

Expanded MEB Training Requirements and the Associated Training Environment

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Summary

The Marine Expeditionary Brigade (MEB) is the Marine Corps' primary organization dedicated to a joint force for small-scale contingencies. It can support a wide range of missions, from humanitarian assistance and disaster relief to forcible entry. The MEB can enable follow-on forces or operate on its own as a decisive force.

Organizationally, the MEB is a mid-sized Marine Air-Ground Task Force (MAGTF) nominally built around a reinforced infantry regiment, a composite aircraft group with both fixed- and rotary-wing aircraft, and a combat service support group (CSSG). MEBs are not standing organizations, but rather are imbedded within each of the Marine Expeditionary Forces (MEFs). MEBs are task-organized as needed for specific missions.

The Marine Corps Training and Education Command (TECOM) was tasked with developing initiatives to enhance MEB-level training to support both the current and future MEB. In particular, TECOM seeks to introduce a large-scale MEB exercise program into the MAGTF curriculum.

TECOM tasked CNA with determining what tasks a MEB needs to train to execute, and what environment is required to support that training. The purpose of this study is to define the requirements for conducting large-scale MEB training exercises and identify the resources required to establish these exercises on a recurring basis.

Task 1 of the study included our efforts to define the MEB and identify training requirements for the MEB command element (CE). This report documents task 2 of the study, the objective of which is to determine the environment required to support MEB training. This task also expanded on the list of MEB training requirements begun in task 1.

Expanded training requirements and their implications on the training environment

We developed two analytical approaches to expand our set of MEB training requirements. The first considers the major subordinate commands (MSCs) and all the integration points involved with combined arms operations. The second analyzes MEB missions and identifies associated training requirements.

MEB as an operational command

For the MEB CE to operate at the operational-level of war it must establish a command and control infrastructure that allows it to determine operational objectives, develop plans and guidance for subordinate elements, allocate and apportion assets, establish a tactical to operational feedback loop, and monitor and direct execution in order to achieve strategic objectives.

The Marine Corps uses three general training formats: command post exercises (CPXs), field training exercises (FTXs), and simulations. Each offers a different training emphasis. CPXs generally focus on planning, while FTXs support tactical execution. Simulation training can involve planning, or a combination of planning and execution, with a focus on communication and integration.

To fully train an integrated MAGTF, the MEB requires a CPX environment that will allow for operational level planning, and an FTX environment that will create the conditions and constraints to tax the MEB's command and control functions.

MEB employment options

Training requirements associated with specific missions generally fall into two categories:

- Tasks associated with a scheme of employment
- Tasks associated with operating conditions.

Based on the scheme of employment requirements derived from the analysis, we determined that a MEB can employ its ground elements in three general ways:

- As a single battalion conducting a single mission
- As single battalions conducting multiple missions simultaneously
- As multiple battalions conducting a single mission

Each mode leads to varied command and control training requirements as well as integration and coordination points. The three employment options require different training environments and physical range requirements.

Training environment constructs

All MAGTFs can be called upon to operate in three dimensions—land, sea, and air. Therefore, at the most general level, they require training in all three environments. We developed constructs for thinking about MEB-sized land and air ranges.

Ground training area

A ground training area can be divided into two functional spaces, the maneuver area and the impact area.

The size of a ground training area is a function of three elements:

- Size of the unit
- Scheme of maneuver
- Fires.

The size of the unit conducting the training dictates the width of the maneuver space, and the scheme of maneuver directs the depth of the maneuver space. The effects of fires dictate the size of the impact area.

Air training space

Air training space is a function of five elements:

- Tactical maneuver space
- Ingress and egress routes
- Refueling and holding areas
- Weapons impact area
- Safety buffer zone.

Introduction

The Marine Expeditionary Brigade (MEB) is the Marine Corps' primary organization dedicated to a joint force for small-scale contingencies. It can support a wide range of missions, from humanitarian assistance and disaster relief to forcible entry. The MEB can enable follow-on forces or operate on its own as a decisive force.

Organizationally, the MEB is a mid-sized Marine Air-Ground Task Force (MAGTF) nominally built around a reinforced infantry regiment, a composite aircraft group with both fixed- and rotary-wing aircraft, and a combat service support group (CSSG). MEBs are not standing organizations, but rather are imbedded within each of the Marine Expeditionary Forces (MEFs). MEBs are task-organized as needed for specific missions.

Formal training opportunities exist for Marine Expeditionary Units (MEUs) and MEFs, as outlined in the MEU Pre-deployment Training Program (PTP) and the MAGTF Staff Training Program (MSTP). MEBs currently lack an equivalent dedicated curriculum.

The Marine Corps Training and Education Command (TECOM) was tasked with developing initiatives to enhance MEB-level training to support both the current and future MEB. In particular, TECOM seeks to introduce a large-scale MEB exercise program into the MAGTF curriculum. Towards that end, TECOM tasked CNA with determining what tasks a MEB needs to train to execute, and what environment is required to support that training.

2015 MEB

The MEB exercise training study is geared towards the future MEB as defined by the 2015 MEB baseline. Understanding the implications of the 2015 MEB's organizational structure and equipment list is essential to defining training and range requirements.

The Marine Corps plans for the 2015 MEB to be employable via amphibious lift or the Maritime Prepositioning Force (Future) (MPF(F)). Key characteristics of the 2015 MEB include:

- Seabasing capability
- Operational reach up to 200 nm
- Future weapons, aircraft, and vehicles
- Reorganized Brigade Service Support Group (BSSG)

Figure 1 shows the general organization of the 2015 MEB baseline, along with key pieces of equipment and weapons systems.

Figure 1. 2015 baseline MEB

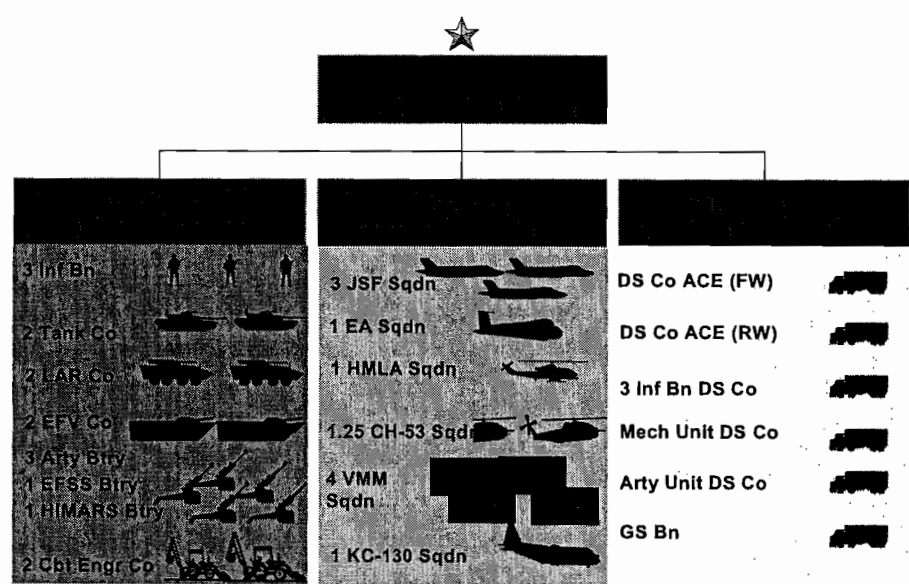


Figure 2 goes into further detail on how the Ground Combat Element (GCE) will be organized according to the 2015 MEB. Some of the key characteristics include:

- Two battalion task forces that embark to the shore via surface lift, and one that travels via vertical lift

- Mobile Combat Service Support detachments (MCSSDs) that provide the reduced support footprint ashore when attached to the battalion task forces
- Increased range of indirect fires provided by batteries of light-weight (LW) 155 Howitzers, the High Mobility Artillery Rocket System (HIMARS), and the Expeditionary Fire Support System (EFSS).

Figure 2. 2015 MEB GCE

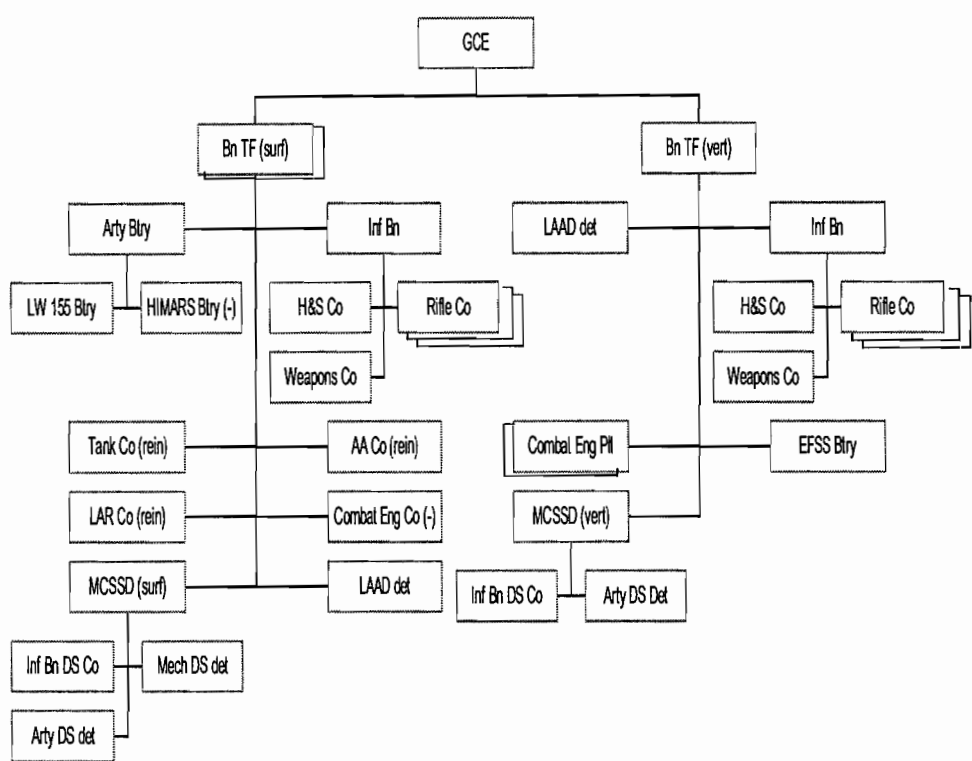
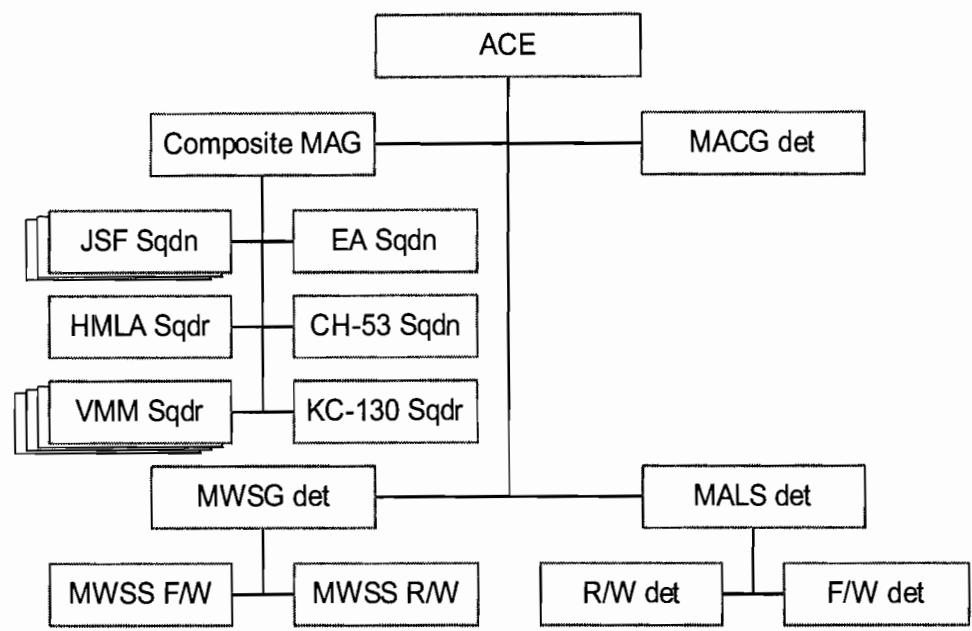


Figure 3 provides detail on the composition and organization of the Air Combat Element (ACE). The 2015 MEB has significantly more air power than the MEU. It is the smallest MAGTF with a fully capable aviation element that performs all six functions of Marine aviation:

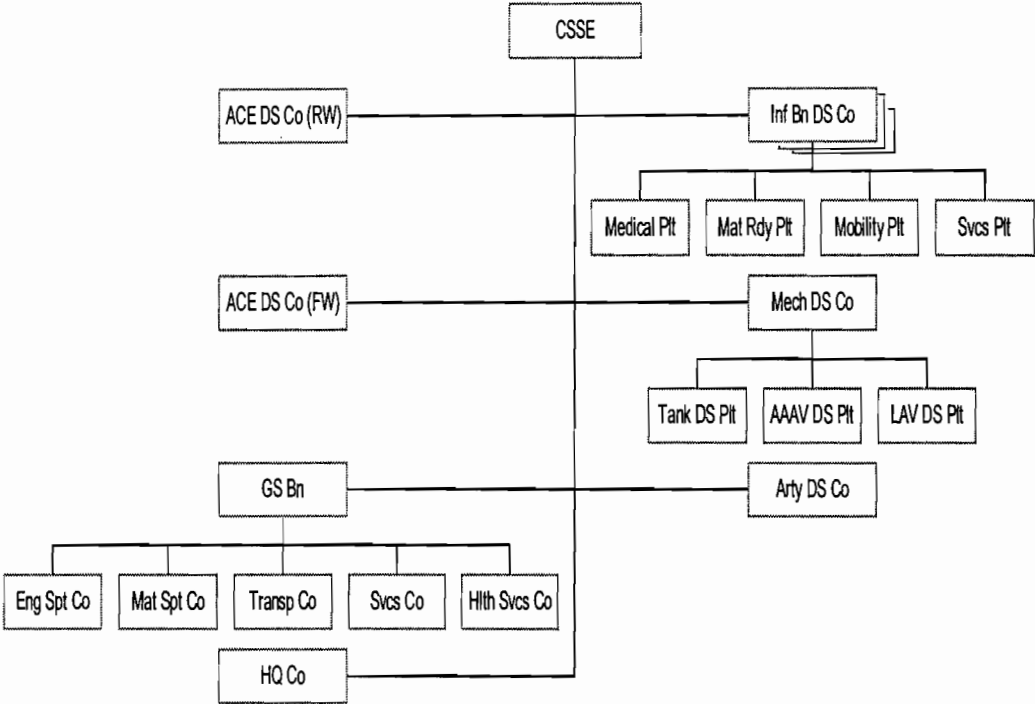
assault support, offensive air support, anti-air warfare, air reconnaissance, airborne command and control, and electronic warfare.

Figure 3. 2015 MEB ACE



The emphasis on seabasing the 2015 MEB led to a reorganization of the Combat Service Support Element (CSSE) in the baseline. The 2015 MEB version of the CSSE divides support into direct and general. Direct support (DS) is provided to the fixed- and rotary-wing elements of the ACE, and to the infantry battalions, mechanized units, and artillery units of the GCE. Detachments from these CSSE units go ashore with the maneuver elements as part of the MCSSD. The general support (GS) battalion includes material support (ordnance, sustainment, and maintenance), engineering support, transportation, and health services. Most GS functions remain on the seabase unless requested by the forces ashore. Figure 4 shows the envisioned organization of the MEB CSSE.

Figure 4. MEB 2015 CSSE



The analysis described in this report assumes that the Marine Corps will continue to organize forces to fight as MAGTFs, and that future equipment and weapons systems will largely follow the descriptions laid out in the 2015 MEB baseline.

Study tasks

The CNA study supporting TECOM’s MEB training efforts is organized into three tasks as follow:

- Task 1 – Identify MEB training requirements
- Task 2 – Determine the training environment required to support MEB training

- Task 3 – Assess specific alternative ranges that support the training environment.

This report documents the results of task 2.

Task 1 summary

Task 1 focuses on defining the MEB and identifying training requirements for the command element (CE). We analyzed the MEB in two general ways. First, we defined the MEB based on its character—how it is formed and organized. Second, we defined the MEB by its missions and the way it is likely to operate.

Our analysis showed that the MEB CE requires dedicated training for its command and control, planning, and coordination responsibilities. We identified sixteen training requirements, and determined that the MEB CE must train to operate as both a tactical maneuver element and an operational-level command. This dual nature separates the MEB CE's training requirements from those of the MEU and the MEF.

The analysis and results of task 1 are documented in [1].

Task 2 approach

Our approach to task 2 addresses two primary issues. First, we expand the list of MEB training requirements to include integrated training needs and mission-specific requirements. From this expanded list, we identify general range characteristics.

Second, we determine the environment necessary to support MEB training. We develop constructs, or ways of thinking about range space in multiple dimensions. The elements of each construct combined with the range characteristics derived from the training requirements, define the training environment for the MEB.

Expanded MEB training requirements

Task 1 of the MEB Training Exercise Study focused on defining the MEB and identifying training requirements for the command element (CE). In this section, we expand upon that analysis by identifying two additional types of MEB training requirements:

- Integration training requirements
- Mission-specific training requirements

First we discuss MAGTF training models and the implications these models have on training requirements and environments. We follow that discussion with a summary of the training requirements and key findings identified in task 1. This leads into our presentation of the integration and mission-specific training requirements. Finally, we conclude this section of the report with a discussion of the broad environmental implications of the different types of MEB training requirements.

MAGTF training

Currently, the Marine Corps has two models for training a MAGTF—the MEU model and the MEF model. Each offers a different approach to MAGTF training, and as a result leads to different types of training and range requirements.

MEU model

MEUs are trained via a multi-phased program that provides training to all levels of the MAGTF [2]. MEU training begins at the unit level, and is directed at each of the MEU forces separately. The training then builds towards greater and greater integration of the MEU as a whole. MEU training culminates in the Special Operations Capable Exercise (SOCEX), during which the MAGTF is certified for operations.

MEU training is divided into three phases:

- The initial training phase focuses on individual and small unit skills training of the MSE's. It includes staff training for the MEU CE and the MSCs, as well as individual skills training and unit level tactical combat drills.
- The intermediate training phase focuses on collective MEU level training that builds on unit capabilities. This phase includes several exercises that bring the entire MAGTF together to integrate functions across the MSEs.
- The final training phase focuses on preparing the MEU for the SOCEX by ensuring that the MEU as a whole can accomplish the required missions and operations. By the end of the final training phase, the MEU should function as a unit to rapidly plan, coordinate, and execute operations.

MEU forces are informally evaluated at every level of command and during every phase of training. Formal evaluation occurs during the SOCEX, and includes an assessment of each element and of the MEU's ability as a whole to complete required missions.

MEF model

MEFs are trained via a five-part package delivered to the MAGTF commander and staff over a few months at least once every 2 years [3]. The MEF Commander and staff are involved in designing the training and identifying their specific training requirements. The package includes:

- Training from the Command, Control, Communication, and Computers Mobile Training Team (C4 MTT). The C4 MTT offers an executive session for commanders and battlestaffs, functional training for watchstanders, and technical training for operators and information managers.
- A war fighting seminar. The seminar content covers the fundamentals of MAGTF operations and any topics selected by the MEF staff relevant to their specific training requirements.

- Training on the Marine Corps Planning Process (MCPPE). Following instruction in the MCPPE, the staff will conduct a practical application exercise where they will have to produce a written operations order.
- A Command Post Exercise (CPX) where the MEF commander and staff execute their order. The CPX can be linked to a scheduled exercises, or can be conducted independently.
- An after action review (AAR) of the CPX to emphasize lessons learned.

Comparing the models

The primary difference between the two models is the identity of the training audience.

When the Marine Corps talks about training a MEU, it is referring to the entire MAGTF. The standardized MEU training program ensures that the MSCs and the operating units receive the necessary training, and that they can come together as a MAGTF to complete their operational requirements.

When the Marine Corps talks about training a MEF, it is referring to the command element alone. MEF training assumes that unit level training and MSE training conducted under the MEF's auspices are sufficient to meet the MAGTF's operational requirements.

This difference begs the questions:

- When the Marine Corps talks about training the MEB, what does it mean?
- Which model is most appropriate, or better suited, for MEB training?

The goal of this study is to define the requirements, both training and range, for conducting a large-scale MEB exercise. These requirements will change based on the MAGTF model the Marine Corps selects. Our analysis offers training requirements derived by considering both models.

Selecting a model for analysis

In task 1 of the study, we considered the MEB training question via the MEF model. We focused on the MEB CE by identifying what training the CE needs and determining why those training requirements are unique. [1]

In this second phase of the study, we expand our perspective on MEB training by moving closer to the MEU model. In this document, we consider what integrated training the MEB needs and what mission-specific tasks the MEB must train to execute. We do not drill down to the unit level. Instead, we use the MEF training assumption, that the unit level training conducted under the MEF's auspices is sufficient.

In this report, we also attempt to answer the question of how to define a general MEB training environment. Most of the physical range requirements we considered are dictated by the MEU-model of training, which seeks to involve the entire MAGTF in the training evolution. However, many of the requirements could be addressed with a CPX-based program similar to that of the MEF, or with a reduced force exercise that only includes representative forces from the MSEs.

MEB CE training requirements

The analysis from task 1 showed that the MEB CE requires dedicated training for its command and control, planning, and coordination responsibilities [1]. The MEB CE must be capable of filling three command functions. It must be able to operate as the:

- Nucleus of a Joint Task Force (JTF) headquarters
- Marine component of a JTF
- Command element of a tactical maneuver force

Due to these three possible roles, the MEB CE must train to operate as both a tactical maneuver element and an operational-level command. This dual nature separates the MEB CE's training requirements from those of the MEU and the MEF. Table 1 lists the MEB CE training requirements identified in task 1 and organizes them based on their relevant level of focus.

Table 1. MEB CE training requirements

Training Requirement	Level of focus
Integrate MEB CE with forward-deployed MEU	Dual
Manage varying modes of deployment/employment	Dual
Transition between operational and tactical levels	Dual
Integrate MEB CE with Joint counterparts	Operational
Conduct operational-level mission analysis and planning	Operational
Operate as an operational command	Operational
Plan, command and control, and implement missions	Operational
Apply operating concepts to different missions	Operational
Command and control STOM and ENS	Operational
Conduct C4 from the seabase	Operational
Plan and coordinate at-sea arrival and assembly	Operational
Operate a headquarters afloat	Operational
Provide at-sea command and control of forces ashore	Operational
Conduct tactical-level mission analysis and planning	Tactical
Operate as a tactical maneuver element	Tactical
Command and control up to a MEB-size maneuver force	Tactical

Integration training requirements

The MEB is the mid-size war fighting force for the Marine Corps. As with the smaller MEU(SOC) and the MEF, the MEB is organized to function as a MAGTF.

The MAGTF is a balanced, air-ground combined arms task organization of Marine Corps forces under a single commander, structured to accomplish a specific mission. It is the Marine Corps' principle organization for all missions across the range of military operations. [4]

The combined-arms nature of the MAGTF creates the need for training to this capability. Integration is essential to effective combined arms.

Approach to identifying integration training requirements

We developed a multi-step methodology to determine integration training requirements for the MEB. First we identified the elements that form a MAGTF and the integration agencies within each

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element. Second, using Marine Corps doctrine we developed an integration responsibilities list for each element and integration agency. As part of that list, we identified who needs to integrate with whom for each responsibility. These integration responsibility lists are included in Appendices A through D.

It is important to note that this is not an exhaustive list, rather it is representative of the level of integration and coordination required to execute combined arms in true MAGTF fashion. The purpose of this phase of the study is not to tell the reader how to perform a specific mission, rather it is to identify the necessary integration training requirements for a MEB to be trained as a MAGTF.

The next step in the approach was to characterize the MAGTF element responsibilities. We applied the broad characterizations of planning and execution. While missions tend to have multiple phases, we used these two general phases to illustrate two different types of integration:

- Integration among the MAGTF elements
- Integration among the command and control agencies of the MAGTF.

As we found in task 1, the MEB CE has a training requirement to be able to function at both the operational and tactical levels of war. We further characterized the responsibilities as either an operational or tactical level responsibility. Finally, we assessed the implications for the training environment.

What does it mean to function at the operational level?

Joint doctrine defines the operational level of war as:

The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or other operational areas. Activities at this level link tactics and the strategy by *establishing operational objectives* needed to accomplish the strategic objectives, *sequencing events* to achieve the operational objectives, initiating actions, and *applying resources* to bring about and sustain these events. These activities imply a broader

dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited *to achieve strategic objectives*. [5] [italics added]

The definition for the tactical level of war is:

The level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces. Activities at this level focus on the ordered arrangement and maneuver of combat elements in relation to each other and to the enemy to achieve combat objectives. [5]

To operate at the operational level of war means the command element must develop guidance, identify the forces required, determine mission objectives, develop a plan or sequence of events, allocate assets, monitor the tactical execution of the mission, and make appropriate adjustments to achieve strategic objectives. Operational level requirements go beyond tactical planning and execution of combined-arms. For example, a command post exercise (CPX) can train a command element on how to plan, produce guidance, identify forces, and determine objectives, but the nature of a field training exercise (FTX) can place constraints on execution, thus training a command element to monitor the mission execution and to make adjustments in allocations in real time.

The tactical component of combined-arms will dictate the physical range requirements as discussed later in the paper. However, if we only consider the MEB in terms of its tactical ability to execute combined arms, then we miss the bigger picture, that is, the operational level of war and the MEB's requirement to ensure that the tactical execution supports strategic objectives.

We applied the joint definitions to the responsibilities list to determine if the responsibility was at the operational level or tactical level. The next section summarizes our analysis.

MEB responsibilities at the operational level

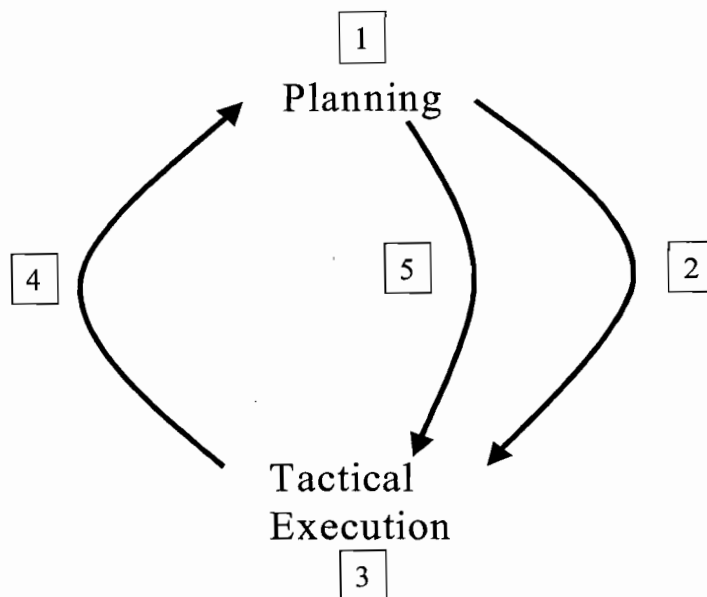
The MEB as a MAGTF has many mission capabilities. Fundamental to this is the ability to plan and execute combined-arms. The MAGTF

also brings with it an imbedded infrastructure that supports missions execution. Examples of this infrastructure include establishing a headquarters and establishing communication network and links. Logistics operations can also be described as an infrastructure network that provides a means for force closure, arrival and assembly, and sustainment.

For the MEB CE to function at the operational level, an infrastructure must be established, i.e., a command and control infrastructure allowing the MEB CE to integrate all of its capabilities to accomplish the mission. The Marine Corps Planning, Decision, Execution, and Assessment Cycle (PDE&A) is the concept the commander uses to establish and implement the infrastructure [6].

In this section we define that infrastructure. Given the fluid and dynamic nature of combined-arms execution, and the operational level command responsibilities to achieve strategic objectives, the assessment part of the cycle is critical. It gives the commander the means in which to make decisions on resource allocation and apportionment recommendations. Figure 5 is a simplified illustration of this infrastructure.

Figure 5. Command and control infrastructure



The steps are:

1. MAGTF commander conducts mission planning using the Marine Corps Planning Process (MCP) and on-going future operations planning.
2. MAGTF commander publishes the Operations Order.
3. MAGTF commander directs tactical execute the mission.
4. Tactical units provide feedback to the MAGTF commander.
5. MAGTF commander monitors and command and controls the mission.

While planning (step 1) continues during execution it is not necessarily done on the same scale as the operations order. Rather the planning is oriented to the next few days of the mission. The execution of the mission (step 3) is an on-going process as well, and indeed tactical planning is taking place. Once the operations order is produced (step 2) and the mission execution begins, steps 4 and 5 become a

continuous loop creating situational awareness allowing the MAGTF commander to direct the mission to meet the operational mission objectives. As an operational-level commander the MEB CE must establish the feedback or assessment loop through procedures and processes. This construct is applicable to the tactical level of war as well.

Command and control infrastructure

Our analysis, found in Appendices A through D, shows that the majority of the responsibilities at the operational level of combined-arms are planning related. Examples of the type of responsibilities include establishing relationships, identifying requirements, establishing procedures and processes, and developing guidance. The execution-related responsibilities include monitoring the situation and making reallocation decisions and keeping the MAGTF commander informed of changing dynamics.

MAGTF integration points and integration agencies

The previous sections discuss the significance of being able to function at the operational level of war. In this section we apply this understanding to the current Marine Corps MEB-size MAGTF structure and the MEB's capability to perform combined-arms operations. The analysis assumes the fundamental MAGTF structure and the combined arms integration points and agencies will not change substantially for the 2015 MEB. Once the integration points and agencies are defined, we show how they integrate for planning and execution of combined-arms. From this understanding we then derive the integration training requirements.

Four elements comprise the MEB, CE, GCE, ACE, and CSSE. Each MSC has integration agencies used to coordinate efforts across the elements as well as perform command and control of subordinate forces. Integration agencies for each MSC are listed below in order from operational-tactical focus to tactical-only focus.

- GCE
 - Force Fires Coordination Center (FFCC)

- Fire Support Coordination Center (FSCC)
- Battalions and companies
- Tactical Air Control Party (TACP)
- Fire Support Teams (FiST)
- ACE
 - Tactical Air Command Center (TACC)
 - Tactical Air Operations Center (TAOC)
 - Direct Air Support Center (DASC)
 - Air Support Element (ASE)
 - Forward Air Controller-Airborne (FAC/A)
 - Tactical Air Controller-Airborne (TAC/A)
 - Assault Support Coordinator (ASC)
 - Helicopter Support Team (HST)
- CSSE
 - General Support Group
 - Direct Support Group
 - Combat Service Support Detachment

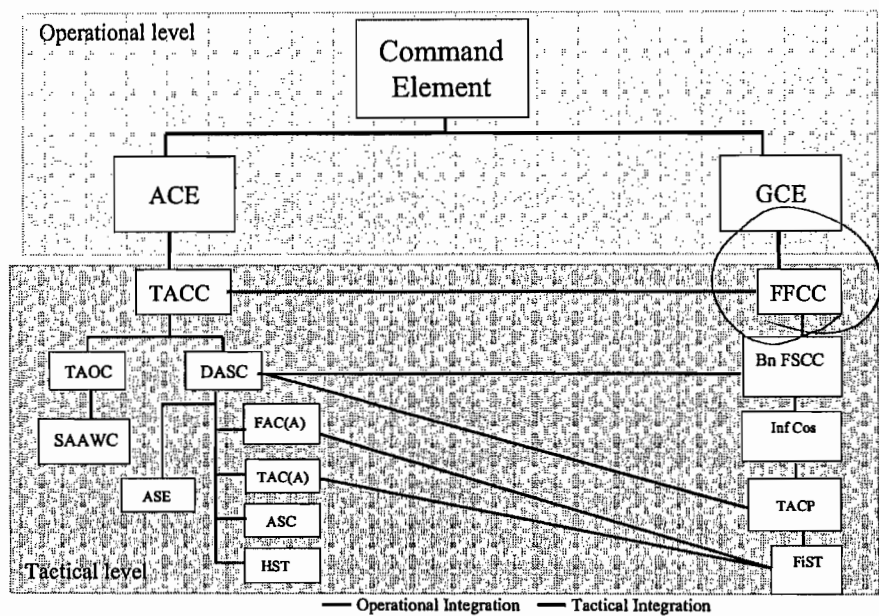
Combined-arms integration

The Marine Corps defines combined-arms operations as:

The tactics, techniques, and procedures employed by a force to integrate firepower and mobility to produce a desired effect upon the enemy [7].

Combined-arms is the integration of maneuver forces with supporting fires from artillery, mortars, helicopters, and tactical aircraft. It requires close coordination during planning and execution to perform this mission. Figure 6 is a generalized graphic representation of the integration and coordination at the operational and tactical levels for combined-arms operations.

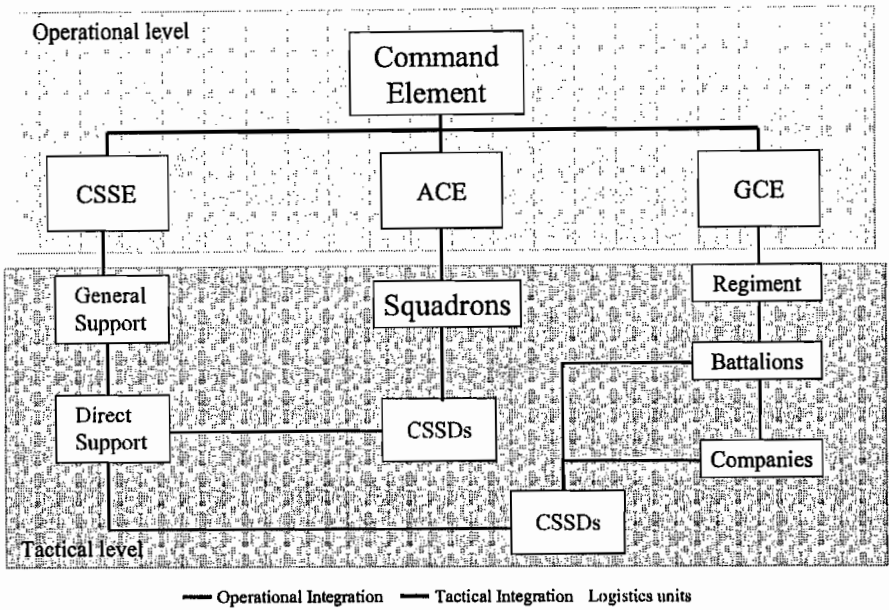
Figure 6. Combined-arms integration points and agencies



Combat Service Support integration

The CSSE provides logistical support to all the MAGTF elements and thus must be integrated with the other elements. Figure 7 is a generalized graphic representation of the integration between the CSSE, the GCE and the ACE.

Figure 7. Combat Service Support integration with GCE and ACE



MAGTF Training Requirements

The analysis shows that the MEB has a requirement to be able to function at the operational and tactical levels of war. As a MAGTF, the MEB has a requirement to be able to plan for and execute combined-arms operations. These two capability requirements create integration training requirements for the MAGTF elements and the subordinate control agencies. Below we summarize the integration training requirements derived from our analysis of integration responsibilities. Appendices A through D contain the detailed lists and analysis. [6-11]

Table 2. Integration training requirements

MAGTF element	Integration training requirement
CE	Establish command relationships (command or support) Establish a centralized command and decentralized control command and control structure Use the Marine Corps Planning Process to generate overall plan and guidance for subordinate units Incorporate the planning, decision, execution, and assessment cycle (PDE&A) into the planning process
GCE operational level	Use standard METT-T ^a and Marine Corps mission planning process Establish targeting process and procedures Develop fire support plan in coordination with CE and ACE to achieve operational objectives Allocate assets for the attack of targets in the area of operations Allocate fire support assets to subordinate battalions
GCE tactical level	Subordinate units provide input to the fire support plan Provide liaison function within the FSCC Coordinate supporting arms with scheme of maneuver (company, battalion, regiment levels) Call for and adjust calls for fire (artillery, mortars, naval surface fire support, and air strikes) Provide battle damage assessment and situational updates to higher headquarters
ACE operational level	Use standard METT-T and Marine Corps mission planning process Provide input into fire support plan Develop plans for the operation order and subordinate plans Provide inputs to larger organization planning cycles (JTF, ATF) Execute 6 phases of the air tasking cycle Exercise decentralized control of sorties through the MACCS Manage resources to meet main effort requirements Plan and execute aviation ground support operations and aviation logistics operations
ACE tactical level	Control Integrate, coordinate, and direct air operations in support of the MAGTF Process and coordinate ground unit requests for immediate air support Command and control subordinate terminal control assets Control aircraft movement and coordinate with scheme of maneuver Coordinate with higher and adjacent air agencies and activities
CSSE operational level	Develop a logistics/Combat Support Estimate to evaluate course of actions (COAs) based on force closure, sustainment, reconstitution and redeployment

Table 2. Integration training requirements (continued)

MAGTF element	Integration training requirement
CSSE tactical level	Develop logistics related intelligence requirements including intelligence preparation of the battlefield, environment and threat information requirements
	Develop relationships with joint logistics organizations and other components
	Establish relationship and agreements with multi-national and host nation organizations
	Integrate logistic requirements with existing plans and annexes
	Apply Force Deployment Planning and Execution operational procedures
	Use Time Phase Force Deployment Database (TPFDD) as a command and control tool for the execution of deployment, force closure, and sustainment operations
	Develop replenishment and redeployment plans
	Control arrival and assembly, throughput of personnel, equipment and supplies
	Prepare arrival areas (port, beach, airfield)
	Employ CSSDs in direct support role to the GCE maneuver elements and ACE units for capabilities which exceed the Marine Wing Support Squadron (MWSS)
	a. METT-T stands for mission, enemy, terrain and weather, troops and support available-time available.

Training environment implications

By understanding the operational and tactical level integration training requirements we can begin to define the necessary environment to train to those requirements.

The Marine Corps uses three primary formats for MAGTF training: CPXs, FTXs, and simulation. The CPX focus, in general is on planning and is usually done with larger headquarters staffs. The staff sections with the MSCs exercise the Marine Corps Planning Process. FTXs involve forces in the field executing missions, like maneuvering, weapons employment, and in some cases tactical planning. A third type of training is simulation, or a computer driven event.

In terms of the command and control infrastructure we defined earlier, the initial planning to develop an OPORD can be done in a CPX

environment. But a CPX environment does not support the necessary feedback loop needed to train operational-level execution. Rehearsal of combined-arms can be done in a simulation environment. The Marine Corps currently has tactical combined-arms simulation training (CAST) which is a valuable tool to prepare elements and agencies for FTX events, but not all training requirements can be met in such an environment.

Thus, to fully train a MEB to function as a MAGTF capable of planning and executing combined-arms, the MEB requires an FTX. An FTS creates the conditions necessary to train the entire command and control infrastructure from initial planning, to execution, to providing feedback into the on-going or current planning.

In the next section of the paper we further expand the list of MEB training requirements by addressing mission-specific training needs.

Mission-specific training requirements

During task 1 of the MEB Training Exercise Study, we identified MEB missions by reviewing the Defense Planning Guidance (DPG) Illustrative Planning Scenarios (IPS), the Dynamic Commitment vignettes, scenarios developed by Marine Corps Combat Development Command (MCCDC) for the Maritime Prepositioning Force (MPF(F)) Analysis of Alternatives, and current Operational Plans (OPLANS). References to these documents can be found in Appendix E. We also considered the real-world operations that MEBs have supported over the last 60 years. Missions that recurred in historical, current, and envisioned future operations were identified as the most likely missions for the MEB. The missions are listed in table 3.

Table 3. MEB missions

- Enabling force in a swift campaign
- Decisive force in a swift campaign
- Enabling force in a decisive campaign
- Maneuver element in a decisive campaign
- Humanitarian Assistance/Disaster Relief (HA/DR)
- Show of force

Table 3. MEB missions (continued)

Ensuring freedom of navigation/overflight
Non-combatant evacuation (NEO)
Peace operations
Strike/raid

These missions highlight the intersection between the MEB’s operational and tactical roles. The first four missions relate to the MEB’s role as a tactical force in an operational campaign. The remaining six missions are tactical in nature, but are the type of missions where a MEB is likely to have an operational command focus. The intersection between the tactical and operational is also apparent in how these missions link the MEB with the other MAGTFs. The four operational missions overlap with MEF responsibilities, while the latter six missions are a subset of MEU responsibilities.

The scenarios and plans referenced above can also be used to identify training requirements and the characteristics of a MEB training environment. Analyzing details of an operation, such as the scheme of employment and the environmental conditions, highlights issues or indicators for command and control training, integrated training, and physical range requirements.

We analyzed a MEB-centric small-scale contingency scenario (SSC) written by MCCDC Futures Warfighting Division for use in the MPF(F) Analysis of Alternatives [12]. It is one of three scenarios constructed to test the MPF(F) concept in an operational context.

We selected the MCCDC scenario for four reasons. First, MCCDC used the scenarios, along with the contexts and conditions they created, to support the design for the 2015 MEB. Second, the emphasis on seabasing, while greater than in less future-oriented plans and scenarios, correlates with current Marine Corps doctrinal trends. The Navy and Marine Corps are applying significant resources towards efforts to seabase the force and minimize the footprint ashore. Third, the MCCDC scenario offers greater detail than most of the other combat-oriented SSC vignettes. That level of detail was necessary to perform our analysis. Finally, the scenario envisions the MEB

supporting four of the missions identified in table 3. At various points throughout the scenario, the MEB:

- Serves as the enabling force in a swift campaign
- Serves as the decisive force in a swift campaign
- Ensures freedom of navigation
- Conducts strikes and raids

With this combination of tactical and operational missions, the scenario succinctly captures the dual nature of the MEB.

Summary of scenario: Operation Certain Passage

Operation Certain Passage is a SSC operation set on the island of Sumatra. In the scenario, the four northernmost provinces have seceded from the national government, and are supporting piracy through the Straits of Malacca. The United States, fearing that the rebellion in Sumatra will disrupt sea commerce and spread to other nations in the region, commits forces to support the national government and reopen the Straits.

Commander, 3rd MEB is designated Commander, Expeditionary Strike Force (ESF) Bravo. Expeditionary Strike Group (ESG) One (Amphibious Ready Group (ARG) with the 15th MEU embarked), and Maritime Prepositioning Group (MPG) Three with the 3rd MEB embarked, comprise the bulk of the ESF Bravo forces.

For its part in the operation, ESF Bravo will deploy forces to conduct seabased Ship-to-Objective-Maneuver (STOM) and Operational Maneuver from the Sea (OMFTS). Their mission is to clear the area of pirate craft and bases, thereby opening the Straits, and to destroy or disperse insurgent forces, thereby restoring order to the region.

Approach to analysis of mission-specific training requirements

Operation Certain Passage is divided into seven phases. We analyzed each phase of the operation looking for three data points:

- Which forces were being used?

- How were the forces organized for assault and maneuver?
- What functions or tasks were being executed?

Once we understood each operational phase in detail, we considered where the coordination or integration points existed. We determined which elements need to be coordinating in order for the functions to occur successfully.

An example of scenario-based analysis: Deconstructing phase 1

Phase one of Operation Certain Passage lasts two days, and marks the initial assault on Sumatra. Three battalion task forces (Bn TFs) go ashore in the initial landings—one from the ESG and two from the MEB. The ESG Bn TF works with MEB Bn TF 1 to seize control of a port and the surrounding industrial facilities, while MEB Bn TF 2 conducts an assault into a neighboring city to capture the regional airfield. The remaining battalion, MEB Bn TF 3, conducts a concurrent demonstration in another area as a feint to hold potential reinforcing rebel units in place. It then remains in reserve aboard the seabase. Only minimal combat service support detachments (CSSDs) deploy ashore with the maneuver elements, while additional support is provided from the seabase. Once the port is secured, the ESG Bn TF returns to the seabase, while the two MEB Bn TFs remain ashore to secure the two primary objectives as well as secondary objectives in the vicinity. Figure 8 offers a graphic of the force organization and scheme of maneuver during phase 1. Table 4 shows our analysis of the functions and coordination points highlighted during this phase of the operation.

We used this approach to analyze all seven phases of Operation Certain Passage. The analysis of the operation can be found in Appendix F. From the results, we were able to expand the list of MEB training requirements and identify general range requirements.

Figure 8. Diagram of Operation Certain Passage, Phase 1

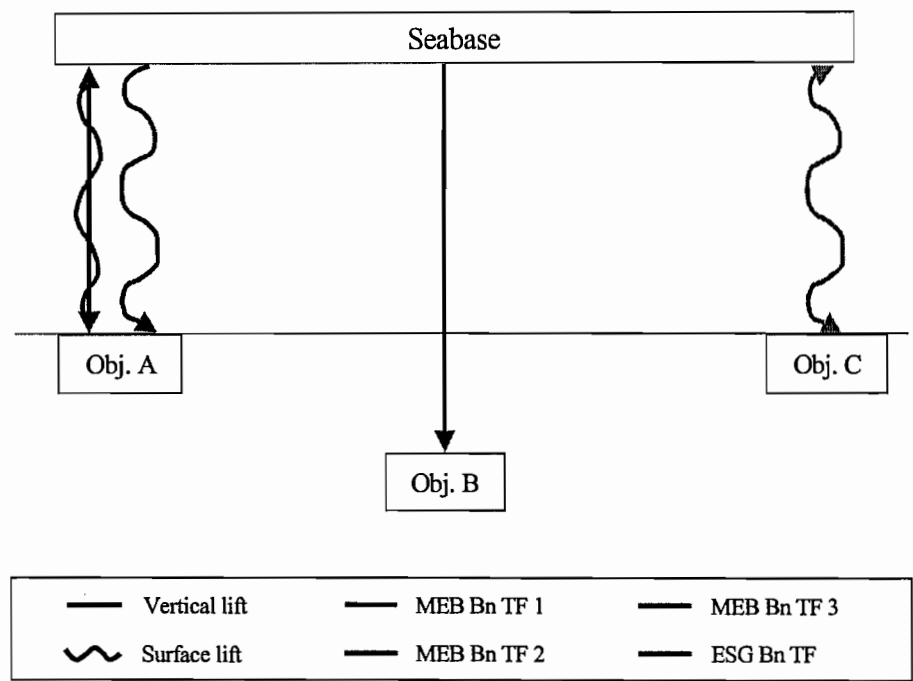


Table 4. Analysis of Operation Certain Passage, Phase 1

Forces	Functions	Coordination points
ESG Bn TF	(1) Air/surface assault to obj. A (2) Seize and secure port (3) Return to seabase	(1) With seabase (2) With MEB Bn TF 1
MEB Bn TF 1	(1) Vertical assault to obj. A (2) Seize and secure port	(1) With seabase (2) With ESG Bn TF
MEB Bn TF 2	(1) Vertical assault to obj. B (2) Seize and secure airfield	(1) With seabase
MEB Bn TF 3	(1) Demonstration landing as feint (2) Return to seabase (3) Reserve force	(1) With seabase
Seabased CE	(1) Plan assaults (2) Coordinate simultaneous assaults (3) Allocate resources	(1) With maneuver elements ashore (2) With higher HQ (3) With seabased support elements

Table 4. Analysis of Operation Certain Passage, Phase 1 (continued)

Forces	Functions	Coordination points
Seabased ACE	(1) Support assaults with vertical lift	(1) With seabase (2) With maneuver elements ashore
Seabased CSSE	(1) Provide mobile CSS dets to maneuver elements (2) Support maneuver elements from sea-base	(1) With seabase (2) With maneuver elements ashore

Implications of the mission-specific training requirements

Consolidating the functions derived from each phase resulted in a list of MEB tasks. We identify these as mission-specific MEB training requirements. The tasks are listed in table 5.

Table 5. Mission-specific MEB training requirements

MEB tasks
Conduct at-sea arrival and assembly
Link-up forces
Develop plans for combat operations
Execute demonstration landing
Conduct single battalion surface assault
Conduct multi-battalion surface assault
Conduct single battalion vertical assault
Conduct multi-battalion vertical assault
Conduct multi-battalion joint surface and vertical assault
Conduct simultaneous assaults on multiple targets
Conduct single battalion raids
Conduct simultaneous raids
Maneuver a single battalion
Maneuver multiple battalions
Conduct urban assault
Conduct mountain assault
Conduct amphibious assaults at night
Seize and secure port facilities
Seize and secure airfields
Conduct relief in place with Joint and Coalition forces
Provide mobile combat service support
Support maneuver elements from seabase
Conduct air strikes
Conduct split MPG operations

We organized most of the MEB tasks identified in our analysis into two categories:

- Tasks associated with a scheme of employment
- Tasks associated with operating conditions.

Scheme of employment tasks

Tasks that we associated with a scheme of employment are listed in table 6. The key finding from these tasks is the variation in how a MEB employs its ground forces.

Table 6. Scheme of employment tasks

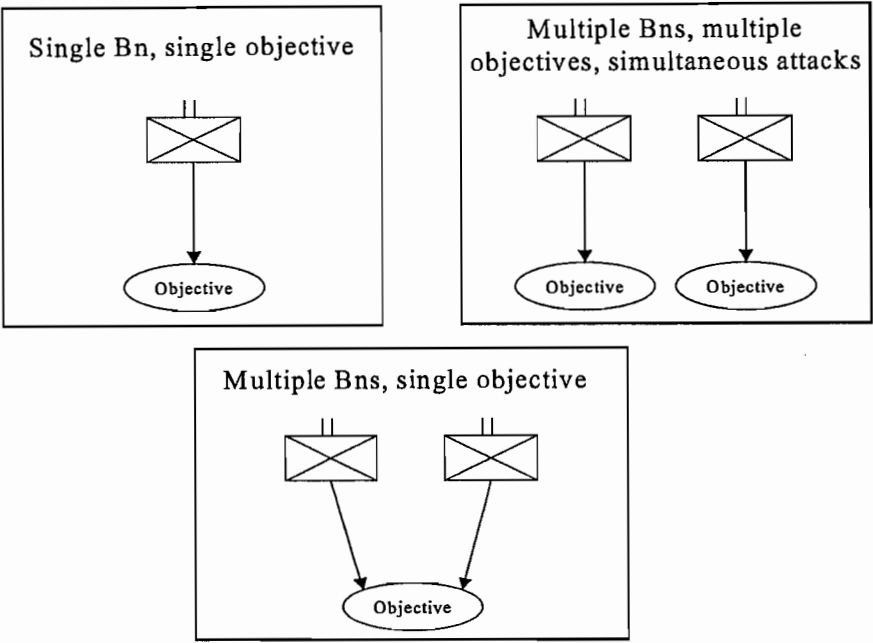
Conduct single battalion surface assault
Conduct multi-battalion surface assault
Conduct single battalion vertical assault
Conduct multi-battalion vertical assault
Conduct multi-battalion joint surface and vertical assault
Conduct simultaneous assaults on multiple targets
Conduct single battalion raids
Conduct simultaneous raids
Maneuver a single battalion
Maneuver multiple battalions
Provide mobile combat service support
Conduct split MPG operations

As figure 9 illustrates, a MEB can employ its ground element in three general ways:

- As a single battalion conducting a single mission
- As single battalions conducting multiple missions simultaneously
- As multiple battalions conducting a single mission.

These three methods of organizing and directing the MEB force have multiple training implications.

Figure 9. How a MEB can employ its battalions



First, the different employment options lead to varied command and control training requirements for the MEB CE and the GCE. Controlling and resourcing multiple battalions operating simultaneously, either in a single objective or multiple objective assault, is likely to tax the resources and communications of the MEB more than a single battalion mission. Likewise, the coordination and deconfliction of combined arms will be more complex when multiple battalions are attacking a single objective than when they are operating in different objective areas.

Second, the three different modes of employing the battalions lead to varied integration and coordination points. As was indicated in our coordination point analysis in table 4, battalions attacking single objectives, whether concurrently or not, integrate predominantly with higher headquarters and supporting forces. But, coordinated assaults by multiple battalions are just that, and therefore require coordination between those assaulting battalion headquarters in

addition to the integration with the command element and supporting forces.

Finally, the different employment options lead to different physical range requirements. Training for a multi-battalion, single objective mission requires a maneuver area large enough to accommodate all the battalions. Training for a multi-battalion, multiple objective operation requires two or more battalion-sized maneuver areas outside of line of sight from each other, but linked in some way to allow command and control training to occur.

Operating condition tasks

Tasks that we associated with operating conditions are listed in table 7. These tasks specify the potential conditions in which a MEB may need to operate, and therefore the conditions under which a MEB should train. Some of the conditions reflect physical environments with which the MEB needs to be familiar, such as urban areas or mountainous terrain. Others reflect types of targets a MEB force needs to be able to seize, such as ports or airfields.

Table 7. Operating condition tasks

- Conduct at-sea arrival and assembly
- Conduct urban assault
- Conduct mountain assault
- Conduct amphibious assaults at night
- Seize and secure port facilities
- Seize and secure airfields
- Support maneuver elements from seabase

Tasks associated with operating conditions help direct training scenarios and influence the training environment. For example, tasks requiring training in basic ground maneuver dictate physical maneuver space, but do not characterize that space in any way. Tasks that require the MEB to conduct multi-battalion maneuvers in an urban environment characterize the range by requiring an urban training facility large enough to maneuver two or more battalions.

The operating condition that appears most prominently in the Certain Passage scenario is operating from the sea. This is likely due to the original purpose of the scenario, as supporting documentation for the MPF(F) AoA. However, most future thinking about Marine Corps operations emphasizes seabasing, and the concept of keeping command and support elements on the seabase while minimizing the forces ashore. Therefore, the MEB needs to train for this type of operation.

Some of the training for seabasing could be simulated. For example, if the training focus is communication and coordination from ship to shore, then the environmental requirement driving the range is the distance that would exist between the command element and the maneuver forces. This separation can be obtained without at-sea training time.

However, much of the training for seabased operations could require time at sea for the MEB and its elements. For example, if seabasing becomes a reality, all the MEB elements will need training on at-sea arrival and assembly, cross-decking of personnel and supplies, and embarking for a movement to shore. The seabased operating condition and the amphibious nature of most Marine Corps operations also leads to the range requirement of beach space large enough for a multiple-battalion assault.

In the next section of the report, we present constructs for thinking about range requirements in multiple dimensions.

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MEB training environment

In the previous section, we presented the results of our analysis identifying MEB training requirements. This section focuses on determining the training environment necessary to support those tasks.

All MAGTFs can be called upon to operate in three dimensions—land, sea, and air. Therefore, at the most general level, they require training in all three environments. The MEU PTP incorporates numerous opportunities to practice tasks and skills in all three environments. These opportunities occur both independent from each other, as well as concurrently and/or sequentially. Similarly, the MEF exercise (MEFEX) coordinated by the MSTP offers the MEF CE the opportunity to train planning functions relative to missions or tasks occurring on the land, in the air, and on the sea.

In this section, we present constructs, or ways of thinking about MEB-sized range space for land and air. We plan to develop a similar construct for sea space as part of task 3. The elements of each construct combined with the range characteristics derived from the training requirements, define the training environment for the MEB.

Elements of a ground training area

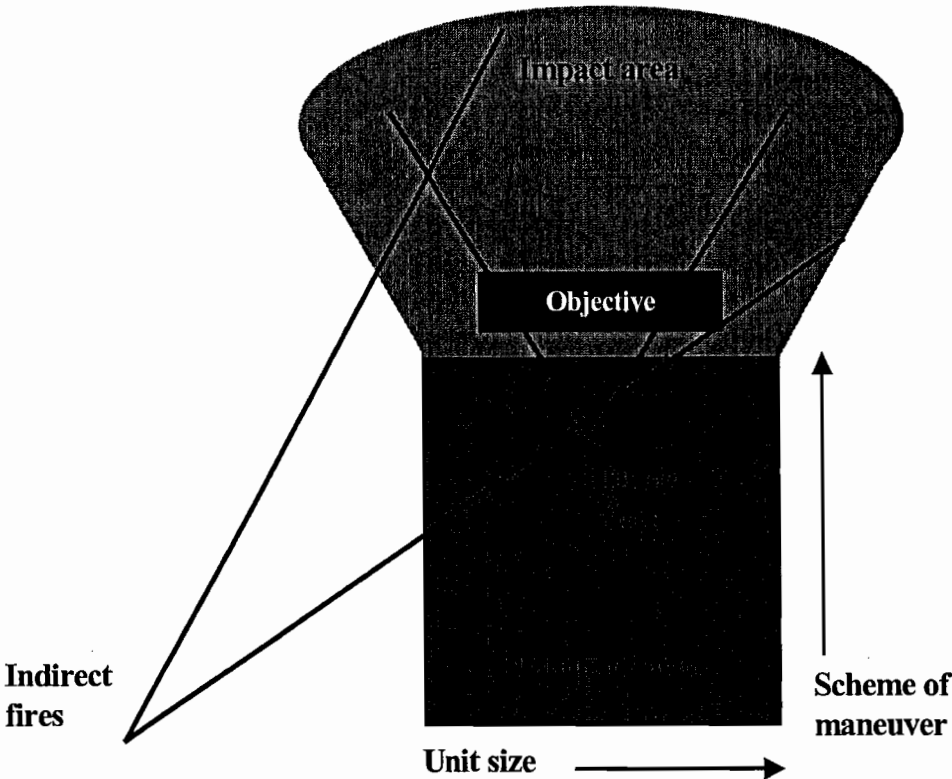
The size of a ground training area is a function of three elements:

- Size of the unit
- Scheme of maneuver
- Fires.

For our purposes, the size of the unit conducting the training dictates the width of the maneuver space. The scheme of maneuver, or how those units move towards the objective, directs the depth of the

maneuver space. The effects of fires dictate the size of the impact area. Figure 10 illustrates this construct.

Figure 10. Elements of a ground training area



In reality, however, the determination is not as simple as the figure suggests. The scenario and the resulting scheme of maneuver effect all three components. For example, a commander selects where to locate his indirect fires based on the location of the target. Shifting the objective would likely result in a change to the indirect firing point, and that would change the dimensions of the impact area. Similarly, how a commander chooses to position forces for a maneuver will effect the width of space the units occupy.

Our calculations consider all three elements very generally. We do not consider specific schemes of maneuver or methods for applying forces towards an objective. Instead, we attempt to calculate a general MEB training area that would be suitable for various scenarios or schemes of maneuver. To account for variation due to scenarios and schemes of maneuver, and to reflect subject matter expertise, we compare our results to the maneuver area requirements approved by the Army for units comparable to the forces that form the MEB. For the most part, the two data points—our calculated results and the Army’s recommendations—provide a range for a MEB training area ground footprint.¹

Maneuver and impact areas

As indicated in figure 10, we divide a ground training area into two functional spaces:

- The maneuver area is space for dismounted or mechanized forces to move to achieve an objective.
- The impact area is space used to contain fired or launched ammunition and explosives, as well as the resulting fragments, debris, and components from various weapon systems [13]. Impact areas are necessary for training involving both explosive and inert ordnance. In other words, it is the area in which bombs, artillery, mortars, and other weapons can impact, without endangering forces on the ground.²

Maneuver and impact areas can be overlapping or displaced, depending on the focus of the training. Exercises focusing on the coordination necessary to safely employ combined arms fires in the proximity of maneuvering friendly forces require a range with overlapping or

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1. The Army document putting forth their requirements for unit maneuver areas does not include any calculations or documentation explaining the results. We were unable to determine exactly how the Army determined its spatial training requirements.
 2. Impact area dimensions also include the airspace associated with flight and dispersal of fragments. In this section, we are only concerned with the dimensions of the impact area on the ground.

connected impact and maneuver areas. If that coordination is not the focus of the exercise, then displaced impact and maneuver areas will suffice to train fires and maneuver concurrently [14].

Width of a MEB maneuver area

We used unit size to calculate the width of a MEB maneuver space. We began by focusing on the infantry regiment around which the 2015 MEB is nominally built. We used the general guidelines and rules of thumb provided in Field Manual (FM) 34-130, Intelligence Preparation of the Battlefield (IPB), to help bound the size of the maneuver area [15]. FM 34-130 reports the typical widths of mobility corridors for all units from company through division. We show those widths in table 8.

Table 8. Typical widths of mobility corridors per FM 34-130

Unit	Width (km)
Division	6
Brigade/Regiment	3
Battalion	1.5
Company	0.5

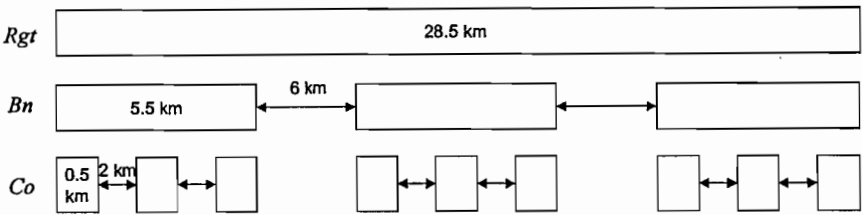
The 3 km wide regimental mobility corridor drawn from FM 34-130 could be considered to bound the width of a regimental maneuver area on the small end of the spectrum. In other words, it offers a suggestion of the minimum width in which a regiment could operate.

FM 34-130 also reports the maximum distance between mobility corridors, as shown in table 9. With this data, we calculated that a regimental corridor could be as wide as 28.5 km. A graphic explanation of this calculation is shown in figure 11.

Table 9. Maximum distance between corridors

Avenues of approach	Mobility corridor	Maximum distance between corridors (km)
Division	Brigade/Regiment	10
Brigade/Regiment	Battalion	6
Battalions	Company	2

Figure 11. Width of a regimental maneuver space based on the recommended maximum distance between corridors



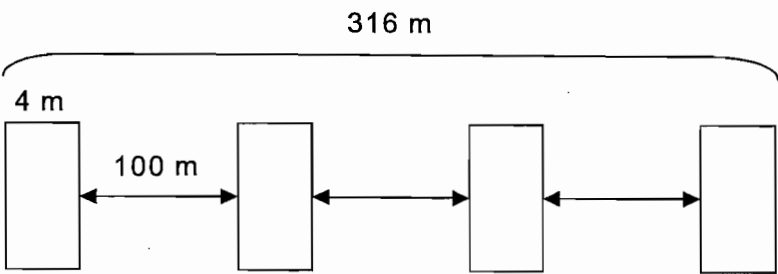
It is unclear whether the IPB guidelines for mobility corridors and widths between corridors reflect dismounted or mechanized space requirements. Lacking any evidence to the contrary, we assumed that the rules of thumb provided in tables 8 and 9 referred to dismounted troop movement. Therefore, we also calculated the additional space requirements for the mechanized elements working with, or transporting, the infantry battalions.

We simplified the calculation for mechanized width requirements by focusing on the tank companies that are part of the 2015 MEB baseline. The M1A1 tank and the future Expeditionary Fighting Vehicle (EFV) share the distinction of being the largest (width-wise) of all the vehicles owned by the MEB. The tanks, along with EFVs and LAVs, are the vehicles most likely to dictate the frontage and width of the maneuver force because they can provide offensive and defensive force. While numerically the MEB may put more 5-ton trucks on the field, those trucks must maneuver within the threat security perimeter established by the more tactically-oriented vehicles or the dismounted infantry regiment. Therefore, we assume that the width

requirement for the two tank companies would sufficiently encompass the space for other vehicles to maneuver as well.

The M1A1 Main Battle Tank is 3.6 meters wide. During training, safety standards recommend that a stand-off distance of 100 meters is maintained between each tank. We calculated an estimated minimum and maximum width requirement for the two tank companies based on how the tanks are positioned relative to each other. The tanks will incur the minimum width requirement if they are operating in column formations. Each tank company will maneuver in two columns, with seven tanks per column. We round the columns up to 4 meters wide with 100 meters between each column. At a minimum, the two tank companies in formation together in four columns, will require roughly 320 meters across. Figure 12 displays this requirement graphically.

Figure 12. Estimated minimum width for two tank companies maneuvering in column formation



Extending the argument to estimate the maximum width requirement the two tank companies would incur, we calculated how much space is necessary for all 28 tanks to form on line. At 4 meters per tank and 100 meters between tanks, the estimated maximum width requirement would be 2,812 meters (2.8 km).

Based on the previous calculations, we estimate that a maneuver area for a reinforced regimental-sized MEB needs to be approximately 3 km to 31 km wide. Table 10 summarizes our results.

Table 10. Summary of estimated maneuver area width requirement

	Dismounted infantry regiment (km)	Mechanized elements (km)	Total MEB (km)
Minimum	3	0.316	3.316
Maximum	28.5	2.812	31.312

Comparison with the Army’s requirements

Army Training Circular (TC) 25-1 establishes maneuver area requirements for selected types of units from platoon through battalion for each unit’s primary missions [16]. Although there are differences between Army and Marine Corps ground units, we determined that it would be useful to compare our calculated results to the Army’s requirements.

It should be noted that we do not know what tactical assumptions were built into the Army’s space requirements. For example, according to TC 25-1, a rifle company of a light infantry division requires 6 km across to train for both offensive and retrograde missions. But the light infantry battalion, which has three rifle companies, requires 13 km and 14 km across for the offensive and retrograde missions respectively. These dimensions likely reflect specific tactics and/or schemes of maneuver. Without a more detailed understanding of the assumed scheme of employment, it is difficult to extrapolate their smaller unit results to a MEB-sized equivalent Army force.

We selected Army units that most closely match the Marine Corps units relevant for our analysis, and compared the recommended widths for the different training missions. The Army’s recommendations for a Light Infantry Battalion are in table 11, and the results for an Army Tank Company are in table 12.

Table 11. Maneuver area width by mission for an Army Light Infantry Battalion

Mission	Maneuver area width (km)
Offense	13
Defense	8
Retrograde	14
Stability	8
Support	8

Table 12. Maneuver area width by mission for an Army Tank Company

Mission	Maneuver area width (km)
Movement to contact	2.5
Attack	2.5
Defend	1.5
Retrograde	2.5
Security	3

A comparison of our Marine Corps component unit results to the Army’s mission-based requirements for comparable component units suggests that our estimated range of training area width may be narrow. Where a Marine Corps battalion in our results needs between 1.5 and 5.5 kilometers for training, the comparable Army battalion requires 8 to 14 kilometers depending on the mission. Our tank company estimations do not differ quite so much. By our calculations, a Marine tank company needs between 100 meters and 1,400 meters; the Army tank company requires 1,500 to 3,000 meters. These differences could be accounted for by specific tactics or mission parameters, but we do not have the data to determine exactly what is driving them.

If we use the Army’s requirements for a Mechanized Infantry Battalion and extrapolate them to compare with our total MEB width, our results appear to be more in line. Table 13 shows the Army’s recommendations for a Mechanized Infantry Battalion and our extrapolation to a three-battalion mechanized force comparable to the MEB in terms of ground assets. Recall that when we combined the widths calculated for an infantry regiment and two tank companies, our

recommended maneuver area width fell between 3 km and 31 km. While our estimated minimum still appears small in comparison to the Army's requirements, our estimated maximum width would more than encompass a comparable Army force.

Table 13. Maneuver area width by mission for an Army Mechanized Infantry Battalion

Mission	Maneuver area width (km)	Three battalion extrapolation (km)
Movement to contact	8	24
Offensive operation	4	12
Defensive operation	6	18
Retrograde	6	18

Depth of a MEB maneuver area

The desired depth of a maneuver area is based on the goal of the training, the training scenario, and the scheme of maneuver. One key element or factor in the depth of the range is enabling units to train to maneuver within the maximum effective range of their indirect fire support. Such maneuver training could be done in conjunction with live fires, or the indirect fire support element could be simulated.

Coordinating maneuver between tactical elements and indirect fire support is just one part of training to maintain momentum at the MAGTF level. During MAGTF movements, tactical elements should stay within range of their indirect fire and combat service support in case such support becomes necessary. This means a MEB must be able to coordinate tactical maneuver of combat vehicles and dismounted infantry with the movement and displacement of indirect fires and combat service support. MEB training areas should be deep enough to require tactical movement and displacement of support elements at least once. Based on this requirement, we considered the maneuver area depth necessary for tactical movement and displacement as a function of the effective range of indirect fire weapons and the likely rate of maneuver by the tactical force.

The MEB can call upon mortars or artillery for indirect fire support during maneuvers. In table 14 we list the MEB's indirect fire weapons along with their maximum range and maximum effective range. The maximum effective range of each weapon is based either on 80 percent of the maximum range or on reported effectiveness. Based on the data in table 14, training to the maximum effective range of the MEB's longest range indirect fire weapon would require a minimum training area of roughly 50 kilometers. This depth would force the MEB to coordinate movement and displacement of all its indirect fire support weapons at least once.

Table 14. Ranges of indirect fire support weapons

Weapon	Maximum range (km)	Maximum effective range (km)
HIMARS MLRS	60	48
HIMARS RRPR	15	12
LW 155 Howitzer (Unassisted/Assisted)	24/30	19/24
EFSS (Unassisted/Assisted)	8/13	6/10
81 mm mortar	5.6	4.5
60 mm mortar	3.5	2.8

It is questionable how much value is added by the realism of training to coordinate at the maximum effective range of one weapon. Moreover, while 50 km can be covered by a mechanized element in a few hours, it is not a reasonable distance for dismounted infantry to traverse in a single day exercise.

To get a sense of how units currently train to coordinated movement and displacement, we considered mechanized training at 29 Palms, CA. Mechanized units training at 29 Palms use the Delta corridor and Blacktop range training area (RTA) for fire and maneuver exercises. In both locations, the initial movement to contact by the mechanized force usually lasts approximately one hour and covers roughly 6 to 8 kilometers. At the end of the movement to contact, the mechanized force halts to plan a breach or assault and to give their indirect fires the opportunity to displace and move forward. Based on these two data points, a training range needs to be approximately 12-16 km deep to test a mechanized unit's coordinated forward momentum.

We can also consider the depth requirement as a function of time. At 29 Palms, mechanized units conduct a 6-8 km movement to contact in one hour. Table 15 shows the minimum depth requirements for exercises of variable duration based on the 7 km/hr movement averaged at 29 Palms. A mechanized exercise lasting six hours or longer would provide enough space for coordinated movement and displacement training for all the MEB indirect fire support weapons.

Table 15. Minimum depth for mechanized movement at 7 km/h

Exercise length (hrs)	Minimum depth (km)
4	28
6	42
8	56
10	70

As was already reported, a single-day dismounted exercise would not be able to cover the distance needed to test coordination out to the maximum effectiveness of all the indirect fire weapons. However, assuming a rate of movement of 3 km/hr, which is the rule of thumb in FM 34-130, a multi-hour exercise would still give a dismounted MEB some maneuver and displacement training, as can be derived from table 16.

Table 16. Distances covered by dismounted movement at 3 km/hr

Exercise length (hrs)	Minimum depth (km)
4	12
6	18
8	24
12	36

Comparison with the Army’s requirements

Once again, we can compare our results to the recommended maneuver areas established by the Army for units by mission. It should be noted that we have no data on the expected duration of the

Army exercises, so it is unclear if that is a variable in their requirements.

According to TC 25-1, a mechanized infantry battalion needs a range 31 km deep to train for a movement to contact. This would roughly equate to a four hour exercise based on the maneuvers conducted at 29 Palms.

An Army light infantry battalion requires a range 16 km deep to train for an offensive operation. This would roughly equate to a 5 hour dismounted exercise based on our calculations.

Size of an impact area

The size of an impact area is largely based on the surface danger zones (SDZs) associated with the weapons being fired. The SDZs for each weapon can be highly variable, particularly for indirect fire weapons. They change with scenarios as well as with performance characteristics of the weapon systems and ammunition models. For example, SDZs change with:

- Scenario variables such as
 - Firing position
 - Target location
 - Size of the target area
 - Impact media
- Weapon and ammunition variables such as
 - Type of ammunition
 - Type of supporting charge
 - Number of charge bags

In addition, there are two types of SDZs—the traditional cone, also called the fan, SDZ and the newer batwing model. The batwing provides for greater containment of ricochets, and is recommended whenever training overlaps fires and maneuver [13]. The batwing

tends to result in SDZs that are wider at the widest point than the SDZs developed for the same weapons using the cone model.

Because of all the variables that go into calculating SDZs for indirect weapons systems, it is very difficult to build them without establishing specifics about the target(s), the weapons, and the level of overlap between fires and maneuver. Therefore, we default to the dimensions of the typical live fire artillery range—10 square kilometers. This size supports both the live-impact area and a safety buffer zone [17].

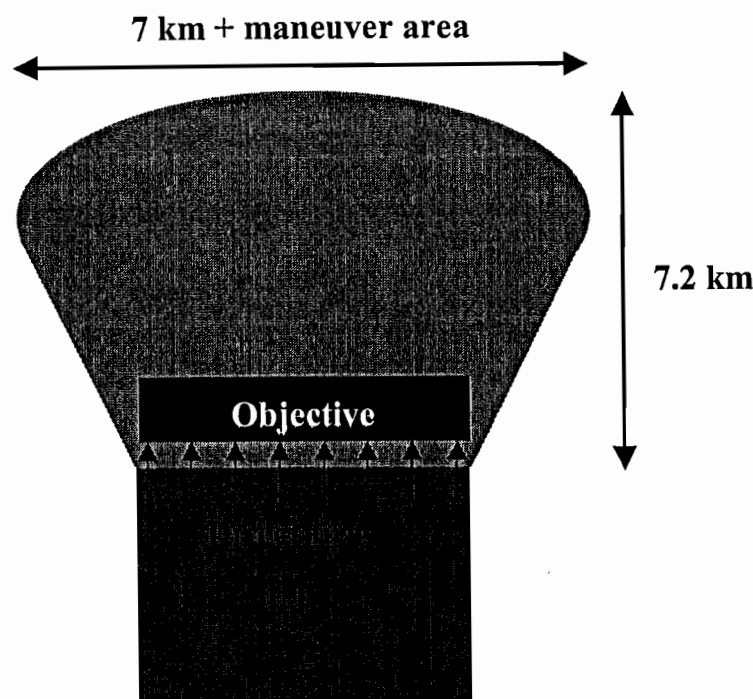
Direct fire impact area

It is somewhat simpler to calculate SDZs for most direct fire ground weapons systems. Different variables can still effect the results, but there are fewer variables that have significant impact. Therefore, we can describe a general direct fire impact area in greater detail.

We use figure 13 to establish the general exercise scenario and the resulting direct fire impact area. The maneuver force begins at the bottom of the maneuver area and moves up towards the objective. The force owns M-16 assault rifles, .50 caliber machine guns, and 120mm tank cannons with high-explosive obstacle-reduction tracer (HE-OR-T) ammunition. For our purposes, the maneuver force can only fire towards the objective in firing lines that run parallel to the depth of the maneuver area. They can only fire when they reach the point where the maneuver area and impact area meet.

Based on this scenario, the impact area must be as deep as the longest range direct fire weapon, in this case, the 120 mm tank cannon with a range of 7.2 km. The impact area must be as wide as the maneuver area plus the maximum width of the widest resulting SDZ. In this scenario, the tank cannon has the widest SDZ of the three weapons at 7.0 km across, or 3.5 km on each wing.

Figure 13. Example of a direct fire impact area



The scenario just described is overly simplistic. However, it shows a quick example of how the size of a direct fire impact area is influenced by many variables, including firing positions, characteristics of the weapons, and width of the maneuver area. The estimated dimensions are also consistent with the size of current maneuver fire areas, including the SR-10 range at Camp Lejeune and the Delta corridor in 29 Palms.

Elements of the air training environment

As with the ground training environment analysis, there are multiple factors that need to be considered to determine an appropriate air training environment for integrated MAGTF operations. The tactical considerations are:

- Refueling, holding areas

- Ingress and egress routes
- Tactical maneuver area
- Weapons impact area
- Safety buffer zone

Each factor effects air space requirements. Weapons impact areas and safety zones are reflected in the ground training environment analysis. These factors would be part of the indirect fires impact area, currently estimated as 10 square kilometers.

The ideal combined arms range would allow the airspace supporting the remaining factors to be contiguous with the ground range. However, in practice, specific ranges make compromises to support the primary training goal; for example, the use of a single fixed-wing ingress heading to support air-to-ground delivery.

The ACE has a variety of missions in support of MAGTF operations, including air interdiction, and SCAR. However, in combined arms operations, their primary mission is close-air supports. Therefore, a MEB training range should include a CAS range in close proximity to maneuvering ground forces. This enables training for integration agencies and maneuver elements.

An additional consideration is the type of air space needed. Currently the military uses restricted air space, military operating areas, and warning areas. Past CNA range alternative studies have analyzed MAGTF air space requirements [18]. We will apply these requirements when considering specific ranges addressed in task 3.

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Conclusions

The analysis documented in this report offers two general results:

- An expanded list of MEB training requirements
- Constructs for thinking about training environments

In addition to these broad analytical results, the analysis validates the need for a MEB field exercise and details how specific MEB employment methods characterize the training environment.

Requirements for an FTX

Understanding the operational level responsibilities of the MEB and the integrated training necessary for the MEB to execute combined arms operations validates the need for a MEB field exercise. There are seven key operational level functions:

- Developing guidance
- Identifying forces
- Determining objectives
- Developing plans
- Allocating assets
- Monitoring tactical execution
- Making adjustments to plans

CPXs which focus on planning, coordination, synchronization, and command and control can train a MEB CE to perform the first four functions. But the latter three responsibilities require a training environment where the MEB CE must react to constraints on execution. Only by providing such constraints can the MEB CE be trained to monitor mission execution, allocate or reallocate assets

appropriately, and adjust plans per on-going tactical results. The MEB needs an FTX to train the entire command and control infrastructure, including mission planning, execution, and the feedback loop which continuously connects the two.

Knowing the MEB requires some level of field exercise is only half the battle. What format should that exercise take, and what kind of environment will support it are also key questions.

Characterizing a MEB training environment

We build on the assumptions that the primary purposes of a MEB FTX are to provide the:

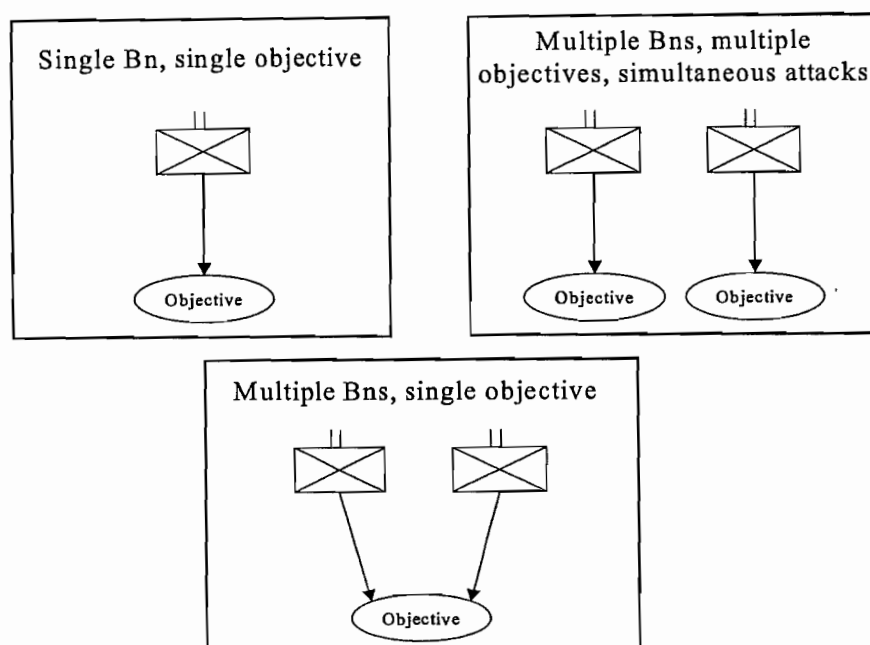
- Tactical complexity to tax the MEB CE's operational responsibilities
- Opportunity to train the MEB's integration responsibilities.

To characterize an environment that would satisfy both these objectives, we consider the three general ways in which a MEB can employ its ground element. MEB ground forces can be employed as:

- A single battalion with a single objective
- Single battalions with multiple objectives
- Multiple battalions with a single objective.

These three modes of employment are depicted in figure 14. Each will tax the command and control feedback loop and the MEB's integration agencies in different ways.

Figure 14. How a MEB can employ its battalions



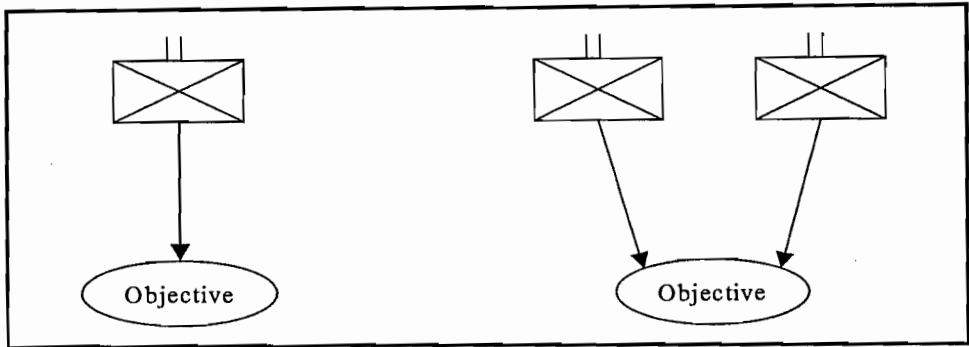
Phase 1 of MCCDC's Operation Certain Passage scenario would best be described as combining a single battalion, single objective mission with a multiple battalion, single objective mission. Graphically, it would look like figure 15.

A training scenario built around the employment described in figure 15 would force the MEB CE to allocate resources between attacks on multiple, parallel objectives. It would require MEB integration agencies to deconflict combined arms requested by multiple battalions operating in close contact. The scenario would tax the communication capabilities of the MEB, both from the CE and MSCs to the dispersed forces and between the operating forces themselves.

An analysis of the MEB employment options also allows us to characterize the training environment. The scenario described in figure 15 requires a training environment that permits dispersed forces as well as dispersion between the operating forces and the command and

control functions. The scenario also requires enough range space to permit multiple objectives and objectives of various size.

Figure 15. Battalion employment in Operation Certain Passage



Applying range constructs to training area characterizations

Finally, our analysis offers a conceptual approach to thinking about ground ranges. The construct we provide asserts that the size of a ground training area is a function of three elements:

- Size of the unit
- Scheme of maneuver
- Fires

These elements combine to define the space needed. By applying this construct to training scenarios or goals, we can identify appropriate training ranges.

As an example, we refer again to the training described in figure 15, which combines a single battalion, single objective mission with a multiple battalion, single objective mission. We already determined that one goal of that scheme is to train the MEB to employ and command and control dispersed forces. The requirement of distance between the objectives, and between the CE and the operating forces,

means the range must include two distinct operating areas. Therefore, we would need to apply the construct—unit size, scheme of maneuver, and fires support—to two tactical objective areas and then determine how to link them for the benefit of CE and integration training.

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Next steps

The purpose of task 3 is to assess specific ranges that support the training environment. Towards that end, we will evaluate how adequately various Marine Corps and joint ranges support the training environment described in this analysis as a combination of exercise scenarios, range characteristics, and spatial constructs. The ranges we plan to consider include, but are not limited to:

- Camp Lejeune
- Camp Pendleton
- Marine Corps Air Ground Combat Center (MCAGCC)
- Marine Corps Air Station (MCAS) Yuma
- National Training Center (NTC)
- Eglin Air Force Base

We intend to combine elements of the MEB scenarios with the range size(s) required to train them. We will then compare the results to the training areas listed above to see if and/or how these current ranges could support training the 2015 MEB.

As part of that analysis of range alternatives, we will also consider how much realism is necessary in training. Analyzing the differences between live fire and inert ordnance training, and using the full MAGTF versus representative forces, will likely have an effect on the comparisons of the different ranges.

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Appendix A

The data used to determine integration responsibilities and the resulting analysis are summarized in Appendices A through D. The tables are divided into seven columns. The first two columns identify the MAGTF element and the subordinate section. The third column lists the identified integration responsibilities derived from Marine Corps doctrine, as referenced in the last column. The remaining columns—phase, level of war, and integrate with whom—are the analytical questions we used to develop the command and control infrastructure, draw the distinction between the operational and tactical levels, and identify the integration points and agencies for combined-arms operations.

Table 17 is the summary for the MEB command element (CE) data and analysis.

Table 17. MEB command element integration responsibilities

MAGTF Element	Section	Integration Responsibilities	Phase	Level of War	Integrate with whom	Source
CE as MARFOR		Develop a Direct Support Plan (DSP)	Planning	Operational	JFC	MCWP 3-2
		Describe intent to maintain OPCON of Marine aviation capabilities/forces	Planning	Operational	JFC, JFACC	MCWP 3-2
		Explain that all Marine Corps sorties are available to JFC for tasking by the JFACC in support of the JFC's overall objectives and campaign plan prior to assignment for ground combat responsibilities	Planning	Operational	JFC, JFACC	MCWP 3-2
		Describe intent to use organic aviation assets in direct support of Marine Corps forces in order to accomplish his JFC-assigned mission in the designated MARFOR area of operations	Planning	Operational	JFC, JFACC	MCWP 3-2
		Describe intent to consolidate, deconflict, prioritize and nominate targets to the joint targeting coordination board (JTCB) to be included on the joint integrated prioritized targeting list (JIPTL)	Planning	Operational	JFC, JFACC	MCWP 3-2
		Provide a MAGTF generated direct support ATO to merge with the JTF joint ATO via CTAPS/TBMCS	Planning	Operational	JFACC	MCWP 3-2
		Allocate sorties in excess of COM-MARFOR's direct support requirements to the JFC for tasking by the JFACC for use in the execution of joint operations	Planning	Operational	JFACC	MCWP 3-2

Excess
Sorties

Table 17. MEB command element integration responsibilities (continued)

MAGTF Element	Section	Integration Responsibilities	Phase	Level of War	Integrate with whom	Source
Command Element <i>Passive</i>		Recommend to the JFACC, if designated as the ACA/AADC, airspace control measures (ACM) that include establishing the MACCS with in MARFOR AO to provide airspace control functions in the MARFOR airspace control sectors as designated by the ACA. Details should be included in the ACP and coordinated with the ACA.	Planning	Operational	JFACC	MCWP 3-2
		Develop guidance using the commander's battlespace area evaluation (CBAE), experience, and information on the mission from higher headquarters.	Planning	Operational	CE	MCWP 3-1
		Determine Fire Support Coordination Measures	Planning	Operational	ACE, GCE	CRM D0008875 .A2
		Monitor air operations (deep and close)	Planning	Operational	ACE	CRM D0008875 .A2
		Redirect resources as required	Planning	Operational	ACE	CRM D0008875 .A2
		Conduct mission planning via Marine Corps Mission Planning Process	Planning	Operational	Marine Service CC, MAGTF elements	MCWP 3-2
		Estimate aviation capabilities required to accomplish the mission	Planning	Operational	Marine Service CC	
		Identify main effort	Planning	Operational	CE	MCWP 3-2
		Publish prioritization guidance	Planning	Operational	CE, ACE, GCE	MCWP 3-2

Table 17. MEB command element integration responsibilities (continued)

MAGTF Element	Section	Integration Responsibilities	Phase	Level of War	Integrate with whom	Source
See GCE Appendix for mission planning processes CE	Battle staff	Publish air apportionment recommendations	Execution	Operational	CE, ACE, GCE	MCWP 3-2
		Function as commander's primary advisors	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Receive, analyze, and distribute information	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Make recommendations to the command group	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Integrate and synchronize resources	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Integrate with higher headquarters plan in planning process	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Focus on next phase or mission, not on immediate or current phase or mission	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Establish an operational planning team to focus planning effort and gather expertise	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Develop mission with regard to MAGTF capabilities, command relationship requirements, and battlespace	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Coordinate future plans and current operations sections to integrate planning of the next battle	Planning	Operational	MAGTF elements	MCWP 3-40.1

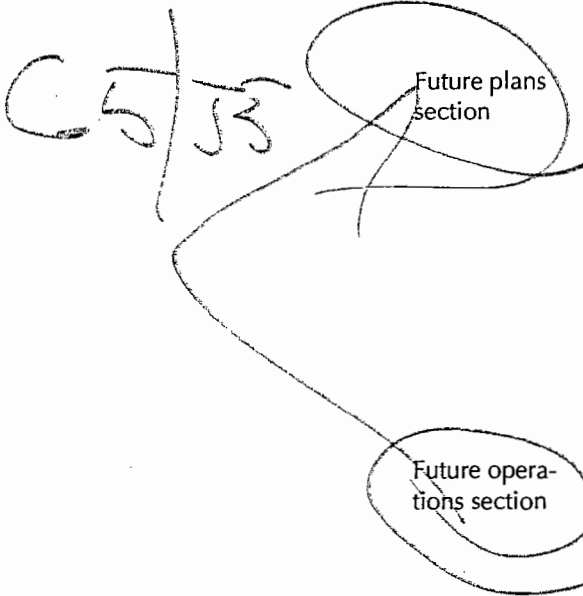


Table 17. MEB command element integration responsibilities (continued)

MAGTF Element	Section	Integration Responsibilities	Phase	Level of War	Integrate with whom	Source
		Integrate staff sections' plans officers, warfighting function representatives, and subordinate LNOs into the planning process	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Develop branch plans and sequels	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Recommend potential commander's critical information requirements (CCIRs)	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Interact with intelligence collection and targeting processes to shape the next battle	Planning	Operational	MAGTF elements	MCWP 3-40.1
	Current operations section	Coordinate and executes the OPORD	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Prepare and transmit the OPORD	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Monitor operations of the force	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Track CCIRs and immediately reports relevant information to the commander	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Analyze battlespace information	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Develop new COAs, allocate resources, and prepare fragmentary orders to modify current OPORD, as required	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Assess shaping actions and progress toward commander's decisive actions	Execution	Operational	MAGTF elements	MCWP 3-40.1

Table 17. MEB command element integration responsibilities (continued)

MAGTF Element	Section	Integration Responsibilities	Phase	Level of War	Integrate with whom	Source
<div>GS</div> <div><div>OPT</div></div>		Monitor the status of forces and material	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Monitor rear area operations	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Coordinate terrain management	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Maintain essential maps and information	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Provide future operations section with situational awareness	Execution	Operational	MAGTF elements	MCWP 3-40.1
		Conduct integrated planning	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Conduct mission analysis	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Develop wargame COAs	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Assist commander in COA selection	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Assist staff in preparation and transition of OPORD	Planning	Operational	MAGTF elements	MCWP 3-40.1
		Serve as linchpin between future plans, future operations, and current operations sections	Planning	Operational	MAGTF elements	MCWP 3-40.1

Appendix B

Table 18 is the summary for the MEB ground combat element (GCE) data and analysis.

Table 18. MEB ground combat element integration responsibilities

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
GCE	FFCC FSC	Plan fire support operations for the deep, close and rear operations	Planning	Operational	CE, ACE	MCWP 3-1
		Coordinate fire support operations for the deep, close, and rear operations	Planning	Operational	CE, ACE	MCWP 3-1
		Conduct fire support operations for the deep, close, and rear operations	Planning	Operational	CE, ACE	MCWP 3-1
		Identify requirements	Planning	Operational	CE, ACE	MCWP 3-1
		Develop estimates of supportability	Planning	Operational	CE, ACE	MCWP 3-1
		Provide input to the operations order (OPORD) and develop appropriate or required annexes and appendices	Planning	Operational	CE, ACE	MCWP 3-1
		Establish targeting board	Planning	Operational	CE, ACE	MCWP 3-1
		Establish targeting procedures and processes for the execution phase of the operation	Planning	Operational	CE, ACE	MCWP 3-1
		Monitor and make recommendations to the division commander for allocating fire support	Execution	Operational	CE, ACE	MCWP 3-1
		Perform targeting functions or processes	Execution	Operational	CE, ACE	MCWP 3-1
		Conduct fire support operations in the MAGTF deep operation	Execution	Operational	CE, ACE	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Conduct fire support operations in the close and rear operations	Execution	Operational	CE, ACE	
	Fire Support Coordination Section	Provide liaison to division forces for artillery control and coordination	Execution	Operational	FSCC	MCWP 3-1
		Coordinate all supporting arms to support the concept of operations	Execution	Operational	CE, ACE	MCWP 3-1
	Target Information Section	Conduct targeting acquisition, target dissemination, and attack recommendation and assessment	Execution	Operational	CE, ACE	MCWP 3-1
	Air Section	Advise the division commander, staff, and commander's of units that do not have a TACP on air support, including AAW	Planning	Operational	CE, ACE	MCWP 3-1
		Participate in forming operation plans and orders on air employment	Planning	Operational	CE, ACE	MCWP 3-1
		Participate with the FSC in targeting and selecting appropriate means of attack	Planning	Operational	CE, ACE	MCWP 3-1
		Prioritize and resolve conflicts in air support requests (ASR)	Execution	Operational	CE, ACE	MCWP 3-1
		Prepare, forward, and coordinate ASRs	Execution	Operational	CE, ACE	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
Regimental Fire Support Coordination Center (FSCC)	Naval Gunfire Section	Relay pertinent information to other tactical air control elements	Execution	Operational	CE, ACE	MCWP 3-1
		Establish and maintain facilities for liaison and communications between supported units and appropriate control agencies	Execution	Operational	CE, ACE, TACC	MCWP 3-1
		Inform and advise the GCE commander on employing, requesting, and controlling NSFS	Execution	Tactical	CE, ACE, TACC	MCWP 3-1
		Plan, coordinate, and integrate supporting arms to support the regiment's scheme of maneuver for current and future operations	Planning	Operational	CE, ACE	MCWP 3-1
		Develop the regiment's fire support plan	Planning	Tactical	FFCC, FSCC	MCWP 3-1
		Perform targeting process and develop targets with its own target acquisition assets, in addition to those developed at higher headquarters	Planning	Tactical	CE, FFCC, FSCC	MCWP 3-1
		Allocates assets for the attack of targets in its area of operations (assets include direct support artillery battalion and available NSFS and aviation)	Execution	Tactical	FFCC, TACC	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Request NSFS and air support, and plans fires within the regiment's area of operations	Execution	Tactical	TACC	MCWP 3-1
		Allocates fire support assets to subordinate battalions (CAS sorties, NSFS ships, etc.)	Execution	Tactical	FSCC, DASC	MCWP 3-1
		Assists and supervises subordinate FSCCs	Execution	Tactical	FSCC	MCWP 3-1
		Coordinate clearance of fires that affect the regiment's area of operations. Normally, coordination will be conducted by subordinate battalions while the regiment monitors and effects coordination with higher, adjacent, and subordinate units, as required	Execution	Tactical	FSCC, DASC	MCWP 3-1
		Coordinate ingress and egress routes for all aviation missions including assault support, CAS, and reconnaissance	Execution	Tactical	FSCC, DASC	MCWP 3-1
		Coordinate employment of all supporting arms in support of the regiment	Execution	Tactical	FSCC, DASC	MCWP 3-1
		Provide battle damage assessment and situational updates to higher headquarters	Execution	Tactical	CE, FFCC	

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
Battalion FSCC	Liaison Section	Conduct artillery liaison and coordination functions for the regiment	Planning	Tactical	FSCC	MCWP 3-1
		Operates the fire support coordination and artillery nets in the FSCC	Execution	Tactical	FSCC	MCWP 3-1
	Tactical Air Control Party (TACP)	Advise regiment commander on aviation matters	Planning	Tactical	FSCC	MCWP 3-1
	NSFS Liaison Team	Establish and maintain facilities for liaison and communications between supported units and appropriate control agencies	Execution	Tactical	TACC	MCWP 3-1
		Inform and advise the GCE commander on employing, requesting, and controlling NSFS	Planning	Tactical	TACC	MCWP 3-1
	Liaison Section	Plan and coordinate artillery fires at the company level	Planning	Tactical	FSCC, FIST	MCWP 3-1
		Call for and adjust artillery fires	Execution	Tactical	FSCC, FIST	MCWP 3-1
	Tactical Air Control Party (TACP)	Battalion TACP OIC (including FACs) serves within the FSCC as the air representative	Execution	Tactical	FSCC, FIST, DASC, FAC(A)	MCWP 3-1
	Shore Fire Control Party	Provide input to the company fire plan	Execution	Tactical	FSCC	MCWP 3-1
		Spot teams call for and adjust NSFS	Execution	Tactical	FSCC, FIST	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
Company Fire Support Coordination Separate Battalion FSCC Senior FSCC in the GCE	81mm Mortar Platoon Representative	Represent 81mm mortal platoon in the Bn FSCC	Execution	Tactical	FSCC, FIST	MCWP 3-1
		FO teams call for and adjust mortar fires	Execution	Tactical	FSCC, FIST	MCWP 3-1
		Coordinate supporting arms with the company's scheme of maneuver	Execution	Tactical	FSCC, FIST	MCWP 3-1
		See above descriptions of FSCCs	Execution	Tactical		MCWP 3-1
		Report pertinent information such as the location of friendly artillery units, fire support coordinating measures (FSCMs), and artillery antiaircraft weapons to other staff sections of the MAGTF FFCC for further dissemination as required	Execution	Tactical	FFCC, TACC	MCWP 3-1
		Conduct targeting functions to meet the GCE commander's intent	Execution	Tactical	FFCC	MCWP 3-1
		Serve on the MAGTF targeting committee	Execution	Tactical	MAGTF elements	MCWP 3-1
		Establish reporting requirements, FSCMs (ex restricted fire areas, RFAs), and fire support coordination procedures when existing procedures are inadequate	Planning	Tactical	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
Mission Planning FSC	Mission Analysis	Use commander's CBAE to frame fire support's role in the plan	Planning	Operational	MAGTF elements	MCWP 3-1
		Identify specified and implied tasks	Planning	Operational	MAGTF elements	MCWP 3-1
		Determine essential fire support tasks (EFSTs) that need to be accomplished to achieve the commander's guidance	Planning	Operational	MAGTF elements	MCWP 3-1
		Understand and apply the affects that Intelligence Preparation of the Battlespace (IPB) has on fire support	Planning	Operational	MAGTF elements	MCWP 3-1
		Based on commander's guidance, analyze the enemy centers of gravity to determine the threat weaknesses that are critical vulnerabilities	Planning	Operational	MAGTF elements	MCWP 3-1
		Translate data on supporting arms into meaningful capabilities	Planning	Operational	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Issue warning order to subordinate FSCs, observers, or supporting arms representative and include mission of supported unit, commander's intent and his guidance for fires, and proposed EFSTs	Planning	Operational	MAGTF elements	MCWP 3-1
	COA development	Conceptualize how to integrate fires into each developing COA	Planning	Operational	MAGTF elements	MCWP 3-1
		Fire support portion of COA should allocate target acquisition assets, attack assets, planned target areas, and create the sequence that targets will be attacked	Planning	Operational	MAGTF elements	MCWP 3-1
		Develop targets as part of COA development at all echelons	Planning	Operational	MAGTF elements	MCWP 3-1
		Determine fire support and acquisition asset requirements to accomplish the fire support tasks assigned to each supporting arms agency	Planning	Operational	MAGTF elements	MCWP 3-1
		Request additional resources as deemed necessary	Planning	Operational	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Build a reconnaissance and surveillance (R&S) plan based upon the COA's scheme of maneuver and identify an asset to accomplish the task, plan to get asset in place and observe for assessment feedback	Planning	Operational	MAGTF elements	MCWP 3-1
		Understand the tentative timing of the scheme of maneuver and establish triggers	Planning	Operational	MAGTF elements	MCWP 3-1
		Apply doctrine and accepted planning factors to ensure plan is feasible	Planning	Operational	MAGTF elements	MCWP 3-1
		Draft a fire support execution matrix (FSEM)	Planning	Operational	MAGTF elements	MCWP 3-1
		Draft target list worksheet and overlay	Planning	Operational	MAGTF elements	MCWP 3-1
		Draft target synchronization matrix	Planning	Operational	MAGTF elements	MCWP 3-1
	COA wargaming	Validate and refine the fire support plan	Planning	Operational	MAGTF elements	MCWP 3-1
		Validate fire support tasks	Planning	Operational	MAGTF elements	MCWP 3-1
		Identify refinements to existing tasks (including assigning the task to another supporting arms agency)	Planning	Operational	MAGTF elements	MCWP 3-1
		Identify additional fire support tasks	Planning	Operational	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	COA comparison and decision	Prepare estimates of support-ability	Planning	Operational	MAGTF elements	MCWP 3-1
		Brief estimates of support-ability to each COA to the commander	Planning	Operational	MAGTF elements	MCWP 3-1
		Brief advantages and disadvantages	Planning	Operational	MAGTF elements	MCWP 3-1
		Issue warning order to subordinate commanders and appropriate supporting arms agencies	Planning	Operational	MAGTF elements	MCWP 3-1
	Order develop-ment	Finalize plans for acquiring, tracking, attacking, and assessing actions taken against High Priority Targets (HPTs)	Planning	Operational	MAGTF elements	MCWP 3-1
		Finalize schedules of fire, FSCMs, and FSEMs	Planning	Operational	MAGTF elements	MCWP 3-1
		Finalize the engagement areas	Planning	Operational	MAGTF elements	MCWP 3-1
		Finalize triggers (offensive maneuver or action, defensive physical ground spot	Planning	Operational	MAGTF elements	MCWP 3-1
		Develop the observation plan to include the task and purpose for each phase of the operation	Planning	Operational	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	Transition	Rehearse the fire support plan to test synchronization of the fire support plan with the scheme of maneuver, target execution responsibilities (primary and alternate observers), artillery and mortar positioning and movement plans, and verification of target acquisition	Planning	Operational	MAGTF elements	MCWP 3-1
		Plan FSCMs, CAS employment, and verification of windows to mass battalion fires.	Planning	Operational	MAGTF elements	MCWP 3-1
		Include fire support refinements from subordinate elements	Planning	Operational	MAGTF elements	MCWP 3-1
		Recommend changes to the fire support plan to the commander based on situational developments	Planning	Operational	MAGTF elements	MCWP 3-1
	Miscellaneous	Reassign targets to other supporting arms as required	Planning	Operational	MAGTF elements	MCWP 3-1
		Acquire preliminary coordination for clearance to fire on targets	Planning	Operational	MAGTF elements	MCWP 3-1
		Coordinate the positioning of the fire support assets	Planning	Operational	MAGTF elements	MCWP 3-1
		Coordinate fire support delivery procedures and observations coverage	Planning	Operational	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Coordinate fire support communications	Planning	Operational	MAGTF elements	MCWP 3-1
		Coordinate the delivery of specialized munitions	Planning	Operational	MAGTF elements	MCWP 3-1
		Effect other required coordination	Planning	Operational	MAGTF elements	MCWP 3-1
		Disseminate the fire support plan	Planning	Operational	MAGTF elements	MCWP 3-1
		Be able to execute quick fire support planning	Planning	Operational	MAGTF elements	MCWP 3-1
		Targeting within the MAGTF CE is performed by the FFCC targeting cell	Planning	Operational	MAGTF elements	MCWP 3-1
		Exercise cognizance of the majority of the MAGTF's intelligence production capabilities	Planning	Operational	MAGTF elements	MCWP 3-1
		Access external MAGTF collection and production assets that can provide intelligence support	Planning	Operational	MAGTF elements	MCWP 3-1
		Establish a MAGTF target list	Planning	Operational	MAGTF elements	MCWP 3-1
		Develop commander's priority intelligence requirements (PIR)	Planning	Operational	MAGTF elements	MCWP 3-1
		Make target recommendations to the amphibious force and/or Joint Task Force	Planning	Operational	MAGTF elements	MCWP 3-1
		Conduct target value analysis (TVA)	Planning	Operational	MAGTF elements	MCWP 3-1

← FFCC targeting cell

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	G-2/S-2	Develop the following products:	Planning	Operational	MAGTF elements	MCWP 3-1
		Target acquisition tasking	Planning	Operational	MAGTF elements	MCWP 3-1
		High-payoff target list	Planning	Operational	MAGTF elements	MCWP 3-1
		Attack guidance matrix	Planning	Operational	MAGTF elements	MCWP 3-1
		Targeting selection standards	Planning	Operational	MAGTF elements	MCWP 3-1
		Requirements for battle damage assessment	Planning	Operational	MAGTF elements	MCWP 3-1
	Target Information Section (TIS)	Maintain required target and situation maps	Execution	Tactical	MAGTF elements	MCWP 3-1
		Maintain target data using automated methods, ex target files	Execution	Tactical	MAGTF elements	MCWP 3-1
		Consolidate, evaluate, and display target information and intelligence	Execution	Tactical	MAGTF elements	MCWP 3-1
		Recommend target classification and attack priorities to the FSC as required	Execution	Tactical	MAGTF elements	MCWP 3-1
		Obtain information and intelligence on the results of attack on targets by the supporting arms from all elements and sources	Execution	Tactical	MAGTF elements	MCWP 3-1
		Coordinate all matters with MAGTF target intelligence officer and artillery unit S-2 for target and counter-fire intelligence support	Execution	Tactical	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
Basic fire support coordination tasks	Division (highest S-2)	Maintain current lists of targets to include counter-mortar, counter-battery, and SEAD lists and provide this information to the supporting arms representatives and to the LF as a whole	Execution	Tactical	MAGTF elements	MCWP 3-1
		Prepare and ensure dissemination of target bulletins after control of the amphibious force target list has been passed ashore	Execution	Tactical	MAGTF elements	MCWP 3-1
		Perform as the clearing house for all target information gathered at lower levels	Execution	Tactical	MAGTF elements	MCWP 3-1
		Merge all subordinate FSCC lists of targets into one MAGTF target list for a given 24-hour period. Provide for SACC for amphib ops)	Execution	Tactical	MAGTF elements	MCWP 3-1
		Advise the commander of changes in the status of fire support	Execution	Tactical	CE	MCWP 3-1
		Recommend changes in fire support employment based on the current tactical situation	Execution	Tactical	MAGTF elements	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Deliver fires on targets detected in the targeting process by executing attack guidance	Execution	Tactical	Firing units	MCWP 3-1
		Select the best supporting arms to attack a target considering availability, weaponing, and coordination requirements	Execution	Tactical	FFCC, TACC	MCWP 3-1
		Clear requests for fire using an established approval mode	Execution	Tactical	FFCC, FSCC	MCWP 3-1
		Integrate fires to support the scheme of maneuver	Execution	Tactical	FFCC, FSCC, TACC, DASC	MCWP 3-1
		Coordinate fires to support the scheme of maneuver	Execution	Tactical	FFCC, FSCC, TACC, DASC	MCWP 3-1
		Coordinate fires between the observer and supporting arms and/or multiple firing units	Execution	Tactical	FIST, FAC(A)	MCWP 3-1
		Request additional fire support when needed	Execution	Tactical	FSCC, DASC, FIST	MCWP 3-1
		Establish and maintain FSCMs to aid the rapid engagement of targets and provide safeguards for friendly forces/installations	Planning	Operational	CE, ACE	MCWP 3-1
		Resolve fire support conflicts at lowest possible level	Execution	Tactical	FSCC, DASC	MCWP 3-1

Table 18. MEB ground combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Disseminate information within the FSCC, to other COC staff sections, and to adjacent battalions, supporting artillery units, and higher headquarters, e.g., unit locations, FSCMs, target information, and fire support status reports	Execution	Tactical	FSCC, TACC, DASC	MCWP 3-1
Rear Area Operations	Rear Area Operations Center	The FSC in the RAOC, augmented by the fire support representatives, coordinates and clears fires missions in the rear area	Execution	Tactical	FFCC, FSCC	MCWP 3-1
		Establish FSCMs	Planning	Operational	FFCC, FSCC	MCWP 3-1

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Appendix C

Table 19 is the summary for the MEB air combat element (ACE) data and analysis.

Table 19. MEB air combat element integration responsibilities

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
ACE		Plan aviation operations	Planning	Operational	MAGTF elements	MCWP 3-2
		Plan use of the battlespace	Planning	Operational	MAGTF elements	MCWP 3-2
		Plan and coordinate the availability of aircraft, crews, ordnance, fuel, facilities	Planning	Operational	Squadrons, CSSE	MCWP 3-2
		Coordinate Marine aviation with joint and multinational aviation operations and resources	Planning	Operational	Joint players	MCWP 3-2
		Exercise decentralized control of sorties through the MACCS	Execution	Operational	GCE, CSSE	MCWP 3-2
		Act as the MAGTF commander's principle Marine aviation advisor	Planning	Operational	CE	MCWP 3-2
		Advise and assist the MAGTF commander and staff in developing the overall concept for the employment of aviation in support of the MAGTF	Planning	Operational	CE	MCWP 3-2
		Coordinate air operations with the GCE and CSSE	Planning	Operational	GCE, CSSE	MCWP 3-2
		Coordinate with the naval expeditionary force and joint task force as necessary	Planning	Operational	Joint players	MCWP 3-2
		Articulate commander's intent	Planning	Operational	ACE, CE	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		As supported main effort identify supporting requirements	Planning	Operational	MAGTF elements	MCWP 3-2
		As supporting effort manage resources to meet main effort requirements	Planning	Operational	MAGTF elements	MCWP 3-2
		Ensure the focus of aviation is aligned with MAGTF commander's priorities	Planning	Operational	CE	MCWP 3-2
		Develop the MAGTF ATO or air plan and/or Marine input to the joint ATO through the air tasking cycle	Execution	Operational	MAGTF elements, Joint players	MCWP 3-2
		Shape the close-in battlespace	Execution	Operational	CE, GCE	MCWP 3-2
		Shape the deep battlespace	Execution	Operational	CE, GCE	MCWP 3-2
		Establish air superiority	Execution	Operational	CE, GCE	MCWP 3-2
		Employ appropriate mix of sustained and surge ops to control operational tempo and maintain momentum without exhausting assets before mission accomplishment	Execution	Operational	CE, GCE, CSSE	MCWP 3-2
		Conduct future operations planning via TACC future ops cell	Execution	Operational	CE, GCE	MCWP 3-2
		Monitor current operations via TACC current ops cell	Execution	Tactical	CE, GCE	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Provide inputs to larger organization planning cycles, JTF, ATF, MAGTF	Planning	Operational	MAGTF elements, Joint players	MCWP 3-2
		Use standard METT-T and MCPP to plan supporting aviation operations	Planning	Operational	MAGTF elements	MCWP 3-2
		Conduct concurrent and parallel planning with MAGTF overall planning	Planning	Operational	MAGTF elements	MCWP 3-2
		Provide input to the fire support plan in the operations order	Planning	Operational	MAGTF elements	MCWP 3-2
		Develop subordinate plans, airspace control plan (ACP)	Planning	Operational	MAGTF elements	MCWP 3-2
		Develop process for producing a daily Air Tasking Order (ATO)	Planning	Operational	MAGTF elements	MCWP 3-2
		Develop the following plans for the Operations Order:	Planning	Operational	MAGTF elements	MCWP 3-2
		Air Defense/Antiair Warfare	Planning	Operational	MAGTF elements	MCWP 3-2
		Offensive Air Support	Planning	Operational	MAGTF elements	MCWP 3-2
		Assault Support	Planning	Operational	MAGTF elements	MCWP 3-2
		Reconnaissance and Surveillance Plan	Planning	Operational	MAGTF elements	MCWP 3-2
		Supplementary Air Operations	Planning	Operational	MAGTF elements	MCWP 3-2
		Aircraft Armament	Planning	Operational	MAGTF elements	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Air Control	Planning	Operational	MAGTF elements	MCWP 3-2
		Air Communications	Planning	Operational	MAGTF elements	MCWP 3-2
		Air Movement Plan/Flight Ferry	Planning	Operational	MAGTF elements	MCWP 3-2
		Aircraft Schedules	Planning	Operational	MAGTF elements	MCWP 3-2
		Air Tasking	Planning	Operational	MAGTF elements	MCWP 3-2
		Execute the 6 phases of the Air Tasking Cycle	Execution	Operational	MAGTF elements	MCWP 3-2
		1) Provide command aviation guidance, including air apportionment decisions (MAGTF commander)	Execution	Operational	MAGTF elements	MCWP 3-2
		2) Target/Air Support mission development	Execution	Operational	MAGTF elements	MCWP 3-2
		Provide guidance in the evaluation and selection of aviation targets	Execution	Operational	MAGTF elements	MCWP 3-2
		3) Allocation and allotment	Execution	Operational	MAGTF elements	MCWP 3-2
		Translate apportionment decision into total number of sorties available for each operation or task	Execution	Operational	MAGTF elements	MCWP 3-2
		Submit allocation requests to the MAGTF commander	Execution	Operational	MAGTF elements	MCWP 3-2
		Once allocation approved, sorties are distributed or allotted to the MAGTF elements	Execution	Operational	MAGTF elements	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		MAGTF elements then plan & coordinate the integration of sorties into their fire and maneuver efforts. The GCE and CSSE commanders determine the appropriate distribution of these sorties	Execution	Operational	MAGTF elements	MCWP 3-2
	4) Tasking	Translate allocation and allotment decisions into an ATO or air plan and pass tasking along to the units	Execution	Operational	MAGTF elements	MCWP 3-2
	5) Force Execution	Aircraft squadrons assign aircrew to aircraft and issue flight schedules	Execution	Operational	MAGTF elements	MCWP 3-2
		Conduct mission planning and coordination with MAGTF command element, ACE, GCE, and CSSE staffs	Execution	Operational	Squadron	MCWP 3-2
		Exercise command and control of aviation forces through MACCS including dynamic retasking of assets to meet a changing situation	Execution	Operational	MAGTF elements	MCWP 3-2
	6) Combat Assessment		Execution	Operational	GCE	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Provide continuous evaluation of the impact of combat operations to the MAGTF commander	Execution	Operational	CE, GCE	MCWP 3-2
		Plan and execute aviation ground support operations conducted by Marine Wing Support Squadron	Planning	Operational	CSSE	MCWP 3-2
		Plan aviation logistics operations conducted by Marine Aviation Logistic Squadron (MALS)	Planning	Operational	CSSE	MCWP 3-2
		Execute aviation ground support operations conducted by Marine Wing Support Squadron	Execution	Operational	CSSE	MCWP 3-2
		Execute aviation logistics operations conducted by Marine Aviation Logistic Squadron (MALS)	Execution	Operational	CSSE	MCWP 3-2
	MACCS					
	TACC	Serve as the command post for the ACE commander and staff	Execution	Operational	ACE	MCWP 3-2
		Control the execution of deep operations	Execution	Operational	CE, GCE	MCWP 3-2
		Integrate, coordinate, and direct air operations in support of the MAGTF	Execution	Operational	CE, GCE	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		When the ACE is the JFACC, serve as the Joint Air Operations Center	Execution	Operational	MAGTF elements	MCWP 3-2
	DASC	Supervise the DASC	Execution	Tactical	DASC	MCWP 3-2
		Conduct direction of air operations directly supporting ground forces	Execution	Tactical	TACC, FFCC, FSCC	MCWP 3-2
		Process and coordinate requests for immediate air support	Execution	Tactical	FFCC, FSCC	MCWP 3-2
		Coordinate air missions requiring integration with ground forces and other supporting arms	Execution	Tactical	FFCC, FSCC	MCWP 3-2
		Manage terminal control assets, FAC(A), ASC(A) in support of ground forces	Execution	Tactical	TACC, FAC(A), ASC(A), FSCC, FIST	MCWP 3-2
		Provide procedural control of assigned aircraft, UAVs, & itinerant aircraft transiting through its assigned area	Execution	Tactical	Aircraft, FSCC, FIST	MCWP 3-2
		Command and control a Tactical Air Control Party (TACP)	Execution	Tactical	TACP, FSCC	MCWP 3-2
		Command and control a Tactical Air Coordinator (airborne) [TAC(A)]	Execution	Tactical	TAC(A), FSCC, FIST	MCWP 3-2
		Command and control a Forward Air Controller (airborne) [FAC(A)]	Execution	Tactical	FAC(A), FSCC, FIST	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Command and control a Assault Support Coordinator (airborne) [ASC(A)]	Execution	Tactical	TACC, ASC(A)	MCWP 3-2
		Command and control a Helicopter Support Team [HST]	Execution	Tactical	TACC, HST	MCWP 3-2
	TACP	Establish and maintain facilities for liaison and communications between parent units and airspace control agencies	Execution	Tactical	FSCC, DASC, TACC	MCWP 3-2
		Inform and advise ground unit commander on the employment of supporting aircraft	Execution	Tactical	FSCC, DASC	MCWP 3-2
		Request and control air support	Execution	Tactical	DASC, FiST, FSCC	MCWP 3-2
	TAC(A)	Coordinate the action of combat aircraft engaged in close support of ground or sea forces	Execution	Tactical	DASC, TACC, FSCC	MCWP 3-2
		Coordinates among TACP, FAC(A) and the fire direction of artillery and naval gunfire	Execution	Tactical	DASC, TACC, FSCC, SACC	MCWP 3-2
	FAC(A)	Perform air reconnaissance and surveillance	Execution	Tactical	DASC, FiST, FSCC	MCWP 3-2
		Conduct terminal control of aircraft engaged in offensive air support operations	Execution	Tactical	DASC, FiST, FSCC	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Control artillery and naval surface fire support missions	Execution	Tactical	FSCC, SACC	MCWP 3-2
		Act as a radio relay	Execution	Tactical	DASC, TACC, FSCC	MCWP 3-2
		Control landing zone preparations	Execution	Tactical	GCE, TACC	MCWP 3-2
	ASC(A)	Coordinate movement of aviation assets during assault support operations	Execution	Tactical	DASC	MCWP 3-2
		Provide situational awareness to the assault force	Execution	Tactical	DASC	MCWP 3-2
		Relays request to the DASC	Execution	Tactical	DASC	MCWP 3-2
		Exercise launch authority for immediate and on-call missions	Execution	Tactical	DASC, TACC	MCWP 3-2
		Coordinates with the TAC(A)	Execution	Tactical	TAC(A), DASC	MCWP 3-2
		Provides routing recommendations to the air mission commander	Execution	Tactical	DASC	MCWP 3-2
	HST	Facilitate the landing and movement of helicopter-borne troops, equipment, and supplies in a landing zone	Execution	Tactical	DASC	MCWP 3-2
		Evacuate selected casualties and enemy prisoners of war	Execution	Tactical	DASC, TACC	MCWP 3-2
	TAOC	Control and manage airspace	Execution	Tactical	DASC, TACC	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Detect, identify and control the interception of hostile aircraft and missiles	Execution	Tactical	TACC	MCWP 3-2
		Provide direction, positive control, and navigational assistance for friendly aircraft	Execution	Tactical	TACC	MCWP 3-2
		Collect and display information from its sensors, other Marine Corps sources, and external sources to enhance the ability of the TACC to prosecute the ACE's support of deep operations	Execution	Tactical	TACC	MCWP 3-2
		Interface with Air Force air operations center and control and reporting center to coordinate joint air defense efforts	Execution	Tactical	Joint participants	MCWP 3-2
	SAAWC	Manages and coordinates all active defense weapons within assigned sector	Execution	Tactical	TACC	MCWP 3-2
		Plan air defense operations	Planning	Operational	CE, TACC	MCWP 3-2
		Manage air defense resources	Execution	Tactical	TACC, TAOC	MCWP 3-2
		Supervise the employment of air defense assets	Execution	Tactical	CE, TACC	MCWP 3-2
		Coordinates with higher and adjacent air agencies and activities	Execution	Tactical	TACC, TAOC	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	Marine Air Traffic Control Detachments	Provide airspace control, management, and surveillance for its designated sector or area of responsibility including Expeditionary Air Fields (AEF) and Forward Operation Bases (FOB)	Execution	Tactical	MAGTF elements	MCWP 3-2
		Coordinates air defense zones by assisting in the detection of hostile aircraft for LAAD Stinger teams assigned to air defense	Execution	Tactical	TACC, SAAWC	MCWP 3-2
		Serve as the MAGTF liaison with host-nation, national, and international civil air traffic control agencies	Execution	Tactical	Host nation	MCWP 3-2
	Low Altitude Air Defense	Provide close-in, low-altitude, surface-to-air weapons fires in defense of forward combat elements, vital areas, and installations	Execution	Tactical	TAOC, SAAWC, (DASC when in direct support of GCE)	MCWP 3-2
		Provide surface-to-air weapons support for units engaged in special or independent operations	Execution	Tactical	SAAWC, TAOC, TACC	MCWP 3-2
		Provide early warning to other elements of the Marine Air Command and Control System (MACCS)	Execution	Tactical	SAAWC, TAOC, TACC	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	Marine Wing Communications Squadron	Responsible for the installation, maintenance, and operation of the ACE commander's communication structure used to direct the efforts of subordinate commanders	Execution	Tactical	ACE	MCWP 3-2
	ACE MALS	Responsible for the installation, maintenance, and operation of the communication structure that provides connectivity among the sub-elements of the MACCS	Execution	Tactical	TACC, TAOC, DASC	MCWP 3-2
		Provide intermediate-level maintenance for aircraft and aeronautical equipment for all supporting units, when authorized perform first degree repair on specific engines	Execution	Operational	CSSD	MCWP 3-2
		Provide aviation supply support for aircraft and Navy-funded equipment to all supporting units	Execution	Operational	CSSD	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Provide Class V(A) ordnance and ammunition logistic support to ACE squadrons to include requisitioning, storage, handling, assembly, transportation, inventory reporting of Class V(A) ammunition, and planning for and operating an ammunition issue point at expeditionary sites	Execution	Operational	CSSD	MCWP 3-2
		Interpret, implement, audit, inspect, and provide oversight for the MAG commanding officer for all policies and procedures relating to the administration and management of operations and maintenance, Navy (less TAD) funds, aviation supply, aircraft maintenance, cryogenics, aircraft ordnance, avionics, and data processing for all units within the MAG and ACE	Execution	Operational	CSSD	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Coordinate with MWSG, MWSS, MACG, and other supporting Navy and Marine Corps activities in planning for the support required to execute aviation logistics	Execution	Operational	CSSD	MCWP 3-2
		Screen and inspect nonserVICABLE aeronautical equipment and material for testing and repair, shipment to another repair facility, or disposal	Execution	Operational	CSSD	MCWP 3-2
		Maintain the capability to deploy and provide MASLP support packages as integral units or as tailored aviation logistic elements assigned to another MALS to support aircraft assigned to a host MAG, MALS, or ACE	Execution	Operational	CSSD	MCWP 3-2
		Conduct individual and unit training to qualify organic and supported squadron personnel for performance of assigned missions and tasks	Execution	Operational	CSSD	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Provide data processing support to facilitate execution of aviation supply, maintenance, and Navy-funded financial functions of the MAG and ACE	Execution	Operational	CSSD	MCWP 3-2
	MWSS	Provide aviation ground support and Combat Service Support (CSS) functions for airfield operations	Execution	Operational	CSSD	MCWP 3-2
		Specific services include EAF, explosive ordnance disposal, weather services, military police support, engineering support, materials handling equipment, motor transportation, intra-airfield communication, aircraft rescue and fire fighting, utilities support and maintenance, field messing, medical support, and aircraft ground vehicle refueling	Execution	Operational	CSSD	MCWP 3-2
		Perform camp commandant functions	Execution	Operational	CSSD	MCWP 3-2
		Provide nucleus for rear area security and air base defense	Execution	Operational	CSSD	MCWP 3-2

Table 19. MEB air combat element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	Combat Service Support Detachment	Transport fuel, ordnance, other supplies required by the ACE from the point of entry in the MAGTF area of operations to the EAF site for distribution by a MWSS and/or MALS	Execution	Operational	CSSE, ACE	MCWP 3-2
		Perform third echelon maintenance on engineer, motor transport, and communications equipment that is supported by the Marine Corps and operated by the ACE	Execution	Operational	CSSE, ACE	MCWP 3-2
		Provide postal, disbursing, exchange, legal, civil affairs, and graves registration services	Execution	Operational	CSSE, ACE	MCWP 3-2
		Provide supply, general engineering, health services, and other support that cannot be satisfied by a MWSS	Execution	Operational	CSSE, ACE	MCWP 3-2

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Appendix D

Table 20 is the summary for the MEB combat service support element (CSSE) data and analysis.

Table 20. MEB combat service support element integration responsibilities

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
MEF or MLC		Define the logistics main effort	Planning	Operational	MAGTF elements	MCWP 4-12
		Identify force logistics support requirements	Planning	Operational	MAGTF elements	MCWP 4-12
		Coordinate and supervise force closure and onward movement	Execution	Operational	MAGTF elements	MCWP 4-12
		Organize logistic support through the communication zone	Execution	Operational	MAGTF elements	MCWP 4-12
		Link strategic sustainment to tactical combat service support	Execution	Operational	MAGTF elements	MCWP 4-12
		Develop agreements with other component commanders and participate in component command-level working groups	Planning	Operational	Joint participants	MCWP 4-12
		Continuously refine force personnel, sustainment, transportation, and reception requirements	Execution	Operational	CE	MCWP 4-12
		Use METT -T to define operational and tactical logistics requirements for each operation	Planning	Operational	MAGTF elements	MCWP 4-12
		Identify the best set of tactical assets to add to a MAGTF for operational logistics purposes	Planning	Operational	MAGTF elements	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Inform the JFC of changes in logistics requirements that might affect Marine Corps' operations	Planning	Operational	Joint participants	MCWP 4-12
		Source Marine forces requirements from the Marine Corps, other Service components, joint, host nation support, or multinational agencies	Planning	Operational	Joint participants	MCWP 4-12
		Allocate intratheater transportation asset	Execution	Operational	MAGTF elements	MCWP 4-12
		Develop theater facilities	Execution	Operational	Joint participants	MCWP 4-12
		Initiate acquisition cross servicing agreements to fill MAGTF requirements and coordinate HNS	Execution	Operational	Host Nation	MCWP 4-12
		Coordinate Marine forces contingency contracting with JFC chief of contracting	Execution	Operational	Joint participants	MCWP 4-12
		Coordinate and integrate health service support in the theater of war with the Joint Force Surgeon or senior medical regulating authority	Execution	Operational	Joint participants	MCWP 4-12
		Coordinate and supervise reconstitution and redeployment	Execution	Operational	MAGTF elements	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
FSSG	CSSE	Ensure the effectiveness and economy of Marine Corps operational level logistics	Execution	Operational	CE	MCWP 4-12
		Employ combat service support detachments (CSSDs) in direct support role to the GCE maneuver elements and ACE units for capabilities which exceed the MWSS	Execution	Tactical	MAGTF elements	MCWP 4-12
		Develop sequels to plans that anticipate the growth of the CSSE task-organization as the theater develops	Planning	Operational	MAGTF elements	MCWP 4-12
		Integrate logistic requirements with existing plans and annexes	Planning	Operational	MAGTF elements	MCWP 4-12
		Determine basic, broad mobilization, deployment, and sustainment requirements	Planning	Operational	MAGTF elements	MCWP 4-12
		Determine theater organization and conduct Logistic Preparation of the Theater	Planning	Operational	MAGTF elements	MCWP 4-12
		Consider battlespace geometry, real estate requirements, movement control and their impact on logistics bottlenecks	Planning	Operational	MAGTF elements	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Determine critical and vital supplies	Planning	Operational	MAGTF elements	MCWP 4-12
		Apportion and allocate resources	Planning	Operational	CE	MCWP 4-12
		Apply "Single Battle Approach": "Those who employ our forces will plan for and execute deployment of our forces	Planning	Operational	CE	MCWP 4-12
		Provide instruction or guidance for redistributing assets from low-to-high priority organizations within the command	Planning	Operational	CE	MCWP 4-12
		Source known requirements and anticipate unidentified requirements	Planning	Operational	MAGTF elements	MCWP 4-12
		Determine size and location of logistic facilities and units	Planning	Operational	MAGTF elements	MCWP 4-12
		Provide efficient means to retrograde, repair, and redistribute critical items	Planning	Operational	MAGTF elements	MCWP 4-12
		Apply Force Deployment Planning and Execution (FDP&E) operational procedures	Planning	Operational	MAGTF elements	MCWP 4-12
		Determine how to accomplish the employment mission	Planning	Operational	CE	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Develop logistics related intelligence requirements, IPB (study of roads, rails, bridges, tunnels, forts, choke points, ports, air-fields, and infrastructure)	Planning	Operational	CE, GCE	MCWP 4-12
		Develop environmental information requirements (IRS)	Planning	Operational	CE, GCE	MCWP 4-12
		Develop threat information requirements (IRS)	Planning	Operational	CE, GCE	MCWP 4-12
		Develop process for CSSE observations to be fed back into the intelligence cells	Planning	Operational	CE	MCWP 4-12
		Identify, evaluate, and determine host nation sources of supplies and services to be used during the operation	Planning	Operational	Host Nation, MAGTF elements	MCWP 4-12
		Establish a contingency contracting capability (in country resources, ICR) to offset logistic shortfalls that occur early in the deployment of the force to theater	Execution	Operational	Host Nation	MCWP 4-12
		Develop a logistics/ Combat Service Support Estimate to evaluate COAs based on force closure, sustainment, and reconstitution and redeployment	Planning	Operational	MAGTF elements	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Determine the force and sustainment requirements to accomplish the employment mission	Planning	Operational	MAGTF elements	MCWP 4-12
		Source force and sustainment requirements	Planning	Operational	MAGTF elements	MCWP 4-12
		Determine a phased deployment plan and correct all force and sustainment information on the TPFDD	Planning	Operational	MAGTF elements	MCWP 4-12
		Use the TPFDD as a command and control tool for the execution of deployment, force closure, and sustainment operations	Execution	Operational	MAGTF elements	MCWP 4-12
		Develop the concept of logistics outlining the intent of how to support and integrate with concept of operations to include a description of the organization and positioning of operational logistics assets, planned employment of other Service and nation logistic/ combat service support forces, HNS logistic capabilities and/or LOC operations	Planning	Operational	MAGTF elements	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Continue to refine the logistics/Combat Service Support Estimate through out the planning process	Planning	Operational	MAGTF elements	MCWP 4-12
		Develop the concept of logistics for the OPPLAN/OPORD include sustainment priorities and resources, base development and other civil engineering requirements, HNS and inter-service responsibilities, Identify the priority and movement of major logistics items for each option and phase of the concept of logistics and lists strategic and theater ports of resupply	Planning	Operational	MAGTF elements	MCWP 4-12
		Develop appropriate OPORD annexes	Planning	Operational	MAGTF elements	MCWP 4-12
	Arrival & Assembly Operations Group	Control arrival and assembly operations through a network of subordinate control organizations	Execution	Operational	MAGTF elements	MCWP 4-12
	Landing Force Support Party (LFSP)	Control throughput of personnel and maritime prepositioning equipment and supplies at theater ports, beaches, and airfields through POG, BOG, A/ DACC, MCC	Execution	Operational	MAGTF elements	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	Port Operations Group	Prepare the port before the arrival of MPF, unload ships, and control the throughput of supplies and equipment after they are offloaded	Execution	Operational	CE, MPF forces	MCWP 4-12
		Prepare the beach before the arrival of the MPSRON and the throughput of supplies and equipment after they are offloaded	Execution	Operational	CE, MPF forces	MCWP 4-12
	Arrival Airfield Control Group	Control and coordinate of the offload of airfield units and equipment	Execution	Operational	CE	MCWP 4-12
		Provide limited combat service support to airfield units	Execution	Operational	ACE	MCWP 4-12
	Movement Control Center	Plans, routes, schedules, and controls personnel and equipment movements over LOCS	Execution	Operational	MAGTF elements	MCWP 4-12
		MPF ops, form convoys containing MPE/S and personnel at ports, airfields, and/or beaches and dispatches them to the AAOEs	Execution	Operational	CE, MPF forces	MCWP 4-12
	Arrival and Assembly Operations Element	Receive MPE/S and distributes the equipment to the units of the MAGTF	Execution	Operational	MAGTF elements	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
	Deployment	Deploy early and in echelons to establish forward base for sustained operations	Execution	Operational	MAGTF elements	MCWP 4-12
	Force Closure Ops	Establish and operate POG, BOG, A/DACG, MCC	Execution	Operational	MAGTF elements	MCWP 4-12
	Sustainment	MLC supply personnel receive, store, and prepare the MEF's accompanying supplies for movement to the combat zone	Execution	Operational	MAGTF elements	MCWP 4-12
		Move cargo to combat service support areas	Execution	Operational	MAGTF elements	MCWP 4-12
		Establish combat service support areas	Execution	Operational	MAGTF elements	MCWP 4-12
		Integrate MARFOR activities and requirements with joint agencies, e.g. JRSOI and JMC	Execution	Operational	MAGTF elements, joint participants	MCWP 4-12
	Replenishment & Redeployment	Develop replenishment and redeployment plans during the employment phase of expeditionary operations	Planning	Operational	MAGTF elements	MCWP 4-12
		Determine MAGTF resource requirements	Planning	Operational	MAGTF elements	MCWP 4-12
		Coordinate Marine Corps requirements with joint, host nation, and strategic logistics support agencies	Planning	Operational	MAGTF elements, joint participants, Host nation	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Synchronize the recovery of the MAGTF from the combat zone with the tactical situation	Execution	Operational	MAGTF elements	MCWP 4-12
		Synchronize replenishment and redeployment operations with arrival of MPF and/or other shipping and strategic aircraft	Execution	Operational	MAGTF elements, MPF forces	MCWP 4-12
		Establish maintenance areas, parking, and staging areas and warehousing	Execution	Operational	MAGTF elements	MCWP 4-12
		Designate, organize, and establish procedures for wash down sites	Planning	Operational	MAGTF elements	MCWP 4-12
		Stage shipping containers, original packaging, and dunnage for MPF regeneration	Execution	Operational	MAGTF elements, MPF forces	MCWP 4-12
		Arrange customs, agricultural, and other pre-redeployment inspections	Planning	Operational	MAGTF elements, MPF forces	MCWP 4-12
		Maintain the continuity of operations between MPF regeneration and other replenishment and redeployment operations	Execution	Operational	MAGTF elements, MPF forces	MCWP 4-12

Table 20. MEB combat service support element integration responsibilities (continued)

MEB Participant	Sub-element	Responsibilities	Phase	Level of War	Integrate with who	Source
		Serve as an information processing agency to keep MARFOR commander informed of subordinate unit deployments	Execution	Operational	MAGTF elements	MCWP 4-11.3
		Coordinate with TRANSCOM on transportation requirements, priorities, and allocations, as required	Execution	Operational	Joint participants	MCWP 4-11.3
		Coordinate with TRANSCOM via JTC JMC in joint operations	Execution	Operational	Joint participants	MCWP 4-11.3
		Establish priorities and sequence for the deployment of MAGTF personnel, equipment, and supplies to meet operational objectives	Planning	Operational	MAGTF elements	MCWP 4-1
		Identify locations and times subordinate units must in place at ports of embarkation, ports of debarkations, and final destinations	Planning	Operational	MAGTF elements	MCWP 4-11.3

Appendix E

The following references were used in task 1 to identify MEB missions.

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Appendix F










Operation Certain Passage is divided into seven phases. We analyzed each phase of the operation looking for three data points:

- Which forces were being used?
- How were the forces organized for assault and maneuver?
- What functions or tasks were being executed?

Below is a brief description of each operational phase along with a diagram of the force organization and scheme of maneuver. Following each figure is a table showing our analysis of the functions and coordination points highlighted during that phase.

Figure 16 provides a legend to understand the phase diagrams.

Figure 16. Legend for SSC phase diagrams

	Vertical lift		MEB Bn TF 1
	Surface lift		MEB Bn TF 2
	Occupying		MEB Bn TF 3
	Raid		ESG Bn TF
	Ground maneuver		

Phase 1: Assault on Sumatra, Part 1

Phase one of Operation Certain Passage lasts two days, and marks the initial assault on Sumatra. Three battalion task forces (Bn TFs) go ashore in the initial landings—one from the ESG and two from the MEB. The ESG Bn TF works with MEB Bn TF 1 to seize control of a

port and the surrounding industrial facilities, while MEB Bn TF 2 conducts an assault into a neighboring city to capture the regional airfield. The remaining battalion, MEB Bn TF 3, conducts a concurrent demonstration in another area as a feint to hold potential reinforcing rebel units in place. It then remains in reserve aboard the seabase. Only minimal combat service support detachments (CSSDs) deploy ashore with the maneuver elements, while additional support is provided from the seabase. Once the port is secured, the ESG Bn TF returns to the seabase, while the two MEB Bn TFs remain ashore to secure the two primary objectives as well as secondary objectives in the vicinity.

Figure 17. Diagram of phase 1

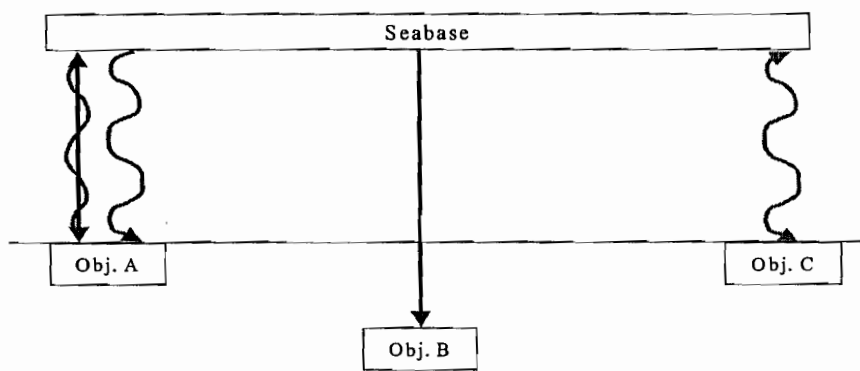


Table 21. Analysis of phase 1

Forces	Functions	Coordination points
ESG Bn TF	(1) Air/surface assault to obj. A (2) Seize and secure port (3) Return to seabase	(1) With seabase (2) With MEB Bn TF 1
MEB Bn TF 1	(1) Vertical assault to obj. A (2) Seize and secure port	(1) With seabase (2) With ESG Bn TF
MEB Bn TF 2	(1) Vertical assault to obj. B (2) Seize and secure airfield	(1) With seabase
MEB Bn TF 3	(1) Demonstration landing as feint (2) Return to seabase (3) Reserve force	(1) With seabase

Table 21. Analysis of phase 1

Forces	Functions	Coordination points
Seabased CE	(1) Plan assaults (2) Coordinate simultaneous assaults (3) Allocate resources	(1) With maneuver elements ashore (2) With higher HQ (3) With seabased support elements
Seabased ACE	(1) Support assaults with vertical lift	(1) With seabase (2) With maneuver elements ashore
Seabased CSSE	(1) Provide mobile CSS dets to maneuver elements (2) Support maneuver elements from sea-base	(1) With seabase (2) With maneuver elements ashore

Phase 2: Assault on Sumatra, Part 2

Phase 2 finds the two MEB Bn TFs still ashore, securing their primary objectives as well as secondary objectives in the vicinity. Meanwhile, the ESG Bn TF and MEB Bn TF 3 conduct a nighttime assault into Objective C, approximately 135 miles north of the initial targets. Prior to the assault, tactical air from the seabase conducts strikes, sealing off the objective and preventing enemy reinforcements. The assault forces seize the objective and neutralize any rebel forces. Once the assault concludes, the ESG Bn TF returns to the seabase and remains in reserve, while MEB Bn TF 3 occupies the port and takes control of the local lines of communication.

Figure 18. Diagram of phase 2

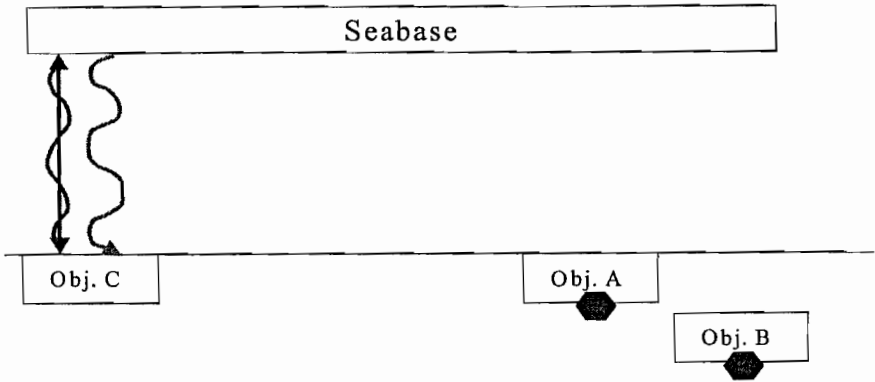


Table 22. Analysis of phase 2

Forces	Functions	Coordination points
ESG Bn TF	(1) Air/surface assault to obj. C (2) Seize and secure port city (3) Return to seabase	(1) With seabase (2) With MEB Bn TF 3
MEB Bn TF 1	(1) Secure obj. A	(1) With seabase
MEB Bn TF 2	(2) Secure obj. B	(1) With seabase
MEB Bn TF 3	(1) Surface assault to obj. C (2) Seize and secure port city	(1) With seabase (2) With ESG Bn TF
Seabased CE	(1) Plan assaults (2) Coordinate assault (3) Allocate resources (4) Direct security operations	(1) With maneuver elements ashore (2) With higher HQ (3) With seabased support elements
Seabased ACE	(1) Support assault with vertical lift (2) Conduct preemptive air strikes	(1) With seabase (2) With maneuver elements ashore (3) With SOF on the ground
Seabased CSSE	(1) Provide mobile CSS dets to maneuver elements (2) Support maneuver elements from sea-base	(1) With seabase (2) With maneuver elements ashore

Phase 3: Consolidation of initial objectives

Phase 3 begins with the arrival of follow-on Army forces to assume responsibility for the initial objectives. As Army forces relieve the ESF forces, the three MEB Bn TFs will return to the seabase and reconstitute. For the first 7-10 days of Army presence, the MPG will provide them with almost complete combat service support. This support will decrease as their own capabilities arrive in theater.

After a brief respite aboard the seabase, each Bn TF conducts 1-4 day air and surface raids on rebel targets along the eastern coast of Sumatra. At any given time, at least one TF Bn is aboard the seabase as a reserve force.

Figure 19. Phase 3: Consolidation of initial objectives

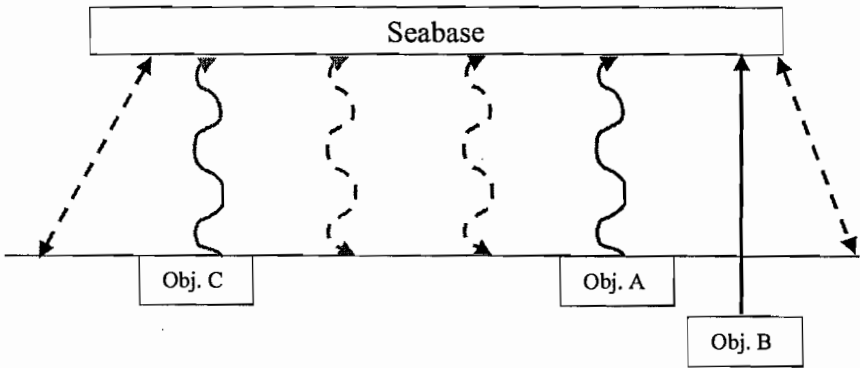


Table 23. Analysis of phase 3

Forces	Functions	Coordination points
ESG Bn TF	(1) Conduct raids via vertical and surface lift	(1) With seabase
MEB Bn TF 1	(1) Conduct relief in place with Army units (2) Return to seabase (3) Conduct raids via surface lift	(1) With seabase (2) With joint forces
MEB Bn TF 2	(1) Conduct relief in place with Army units (2) Return to seabase (3) Conduct raids via vertical lift	(1) With seabase (2) With joint forces
MEB Bn TF 3	(1) Conduct relief in place with Army units (2) Return to seabase (3) Conduct raids via surface lift	(1) With seabase (2) With joint forces
Seabased CE	(1) Direct relief in place with Army units (2) Plan raids and select objectives (3) Direct raids (4) Allocate resources	(1) With joint forces (2) With higher headquarters (3) With SOF on the ground (4) With maneuver elements ashore (5) With seabased support elements
Seabased ACE	(1) Support returns to seabase (2) Support raids with vertical lift	(1) With seabase (2) With maneuver elements ashore
Seabased CSSE	(1) Support maneuver elements from sea-base (2) Support Army forces from seabase	(1) With seabase (2) With joint forces (3) With maneuver elements ashore

Phase 4: Pursuit to the North

During phase 4, the ESF moves north and west aboard the seabase while continuing to conduct raids along the coast.

Figure 20. Diagram of phase 4

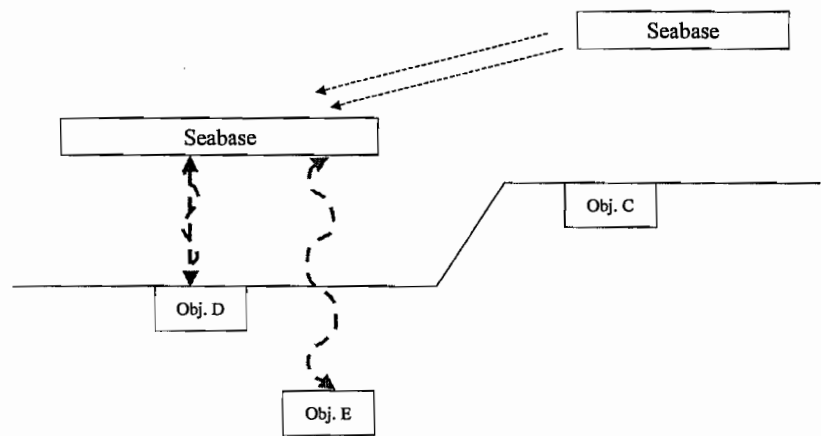


Table 24. Analysis of phase 4

Forces	Functions	Coordination points
ESG Bn TF	(1) Conduct raid via vertical and surface lift to obj. D	(1) With seabase
MEB Bn TF 1	(1) Be prepared to conduct raids as needed	(1) With seabase
MEB Bn TF 2	(2) Be prepared to conduct raids as needed	(1) With seabase
MEB Bn TF 3	(3) Conduct inland raid via vertical lift to Obj. E	(1) With seabase
Seabased CE	(1) Direct movement of seabase (2) Turn over responsibility of area to Army forces (3) Plan raids and select objectives (4) Direct raids (5) Allocate resources	(1) With MPG/Navy (2) With joint forces (3) With higher HQ (4) With SOF on the ground (5) With maneuver elements (6) With seabased support elements
Seabased ACE	(1) Support raids with vertical lift	(1) With seabase (2) With maneuver elements
Seabased CSSE	(1) Support maneuver elements from sea-base	(1) With seabase (2) With maneuver elements

Phase 5: Seizure of Banda Aceh

Phase 5 is the longest phase of the operation, lasting two weeks and encompassing coordinated, multi-battalion assaults on two objectives. The ESG Bn TF and MEB Bn TF 1 seize the port and airfield in the large northernmost city on the island, while MEB Bn TFs 2 and 3 conduct vertical assaults inland to the mountains to pursue the fleeing rebels. Prior to the assaults, fixed-wing assets from the seabase will strike rebel strongholds throughout the mountains. By the end of phase 5, the MEB will be responsible for controlling settlements, ports, roads, and railways along the northeast coast of the island inland to the high ground. Phase 5 ends as MEB forces are relieved by Army units.

Figure 21. Diagram of phase 5

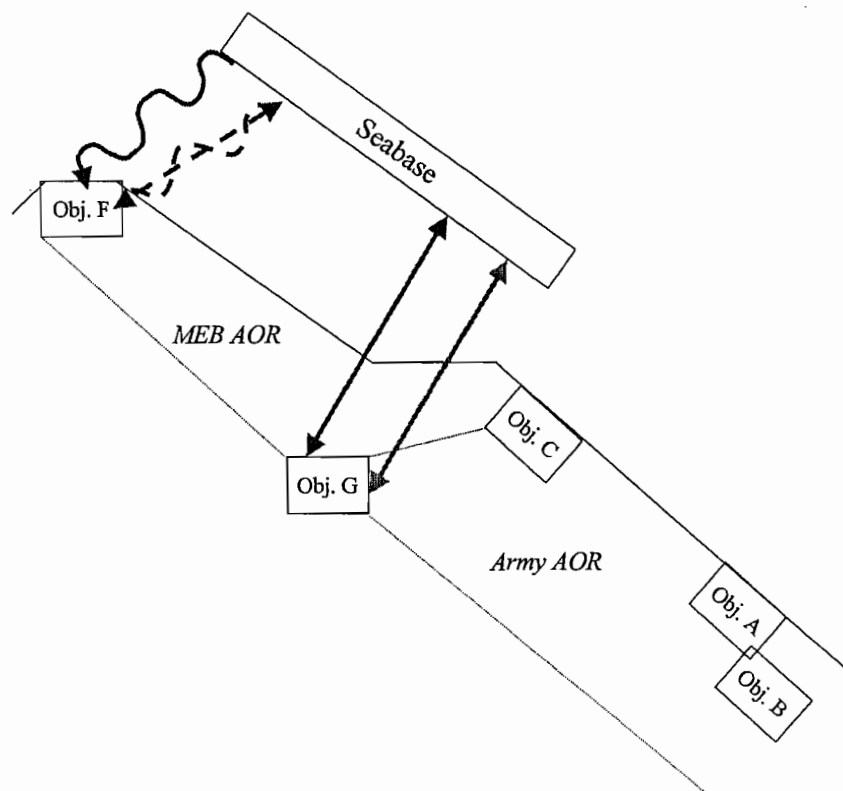


Table 25. Analysis of phase 5

Forces	Functions	Coordination points
ESG Bn TF	(1) Air/surface assault to obj. F (2) Seize and secure port (3) Seize and secure airfield (3) Return to seabase	(1) With seabase (2) With MEB Bn TF 1
MEB Bn TF 1	(1) Air/surface assault to obj. F (2) Seize and secure port (3) Seize and secure airfield	(1) With seabase (2) With ESG Bn TF
MEB Bn TF 2	(1) Air assault inland to obj. G (2) Secure mountain region (3) Conduct relief in place with Army forces (4) Return to seabase	(1) With seabase (2) With MEB Bn TF 3 (3) With joint forces
MEB Bn TF 3	(1) Air assault inland to obj. G (2) Secure mountain region (3) Conduct relief in place with Army forces (4) Return to seabase	(1) With seabase (2) With MEB Bn TF 2 (3) With joint forces
Seabased CE	(1) Plan assaults (2) Coordinate simultaneous assaults (3) Allocate resources	(1) With maneuver elements ashore (2) With higher HQ (3) With seabased support elements
Seabased ACE	(1) Conduct preemptive air strikes (2) Support assaults with vertical lift	(1) With seabase (2) With SOF (3) With maneuver elements
Seabased CSSE	(1) Provide mobile CSSD dets (2) Support maneuver elements from sea-base	(1) With seabase (2) With maneuver elements

Phase 6: To the Indian Ocean

Phase 6 begins with split MPG operations, as part of the seabase moves to positions off the west coast of Sumatra, while the rest remains to support surprise assaults over the mountains to the opposite coast. Once the assaults are launched, the seabasing ships proceed to the western coast to rejoin the MPG. The ESG Bn TF and MEB Bn TF 2 conduct the initial vertical assaults over the mountains to different objectives. While the ESG Bn TF stays ashore and conducts subsequent operations in the mountains and along the coast, the MEB Bn TF returns to the seabase as a reserve force. This allows the other MEB Bn TFs to initiate their assaults. Throughout phase 6, tactical aircraft from the ESF and adjacent Carrier Strike Group (CSG) strike targets across the northwestern half of the island. Phase 6 ends when subsequent operations subdue the remaining rebel

forces and the maneuver elements are relieved by national government forces moving up the coast.

Figure 22. Diagram of phase 6

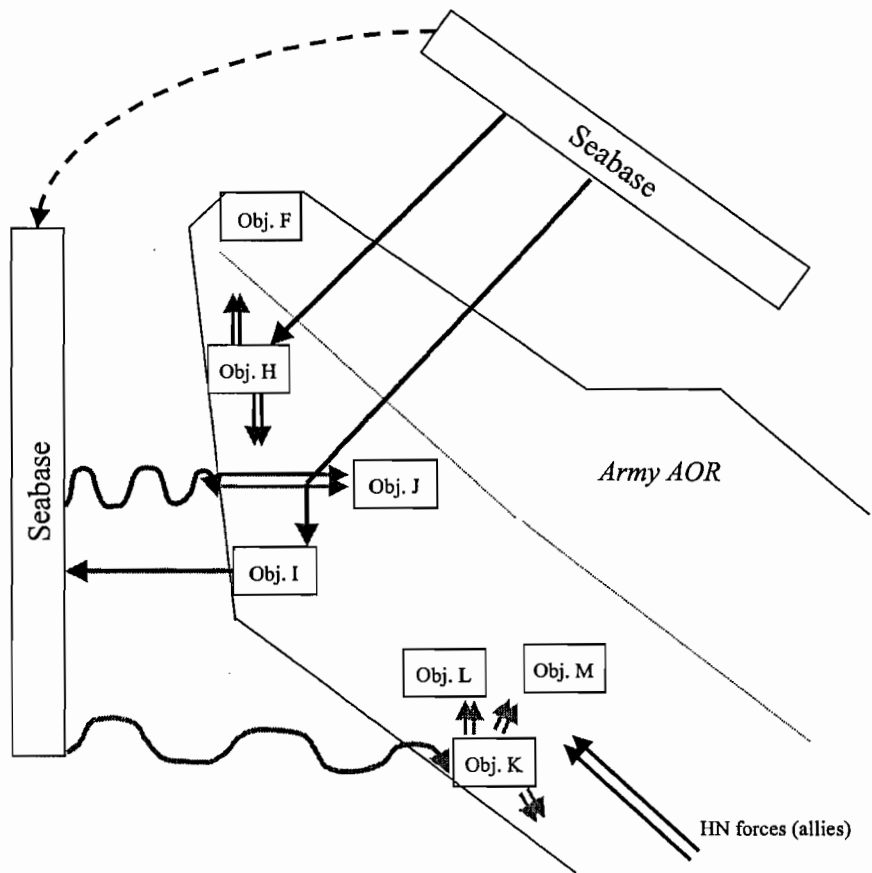


Table 26. Analysis of phase 6

Forces	Functions	Coordination points
ESG Bn TF	(1) Vertical assault over mountains to obj. H (2) SOA along coast and mountains	(1) With seabase
MEB Bn TF 1	(1) Surface assault to shore (2) Ground maneuver inland (3) Assault obj. J	(1) With seabase
MEB Bn TF 2	(1) Vertical assault over mountains to obj. I (2) Return to seabase (3) Reserve force	(1) With seabase
MEB Bn TF 3	(1) Surface assault to obj. K (2) Ground maneuver to obj. L and M (3) Split Bn operations (4) SOA in foothills and plains (5) Link-up with HN forces	(1) With seabase (2) Inter-battalion (3) With allies
Seabased CE	(1) Plan split MPG operations (2) Plan assaults (3) Coordinate simultaneous assaults (4) Allocate resources (5) Direct link-up with HN forces	(1) With seabased support elements (2) With MPG/Navy (2) With higher headquarters (3) With maneuver elements ashore (4) With allies
Seabased ACE	(1) Strikes (2) Tactical air support	(1) With seabase (2) With maneuver elements ashore
Seabased CSSE	(1) Support operations ashore via split MPG	(1) With other half of seabase (2) With maneuver elements ashore

Phase 7: Cleaning out rebels

During the final stage of the operation, the ESF operates from the seabase as a mobile reaction force conducting raids or attacking rebel concentrations as directed by the JTF commander. For this phase, the MPG splits again, with half the seabase and two embarked Bn TFs moving to the northeast coast to assist in operations around the Strait of Malacca, and the remaining force staying along the northwest coast.

Figure 23. Diagram of phase 7

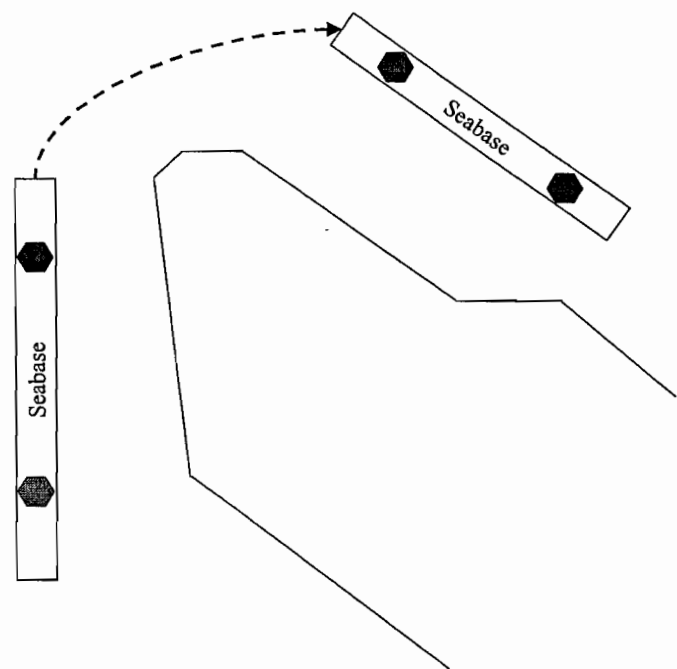


Table 27. Analysis of phase 7

Forces	Functions	Coordination points
ESG Bn TF	(1) Be prepared to conduct ops per CJTF	
MEB Bn TF 1	(1) Be prepared to conduct ops per CJTF	
MEB Bn TF 2	(1) Be prepared to conduct ops per CJTF	
MEB Bn TF 3	(1) Be prepared to conduct ops per CJTF	
Seabased CE	(1) Plan split MPG ops (2) Be prepared to plan ops per CJTF	(1) With higher HQ (2) With MPG/Navy
Seabased ACE	(1) Be prepared to conduct ops per CJTF	
Seabased CSSE	(1) Split MPG	(1) With other half of seabase

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