored vehicles, not tanks. When stationary, the vehicle's .50 caliber machine gun can hit moving vehicles out to 2000 meters. The MK19 grenade launcher, primarily an area weapon, can hit stationary vehicles out to 2000 meters with practice, but it is useless against moving vehicles because of the rounds' long flight time. Maneuver is also affected by the turret's location. Mounted on the vehicle's right side, the turret cannot easily cover the left side of the vehicle, where the fuel tank is found. If the enemy fires an ATGM at the AAV from the

left flank, the crew may not have time to turn the AAV, identify and suppress the threat before being hit.

The Marine Corps addresses its shortage in ground antitank systems by using armored HMMVWs mounting TOW missile systems. This system does not overcome the mechanized battalion's limitations conducting offensive operations. Though the TOW missile has a range of 3750 meters, the TOW equipped HMMVW is very vulnerable to direct and indirect fires. The vehicle has limited value in the offense unless it can fire the TOW from positions beyond enemy direct fire, and the HMMVW is not receiving indirect fire.

Even the artillery used by the Marine Corps is less capable than Army systems. The Marine Corps acquired the M198 towed 155mm howitzer because it takes up less space aboard ship and amphibious forces can bring it ashore faster than self-propelled artillery. It is also transportable by helicopter. Although it fires the same types of rounds as the M109, the M198 will not fire as long as the M109 because of the danger to the exposed crew and ammunition trucks from counterbattery fires, as well as the increased time needed to physically emplace the howitzer. The M198 can be less responsive than the M109 because the trucks that pull it lack the mobility of tracked vehicles. The Marine Corps also does not possess the MLRS for long range artillery support.

Where Marines have an advantage over soldiers is that the Marine Corps owns its close air support aircraft. As a result, Marine fixed wing air support will generally be more responsive and of greater quantity than what the Army receives from the Air Force. Primary CAS systems are the F/A-18 Hornet and the AV-8B Harrier. While they are

susceptible to air defense weapons and require extensive coordination, fixed wing aircraft can overcome artillery limitations.

The Marines also have the AH-1W Cobra attack helicopter. Though not as capable as the Apache, battalions will have Cobras in support even when fixed wing air is not available. Capable of carrying eight Hellfire or TOW antitank missiles, the Cobra is controlled like CAS aircraft. The infantry company commander designates targets via the forward air controller (FAC). The Cobras usually fire rising up from hide positions near the forward line of troops, instead of flying deeper into enemy territory where antiair fires are more likely. Marine Cobra squadrons normally remain in support of the GCE and are not assigned separate missions.[50]

The Marine Corps possesses one other asset with an important role on the mechanized battlefield. The Light Armored Vehicle (LAV) is an eight wheeled armored vehicle acquired in the 1980's to provide mobility and firepower to the reconnaissance effort. Whereas the Army brigade has no organic screening force beyond the assets in the maneuver battalion, The GCE will rely on LAV units and on specially trained dismounted reconnaissance teams, frequently inserted by air. This gives the GCE a potent reconnaissance force that can operate in many environments, without having to strip assets from subordinate battalions. The main variant of the LAV mounts a 25mm chain gun similar to the Bradley, but there are also TOW-equipped antitank, mortar and command and control variants.

Before continuing, it is necessary to understand how the MEB commander would doctrinally organize the assets of the MPS and the fly in units. The MEB is structured with

Marine Expeditionary Brigade (MPS)

Ground Combat Element structure

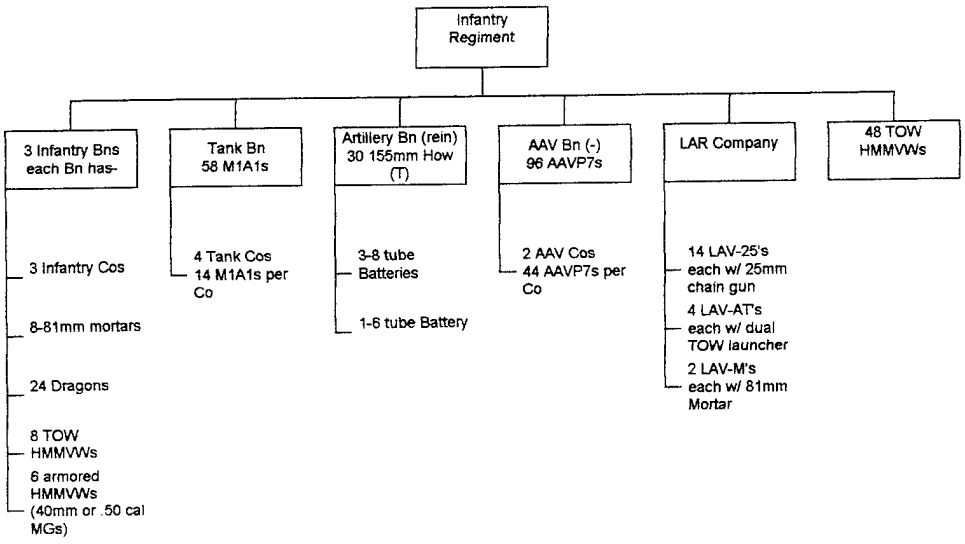

Figure 2.

a command element, a ground combat element built around a Marine infantry regiment, an aviation combat element and a combat service support element. Aviation support includes 36 F/A-18s, 20 AV-8Bs, 18 AH-1W Cobras and enough lift helicopters to lift one infantry battalion.[51] When the MEB is fully deployed, the MPF squadron provides the infantry regiment commander, dual-hatted as the GCE commander, all the assets depicted in Figure 2. 48 of the 72 TOW HMMVWs available will likely remain at the port waiting use by follow on units. TOWs are a regimental asset, and the regiment has crews for 24 vehicles. Manning the extra 48 vehicles would require stripping TOW crews from other regiments and is unlikely. The same holds for the battery of six 155mm (T) howitzers. They exceed the allowance of any artillery battalion, and the guns would probably await

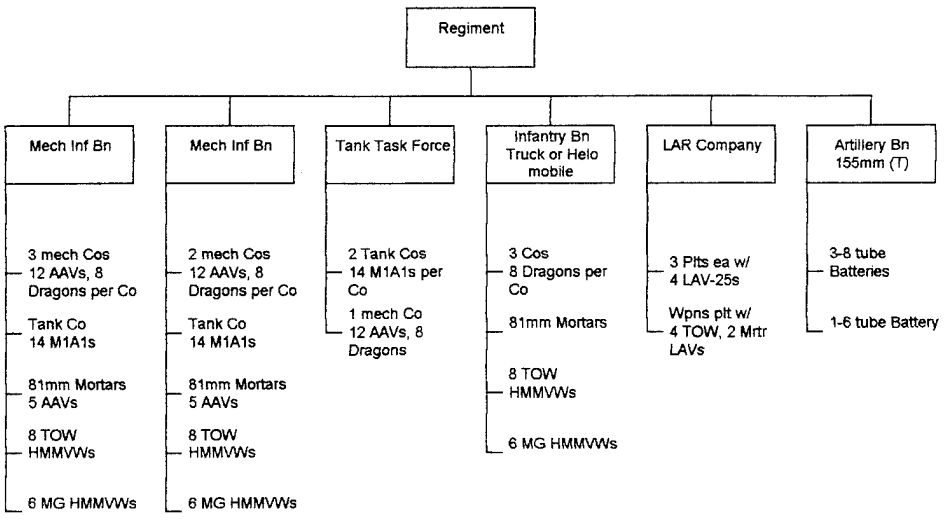

Figure 3.

follow on forces, or become war reserve.

As mentioned earlier, a MPS-resourced MEB has limited mobility and antiarmor capabilities compared to an Army brigade, though greater mobility than other types of MAGTFs. The AAVs are sufficient to mechanize two of the regiment's three infantry battalions, and the third battalion can be either motorized or heliborne. The GCE commander must decide how best to organize his forces to meet the threat. Figure 3 represents a common task organization of the regiment when facing an armored opponent. The GCE commander's planning is constrained because of the inherent limitations of hisinfantry forces. Further analysis requires a closer look at the mechanized infantry battalion.

Marine Infantry Battalion

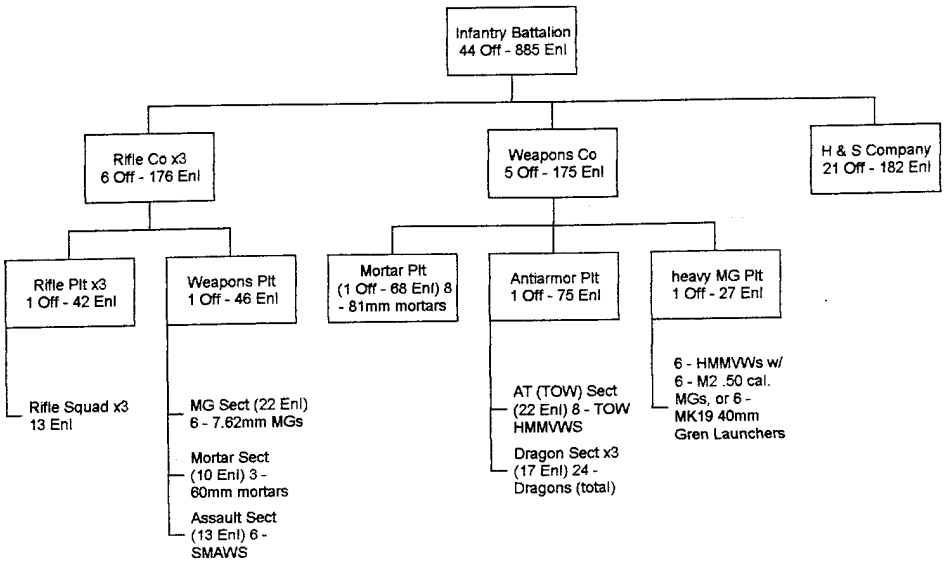

Figure 4.

A mechanized Marine infantry battalion is formed by attaching an AAV company. The infantry battalion by itself is large, with over 900 men in five companies, as depicted in Figure 4. Except for the eight TOWs and the mortars, the battalion's weapons ranges are limited to about 2000 meters. The battalion has little inherent mobility, except for the HMMVW-mounted TOWs and the heavy machine gun platoon. The AAVs' MK19's and .50 caliber machine guns greatly increase the battalion's firepower at ranges up to 2000 meters.

A Marine mechanized infantry battalion attacking a mechanized enemy in the defense has significant limitations when tanks are not attached, because AAVs provide little offensive firepower against armored vehicles. The battalion commander must attack

deliberately, relying on air and artillery to suppress or destroy enemy armor and antitank systems before closing to direct fire range. Without tanks, the lead company commander must suppress enemy positions or screen with smoke until he can range the enemy position with HMMVW equipped TOWS. Unfortunately, the Marine Corps does not own mobile smoke-generating assets other than tank and AAV smoke generators, so the company commander will rely on artillery for smoke missions. This causes the company commander to suppress targets with air power, thereby complicating fire support coordination and effectively slowing down the offense.

As mentioned earlier, TOWs are vulnerable to all incoming fires. If TOWs are used offensively, enemy fire will likely suppress or destroy them. If the TOWs are destroyed, the company only has aviation, artillery and twenty four Dragon antitank weapons with which to engage enemy positions. The ground mounted Dragon is a poor offensive weapon because the firing team has to dismount the AAV, exposing the Marines to indirect fire and stopping the advance. The Dragon is a very slow moving missile, giving the enemy time to spot it and suppress the gunner. Dragons are limited to a 1000 meter range and stand little chance of defeating modern tanks. The Marine Corps will begin replacing the Dragon with the Javelin Advanced Antitank Weapon System-Medium (AAWS-M) in the near future. The Javelin has a 2000 meter range and a top attack option. Its most significant advantage is that it is a fire and forget weapon, allowing the gunner to quickly engage multiple targets or seek cover immediately after firing.[52] The Javelin will significantly improve the antitank capability of the Marine battalion, but its employment will still inhibit maintaining the tempo desired for offensive mechanized

operations.

If the company commander must rely heavily on supporting fires during offensive operations, Marine fire support coordination techniques are effective but extremely hazardous. The infantry company commander normally coordinates fires from his AAV, designating which fire support asset will engage each enemy target. His fire support team incudes artillery and 81mm mortar forward observers, a forward air controller, and possibly a naval gunfire liaison team. The observers ride in the back of the company commander's AAV along with their radio operators. To observe targets, they must stand on the bench seats with the top cargo hatches locked in the open position. This method allows for close coordination by the company commander, but it exposes the Marines to artillery air bursts, including nuclear and chemical fires. The company is further at risk because most of the key personnel are in one vehicle. The commander's AAV is easily distinguishable because it must be positioned forward to observe the battlefield and, with the cargo hatches open and extra radio antennas and the fire support team exposed, the AAV has a unique signature.[53]

The limitations cited above are reasons why tanks are critical to the success of the mechanized battalion. Figures 5 and 6 illustrate two ways to configure a battalion with a company of tanks attached. The examples assume that the battalion does not detach a mechanized company to the tank battalion, giving the battalion commander four maneuver elements. Since the battalion normally only has three companies, giving it four maneuver elements may seem to exaggerate the battalion's capabilities. In fact, it points out the constraints battalion commanders operate under. If the battalion commander wants to

Task-organized Marine Infantry Battalion

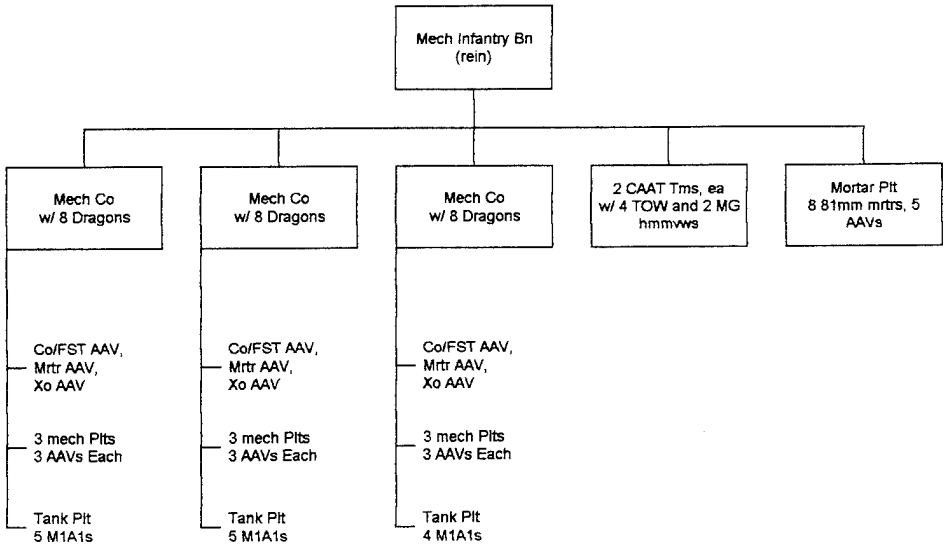

Figure 5.

provide each mechanized company protected antiarmor firepower, then he must strip the tank company, attaching one platoon to support each company. He cannot maintain a tank heavy fourth company to provide an armored punch or to counter enemy armored penetrations. As shown in Figure 6, the commander can give a platoon of tanks to one mechanized company and still keep a tank heavy force, but one of the two companies leading the attack will be bereft of tanks, unless the tank heavy company and the tank reinforced mechanized company lead.

The Marine mechanized battalion is better suited for defense of a battle position than offensive operations. Company commanders can direct supporting arms more effectively by dismounting from the AAV along with their fire support teams. The

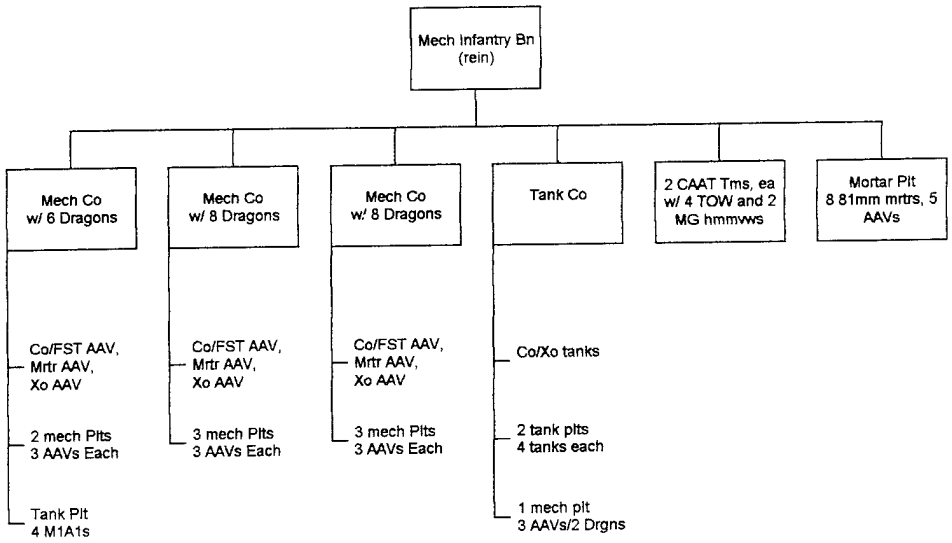

Figure 6.

HMMVW TOWs, when fired from defilade and supported with alternate and secondary firing positions, are more survivable than when in the attack. Fixed and rotary wing aircraft can assist by attriting the advancing enemy mechanized force and by causing him to deploy. When the enemy closes to within a 1000 meters (2000 meters with the Javelin), the Dragons can strike at tanks while the AAVs and the heavy machine guns disable or destroy APCs and soft targets. The Marine squads and mortars can engage the deployed enemy infantry, separating them from their vehicles. The battalion commander can place two or three mechanized companies in battle positions and retain the tank company for counterattacks.

The biggest drawback to a positional defense is the greater time it takes Marines to

establish such a defense when compared with a similarly organized Army mechanized task force. Additionally, the Marine defense cannot be as quickly reoriented. The infantry must dismount from the AAVs, establish and dig in firing positions, develop a fire plan that integrates supporting fires and the fires from the AAVs, tie in or refuse the flanks, etc. Each rifle company commander must position 120 Marines in the line platoons as well as mortars, machine guns and AAVs. An Army company commander only positions fourteen fighting vehicles, and his vehicles can rapidly displace or transition to the offense. Reembarking twenty Marines into an AAV is a slow process that hinders displacement. Because the AAV lacks an antiarmor weapons system, it cannot defeat advancing enemy armor, and the infantry are at great risk while reembarking. A mechanized Marine battalion is good at establishing a fixed defense given time, but time may not be available when facing a fast moving mechanized force.

How does the battalion's limitations affect the actions of the GCE commander? Recall that the tank battalion will likely provide tanks to the mechanized battalions, diluting the combat power of the tank heavy task force. The regiment will then consist of three mechanized battalions: one with three mechanized companies and a tank company (the organization previously discussed), one with two mechanized companies and a tank company, and one with two tank companies and one mechanized company. The non-mechanized fourth battalion seriously constrains the mobility of the GCE and complicates tactical plans. Planners must determine whether to the battalion should move dismounted or by trucks or helicopters. The fourth battalion is also of marginal utility against a mechanized opponent. Without armored mobility, the fourth battalion is limited to

heliborne operations, operating in restricted terrain, or establishing a static defense. Frequently the battalion is assigned a reserve role, freeing mechanized forces for offensive tasks and reducing the extensive planning required to integrate the battalion in offensive operations.

Compared to an Army brigade, offensive operations by the GCE will be slower, limited by mobility and a dearth of direct antiarmor firepower. Enemy defenses will be breached deliberately with the emphasis on close integration of fire support assets. Air will play a key role, and it may be expected to defeat enemy counterattacks or buy time until ground forces can respond. To employ all of his assets, the GCE commander may have the heliborne force seize key terrain, followed by a linkup operation.

More specifically, the MEB cannot conduct the forms of maneuver in the same manner as the Army brigade. The difficulties the Marine commander faces when he organizes his forces to conduct an envelopment or penetration underscores the importance of tanks, the limitations of the AAV, and the value of a mechanized fourth battalion. Arming the AAV with an antiarmor weapon would help immeasurably, because the GCE commander could designate a tank heavy force as the main effort knowing his remaining battalions have a significant protected long range antiarmor capability.

When the GCE commander task-organizes for an envelopment, he takes greater risks than his Army counterpart. The commander will have to decide where to place his tanks. The enveloping force will almost certainly be the tank task force, possibly reinforced by a mechanized battalion. This leaves one mechanized battalion conducting the supporting attack with the fourth battalion (non-mechanized) either assisting the

supporting attack, in reserve, or conducting a heliborne assault to seize key terrain. The reserve, ideally a mobile force with tanks, is without them, unless a mechanized battalion detaches its tank company, or a mechanized battalion stays in reserve. If a mechanized battalion detaches its tanks to support the reserve, then that battalion is vulnerable to armored attacks. If a mechanized battalion stays in reserve, then the envelopment may not be sufficiently strong to achieve its purpose, or the supporting attack has to be weakened, lessening its prospects for success.

One might argue that comparing the MEB to a balanced brigade isn't fair because the brigade owns a second tank battalion. Even with two mechanized battalions and one tank battalion, the Army brigade commander has fewer concerns than his Marine counterpart. He can still envelope with an armored task force and keep a tank company in reserve knowing that, with the Bradleys, the mechanized battalions possess significant antiarmor firepower.

The penetration also requires a more careful allocation of resources and a measured degree of risk. A likely course of action for the GCE is for one mechanized battalion to hold the front while air and/or a heliborne force isolates the point of penetration. A mechanized battalion ruptures the defense and holds the shoulders, permitting the tank task force to assault through and seize the objective. The reserve might consist of a heliborne or mechanized infantry company or a tank company from one of the mechanized battalions. If not heliborne, the infantry battalion could assist holding the front line or become the reserve, possibly freeing up a mechanized/tank company. The weakness in this plan is that the tank task force may not be robust enough, especially since

it is assaulting the objective without another ground force reinforcing it. By substituting the 8 TOW HMMVWs of the motorized battalion for the tank company from the larger mechanized battalion, the tank task force can get another tank company. But this fix seriously degrades the antitank capability of the motorized battalion, lessening its value as a reserve force. One of the mechanized battalions would also be without tanks, hindering its effectiveness, especially if counterattacked. Again, the GCE commander's options are degraded because he has limited antiarmor firepower.

As opposed to the Army brigade, Marine mechanized forces are particularly well suited for infiltration because the mechanized battalion can detach the AAVs and tanks and revert to basic infantry, which are ideal for covert movement. Once the battalion has infiltrated, it can seize assigned objectives, possibly in conjunction with the heliborne battalion. This disruption of the enemy's defense may provide opportunities to assault with the tank task force and the other mechanized battalion to link up with the dismounted battalions, or attack mechanized forces responding to the infiltrating force. CAS can greatly increase the staying power of the infiltrating force.

Employed in the defense, the GCE is as potent a force as an Army brigade, but the GCE may have less flexibility because it is more static in the defense. Only the positional defense is applicable here, because a MEB will not normally perform a mobile defense unless it is part of a larger force.[54] The portions of the battle framework of greatest concern to the maneuver battalions are the security area and the main battle area. Reinforced, the LAI company can conduct guard or screening missions in the security area. Such reinforcement may be limited to air and artillery, allowing the battalions to

retain all their combat power. The Army brigade, short dedicated reconnaissance assets, has no choice but to task his battalions for this mission.

The GCE has good flexibility in the main battle because it can defend in restricted terrain. If needed, one or both of the mechanized battalions can detach their AAVs and tanks and defend in restricted terrain alongside the third infantry battalion. For unrestricted terrain the GCE has three mechanized forces available for forward defense and for reserve and counterattack missions. If the GCE commander reinforces the mechanized battalions with tanks, he cannot weight the reserve with armor. Because the battalions are slower reorienting their defenses than a faster moving mechanized opponent, the opponent may quickly gain the initiative by penetrating or enveloping the Marine position. The GCE commander will likely count on air power to attrit and disorganize enemy mechanized forces enveloping or penetrating friendly positions and buy time for ground forces to reorient and stop the enemy attack.

While the MEB has limitations in mechanized operations when compared to Army heavy brigades, it is still capable of confronting most third world mechanized forces. The MEB may be unable to effectively oppose larger, modern forces possessing numerous air defense systems combined with very good command and control. Yet if the nation wants to keep a rapid response capability without a greater investment in resources, there are no other options. In a crisis, the insertion of a MPS resourced MEB into a lodgement established by amphibious assault forces while heavier Army forces transit to the area is still a viable concept. Joint force commanders can economically build on this force by using a second MPF squadron, although conditions would have to warrant the depletion

of all tank battalions and nearly all of the AAV companies in the active Marine Corps force structure.

What does the future look like for the Marine mechanized forces? The Marine Corps is currently closely examining its force structure, equipment and doctrine in light of foreseeable capabilities provided by technological advances. The service wants to remain the preferred expeditionary force, able to rapidly insert combat power through amphibious forcible entry, launched from naval platforms twenty to fifty nautical miles from shore. The concept relies on two assets still being developed; the MV-22 Osprey and the Advanced Amphibious Assault Vehicle (AAAV). The Osprey will marginally affect mechanized operations by revitalizing the airmobile assault force, making its insertion and extraction more rapid and less vulnerable to interdiction. Of greater importance is the AAAV. If the AAAV can meet specifications, it will be an IFV that can transit open water at twenty to twenty five knots while transporting 18 Marine infantrymen. It will have a stabilized 25mm cannon, upgradeable to a larger caliber that can defeat vehicles more heavily armored than the BMP-2. It will have laser rangfinding, thermal sights and accomodate an ATGM system. It will have an NBC protection system, GPS guidance system and advanced communications for fire coordination and long range communications.[55]

The AAAV will be quite an improvement over the current vehicle, capable of providing Marine mechanized forces the firepower, mobility and protection of army heavy forces. But Marine forces will still possess at least two limitations that may hinder its effectiveness in mechanized operations. First, Marines do not plan on any increase in tank

battalions. The reason is that tanks are big and heavy and hinder the rapid insertion of Marine amphibious forces. Unless the Marine Corps acquires more tanks, the service will not be able to field a fully mechanized division. The Marine Corps appears comfortable with that prospect. Numerous articles in professional journals indicate that the service is much more interested in maintaining its expeditionary capabilities than operating heavier forces in large scale land warfare.

The second limitation is the AAAV, which will still carry a reinforced rifle squad that normally trains as an infantry force. GCE commanders will have a vehicle that will probably be more capable than the Bradley, yet they will be constrained from employing it in a like manner knowing that they are placing twenty one Marines in harms way, not the nine soldiers riding in a Bradley. Doctrinal questions loom: when do the infantry dismount to take advantage of their organic weapons? Once ashore, do forces reorganize with only a security force riding in the amtrac, employing those dismounted as a Osprey-borne assault force while the mechanized force, freed of the bulk of infantry, maneuver freely in concert with tanks? Though these questions and many more need answers, the AAAV will greatly enhance the capabilities of Marine mechanized forces, providing options not previously available to the GCE commander.

Endnotes

1. Michael R. Gordon, "Force May Double: Clinton Moves to Deter an Attack on Kuwait-More Jets Sent ," New York Times, 10 October 1994, A1.

2. Richard D. Hooker, Jr., "America's 2 Armies," Joint Forces Quarterly 5, Autumn/Winter 1994-95, 38-46. Major Hooker's article sums up the arguments succinctly. He states that Marines have conducted land warfare as its core business since World War Two, and that this country can't afford to pay "...for Marine divisions to fight like Army divisions and be sustained in the field by Army logistics, supported by Army tanks and artillery, and flanked by Army combat formations..." (p. 41). The article mainly concerns mechanized forces, but he extends his argument to any type of ground force that could be viewed as infringing on the responsibilities assigned by law to the Army. Martin Binkin and Jeffrey Record, Where Does the Marine Corps Go from Here?, (Washington, DC: The Brookings Institute, 1976). The authors provide criticism of Marine Corps force structure and present alternatives during a period of fiscal constraints similar to today. Victor H. Krulak, First to Fight, (Annapolis, Md.: Naval Institute Press, 1984). Lt. Gen. Krulak's book provides good background on the roles and missions dispute from a Marine Corps perspective.

3. The term "unique" is used because it initially was a new concept that differed substantially from the British attempts at Gallipoli or other previous concepts. The U.S. Army borrowed its amphibious doctrine in World War Two from the Marine Corps.

4. Victor J. Croizat, Across the Reef, The Amphibious Tracked Vehicle at War, (London, England: Arms and Armour Press, 1989), 26.

5. Ibid., 63, 160.

6. Ibid., 201, 235.

7. Krulak, First to Fight, 51.

8. US Marine Corps, FMFM 1-2 The Role of the Marine Corps in the National Defense, (Washington, DC: GPO, 1991), 3-8.

9. Ibid., 3-6. See also Robert Debs Heinl, Jr., Soldiers of the Sea: The United States Marine Corps, 1775-1962, (Annapolis, Md: United States Naval Institute, 1962), 518.

10. Heinl, Jr., Soldiers of the Sea: The United States Marine Corps, 1775-1962, 10.

11. US Marine Corps, FMFM 1-2 , 3-12. FMFM 1-2 articulates in detail how Marine forces contribute to political reinforcement operations. It lists specific tasks forward deployed Marine forces should be prepared to carry out, such as noncombatant evacuation operations, control civil unrest and "seizure of areas" for political reasons (p. 3-14).

12. Allen R. Millett, Semper Fidelis: The History of the United States Marine Corps, (New York, N.Y.: Macmillan Publishing Co., Inc., 1980), 497-500.

13. Ibid., 506-507.

14. US Marine Corps, FMFM 1-2, 3-6.

15. Millett, Semper Fidelis: The History of the United States Marine Corps, 539-541.

16. Heinl, Soldiers of the Sea: The United States Marine Corps, 1775-1962, 597.

17. J.H. Alexander, Maj., "The LVTP-7 and the Surface Assault," Marine Corps Gazette, June 1972, 34-35.

18. The specific concerns of the Marines in the 60's were Egypt, Israel and Syria, among whom war would erupt in 1967 and again in 1973, almost bringing in the US against the Soviets.

19. Richard E. Simpkin , Mechanized Infantry, (Oxford, England: Brassey's Publishers Limited, 1980), 95.

20. Ibid., 52-56.

21. Christopher F. Foss, Ed., Jane's Armour and Artillery: Fourteenth Edition 1993-1994. (Coulsdon, Surrey, UK: Jane's Information Group, Ltd., 1993), 389.

22. Foss, Ed., Jane's Armour and Artillery: Fourteenth Edition 1993-1994, 245 and 253.

23. Alexander, Maj., "The LVTP-7 and the Surface Assault," 33.

24. J. C. Love, LtCol., USMC, "Example of the LVTP-7," Marine Corps Gazette, December 1973, 47-49.

25. US Marine Corps, FMFM 9-2 Amphibious Vehicles, (Washington, D.C.: GPO, 1981), M-1. The author has extensive experience transporting pallets and other cargo inside LVTs.

26. Alexander, Maj., "The LVTP-7 and the Surface Assault," 32-33.

27. US Marine Corps, CMC Ltr RDD-26-4-6-avs, "Required Operational Capability (ROC) No. MOB 1.11 for a Landing Vehicle Tracked (Experimental) (LVT(X)), including variant vehicles.", (Washington. DC: Department of the Navy, 14 July 1982), 11.

28. Ibid., 2.

29. Foss, Ed., Jane's Armour and Artillery: Fourteenth Edition 1993-1994, 411-414.

30. Thomas M. Johnson, LTC, USA, and Raymond S. Barrett, Lt. Cdr., USN, "The Rapid Deployment Joint Task Force," United States Naval Institute Proceedings, November 1980, 95.

31. Robert T. Haffa, Jr., The Half War: Planning U.S. Rapid Deployment Forces to Meet a Limited Contingency, 1960-1983, (Boulder, Co.: Westview Press, 1984), 185.

32. Jeffrey Record, The Rapid Deployment Force and U.S. Military Intervention in the Persian Gulf, (Washington, D.C.: Corporate Press, Inc., 1981), 44-45.

33. Ibid., 49.

34. Headquarters, US Marine Corps briefing charts, MPF Force Composition, POR-D/26-03/JQ/95. For a more detailed breakdown, see US Marine Corps, NAVMC 2907 (Draft): Maritime Prepositioning Objective (MPF) Prepositioning Objective (PO), (Washington D.C.: GPO, March 1995), 2-1 and appendix C.

35. John E. Greenwood, Ed., "Marine Corps Tank Update," Marine Corps Gazette, September 1995, 7.

36. Headquarters, U.S. Marine Corps briefing charts, MPF/AWR SHIP COMPARISONS, POR-C dated 10 February 1995.

37. Robert a. Chilcoat and David S. Henderson, "Army Prepositioning Afloat," Joint Forces Quarterly 4, Spring 1994, 51-57. Carl E. Mundy Jr., "Thunder and Lightning: Joint Littoral Warfare," Joint Forces Quarterly 4, Spring 1994, 45-50. These two articles both address using prepositioned assets to insert forces into a theater, but the authors suggest different methods. The Chilcoat and Henderson article suggests using an army airborne division to secure the airfield for the follow-on insertion of the Marine and Army forces, while General Mundy describes a scenario where Marine amphibious forces secure a port for the follow-on insertion of the MPF followed by the APA. It appears that the specific method for securing the port and airfield will be situationally dependent.

38. Charles D. Melson, Evelyn A. Englander, and David D. Dawson, U.S. Marines in the Persian Gulf, 1990-1991: Anthology and Annotated Bibliography, (Washington D.C.: GPO, 1992), 10-12.

39. US Marine Corps, FMFM 6-11 Mechanized Operations(Coordinating Draft), (Quantico, Va.: MCCDC, 1991), 2-1, 2-8. The Marine Corps has limited quantities of AAVs and tanks, only enough to mechanize one third of the ground force. Therefore a deployed division has one tank battalion and AAV assets for one regiment, while a deployed regiment only has a tank company and one mechanized battalion. adding more AAVs and tanks is possible if they are taken from other units or reserve units are

activated, but amphibious MAGTFs usually forego additional mobility because more ships are needed to transport the additional tracked vehicles and crews. The exception is the MPF squadrons.

40. Simpkin, Mechanized Infantry, 13-14.

41. Ibid., 20-21.

42. US Army, FM 71-100 (Initial Draft) Division Operations, (Washington, DC: GPO, 1994), 1-10, 1-11.

43. US Army, FM 71-3 Armored and Mechanized Brigade, (Washington DC: GPO, 1988), 1-1.

44. Ibid.

45. US Marine Corps, FMFM 2-11 Antiarmor Operations, (Washington. DC: GPO, 1992), 1-3.

46. Ibid., 1-1.

47. US Marine Corps, FMFM 1 Warfighting, (Washington. DC: GPO, 1989), 59.

48. US Army, FM 71-3 Armored and Mechanized Brigade, 3-11. US Army, FM 71-100 (Initial Draft) Division Operations, 4-18. FM 71-3 states that the turning movement may include the brigade as part of a larger force, while FM 71-100 states that normally armies or corps conduct turning movements, divisions only rarely.

49. US Army, FM 71-1 Tank and Mechanized Infantry Company Team, (Washington DC: GPO, 1988), 3-26 to 3-31, and 4-11 to 4-25.

50. Cobras in the Marine Corps are often described as "flying artillery", because Cobra-delivered fires are controlled like artillery. This is a hot topic in the service, with some advocating their use as a separate maneuver element as in the Army. For more on this subject see the following three articles. Michael W. Binney, "The AH-1W Supercobra: Too Limited?" Marine Corps Gazette, May 1995, 37-38. Gregg R. Shimp, "Utilization of the NTS Cobra as a FAC(A)/RWCAS Platform in the Attack," Marine Corps Gazette, May 1995, 40-41. Patrick M. Delatte, "Do You Really Need a Forward Air Controller For a Cobra Attack?" Marine Corps Gazette, May 1995, 40-41.

51. US Marine Corps, NAVMC 2907 (Draft): Maritime Prepositioning Objective (MPF) Prepositioning Objective (PO), (Washington D.C.: GPO, March 1995), 2-1.

52. Ibid., 341-342.

53. The author, whose military occupational specialty is assault amphibians, has extensive experience in exercises and in Desert Storm concerning this subject. The Marine Corps does not have a better method to coordinate fires at this time. For other discussions on organizing the infantry company commander's AAV, see Richard C. McMonagle, Harry P. Ward, Paige L. Chandler, Greg A. Christian, "The Company Command AAV," Marine Corps Gazette, December, 1991, 51-53.

54. Ibid., 6-14.

55. US Marine Corps, "System/Segment Specification (A-Spec) For the Advanced Amphibious Assault Vehicle (AAAV) Draft (Version 13)," Office of the Direct Reporting Program Manager: Advanced Amphibious Assault Vehicle, (23 June 1995) 1, 8, 12, 22, 27-32, 34-43.

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