

FORCE PROJECTION OPERATIONS: LESSONS FROM AMPHIBIOUS WARFARE DOCTRINE

A Monograph
by
Major Frank R. Boynton
United States Marine Corps



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School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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Major Frank R. Boynton

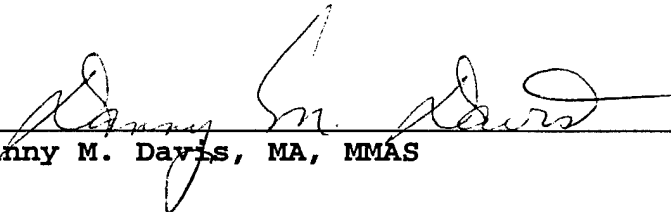
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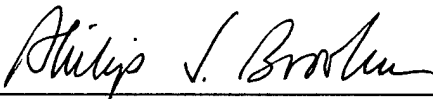
LtCol Mastin M. Robeson, BS

Monograph Director



COL Danny M. Davis, MA, MMAS

Director, School of
Advanced Military
Studies



Philip J. Brookes, Ph.D.

Director, Graduate
Degree Program

Accepted this 23d Day of May 1996

Abstract

Force Projection Operations: Lessons From Amphibious Warfare Doctrine by
Major Frank R. Boynton, USMC

This monograph addresses the threats to force projection operations and assesses current doctrine to counter these threats during the operation. The threats considered are sea mines, diesel-electric submarines, anti-ship missiles, and air attack. It is the hypothesis of this paper that the threats currently faced by force projection operational planners are the same as those faced by force projection planners during World War II and Korea. Can the doctrine employed during those two conflicts still serve current force projection planners?

Landing Force Manual 01, Doctrine for Amphibious Operations was developed during the 1930's. It was a doctrine to answer the need for a method of projecting power in order to conduct a naval war against Japan. The methods described in Landing Force Manual 01 were designed to counter enemy threats to the amphibious forces by isolating the objective area, neutralizing the threats within, projecting power in the form of firepower and maneuver forces ashore, and providing for force projection. These tasks remain the same for modern day force projection operations.

Landing Force Manual 01 is proposed as a base document to remedy a doctrinal deficiency in the US military, a lack of a clear doctrine for force projection operations. Suggestions are made to bring Landing Force Manual 01 up to date so it may serve as a doctrinal basis for planning all force projection operations. Alternatively, recommendations are offered regarding how Landing Force Manual 01 may serve as the basis for a new doctrine for force projection.

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I. Introduction

By 1999, ninety-three percent of US Army forces will be located in the continental United States (CONUS).¹ Where the nation's next war will occur is uncertain. The two major regional contingencies usually discussed are in the Persian Gulf or on the Korean Peninsula, beyond that there is little certainty about the future. One thing that is certain, however, is that the next war will require that those forces located in the continental United States be transported to the theater of operations. This means that one of the essential tasks for fighting the next war will involve simply getting to the area of operations. During Operations Desert Shield and Desert Storm in the early 1990's, 3.2 million short tons of dry cargo and more than six million tons of petroleum products flowed into theater by sea. Of the total cargo needed to support allied forces in the Persian Gulf in this war, 95% went by sea.² The US military in general, and the US Army in particular must address these deployment realities and the operational impacts in their doctrines for conducting operations.

US forces faced similar challenges in the recent past. During World War II, US forces used a doctrine to deal with these challenges and to allow force projection operations to proceed in the face of enemy opposition. Can that same doctrine still serve planners dealing with the challenges of planning future force projection operations? FM 100-5 is the US Army's keystone doctrine. It describes how the Army thinks about conducting operations.³ The introduction to FM 100-5 states that the goal of the doctrine is to "provide for a force-projection Army that can build and sustain substantial combat power in remote regions of the globe."⁴ This paper will address something that is not mentioned in FM 100-5: that it is an essential requirement for the Army, in coordination with the other services, to assist in setting the conditions which will allow

the projection of forces to those remote regions of the globe where future operations will occur. Setting the conditions for success needs to include successfully countering the threats to force deployment operations in order to allow the timely and unhindered delivery of forces, supplies and equipment to the theater by sea and air. The Army needs to place particular doctrinal emphasis on these tasks due to their major reorientation from being forward based to a CONUS-based Army.

Inherent in this requirement is the need for the US military to adjust operational plans so those plans conform to the realities imposed by the conditions as they exist at the time of execution. Operational planning is based on doctrine. Force projection doctrine must account for the need to set the conditions for success in a force projection operation. Once delivered to the theater and organized for combat, US forces will possess qualitative advantages over any potential foe for the foreseeable future. The vulnerable phase for US force projection operations is during strategic transport operations and during the transition to an organized combat force established in the area of operations. It is during these transition phases that a well-organized and properly equipped foe could potentially cause US forces the most difficulty. A regional threat possessing the capability to lay sea mines, or possessing modern diesel-electric submarines or modern aircraft with dedicated crews can cause serious difficulty for US planners and operational commanders. That difficulty could come as an enemy attempts to directly preempt the delivery of US forces into the theater by attacking strategic transport assets as they close on, or arrive at, theater reception facilities. It could also come indirectly as the enemy exploits weaknesses in the theater command and control structure which develop during the transition from the strategic transport phase to the major combat phase.

These considerations are not new to the US military. Prior to World War II the US military faced a strategic environment very similar to the current one. Before US involvement in that war, the US military faced an era of declining budgets. Like today, forces were primarily based in the continental United States and as such had to project power from their US bases. There was no one single threat to focus on. Plans were developed for a wide array of possible enemies. These potential enemies possessed significant threats to counter US ability to project power. The doctrine developed during the 1930's and applied during World War II countered similar threats to those planners face now: enemy mines, submarines, and aircraft. New threats exist in the form of missiles, however they are conceptually the same type of threat faced by planners during World War II, they are a means of delivering an ordnance payload.

Mines and submarines can do immense damage to US forces arriving in theater before these forces can realize their combat power potential. Air strikes against US forces arriving in theater before those forces can establish a coherent theater-wide air defense system could cause significant damage to forces, strategic mobility assets and theater reception facilities. Theater and ballistic missiles pose threats similar to air attack, but most significantly bring the added threat of attack by weapons of mass destruction from long range with short notice.

A doctrine for force projection must consider the operational impacts of these threats on force projection. In the future, force projection planners must strive to construct operations so that they minimize the impacts of these threats. During World War II, US forces used a doctrine to counter these threats and to allow force projection operations to proceed in the face of enemy opposition. Can that same doctrine still serve planners dealing with the challenges of planning future force projection operations?

II. Force Projection Defined

FM 100-5 defines force projection as the movement of military forces from CONUS or a theater in response to requirements of war or operations other than war. These operations extend from mobilization and deployment of forces, to redeployment to CONUS or home theater, to subsequent demobilization.⁵ A critical aspect of force projection operations currently is under-emphasized in that definition. That under-emphasized aspect is the need to set the conditions in the area of operations essential in order to allow a force projection operation to proceed. Those conditions for success need to occur both during the strategic transportation phase of the operation and the transition phase as the forces prepare for combat operations.

US force projection operations are described as either forcible entry or permissible entry operations.⁶ Forcible entry includes either amphibious assault or airborne assault. Setting the conditions for forcible entry requires certain specific tasks to be accomplished. Setting the conditions for an amphibious assault, for example, includes the tasks of preparing the amphibious objective area in terms of mine sweeping and clearing, establishing dominance over the enemy's submarine force, establishing an air defense umbrella both over the landward and seaward sectors, and establishing an anti-theater and anti-ballistic missile defense umbrella over the landward sector. Setting the conditions for an airborne assault obviously does not require preparation of the seaward sector as a necessary precondition for airborne operations. However, if the airborne assault is an enabling force in support of a larger force projection operation, the preparation of the seaward sector may be a necessary precondition for the larger overall operation. If any additional US forces are to be deployed as part of the operation, and especially if they are heavy forces, they will arrive by sea. As stated earlier, 95% of the tonnages delivered to the Kuwaiti theater of

operations arrived by sea.⁷ Setting the conditions for this airborne operation, therefore also requires setting the conditions for delivery of reinforcing forces and the sustainment flow by sea. The achievement of dominance over the enemy's mine, submarine, anti-ship missile and air threat is therefore integral to this airborne operation. The time required to achieve US dominance over these threats will dictate the timeline of the airborne operation. The flaw in the current definition and doctrine is that this linkage between the achievement of the different tasks essential to setting the conditions for a force protection operation (ASW, counter-mine, air defense, etc) is not addressed as a coherent, single requirement with each service having responsibilities in support of the overall force projection effort. The failure to set the conditions for a force projection operation will have effects across the joint environment. Each service needs to participate in setting the conditions for success and to consider the effects on that service's portion of the overall mission should those conditions not be successfully set.

Doctrine must reflect these service roles. Setting the conditions for success requires the commander of the operation to neutralize or suppress the enemy's ability to interdict the US flow into theater or to attack US forces once in theater, but prior to the US forces being organized for combat. The requirement to set the conditions for success is inherently joint, yet service doctrine must reflect that particular service's role in participating in setting the conditions for success in force projection. The tasks required may be single service responsibilities. For example, countering the sea-mine threat is inherently a Navy task. The tasks may be multi-service, air defense for example. All services must consider the mission effects of failing either to accomplish such tasks, or to not accomplishing these tasks in a timely manner.

It is the hypothesis of this paper that the requirements for setting the conditions for force

projection operations are not adequately described in current joint or service doctrine . In particular, US Army doctrine fails to adequately address this issue as the Army begins to transition from being a forward deployed force to a force projection force. This paper will show that the doctrine used in planning World War II amphibious operations is still valid. Planners and commanders will still find it a valuable tool for planning operations. Doctrine for amphibious operations can also serve as a basis for a new doctrine for force projection operations.

III. Battlespace Defined

A relatively new concept which is helpful in considering force projection operations is the concept of battlespace. The different US military services have slightly variant definitions of battlespace. In order to come to a consensus understanding of the concept, it is necessary to discuss the various service definitions.

The United States Navy, in Naval Doctrine Publication 1, Naval Warfare, defines battlespace as: "All aspects of air, surface, and subsurface, land, space, and the electromagnetic spectrum that encompass the area of influence and the area of interest."⁸ The area of influence is defined as "a geographical area in which a commander is directly capable of influencing operations by maneuver or fire support."⁹ The area of interest is defined as "the area of concern to the commander, including the area of influence, areas adjacent, and areas extending into the enemy's water or territory to the objectives of current or planned operations. This also includes areas occupied by enemy forces that could jeopardize the mission."¹⁰ Battlespace dominance is defined as "the degree of control over the dimensions of the battlespace that enhances friendly freedom of action and denies the enemy freedom of action. It permits power projection and force sustainment to accomplish the full range of potential missions."¹¹ In essence, battlespace is

defined as the areas the commander is concerned about and can influence, and the area from which our adversaries can influence US operations. Battlespace dominance is the ability to use the full spectrum of our means to enhance our ability to operate and to degrade the enemy's capabilities.

The US Army has a different concept of battlespace. The US Army's Field Manual (FM) 100-5 defines battlespace as "the components determined by the maximum capabilities of a unit to acquire and dominate the enemy; includes areas beyond the area of operations; it varies over time according to how the commander positions his assets."¹² This definition seems to track fairly closely with the area of influence which is the area around the commander that he could influence with means at his disposal. FM 100-5 further defines battlespace as a "physical volume that expands or contracts in relation to the ability to acquire and engage the enemy. It includes the breadth, depth, and height in which the commander positions and moves assets over time; battlespace is then a three dimensional volume of space. Battlespace is not assigned by a higher commander and extends beyond the commander's AO. It is based on the notion that commanders expand their thinking to develop a vision for dominating the enemy and protecting the force before any mental constraints are emplaced, such as overlays depicting phase lines, boundaries and arrows. Battlespace also includes the operational dimensions of combat, which are time, tempo, depth, and synchronization."¹³

The FM 100-5 definitions and discussions of battlespace seem to be an attempt to grasp at the concept that a commander and planners need to think beyond the narrow confines of their own area of operations. Unfortunately, the definitions in FM 100-5 do not add clarity to the concept. On one hand, FM 100-5 defines battlespace as a physical volume of space. In the same

section, battlespace is said to include time, tempo, depth, and synchronization which are conceptual vice physical entities. FM 100-5's emphasis on defining battlespace prior to placing control measures on the map makes the consideration of battlespace seem to be merely the first step in a sequence of deliberate planning steps. FM 100-5 considers battlespace to be devoid of the "constraints" of control measures, yet includes the considerations of time, synchronization, etc. The author believes the consideration of battlespace is a continual process for the commander and his staff and FM 100-5's definition minimizes the fact that battlespace must be continuously evaluated. FM 100-5's definition of battlespace serves to detract from the value of the concept by including factors which cloud rather than clarify the concept. These may not be mutually exclusive descriptions, but they are needlessly confusing. Lieutenant General Paul E. Funk, US Army, provides some clarification in an article in Military Review. He describes battlespace as providing a "framework for commanders to view potential missions, freeing their thoughts from physical restrictions and allowing them to consider mission, enemy, terrain, troops and time available uninhibited by externally imposed graphics. A tool for all levels of command, from squad leader to corps commander, battlespace offers a holistic look at fighting an effective fight. It is a way to think about fighting - a visualization by commanders at every level of the entire battlefield and all phases of the campaign and operation."¹⁴

The two different definitions reflect the different service's approaches to the concept of battlespace. For the purposes of this monograph, a consensus definition of battlespace will more closely follow the Navy definition. Force projection planning requires a consideration of battlespace which allows a full visualization of the operational area. This visualization should be fluid, continuous and comprehensible. A holistic view of a force projection operation must

consider the strategic movement phase as part of the whole operation. Battlespace provides a conceptual basis for considering both the area of operations and the area required for accomplishing the strategic deployment phase of the operation.

The author believes military readers are more familiar and comfortable with the concepts of area of interest and the area of influence than with the more esoteric descriptions found in FM 100-5. While defining battlespace in terms of the sum of the area of influence and area of interest is not universally agreed to, the author will do so in order to allow the reader to apply the concept of battlespace based upon those well understood notions. The ultimate resolution of the definitional distinctions between the Navy and the Army is beyond the scope of this monograph. The definition of battlespace which will be used in this monograph is: *battlespace is the sum of the areas of interest and influence. It is the area in which the friendly commander can locate and influence enemy actions with fire or maneuver. It includes the areas essential to the conduct of force projection operations. It also includes areas where the enemy can influence friendly actions with his fires or maneuvers, including those areas essential to allow force projection operations. These areas may be beyond the area of operations.*

The use of the concept of battlespace for force projection operations is best shown with an illustration. In a force projection operation into the Persian Gulf, the commander of the operation must consider the areas where he can impact on the enemy (area of influence). Beyond that, he must seek out the enemy even beyond the limits imposed by his weapons systems but within a radius of specified time-distance factors (area of interest). He must consider the potential actions of the enemy to adversely influence friendly courses of action. In this Persian Gulf scenario, the area of influence would be the limit of the range of weapons as constrained by geography, politics,

and rules of engagement: Tomahawk cruise missiles, carrier and land based air, air defense assets, etc. The area of interest would be the area beyond the limit of the range of those weapons where we search out the enemy to determine potential actions and effects. This can be defined in terms of time, with a calculation of time-distance factors. The commander "needs to look out seventy-two hours" is typical phrasing. The commander must also consider potential enemy actions in terms of what those enemy capabilities are as they fit into the time-distance factors.

It is essential that the commander also consider those areas upon which his force projection depends. In this scenario, forces must flow through the Straits of Hormuz. The capability of the enemy to interdict the flow through the Straits of Hormuz with either mines or submarines must be considered by the ground commander as well as the naval and joint commanders. The Straits of Hormuz are therefore in the ground commander's area of interest and part of his battlespace. The interdiction of the flow through the Straits of Hormuz will have effects, and perhaps disastrous ones, on the ground scheme of maneuver as well as the naval scheme and must be considered. A course of action developed by the ground commander which is based upon invalid assumptions regarding flow rates through the Straits is an invalid course of action. Controlling the Straits of Hormuz (and thereby allowing the flow of friendly shipping) is an essential precondition for US force projection operations in the Persian Gulf, including both the strategic transportation of forces and supplies as well as the subsequent ground combat operations. The battlespace of the ground commander for an operation in the Persian Gulf would therefore include the landward area of operations, the air and sea space contiguous to that landward sector, and those areas essential for the uninterrupted flow of his forces, equipment and sustainment through the Straits of Hormuz.

Battlespace for the commander, in general, would therefore include the geographical area he could search with his various available sensors, to include tactical and strategic overhead systems, the geographical area the commander can range with his weapons, and the geographical area, perhaps not necessarily contiguous with the battlefield, essential for the commander to ensure the flow of those forces and equipment with which he will generate his combat power.

The US Navy has developed the doctrinal concept of battlespace dominance in order to bring the concept of battlespace into a realm with which planners and commanders can deal. Battlespace includes the sea, air and land environments where operations are conducted. The dominated battlespace expands and contracts and has limits as forces, weapons and sensors are positioned and repositioned by both friendly and enemy commanders. Dominating that battlespace presupposes effective command and control capabilities and serves as a logical prerequisite for the projection of power ashore.¹⁵ Battlespace dominance means that US forces can maintain access from the sea to permit unimpeded entry of equipment and resupply.¹⁶

The concepts of battlespace and battlespace dominance serve well in discussions of doctrine for force projection operations. Especially important is the presupposition of command and control. Force projection forces must establish effective command and control in order to ensure sufficient battlespace dominance to enable the preponderance of force to flow into theater. The command and control function must be transitioned to the main force when it arrives in theater. The battlespace for the early phases of a force projection operation may be smaller than the battlespace for the sustained ground combat phase. A command and control system adequate to control the force projection phase may not necessarily be able to control the larger, perhaps theater-wide command and control system required during the major combat phase.

The design and planning of a force projection operation must consider and reflect the realities of the force's ability to achieve battlespace dominance. The timeline for achieving battlespace dominance becomes the timeline for the overall force projection operation. The geographical limits of the battlespace which can be actually be dominated are the true limits of the operation. The commander must resolve conflicts between actual battlespace dominance and required battlespace dominance. Either the battlespace must be modified, by increasing resources (such as air defense or anti-submarine warfare assets) allocated to the initial phases of the operation, or the operational plan altered in order to fit into the battlespace the force can actually dominate. The achievement of battlespace dominance is an inherently joint task, but individual service doctrines should reflect each service's responsibility in resolving conflicts. For example, all services need to assist in the air defense effort with both active and passive activities. These actions need to be coordinated into an operation-wide effort. In some tasks, a single service's highest contribution may be considering the limits of the battlespace dominance and modifying their portion of the operation to reflect those realities.

The battlespace which the commander needs to dominate can be viewed as the aggregate of multiple overlapping spheres. The first sphere might be superiority over the enemy's submarine threat. This would be in the subsurface portion of the sea sector. The second might be superiority over the enemy's air threat which would extend over the entire area of operations. Another might be a separate sphere over the enemy's mine threat, another subsurface sphere but one perhaps located in close to the channels and approaches to ports and landing beaches. A sphere to counter the enemy's ballistic missile threat which would perhaps be just over the landward sector. The sum of these spheres results in the battlespace to be dominated. Achieving

battlespace thus becomes a more complete and thoroughly integrated, or nested, series of tasks designed to attain comparative superiority in specific areas between US forces and the enemy.

These tasks can then be analyzed precisely and specifically during mission analysis.

Navy doctrine describes "zones of superiority" in six dimensions of Naval Warfare.¹⁷

These six dimensions include:

- | | |
|----------------|-----------|
| (1) Air | (4) Land |
| (2) Surface | (5) Space |
| (3) Subsurface | (6) Time. |

These six dimensions become zones of competition between US forces and the enemy. Mission analysis should assess which service can do the most to achieve dominance in each zone.

Battlespace dominance is achieved when US forces are able to dominate the enemy in each of these zones. The lack of a cohesive doctrine for comprehending battlespace dominance is problematical. This lack is compounded by the different definitions in the various service doctrines. The US Army's FM 100-7, *Decisive Force: The Army in Theater Operations*, in its force projection section discusses only air defense as a necessary precondition for force projection.¹⁸ It does not discuss the timeline required for dealing with subsurface threats as an integral factor in the force deployment timeline which impacts on the ground scheme of maneuver. It does not discuss the interrelationships of the other services' capabilities and contributions. Neither does it discuss the potential impact to the ground commander of losing the anti-submarine nor mine clearing fights. The inability to achieve dominance over the enemy's submarines in the Strait of Hormuz, for example, would have serious consequences on an operation in the Persian Gulf. As stated earlier, in Operation Desert Shield, 95% of the tonnages which arrived into

theater came by sea.¹⁹ One hundred per cent of that sealift came through the Straits of Hormuz. The interdiction of that flow could have had disastrous consequences to Operation Desert Storm. *The ground combat commander as well as the Naval commander must consider the threats to those ships as an integral part of the overall operational plan.* These naval threats control the lifeline and hence the timeline for the flow into the theater. How the operations are designed and described influences the risks commanders might or might not be willing to take. All commanders must participate in actions to dominate their battlespace, including the portion of the area of operations essential for the projection of forces and the aggregate battlespace required can be described. This description of the necessary battlespace begins to assist in assessing the early tasks for the force projection units.

The concept of zones of superiority can apply to all force projection operations, not just Navy operations. It is the establishment of the zones of superiority in and around the area of operations which the author considers to be "setting the conditions for success." Establishing dominance over the enemy's air threat may require a combination of aircraft carriers, cruisers, land-based surface to air missiles and fighters. This air defense system may be a mission requirement which must be in place before a force projection operation can occur. It is this requirement to set the conditions for success (defined in this paper as establishing battlespace dominance) which is deficient in current force projection doctrine. US doctrine fails to consider such questions as whether both US Army and US Marine Corps land-based air defense missile systems should be deployed and in what sequence they should be sent to the theater. Who will have the authority to locate them on the ground so they best integrate into the air defense system designed to support the expeditionary portion of the operation? If the Navy is providing initial air

defense with carrier aviation and guided missile cruisers, will the land-based air defense systems be under the operational control of the Navy air defense coordinator? These issues are dealt with in the doctrine for sustained operations ashore, but they have not been addressed in the doctrine for force projection operations. For example, FM 100-7 describes air defense as a consideration which should be established in the lodgement area "as soon as possible."²⁰ FM 100-7 does not address command and control of those early arriving air defense units, how they will interface and coordinate with systems already in theater, and does not provide a citation to a doctrine which does.

There are lessons for modern force projection planners and commanders from World War II. The US military conducted the greatest force projection operations in the history of war during World War II. While battlespace dominance is a relatively new term, it is not a new concept. Battlespace dominance was an essential precondition for conducting the large scale amphibious operations of World War II. Does the doctrine used to conduct these World War II operations remain valid for contemporary force projection operations? Has the US military, in the post World War II era, forgotten the lessons of these World War II operations? Could the World War II doctrine and experience provide a basis for a review of current and future US force projection doctrine? The author will demonstrate that the US military's World War II experience and doctrine is extremely relevant to current and future operations. The US military has transitioned, as described earlier, from a forward presence force to a force projection force. This monograph will assess current threats to force projection operations and investigate the validity of applying the doctrine from World War II to counter them.

IV. ATTAINING BATTLESPACE DOMINANCE - A TASK LIST FOR PLANNERS

Battlespace dominance is easier to understand if battlespace is described in a more concrete and less theoretical manner. Mission analysis can provide the planners and commanders throughout the Joint Task Force with an essential task list required to be accomplished in order to ensure battlespace dominance. The Navy "zones of superiority" can serve as a basis of considering the concept of battlespace dominance but does not necessarily describe a total task list. By describing battlespace in geographical terms, it becomes possible to describe the task list in terms of geography. This, in turn, allows the planner to consider battlespace in terms of ranges and effects of weapons and sensors and to assess the feasibility of various courses of action in light of their operational limitations. A task list for achieving battlespace dominance could then include:

1. For the sea sector:
 - a. Clearing required shipping lanes and proposed landing areas of mines.
 - b. Precluding further mining by the enemy. This will require isolation of the battlespace and destruction of the enemy's mine laying assets.
 - c. Gaining and maintaining air superiority over the sea area required for the operation. Using a combination of carrier aviation and air defense guided missile cruisers initially, the commander then integrates land based air defense assets into the total effort.
 - d. Gaining and maintaining control of the electronic spectrum over the sea area required for the operation.
 - e. Precluding enemy submarine operations.

2. For the land sector:

a. Isolating of the area of operations by air operations and deep fires to interdict enemy forces and prevent them from entering the battlespace.

b. Gaining and maintaining air superiority over the landward sector required for the operation. These operations will be similar to the sea sector. Expeditionary forces including Navy, and perhaps Marine Corps units can initially operate to achieve air superiority. US Air Force and US Army forces can then be integrated into the effort once the necessary degree of battlespace dominance has been achieved by the expeditionary forces.

c. Establishing and maintaining a theater missile defense over the landward sector required for the operation. This will require passive measures by all forces as well as active defense measures. Offensive strikes to destroy threat systems can be integrated into the overall effort.

d. Establishing and maintaining a ballistic missile defense over the landward sector required for the operation. This will require essentially the same task list as air defense, but will require passive activities throughout the depth of the US battlespace.

This task list, or one like it, can be used by planners to determine what weapons, sensors, and types of units are required to achieve battlespace dominance. Does the operation require an airborne command and control platform? Can an E-2C Hawkeye off of a forward deployed aircraft carrier serve as the airspace manager, or does the size of the threat and the size of the area of operations require a more capable airborne platform? Can an Aegis cruiser provide an air defense umbrella for the landward sector for the duration of the operation, or should ground based air defense systems be sent to the theater? What types of land-based air defense systems

are required, Patriot, Hawk, or Stinger? The sea mine threat can be assessed to identify the scope of the mine clearing effort, and then the number of mine counter-measure platforms can be determined. The time required for the mine clearing effort can then be applied to the timeline of the force projection phase of the operation.

Gaining dominance over the enemy when measured in terms of time may be the greatest challenge. A regional power could negatively impact the US force projection timeline to such a degree as to make the US early entry forces vulnerable to a preemptive or a spoiling attack. This delay, and the potential to put early entry forces at risk, carries with it the threat that an early battlefield defeat may have operational impacts beyond the actual battlefield losses involved.

V. COUNTERING THE THREATS

The discussion of battlespace dominance and the required planning and actions to achieve it can serve as a basis for analyzing the essential tasks required of force projection planners and commanders. For the purposes of this paper, the essential tasks relate to achieving dominance in the previously described zones of superiority and will be assumed to include the following:

Achieving dominance over the enemy's submarine threat.

Achieving dominance over the enemy's air threat.

Achieving dominance over the enemy's sea mine threat.

Achieving dominance over the enemy's anti-ship missile threat.

Accomplishing these tasks includes, as a basic prerequisite, establishing the capability to command and control the different forces and weapons operating in these spheres. These threats will be described in order to make the reader aware of the significance of countering their potential impacts and hence, the criticality of achieving battlespace dominance prior to commencing large

scale force projection operations.

Countering Enemy Submarines

The enemy submarine threat is potentially a very significant factor in planning force projection operations. Modern diesel-electric submarines are proliferating in the world. Nuclear submarines use the same weapons and pose the same types of threats to surface shipping but remain sufficiently rare to be beyond the scope of this paper. For the purposes of this paper, the diesel-electric submarine will be used as a vehicle to assess the threat.

The British experience with Argentine submarines in the Falkland's War serves as an illustration. The Argentine Navy had two operational submarines during the war. One was a US constructed, World War II-era, Guppy-type. This boat was disabled by the British during action off South Georgia Island on 25 April 1982 before it had a significant operational impact. The second boat was the German-built *San Luis*, completed in 1974. She located and operated in the area of the main British Task Force for several days. Although she maneuvered into position and actually fired torpedoes at British vessels, these attacks were unsuccessful due to a malfunctioning fire control system.²¹ The British were unable to successfully prosecute an attack on the *San Luis* despite the sophistication and modern design of the British warships in the area with their emphasis on high tech anti-submarine warfare systems. The British unsuccessfully expended over two hundred items of anti-submarine ordnance, some of it quite expensive and sophisticated, against the *San Luis*.²²

The British discovered, fortunately without significant loss of shipping or friendly casualties, the difficulty in defending a force projection naval force against submarines in shallow water. The shallow water environment is one of the most difficult to acoustically model and

hence it is more difficult to successfully employ standard search techniques since sound transmission paths do not fit into conventional deep water models. Attempts to construct a shallow water model have met with only limited success due to the high variability of the sea floor and a host of other oceanographic factors.²³ For the purpose of this paper, the author will use the general definition of shallow water as that being inside the 100 fathom line, or a line tracing the six hundred foot contour line representing water six hundred feet deep or less. This is generally considered the tactical definition of shallow water.²⁴

Shallow water is typically found in coastal areas. As it has been defined, the Falklands naval campaign was conducted in shallow water. The Falkland Islands lay on the Argentine continental shelf despite being fairly distant from the South American continent.²⁵ In a more centrally located theater of war than the Falkland Islands, high commercial shipping volumes associated with the coastal traffic flow will add further to the already high ambient noise level.²⁶ This background noise level would make detection and prosecution of an attack on a submarine even harder than it was for the British in the Falklands. It is precisely this difficulty in detection which could entice the enemy to employ submarines in shallow, coastal waters against US force projection naval vessels in a similar situation.

The threat posed by even primitive submarines in an environment where they are difficult to detect and to destroy cannot be minimized. The following chart depicts the losses imposed on shipping by the German Navy during World War I using very primitive U-boats.

Losses from Submarine in Shallow Water in World War I²⁷

<u>Timeframe</u>	<u>Total ships lost</u>	<u>No. lost in shallow water</u>	<u>Dist from shore</u>
Winter 1917-18	200	126	10 miles
		70	50
Feb 1917-Oct 1918	2000	860	10
		580	50

To counter the threat posed by U-boats, and to minimize their effectiveness as demonstrated in the chart, the British employed a total of 2,932 surface vessels and aircraft to counter a German submarine force of 178, a 16:1 ratio of hunter to the hunted.²⁸

Total losses to submarine attack in the first year of World War II for the British Navy included 12 surface combatants and 438 merchant vessels, totalling 2 to 3 million tons of shipping. This was accomplished for the loss of 28 U-boats.²⁹ While advances in submarine detection and attack were developed throughout the Second World War, by the end of the war, the Allies had outstripped the Germans in spending 15:1 for anti-submarine warfare versus U-boat expenditures.³⁰

The modern diesel-electric submarine is a much more potent threat than its World War I and World War II predecessors. A modern boat, such as the West German TR-1700, is an extremely significant threat. Developed in the early 1980's, the TR-1700 can sustain 25 knot speeds, submerged, for one and one half hours. It can remain submerged for as long as seventy days by using a snorkel. It has six bow mounted 21 inch torpedo tubes and carries 16 reloads. The automatic loader can reload a torpedo tube in 50 seconds. The boat has a 12,000 nautical mile range and a depth limit of 890 feet. A 21 inch torpedo is capable of 55 knots. With wire

guidance, acoustic homing, and its 250 kg warhead, it is a deadly threat.³¹

The proliferation of the diesel-electric submarine increases the likelihood US forces will have to counter them in force projection operations. Both the former East-bloc countries and US allies export submarines. For example, Germany has exported numerous modern diesel-electric submarines to regional powers:³²

<u>Country</u>	<u>Number</u>
Argentina	2 TR-1700
	2 Type 209
Colombia	2 Type 209
Ecuador	2 Type 209
India	2-4 Type 209
Indonesia	2 Type 209
Peru	6 Type 209
Venezuela	2 Type 209
Brazil	1-4 Type 209
Chile	2 Type 209

Great Britain, France and the Netherlands also export submarines. The former Soviet Union has exported approximately 117 Romeo, Foxtrot, Whiskey and Kilo class submarines to countries such as Cuba, Libya and Syria. China has exported approximately 23 Romeo and Whiskey class submarines to North Korea.³³

Submarines can be especially dangerous adversaries in shallow water. It is in this very same shallow water where force projection naval forces close with the landward sector of the area

of operations. Making the submarines in the littoral region an even a greater hazard to US force projection efforts is the limited ability of the US to absorb losses. There is much discussion in the United States on the ability of the nation to absorb combat casualties. This is a philosophical debate. A more practical debate is the limited number of strategic mobility assets the US has. The US will transport much of its combat power to the theater on its strategic sealift assets. Currently there are only 67 ships in the Strategic Sealift Program. There are a total of only 96 more in the Ready Reserve Fleet.³⁴ A strategic sealift fleet this small cannot sustain even a fraction of the rate of the losses inflicted during the World Wars. These vessels are essentially commercial cargo vessels which are much more vulnerable to attack than a warship due to slow speeds and a lack of compartmentalization and damage control assets. Should a foe ignore our warships and attack US commercial-type shipping employed in force projection operations with his submarines, he poses a different, but perhaps even more difficult challenge for planners. The naval theorist Sir Julian Corbett proposed just this style of maritime warfare in his work *Some Thoughts on Naval Strategy*.³⁵ The risk of a commercial ship sinking from a torpedo hit is high. Torpedoes hit below the water line, and may be wire-guided to those areas of the ship most vulnerable to attack. Large warheads and high speeds make them very dangerous. "Missiles may cripple, but torpedoes sink."³⁶ There are counter-measures to the submarine threat, but they are costly in terms of resources, as the British learned in both World Wars and in the Falklands.

The most significant item for the operational planner and the commander to consider, however, is the threat to battlespace dominance that the enemy submarines pose. The submarine threat is extremely significant. The costs to counter the submarine threat are high in terms of resources, and especially in terms of time. The time costs of searching and destroying enemy

submarines may impose downstream effects on the whole force projection operation. The cost in time impacts on the entire force projection operation, not just on the naval side. All planners, regardless of service, must consider this aspect of gaining battlespace dominance. Navy planners must plan to counter the threat. Army planners must account for the time the task will require and incorporate it into their timelines. Preemptive airstrikes at the beginning of hostilities may be a means of simplifying the anti-submarine campaign. If they are not authorized or successful, operational impacts will ensue.

The intent of this paper is not to make the reader an anti-submarine warfare expert, but rather to expose him to the significance of the threat posed by modern but not necessarily state of the art submarines. The naval commander has the responsibility for attaining battlespace dominance in the subsurface zone. The US Navy has excellent systems for dealing with the threat. The threat posed by submarines operating in shallow water, however, is different from the deep water threat for which the US Navy is optimized. This change in the environment is well recognized and development of measures to assure an effective ASW capability are well underway. Until the shallow water area becomes a zone of superiority, however, the entire force must accommodate the realities of the submarine threat. This may mean more initial forces must flow into theater by air. Shipping might have to gather in a secure area and then proceed by escorted convoy. This will impart a delay in the flow of forces into the theater. Forces flying to the area of operations to marry up with equipment delivered by sea will be delayed until the sea delivery schedule is determined. A port which can support the offload of one or two ships may not be able to support the offload of a convoy's worth of ships. Ships waiting to offload are a waste of scarce sealift assets. Again, more delay is added to the operation's timeline. The

timelines for the flow into theater and the offload of vessels can quickly become very complicated. All planners, regardless of service, must accommodate these impacts into their force projection plans; to ignore it renders the plans invalid as they are based on false assumptions. For the commanders and their planners, countering the threat may mean delaying entry operations in order to allocate adequate time to find and sink the enemy submarines. Other options include altering the flow of shipping to avoid submarine operating areas and accepting potential losses of efficiency, shifting more of the burden to air assets, or simply taking the risk of not countering the threat and absorbing the losses imposed.

Countering Enemy Sea Mines

The Department of Defense final report to Congress on the conduct of the Persian Gulf War said this about the impacts of sea mines on force projection operations:

"The Iraqi mine threat affected almost all naval operations during the conduct of the Persian Gulf conflict. The coalition's ability to conduct amphibious operations and naval gunfire support was constrained by the minefields in the northern Persian Gulf. The mine threat also affected naval air strike operations because it forced the carrier battle groups in the Persian Gulf to operate at greater ranges from targets in Iraq."³⁷

The mines that the Iraqi's employed in this effort were very low technology, very low cost devices. This did not minimize their effectiveness. The Bridgeton, an oil supertanker, struck a mine during the 1987 Iran-Iraq "tanker wars". The mine was a 1908 era Russian bottom-moored, floating, contact mine. This mine was powerful enough, despite its old design, to damage a 401,382 ton supertanker sufficiently to require a layup in the repair yard for several months.³⁸ For purposes of comparison, consider that a Nimitz class nuclear aircraft carrier displaces 91,487

tons³⁹ or approximately 25% of the gross tonnage of the Bridgeton. A Wasp class amphibious assault ship displaces 40,500 tons, roughly ten percent of the bulk of the supertanker.⁴⁰ Consider the relative damage that mines, which crippled a ship as immense as the Bridgeton, can do to a warship of a much smaller size.

To provide an illustration of the damage which can be inflicted by a mine, consider the two US Navy warships which struck mines during Operation Desert Storm. The USS Princeton struck a floating mine in the northern Persian Gulf on 18 February, 1991. While suffering only four casualties, Princeton suffered serious hull damage. The ship was in drydock until the end of April, 1991. A single, relatively cheap mine had rendered a very high cost Ticonderoga class guided missile cruiser combat ineffective for a period of two months.⁴¹

On the same day the amphibious assault ship USS Tripoli struck a mine while serving as the flagship of a Mine-Countermeasures squadron. A single mine tore a sixteen by twenty foot hole in her side ten feet below the waterline. As a result of heroic damage control efforts, Tripoli was able to remain on station and continued to act as flagship.⁴²

The mines employed by Iraq in Desert Storm were laid over a period of probably several months. They covered a semi-circle within a fifty mile radius of Kuwait City.⁴³ Theoretically, the density and disposition of the minefields would have guaranteed an "adequately effective threat to shipping but it was found that, because of poor handling and insufficient experience of the layer, large numbers were inoperative or ill-planted."⁴⁴

Mines are the poor country's answer to countering a seaborne force projection operation. The North Korean Navy's surface forces could not preclude the US Navy from doing whatever it wanted during the Korean War of the early 1950's. The US Navy ranged freely along both sides

of the Korean peninsula, projecting power inland via carrier aviation and naval gunfire. The North Koreans, with the aid of their Soviet advisors, determined that the sea mine is the "poor man's friend, a weapon whose effect is extremely disproportionate to its cost."⁴⁵

Wonsan lies on the east coast of the Korean peninsula. It is an excellent choice for an entry operation due to a good harbor, good trafficability over the beach and excellent corridors leading out of the port area for the maneuver forces. It was chosen as a site for an amphibious landing for an operation designed to outflank the North Korean Peoples' Army. Minesweeping in support of landing operations in the port of Wonsan began on the morning of 12 October 1950. Three US minesweepers penetrated the minefields protecting the port of Wonsan at 1112. Almost immediately, the USS Pirate struck a mine and sank in short order. An hour later, the USS Pledge suffered the same fate.⁴⁶ Shore based guns hampered the rescue effort.

The commander of the amphibious operation adopted a more conservative approach to clearing the mines. Wooden hulled minesweepers were employed in conjunction with helicopters and divers to clear mines. This method allowed a channel to be cleared through the minefield in five days. The Republic of Korea minesweeper YMS 516 conducted a final sweep of the channel on the day of the landing, 17 October. It was blasted into splinters. A Soviet manufactured mine with an 1800 pound explosive warhead had been laid in the channel which had just been "cleared". The mine employed a ship counter, which allowed eleven ships to pass overhead, but detonated when the twelfth ship passed. The amphibious operating area was closed until 25 October. The mines in the port of Wonsan required thirteen days to be neutralized, yet only 255 mines of approximately 3000 laid were actually swept.⁴⁷

Similarly, the German's plan for the defense of the English Channel coast during World

War II was to "lay mines and still more mines. *It is incomparably more effective to sink a whole cargo at sea than to have to fight the unloaded material and personnel on land.*"⁴⁸

Clearing mines has always been a difficult endeavor. The ability of the US Navy to conduct "timely mine clearance operations has fallen to dangerously low levels. Large magnitude sweep operations such as those required for large scale amphibious operations are no longer possible."⁴⁹ To conduct effective mine clearance operations, large amounts of time must be expended.⁵⁰ Large amounts of time in the mine clearing effort in preparation of a force projection operation will provide the enemy time to recover from any surprise. To compromise the secrecy of US intentions in the face of a capable foe may render the entire operation infeasible.⁵¹

The number of successful force projection operations into mined areas are few. Clearing mines is difficult enough, clearing mines in the face of a defending enemy poses additional hazards. Well laid sea minefields are similar to well laid ground minefields. Planners should expect they are covered by fire. This renders the minesweeping effort susceptible to direct fire. Such was the case in the Dardenelles campaign in WW I. The Turkish defenders laid 344 moored contact mines in eleven lines in the "Narrows" of the Dardenelle Straits. The chart depicts the weapons which the Turks emplaced to cover the minefield.⁵²

European Side

30 Heavy guns

6 Medium guns

3 Medium howitzers

Asian Side

31 Heavy guns

8 Medium guns

4 Medium howitzers

The Narrows is a chokepoint in the Straits where they constrict to a width of three quarters of a mile. Thus, covering a channel less than a mile wide were 82 guns, six of which were fourteen inch naval rifles which were capable of dueling a battleship on even terms. Less heavily armored warships had no defense against such a weapon.

This combination of weapons posed a difficult combined arms dilemma. To avoid the mines, ships had to sail slowly and carefully. Sailing slowly made them more vulnerable to the shore batteries. The minesweepers could not sweep the mines until the guns were suppressed, yet the guns could not be suppressed until the mines were swept.⁵³ A complex pattern of minesweeping efforts with different combinations of covering fire was attempted after several unsuccessful attempts. On 18 March 1915, the Allies attempted to force the Narrows. Three divisions of battleships and cruisers were to enter the Straits to pound the Turkish forts into submission. The minesweeping flotilla was to enter the Straits and sweep the Narrows when the Turkish guns had been silenced. The assault began at 1135 with good effect against the Turkish forts.⁵⁴ The attempt then degenerated from an apparent success to a complete disaster. The French battleship *Bouvet* struck a mine. Steaming quickly, she rolled and sank within two minutes, taking with her 640 men.⁵⁵ HMS *Inflexible* struck a mine near where *Bouvet* had sunk. She retired with heavy damage and casualties. HMS *Irresistible* struck a mine, lost power and was hammered by shore batteries. HMS *Ocean* suffered the same fate. By nightfall, the Allies had lost one battleship, had one heavily damaged, and two abandoned and adrift in the Dardenelles. The Turks did not lose a single ship.⁵⁶ The attempt to force the Straits had failed.

The hazards posed in clearing mines are significant. Consider the fact that during the evacuation from Dunkirk, twelve British Navy *minesweepers* struck mines. Seven were lost. The

other five managed to make it back to port for repairs.⁵⁷ Operation Overlord, the invasion of Normandy, further demonstrates the hazards of clearing mines. The British cleared 860 sea mines from their sector between June 6 and September 30, 1944. They lost 14 ships in the process. The US Navy cleared 454 mines in their sector for a loss of 34 ships, six of which were minesweepers.⁵⁸ The allies lost a total of forty-eight ships while clearing 1354 mines, a ratio of 1 ship lost per 28.2 mines cleared. To put the size of that effort in perspective, consider that the Allies employed 85 minesweepers to sweep just Utah Beach at Normandy. Employing today's US Navy mine warfare vessels, the Utah Beach mine clearing effort would have required three days using every mine warfare vessel flying the US flag.⁵⁹ Three days of intensive minesweeping efforts would surely have compromised the surprise which was essential to preclude the Germans from redeploying forces to the Normandy area. The Marine amphibious brigade employed during Operation Desert Storm was composed of thirty-one surface vessels. Using the Normandy loss rates of one ship per 28.2 mines laid, a force of that size in an effort similar to the Utah Beach assault theoretically could have been sunk by Iraqi mines alone.⁶⁰

Mines are cleared today essentially the same way as in World War I. Mine sweepers, primarily helicopters, can clear areas from floating moored mines. Mine hunters, using sophisticated sonars, can locate mines resting on the bottom. Despite improvements it will be some time before there is significant improvement in US capability to cope with the mine threat. The United States Navy is now in the process of launching the Avenger class of Mine Counter-measures vessels, but there were no counter mine vessels launched in the thirty years between 1958 and 1988.⁶¹ It will take time to address the shortfall in mine clearing capability.

Moored minefields pose significant hazards, randomly laid mines adrift in the currents are

even more dangerous. They will require additional effort to detect and to clear. Unmoored, floating mines such as the US Navy encountered in the Persian Gulf pose special hazards: they are very difficult to detect as they may float below the surface, they cannot be swept because they have no mooring cable and they can be laid in one area and have effects in another. The author's personal experience in the Persian Gulf during Operation Desert Storm was that unmoored floating mines were usually visually by a lookout. A Navy explosive ordnance disposal diver was then dropped by helicopter in the vicinity of the mine, who hand emplaced an explosive charge. The charge was set, the diver swam away from the mine and was recovered by helicopter. The charge was then detonated and the mine destroyed. Randomly laid mines adrift in the currents will require significant amounts of time to detect and to clear. Hazards will remain for surface vessels due to the extreme difficulty of detecting floating, unmoored mines.

The key point for the planner to consider is not the intricacy of laying and clearing mines. The issues for the planner are the time delays and the loss of surprise which will impinge on the entire operation which are required by a mine clearing effort. The lethality of sea mines mandates that their neutralization be considered as an essential task prior to deploying friendly shipping into the area of operations. Tasked with planning a force projection operation, the planner must account for the impact of the effort to counter the mine threat on the operation as a whole and the plan must reflect the impacts of failing to successfully neutralize the mine threat. The response that "we cannot deal with the mine threat without compromising operational security and so we will accept risk in this effort" is simply not acceptable.

Countering Enemy Anti-Ship Missiles

In 1982, England went to war with Argentina over the Falkland Islands in the South

Atlantic. This war effort required a force projection from the home islands of Great Britain across the Atlantic to a cluster of islands 400 miles from Argentina. At this time, the Argentine Navy reportedly had five Super Entendard aircraft and five AM-39 Exocet anti-ship missiles. The Argentine Navy declared the Exocet weapons system operational two days before the Argentine forces moved against the Falkland Islands.⁶²

On May 4, 1982, a single Entendard fired an Exocet from a distance in excess of twenty miles. The missile flew at high sub-mach speeds, about mach 0.93 or six hundred miles per hour, and extremely low altitudes, perhaps as low as two meters.⁶³ A launch range of twenty miles and a speed of 600 miles an hour gives the target 120 seconds of response time. In the case of the HMS Sheffield, this wasn't enough time. The Exocet carries a 165 KG warhead which is fused to detonate inside the hull of the target ship. In the case of the Sheffield, the warhead failed to detonate but rather appeared to burn up. The subsequent fires overwhelmed all attempts at damage control and the Sheffield was lost due to fires which burned out of control.⁶⁴

Perhaps more significant for the purposes of this study was the next employment of the Exocet missile. On March 25, two Argentine Super Entendards attacked. Firing their two missiles at the largest radar returns, the missiles homed in on one of the two British aircraft carriers in the task force. A continuous chaff cloud fired as a defensive measure decoyed the missiles from their intended target. Flying through the chaff clouds, the missiles acquired another target. The Atlantic Conveyor was a commercial container ship without defensive counter-measures. Five kilometers from the carrier, the Atlantic Conveyor was struck by the two Exocet missiles.⁶⁵ Atlantic Conveyor went down with all but one of the British expeditionary force's heavy lift helicopters. Four CH-47 Chinooks and six Wessex helicopters were lost. Also lost

were tents to accommodate 4,000 men, tents which were critical in the near Arctic conditions. Lost also was the expeditionary airfield which would have allowed the British Harriers to be shore-based.⁶⁶ On the last day of the war, the Argentines fired an Exocet from a shore position and hit the British destroyer Glamorgan. When fired from a shore position, the Exocet proved even more difficult to detect, as it was hidden from radar by the background clutter. Glamorgan suffered thirty casualties, including thirteen sailors killed, but manage to remain in action.⁶⁷

The shore-based cruise missile poses a different threat from an air launched cruise missile, and requires different counter-measures. These coastal defense cruise missiles are much more than mere defensive weapons. When moved into a strategic chokepoint they can have immense operational effects. The most important characteristics of coastal defense cruise missiles are mobility and stealth.⁶⁸ The launch vehicles are the size of medium to large trucks. They can move rapidly from one launch site to another. It is extremely difficult to locate and to identify those vehicles associated with cruise missiles used in a coastal defense mode.

The threat posed by sophisticated anti-ship missiles fired from either aircraft or from shore batteries adds yet another factor to be considered in the campaign to achieve battlespace dominance. The Sheffield had a total warning time of two minutes from its sensors. No amount of warning time would have saved the Atlantic Conveyor as she had no counter-measures to employ. To counter the missile threat, the task force may have to violate the conventional wisdom regarding electronic emissions and actively illuminate their radars in a constant search for coastal defense cruise missiles. This causes secondary effects as the task force will compromise its location and movement if it has a significant electronic signature. The short warning time experienced by Glamorgan may make this unavoidable. Fortunately, most coastal defense cruise

missiles are based upon ship-borne or air launched cruise missiles that can be countered by available electronic countermeasures or shot down by close in defensive weapons systems.⁶⁹ The risk is that electronic counter-measures may have to be employed continuously and thereby compromise the location of the ship to an enemy searching for signs of an approaching task force.

The critical item of information in countering the coastal defense cruise missile is warning time. The requirement to provide for the maximum possible warning time must become a priority of the entire joint force, and not merely the naval component. Once again, service doctrine must account for the impact of the threat on operational planning, and must plan to function as part of the campaign to counter the threat. Time to counter the threat must be built into the plan, and the failure to adequately address the threat must be addressed.

Which of the ships lost by the British to Exocet attacks had the greatest impact on the campaign? Certainly it was Atlantic Conveyor. When her helicopters were lost, the British were forced into their 'yomp' across the island. Which of the ships was least able to defend itself against the threat? Again it was Atlantic Conveyor. Glamorgan took significant casualties, but remained on station. Sheffield was lost only due to an indirect effect of the missile, raging fires caused by the impact of the missile and not the explosion of the warhead.

Force projection operational planners must develop plans to suppress or completely neutralize the threat posed by anti-ship missiles before bringing cargo ships into harm's way. It is only logical that the enemy will attack US cargo vessels. If a single missile can "sink" a helicopter squadron, or a tank company or more, the ship carrying such cargo must be considered a likely priority target.

To counter the anti-ship missile threat, the unarmed cargo vessels and tankers must not

sail into harm's way until battlespace dominance is achieved. Two tasks must be accomplished to counter this threat:

Gaining and maintaining air superiority. This will deny the enemy one means to delivering anti-ship missiles. Local escort vessels will have to provide close in defense of the cargo vessels, transports, and tankers. This will require a coordinated effort of combat air patrol aircraft and surface vessels to escort convoys of the cargo vessels.

Attacking and either destroying or neutralizing land based anti-ship missile firing positions. As the British learned in the Falklands, the missile launched from land is more difficult to counter due to the background clutter provided by the land mass. The high speed and short reaction times will present warships with a difficult threat to counter. A unarmed container ship like Atlantic Conveyor will has no such options. An exclusion zone to keep the missiles from targeting friendly shipping in transit zones is essential. This will require an effort similar to the Scud hunting operations of Operation Desert Storm. Planners will have to dedicate over head sensors, airborne sensors, command and control platforms and attack sorties to the neutralization of missile launch sites.

Such a coordinated effort will have to begin before US forces begin to close on the theater. The effort again is inherently Joint, yet each service doctrine must account for the fact that the task is a precondition for force deployment. Hence, Service plans must incorporate these considerations at the earliest opportunity. For example, an Army plan to offload the Afloat Prepositioned Ships and to marry that prepositioned equipment with arriving units must account for any delays imposed by the effort to achieve battlespace dominance against the anti-ship missile threat.

Countering Enemy Air Threats

The initial defense plan by the Argentines for the Falkland Islands was simple: sink British ships.⁷⁰ On May 21, 1982, the Argentine forces flew seventy-two sorties against British ships gathering in the vicinity of San Carlos Water. HMS Ardent was hit by two 1,000 pound bombs on the aft deck, knocking out all major systems. Ardent was hit by ten more bombs, forcing her to be abandoned. HMS Argonaut was badly damaged by two bomb hits on her flight deck. Antrim, Brilliant, and Broadsword were all hit with bombs which failed to explode. The cost to the Argentines for these attacks was sixteen fixed wing aircraft.⁷¹ Air attacks resumed on 23 May after a one day respite. HMS Antelope was struck by two 1,000 pound bombs that again failed to explode. One of these bombs exploded during an attempt to disarm it, resulting in the loss of the ship. Six more Argentine aircraft were shot down. The next day, the HMS Sir Galahad was hit, again by a bomb which failed to explode. HMS Sir Lancelot was also hit. Since the start of the San Carlos action, ten British ships had been sunk or hit by bombs which failed to explode. On 25 May, HMS Coventry was hit with three 1,000 pound bombs and capsized within twenty minutes. HMS Broadsword was hit but remained operational. Four Argentine Skyhawks were shot down. On June 8, the Sir Galahad and Sir Tristram were attacked resulting in fifty-one killed and forty-six injured. HMS Plymouth was struck by four bombs, none exploded. Seven Argentine aircraft were shot down.

The following chart details how close Argentine air attacks came to achieving their objective of sinking the British ships.

Results of Argentine Air Attacks on British Ships⁷²

Aircraft Carriers	Hermes Invincible	
Amphibious Assault Ship	Fearless	
County Class Destroyer	Antrim Glamorgan	Hit by a bomb, failed to explode on 21 May. Hit by shore-based Exocet, thirty casualties, remained operational, 12 June.
Sheffield Class Destroyer	Cardiff Coventry Exeter Glasgow Sheffield Southampton	Hit by 3 bombs, sank on 25 May. Struck by a bomb, failed to explode 12 May. Sunk, due to fire resulting from Exocet missile hit on 4 May.
Broadsword Class Destroyer	Battleaxe Broadsword Brilliant	Hit by a bomb, failed to explode 12 May. Hit by a bomb, failed to explode 21 May. Hit by a bomb, remained on station on 25 May. Hit by a bomb, failed to explode on 21 May.
Amazon Class Frigate Active	Alacrity Ambuscade Antelope Ardent Arrow Avenger	Hit by 2 1000 pound bombs on 23 May. Sank on 24 May. Hit by 2 1000 pound bombs on 21 May. Abandoned after 10 more bomb hits. Hit by bomb, slightly damaged on 1 May
Leander Class Frigate	Andromeda Argonaut Minerva Penelope	Hit by two bombs on 21 May. Dead in water.

Rothesay Class Frigate	Plymouth	Struck by 4 bombs, failed to explode on 8 June.
	Yarmouth	
Logistic Landing Ship	Sir Bedivere	Hit by a bomb, failed to explode on 24 May. Hit by bombs on 8 June. Sank on 21 June.
	Sir Galahad	
	Sir Geraint	
	Sir Lancelot	Hit by a bomb, failed to explode on 24 May.
	Sir Percivale	
	Sir Tristram	Hit by bombs on June 8.

These warships mounted a variety of air defense systems, some quite modern and capable, some admittedly either obsolete or approaching obsolescence. The Logistic Landing Ships were essentially unarmed. The attacking Argentine pilots flew relatively unsophisticated aircraft such as the A-4 Skyhawk. They dropped unguided general purpose bombs and the results were dramatic. Thirty-three British warships participated in the operation. Sixteen, or nearly half, were hit by bombs. The attacking jets managed to hit British ships with a total of at least thirty-five bombs. Twelve of those thirty-five bombs failed to explode, or over one third. Four British warships were sunk by bombs: Antelope, Ardent, Coventry, and Sir Galahad. Three British ships were hit with Exocet missiles: Sheffield, Glamorgan and Atlantic Conveyor. Sheffield and Atlantic Conveyor were sunk.⁷³ The losses could have been much more severe had the Argentine ordnance functioned at a more normal rate and the Argentine pilots been able to distribute their ordnance loads across the entire British fleet. Some British ships were not hit at all while the Ardent, for example, received twelve hits. Had the Argentine pilots focused more on cargo vessels and less on combatant vessels, they may have more significantly impacted the British expedition. Consider the impact of the loss of the Atlantic Conveyor with its critical cargo

of Chinook helicopters.

These simple statistics demonstrate the effect that a highly trained and motivated attacker can have with less than state of the art aircraft and ordnance, as long as they are willing to sustain the losses. The losses the British endured, and the losses they narrowly avoided, demonstrate the potential damage and disruption which can be inflicted on a US force projection operation. The conclusion is that achieving air superiority is an absolutely essential precondition for force projection operations. Failure to accommodate the air superiority effort in the overall plan may simply provide a target rich environment for a motivated enemy air force.

The British were unable to achieve air superiority in the vicinity of their landing beaches until shore-based air defense systems were landed and operational.⁷⁴ The requirement to land the landing force, and to provide close support for those forces caused the British ships to be in close proximity to each other in restricted waters. The terrain of the landward sector provided a means for the attacking jets to terrain mask, foiling British efforts to detect the inbound aircraft with radar. US forces could face similar threats unless the battlespace is first isolated, and then the air threats in the battlespace are neutralized or destroyed. Like the other threats, planners must consider the impact of the air superiority effort when developing their force projection plans and timelines.

VI. A Proposed Doctrine for Force Projection Operations

Future force projection operations may be significantly different from force projection operations of the recent past. Force projection may involve far less landing across hostile shores and far more operations designed to forcibly enter the area of operations. The enemy may use the threats discussed earlier in this monograph to deny the US entry to the area of operations rather

than attempting to defeat US forces at the water's edge. Current doctrine for force projection operations does not adequately address the possibility of a scenario where the enemy attempts to deny the US entry to the area of operations by using the weapons described earlier in this monograph. Additionally, current doctrine fails to adequately describe the operational impacts of such enemy efforts.

The era between the World Wars was an era of reduced budgets for the US military. After the outbreak of World War II, this CONUS-based military force required force projection operations in order to get into the area of operations. The need for force projection was particularly pressing after the initial setbacks against the Japanese. This strategic environment in the Pacific theater was the impetus of the development of the doctrine for amphibious operations which resulted in the island hopping campaign against Japan. The current military environment is very similar. Formerly forward deployed units are relocating to the continental United States. The projection of those forces from CONUS to the area of operations will require a doctrinal renaissance similar to that which led to the development of amphibious warfare doctrine.

During the period between the two World Wars, the United States Marine Corps assessed the strategic environment in the Pacific theater. Based on that assessment, the Marines identified the need for a doctrine, based on their role of seizing and defending advanced naval bases, that addresses an amphibious capability to defeat Japan. This doctrine was based on the theoretical works of Marine Major Pete Ellis.⁷⁵

In the post-World War I era, the US had two strategic outposts in the Pacific, the island of Guam in the Marianas chain, and the Philippine Islands. The Treaty of Versailles mandated many western Pacific islands formerly belonging to the German empire to Japan. Strategic islands in the

Marianas, Caroline and Marshall Island groups were now Japanese possessions and flanked the overseas routes to these two US possessions.⁷⁶ Based on this strategic setting, Major Pete Ellis sketched an outline plan of naval strategy for the Pacific theater with particular attention to the Marine Corps' role.⁷⁷ He first presented his concepts in a lecture in 1919.⁷⁸ Ellis stated, "In order to impose our will upon Japan, it will be necessary for us to project our fleet across the Pacific."⁷⁹ A very similar strategic environment exists today. The areas of operations for future conflicts will require operations similar to those that Ellis described. His premise can be restated today to say that in order to impose our will on an enemy, it will be necessary to project US joint forces into the theater of operations.

Based on the proposals of Major Ellis, and at the direction of the Commandant of the Marine Corps, the Marine Corps began to develop a manual for landing operations in November of 1933.⁸⁰ The preliminary work was adopted by the Navy in 1938 and became the official doctrine for landing operations.⁸¹

A direct descendant of the 1938 doctrine is Landing Force Manual (LFM) 01, *Doctrine for Amphibious Operation*, which was adopted by all four US armed services (known to the US Army as FM 31-11). Current Joint amphibious doctrine is embodied in Joint Publication 3-02, *Joint Doctrine for Amphibious Doctrine*. It is functionally similar and in many ways identical to LFM-01. In order to address the heart of amphibious doctrine, LFM-01 will be used to present the doctrinal discussion.

LFM-01 defines the salient requirement of the amphibious operation as the "necessity of building up combat power ashore from an initial zero capability to a full coordinated striking power ashore. The special measures introduced to meet this requirement form the basis of the

organizational and technical differences existing between amphibious and land warfare."⁸² With the exception of an actual assault across a hostile shore, the requirements described for an amphibious assault are conceptually identical for a modern force projection operation.

Current doctrine for force projection operations is deficient. The Army's Field Manual (FM) 100-5, *Operations*, of June 1993, defines force projection as the movement of military forces from CONUS or a theater in response to requirements of war or operations other than war. Force projection operations extend from mobilization and deployment of forces to redeployment to CONUS or home theater, to subsequent demobilization.⁸³ This definition is flawed. The FM 100-5 definition suffers in that it is overly broad and does not provide adequate guidance to force projection planners.

Naval Doctrinal Publication (NDP)-1, *Naval Warfare* does not use the term force projection, preferring the term power projection. It defines power projection as the application of offensive military force against an enemy at a chosen time and place. Maritime power projection may be accomplished by amphibious assault operations, attack of targets ashore, or support of sea control operations.⁸⁴ This definition is incomplete. By focusing the definition solely on offensive operations, NDP-1 does not address other types of force projection operations. An example of a non-offensive force projection operation would be an operation to project defensive forces into Kuwait to deter aggression by Iraq.

A definition of force projection operations must be finite or the special requirements of the force projection phase of the operation will not be adequately addressed. Using the definition in FM 100-5 for example, World War II in its entirety was a force projection operation. During World War II, force projection provided the means for delivering forces, equipment and supplies

into the theater, and allowed for an initial buildup of combat power from zero. Entire field armies were eventually engaged against the enemy. There was a transition from the force projection phase to the sustained land combat phase. LFM-01 provides guidance for the termination of the force projection phase and the commencement of sustained combat operation phase. LFM-01 states that the termination of an amphibious operation is predicated on the accomplishment of the amphibious task force in accordance with specific conditions contained in the initiating directive. The firm establishment of the landing force ashore is usually specified as one of these conditions. The landing force is regarded as firmly established ashore when in the opinion of the landing force commander:

- (1) The force beachhead has been secured.
- (2) Sufficient tactical and supporting forces have been established ashore to ensure the continuous landing of troops and material requisite for subsequent operations.
- (3) Command, communications, and supporting arms coordination facilities have been established ashore.
- (4) The landing force commander has stated that he is ready to assume full responsibility for subsequent operations.

The authority promulgating the initiating directive will then terminate the amphibious operation and dissolve the amphibious task force.⁸⁵ This guidance should be used to determine the end of the force projection phase of an operation, and commencing the sustained land combat phase. Using this guidance, the force projection phase of the Falkland's campaign would have terminated when the British forces had been established ashore. The sustained land combat phase began with the British breakout from the beachhead.

At this point, the following definition of force projection operations is proposed: *Force projection operations are enabling operations involving the movement of forces into an area of operations and the subsequent application of that force to achieve battlespace dominance. These force projection operations subsequently terminate and a transition to sustained combat operations is effected when adequate combat power has arrived in theater to achieve the campaign objectives. Force projection operations will normally require the buildup from zero or a low initial capacity to full offensive striking power.* This definition provides a synthesis of both the FM 100-5 and NDP-1 descriptions. Force projection is both the movement of forces into theater, and the application of that force. Initial operations are specifically delineated in the proposed definition in order to provide for those cases where a supporting mission may be required to ensure the uninterrupted flow of forces, equipment and supplies into theater. A key consideration for planners is that force projection combat power may begin at zero and require a total capability to be projected into the theater, or it may start from an initial level, with a reinforcement of forces already in theater. Grenada offers an example of the former, Panama offers an example of the second.

The doctrine for amphibious operations will serve us well is in the area of supporting operations. Supporting operations for amphibious operations are the prior and concurrent operations, as required, conducted by forces other than those assigned to the amphibious task force. Examples of supporting operations are:

- (1) Feints or demonstrations intended for purposes of deception.
- (2) Isolation of the objective area by interdicting the movement thereto of enemy forces.
- (3) Operations designed to assist in gaining or maintaining air, ground, or naval

supremacy.

(4) Air, surface, submarine, or special operations designed to secure information.

(5) Psychological and unconventional warfare operations.⁸⁶

Battlespace dominance is a relatively new term, but it is not a new concept. The concept of battlespace dominance pervades LFM-01. The Advance Force is one component of the Amphibious Task Force. It conducts supporting operations as an independent force. It provides a means for the amphibious force to achieve battlespace dominance as a preliminary operation, the goal of which is to enable the amphibious task force to enter the amphibious objective area unimpeded. This allows the amphibious assault to proceed against a foe which has been isolated from reinforcement.

Doctrinally, the Advance Force precedes the Amphibious Task Force to the objective area. Its function is to prepare the amphibious objective area for assault by conducting "such operations as reconnaissance, minesweeping, preliminary bombardment, underwater demolition operations, and air operations."⁸⁷ The Advance Force may be tasked to conduct operations for the following purposes:

1. To isolate the objective area. Isolation of the objective area is accomplished primarily by air operations designed to sever lines of communication. Air, surface, and subsurface superiority is attained by bombardment, surface and air sweeps, and antisubmarine operations. Destruction or neutralization of distant enemy forces that threaten the amphibious task force, including the advance force, provides freedom from enemy interference while the task force is en route to the objective area.⁸⁸

2. To gain information of the enemy.

3. To prepare the objective area.⁸⁹

The tasks assigned to the advance force in amphibious operations relate directly to countering the threats to force projection operations described earlier in this monograph. The result of the cumulative effects of these Advance Force operations is battlespace dominance. LFM-01 states that these operations are conducted to achieve "isolation and attainment of superiority. Isolation of the objective area is accomplished primarily by air operations designed to sever lines of communications. Air, surface, and subsurface superiority is attained by bombardment, surface and air sweeps, and antisubmarine operations. Destruction or neutralization of distant enemy forces that threaten the amphibious task force, including the advance force, provides freedom from enemy interference while the task force is en route to the objective area."⁹⁰ As described earlier in this paper, these are exactly the tasks required to assure the free flow of forces, equipment and supplies into the area of operations.

A second means for achieving battlespace dominance can be found in amphibious doctrine. It is, in the absence of a designated Advance Force, the use of elements of the amphibious task force itself. These operations are considered as pre-assault operations rather than supporting operations. Pre-assault tasks are the same as those required of the Advance Force. These pre-assault operations are conducted in order to:

- (1) To isolate the objective area.
- (2) To gain information of the enemy.
- (3) To prepare the objective area.

Force projection capability may not necessarily require landing forces against a defended shore, as in an amphibious assault, but may rather imply the need to forcibly enter the area of

operations. In the Falkland's example, the British landing was essentially uncontested. The force projection operation as a whole was seriously contested by Argentine air and missile attacks as the British forces closed on the Falkland Islands. The US may have to forcibly enter an area of operations by clearing mines or attacking submarines in order to allow the introduction of force using sealift. Current US Army doctrine does not address these supporting operations as integral to the overall force projection effort. The doctrine for amphibious operations provides a means to transition to a new force projection doctrine which accounts for these operational requirements.

VII. Conclusions and Recommendations

A future doctrine for force projection should emulate LFM-01. The doctrine for amphibious operations can and should provide the basis for a comprehensive doctrine for force projection operations. This doctrine should address achieving battlespace dominance in the force projection objective area in order to accomplish the tasks described doctrine as supporting operations and pre-assault operations in amphibious doctrine. This will typically call for an independent joint task force with the specified task of achieving battlespace dominance in the objective area in order to enable follow-on force projection operations. Organized similarly to the advance force in amphibious doctrine, this JTF would be dissolved when the main body for the operation arrives and is established in theater. This JTF would have a single mission analogous to advance force operations in amphibious doctrine, and would therefore have a single focus, that of enabling force projection operations by dominating the enemy threats in the battlespace. This will allow the main force to concentrate on the main effort, rather than dissipating its effort across a broad series of tasks. When the situation does not require a special JTF, supporting operations can be conducted by the main force as provided in LFM-01.

Additionally, FM 100-5 should be changed to better address force projection operations.

FM 100-5 describes the general sequence of force projection operations as:⁹¹

Mobilization, if required.

Predeployment Activity.

Deployment.

Entry Operations.

Operations.

War Termination and Post-Conflict Operations.

Redeployment and Reconstitution.

Demobilization.

There are four steps which are involved in force projection operations which this monograph is concerned with. Mobilization is described as a process in which the armed forces augment the active component capability in preparation for war or other national emergencies. Predeployment activity is described in FM 100-5 as a series of tasks relating to training, force tailoring, developing logistics plans, and prioritizing lift requirements. This series of tasks does not include any discussion of conducting supporting operations for a force projection operation. Deployment is defined as the relocation of forces to desired areas of operations; the movement of forces within areas of operations. Entry operations are described as the sequencing of combat units and supporting structures in a manner that enables them to gain and sustain the initiative and protect the force after landing. FM 100-5 states that whenever possible, US forces seek unopposed entry. Opposed entry operations are described as requiring combat operations to land deploying forces in the theater.

This sequence found in FM 100-5 does not address the critical issue of attaining battlespace dominance as an essential precondition for force projection as discussed in this monograph. There is no discussion of countering enemy threats to force projection. The sequence described in FM 100-5 should be changed to include a new step between predeployment activities and deployment. This step should be entitled establishment of battlespace dominance. This step should be described as *an inherently joint task designed to counter enemy threats to force projection operations. The purpose of establishing battlespace dominance is to enable unimpeded US force projection operations into the area of operations. Time for this task must be accounted for as part of the overall effort. All services must be prepared to provide resources to achieve battlespace dominance. The achievement of battlespace dominance is an essential precondition for force projection operations.*

The purpose of proposing new doctrine is to focus planners on the tasks essential to conduct successful force projection operations. Current doctrine does not provide adequate guidance to planners in considering all the tasks for conducting force projection operations nor does it adequately represent the threats to force projection that regional powers may bring to bear. These proposed additions to doctrine are offered to provide a source for planners to refer to when planning force projection operations.

LFM-01 remains a valid resource for planners. Its value can be enhanced by adopting the tenets in LFM-01 as the basis for a new doctrine for US force projection operations. The new doctrine should be universally applicable to force projection operations, both seaborne movements and airborne movements. A new doctrine for force projection can serve the same function for future force projection operations that LFM-01 did for amphibious operations in the past.

ENDNOTES

1. Mark Pires and Darrell Williams, Strategic Lift: Can the United States Conduct Two Nearly-Simultaneous Major Regional Contingencies?, (SAMS Monograph, USACGSC School of Advanced Military Studies, Fort Leavenworth, KS, Spring Term 1995),page 4.
2. Andrew H. Card, US Secretary of Transportation, "Proposals for a Healthy US-Flag Fleet", Defense Transportation News, (August 1992), page 28.
3. U. S. Army, Field Manual (FM)100-5, Operations, (Fort Leavenworth, KS, 1993), introduction.
4. Ibid.
5. Ibid., glossary.
6. Ibid., page 3-10.
7. Scott C. Truver "Can't Get There From Here?" Armed Forces Journal International, (August, 1995), page 27.
8. U. S. Navy, Naval Doctrine Publication (NDP) 1, Naval Warfare, (Washington, DC, 1994), glossary.
9. Ibid.
10. Ibid.
11. Ibid.
12. FM 100-5 Operations, 1993, glossary.
13. Ibid., page 6-12.
14. Lieutenant General Paul E. Funk, U. S. Army, "Battle Space: A Commander's Tool on the Future Battlefield", Military Review (June 1993), page 36.
15. NDP-1 Naval Warfare, page 63.
16. Memorandum from CDR Rick Holdcroft of the Naval Doctrine Command dated 8 Feb 1994.
17. Ibid.
18. U. S. Army, Field Manual 100-7, Decisive Force: The Army in Theater Operations, (Washington, DC, 1995), page 6-17.

19. Truver, "Can't Get There From Here?".
20. U. S. Army FM 100-7, Decisive Force: The Army in Theater Operations, page 6-17.
21. Department of the Navy, Office of Program Appraisal, Lessons of the Falklands, Summary Report, (Washington, DC, 1983), page 8.
22. Daniel Withers, Anti-Submarine Warfare: Considerations for Future Operations in Third World Regions, (Naval War College, Newport, RI, 1992), page 19.
23. John S. Husaim, Anti-Submarine Warfare in the Littoral: An Essential Element of Battlespace Dominance, (Naval War College, Newport, RI, 1995), page 9.
24. Kenneth P. Weinberg, Shallow Water ASW: An Analysis of Threats and Capabilities, (Naval War College, Newport, RI, 1980), page 11.
25. Victor G. Ristvedt, The Conventional Submarine Threat in Littoral Regions, (Air War College, (Air University, Maxwell Air Force Base, Alabama, 1993), page 5.
26. Husaim, page 10.
27. Weinberg, Table 1, page 4.
28. Clinton H. Cragg, The United States Versus the Third World Submarine: Are We Ready?, (Naval War College, Newport, RI, 1991), page 22.
29. Ristvedt, page 7.
30. Ibid., page 31.
31. Cragg, page 15.
32. Withers, Appendix 1.
33. Ibid., Appendix 2.
34. Kendall H. Card, Air Protection of a Maritime Action Group--The Indian Ocean Challenge, (Naval War College, Newport, RI, 1992), page 28.
35. Julian S. Corbett, Some Principles of Maritime Strategy, (Annapolis, MD, Naval Institute Press, 1988), Chapter 4, Section II.
36. "Torpedoes", Naval Forces, Vol. 10, no 3, 1989, page 83.
37. US Department of Defense, Final Report to Congress on the Conduct of the Persian Gulf War, (Washington, DC, 1992), page 306.

38. Paulette R. Neshiem, Protection of Merchant Shipping, (US Army War College, Carlisle Barracks, Pa, 1990), page 16.
39. "Naval Ships", All Hands, (January 1995), page 32.
40. Ibid., page 37.
41. US Naval Institute, Desert Score, US Gulf War Weapons, (July 1991), page 233.
42. Ibid., page 249.
43. North Atlantic Treaty Organization, "Mine Warfare in the Gulf", NATO's Sixteen Nations (January, 1992, Vol 37), page 10.
44. Ibid.
45. James F. Ball, The Effects of Sea Mining on Amphibious Warfare, (Master's Thesis, USACGSC, Ft Leavenworth, KS, 1992), page 27.
46. Ibid., page 101.
47. Ibid., page 104.
48. Ibid., page 21.
49. Ibid., page 1.
50. Ibid.
51. Ibid.
52. Ibid., page 56.
53. Ibid., page 60.
54. Ibid., page 62.
55. Ibid.
56. Ibid., page 63.
57. Ibid., page 21.
58. Ibid., page 93.
59. Ibid., page 94.

60. Ibid.
61. Gerard Gambiez, France, Should We Fear Mine Warfare?, (US Army War College, Carlisle Barracks, Pa, March 1989), page 12.
62. Bruce W. Watson and Peter M. Dunn, Military Lessons of the Falkland Islands War, (Westview Press, Boulder, Colorado, 1984), page 44.
63. Ibid., page 86.
64. Ibid., page 87.
65. Ibid.
66. Ibid., page 158.
67. Ibid., page 165.
68. Michael E. Rogers, "Countering Coastal Defense Cruise Missiles", Proceedings, (September, 1987), page 52.
69. Ibid., page 53.
70. Ibid., page 44.
71. Ibid, page 156.
72. Watson and Dunn, Military Lessons of the Falkland Islands War, page 142.
73. Ibid., Appendix: A Diary of the Falkland's Conflict, page 135.
74. Julian Thompson, No Picnic, (New York, Hippocrene, 1985), page 62.
75. Jeter A. Isely and Philip A. Crowl, The US Marines and Amphibious War, (Princeton, NJ, Princeton University Press, 1951), page 25.
76. Ibid.
77. Ibid.
78. Ibid.
79. Ibid.
80. Ibid., page 35.
81. Ibid., page 36.

82. Department of the Navy, Office of the Chief of Naval Operations, Landing Force Manual 01, Doctrine for Amphibious Operations, (Washington, DC, 1967) page 1-3. This version of this doctrine is used as it is the earliest version adopted by all of the US armed services and NATO. It is designated as ATP-8 for NATO, NWP-22(B) for the US Navy, FM 31-11 for the US Army, AFM 2-53 for the US Air Force, and LFM 01 for the US Marine Corps.
83. US Army , FM 100-5 Operations, 1993, page Glossary-4.
84. US Navy, NDP-1 Naval Warfare, page 74.
85. US Marine Corps, LFM-01 Doctrine for Amphibious Operations, page 1-6.
86. Ibid., page 1-4.
87. Ibid., page 2-8.
88. Ibid., page 15-4.
89. Ibid., page 15-3.
90. Ibid., page 15-4.
91. US Army, FM 100-5 Operations, 1993, page 3-7.

BIBLIOGRAPHY

Books

Corbett, Julian S. Some Principles of Maritime Strategy. Annapolis, MD: Naval Institute Press, 1988.

Isely, Jeter A. and Crowl, Philip A. The US Marines and Amphibious War. Princeton, NJ: Princeton University Press, 1951.

Thompson, Julian. Lifeblood of War. London, Brassey's, 1991.

Thompson, Julian. No Picnic. New York: Hippocrene, 1985.

Vaux, Nick. Take That Hill, Royal Marines in the Falklands War. Washington, DC: Pergamon-Brassey's International Defense Publishers, 1986.

Watson, Bruce W. and Dunn, Peter M. Military Lessons of the Falkland Islands War. Boulder, CO: Westview Press, 1984.

Studies

Ball, James F. The Effects of Sea Mining on Amphibious Warfare. Ft. Leavenworth, KS: USACGSC, 1992.

Boyter, H. G. III. Mine Countermeasures, A Viable US Capability? Newport, RI: Naval War College, 1988.

Bradley, Stephen C. Clearing the Vital Choke Points in the Sea Lines of Communication--Its Not Just a Navy Problem and Solution. Newport, RI: Naval War College, 1993.

Buck, Ralph V. Merchant Ship Attrition: A Historical Perspective. Arlington, VA: A study performed for the Director, Strategic Sealift Division, Office of the chief of Naval Operations under contract number PO SB-6, 1986.

Card, Kendall H. Air Protection of a Maritime Action Group--The Indian Ocean Challenge. Newport, RI: Naval War College, 1992.

Cosgrova, Brian A. "From the Sea" Versus the U-boat. Newport, RI: Naval War College, 1994.

Cragg, Clinton H. The United States Versus the Third World Submarine: Are We Ready? Newport, RI: Naval War College, 1991.

Ehlers, Mark A. Countering the Third World Mobile Short Range Ballistic Missile Threat: An Integrated Approach. Monterey, CA: Naval Postgraduate School, 1992.

Fanta, Peter J. Sea Mines at the Operational Level of War. Newport, RI: 1995.

Fowler, Robert J. Mine Countermeasures at the Operational Level of War. Newport, RI: Naval War College, 1993.

Gambiez, Gerard. Should We Fear Mine Warfare? Carlisle Barracks, PA: US Army war College, 1989.

Gear, Bud Stanwood. Sea Denial Capabilities of Third World Countries. Master's Thesis. Monterey, CA: Naval Postgraduate School, 1982.

Houser, Robert E. Will Military Sealift Become Our Achilles Heel? Newport, RI; Naval War College, 1991.

Husaim, John S. Anti-Submarine Warfare in the Littoral: An Essential Element of Battlespace Dominance. Newport, RI: Naval War College, 1995.

Kusumoto, Neal J. The Lost Art of Maritime Mining. Newport, RI: Naval War College, 1995.

Lokkins, Craig J. The Falklands War: A Review of the Sea-Based Airpower, Submarine and Anti-Submarine Operations. Maxwell Air Force Base, AL: Air War College, 1989.

Neshiem, Paulette R. Protection of Merchant Shipping. Carlisle Barracks, PA: US Army War College, 1990.

O'Pray, John E. Regional Ballistic Missiles--An Emerging Threat to Deployed US Forces? Maxwell Air Force Base, AL: Air War College, 1990.

Pires, Mark and Williams, Darrell. Strategic Lift: Can the United States Conduct Two Nearly-Simultaneous Major Regional Contingencies? An unpublished monograph. Fort Leavenworth, KS: USACGSC School of Advanced Military Studies, December, 1993.

Wallace, R. J. Mine Warfare: Its Implication for the Future of Amphibious Operations. Washington, DC: National Defense University, 1993.

Ristvedt, Victor G. The Conventional Submarine Threat in Littoral Regions. Maxwell Air Force Base, AL: Air War College, 1993.

Weinberg, Kenneth P. Shallow Water ASW: An Analysis of Threats and Capabilities. Newport, RI: Naval War College, 1980.

Withers, Daniel. Anti-Submarine Warfare: Considerations for Future Operations in Third World Regions. Newport RI: Naval War College, 1992.

Government Publications

Department of the Navy, Office of the Chief of Naval Operations. Landing Force Manual 01. Doctrine for Amphibious Operations. Washington, DC: Chief of Naval Operations, 1967.

US Department of Defense. Joint Publication 3-02: Joint Doctrine for Amphibious Operations. Washington, DC: The Joint Chiefs of Staff, 8 October, 1992.

US Army. Field Manual 100-5. Operations. Washington, DC: Department of the Army, 1993.

US Army. Field Manual 100-7. Decisive Force: The Army in Theater Operations. Washington, DC: Department of the Army, 1995.

US Department of Defense. Final Report to Congress on the Conduct on the Persian Gulf War. Washington, DC: Department of Defense, 1992.

US Navy. Naval Doctrine Publication 1. Naval Warfare. Washington, DC: Department of the Navy, 1994.

Articles

Almond, Denise L. Editor. "Desert Score, US Gulf War Weapons", US Naval Institute, (July 1991), page 233.

Card, Andrew H. "Proposals for a Healthy US-Flag Fleet", Defense Transportation News (August 1992), page 28.

Funk, Lieutenant General Paul E. "Battle Space: A Commander's Tool on the Future Battlefield", Military Review (June 1993), page 36.

Rogers, Michael E. "Countering Coastal Defense Cruise Missiles", Proceedings, (September 1987), page 52.

Truver, Scott C. "Can't Get There From Here?" Armed Forces Journal International (August 1995), page 27.

Wilde, Josef, Vice Admiral. "Mine Warfare in the Gulf", NATO's Sixteen Nations, (January 1992), page 10.

No author credited. "Naval Ships", All Hands, (January 1995), page 32.

Other Sources

Holdcroft, Rick. Commander, US Navy, of the Naval Doctrine Command. Unpublished memorandum dated 8 February 1994, entitled: "Battlespace Dominance".