CGSC **STUDENT TEXT 100-3**

BATTLE BOOK

U.S. Army Command and General Staff College
Fort Leavenworth, Kansas

1 July 2000

The Military Decisionmaking Process

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Mission Receipt	**Mission Analysis**	**COA Development**	**COA Analysis**	**COA Comparison**	**COA Approval**	**Produce Orders**
Component Steps	1. Analyze higher order. 2. IPB. -Define the battlefield. -Describe battlefield effects. -Evaluate the threat. -Develop threat COAs. 3. Specified, implied & essential tasks. 4. Review available assets. 5. Determine constraints. 6. Identify critical facts & assumptions. 7. Conduct risk assessment. 8. Determine initial CCIR PIR, EEFI, & FFIR. 9. Prepare initial recon annex. 10. Plan use of available time. 11. Write the restated mission. 12. Mission analysis briefing. 13. Restated mission approved. 14. Commander's intent. 15. Commander's guidance. 16. Issue warning order. 17. Review facts & assumptions.	1. Analyze relative cbt pwr. 2. Generate options. -Suitable. -Feasible. -Acceptable. -Distinguishable. -Complete. 3. Array forces. 4. Develop scheme of maneuver. -Purpose. -Risk. -Critical events. -Purpose of ME. -Purpose of SE. -Purpose of reserve. -Deep, close, rear. -Responsibilities, graphics. 5. Assign headquarters. 6. Prepare COA statement & sketch.	1. Gather the tools. 2. List friendly forces. 3. Assumptions. 4. Critical events & DPs. 5. Evaluation criteria. 6. Select wargame method. -Avenue. -Belt. -Box. 7. Select recording method. -Narrative. -Sketch. -Sync matrix. -Execution checklist. 8. Wargame. 9. Assess results.	1. Post criteria matrix. 2. Weight criteria. 3. Evaluate COA strengths & weaknesses. 4. Consider estimates. Staff estimates: 1- Mission. 2- Situation & considerations 3- COA analysis. -Requirements. -Capabilities. -Shortfalls. -Recommendations. 4- Comparison. 5- Conclusions & recommendations.		1. SITUATION a. Enemy forces. b. Friendly forces. c. Attachments/detach. d. Assumptions. 2. MISSION 3. EXECUTION Intent: a. Concept of opns. (1) Maneuver. (2) Fires. b. Tasks to mvr units. c. Tasks to CS units. d. Coordinating instr. 4. SERVICE SUPPORT 5. COMMAND & SIGNAL Annexes: A - Task Organization B - Intelligence C - Operation Overlay D - Fire Support
Briefing Format	1. Mission & intent two levels up. 2. Mission, intent & concept of higher. 3. Commander's guidance. 4. IPB products. 5. Specified, implied & essential tasks. 6. Constraints. 7. Forces available. 8. Hazards and their risk. 9. Recommended initial CCIR. 10. Recommended timeline. 11. Proposed restated mission.	1. IPB update. 2. SITEMPs. 3. Restated mission. 4. Mission & intent two levels up. 5. COA statements & sketches. 6. COA rationale.	1. Higher's mission, intent & deception. 2. Updated IPB. 3. COAs wargamed. 4. Assumptions. 5. Techniques used. 6. For each COA: -Critical events. -Actions/reactions. -Pro & cons.	1. Higher's mission & intent two levels up. 2. Restated mission. 3. Status of forces. 4. Updated IPB. 5. Each COA: -Assumptions. -Effects on staff estimates. -Advantages/disadvantages. -Risk. 6. Recommended COA.		E - ROE F - Engineer G - Air Defense H - Signal I - Service Support J - NBC K - Provost Marshal L - R&S M - Deep Operations N - Rear Operations O - AC$^{\angle}$
Products	1. SITEMP/event template. 2. Restated mission. 3. Commander's intent. 4. Commander's guidance. -Friendly/enemy COAs. -CCIR. -Recon guidance & deception. -CS/CSS priorities. -Timeline & type order/rehearsal. 5. Warning order. -Mission, intent, CCIR, timeline, mvt. -Priorities, OPORD, rehearsal.	1. COA statements & sketches. 2. SITEMPs.	1. Refined/detailed COA & sync matrix. 2. Location & timing of cbt pwr at decisive point. 3. Detailed task org. 4. Refined event template. 5. CCIR & collection plan. 6. Concepts for fires, engr & support. 7. Subordinate tasks. 8. Deception. 9. Risk.	1. Complete staff estimates.	1. Approved COA. 2. Cdr's guidance. 3. Warning order.	P - C^2W Q - OPSEC R - PSYOP S - Deception T - EW U - CMO V - Public affairs

PREFACE

Student Text (ST) 100-3 will help the CGSC student plan corps and below operations. It provides planning factors for selected battlefield operating systems (BOSs), including force structure, capabilities of systems, employment considerations, spatial and time requirements for systems, and communications requirements. The text is also designed to give a general overview of doctrine.

Planning factors are a consideration of multipliers used to estimate the amount and type of effort involved in a contemplated operation. Planning factors are expressed as rates, ratios, or length of time. Planning factors may be increased or decreased based on the level of training. They are used to synchronize battlefield activities in time, space, and purpose.

This ST will also serve as a quick reference for combat planners. It has been derived from the most current doctrinal literature available; however, this ST is for instructional purposes only.

Unless the publication states otherwise, masculine pronouns do not refer exclusively to men.

Any comments, additions, deletions, or modifications for the rewrite for the next academic year should be directed to one of the following:

Internet:
battlebook@leav-emh1.army.mil

Mail:
Commandant
CGSC (ATTN: CTAC/Battle Book)
Ft. Leavenworth, KS 66027-5900

Telephone:
LTC James McCreight
DSN: 552-4737
COM: (913) 684-4737

BATTLE BOOK

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CHAPTER 1

KEY DOCTRINAL CONCEPTS AND EMERGING DOCTRINE

Section I. DOCTRINE

1-1. DOCTRINE

a. General description of doctrine. Doctrine—

(1) Is the condensed expression of an army's approach to warfare and support and stability operations (SASO).

(2) Is authoritative, but requires judgment in its application.

(3) Must be uniformly known and understood (and accepted).

b. Role of doctrine. Doctrine—

(1) Is the statement of how the US Army, as part of a joint team, intends to conduct war, conflict, and peace.

(2) Facilitates communication between Army personnel.

(3) Establishes a shared professional culture and operational approach.

(4) Serves as a basis for curriculum in the Army school system.

(5) Sets the direction for modernization.

(*6*) Sets the standard for leadership development and soldier training.

(7) Must—

- Be able to accommodate a wider variety of threats.
- Be relevant to rapidly changing requirements.
- Reflect new technology and potential for the future.
- Account for resources and force dispositions (force projection versus forward deployment).

NOTE: The new Army field manual number system hierarchy will change FM numbers; i.e., FM 100-40 will become FM 3-40, and FM 100-5 will become FM 3-0. This chapter contains quotations from FM 3-40/100-40 (DRAG), *Offensive and Defensive Tactics*, 28 Jan 99, and from FM 3-0/100-5 (Draft), *Operations*, Apr 00. These documents are not to be used for reference or citation.

1-2. A COMPREHENSIVE VIEW TOWARD THE ART AND SCIENCE OF WAR

"Army forces are the decisive component of land warfare in joint and multinational operations. The Army provides combatant commanders with organized, trained, and equipped forces to fight and win the nation's wars and achieve directed national objectives in all military operations. This statement underscores the long and proud traditions of the Army. Fighting and winning the nation's wars is the foundation of Army service; it is the Army's non-negotiable contract with the American people." (FM 3-0/100-5 (Draft), para 1-1)

Army forces must be able to selectively apply all aspects of military power in any arena and under any foreseeable restraints. "**Tactics is the art and science of employing available means to win battles and engagements. It is the employment of units in combat. It is the ordered arrangement and maneuver of units in relation to each other, the terrain, and the enemy to achieve their full lethality**." (FM 3-40/100-40 (DRAG), chap 1)

"Operational art helps commanders use resources efficiently and effectively to achieve strategic objectives. It provides a framework to assist commanders in ordering their thoughts when designing campaigns and major operations. Operational art helps commanders understand the conditions for victory before seeking battle. Without operational art, war would be a set of disconnected engagements, with relative attrition the only measure of success or failure. Operational art requires commanders with the ability to visualize, anticipate, create, and seize opportunities. It is practiced not only by JFCs but also by their senior staff officers and subordinate commanders. Operational art looks not only at the employment of military forces but also at the arrangement of their efforts in time, space, and purpose." (FM 3-0/100-5 (Draft), para 2-6)

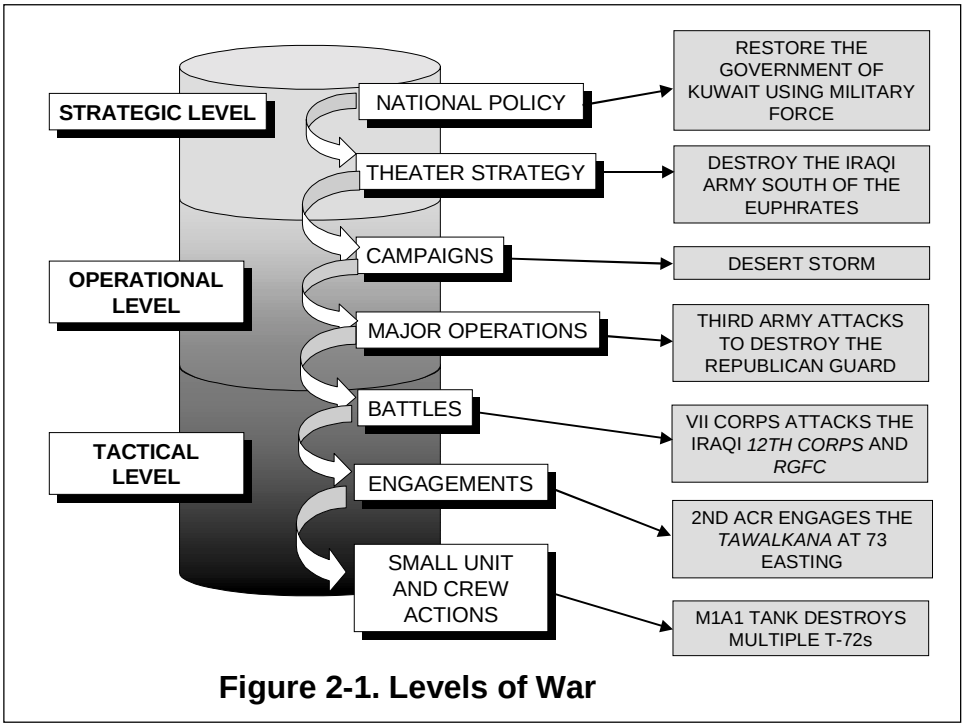


Figure 1-1. Levels of war.
NOTE: This figure is figure 2-1 in FM 3-0/100-5 (Draft).

"The science of tactics encompasses the understanding of those military aspects of tactics—capabilities, techniques, and procedures—that can be measured and codified. * * * Mastery of the science of tactics is necessary for the tactician to understand the physical and procedural constraints under which he must work. ** * However—because combat is an intensely human activity—the solution to tactical problems cannot be reduced to a formula. *** * * The art of tactics consists of three interrelated aspects: the creative and flexible array of means to accomplish missions, decision making under conditions of uncertainty when faced with an intelligent enemy, and understanding the human dimension—the effects of combat on soldiers**. * * *" (FM 3-40/100-40 (DRAG), paras 1-12 through 1-14)

1-3. HASTY VERSUS DELIBERATE OPERATIONS

"A *hasty operation* is an operation in which a commander directs his immediately available forces, using fragmentary orders (FRAGOs), to perform activities with minimal preparation, trading planning and preparation time for speed of execution. A *deliberate operation* is an operation in which a commander's detailed intelligence concerning the situation allows him to develop and coordinate detailed plans, including multiple branches and sequels, task organize his forces specifically for the operation to provide a fully synchronized combined arms team, conduct extensive rehearsals, and extensive shaping of the battlefield takes place. Most operations lie somewhere along a continuum between two extremes.* * *" (FM 3-40/100-40 (DRAG), para 1-22)

"The commander must be able to choose the right point along the continuum to operate. His choice involves balancing several competing factors. The commander's decision to conduct a hasty or deliberate operation is based on his current knowledge of the enemy situation and his assessment of whether or not the assets available (to include time), and the means to coordinate and synchronize those assets, are adequate to accomplish the mission. * * * Uncertainty and risk are inherent in tactical operations and cannot be eliminated. * * * The commander should take the minimum time necessary in planning and preparing to ensure a reasonable chance of success. Reduced coordination at the start of the operation results in less than optimum combat power being brought to bear on the enemy, but often allows for increased speed and momentum. * * * All else being equal, it is better to err on the side of speed, audacity, and momentum than on the side of caution when conducting military operations. Bold decisions give the best promise of success; however, one must differentiate between calculated risks and a military gamble. *** * *"** (FM 3-40/100-40 (DRAG), paras 1-23 through 1-26)

Uncertainty and risk are a fundamental part of all military operations. Risk taking is implicit in the idea of recognizing and acting on opportunity. Risk, reasonably estimated and intentionally accepted, is not gambling. Carefully determining the risks, analyzing and controlling as many hazards as possible, and executing a supervised plan that accounts for those hazards contributes to the successful application of military force. Gambling, in contrast to risk, is the imprudent willingness to stake the success of an entire undertaking on a single, improbable event. Commanders can assess risk in ascending orders of magnitude by answering two questions:

- Am I risking the success of the operation?
- Am I risking the destruction of the force itself?

Section II. BASIC CONCEPTS AND DEFINITIONS

1-4. DOCTRINAL HIERARCHY OF OPERATIONS

"Figure 2-1 [1-2 in this book] shows the doctrinal hierarchy and relationship between the types and subordinate forms of operations. While an operation's predominant characteristic labels it as an offensive, defensive, stability, or support action, different units involved in that operation may be conducting different types and subordinate forms of operations, and often transition rapidly from one type or subordinate form to another as the situation develops. * * *" (FM 3-40/100-40 (DRAG), para 2-2)

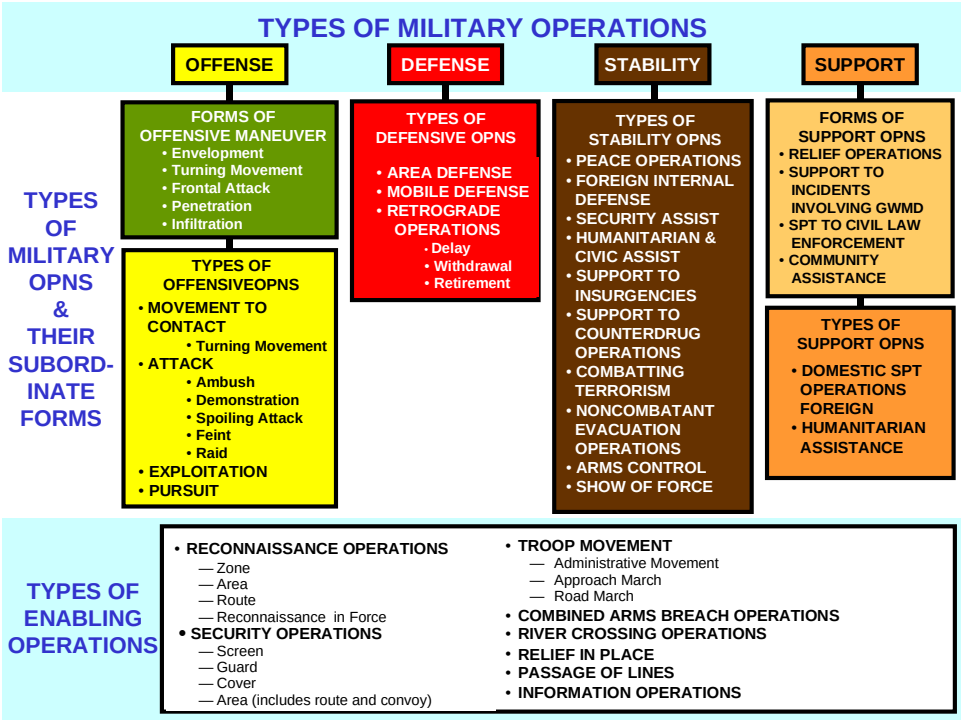


Figure 1-2. Doctrinal hierarchy of operations.
NOTE: This figure is figure 3-1 in ST 100-40, 28 Jan 99.

"**The commander conducts enabling operations to assist the planning, preparation, and execution of any of the four types of military actions * * *. Enabling operations are never decisive operations. They are either shaping or sustainment operations. * * *** This hierarchy does not describe discrete, mutually exclusive operations. * * * For example, an attacking commander may have one subordinate conducting an envelopment, while another conducts a frontal attack to fix the enemy. * * *" (FM 3-40/100-40 (DRAG), paras 2-3 and 2-4)

1-5. TWO FACTORS OF METT-TC

a. Mission. "The first consideration in planning a tactical operation is always the assigned mission. The mission statement defines the *who, what, when, where*, and *why* of the operation. A thorough understanding of *why* the unit is conducting an operation provides the focus for the planning process. The commander analyzes his mission in terms of the higher commander's intent, mission, and concept of operation. (* * *.) When assigning missions to subordinates, the commander ensures all subordinate

missions support his decisive operation(s) and his higher commander's intent. Missions to subordinate commanders should always allow the greatest possible freedom of action, constrained only by those measures that ensure coordination of the necessary effects. * * * Some types of operations require greater control and coordination, such as a combined arms breaching operation." (FM 3-40/100-40 (DRAG), paras 2-6 and 2-7)

(1) *Mission type orders.*

"Mission * * * (Army)—The commander's expression of what the unit must accomplish and for what purpose. * * *" (FM 101-5-1, p 1-102)

"Mission type order * * * (Army)—Specifies what subordinate commanders are to do without prescribing how they must do it. Mission type orders enable a command to seize and maintain initiative and to set the terms of battle. Mission type orders allow subordinate leaders to exercise independent judgment and exploit hanging [sic] situations." (FM 101-5-1, p 1-103)

"Orders will be short and mission-oriented. Limitations to subordinate commanders' freedom will be restricted to those required to ensure a coordinated and synergistic accomplishment of the corps mission." (FM 100-15, p 4-19)

"Characteristics of good [operation plans] OPLANs and [operation orders] OPORDs include * * * balance. [They] provide a balance between centralization and decentralization. The commander determines the appropriate balance for a given operation by using [mission, enemy, terrain, troops, and time available] METT-T. During the chaos of battle, it is essential to decentralize decision authority to the lowest practical level. Over-centralization slows action and contributes to loss of initiative. However, decentralization can cause loss of precision. The commander must constantly balance competing risks while recognizing that loss of precision is usually preferable to inaction." (FM 101-5, pp H-3 and H-4)

(2) *Mission statement.* "The restated mission must contain all elements of a mission statement:

- Who (what types of forces) will execute the action?
- What type of action (for example, attack, defend) is contemplated?
- When will the action begin?
- Where will the action occur (area of operations and objectives)?* * *
- Why (for what purpose) will each force conduct its part of the operation?

The element of what states the essential tasks." (FM 101-5, p 5-8)

The mission statement contains the essential task(s). After analyzing specified and implied tasks, the staff presents to the commander for his approval a tentative list of tasks that *must* be executed to accomplish the mission.

The *type of action* and, as appropriate, the *essential tasks* are components of the mission statement. A current list of types of operations for maneuver units appears above. Other actions may apply to CS and CSS units. For example, FM 63-2 identifies *sustaining the offense*, *sustaining the deep attack*, and *sustaining retrograde operations*. Planners may consider these as appropriate actions for that unit.

(3) *Commander's intent.* "The commander's intent is a clear, concise statement of what the force must do to succeed with respect to the enemy and the terrain and to the desired end state. It provides the link between the mission and the concept of operations by stating the key tasks that, along with the mission, are the basis for subordinates to exercise initiative when unanticipated opportunities arise or when the original concept of operations no longer applies. If the commander wishes to explain a broader purpose beyond that of the mission statement, he may do so. Intent is normally expressed in four or five sentences and is mandatory for all orders. The mission and the commander's intent must be understood two echelons down." (FM 101-5, p 5-9)

"* * * Key tasks [intent statement] are not tied to a specific course of action, rather they identify that which is fundamental to the force's success. In changed circumstances, when significant opportunities present themselves or the course of action no longer applies, subordinates use these tasks to keep their efforts supporting the commander's intent. The operation's tempo, duration, and effect on the enemy, and terrain that must be controlled, are examples of key tasks." (FM 101-5, p 5-9)

b. Concept of operations.

"* * * describes how the commander sees the actions of each of his units fitting together to accomplish the mission. As a minimum, the description includes the scheme of maneuver and concept of fires." (FM 101-5-1, p 1-36).

The concept of operations provides "sufficient detail to ensure appropriate action by subordinates in the absence of additional communications or further instructions." (FM 101-5, p H-15)

For maneuver units, the concept includes "* * * missions or tasks for each unit that reports directly to the headquarters issuing the order. * * * (FM 101-5, p H-17)

The concept of operations also contains tasks that are "* * * based on the COA statement from the decision-making process and, at a minimum, will address close, deep, rear, security, and reserve operations as well as describe the type or form of operation and designate the main effort." (FM 101-5, p H-15) Subparagraphs identify tasks and missions to maneuver units and CSS units.

FM 101-5-1 defines a *tactical task* as "the specific activity to be performed by the unit while conducting a form of tactical operation or a choice of maneuver. It is the minimum essential effects to accomplish the purpose." (p. 1-151) FM 3-40/100-40 (DRAG) and FM 101-5-1 contain a list of tasks performed primarily by maneuver units that have a special connotation beyond their common English language meaning; however, these are not complete listings. For example, field manuals for attack helicopter units identify "attack to attrit" as the operation and task, but "attrit" is not on the list below. Maneuver units, as well as other units, may also have other tasks associated with stability operations and support operations.

The tactical tasks are particularly useful at the lower echelons of maneuver units in describing desired activity and/or effect. As appropriate, the same tactical task used within the concept of operations may also be an essential task in the mission statement or a key task in the intent statement. Analysis of what the unit must do as a whole and whether the task remains constant regardless of tempo, duration, enemy, and terrain are other considerations that impact on the decision to use the same task in more than one instance.

In determining tasks to support actions or operations of other types of units, such as signal brigades, division support commands, or engineer groups, planners should consult the appropriate field manual to

identify that unit's type of operations and tasks in developing a mission statement, commander's intent, and concept of operation. Other actions may apply to CS and CSS units. For example, FM 63-2 identifies sustaining the offense, sustaining the deep attack, and sustaining retrograde operations; planners may consider these as appropriate actions for those units.

Most collective tasks for any type unit are listed in the unit mission training plans.

c. Civil considerations. **"**Civil considerations relate to civilian populations, culture, organizations, and leaders within the battlespace. Commanders consider civilian political, economic, and information matters well as more immediate civilian activities and attitudes." (FM 3-0/100-5 (Draft), para 5-20)

1-6. BATTLEFIELD OPERATING SYSTEMS

"Armed with a coherent and focused commander's intent, the commander and staff develop the concept of operations and synchronize the battlefield operating systems (BOS). The BOS is a listing of critical tactical activities, that provide a means of assessing planning, preparation, and execution of an operation in discrete subsets. As such, the BOS become a directive framework for the physical means (soldiers and equipment) the commander uses to accomplish the mission. There are seven BOS: intelligence, maneuver, fires, air defense, mobility/countermobility/survivability, CSS, C2." (FM 3-40/100-40 (DRAG), para 5-56.

*a. Intelligence. "*The intelligence system analyzes and predicts enemy/adversary actions, provides data on the weather, and performs intelligence preparation of the battlefield (IPB). Intelligence is a continuous process and is fundamental to effective planning, security, and military deception. * * *" (FM 3-40/100-40 (DRAG), para 5-57)

b. Maneuver. "Maneuver systems move to achieve a position of advantage with respect to enemy forces. The Army systems that are organized, trained, and equipped primarily for maneuver are infantry, armor, cavalry, and attack helicopter forces. Maneuver forces may also conduct other missions to include noncombatant evacuation operations, combat search and rescue, reconnaissance, and civil-military operations." (FM 3-40/100-40 (DRAG), para 5-58)

c. Fire support. "The fire support system includes the collective and coordinated use of target acquisition data, indirect-fire weapons, fixed-wing aircraft, electronic warfare (EW), and other lethal and nonlethal means to attack targets throughout an AO. At the operational level, maneuver and fires may be complementary in design, but distinct in objective and means. Fires are closely integrated with maneuver through fire support.

"At both the operational and tactical levels**, fire support is the collective and coordinated employment of the fires of armed aircraft, land- and sea-based indirect fire systems, and EW systems against ground targets to support land combat operations**. Fire support integrates and synchronizes fires and effects to delay, disrupt, or destroy enemy forces, systems, and facilities.

"Generating effective firepower against an enemy requires that organic and supporting fires be coordinated with other BOS. Subordinate systems and processes for determining priorities, identifying and locating targets, allocating fire support assets, attacking targets, and assessing battle damage are fully integrated.

"Much of the firepower available to Army forces lies outside the direct control of the Army commander. Consequently, the ability to employ all available joint fires throughout the depth of the AO as an integrated and synchronized whole depends on fire support planning, preparation, and execution.

Fire support synchronizes the multiple effects of each with the commander's intent and concept of operation." (FM 3-40/100-40 (DRAG), paras 5-59 through 5-62)

d. Air defense. "The air defense system protects the force from air and missile attack, preventing the enemy from interdicting friendly forces while freeing the commander to synchronize maneuver and firepower.

"Air defense operations are performed by all members of the combined arms team; however, ground-based air defense artillery (ADA) units execute the bulk of the Army's air defense tasks. These units protect deployed forces and critical assets within a theater by preventing enemy aircraft, missiles, and unmanned aerial vehicles from locating, striking, and destroying friendly forces and resources.

"The WMD threat and the proliferation of missile technology increase the importance of the air defense system. The potential for catastrophic loss of soldiers, time, and initiative to a missile attack has operational-level consequences. Theater missile defense (TMD) thus becomes crucial at the operational level.

"Air defense operations are an integral part of joint counterair operations. The joint force air component commander (JFACC), when designated by the JFC, organizes and executes counterair operations throughout the theater or JOA. Normally assigned as both the area air defense commander (AADC) and the airspace control authority (ACA), the JFACC synchronizes offensive and defensive counterair operations. As the AADC, the JFACC is further responsible for the planning, integration, coordination, and execution of integrated air defense operations." (FM 3-40/100-40 (DRAG), paras 5-63 through 5-66)

*e. Mobility/countermobility/survivability. "*Mobility operations preserve freedom of maneuver of friendly forces. Mobility missions include breaching enemy obstacles, increasing battlefield circulation, improving existing routes or building new ones, providing bridge and raft support for crossing rivers, and identifying routes around contaminated areas. Countermobility denies mobility to enemy forces so Army forces can destroy them with fires and maneuver. Countermobility limits the maneuver of enemy forces and enhances the effectiveness of fires. Countermobility missions include building obstacles and using smoke to hinder enemy maneuver.

"Survivability operations protect friendly forces from the effects of enemy weapon systems and from natural occurrences. Hardening of facilities and fortification of battle positions are active survivability measures. Military deception, operations security (OPSEC), and dispersion can increase survivability. Nuclear, biological, chemical (NBC) defense measures are also essential survivability tasks."
(FM 3-40/100-40 (DRAG), paras 5-67 and 5-68)

f. Combat service support. "CSS incorporates a variety of technical specialties and functional activities, to include maximizing the use of available host nation infrastructure and contracted logistics support. It provides the physical means with which forces operate, from the production base and replacement centers in the US, to soldiers in contact with the enemy. It applies across the full range of military operations and at all levels of war. * * *" (FM 3-40/100-40 (DRAG), para 5-69)

g. Command and control. "Command and control has two components – the commander and the C2 system. A commander cannot exercise C2 alone except in the smallest of units. The C2 system serves its purpose if it allows the commander freedom to operate, make informed decisions, delegate authority, lead from any critical point on the battlefield, and synchronize actions across the entire AO. Moreover, the C2 system supports the ability of the commander to adjust plans for future operations, even while focusing on the current fight. Skilled staffs work within the commander's intent to direct and

control units and resource allocations to support the desired end. They also are alert to spotting enemy or friendly situations that require command decisions and advise the commander concerning these decisions. The related tools for implementing command decisions include [a shared situational understanding,] communications, and computers.

"Reliable communications are central to the C2 system. Effective battle command requires reliable signal support systems to enable the commander to conduct operations at varying operational tempos. Signal planning increases the commander's options by providing the signal support to pass critical information at decisive times, thus leveraging tactical success and anticipating future operations. Nonetheless, the commander, not his supporting communications system, dictates command style."
FM 3-40/100-40 (DRAG), paras 5-70 and 5-71)

Section III. LAND FORCE DOMINANCE

1-7. AN APPROACH TO BATTLEFIELD ORGANIZATION[1]

"Land Force Dominance consists of those actions and functions executed throughout the height, width, and depth of an area of operations designed to accomplish the assigned mission. These actions and functions may be executed against a single decisive point, simultaneously against multiple decisive points, or sequentially against multiple decisive points based on the factors of METT-TC [mission, enemy, terrain and weather, troops, time available, and civil considerations]. * * * Land Force Dominance is the Army's basic operational concept and applies to all four types of military actions: offense, defense, stability, and support. This concept describes how a commander should think about operations using the battlefield organization and operational continuum * * *. The goal of Land Force Dominance is to accomplish the mission through simultaneous precision operations distributed in space against multiple objectives, but concentrated in time to break the moral [sic] and coherence of the enemy force and cause its defeat through disintegration, not through attrition. Each operation creates an effect, the sum of which is greater than if each operation were discrete. * * *" (ST 100-40, paras 2-1 through 2-3)

"The Army adopted Land Force Dominance as its umbrella concept in reaction to the opportunities and dangers found in today's dynamic security environment. The disappearance of an echeloned, heavy threat in Central Europe, * * * [advances in] technology, * * * advances in information systems, * * * [assist] the commander's capability to synchronize the effects of his combat power and assist in task organizing his forces for the mission and terrain within his area of operations. * * * Ordinarily, divisions are the smallest echelon that command and control multiple, simultaneous, decisive operations in offensive and defensive actions." (St 100-40, paras 2-6 and 2-8)

[1] Not authoritative but part of emerging doctrine.

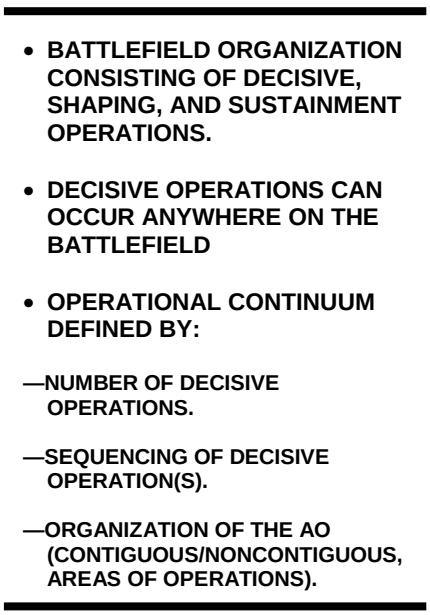


Figure 1-3. What is new about land force dominance.
NOTE: This figure is figure 2-1 in ST 100-40.

1-8. BATTLEFIELD ORGANIZATION

"The battlefield organization facilitates the commander's execution of simultaneous operations by providing a way to visualize how to employ his forces against the enemy. It helps the commander relate his subordinate forces to one another, to the mission, and to the enemy in terms of time, space, resources, and purpose. This framework also assists in establishing geographical areas of operation necessary for accomplishing specific tactical tasks, such as a river crossing operation. * * *" (ST 100-40, para 2-9)

"Battlefield visualization (Army)—The process whereby the commander develops a clear understanding of his current state with relation to the enemy and environment, envisions a desired end state, and then subsequently visualizes the sequence of activity that will move his force from its current state to the end state. The commander articulates a battlefield vision through an intent statement which guides the development of a concept for the operation and subsequent execution of the mission." (FM 101-5-1, p 1-18)

"A battlefield organization consisting of decisive, shaping, and sustaining operations replaces the previous battlefield organization of deep, close, and rear operations * * *. (However, commanders can still use the terms *deep* and *close* to refer to the geographic relationship of friendly and enemy forces.) The components * * * (decisive, shaping, and sustainment) are based on the effects they achieve, not who does them and their geographical location * * *. The battlefield organization also replaces the terms *main* and *supporting efforts* with the terms *decisive* and *shaping*, allowing the commander to establish priorities and guide the allocation of resources. * * * Decisive and shaping operations are nested, ultimately focusing on the enemy center of gravity. * * *" (ST 100-40, paras 2-10 and 2-11)

"Decisive and shaping operations are nested, ultimately focusing on the enemy center of gravity. * * * Each brigade shown [in fig 2-2] has no more than one decisive operation. As depicted * * *, two or more units may be involved in the conduct of a decisive operation. * * * The middle division is simultaneously directing multiple brigades in multiple decisive operations. The right division is

conducting shaping operations with one of its brigades conducting a decisive operation in support of the division's shaping operation." (ST 100-40, para 2-11)

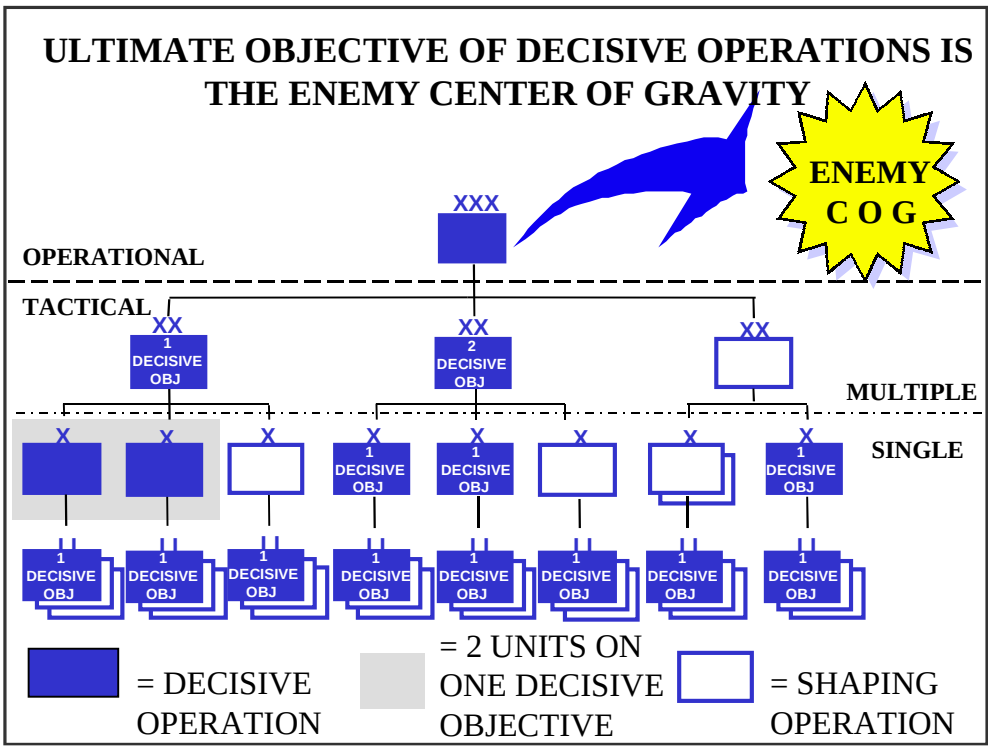


Figure 1-4. Example nesting of decisive operations.
NOTE: This figure is figure 2-2 in ST 100-40.

"Decisive operations at any echelon directly achieve the mission of the higher headquarters. The decisive operations conclusively determine the outcome of major operations, battles, and engagements. There is only one decisive operation for any phase of an operation for any given echelon. The decisive operation may include multiple actions conducted simultaneously throughout the depth of the AO. Commanders weight the decisive operation wile economizing on the effort allocated to shaping operations." (FM 3-0/100-5 (DRAG), paras 4-82)

"In the offense and defense, the decisive operations normally focus on maneuver. * * *" (FM 3-0/1-00-5 (Draft), para 4-83)

"**Decisive operations are those actions applying military capabilities to accomplish the most important task and purpose at a given time, whose success will make the most difference in the accomplishment of the higher commander's mission.** The commander designates activities that directly accomplish his mission as his decisive operation(s) in his concept of operations. Every decisive operation has an objective. * * * [The commander] must be able to shift his decisive operations quickly to take advantage of opportunities as they are discovered or created. * * * The commander can use the following techniques to ensure that the effects of overwhelming combat power are available to subordinates conducting decisive operations:

- Narrowing the boundaries or decreasing the size of the area of operations * * * to increase the concentration of combat power.

- Reinforcing the decisive operation with extra combat power.
- Allocating priority for CS and CSS to the decisive operation.
- Planning employment options for reserves to support the decisive operation.
- Conducting shaping operations to fix enemy forces outside the area of the decisive operation.
- Sequencing actions.
- Phasing operations." (ST 100-40, paras 2-13, 2-16, and 2-17)

Regardless of the type of operations, shaping operations may become the decisive operations if circumstances or opportunity demand. In that case, the commander weights the new decisive operations at the expense of other shaping operations.

Decisive point (Army)—1. A point, if retained, that provides a commander with a marked advantage over his opponent. Decisive points are usually geographic in nature but could include other physical elements, such as enemy formations, command posts, and communications nodes. 2. A time or location where enemy weakness is positioned that allows overwhelming combat power to be generated against it. It could be an enemy weakness to be exploited or a time when the combat potential of the enemy force is degraded. 3. Conveys to subordinates a potential point of decision that the commander has identified through his estimate process to apply overwhelming combat power. (FM 101-5-1, p 1-46)

"Shaping operations consist of all actions applying military capabilities to set the conditions for decisive operations. The goal of shaping operations is to reduce the enemy's capability to fight in a coherent manner before or while the commander executes one or more decisive operations. * * * A commander allocates only minimum essential combat power to his shaping operations to ensure that each decisive operation has overwhelming combat power. * * * shaping operations include actions that deny the enemy the use of terrain and the electromagnetic spectrum, destroy or degrade his essential capabilities * * *. They also include the movement of friendly forces to positions of advantage * * *." (ST 100-40, paras 2-20 and 2-21)

"Sustainment operations include logistics and CSS operations to support friendly forces and the security and maintenance of the sustainment base to include lines of communication. * * * By their nature, sustainment operations are not decisive; however, failure in these operations can cause the overall effort to fail. * * *" (ST 100-40, para 2-26)

1-9 OPERATIONAL CONTINUUM

"Land Force Dominance takes place in an operational continuum defined by the:

- Number of decisive operations (single or multiple).
- Sequence of decisive operations (simultaneous or sequential).
- Organization of the area of operations (contiguous or noncontiguous areas of operation).

* * * The commander chooses where he conducts his operations based upon his situational understanding of the factors of METT-TC and his relative combat power. That choice is always made in an environment of uncertainty and always entails some risk. * * *" (ST 100-40, para 2-28)

1-10. SUPPORT OPERATIONS

Support operations. "In support operations, Army forces provide essential support, services, assets, or specialized resources to help civil authorities deal with situations beyond their capabilities. Army forces conduct support operations to assist foreign and domestic civil authorities to prepare for or respond to crises and relieve suffering. The overarching purpose of support operations is to meet the immediate needs of designated groups for a limited time until civil authorities can accomplish these tasks without Army assistance. In extreme or exceptional cases, Army forces may provide relief or assistance directly to those in need. More commonly, Army forces help civil authorities or NGOs provide the required support to the affected population. Support operations, especially those conducted domestically, are often conducted as stand-alone actions. However, most offensive, defensive and stability operations require complementary support operations before, during, and after execution." (FM 3-0/100-5, para 10-1)

1-11. STABILITY OPERATIONS

"Combatant commanders employ Army forces to conduct stability operations outside the US and US territories to promote and protect US national interests. Stability operations influence the political, civil, and military environments and disrupt specific illegal activities. Combatant commanders accomplish stability goals by supporting diplomatic initiatives, improving military-to-military relations, and by deterring or resolving conflict. Their overarching purpose is to promote and sustain regional and global stability. Stability operations encompass arrange of actions that shape the strategic environment and respond to developing crises * * *. The military activities that support stability operations are diverse, continuous, and often long-term.

1-12. CONCLUSION

"Successful generals make plans to fit circumstances, but do not try to create circumstances to fit plans."

—GEN George Patton

"Commanders identify the times and places where they can combine the effects of combat power to relative advantage. To ensure an enemy reaction, they threaten something the enemy cares about. By striking, or presenting a credible threat to the enemy's center of gravity and decisive points, commanders compel the enemy to react. By causing an enemy reaction, commanders initiate an action-to-reaction sequence that ultimately reduces the enemy's options to zero. Each action in the sequence reduces the number of possibilities to be considered, thereby reducing friendly uncertainty. That is the essence of seizing and retaining the initiative." (FM 3-0/100-5, para 6-34)

"War is 10 percent planning and 90 percent execution."

—GEN George Patton

CHAPTER 2

ARMY OF EXCELLENCE (AOE) ORGANIZATION AND EQUIPMENT

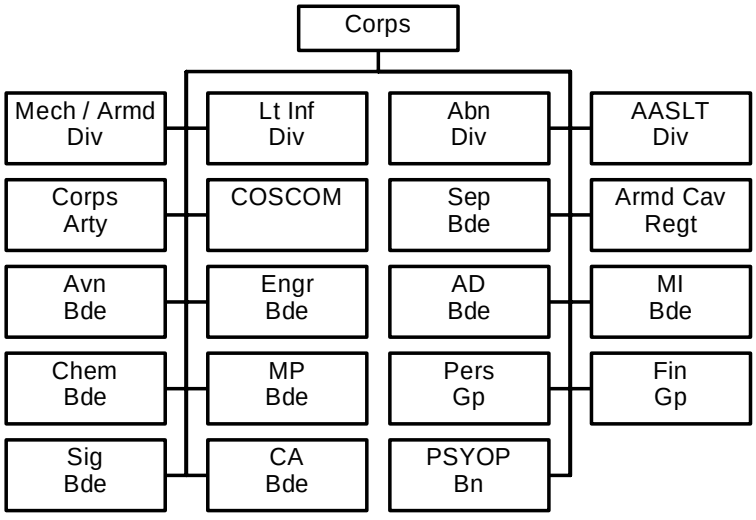
Section I. INTRODUCTION

2-1. GENERAL

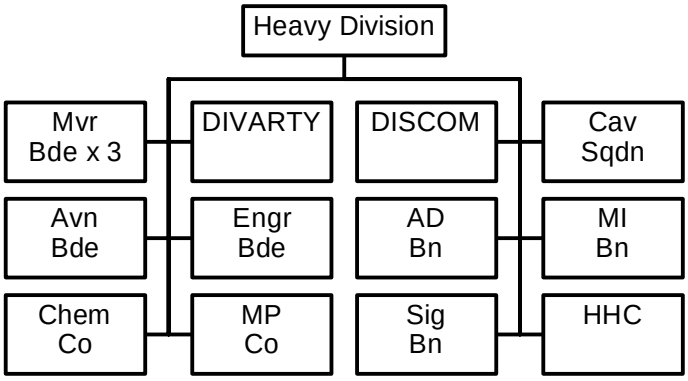
This chapter provides organizational diagrams and equipment data for units and systems that can be found in a US Army corps.

Section II. CORPS AND DIVISIONS

2-2. CORPS

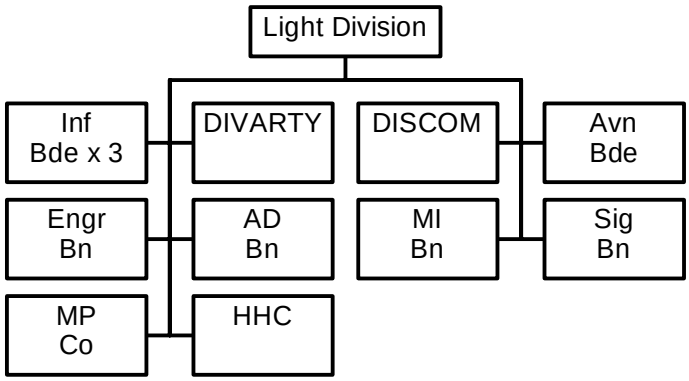


Mechanized infantry division (five infantry battalions and four tank battalions) or armored division (four mechanized infantry battalions and five tank battalions).

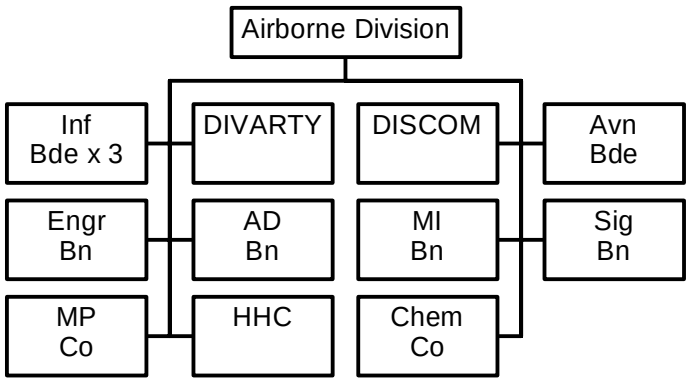


NOTE: The cavalry squadron in each division is attached to the aviation brigade.

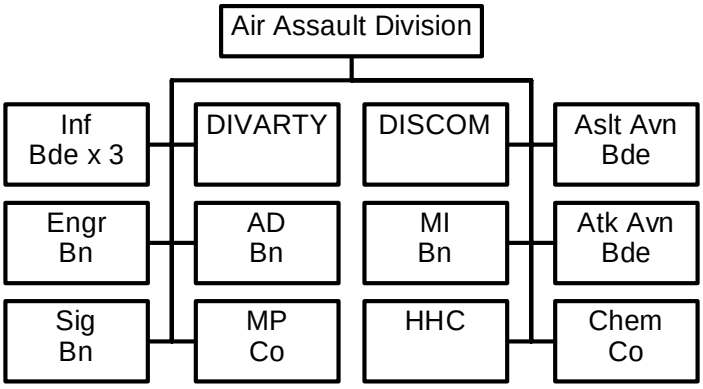
2-4. LIGHT DIVISION



2-5. AIRBORNE DIVISION

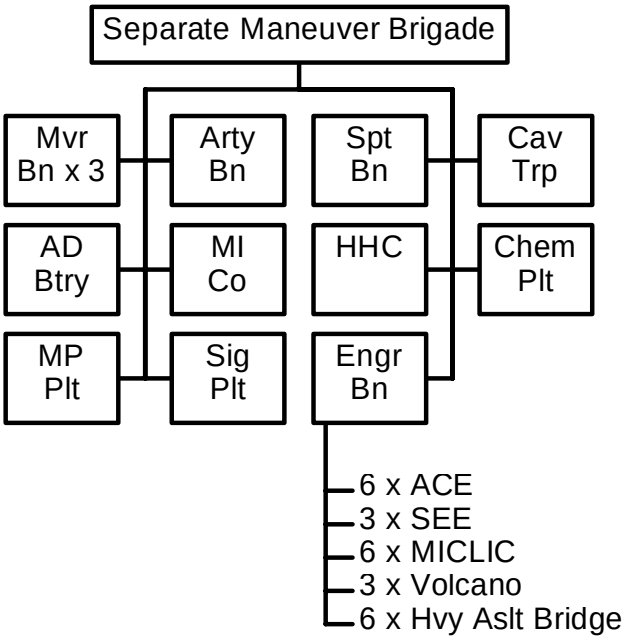


2-6 AIR ASSAULT DIVISION



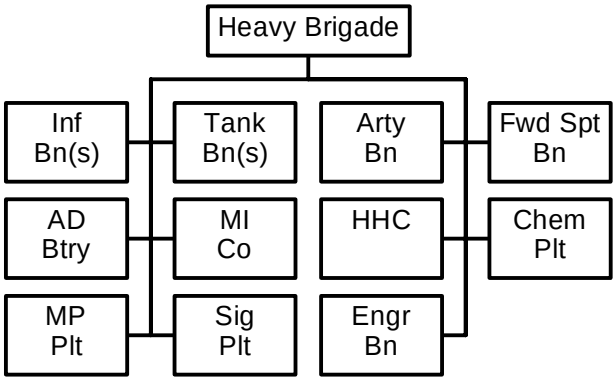
Section III. ARMORED AND INFANTRY UNITS

2-7. SEPARATE ARMORED, MECHANIZED, OR INFANTRY BRIGADES



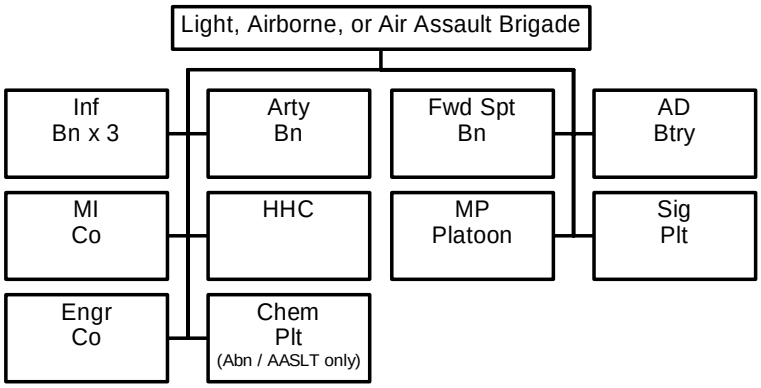
NOTE: Designated as armored, mechanized, or infantry depending on the type the majority of the subordinate battalions are.

2-8. ARMORED OR MECHANIZED DIVISIONAL BRIGADE



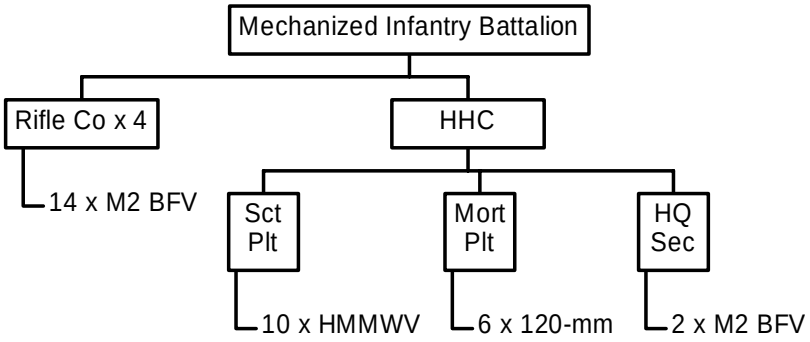
NOTE: Depicted with normal combat multipliers.

2-9. LIGHT, AIRBORNE, OR AIR ASSAULT DIVISIONAL BRIGADE

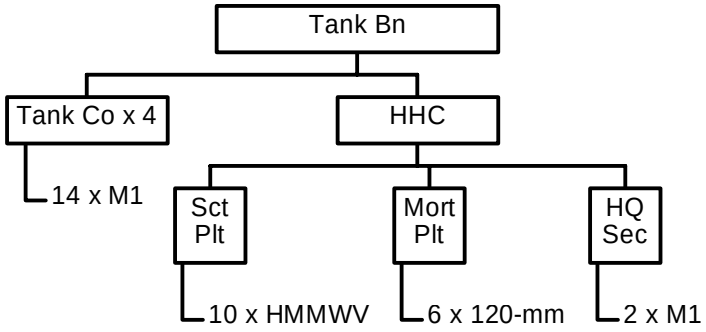


NOTE: Light, airborne, or air assault with normal combat multipliers.

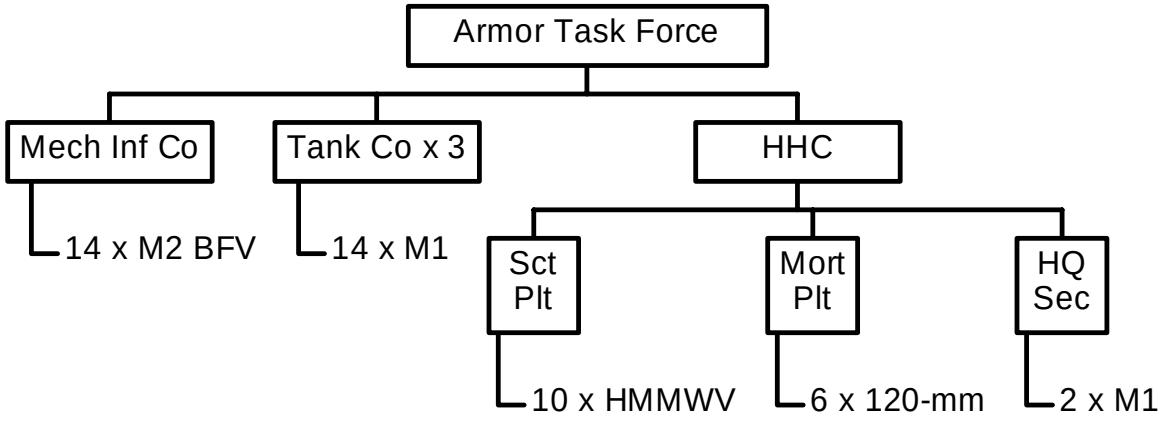
2-10. MECHANIZED INFANTRY BATTALION



2-11. TANK BATTALION

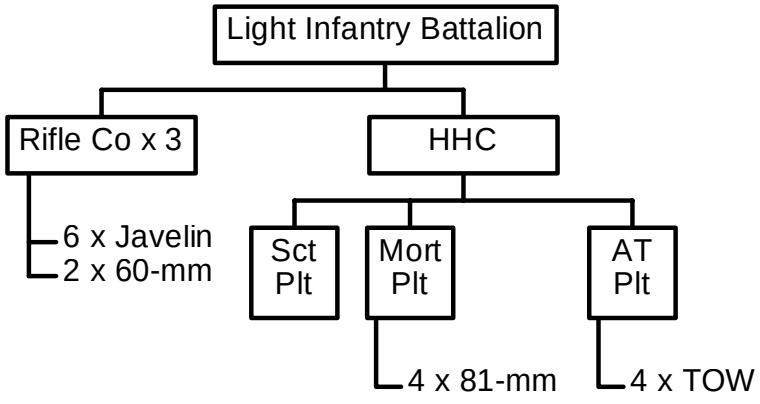


2-12. TASK FORCES

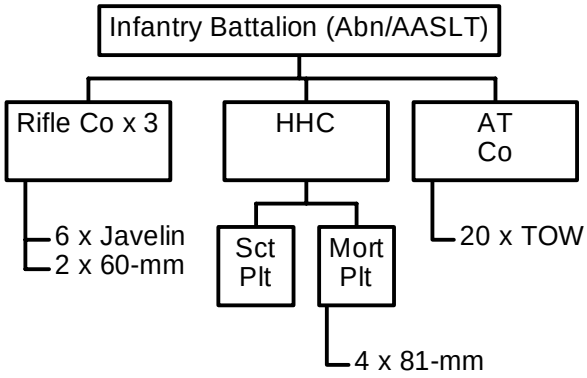


NOTE: This chart is for an armor task force (TF). According to FM 101-5-1, many variations are possible. A TF is a battalion-sized unit of the combat arms comprising a battalion control HQ with at least one of its major organic subordinate elements (a company) and at least one attached company-sized element of another combat or combat support arm.

2-13. LIGHT INFANTRY BATTALION

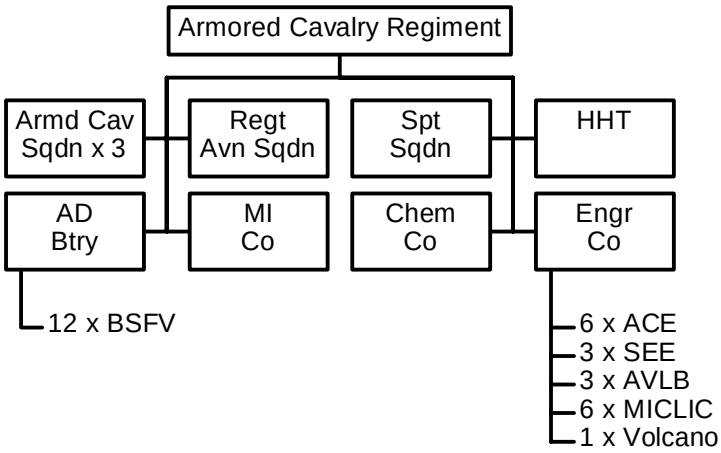


2-14. AIRBORNE OR AIR ASSAULT INFANTRY BATTALION

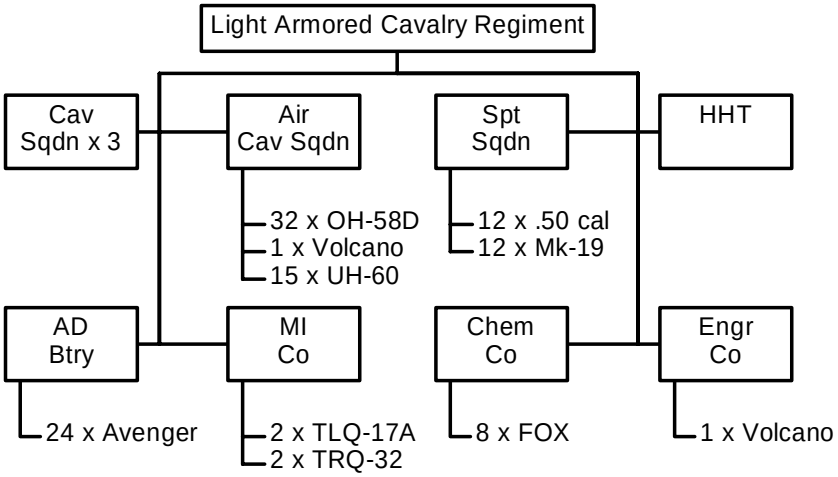


Section IV. GROUND CAVALRY UNITS

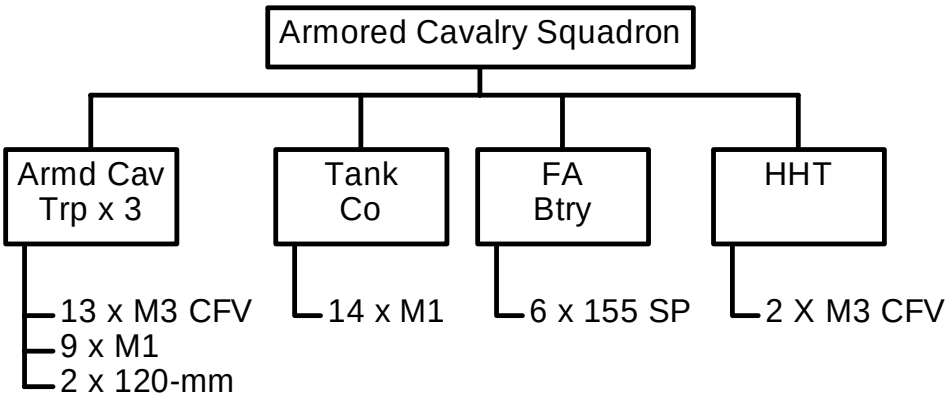
2-15. ARMORED CAVALRY REGIMENT



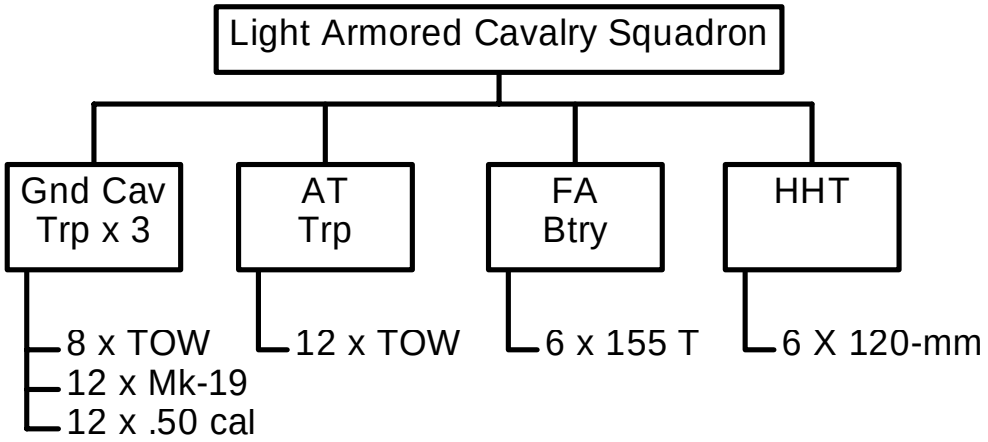
2-16. LIGHT ARMORED CAVALRY REGIMENT



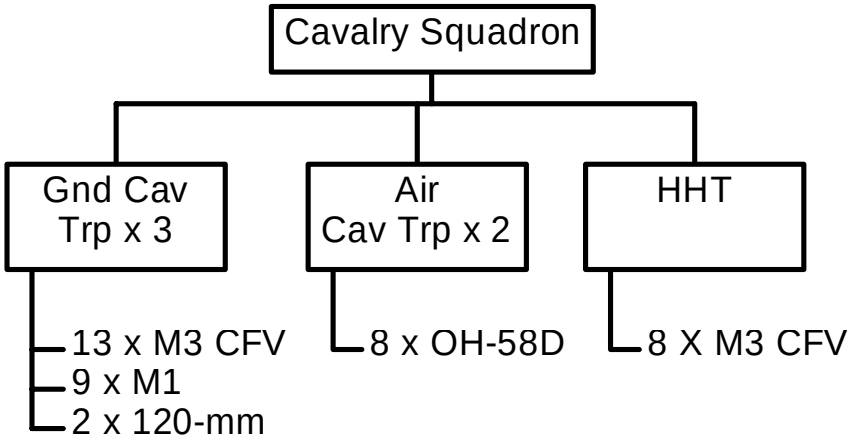
2-17. ARMORED CAVALRY SQUADRON: ARMORED CAVALRY REGIMENT



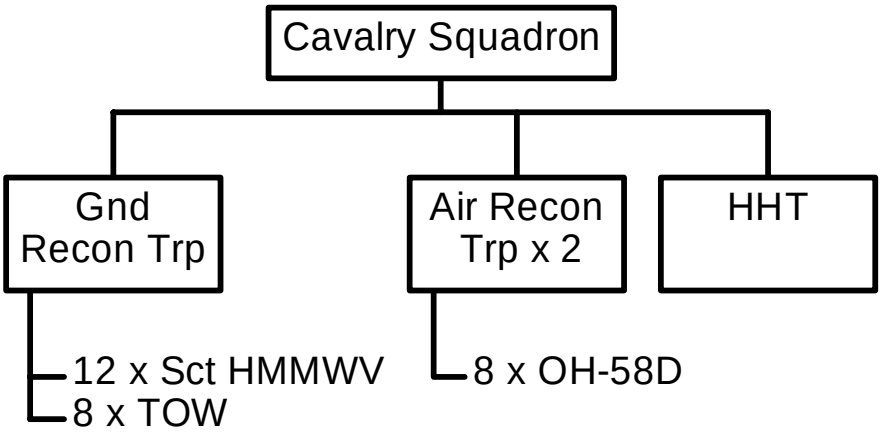
2-18. LIGHT ARMORED CAVALRY SQUADRON



2-19. CAVALRY SQUADRON: HEAVY DIVISION

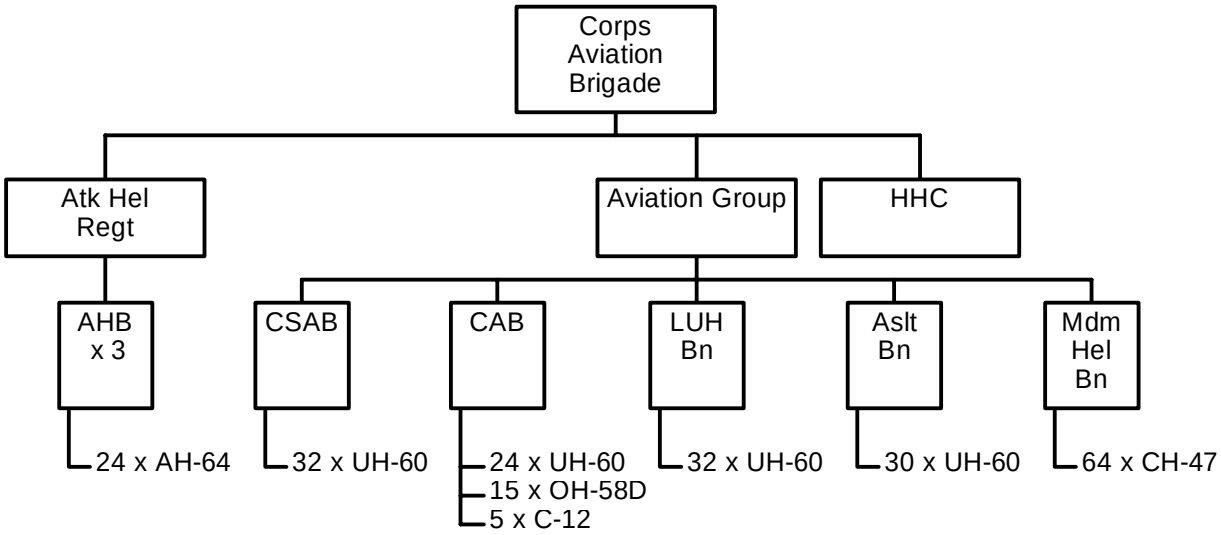


2-20. CAVALRY SQUADRON: LIGHT, AIRBORNE, OR AIR ASSAULT DIVISION

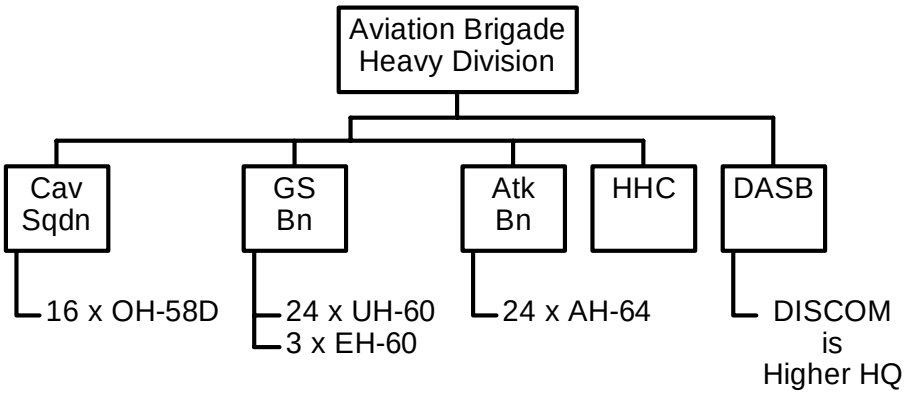


Section V. ARMY AVIATION

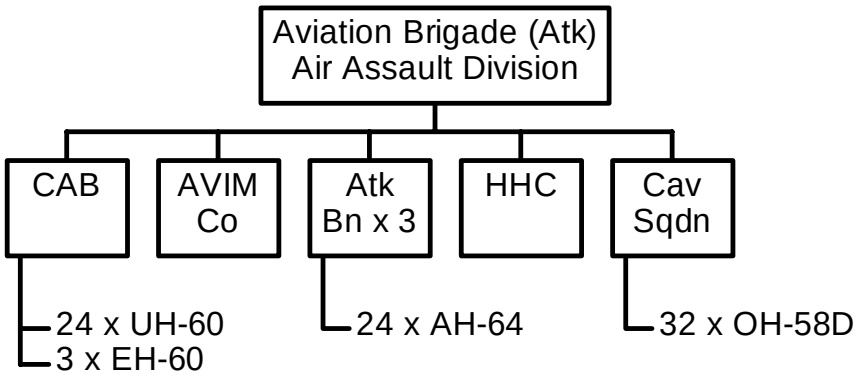
2-21. AVIATION BRIGADE: CORPS



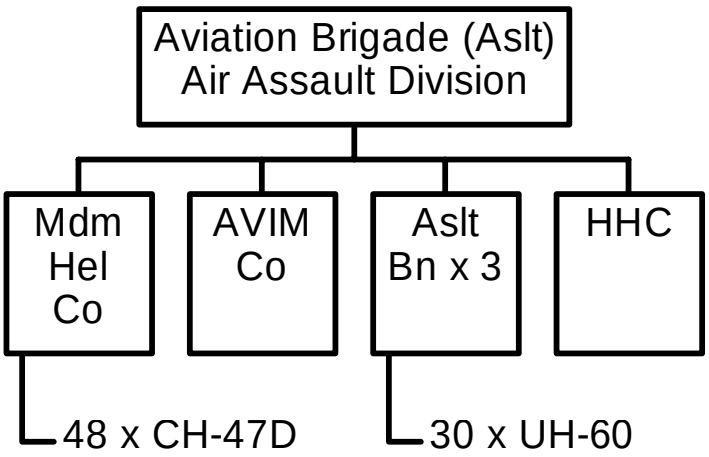
2-22. AVIATION BRIGADE: HEAVY DIVISION



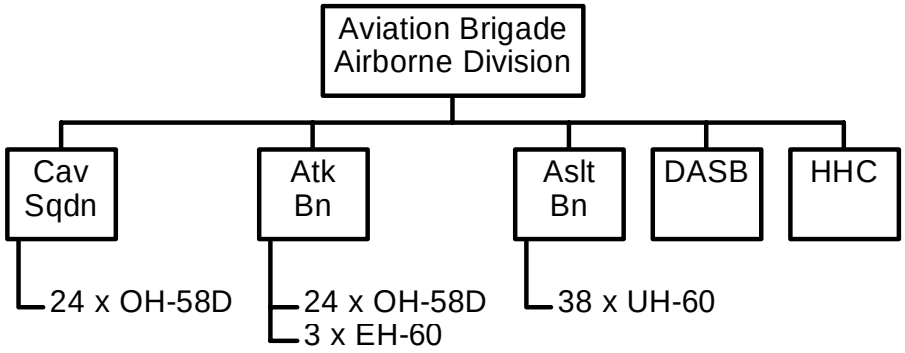
2-23. ATTACK AVIATION BRIGADE: AIR ASSAULT DIVISION



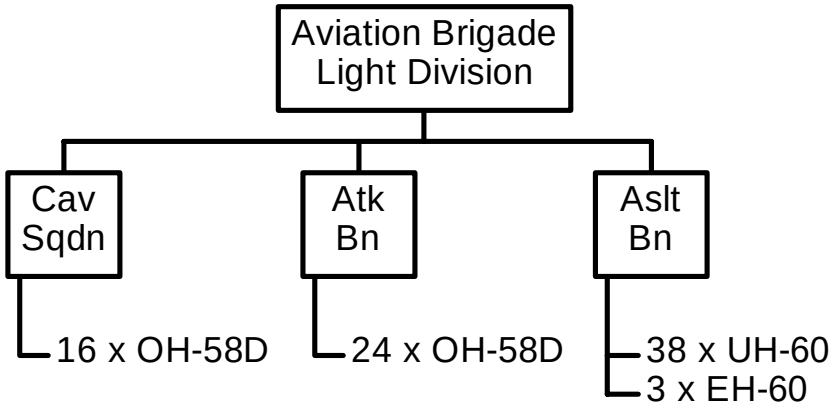
2-24. ASSAULT AVIATION BRIGADE: AIR ASSAULT DIVISION



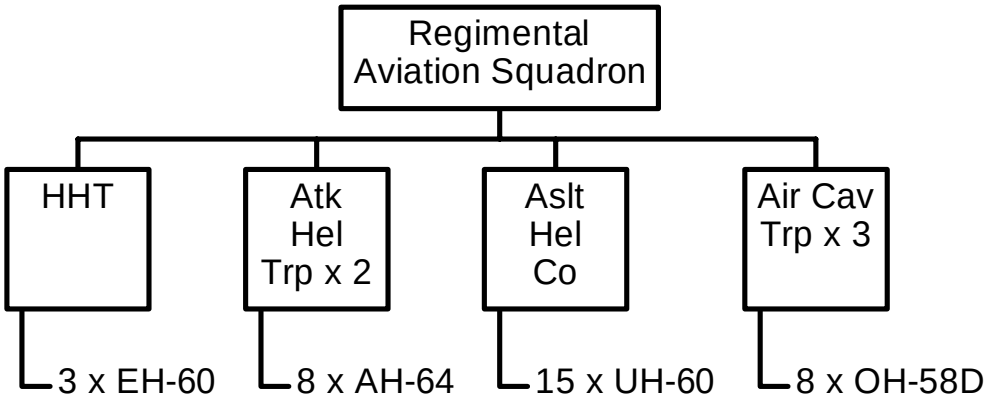
2-25. AVIATION BRIGADE: AIRBORNE DIVISION



2-26. AVIATION BRIGADE: LIGHT DIVISION

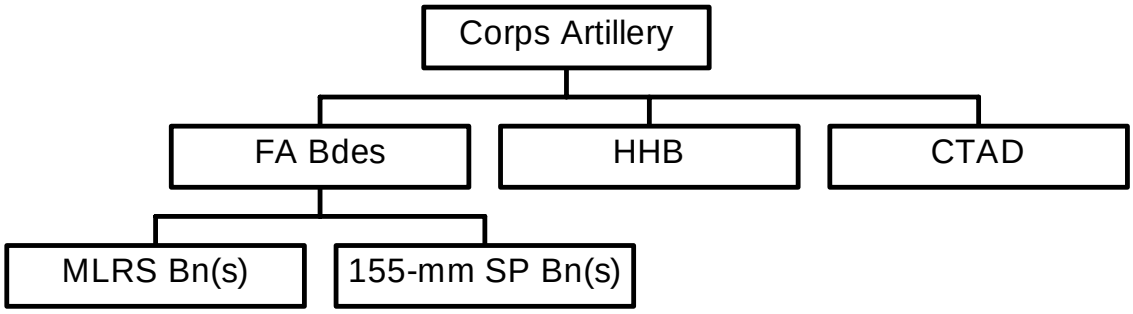


2-27. REGIMENTAL AVIATION SQUADRON: ARMORED CAVALRY REGIMENT



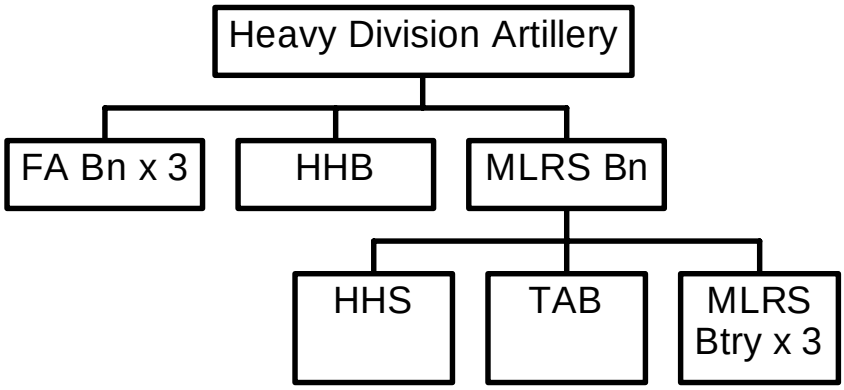
Section VI. ARTILLERY

2-28, CORPS ARTILLERY

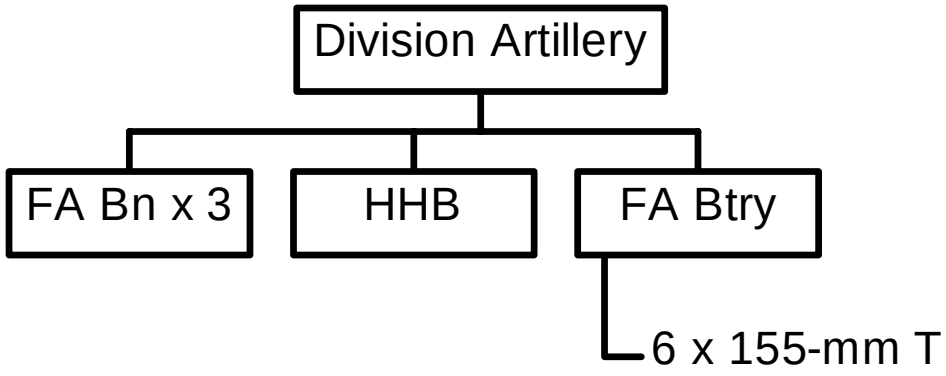


NOTE: Corps artillery is tailored for specific missions.

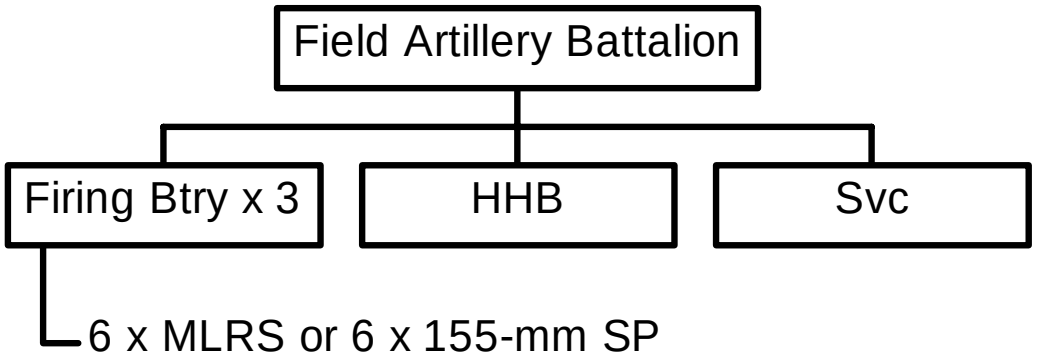
2-29. HEAVY DIVISION ARTILLERY



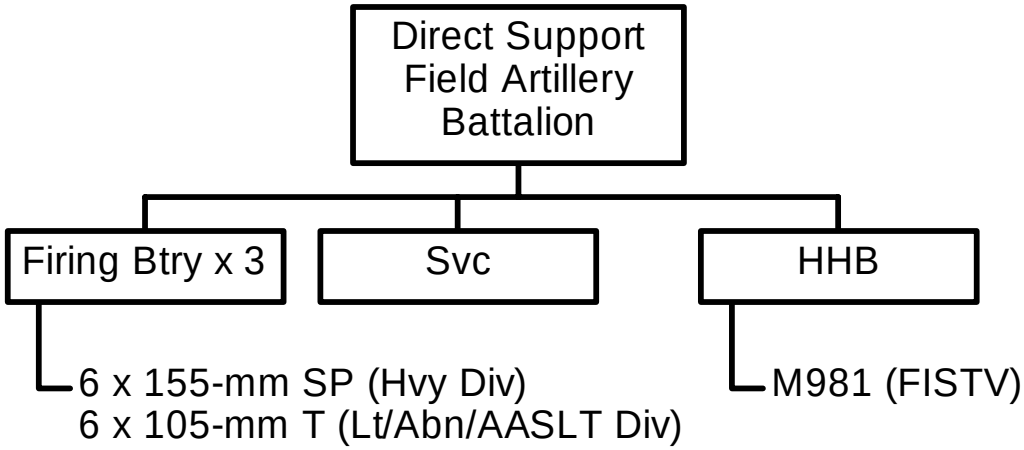
2-30. LIGHT DIVISION ARTILLERY: LIGHT, AIR ASSAULT, OR AIRBORNE DIVISION



2-31. FIELD ARTILLERY BATTALION: CORPS ARTILLERY

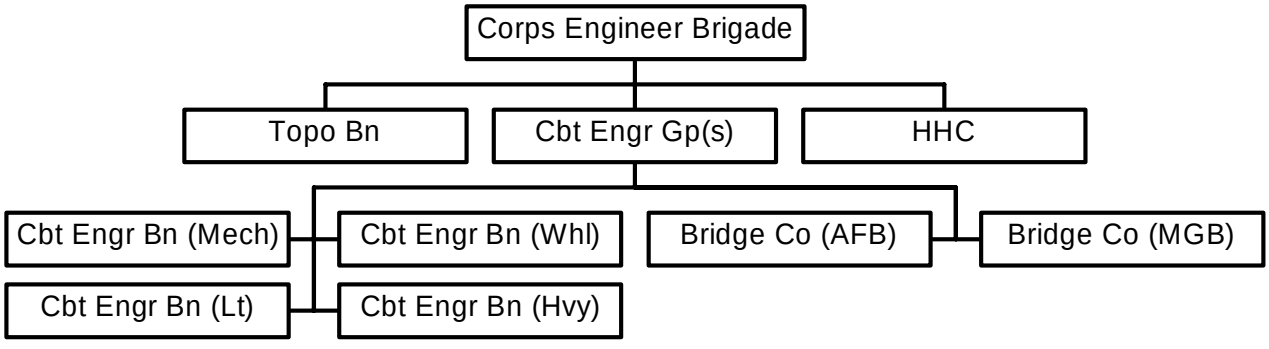


2-32. DIRECT SUPPORT FIELD ARTILLERY BATTALION: DIVISION ARTILLERY

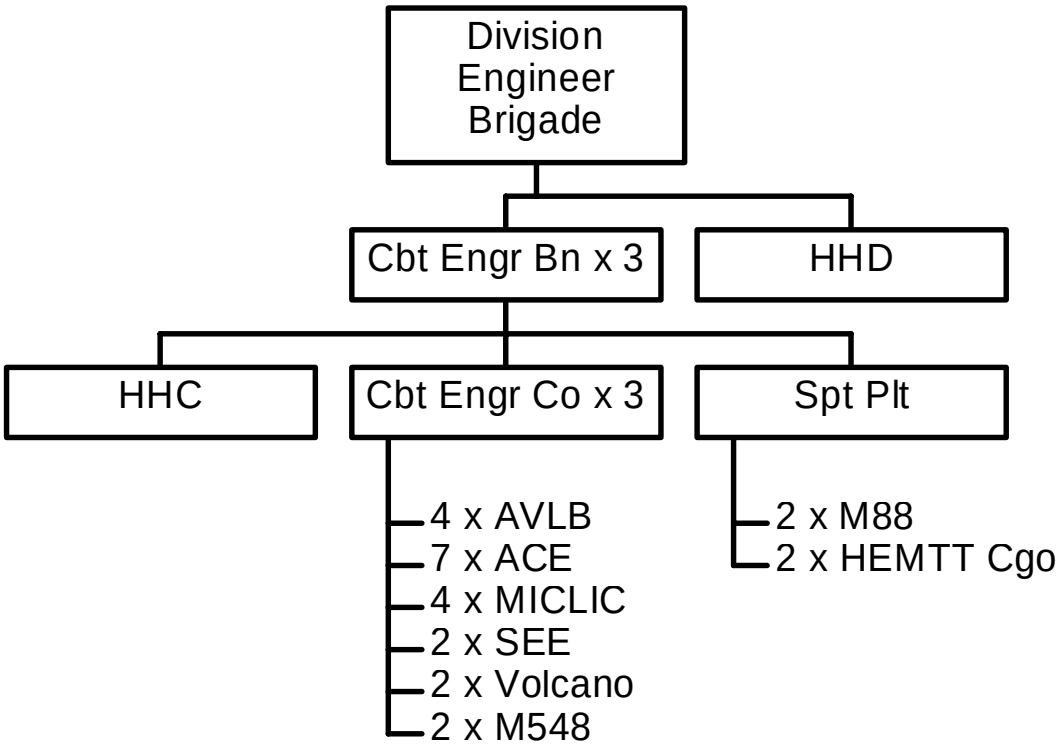


Section VII. ENGINEERS

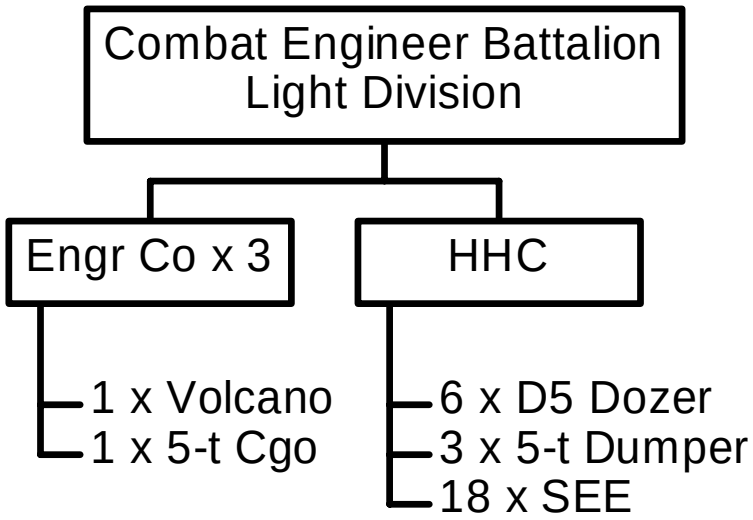
2-33. ENGINEER BRIGADE: CORPS



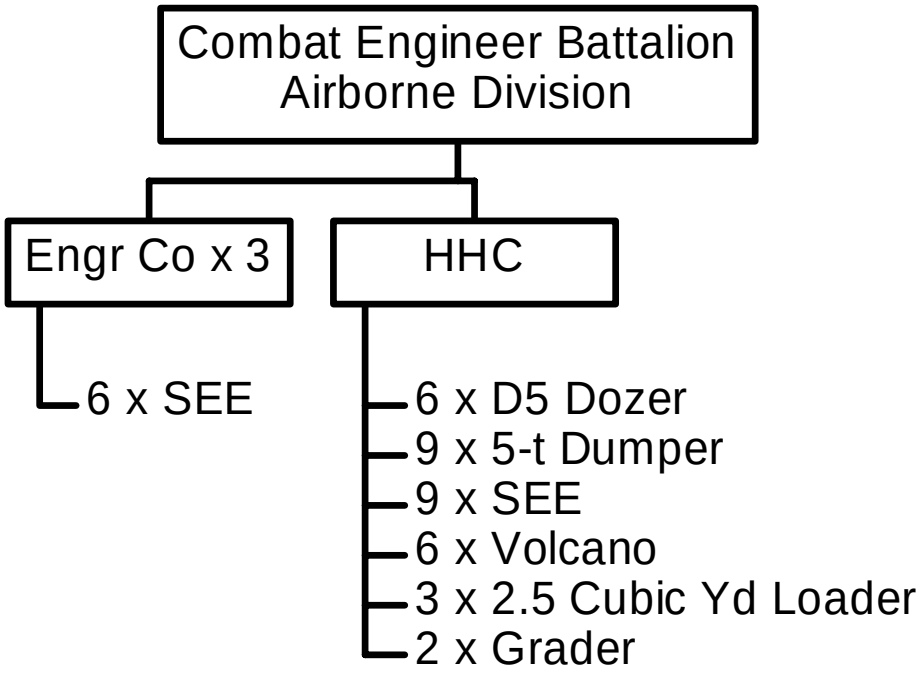
2-34. DIVISION ENGINEER BRIGADE: HEAVY DIVISION



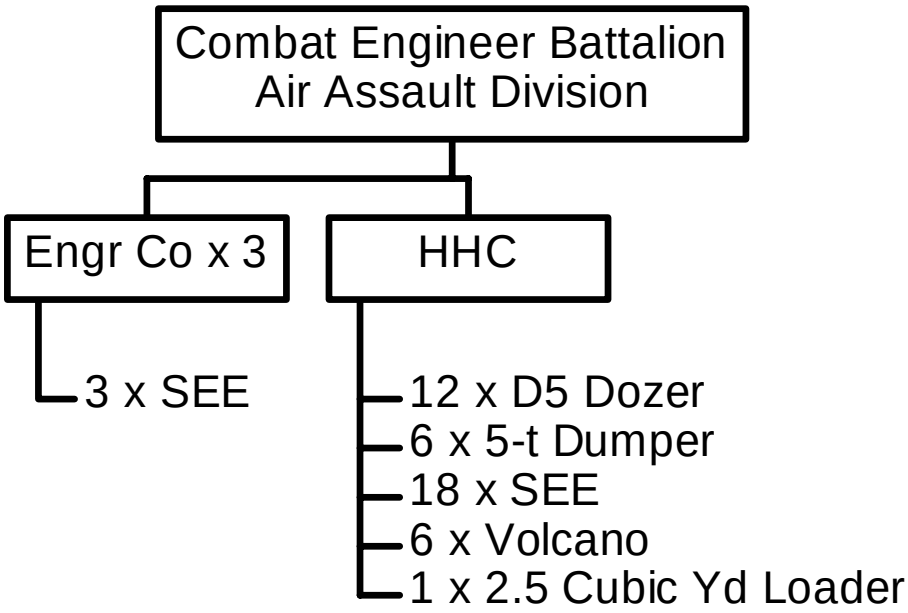
2-35. ENGINEER BATTALION: LIGHT DIVISION



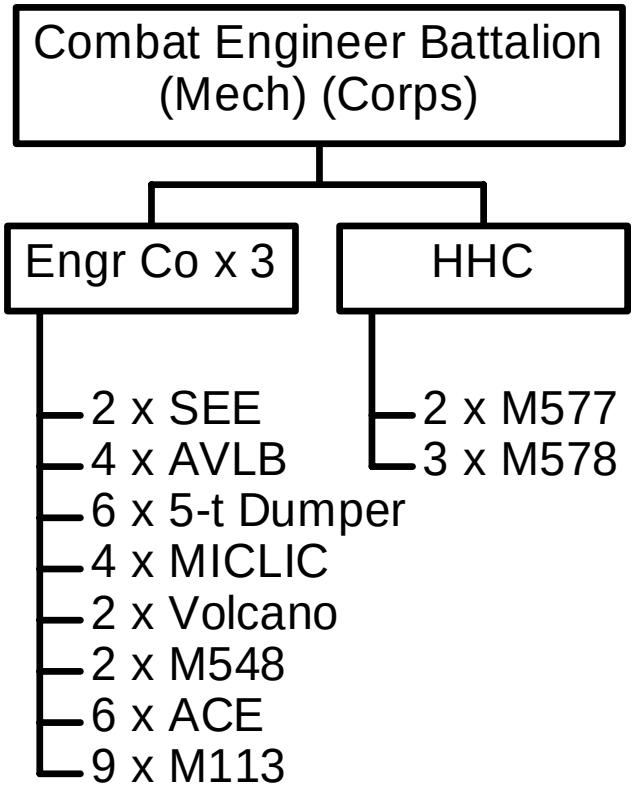
2-36. ENGINEER BATTALION: AIRBORNE DIVISION



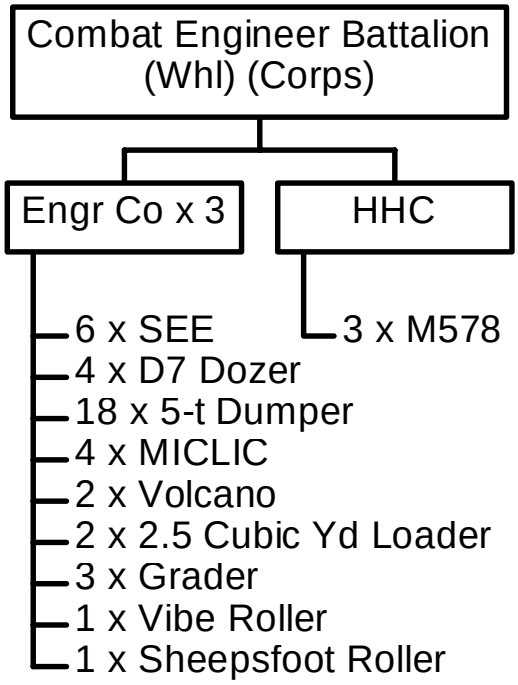
2-37. ENGINEER BATTALION: AIR ASSAULT DIVISION



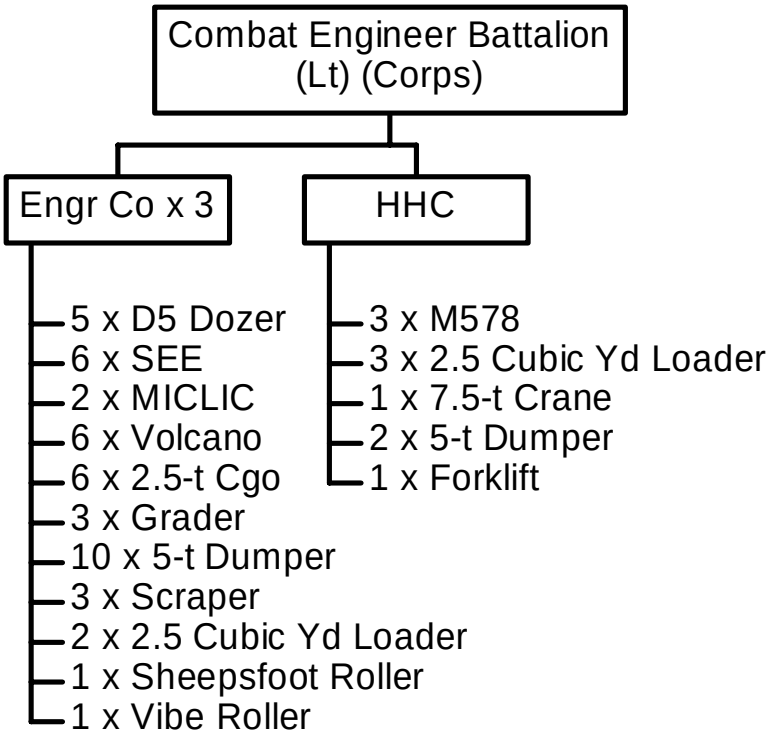
2-38. COMBAT ENGINEER BATTALION (MECHANIZED): CORPS



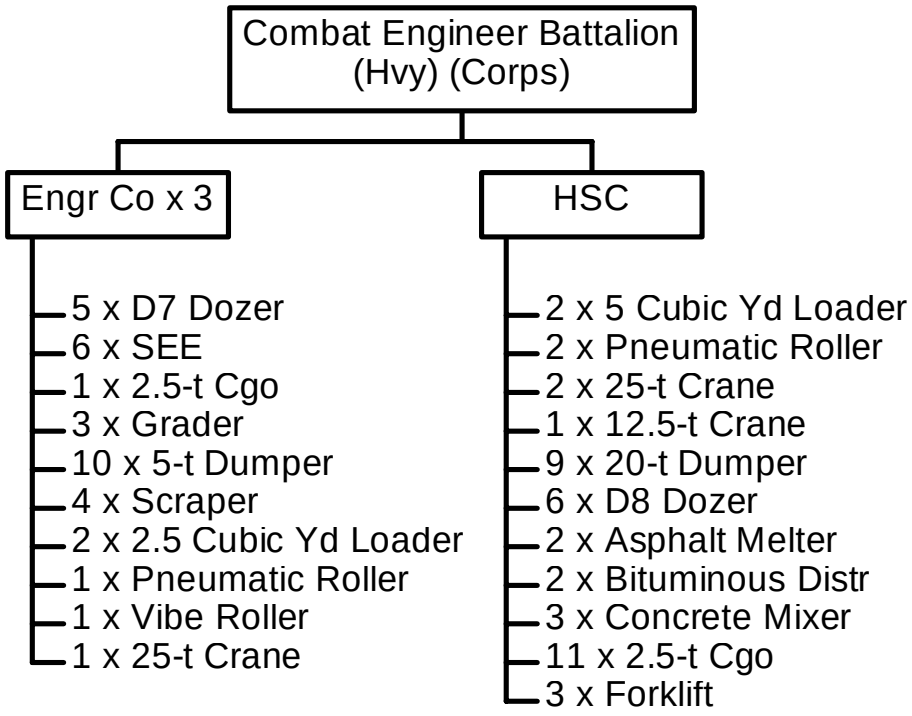
2-39. COMBAT ENGINEER BATTALION (WHEELED): CORPS



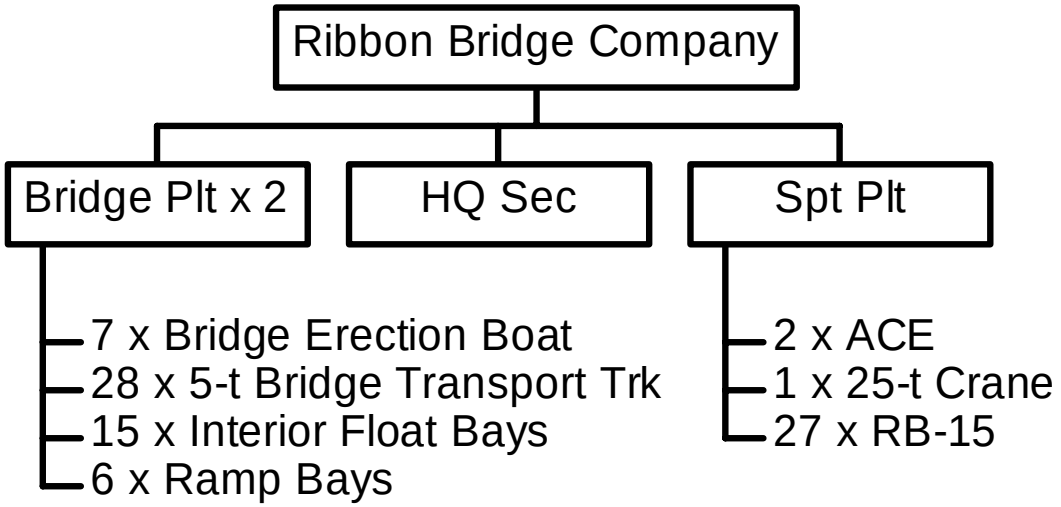
2-40. COMBAT ENGINEER BATTALION (LIGHT): CORPS



2-41. COMBAT ENGINEER BATTALION (HEAVY): CORPS

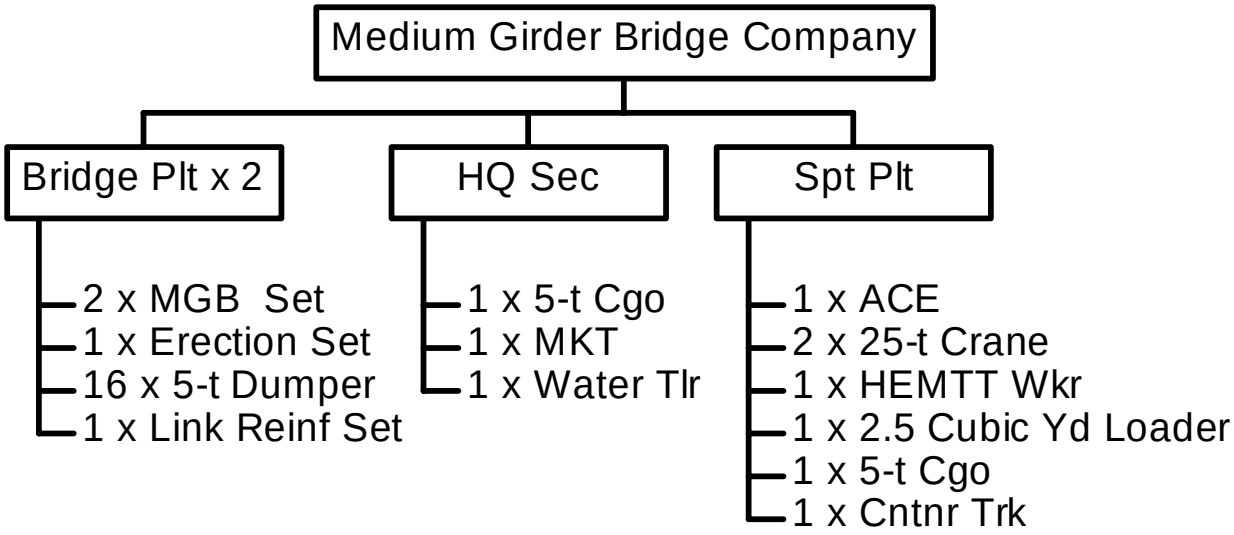


2-42. ENGINEER COMPANY (ASSAULT FLOAT BRIDGE RIBBON): CORPS



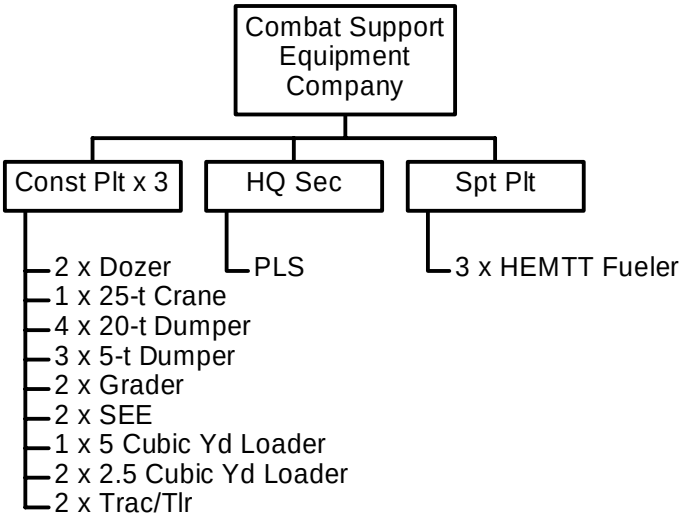
NOTE: Company has 215 meters of class 60 bridge capability

2-43. ENGINEER COMPANY (MEDIUM GIRDER BRIDGE RIBBON): CORPS



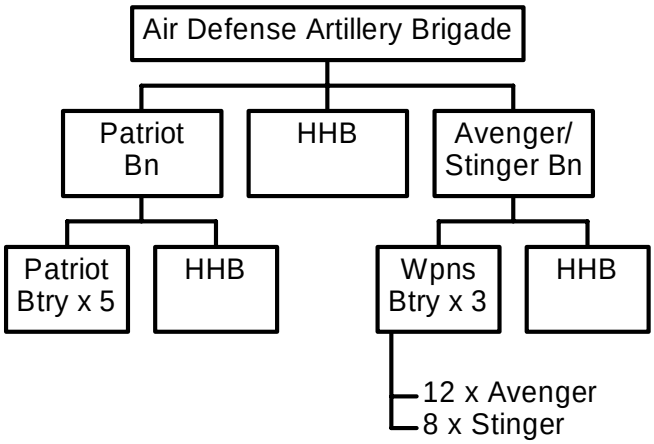
NOTES: 1. Company has 4 × 29.1 meters of class 60 capability or 2 × 46.5 meters of class 60 capability (with the link reinforcing set (LRS)).
2. LRS requires 3.7 meters clearance below bottom of bridge.

2-44. COMBAT SUPPORT EQUIPMENT COMPANY: CORPS

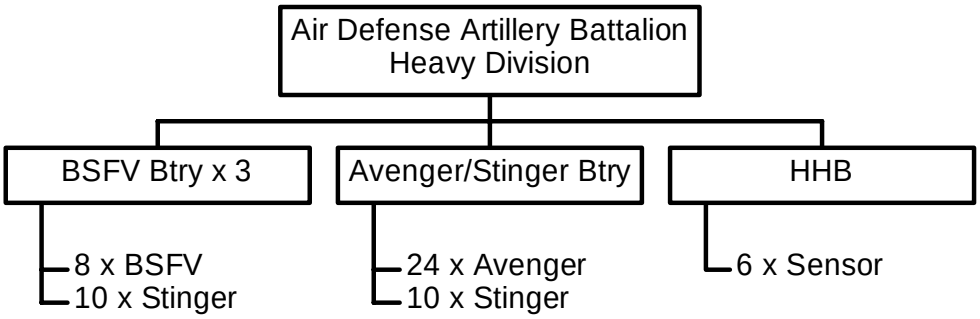


Section VIII. AIR DEFENSE

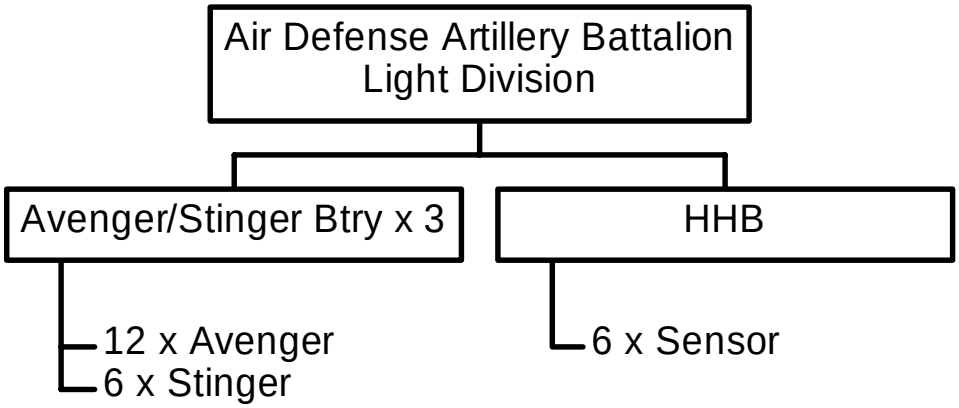
2-45. AIR DEFENSE ARTILLERY BRIGADE: CORPS



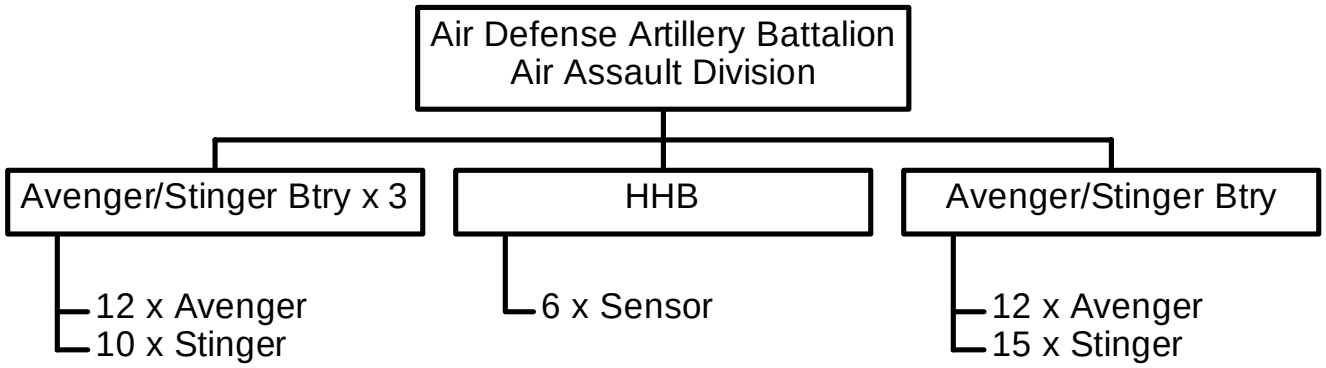
2-46. AIR DEFENSE ARTILLERY BATTALION: HEAVY DIVISION



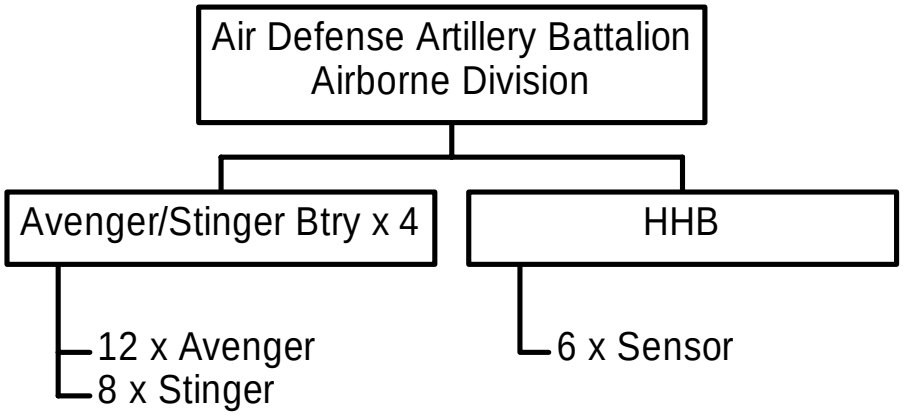
2-47. AIR DEFENSE ARTILLERY BATTALION: LIGHT DIVISION



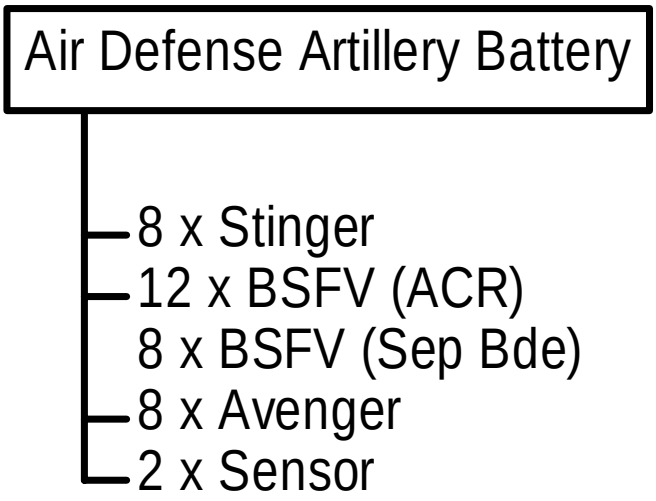
2-48. AIR DEFENSE ARTILLERY BATTALION: AIR ASSAULT DIVISION



2-49. AIR DEFENSE ARTILLERY BATTALION: AIRBORNE DIVISION

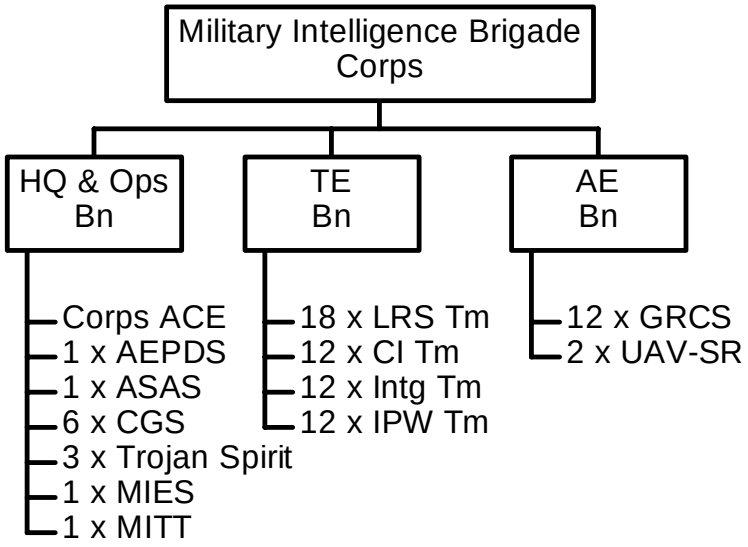


2-50. AIR DEFENSE ARTILLERY BATTERY: ARMORED CAVALRY REGIMENT OR SEPARATE BRIGADE

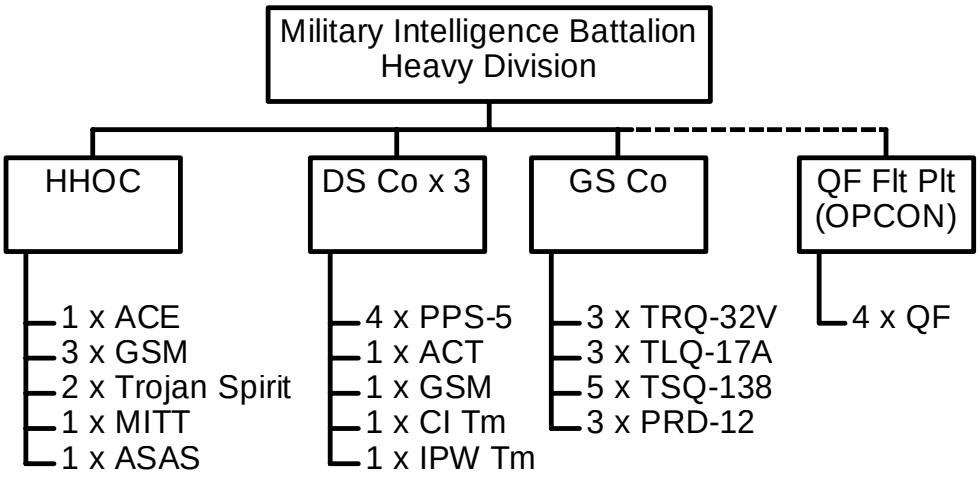


Section IX. MILITARY INTELLIGENCE

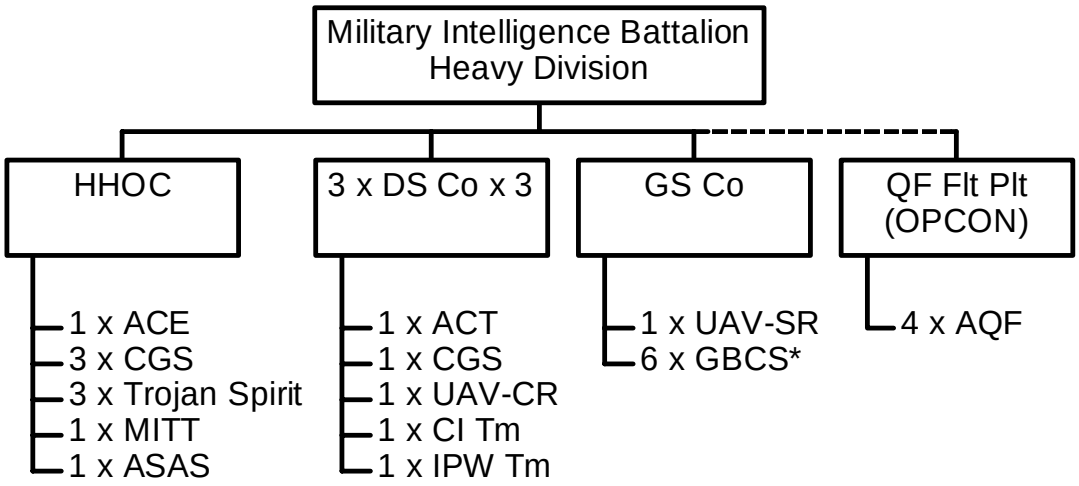
2-51. MILITARY INTELLIGENCE BRIGADE: CORPS (OBJECTIVE TOE)



2-52. MILITARY INTELLIGENCE BATTALION: HEAVY DIVISION (INTERIM MTOE)

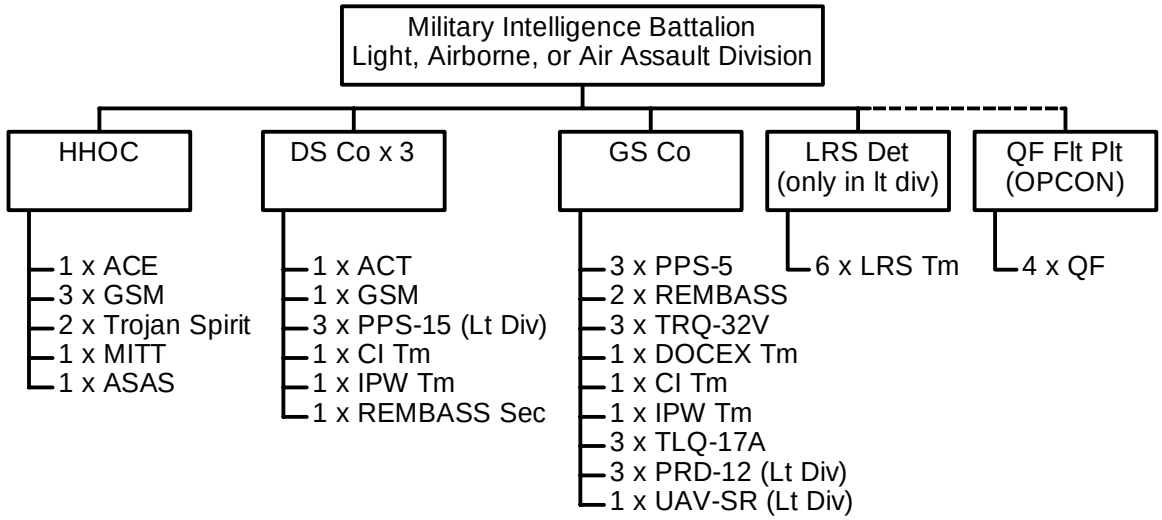


2-53. MILITARY INTELLIGENCE BATTALION: HEAVY DIVISION (OBJECTIVE TOE)

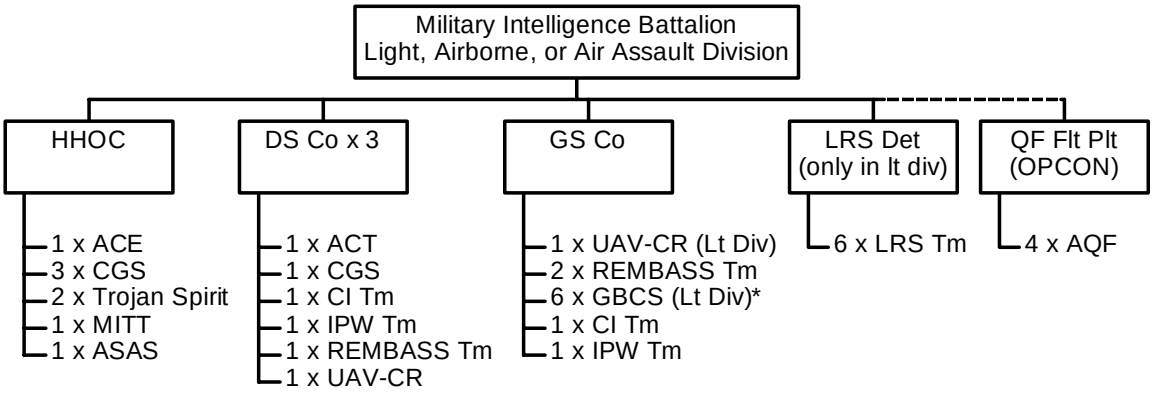


*Not fielded.

2-54. MILITARY INTELLIGENCE BATTALION: LIGHT, AIRBORNE, OR AIR ASSAULT DIVISION (INTERIM MTOE)

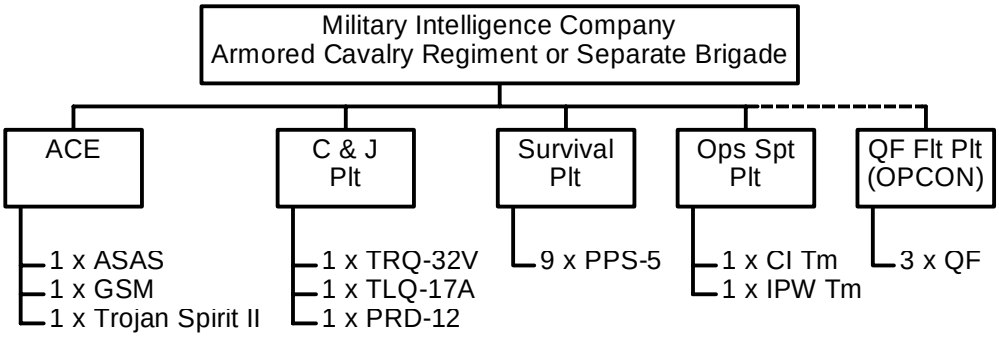


2-55. MILITARY INTELLIGENCE BATTALION: LIGHT, AIRBORNE, OR AIR ASSAULT DIVISION (OBJECTIVE TOE)

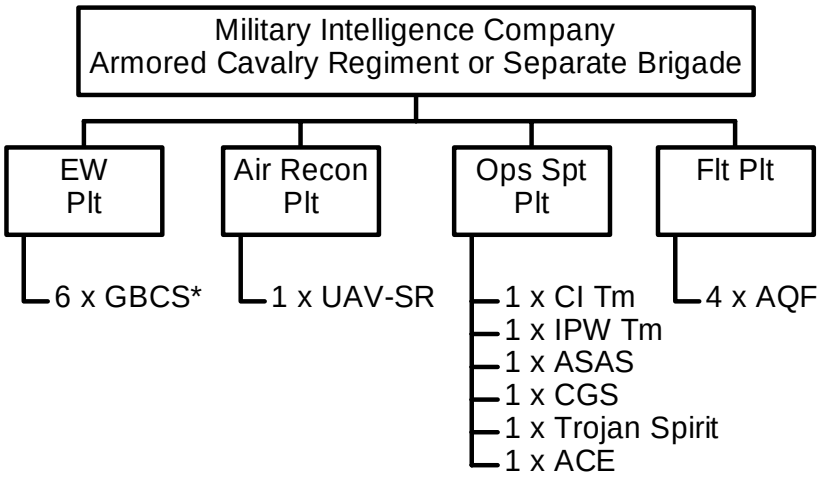


*Not fielded.

2-56. MILITARY INTELLIGENCE COMPANY: ARMORED CAVALRY REGIMENT OR SEPARATE BRIGADE (INTERIM MTOE)



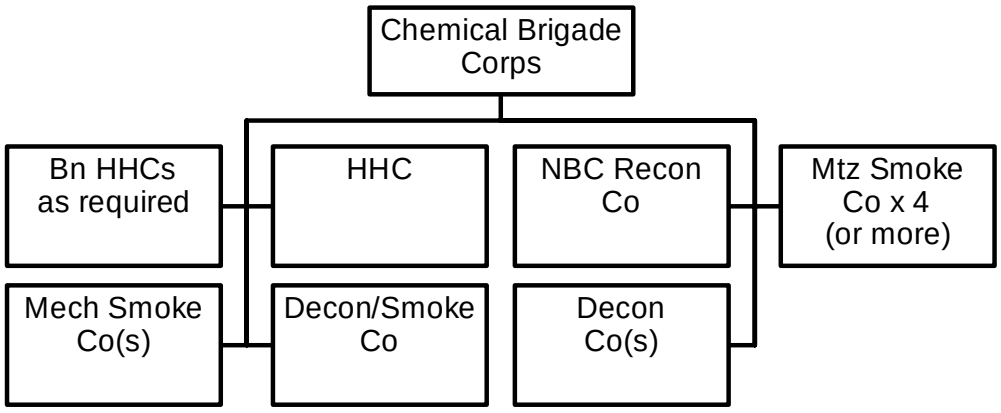
2-57. MILITARY INTELLIGENCE COMPANY: ARMORED CAVALRY REGIMENT OR SEPARATE BRIGADE (OBJECTIVE TOE)



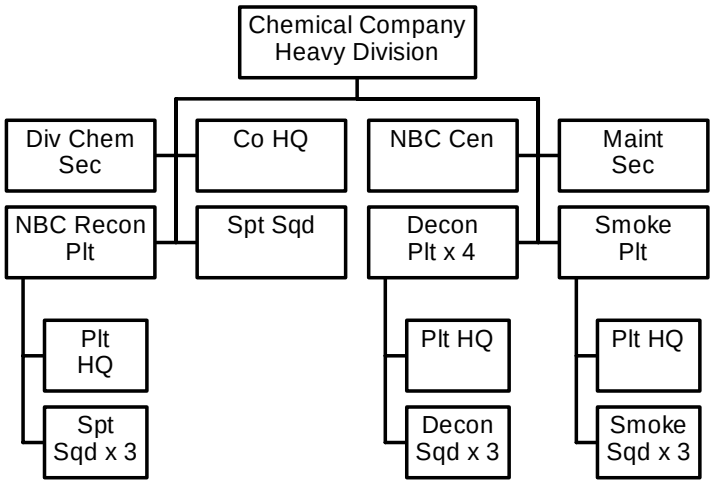
*Not fielded

Section X. CHEMICAL

2-58. CHEMICAL BRIGADE: CORPS

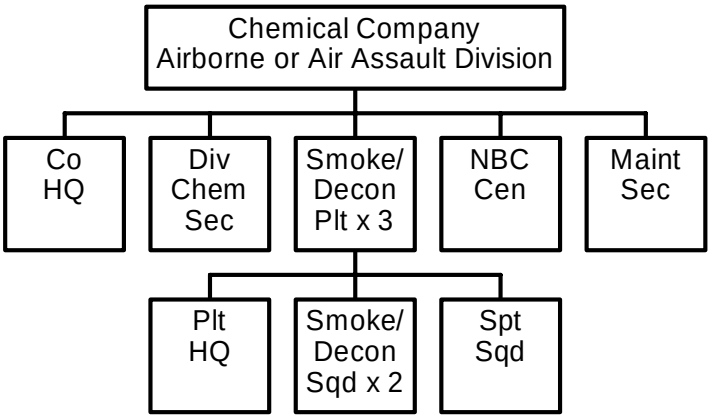


2-59. CHEMICAL COMPANY: HEAVY DIVISION



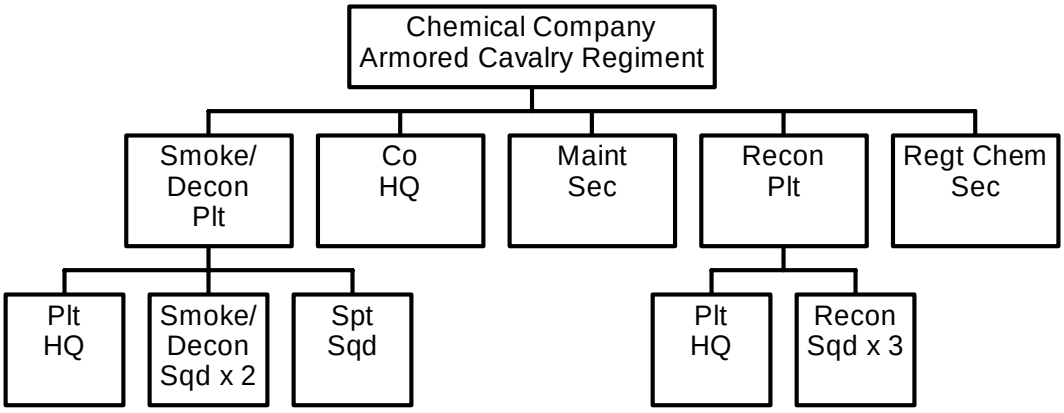
NOTE: The company has twenty-seven 5-ton trucks, fifteen 2 ½-ton trucks, fifteen tank and pump units (TPUs), twelve 500-gallon tanks, and twelve 300-gallon tanks that can be used to support many division missions.

2-60. CHEMICAL COMPANY: AIRBORNE OR AIR ASSAULT DIVISION



NOTE: The company has thirty-two 5-ton trucks, twenty-five HMMWVs, six 500-gallon tanks, and six 3,000-gallon tanks that can be used to support many division missions.

2-61. CHEMICAL COMPANY: ARMORED CAVALRY REGIMENT



Section XI. EQUIPMENT

2-62. MANEUVER SYSTEMS

System	*Weapon*	*Cruising range/ Duration time/ Max eff range*	*Basic load Fuel/ammo (rd)*	*Vehicle speed/ Rate of fire*
M1 tank		289 miles	505 gal	42 mph hwy/30 xctry
	120-mm	2,500 meters	40	
	.50 cal	1,500 meters	1,000	
	7.62 coax mg	900 meters	10,000	
	Loader 7.62	900 meters	14,000	
	Smoke GL	30 meters	24	
	Thermal	2,000 meters		
M2 BFV		300 miles		42 mph hwy/30 xctry
	TOW	3,750 meters	7	
	25-mm APDS	1,700 meters	225	
	HEI-T	3,000 meters	675	
	7.62 coax mg	900 meters	2,340	
	Smoke GL	30 meters	16	
	Thermal	2,000 meters		
M3 CFV		300 miles		42 mph hwy/30 xctry
	TOW	3,750 meters	12	
	25-mm-APDS	1,700 meters	425	
	HEI-T	3,000 meters	1,280	
	Smoke GL	30 meters	16	
	Thermal	2,000 meters		
AH-64	"Apache"	2 hr/10 min	370 gal	140 kn (normal cruise)
	Hellfire	8,000 meters	Up to 16	
	2.75" rocket	6,600 to 9,000 meters	Up to 38	
	30-mm gun	4,000 meters	1,000	
	TADS sight	8,000 to 10,000 meters		
	FLIR sight	5,000 to 6,000 meters		
OH-58D	"Kiowa Warrior"	1 hr/50 min	112 gal	90 kn (normal cruise)
	Hellfire	8,000 meters	Up to 4	
	2.75" rocket	6,600 to 9,000 meters	Up to 14	
	ATAS (Air-to-Air Stinger)	6,000 meters	Up to 4	
	.50 cal gun	1,500 meters	500	
	TIS sight	6,000 to 7,000 meters		
	TVS sight	7,000 meters		
	Laser range	10,000 meters		
UH-60A/L	"Blackhawk"	2 hr/15 min	362 gal	120 kn (normal cruise)
	M-60D(2) 7.62	1,100 meters		
	Utility		13 pax w/ seat	
			22 pax w/o seat	
	Internal		5,000 lbs	
	External		8,000 lbs	
Bradley	BSFV	300 miles		42 mph hwy/30 xctry
Stinger	TOW	3,750 meters	5	
Fighting	25-mm APDS	1,700 meters	225	

System	*Weapon*	*Cruising range/ Duration time/ Max eff range*	*Basic load Fuel/ammo (rd)*	*Vehicle speed/ Rate of fire*
Vehicle	HEI-T	3,000 meters	675	
	7.62 coax mg	900 meters	2,340	
	Smoke GL	30 meters	16	
	Thermal	2,000 meters		
	Stinger (MANPADS)	4,000 meters	6 msls	
Avenger	Stinger	4,000 meters	8 msls	
	.50 cal mg	1,500 meters	200 rds	
MANPADS	Stinger team (2 man)	300 miles (HMMWV)		
	Stinger	4,000 meters	6 msls	

2-63. INDIVIDUAL AND CREW-SERVED WEAPONS

Weapon	*Range (meters)*	*Rate of fire per min*	*Remarks*
TOW	3,750	3	Thermal sight
Javelin	2,000	1	CLU has day and night capability
M47 Dragon	1,000	1	Day and night sights
M2 .50-cal mg	1,500	550	
Mk-19		325 to 375	
M136 AT-4	300 moving 600 stationary	1	
M72A2 LAW	125 moving 200 stationary	1	
M249 SAW	Max eff—600	750 normal, 1,000 max	
M60 mg	Max eff—1,100	100 normal, 200 rapid	
M16A2	580		
M203	350		
Stinger	4,000	1	

2-64. ADA EQUIPMENT

Weapon system	*Weapon Characteristics*	*Range*	*Mileage/Ammunition*
Bradley Stinger Fighting Vehicle	BSFV TOW 25-mm APDS HEI-T 7.62 coax mg Smoke GL Thermal Stinger (MANPADS)	300 miles 3,750 meters 1,700 meters 3,000 meters 900 meters 30 meters 2,000 meters 4,000 meters	42 mph hwy/30 xctry 5 rds 225 rds 675 rds 2,340 rds 16 rds 6 msls
M6, Linebacker	BSFV 25-mm APDS HEI-T 7.62 coax mg	300 miles 1,700 meters 3,000 meters 900 meters	42 mph hwy/30 xctry 225 rds 675 rds 2,340 rds

	Smoke GL Thermal Stinger (External Pod)	30 meters 2,000 meters 4,000 meters	16 rds 10 msls (4 in launcher, 6 on board storage)
Avenger	Stinger .50 cal mg	4,000 meters 1,500 meters	8 msls 200 rds
MANPADS	Stinger Team (2 Man) Stinger	300 miles (HMMWV) 4,000 meters	6 msls

System	*Characteristics*	*Range*	*Fire control*	*Weapons*
AH-64D Longbow	Twin engine Length 58 feet Height 16 feet 4 bladed GPS	400 km 3 hrs endurance	Fire control radar Detect, classify, prioritize 256 targets 32x optic FLIR	16 Fire & Forget Hellfire 20 km FFAR rockets 30-mm chaingun (4-km range) AIM-9 Sidewinder Antiradiation missile
RAH-66	Comanche Twin engine 5 bladed Cockpit overpressure Exhaust cooling Fly by wire 20-mm Gatling gun	1,200 NM 2.5 hrs endurance	Fire & Forget radar Radar warning IR jammer Radar jammer Laser warning	AIM-9 Sidewinder Air-to-air Stinger (14 max) Antiradiation missile 70-mm FFAR (9-k range)

2-65. MILITARY INTELLIGENCE EQUIPMENT

System	*Prime mover*	*Function/ connectivity*	*Range*	*Allocation*
AN/PPS-5B ground surveillance radar (GSR)	Manpacked and vehicle	Moving target indicators (MTIs).	Pers: 6 km Veh: 10 km	12: Hvy div
AN/PPS-15 GSR	Manpacked and vehicle	MTIs.	Pers: 1.5 km Veh: 3.0 km	9: Abn/AASLT div 12: Lt div
AN/ALQ-151(v)1 QUICKFIX (QF) *AN/ALQ-151(v)2 Advanced QUICKFIX (AQF)*	EH-60A, EH-60L (BLACKHAWK)	EA (jam): COMINT. Intercept DF: COMINT and/or ELINT (VHF) Trailblazer. Interfaces with GBCS and other AQF for enhanced DF and targeting.	LOS = 50 km Station time: 6 hours	QF 4: Div 3 ACR and sep bde AQF 4: Div, ACR and sep bde
Improved Remotely Monitored Battlefield Sensor System (IREMBASS/REMBASS)	IREMBASS: manpacked REMBASS: HMMWV	Unattended ground sensor (seismic, acoustic, meteorological) that detects, classifies, and determines direction of movement.	NA	5: Lt, abn, and AASLT div

System	*Prime mover*	*Function/ connectivity*	*Range*	*Allocation*
PRD-12 Lightweight Man-transportable Radio Direction Finding System (LMRDFS)	Manpacked: 60 lbs Carried by two soldiers	Comm intercept/DF system. On emitter location missions, works with TEAMMATE. Ideal in lt, abn, AASLT, SOF ops. Rapid relocation. Optimizes collection in forward AO.	NA	1: Lt div, sep bde, and ACR 3: Hvy and AASLT div 7: SOF bn 10: SOF SA
Common ground station (CGS)	HMMWV	Receives, stores, manipulates, and displays data, secondary imagery, and broadcast intelligence. Receives data from GRCS, GBCS, U-2, JSTARS, UAV, and ARL.	NA	6: Corps 6: Div 1: ACR 2: EAC MI bde
RC-12K/N/P/Q GUARDRAIL common sensor (GRCS)	RC-12D	Intercept and DF: COMINT and/or ELINT. Downlinks to CTT (commander's tactical terminal) and IPF (integrated processing facility). Enhanced signal classification and precision emitter location.	LOS data link range: 150 km. Station time: 5.5 hr Altitude: 20,000 to 30,000 ft. LOS coverage: 450 km from aircraft.	12: Corps
AN/TRQ-32V receiving set TEAMMATE	HMMWV	Intercept and DF: COMINT.	LOS: 30 km	3: Div 2: ACR
AN/TSQ-138 special purpose detection set TRAILBLAZER	5-ton truck	Intercept and DF: COMINT.	LOS: 50 km	5: Hvy div
AN/TLQ-17A countermeasures set TRAFFIC JAM	HMMWV	EA (jam): COMINT	LOS: 20 km	3: Div 2: ACR
Joint Surveillance Target Attack Radar System (JSTARS) E-8C	Boeing 707	MTI radar FTI. Wide area surveillance. Small area Surveillance. Synthetic aperture radar (SAR) imagery. Downlinks data to GSM/CGS at division and corps.	LOS: 175 km Station time: 8 hours	NA
JSTARS ground station module (GSM)	Hvy: 5-ton truck. Lt: HMMWV.	Receives, stores, manipulates, and displays data, secondary imagery, and broadcast intelligence. Receives data from GRCS, GBCS, U-2, JSTARS, and UAV.	NA	*Interim* 7: Corps 6: Div 2: EAC MI bde
Mobile integrated tactical terminal (MITT)	HMMWV	Receives, annotates, and transmits secondary imagery and SIGINT data via ACUS comm or SUCCESS radio. Receives data from TENCAP systems.	NA	1: Corps 1: Div

System	*Prime mover*	*Function/ connectivity*	*Range*	*Allocation*
Unmanned aerial vehicle—close-range(UAV—CR) "OUTRIDER"	Length: 9.9 ft Wing span: 11 ft Dry weight: 300 lbs Max speed: 110 kn Height: 5 ft Payloads: Color CCD FLIR Max altitude: 15,000 ft Operating altitude: 15,000 ft	RISTA. BDA, moving target detection, and tracking. Downlinks to ground control station to CGS to remote video terminal (RVT). C band frequency: 9.6 kbps.	200 km Station time: 4 hours 50 km at 7 hrs endurance	1 baseline = 4 aircraft platforms 2 GCS 2 GDT 1 RVT 3: Div (fielding begins in 1999)
Unmanned aerial vehicle—short-range (UAV-SR) "HUNTER"	Length: 23 ft Wing span: 29.2 ft Dry weight: 1,200 lbs Max speed: 106 kn Height: 5.4 ft Payload: FLIR Max altitude: 15,000 ft Operating altitude: 15,000 ft	Day and night RISTA. BDA, moving target detection, and tracking. Downlinks to ground control station to CGS to RVT. C bank frequency: 7.317 kbps	8 to 10 hrs LOS 125 km on GCS 50 km on LRS 75 km on ADR	1 baseline = 8 aircraft platforms 4 ADR 3 GCS/MPS 2 GDT 4 RVT 1 LRS 2: Corps 1: Div and ACR
Modernized Imagery Exploitation System (MIES)	3 operational vans 1 satellite comm van 1 national input segment van 1 exploitation van	Receives, processes, and disseminates national and theater imagery. Provides first-phase imagery exploitation for I&W missions. Exploits imagery digital or hard copy format.	NA	1: Corps
Advanced Electronic Processing and Dissemination System (AEPDS)	4 × UNIX-based SUNSPARC	Receives and processes intel data collected by national, theater, and corps sensors. Processes SIGINT data and intel received from other TENCAP systems. Processes electronic OB, dynamic database processing and reporting.	NA	1: Corps MI bde and EAC MI bde
All source analysis system (ASAS)	ASAS-all source (AS): 6 × AS work stations ASAS single source (SS): 6 × SS work stations	Automates the processing and analysis of intel data from all sources. "Linchpin" system in forming a seamless intel architecture. Designed to support management of IEW operations and target development in bns, bdes, ACR, sep bde, divs, corps, and EAC.	NA	1: EAC, corps, div, ACR, and sep bde

System	*Prime mover*	*Function/ connectivity*	*Range*	*Allocation*
AN/MLQ-38 ground based common sensor heavy (GBCS-H) *AN/MLQ-39 ground based common sensor light (GBCS-L)*	Heavy: electronic fighting vehicle (XM5) Lt: HMMWV	Processes signal data at the sensor and provides target detection, identification, and location reports in NRT. Precision (targetable) emitter locations, instantaneous signal acquisition targeting, processing, and reporting. Smart "stealth" jamming against communications emitters. COMINT: MHF to SHF ELINT: UHF to EHF Operates on the move, 24 hrs.	LOS: 40 km	6: Div, ACR, and sep bde
AN/TSQ-190(V) TROJAN SPIRIT II	HMMWV	Satellite terminal with secure voice, data, fax, video, and SIDs capability. Provides a forward-deployed, quick-reaction reporting and analysis link interface with ASAS and DISE to support split base operations	NA	3: Corps and EAC MI bde 2: Div 1: ACR and sep bde

CHAPTER 3

LIMITED CONVERSION DIVISION (LCD) ORGANIZATION AND EQUIPMENT

Section I. INTRODUCTION

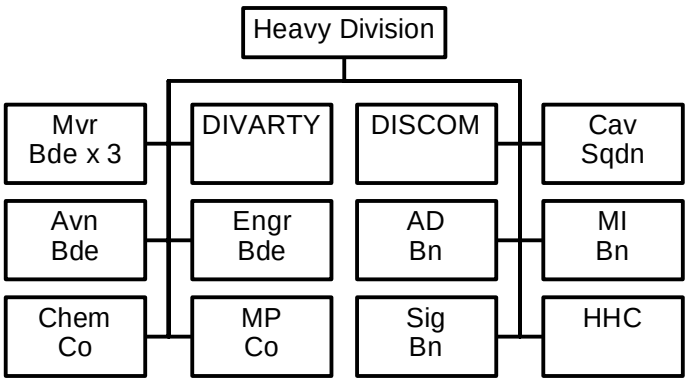
3-1. GENERAL

This chapter provides organizational diagrams for units that can be found in a US Army Limited Conversion Division.

Section II. DIVISION

3-2. HEAVY DIVISION

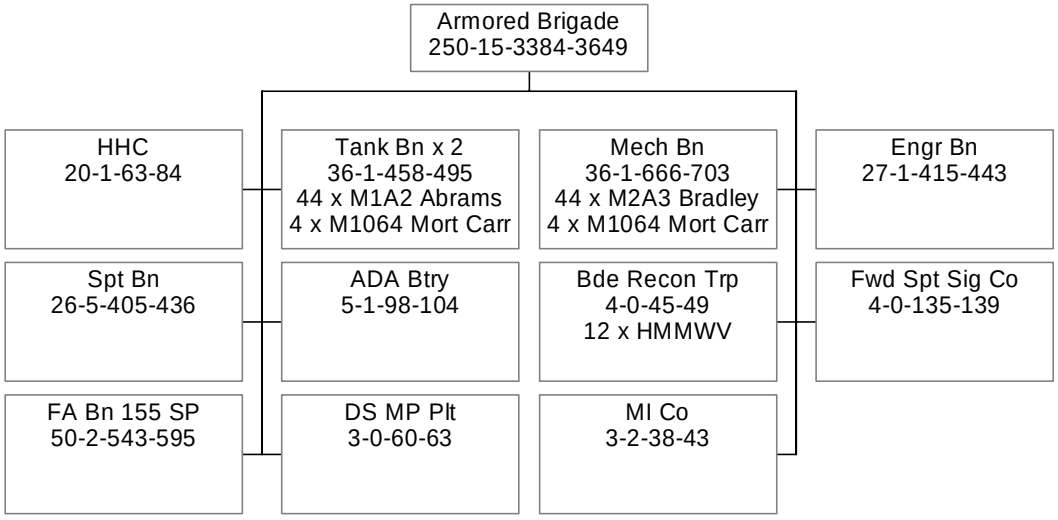
Mechanized infantry division (five infantry battalions and four tank battalions) or armored division (four mechanized infantry battalions and five tank battalions).



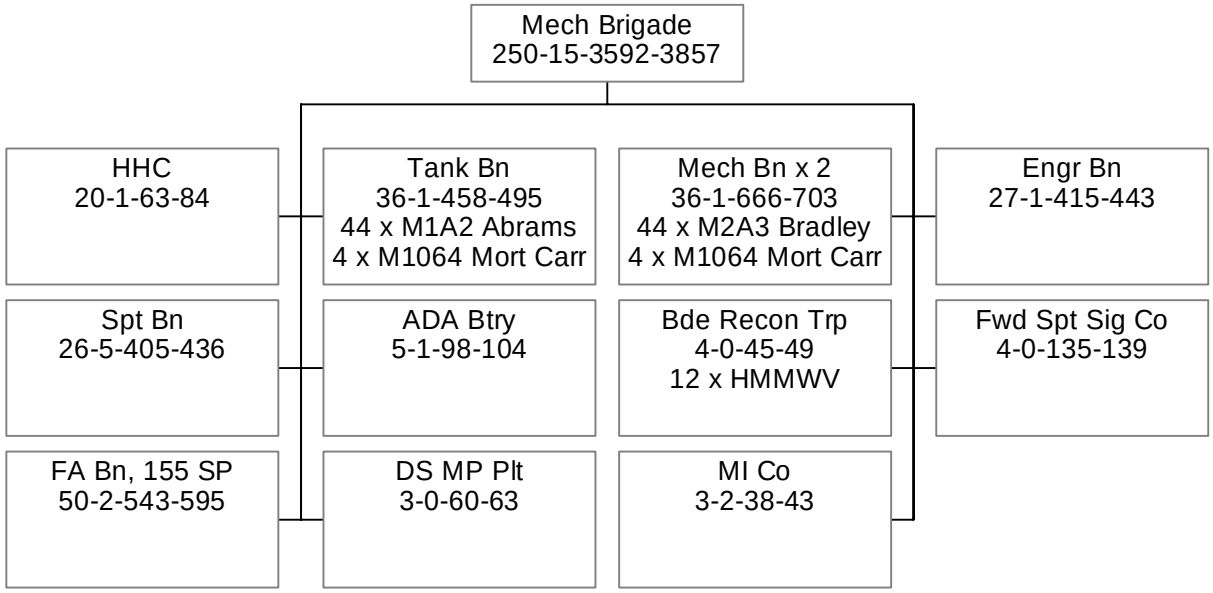
NOTE: The cavalry squadron in each division is attached to the aviation brigade.

Section III. ARMORED AND INFANTRY UNITS

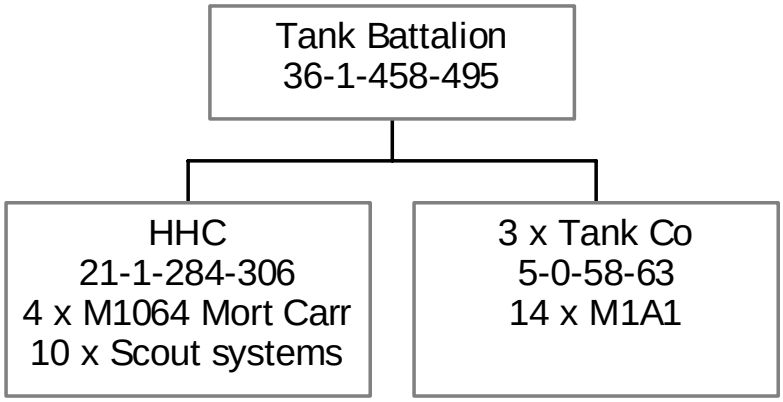
3-3. ARMORED BRIGADE



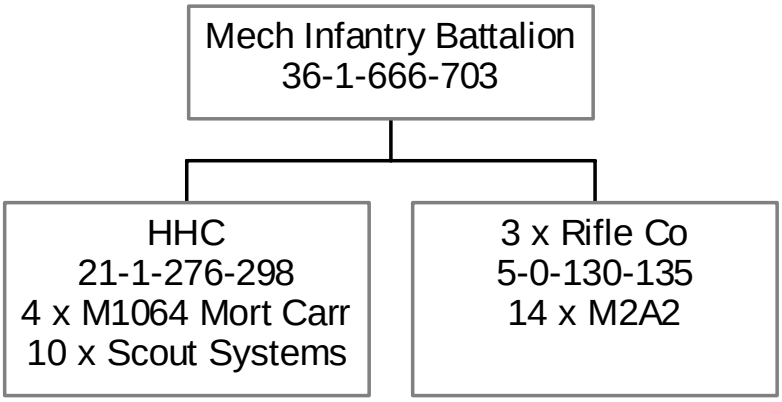
3-4. MECHANIZED BRIGADE



3-5. TANK BATTALION

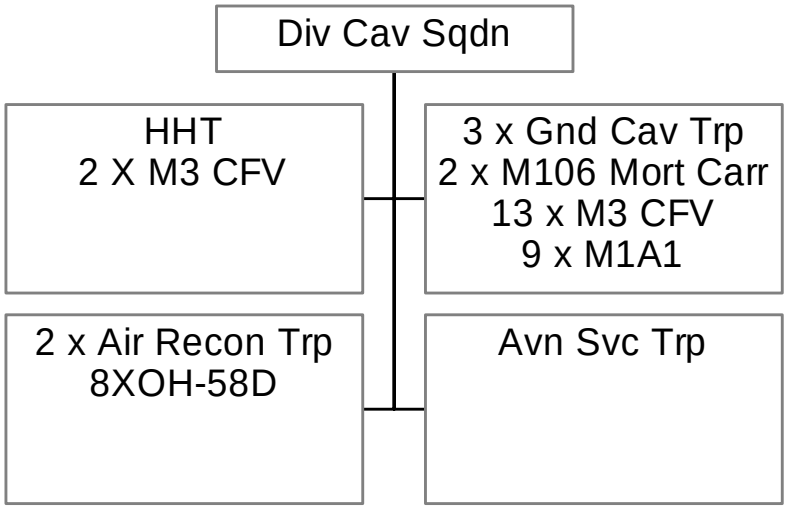


3-6. MECHANIZED INFANTRY BATTALION



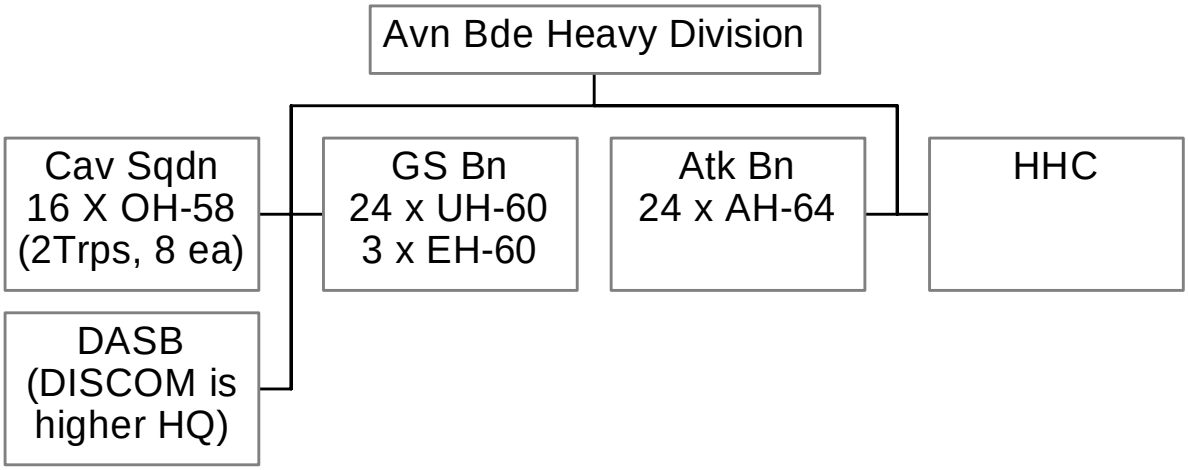
Section IV. GROUND CAVALRY UNITS

3-7. CAVALRY SQUADRON: HEAVY DIVISION



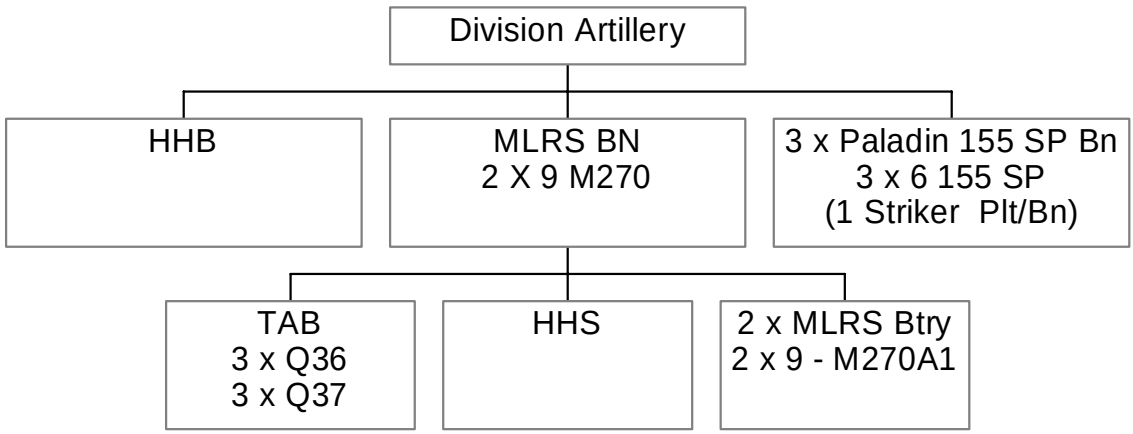
Section V. ARMY AVIATION

3-8. AVIATION BRIGADE: HEAVY DIVISION

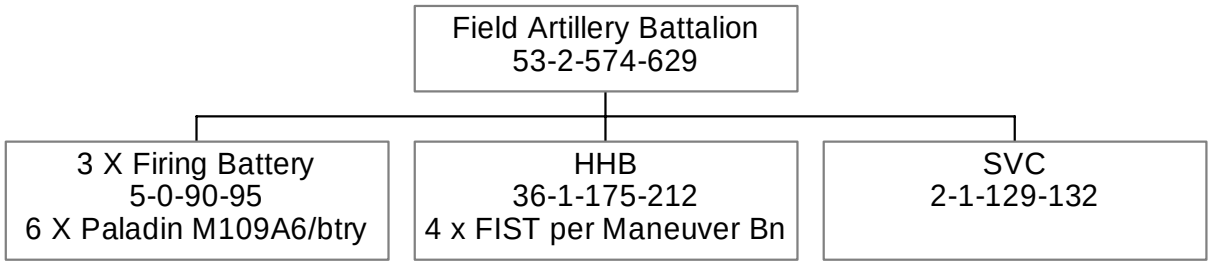


Section VI. ARTILLERY

3-9. HEAVY DIVISION ARTILLERY

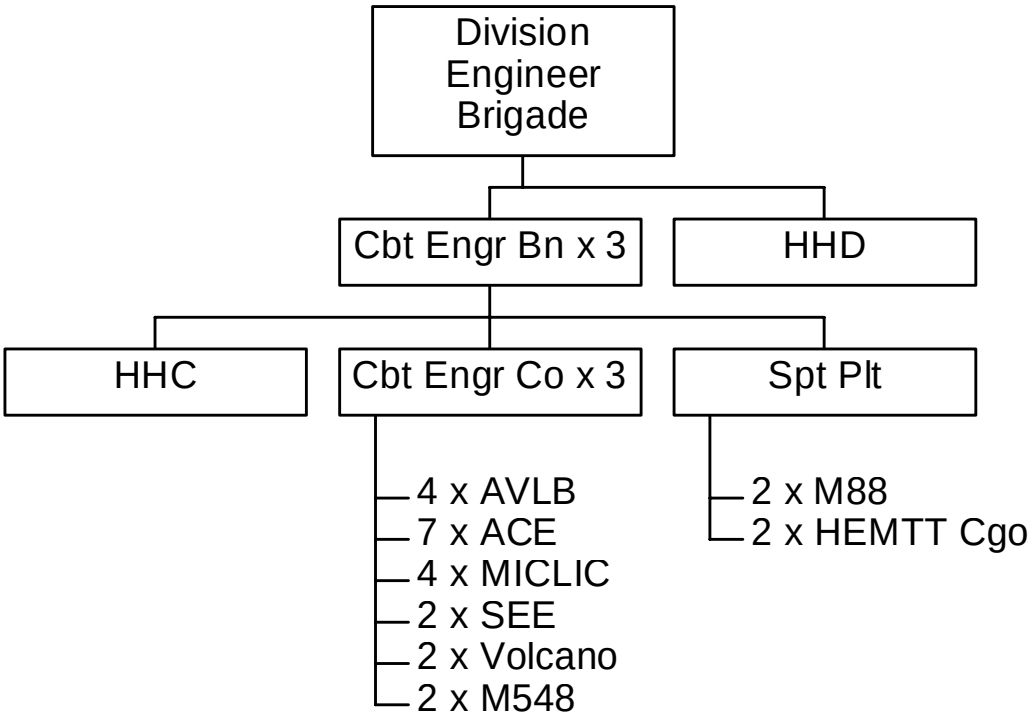


3-10. DIRECT SUPPORT FIELD ARTILLERY BATTALION

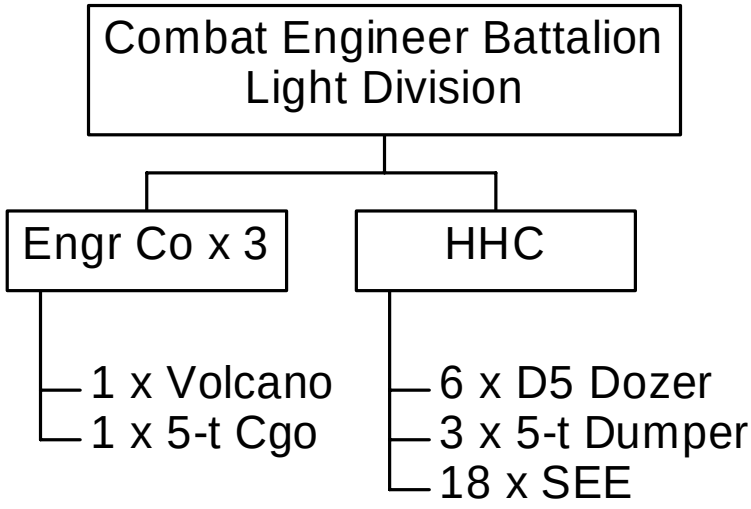


Section VII. ENGINEERS

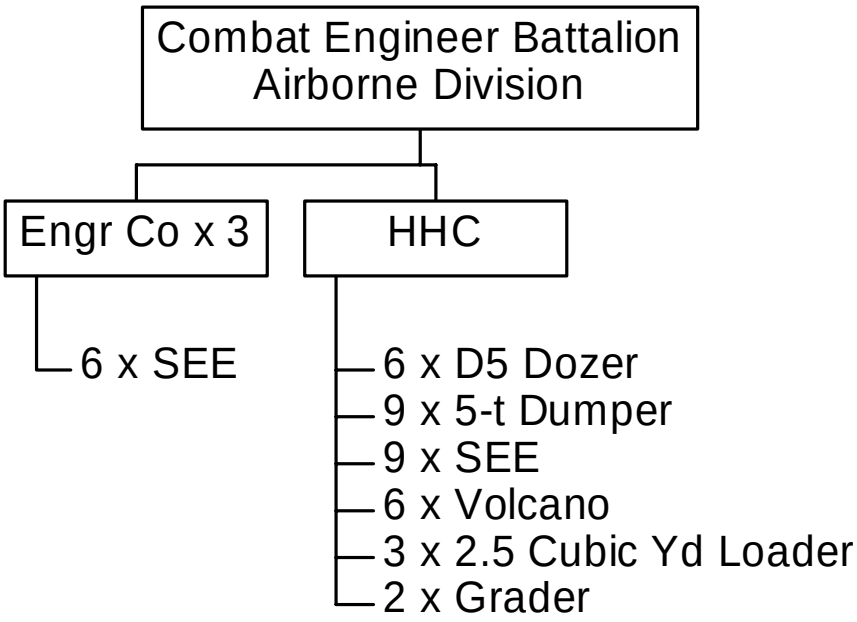
3-11. DIVISION ENGINEER BRIGADE: HEAVY DIVISION



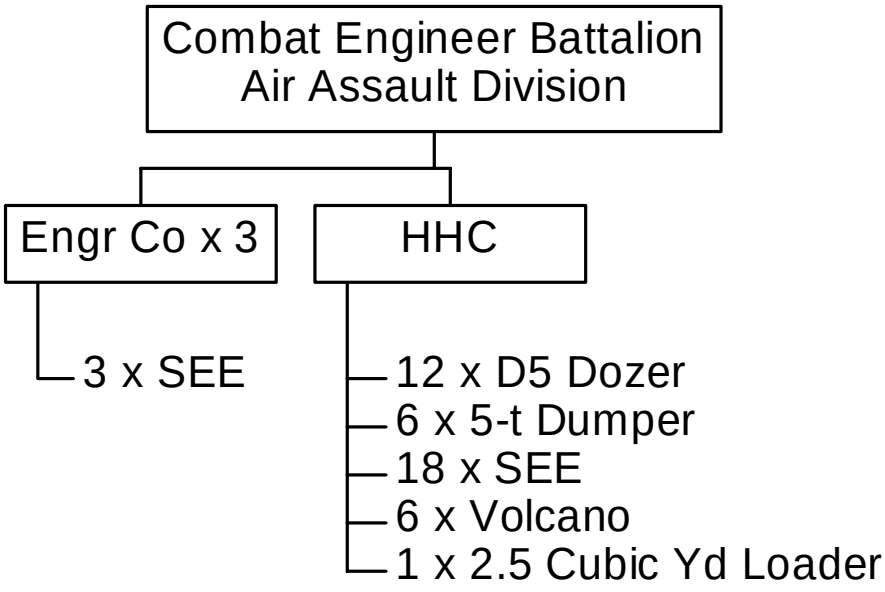
3-12. ENGINEER BATTALION: LIGHT DIVISION



3-13. ENGINEER BATTALION: AIRBORNE DIVISION

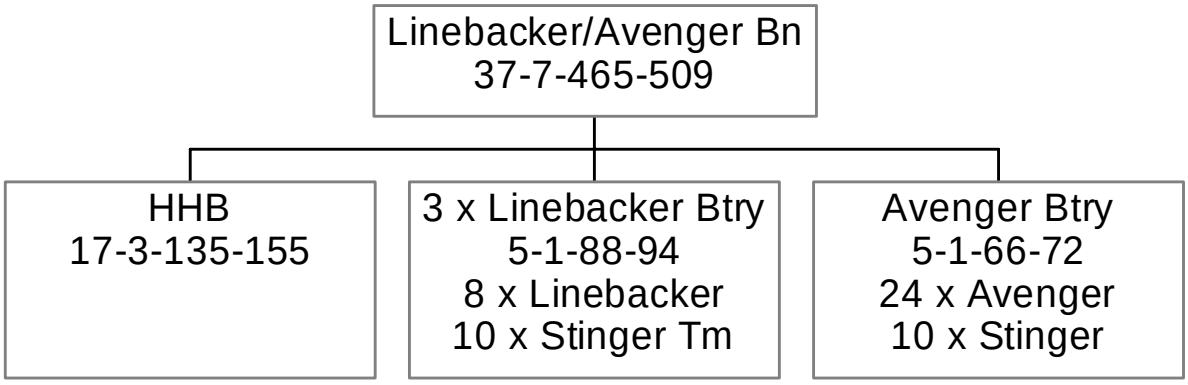


3-14. ENGINEER BATTALION: AIR ASSAULT DIVISION

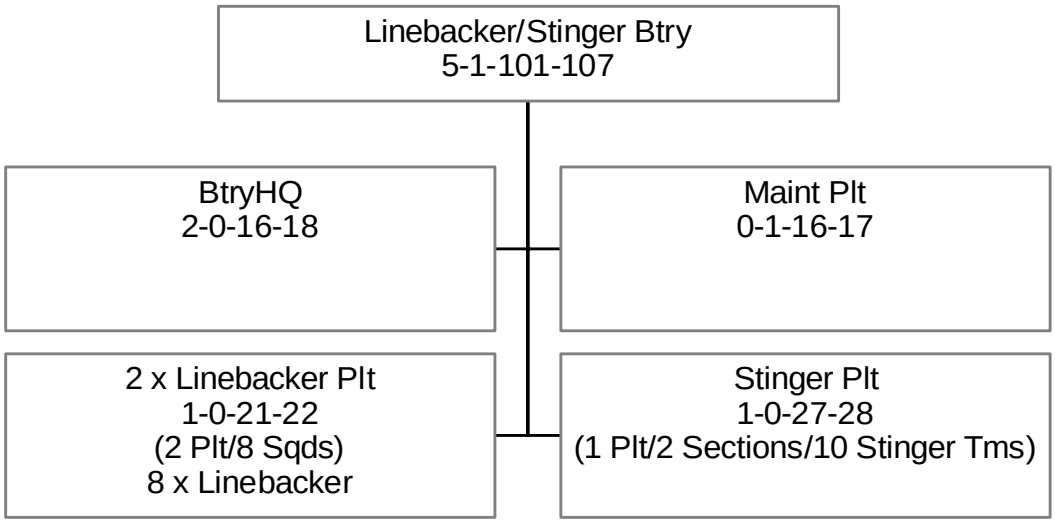


Section VIII. AIR DEFENSE

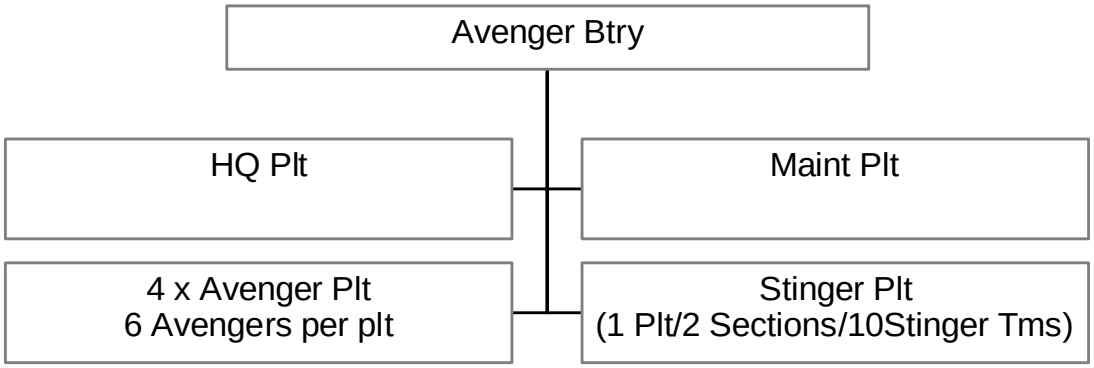
3-15. AIR DEFENSE ARTILLERY BATTALION: LINEBACKER/AVENGER, DIRECT SUPPORT



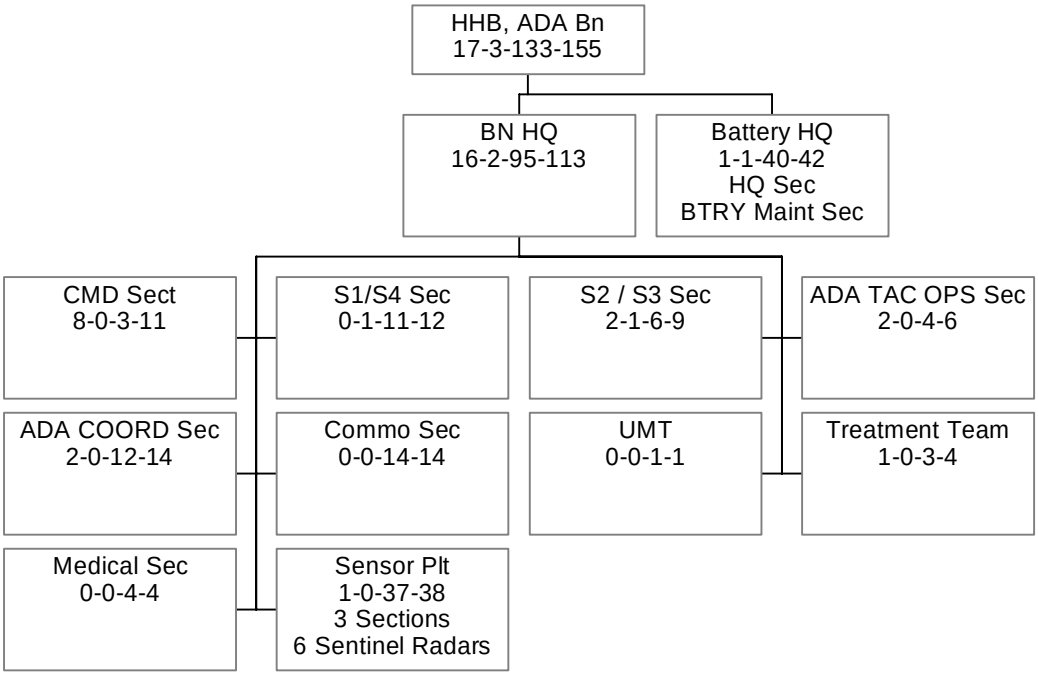
3-16. AIR DEFENSE ARTILLERY BATTERY, DIRECT SUPPORT



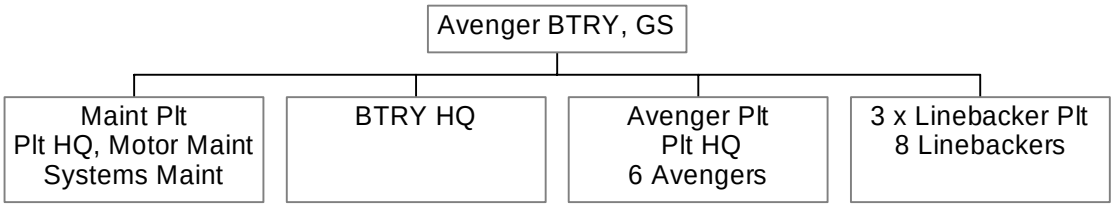
3-17. AIR DEFENSE ARTILLERY BATTERY, DIRECT SUPPORT/AVENGER



3-18. HHB, ADA BATTALION, LINEBACKER/AVENGER

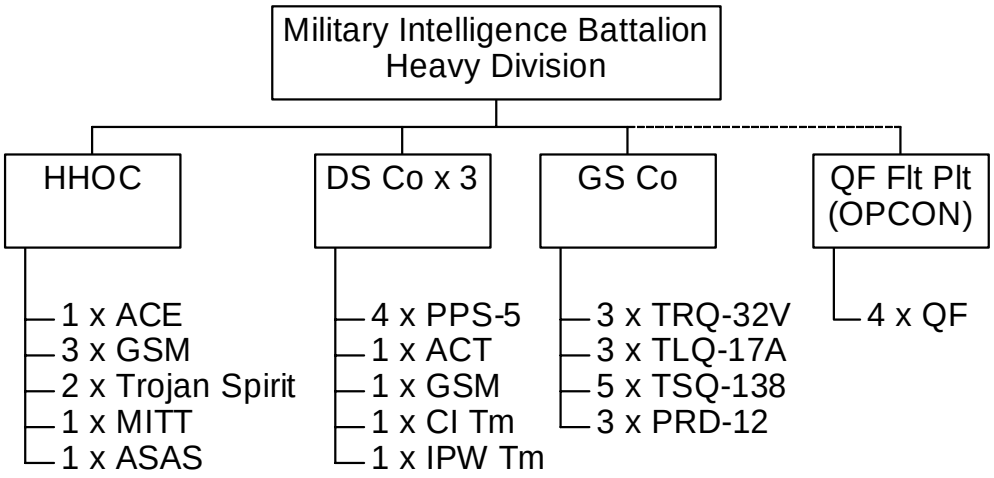


3-19. LINEBACKER/AVENGER BATTERY, ACR

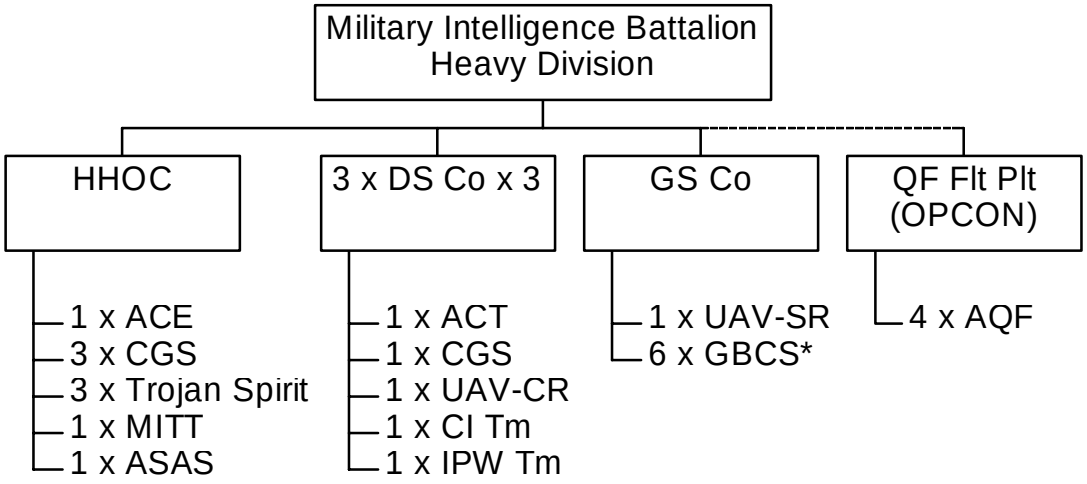


Section IX. MILITARY INTELLIGENCE

3-20. MILITARY INTELLIGENCE BATTALION: HEAVY DIVISION (INTERIM MTOE)

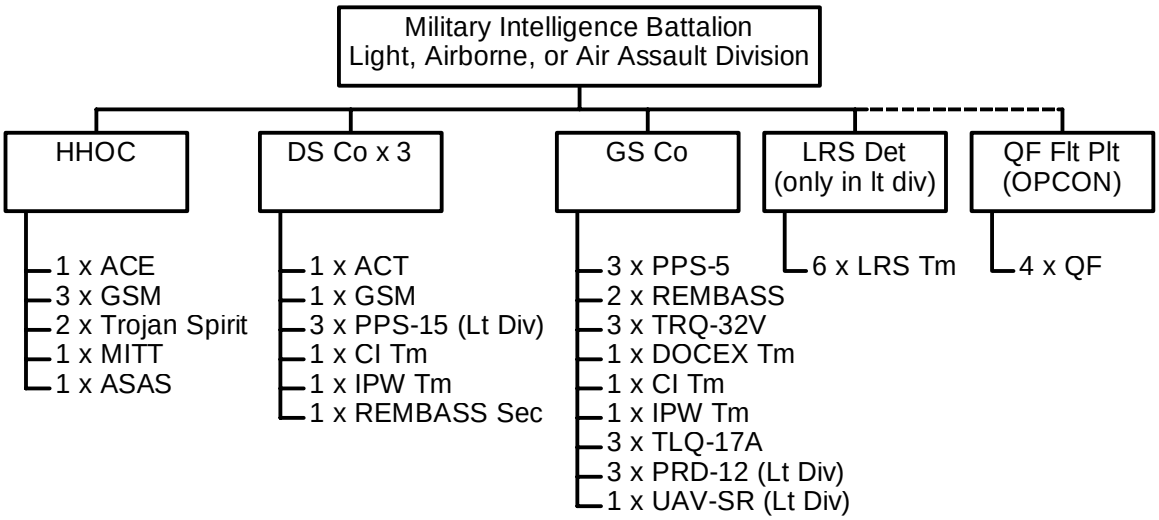


3-21. MILITARY INTELLIGENCE BATTALION: HEAVY DIVISION (OBJECTIVE TOE)

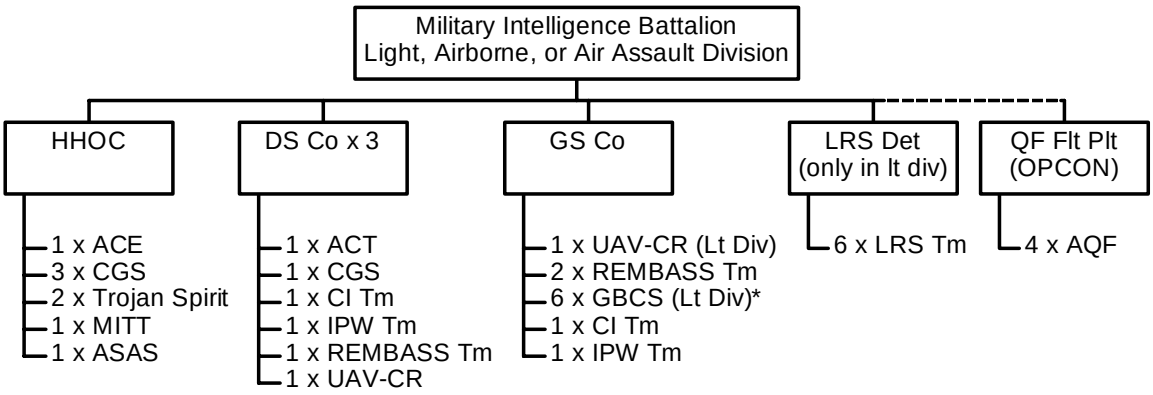


*Not fielded.

3-22. MILITARY INTELLIGENCE BATTALION: LIGHT, AIRBORNE, OR AIR ASSAULT DIVISION (INTERIM MTOE)

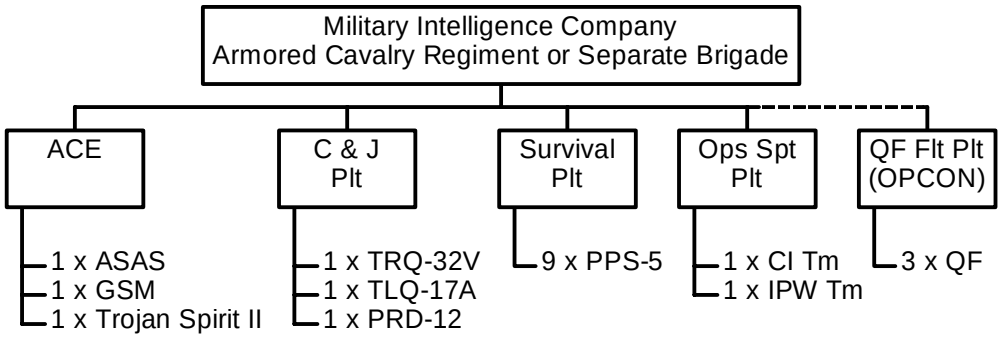


3-23. MILITARY INTELLIGENCE BATTALION: LIGHT, AIRBORNE, OR AIR ASSAULT DIVISION (OBJECTIVE TOE)

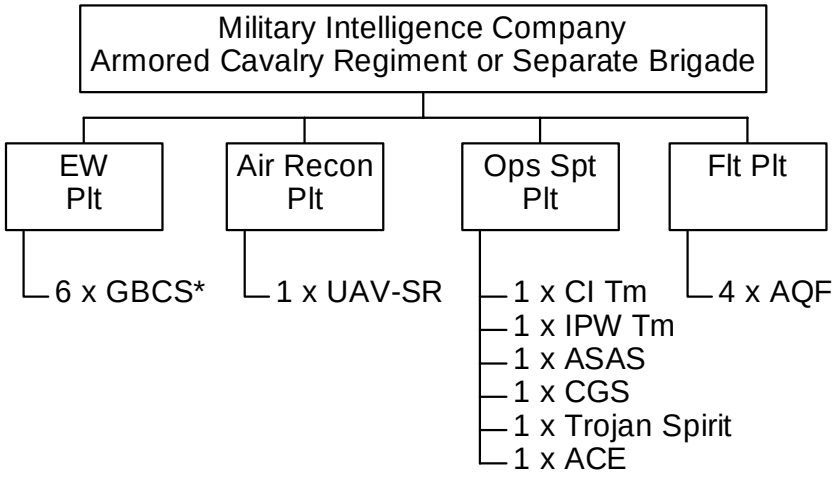


*Not fielded.

3-24. MILITARY INTELLIGENCE COMPANY: ARMORED CAVALRY REGIMENT OR SEPARATE BRIGADE (INTERIM MTOE)



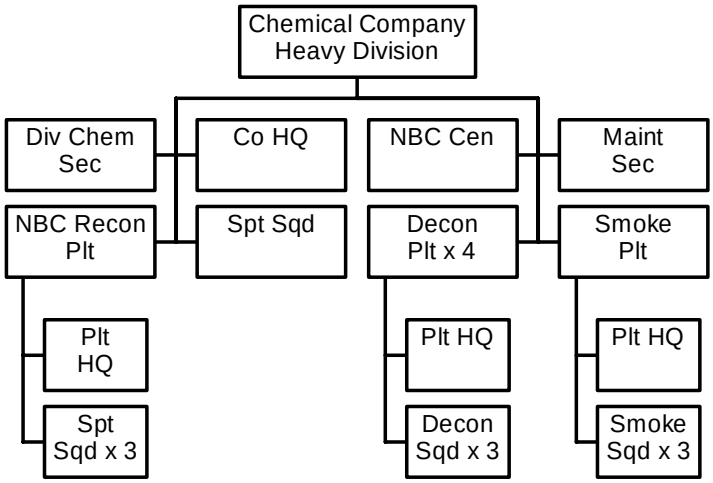
3-25. MILITARY INTELLIGENCE COMPANY: ARMORED CAVALRY REGIMENT OR SEPARATE BRIGADE (OBJECTIVE TOE)



*Not fielded

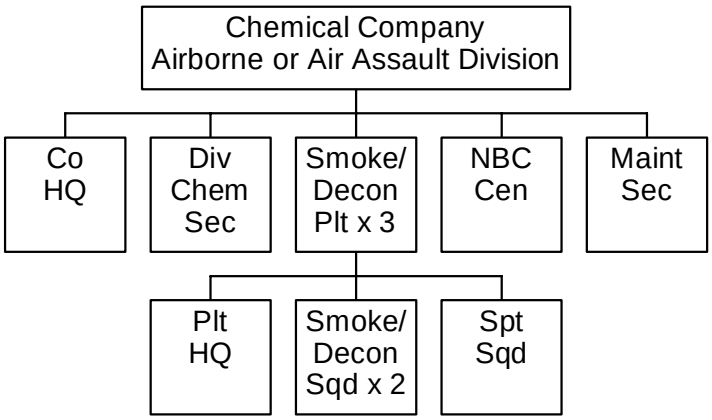
Section X. CHEMICAL

3-26. CHEMICAL COMPANY: HEAVY DIVISION



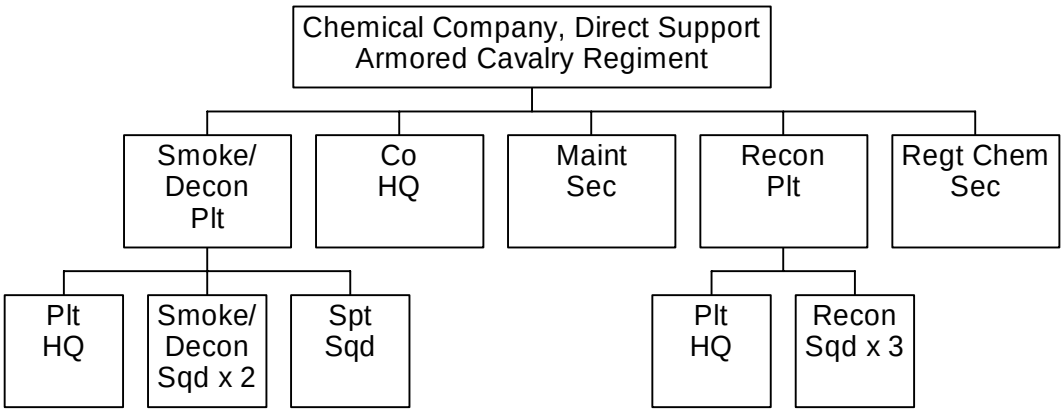
NOTE: The company has twenty-seven 5-ton trucks, fifteen 2 ½-ton trucks, fifteen tank and pump units (TPUs), twelve 500-gallon tanks, and twelve 300-gallon tanks that can be used to support many division missions.

3-27. CHEMICAL COMPANY: AIRBORNE OR AIR ASSAULT DIVISION



NOTE: The company has thirty-two 5-ton trucks, twenty-five HMMWVs, six 500-gallon tanks, and six 3,000-gallon tanks that can be used to support many division missions.

3-28. CHEMICAL COMPANY, DIRECT SUPPORT: ARMORED CAVALRY REGIMENT



Section X. EQUIPMENT

Weapon system	*Weapon Characteristics*	*Range*	*Mileage/Ammunition*
Bradley Stinger Fighting Vehicle	BSFV TOW 25-mm APDS HEI-T 7.62 coax mg Smoke GL Thermal Stinger (MANPADS)	300 miles 3,750 meters 1,700 meters 3,000 meters 900 meters 30 meters 2,000 meters 4,000 meters	42 mph hwy/30 xctry 5 rds 225 rds 675 rds 2,340 rds 16 rds 6 msls
M6, Linebacker	BSFV 25-mm APDS HEI-T 7.62 coax mg Smoke GL Thermal Stinger (External Pod)	300 miles 1,700 meters 3,000 meters 900 meters 30 meters 2,000 meters 4,000 meters	42 mph hwy/30 xctry 225 rds 675 rds 2,340 rds 16 rds 10 msls (4 in launcher, 6 on board storage)
Avenger	Stinger .50 cal mg	4,000 meters 1,500 meters	8 msls 200 rds
MANPADS	Stinger Team (2 Man) Stinger	300 miles (HMMWV) 4,000 meters	6 msls

System	*Characteristics*	*Range*	*Fire control*	*Weapons*
AH-64D Longbow	Twin engine Length 58 feet Height 16 feet 4 bladed GPS	400 km 3 hrs endurance	Fire control radar Detect, classify, prioritize 256 targets 32x optic FLIR	16 Fire & Forget Hellfire 20 km FFAR rockets 30-mm chaingun (4-km range) AIM-9 Sidewinder Antiradiation missile
RAH-66	Comanche Twin engine 5 bladed Cockpit overpressure Exhaust cooling Fly by wire 20-mm Gatling gun	1,200 NM 2.5 hrs endurance	Fire & Forget radar Radar warning IR jammer Radar jammer Laser warning	AIM-9 Sidewinder Air-to-air Stinger (14 max) Antiradiation missile 70-mm FFAR (9-k range)

CHAPTER 4

FORCE XXI ORGANIZATION AND EQUIPMENT

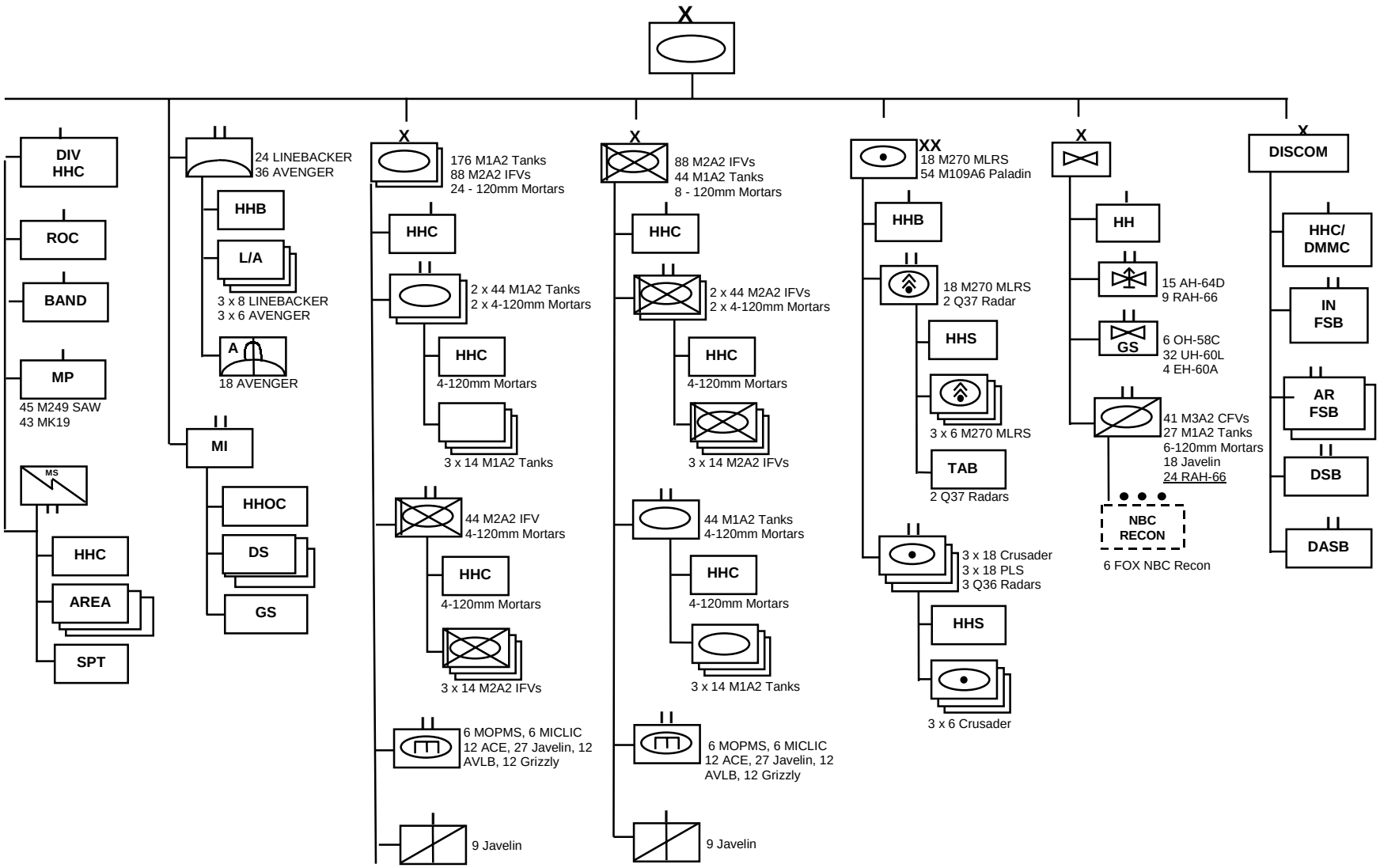
Section I. INTRODUCTION

4-1. GENERAL

This chapter provides organizational diagrams for units that can be found in a US Army Force XXI division.

Section II. DIVISION

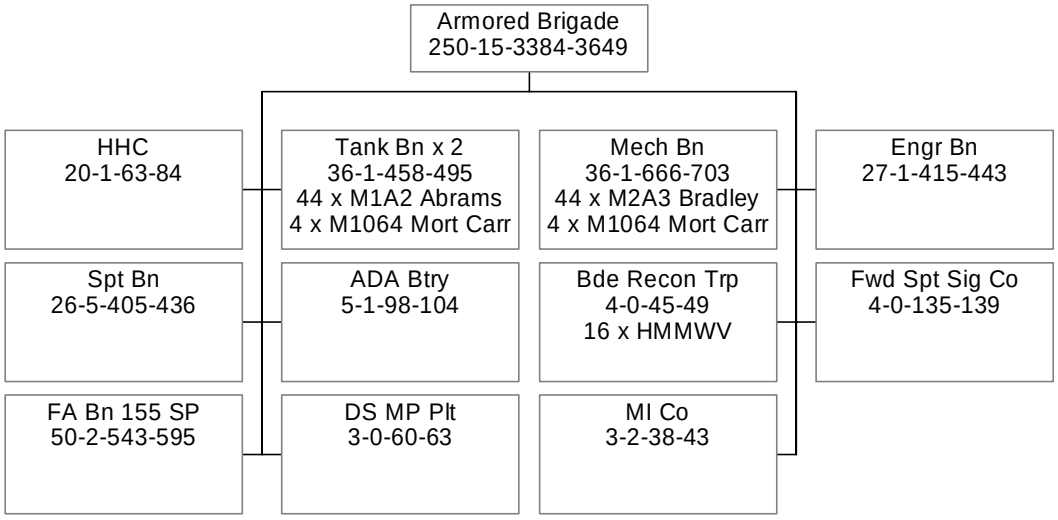
4-2. HEAVY DIVISION (FORCE XXI ARMOR DIVISION)



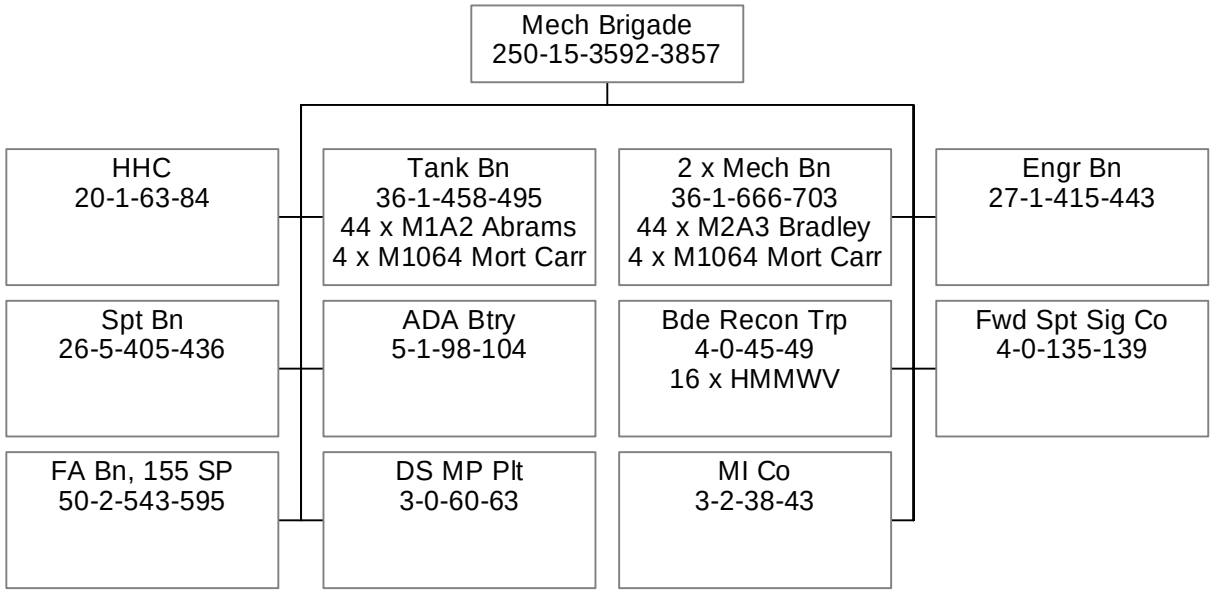
NOTE: The corps will provide chemical support to the division.

Section III. ARMORED AND MECHANIZED BRIGADES

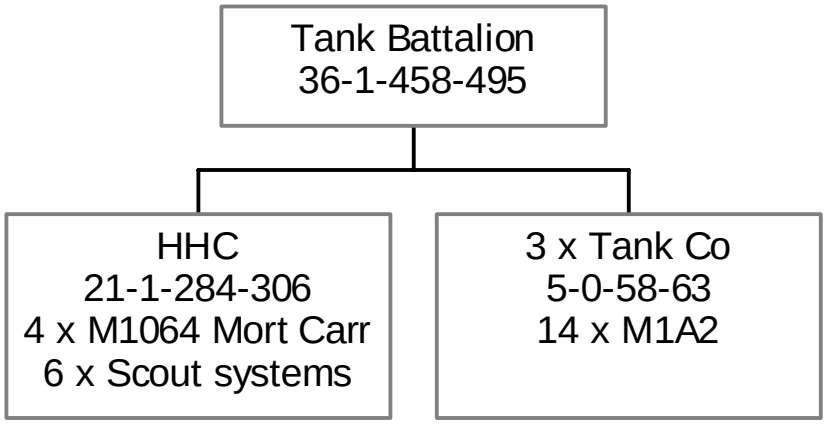
4-3. ARMORED BRIGADE



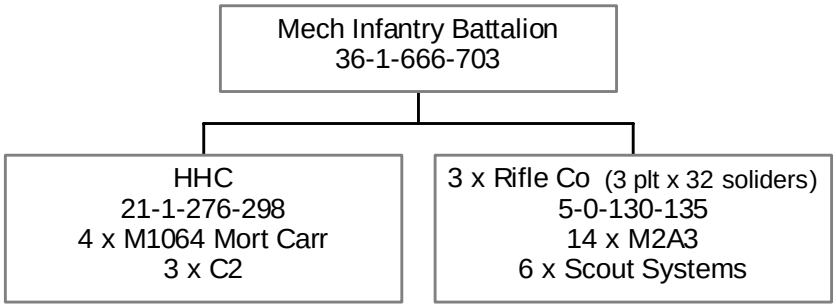
4-4. MECHANIZED BRIGADE



4-5. TANK BATTALION

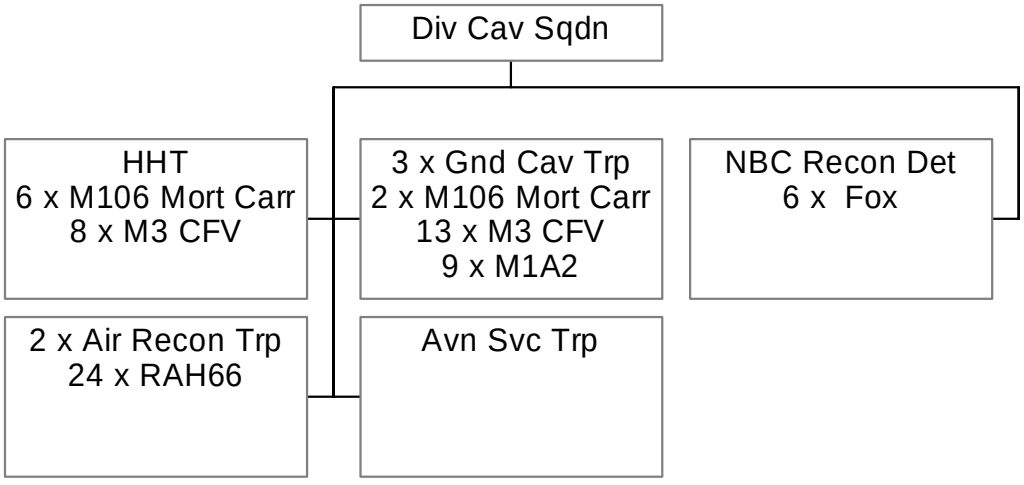


4-6. MECHANIZED INFANTRY BATTALION



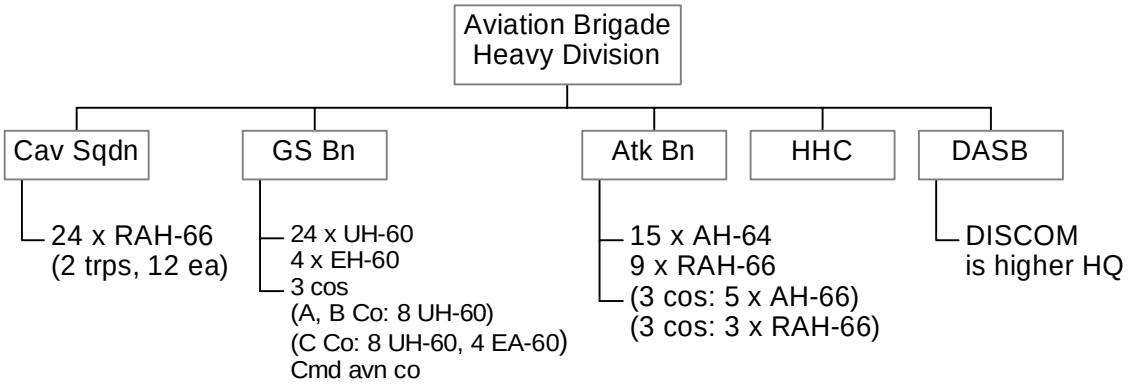
Section IV. GROUND CAVALRY UNITS

4-7. CAVALRY SQUADRON: HEAVY DIVISION



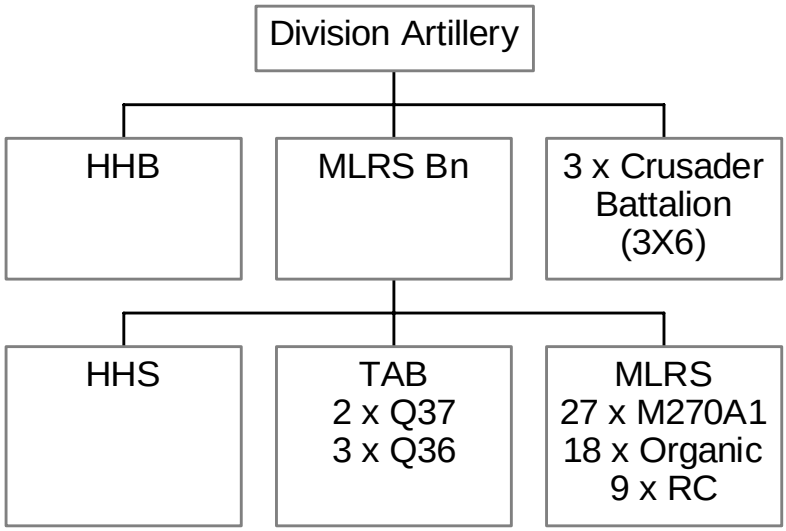
Section V. ARMY AVIATION

4-8. AVIATION BRIGADE: HEAVY DIVISION

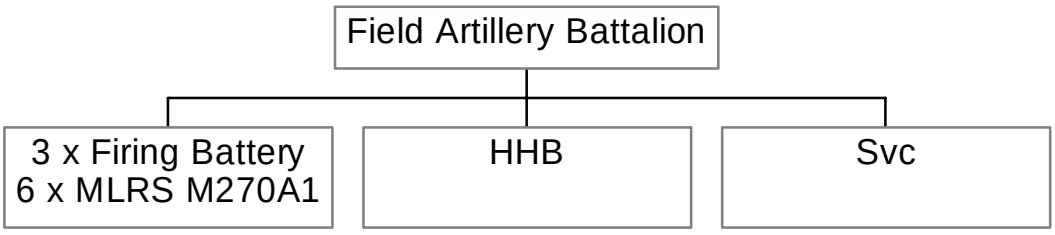


Section VI. ARTILLERY

4-9. HEAVY DIVISION ARTILLERY

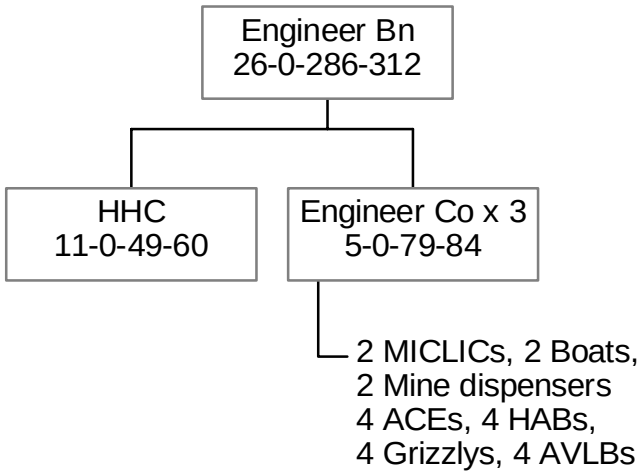


4-10. DIRECT SUPPORT ARTILLERY BATTALION: DIVISON ARTILLERY

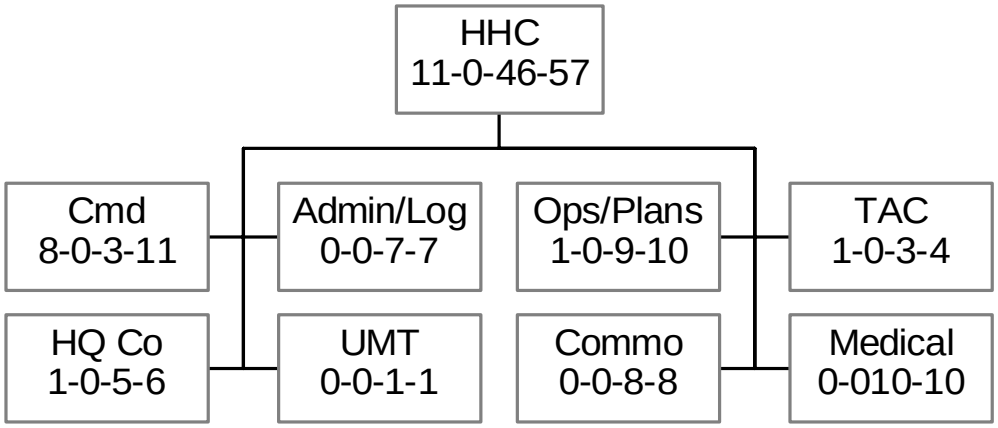


Section VII. ENGINEERS

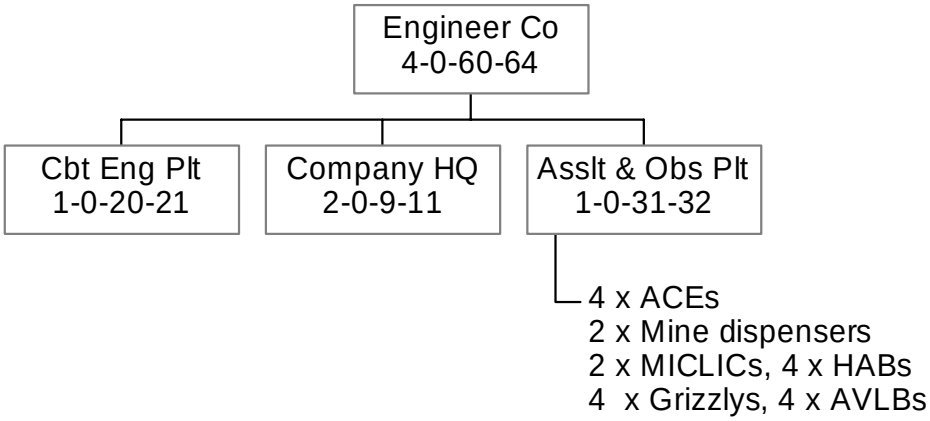
4-11. ENGINEER BATTALION



4-12. ENGINEER BATTALION HHC

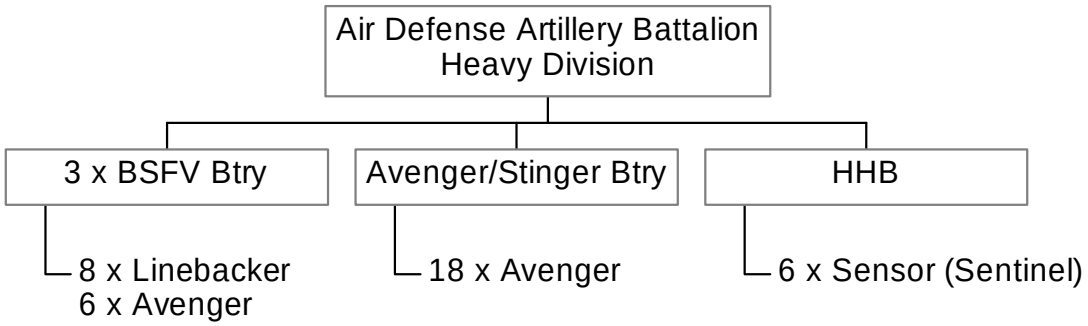


4-13. ENGINEER COMPANY

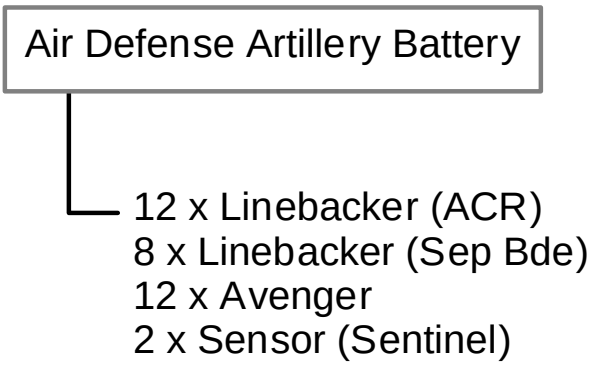


Section VIII. AIR DEFENSE

4-14. ADA BATTERY: HEAVY DIVISION

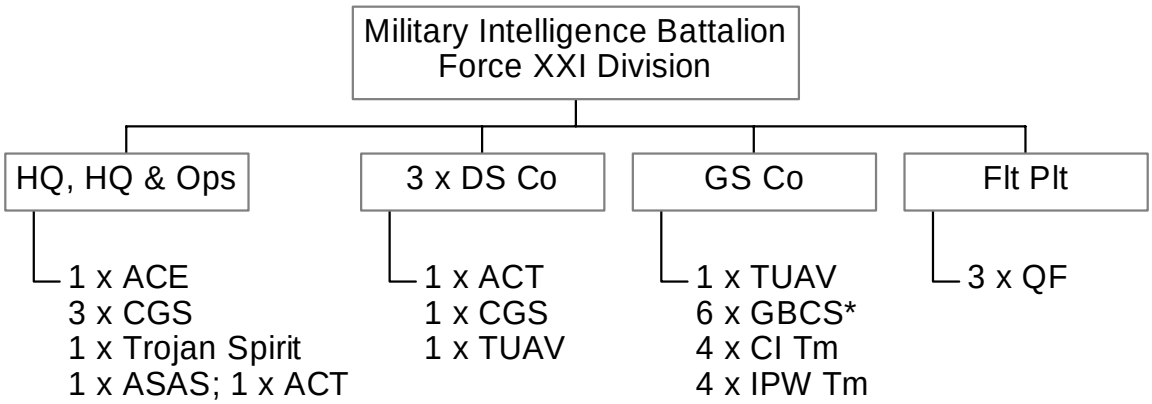


4-15. ADA BATTERY: ACR



Section IX. MILITARY INTELLIGENCE

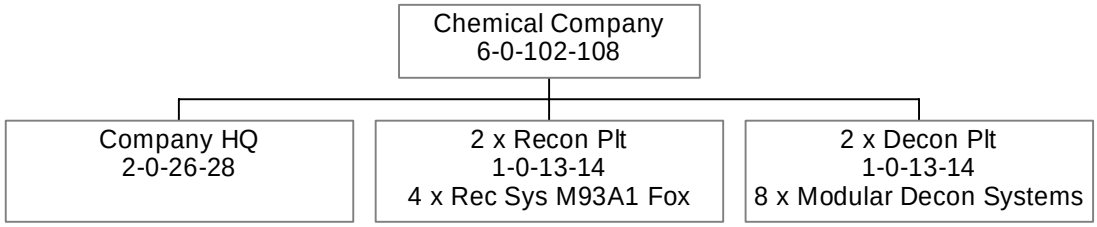
4-16. MILITARY INTELLIGENCE BATTALION



*Not fielded.

Section X. CHEMICAL

4-17. CHEMICAL COMPANY (RECON/DECON) (CORPS)



NOTE: The corps chemical company will augment the Force XXI Division.

Section XI. EQUIPMENT

Weapon system	*Weapon Characteristics*	*Range*	*Mileage/Ammunition*
Bradley Stinger Fighting Vehicle	BSFV TOW 25-mm APDS HEI-T 7.62 coax mg Smoke GL Thermal Stinger (MANPADS)	300 miles 3,750 meters 1,700 meters 3,000 meters 900 meters 30 meters 2,000 meters 4,000 meters	42 mph hwy/30 xctry 5 rds 225 rds 675 rds 2,340 rds 16 rds 6 msls
M6, Linebacker	BSFV 25-mm APDS HEI-T 7.62 coax mg Smoke GL Thermal Stinger (External Pod)	300 miles 1,700 meters 3,000 meters 900 meters 30 meters 2,000 meters 4,000 meters	42 mph hwy/30 xctry 225 rds 675 rds 2,340 rds 16 rds 10 msls (4 in launcher, 6 on board storage)
Avenger	Stinger .50 cal mg	4,000 meters 1,500 meters	8 msls 200 rds
MANPADS	Stinger Team (2 Man) Stinger	300 miles (HMMWV) 4,000 meters	6 msls

System	*Characteristics*	*Range*	*Fire control*	*Weapons*
AH-64D Longbow	Twin engine Length 58 feet Height 16 feet 4 bladed GPS	400 km 3 hrs endurance	Fire control radar Detect, classify, prioritize 256 targets 32x optic FLIR	16 Fire & Forget Hellfire 20 km FFAR rockets 30-mm chaingun (4-km range) AIM-9 Sidewinder Antiradiation missile
RAH-66	Comanche Twin engine 5 bladed Cockpit overpressure Exhaust cooling Fly by wire 20-mm Gatling gun	1,200 NM 2.5 hrs endurance	Fire & Forget radar Radar warning IR jammer Radar jammer Laser warning	AIM-9 Sidewinder Air-to-air Stinger (14 max) Antiradiation missile 70-mm FFAR (9-k range)

CHAPTER 5

MANEUVER

Section I. INTRODUCTION

5-1. GENERAL

a. *Maneuver* is a principle of war, an element of combat power, and a battlefield operating system.

(1) *Principle of war*: "Place the enemy in a position of disadvantage through the flexible application of combat power." (FM 100-5, Jun 93, p 2-5)

(2) *Element of combat power*: "* * * movement of combat forces to gain positional advantage, usually in order to deliver—or threaten delivery of—direct and indirect fires.* * * Commanders may achieve the effects of maneuver without movement by allowing the enemy to move into a disadvantageous position. * * * Maneuver is rarely effective without firepower and protection." (FM 100-5, Jun 93, p 2-10)

(3) *Maneuver operating system*: "* * * movement [or employment of forces] relative to the enemy to put him at a disadvantage * * * to create the conditions for tactical and operational success." (FM 100-5, Jun 93, p 2-13)

b. Infantry, armor, cavalry, and attack helicopter forces compose the maneuver operating system. In general, dismounted infantry is most effective during limited visibility, where fields of fire are limited, and where the battle must be decided by close, hand-to-hand combat. Mechanized infantry and armor forces are most effective where terrain favors mobile combat and provides fields of fire at extended ranges. Cavalry units, though designed to perform reconnaissance and security missions, defend or delay against larger forces when terrain favors mounted combat. Finally, attack helicopter units, though unable to seize terrain or effectively contend with a dug-in enemy, are highly mobile and can provide accurate, lethal, long-range antitank fires to destroy moving armored vehicles or deny avenues of approach

Section II. HEAVY MANEUVER

5-2. EMPLOYMENT OF HEAVY FORCES (FM 71-3)

a. *Capabilities*.

(1) Conduct sustained, mobile combat operations against enemy maneuver forces in a conventional, chemical, or nuclear environment.

(2) Operate as an attack or counterattack force and accomplish rapid movement in exploitation and pursuit.

(3) Accomplish limited penetrations.

(4) Conduct limited air assault (AASLT) operations to quickly seize critical objectives.

(5) Conduct dynamic defensive operations, dispersing over great distances and concentrating rapidly from widely separated areas.

(6) Conduct delaying actions against larger enemy heavy forces.

(7) Conduct security operations for a larger force.

b. Limitations (caused by the high density of tracked vehicles).

(1) Mobility and firepower are restricted by urban areas, dense jungles and forests, very steep and rugged terrain, and significant water obstacles.

(2) Substantial quantities of heavy equipment limit strategic mobility.

(3) Consumption of supply items is high, especially classes III, V, and IX.

(4) Tracked vehicles require heavy logistic support and often use railroad and highway transport for long, administrative ground moves.

5-3. HEAVY DIVISIONS

The heavy divisions of the US Army (armored and mechanized) provide mobile, armor-protected firepower. Because of their mobility and survivability, the Army employs heavy divisions over wide areas that afford them long-range and flat-trajectory fire. They destroy enemy armor forces and seize and control terrain. During offensive operations, heavy divisions can rapidly concentrate overwhelming combat power to break through or envelop enemy defenses. They then strike to destroy fire support, command and control (C^2), and service support elements. Using mobility for rapid concentration to attack, to reinforce, or to block, they defeat an enemy while economizing forces in other areas. Heavy divisions operate best in basically open terrain where they can use their mobility and long-range, direct-fire weapons to the best advantage.

5-4. HEAVY BRIGADES

a. General. The brigade mission is to close with and destroy enemy forces using mobility, firepower, and shock effect. Armored and mechanized infantry brigades are organized to fight on any part of the battlefield in a conventional, nuclear, or chemical environment. The key to victory in the brigade battle is the ability of the brigade to synchronize subordinate maneuver battalions and integrate combat support (CS) and combat service support (CSS) combat multipliers in support of the brigade effort as part of a division or corps operation. Brigades do not act independently but as part of a division or corps. Brigades can direct battles against enemy battalions and regiments up to 15 kilometers forward of the forward line of own troops (FLOT) by controlling task forces (TFs) and attack helicopter units, by establishing priorities of supporting artillery fires, and by coordinating United States Air Force (USAF) close air support (CAS) operations. The brigade influences the battle mainly through task organizing the TFs, assigning missions and sectors, applying force multipliers, assigning and shifting priorities of CS and CSS assets, and constituting and committing the reserve.

b. Divisional brigades. Most brigades are divisional and normally fight as part of a division. Divisional brigades are tactical HQ that control mission-tailored battalion TFs.

c. Separate heavy brigades. Separate brigades are organized for and are capable of conducting sustained operations under corps control. Unlike divisional brigades, they have fixed organizations that include combat, CS, and CSS units. They conduct operations under corps command and are organized to provide their own support.

5-5. MECHANIZED AND TANK BATTALIONS AND TASK FORCES (FM 71-123)

a. Battalions. Mechanized infantry and tank battalions are organized, equipped, and trained to accomplish compatible missions.

(1) The mechanized infantry battalion mission is to close with the enemy by means of fire and maneuver to destroy or capture him, or to repel his assault by fire, close combat, and counterattack.

(2) The tank battalion mission is to close with and destroy enemy forces using fire, maneuver, and shock effect, or to repel enemy assault by fire and counterattack.

b. Heavy task forces.

(1) *Task organizations*. Task organization increases the capability of tank and mechanized infantry battalions. Based on his assessment, the brigade commander task organizes tank and mechanized infantry battalions by *cross-attaching* companies between these units. The brigade commander determines the mix of companies in a TF. The battalion TF may be *tank-heavy* (more tank companies than mechanized companies), *balanced* (equal number of tank and mechanized companies), or *mechanized-heavy* (more mechanized companies than tank companies). Similarly, the TF commander's estimate may require cross-attaching platoons to form one or more *company teams* for specific missions.

(2) *Employment considerations.*

(*a*) The TF is the lowest echelon at which firepower, maneuver, intelligence, and support are combined under a single commander. Task forces normally fight enemy forces they can see and engage—this defines an area extending from less than 100 meters in forests, urban areas, or close terrain, out to about 5 to 6 kilometers from the battalion direct- and indirect-fire weapon systems.

(*b*) During the offense, the commander expects the battalion TF to defeat a defending enemy company. Following any penetration, the TF prepares to fight enemy battalion reserves (platoon or company). The TF has no separate rear operations and responds to rear threats as a part of the close fight.

(*c*) During the defense, the commander expects the battalion TF to defend against and defeat an enemy regiment or brigade. The battalion TF close fight consists of subordinate companies defeating the companies of the enemy first-echelon battalions and then defeating the companies of second-echelon battalions.

5-6. COMBAT FORMATIONS

Combat formations are designed to allow the unit to move on the battlefield, given enemy capabilities, in a posture suited to the senior commander's intent and mission. Each formation has its advantages and disadvantages. Subordinate units also employ combat formations, consistent with their particular situation. These formations are applicable for all tactical units, regardless of the echelon. Combat formations describe the general configuration of the unit on the ground. Terrain characteristics and visibility determine the actual location of units. Standard formations allow commanders to rapidly shift forces from one formation to another. This gives them the agility to take advantage of changes in the battlefield. All formations are a variant of the line or column formation. Units may employ any one or combination of six formations. When designating a formation, the commander considers—

- The relationship of one unit to another on the ground.
- Where the enemy will make contact and how he wants to act on it.
- Where he wants his firepower.
- The level of security desired.

a. Column formation. The unit moves in column formation when contact is not expected, the objective is distant, and speed and control are of the essence. Normally, the lead element uses traveling overwatch while the following units are in traveling formation. The column formation—

- Is easy to control, facilitates speed of movement, and is useful in restricted terrain.
- Is flexible and provides for quick transition to another formation or movement against a threat.
- Places minimum combat power forward.
- Places the majority of firepower to flanks.
- May inadvertently bypass enemy units or positions.

b. Line formation. The line formation arranges subordinate maneuver elements abreast. Since it does not dispose subordinates in depth, the line provides less flexibility of maneuver than other formations. It is used when continuous movement with maximum firepower to the front is required, such as during the assault, or when wide coverage is required. The line formation—

- Permits maximum firepower to the front and poor firepower to the flanks.
- Is difficult to control, especially in restricted terrain or during limited visibility.
- Facilitates the use of speed and shock in closing with the enemy.
- Allows for no reserve and limited overwatch force.

c. Wedge formation. The wedge best disposes forces to attack an enemy appearing to the front and flanks. The wedge is used when enemy contact is possible or expected, but the location and disposition of the enemy are vague. It is the preferred formation for a movement to contact as it initiates contact with the smallest element. When enemy contact is not expected, the wedge may be used to rapidly cross open terrain. The wedge formation—

- Facilitates control: orientation can be changed rapidly.
- Provides maximum firepower to the front and good firepower to the flanks.
- Can be quickly changed to the line, ”V,” echelon, or column formations.
- Is difficult to control in restricted terrain or poor visibility.
- Requires sufficient space to disperse subordinate units laterally and in depth.
- Allows the unit to make contact with one element while retaining the remainder to maneuver.
- Initiates contact with the smallest elements.

d. ”V” formation. The “V” formation disposes the unit with two elements abreast and one or more trailing. This arrangement is most suitable to advance against an enemy known to be to the front. It may be used when enemy contact is expected and the location and disposition of the enemy are known. The “V” formation—

- Is less easy to reorient than the wedge; it is very difficult to control in restricted terrain.
- Provides for maximum firepower forward and good firepower to the flanks.
- Facilitates a continuation of maneuver after contact is made and a rapid transition to the assault.
- Can be quickly changed to the line, wedge, or column.
- Requires sufficient space for dispersal laterally and in depth.

e. Echelon formation. The echelon formation arranges the unit diagonally right or left. It is commonly used by units operating on the flank of a larger formation. The echelon formation—

- Provides for firepower forward and in the direction of echelon.
- Facilitates control in open areas: control is more difficult in restricted areas.
- Facilitates a continuation of maneuver after contact is made.
- Can be quickly changed to any other formation.

f. Box formation. The box formation arranges the unit with forward and trail elements. The box formation can easily be changed to any other formation. It is used to facilitate rapid movement, yet still provide adequate security. The box formation—

- Provides firepower to the front and flanks.
- Can be quickly changed to other formations.
- Is easy to control; it facilitates speed of movement.
- Requires sufficient space for dispersion laterally and in depth.
- Is recommended for use in the pursuit.

5-7. EMPLOYMENT OF A MECHANIZED INFANTRY PLATOON

a. This platoon consists of two mounted sections of two vehicles each and two dismounted infantry squads of nine men each. A mounted section consists of two Bradley fighting vehicles (BFVs) and two crews. A squad consists of the squad leader and two fire teams.

b. The platoon HQ and augmentees are distributed on two BFVs.

c. A squad leader is responsible for dismounted squad training and employment.

d. The Bradley commander is responsible for BFV crew training and employment.

Section III. CAVALRY AND SCOUT

5-8. GENERAL

Cavalry is organized in six basic designs: ACR (heavy), ACR (light), heavy division cavalry squadron, light division cavalry squadron, air reconnaissance squadron, and separate cavalry troop. These designs reflect the role of the cavalry unit and the organizational characteristics of the parent unit. There are field manuals that discuss these organizational designs in detail. Major commands (MACOMs) will modify tables of organization and equipment (TOEs). When the commander assigns combat missions to divisional or regimental cavalry units, he must realize that the structure of the divisional and regimental cavalry units is quite different. Some cavalry units may require augmentation to accomplish specific tasks.

	Recon			*Security*						*Economy of force role*					
	Route	Area	Zone	Screen	Guard	Cover	Area	Route	Convoy	Hasty attack	Attack	MTC	BP	Sector	Delay
ACR (heavy)		X	X	X	X	X				X	X	X		X	X
Squadron		X	X	X	X					X	X	X		X	X
Troop	X	X	X	X						X	X	X	X	X	X
Sct plt	X	X	X	X						O		O	O	O	O
RAS		X	X	X						X		X			X
Air trp	X	X	X	X						X	O	X			X
ACR (light)		X	X	X	⊗	⊗				⊗	⊗	⊗		⊗	⊗
Squadron		X	X	X	⊗					⊗	⊗	⊗		⊗	⊗
Troop	X	X	X	X						⊗	⊗	⊗	⊗	⊗	⊗
Sct plt	X	X	X	X						O		O	O	O	O
CAS		X		X						X	O	X			X
Air trp	X	X	X	X						X	O	X			X
Hvy div cav sqdn		X	X	X	X					X	X	X		X	X
Troop	X	X	X	X						X	X	X	X	X	X
Sct plt	X	X	X	X						O		O	O		O
Air trp	X	X	X	X						X		X		O	X
Light div cav sqdn		X	X	X						⊗	⊗	⊗			⊗
Troop	X	X	X	X						⊗	⊗	⊗	⊗	⊗	⊗
Sct plt	X	X	X	X						O		O	O	⊗	O
Air trp	X	X	X	X						X	O	X		O	X
TF sct plt	X	X	X	X											

⊗ = METT-T dependent; may require reinforcement. Threat composition must be equal to or less than unit in respect to firepower, survivability, and maneuverability.

O = Nondoctrinal but capable, given METT-T.

5-9. ARMORED CAVALRY REGIMENTS

a. Employment.

Corps framework	*Offense*	*Defense*
Deep	Perform recon and security for other heavy forces conducting operations. In conjunction with other heavy forces, attack into enemy rear to destroy enemy second-echelon forces, CS units, and supply bases and to disrupt LOC. Perform economy of force to release other heavy forces for deep operations.	Same as offense.
Close	Augment an attacking division.	Conduct defensive operations in an economy of force role or as part of a larger force. Conduct counterattack.
Rear	Support corps deception plan. Perform area security mission, area surveillance, or recon. As TCF, attack and defeat enemy Level III threat.	Same as offense.
Reserve	Serve as corps reserve in economy of force role or as part of larger force.	Same as offense.
Reconnaissance/ security	Conduct reconnaissance and security for the corps either to front, flanks, or rear.	Conduct covering force operations. Conduct flank security.

b. Characteristics.

(1) Flexible combined arms team.

(2) Armored and air cavalry elements combined into air-ground teams.

(3) Mobility and agility.

(4) Shock and violent execution.

c. Fundamental role of ACRs (heavy). The ACR facilitates the corps commander's ability to maneuver brigades and divisions, concentrate superior combat power, and apply combat power against the enemy at a decisive time and place. Primary tasks (not necessarily missions themselves) that cavalry organizations perform for the commander include—

(1) Providing fresh information about terrain and weather.

(2) Providing reaction time and maneuver space.

(3) Preserving combat power.

(4) Restoring command and control.

(5) Facilitating movement.

(6) Performing rear operations.

d. Operations.

(1) *Reconnaissance*.

(a) The regiment does not usually perform *route* reconnaissance.

(b) The regiment performs *zone* reconnaissance as part of a covering force mission. The regimental squadron may perform the zone reconnaissance as a primary mission. The reconnaissance is conducted by advancing with troops abreast to check all routes and terrain and to locate all enemy forces. If contact is made, the regimental squadron develops the situation through standard actions on contact.

(c) Depending on the factors of METT-T, an air cavalry troop can be assigned to reconnoiter part of the zone on its own or with attached ground elements. It may be kept in reserve, it may support ground elements with scout-aeroweapon teams, or it may secure the front and/or flanks of advancing cavalry troops.

(d) The regiment does not normally conduct an area reconnaissance. It assigns the mission to one of its squadrons or to an air cavalry troop. Except for movement to and from the area, an area reconnaissance is conducted the same as a zone reconnaissance. A cavalry squadron or troop moves to and reconnoiters one large area or several small, dispersed areas. Emphasis is placed on reaching the area quickly. The squadron develops enemy situations encountered en route only enough so that elements can bypass them and report.

(e) In tasking cavalry to perform reconnaissance operations, commanders and staff planners must consider the time element. Reconnaissance operations normally are detailed and time consuming to execute.

(2) S*ecurity missions*.

(a) The regiment with a screen mission assigns sectors or zones to its squadrons. The squadrons then assign sectors or zones to their troops. The air cavalry may be given a sector or a zone, but it usually supplements the efforts of the squadron(s) by extending the screen in length, or depth, or both.

(b) The ACR will normally be assigned cover or screen missions. The squadrons may be assigned a screen or guard mission to execute the regimental mission.

(c) When the ACR acts as an advance covering force for a main body moving to contact, the force moves as in a zone reconnaissance. In the cover for a defending force, the covering force defends or delays as required. Field artillery, engineers, AD, intelligence resources, and CSS should heavily support the covering force. This reinforcement increases the distance and length of time the regiment can operate away from the main body and the capability of the regiment to destroy the enemy. Squadrons, troops, and platoons normally conduct covering force operations as a part of a larger force.

(3) *Economy of force operations*. In addition to the primary cavalry roles of reconnaissance and security that relate directly to security and surprise (two principles of war), heavy cavalry traditionally executes economy of force missions. The commander's calculated acceptance of risk identifies the requirements for attack, defend, delay, and supporting operations. The commander may employ minimum resources in selected areas to concentrate combat power at a decisive location and time in his AO. His focused mass (combat power) may require economy of force missions to deceive the enemy about his actual maneuver.

e. A*rmored cavalry regiment (light).* The ACR (light) is a self-contained combined arms organization capable of being packaged and rapidly deployed by air or sealift as part of a force projection Army responding to worldwide contingencies. The role of the ACR (light) may be traditional, initial entry, or follow-on. The traditional role would support a US corps or TF through a reconnaissance, a security, and/or an economy-of-force capability. As an initial entry force, the ACR (light) would support Army or joint task force (JTF) operations with credible force as a demonstration of US resolve. In the follow-on role, the ACR (light) would follow an opposed entry force (division ready brigade (DRB) type) to expand the point of entry, to provide reconnaissance and security, and to serve as the initial combat-capable maneuver force. Because of the C^2 structure and support base within the regiment, it is a very modular organization capable of rapidly integrating heavy forces into its task organization. This factor supports the army with a force that can be tailored for the situation and expanded once it is deployed to a theater if the situation dictates the need for heavy forces. The ACR (light) typically supports the contingency corps. It is often reinforced by corps CS units and divisional maneuver battalions. The ACR (light) operates independently over a wide area and at extended distances from other units. The ACR (light) is a highly mobile, light-armored force capable of fighting the fully mechanized, motorized, or dismounted threat in the environmental states of war or conflict. It is also capable of military SASO in a peacetime environment. When the ACR (light) is supporting a light corps, limitations may exist in corps support capabilities, strategic mobility, and terrain restrictions.

5-10. CAVALRY SQUADRONS

Cavalry squadrons perform reconnaissance and security missions. When appropriately reinforced, cavalry units can perform offensive and defensive missions.

a. Regimental armored cavalry squadron (heavy). The cavalry squadron in the ACR (heavy) usually functions as part of its parent ACR, but it may operate separately. The squadron can conduct reconnaissance missions or offensive or defensive missions as an economy of force mission. Its mobility and firepower suit it for exploitation and pursuit missions. In the defense, cavalry, with its combined arms organization through troop level, is well suited as an economy of force element to delay over-extended frontages, to defend secondary avenues of approach, or to fight beside divisional units from battle positions (BPs) as part of the regiment. Its organic systems provide long-range antiarmor engagement capability. Its tactical mobility facilitates rapid lateral or indepth movement on multiple routes. Further, these capabilities make the cavalry a potent counterattack force.

b. Division cavalry. The mechanized or armored division cavalry squadron is assigned to the aviation brigade; however, the squadron is normally tactically employed by division HQ. The light division cavalry squadron in the aviation brigade of the light infantry division possesses a significant tactical mobility advantage over the infantry battalions in the division. The air cavalry squadron is a highly mobile, armed force organized as part of the airborne and AASLT divisions. It is also organic to those corps without an ACR. It is equipped predominantly with air cavalry troops. When present, the ground troops are mounted in high-mobility, multipurpose, wheeled vehicles (HMMWVs).

5-11. BATTALION SCOUT PLATOON

The battalion is the lowest tactical echelon with its own organic reconnaissance and security assets. The battalion scout platoon comprises two scout sections and a C^2 section. Each scout section comprises two scout squads with two HMMWVs; each HMMWV has a three-man crew. One HMMWV in each squad may carry a military motorcycle (the military motorcycles have not been approved for implementation or fielded by Army tank and mechanized infantry battalions). Depending on the MTOE, the platoon should have five Javelin or Dragon antitank weapon systems. The platoon is also equipped with electro-optics to enhance reconnaissance and surveillance capabilities. These systems include the UAS-11 night observation device long-range (NODLR), the AN/PVS-4 individual weapons sight, the AN/PVS-7 night-vision goggles (NVGs), the AN/PAS-7 hand-held thermal viewer, M22 binoculars, and the M49 telescope.

Section IV. LIGHT INFANTRY OPERATIONS

5-12. DOCTRINE

Light infantry, AASLT, and airborne units each possess unique skills and operational design. These units are generally more deployable and have less firepower than mechanized infantry units, but they share the common mission to close with and destroy the enemy. Because AASLT and airborne are a means of delivery to the battlefield, airborne and AASLT forces are also referred to as light forces.

a. Operations in depth. Due to their unique organized structure, each of these units possesses differing capabilities to conduct combat across the depth of the battlefield.

(1) *Deep*. Unlike heavy divisions, these light forces do not have MLRS and/or the Army Tactical Missile System (ATACMS) in their DIVARTY. However, they do possess unique capabilities to conduct deep maneuver.

(*a*) *Light infantry division*. The light infantry division conducts deep operations using attack aviation and ground maneuver. The light infantry division is ideally suited to conduct deep maneuver by infiltration. Unless augmented by additional assault aviation units, the light infantry division cannot conduct major forcible entry operations. Due to its small size, it is more deployable than any other division.

(*b*) *AASLT division*. The AASLT division possesses both an attack aviation brigade and an assault aviation brigade. With its three attack battalions (AH-64), the AASLT division can conduct significant deep operations. Using its organic assault and medium helicopter battalions, it can also transport the assault elements of an entire AASLT brigade with CS and CSS in one lift. Consequently, it can conduct forcible entry operations within the range of its helicopters. However, if using sealift or airlift, the AASLT division is not as strategically deployable as an airborne or a light division because of its large number of organic helicopters.

(*c*) *Airborne division*. Using airborne assault, the airborne division can conduct deep operations on any suitable drop zone (DZ). It has the unique capability to conduct forcible entry operations anywhere in the world from the continental United States (CONUS) without using an intermediate staging base (ISB). The size of the operation is limited only by the amount of airlift allocated to the mission and USAF aircraft available for fire support and CSS.

(2) *Close*. Due to their limited firepower, protection, and ground tactical mobility, these three divisions are best suited for close operations in restricted terrain, limited visibility, adverse weather, and urban warfare; however, light forces can be attached to armored units to conduct specific, special operations for a short time.

(3) *Rear*. These three types of light forces generally conduct rear operations in the same manner. Because of the size and logistic requirements of its large aviation brigade, terrain management and sustainment will be most demanding for the AASLT division.

b. Unique planning procedures. AASLT and airborne operations are both backward planned (the ground tactical operation is planned first and all preceding phases are planned afterward) using closely related phases. The four phases of planning airborne operations are ground tactical, landing, air movement, and marshaling. The five phases of AASLT operations are ground tactical, landing, air movement, loading, and staging. Although the number and names for the phases differ when planning the two types of operations, both are similar in that the ground tactical plan dictates the preceding phases.

5-13. EMPLOYMENT CONSIDERATIONS

a. *Common employment considerations*. All light forces share the following common—

(1) *Capabilities*.

(*a*) Effectively maneuver in areas that restrict the mobility of mechanized forces.

(*b*) Seize, occupy, and retain terrain.

(*c*) Employ all forms of mobility, such as trucks, helicopters, aircraft, rafts, etc.

(*d*) Operate under limited visibility, with or without night vision devices.

(*e*) Close with and destroy the enemy.

(*f*) Employ organic and supporting direct and indirect fires to defeat heavy forces.

(2) *Limitations*.

(*a*) When operating on foot, light forces are not as mobile as heavy forces.

(*b*) Light forces are vulnerable to all types of observed fire, especially artillery and CAS.

(*c*) Infantry battalions possess limited organic CS and CSS assets.

(*d*) Light forces that require high-level mission-oriented protective posture (MOPP) have severely degraded combat power.

(*e*) Light forces have a limited antitank capability.

b. *Capabilities and limitations of a light infantry division*.

(1) *Capabilities*. The light infantry division can—

(*a*) Attack to defeat light enemy forces or seize terrain. It can attack to defeat heavy enemy forces on close terrain if augmented.

(*b*) Reinforce forward-deployed forces by fully integrating into their operating and support structure. The light infantry division is particularly useful as an economy-of-force unit on close terrain, allowing deployed heavy units freedom for decisive employment elsewhere.

(*c*) Operate for 48 hours without external support.

(*d*) Conduct military operations on urbanized terrain (MOUT).

(*e*) Conduct rear operations within the limits of organic tactical mobility assets.

(*f*) Integrate and command and control combat, CS, and CSS augmentation forces.

(*g*) Participate in amphibious operations that are not a part of a forced entry.

(*h*) Conduct AASLT operations within the limits of organic aviation assets.

(*i*) Reinforce or be reinforced by airborne, AASLT, ranger, special, or heavy forces.

(2) *Limitations*. The light infantry division—

(*a*) Has limited vehicular mobility.

(*b*) Has limited aircraft capability.

(*c*) Has limited antiarmor capability.

(*d*) Has limited protection from conventional and nuclear fires.

(*e*) Has limited capability for NBC reconnaissance, deliberate smoke production, and decontamination.

(*f*) Cannot conduct a forced entry operation.

(*g*) Operates without redundant systems.

(*h)* Requires external CSS after 48 hours.

(*i*) Requires local air superiority and possibly naval support for deployment into a hostile area.

c. Capabilities and limitations of an AASLT division.

(1) *Capabilities.* An AASLT division can—

(*a*) Attack into otherwise inaccessible areas.

(*b*) Overfly barriers, bypass enemy positions, achieve surprise, and cause the enemy to react prematurely or disclose his positions to other attacking forces.

(*c*) Concentrate, disperse, or redeploy rapidly to extend the division AO, to develop enemy contact, or to decrease division vulnerability to enemy attack.

(*d*) Maintain a rapid tempo of operations by fighting simultaneously in more than one direction or in more than one AO.

(*e*) Conduct operations under adverse weather conditions and during limited visibility to facilitate deception and surprise.

(*f*) Rapidly move field artillery (FA) by air and conduct artillery raids.

(*g*) Conduct airhead operations without external support for approximately 2 days.

(2) *Limitations.*

(*a*) Helicopters cannot fly in extremely severe weather conditions.

(*b*) Secure landing zones, in the AO, are needed to land units prepared to employ fire and movement (tactical integrity).

(*c*) The division has minimum ground transportation.

d. Capabilities and limitations of an airborne division.

(1) *Capabilities.* The airborne division can—

(a) Conduct an airfield seizure to secure a lodgment for follow-on airland forces.

(b) Conduct a combined arms combat parachute assault to seize and secure vital objectives behind enemy lines until linking up with other supporting forces.

(c) Rescue US nationals besieged overseas.

(d) Reinforce forward-deployed forces (if augmented with transportation).

(e) Serve as a strategic or theater reserve.

(f) Conduct large-scale tactical raids.

(g) Occupy areas or reinforce friendly units beyond the immediate reach of ground forces.

(h) Capture one or more ISBs for forward operating bases (FOBs) for ground and air operations.

(2) *Limitations*. An airborne division—

(a) Must rely on the USAF airlift for initial entry into battle and for resupply until linkup with ground forces.

(b) Requires more CAS than normally provided to infantry divisions because it is organized with only light FA. The absence of medium and heavy FA limits support for maneuver battalions and reduces the ability to deliver counterfire and to suppress enemy AD.

(c) Has limited ground and air mobility once delivered into the objective area. The nine infantry battalions are footmobile. Truck transport normally moves supplies. Using these trucks for troop movement hampers the division logistic effort. The assault aviation companies of the aviation brigade can lift the assault elements of only two rifle companies at one time.

(d) Is vulnerable to attack by enemy armor or motorized formations because of its limited antiarmor capability. Substantial numbers of tube-launched, optically tracked, wire-guided (TOW) and Dragon missiles in the division may help but do not completely offset this limitation.

(e) Is unsuited for operations in a nuclear, chemical, or biological environment.

Section V. AVIATION

5-14. DOCTRINE

a. Principles.

(1) *Fight as an integral part of the combined arms team.*

(a) The aviation brigade must be integrated into the overall scheme of maneuver.

(b) Aviation provides the commander with speed, flexibility, and firepower throughout the entire battlefield.

(c) Aviation performs well with other branches (combat, CS, and CSS).

(d) The aviation brigade increases the tempo of operations.

(e) The use of aviation helps ensure the enemy has to fight in more than one direction.

(2) *Exploit the capabilities of other branches and services.*

(a) Tactical air, naval gunfire, and EW strengthen and support aviation capabilities.

(b) Combined effects of Sister services and allied forces amplify aviation lethality and survivability.

(3) *Capitalize on intelligence-gathering capabilities.*

(a) Aviation provides real-time information on the enemy, weather, and terrain.

(b) Aviation brigade requires external intelligence sources for thorough mission planning.

(4) *Suppress enemy weapons and acquisition means.*

(a) Suppression of enemy air defenses (SEAD) is accomplished using attack helicopters, ground weapons, electronic warfare (EW), fire support (FS), and other service air assets.

(b) Aircraft survivability equipment (jammers, chaff, flares) enhances survivability.

(5) *Exploit firepower*. Use aviation to—

(a) Destroy point targets.

(b) Provide area suppressive fires.

(c) Observe and adjust indirect fires.

(d) Strike decisively at the enemy from any direction.

(e) Move, position, and resupply infantry, air defense, antitank, and artillery.

(f) Provide rapid aerial resupply of critical combat assets.

(6) *Exploit range and target standoff.*

(a) Hellfire missiles provide lethal fires to targets inaccessible to shorter-range weapon systems.

(b) Standoff enhances aviation survivability.

(7) *Exploit mobility*.

(a) Move to strike the enemy from almost any direction.

(b) Air assaults and air movements can concentrate or disperse forces rapidly.

(8) *Exploit surprise*. Surprise the enemy with firepower and mobility.

(9) *Mass effects*. Reposition at critical points on the battlefield to exploit enemy weaknesses.

(10) *Use terrain for survivability*. Minimize exposure to direct fire and target acquisition for survivability and to conceal friendly locations or intentions.

(11) *Displace forward elements frequently*. Relocate HQ, forward arming and refueling point (FARP), and assembly areas to reduce detection and increase survivability.

(12) *Maintain flexibility*. Aviation—

(a) Allows commanders the flexibility to adapt rapidly to developing situations.

(b) Can respond quickly to disrupt the enemy with effective firepower.

(13) *Support deception*. Aviation can support deception plans in a variety of missions.

(14) *Exercise staying power*. Aviation can provide continuous operations in nearly all weather conditions when provided adequate service support.

b. Combat missions.

(1) *Reconnaissance and security*. Conduct raids, feints, demonstrations, counterattacks, joint air attack team (JAAT) operations, covering force operations, and reconnaissance-in-force operations.

(2) *Attack*. Attack against concentrated armor or light forces, provide aerial security, perform JAAT operations, overwatch ground forces during movement or passage of lines, reinforce ground forces by fire, and provide SEAD.

(3) *Air assault*. Conduct raids; bypass obstacles; reinforce encircled forces; extract stay-behind forces; conduct deception operations; support retrograde operations; support breakout of encirclement; conduct counterattacks and reliefs; establish an airhead in the enemy rear area; insert or extract long-range surveillance forces; rapidly react to rear area threats; block movement of enemy forces; seize and retain key terrain; and support exploitation, pursuit, lodgment, linkup, and river-crossing operations.

(4) *Theater missile defense* (emerging doctrine). This is a joint mission using deep attacks to destroy missile launch platforms, C^4I nodes, and missile stocks.

(5) *Special operations*. Special operations aviation (SOA) units conduct special operations with specialized aircraft. These units support strategic and operational objectives. Examples of missions include deep reconnaissance, limited deep attacks, insertion of special operations forces (SOF), combat search and rescue, and special intelligence gathering.

c. Employment.

(1) The attack helicopter battalion (AHB) has three eight-ship attack helicopter companies. AHBs are employed in three ways:

(a) Maximum destruction. Simultaneous three-company attacks on one engagement area (EA).

(b) Phased. One company attacks, a second company quickly follows it, and a third company relieves the first company on station.

(c) Continuous. One company attacking, one en route, and one in the forward arming and refueling point (FARP).

(2) The attack helicopter battalion has the primary mission of attacking enemy armored and/or artillery formations. Deep attack is the primary mission of corps AHBs.

(3) The aviation group provides C^2 aircraft and assault and cargo helicopter support to the corps.

(4) The command aviation battalion (CAB) provides GS to the corps HQ, the separate combat brigades, and the corps CS HQ. It also contains aerial observer aircraft for corps artillery.

(5) The assault helicopter battalion has two 15-ship assault helicopter companies (UH-60). The corps may employ either an assault helicopter company or an entire assault helicopter battalion to support a major subordinate command (MSC). The battalion can also augment the medium helicopter battalion for logistic transport operations.

(6) The medium helicopter battalion contains four 16-ship medium helicopter companies (CH-47). These companies must perform the bulk of the air movement missions within the corps AO.

(7) The combat support aviation battalion (CSAB) provides dedicated support to the attack helicopter regiment and utility support to the corps.

(8) Attack helicopters are most effective when employed against moving targets. (FM 17-95, p 5-6)

(9) In the close battle, greater distances and obstacles to vision (smoke, dust, etc) reduce the crew's ability to conduct target identification; potential for fratricide increases.

CHAPTER 6

INTELLIGENCE

6-1. MISSION OF INTELLIGENCE

Intelligence provides timely, concise, accurate, relevant, and synchronized intelligence and electronic warfare (IEW) support to tactical and operational commanders across the range of military operations. IEW operations in peace support the deterrence of war. In war and SASO, IEW operations support the winning of battles and campaigns. IEW operations reduce uncertainty and risk to US forces and permit the effective application of force.

a. Intelligence. Intelligence supports the Army as a whole through the intelligence operating system. The intelligence operating system is a flexible and tailorable architecture of procedures, organizations, and equipment that responds to the intelligence needs of commanders at all echelons. It consists of intelligence collection and analysis assets at each echelon from the national level down to the maneuver battalion level.

Since no echelon has all the organic intelligence capabilities it needs to fully support the commander, IEW assets must be employed to support the needs of all echelons. This support is comprehensive and reaches across the range of military operations.

b. Commander drives intelligence. The commander drives the intelligence effort. The commander's role in IEW is central to the success or failure of IEW in operations, not just when the crisis begins, but well before and throughout the operation. The commander directs the intelligence effort by selecting and ranking intelligence requirements. He designates the CCIR, the information the commander needs to visualize the outcome of operations. The staff assists the commander in developing intelligence requirements and will generate additional ones in support of the concept of operations and targeting as needed. The commander and staff establish these requirements to fill the gaps and voids in unit common understanding of the battlefield.

6-2. INTELLIGENCE

a. Distinction. A distinction can be made between intelligence and information. Much information is used in the development of intelligence. If raw data can be used for fire or maneuver as received, with no interpretation or integration with other data, it is combat information. Combat information is unevaluated data gathered by or provided directly to the tactical commander that, due to its highly perishable nature, cannot be processed into intelligence in time to satisfy the user's requirements. Once raw data is validated, integrated, compared, and analyzed, it becomes intelligence. In other words, the distinction between intelligence and combat information is in how the information is handled and used. If information must be processed and analyzed, it is intelligence and not combat information.

b. The intelligence cycle. Intelligence operations follow a five-step process known as the intelligence cycle. The intelligence cycle is focused on the commander's mission and concept of operation. The principal of the cycle is intelligence synchronization. Each step within the cycle must be synchronized with the commander's decisionmaking and operational requirements to successfully influence the outcome of the operations.

(1) *Plan and direct*. Planning and directing involves task organizing MI assets; identifying personnel, logistics, and communications requirements; identifying, ranking, and validating intelligence requirements; developing a collection plan; issuing requests for information on collection and production; and monitoring the availability of collection information. Priority intelligence requirements (PIR) and information requirements (IR) derive from this phase. (See para 6-3 for further PIR discussion.)

(2) *Collect*. Collecting includes acquiring information and providing this information to processing and production elements. (FM 34-2)

(3) *Process*. Processing is the conversion of collected information into a suitable form that can be readily used by intelligence personnel to produce intelligence. Processing includes data form and format conversion, photographic development, transcription and translation of foreign language material, and printing.

(4) *Produce*. Producing involves the integration, evaluation, analysis, and synthesis of information from single or multiple sources into intelligence. The time constraints and demands of the battle for the S2's tactical units tend to make the processing and producing steps indistinguishable.

(5) *Disseminate*. Disseminating intelligence is the conveyance of intelligence to users in a usable form. The diversity of forms and means requires interoperability among C^4I systems.

c. Intelligence disciplines and functions. To clearly describe MI, the intelligence areas are divided into four intelligence disciplines—human intelligence (HUMINT), imagery intelligence (IMINT), measurement and signature intelligence (MASINT), and signals intelligence (SIGINT)—and two multidiscipline intelligence functions—counterintelligence (CI) and technical intelligence (TECHINT). To be effective and minimize threat deception, every intelligence operation must attempt to use all disciplines. The disciplines themselves must complement and cue each other for maximum effectiveness. Rarely will separate disciplines produce a comprehensive picture of the threat. Instead, each discipline will produce bits and pieces of information that analysts will synthesize to approach a total picture. (For detailed discussion see FM 34-1, chap 2.)

d. Primary intelligence tasks. MI accomplishes its mission through six primary tasks that generate intelligence synchronized to support the commander's mission and intelligence requirements. The six tasks can be thought of as the mission-essential task list (METL) for intelligence. The six intelligence tasks are—

- Provide indications and warning (I&W).
- Perform intelligence preparation of the battlefield (IPB).
- Perform situation development.
- Perform target development and support to targeting.

- Support force protection.

- Perform battle damage assessment (BDA).

(1) *Indications and warning.* The commander uses I&W for early warning to prevent surprise through anticipation and to reduce risk from enemy actions that are counter to planning assumptions. This enables him to quickly reorient the force to unexpected contingencies or to shape the battlefield by manipulating enemy activities. I&W helps a commander decide whether to maintain or increase unit readiness levels if hostilities are likely. In force projection operations, I&W provides the commander time to plan and surge the intelligence effort for the impending operation. Detection of developments that may initiate force projection operations requires intelligence readiness be developed and maintained through pre-crisis intelligence operations.

(2) *Intelligence preparation of the battlefield.* The commander uses IPB to understand the battlefield and enemy. This enables him to use weather, terrain, and enemy methods of operation to synchronize battlefield operating systems (BOSs) for maximum effect. It also helps him understand the limits of the operation. The G2/S2 orchestrates the staff effort in performing IPB. IPB integrates the effects of the operational environment, weather, and terrain with the doctrine and anticipated intentions of potential opponents and reveals enemy capabilities and vulnerabilities to help determine the enemy course of action (COA). IPB enables the commander to plan the operation and time its execution to achieve desired effects or to structure conditions for future operations. The process consists of four steps:

- Define the battlefield environment.

- Describe the battlefield's effects.

- Evaluate the threat.

- Determine threat COAs.

These three principal types of templates are developed during the IPB process.

Template	*Description*	*Purpose*
Doctrinal	Depicts enemy doctrinal deployment for various types of operations without constraints imposed by weather and terrain. Compositions, formations, frontages, depths, equipment numbers and ratios, and high-value targets (HVTs) are types of information displayed.	Illustrates the disposition and activity of threat forces and assets (HVTs) conducting a particular operation unconstrained by the effects of terrain and weather.
Situation	Depicts how the enemy might deploy and operate within the restraints imposed by the weather, terrain, and current strength.	Identifies critical enemy activities and locations. Provides a basis for situation and target development and HVT analysis.
Event	Depicts locations where critical events and activities are expected to occur and where HVTs will appear. Provides a basis for collection operations and for locating and tracking HVTs.	Analyzes time-related events within critical areas. Depicts where activity (or its lack) will indicate which COA the threat has adopted.

For a detailed discussion on IPB, refer to FM 34-130.

(3) *Situation development*. The commander uses situation development to help understand the battlefield, thereby reducing risk and uncertainty while executing his plan. Situation development provides an estimate of enemy combat effectiveness. Based on the results of continuous IPB, it confirms or denies enemy COAs and explains what the enemy is doing in relation to the friendly force commander's intent. Situation development helps the commander in his decisions to execute branches and sequels as the operation develops. Situation development is especially demanding for MI units. As an asset manager, the MI commander must anticipate and war game the collection positions for each of his IEW systems throughout the operation. Based on the results of this war gaming, the MI unit commander may prompt the staff of the supported unit to reconsider select elements of its plan.

(4) *Target development and support to targeting*. The commander uses intelligence in target development to effectively employ the fire support operating system for nonlethal electronic attack and lethal fires. Target development provides targets and targeting for attack by fire, maneuver, and electromagnetic means.

Given a selected COA and the input generated by the IPB process, target priorities can be developed. The target value analysis (TVA) process identifies potential critical enemy functions that could interfere with the friendly COA or are essential to the successful completion of the enemy mission. These critical enemy functions are called high-value targets (HVTs). Both the fire support and the intelligence systems further develop HVT priorities in their target attack and collection plans.

See FM 6-20-10 and FM 34-130 for further discussion on intelligence support to targeting.

(5) *Force protection*. Force protection analysis gives the friendly commander a good estimate of what the enemy commander will see and not see of our operation and allows the commander to plan for operations security (OPSEC). Force protection analysis allows the friendly commander to—

- Identify enemy intelligence collection capabilities.
- Assess friendly vulnerabilities from the perspective of the enemy.
- Identify risk to the force.
- Contribute to avoiding enemy collection once the risk is identified.
- Plan for OPSEC, deception, and other security measures.

For further discussion on intelligence support to force protection see FM 34-60.

(6) *Battle damage assessment*. The commander uses BDA to determine if his operational and targeting actions have met his conditions for initiating subsequent COAs. If the desired operational conditions have not been met, BDA gives the commander the information necessary to decide if, when, and how the targets should be reengaged.

BDA provides a timely and accurate analysis in terms of damage and impact on enemy combat effectiveness. BDA includes physical and functional damage assessments as well as target system assessment. The most accurate BDA is derived from multiple sources and the results of all-source analysis. The commander maximizes his limited intelligence assets when developing BDA and targeting requirements at the same time as his other intelligence requirements.

The commander determines BDA-related PIR and ranks them against his other PIR during the "decide" phase of the targeting process. The G2/S2 integrates the commander's BDA-related PIR into the intelligence collection plan and synchronizes the PIR collection with the target engagement windows. Since allocating collection resources for BDA could divert IEW assets from other missions, BDA-related PIR should only address the commander's most critical requirements. The G2/S2 ensures intelligence collected on BDA-related PIR is integrated into the targeting process, specifically the G3/S3 combat assessment (CA).

Success in the BDA process is achieved when the commander has the necessary information to quickly decide when to—

- Proceed with his original concept of operations.
- Restrike a target to ensure the desired effect is accomplished.
- Adjust the concept of operations because the desired effect cannot be achieved with constrained resources.

6-3. DEVELOPING PRIORITY INTELLIGENCE REQUIREMENTS

During analysis and comparison of friendly COAs (staff war gaming), the staff identifies a set of intelligence requirements for each potential friendly COA. Each requirement supports a friendly decision expected to occur during execution of a COA. This is the basis of the command list of intelligence requirements.

To this list are added those requests received from higher units—in the form of intelligence acquisition tasks—and lower units—in the form of requests for intelligence. After arranging the list of requirements in priority order, the collection manager recommends the most important to the commander as PIR. The commander approves the ranked-in-priority list of intelligence requirements and designates those tied directly to his decision points (DPs) as PIR. A unique PIR list should be developed for each friendly COA.

Good PIR meet the following criteria:

- They provide intelligence required to support a single DP.
- They ask only one question.
- They focus on a specific fact, event, or activity.

IR are those items of information regarding the enemy and the environment that need to be collected and processed to meet the PIR of the commander. Once determined, PIR and IR focus the entire planning and supervising effort for the intelligence operating system.

6-4. INTELLIGENCE SYNCHRONIZATION

Successful intelligence synchronization provides critical intelligence on time and on target. Synchronization begins with the decisionmaking and targeting processes. Taken together, these processes identify the decisions that must be made during the execution of a COA. These decisions drive the intelligence requirements of the command. Every identified decision should be supported by an intelligence requirement.

Intelligence synchronization is the process that ensures the intelligence system provides answers to IR in time to influence the decision they support. The S2 develops specific orders or requests (SORs) that synchronize the activities of the intelligence collectors with the specific IR. The S2/collection manager ensures that—

- All requirements are fully supported by a set of SORs.
- Collection and reporting timelines deliver intelligence in time to influence each decision.
- Time is planned and allocated for collection, processing, and dissemination.

The S2/collection manager is the key to intelligence synchronization. He checks to ensure that all decisions identified during COA development are supported by intelligence requirements. He then manages the collection process to ensure that—

- Collection supports all intelligence requirements.
- All SORs support some intelligence requirement.
- Collection strategies are properly "backwards planned" to ensure timely receipt of intelligence.
- Collectors and processors have dissemination guidelines.
- Collectors execute the strategies within the timelines each IR dictates.

6-5. INTELLIGENCE PREPARATION OF THE BATTLEFIELD SUPPORT TO THE MILITARY DECISIONMAKING PROCESS

a. Mission analysis. Prior to staff mission analysis, the G2/S2 should attempt to provide as many of the following products as possible. At the conclusion of mission analysis, the G2/S2 will complete the following products:

- Modified combined obstacle overlay (MCOO) for terrain analysis.
- Threat model, to include doctrinal templates, description of threat tactics and options, and a list of HVTs.
- Enemy situation templates.
- Initial event template.
- Suggested PIR list.

b. COA development. Incorporating the results of IPB into COA development ensures that each friendly COA takes advantage of the opportunities that the environment and the enemy situation offer and ensures that each COA is realistic. During COA development, the G2/S2—

- Designates the most dangerous enemy COA.
- Develops an initial reconnaissance and surveillance (R&S) plan and/or collection plan.

c. COA analysis. Based on the results of the war gaming, the G2/S2—

- Refines and ranks in priority suggested PIR.
- Identifies supporting intelligence requirements.
- Refines the enemy COA models and event matrices (if necessary), focusing on the intelligence required to execute the friendly COA.
- Refines the R&S plan and/or collection plan.
- Develops the BDA plan.

d. Execution. As the battle progresses, the staff uses IPB to continuously evaluate the situation facing the commander. Therefore, it is critical that the G2/S2 update the IPB products as the situation dictates, to include the—

- MCOO.
- Situation templates.
- PIR.
- R&S plan and/or collection plan.

Further discussion on intelligence support to the military decisionmaking process (MDMP) is found in FM 101-5 and FM 34-130.

6-6. ELECTRONIC WARFARE

Electronic warfare (EW) is an essential component of command and control warfare (C^2W). Effective use of EW as a decisive element of combat power requires coordination and integration of EW operations with the commander's scheme of maneuver and FS plan. The integrated use of EW throughout the battlefield supports the synergy needed to locate, identify, damage, and destroy enemy forces and enemy C^2 structure. EW can provide the commanders with substantial capabilities to electronically influence and control the battlefield.

a. Army EW operations are developed and integrated as part of the commander's overall concept of operations. Within the staff—

- The G3/S3 is responsible for planning and coordinating EW operations.

- The G2/S2 identifies EW support requirements and forwards them to the collection manager in the ACE.

- The ACE subsequently issues SORs to support these requirements. The EW assets are generally a mix of ground and air systems, and they can be augmented and tailored to support operational requirements.

b. EW includes three major components.

(1) *Electronic warfare support (ES)*—

- Gathers information by intercepting, locating, and exploiting enemy communications (radios) and noncommunications emitters (radars).

- Gives the commander timely information on which he can base his immediate decisions.

- Focuses on the commander's immediate needs for identifying enemy intent and targeting information.

(2) *Electronic attack* uses lethal and nonlethal electromagnetic energy to damage, destroy, and kill enemy forces.

- Nonlethal EA (jamming) degrades or denies the enemy effective use of his C^2 structure and information systems.

- Electronic deception causes an enemy to misinterpret what is received by his electronic systems.

(3) *Electronic protection (EP)* protects personnel, facilities, or equipment from the effects of friendly EW or enemy EW that degrades or destroys friendly communications and noncommunications capabilities.

6-7. PLANNING AND EXECUTING INTELLIGENCE AND ELECTRONIC WARFARE SUPPORT

a. *IEW supports commanders*. Commanders use IEW support to anticipate the battle, understand the battlefield, and influence the outcome of operations. IEW enables commanders to focus, leverage, and protect their combat power and resources. All commanders use IEW to support force protection, and, while IEW support is required for every situation, each application will be tailored to the commanders' requirements at each echelon and for each operation.

b. *Commander's intelligence team.* The G2/S2 and the MI commander are a team whose mission is to provide IEW support to the commander. As a team, they are responsible to the commander for planning and directing the intelligence activities of the command. Together, they develop standards for intelligence training and operations.

(1) *G2/S2*. The G2/S2 is the commander's senior intelligence officer and primary staff officer for intelligence at Army service component through battalion. The G2/S2—

- Directs and supervises the commander's intelligence and CI operations.

- Ensures the commander is supported with timely intelligence, targets, and BDA.

- Supports the intelligence needs of all staff elements (i.e., G3/S3, G4/S4, fire support coordinator (FSCOORD) or fire support officer (FSO)).

- Coordinates the employment of IEW assets with the scheme of maneuver and scheme of fires.

- Prepares and issues SORs to supporting MI units.

- Maintains close and continuous contact with IEW elements at higher echelons to ensure the commander's critical IEW needs are understood and acted on.

- Supervises the intelligence training of the unit and intelligence staff.

- Ensures the all-source analysis system (ASAS) is used to the full extent of its capability.

(2) *MI commander*. The MI commander executes IEW operations using his organic and attached assets. He is the primary executor of G2 intelligence tasking and G3 EW tasking. The MI commander—

- Provides the commander with a trained and mission-ready IEW force.

- Develops MI leaders capable of leading small teams in SASO and companies or battalions in war.

- Is responsible for the C^2, sustainment, and protection of his MI unit.

- Ensures his unit executes the G2/S2 intelligence SORs and G3/S3 EW SORs in concert with the concept of operations.

- Anticipates the IEW operational requirements of future operations.

6-8. INTELLIGENCE OPERATIONS

a. Operation concept.

(1) *Concept of employment.* US forces must be prepared to face forces of varying degrees of sophistication anywhere in the world. These critical tasks lead to the success of any operation:

- The synchronization of intelligence collection and production with commander's requirements.
- The rapid processing of combat information from all sources.
- Effective and timely dissemination of intelligence to commanders.

(2) *Analysis and control element.* The mission of the ACE is to produce and disseminate intelligence and to focus collection resources so that it can provide the information the commander needs to make decisions. The ACE provides centralized collection management and analysis for multiple assets covering all intelligence disciplines. These assets can include national, theater, and tactical intelligence. The ASAS is the primary intelligence processing system supporting the ACE in both divisions and corps.

The ACE integrates the functions of collection management, dissemination, targeting, analysis, all-source production, and technical control into a single intelligence staff element. The ACE is a flexible, dynamic organization designed to support the environment of force projection operations.

(3) *ACE interface with the commander's intelligence team.* Under the direction of the G2, the ACE employs the ASAS to direct, process, produce, and disseminate intelligence to support decisionmaking and targeting. The MI commander works closely with the ACE and provides collection and nonlethal targeting from MI assets.

At the brigade level, the S2 and supporting DS MI commander form the intelligence team. ASAS workstations from the S2 section and the MI company form an ACT. The ASAS workstation in the DS company may operate as either a collateral workstation or a sensitive compartmented information (SCI) workstation, depending on mission requirements.

The division ACE and the MI battalion work together to accomplish collection management in support of the division. This requires close coordination between the ACE and the MI battalion, whether through physical collocation or electronic connection. The MI battalion tactical operations center (TOC) should collocate with the division main CP whenever the tactical situation permits. When not collocated, or when operating in split-based operations, the MI battalion TOC should provide a liaison to the ACE.

At both corps and division levels, the ACE, in coordination with G2 plans and operations, performs requirements management. The ACE also provides mission management and specific operational and technical tasking of assets, while the MI battalion maneuvers assets, coordinates with maneuver forces, and performs asset management.

(4) *ASAS at corps and division.* The requirement for the ASAS is based on the need for automated support to assist in the timely receipt, processing, analysis, and reporting of large volumes of intelligence data. This volume of information is generated when the vast capabilities of national, joint,

and army intelligence collectors are focused on the needs of tactical commanders. At both the corps and division-level ACEs, the ASAS provides the G2 with—

- Automated intelligence collection requirements management.
- Multidisciplined collection mission management.
- Support to indications and warning.
- Single and all-source processing.
- Situation development.
- Target development.
- Limited BDA support.
- Multidisciplined CI support for force protection.
- Message dissemination.

At corps, the ASAS is organic to the operations battalion of the corps MI brigade. The corps ACE and the MI brigade work together to accomplish collection management in support of the corps.

At division, the ASAS in the ACE is organic to the headquarters, headquarters and operations company (HHOC) of the division MI battalion. Collateral workstations are organic to the division and brigade HHCs.

(5) *Deployable intelligence support element (DISE).* The DISE is a small, tactically tailored, forward-deployed intelligence support team designed to support initial entry forces in force projection operations. Army organizations from corps through brigade can form a DISE from assets in their organic and DS MI organizations. The mission of the DISE is to provide the commander accurate, detailed, and timely intelligence received from the intelligence support base (corps, theater, and national intelligence assets and agencies). The DISE brings together communications, automated intelligence fusion, and broadcast downlinks in a small but powerful package.

The DISE generally consists of one to three HMMWVs with communications shelters, intelligence processors, and analysts. It is normally equipped with—

- ASAS computer workstations.
- TROJAN SPIRIT (satellite communications) (SATCOM).
- JSTARS (GSM/CGS).

6-9. TACTICAL INTELLIGENCE ORGANIZATIONS

Military intelligence units are organic and assigned from separate brigade or regiment to corps level. The MI unit organization charts and their associated systems are listed in chapter 2.

a. *Military intelligence brigade (corps).* The corps MI brigade (para 2-51) is structured to provide reinforcing support to divisions, separate brigades, and cavalry regiments and GS to the corps.

(1) *Composition*. The MI brigade comprises three battalions:

(*a*) *The headquarters and operations battalion* provides the G2 the ACE, intelligence special purpose communications, single-source processors, GSMs, and the ASAS.

(*b*) *The tactical exploitation (TE) battalion* provides long-range surveillance, enemy prisoner of war (EPW) interrogation, document exploitation, and CI.

(*c*) *The aerial exploitation (AE) battalion* operates and maintains special electronic mission aircraft and unmanned aerial vehicles (UAVs) in GS of corps operations.

(2) *Support relationships.*

(*a*) The HQ and operations battalion, the AE battalion, and the TE battalion are in general support of the corps.

(*b*) Elements of the AE battalion and the TE battalion may be detached to reinforce subordinate corps units. This reinforcement will usually be for interrogators, CI agents, and UAV control. When reinforcing, these units will respond to tasking from the reinforced HQ in priority over corps tasks.

(*c*) Elements of the AE and TE battalions are assigned a general support reinforcing (GSR) role when additional flexibility is needed to meet a rapidly changing tactical situation.

b. *Military intelligence battalion (division).* The MI battalion in both the heavy and light divisions (paras 2-52 through 2-55) are structured to provide one DS company to each of the three ground maneuver brigades. A GS company remains at division level to support the division commander's intelligence needs.

(1) The DS companies provide organic EPW interrogation, CI, UAV control, automated intelligence and combat information processing, analysis, display and dissemination (CGS), ground-based SIGINT and EW, and IEW-specific maintenance. The company supports the brigade in a doctrinal DS mission. The company responds to tasking, in priority, from the brigade and then the parent MI battalion. The brigade S2 supervises the collection, analysis, and dissemination of combat information and intelligence. The company commander positions assets to accomplish the mission tasking from the brigade by controlling technical operations and is the mission and asset manager.

(2) The GS company provides general IEW support to the division. It provides tactical SIGINT and EW (GBCS) and UAV launch, recovery, maintenance, and control. It can also weight the DS companies as the situation requires.

(3) The HHOC provides the integrated collection management, technical control, and all-source analysis element to the G2 and automated intelligence processing, display, and dissemination (CGS, ASAS, and intelligence special-purpose communications).

(4) The QUICKFIX platoon, organic to the aviation brigade, is habitually OPCON to the MI battalion. It operates in GS to the division to allow for greater collection range and depth.

(5) Long-range surveillance units (LRSUs) (light divisions only) operate in GS to the division and are deployed 15 to 80 kilometers forward of the division FLOT to observe selected named areas of interest (NAIs).

c. Military intelligence company (separate brigade or ACR) (paras 2-56 and 2-57). Organic to a cavalry regiment or separate brigade, this company will be a conduit for combat intelligence flowing to the S2 and from the S2 to corps or division.

(1) This company will bring the maneuver unit direct access to corps and division intelligence and indirect access to theater- or component-level intelligence. It provides an automated intelligence processing, display, and dissemination capability (CGS), and, depending on individual force design, CI and interrogation, ground-based SIGINT/EW, analysis, intelligence special purpose communications, UAV control capability, and IEW-specific maintenance.

(2) The primary mission of this MI unit is to develop, assess, and disseminate combat information and intelligence required by the cavalry or separate brigade commander for maneuver, reconnaissance and counterreconnaissance, security operations, and economy of force operations, and to target critical enemy nodes directly.

CHAPTER 7

FIRE SUPPORT

Section I. DOCTRINE

7-1. GENERAL

This chapter discusses all elements of FS—FA, mortars, EW, naval gunfire (NGF), air interdiction (AI), and CAS, as well as a brief section on psychological operations (PSYOP) as one element of combat power. It discusses major weapon systems, roles and missions, capabilities and limitations, planning considerations, and other requirements necessary for effective employment of FS assets.

Fire support is the collective and coordinated use of indirect fire weapons, armed aircraft, and other lethal and nonlethal means in support of a battle plan. Lethal fire support includes mortars, FA, NGF, and air-delivered weapons. Nonlethal means are EW capabilities of MI organizations, PSYOP, illumination, and smoke. The combined arms commander employs these means to support his scheme of maneuver; to mass firepower; and to delay, disrupt, or destroy enemy forces in depth. Fire support destroys, neutralizes, and suppresses enemy weapons, enemy formations, and enemy indirect fire systems.

7-2. FIRE SUPPORT AS A BATTLEFIELD OPERATING SYSTEM

Firepower provides the destructive force essential to defeating enemy ability and will to fight. Synchronizing fires with maneuver is critical to the successful prosecution of combat operations. Fire support is the collective and coordinated employment of the fires of armed aircraft and land- and sea-based indirect fire systems against ground targets to support land combat operations.

Generating effective firepower against an enemy requires that organic and supporting fires be coordinated with other BOSs, such as intelligence, logistics, and command and control. Except for certain ground direct-fire weapons, the weapons and systems discussed here are in the category of FS.

a. *Mortars* are organic to light infantry companies and to light infantry, mechanized infantry, and tank battalions. They are high-angle, relatively short-range, high rate of fire, area-fire weapons. Their mobility makes them well suited for close support of maneuver. They are ideal weapons for attacking targets on reverse slopes, in narrow gullies, in ditches, in MOUT, and in other areas that are difficult to reach with low-angle fire. Mortars are especially effective for smoke and illumination missions. They provide excellent initial smoke coverage with white phosphorus (WP) ammunition because of their high rate of fire. They can provide immediate illumination within the company or battalion area.

b. *Naval gunfire*, when available, gives the maneuver commander long-range, rapid-fire, indirect fires. Depending on the hydrography and orientation of the ground operation, NGF may provide deep indirect fire attacks on enemy formations and installations. The NGF assets remain under the control of the Navy and, if threats are made to naval operations, the target attack priorities of the ship may cause it to hold or cancel land force fire missions until the other threats are subdued.

c. *Combat air support* gives the maneuver commander the capability to see and attack targets throughout his area of operations. Those elements of the air mission most relevant to FS are—

(1) *Close air support*. CAS is an operation directed against a target near friendly forces and requires detailed planning and integration with the fire and movement of those forces.

(2) *Air interdiction*. AI is an operation directed against targets that are not near friendly forces. It is most often employed in support of maneuver force deep operations.

The availability of air sorties at a particular echelon depends on the apportionment, allocation, and distribution decisions made at echelons above corps (EAC). The Air Force provides a tactical air control party (TACP) at all echelons of maneuver from battalion through corps. The TACP provides technical expertise on the employment of air support, communications for directing CAS and requesting immediate CAS, and assistance in requesting planned air sorties.

d. Army aviation performs the full spectrum of combat, CS, and CSS missions. To assist FS, Army aviation may provide aerial forward observation, air movement of weapon systems and/or ammunition, aerial mine delivery, and, on an exceptional basis, attack helicopters to provide aerial rocket fire.

e. Electronic warfare is an essential element of FS. In addition to its intelligence-producing capability, it is considered a nonlethal attack means. It can, when integrated into the overall concept of the operation, confuse, deceive, delay, disorganize, and locate the enemy. Electronic attack, in particular, provides a nonlethal alternative or supplement to attack by fire and maneuver. It is especially well suited for targets that cannot be located with targeting accuracy or that require only temporary disruption. For further discussion on EW, see chapter 6.

f. Field artillery destroys, neutralizes, or suppresses the enemy by cannon, rocket, and missile fire and helps integrate all FS into combined arms operations. Field artillery provides close support to maneuver forces, counterfire, and interdiction as required. These fires neutralize, canalize, or destroy enemy attack formations or defenses; obscure enemy vision or otherwise inhibit enemy ability to acquire and attack friendly targets; and destroy targets deep in the enemy rear with long-range rockets or missiles.

g. Psychological operations, as a nonlethal means of fire support, offers numerous activities designed to discourage and disrupt enemy operations while protecting those of friendly forces.

7-3. CORPS EMPLOYMENT OF FIRE SUPPORT IN OPERATIONS IN DEPTH

Mission		*Operation*		*Fire support*			
				Field artillery	*EW*	*Interdiction*	*J-SEAD*
Offense	Break enemy plan. Fix enemy force. Defeat or destroy enemy force through offensive action. Pursue or support EAC objectives.	*Deep*	Find enemy 2d echelon and reserve. Position to support EAC plan.	Suppress/neutralize targets. Destroy HPTs in enemy rear. Delay and disrupt enemy commitment of 2d echelon and reserves. Support J-SEAD and JAAT operations. Attack enemy means to interfere w/corps main attack.	Jam enemy fire direction and command nets to support deep maneuver operations. Support J-SEAD. Deconflict jamming w/adjacent and joint operations.	Conduct AI to delay, disrupt, or destroy HPTs in enemy rear. Support JAAT operations. Conduct aerial EW and recon. Support deep maneuver with CA, CAS, troop transport, and resupply operations. Support J-SEAD.	Protect theater air and Army avn conducting deep operations. Locate enemy AD systems. Jam enemy AD radars and comm nets Attack enemy AD weapons and fire control systems using theater air, attack helicopters, and FA.
		Close	Defeat or destroy engaged enemy divisions. Facilitate passage of lines. Maneuver to achieve objectives.	Augment FA of committed maneuver units. Provide GS fires to disrupt enemy counterattack for counterfires and to support J-SEAD and JAAT operations. Suppress/neutralize targets.	Jam enemy fire direction and command nets to support attacking maneuver units. Jam enemy counterattack forces. Jam enemy SIGINT systems to protect friendly comm. Support J-SEAD.	Conduct CAS operations to support committed maneuver units. Support JAAT operations. Conduct aerial EW and resupply operations. Support J-SEAD. Conduct surveillance.	Protect theater air and Army avn supporting close operations. Locate enemy AD systems. Jam enemy AD radars and comm nets. Attack enemy AD weapons and fire control systems using theater air, attack helicopters, and FA.
		Rear	Retain freedom of action. Prepare to commit reserves.	Designate FA to support response force and TCF. Support corps deception plan. Organize to support commitment of reserve.	Jam enemy SIGINT systems to protect (mask) friendly comm.	CA operations. Divert CAS to attack Level III rear threats.	May be necessary to conduct J-SEAD to support rear operations when enemy has sufficient Level III threat w/AD capability.
Defense	Gain time. Reduce enemy attack tempo. Create opportunity to shift to the offensive. Defeat attacking enemy. Seize initiative. Cause enemy to alter plans for commitment of follow-on forces.	*Deep*	Find enemy 2d-echelon forces. Disrupt enemy tempo. Deny enemy ability to concentrate combat power to interfere.	Destroy HPTs in enemy rear. Delay and disrupt enemy commitment of 2d echelon and reserves. Support J-SEAD and JAAT operations.	Jam enemy fire direction and command nets to support deep maneuver operations. Support J-SEAD. Deconflict jamming w/adjacent and joint operations.	Conduct AI to delay, disrupt, or destroy HPTs in enemy rear. Support JAAT operations. Conduct aerial EW and recon. Support deep maneuver w/CA, CAS, troop transport, and resupply operations. Support J-SEAD.	Protect theater air and Army avn conducting deep operations. Locate enemy AD systems. Jam enemy AD radars and comm nets. Attack enemy AD weapons and fire control systems using theater air, attack helicopters, and FA.
		Close	Control close operations. Destroy tactical echelon. Facilitate passage of reserves.	Augment FA of committed maneuver units. Provide GS fires to disrupt enemy attack to support the corps counterattack, for counterfires, and to support J-SEAD and JAAT operations. Suppress/neutralize targets.	Jam enemy fire direction and command nets to support the defending maneuver units. Jam during withdrawal of covering force and during corps counterattack. Jam enemy SIGINT systems to protect (mask) friendly comm. Support J-SEAD. Deconflict jamming with adjacent and joint operations. Support deception.	Conduct CAS operations in support of committed maneuver units. Support JAAT operations. Support CA operations. Conduct aerial EW and resupply operations. Support J-SEAD. Conduct surveillance.	Protect theater air and Army avn supporting close operations. Locate enemy AD systems. Jam enemy AD radars and comm nets. Attack enemy AD weapons and fire control systems using theater air, attack helicopters, and FA.
		Rear	Retain freedom of action. Position reserves.	Designate FA to support response force and TCF. Support the corps deception plan. Organize to support commitment of reserve.	Jam enemy SIGINT systems to protect (mask) friendly comm.	Support CA operations. Divert CAS to attack Level III rear threats.	May be necessary to conduct J-SEAD to support rear operations when enemy has significant Level III threat w/AD capability.

7-4. TARGETING METHODOLOGY

a. Decide-detect-deliver-assess (D^3A). The vast array of targets anticipated on the battlefield generates competing demands for FS. These demands could exceed the capability of the system to respond to all requirements. Through the use of the D^3A methodology, the force commander can avoid an overload of the system by establishing priorities on how and when he will use FS to meet critical demands. The D^3A approach enables the force commander to take the initiative in selecting, locating, and attacking high payoff targets (HPTs).

(1) *Decide*. The decide phase provides the focus and priorities for the collection management and fire planning process. It employs an estimate of enemy intent, capabilities, and vulnerabilities in conjunction with an understanding of the friendly force mission and concept of operations to determine *what* HPTs to look for, *when* and *where* they are likely to appear on the battlefield, *who* (collection assets) can locate them, and *how* the targets should be attacked. The following products are developed during the decide phase:

- *High-payoff target list (HPTL)* (fig 7-1): a ranked list of HPTs whose loss to the enemy will contribute to the success of the friendly COA.

- *Intelligence collection plan*: a plan that answers the commander's PIR and supports the acquisition of HPTs. For more details see chapter 6.

- *Target selection standards (TSSs)*: a way to decide whether to attack targets developed by various sources. TSSs give an attack manager a ready reference with which to evaluate sources that report directly to him. TSSs (fig 7-2) break nominations into two categories: targets and suspected targets. Targets meet accuracy and timeliness requirements for attack, while suspected targets must be confirmed before any attack.

- *Attack guidance matrix (AGM)* (fig 7-3): a matrix that addresses which targets will be attacked, how, when, and the desired effects. It is approved by the commander.

(2) *Detect*. During the detect phase the collection plan is executed. As specified targets are located, the appropriate TOC or delivery system is notified to initiate target attack.

(3) *Deliver*. Timely, accurate delivery culminates in synchronization of the FS system. The delivery is rapidly executed by having designated attack systems respond to the commander's guidance when HPTs are observed.

(4) *Assess.* Combat assessment (CA) is a timely and accurate estimate of damage resulting from the attack against a target. CA is composed of BDA, munitions effects assessment (MEA), and re-attack recommendations. As a part of the targeting process, CA helps determine if re-attack is necessary. Dedicated intelligence acquisition systems must be identified in the decide phase to support the commander's request for CA on specified HPTs.

HIGH-PAYOFF TARGET LIST
EVENT OR PHASE: DEEP FIGHT

Priority	*Category*	*Target*	*Remarks*
1	RSTA	FLAT FACE radar (220+ km)	Tgt acq. Deny early warning of deep attack.
2	RSTA	LONG TRACK radar (150 km)	Tgt acq. Deny early warning of deep attack.
3	ADA	STRAIGHT FLUSH radar (60 to 90 km)	Fire control (SA-6). Open air corridor.
4	ADA	LAND ROLL radar	Fire control (SA-8). Open air corridor.
5	FS	END TRAY radar	SS-21 meteorological station. Locate SS-21 positions.
6	FS	SS-21 (70 km)	Destroy AAG and chemical delivery systems.
7	FS	2S5 (28 to 33 km)	Destroy enemy phase I fires.
8	FS	HIND-D	Destroy deep assets/counterattack force.
9	Maneuver	TBR in column	2 TD. Delay 2d echelon.
10	Maneuver	IMIBR in column	42 IMIBR. Disrupt reserve.

Figure 7-1. Sample high-payoff target list.

TARGET SELECTION STANDARDS

HPT	*Attack System*	*TLE (m)*	*DT (min)*
FLAT FACE radar	AI/CAS	300	30
LONG TRACK radar	AI/CAS	300	30
STRAIGHT FLUSH radar	ATACMS	150	15
BM-22	MLRS/cannon	150	15
BM-21	MLRS/cannon	150	15
2S7	Attack helicopters	1,000	30
ARK-1 CF radar	cannon	75	30
HIND FOB	ATACMS	150	60
42 IMIBR	Attack helicopters	1,000	30

TLE—target location error
DT—dwell time

Figure 7-2. Target selection standards.

ATTACK GUIDANCE MATRIX
EVENT: DEEP ATTACK

HPTL	*When*	*How*	*Effect*	*Remarks*
FLATFACE radar	P	AI	D	Plan in J-SEAD
LONG TRACK radar	P	AI	D	Plan in J-SEAD
STRAIGHT FLUSH	P	ATACMS	D	Plan in J-SEAD
LANDROLL radar	P	MLRS	S	SEAD
END TRAY radar	I	EA	S	
SS-21	I	ATACMS	D	Counterfire—requires BDA
2S5	I	Attack helicopters	D	BDA
HIND-D	I	ATACMS	D	
TBR in column	A	Attack helicopters/AI	D	BDA
IMIBR in column	A	Attack helicopters/AI	D	BDA

When	Effect
A—as acquired	S—suppress
I—immediate	N—neutralize
P—planned	D—destroy

NOTES: 1. HPTL column. This column shows the ranked HPTs identified during war gaming. They have priority for engagement.

2. When. Timing the attack of targets is critical to maximize the effects. During war gaming, the optimum time is identified and reflected in this column.

- The letter "P" indicates that the target should not be engaged now, but should be *planned* for future firing (for example, a preparation, a SEAD program, or a countermobility program). It could also indicate that the target should be filed as artillery target intelligence (ATI) information.

- The letter "A" stands for *as acquired*. Such targets should be engaged in the sequence they are received in the HQ, with respect to the priority noted on the HPTL.

- The letter "I" indicates the attack must be immediate and is a special case. This designation should be limited to a very small percentage of targets and only the most critical types. Too many immediate targets are disruptive and lower the efficiency of attack systems. Immediate attacks take precedence over all others and must be conducted, even if FS means have to be diverted from attacks already under way. Some examples of very important targets include NBC-capable missile systems, division HQ, and NBC weapons storage and support facilities. Multiple rocket launchers may be considered for immediate attack, depending on their demonstrated effectiveness against friendly forces and their tactical employment. The G3 and the FSCOORD must establish procedures within the TOC that allow for immediate attack of targets.

Figure 7-3. Example of an attack guidance matrix.

b. Top-down fire planning. Top-down fire planning gives the maneuver brigade an FA plan that focuses the FS effort exactly where the combined arms commander intends to fight the battle. It provides guidance, allocates resources, assigns target execution responsibility, and fully supports the combined arms commander's scheme of maneuver.

Fire support planning is the continuing process of analyzing, allocating, and scheduling FS. It determines how FS will be used, what types of targets will be attacked (decide), what collection assets

are available to acquire and track the targets (detect/track), what assets will be used to attack the target (deliver), and what assets are available to verify (assess) effects on the target. The goal is to effectively integrate FS into battle plans to optimize combat power. Planning must be flexible to accommodate unexpected and rapid changes. It anticipates the massing of FS assets, changes in the force mission, realistic movement times, resupply, target acquisition, technical support, and unit replacement.

Formal fire planning is conducted through a deliberate top-down process, with bottom-up refinement. An advantage of top-down fire planning is that the concept for FS is developed early, which allows the artillery and brigade staffs to plan concurrently. Additionally, the FSCOORD and the brigade FSO, who are the most experienced field artillerymen in the force, develop the initial fire plan. In high-tempo operations, the top-down fire planning process provides a workable plan in a relatively short time. Finally, top-down fire planning is simple. Planning originates at the higher levels and is refined at the lower levels. The plan, in its completed form, has a limited number of FA targets.

The brigade fire plan contains only those targets the FSCOORD thinks are essential to support the commander's intent. The remaining targets are allocated to the TFs according to priorities for FA support. The TF commander plans targets to support his plan on the basis of the targets brigade allocated him. Any remaining artillery targets may be further allocated down to the companies. The TF commander and FSO allocate mortar targets in the same manner in which the brigade allocated their artillery targets.

By limiting the number of targets in the total plan, the fire support element (FSE) focuses fires on meaningful targets, increases the level of detail, and provides the FA battalion fire direction center (FDC) with a manageable number of targets. The brigade assigns target execution responsibility down to specific TFs. The TF commander must then assign responsibility within his command. The FSO must identify primary and backup observers.

Remember, if it is important enough to target, it is important enough to have eyes on target. At the company or team level, the commander is responsible for ensuring assigned targets are observed, have a trigger, and are rehearsed. This does not mean that a maneuver commander cannot request additional targets; he must just be sure they are justified.

Critical to the success of top-down fire planning is the concept of bottom-up refinement. During the decisionmaking process, targets are planned on the basis of map spots and situational templates. Targets must be refined on the basis of such things as the reconnaissance effort, actual occupation of the terrain, and updated intelligence.

In a mechanized environment, most battles are decided in the first 90 minutes. The number of "killer" fire missions artillery can shoot during this period is limited as shown in figure 7-4. When the factors normally affecting artillery units are considered, the number of "killer" fire missions is further reduced as shown in the figure. Looking at the fire plan from this perspective, the targeting effort must focus on critical events to accomplish the intent.

(1) *Military decisionmaking process.* Top-down fire planning is conducted throughout the MDMP. The considerations listed below illustrate how to integrate FS into the MDMP.

(*a*) *Intelligence preparation of the battlefield.* IPB, while not a separate step in the MDMP, warrants special consideration. The IPB affects FS planning in the following ways:

- Situational templates are the start point for the targeting effort. Poor templates used in the war gaming process result in poor targeting.

- High-value targets are developed initially from doctrinal templates and refined by the situation templates. HVTs are those assets that the enemy commander requires to successfully complete his mission. During the war gaming process, HPTs are identified. HPTs are those HVTs that must be acquired and successfully attacked for the success of the mission.

- Targets generated during the IPB process are included in the initial stages of the top-down fire planning process.

IN A PERFECT WORLD, battalion FFE mission standards (bn 3) • First volley: 3.40 minutes • Second volley: 1 minute (sustained rate) • Third volley: 1 minute (sustained rate) Total mission time: 5.4 minutes (approx 6.0 minutes) Total bn 3s available in 1 hour: 10 missions
IN REALITY, • Counterfire, ground, and air threat. • Comm problems (EW threat) • Operations readiness • 1 minute shift time for 155-mm howitzer • Other problems Total bn 3s available in 1 hour: 5 to 7 missions

Figure 7-4. Killer missions.

(*b*) *Mission analysis*. During the mission analysis phase, the FSO must accomplish several tasks. He should call the DS battalion and give them a warning order. He should provide an FS estimate.

In addition to the normal information in the warning order sent to the DS battalion, the brigade FSO should provide the brigade staff a planning time line. This allows the DS battalion S3 to get in early on the staff planning process and facilitates concurrent planning by the DS battalion.

When developing the FS estimate, the FSO must consider these areas:

1. Availability of firing units. How many tubes of what type are available for the upcoming operation?

2. Maintenance or combat losses. What is the likelihood of getting any tubes back in time for H-hour?

3. Allocation of FS assets. What FS assets has the higher HQ allocated for the upcoming operation?

4. Ammunition considerations. Field artillery ammunition requirements place the most demands on transportation assets in the brigade. Providing the right types and quantities of ammunition to the artillery on time requires extraordinary planning. Early in the planning process, determine—

- Ammunition shortfalls.
- Availability of ammunition.
- Availability of transportation support.

5. The status of the combat observation lasing team (COLT) and the fire support team (FIST). This applies to both personnel and equipment, especially the fire support team vehicle (FISTV). Determine the following:

- Can shortages be organized and placed in the most critical areas?
- Is the FISTV a high-maintenance priority?

6. Status of OH-58D helicopters. The OH-58D helicopter is an important consideration in mission analysis. The FSO must identify the need for this asset early and send the request to the division. Again, this helicopter is no longer an FS asset and must be coordinated externally with the aviation brigade.

(*c*) *Commander's guidance for fire support*. After completing the estimate process, the brigade staff members come together with the commander and brief their estimates. After the mission analysis briefing, the commander issues guidance to initiate the development of COAs. The guidance at this stage is critical to develop a viable FS plan that supports the overall intent. It should include the following:

- Attack criteria.

- Engagement criteria. This is the size and type of units the commander wants engaged at different points in the battle.

- Priorities for target engagement. This is when the HPTs are ranked.

- Guidance for special munitions (illumination, smoke, Copperhead, family of scatterable mines (FASCAM)).

- Specifics of how, when, and where FS should be employed in the development of COAs.

The FSO should give a backbrief to ensure the guidance was clearly understood.

(*d*) *Attack guidance*. The maneuver commander must decide what effect FS must have on a particular target. Most important is the interpretation of terminology. The maneuver definition of destruction is much different than the definition of the FA. The commander articulates desired effects in exact numbers by vehicle type or unit size. The three types of artillery effects are—

- *Destruction*. To artillerymen, destruction equates to 30-percent casualties. This may not guarantee achievement of the maneuver commander's intent. The surviving 70 percent may still influence the battle. Destroy should mean the target is rendered permanently combat ineffective. Destruction missions are expensive in time and ammunition. The FSCOORD and commander must have mutual understanding of the desired effects. Key questions should address the size and type of unit the commander desires destroyed. The commander and the FSCOORD must consider whether neutralization or suppression may be more efficient. With Copperhead, however, destruction of HPTs is feasible attack guidance.

- *Neutralization*. The FM 101-5-1 definition of neutralization leads the commander to understand the target will not be able to interfere with a particular operation. Neutralization renders the target ineffective or unusable for a temporary period, pending repair or reconstitution. The element of timing requires mutual understanding between the FSCOORD and commander. Damage of 10 percent or more to a target that is repairable within 12 to 24 hours may meet a brigade commander's guidance, but may not establish the conditions for division success. Key questions the FSCOORD or FSO must ask are when and how long the commander wants the target rendered incapable of interfering.

- *Suppression*. Suppression is used to prevent effective fire on friendly forces. It is typically used to support a specified movement of forces. Exercise observations reveal a tendency to use one-round volleys to suppress a target. This is normally insufficient to provide suppression for an action or move that lasts more than a few minutes. The FSCOORD or FSO must ask the commander when and for how long he desires the target to be suppressed.

The commander may describe what the FS is to accomplish in order of priority. Usually, this will be a menu of choices that eventually exceeds the capabilities of the assets available. The FSCOORD or FSO then has the responsibility to draw the cut line and tell the commander what cannot be done. Through a process of give and take, the list will be refined, and the fire supporters can put the artillery, mortars, NGF, and CAS where the commander wants them. Additionally, effectiveness cannot be measured in number of tanks or BMPs destroyed. If the commander's guidance was to suppress, then success should be measured in effective missions, not BDA.

When possible, the DS FA battalion S3 should go to the brigade TOC when the commander's guidance is issued. The DS FA battalion S3 then gains firsthand knowledge of the upcoming operation and can return to his TOC to begin the FA support plan. If the DS FA battalion S3 cannot be present, the FSO passes the guidance to the DS FA battalion TOC to allow its planning process to begin.

(*e*) *Course of action development*. COA development should not be limited to field artillery, but should consider all FS systems. The FSO must develop the COAs with the maneuver S3 if the synchronization of maneuver and FS is to be maximized. The repositioning of artillery and other FS assets must be determined so that the operating tempo (OPTEMPO) is maintained without a degradation of FS.

(*f*) *Field artillery positioning*. Early on, the DS battalion needs to have cleared land so it can start reconnaissance and movement. Terrain management considerations must include—

- Locations of delivery units, radars, TOCs, and trains.
- Movement routes and times.
- Supply routes.

A technique to reduce coordination for position areas is to develop an overlay that identifies—

- Areas that require no coordination to occupy.
- Areas that require coordination before they are occupied.
- Areas not available for occupation.

The enemy counterfire and air threat will increase terrain requirements for FA and mortars so that survivability moves can be conducted. Priorities of positioning are—

- DS artillery battalion.
- Reinforcing battalions.
- GSR and GS battalions.

The primary enemy threats to artillery are counterfire, air attack, and ground attack. The presence of any or all of these threats will dictate appropriate positioning and movement techniques. The DS FA battalion S3 ultimately has two key positioning considerations: position the artillery to support the FS plan, and survive to provide uninterrupted support for current and future operations.

(*g*) *Course of action analysis and comparison (war gaming).* War gaming is arguably the most critical step in the decisionmaking process. The FSO should come to the war game with a tentative FS plan to support the particular COA. An effective war gaming process will—

- Determine the HPTs to allow development of the HPTL.

- Synchronize FS with other BOSs and allow initial development of the fire support execution matrix (FSEM).

- Define critical events for brigade and TF FSOs.

- Provide an 80-percent solution. For the process to work, the commander must have given the FSO guidance for FS with which to begin. Without this, the FSO will be planning on the basis of his vision of the battlefield, not the commander's.

- Position the artillery. Consider having the DS battalion S3 present during war gaming.

The effectiveness of the fire plan can usually be determined by analyzing the war gaming procedures. The war gaming process is a critical event that must include the FSO. Failure to include him in this process will result in a fire plan developed in a vacuum.

(*h*) *Decision on the course of action and scheme of fires.* After the proposed COAs are briefed, the commander announces the decision and states the concept of the operation. The fires paragraph should clearly articulate the scheme of fires. Specificity is the key.

(*i*) *Orders brief.* The following should be considered for the FS portion of the orders brief:

- Scheme of fires.

- Targets planned and their purpose.

- Availability of FS assets and their status and allocation.

- Priority of fires (POFs).

- Clearance of fires procedures (if different from standing operating procedures (SOPs)).

- AGM and HPTL.

- Fire support coordinating measures (FSCMs).

- Cutoff times for target refinement.

- Rehearsal instructions.

- Any requirements a higher FS team will place on subordinate FS teams.

- Retransmission requirements for communications, depending on terrain.

(*j*) *Targeting meeting*. The targeting meeting is a technique used to update and revalidate targets. These meetings should be scheduled daily or should be mission dependent. Target acquisition assets are coordinated and synchronized, and the HPTL and AGM are updated. Key personnel involved are the—

- *Brigade executive officer (XO)*: responsible for conducting the targeting meeting.

- *Brigade FSO or targeting officer*: assists with or runs the targeting meeting. The FSO ensures required FS assets are planned and allocated, ensures the validity of the HPTL and makes changes on the basis of the respective commander's guidance, and makes any changes to the HVTs on the basis of updated intelligence.

- *Other participants*: may include the air liaison officer (ALO), EW officer, DS battalion S3 and S2, brigade engineer, ADA representative, brigade chemical officer, and the DS battalion fire direction officer (FDO).

Each participant reviews his taskings, assets available, and allocation of assets to meet the commander's guidance. The meeting verifies and/or updates the HPTL (decide); verifies, updates, and retasks available collection assets (detect); allocates delivery systems to engage the target (deliver); and confirms the assets tasked to verify the effects on target (assess). At brigade level, high tempo and austere staffs make this a very informal process.

(2) *Preparation*. The preparation phase is characterized by conducting rehearsals and refinement.

(*a*) *Combined arms rehearsal*. The combined arms rehearsal is required to synchronize all the BOSs before combat operations. Any last-minute changes to the operation made after the rehearsal may cause a reduction in the effectiveness of FS.

Key FS points that should be highlighted during the rehearsal include—

- Synchronization of the FS plan with the scheme of maneuver.

- Target execution responsibilities, to include primary and backup observers and their engagement criteria.

- Artillery and mortar positioning and movement plans.

- Verification of the target acquisition (TA) plan.

- FSCMs.

- CAS and JAAT employment.

- Verification of windows to mass battalion fires.

The FSEM (fig 7-5) is the blueprint for executing the fires portion of the operation order (OPORD) and should correspond to the synchronization matrix. There is no specific format for how an FSEM is set up. An example is shown below. The matrix should be clear and simple and should convey the commander’s concept of fires and plan for execution. It must be easy to work with and detailed enough to implement. It should be tied to the events on the decision support template. The brigade FSEM allocates resources and assigns responsibilities for transition from the brigade to the TF fight. The TF FSEM is a stand-alone document. It is detailed enough for TF and company FSOs to assume control and execute the TF commander’s intent for fire support. A more detailed explanation of the FSEM is in FMs 6-20-40 and 6-20-50.

At TF level, the TF FSO prepares the FSEM (fig. 7-6). He coordinates with the company FSOs and mortar platoon leader. In conjunction with the TF S3, he positions and controls the organic mortars of the TF. With the S2, he positions and controls observation assets. This coordination is needed to ensure the FS plan—

- Meets the commander's guidance.
- Avoids unplanned duplication.
- Uses all assets assigned to the TF.
- Assigns observers and backup observers for all TF targets and brigade targets assigned to the TF.
- Specifies who, when, where, and how for detecting and delivering fires on targets.

Unit/Phase	*Advance*	*Assault*	*Advance*	*Secure*
TF 77 INF		AB1000 AB1004	AB1010	
TF 1 ARMOR			AB1009 AB1008	
TF 78 ARMOR		AB1002 AB1003 AB1005		A4B
TF 2 ARMOR	A1B	AB1001 AB1006 AB1007		A3B
Coordinating Instr				
Bde	A2B Bde prep	CAS Div prep	CAS	CAS
CFL	PL HORSE	OO PL DOG	OO PL CAT	

Figure 7-5. Example of a brigade fire support execution matrix.

The effectiveness of the maneuver rehearsal is increased if the fire supporters are present and actively participating. Subordinate commanders should not leave them back at the track doing "more important" duties. The FSE should have a supply of rehearsal props, such as string, 3-in by 5-in cards, and cotton balls (to replicate smoke) to augment the TOC supply of props.

An FS rehearsal will also be conducted shortly after the maneuver rehearsal. Key participants will include the artillery battalion, mortars, all FSEs, observers, and other FS agencies, such as the ALO. The focus of this rehearsal is on the FS system from shooter to executor. It should address areas such as—

- Communications to observers, FSEs, radars, TOC, trains, and alternate nets.
- Positioning elements, such as routes, order of march, and movement times.
- Observer locations, such as FIST, COLT, and OH-58D.
- FSCMs.

- Target lists and schedules.

- Fire direction, such as fire unit availability, ammunition management, firing data and onhand ammunition verified, timings for special munitions, site-to-crest, air corridors, and restrictive FSCMs.

	AA	*LD/LC*	*PL GUN*	*PL PISTOL*	*PL SABER*
Team TANK	FA Pri tgt AB3002	FA POF Pri tgt C3B	Series fired	FA POF 155-mm FPF	
Team B	Mort B POF Pri tgt AB3110	Mort B Pri tgt AB3119	Mort POF	Mort B POF 155-mm FPF	
Team C	Mort A POF Pri tgt AB3207		FA POF Group C6B		
Team D		Mort A POF Pri tgt AB3216		Mort A POF Mort FPF	
Scouts	FA POF				
TF	Group C4B Series JOE	ACA ORANGE TOT 0800	F16 (ground alert) 0815-1015	Groups C7B, C8B, C9B CA GRAPE OO	FA POF Groups C12B, C13B
Attack helicopters		TAI 6		TAI 5	

AA—assembly area
ACA—airspace coordination area
LC—line of contact
LD—line of departure
Mort—mortar
TOT—time on target

Figure 7-6. Example task force fire support execution matrix.

(*b*) *Refinement*. Refinement of targets is an essential part of the preparation phase. Initial targeting is usually based on map spots, which require the need to establish actual target locations on the basis of the terrain. Refinement considerations include—

- Changing the target locations, but not the purpose of the target. The purpose of the target was established during the war gaming process; changing it dilutes synchronization.

- Adhering to the target cutoff times. Massive changes to the plan close to H-hour are detrimental to artillery ability to successfully support the mission.

A key to refinement is to ensure the FSE has a system to check that the purpose of the refined targets is still the same. Failure to check the refined targets may result in fires that no longer meet the original guidance. He and his staff have the greatest challenge reacting to last-minute changes. The DS FA battalion S3 knows best the capabilities of his staff and firing units to react to last-minute changes in the fire plan.

(3) *Execution*. During the battle, the positioning of the FSCOORD and FSOs depends on METT-T. Some considerations include—

- C^2 requirements to execute the fire plan.

- Communications assets available to the TF FSO and FSCOORD. These assets must be addressed and rehearsed before execution. At a minimum, they will need to communicate on their respective maneuver command and FS nets. The FSCOORD will also have the need to communicate on the FA battalion command net. When not collocated with his supported maneuver commander, the most critical net for the FSCOORD is the maneuver command net to ensure that FS needs are being met. On the basis of the availability of radios in the vehicle in which the TF FSO or FSCOORD is riding, a plan must be developed to serve his communications needs. The brigade and TF FSEs provide a critical communications function by monitoring nets not available to the TF FSO and FSCOORD and keeping them apprised of the situation.

- The payoff in traveling with the commander versus being in FM contact.

- The FSO's ability to control fires from the commander's position. His ability to communicate and see the battlefield will determine this.

c. Offensive fire planning.

Phase	*Actions to be taken*
Short of the LD or LC	Consider planning fires— To support the unit movement to the LD or LC. To support the unit if the attack fails and the enemy counterattacks. To impede enemy patrols and early warning systems.
From the LC or LD to the objective	Provide priority of fires to lead elements. Consider planning— Fires to suppress enemy direct-fire weapons. Smoke to restrict enemy observation of friendly maneuver elements. Smoke to screen friendly obstacle-breaching operations. Fires on exposed flanks. Consider placing a forward observer (FO) or a COLT in overwatch position. Consider recommending preparation fire if the advantages outweigh the disadvantages: Will the enemy be forewarned of an attack? Will the loss of surprise significantly affect the chance for success? Are there enough significant targets to justify a preparation? Is there enough fire support ammunition to fire an effective preparation? Can the enemy recover before the effects can be exploited? Determine when and how you will shift fires. Use one of the following methods: Time—at a predetermined time, fires will shift. Location—fires shift when the maneuver unit reaches a certain location, such as a PL. On call—the maneuver commander directs when the fires shift. Event—a predetermined event signals shifting of fires.
On the objective	Consider planning— Fires to block enemy reinforcement and resupply by ground or air. Fires to suppress enemy direct-fire weapons. Obscurants to screen friendly forces or obscure hostile ground observation when consolidating on the objective with smoke and WP. Signals for lifting or shifting fires. Fires as you would for the defense when consolidating on the objective.
Beyond the objective	Consider planning fires— To impede enemy reinforcements. To block avenues of approach for counterattacking enemy forces. To slow or block enemy retreat.

d. Defensive fire planning.

Focus	*Actions to be taken*
In front of the position	On avenues of approach— Target enemy avenues of approach and/or chokepoints. If COLTs are available, position them to cover avenues of approach where high value targets will appear. If available, plan FASCAM to slow the enemy. Integrate fire support with direct fire weapons. Plan trigger points for possible moving targets. On key terrain— Place an FO or a COLT on terrain where it can provide early warning, target location, and laser designation and/or overwatch of the battle. Plan to obscure enemy observation of friendly movements. On obstacles— Coordinate coverage of obstacles with the engineers. Plan fires behind, in front of, and adjacent to obstacles to hinder enemy breaching operations. Consider the use of smoke or riot control agents to hinder breaching operations. If available and in conjunction with the engineer, plan FASCAM to reseed minefield that the enemy has breached. Plan fires to close gaps and lanes in barrier or obstacle plans. Plan fires to help canalize the enemy. Integrate fire support with obstacles to complement direct-fire weapons. Accurately locate obstacles and preplanned targets.
On the position	Consider— Using groups or series to assist in withdrawal. Using smoke to facilitate disengagement. Planning fires on top of your battle position to help in the disengagment, to deny the enemy access to the position, and to support a counterattack. Plan final protective fires (FPF) (a prearranged barrier of fire designed to protect friendly troops). Use the following sequence in planning FPF, but remember that the maneuver commander selects the FPF locations. Select the fire support asset to fire the FPF. Adjust fire onto the FPF to determine actual firing data to be used in firing the FPF (the tactical situation, time, or ammunition supply may not allow the FPF to be adjusted). Determine the FPF time of flight. Select the FPF reference point (a permanent visible point on terrain to the front that is used to determine when the FPF will be requested). Consider time of flight (TOF) and the estimated rate of enemy movement. Integrate the FPF into the final protective lines of the company direct-fire weapons. Determine how the FPF call for fire will be initiated.
Behind the position	Consider planning fires— To support alternate battle positions. To support a counterattack. To delay the enemy as the company withdraws. To prevent reinforcements by the enemy.

7-5. COMMAND AND SUPPORT RELATIONSHIPS

The fulfillment of FA FS responsibilities and ultimately the FA mission depends on how well the FSCOORDs, maneuver commanders, and planners understand the organization and uses of the FA in specific command relationships. The FA commander derives his specific FS responsibilities from the command relationships and tactical missions he is assigned. Command and control are established through the process of "organization for combat." This two-step process consists of—

a. Establishing a command relationship (organic, assigned, attached, or OPCON).

(1) *Organic*. Field artillery units are organic when they form an essential part of a military organization as shown in its TOE or MTOE. An example is the FA battalion that is part of the divison artillery (DIVARTY).

(2) *Assigned*. Field artillery units assigned are those placed in an organization on a relatively permanent basis for the purpose of strategically tailoring the force. A commander exercises essentially the same degree of C^2 over assigned units as he does over organic units. An example is the FA brigade headquarters and headquarters battery (HHB) assigned to a corps or the FA battalions assigned to the FA brigade.

(3) *Attached*. Attached units are placed in an organization on a relatively temporary basis. Subject to the limitations stated in the attachment order, the receiving commander exercises the same degree of control over attached units as he does over his own organic units. Force artillery commanders can tailor forces with the attachment of cannon, rocket, missile, and TA assets. The maneuver unit must provide logistic and administrative support when FA is attached to it.

(4) *Operational control*. OPCON is a status often used between maneuver elements, but rarely used to establish a relationship between a maneuver unit and an FA unit. Generally, OPCON has the same intent as attachment, but the receiving unit has no responsibility for administrative or logistic support. Artillery units establish OPCON relationships to accomplish specific missions that are usually limited by function, time, or location. An example occurs when an FA battalion is DS to an ACR and the howitzer battery of the ACR is OPCON to the FA battalion. However, in this example, it is the ACR commander's decision.

b. Assigning tactical missions (DS, R, GSR, or GS).

(1) *Direct support*. DS is the most decentralized standard tactical mission. An FA unit in DS of a maneuver unit is concerned primarily with the fire support needs only of that unit. The DS artillery commander is the FSCOORD for the supported maneuver unit. He plans his unit fires to support the maneuver commander's intent for the operation and positions his unit where it can best support the scheme of maneuver. Field artillery units should habitually support the same maneuver force to enhance coordination and training.

(2) *Reinforcing*. The reinforcing (R) mission causes one FA unit to augment the fires of another FA unit. When a DS FA battalion needs additional fires to meet the FA support needs of a maneuver force, another FA battalion or an FA brigade may be assigned the reinforcing mission. A DS artillery battalion staff has difficulty controlling the fires of and positioning more than two reinforcing battalions.

(3) *General support reinforcing*. The GSR mission requires the FA unit to furnish artillery fires first for the force as a whole and then to reinforce the fires of another FA unit as a second priority. A GSR unit remains under the control of the force artillery HQ having the priority of fires. The GSR mission allows the force commander flexibility to respond to varied tactical situations.

(4) *General support*. General support is the most centralized of standard tactical missions. An FA unit with a GS mission supports the force as a whole and remains under the control of the force

artillery HQ. Thus, the artillery is immediately responsive to the needs of the force commander. However, GS and GSR missions require the force artillery HQ to plan the fires of the supporting FA unit.

Inherent Responsibilities

An FA unit with a mission of—	*1. Answers call for fire in priority from—*	*2. Has as its zone of fire—*	*3. Furnishes FISTs*	*4. Furnishes liaison officer*	*5. Establishes communi-cations with—*	*6. Is positioned by—*	*7. Has its fires planned by—*
Direct support (DS)	1. Supported unit. 2. Own observers. 3. Force FA HQ.	Zone of action of supported unit.	Provides temporary replace-ments for casualty losses as required.**	No requirement.	Company FSOs, FSOs, and supported maneuver unit HQ.	DS FA cdr or as ordered by force FA HQ.	Develops own fire plans.
Reinforcing (R)	1. Reinforced FA. 2. Own observers.* 3. Force FA HQ.	Zone of fire of reinforced FA.	No require-ment.	To reinforced FA HQ.	Reinforced FA HQ.	Reinforced FA or as ordered by force FA HQ.	Reinforced FA HQ.
General support reinforcing (GSR)	1. Force FA HQ. 2. Reinforced unit. 3. Own observers.*	Zone of action of supported unit to include zone of fire of reinforced FA.	No require-ment.	To reinforced FA HQ.	Reinforced FA HQ.	Force FA HQ or reinforced FA if approved by force FA HQ.	Force FA HQ.
General support (GS)	1. Force FA HQ. 2. Own observers.*	Zone of action of supported unit.	No require-ment.	No require-ment.	No require-ment.	Force FA HQ.	Force FA HQ.

*Includes all target acquisition means not deployed with supported unit (e.g., radar, FA aerial observer, and survey parties).

**A fire support section (FSS) for each maneuver brigade/battalion/cavalry squadron and one FIST with each maneuver company or ground cavalry troop are trained and deployed by the FA unit authorized these assets by TOE. After deployment, FISTs and FSSs remain with the supported maneuver unit throughout the operation.

c. Assigning nonstandard tactical missions. Commanders create nonstandard tactical missions by changing, modifying, or amplifying one or more of the seven inherent responsibilities or by explaining contingencies not covered by those responsibilities. Unless specifically authorized by the corps commander, a reinforced unit does not have the authority to subassign missions or to establish quickfire channels with the battalions of the FA brigade. Exceptions to this doctrine may be addressed in the tactical standing operating procedures (TSOP) or command guidance.

7-6. FUNDAMENTALS OF ORGANIZING FIELD ARTILLERY FOR COMBAT

Field artillery is organized for combat to provide responsive and effective FA fires and to coordinate all fire support. The objective for FA organization for combat is to ensure that each FA unit is in a tactical organization and is assigned a tactical mission. After analyzing the factors of METT-T, the FSCOORD recommends and the supported force commander approves FA organization for combat. The FSCOORD then applies the following principles:

a. A—Adequate field artillery support for committed units.

b. W—Weight the main effort (offense or defense).

c. I—Immediately available field artillery support for the commander to influence the action.

d. F—Facilitate future operations.

e. M—Maximum feasible centralized control.

Additionally, planners should consider the following when organizing for combat: positioning, ammunition, displacements, survey, meteorology, target acquisition, logistics, and timing.

Section II. EMPLOYMENT CONSIDERATIONS

7-7. CURRENT FIELD ARTILLERY ORGANIZATIONAL FORCE STRUCTURE

a. Field artillery organizations. The basic FA organization is the FA battalion. A battalion contains all the elements necessary to support a maneuver brigade with fire. The typical FA battalion has an HHB, a service battery, and three firing batteries. The HHB provides C^2, liaison with maneuver and other fire support elements, signal, survey, and TA capabilities. The service battery provides ammunition trains, maintenance, and supply capabilities. The firing batteries contain the cannon, rocket, or missile system assigned to the battalion.

b. Separate commands. ACRs and separate brigades have organic artillery units—a battery within each squadron of the ACR and a battalion within a separate brigade.

c. Division artillery. At division level, the DIVARTY is the tactical HQ that commands and controls the assigned FA units. The DIVARTY commander is responsible for all FA support for the division. The DIVARTY establishes a TOC for the control of FA fires and provides FSEs to the division main and tactical CPs to plan and coordinate all FS for the division.

d. Corps artillery. Based on the corps mission, FA cannon, rocket, and missile battalions are assigned to the corps artillery along with a number of FA brigade HQs to provide C^2. The corps artillery HQ plans and coordinates FS for the corps, establishing a TOC for the tactical control of FA units retained directly under corps control and providing FSEs to the corps main and tactical CPs to plan and coordinate all FS for the corps.

e. Field artillery brigades. The corps commander, advised by the corps artillery commander, attaches FA battalions to an FA brigade HQ, tailoring a brigade for the specific mission. An FA brigade may fire in support of the corps as a whole or augment the fires of a specific division, extending the corps commander's span of control and providing flexibility in how he plans to fight the corps. Note that, unlike a DIVARTY, an FA brigade has no TA battery.

7-8. FIELD ARTILLERY CAPABILITIES AND LIMITATIONS

a. Capabilities.

(1) Provides fires under all conditions of weather and types of terrain.

(2) Shifts and masses fires quickly and without need to displace.

(3) Adds depth to combat.

(4) Provides a variety of conventional shell and fuze combinations.

(5) Is as mobile as the supported force.

(6) Provides counterfires and/or suppressive fires.

b. *Limitations*.

(1) Firing and communication signatures make the field artillery vulnerable to detection.

(2) Limited self-defense capability against ground and air attacks.

(3) Limited ability to destroy targets without considerable ammunition expenditure.

7-9. PRINCIPLES OF FIRE SUPPORT

The principles of fire support are the framework for a thought process ensuring the most effective use of fire support assets. These principles apply at all levels of command, regardless of the specific fire support assets available.

a. Plan early and continuously.

b. Exploit all available targeting assets.

c. Consider the use of all lethal and nonlethal FS means.

d. Use the lowest echelon capable of furnishing effective support.

e. Use the most effective means to accomplish the mission.

f. Furnish the type of support requested.

g. Avoid unnecessary duplication.

h. Consider airspace coordination.

i. Provide adequate support.

j. Provide rapid and effective coordination.

k. Provide for flexibility of employment.

l. Provide for safeguarding and for the survivability of friendly forces.

7-10. BASIC FIRE SUPPORT TASKS

a. *Support forces in contact*. Responsive FS protects and ensures freedom of maneuver to forces in contact with the enemy in deep, close, and rear operations. This includes—

(1) Assignment of DS and reinforcing tactical missions.

(2) Types of fire: close support, interdiction (deep), counterfire (reactive), SEAD, and rear fires.

(3) Placement of permissive FSCMs.

(4) Plans for target acquisition.

b. Support the battle plan. The force commander retains direct control over enough firepower to influence the battle. This includes—

(1) Assignment of GSR and GS tactical missions.

(2) Types of fire: counterfire (proactive), interdiction, and rear fires.

(3) Attack of HPTs by lethal and nonlethal means.

c. Synchronize the FS system. FS activities are arranged in time, space, and purpose. This includes—

(1) D^3A methodology.

(2) War gaming during MDMP.

d. Sustain the FS system. This includes—

(1) *Protection.*

- Survivability positions.
- Actions to counter the effects of enemy firepower and maneuver.

(2) *Logistic support.*

- Stocks and supplies protected and properly positioned.
- Mission-capable equipment.
- Logistics planning.
- Required supply rate (RSR) versus controlled supply rate (CSR).

(3) *Technical support.*

- Redundant C^2 facilities.
- Well-trained FS personnel.
- Mobile and correctly placed FS systems.
- Accurate and rapid meteorology, survey, and communications.

Section III. SYSTEM AND WEAPON DATA

7-11. FIELD ARTILLERY AMMUNITION

Each round of cannon field artillery ammunition consists of a projectile and a fuze.

a. Fuzes. Fuzes cause a projectile to achieve some desired effect on a target. Some of the more common types of fuzes are—

(1) *Point detonating.* A point detonating (PD) fuze causes a projectile to detonate on impact with a solid object. It may also be called a quick or superquick fuze.

(2) *Delay.* A delay fuze allows the projectile to penetrate a target before detonating. The fuze provides a 0.05-second delay, allowing the projectile to travel approximately 15 meters after the fuze strikes a solid object. Delay fuzes might be used to attack enemy troops under a thick tree canopy. A specially hardened concrete-piercing fuze is required to withstand the impact of firing against concrete with the intent of penetrating it.

(3) *Mechanical time.* A mechanical time (MT) fuze is used when the projectile must detonate or function at some distance above the ground (an airburst). The height of burst can be adjusted by varying the time set on the fuze.

(4) *Variable time.* A variable time (VT) fuze transmits a radio signal and, by measuring its reflected energy, automatically functions to provide either a 7- or 20-meter height of burst.

b. Projectiles.

(1) *High explosive.* The high explosive (HE) projectile is best used against personnel targets. The HE projectile explodes, causing the outer shell casing to shatter into many small, irregularly shaped fragments. The 155-mm HE shell has a killing radius of 50 meters.

(2) *Illumination.* Illumination (illum) rounds disperse flares on parachutes and are used for illuminating a designated area or for signaling.

(3) *Smoke.* Smoke (M116B) rounds eject canisters that fall to the ground and burn, emitting white smoke for 40 to 90 seconds, depending on the caliber of weapon.

(4) *Burster-type white phosphorus.* Burster-type WP rounds burn with intense heat and emit dense white smoke. They may be used as the initial rounds in a smokescreen to rapidly create smoke or used against material targets, such as class V sites or logistic sites. It is against the law of land warfare to employ WP against personnel targets.

(5) *Dual-purpose improved conventional munition.* The dual-purpose improved conventional munition (DPICM) round is available for 155-mm howitzers and now constitutes the largest percentage of the basic load of these weapons. The DPICM round disperses a cylindrical submunition that detonates on impact as a small shaped charge (capable of penetrating 2.5 to 3 inches of armor) with the outer casing fragmenting with a killing radius of 5 meters.

(6) *Rocket-assisted projectiles.* Rocket-assisted projectiles (RAPs) extend the effective range of cannon artillery. RAP rounds exist for 105-mm and 155-mm howitzers.

(7) *Laser-guided field artillery projectile (Copperhead).* Copperhead is a 155-mm cannon-launched guided projectile (CLGP) with a shaped charge warhead and a laser seeker. When fired at a moving or stationary hard point target, Copperhead homes in on laser energy reflected from the target during the final portion of its trajectory. Laser energy is provided by a remote laser designator that may

be ground, vehicular, or aerial mounted. Optimum use of Copperhead is against multiple targets in large target arrays outside the range of maneuver direct-fire weapon systems.

(8) *Family of scatterable mines.* There are two types of FA-delivered FASCAM: area denial artillery munitions (ADAM), containing antipersonnel mines, and the remote antiarmor mine system (RAAMS), used against lightly armored vehicles. Both are available only in 155 millimeter. FASCAM has two preset self-destruct times: short duration and long duration. The corps commander has the authority to employ FASCAM; this authority may be delegated to brigade level for long-duration mines and to battalion level for short-duration mines.

(*a*) *Area denial artillery munitions.* The ADAM round ejects 36 mines over the target area. After each mine comes to rest on the ground, it deploys seven 20-foot sensor triplines. Disturbing a tripline causes the mine to propel a bomblet 2 to 8 feet above the ground where it detonates, projecting approximately 600 fragments in all directions. If the mine is not triggered within its preset time, it automatically self-destructs, thereby clearing the area.

(*b*) *Remote antiarmor mine system.* Each RAAMS shell expels nine mines over the target area. Any metallic object (for example, a tank or self-propelled vehicle) passing over a mine causes it to activate and destroy or damage the equipment. If the mine is not triggered within its preset time, it automatically self-destructs, thereby clearing the area. Some of the mines have antidisturbance firing mechanisms that cause casualties if disturbed by enemy personnel attempting to clear the mine area.

7-12. CHARACTERISTICS OF FIELD ARTILLERY

Weapon	*Rds on veh/ prime mover*	*Rds bulk loaded*	*Range (meters)*	*Weight (lbs)*	*Time to emplace (min)*	*Max rate of fire-no rd first 3 min*	*Sustained fire rds per hour*	*No of weapons per unit*	*Ammunition*	
									Types	*Fuzes*
105-mm how (towed) L119	40	150	11,400 15,100 (RAP)	4,520	3	15	180	18/lt inf FA bn	WP HE HEAT-T Illum Smoke ICM APERS HEP-T	MT PD VT MTSQ CP
105-mm how (towed) M102	40	150	11,500 15,100 (RAP)	3,338	3	30	180	18/abn div FA bn (RC) only)	Same as above	Same as above
155-mm how SP M109A5	28/36	206	18,100 23,500 (RAP)	53,940	1	12	60	18/armd or mech div FA bn 18/corps FA bn	Illum WP HC ICM RAP DPICM ADAM RAAMS Copperhead	CP PD MT MTSQ VT

Weapon	*Rds on veh/ prime mover*	*Rds bulk loaded*	*Range (meters)*	*Weight (lbs)*	*Time to emplace (min)*	*Max rate of fire-no rd first 3 min*	*Sustained fire rds per hour*	*No of weapons per unit*	*Ammunition*	
									Types	*Fuzes*
155-mm how M109A6	39	203	24,000 30,000 (RAP)	64,000	1.3	12	60	18/armd or mech div FA bn 18/corps FA bn	Illum WP HC ICM DPICM RAP HE ADAM RAAMS RAP Copperhead	CP PD MT MTSQ VT
155-mm how M198	28	161	18,000 30,000 (RAP)	15,800	5	12	Variable	18/corps FA bn 6/lt inf div FA btry	HE, Illum RAP ICM DPICM ADAM RAAMS HC WP Copperhead	CP PD VT MTSQ MT
MLRS (M720) ATACMS	12	96	30 km	54,000	2 to 20		12	Armd or mech div FA bn 18 SPLL/ div 18/corps FA bn	M77 DPICM ATACMS	Remotely settable electronic time fuze
XM 2001 Crusader	60	130		110,000				Armed or mech div FA bn Corps FA Bn		

Section IV. COMMAND AND CONTROL

7-13. CORPS AND DIVISION COMMAND POSTS

Corps and division CPs are divided into tactical, main, and rear CPs. Like the command cell, current operations cell, plans cell, CSS cell, and ACE, the FS cell operates at the main CP. The FA representatives who constitute the FS element form the nucleus of the FS cell. Other personnel who may either work in the FS cell habitually or actively coordinate with it as needed are the G2, G3 air, assistant

division engineer (ADE), chemical officer, EW officer, and representatives from the TACP, AD, and division aviation. The FSCOORD, or the assistant fire support coordinator (AFSCOORD) in his absence, supervises FS cell activities. These include planning, coordinating, and integrating fire support operations, to include theater air and EW support.

7-14. COMMAND POSTS, CELLS, AND ELEMENTS

a. Fire support coordination facilities. Field artillery commanders at corps, division, and brigade levels supervise the operation of the force commander's FS coordination agencies in addition to commanding their respective FA organizations. This dual responsibility requires the FA commander to know the functions and objectives of the force, the operation of the force FS system, and the technical aspects of FA fire.

Field artillery is organized at corps, division, and brigade with a specific C^2 structure that enables the FA commander to accomplish both aspects of his mission. There is an FA HHB in each corps artillery and DIVARTY, FA brigade, and FA battalion. The HHB provides a CP for the C^2 of the subordinate FA units and also provides the nucleus of an FSE to the force commander. The FA commander's designated representative supervises both the FA CP and the FSE on a full-time basis. The S3 operations officer is usually in charge of the FA CP while the FSO or AFSCOORD is in charge of the FSE. How the FA commander divides his time and emphasis between the FA CP and the FSE depends on the force commander's guidance, the combat situation, and the general FS state of readiness.

b. Corps and division main command post fire support cell. The main FS cell is collocated with the corps or division main CP and must be close to the G2 and G3 elements to be effective in FS planning. The main FS cell is concerned primarily with planning future operations and with fighting deep operations.

The FS cell members serve with the corps or division staff in targeting efforts. Specific requirements for FS cell representatives (in the tactical, main, and rear CPs) may include—

Recommending targets.

- Using TVA to identify target priorities.
- Determining FS needs.
- Expediting FS.
- Assessing FS effects.
- Coordinating timing of FS attacks (to include EW).
- Recommending use of theater air assets.

c. Corps or division tactical command post fire support element. The tactical CP FSE is responsible for FS coordination for the current battle. It is austere. It coordinates and implements the FS from the subordinate FS cells and identifies FS requirements for the immediate and near-immediate tactical situations. Representatives from all FS resources responsive to the corps or division collocate with the FSE. The FSE is as mobile as the supported maneuver force tactical CP.

d. Corps or division rear command post fire support element. The FSO coordinates artillery positioning (when applicable) with the rear operations cell; establishes procedures for requesting FS, to include mortars, artillery, attack helicopters, and theater air; recommends FSCMs; and advises the rear operations cell in FS matters.

Bases, base clusters and response forces, and the TCF submit their FS plans to the rear area FSO. He collates them and coordinates the composite rear area FS plan with the main FS cell. Calls for fire from a rear element are made to the rear area FSO. He coordinates those requests within the operations cell and with other rear area elements and forwards the request to the main FS cell. The main FS cell determines the most suitable FS asset available, initiates the request, and notifies the rear FSO of the decision and response.

The TCF designated to interdict and defeat Level III threat forces normally includes supporting artillery.

At corps, the FSO consolidates FS plans from subordinate rear area operations centers (RAOCs), response forces, and the TCF for integration into the overall corps rear FS plan.

7-15. FIRE SUPPORT COORDINATOR

The FA commander at corps, division, or brigade is designated the FSCOORD. He is the force commander's primary adviser on FS matters. He maintains a good working relationship with the commander, operations officer (G3), and ALO throughout the planning and execution phases of the operation. The FSCOORD must be thoroughly familiar with the battle plan so that he can anticipate missions, situations, and changes and then advise the force commander on the best use of FS. The FSCOORD's primary responsibilities (at corps or division level) are to—

- Establish and supervise the activities of the FS cell.
- Plan and synchronize FS.
- Prepare the FS portion of the corps or division operation plans (OPLANs) and OPORDs.
- Advise and inform on all FS missions.

7-16. CONTROL MEASURES AND TERMS

The FSCOORD coordinates all FS impacting in the area of responsibility of his supported maneuver commander, including that requested by the supported unit. He ensures that FS will not jeopardize troop safety, will interface with other FS means, and/or will not disrupt adjacent unit operations. FSCMs help him in those efforts. They are designed to facilitate the rapid engagement of targets and, at the same time, provide safeguards for friendly forces. All FSCMs are depicted in *black.*

a. A boundary—

- Is the basic FSCM.
- Indicates the geographical area a unit is responsible for.
- Is normally designated along recognizable terrain features.
- Is both permissive and restrictive in nature.

— *Restrictive*: No FS means may deliver fires across a boundary unless the fires are coordinated with the force having responsibility within the boundary.

— *Permissive*: Some other FSCM is in effect that allows firing without further coordination. It may also be that a maneuver commander enjoys complete freedom of fire and maneuver within his own boundaries.

b. Permissive measures. Permissive measures are those measures that expedite the attack of targets.

(1) *Coordinated fire line (CFL).*

- A line beyond which conventional or improved indirect-fire means (mortars, field artillery, and NGF ships) may fire at any time without additional coordination.

- Purpose is to expedite the attack of targets beyond it.

- Brigade or division can establish a CFL within its zone.

(2) *Fire support coordination line (FSCL).*

- A line beyond which all targets may be attacked by any weapon system (including air) without endangering troops or requiring additional coordination with the establishing HQ.

- The FSCL expedites attack of a target beyond the FSCL.

- Established by corps or independent division.

- Placed on identifiable terrain.

(3) *Free-fire area (FFA).*

- A specific, designated area into which any weapon system may fire without additional coordination with the establishing HQ.

- Expedites fires and also facilitates jettisoning CAS munitions.

- Established by division or higher (host nation).

- Established on identifiable terrain or by grid designation when necessary.

c. Restrictive measures. Restrictive FSCMs safeguard friendly forces.

(1) *Restrictive fire line (RFL).*

- A line established between converging friendly forces that prohibits fires or effects from fires across the line without coordination with the affected force.

- Prevents interference between converging forces.

- Common commander of forces establishes RFL.

- Established on identifiable terrain.

(2) *No-fire area (NFA).*

- An area in which no fires or effects of fires are allowed except—

  — Temporarily, by establishing HQ.

  — When an enemy force within the NFA engages a friendly force. The commander may engage the enemy to defend his force.

- Area that prohibits all fires or their effects into an area without prior clearance.
- Division or corps (host nation) establishes.
- Established on identifiable terrain, grids, or with a radius from a center point.

(3) *Restrictive fire area (RFA).*

- An area in which specific restrictions are imposed and into which fires that exceed those restrictions will not be delivered without coordination with the establishing HQ.
- Regulates fires into an area according to the stated restrictions.
- Established by battalion or higher.
- Established on identifiable terrain, grids, or with a radius from a center point.

(4) *Airspace coordination area (ACA).*

- A block of airspace in the target area in which friendly aircraft are reasonably safe from surface fires.
- Can be formal (three-dimensional box) or informal (time, lateral separation, altitude) to provide separation between surface-to-surface and air-delivered fires.
- Formal ACA includes minimum and maximum altitudes, a baseline designated by grid coordinates at each end, the width, and the effective times.

d. Terms.

counterfire—Fire intended to destroy or neutralize enemy FS capabilities that have been identified as having fired on friendly forces. Counterfire includes counterbattery, counterbombardment, and countermortar fire.

destruction—To artillerymen, destruction equates to 30-percent casualties. Destroy should mean the target is rendered permanently combat ineffective. Destruction missions are expensive in time and ammunition.

group of targets—Two or more targets on which fire is desired simultaneously. The group is designated by a letter-number combination.

interdiction fire—Fire placed on an area or point to prevent the enemy from using the area or point. Additionally, it is fire to divert, disrupt, delay, or destroy the enemy surface military potential before it can be used effectively against friendly forces.

neutralization—To artillerymen, fires that are intended to render a target out of the battle temporarily by causing a minimum of 10-percent casualties. The definition of neutralization, per FM 101-5-1, leads the commander to understand the target will not be able to interfere with a particular operation. Key questions the FSCOORD or FSO must ask are *when* and *how long* the commander wants the target rendered incapable of interfering.

series of targets—In FS, a number of targets and/or group(s) of targets planned in a predetermined time sequence to support a maneuver phase. The series is indicated by a code name or nickname.

suppression—Used to prevent effective fire on friendly forces. It is typically used to support a specified movement of forces. The FSCOORD or FSO must ask the commander *when* and *how long* he desires the target suppressed.

suppression of enemy air defenses (SEAD)—That activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means.

target—An object, vehicle, individual, etc., that is the aiming point of any weapon or weapon system.

Section V. PLANNING FACTORS

7-17. SMOKE

a. *Types*.

- Hasty: artillery, vehicular, grenades.
- Deliberate: generator, smoke pots, aircraft.

b. *Purposes*.

- Signaling or identifying.
- Obscuring.
- Decoy.
- Screening.

c. *Methods*.

- Blanket: friendly position.
- Haze: friendly position or enemy position.
- Curtain: between friendly and enemy positions.

d. *Factors affecting smoke employment*.

- Wind speed.
- Wind direction.
- Humidity.
- Precipitation.
- Air temperature.
- Ammunition.

e. Planning time factors.

Activities	*60-mm mortar (min)*	*81-mm mortar (min)*	*107-mm mortar (min)*	*105-mm howitzer (min)*	*155-mm howitzer (min)*
Occupation	1:30	4:30	6:00	6:00	8:00
Hipshoot	2:00	2:00	5:00	11:00	11:00
Bn/plt FFE	1:00	1:00	2:00	1:35	1:35
Primary target	:30	:30	:30	:25	:25
Immediate suppression	:30	:30	:30	:40	:40
Immediate smoke	:30	:30	:30	:40	:40
Quick smoke	NA	:30	3:00	5:25	5:25
Low adjust	NA	NA	NA	4:35	4:35
High adjust	3:00	3:00	4:00	5:45	5:45
Copperhead	NA	NA	NA	NA	2:30
FASCAM	NA	NA	NA	NA	15+
FPF	:30	:30	:30	:25	:25

NA—not applicable

7-18. ILLUMINATION CAPABILITIES

Type	*Range (meters)*		*Burn rate (seconds*	*Rate of continuous illum (rounds/minute)*	*Diameter of area illum (meters)*
	Min	*Max*			
107-mm/					
M335A2	440	5,490	90	1	800
105-mm/					
M314A3		11,500	60	2	800
155-mm/					
M485A2		17,500	120	1	1,000
120-mm/					
M91	200	7,100	60	2	1,500
M930	200	7,200	60	2	1,500
81-mm/					
M853	300	5,060	60	2	650
M301A3	100	950	60	2	360
60-mm/					
M721	200	3,500	25	4	500
M83A3	725	950	25	4	300

7-19. FINAL PROTECTIVE FIRES

Standard Widths

System	*Elements*	*Size (meters)*
60-mm mortar	2 tubes	70 x 35
81-mm mortar	4 tubes	140 x 35
81-mm mortar (improved)	4 tubes	140 x 35
120-mm mortar	6 tubes	360 x 100
120-mm mortar	3 tubes	180 x 100

System	*Elements*	*Size (meters)*
107-mm mortar	3 tubes	120 x 40
107-mm mortar	6 tubes	240 x 40
105-mm howitzer	3 guns	105 x 35
105-mm howitzer	6 guns	210 x 35
155-mm howitzer	4 guns	200 x 50
155-mm howitzer	6 guns	300 x 50
155-mm howitzer	6 guns	400 x 50

7-20. FAMILY OF SCATTERABLE MINES

a. 155-mm remote antiarmor mine system (RAAMS).

(1) Each round has 9 mines.

(2) Range.

- M198: 17,740 meters.
- M109: 17,500 meters.

b. 155-mm area denial artillery munitions (ADAM).

(1) Each round has 36 mines.

(2) Range.

- M198: 17,740 meters.
- M109: 17,500 meters.

c. Fire planning.

(1) *Standard size.*

(*a*) High angle: 400 meters by 400 meters.

(*b*) Low angle: 200 meters by 200 meters.

(2) *Rounds per aimpoint*.

M718/M741 (RAAMS) high-angle fire			
Desired density	0.001	0.002	0.004
Rounds per aimpoint	24	48	96
M718/M741 (RAAMS) low-angle fire			
Desired density	0.001	0.002+	0.004
Rounds per aimpoint	6	12	24
M692/M741 (ADAM) high- or low-angle fire			
Desired density	0.001	0.002	0.004
Rounds per aimpoint	3	6	12

d. Scatterable mine self-destruct times.

Type	*Arm*	*Short*	*Long*	
ADAM/RAAMS	2 minutes, 45 seconds	4 hours	48 hours	
GEMSS (Flipper)	45 minutes		5 days	15 days
Volcano	2 minutes, 45 seconds	4 hours	48 hours	15 days
MOPMS	2 minutes	4 hours	Recycle to 15 days	
Gator	2 minutes	4 hours	48 hours	15 days
PDM	50 seconds	4 hours		

Mines begin to self-destruct at 80 percent of laid life (4x.8=3 hours, 12 minutes). At least 20 percent of mines have antihandling devices.

e. Employment considerations.

- Maneuver.
- Firing unit.
- Time.
- Safety.
- Terrain.
- Weather.
- Logistics.

7-21. COMBAT OBSERVATION LASING TEAM

a. Description of COLT.

(1) Laser designator-equipped observer team.

(2) Maximizes use of smart munitions as well as conventional munitions.

(3) Identical to company FIST in equipment capability, but has fewer personnel.

b. Organization.

(1) *Equipment*. M981 FISTV with G/VLLD. Currently there are six COLTs in a heavy brigade and three in a light brigade. This allows the brigade the flexibility to employ trained observers throughout the depth of the battlefield.

(2) *Personnel*.

- Sergeant team chief (primary G/VLLD operator).
- Fire support specialist.
- Driver/radioteletypewriter operator.

7-22. FIRE SUPPORT TEAM VEHICLE/COLT EMPLOYMENT CONSIDERATIONS

a. Position to best enhance commander's intent.

b. Employ in defilade positions to enhance survivability.

c. Employ on even plane with target to enhance laser designation.

d. Allow for final 20 seconds time of flight of Copperhead projectile.

e. Clearly state targets and priorities for engagement.

f. Should be positioned where targets are most likely to be stationary or moving slowly.

g. Requires detailed planning.

- Must plan security.

- Taskings in reconnaissance and surveillance plan must not detract from primary mission: target acquisition and killing.

7-23. BASIC LOADS

a. Class V basic load for howitzers.

Howitzer	*Munition*	*Quantity*
M109A5	Illumination	5
M109A6	HCBE(smoke)	15
	RAAM	19
	Copperhead	1
	HE	18
	WP	5
	HE APICM	5
	HE DPICM	135
	HE RAP	24
	Total	227
M198 (towed)	155-mm HE	84
	HEP-T	5
	Illum	5
	Smoke	12
	HCBE	12
	HEICM	64
	APERS	6
	Total	188

b. Class V basic load for mortars.

System (mortar)	*Munition*	*Quantity*
107-mm	HE	125
	Illum	5
	WP	30
	Total	160
81-mm	HE	106
	Illum	4
	WP	11
	Grenade incendiary	2
	Total	123
60-mm (M224)	HE	227
	Illum	52
	WP	70
	Grenade incendiary	2
	Total	351
120-mm (M120)	HE	75
	WP	10
	Illum	10
	HE(PD)	125
		220

7-24. EXPENDITURE RATES

The average expenditure rates shown below are expressed in rounds per weapon per day for assigned or attached artillery.

Division artillery			
	First day 155-mm	*Succeeding day 155-mm*	*Protracted period 155-mm*
Covering force	254	274	174
Defense of position	203	207	183
Attack of position	146	153	140
Corps artillery			
	First day 155-mm	*Succeeding day 155-mm*	*Protracted period 155-mm*
Covering force	309	333	212
Defense of position	227	235	199
Attack of position	176	183	170

Note: These numbers represent operations conducted against heavy resistance.

7-25. MUNITIONS EFFECTS TABLE

Target	Suppress (10 %)				Neutralize (20 %)				Destroy (30 %)			
	HE	DPICM	APICM	MLRS	HE	DPICM	APICM	MLRS	HE	DPICM	APICM	MLRS
Tank												
Plt	48	24		2		54		6		102		11
Co	96	48	NA	6	NA	102	NA	11	NA	204	NA	17
Bn	144	96		17		204		24		612		66
Mechanized												
Plt	48	12		5	54	18		3	108	54		5
Co	60	24	NA	6	78	36	NA	3	162	78	NA	7
Bn	102	78		12	216	102		10	248	324		27
Infantry in open												
Plt	6	6	6	1	12	6	6	1	18	12	12	2
Co	12	6	6	1	24	66	6	1	66	18	18	2
Bn	54	24	18	3	114	66	42	9	324	116	216	26
Dug in with no overhead cover												
Plt	18	12	6	1	42	18	6	2	108	30	56	4
Co	42	12	12	1	60	18	18	2	126	42	96	6
Bn	102	54	54	6	216	102	174	12	648	246	540	36
Dug in with overhead cover												
Plt	36	18	6	5	60	36	18	5	108	36	114	5
Co	60	18	18	5	73	36	48	5	186	36	156	5
Bn	168	54	108	5	324	84	264	11	864	240	756	36
Mortar and artillery												
Plt	48	12		2	54	18		3	108	54		5
Btry	60	24	NA	6	78	36	NA	3	162	78	NA	7
Bn	102	78		12	216	102		10	248	324		27

NOTES: 1. All numbers are in rounds. Not differentiated by caliber.

2. Tank (plt = 3 to 4 tanks, co = 10 to 13 tanks, bn = 36 to 40 tanks).

3. Mech (plt = 30 pers, 3 to 4 APCs, co = 90 pers, 10 to 13 APCs, bn = 430 pers, 36 to 40 APCs).

4. Mort/arty (btry = 6 tubes, bn = 18 tubes).

7-26. RESUPPLY RATES

Cannon battalions require 3.6 turnarounds per day by organic transportation assets to an ammunition supply point (ASP) or an ammunition transfer point (ATP) to resupply their entire basic load. MLRS batteries require 1.3 turnarounds.

Section VI. NAVAL SURFACE FIRE SUPPORT

7-27. GENERAL

When naval surface fire support is available and the general tactical situation permits its use, naval firepower can provide large volumes of devastating, immediately available, and instantly responsive fire support to combat forces operating near coastal waters. These fires may be in support of amphibious operations within range of naval aircraft and gunfire, but they also may be made available to support land operations.

7-28. MISSION

The general mission of naval surface fire support is to support maneuver force operations by destroying, neutralizing, or suppressing enemy targets that oppose our forces. Naval surface fire support may be provided by NGF and naval air power. Usually, it is delivered in concert with support fires from other arms.

7-29. NAVAL GUNFIRE CHARACTERISTICS

Naval gunfire—

- Has a flat trajectory that makes it effective against vertical-face targets, but ineffective against rear-slope targets.
- Can deliver a high volume of fire in a short period of time.
- May provide precision-guided munitions (PGM).
- Has a large range error. Units should always try to avoid firing over or near friendly units. They should fire parallel to the FLOT.
- Is less accurate in rough seas.
- Has limited communications between ship and shore.
- Is generally coordinated and executed through the support of liaison personnel from the Marine air-ground task force (MAGTF) liaison companies.

The only US NGF weapon system available now is the 5-inch/54 found primarily on destroyers.

The danger-close distance for the 5-inch gun is 750 meters.

The 5-inch gun can provide illumination burn time from 45 to 72 seconds.

Ship	*Gun size*	*Range (meters)*		*Rate of fire (rounds per minute)*		*Ammunition available*
		Maximum	*Minimum*	*Maximum*	*Minimum*	
Guided missile cruiser (CGN and CG)	5-inch 5-inch	15,700 23,000	910 910	22 40	15 20	HE, WP, illum HE, WP, illum
Guided missile destroyer (DDG)	5-inch	22,000	910	40	20	HE, WP, illum
Destroyer (DD)	5-inch	30,000	910	40	20	HE, WP, illum
Guided missile frigate (FFG)	76-mm	12,700	NA	80	NA	PD
Amphibious assault ship (LHA)	5-inch	22,000	910	40	20	HE, WP, illum

7-30. NAVAL AND CRUISE MISSILE CHARACTERISTICS

Designation	*Mission*	*Range*	*Warhead*
TASM	Antiship	250 NM	Unitary conventional
TLAM-C	Land attack	675 NM	Unitary conventional
TLAM-D	Land attack	485 NM	Bomblets
TLAM-N	Nuclear attack	1,352 NM	Nuclear

Section VII. MORTARS

7-31. GENERAL

The FSO should plan and control mortar fires to ensure they are integrated into the overall fire plan. Mortars are very effective against lightly protected personnel and for obscuration, illumination, and close-in defensive fires.

Mortars—

- Are the most responsive FS assets of the battalion.
- Provide highly responsive WP and illumination to the TF commander.
- Are easily detected by counterbattery radars.
- Necessitate different positioning considerations because of the range differences between the various munition types (HE, WP, and illumination).
- Can carry only limited amounts of ammunition.

Clearance of fires, including mortars, must be addressed in the commander's guidance and maneuver rehearsal process.

7-32. US MORTAR CAPABILITIES

Type weapon	*Range (meters)*		*Maximum FPF width (meters)*	*Weight (pounds)*	*Rates of fire (rounds/ minute)*	
	Minimum	*Maximum*			*Sustained*	*Maximum*
60-mm mortar						
HE M720/M889	70	3,500	60	18 to 45	20	30
HE M49A4	45	1,830				
81-mm mortar (M29A1)						
HE M374A2	70	4,790	140/4 tubes	98	8	25
HE M374A3	73	4,790				
HE M329A1	80	5,800	40/4 tubes	93	15	30
HE M329A2	73	4,790				
107-mm mortar (M30)						
HE M329A1	770	5,060	240/6 tubes	675	3	18
HE M329A2	440	6,840	120/3 tubes			
120-mm mortar (M120)						
HE MS7	200	7,200	360/6	319	4	15
HE M933	200	7,200				
HE M934	200	7,200	180/3			

Section VIII. TARGET ACQUISITION

7-33. GENERAL

Field artillery TA units comprise weapons-locating radar (WLR) sections, survey sections, and target-processing sections. These are controlled by HQ sections or by section leaders. WLR sections are organized by mission and equipment differences and are equipped with either AN/TPQ-36 or AN/TPQ-37 radars. TA units can be organized into TA batteries (TABs), TA platoons, TA detachments, and separate sections under a staff organization.

a. Organizations.

(1) A TAB is organic to heavy and motorized divisions. The radar platoon comprises two AN/TPQ-37 radar sections, three AN/TPQ-36 radar sections, and a three-man radar platoon HQ. The TAB is assigned to the DIVARTY.

(2) A *target acquisition platoon* of a separate maneuver brigade is assigned to the HHB of the organic artillery battalion.

(3) At corps level, the *corps target acquisition detachment* (CTAD) is organic to corps artillery on the basis of one per light division. It is designed to be attached to each light infantry, airborne, and AASLT DIVARTY on deployment. The CTAD comprises a HQ section, a position and azimuth determining system (PADS) team, and two WLR sections. There are two AN/TPQ-37 radars in the CTAD. The coverage provided by these radars is in addition to the coverage provided by the AN/TPQ-36 radar organic to each DS artillery battalion in the light division.

b. Radius. The primary mission of AN/TPQ-36 and AN/TPQ-37 WLRs is to detect and locate enemy mortars, artillery, and rockets quickly and accurately enough to permit immediate engagement. Their secondary mission is to observe registrations and help the FDC adjust fire for friendly units. The secondary mission should be performed only when absolutely necessary.

(1) The AN/TPQ-36 is optimized to locate shorter-range, high-angle, lower-velocity weapons such as mortars and shorter-range artillery; however, it can also locate longer-range artillery and rockets within its maximum range. It is normally placed 3 to 6 kilometers behind the FLOT. It has a maximum range of 24 kilometers and a minimum range of 900 meters. It is normally attached to a DS FA battalion.

(2) The AN/TPQ Q-37 is optimized to locate longer-range, low-angle, higher-velocity weapons such as long-range artillery and rockets. It is normally deployed 8 to 12 kilometers behind the FLOT. The Q-37 can be emplaced and ready for operation within 30 minutes and march-ordered within 15 minutes during daylight operations. It has a maximum range of 50 kilometers and a minimum range of 3 kilometers. The AN/TPQ-37 is normally attached to a GS FA battalion.

7-34. AN/TPQ-36 AND AN/TPQ-37 FIREFINDER RADARS

a. Positioning considerations. Both tactical and technical aspects of positioning must be considered. Search zones rank the search pattern and provide the reaction posture of the radars to best meet the maneuver commander's intent and priorities. Each firefinder radar can store up to nine different zones. There are four different types of zones used with the radar.

b. Types of zones.

(1) *Critical friendly zone (CFZ):* friendly unit or location that maneuver commander designates as critical to achieving his mission. Generates priority 1 call for fire.

(2) *Call for fire zone (CFFZ):* area beyond the forward edge of the battle area (FEBA) that the maneuver commander wants suppressed, neutralized, or destroyed. Generates priority 2 call for fire.

(3) *Artillery target intelligence zone (ATIZ):* area in enemy territory that the maneuver commander wishes to monitor closely.

(4) *Censor zone (CZ):* area in which the commander wishes to ignore all target detections.

c. *Radar deployment order (RDO) responsibility*.

(1) FA battalion: FA battalion S2.

(2) DIVARTY CP: counterfire officer.

(3) FA brigade CP: counterfire officer.

(4) Maneuver brigade CP: FSO and/or targeting officer.

d. *Cueing agents*. Cueing agents designate who has authority to turn on the radar. The person with the most accurate and timely knowledge of the battlefield should be responsible for the cueing agent.

e. *Reporting channels*. Radios on the reporting channels will receive combat information from the radar for target processing.

Section IX. PSYCHOLOGICAL OPERATIONS

7-35. GENERAL

Psychological operations are considered a nonlethal means of fire support. Corps PSYOP support normally comprises a PSYOP tactical support battalion with from one to three PSYOP tactical support companies. The battalion provides the corps with a corps PSYOP support element (CPSE). This element provides interface with a psychological operations task force (POTF) or a joint psychological operations task force (JPOTF).

Each tactical support company is normally DS to a division, a separate brigade, or an ACR. Tactical support companies provide product development and tactical dissemination.

7-36. PSYOP MISSIONS

a. *Deep operations*. At the division level, PSYOP—

- Creates a favorable image because of the good treatment of enemy prisoners of war by US and allied soldiers.

- Discourages and disrupts opponent operations by spreading doubt, discontent, and distrust among opponent personnel in the targeted area.

- Supports strategic PSYOP by furnishing detailed and timely information of local susceptibilities up the chain of command.

- Assists in tactical cover and deception operations.

- Induces surrender.

- Produces "free pass" leaflets and coordinates with friendly commands to ensure leaflets are honored.

- Designs programs of psychological actions that are amplified by psychological products.

b. *Close operations*. At the division level, PSYOP—

- Assists in tactical cover and deception operations.

- Helps control civilians in the combat area.

- Gives information and directions to isolated friendly elements operating in the combat zone.

- Discourages and disrupts operations by spreading doubt, discontent, and distrust among opponent personnel.

- Lowers enemy morale and efficiency by emphasizing friendly successes and the futility of dying.

- Emphasizes danger to opponent of working in an NBC environment.

- Provides "free pass" leaflets.

- Facilitates the occupation of opponent towns by delivering ultimatums and giving directions for ceasing hostilities.

- Publicizes civilian control measures by using broadcasts and printed information.

c. *Rear operations*. At the division level, PSYOP—

- Provides area assessment to identify key leaders and local sensitivities.

- Creates a favorable image of US and allied soldiers and leaders to local populace.

- Counters hostile propaganda by initiating a well-planned, aggressive, and effective PSYOP program.

- Publicizes civilian control measures by using broadcasts and printed information.

- Helps control the enemy and civilians in the combat area.

- Uses local nationals and interpreters to establish effective communications nets and intelligence sources within the rear area.

CHAPTER 8

AIR DEFENSE

8-1. DOCTRINE

a. General. Modern warfare is three-dimensional and the airspace of a theater is as important a dimension as the terrain. Airspace is used for various purposes, including reconnaissance and surveillance, maneuver, delivery of fires, transportation, and C^2. Effective control and use of airspace directly influence the outcome of campaigns, major operations, engagements, and battles. Commanders must consider airspace and its use in all of their operational planning. Commanders must also anticipate the enemy will contest use of the airspace and must protect their forces from enemy observation and attack. In addition to providing force protection, AD operations contribute to gaining and maintaining control of the air environment, and they help win the information war, thereby providing freedom of maneuver for the maneuver forces.

(1) *Chapter overview*. This AD chapter introduces counterair and theater missile defense operations, the AD operating system and its part in these joint operations, and the role of air defense artillery (ADA) as the proponent for the operating system. It will summarize the air threat to the joint force and demonstrate how AD participates at all levels of war and fights the threat throughout the depth of the battlefield. The chapter will introduce AD planning processes, command and support relationships, employment considerations, systems employed by ADA, and planning factors for employment of ADA systems.

(2) *Counterair operations* are those operations conducted to attain and maintain a desired degree of air superiority by the destruction or neutralization of enemy air forces. Protection of the force and selected geopolitical assets, as well as control of the air environment, are the objectives of counterair operations. Ultimately, control of the airspace enables commanders to execute their plans. Counterair operations are joint and comprise three complementary and mutually supporting operations: offensive counterair (OCA), defensive counterair (DCA), and SEAD.

(*a*) *OCA operations* destroy, disrupt, or limit enemy air power as close to its source as possible. Joint forces conduct OCA operations at a time and place of their choosing rather than in reaction to the enemy.

(*b*) *DCA operations* include all measures and means designed to nullify or reduce the effectiveness of hostile air attacks and are primarily in reaction to enemy air offensive initiatives. DCA operations consist of active and passive measures. Active measures seek to destroy attacking aircraft or surveillance platforms, including UAVs. Passive measures seek to minimize the effects of hostile air action by using cover, concealment, camouflage, deception, dispersion, and protective construction.

(*c*) *SEAD* neutralizes, destroys, or temporarily degrades enemy AD systems in a specific area by physical attack and/or EW. Joint suppression of enemy air defenses (J-SEAD) increases the overall effectiveness of friendly air, land, and naval operations by reducing enemy AD capabilities.

(3) *Theater missile defense.* Theater missile defense (TMD) includes all measures and means to counter the theater missile (TM) threat posed by air-to-surface, subsurface-to-surface, and surface-to-surface missiles. TMs include short-, medium-, and intermediate-range ballistic missiles, tactical air-to-

surface missiles (TASMs), and cruise missiles (CMs). Like counterair operations, TMD is inherently joint. Its primary objective is to ensure the joint force commander (JFC) has the freedom to conduct joint operations without undue interference from enemy TM operations. Supporting objectives include deterrence of enemy use of TMs and protection of the force and areas of vital interest from TM attack. TMD consists of four types of operations: active defense, passive defense, attack operations, and C^4I.

(*a*) *Active defense*. Active defense applies to operations initiated to protect against a TM attack by destroying TMs in flight. Active defense includes multitiered defense in depth by means of multiple engagements using air, land, sea, space, and special operations assets. It also includes active EW to disrupt remote or onboard guidance systems.

(*b*) *Passive defense*. Passive defense applies to measures initiated to reduce vulnerability and minimize the effect of damage caused by TM attacks. Passive defense includes TM early warning and NBC protection, countersurveillance, deception, camouflage and concealment, hardening, EW, mobility, dispersal, redundancy, recovery, and reconstitution.

(*c*) *Attack operations*. Attack operations apply to operations initiated to destroy, disrupt, or neutralize TM launch platforms and their supporting command, control, and communications (C^3); logistic structures; and reconnaissance, intelligence, surveillance, and target acquisition (RISTA) platforms. Attack operations include offensive action by air, land, and sea forces and SOF.

(*d*) *C^4I*. TMD C^4I is an integrated system of doctrine, procedures, organizational structures, facilities, communications, computers, and supporting intelligence. It includes missile warning and cueing of defense systems by missile warning sensors and ground stations. C^4I provides command authorities at all levels with timely and accurate data and systems to plan, monitor, direct, control, and report TMD operations.

(4) *Air defense operating system.* Ground-based air defense represents the Army's contribution to counterair operations and TMD. Army AD is a major contributor to DCA and TMD attack operations, and it provides most of the joint force TMD active defense capabilities. The AD operating system protects the combined arms team and other priority forces and assets—joint as well as Army—by preventing enemy aircraft, missiles, and unmanned aerial vehicles from locating, striking, or destroying them.

(a) Air defense objectives. Air defense objectives are similar at each level of war. Air defense commanders plan operations to support accomplishment of the force commander's objectives.

1. At the *strategic level*, ADA protects forces and geopolitical and military assets of strategic significance. Such forces or assets are critical to achieving national objectives. Normally assigned by the National Command Authorities (NCA), strategic AD missions may be performed by units at every echelon of command. Units may protect cities, economic facilities, or religious and cultural sites of a host nation, coalition member, or ally, or they may protect vital US assets.

2. At the *operational level* of war, counterair and TMD plans support the JFC's intent and concept of the operation by seeking to achieve two primary objectives: gain control of the air environment and protect the force and selected assets. At this level Army combined arms forces provide DCA and TMD active defense and attack operations support. ADA units conduct DCA and TMD active defense operations, help integrate contributions to counterair and TMD by other combined arms team

members, and protect priority forces and assets in the communications zone (COMMZ) according to the counterair and TMD priorities of the JFC and joint force land component commander (JFLCC).

3. At successively lower levels of command, the focus of Army AD shifts increasingly away from control of the air environment toward protecting the force. Although an extension of operational objectives, AD operation objectives emphasize force protection rather than control of the air environment. Air defense operations at this level support the overall objectives of corps and divisions. AD operations seek to ensure friendly forces retain freedom of maneuver, help win the information war by protecting C^2 nodes and denying the enemy RISTA data that originate from enemy airborne platforms, sustain the battle by protecting vital sustainment assets and forces, and destroy enemy aircraft the first time.

(*b*) *Army contributions to air defense.* ADA is the only Army force dedicated to executing AD operations. All members of the combined arms team, supported by an accurate and timely early warning and intelligence capability, contribute to AD either directly or indirectly. Table 8-1 shows a sampling of Army contributions to AD:

*Table 8-1. Army Participation in Air Defens*e

	Army assets	*Air defense contributions*
Air defense artillery	Patriot Short-range air defense (SHORAD)	Active TM defense Protect maneuver forces and critical assets
Field artillery	Missiles Rockets Cannons	Attack tactical ballistic missile launch sites Attack critical air operations support facilities Provide SEAD
Army aviation	Helicopters	Provide self-defense Attack enemy air and missile assets on the ground On order, provide air defense for maneuver control Provide SEAD
Chemical	Smoke units	Conceal, deceive, restrict contour flight approaches

(5) *Air defense artillery mission.* Army ADA units have responsibility for executing the bulk of the force protection mission. "The mission of US Army ADA is to protect the force and selected geopolitical assets from aerial attack, missile attack, and surveillance." (FM 44-100, p 1-2) The mission requires ADA forces to participate in operations at all levels of war and to be able to provide force protection throughout an AO or theater of war from entry through decisive operations and redeployment. This mission also requires AD commanders to help integrate the contribution of the other combined arms team members.

(6) *Threat*. During the cold war, the principal aerial threat to US forces consisted of fixed- and rotary-wing aircraft. Our strategy was to avoid defeat through sufficient redundancy in ground- and air-based defenses.

The air threat to friendly forces and combat functions is significantly greater than in the past due to the emergence of weapons of mass destruction (WMD), the proliferation of missile and microcircuit technologies, and the introduction of low observable technology. Though still dangerous, the manned fixed-wing aircraft is no longer the principal threat to friendly forces. US, allied, or coalition air forces will protect the force from most of the fixed-wing aircraft threat; however, the variety of other air and missile systems is growing, and they are capable of performing a wide range of missions against the joint force.

The Persian Gulf War marked a shift in the nature of future air threats to US operations. Iraqi use of the Scud missile caused the theater commander to dedicate considerable resources to counter this threat, including the diversion of limited AD resources to defense of civilian targets in allied countries. TBMs, CMs, and TASMs have become major threats to US forces during all phases of force projection operations. The psychological effects and the potential for catastrophic loss of soldiers, time, or initiative, forcing a change to operational objectives, require a greater role for theater missile defense when generating combat power at the operational level.

Armed utility and attack helicopters will probably serve as the principal CAS weapon system for most potential enemies. These enemies also use helicopters for RISTA, AASLT operations, and insertion of forces into rear areas.

UAVs have emerged as a new multifaceted threat. The list of countries employing UAVs is steadily growing, and they have or are developing the ability to use the UAVs for RISTA, attack, deception, and electronic attack.

(7) *Air defense operations in depth.* Countering the spectrum of present-day and emerging aerial threats requires tight integration and synchronization between the air and missile defense efforts of the Services. Joint doctrine for air and missile defense of a theater, for training, and for institutionalized relationships exists to ensure unity of effort between the Services. The air threats confronting the joint force are divided into those best addressed by manned aircraft and those best countered by surface-based systems. This integrated AD requires a complementary mix of air- and ground-based defenses to provide the synergy necessary to counter today's range of aerial threat platforms and technologies. The ADA systems that contribute to air and missile defense are divided into two categories, are found at levels EAC to maneuver battalion, and are deployed throughout the depth of the battlefield.

(*a*) *High- to medium-altitude air defense systems*. Patriot is the active Army's only active high- to-medium-altitude air defense (HIMAD) artillery system and is deployed to defend high-priority assets against TMs and hostile aircraft. Patriot units assigned to EAC or corps ADA brigades could be task organized, when available, to bolster corps and division AD coverage, respectively.

(*b*) *Short-range air defense systems.* SHORAD plays a major role in the integrated AD of a theater. SHORAD protects the force as it executes force projection operations on what is expected to be an extended, noncontiguous battlefield. SHORAD systems specifically detect and kill rotary-wing aircraft, CAS aircraft, and UAVs. They also contribute to the destruction of low-altitude, deep strike, fixed-wing aircraft and CMs. SHORAD systems include gun and missile systems, such as Avenger, the Bradley Stinger fighting vehicle (BSFV), and the Stinger man-portable air defense system (MANPADS). SHORAD weapons are normally employed in support of maneuver forces to defend their most critical assets against attack by enemy CAS aircraft and helicopters. Commanders also employ SHORAD weapons in rear areas to defend assets such as air and logistics bases, as well as other forces and key installations in the AO.

SHORAD systems are integrated using the forward area air defense (FAAD) command, control, communications, and intelligence (C^3I) suite of subsystems. The FAAD C^3I system integrates data from a multitude of organic and external sensor platforms to provide responsive, near real-time track location data (cueing) to air defense weapons. The C^3I architecture also completes the three-dimensional battlefield picture for maneuver commanders by providing real-time data on activities above the battlefield. Organic sensors include the ground-based sensor (GBS) and the light and special division interim sensor (LSDIS). GBS and LSDIS are critical elements of low-altitude air defense C^3I; the "eyes" of SHORAD, they provide detection and tracking data on aerial threats in the forward area.

(8) *Air defense coordination.* At each echelon, the ADA commander has two roles. He is both the commander of the ADA units assigned to him and the air defense coordinator (ADCOORD) to the commander he supports.

The EAC and corps ADA brigade commanders and the division ADA battalion commanders have responsibility for Army active air and missile defense planning to protect their supported commander's air and missile defense priorities. At EAC the planning may be for the Army component or possibly the entire land force.

As ADCOORD, the ADA commander is responsible for planning counterair operations to support the force commander's concept of the operation. An integral member of the supported commander's staff, the ADCOORD prepares the AD estimate and the AD annex to the force operation plan (OPLAN) or operation order (OPORD). The ADCOORD also coordinates with ADA elements at higher and lower echelons, as well as with adjacent units, to ensure vertical and horizontal integration of AD coverage throughout the battlefield.

The JFC may appoint a separate TMD coordinator—the ADCOORD or another staff officer or commander—to focus the TMD planning and integration functions of the force. When the ADCOORD is not the TMD coordinator, he actively participates in TMD planning and closely coordinates ADA contributions to the overall TMD effort. In the absence of a separate TMD coordinator, the ADCOORD assumes responsibility for TMD planning and integration. Table 8-2 summarizes the functions the ADA commander performs as commander, ADCOORD, and de facto TMD coordinator. The remainder of this chapter assumes the ADA commander is functioning as both the ADCOORD and TMD coordinator.

(9) *Theater army air defense coordinator.* The commander of the highest echelon Army AD command in the theater—depending on the size of the theater and the joint force, that could be an ADA battalion, a corps, or an EAC brigade, or a higher command—is normally also the theater army AD coordinator (TAADCOORD) to the JFLCC. The TAADCOORD is the principal adviser of the JFLCC and coordinator for theater counterair and theater missile defense operations.

The TAADCOORD performs several unique functions. He is the Army air defense coordinator to the JFLCC and the area air defense commander (AADC). The TAADCOORD ensures that the Army is an integral part of joint counterair and active missile defense operations and planning at the theater level. As a special staff officer to the JFLCC, the TAADCOORD participates in the J3 or deputy chief of staff for operations and plans (DCSOPS) planning cells and assists in developing Army OCA and DCA input to the air operations plan. He participates in the integration of Army TMD operations. The TAADCOORD participates in the AADC's DCA planning as ADCOORD and Army AD representative to the joint force air component commander (JFACC). The TAADCOORD also ensures that corps air and missile defense requirements are integrated into joint counterair and TMD planning. As the commander of the highest echelon AD command in the theater, the TAADCOORD also contributes the majority of the joint force surface-to-air missile (SAM) force. He deploys resources in both the combat zone and COMMZ and, based on the concept of the operation, influences tactical operations by shifting ADA forces between these two areas.

Table 8-2. ADA Commander Functions

Commander functions	*ADCOORD functions*
Develop air and missile defense plans to protect the force commander's air and missile defense priorities. Task organize, assign missions, and direct and coordinate the efforts of organic, assigned, and supporting ADA units to support the force commander's concept of the operation. Coordinate ADA planning with higher, lower, and adjacent ADA units.	Prepare the AD estimate. Assess the air and missile threat. Recommend OCA, DCA, and TMD priorities. Coordinate Army AD airspace use within the designated AO. Working closely with the FSCOORD, G2/S2, and G3/S3, integrate OCA and TMD attack operation priorities into the targeting process. Recommend active and passive air and missile defense measures. Recommend the use of other combat arms in an air defense role. Plan air and missile defense operations in support of the force commander's concept of the operation. Prepare the air and missile defense annex(es) to the OPLAN or OPORD. Coordinate with ADA elements and/or joint counterair and TMD participants at higher and lower echelons and with adjacent ADA units.

b. Air defense planning.

(1) *Types of air defense.* The two basic types of AD are area and point.

(*a*) An *area defense* affords priority of protection to a group of assets; broad coverage is intended. Counterair aircraft armed with air-to-air weapons and Patriot missile systems are well suited for area defense.

(*b*) A *point defense* is designed for the protection of a more limited area, normally in the defense of the vital elements of a force and/or the vital installations of the rear area. A point defense gives a priority of defense to specific assets. These assets can be either mobile or static organizations or installations. SHORAD systems normally operate as part of a point defense. Patriot is employed in a point defense when defending against theater missile threats.

(2) *Air and missile defense priorities.* Before employing weapon systems in a point defense, the ADA commander considers METT-T, IPB, and the maneuver commander's intent and concept of operation to develop air and missile defense priorities. Priorities are based on the factors of criticality, vulnerability, recuperability, and the threat as they apply to each of the supported commander's assets.

(*a*) *Criticality:* the degree to which an asset or force is essential to mission accomplishment.

(*b*)*Vulnerability:* the degree to which an asset or force is susceptible to surveillance and attack or to damage if attacked.

(*c*) *Recuperability:* in terms of available time, equipment, and manpower, the degree to which an asset or force can recover from inflicted damage and continue its mission.

(*d*) *Threat:* the probability that an asset or force will be targeted for attack by enemy air.

The ADA commander recommends the ADA priorities to the maneuver commander for approval. Once approved, the priorities form the basis for allocating AD resources.

(3) *ADA employment principles.* ADA commanders apply four principles when planning active AD operations: mass, mix, mobility, and integration.

(*a*) *Mass:* the concentration of AD combat power achieved by assigning sufficient firepower to successfully defend the force or asset against air and missile attack or surveillance. To mass AD combat power, commanders may have to accept risks in other areas of the battlefield. For SHORAD systems, mass normally requires employment of no less than a platoon-sized organization. A battalion-sized element is the smallest unit capable of achieving mass when employing a HIMAD system such as Patriot.

(*b*) *Mix:* employment of a combination of weapon and sensor systems. Mix offsets the limitations of one system with the capabilities of another and complicates the problem of the attacker. Commanders consider all joint and combined arms resources when applying this principle. Mix causes the enemy to adjust its preferred tactics. Enemy tactics designed to defeat one system may make him vulnerable to another weapon system.

(*c*) *Mobility:* capability to move from place to place while retaining the ability to perform the AD mission. The mobility of AD resources must be equivalent to the mobility of the supported force.

(*d*) *Integration:* close coordination of effort and unity of action that maximizes operational effectiveness. Integration also minimizes interference with other operating systems. ADA systems must be integrated into both the ground scheme of maneuver and the joint DCA and TMD battles.

(4) *Employment guidelines.* Six employment guidelines apply when planning the use and positioning of ADA resources. METT-T determines which guidelines apply to a given situation.

(*a*) *Mutual support*: the fires of one weapon can engage targets in the dead zone of an adjacent weapon system.

(*b*) *Overlapping fires*: engagement envelopes of both weapons overlap.

(*c*) *Balanced fires*: weapons are positioned to deliver an equal volume of fires in all directions.

(*d*) *Weighted coverage*: fires are concentrated on the most likely enemy air avenue of approach.

(*e*) *Early engagement*: weapons and sensors are positioned so they engage before the enemy weapon system releases ordnance.

(*f*) *Defense in depth*: weapons are positioned so the enemy comes under an increasing volume of friendly fires.

c. Command and support relationships. The JFC, JFLCC, and corps and division commanders establish command and support relationships for ADA units in accordance with joint doctrine. ADA forces assigned to echelons corps and below (ECB) are OPCON to the echelon commander. EAC ADA forces are under the operational control of the JFLCC.

Special command relationships can be formed by placing the ADA unit under the tactical control of (TACON to), OPCON to, under the operational command of (OPCOM to), or attached to another unit. Support relationships, which define specific arrangements and responsibilities between supporting and supported units, may also be used.

Support relationships				
Issue	*DS*	*GS*	*Reinforcing*	*GSR*
Who establishes AD priorities?	The supported commander (cdr).	ADA cdr who established the support relationship.	The supported cdr.	The ADA cdr who established the support relationship.
Who positions ADA fire units?	The ADA cdr with approval of the supported cdr.	The ADA cdr in coordination with local ground cdr.	The ADA cdr with approval of reinforced ADA cdr.	The ADA cdr in coordination with reinforced ADA cdr.
Who coordinates for terrain used by ADA fire units?	The supported cdr.	The ADA cdr who established the support relationship.	The reinforced cdr.	The ADA cdr who established the support relationship.
With whom should liaison be established?	The supported unit.	As required.	As required and the reinforced ADA unit.	As required and the reinforced ADA unit.
With whom should communications be established?	The supported unit.	As required.	As required and the reinforced ADA unit.	As required and the reinforced ADA unit.

NOTES: 1. The term "positions" specifies the selection of the exact placement of individual fire units within the AO.

2. The parent ADA unit commander retains responsibility for administration and logistics.

8-2. TACTICAL TASKS FOR AIR DEFENSE ARTILLERY

	Deep	*Close*	*Rear*
Offense	Provide air and missile defense to deep strike assets. Recommend OCA and TMD attack operation targets.	Provide early warning of air and/or missile attack to supported units. Prevent enemy interdiction of chokepoints. GS units provide air defense of C^2, CSS, fire support, and other priority assets throughout the zone. Protect the reserve in its assembly area. Give the main attack priority. Move EAC Patriot forward into the corps rear area to allow corps Patriot to support maneuver forces. Anticipate the pace of maneuver and coordinate movement of corps Patriot into division AOs or through divisional boundaries to provide continuous coverage of maneuver forces.	GS ADA protects the high-value assets in the rear; e.g., C^2, aviation, and CSS. Integrate ADA into protection of LOC and air and sea ports of debarkation. Protect geopolitical assets from air and/or missile attack. Patriot protects priority assets from fixed- and rotary-wing aircraft, UAVs, and CMs. Patriot also defends against TBMs and TASMs.

	Deep	*Close*	*Rear*
Defense	Protect deep strike assets. Recommend targets for OCA and TMD attack operations.	Provide early warning of air and/or missile attack. Protect priority assets of the maneuver force. Normally, priority goes to the main effort. Place fire units in a counter-RISTA role during counterreconnaissance operations. Employ fire units to achieve mutual support. Maximize weighted coverage and extend coverage 2/3 to 3/4 of engagement range forward of supported force defensive positions to achieve early engagement. BSFVs give priority to the main effort ground maneuver and counterattack forces. Maneuver with the counterattack force using offensive guidelines. BSFVs plan and prepare positions in depth to support the scheme of maneuver.	Provide AD of priority assets in the rear; e.g., C^2, aviation, and CSS. These may include air and naval facilities or bases. Protect LOC and air and sea ports of debarkation. Defend against air and/or missile attack of geopolitical assets. Position Avenger to defeat enemy attempts at air insertion.

8-3. WEAPON SYSTEM AND SENSOR CHARACTERISTICS

a. Patriot missile system. The Patriot missile system is effective against aircraft, UAVs, CMs, antiradiation missiles, and TBMs. Patriot possesses a fast-reaction capability, a high degree of firepower, and the ability to operate in a severe electronic attack environment. The multifunction, phased-array radar searches, detects, and tracks multiple aircraft from near ground level to altitudes in excess of 80 kilometers. Depending on the terrain, the radar acquires airborne systems to ranges beyond 160 kilometers, provides missile guidance to intercept, and performs electronic protection functions. Patriot also boasts automated operations against the TBM with the capability of human override.

Ideally, batteries providing defense against TBMs should be placed no farther than 20 kilometers apart. The assets Patriot is defending should normally be no farther than 20 kilometers from the unit. A battalion-sized element is the smallest unit employed to achieve mass.

Patriot battalions are assigned to corps and EAC ADA brigades. Each battalion has five firing batteries; each battery has eight launchers.

b. Avenger. The Avenger is a lightweight, day-night, limited-adverse-weather missile system that counters the threat of low-altitude, high-speed, fixed- or rotary-wing aircraft and UAVs. Avenger is capable of rapid reaction and multiple engagements within seconds. The system has 360-degree coverage and an acquisition range in excess of 10 kilometers. The Avenger fire unit incorporates two turret-mounted Stinger missile pods, a .50-caliber machinegun, forward looking infrared radar (FLIR), laser range finder (LRF), and identification, friend or foe (IFF). The fully rotatable turret with a gyro-stabilized launch system gives the Avenger a fire-on-the-move capability. The system is mounted on a HMMWV. Operated by a crew of two (a gunner and a driver-observer), the fire unit can engage a target out to 5 kilometers by missile or 1,500 meters with the machinegun. The gunner may fire from inside the turret or from a remote location, and he can convert the Stinger missile rounds to a MANPADS configuration.

Avenger should be positioned so that the engagement capability of one system overlaps that of an adjacent system. Mutual support distance for fire units is 3 kilometers. Overlapping fires distance is 4 kilometers. Avenger may also be positioned with Stinger teams for added asset protection. The limited engagement range of the Avenger may be overcome by sound IPB, positioning well forward of the defended asset, and the ability of the Avenger to receive and use a cue from FAAD C^3I. The capability to remotely cue Avenger provides the ground force commander an effective defense against the UAV threat. As with all SHORAD systems, mass is normally achieved with units of platoon size and above.

c. Bradley Stinger fighting vehicle. The BSFV is an interim ADA system based on the M2A2 BFV that provides a gun and missile mix to forward maneuver forces. By placing a Stinger team inside the M2, the BSFV provides mobility and survivability to the Stinger team and also provides ADA continuous coverage to the maneuver force. Until modifications are made to the interim system, the BSFV must stop and the Stinger team dismount to engage with the Stinger weapon. The BSFV is equipped with a 25-mm main gun, a 7.62-mm coaxial machinegun, an externally mounted TOW missile launcher, and two M257 smoke grenade launchers (GLs). The 25-mm chain gun and 7.62-mm coaxial machinegun cover the Stinger dead zone, provide for self-defense, and are capable of engaging rotary-wing aircraft. The BSFV carries six Stingers—four missile rounds and two ready-to-fire weapon rounds. It also carries TOW missiles—three in the rack and two ready to fire. BSFVs fight by platoons, optimizing mass and C^2.

d. M-6 Linebacker. The Linebacker is an air defense system based on upgrades to the BSFV. These upgrades give the Linebacker the ability to effectively engage air threats on the move while the crew remains under the protection of armor. A four-shot Stinger launcher replaces the TOW launcher.

e. MANPADS. Employed by a two-man team consisting of a team leader and gunner, Stinger is a man-portable, shoulder-fired, infrared-homing, fire-and-forget guided missile. Stinger provides AD for forward combat elements against low-altitude, hostile, fixed- and rotary-wing aircraft. Stinger has a range in excess of 4 kilometers and an IFF capability. The team prime mover is the HMMWV.

Stinger teams are found in the divisional ADA battalion, the ACR, and separate brigades. System operation at night or in adverse weather conditions is restricted by the gunner's ability to see and identify the target. This limitation is offset somewhat by FAAD C^3I. Teams should normally be positioned so that the engagement capability of one team overlaps that of an adjacent team. Although affected by the impact of the terrain on line of sight (LOS), this is ideally between 2 and 3 kilometers.

f. FAAD C^3I. The FAAD C^3I system provides automated assistance to SHORAD engagement operations. The system includes the air battle management operations center (ABMOC), the Army airspace command and control (A^2C^2) center, sensors, battery CPs, platoon CPs, fire units, and digital and voice communications to tie the elements together.

FAAD C^3I provides the division, as well as corps, with a real-time picture of air activity. The ABMOC and ADA A^2C^2 receive air "tracks" from external sources (e.g., airborne warning and control system (AWACS) or HIMAD), as well as SHORAD sensors. Track information from external and sensor sources is automatically correlated and transmitted to ADA batteries, platoons, sections, and individual fire units.

g. Light and special division interim sensor (LSDIS). With the phasing out of the forward area alerting radar (FAAR), the ADA community has adopted the LSDIS to fill the gap. The LSDIS is the interim replacement for the FAAR in light and special divisions of ADA SHORAD units.

The LSDIS is an all-weather, 24-hour, stand-alone system that is air-droppable and HMMWV-mountable and can meet surveillance and detection requirements. It is lightweight, man-portable, and rugged and provides SHORAD units with alerting and other EW information. This sensor can detect 1-m^2 targets out to a range of 20 kilometers and from 0 to 3 kilometers above ground level, providing target azimuth and range. Two soldiers can deploy the system in less than 10 minutes.

h. Ground-based sensor. The GBS is the SHORAD sensor for all heavy maneuver ADA units. GBS detects 1-m^2 targets to an instrumented range of 40 kilometers and an altitude of 0 to 4 kilometers. GBS provides cueing (specific and timely range, azimuth, and elevation) data on aircraft within the designated range of a weapon system. This cueing quality data lets the weapon systems orient on a potential target.

System	*Patriot*	*Avenger*	*BSFV/BSFV-E*	*MANPADS (Stinger)*	*Sentinel*
Acquisition	Radar	Visual/FLIR	Visual/infrared (IR) scope	Visual	Radar
Engagement range (ABT)	60 km (planning)	4+ km	Stinger: 4+ km TOW: 3.7 km (BSFV only) 25-mm: 1.7 km Coaxial (coax) mg: 900 meters	4+ km	40+ km
Engagement altitude (km)	24 (planning)	3+	3+	3+	3+
Number of systems per unit	5 btrys/bn 8 lchrs/btry	12/btry in corps; lt, abn, and AASLT div 12 in sep bde, enhanced (lt) 24 in lt ACR and hvy div 8 in ACR and sep bde, enhanced (hvy)	8/btry in hvy div 8 in sep bde 12 in ACR	8/btry in abn div and sep bde, enhanced (lt) 10/btry in hvy and AASLTdiv 6/btry in lt inf div	6 per div
Mutual support distance (km)	15	3	2	2	15
Armament/ ammunition basic load	32 msls/btry	8 msls .50-cal mg	6 Stinger msls 5 TOW msls (BSFV only) 300 25-mm rds 600 mg rds	6 msls/team	

8-4. AIR DEFENSE COMMAND AND CONTROL

a. Air defense control. Air defense within a theater is always a joint effort. The JFC will assign overall responsibility for AD to a single commander, normally his JFACC. As the AADC, the JFACC will integrate, coordinate, and control the AD effort within the theater of operations. This also requires him to establish procedures that permit friendly airspace use with minimum impact on the offensive and defensive capabilities of friendly forces.

ADA forces assigned to ECB maneuver elements are OPCON to the echelon commander. At EAC, ADA forces are OPCON to the JFLCC. Though OPCON to the JFLCC and assigned, attached, or organic to Army maneuver elements, the ECB units remain subject to theater or region rules of engagement (ROE) established by the AADC and/or his appointed regional AD commanders. This relationship helps ensure a coordinated and integrated AD effort while permitting each maneuver commander the freedom of action necessary for mission accomplishment. The JFACC, as the airspace control authority (ACA), also regulates the use of the airspace in cooperation with the JFLCC by establishing measures and means for deconflicting the activities for the multiple airspace users.

ADA forces assigned to echelons above corps (EAC) will fall under the command and control of the Army Air and Missile Defense Command (AAMDC), which is subordinate to the JFLCC when designated, and is otherwise subordinate to the Army forces (ARFOR) commander. The AAMDC commands the EAC ADA brigades. The AAMDC coordinates all AD and theater missile defense (TMD) operations for the ARFOR to provide theater operational protection against enemy air operations, including TMD attacks.

b. Engagement operations principles. Centralized control with decentralized execution and air battle management are the fundamental principles that form the basis for AD engagement operations. They apply to both offensive and defensive activities, but they particularly relate the management of AD systems in active air and missile defense operations to the conduct of the overall battle.

(1) *Centralized control with decentralized execution* permits the exploitation of the combat capabilities of AD at each level of command. Centralized control ensures unity of effort and integration and coordination of AD assets. It also facilitates the synchronization of defensive operations. For Army ADA, centralized control is manifest in theater ROE and AD weapon control procedures. Decentralized execution is necessary because the span of control of all AD forces and actions is too great for one commander to bear. Decentralized execution also enables AD assets to maximize their individual capabilities and respond effectively to fast-moving air and missile threats.

(2) *Air battle management* controls the engagement of air targets, ensuring destruction of enemy aircraft while preventing fratricide. To accomplish this goal, the battle management process requires real-time data using electronic means and sensors to coordinate airspace control and air defense C^4I. This management employs a mix of positive control and procedural control measures.

(*a*) *Positive control* relies on real-time data from sensors, IFF, computers, digital data links, and communications equipment to provide airspace and AD control. Positive control is desirable, but it is not always possible due to battlefield conditions and inherent system vulnerabilities.

(*b*) *Procedural control* complements positive control and overcomes its shortcomings. Procedural control relies on techniques such as segmenting airspace by volume and time using weapon control statuses (WCSs). Procedural techniques are usually more restrictive than positive techniques but are less vulnerable to degradation from electronic or physical attack. Procedural control enhances the continuity of operations under adverse battlefield conditions when positive control becomes degraded. Procedural techniques also provide a means to manage AD systems that do not have real-time data transmission capabilities.

(3) *Airspace control* provides increased operational effectiveness by promoting the safe, efficient, and flexible use of airspace. It consists of the coordination, integration, and regulation of the use of airspace with defined dimension. Because of the close relationship between airspace control and AD, the ACA is normally the AADC.

c. Air defense rules and procedures. The JFACC (AADC) uses AD warnings, ROE, and WCSs to determine the employment of AD weapon systems and to exercise the appropriate level of control.

(1) *Air defense warning.* The air defense warning (ADW) represents the commander's evaluation of the probability of air attack within his AO. Area or region air defense commanders routinely issue ADWs. Any commander can also issue a local ADW for his command, but the warning level can never be lower than the one set by higher authority. Commanders issue ADWs independently of all other warning procedures and alert statuses. The ADWs are—

(a) ADW RED: attack by hostile aircraft or missiles is imminent or in progress.

(b) ADW YELLOW: attack by hostile aircraft or missiles is probable.

(c) ADW WHITE: attack by hostile aircraft or missiles is improbable.

(2) *Rules of engagement.* ROE are "directives issued by competent military authority which delineate the circumstances and limitations under which US forces will initiate and/or continue combat engagement with other forces encountered." (FM 101-5-1, p 1-135) The AADC establishes ROE to help him delegate the authority to engage aircraft and also to permit him to retain control of the air battle by prescribing the exact conditions under which engagements can be conducted.

(*a*) *Self-defense.* Commanders have the responsibility to take whatever action is required to protect their forces and equipment against air or missile attack. The right of self-defense takes precedence over other air and missile defense rules and procedures. For air defense purposes, an attack on the defended force or asset can constitute self-defense.

(*b*) *Hostile criteria* are basic rules declared by the commanders of unified commands, and by other appropriate commanders when so authorized, that are used by echelons having identification authority to determine the friendly or hostile character of unknown detected aircraft. Identification authority is normally retained by the sector's control and reporting center (CRC). Identification authority may be delegated to lower echelons, but only in rare cases. Examples of hostile criteria can include speed, altitude, and heading of an aircraft or visual recognition of specific enemy characteristics or hostile acts.

(3) *Weapon control status.* The WCS describes the relative degree with which the fires of AD systems are managed. The WCS can be applied to weapon systems, volumes of airspace, or types of aircraft. The degree or extent of control will vary, depending on the tactical situation. Separate WCSs for fixed-wing aircraft, rotary-wing aircraft, UAVs, and TMs are normal. The AADC imposes the WCS. The AADC normally delegates the authority for establishing rotary-wing WCS to the maneuver force commander. He may also delegate the authority for establishing UAV and/or missile WCSs. Additionally, maneuver commanders (i.e., corps, division, brigade, or battalion) have the authority to impose a more restrictive WCS within their AOs for assigned or attached ADA weapons and combined arms operating in an AD mode if the local situation so demands. The three WCSs are weapons free, weapons tight, and weapons hold.

(*a*) *Weapons free*. Weapons can fire at aerial targets *not positively identified as friendly*. This is the least restrictive WCS.

(*b*) *Weapons tight*. Weapons can fire only at aerial targets *positively identified as hostile* according to the prevailing hostile criteria. Positive identification (ID) can be accomplished by a number of means to include visual ID (aided or unaided) and meeting other designated hostile criteria supported by radar track correlation and IFF.

(*c*) *Weapons hold*. Weapons cannot fire *except in self-defense or in response to a formal order*. This WCS is the most restrictive.

d. Airspace control measures. These measures, nominated by corps and division through the Army battlefield coordination element (BCE) to the AADC for approval, allow friendly air forces optimum use of airspace while minimizing the risk of engagement by friendly AD. Some temporary airspace restrictions can be imposed on segments of airspace of defined dimensions in response to specific situations and requirements. When approved, these measures are included in the Air Force air tasking order (ATO). They aid in fire distribution, airspace control, and friendly protection.

(1) *High-density airspace control zone*. The high density airspace control zone (HIDACZ*)* is the airspace control measure that provides the maneuver commander with the authority to unilaterally change weapon control status, such as from weapons hold to weapons free. It is airspace of defined dimensions in which there is a concentrated employment of numerous and varied airspace users. The HIDACZ allows the commander to restrict a volume of airspace from users not involved with his operation.

(2) *Restricted operations zone*. The term restricted operations zone (ROZ) identifies airspace of defined dimensions within which there is a specific operational mission or requirement, generally for a short time. The ACA establishes a ROZ in response to the requests of ground force commanders. Examples include ROZs for airborne operations or flight routes for Army IEW aircraft, such as special electronic mission aircraft (SEMA) or a UAV.

(3) *Minimum risk route*. A minimum risk route (MRR) or a low level transit route (LLTR*)* (North Atlantic Treaty Organization (NATO)) is a temporary corridor of defined dimensions passing in either direction through friendly ADA defenses and controlled or restrictive airspace. It is designated to reduce risk to high-speed aircraft transiting the tactical operations area at low altitudes. The WCS for an MRR or an LLTR will normally be maintained at weapons tight.

(4) *Standard-use Army aircraft flight routes.* Standard-use Army aircraft flight routes (SAAFRs*)* are established below the coordinating altitude to facilitate the movement of friendly Army aviation assets. Normally located in the rear areas of corps through brigade, these routes are jointly recognized routes that do not require joint approval.

8-5. PLANNING FACTORS

Defense design recommendations. Defense design begins with the commander's guidance, which is driven by the supported commander's priorities and threat capabilities. The following four examples depict varied scenarios.

a. Pure tactical ballistic missile defense. The specific priorities for a pure TBM defense must be articulated and well defined because the acquisition, tracking, and engagement parameters differ considerably from other types of air threats. Primary target lines (PTLs) will be oriented toward the templated source of the TBM threat. Air-breathing threats (aircraft) are engaged only as directed by higher authority and only when those engagements do not detract from the primary mission of destroying TBMs. Batteries should be placed no farther than 20 kilometers apart when the mission allows. Defended assets must be no farther than 20 kilometers from the Patriot battery.

b. Pure air-breathing threat defense. In a pure air-breathing threat (ABT) defense against fixed- and rotary-wing aircraft and UAVs, Patriot batteries should be arrayed to provide AD to assets and forces as dictated by the mission analysis. When mission and resources permit, PTLs should converge. Batteries should be placed no farther than 20 to 30 kilometers apart. Defended assets should be no farther than 30 kilometers from the battery.

c. Tactical-ballistic-missile-heavy defense. When arrayed in a TBM-heavy defense, Patriot batteries should focus on providing effective fires against TBMs, but they must consider the ABT as well. PTLs should be toward the TBM threat, while secondary target lines (STLs) should be oriented toward ABT air avenues of approach, and planners should keep in mind the shorter acquisition range of the Patriot radar against ABTs when in the TBM search mode. This defense should be considered when deploying Patriot as a TF, and it is especially useful for contingency operations when the threat of both

TBMs and conventional fixed- and rotary-wing aircraft exists. Batteries should be placed no farther than 20 kilometers apart. Defended assets should be no farther than 20 kilometers from the battery.

d. Air-breathing-threat-heavy defense. The priority for an ABT-heavy defense is to destroy enemy aircraft. This defense would be used when the threat of TBM attack exists but the major threat is from fixed- and rotary-wing aircraft. The defense design should be oriented on the ABT, PTLs should converge whenever possible, and assets designated for TBM protection must be clearly defined so that one or two Patriot batteries may be allocated to the TBM mission. Patriot batteries should be no farther than 20 kilometers apart for TBM and 30 kilometers for ABT.

CHAPTER 9

MOBILITY AND SURVIVABILITY

9-1. GENERAL

Mobility operations enable the force commander to maneuver combat, CS, and CSS elements to gain positional advantage, to support maneuver, or to provide sustainment. *Countermobility* operations restrict enemy battlefield mobility. *Survivability* operations reduce force susceptibility to detection and reduce force vulnerability to the effects of enemy weapons.

The mobility and survivability operating system includes combat engineers, aviation, FA, NBC decontamination and smoke units, and tactical air fires and airlift.

a. Engineers reduce obstacles and fortifications to assist movement, emplace obstacles to augment the terrain to impede or canalize an enemy, and prepare fighting positions or harden facilities against destruction.

b. NBC units enhance mobility and survivability through deliberate smoke operations and chemical decontamination.

c. Assault and medium helicopter units permit commanders to maneuver combat, CS, and CSS elements across otherwise untrafficable terrain or around enemy units. Assault helicopter units equipped with mine-scattering systems enable commanders to rapidly affect an enemy maneuver plan. Army air movement operations and Air Force tactical airlift can relocate combat forces within the combat area and perform logistics operations.

d. Field artillery and tactical air fires can deliver a variety of scatterable mines to drastically alter the trafficability of the target area and the ease of movement.

Section I. ENGINEER

9-2. ENGINEER BATTLEFIELD FUNCTIONS

Engineers multiply the effectiveness of friendly forces through the execution of mobility, countermobility, survivability, sustainment engineering, and topographic operations. These operations are planned for and applied across the depth of the battlefield. Their synchronization with other BOSs is critical to their mission contribution.

a. Mobility operations. Mobility operations overcome obstacles and fortified positions when forces move forward in the attack. Mobility operations free the force to maneuver at will, while simultaneously attacking the ability of the enemy to move and maneuver. Employing combat engineer personnel, equipment, and materials with lead maneuver units to maintain the momentum characterizes engineer support. The composition of the force varies with the operational environment, mission, enemy strength and capabilities, terrain, weather, friendly force organization, and time available. It changes rapidly as the flow of the battle changes. Forward combat engineer elements emphasize hasty, combat-related tasks.

Enemy attempts to use nuclear weapons and block avenues of approach magnify the delaying effect of natural terrain. Combat engineers clear the way. They—

(1) Fill craters and ditches.

(2) Demolish or remove roadblocks.

(3) Make quick bypasses around obstacles and contaminated areas.

(4) Clear paths through minefields.

(5) Span gaps.

(6) Make combat trails through wooded areas, heavy vegetation, and areas of massive tree blowdown.

(7) Assist in the assault of fortified positions.

b. Countermobility operations. Countermobility operations consist of obstacle installation and execution. In past combat experiences, obstacles were mostly confined to the defense. With the advent of the FASCAM, which enables commanders to emplace obstacles quickly for specific durations, this is no longer the case. Minefields containing self-destructing mines can now be installed by helicopter, high-performance aircraft, ground dispenser, and artillery in both the offense and the defense. Obstacle installation and execution is a combat multiplier of significant value to the commander and one that must be fully integrated with the tactical plan. The emphasis and priority of countermobility operations will change many times during the battle, and, for this reason, every commander must have his engineer immediately available to recommend the proper action and implement decisions.

(1) *Obstacle types*.

(*a*) *Tactical obstacles*. Tactical obstacles are employed to reduce the ability of the enemy to maneuver, mass, and reinforce and to increase his vulnerability to fires. Obstacles are designed and employed to disrupt, fix, turn, or block the movement of the opposing force. Obstacle groups are designed to produce one of these four functions.

Engineers will often only improve the existing obstacle characteristics of the terrain instead of constructing entirely new artificial obstacles. This can save valuable construction and demolition materials, equipment, and personnel hours—it takes far less effort to widen a gully or drainage ditch or steepen the side of a hill, levee, or road embankment than it takes to dig an antitank ditch.

Tactical obstacles are not planned and sited simply because the terrain allows construction of "a really good obstacle" or because an obstacle sited there "ties in with terrain." Obstacles are planned and sited to support the tactical plan by physically manipulating the enemy in a way that is critical to the commander's plan. They are one means to shape the battlefield and bend the enemy to our will.

(*b*) *Protective obstacles*. Protective obstacles, whether installed by the defending force or by the engineers, are a critical part of force security of its defensive positions. Much like final protective fires (FPFs), protective obstacles provide the force with a combat "edge" during the enemy final assault that may make the difference between success and failure. They also are used to impose a delay on an attacker so the defender has time to break contact and displace to another battle position.

Protective obstacles normally complement the defending force. The greatest close combat threat to a defending tank team is dismounted infantry. Antipersonnel obstacles are used to limit the ability of dismounted infantry to close with the defender. The greatest threat to an infantry defense is a tank force, which is kept out of the battle position with antitank obstacles. Neither type of obstacle is used in isolation; however, both are primarily oriented against the most severe close combat threat. As with tactical obstacles, protective obstacles have two important characteristics: they are sited according to terrain, and they are covered by defending fires.

Protective obstacles are installed adjacent to a battle position and are removed when the position is no longer occupied. These are the only obstacles that can be employed outside of designated obstacle zones and belts. If enemy action forces the defender to leave the position without recovering the obstacles, they are reported through operational channels.

(2) *Obstacle command and control.* Tactical obstacles are an integral part of the maneuver commander's plan. They are designed to cause specific effects on the attacking force in accordance with the commander's intent. Obstacle planning develops a coordinated, synchronized obstacle system that supports not only the immediate commander's plan, but also the higher commander's intent. Synchronized obstacle plans ensure that every obstacle supports the entire operation, from corps down through battalion. Necessary control of the obstacle planning process is accomplished by graphically designating obstacle zones, obstacle belts, and obstacle restricted areas; designating critical directed obstacles; and reserving certain obstacles for execution only on order from specific higher HQ.

Obstacle graphic control measures include obstacle zones, obstacle belts, obstacle groups, and obstacle restricted areas. Division commanders generally designate obstacle zones where lower echelons are allowed to employ tactical obstacles. These are identified during the staff planning process and support the maneuver plan. As tactical obstacles are only allowed within designated obstacle zones, division-level maneuver is unrestricted by friendly obstacles outside of the zones. Brigades establish obstacle belts within obstacle zones to further control obstacle employment areas and focus the defense within the brigade. These belts consist of a system of obstacles designed to create one of the four obstacle effects and allow brigade-level maneuver within the obstacle zone in areas outside of the obstacle belts. Task forces and battalions establish obstacle groups within obstacle belts to control obstacle employment and focus obstacle effect within the task force defense. Obstacle restricted areas are used to limit the type or number of obstacles within an area. The actual restrictions are described in the body of the order; however, these areas are designated only for unusual, specific purposes (for example, to deceive the enemy into conducting a penetration at a certain point by giving the appearance of a defense supported by obstacles that, in reality, have been restricted so they can be easily overcome).

At corps level, obstacle zones are used infrequently. Generally the corps does not specify the division fight, so a division is left free to develop its own system of zones. If the corps plan includes corps-level maneuver through a division area, an obstacle-restricted area is used. Corps-level obstacle zones may be employed for a specific purpose, such as to focus a division defense along a major river, but this is the exception. Unless the corps order restricts tactical obstacle employment to corps-specified zones, divisions and ACRs are free to develop their own zones anywhere in sector.

A division plan may not provide obstacle zones to a brigade if the division commander intends to allow the brigade maximum flexibility. In this case, the OPORD would specify that the brigade is free to employ tactical obstacles throughout its sector, thus allowing the brigade to develop obstacle belts anywhere within its boundaries.

The commander may also direct certain obstacles that are critical to the plan at his level. These become priority obstacles at the execution level. Certain targets may be reserved; reserving targets restricts the lower level commander's authority to execute these targets. Reserved obstacles allow critical, planned movement on the battlefield before their execution (passage lanes and counterattack routes are examples). Reserved obstacles require obstacle handover and execution instructions in the form of written combat orders. Depending on the criticality of the obstacle, an engineer team may remain at the obstacle to assist in its execution. Because reserved obstacles rapidly dissipate the engineer force, the commander minimizes their use and releases them at the earliest opportunity.

Obstacle reporting is a maneuver commander's responsibility. Staff engineers assist him with this responsibility. Engineer units also report obstacle status through engineer channels from the emplacing unit level to the authorizing command level.

c. Survivability operations. The last major category of tasks performed by engineers on the battlefield is survivability operations. The lethality and accuracy of enemy direct- and indirect-fire weapon systems have been well documented. The corollary to this capability is to protect vulnerable weapons, C^2 facilities, critical supplies, and other vital facilities. This protection will vary from using the natural folds of a terrain feature to establishing an elaborate shelter with overhead cover and interlocking fighting and/or communications trenches. Engineer forces provide expertise, manpower, materiel, and equipment to conduct survivability operations. The *maneuver commander* must decide the amount of effort and the priority he wants placed on survivability versus mobility and countermobility. Regardless of the priority, *the maneuver and FS forces must accomplish a great deal of the work themselves*.

Normally, positions will provide only side and frontal protection. Engineers use chain saws and other light power tools to assist maneuver units in clearing fields of fire. They can use armored combat earthmovers (ACEs), small emplacement excavators (SEEs), scrapers, and dozers to dig defilade positions for antiarmor weapon systems. Small engineer elements can fortify strongpoints and can modify existing structures in towns and villages.

d. Sustainment engineering operations. Sustainment engineering operations provide construction, main supply route (MSR) and LOC maintenance and repair, airfield damage repair, and facility restoration.

e. Topographic operations. Topographic engineering provides commanders information about the terrain. Topographic units furnish terrain analysis products, maps, and digital terrain data.

f. Engineers as infantry. While engineers are trained to conduct limited infantry missions and do have a responsibility in that regard, their reorganization and commitment to that role deprive the tactical commander of an important combat multiplier. Normal missions in combat result in engineer units being committed over a wide front. It takes time to reorganize them into an effective infantry formation and to secure forward observers, mortars, and additional antitank weapons. The major unit commander (generally no lower than a division commander) commits engineers as infantry only when the supported command is in danger of defeat.

Normally in operations, engineer units provide their own security and protection at worksites, and they are expected to get to and from the site without help from the supported unit; however; the productivity of the limited engineer resources can be greatly increased by using maneuver or other forces to provide security for the engineer work site.

9-3. ENGINEER RESOURCES AVAILABLE TO THE COMMANDER

a. Engineer allocation. Commanders should push engineer forces forward in the combat zone to provide a responsive and integrated capability to the maneuver units.

The corps commander apportions his engineer effort between the committed divisions and the corps area based on the recommendations of the corps engineer. In the tactical plan the corps commander will also direct engineer support to keep critical logistic supply routes open and to support other requirements, such as a corps-controlled covering force or area damage control (ADC).

Each division commander evaluates the support that his engineer and his G3 estimate will be necessary for his major subordinate commanders. Considering the capabilities of the organic divisional engineer unit (brigade or battalion), plus any added support from corps engineers, the division commander assigns priorities for engineer support to the division engineer. If the total engineer capabilities available to the division are insufficient, the division engineer initiates requests through the division G3 to the corps G3 for additional corps engineer assets to be allocated to the division.

The preceding process is further refined at the brigade level. The brigade commander develops his estimate of the critical engineer workload in his sector through his brigade engineer, usually the supporting engineer battalion commander. The brigade engineer identifies the mobility, countermobility, and survivability requirements of the brigade and its task forces. On the basis of his analysis of the tactical scheme, the men and materials available, and the time available for accomplishing combat engineer tasks, the brigade engineer makes recommendations for priorities of engineer support to the brigade commander. He will also recommend a command or support relationship that best meets the commander's priorities. Following the brigade commander's decision on priorities and command control, the brigade engineer allocates assets. If necessary, the brigade engineer requests additional assistance from the division engineer.

b. Engineer units.

(1) *Engineer commands (ENCOMs)* command and control HQ for engineer units assigned or attached to theater armies. Their primary responsibility is construction and engineer support in the COMMZ.

(2) *Engineer brigades* at theater army command and control two to five engineer groups each. They may be attached to an ENCOM. Each corps contains an engineer brigade that commands and controls all nondivisional engineer units assigned or attached to the corps. Each heavy division contains an engineer brigade that commands and controls all engineer units assigned or attached to the division.

(3) *Engineer groups* are found in corps engineer brigades when the size of the brigade requires the use of an intermediate control HQ.

(4) *Battalions* are the basic building blocks for engineer organizations. A committed division usually needs the equivalent of five engineer battalions. The five basic categories of battalions are—

(*a*) *Combat battalions*.

1. A divisional combat engineer battalion performs the engineer battlefield functions at the forward edge of the battlefield for its division, focusing on mobility, countermobility, and survivability. The engineers are closely integrated with the maneuver units. They have established normal relationships, train together, and thoroughly understand each other's battle drills and procedures. Engineer battalions are specifically structured for the heavy (mechanized and armored), airborne, AASLT, light infantry, and infantry divisions.

2. Corps combat engineer battalions are designed as mechanized, wheeled, or light combat battalions. All three can reinforce the divisional battalions in the forward brigade areas, support the division rear, or work in the corps area behind the division. The mechanized battalion operates well forward in the heavy division area. The wheeled battalion operates in any type of division, but is at risk when the threat is an armored force. The airborne or light battalion supports the initial deployment of airborne, AASLT, or light divisions in contingency operations. Corps battalions also train with maneuver units and understand their procedures.

3. Combat battalions, whether corps or divisional, also have the mission to fight as infantry if required.

(*b*) *Combat (heavy) battalions*. Primarily designed to perform horizontal and vertical construction (e.g., buildings, plumbing, power, and lighting), combat (heavy) battalions can also support the construction of battle positions; roads; and obstacles, such as tank ditches. They are equipment-intensive organizations, with such equipment as dozers, scrapers, graders, scoop loaders, entrenching machines, dump trucks, and cranes.

(*c*) *Bridge battalions*. Bridge battalions are collections of bridge companies that could include medium girder bridge (MGB) companies and assault float bridge (AFB) companies. They are only found in corps-level engineer brigades.

(*d*) *Topographic battalions*. Topographic battalions provide map production, map product storage and distribution, survey support, and terrain analysis.

(*e*) *Support battalions*. Support battalions are collections of support companies and teams, such as combat support equipment companies, port construction companies, light equipment companies, dump truck companies, and pipeline construction companies.

c. Engineer unit organization, capabilities, and limitations.

(1) *Division engineer (DIVEN) brigades (heavy divisions)*.

(*a*) *Organization*. Engineer brigades organic to the heavy divisions consist of an HHD and three combat engineer battalions. All brigades are 100-percent mobile.

1. Headquarters and headquarters detachment. The HHD contains the DIVEN HQ, which provides centralized C^2 and planning for the total division engineer effort. There is an ADE

section, a division tactical CP engineer section, and a brigade operations and plans section to accomplish this effort.

2. Combat engineer battalions (DIVEN brigade). Engineer battalions assigned to the organic DIVEN brigade comprise an HHC, three combat engineer companies, and one support platoon. A battalion is normally associated with each committed maneuver brigade.

(a) *Headquarters and headquarters company*. In addition to normal C^2 functions, the HHC contains maintenance and supply elements that augment the line companies. There is an assistant brigade engineer section that plans and coordinates brigade engineer support at the brigade main CP.

(b) *Combat engineer companies*. The combat engineer companies of a heavy division engineer battalion comprise a company HQ, two identical combat engineer platoons, and an assault and obstacle platoon. Major items of engineer equipment in each company are armored-vehicle-launched bridges (AVLBs), Volcanos, ACEs, mine-clearing line charges (MICLICs), and SEEs.

(*b*) *Employment*. The assigned engineer battalions of the DIVEN brigade provide the nucleus of support to the committed maneuver brigades. Normally, each division will receive additional engineer support from corps resources to augment its own capabilities; for example, bridging requirements that cannot be satisfied with AVLBs must come from corps.

(2) *Engineer battalions (light, airborne and air assault divisions).*

(*a*) *Organization and equipment*. These battalions comprise an HHC and three identical combat engineer companies. Most of the equipment is smaller than that found in other engineer battalions, and this equipment can be airdropped, airlanded, or transported by helicopters. Major items of equipment are motorized graders, dump trucks (2½- and 5-ton capacities), tractor-dozers (light), scoop loaders, and trailer-mounted air compressors.

(*b*) *Employment.* The engineer battalion improves or constructs air delivery facilities (drop, extraction, and airlanding facilities and zones) in the objective areas during the assault phase of an airborne or airmobile operation.

(*c*) *Limitations*. Limited haul and earthmoving capabilities hamper obstacle creation and reduction, protective shelter construction, and combat route missions (mobility, countermobility, and survivability). The unit conducts "light" engineer missions of short duration. Additionally, the combat engineer companies must receive the majority of their equipment from the equipment platoon of the HHC. Bridging support must come from corps.

(3) *Corps engineer battalions.*

(*a*) *Corps combat engineer battalion, mechanized*. The corps combat engineer battalion (mechanized) has three combat engineer companies and can provide combat engineer support to any type of division. The mechanized battalion has M113s as the squad vehicle and has capabilities similar to the battalions of the heavy DIVEN brigade.

(*b*) *Corps combat engineer battalion, wheeled*. The organization and capabilities of the wheeled battalion are similar to those of the mechanized corps combat engineer battalion; however, the

wheeled battalion is less survivable in the forward division area because it has 5-ton dump trucks as squad vehicles instead of M113s. The corps wheeled combat battalion does not have AVLBs.

(4) *Specialized engineer units (assigned to engineer brigades or groups)*.

(*a*) *Medium girder bridge company*. Normally, one MGB company is assigned per nondivisional engineer brigade or group. The four MGB sets have components for four 30.5-meter (100-foot) class 60 bridges or two 49.7-meter (160-foot) class 60 bridges with cable reinforcement kits. The company has sufficient personnel and equipment to assemble two bridges simultaneously. When the bridging is downloaded, the unit can provide thirty-two 5-ton dump trucks for earthmoving and general cargo hauling.

(*b*) *Assault float bridge company*. Normally, two AFB companies are assigned per nondivisional engineer brigade or group. They are equipped with ribbon bridging. The company can provide 213 meters (700 feet) of class 60 float bridge, 6 class 60 rafts, or a combination of bridges and rafts within the limits of the 30 interior and 12 ramp bays organic to the unit. The company has 5-ton bridge trucks and two 2-ton cargo trucks available for transport missions when the bridging is offloaded.

(*c*) *Combat support equipment company*. Normally, one engineer combat support equipment company is assigned per nondivisional engineer brigade or group. It supports one to three combat engineer battalions with construction equipment, such as dump trucks, cranes, dozers, entrenching machines, earthmovers, graders, rock crushers, and asphalt distributors.

(5) *Engineer company (separate brigade and ACR)*. The engineer company of the separate heavy brigade has more equipment and men than either a divisional or nondivisional company and provides engineer capabilities to a separate armored brigade, separate mechanized brigade, or separate infantry brigade. Organic equipment not found in divisional combat companies that is found in the engineer company of the separate heavy brigade includes cranes and bridging. The assault and obstacle platoon has six heavy assault bridges. The engineer company of the ACR and the engineer company of the separate light infantry brigade provide essentially the same support except that they contain *no bridge platoon*. The engineer company of the ACR, however, does contain three AVLBs to aid in spanning short gaps.

(6) *Other units*. At engineer brigade or group level, other specialized units (such as terrain analysis detachments, topographic companies, and engineer teams) provide administrative or technical support. Division and corps HQ in Europe have terrain analysis teams.

9-4. EMPLOYMENT PRINCIPLES

a. Employment of engineers. Whatever command or support relationship the G3 establishes between corps engineer units and the divisions, the following employment considerations apply:

(1) The thrust of engineer effort is forward. Corps engineer elements can work as far forward as the brigade areas.

(2) Engineers follow the concept of normal association; the same engineer units operate whenever possible with the same maneuver elements.

(3) The division engineer, as the single engineer point of contact for the division commander, coordinates or directs all engineers operating within the division AO. Within the brigade areas, the

brigade engineer normally performs this coordinating or directing function and acts as the single point of contact for the brigade commander.

In the heavy division, an engineer battalion habitually supports each brigade. The battalion commander performs the brigade engineer function. In the infantry, airborne, and AASLT divisions, a DS engineer company supports each brigade. In these units an engineer staff officer performs the brigade engineer function. If the division engineer determines that the number of engineers operating within the brigade area exceeds the coordinating capability of the brigade engineer, he may form an engineer TF.

b. Mission planning considerations.

(1) *Offense*.

(*a*) A highly mobile engineer force, well forward and integrated into maneuver formations, maintains the momentum of the attack. Redundancy in engineer forces is necessary to conduct breaching. Task force mobility assets, such as rollers and plows, are also used to the maximum extent possible for in-stride breaches or to proof lanes.

(*b*) Engineers must make detailed coordination arrangements to hand over obstacles from forward breaching units to follow-on engineers for lane improvement and obstacle clearance.

(*c*) Special considerations include replacement bridges for AVLB launchers, follow-on tactical bridging to replace AVLB spans, MICLIC resupply, and minefield lane-marking materials.

(*d*) Sustainment engineering requirements increase, since LOC will lengthen.

(*e*) Units must have rapid obstacle emplacement capability for flank security.

(*f*) At brigade and TF levels, engineers must have resources to emplace obstacles rapidly to protect attacking forces from enemy counterattacks once the objective has been attained.

(*g*) Engineers must plan for eventual transition to the defense (barrier materials and mines).

(2) *Defense*.

(*a*) A thorough, indepth understanding of the commander's intent leads to an obstacle system that not only disrupts the enemy where desired, but also assists counterattacking friendly forces and facilitates future operations.

(*b*) Large amounts of barrier material and engineer munitions require time and transport to bring forward.

(*c*) The commander must identify critical engineer tasks early. Terrain preparation requires time for completion. Engineers must not remain idle while final planning is in progress.

(*d*) The engineer task organization allows rapid transition to the offense. The reserve always has a designated force of engineers. Although engineers are positioned with reserve forces, engineer units themselves are not held in reserve but remain committed and work on the commander's priority tasks.

9-5. COMBAT ENGINEER PLANNING FACTORS

a. River-crossing planning factors.

(1) *Heavy division engineer battalion.* There are 12 military load classification (MLC) 60 AVLBs in this engineer battalion. Each can span an 18-meter gap in 5 minutes. To cross M1s, they are restricted to a span of 15 meters.

(2) *Corps medium girder bridge company.*

(*a*) Four MLC 60 bridges 30.5 meters long take one platoon 1 hour for each bridge.

(*b*) Two MLC 60 bridges 48.8 meters long take one platoon 4 hours for each bridge.

(3) *Corps ribbon bridge company.*

(*a*) Six MLC 60 rafts can be constructed in 20 minutes each.

(*b*) The company has 212 meters of bridge. One company can construct up to three bridges with a total length of 212 meters simultaneously; i.e., three 70-meter bridges.

(4) *Crossing times (minutes per round trip).*

Equipment	*River width in meters*				
	50	*75*	*100*	*150*	*200*
Pneumatic assault boat	*Minutes*				
with motor	2.7	3	3.3	4	4.7
with paddles	3.3	4	5.3	6	7.3
Rafts (ribbon)	6.7	7.5	8.3	10	

NOTES: 1. The times above are round-trip times for a river of the width shown and include load and unload times and safety factors.
2. Ribbon bridges can cross 200 vehicles per hour for any length of bridge.

b. Excavation (survivability) planning factors.

(1) *Mobility/countermobility/survivability assets.*

Heavy engineer platoon	3 squads, 1 ACE
Heavy engineer company	2 platoons, 7 ACEs, 4 AVLBs, 2 SEEs, 4 MICLICs, 2 Volcanos
Light engineer platoon	3 squads
Light engineer company	2 platoons, 1 Volcano, 4 SEEs
Tank company	3 mine plows, 1 mine roller
Mechanized infantry company	3 infantry platoons
Light infantry company	3 infantry platoons

(2) *Standard work rates.*

Survivability	*Dozer BTH*	*ACE BTH*
Hull defilade position (HDP)	1 ea/1 BTH	1 ea/1.5 BTH
Turret defilade position (TDP)	1 ea/2.5 BTH	1 ea/3.5 BTH
HMMWV TOW position	1 ea/1.5 BTH	1 ea/2 BTH
Vehicle [protective position	1 ea/.75 BTH	1 ea/1 BTH
Dismounted crew position	1 ea/1 SEE hour	1 ea/1 SEE hour
Individual fighting position	1 ea/.5 SEE hour	1 ea/.5 SEE hour

NOTES: 1. Blade team hour (BTH) is one blade team working for 1 hour. A blade team consists of two blades (ACE, dozer). One vehicle (ACE or dozer) digs (cutter) while the other blade spreads the spoil (strikes). A dozer/ACE mix uses the dozer BTH.
2. SEE hour is one SEE working for 1 hour.

(3) *Assumptions*.

(*a*) Personnel work 12 hours per day.

(*b*) Blades work 18 hours per day.

(*c*) Platoon and blade team are the basic planning units.

(*d*) Blades are employed as a team. At least one blade of the team is a dozer or an ACE.

(e) ACEs, dozers, CEVs, and bucket loaders are blade equivalents (plus or minus).

(4) *Available BTH formula*. BTH available = number of teams × effective hours per day × number of days.

(*a)* Assets are in terms of equipment or units (blade teams, platoons, etc).

(*b*) Use 18 hours per day if no shortage of personnel; use lower figure of 12 hours per day if short of personnel.

(*c*) Round blade team figure (answer) *down* to nearest whole number; e.g., 10.5 = 10.

(*d) Example.* Heavy engineer company with 2 days of preparation time. No shortage of assigned personnel. Equipment available is 7 ACEs and 2 SEEs; since the ACE (or dozer) must form the base of the blade team, four teams are formed.

BTH available = number of teams × effective hours per day × number of days.

BTH available = 4 × 18 hr/1 day × 2 days.

BTH available = 4 × 36 hours.

BTH available = 144 hours.

c. Type unit survivability work estimates.

(1) Deliberate fighting positions are required to protect a vehicle from kinetic energy hypervelocity projectiles. The position is constructed in four phases: hull defilade, concealed access ramp or route, hide location, and turret defilade. All fighting positions for fighting vehicles (M1A1s, M2s, M3s, etc) are planned as deliberate positions. Additionally, M577s (as well as other CP vehicle types) and mission essential vehicles use these deliberate fighting positions to enhance survivability.

(2) Vehicle protective positions (e.g., parapets) are constructed for vehicles and weapon systems that do not provide direct fire against the enemy. Parapets positioned at the front of or around major weapon systems will provide improved protection from direct fire and from blast fragments of indirect fire artillery. Unless separate overhead cover is constructed, these positions do not provide blast protection from indirect fire: superquick-, contact-, or delay-fuze shells. The positions do, however, provide medium artillery shell fragmentation protection from near-miss bursts greater than 5 feet from the position and from direct fire high-explosive antitank (HEAT) projectiles of 120-mm or less fired at the base of the 8-foot-thick parapet.

(3) The following chart represents work estimates for deliberate turret defilade positions based on M9 ACE blade team hours (3.5 BTH per turret defilade position). The data presented below is for illustrative purposes only using the standard work rates (variations will be experienced based on soil type, availability of equipment and personnel, and physical dimensions of equipment to be emplaced.)

All items are in blade team days (BTD) (BTH divided by 18 hrs/day).

Type unit	*Primary*	*Alternate*	*Supplemental*	*Total*
M2 company (14 × M2)	2.7	2.7	2.7	8.1
M1A1 company (14 × M1A1)	2.7	2.7	2.7	8.1
M2 heavy team (9 × M2 + 4 × M1)	2.5	2.5	2.5	7.5
M1A1 heavy team (10 × M1A1 + 4 × M2)	2.7	2.7	2.7	8.1
Balanced team tank company HQ.(10 × M1 + 8 × M2)	3.5	3.5	3.5	10.5
Heavy mortar platoon (split section—3 M106s, 1 M577)	.8	.8	.8	2.3
M109A6 battery (6 M109A6s, 6 FASVs, 3 M577s)	3.7	3.7	3.7	11.1
M109A6 battalion	11.0	11.0	11.0	33.0
Patriot battery (8 launchers, RS, EPP, ECS, AMG, CP)	2.5	-	-	2.5

NOTES: 1. One Patriot battery has eight launcher stations, radar set, electric power plant, engagement control system, antenna mast group, and command post. Does not include essential battery support systems.
2. ADA doctrine has units moving to new locations after either radiating and/or firing from present sites.

d. Strongpoints.

(1) A strongpoint requires one equal-sized engineer organization day, plus maneuver force working entire time. For example, a battalion strongpoint requires one engineer battalion day.

(2) Priority of effort is protective obstacles, then tactical obstacles.

(3) Planning factors provide minimum times; add 50 percent more for optimum.

e. Integration of commander's intent for survivability. Receive commander's intent and priorities. Determine—

- Primary, alternate, and/or supplementary positions.
- Type of position (hull, turret, or hide).
- Battle position and engagement area priorities.
- Unit priorities.
- Weapon and vehicle priorities.

f. Scatterable mine planning factors. Scatterable mines are laid without regard to pattern. They are designed to be delivered or dispensed remotely by aircraft, artillery, missile, or ground dispenser. All scatterable mines have a limited active life and self-destruct after their active life has expired. The duration of the active life varies with the type of mine and the type of delivery system.

Based on the tactical plan, the maneuver commander's staff engineer determines the location, size, time, and density of the minefield. With this information and a thorough understanding of available systems, he recommends the type minefield to be emplaced (conventional or scatterable). If a scatterable minefield is selected, he recommends the delivery system and coordinates with the appropriate staff officers.

(1) *Volcano*. The Volcano M139 mine dispenser can be mounted on a UH-60, a 5-ton vehicle, or an M548 tracked cargo vehicle. Each dispenser consists of 4 launching racks, and up to 4 racks can be mounted on a vehicle; each holds 40 M87 mine canisters (for a total load of 160 canisters). Each canister holds one antipersonnel (AP) and five antitank (AT) mines. All canisters are capable of dispensing mines with a 4-hour, a 48-hour, or a 15-day self-destruct time. Mines arm 2 minutes and 45 seconds after being dispensed. The Volcano is used to emplace tactical minefields, reinforce existing obstacles, close lanes, protect flanks, or deny the enemy the use of terrain.

(2) *Modular pack mine system (MOPMS).* The MOPMS is a man-portable, 162-pound suitcase-shaped mine dispenser that can be emplaced anytime before dispensing mines. The dispenser contains 21 mines (17 ATs and 4 APs) with a 4-hour duration before they self-destruct. The MOPMS provides a self-contained, on-call minefield emplacement capability for all forces. It is ideally suited for closing gaps or lanes in existing minefields, hasty protective minefields, ambushes and booby traps, tactical minefields intended to disrupt or fix, and nuisance minefields. MOPMS dispensers are issued as standard class V munitions and are drawn from an ammunition supply point (ASP) on a mission basis. Due to the weight of the system, it is normally transported by vehicle as close as possible to the emplacement site where it can be easily hand-emplaced by four soldiers using the four foldout carrying handles.

(3) *ADAM and RAAMS.* Aerial denial artillery munitions (ADAM) and remote antiarmor mine system (RAAMS) mines are delivered by a 155-mm howitzer. Mines are contained within a 155-mm projectile and dispensed while in flight. The M692 (long duration—48 hours) and M731 (short duration—4 hours) ADAM projectiles deliver AP mines with different self-destruct times. Each ADAM artillery round contains 36 mines. The RAAMS artillery round contains nine AT mines (same self-

destruct times as the ADAM). These systems provide the maneuver commander with the ability to emplace mines directly on top of, in front of, or behind enemy forces.

(4) *Gator*. The Gator system is delivered by Air Force and Navy aircraft. Each Gator canister delivered by the Air Force contains 72 AT and 22 AP mines and each canister delivered by the Navy contains 45 AT and 15 AP mines. The number of canisters carried depends on the type of aircraft. Six canisters (a typical Air Force payload) will create one 200 × 650-m minefield. Self-destruct and arming times are the same as for the Volcano. Gator is a corps asset. The primary limitations of the Gator are the competition for high-performance aircraft to emplace mines and its relative ineffectiveness on units in a column.

(5) *FASCAM planning factors*.

Type of system	*Minefield size (meters)*	*Self-destruct times*	*Safe arm times*
Volcano	1,115 × 120	4 hrs/48 hrs/15 days	2 minutes, 45 seconds
MOPMS	70 × 35	4 hrs	2 minutes
ADAM/RAAMS	400 × 400	4 hrs/48 hrs	2 minutes, 45 seconds
Gator	200 × 650	4 hrs/48 hrs/15 days	2 minutes

NOTE: MOPMS can be recycled three times for a total of 16 hours prior to self-destruction.

g. Standard minefield planning factors.

(1) *Obstacle belt and group planning factors*.

(*a*) Determine the width of the avenue of approach within the belt or group.

(*b*) Determine the desired obstacle effect and resource planning factor. Each tactical obstacle effect has a specific resourcing factor. This numeric value helps determine the amount of linear tactical-obstacle effort needed to achieve the desired effect. The resource factor is multiplied by the width of the avenue of approach or mobility corridor to get the total number of linear obstacles required.

Obstacle effect	*Resource factor*
Disrupt	.5
Fix	1.0
Turn	1.2
Block	2.4

1. Disrupt. A disrupt effect breaks up enemy formations, causes premature commitment of breach assets, interrupts C^2, alters timing, and causes a piecemealed commitment of attacking units. Disrupt minefields are used forward of or within engagement areas (EAs).

2. Fix. A fix effect slows the enemy within a specified area, normally an EA, so that he can be destroyed with fires. The primary use of the fix effect is to give the defender time to acquire, target, and destroy the attacking enemy throughout the depth of an EA or avenue of approach.

3. Turn. A turn effect manipulates enemy maneuver in a desired direction.

4. Block. A block minefield is designed specifically to stop an enemy advance along a specific avenue of approach or to allow the enemy to advance at an extremely high cost. Blocking

obstacles are complete and integrated with intense fires; minefields by themselves do not stop an attacker.

(2) *Standard minefield planning factors.*

	Disrupt	*Turn*	*Fix*	*Block*
Frontage (m)	250	500	250	500
Depth (m)	100	300	120	320
AT full (no of rows)	1	1	1	4
AT track (no of rows)	2	2	2	2
IOE (yes or no)	N	N	Y	Y
AHD (yes or no)	N	N	N	Y
Platoon hours required	1.5	3.5	1.5	5.0
Full-width mines	42	336	63	378
Track-width mines	84	168	84	168
*Density**	0.5	1.0	0.6	1.1

IOE: irregular outer edge
AHD: antihandling device

NOTE: Minefield density is an expression of how many mines are contained in the minefield. It is expressed in either linear or area density. Linear density is an expression of the average number of mines within a 1-meter path through the depth of the minefield anywhere along the front. Area density is the average number of mines in a 1-square-meter area anywhere in the minefield. Area density is normally used to express only the density of scatterable minefields.

(3) *Scatterable mine characteristics.*

(*a*) *Scatterable AT mine characteristics.*

Mine	*M723*	*M70*	*M75*	*BLU 91/B*	*M76*	*Volcano*
Delivery system	155-mm artillery (RAAMS)	155-mm artillery (RAAMS)	GEMSS Flipper	USAF (Gator)	MOPMS	Ground/air
Arming mechanism	1—G force 2—spin	1—G-force 2—spin	1—spin 2—electric	1—bore spin 2—electric	1—bore spin 2—electric	Crystal oscillator
Safe arm time	2 min, 45 sec	2 min, 45 sec	45 min	2 min	2 min	2 min, 45 sec
Fuzing	Magnetic	Magnetic	Magnetic	Magnetic	Magnetic	Magnetic
Warhead	M-S plate	M-S plate	M-S plate	M-S plate	M-S plate	M-S plate
AHD	20 %	20 %	20 %	No	No	No
Self-destruct time	48 hrs	4 hrs	5 days 15 days	4 hrs 48 hrs 15 days	4 hrs (recycle up to 3 times)	4 hrs 48 hrs 15 days
Explosive weight (lb)	1.3 RDX	1.3 RDX	1.3 RDX	1.3 RDX	1.3 RDX	1.3 RDX
Mine weight (lb)	3.8	3.8	3.8	3.8	3.8	3.8
Mines per 5-ton dump	9 per M718 projectile	9 per M741 projectile	1,600	NA	30 modules (510 mines)	160 canisters (800 mines)

M-S: magnetic sensing
RDX: type of explosive

(*b*) *Scatterable AP mine characteristics*.

Mine	*M72*	*M67*	*M74*	*BLU 92/B*	*M77*	*Volcano*
Delivery System	155-mm artillery (RAAMS)	155-mm artillery (RAAMS)	GEMSS Flipper	USAF (Gator)	MOPMS	Ground/air
Arming mechanism	1—G force 2—spin	1—G force 2—spin	1—spin 2—electric	1—bore spin 2—electric	1—bore spin 2—electric	Crystal oscillator
Safe arm time	2 min, 45 sec	2 min, 45 sec	45 min	2 min, 45 sec	2 min	2 min, 45 sec
Fuzing	Trip wire	Trip wire	Trip wire	Trip wire	Trip wire	Trip wire
Warhead	Bounding fragment	Bounding fragment	Blast fragment	Blast fragment	Blast fragment	Blast fragment
AHD (%)	20	20	20	100	0	0
Self-destruct time	48 hrs	4 hrs	5 days 15 days	4 hrs 48 hrs 15 days	4 hrs (recycle up to 3 times)	4 hrs 48 hrs 15 days
Explosive weight	21 grams Comp A5	21 grams Comp A5	1.2 lbs Comp C4	1.2 lbs Comp B4	1.2 lbs Comp B4	1.2 lbs Comp B4
Mine weight (lbs)	1.2	1.2	3.2	3.2	3.2	3.2
Mines per 5-ton dump	36 per M692	36 per M731 projectile	1,600	NA	30 modules (120 mines)	160 canisters (160 mines)

h. Countermobility planning factors.

(1) *Antitank ditch (ATD).*

(*a*) Dozer: 70 meters per BTH.

(*b*) ACE: 50 meters per BTH.

(2) *Countermobility times needed to form obstacles*.

(*a*) Standard disrupt minefield: 1 ea/1.5 platoon hours (PH) (one platoon (three squads) working for 1 hour.

(*b*) Standard fix minefield: 1 ea/1.5 PH.

(*c*) Standard turn minefield: 1 ea/3.5 PH.

(*d*) Standard block minefield: 1 ea/5 PH.

(*e*) Triple standard concertina: 300 m/1 PH.

(*f*) Road crater: 1 ea/1.5 squad hours (SHs) (one squad working for 1 hour).

(*g*) Point minefield: 1 ea/1 SH.

(*h*) Concertina roadblock: 1 ea/1 SH.

(*i*) Bridge demolition—massive: 1 ea/2 SH.

(*j*) Bridge demolition—steel: 1 ea/1 SH.

(*k*) Mine prep A + classes IV and V supply point: 100 mines/1 SH.

i. *Mobility planning factors*. The following factors need to be considered in mobility planning.

(1) Plan for a 50-percent loss of assets during breaching operations.

(2) Lane reduction time.

(*a*) *Mechanical reduction*: 10 minutes per 120-m deep minefield.

(*b*) *Manual reduction*: 10 minutes per 120-m surface-laid minefield. Buried minefield reduction is drill specific.

(*c*) *Breach ATD with ACE team*: 10 minutes.

(*d*) *Breach ATD with AVLB*: 10 minutes.

(3) *In-stride/deliberate breach requirements*. Assign an engineer platoon reinforced with required breaching assets to each lane.

(*a*) Two lanes (minimum) per assaulting task force.

(*b*) One lane (minimum) per assaulting company.

Section II. NUCLEAR, BIOLOGICAL, AND CHEMICAL

9-6. MILITARY POLICY AND ORGANIZATION

Nuclear, biological, and chemical weapons have had a profound impact on how our world is shaped and how our forces will fight. Each technology change has altered doctrine, tactics, techniques, and procedures. For decades, our leadership has struggled to prevent the proliferation of NBC weapons. Nevertheless, the list of countries that possess NBC capabilities grows each year. As a result, countries possessing these weapons could threaten the interests of the United States of America in every possible theater of the world.

"My nightmare was that our units would reach the barriers in the very first hours of the attack, be unable to get through, and then be hit with a chemical barrage. We'd equipped our troops with protective gear and trained them to fight through a chemical attack, but there was always the danger that they'd end up milling around in confusion—or worse, that they'd panic. The United States had not fought in a gas attack since World War I. The possibility of mass casualties from chemical weapons was the main reason we had sixty-three hospitals, two hospital ships, and eighteen thousand beds ready in the war zone.

"I also worried about the great empty area of southern Iraq where the Army would launch its attack. I kept asking myself, `What does Saddam know about that flank that I don't? Why doesn't he have any forces out there?' The intelligence people suggested offhandedly, `Maybe he plans to pop a nuke out

there.' They then nicknamed the sector the `chemical killing sack.' I'd flinch every time I heard it. I had a nightmare vision of Fred Franks and Gary Luck hitting that area only to have the Iraqis dump massive quantities of chemicals while the Republican Guard counterattacked and fought us to a stalemate. I became increasingly jumpy."

—General H. Norman Schwartzkopf, 1991

a. General. Nuclear and chemical weapons can dramatically alter the character of battle in a relatively short time span. Their destructive powers alter force ratios. Their psychological impact affects the control of forces. They severely restrict mobility by destroying urban areas and forests and contaminating terrain, equipment, and facilities. They rapidly create mass casualties that overwhelm medical evacuation and treatment facilities. Moreover, the physiological effects of working encapsulated in protective clothing and shelters, the loss of dexterity and visual acuity, and the difficulty in performing even the simplest bodily functions degrade individual performance.

b. US military policy.

- Nuclear—US forces many use nuclear weapons first, if necessary.
- Biological (including toxins)—US forces will never use biological weapons.
- Chemical—US forces will not use chemical weapons.
- Herbicides—US forces may use herbicides under specific conditions.
- Riot control agents (RCA)—US forces may use riot control agents under specific conditions. Generally those conditions are limited controlling rioting non-combatants and enemy prisoners of war. Use of RCAs against combatants is prohibited since it could potentially violate the Chemical Warfare Convention.

c. Principles of operation.

(1) The chemical corps operates with four principles of operation: *sense, shape, shield, and sustain*. These principles support the Army patterns of operation and will enable units to achieve information dominance and protect the force on the future battlefields. The principle of *sense* relies on the use of cooperative detection to integrate surveillance systems, detection equipment, identification systems, and monitoring and reconnaissance systems into a network of sensors that provides current NBC situational awareness to commanders and their units. Through *sensing*, units can avoid NBC hazards. S*hape* uses NBC IPB, NBC battle staff, and computerized warning and analytical tools to ensure that the NBC hazards are clear. This principle supports the employment of NBC units, protective levels, and medical treatments as part of the *shield* principle to prevent NBC casualties. *Sustain* provides decontamination and medical post-exposure treatments to restore units to full effectiveness. These four principles form the foundation of US NBC defense doctrine.

(2) In addition to these principles of operations, our national strategy to deter NBC warfare is accomplished in peacetime by engaging other countries in disarmament and counterproliferation activities. During conflict, we use threat of retaliation and other information operations as well as preemptive strikes to deter NBC use. NBC-trained units that employ the principles of operation bolster this deterrence. If we cannot deter enemy use, we use *sense* to positively identify contamination and clean areas. *Shape* provides analyzed NBC information that ensures all units are warned, that units that

can avoid it do so, and that those that cannot are properly protected. *Shield* provides the appropriate level of protection. *Sustain* requires necessary action to restore combat power through decontamination and medical treatment.

d. Organization.

(1) *Chemical brigade*. The normal allocation of chemical brigades is one per committed corps. The chemical brigade has no standard structure. It can command and control two to seven chemical battalions plus separate chemical companies as the mission dictates. The chemical brigade HHC is authorized 17 officers, 1 warrant officer, and 47 enlisted soldiers. Since all US Army chemical brigades are currently found in the reserves, the brigade commander does not wear a dual hat as the corps chemical officer.

(2) *Chemical battalion*. The normal allocation of chemical battalions is one per committed division. The chemical battalion has no standard structure. It can command and control two to seven chemical companies as the mission dictates. At corps level and below, the chemical battalion HQ will normally not have the robust S2 cell that the enhanced chemical battalion HQ has at EAC. The enhanced chemical battalion HQ is also referred to as a theater army (TA) chemical battalion.

(3) *Divisional chemical company (airborne or air assault division)*. This chemical company is an organic part of an airborne or air assault division. It provides decontamination, smoke, and staff support to the division. When operating over extended distances and isolated, the platoons of this company are routinely attached to the supported unit. One platoon can provide a smoke haze from 550 to 1,400 meters in width (depending on weather and terrain). It can establish two operational decontamination sites or one thorough decontamination site. The platoon cannot provide smoke and decontamination support simultaneously−it must reconfigure to change missions.

(4) *Divisional chemical company (heavy division)*. This chemical company is an organic part of an armored or mechanized infantry division; it is not part of the digitized heavy division structure. It provides reconnaissance, decontamination, smoke, and staff support to the division. The smoke platoon can provide a smoke haze from 600 to 1,200 meters in width (depending on weather and terrain). Each decontamination platoon can establish three operational decontamination sites or one thorough decontamination site. The reconnaissance platoon has six M93 NBC reconnaissance vehicles. These vehicles normally operate in pairs.

(5) *Chemical company (smoke, decontamination, reconnaissance) (ACR)*. This company is an organic part of the ACR. It provides a reconnaissance and smoke capability identical to the one in a heavy division. It can operate a single thorough decontamination site or two operational decontamination sites.

(6) *Chemical company (smoke generator, mechanized)*. This corps-level chemical company provides large area smoke support for a heavy division. It has three smoke platoons with seven M1059 (or M58 bispectral) smoke generator carriers (M113A3) in each. The platoon has two smoke squads and a support squad.

(7) *Chemical company (smoke/decontamination) (corps*). This chemical company provides large area smoke and decontamination support for a light division. It has four platoons with two smoke/decontamination squads and a support squad in each. Each smoke/decontamination squad has three M157 (or M56 bispectral) smoke generators (HMMWV) and M17 lightweight decontamination apparatuses. The support squad hauls water in support of decontamination missions or fog oil in support

of smoke missions. This company can take up to 6 hours to terminate one type of mission (smoke) and initiate a mission in its alternate role (decontamination).

(8) *Chemical company (reconnaissance).* This chemical company provides NBC reconnaissance support to a corps or theater army. It has three reconnaissance platoons with four squads in each. Each squad will have either two M93 Fox NBC reconnaissance vehicles or three armored HMMWVs. The M93 Fox is an amphibious, armored, wheeled vehicle capable of conducting chemical reconnaissance at 20 kilometers per hour on roads and trails. An improved version can conduct chemical monitoring from up to 5 kilometers away (line-of-sight) using a mast-mounted monitor.

(9) *Biological defense company*. This corps-level company brings one Long-Range Standoff Biological Detection System (LRSBDS) and 35 Biological Integrated Detection System (BIDS) teams to the battlefield. The LRSBDS mounts in a UH-60 helicopter cargo compartment and provides a long-range, nonspecific warning of an approaching particulate or aerosol cloud. The BIDS provides monitoring, sampling, detection, and presumptive identification of biological agents.

(10) Chemical company (r*econaissance/decontamination).* This corps-level company provides NBC reconnaissance and equipment decontamination for the Force XXI Digitized Division. It performs NBC reconnaissance and decontamination missions simultaneously. Reconnaissance and decontamination elements are dedicated to their respective missions. The company operates two thorough equipment and aircraft decontamination sites (DEDS/DADS) capable of decontaminating up to 32 vehicles per hour (16 vehicles per hour per platoon, or 8 vehicles per hour per two squads). It conducts route, zone, area, point, bypass, and named area of interest (NAI) NBC reconnaissance. It habitually operates in the division area and depends on the supported unit for 17 additional personnel to supplement each DED equipment decontamination site and 32 additional personnel to supplement each DAD aircraft decontamination site.

(11) *Chemical detachment (NBC reconnaissance).* This unit is assigned to the cavalry squadron of the Force XXI Digitized Division. It provides NBC reconnaissance support for elements of a Force XXI Digitized Division (FDD). It uses its six M93A1 FOXs to conduct route, zone, and area NBC reconnaissance to determine the presence and extent of NBC contamination.

(12) General allocation rules. This table highlights the number and type of chemical companies allocated to corps and each type of division. The number of chemical companies allocated to a corps is designed to support from 2 to 5 divisions and the ACR in that corps. To calculate the number of chemical companies allocated to a mission, add the number of companies for each type of division in the corps to the number of companies for the corps. This total determines the authorized number of chemical battalions and brigade HHDs.

SRC	*Chemical unit*	*Light division*	*Heavy division*	*FXXI division*	*Corps*
03-219F	Recon det			1	
03-477A	BIDS			1	1
03-427L	Recon co				2
03-057L	Abn/AASLT chem co	1			
03-157L	Hvy div co		1		
03-457F	Recon/decon			1	
03-467L	Smoke/decon	1	1	1	6
03-437	Smoke co (mech)		1	1	
03-377L	ACR co				1

Example: A corps operation with one airborne division, one FXXI division, two heavy divisions, and an ACR would be allocated the following: one reconnaissance detachment, two BIDS companies, two reconnaissance companies, one airborne chemical company, one heavy division company, one reconnaissance/decontamination company, 10 smoke/decontamination companies, three mechanized smoke companies, and one ACR chemical company, for a total of 22 chemical companies. The number of chemical battalions = 22 x .2 = 4 (rounded down) chemical battalions. Planners would allocate one chemical brigade to this operation.

9-7. GENERAL DESCRIPTION OF BATTLEFIELD OPERATING SYSTEMS APPLIED TO THE NBC BATTLEFIELD IN PLANNING

a. Intelligence and electronic warfare.

(1) Does the situation template consider the NBC threat?

(2) Do my priority intelligence requirements (PIR) include capability and intent of—

- Enemy nuclear delivery systems?
- Enemy chemical delivery systems?
- Enemy biological delivery systems?

(3) Does the intelligence collection plan include NBC named areas of interest (NAIs)? Do NBC reconnaissance units cover these NAIs? If not, do the units with responsibility for coverage have the necessary equipment and training to report if a NBC agent is employed at the NAI?

(4) Did I provide any NBC-related assumptions for consideration in the plan?

- Enemy use of NBC weapons to deny and restrict use of key terrain.
- Enemy use of NBC weapons to cause casualties in forward elements.
- Enemy use of NBC weapons against my trains, creating added logistic burdens.

b. *Maneuver*. Does my tactical plan take into account the tradeoffs and risks?

(1) Casualties from NBC weapons if I do not raise protection to MOPP 3 or MOPP 4.

(2) Casualties from enemy fires or heat stress if I do raise protection to MOPP 3 or MOPP 4.

(3) Increased time to complete tactical tasks if battlefield is contaminated? (Generally add 50 percent more time.)

(4) Decreased effectiveness of units that operate in MOPP 3 or MOPP 4? (Plan for 25 to 50 percent less effective.)

c. *Fire support*.

(1) Does my plan have NBC-capable units as HPTs?

(2) Does my plan consider that FS is less responsive when crews are in MOPP 3 or MOPP 4?

(3) Does my plan consider that calls for indirect fire increase under NBC conditions?

(4) Did I plan for smoke? Does this plan incorporate smoke grenades, smoke pots, smoke generators, and indirect delivery systems (artillery and mortars)? Does the smoke plan meet the commander's intent and clearly define the target and desired effects?

d. *Air defense*.

(1) Does my plan consider using smoke to help restrict aerial observation?

(2) Does my plan include engaging air targets forward?

e. *Mobility and survivability*.

(1) Do planned march routes avoid known areas of contamination?

(2) Do planned march rates consider degradation caused by NBC conditions?

(3) Does my plan integrate camouflage, concealment, and deception (CCD) measures for passive defense and avoidance?

(4) Does my plan include integrating smoke to protect my force and defeat enemy reconnaissance, surveillance, and target acquisition (RSTA) systems? Are times and locations for the use of IR smoke identified? Does my plan consider the use of IR smoke to defeat enemy RISTA and its effects on friendly systems at the time of employment?

(5) Did I provide guidance on acceptable levels of risk tied to key decision points or phases of the operation? Operational exposure guidance? MOPP?

(6) Have I issued automatic masking criteria?

(7) Did I plan for road guides to help bypass contaminated areas?

(8) Does my plan include decontamination considerations? Are decontamination sites linked to the templated NBC targets?

- Dispersal, decontamination, and reorganization areas.
- Linkup points.
- Water sources.
- Replacement of contaminated stocks, including chemical defense equipment (CDE).

(9) Does my plan designate sampling criteria? Are sample handling techniques clearly understood and sample transfer points designated?

f. Combat service support.

(1) Does the chemical unit supporting my force require sustainment and security support?

(2) Does my plan consider distribution of NBC equipment?

(3) Does my plan include transportation to move CDE?

(4) Does my plan consider that maintenance and transportation operations under NBC conditions are significantly slower?

(5) Does my plan consider that operations under NBC conditions significantly limit health service support capability?

(6) Does my plan consider contaminated casualty evacuation and decontamination?

g. Command and control.

(1) Does my plan consider the mental stress of MOPP 4?

- Is the plan simple?
- Is the plan well synchronized?

(2) Does my plan consider physiological degradation of MOPP 4?

- Work-rest plan.
- Command drinking plan.

(3) Which net will I designate to pass NBC attack information?

9-8. NUCLEAR WARFARE

a. General. Despite existing nonproliferation agreements, at least six Third World states are technologically capable of producing nuclear weapons. The list could soon expand to include seven or eight others; for example, North Korea has a nuclear weapons program and Iraq is on the verge of developing a nuclear weapon. Also to be considered is the possibility of a breakdown of accountability in the states of the former Soviet Union that have nuclear weapons. Weapons or nuclear material could find their way to potential trouble spots or terrorist organizations. A summary of nuclear weapons effects follows.

b. Distribution of energy.

(1) *Blast*. Blast is the brief and rapid movement of air vapor away from the center of a nuclear explosion. Blast causes large over-pressures that rupture eardrums and pressure-sensitive mines or other pressure-sensitive equipment. Blast causes rubble, cratering, and tree blowdown.

(2) *Thermal radiation*. Thermal radiation is the heat and light produced by a nuclear explosion. The visible light and infrared radiation extend great distances and produce most of the thermal damage of military significance. Unprotected soldiers can receive burns; temporary loss of sight (flash blindness); loss of night vision; and retinal burns, which are painless but may result in permanent blind spots.

(3) *Initial radiation*. Initial radiation consists of gamma rays and neutrons emitted within the first minute after the burst. Neutrons and gamma rays have a long range in air, are highly penetrating, and are the chief casualty producers. The greater the yield, the greater the dose of initial radiation at a given range.

(4) *Residual radiation*. Residual radiation consists primarily of fallout and small amounts of neutron-induced gamma activity (NIGA). Residual radiation occurs after the first minute following a nuclear burst.

c. Nuclear defensive operations. FM 3-4.

d. Effects of radiation exposure on combat personnel. TC 3-10.

9-9. BIOLOGICAL WARFARE

a. General. Biological warfare (BW) is the employment of biological agents or agents of biological origin (toxins) to produce casualties in man or animal and damage to crops or material. Medical and pharmaceutical facilities, widely established in the Third World, can produce BW agents as well as medicines. Biological weapon systems can provide the widest area coverage per pound of payload of any weapon system. Live pathogens, such as anthrax and plague, and botulinum toxin formed the basis of the biological threat 2 decades ago and have re-emerged as the principal threat today. Naturally or artificially produced toxins are faster acting and more stable than live pathogens.

b. Detection systems.

(1) *Biological Integration Detection System (BIDS)*. The BIDS will be the primary mission equipment of the chemical company (biodetection). The biodetection company will be assigned to a chemical brigade and will be allocated on the basis of one per corps.

(2) *Biological standoff (remote) sensor*. The biological standoff (remote) sensor is an aerial system that can be mounted in a UH-60 helicopter cargo compartment. It is a promising standoff detection module that will provide a long-range nonspecific warning of an approaching particulate or aerosol cloud. It will be used in conjunction with the BIDS to warn detection elements in the path of the cloud that they should begin continuous monitoring. The remote biosensor will be issued to the chemical company (biodetection).

c. Biological avoidance. FM 3-3.

9-10. CHEMICAL WARFARE

Today, 24 or more countries may be developing chemical weapons. Iraq successfully used chemical weapons in its war with Iran, and Iran also used them. Libya and Syria produce chemical weapons. In the Far East, North Korea has followed Russia and China in acquiring chemical weapons. The hazards from a chemical strike may last for less than an hour or for several weeks. The effects on personnel may be immediate. For soldiers forced into the higher levels of protection (MOPP 3 or MOPP 4), tasks are more difficult and can take longer to perform.

9-11. NBC DECONTAMINATION

a. Levels of decontamination.

(1) *Immediate (by individual)*. Minimize casualties, save lives, and limit the spread of contamination.

(2) *Operational (by unit)*. Sustain operations, reduce the contact hazard, and limit the spread of contamination to eliminate the necessity of or reduce the duration of wearing MOPP gear.

(3) *Thorough (by chemical unit)*. Reduce or eliminate the need for individual protective clothing.

b. Principles of decontamination.

(1) Decontaminate as soon as possible.

(2) Decontaminate only what is necessary.

(3) Decontaminate as far forward as possible (limit spread).

(4) Decontaminate by priority.

c. Decontamination platoons.

(1) Provide operational decontamination support.

(2) Provide thorough decontamination support.

(3) Can operate as squads or as a platoon.

(4) Require security and personnel augmentation from your unit.

9-12. CHEMICAL UNIT EQUIPMENT

a. M12A1 power-driven decontamination apparatus (PDDA). The M12A1 multipurpose, skid-mounted, power-driven decontamination apparatus consists of three major assemblies: a pump unit, a water tank and personnel shower assemblies, and an M2 water heater. The prime-detergent tank of the pump unit assembly holds priming water, detergent, or foaming liquids. The pump delivers up to 50 gallons of water or super tropical bleach (STB) decontaminating agent slurry per minute at a working pressure of about 105 pounds per square inch and 100°F using both hoses. The skid-mounted, 500-gallon, stainless steel tank has a working capacity of 447 gallons of water or 317 gallons of slurry. It consumes 600 gallons of water per hour. The hopper-blender assembly and fluid agitation system in the tank are used to blend STB agent and water. The shower assembly is used to form a field shower for showering up to 24 people at a time. The M2 water heater is used with the pump and tank units to provide hot water for both decontamination and showering.

The M12A1 mixes and sprays decontaminating slurries and solutions and hot, soapy water rinses during decontamination operations. It is also used for fire fighting with water or foam, de-icing operations, washing vehicles, pumping various fluids, and showering personnel in the field. The M12A1 cannot apply defoliants, herbicides, or insecticides.

b. M17 lightweight decontamination system (LDS). The M17 LDS consists of a pumper/heating unit, an accessory kit, and a water storage tank. The basic unit is a portable, lightweight, compact, gasoline-powered engine with a belt-driven water pump and coil-type water-heating unit. This equipment is designed to draw water from 30 feet away and 9 feet below pump level and deliver it at controlled temperatures up to 120 °F and pressure up to 100 pounds per square inch. The 145-pound accessory kit contains hoses, cleaning jets, and shower hardware. The rubberized-fabric, self-supporting tank weighs 709 pounds empty and has a fill capability of 1,580 gallons. The entire unit is independent of outside power and provides a showering capability for up to 12 people at a time.

c. M93 NBC reconnaissance system (NBCRS). The M93 NBCRS (Fox) can locate, mark, and report NBC agent contamination on the battlefield. The crew can operate in a contaminated environment in an environmentally controlled suite inside the vehicle.

The M93 NBCRS is equipped with various chemical and nuclear detection devices. The MM1 mobile mass spectrometer is capable of identifying approximately 960 chemical compounds, but is programmed to monitor for 22 agents at any one time. All known chemical warfare agents are programmed in the MM1 for rapid identification. A pair of sampling wheels alternates contact with the ground, absorbing liquid contamination. The wheels alternate contact with the extended probe of the MM1. The probe draws vapor from the respective wheel and surrounding air for the MM1 to analyze. The crew obtains samples of soil, vegetation, or munition fragments without dismounting the vehicle or exposing themselves to contamination. The samples are stored in a sampling tray at the rear of the vehicle. The vehicle is also equipped with an M8A1 automatic chemical agent alarm as a backup detection device. For radiological contamination, the M93 NBCRS is equipped with the ASG1 and AN/VDR2 radiac meters. These devices can measure radiation from .02 to 1,000 centigray (cGy) per hour (cGyph). The vehicle is also equipped with the vehicle orientation system (VOS) 1. The VOS1 maintains a grid map location of the vehicle, allowing for accurate NBC surveys.

The vehicle is crewed by four soldiers: vehicle commander, driver, MM1 operator (operator 1), and a probe and sample arm operator (operator 2). The vehicle weighs 19.2 tons combat loaded and is armed with a 7.62-mm machinegun and two M250 smoke grenade launchers. The M93 NBCRS can enter the

water and swim without stopping for external preparation. A pair of propellers at the rear of the vehicle steers and moves the vehicle in the water. Vehicle speed in the water is a constant 6.5 miles per hour; however, the vehicle wheels enable it to swim at 2.5 miles per hour without using the propellers.

d. M1059 mechanized smoke carrier. The M1059 has a crew of three: vehicle commander, driver, and smoke generator operator. The vehicle commander also acts as the gunner for the M2 machinegun.

e. M157 motorized smoke carrier. The M157 motorized smoke carrier consists of the same components as the M1059, except they are mounted on an M1037 HMMWV chassis. The motorized smoke carrier has a typical crew of two and is normally equipped with an M60 machinegun. As with the M1059, the M157 smoke generator sets cannot be dismounted from the vehicle.

The M157 smoke generator set consists of two M54 smoke generator assemblies, a fog oil tank, an air compressor assembly, a fog oil pump assembly, and a control panel assembly. The M54 smoke generator assembly is a gasoline-operated pulse jet engine that vaporizes fog oil. The fog oil tank, mounted inside the carrier, holds up to 120 gallons of fog oil. The fog oil is drawn from the fog oil tank and flows to the smoke generators.

f. M56 and M58. The M56 and M58 replace the M157 and M1059 respectively. Each has all of the characteristics of the system it replaces with the addition of being able to generate infrared-defeating smoke.

g. M31 BIDS. The M31 BIDS is a stationary, point-sampling system that is best employed as part of an array of BIDS to ensure maximum probability of detection. It performs biological monitoring, sampling, detection, identification, reporting, and sample evacuation. A platoon comprises seven BIDS; there are 35 in a BIDS company. Additional information is contained in FM 3-101-6.

9-13. SMOKE OPERATIONS

a. General. Obscurants are man-made or naturally occurring particles suspended in the air that block or attenuate the transmission of a particular part or parts of the electromagnetic spectrum, such as visible light, infrared IR, or microwaves. Fog, mist, dust, smoke, and chaff are examples of obscurants.

Smoke is an artificially created obscurant normally produced by burning or vaporizing some product. An example is the vaporization of fog oil to produce smoke from a mechanical smoke generator. Smoke and obscurants themselves are not lethal; however, when synchronized throughout the depth of the battlefield, they enhance the maneuver commander's ability to maneuver. They concentrate combat power against enemy vulnerabilities at the critical time and place. They also reduce the maneuver commander's vulnerability to enemy intelligence and TA. Smoke and obscurants can be a combat multiplier for the combat commander by—

- Degrading the enemy ability to see.
- Disrupting the enemy ability to communicate.
- Concealing friendly forces.
- Deceiving the enemy.

- Providing a means to identify and signal.

b. Types of smoke.

(1) *Obscuring*. Projected smoke placed directly on the enemy to attack or defeat TA and guidance systems.

(2) *Screening*. Generated, projected smoke placed between enemy and friendly forces to degrade enemy ground and aerial observation.

(3) *Protecting*. Generated smoke placed on own assets to defeat enemy guidance systems and attenuate enemy weapons by reflection, refraction, and absorption (e.g., laser or directed energy).

(4) *Marking*. Projected or generated smoke placed at a particular location to mark targets, identify friendly positions, or serve as some other communication.

c. Means of producing smoke.

(1) *Projected smoke*: artillery, mortars, rockets, grenades.

(2) *Generated smoke*: large area smoke generators, smoke pots, grenades.

(3) *Self-defense smoke*: vehicle engine exhaust smoke system (VEESS) (diesel only), grenades.

d. Uses of smoke in the offense.

(1) Conceal movement.

(2) Conceal a breaching operation.

(3) Conceal a river crossing.

(4) Conceal assembly areas.

(5) Screen a deliberate attack.

(6) Screen flanks of moving elements.

(7) Divert enemy attention for the main attack.

(8) Bypass enemy strongpoints.

(9) Reduce effectiveness of enemy TA.

e. Uses of smoke in the defense.

(1) Reduce personnel and equipment losses.

(2) Slow and disrupt enemy movement.

(3) Disrupt enemy C^2.

(4) Force the enemy to mass, producing a lucrative target.

(5) Conceal a retrograde.

(6) Isolate attacking echelons.

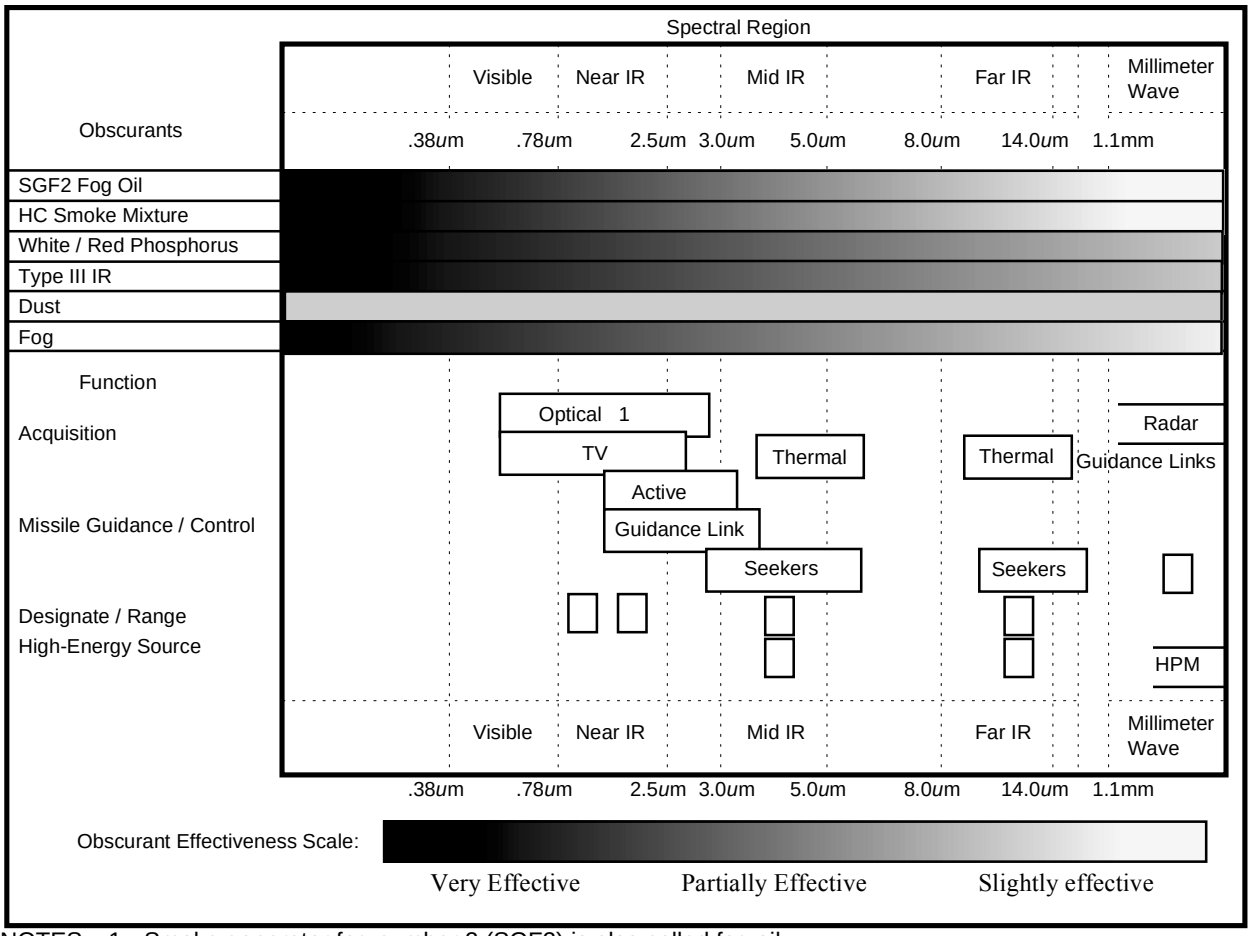
(7) Silhouette targets as they break through the smoke.

(8) Conceal defensive positions.

(9) Conceal disengaging and moving forces.

(10) Conceal a river crossing.

f. Uses of smoke and obscurants to defeat electro-optical systems. Some electro-optical TA and sighting devices can be rendered ineffective; others can be degraded significantly; some cannot be affected at all with current capabilities. This tactical decision aid can help select the type of smoke to delete a particular electro-optical system.



NOTES: 1. Smoke generator fog number 2 (SGF2) is also called fog oil.

2. Hexachloroethane smoke (HC) is a pyrotechnic composition of hexachloroethane, zinc oxide, and aluminum powder.

3 There are three categories of white and red phosphorus:

a. *White phosphorus* (WP) is a spontaneously flammable, natural element. It ignites on contact with air and is relatively unstable in storage. WP burns at 5,000 °F, making it the most effective smoke to defeat thermal imagery systems.

b. *Plasticized white phosphorus* (PWP) is a formulation of white phosphorus and some other agents (e.g., butyl rubber) to stabilize the smoke agent fill and slow the burning. This slowed burning tends to produce a more coherent smoke cloud with less pillaring.

c. *Red phosphorus* (RP) is not spontaneously flammable, so it requires ignition to burn and make smoke. RP burns at a lower temperature (4,000 °F), which produces a more coherent smoke cloud.

4. Type III IR obscurant is a micropulverized metal compound.

g. Smoke platoon. The smoke platoon, mechanized or motorized, is the basic unit capable of generating large-area smoke screens. The smoke platoon can support ground maneuver forces or operate in the rear area, providing support to fixed facilities. Mechanized smoke platoons can expect to operate in the forward combat area. They can expect rapid and frequent movements. Contact with enemy forces is probable. Motorized smoke units, depending on the type of unit they are supporting, also can operate in the forward combat area. However, motorized smoke will require more security from the supported unit when operating in the forward combat area. The smoke platoon also must operate in a manner that makes maximum use of its capability to generate large-area smoke screens.

h. Smoke planning process.

(1) Each echelon of command plans for smoke employment to support current and future operations.

(2) Integrate smoke into the overall tactical plan.

(3) Synchronize smoke use with key events or decision points.

(4) Base smoke planning on the same factors as the tactical plan: METT-T and distance.

(5) Mission considerations include—

- Types of smokes and obscurants available.
- Unit capabilities.
- Detailed planning and preparation.
- Employment techniques.
- Communications.
- Intelligence.
- Whether the unit has successfully operated in smoke previously.

(6) Chemical staffs must coordinate with other staff sections to—

- Develop estimates that define enemy capabilities and our own COAs.
- Analyze smoke targets.
- Rank smoke resources in priority.
- Recommend COAs to the commander.

(7) When the commander approves the staff estimates, the staff prepares orders that combine smoke with combat power.

i. Smoke estimate.

(1) The chemical officer prepares the smoke estimate in coordination with the G3/S3, the fire support officer (FSO), and the smoke unit leader.

(2) The estimate goes to the S2 and the targeting officer for inclusion into the target value analysis (TVA) for FS planning and to the S3 and chemical staff for smoke planning.

j. Smoke coordination checklist.

(1) What are the grid coordinates of the smoke mission?

(2) What is the duration of the smoke mission?

(3) What are the start and stop times of the mission?

(4) What type of smoke mission does the unit require?

(5) What kind of visibility is required in smoke?

(6) How might smoke interfere with friendly or allied operations?

(7) What types of smoke support are available?

(8) How will weather and the terrain affect the mission?

(9) What is the direction of the attack?

(10) What is the direction of known or suspected enemy?

(11) What are the supporting units and call signs?

(12) What is the tactical situation in the proposed smoke area?

(13) How and where will classes I, III, V, and VIII be located?

(14) How will fog oil be resupplied?

(15) Who will provide maintenance support?

(16) How will the smoke be integrated into the FS plan?

(17) What is the situation concerning enemy contact and obstacles in the proposed smoke area?

(18) What are the grid coordinates of the supported unit tactical operation center (TOC)?

k. Mobile smoke capabilities. Mobile smoke units use six vehicles (12 M157 generators) spaced 100 meters apart to produce a smoke coverage area 100 meters by 1,400 meters. The vehicles travel behind each other at 15 kilometers per hour using the racetrack method with two different-sized orbits: 500 meters and 1,000 meters.

l. Smokepot planning guide. FM 3-50.

m. Smoke platoon coverage capabilities. FM 3-50.

Section III. MILITARY POLICE

9-14. GENERAL

This section focuses on the functions, missions, capabilities, and employment of military police (MP) on the battlefield. MPs on the battlefield support the combat commander's mission to win the battle. They help the commander achieve his objective of destroying the enemy forces, large or small, wherever and whenever the Army is sent to war.

Military police provide a wide range of support to contribute to Army battlefield success. They combat enemy forces in the rear area; expedite the movement of critical combat resources; evacuate EPWs; provide security to critical Army facilities and resources; and provide commanders and soldiers with police services, as needed. MPs on the battlefield operate as a flexible economy of force organization. Organized in small tactical elements, they perform a wide range of support keyed to the echelon commander's priorities.

9-15. MILITARY POLICE FUNCTIONS

MPs help commanders meet the challenges of today's battlefield. MPs have always provided the Army a wide range of diverse support and are ready to perform this support with a limited but flexible force. MP support includes—

a. Combat operations against the rear area threat. The MP role in the rear area may, for short periods of time, become a direct combat role. MPs, based on METT-T and the commander's priorities, have the responsibility to seek out, close with, and destroy Levels I and II enemy forces in the rear area.

When MPs fight as a combat force, they help keep the enemy from delaying the commander's reinforcing units and disrupting his C^2. They defeat as much of the rear threat as possible. Level III enemy forces are too large a group to be defeated by MPs, but MPs identify, report, and, if possible, delay and disrupt them until the commander can deploy a TCF to defeat the rear enemy.

b. Combat support operations expedite the movement of combat resources and the evacuation, internment, and resettlement of EPWs. MPs reconnoiter routes to and within the battle area. They find alternate road networks to ensure a way is open to move reinforcing troops, fuel, food, and ammunition across the battlefield. They also expedite the rapid movement of units and essential supplies; spot and block off contaminated or damaged areas; and identify bypasses and restore the commander's tactical mobility.

Military police ensure tactical commanders are not impeded by the burden of guarding and caring for displaced civilians, refugees, or EPWs. Military police quickly collect EPWs from combat units. They rapidly move them from the battle area to meet the obligations of international law.

Military police intelligence operations help provide the tactical commander a doctrinally and operationally integrated MP, Criminal Investigation Division (CID), and MI intelligence systems picture.

Police intelligence is the collection, processing, and dissemination of information specifically applicable to criminal activities and violation of criminal law. Operational intelligence is the information required to conduct security, control, and other MP activities. Thus, police intelligence operations will include route reconnaissance and surveillance, intelligence collecting and reporting, information dissemination, area reconnaissance and surveillance, NBC detection and reporting, and, finally, criminal intelligence operations.

c. Combat service support operations provide the commander and soldiers with law and order services. When needed, MPs can assist the commanders and fellow soldiers by providing a variety of police services. They may be tasked to prevent diversion of military resources or to investigate criminal activity and deal with military offenders.

Military police on the battlefield, with their ability to move, shoot, and communicate, can significantly multiply a commander's combat power. They can do this without increasing the commander's total force or diverting resources from more critical operations.

9-16. MILITARY POLICE BATTLEFIELD MISSIONS

The MPs have five battlefield missions: maneuver and mobility support (battlefield circulation control), force protection (area security), enemy prisoners of war (EPWs) internment and resettlement operations, law and order, and police intelligence operations. These missions are conducted independently or simultaneously. The MPs, in performing these operations, provide a full range of battlefield support.

a. Maneuver and mobility operations help the commander get the right people and equipment to the right place at the right time. They are conducted using three primary operations: route reconnaissance and surveillance; circulation control and main supply route regulation enforcement and security; and dislocated civilian, straggler, and refugee control.

(1) *Route reconnaissance and surveillance*:

- Obtain detailed information on routes and nearby terrain.
- Provide detailed route reconnaissance overlays.
- Provide information on enemy activity.
- Provide information on contaminated areas, damaged areas, traffic delays, obstructions, bridges, and urban areas.

(2) *Circulation control and main supply route regulation enforcement and security*:

- Keep MSRs free of congestion and unauthorized use (enforce commander's highway regulation and traffic circulation plan).
- Expedite movement of critical assets along routes.
- Provide alternate routes and temporary route signs.

- Provide directions and information for units moving along routes.

- Operate traffic control points (TCPs), roadblocks, checkpoints, and holding areas, and conduct defiles at critical points.

- Develop traffic circulation plan.

(3) Dislocated civilian, straggler, and refugee (primarily the responsibility of the G5 and/or host nation) control:

- Keep MSRs clear of straggler movement (coordinate with G5/S5 and/or host nation authorities on displaced civilian control operations).

- Direct stragglers to their units and escort when necessary.

- Provide and/or direct to medical support as required.

- Establish straggler control points, mobile patrols, checkpoints, and TCPs to assist in straggler and displaced persons control.

- Assist, direct, or deny the movement and control of refugees.

- Provide alternate routes and direction to refugees.

- Provide and/or direct to medical assistance as required.

- Keep MSRs clear for movement by combat and support units.

(4) *Special missions*:

(*a*) *Battle handover and passage of lines*.

- Provide circulation control.

- Evacuate EPWs and stragglers.

- Reduce confusion and congestion.

- Maintain unit integrity during passage.

- Prevent possible infiltration by enemy units.

- Provide guides through passage lanes.

(*b*) *Hasty water crossing*.

- Reduce congestion and increase speed during crossing.
- Provide security to staging areas and crossing sites.
- Establish TCPs to maintain crossing flow.
- Conduct basic signing at sites.
- Support engineer operations with security and movement.
- Control movement into and out of the crossing site by units conducting crossing and support units.

b. Force protection (area security) is a major part of the MP battlefield mission. The MP force protection mission helps the tactical commander provide security and protection for the brigade, division, and corps rear areas. MP employment for area security may become more important than MP employment for maneuver and mobility support. MPs provide combat power to the commander for rear area operations and protection. MP employment in the rear area provides the commander with an available light, mobile force that can shoot, move, and communicate. MPs are a response force to enemy attempts to disrupt and delay friendly operations in the rear.

(1) *Area reconnaissance and surveillance*:

- Monitor likely avenues of approach, LZs, and DZs to give early warning.
- Seek specific information about local towns, bridges, terrain features, road networks, sites, terminals, and ports designated critical by the commander.

(2) *Security of designated critical assets*:

- Provide security for critical facilities, key personnel, pipelines, railways, bridges, tunnels, and conventional ammunition storage facilities.
- Provide mobile security for key convoys and escort key personnel.

(3) *Base response force*:

- Provide mobile, flexible force against enemy threat in the rear area.
- Respond to Levels II and III threats in the rear area. Defeat Level II and delay Level III (base commander is responsible for destroying Level I threats).

(4) *Counterincursion*:

- Provide response force for Level II threat.

- Delay and disrupt Level III threat as directed.

(5) *Air base ground defense*: establish exterior defense against ground attack.

(6) *Terrorism counteraction*:

- Conduct raids and rescues.
- Conduct show of force and intelligence gathering.

(7) *Area damage control*:

- Secure critical activities and reroute battlefield movement.
- Report and block off affected rear area.

(8) *NBC detecting and reporting*:

- Provide early warning of NBC use and location.
- Detect, mark, and report enemy use of NBC.

c. Military police EPW internment and resettlement operations relieve the tactical commander of the need to use combat forces to conduct this mission. The MP EPW mission is of humane as well as tactical importance. In any conflict involving US forces, safe and humane treatment of EPWs and US prisoners is essential and regulated by law. MPs perform their EPW mission to collect and evacuate EPWs throughout the theater of battle. To the tactical commander, MP support to EPW and US prisoner operations is critical to the commander's ability to focus on combat operations.

(1) *EPW collection*:

- Establish collection point.
- Segregate and secure EPWs.
- Secure and safeguard EPWs from retaliation by friendly forces or host nation personnel.

(2) *EPW evacuation*: provide security during movement and take accountability of EPWs from combat units.

d. The MP law and order mission extends the combat commander's C^2. MPs perform law and order operations to suppress the chance for criminal activity and to confine US prisoners. They conduct law and order operations only when the combat commander requires it and when battle intensity permits. The commander's need for these operations depends on the tactical situation. The four primary law and order missions are—

- Law enforcement.
- Criminal investigation.

- Temporary US military prisoner confinement.

- Terrorism counteraction.

e. Police intelligence operations involve MP, CID, and MI intelligence systems that must be doctrinally and operationally integrated to provide the maneuver commander a complete intelligence picture. Two major categories of police intelligence operations include—

(1) *Criminal intelligence*: processed information pertaining to individual and organized criminal activities.

(2) *Operational intelligence*: the information required to conduct security, control, and other MP activities.

9-17. MP ORGANIZATIONS

See wiring diagrams in FM 19-1 and FM 19-4.

a. MP support to the corps. An MP brigade assigned to each corps provides MP support to the corps. The MP brigade provides general support throughout the corps rear area. Thus, subordinate MP units are not assigned to subordinate corps units; instead, the MP brigade commander gives them AOs that they can quickly shift as needed to ensure accomplishment of MP missions in accordance with the corps commander's concept of operations. When possible, these AOs coincide with the corps RAOC and corps support areas of responsibility. This flexible employment fulfills the economy of force role that most MPs have on the battlefield. The MP brigade supporting a corps contains a brigade HQ and three to six MP battalions. Each MP battalion has three to six MP CS companies. The brigade commander will employ these companies throughout the corps rear area to provide maximum support to corps operations.

(1) *Command and control*. The C^2 in a corps MP brigade is consistent with that of brigades throughout the Army. The MP brigade commander commands the brigade and attached units and personnel. Battalion commanders work for the brigade commander. CS company commanders work for the battalion commanders. Platoon leaders receive their orders from respective company commanders and direct their platoons to assure mission accomplishment. The C^2 relationship is altered when corps MP assets are sent forward to augment a division MP company. Corps MP companies are attached to the division and placed OPCON to the division provost marshal (DPM) for as long as the unit is needed in the division area.

(2) *Support relationships.* A corps MP brigade provides GS to all US forces operating in its command AO. The MP units assigned to the MP brigade provide GS throughout the corps rear area.

(3) *Capabilities of an MP company (corps support).*

- Maneuver and mobility operations for up to 360 kilometers of main, axial, and alternate supply routes.

- Force protection (area security) for 2,000 km^2 or 800 km^2 of high-density urban terrain.

- Security for 12 critical sites or facilities.

- Escorts for 1,900 EPWs traveling by vehicle and 3,800 EPWs traveling by train.
- Guards for up to 2,000 EPWs in a holding area with adequate facilities.
- Control of dismounted refugee movement of up to 150,000 per day (not including care, shelter, or protection of the same).
- Battlefield law and order for 75, 000 nondivisional personnel.
- Security of one major HQ.

The planning figures presented above represent the maximum capabilities of a corps support MP company when performing each of these missions exclusively. However, since most of these requirements occur simultaneously on the battlefield, it is impossible to perform all of these missions adequately. Accordingly, missions must be ranked in priority based on the commander's guidance and the tactical situation.

(4) *Employment considerations*:

- Size of MSR network.
- Number and composition of urban areas.
- Location of CS and CSS facilities and units.
- Location of critical facilities that may require dedicated security.
- Expected enemy activity.
- Degree and frequency of support needed by each division.
- Current and projected tactical situation.
- Mission priority as set by the commander.

b. MP support to divisions. An MP company assigned to each division provides MP support to the division and maneuver brigade areas. The company is fully mobile so it can relocate frequently under short notice.

The organization of MP units supporting divisions is set by the TOE. Division MP companies fall mainly into two categories: those that support heavy divisions and those that support light divisions.

(1) *Command and control* of MP units in divisions extends downward from the tactical commander. The division MP company and any other MP assets that have been provided by corps pre-OPCON are controlled by the to the division PM. The MP company commander has day-to-day control of the unit. He commands the company and any platoons attached or OPCON from other commands. Each platoon leader directs and supervises his platoon in the execution of its mission.

(2) *The support relationships* of an MP unit supporting a division differ with the type of division to which the company is assigned. In a light division, the MP company is not resourced to provide DS to the maneuver brigades. This MP unit provides only GS to the entire division. In a heavy division, the MP company is organized to provide DS to each maneuver brigade, as well as to provide support to the division rear area. Usually, once an MP platoon has been assigned a DS mission to a maneuver brigade, it will coordinate to receive all logistic support from that brigade.

(3) *Capabilities of an MP company, heavy division*.

- Coordination and advice on rear area security plans.

- Maneuver and mobility operations of vehicular traffic and individuals in the division through the establishment of points and the operation of mobile patrols.

- Force protection (area security) through the use of mobile patrols, reconnaissance, and reaction capability.

- One EPW-civilian internee (CI) collection point within the division rear area.

- Area and route reconnaissance in conjunction with mobile patrol operations in the division rear area.

- Law enforcement operations in the division area.

- Assistance in securing the division main CP.

- Support for the brigades as required.

(4) *Capabilities of an MP company, light division*:

- A provost marshal (PM) section to exercise OPCON over assigned and attached units.

- Maneuver and mobility operations to expedite movement of vehicular traffic and individuals in the division.

- Force protection (area security) operations, reconnaissance, and response forces.

- Battlefield law and order operations to alleviate major problems endangering the successful accomplishment of the division mission; e.g., war crimes and criminal diversion of war material.

- One EPW—CI collection point within the division rear area.

- Temporary detention of US military prisoners.

(5) *Employment considerations*.

- Type of division being supported.
- MSR size and network.
- Availability of support assets.
- Availability of additional MP support.
- Tactical situation.
- Enemy situation and potential.

NOTE: The division band will normally be available, at the direction of the division commander, to perform its secondary mission of supporting MP operations in the division rear area. Primarily used to assist in the security and protection of EPWs, the band frees MP assets to perform their five battlefield missions (para 9-16).

c. MP support to separate brigades. Military police support is provided by an MP platoon assigned to the brigade HHC. A separate PM cell within the brigade HHC serves as the C^2 element for the platoon. The HHC provides support to the platoon and the PM section for maintenance, supply, mess, etc. As there is no organic support for the platoon or the PM section, close coordination for this support is required. The platoon must compete with other brigade HHC assets for priority of repair for weapons, vehicles, and communications equipment.

(1) *Command and control*. The C^2 for MP units supporting separate brigades extends downward from the tactical commander. Separate brigade MP assets as well as MP assets provided by corps are OPCON to the separate brigade PM the way division MP assets are OPCON to the division PM. The platoon leader directs the execution of the platoon's missions.

(2) *Support relationships*. The support relationships of MP units supporting separate brigades differ with the type of brigade to which the platoon is assigned. In a heavy separate brigade, the MP platoon employs all of its squads to provide GS to the entire brigade AO. Thus, the supporting relationship of an MP platoon supporting a heavy separate brigade and that of an MP company supporting a light infantry division are the same. The number of squads employed will vary with the brigade commander' s needs and the size of the brigade.

(3) *Employment considerations*.

- Limited MP assets and resources.
- Brigade AO.
- METT-T.
- MSR network and size.

- Type of separate brigade.

CHAPTER 10

BATTLEFIELD CALCULATIONS

Section I. MOVEMENT PLANNING

10-1. GENERAL

An effective corps or division planner must understand how large corps and divisions are, the amount of space they may occupy, and the considerations for moving them under varying circumstances.

Moving a typical corps by tactical road march entails moving at least 25,000 vehicles, assuming the corps has 3 divisions, an ACR, and supporting troops. The corps would occupy road space of 2,500 kilometers if it marched at the normal interval of 100 meters between vehicles (10 vehicles per kilometer), even without gaps between march units and serials. Pass time at 25 kilometers per hour would be more than 4 days.

To conduct tactical operations, the corps must march on multiple routes at the greatest possible speed, making the most economical use of road space. Economizing road space requires greater vehicle density on the routes in use, a function of shorter intervals between vehicles and minimal gaps between march units and serials. Increasing the number of routes adds flexibility and speed. Condensing intervals and gaps increases risks.

The corps can shorten its movement time and accelerate its deployment by marching in division columns with four routes for each of two leading divisions and by—

- Moving at a daylight rate of march of 30 kilometers per hour.
- Maintaining a 50-meter interval between vehicles.
- Limiting gaps to 2 minutes between march units and 5 minutes between serials (1,000 m and 2,500 m at 30 kmph). On eight routes at that interval and speed, the corps column length and pass time become manageable, and divisions can deploy to fight in a reasonable amount of time.

Under these conditions, the 25,000 vehicles of the corps would occupy about the same total road space of 2,500 kilometers (1,200 km of occupied road space plus 1,300 km of gaps). Distributed over eight routes, the average corps column would be only 320 kilometers long and would pass in 10.5 hours at 30 kilometers per hour. A reinforced division (6,000 vehicles) marching on four routes would average 155 kilometers per column and would pass in just over 5 hours.

10-2. ARMORED DIVISION CONDUCTING A TACTICAL ROAD MARCH

a. *Total wheeled and tracked vehicles.* Total vehicles in a division = 5,314. (Trailers, aircraft, and vehicles that would probably or normally move by lowbed (bulldozers, forklifts, etc) were not counted.)

b. Road space. For an entire armored division to conduct a tactical road march, with 100 meters from the front of one vehicle to the front of the next vehicle and no considerations for march units and serials, the division requires 531 kilometers of road space. If the division moves on two routes, it requires 265 kilometers of road space per route.

10-3. ROAD MARCH PLANNING FACTORS

Movement formulas are applied to known distance, rate, and time data to derive information necessary to prepare a time schedule. The time schedule is used to regulate departures and arrivals of march elements.

a. Time and distance relationships. Relationships between time and distance are the basis for march planning. The planner determines how far the column is to travel (distance) and how long it will take to make the move (time). He must also know the space (the length of the column) the column will occupy on the route and the distance (gap) that separates march elements. Each term used for distance has its corresponding term for time. The length of the column in kilometers has an equivalent pass time in minutes. The relationships between time and distance and the average rate of march are shown in figure 10-1.

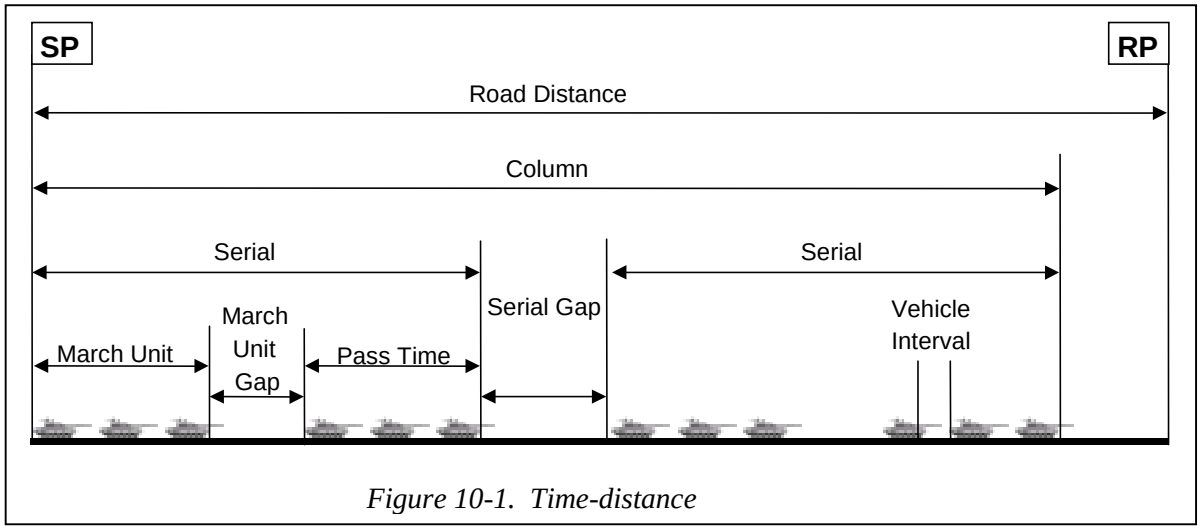


Figure 10-1. Time-distance

b. Terms.

(1) *March column*—elements using the same route for a single movement under control of a single commander.

(2) *Serial*—a major subdivision of a march column. Usually a battalion-sized unit. Usually 2 to 20 march units.

(3) *March unit*—a major subdivision of a serial. Usually a company-sized unit. Usually 10 to 24 vehicles.

(4) *Arrival time*—head of column reaches the start point (SP).

(5) *Clearance time*—tail of column reaches the release point (RP).

(6) *Pass time (PST)*—time between when the first vehicle passes a given point and when the last vehicle passes the same point.

(7) *Vehicle interval*—space between two vehicles (km).

(8) *March unit gap (MUG)*—gap between the rear of one march unit and the front of the next march unit within a serial.

(9) *March unit gap time (MUGT)*—time measured between the rear of one march unit and the front of the next march unit within a serial as they move past any given point.

(10) *Serial gap (SG)*—gap between the rear of one serial and the front of the next serial within a march column.

(11) *Serial gap time (SGT)*—time measured between the rear of one serial and the front of the next serial within a march column as the move past any given point.

(12) *Time distance (TDIS)*— time required to move from one point to another at a given rate of speed.

(13) *Road clearance time*— time it takes from when the first vehicle passes the SP to when the last vehicle passes the RP.

(14) *Extra time allowance (EXTAL)*—time added to allow for the accordion effect during a movement and unplanned delays.

(15) *Rate of march*—average number of kilometers traveled in any given period of time.

(16) *Density*—average number of vehicles per kilometer.

(17) *Speed*—planned velocity of the lead vehicle (kmph).

c. Formulas.

(1) *Pass time (PST).* (# of vehicles × 60 / (density × speed)) + EXTAL + (# of SGs × SGT) + (# of MUGs × MUGT).

(2) *Time distance (TDIS).* Distance (km) / rate of march.

(3) *Road clearance time*. ((TDIS + 60) + PST) / 160.

(4) *Extra time allowance (EXTAL). # of vehicles / 25.*

(5) *Rate of march.* Distance / time.

(6) *# of MUGs.* # of march units – # of serials.

(7) *# of SGs.* # of serials – 1.

Section II. SEEING, HITTING, AND KILLING

10-4. PLANNING FACTORS

a. The ability to observe is determined by—

(1) The capability and range of the sensor, human eye, optics, etc.

(2) The line of sight based on the terrain.

(3) Visibility based on day or night, weather, and battlefield obscuration.

b. The probability of hit (P^h) is based on—

(1) The capability of the weapon system.

(2) The accuracy of the round.

(3) The range.

(4) Gunner proficiency.

(5) Target speed and exposure.

c. The probability of kill (P^k) is the probability of killing the target *if* it is hit based on the—

(1) Velocity and penetrating power of the round at a given range.

(2) Angle of impact.

d. Ammunition expenditure is forecast by considering the—

(1) Number of targets.

(2) P^h and P^k.

Example: How many rounds are need to kill 10 targets if the probability of hitting the target is 90 percent and the probability of killing (if hit) is 80 percent.

10 kills = (# of rounds fired) × (# of targets hit ÷ # of rounds fired) × (# of targets killed ÷ # of targets hit)

10 kills = (# of rounds fired) × (.9 hits/ round) × (.8 kills/ hit)

# of rounds fired = (10 kills) ÷ (.72 kills / round fired) = 10 ÷ .72 = 13.9

The shooter will require 14 rounds to kill 10 targets.

10-5. CONSIDERATIONS

Several considerations combine to make lethal frontal engagements of enemy tanks unrealistic beyond 2,000 meters. Because of the approach to armor design, enemy tanks have most of their armor protection concentrated in the formal 60-degree arc of the turret. These enemy armors are difficult to penetrate frontally at any range with kinetic energy (KE) ammunition. However, the sides, top, and rear have relatively thin armor, making them vulnerable to attack from these aspects. Reactive armor has an even greater negative effect on chemical energy (CE) warheads, whether delivered by tank or missile. Although attempts to increase KE penetration capabilities against enemy armor have been fairly successful, the more modern long-rod penetrators achieve this at the expense of some delivery accuracy. Obviously, to achieve a kill, the penetration must first hit the target.

a. Range. It is possible to hit an enemy tank at 3,000 meters, but more difficult to do so on the first round of firing than on successive rounds. Further, even given a hit, the P^k will be very low against turret frontal aspects. With a limited number of rounds on board a tank (40 rounds on an M1A1 tank), and the time and logistic support needed for resupply, the commander must manage resources carefully. The idea is to make every bullet count, which requires reduced engagement ranges. There is a balance. Engaging at too close a range frontally will increase P^h and P^k, but will reduce the number of targets that can be destroyed before the attacker is on the friendly unit's position. If mission considerations take priority (for example, a delay mission), the engagement ranges may be extended at the cost of the number of kills possible before resupply is required. The ideal planning range is 1,500 meters. This can be extended with recognition of degraded P^h, degraded P^k against turret frontal armor, and reduced kills with the onboard load of ammunition. A planning range of 1,000 to 1,500 meters is appropriate if obscuration is expected.

b. Target exposure. The number of targets affects defensive operations. Defense missions imply superiority in enemy combat vehicles. The implication for the defender is to kill enemy vehicles and to keep on killing them over a long period of time. Then, when the attacker-to-defender ratio is sufficiently reduced, at least locally, the defender must seize the initiative from the attacker. Speed of the threat attack presents problems. Speed causes more targets to be at a given point during a specific period. The counter to this must be to spread the fight through the depth of a sector. Depth in the brigade sector will normally be achieved by deploying company teams in depth within the battalion sectors. Rarely could a brigade afford to thicken the battlefield sufficiently to have battalions in depth, and there would be significant C^2 problems. At the other end of the spectrum, the team commander will normally fight his team intact on one position at a time. He will not split the company team and fight platoons in depth from different positions. This does not preclude moving platoons separately from one company team position to the next. Selecting restrictive terrain with chokepoints will help regulate the flow of the attacker into the killing area. Given effective fire distribution, the defender should be able to kill at least three vehicles per defending tank against the enemy flank before the enemy can begin to return fire.

c. Fire distribution. An optimum direct-fire distribution plan would result in each target being killed only once. More targets and shooters in the fight make this increasingly difficult to achieve. It is difficult enough at platoon and company levels. A battalion EA will almost certainly result in less efficient fire distribution due to duplication, masking, dead space, and obscuration. In an ideal situation, good fire distribution should allow a defending team with terrain masking that is engaging from the flank at 1,000 to 1,500 meters to quickly destroy a reinforced threat company. If the terrain is not ideal for such close engagement, the defender must adapt these principles to the terrain for longer ranges but recognize that this will degrade visibility, C^2, P^h and P^k, and favorable direct-fire combat ratios.

d. Obstacle use. An effective obstacle plan will increase target exposure times or angles of attack by slowing, stopping, or turning the enemy.

e. Areas of fire and observation. When employed in the defensive role as part of a battalion, the tank company defends a strongpoint 1,000 meters wide and 500 meters in depth. There are 300 meters between platoons. The arc of observation for a tank with a stationary turret is restricted to the gunner's and the commander's sights, an arc of 18 degrees. There are normally 150 meters between individual tanks.

Section III. RELATIVE COMBAT POWER

10-6. ANALYZING RELATIVE COMBAT POWER

Combat power is the effect created by combining maneuver, firepower, protection, and leadership, the dynamics of combat power, in combat against the enemy. By integrating and applying the effects of these elements with any other potential combat multipliers (CS and CSS arms as well as other service assets available) against the enemy, the commander can generate overwhelming combat power to achieve victory at minimal cost. This task is difficult, at best. It requires an assessment of both tangible and intangible factors as well as consideration of an inordinate number of those factors either directly or indirectly affecting the potential outcome of the battle.

However, by analyzing relative-force ratios and determining and comparing the most significant strengths and weaknesses of each force as a function of combat power, planners can gain some insight into—

- Friendly capabilities pertaining to the operation.
- What type operations may be possible from both friendly and enemy perspectives?
- How and where the enemy may be vulnerable.

Although some numeric relationships are used in this process, it is not like the former Soviet mathematically substantiated computation for the correlation of forces; rather, it is only a largely subjective estimate. The COAs must not be based strictly on mathematical analyses. Pure, logical approaches are often predictable, sacrificing the surprise that bold, audacious action can achieve.

Planners can initially make a rough estimate of relative-force ratios. Figure 10-2 shows a corps-level analysis in which planners are counting maneuver and field artillery brigades as roughly equal to enemy equivalents.

Friendly corps		*Enemy army*	
Unit	*Number*	*Unit*	*Number*
Division (maneuver)	3	Division (maneuver)	4
ACR (maneuver)	1	ACR (maneuver)	1
Aviation brigade (maneuver)	1	Aviation regiment (maneuver)	1
FA brigade (fires)	4	FA regiment (fires)	3
		AT regiment (fires)	1
Total	9	*Total*	10
Ratio = 9 : 10 = 1.0 : 1.1			
Ground brigade (maneuver)	9	Ground brigade	16
DIVARTY (fires)	3	DIVARTY (fires)	1
Aviation brigade (division	3	Aviation brigade (division)	1
ACR (maneuver)	1	ACR (maneuver)	4
Aviation brigade (corps) (maneuver)	1	Aviation brigade (corps) (maneuver)	3
FA brigade (fires)	4	FA brigade (fires)	1
Total	21	*Total*	26
Ratio = 21 : 26 = 1.0 : 1.2			

Figure 10-2. Samples of relative force ratios.

When the staff finishes its computations, it draws conclusions about friendly and enemy relative capabilities and limitations as they pertain to the tactical situation. These computations give the staff a feel for relative strengths and weaknesses, but not absolute mathematical answers as to what friendly or enemy forces will do. Numerical relative-force ratios do not include the human factors of warfare. Many times human factors may be more important than the number of tanks or tubes of artillery. Therefore, the staff must carefully consider and integrate them into their comparisons. By using historical minimum-planning ratios for various combat missions and carefully considering terrain and enemy templating assumptions, planners can generally conclude what type of operations they can conduct (fig 10-3).

Relative strengths and weaknesses can be further refined by attempting to derive the single greatest strength and weakness of each force, at a minimum, in each of the four dynamics of combat power. By comparing friendly strengths against enemy weaknesses, planners may be able to deduce particular vulnerabilities for each force that may be exploitable or may need to be protected. These deductions may further lead planners to gain insights on potential decision points. They can then *determine the ratio of friendly units required*. (The ratios are for developing COAs only and not for actual combat.) Historical experience shows that a defender has about a 50-50 probability of successfully defeating an attacking force approximately three times his equivalent strength. The defender has many advantages: full use of cover and concealment, selection of the ground on which to fight, weapons sighted for maximum effectiveness, choice of firing first, and use of obstacle value of the terrain. Therefore, as a starting point, the commander might attempt to defend on each avenue of approach (AA) with, roughly, a 1:3 force ratio expressed as a friendly unit arrayed against the next-higher-level enemy unit; for example, a friendly battalion would defend against an enemy regiment.

A planner first compares the relative force ratios with the ratios in column 2 of figure 10-3. He can then determine if his unit has the odds that would give him the flexibility to conduct any type of operations he desires. The G2/S2 will also know if the enemy has that capability. In a defensive situation, the planner would know the enemy must conduct a penetration. In an offensive situation, he would know he cannot conduct offensive operations without massing his forces and accepting risk in

some area. He would be able to use this information when he begins developing a scheme of maneuver. If he identifies a ratio closer to one of the other planning ratios, he could draw other conclusions indicating another type of possible operation. This step provides the planner with a notion of "what to," not "how to." There is no direct relationship between force ratios and attrition or advance rates. *Relative-force ratios do not necessarily indicate the chance for success.*

Friendly mission	*Friendly : enemy*	*Position*
Delay	1 : 6	
Defend	1 : 3	Prepared or fortified
Defend	1 : 2.5	Hasty
Attack	3 : 1	Prepared or fortified
Attack	2.5 : 1	Hasty
Counterattack	1 : 1	Flank

Figure 10-3. Historical minimum planning ratios.

CHAPTER 11

UNITED STATES AIR FORCE OPERATIONS

Section I. UNITED STATES AIR FORCE MISSION AND ORGANIZATION

11-1. MISSION

The mission of the United States Air Force (USAF) is to defend the United States through the control and exploitation of air and space. The USAF provides theater and joint force commanders air and space capabilities at the strategic, operational, and tactical levels of war by presenting these commanders a task organized, integrated package with the proper balance of force, sustainment, and force protection elements through a deployed air and space expeditionary task force (ASETF). Present and emerging technology will make it possible to find, fix, or track and then target, and destroy anything that moves on the surface of the earth.

The USAF Global Engagement doctrine mirrors the Chairman's Joint Vision 2010 doctrine of full spectrum dominance. At the strategic level, the air component's strategic attack and intertheater airlift missions affect the war; at the operational level, the air component's interdiction and counterair missions affect the campaign; and at the tactical level, the air component's interdiction and close air support missions affect battles. Strategic attack missions flown against command and control facilities, communications, and national infrastructure enable future operational and tactical success. Space operations enable the receipt of intelligence, navigational information, and communications necessary for successful tactical operations.

11-2. USAF CORE COMPETENCIES

While all the Services possess and are charged with application of certain air power assets, only the USAF is charged with the full spectrum of America's air and space power requirements and capabilities. The USAF develops, trains, and maintains its elements of air and space power to produce decisive effects on the modern battlefield. The "capstone" USAF doctrinal manual, Air Force Doctrine Document 1 (AFDD 1) (analogous to Army FM 100-5) characterizes the dynamic blend of Service philosophy, knowledge, and hardware necessary to be the nation's air and space force through the use of six *core competencies*.

These core competencies are consistent with joint doctrine, particularly Joint Vision 2010. The core competencies are not doctrine per se, but they are the enablers of doctrine. They begin to translate the central beliefs of doctrine into operational concepts. A particular core competency is not necessarily unique to the USAF; however, speed, flexibility, and the global nature of its reach and perspective distinguish USAF execution of its core competencies. To remain the world's premier air and space force, the USAF must be capable of ensuring execution of all six of these core competencies briefly explained below.

a. Air & Space Superiority. Job One! Air & Space Superiority is the source of joint force flexibility. Not only does this make all other joint force functions possible, it makes a CONUS-based, deployable joint task force feasible. History proves that without air superiority, landings of surface forces (permissive or opposed) are simply not possible without unacceptable losses.

b. Global Attack. Global Attack speaks to the USAF ability to put fire and steel on targets anywhere on the globe at any time. Key to this capability are the USAF Global Attack assets, which can be used to strike targets from the CONUS and/or deployed locations, usually with less notice and en route time than any other Service system. With the decreasing numbers of land- and sea-based assets and fewer OCONUS operating locations, USAF Global Attack capabilities are more essential than ever before.

c. Rapid Global Mobility. Rapid Global Mobility is the timely movement, positioning, and sustainment of military forces through air and space for all military operations. In an era when forward basing is diminishing, global mobility helps ensure the potency and rapid projection of stateside US forces. The value of Rapid Global Mobility is most apparent in immature theaters where the key to successful contingency operations is the capability of the United States to rapidly deploy forces to aid friendly nations.

d. Information Superiority. Information Superiority refers to the USAF ability to collect, control, exploit, and defend information while denying the adversary the ability to do the same. That done, the USAF is quickly transitioning to near-real-time integration of the entire joint force through dedicated communications links to innovative technologies, such as unmanned aerial vehicles (UAVs), airborne warning and control system (AWACS), RIVET JOINT, airborne battlefield command and control center (ABCCC), and JSTARS. This provides the JFC, JTF staff, component commanders, and subordinate units situational awareness.

e. Precision Engagement. Smaller forces drive a requirement for enhanced lethality. At the heart of the "most bang for the buck" concept is the high kill probability inherent in precision guided munitions (PGMs). Use of these systems allows us to safely reduce our overall force size while retaining a qualitative edge over potential adversaries. Of equal importance in a world increasingly unwilling to accept civilian casualties is the ability to precisely strike military targets with minimal collateral damage.

f. Agile Combat Support. All of the other core competencies are meaningless if an operation cannot be logistically sustained. Agile Combat Support translates to a concept of transportation-based logistics systems versus the old supply-based system that required stockpiles of all classes of supply at every organizational echelon. Agile, responsive logistics systems are key to the deployability, effectiveness, and sustainability of our forces.

For a more in-depth study of USAF core competencies and how they blend in with Joint Vision 2010, read AFDD 1 at the following Internet site: http://www.usafdoctrine.maxwell.af.mil

11-3. SELECTED AIR AND SPACE POWER FUNCTIONS

The air and space power functions that most directly affect Army operations are counterair, counterland (interdiction and close air support), airlift, and special operations employment. Indirectly affecting all Army operations is the air and space power function of strategic attack.

a. Counterair (CA). CA operations are conducted to attain and maintain a desired degree of air superiority by the destruction or neutralization of the enemy air force and surface-based air defense network. It is essential to emphasize that *without control of the air, surface and air operations may be severely affected, and the JTF may be denied much, if not all, its flexibility*. CA includes both offensive and defensive actions.

(1) *Offensive counterair* (OCA). OCA missions imply proactive attacks normally conducted over enemy territory against enemy ability to employ air power, and SEAD. Targets are not only aircraft themselves, but also such things as airfields, command and control facilities, and munitions storage.

(2) *Defensive counterair* (DCA). DCA missions include both aircraft and air defense systems and are simply reactive responses to enemy air attacks. DCA usually consists of air-to-air engagements or defensive engagements against surface-to-air systems.

b. Counterland. Counterland operations are conducted to attain and maintain a desired degree of superiority over enemy surface operations to dominate the surface environment by the destruction or neutralization of enemy surface forces:

(1) *Interdiction*. Interdiction is a form of air maneuver. It is conducted to destroy, neutralize, or delay enemy military potential before it can be brought to bear effectively against friendly forces. It is conducted at such a distance from friendly ground forces that detailed integration of each air mission with the fire and movement of friendly forces is not required.

(2) *Close air support* (CAS). CAS is air action by fixed-wing and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that *require detailed integration* of each air mission with the fire and movement of those forces. CAS produces the most focused but briefest effects of any counterland mission; by itself, it rarely achieves campaign-level objectives.

c. Airlift. Airlift provides rapid and flexible means to deploy and employ combat forces and material worldwide. Intertheater (strategic) airlift provides the air bridge that links theaters to the CONUS and to other theaters. These missions are under the combatant command of the United States Transportation Command (USTRANSCOM). Intratheater (theater) airlift provides the air movement of personnel and material within a CINC's AOR. These air assets are either assigned or attached to that geographic CINC.

d. Special operations employment. Air Force Special Operations Command (AFSOC) operates specially modified aircraft to support timely and tailored responses throughout the spectrum of conflict. Low visibility and covert or clandestine actions, usually in enemy controlled or politically sensitive territories, characterize this function. AFSOC is the air component of Special Operations Command (SOCOM).

e. Strategic attack (SA). SA is an important USAF function whose effects are not immediately felt at the tactical level. These operations are designed to achieve their objectives without first having to necessarily engage the adversary's fielded military forces in extended operations at the operational and tactical levels of war. It is carried out against enemy centers of gravity so as to affect the capability of the enemy to wage war.

f. Additional air and space power functions can be found in AFDD 1.

11-4. USAF ORGANIZATION

The USAF comprises the active duty and reserve components, and the reserve component is made up of the Air National Guard and the Air Force Reserve. These components organize, train, and equip air forces, through associated major commands (MAJCOMs), for employment in the unified commands. Examples of MAJCOMs are Air Combat Command, Air Mobility Command, and US Air Forces in Europe. In the notional wing structure in figure 11-1, note that all operational, logistical, support, and medical units report to the wing commander, who can be either a brigadier general or a colonel, depending on the size of the wing.

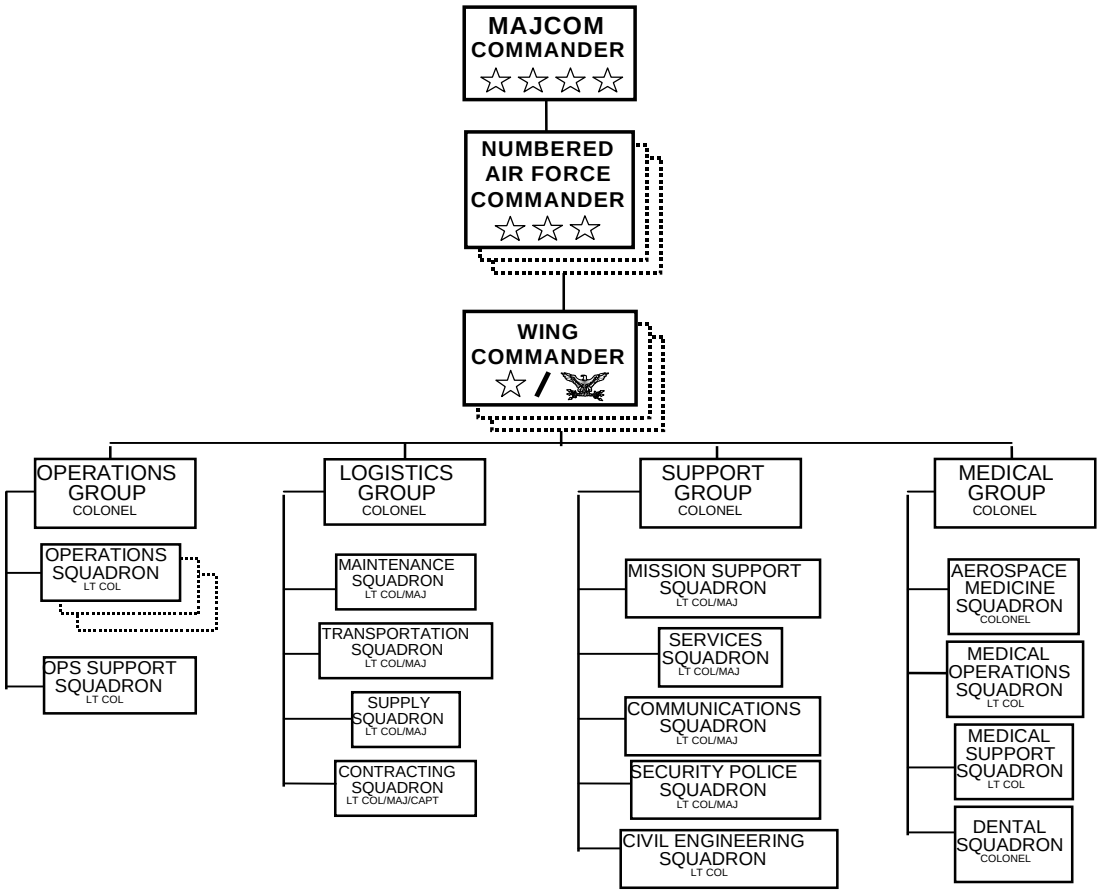


Figure 11-1. Notional wing structure.

11-5. TODAY'S EXPEDITIONARY AEROSPACE FORCE (EAF) AND THE AIR AND SPACE EXPEDITIONARY TASK FORCE (ASETF)

a. The concept: The US Air Force is rapidly changing. Since the Cold War, personnel cuts have forced every branch of the armed services to reexamine its role in national security. The Air Force looked closely and saw it needed to prepare for the changing face of world dynamics. The end result, after rightsizing its force and scaling back its presence overseas, was clear: the Air Force would need to become more expeditionary. One definition of expeditionary is "sent on military service abroad." That's why the term Expeditionary Air Force now applies so well to the Air Force of the 21st Century. Realigning and configuring itself to meet future global challenges, the Air Force of tomorrow is expeditionary, like its Navy and Marine counterparts, and is turning its focus toward meeting its future challenges.

The expeditionary aerospace force will—

- Give America an adaptive response to provide relevant aerospace forces in the 21st century.

- Allow the Air Force to better manage the force and determine when that force is stressed and where relief should be focused.

- Provide Air Force units, people, and their families greater deployment stability and predictability as it matures over time.

- Shape how the Air Force is organized, trained, and equipped to support the national military strategy.

b. Expeditionary Aerospace Force (EAF). Calling itself an EAF is a fundamental and evolutionary change for the Air Force, a shift to an expeditionary warrior mindset and a vision for how the Air Force organizes, trains, equips and sustains aerospace forces to meet the requirements of national military strategy and the challenges of a changing global security environment. The Air Force will form 10 new teams of forces, called aerospace expeditionary forces, that will be **c**omposed of F-15s, F-117s, F-16s, C-17s, B-52s and many other aircraft from across the broad Air Force spectrum. The teams will be on call, like global troubleshooters, and be sent when needed by our nation. Their role in future operations will be vital to making sure mission requirements are met. AEFs will be America's key future air and space watchdog**.** *Overview briefing(s), fact sheets and other information to help you better understand the EAF can be accessed through the Internet at www.af.mil/eaf.*

c. Aerospace expeditionary force (AEF). An AEF is one of ten predetermined sets of USAF forces (aircraft, equipment, and personnel) from which tailored force packages will be deployed in support of the combatant CINCs. These AEFs are placed in on-call status in pairs; i.e., 1 and 2, 3 and 4, etc. Each AEF will have 10,000 to 15,000 men and women and will operate a cross section of Air Force weapons systems (120 to 150 aircraft). Because an AEF is a Total Force organization**,** it will include many types of aircraft and combat support personnel drawn from the USAF's major commands, the Air Force Reserve, and the Air National Guard. It will consist of geographically separated units virtually linked to specific AEFs. AEFs consist of more than squadrons of combat aircraft. Global mobility provided by strategic airlift and aerial refueling will make expeditionary operations possible. AEFs will not have space systems assigned to them, but they will rely heavily on space support for communications, navigation, weather, threat warning, intelligence, surveillance, and reconnaissance to complement theater assets. Each AEF will have security forces, medical teams, fire fighters, communications, transportation, maintenance, and the other elements necessary to establish continuous operations at active airfields or austere forward locations.

d. Aerospace expeditionary wing (AEW). During the development of the EAF concept, the Service identified shortfalls in some capabilities, specialized personnel fields, and specific types of equipment that could not be met in the short term. In the interim, the USAF will maintain, in addition to the ten AEFs, two on-call AEWs centered around the 366th Wing, at Mountain Home AFB, ID, and the 4th Fighter Wing, at Seymour-Johnson AFB, NC. These two on-call AEWs will provide rapid response and force projection capability to answer unanticipated "pop-up" contingencies and crises. The wings will stand alternate 90-day on-call cycles, with each supplementing the pair of on-call AEFs. Once the Air Force corrects the identified shortfalls, it plans to integrate the on-call AEWs into the ten AEFs as quickly as possible.

e. Air and space expeditionary task force. Two central ideas—the principle of unity of command and the tenet of centralized control and decentralized execution—underpin the way the Air Force organizes. Air Force elements deployed in an expeditionary role are designated as an ASETF. The ASETF is the designated organization to fulfill the JTF and JFACC campaign objectives; it provides the JFACC with a single point of contact for air and space force capabilities in a task-organized and tailored package of air, space, and information capabilities. This structure also preserves USAF unity of command. An ASETF can be sized as a numbered air force (NAF), an air expeditionary wing (AEW), or an air expeditionary group (AEG), depending on the level and nature of the conflict and the size of the air

and space component required. Air expeditionary forces (AEFs) are deployed in wings, groups, or squadrons attached to an ASETF, although the term "AEF" is generic.

f. Numbered air force. The NAF is the senior warfighting echelon in the USAF. NAFs are permanently assigned on a regional basis and usually consist of multiple wings or other assigned and/or attached forces and a command element. An AEW consists of multiple groups and a command element. An AEG contains one or more squadrons and a command element. The core element of these warfighting echelons is the squadron, the basic fighting unit of the USAF. The ASETF will reflect the numerical designation of the tasked NAF. In the case of 9 AF based out of Shaw Air Force Base (AFB), SC supporting SOUTHERN WATCH in Southwest Asia during 1997, the ASETF became known as 9 ASETF. Figure 11-2 depicts the actual 9 ASETF—SOUTHERN WATCH command structure. Note the AEWs and their respective expeditionary fighter squadrons (EFSs), expeditionary bomber squadron (EBS), and airlift expeditionary squadron (AES), of which the 96 EBS operated from its CONUS location at Barksdale AFB.

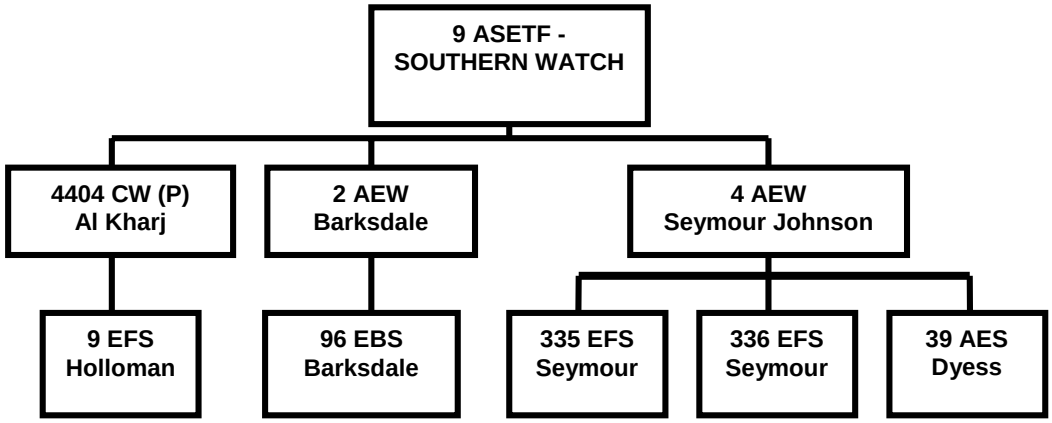


Figure 11-2. 9 ASETF.

The exceptional speed, range, and lethality of expeditionary air and space forces allow global operations far from the operational area. Air and space expeditionary forces will increasingly be able to influence a distant operational area without being physically present. Whether operating independently or complementing other joint assets, such as an on-station carrier battle group, the quick-reaction response and global reach of air and space forces make boundaries and organizational structures less constraining.

Additional information on ASETF employment is available in AFDD 2, which may be accessed through the Internet at www.usafdoctrine.maxwell.af.mil.

11-6. TASKING OF AIR AND SPACE ASSETS

In any contingency operation, the JFC or theater CINC has overall responsibility for attaining the military objectives of that operation, including the employment of air and space forces. The joint force air component commander (JFACC), when appointed by the JFC, provides an unparalleled combat capability that supports the JTF mission and objectives by exploiting the capabilities of joint air and space operation through the synergistic command and control of all air and space assets made available to the JFC. In unilateral operations, the JTF employs air and space power using the apportionment, allocation, and distribution process.

a. Apportionment. This process begins with an air apportionment decision made by the JFC. Apportionment is the total expected air effort, normally expressed in priority of emphasis, that should be devoted to the various air operations or geographic areas. For example: first, protect our ports, airfields, and critical C^2 nodes from air and ground attack by aircraft or SCUD missiles; next, delay and disrupt second-echelon enemy forces for 24 hours; third, reduce enemy C^2 and surveillance by 50 percent in the area of operation and enemy nuclear, biological, and chemical (NBC) capability by 80 percent prior to our counteroffensive; and last, provide air support to troops in contact. After consulting with the other component commanders, the JFACC forwards the apportionment recommendation to the JFC who then either approves or modifies the recommendation. *Ultimately, it is the JFC, not the JFACC, who decides how air will be apportioned in the theater.*

b. Allocation. After the apportionment decision, the JFACC determines the allocation of air and space assets by tasking available assets to perform particular functions (i.e., counterair, counterland, etc). The JFACC determines this by totaling the number of sorties available by aircraft type along with a general idea of when those sorties will be available and for what missions. During this process, the other component commanders use the air allocation/request (ALLOREQ) message to inform the JFACC, not later than 24 hours prior to the air tasking day, of their plan to use their own aerospace assets, including "excess" sorties that the JFACC might be able to use to task unfilled targeting requests. *It is through the JFACC tasking that aircraft perform specific air and space functions.*

c. Distribution. Using the sortie allotment (SORTIEALOT) message) not later than 18 hours prior to the applicable tasking day, the JFACC will then advise the JFC and joint force land component commander (JFLCC) of the sorties that have been allocated in direct support of the JFLCC. For this portion of the air effort, the JFLCC normally chooses to distribute that support to subordinate commanders through a process called distribution *(i.e., the JFLCC determines which subordinate maneuver units get what amount of CAS).*

Apportionment, allocation, and distribution are US doctrinal procedures. Other theaters of operation, such as Europe or Korea, use similar procedures but incorporate slight variations to meet theater-specific requirements. Figure 11-3 shows the air and space tasking decisionmakers in a *functional* unilateral joint task force.

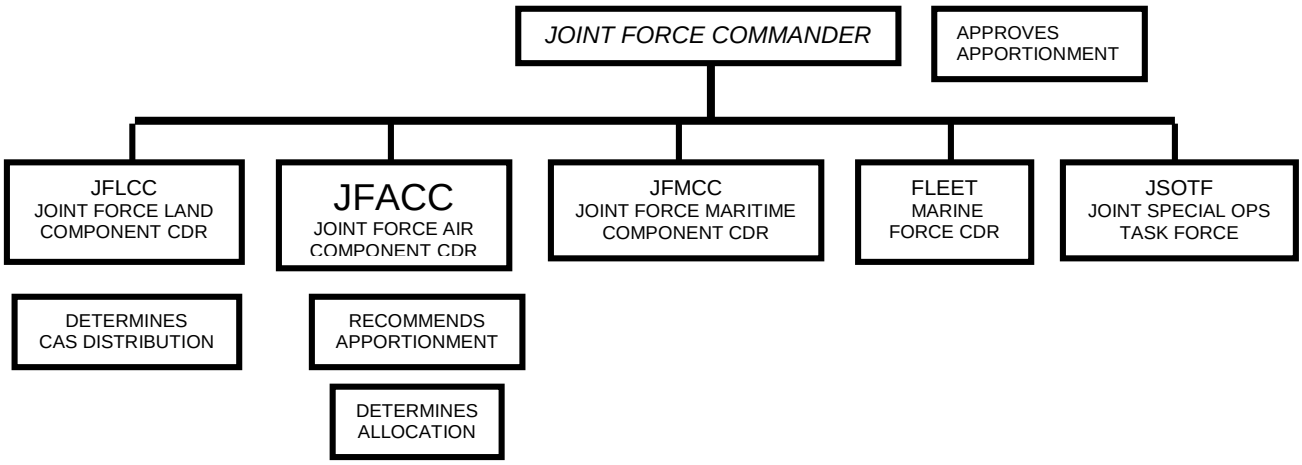


Figure 11-3. Air and space tasking decision makers in a JTF.

d. JFACC. During a contingency, the JFC will normally designate a JFACC. The primary purpose of the JFACC is to provide unity of effort for employing air power for the benefit of the joint force as a whole in support of the JFC's objectives. Normally, the JFACC is the Service component

commander who has the preponderance of air assets in theater *and* the command, control, and communication abilities to prosecute the air campaign. Depending on the situation and/or contingency, the JFACC may be sea based or land based and may be a USAF, a USN, or a USMC officer. Also, the JFACC is normally assigned additional responsibilities as the area air defense commander (AADC) and the airspace control authority (ACA). Other routine responsibilities the JFACC is assigned include being the *supported commander* for counterair operations; strategic attack operations, when air operations constitute the bulk of that capability; and the JFC's overall air interdiction effort. The JFACC also functions as the supporting commander, as directed by the JFC, for CAS, air interdiction within the AOs of the land and naval components, and maritime support. The JFACC typically will be permitted to exercise OPCON over assigned and attached forces and tactical control (TACON) over other forces made available for tasking. As with all unilateral operations, command responsibilities, taskings, and coordinating procedures depend on the situation and theater (METT-T).

e. Joint air operations development. Planning for joint air operations begins with understanding the joint force mission. The JFC's strategic appreciation of the political, economic, military, and social forces affecting the area of responsibility/joint area of operations (AOR/JOA) and the articulation of strategic and operational objectives needed to accomplish the mission form the basis for determining a component's objectives. The joint air and space operations plan (JASOP) documents the JFACC's plan for integrating and coordinating joint air operations in support of those objectives. The JASOP encompasses operations of joint air capabilities and forces from joint force components. A selected team of planners and weapon systems experts from each Service component enables consideration and understanding of all component capabilities and forces. There are five phases in the air and space operations planning process: operational environment research (intelligence preparation of the battlefield (IPB)or IPB by another name), objective determination, strategy identification, center(s) of gravity identification, and JASOP development.

f. Joint air operations center. When the Commander, Air Force Forces (COMAFFOR) is appointed the JFACC, the COMAFFOR's organization will include an appropriate Air Support Center (ASC) and 'A'-Staff, a Joint Air Operations Center (JAOC), and a Director of Mobility Forces (DIRMOBFOR). A key member of a USAF-appointed JFACC's staff is the A3/A5 (the air operations center (AOC) director) who is responsible for assessing, planning, and executing the air campaign. Figure 11-4 is a notional HQ with COMAFFOR as JFACC, along with staff and associated liaison support teams.

To achieve the JFC's campaign objectives, the JAOC plans and prosecutes the air campaign using asymmetric and parallel warfare techniques that reduce the need for force-on-force warfare, or, at the very least, ensure its success. This allows the JAOC to focus on strategic- and operational-level centers of gravity, rather than solely against tactical targets.

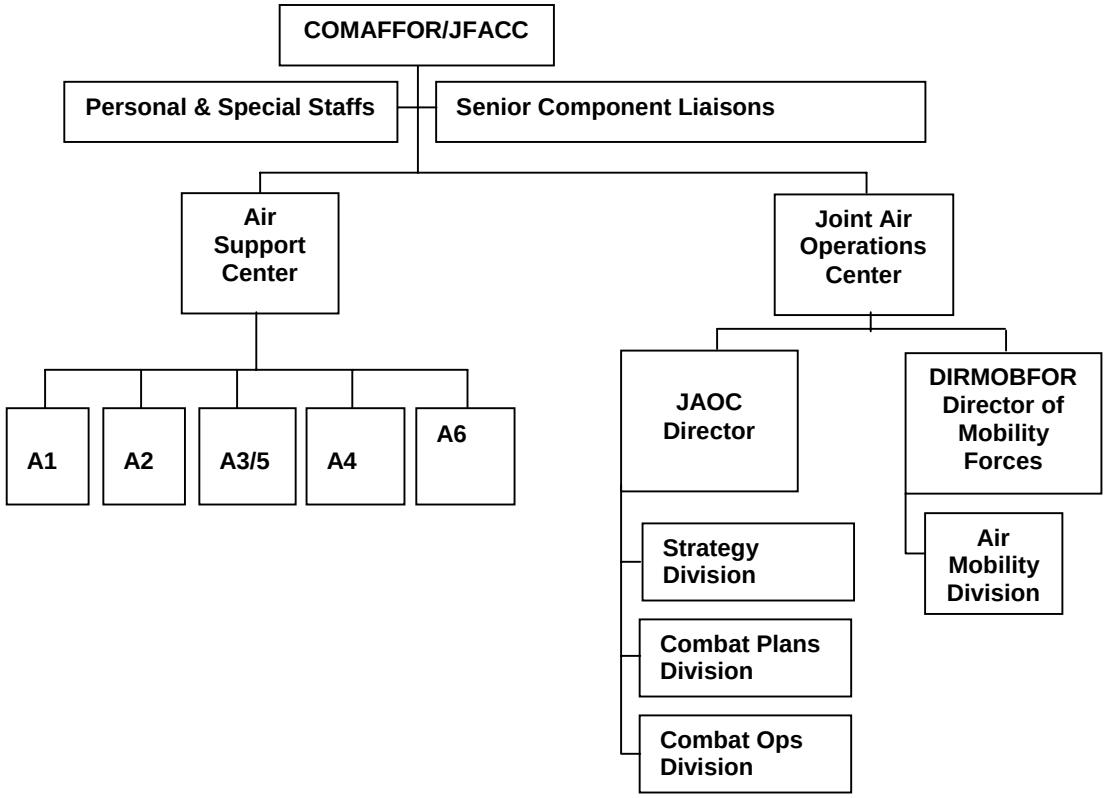


Figure 11-4. Joint air operations center notional HQ.

11-7. USAF AND USA INTERFACE

Melding USAF support for USA tactical operations is the job of the USAF theater air control system (TACS) and the Army air-ground system (AAGS). The TACS/AAGS interface is just one part of the larger theater air-ground system (TAGS), which is required to support the JFC's guidance and objectives. The portions of the TAGS that most support Army land maneuver are shown in figure 11-5 (some TAGS coordination links are deleted for clarity). For this Service component JFC organization pictorial, the JFACC is an Air Force officer and the JFLCC is an Army officer.

TACS/AAGS performs this crucial interface by—

- Establishing the personnel, facilities, and communications interfaces necessary for centralized control of available air power by the JFACC.

- Decentralizing execution of air operations according to the priorities designated by the JFC.

Centralized control of assets allows the JFACC to fully exploit the flexibility of assigned or attached air resources. Through the JAOC, the TACS assigns or attaches air and ground resources to fly, monitor, and control the various missions. The air support operations center (ASOC), collocated with the corps HQ and subordinate to the JAOC, plans, coordinates, and directs aerospace support for land forces at corps level and below. The tactical air control party (TACP) is the principal Air Force liaison element collocated with Army maneuver units from battalion through corps. The primary TACP mission is to advise ground commanders on the capabilities and limitations of aerospace power. Air Force combat weather teams are also fielded with appropriate Army HQ from corps to battalion level.

The Army counterpart of the system is AAGS. The AAGS gives the JFLCC the organization and means to process, evaluate, and coordinate requests for air support and to continuously exchange combat information and intelligence with the air component.

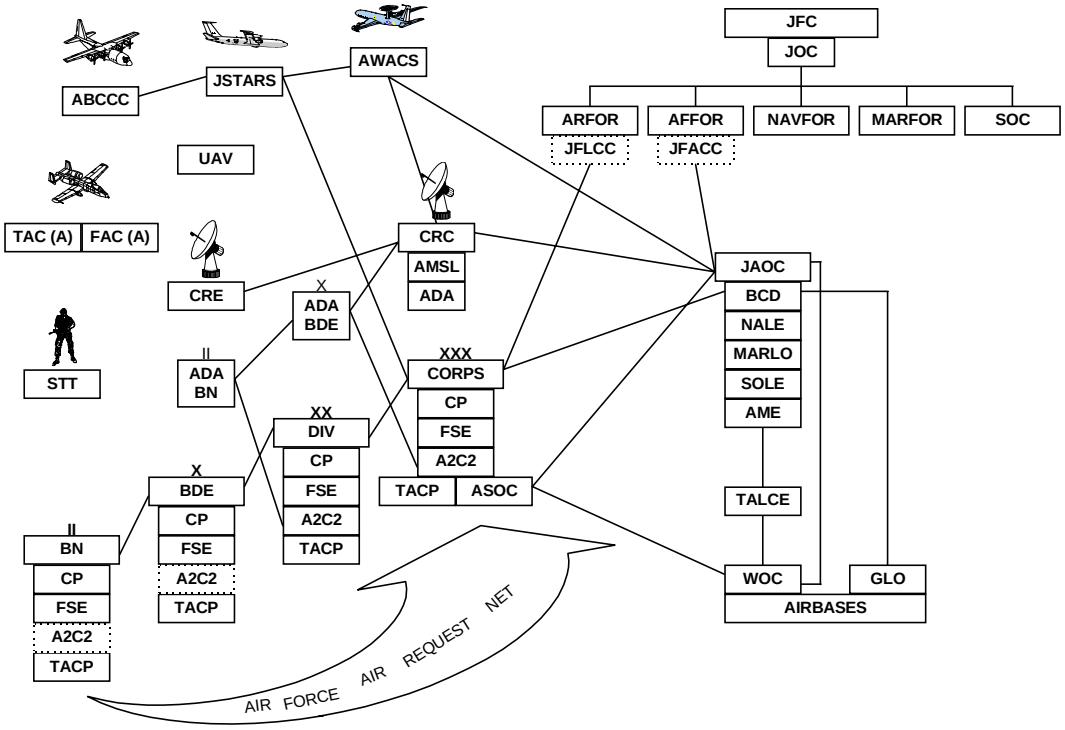


Figure 11-5. Theater air-ground system.

11-8. CLOSE AIR SUPPORT

Close air support is an air power function that can augment insufficient organic unit fire support at a critical time during a particular maneuver phase. The desired level of destruction or desired effects may not be achievable from organic assets but may be achievable by CAS assets. The TACS/AAGS system allows planners and commanders to use available CAS sorties at the decisive place and time. CAS—

- Supports JFLCC objectives.
- Should normally be massed to apply concentrated combat power.
- Should create opportunities.
- Should be planned and controlled to reduce the risk of friendly casualties.
- Requires SEAD in the target area and may interrupt indirect fires because of risk to aircraft.

There are two types of CAS requests: preplanned and immediate. Figure 11-6 is a simplified pictorial of the TACS and AAGS preplanned and immediate CAS request system. Adjacent to the pictorials are some of the more common advantages and disadvantages of the two systems.

a. Preplanned CAS missions are anticipated, planned, and requested through the Army S3/G3 channels. This process allows the G3 air in the corps fire support element (FSE) to priority rank the approved intermediate command level CAS requests. The corps forwards these ranked requests to the LCC for final approval and then to the Army battlefield coordination detachment (BCD), located in the AOC, for integration into the air tasking order (ATO). A preplanned CAS request can still be included in the ATO 12 to 24 hours prior to execution, depending on the situation. There are two kinds of preplanned CAS: scheduled and on-call. Preplanned *scheduled* CAS is the result of a refined IPB with a specific target, time of attack, and terminal attack coordination; it has dedicated ATO-tasked missions. Preplanned *on-call* CAS missions are either ground or airborne alert missions that do not have sufficiently refined targeting information, but are included in the ATO (alert aircraft in time blocks) to cover anticipated combat conditions. As specific targeting information becomes known, these sorties will be executed against assigned targets. *Again, all preplanned CAS missions are included in the ATO, which is the preferred method of requesting CAS.*

b. Immediate CAS is flown to support combat operations that had CAS requirements that were not anticipated during the planning process and, consequently, are *not* on the ATO. When CAS requirements are not anticipated and air support is required, the TACP uses the Air Force Air Request Net (AFARN) as the conduit for requesting immediate CAS. The request itself simultaneously energizes all Army echelons to determine whether any organic fire support can fulfill the request. Silence by intermediate FSE echelons signifies approval for immediate CAS. Simultaneously, the ASOC, the AOC, and ABCCC coordinate for any available air missions that can support the request. If the tasked ASOC has no available CAS assets, then the ASOC will request that the LCC redistribute CAS assets from another subordinate unit to fill this request (if the JFLCC has multiple corps or subordinate units). The ASOC will issue scramble orders (when given OPCON to divert on-call assets) to the wing operations center (WOC), or the AOC will divert lower priority missions to fulfill the immediate request. If available, on-call missions are normally used to support these requests. This diversion of other ATO-tasked missions (i.e., AI, offensive counterair, and other preplanned CAS) for immediate CAS is a *zero-sum event*. Immediate CAS requests at the tactical level will be supported, *but possibly at the expense of attacking other JFC operational- or strategic-level targets.*

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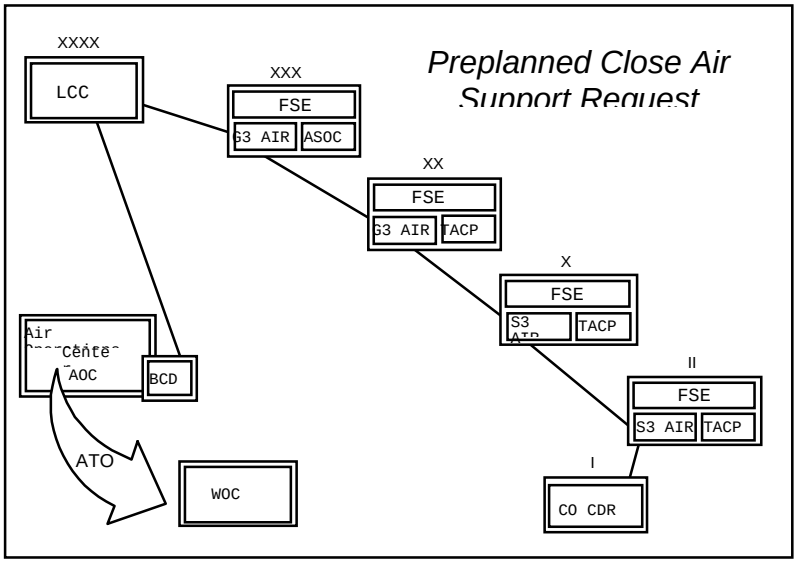
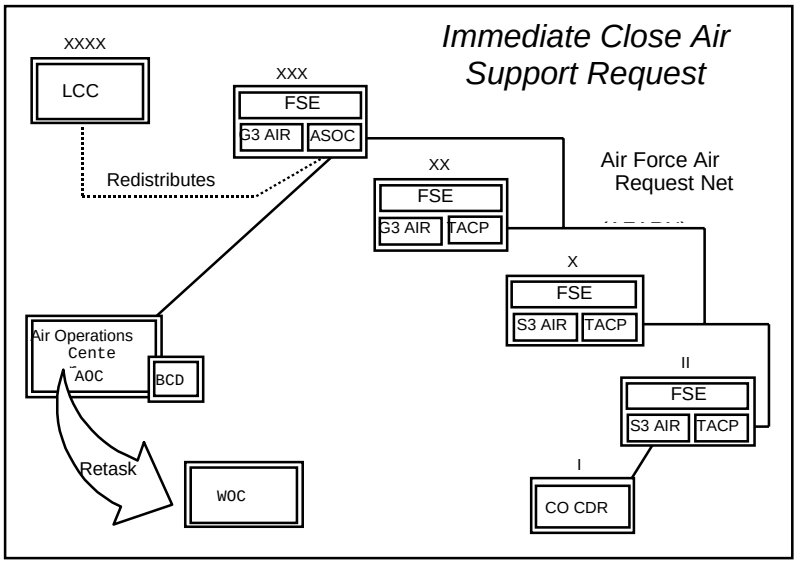


Advantages

- **Proper planning/coordination: SEAD/ADA/JAAT/FSE/Airspace/on ATO**
- **Proper target/weapon mix**
- **Additional intel and recce available**
- **Aircrew familiar with situation/terrain**

Disadvantages

- **Timing is critical**
- **Sortie may be ineffective if IPB wrong**
- **Sortie lost if not executed**



Advantages

- **Reaction to the unexpected**
- **Used at decisive time and place**
- **Can have quick response time**
- **Additional intel and recce provided**

Disadvantages

- **May not have proper target/weapon mix**
- **Aircrew unfamiliar with situation**
- **Original target may not be hit**
- **Increased comm (ground/FAC/aircrew)**

IMMEDIATE IS RELATIVE...

Figure 11-6. Close air support.

11-9. INTERDICTION

Air interdiction (AI), to include both lethal and nonlethal systems, is employed to destroy, disrupt, divert, or delay the enemy's surface military potential before it can effectively engage friendly forces or otherwise achieve its objectives. Direct attack *for the purpose of destroying* enemy fielded forces has traditionally been more limited than the other effects, mainly due to the difficulty of finding and targeting individual guns or vehicles; however, modern sensor and weapons technology is changing this picture, and direct destruction of enemy forces is becoming a more viable option for air interdiction. Interdiction planners should analyze the enemy army for key vulnerabilities that, if attacked, will have a *disruptive* effect across significant portions of the enemy force. Enemy forces that become *disrupted* or *diverted* to a longer line of communication will be *delayed* in reaching the close combat zone and may become more vulnerable to destruction themselves. Of the possible effects of AI, *delay* is the most dependent on coordination with the ground scheme of maneuver, since success or failure rests on winning the ground battle before the enemy forces are in contact.

Although preplanning is the normal method for accomplishing AI, there are several types of nonpreplanned, or "flexible," types of AI missions. *Armed reconnaissance, also known as "armed recce" and "road recce," is a form of AI that is planned against a particular area, rather than a particular target.* Armed reconnaissance is normally flown into areas where lucrative targets are known or suspected to exist, or where mobile enemy surface units have moved to as a result of ground fighting. In cases where a specific area to search for enemy AI targets cannot be predetermined, missions may be flown in an airborne alert or on-call status. When flexible AI is flown in direct support of the ground component, the target priorities should reflect those established by the ground component and communicated via the BCD or the TAGS. Target priorities may be available prior to takeoff or may be passed in flight by an appropriate C^2 agency, such as an ASOC or ABCCC. A downside of all nonpreplanned, dynamic targeting counterland missions is an overall reduction in probability of killing the target. Preplanned missions allow aircrews more time to study the target imagery and to align attack axes to optimize weapons effects. In addition, force packaging for SEAD support is particularly difficult when range or threat precludes Army fire support assets from performing SEAD

Regardless of who provides SEAD or if it is even necessary, flexible interdiction's mission to affect time-critical targets (TCTs) necessitates establishing responsive administrative measures for deconflicting and coordinating attacks. Establishing a *Grid Box Reference System* is one method that enables this coordination. Grid Box, or *"Kill box," AI* is facilitated by establishing temporary fire support control measures or airspace control measures over a common (joint) grid system, expediting and deconflicting attacks with other components. The commonality of the grid system to all services enables simultaneous joint engagements to occur in a localized area, on short notice, for a specific length of time, both in front and behind the FSCL. (FM 90-36, *Targeting*)

For AI short of the fire support coordination line (FSCL), command and control of air assets is normally accomplished through the ASOC or ABCCC. Procedural control measures may be used to deconflict air assets and ground maneuver units. Elements of the TAGS can also provide up to date targeting information, which can enhance the effectiveness of AI against mobile targets. The key to providing proper control for air interdiction lies in assessing how much flexibility will be required and which C^2 assets will be in the best position to provide targeting updates in a timely fashion. When a significant amount of AI is expected to target the enemy short of the FSCL or otherwise come under the control of the ASOC, the JFACC may delegate to the ASOC some authority to re-role missions between CAS and AI short of the FSCL. (AFDD 2-1.3, *Counterland*, 27 Aug 99)

11-10. INTERTHEATER (STRATEGIC) AIR MOBILITY

Intertheater deployment of our nation's military is a joint responsibility of the Army, Navy, and Air Force. The Air Force contribution to the USTRANSCOM mobility triad is the Air Mobility Command (AMC). AMC provides the National Command Authorities (NCA) the unique capability to quickly project national power throughout the world. US strategic air mobility forces continuously perform their mission by—

- Promoting world stability.
- Strengthening international relations through humanitarian missions.
- Keeping the capabilities and character of America highly visible.
- Providing effective deterrence—protecting our Allies and keeping our markets open.

- Providing rapid global mobility and decisive deployment of combat power.

AMC is responsible for maintaining a complex worldwide airlift system. This complex system includes maintenance, aircraft, supply, aerial ports, intelligence, command and control, and base and en route support services. Command and control plays a critical part in this overall structure.

a. Tanker Airlift Control Center (TACC). AMC headquarters is located at Scott AFB, IL, and retains control of intertheater airlift assets regardless of where that asset is located (even when these airlift assets are within a CINC's theater, AMC retains control). The TACC is the AMC commander's executive agency for operations involving USTRANSCOM air assets, including air refueling, intertheater airlift, CONUS-based operational support, and CONUS aeromedical assets. The TACC operates 24 hours a day and is organized to function the same in peace, contingencies, and war.

An Air Force brigadier general commands the TACC. Two cells within the TACC control all intertheater tanker and airlift assets worldwide — the East and West Cells. The dividing line between the two cells is a north-south line through the Mississippi River and the island of Diego Garcia. The TACC routinely handles about 150 missions per day. AMC has 13 key overseas locations supporting this command and control structure; these locations are sized to meet normal day-to-day operations. Additionally, to maintain the capability to deploy effectively in light of a reduced overseas presence, two air mobility operations groups (AMOGs) exist—one at McGuire AFB, NJ, and one at Travis AFB, CA. The AMOGs provide AMC the necessary flexibility to respond to crisis, contingency, and wartime situations in any theater.

b. Air Reserve Component (ARC). The Air National Guard and the Air Force Reserve are essential to AMC's success during a national airlift emergency. About one-third of the AMC aircraft are located in the ARC, and AMC has an even greater dependence on the ARC for personnel—about 50 percent. This is important at the national level, since a 200,000-reserve call-up or a complete reserve mobilization is essential if AMC is required to accomplish a lengthy intertheater deployment like DESERT SHIELD/DESERT STORM.

c. Cargo categories and AMC intertheater aircraft. Air cargo is divided into three categories:

- *Bulk*—any cargo that can be strapped to a single 463L pallet.

- *Oversized*—any cargo that cannot fit onto a single 463L pallet but still can fit inside the cargo compartment of a C-141.

- *Outsized*—anything that is too big to fit on a C-141 but that will fit in a C-5 or C-17. All users are responsible for rigging their cargo, briefing their personnel, and meeting loading times of the scheduled missions.

The C-141 Starlifter, AMC's core airlifter, is rapidly reaching the end of its useful service life. The last active duty C-141 is scheduled for retirement in FY 2003, and the last ARC C-141 is scheduled to retire in FY 2006. Modernization programs, including the global positioning system (GPS), airlift defensive system (ADS), and an upgraded cockpit, are underway to ensure the viability of this aircraft until the C-17 assumes the core airlifter role.

Another workhorse of the airlift fleet, the C-5 Galaxy, will be in service well into the this century. AMC is investing heavily in the C-5, focusing on modernizing the aircraft to improve its reliability and

increase mission capable rates. Due to the rapid retirement of the C-141 fleet and slower-than-projected acquisition of C-17s, the role and demand for C-5 intertheater airlift will continue to expand. Although the C-5 can carry outsized cargo, its massive size and weight limit its ability to operate at many airfields.

The C-17 Globemaster will replace the C-141 as the backbone of the air mobility airlift fleet. This versatile aircraft can provide outsize cargo capability, special operations low-level (SOLL) mission capability, special weapons transportation, aeromedical evacuation, and, most importantly, direct delivery to forward areas. It is roughly the same size as a C-141 with the capability to land at C-130-sized airfields. Eight C-17s can be parked in the same ramp space as three C-5s. The C-17 can airlift cargo directly to a forward operating base (FOB) or other forward location. It is capable of air dropping a single load of up to 60,000 pounds and sequential loads of up to 110,000 pounds. The C-17 provides the capability and flexibility to support both theater and intertheater missions while significantly improving throughput during contingencies. The Air Force is buying 135 C-17s and expects to have about 60 aircraft by the year 2001.

AMC also supplies the "force multiplier" portion of air mobility through the KC-135 Stratotanker and KC-10 Extender. The KC-135 is AMC's core air refueler. Despite being an integral part of the Air Force fleet since the 1950s, the Stratotanker continues to be an essential and viable contributor to US global mobility capabilities. Modernization programs and new engines will keep the KC-135 mission ready for some time. The KC-10 is a multirole aircraft with excellent reliability and mission capable rates. It can carry more cargo and fuel and has a greater range than the KC-135. Both of these aircraft require special material handling equipment (MHE) to load and offload the aircraft.

d. Civil Reserve Air Fleet (CRAF). As mobility requirements continue to exceed our capability, AMC must rely on the commercial sector. Military and commercial resources are equally important and interdependent for mission accomplishment during peacetime and war. Commercial air carriers participating in the CRAF program satisfy requirements for passenger and cargo airlift augmentation. In accordance with the National Airlift Policy, organic assets fly only to the extent necessary to maintain readiness and to meet military unique requirements. Therefore, civil airlift is utilized to meet the remaining requirements. This not only extends the service life of the organic fleet, but also maximizes the commercial business base as an incentive for air carriers to participate in the CRAF (which provides our wartime surge capability) and capitalizes on cost effective and efficient civil air resources. When fully mobilized, the CRAF provides over 90 percent of the total passenger lift and over 35 percent of cargo lift.

The CRAF has five segments: long range, short range, aeromedical, domestic, and Alaska. The number of aircraft in each segment changes frequently, thus changing lift capability. The CRAF has three stages.

- Stage I is activated by CINCTRANS with SECDEF approval during a committed airlift expansion. A relatively small number of aircraft are activated in Stage I. The carriers have 24 hours to make the aircraft and crews available.

- Stage II is also activated by CINCTRANS with SECDEF approval and the carriers have 24 hours to respond.

- Stage III is activated by CINCTRANS with SECDEF approval, but only after a declaration of emergency or situation short of emergency by the President or Congress. Due to the large number of required aircraft in Stage III, the carriers have 48 hours to respond.

e. Additional information for intertheater airlift operations may be found at the following Internet site: USTRANSCOM—http://ustcweb.safb.af.mil

11-11. INTRATHEATER (THEATER) AIR MOBILITY

Intratheater airlift is defined as "the immediate and responsive air movement and delivery of combat troops and/or supplies directly into objective areas through airland or airdrop and the air logistics support of all theater forces, including those engaged in combat operations" *(immediate is defined as within 6 to 8 hours).* If the need arises, any airlift aircraft can be assigned to a theater CINC and thus become an "intratheater airlifter." Who controls the aircraft, not the type of aircraft, determines whether it is an intratheater airlifter or not. Therefore, if the theater CINC is given operational control of an airlift asset, it becomes an "intratheater airlift asset."

An intratheater airlift asset may airdrop personnel and/or supplies to an individual DZ, which may have a tactical effect on the battlefield, but that same aircraft may also use the speed, range, and flexibility of airpower to deliver cargo hundreds of miles away to another DZ in the same day. Intratheater airlift can produce campaign-level effects when used in mass and tactical-level effects when spread out across the theater.

The C-130 is currently the Air Force's only dedicated intratheater airlift aircraft in which theater CINCs have been given operational control, primarily due to its ability to operate from short, unimproved runways at austere airfields. It has a short range and most versions are not capable of being air refueled in flight.

There are four intratheater delivery systems: airland, container delivery system (CDS), heavy equipment (HE) drop, and personnel airdrop. Airland is the simplest and can deliver more cargo than any other method. With this method, the aircraft is available to backhaul cargo on the return leg. One disadvantage of airland delivery is MHE is usually required at both the on-load and the off-load points. CDS allows supplies to be airdropped at low altitudes and into small DZs (accuracy capable down to about 200 yards circular). HE drops are made at higher altitudes; this requires larger DZs clear of obstacles, thereby reducing accuracy. Significant rigging preparation is required, thus limiting the amount of CDS and HE that can be dropped in theater.

11-12. AIRLIFT REQUEST AND TASKING PROCEDURES

Airlift request procedures are the same for both intertheater and intratheater airlift and are virtually the same in peacetime and war. It should not matter to the end user of air mobility if an intratheater asset or an intertheater asset delivers the goods. The airlift user provides the lift requirements. The "airlift system" will determine how best to meet those requirements and whether intertheater or intratheater airlift assets work best.

Whether during peacetime, a contingency, or a full-scale war, there is consistently more demand for airlift than there are assets available for tasking. Therefore, requests are ranked in priority according to the national requirements justification. Below is the current airlift priority system.

JCS priorities (Joint Pub 4-04)

1A-1	Presidential-directed mission	3A-1	Unit inspection or evaluation (EDRE, ORI, etc)
1A-2	Forces in combat	3A-2	Forces maintained in a state of readiness to deploy
1A-3	National priority programs approved by President	3A-3	Requirements channels
1A-4	Special weapons	3B-1	Field training exercises, proficiency airdrops, and air assaults
1B-1	Missions directed by OSD of JCS	3B-2	Flare drops, unconventional warfare, JACC/CP
1B-2	Units, projects, or plans approved by JCS	3B-3	Service schools requiring airborne, airdrop, or air transport
1B-3	Frequency channels	3B-4	Airdrop/air transportability or aircraft certification of new or modified equipment
2A-1	Forces deploying for combat support	4A-1	US and foreign forces supporting war plans and support activities essential to such support
2A-2	Industrial production activities to prevent work stoppage or re-institute production	4A-2	Static loading exercises
2B-1	JCS-directed exercises	4B-1	Other US or foreign forces activities
2B-2	JCS-coordinated exercises	4B-2	Other non-DOD activities not supported by commercial airlift
2C-1	AF ORIs requiring special ops activities	4B-3	Static display
2C-2	Special ops training in support of JSOC		
2C-3	JA-ATT fenced by AMC/CC		

a. Peacetime airlift request procedures (fig 11-7). There is only one system to process airlift requests. During peace or war, airlift requests are submitted through Service channels to a component validator. The validator reviews the requests for feasibility (and funds in peacetime) and then forwards them to a theater validator. The theater validator will also review the requests for feasibility and available funds. The theater validator will then rank in priority the request with all other theater airlift requests. If the theater validator determines that intertheater assets can best meet the airlift requirement, the request will be forwarded through USTRANSCOM to AMC. Otherwise, the request is forwarded to the airlift control center (ALCC) and then to the WOC for execution.

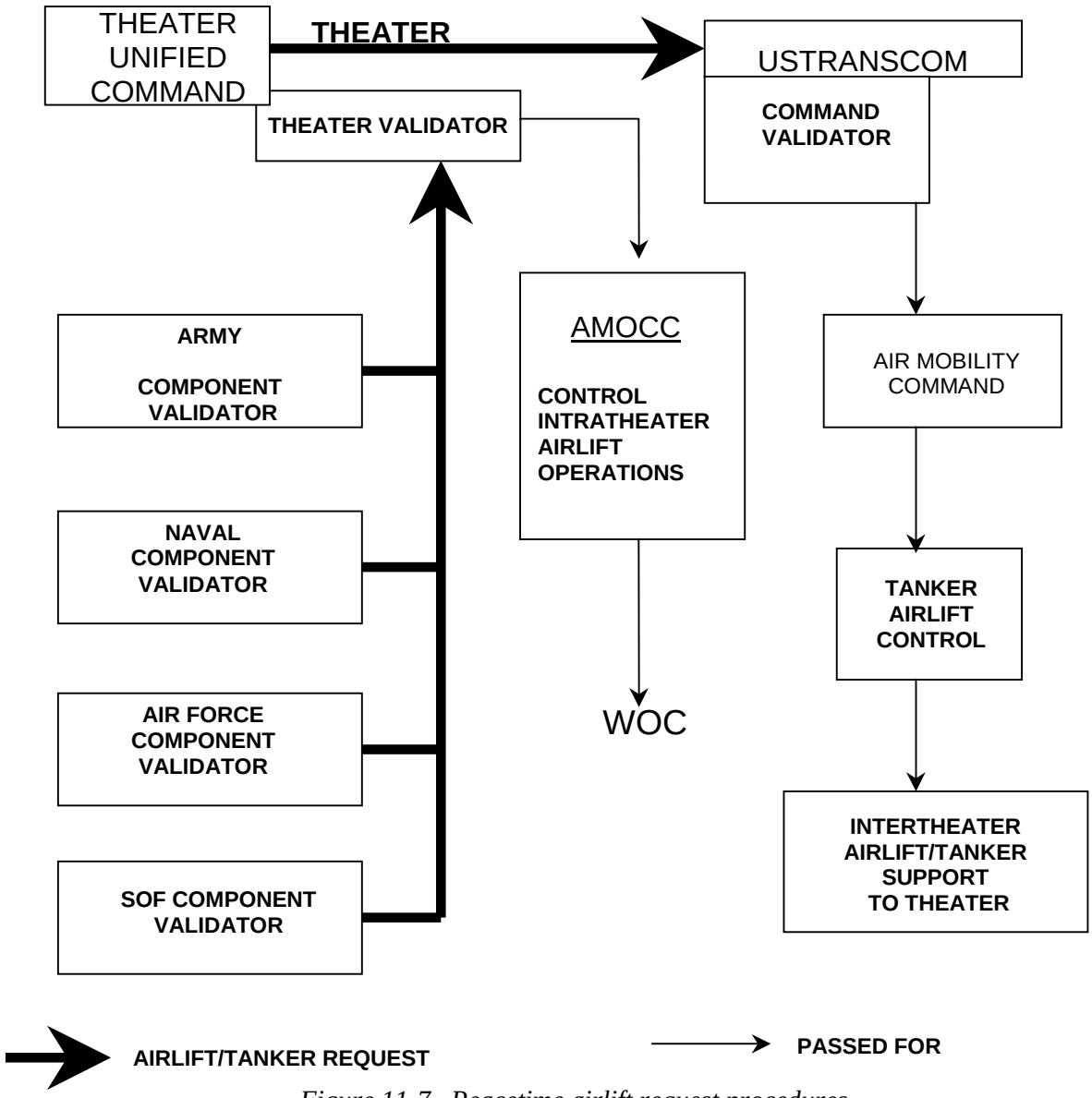


Figure 11-7. Peacetime airlift request procedures.

Contingency/wartime airlift request procedures (fig 11-8). The contingency or wartime environment slightly changes the airlift command and control structure. The DIRMOBFOR is the senior officer that acts as a liaison between the AOC director and the TACC on airlift issues. The ALCC is the controlling agency for theater airlift and the air mobility element (AME) controls/monitors intertheater airlift. To meet the needs of the JFC, these two in-theater organizations are under the direction, not the command, of the DIRMOBFOR.

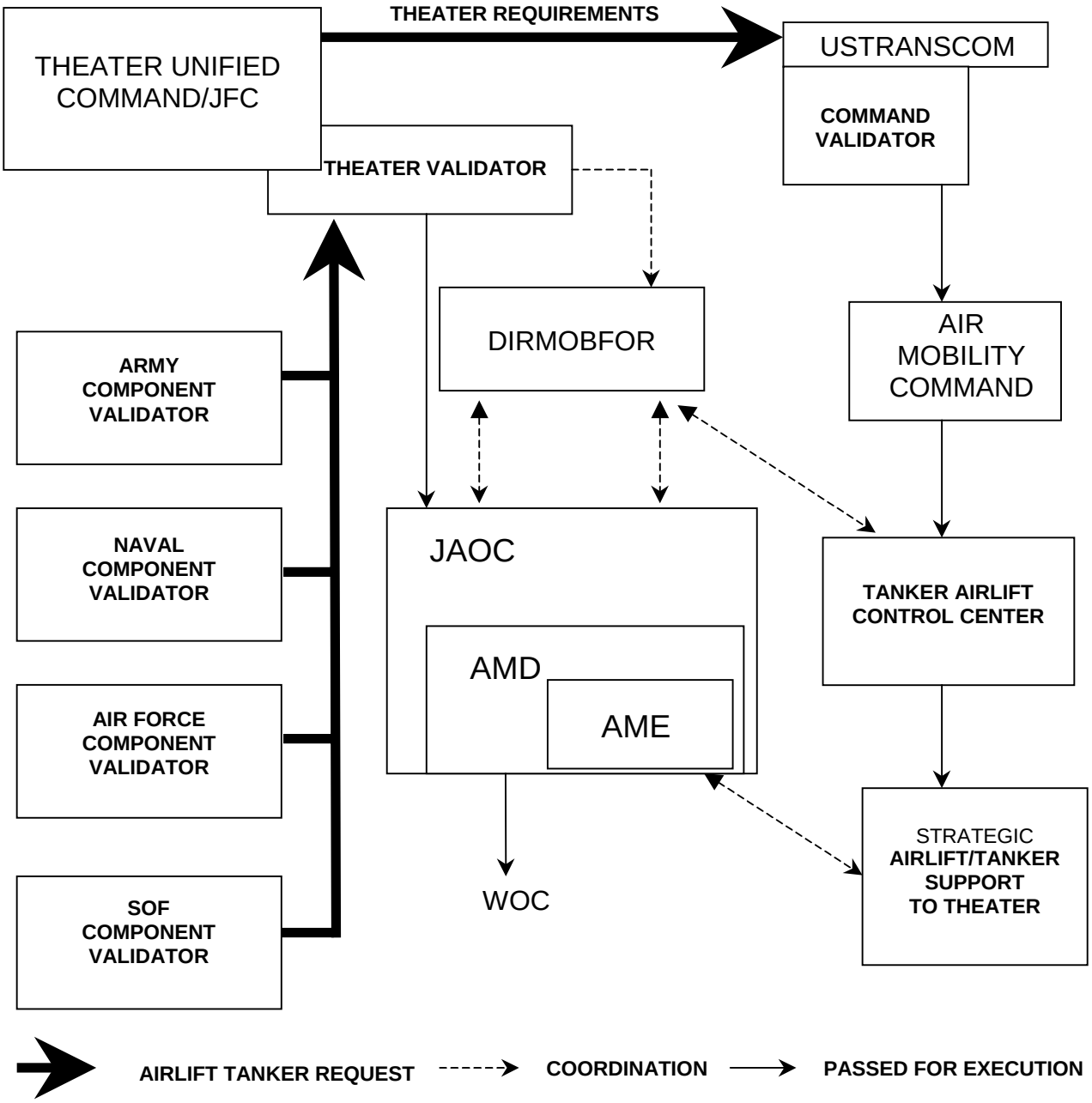


Figure 11-8. Contingency/wartime airlift request procedures.

c. Preplanned air requests. In the Army, preplanned airlift requests typically follow S4/G4 channels, with each echelon reviewing the request for consistency with the scheme of maneuver to ensure that airlift is the best means to move the cargo. In a single corps theater, the corps transportation officer (CTO) will probably be the final Army validator and will send the request to the joint board. Until the joint board validates the request, usually a joint movement center (JMC) or joint transportation board (JTB), the airlift provider cannot move the cargo. The United States does not have enough airlift assets to meet every airlift request. Those requests that support the CINC's campaign plan will receive the highest priority. After validation of the preplanned request, the mission is included on the ATO for execution. *Again, this process takes time and is normally requested along the same timelines as preplanned CAS (36 hours in advance).*

d. Immediate airlift. For immediate airlift, the validation sequence is the same with two exceptions. First, for expediency, S3/G3 channels may be used. Second, the request is broadcast over the AFARN, just like immediate CAS requests, usually by the theater airlift liaison officer (TALO), working in a TACP, who first receives the request. All TALOs and the ALCC monitor the AFARN. Like the fighter duty officer (FDO) at the ASOC, the ALCC will "lean forward" and commence planning to meet the requirement. TALOs will coordinate with their appropriate level S3/S4 or G3/G4 to ensure the requirement cannot be better met by other means such as Army aviation or land transportation.

Although there are several similarities between the preplanned and immediate CAS and airlift request procedures, there are some differences. An important difference for immediate airlift requests is that "silence *is not* consent" on the AFARN. Unlike CAS, no airlift assets are distributed to Army corps for support. All users compete for airlift all of the time. The entire validation process must be followed up to and including JMC/JTB validation before the ALCC can execute the airlift mission. *Remember, "immediate" does not equate to "instantaneous*."

Airlift request procedures are basically the same in peace and war. In peacetime, all airlift requests are "preplanned," although some have less planning time than others do. The major difference between peacetime and war or contingencies is the formation of the Air Mobility Division (AMD) collocated with the JAOC. The AMD directs and coordinates all intratheater assets in the joint air operations area (JAOA). An AME is deployed from the TACC to coordinate all intertheater airlift in the JAOA with the AMD. Otherwise, the structure and process for airlift requests remain relatively the same.

e. Other AMC assets. Airlift is more than aircraft. There are several additional theater air mobility elements: special tactics teams (STTs), tanker airlift control elements (TALCEs), aerial ports (both mobile and fixed), air evacuation control centers (AECCs), and the Air Force tanker task force (TTF). These organizations may be established at any given airfield, including austere locations, and tailored in size from 1 to 100 people, or more, depending on the anticipated airflow and support required for tanker and airlift missions.

Section II. UNITED STATES AIR FORCE SPACE OPERATIONS

11-13. SPACE POWER

The United States is the world's foremost aerospace power, and USAF space forces are essential elements of that power. Space systems and capabilities enhance the precision, lethality, survivability, and agility of all operations: air, land, sea, and special operations. Space operations are key elements in achieving global awareness and maintaining information superiority. Space assets contribute significantly to overall aerospace superiority and support terrestrial-based forces across the entire spectrum of military operations.

Space and terrestrial-based forces complement each other. Used properly, space forces are a significant force multiplier for terrestrial-based forces. In addition to supporting terrestrial operations, many military functions previously performed by terrestrial forces may be accomplished by space forces. In some cases, space may be the focus of operations and may be supported by complementary terrestrial-based forces. As space and air forces are fully integrated into a total aerospace force, future space assets may function not only as a force multiplier, but as the force of decision itself.

Space force enhancement in the areas of communications; reconnaissance, intelligence, surveillance, and target acquisition (RISTA); navigation and positioning; weather, terrain, and environmental monitoring; and missile launch detection and warning have proven invaluable in recent operations. The Persian Gulf war in 1990 has been called the first "space war" because it was the first time that space

systems were widely used in tactical operations. That was, however, a lopsided example because the United States and its coalition partners had access to and control of a variety of space systems while Iraq had almost none. In future conflicts, the United States may have to fight for space superiority. Knowledge of space forces and their capabilities and limitations is essential to successful control and optimal execution of aerospace power.

Centralized control and decentralized execution are essential to space power, just as they are to air power. Since the effects and contributions of space forces are global in nature and include critical national assets, they are tasked and assigned from a global perspective. Theater commanders do not have actual physical control of the satellite, its control systems, or ground control nodes. However, in a regional conflict, theater commanders have control over accurate and timely products from space and normally have tactical control over space component equipment and its application in the area of responsibility (AOR).

11-14. UNITED STATES SPACE COMMAND

United States Space Command (USSPACECOM) is the unified command exercising control authority over Service space command components. Within USSPACECOM, the 14 AF Commander is the Air Force component commander designated to manage, integrate, and direct Air Force space forces. The 14 AF Commander provides space support to theater forces as required or when requested. Currently, theater support teams augment the JFACC staff to provide space expertise to support planning and execution of air and space taskings or missions. As the Air Force moves to more integrated aerospace operations, reliance on theater support teams will diminish as space specialists are assigned to permanent duty on numbered Air Force staffs.

Assets not assigned to a Service component provide an increasing portion of the capabilities of the space systems available to the theater commander. These assets include, but are not limited to, US national systems, leased commercial assets, or multinational force assets. They are closely linked to the air campaign planning and execution process for situational awareness and battlespace preparation. Command and control of these assets seldom follow the standard combatant command (command authority), OPCON, or TACON rules. To obtain the widest range of benefits available from these assets requires flexibility and innovation on the part of the commander.

Air Force space operations focus on space control, force application, force enhancement, and space force support. Gaining air and space superiority is a primary goal of a military campaign and must be achieved early to ensure freedom of action. Like air superiority, space superiority helps provide the freedom to conduct operations without interference from an adversary. Hostile powers must not be permitted to freely use space systems against US national interests.

11-15. SPACE CONTROL

Space control is the means by which space superiority is gained and maintained to assure friendly forces can use the space environment while denying its use to the enemy. To accomplish this, space forces must survey space, protect the ability to use space, prevent adversaries from exploiting US or allied space services, and negate the ability for adversaries to exploit their space forces. Counterspace is the mission carried out to achieve space control objectives by gaining and maintaining control of activities conducted in or through the space environment. Counterspace involves activities conducted by land, sea, air, space, information, and/or special operations forces. Counterspace includes offensive and defensive operations.

a. Offensive counterspace: operations that destroy or neutralize an adversary's space systems or that information they provide at a time and place of our choosing through attacks on the space, terrestrial, or communication link elements of space systems. The principal means of conducting offensive counterspace operations is through the use of terrestrial-based forces such as air attacks against space system ground nodes or supporting infrastructure. Offensive counterspace operations achieve five major purposes: deception, disruption, denial, degradation, and destruction of space assets or capabilities.

b. Defensive counterspace: space-related operations that consist of active and passive actions to protect US capabilities from enemy attack or interference. The objective of active defense is to detect, track, identify, intercept, and destroy or neutralize enemy space and missile forces. Passive defense reduces the vulnerabilities, protects, and increases the survivability of friendly space forces and information.

11-16. FORCE APPLICATION

Force application is defined as attacks against terrestrial-based targets carried out by military weapon systems operating in space. Currently, there are no force application assets operating in space, but technology and national policy could change so that force application missions could be performed from platforms operating in space. For example, space systems, such as the space-based laser, could provide space-based attacks against terrestrial-based targets and provide timely suppression of enemy defenses to improve the penetration effectiveness of air assets. Space-based weapon systems that deliver this firepower may rely on other space-based systems for target acquisition, command and control, navigation, midcourse corrections, and terminal guidance.

11-17. FORCE ENHANCEMENT

Force enhancement operations consist of those operations conducted from space with the objective of enabling or supporting terrestrial-based forces. Communications; RISTA, navigation and positioning; weather, terrain, and environmental monitoring; and missile launch detection and warning help reduce uncertainty and friction at all three levels of war: strategic, operational, and tactical. Enabling and supporting space operations increase the ability of a force to detect, plan, and react faster than an adversary. Force enhancement must also include consideration of civil, commercial, and allied space support that can augment DOD space systems.

Space force support is carried out by terrestrial–based elements of military space forces to sustain, surge, and reconstitute elements of a military space system or capability. These activities deploy, sustain, or augment on-orbit spacecraft, direct missions, and support other government or civil organizations. Space force support involves spacelift and satellite operations.

11-18. SPACELIFT

Spacelift provides the Air Force with the ability to project power by delivering satellites, payloads, and material into or through space. The Air Force uses a combination of military, DOD civilian, and civilian contractor personnel to process, integrate, assemble, check out, and launch space vehicles. Civil and commercial contributions further expand the number of launch sites available to spacelift. During periods of increased tension or conflict, a spacelift objective is to launch and deploy new or replacement space assets and capabilities as necessary to achieve national security objectives. Spacelift operations are conducted to deploy, sustain, or augment satellite constellations supporting US military operations.

11-19. SATELLITE OPERATIONS

The Air Force Satellite Control Network (AFSCN) provides a means to maneuver, support, and sustain on-orbit forces. The AFSCN is a worldwide network of single-system and multiple-system facilities and sensors that provides telemetry, tracking, and commanding (TT&C) support, conducts network processes, and distributes mission data for virtually all DOD and US civilian spacecraft and selected foreign space programs.

For a complete overview of USAF space operations, refer to AFDD 2-2, *Space Operations*, 28 Aug 98 at Internet site http://www.usafdoctrine.af.mil

Section III. UNITED STATES AIR FORCE AIRCRAFT CAPABILITIES AND MUNITIONS

11-20. SELECTED USAF AIRCRAFT AND CAPABILITIES

a. USAF aircraft that perform counterair, counterland, and strategic attack:

	F-15A/C Eagle	*F-15E Strike Eagle (Dark Grey)*	*F-16C/CG/CJ Falcon (Viper)*
Mission	Counterair	Counterair, interdiction, strategic attack	Counterair, counterland
Avionics	APG-63 or 70 radar AESA RLGINS, JTIDS	APG-70 radar, LANTIRN, GPS, RLGINS	APG-68 radar, GPS F-16C: Block 30—general purpose F-16CG: Block 40—LANTIRN F-16CJ: Block 50— HTS (SEAD)
Radios	2 × UHF Have Quick II KY-56 capable	2 × UHF Have Quick II KY-58 capable	2 × UHF Have Quick II, KY-58 capable, VHF AM / FM
Speed	Mach 2 plus	Mach 2 plus Low-level—540 to 600 knots	Mach 2 plus 450 to 540 knots
Range	Unrefueled ferry—1,500 NM Hi-Lo-Hi—1,200 NM Hi-Lo—1,500 NM	Unrefueled ferry—2,300 NM Hi-Lo-Hi—1,200 NM Hi-Lo—1,000 NM	Unrefueled ferry—1,000 NM Hi-Lo-Hi—350 NM Hi —500 NM Lo—250 NM
Weapons	900 rds (20-mm) F-15A: 4 × AIM-9L/M + 4 × AIM-7M F-15C: Combos up to 8 × AIM-120	500 rds (20-mm) 8 × AIM-9/-7/-120 12 × GBU-12 PGM or 4 × GBU-10 PGM or CBU/GP bombs Mixed loads for flex 2 X AGM-130/GBU-15 JDAM, JSOW, GBU-28	510 rds (20-mm) 9 stations available Air-to-air 2 × AIM-9 + 4 × AIM-120 Air-to-ground 2 × AIM-9 or 2 × AIM-120 and 6 × Mk-82 or 2 × Mk-84 or 4 × CBU, 4 × AGM-65 or 2 × AGM-88, 2 × LGBs or 2XJDAM
EC/ECCM	ALR-56, ALE-45, ALQ-135	ALR56, ALE-45, ALQ-135	ALR-69/-56, ALE-40/-47, ALQ-131/-184
Nights	No low level. Weapons have full capability.	LANTIRN/TFR down to 100’ AGL	Without LANTIRN-No low level or PGMs (PGMs require targeting pod). With LANTIRN, full capability. NOTE: NVG capable for all blocks.

	F-117A Night Hawk (Shaba)	*A/O A-10 Thunderbolt II (Wart Hog)*	*EA-6B ICAP II Prowler*
Mission	Strategic attack	CAS, FAC-A, CSAR	Counterair (SEAD and jammer)
Avionics	IR acquisition and targeting system, laser rangefinder/ designator	Pave Penny, INS, Low-altitude safety and targeting enhancement	INS, GPS, radar, UHF, VHF, HF, KY-58 secure voice
Radios	UHF (secure)	UHF Have Quick II, KY-58 capable VHF/FM, VHF/AM	UHF, VHF, HF, KY-58 Secure voice
Speed	High subsonic	Cruise—300 kn 450 kn max	Cruise—420 kn, Dash—480 kn
Range	Classified, air-refuelable	Unrefueled ferry—1,600 NM Hi —800 NM Lo— 200 NM (with 30-min loiter)	Ferry—1,200 NM, air refuelable
Weapons	2 weapons only of up to 2,000 lbs class. Example: 2 × GBU-27 2 × GBU-12 2 × GBU-10 2 × CBU 87/89/97	1,174 rds (30-mm) 11 stations available: Air-to-air: 2 or 4 × AIM-9 Air-to-ground: all GPs, AGM-65s, CBUs, 2.75" rockets, and some LGBs (ground / buddy laze)	ALQ-99 Tactical Jammer USQ-113 Comm Jammer AGM-88 HARM
EC/ECCM	Stealth / low observable	ALR-69, ALE-40, ALQ-184/-131	ALE-39, ALQ-167, ALQ-126B
Night:	Yes; however, not all weather capable	NVGs, night illumination flares	Yes, all weather
NOTE: EA-6Bs are flown jointly with USN.			

	B-1B Lancer (Bone)	*B-2 Spirit*	*B-52H Stratofortress (BUFF)*
Mission	Strategic attack, interdiction	Strategic attack	Strategic attack, interdiction
Avionics	TFR, dual INS, synthetic aperture radar, offensive avionics, GPS	TF, ground moving target search, astro tracker, GPS NS, all system quadruple redundant	Doppler radar, dual INS, terrain avoidance radar, steerable TV offensive avionics, FLIR, GPS
Radios	2 × UHF Have Quick II, KY-58, HF, VHF, SATCOM, SINCGARS (Block D)	UHF, VHF, HF, KY-58, Have Quick, SATCOM,	2 × UHF Have Quick II, HF, AFSATCOM, KY-68
Speed	1.2 Mach	High Subsonic	.84 Mach or 390 kn max
Range	Hi—4,200 NM Hi-Lo-Hi—3,800 NM Lo—2,000 NM Air refuelable	Air refuelable	Air refuelable
Weapons	84 × Mk-82 30 × CBU-87/-89 24 x JDAM (3 weapons bays)	8 × GBU 37 16 × Mk-84 16 × JDAM/JSOW 36 × CBU-87/-89/-97 84 × Mk-82	All GP, CBU, air deliverable mines, Harpoon, CALCM, and HAVE KNAP
EC/ECCM	ALQ-161	Stealth/low observable	Numerous (dedicated EWO)
Night	Yes, all weather, night operations preferred	Night operations preferred	Yes, NVGs, all weather, night operations preferred

b. USAF aircraft that perform special operations employment functions:

Weapon System Overview	*AC-130H/U GUNSHIP (Spectre)* 	*MC-130E/H Combat Talon (Black Bird)* 	*MH-53J PAVELOW III* 
Mission	CAS, interdiction, armed recon, point defense, escort, surveillance, CSAR, LZ/DZ support, and limited C^2	Infiltration, exfiltration, resupply, psychological operations, and aerial recon into hostile territory using airland and/or airdrop. MC-130E capable of air refueling helicopters	Low-level, long-range undetected penetration into denied areas for infiltration, exfiltration, or resupply of SOF forces; includes airdrop and heavy-lift sling ops. Performs shipboard ops and CSAR
Avionics	Precision Navigation System (INS, Doppler, GPS), Fire Control System, LLLTV(H)/ALLTV (U), IR imaging systems/Laser Illuminator F-15E Strike Radar (U) Pressurization System (U)	Precision Ground-Mapping Radar (PGM), TF/TA radar, Precision Navigation System (INS, Doppler, GPS), Automated Computed Air Release Point System (AUTOCARP), FLIR, PPN-19 Beacon, NVG capable	Enhanced nav system w/INU & GPS, TF/TA radar, FLIR, RLGINS. Doppler nav, projected map display. All sensors fully integrated w/stand-alone capability. NVG capable
Radios	Secure HF, UHF, VHF AM/FM and SATCOM. HAVE QUICK capable	Secure HF, UHF, VHF AM/FM and SATCOM. HAVE QUICK capable	Secure UHF-Have Quick II, VHF AM/FM, HF, and SATCOM. PLS (PRC-112), Data Burst
Speed	250 kn (true airspeed) Cruise—300 mph (at sea level)	300 mph (480 kph) Low level—250 kph	TF—110 (KIAS) (Normal planning cruise speed) Dash—130 kn
Range	*Unrefueled* Ranges - w/combat ammo load AC-130U—200 NM AC-130H—1500 NM Unlimited w/air refueling	3,110 Statute miles (2700 NM) Unlimited w/air refueling	Distance 268-481 NM unrefueled Combat radius: 134-241 NM (Distances reflect fuel & ammo con-figurations). Typically, 300 NM w/10-15 min loiter (20-man team) Air refuelable (MC-130)
Weapons	25-mm (U-only) 40-mm Bofors Cannon (100 rds/min) 105-mm howitzer (6-10 rds/min) All Weather capable (U-only) Dual Target Attack (U-only)	BLU-82 Psychological warfare leaflets	GAU2 B/A 7.62 miniguns XM218 .50 cal mgs
ECM/ECCM	WJ-1840 (Receiver), RHAW, IRCM, IRWR, ALE-40 (Chaff/Flares), ALQ-172 (ECM)	WJ-1840 (Receiver), RHAW, IRCM, IRWR, ALE-40 (Chaff/Flares), ALQ-172 (ECM)	RHAW, ALE-40 (Chaff/Flares), ALQ-157, IR/-162 ECM

Night	Yes. Operates best under the cover of darkness. Certain threats may dictate higher employment altitudes -- a msn planning consideration (sensor re-solution decreases with altitude & fire control is slightly degraded).	Yes, NVGs, adverse weather; used primarily at night due to ability to exploit night, all weather, low level environ-ment. Missions may require overt, clandestine or low visibility operations	Yes, NVGs, adverse weather. NOTE: Sling and hoist capable. Infiltrate/exfiltrate up to 30 troops, light vehicles, SOF Ducks.
Load	NA	53 troops or 26 paratroopers (MC-130E) 75 troops or 52 paratroopers (MC-130H)	27 troop seats or 14 litters
This unclassified *special operations forces (SOF) reference* provides general information and mission data. References are doctrinally based, drawing information from Joint, USSOCOM, and Service publications. Actual operational parameters may vary.			

Weapon System Overview	***MC-130P COMBAT SHADOW*** 	***MH-60G PAVE HAWK*** 	***EC-130E COMMANDO SOLO*** 
Mission	Clandestine formation/single-ship intrusion of hostile territory to provide aerial refueling of SOF helicopters; infiltration, exfiltration, and resupply of SOF by airdrop or airland ops.	Infiltration, exfiltration, and resupply of SOF in day, night, or marginal weather; CSAR	One-of-a-kind aircraft. Airborne electronic broadcasting system. Conducts PSYOP and civil affairs broadcast msns in radio, TV, and military comm bands. Secondary C^3CM role
Avionics	Airborne, IFF, and Doppler radars SCNS, and GPS. Air Refueling Receptacle Slipway Installation system	Weather radar, FLIR, RLGINS, Doppler NAV, GPS, electronic map display (all sensors fully integrated), and PLS	INS, radio communications, and transmission equipment
Radios	Secure UHF, VHF, VHF-FM, HF and SATCOM; HAVE QUICK capability KY-879 data burst capability	UHF Have Quick II, HF, VHF AM/FM, PLS (PRC-112), SATCOM, digital data burst (all radios secure capable)	UHF Have Quick II, ARC-164, ARC-186, KY-58, VHF/FM, VHF/AM
Speed	Max AR speed -- 120 kn Normal Cruise -- 250 kn Max Speed – 290 kn	Cruise—120 kts Dash—160 kts	299 mph
Range	Combat Range -- 12.5 hrs (4277 NM) w/out AR -- 12.5 hrs (2875 NM) low-level	225 NM unrefueled 205 NM with 10 to 15 min loiter (8 man team) (infiltrate, exfiltrate up to 10 combat-equipped troops) Air refuelable (H/MC-130)	2,100-plus miles (endurance unrefueled—10 hours). Unlimited with in-flight refueling
Weapons	NA	7.62 miniguns and/or .50 cal mg. 7/19 shot aerial rocket pods or dual 20mm cannons/.50-cal mg (external stores support system)	"Voice of the Gulf" 6 transmitters, 9 fixed antennas, one adjustable-length trailing wire. Transmission line loss varies between 0 and 1.5 db
ECM/ECCM	RHAW, Chaff/Flares, IRWR	APR-39, ALQ-144 IRCM, HIRSS, improved chaff/flare	NA
Night	Yes. Night terrain contour (NTC) procedures in VMC conditions w/NVGs. NVG Takeoff and landings	Yes, NVGs, FLIR, and color weather radar (adverse weather). NOTE: sling and/or hoist capable.	Flies during day or night scenarios.
Load	26 Paratroopers 34 troops w/equipment (airland)	12 combat-equipped troops--config w/out int aux fuel tanks. 10 troops (max)/6 optimum--w/int fuel tanks.	NA
This unclassified *SOF Reference* provides general information and mission data. References are doctrinally based, drawing information from Joint, USSOCOM, and Service publications. Actual operational parameters may vary.			

c. USAF aircraft that perform airlift and/or tanker functions:

	C-5A Galaxy (Fred)	*C-17A Globemaster III (Buddha)*	*C-141B Starlifter (Lizard/Tube of Pain)*
Mission	Intertheater airlift	Intertheater airlift	Intertheater airlift
Max Payload	291,000 lbs	170,900 lbs	90,000 lbs
2,900 NM Payload	188,000 lbs	170,900 lbs	72,000 lbs
Range with Max Payload	1,530 NM (unrefueled)	2,400 NM (unrefueled)	2,170 NM (unrefueled)
Pallet Load	36	18	13
Min Wartime Runway	5,000 ft × 90 ft	3,000 ft × 90 ft	5,000 ft × 90 ft
Normal Runway	6,000 ft × 150 ft	3,000 ft × 90 ft	6,000 ft × 98 ft
Delivery	Airland (CDS and HED test only) Pax: 340 max/73 normally	CDS, HED Airland 102 paratroopers	CDS, HED Airland 155 paratroopers or 200 troops

	C-130H Hercules (Herc/Little MAC)	*KC-10A Extender (Gucci Boys/Shamu)*	*KC-135R Stratotanker (Tanker Toads)*
Mission	Intratheater airlift	Air refueling Intertheater airlift	Air refueling Inter/Intratheater airlift
Max Payload	50,000 lbs	169,500 lbs	30,000 lbs
2,900 NM Payload	22,000 lbs.	169,500 lbs	28,400 lbs
Range with Max Payload	2,049 NM unrefueled	4,370 NM unrefueled	2,100 NM (only 8 KC-135s are air refuelable—JCS assets)
Pallet Load	5.5	27	6
Min Wartime Runway	3,000 ft × 60 ft	6,000 ft × 90 ft	7,000 ft × 149 ft
Delivery	CDS, HED Airland 64 paratroopers or 92 troops	Airland only, special MHE required Fuel offload: 290,000 lbs	Airland only, special MHE required Fuel offload: 110,000 lbs

d. USAF aircraft that perform command and control, intelligence, surveillance, reconnaissance, and counterinformation functions:

	E-3C Sentry (AWACS)	*EC-130E ABCCC*	*E-8C Joint-Stars (JSTARS)*
Mission	Command and control, surveillance	Command and control	ISR
Avionics	GPS, APY-1/-2 radar, JTIDS, PDS	GPS, JTIDS, TADIL-J, CIS-AA, DCT	GPS, JTIDS, TADIL-J, APY-3 Norden multimode side-looking phased-array radar (SAR/MTI)
Radios	13 UHF, 3 VHF, 3 HF,2 SATCOM, (Secure/Have Quick II)	23 securable radios: 3 UHF SATCOM, 8 UHF Have Quick II, 8 VHF AM/FM, 4 HF, plus teletype, relay, and repeaters.	12 UHF, 3 VHF (SINCGARS), 2 HF, SATCOM (all secure or encrypted)
Range	Air refuelable 1,000 NM with 6 hrs on-station-time: unrefueled	On-station 6 to 8 hrs unrefueled On-station 10–to 14 hrs refueled Air refuelable	Air refuelable 20-hr flight endurance with 1 refueling
Coverage	-	-	386,100 NM during an 8-hr sortie
NOTES:	-	1. Only 7 ABCCC III equipped aircraft in USAF inventory. 2. No active radars on board. 3. Endurance limited by crew duty.	Includes crewmembers from US Army.

	EC-130H Compass Call	*RC-135V/W Rivet Joint*	*U-2 Dragon Lady*
Mission	Counterinformation (C^3) jamming	ISR (SIGINT collection, analysis, dissemination)	Strategic reconnaissance
Avionics	INS, GPS, JTIDS	-	INS, GPS
Sensors	-	Passive SIGINT arrays	Optical, EO, radar, SIGINT
Radios	UHF Have Quick II, KY-58 VHF/FM, VHF/AM, SATCOM	UHF, VHF (Have Quick II and secure capable), HF, SATCOM (secure voice)	UHF, HF, VHF
Speed	-	-	Cruise 430 kn Max classified
Range	10 hours endurance unrefueled Air refuelable	8 hours endurance Air refuelable	3,000 NM plus 9 hours loiter
Weapons	Counterinformation targets HF, UHF, and data link capabilities.		
Links	-	JTIDS, IDM, TRAP, LINK 11, TIBS, Purple Net, TADIL	-

	EC-130H Compass Call	*RC-135V/W Rivet Joint*	*U-2 Dragon Lady*
Altitude	-	-	70,000 feet plus
Night		Yes, all weather	Yes, all weather
NOTES:	Primarily a command, control, and communications countermeasures platform/jammer.	Other variants of the RC-135 fulfill specialized roles: RC-135U (COMBAT SENT) collects and analyses technical ELINT. RC-135S (COBRA BALL) collects data on theater and strategic missiles. Night: yes, all weather.	Night: yes, all weather.

NOTE: Missions listed for these aircraft are those that are normally performed; however, most aircraft can perform any air mission (i.e., a B-52 could and has flown CAS and countersea and a C-141 could fly theater airlift). These aircraft can also deliver other types of weapons and ordnance; those listed are the normal loads or weapon mixes.

e. Web address. Additional information on Air Force aircraft and Air Force MAJCOMs is on the Internet: http://www.af.mil/news/indexpages/fs_index.html.

11-21. SELECTED USAF AIRCRAFT MUNITIONS

a. Air-delivered, free-fall non-PGMs.

Name	*Classification*	*Specification*
Mk-82	General purpose (GP) bomb	500 lbs
Mk-84	GP bomb	2,000 lbs
BLU-82	Daisy Cutter (C/MC-130)	15,000 lbs
BLU-109	Improved GP bomb (Penetrator) Normally used w/guidance kit	2,000 lbs
CBU-52	Cluster bomb unit (CBU)	AP
CBU-58	CBU	AP
CBU-71	CBU	AP (random delay)
CBU-87	Combined effects munitions (CEM)	AP/AT
CBU-89	Gator mines	AP/AT
CBU-97	Sensor-fused weapon (SFW)	AT

b. Air-delivered free-fall PGMs.

Name	*Classification*	*Specification (lbs)*
GBU-10	Laser-guided bomb (LGB, Mk-84/BLU 109)	2,000
GBU-12	LGB (Mk-82)	500
GBU-15	Glide bomb (infrared/electro-optic) (Mk-84/BLU 109) with GPS guidance	2,000
GBU-24 (A/B)	LGB Paveway III (/B Mk-84, A/B BLU-109)	2,000
GBU-27	LGB (F-117 specific, BLU-109 capable)	2,000
GBU-28	LGB Paveway III (BLU-113) F-15E specific	4,700
GBU-31v1/3	JDAM (v1 Mk-84/v3 BLU-109)	2,000
GBU-37	B-2 GATS/GAM (BLU-113)	4,700
AGM-154	JSOW (SFW or unitary warhead)	1,065 to 1,500

c. Rocket-assisted and rocket-powered PGMs.

Name	*Classification*	*Specification*
AGM-65D/G	Maverick (infrared)	D-AT/G-Blast frag
AGM-86C	CALCM (B-52 specific)	1,000 lbs
AGM-88	HARM	SEAD missile
AGM-130A/C	Rocket-assisted glide bomb (A-Mk-84/C-BLU-109) GPS guidance	2,000 lbs
AIM-7	Air-to-air missile (Sparrow)	Radar guided
AIM-9	Air-to-air missile (Sidewinder)	Infrared guided
AIM-120	Air-to-air missile (AMRAAM)	~~A~~ctive radar

d. Risk-estimate distance for aircraft-delivered ordnance

(COMBAT USE ONLY—NOT FOR PEACETIME TRAINING)

Weapon	*Risk-Estimate Distance (m)* *10% PI*	*0.1% PI*
MK-82 low drag	250	425
MK-82 high drag	100	375
GBU-12[a]	250	425
Mk-84	325	500
GBU-10[a]	225	500
CBU-52[b]	275	450
CBU-58/-71[b,c]	350	525
CBU-87/-89[b]	175	275
AGM-65[d]	25	100
M61 (20-mm)	100	150
GAU-8 (30-mm)	100	150
GAU-12 (25-mm)	100	150
AC-130 (105-mm)	80	200

PI—Probability of incapacitation.

NOTE: Casualty criterion is the 5-minute assault criterion for a prone soldier in winter clothing and helmet. The PI means a soldier is physically unable to function in an assault within a 5-minute period after an attack. All attacks are flown parallel to the FLOT. The ground commander must accept responsibility for friendly risk when targets are inside the 0.1-percent PI criteria.

[a]GBU values are for weapons that do not guide and have ballistic trajectories similar to GP bombs.
[b]Not recommended for use near troops in contact.
[c]Contains time-delay fuses that detonate at random times after impact.
[d]Data applies to AGM-65A, B, C, and D models. AGM-65E and G models have larger warheads and risk-estimate distances are not currently available.

Selected weapons are from FM 90-20.

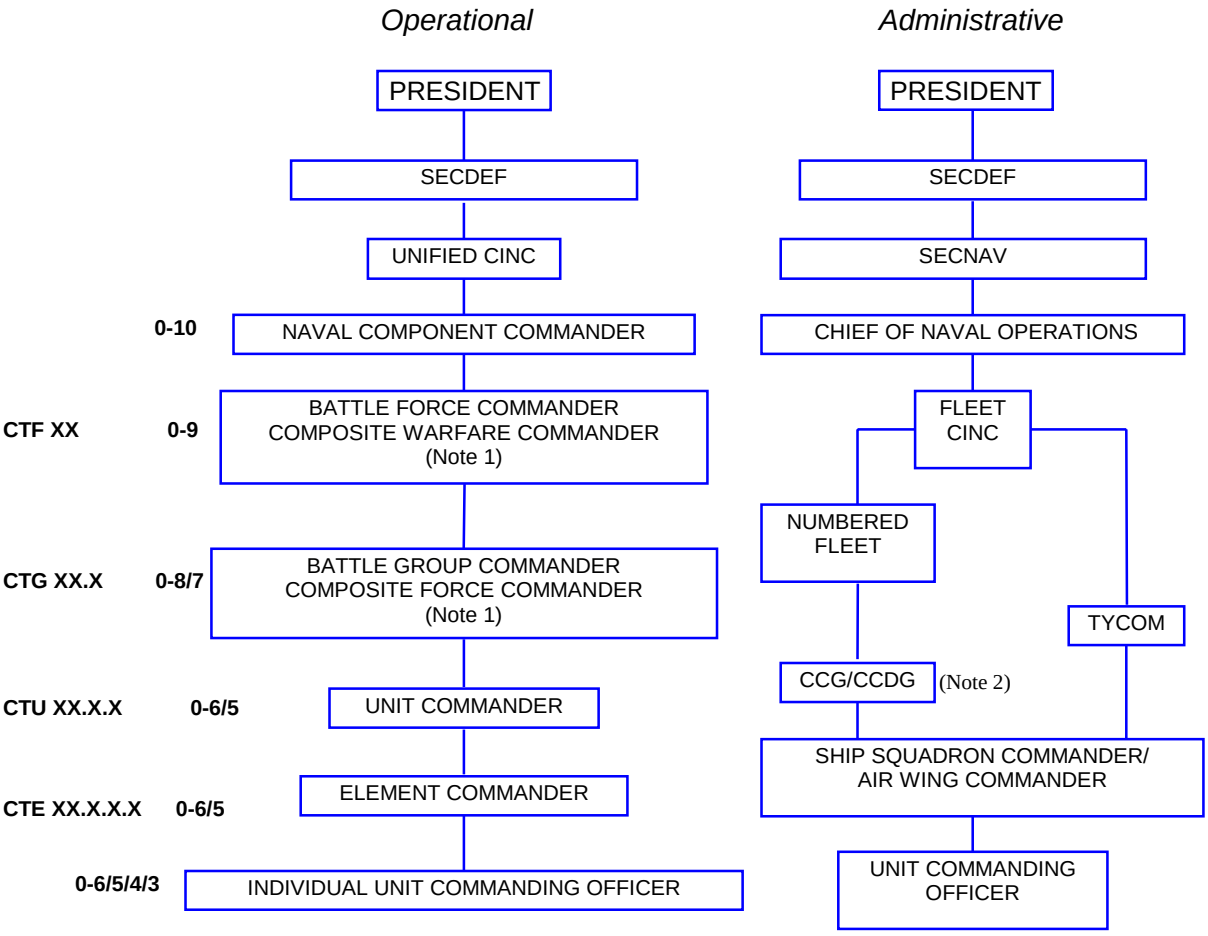
CHAPTER 12

UNITED STATES NAVY OPERATIONS

12-1. ORGANIZATION

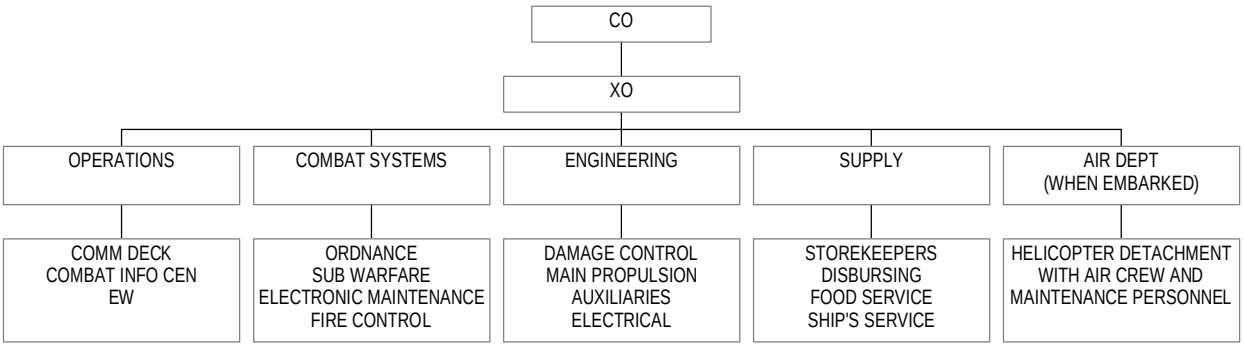
The US Navy is organized, trained, and equipped to conduct joint and sustained operations at sea and to influence events on land. Shaped for joint operations, expeditionary in nature, and operating in the littoral regions of the world, Naval forces are tailored for our national security needs.

a. Chain of command for Naval operations.



NOTES 1. CWC level of command depends on size of battle force or group involved.
2. CCG- Commander, Carrier Group
CCDG- Commander, Cruiser-Destroyer Group

b. Generic shipboard organization.



12-2. KEY OPERATIONAL CAPABILITIES

a. Battlespace dominance (previously called "sea control in the blue-water environment"): control of the sea, air, and land environment where we conduct operations. Control means ensuring effective transition from open ocean to littoral areas and from sea to land and back to accomplish the full range of potential missions. Control also means ensuring fleet defense, enabling the power projection mission, and protecting aerial ports of debarkation (APODs) and sea ports of debarkation (SPODs) for the Army and the Air Force in initial operations.

b. Power projection: to apply combat power ashore as required.

c. Strategic deterrence: a mobile and survivable nuclear force, a critical leg of our nation's strategic triad.

d. Force sustainment: the ability to move by sea those forces and supplies required to support our national policies and objectives.

e. Command, control, and surveillance: capabilities to promote efficient joint and combined operations and exploitation of information systems to provide commanders with immediate intelligence.

12-3. FUNDAMENTAL WARFARE TASKS

- Air warfare (air defense and air superiority).
- Sea combat (surface warfare, undersea warfare and maritime superiority).
- Mine warfare.
- Coastal warfare.
- Command and control warfare (C^2W).
- Strike warfare.
- Special warfare.

12-4. SUPPORTING WARFARE TASKS

- Surveillance.
- Intelligence.
- Logistics and sustainment.

12-5. GENERAL INFORMATION

Listed in block format are a few ship "classes" for review. Note that there are not only significant differences in capabilities between the classes, but there may also be significant differences among the ships in each class. When dealing with naval forces, one encounters a series of acronyms designating ship types. These letter designations for warships, adopted by the US Navy around the turn of the century, have since been used worldwide as a *universal* shorthand for warship types. These designations (listed below) are used throughout this section.

Naval Designations

CVN	Carrier (nuclear powered	LHD	Amphibious assault ship
CV	Carrier (conventional power)	LPD	Amphibious transport dock
CG	Missile cruiser	LSD	Landing ship, dock
DD	Destroyer	MCM	Mine countermeasures ship
DDG	Missile (antiair) destroyer	MHC	Mine hunter, coastal
FFG	Missile frigate	TAE	Ammunition ship
PC	Patrol coastal	T-AK	Auxiliary cargo ship
SSN	Attack submarine (nuclear)	T-AO	Auxiliary oiler
SSBN	Ballistic missile submarine (nuclear)	T-AFS	Combat stores ship
LCAC	Landing craft air cushion	AOE	Fast combat support ship
LCC	Amphibious command ship	AS	Submarine tender
LHA	Amphibious assault ship		

12-6. ORGANIZATION FOR COMBAT

Generally, operational Naval forces are grouped into *fleets, forces, groups, units, and elements.* The size and makeup of the organization depends on its mission (task organized). Some common Naval organizations for combat are—

a. Amphibious task force/amphibious ready group. An amphibious task force is a group of amphibious ships carrying a landing force to an amphibious landing; following the landing, the group provides support to the landing force ashore. Amphibious ships lack significant defensive armament and are normally escorted by a surface action group (SAG) or an aircraft carrier battle group (CVBG). Beginning with recent deployments, CGs are permanently assigned to amphibious ready groups (ARGs) for the duration of the cruise. This addition greatly adds to all warfare defensive and offensive capabilities. The task force includes helicopter carrier(s) with United States Marine Corps (USMC) helicopters and AV-8B Harrier vertical and short takeoff and landing (VSTOL) aircraft, both of which are trained for and used in the support of ground forces ashore. An ARG is a task force of three or four ships that transports and supports a Marine expeditionary unit (MEU) special operations capable (SOC)

(or a Marine expeditionary force (MEF)(FWD) if required) and typically comprises an LHA or LHD, an LPD and 1 or 2 LSDs (see chap 11 for greater detail).

b. Carrier battle force. A carrier battle force (CVBF) comprises several carriers and their escorts working together under a single commander. Although infrequently used, a CVBF would be formed by combining two or more battle groups and could easily number over fifteen ships.

c. Carrier battle group. A CVBG has significant combat flexibility through the employment of its carrier air wing, surface combatants, and support submarines. As such, the CVBG has a robust offensive and defensive capability in all warfare mission areas, with the possible exception of mine countermeasure warfare. The composition of the CVBG (and its subsequent tactical or theater disposition) takes into account the strengths and limitations of all the various platforms (air, surface, subsurface, and maritime patrol aircraft (MPA), if available). The combined effect of all individual units working as a team provides the necessary offensive and defensive capabilities to accomplish nearly any maritime mission. The typical CVBG comprises one CV or CVN; a carrier air wing capable of supporting a sustained rate of 85 strike sorties per day (109 total sorties per day) and a 3- to 5-day surge rate of 134 strike sorties per day (166 total sorties per day); 6 surface combatants (CGs, DDGs/DDs/FFGs, of which at least 3 are Aegis-capable and 4 of which are vertical launch system (VLS)/Tomahawk capable, and which carry an aggregate of 6 to 10 Light Airborne Multipurpose System (LAMPS) helicopters); 2 SSNs; and 1 multi-purpose AOE.

d. Naval expeditionary force. The Naval expeditionary force (NEF) provides a robust, unobtrusive forward presence that may be intensified or withdrawn as required on short notice. The NEF, which can act alone or as an enabling force in the littoral region, combines the power projection capabilities of the CVBG and the amphibious task force (ATF). Although not currently specified in doctrine, a NEF is commonly considered to consist of one CVBG and one ARG with MEU(SOC) embarked and may include mine countermeasures ships.

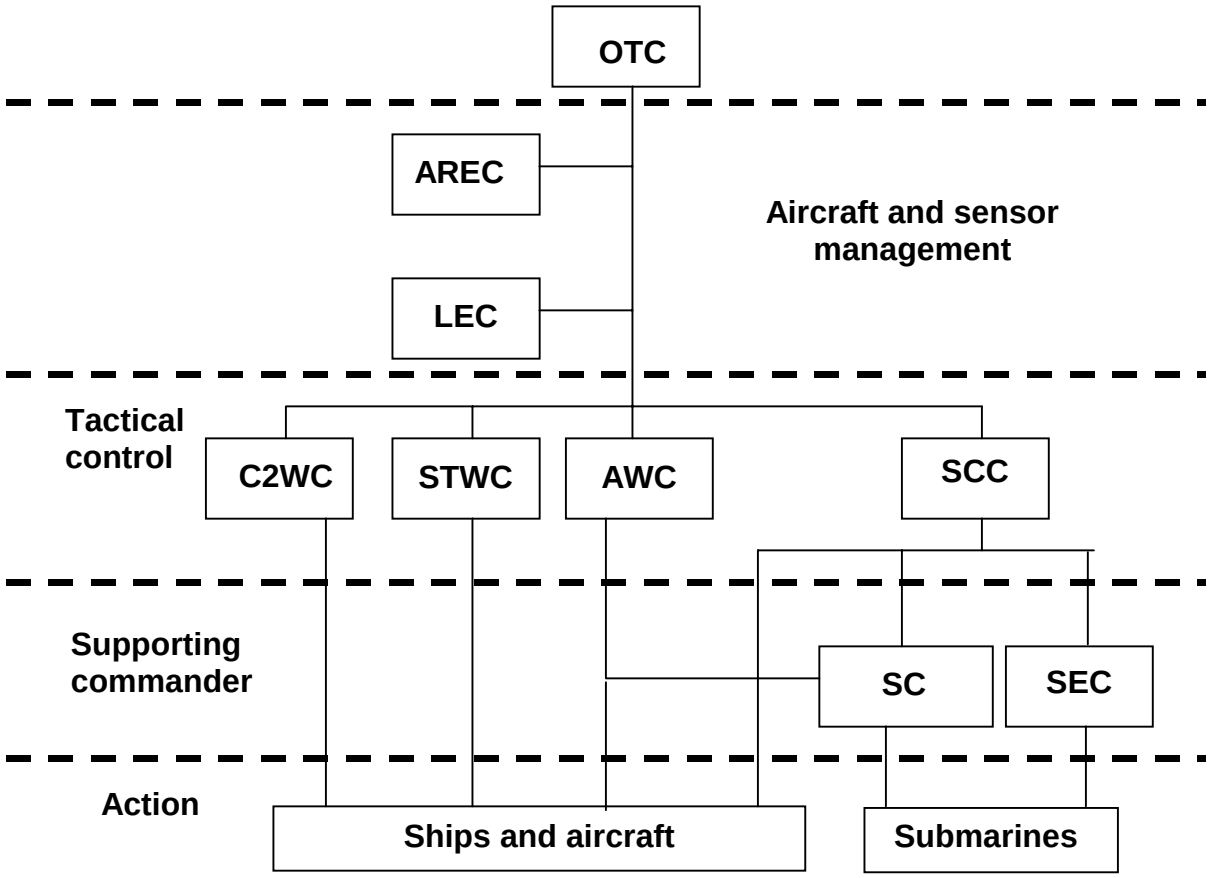
e. Surface task force or surface action group. The surface task force (STF) or SAG is a naval formation of combatant ships that does not include an aircraft carrier. It is organized with CGs, DDGs, DDs, and/or missile frigates (FFGs). Although it lacks organic fixed-wing capability for air and maritime supremacy operations, it has SW helicopters aboard several ships for screening, targeting, and surveillance. SAGs vary in the number and type of ships assigned, depending on the mission, but will generally contain both Aegis and Tomahawk vertical launch capability.

f. Deployment cycles. CONUS-based ships and submarines (except SSBNs) operate on an 18-month deployment cycle. A ship will deploy for 6 months and, on return to CONUS, begin a 12-month combined maintenance and training cycle to prepare for the next deployment. In general, most ships enter an extensive (1+ year) overhaul every three to five deployment cycles. At any given time, approximately 15 to 20 percent of the active fleet is in some form of extensive maintenance that precludes operational tasking.

g. Underway replenishment (UNREP) operations. Navy or Military Sealift Command supply ships carry the fuel, provisions, ammunition and repair parts to continually sustain deployed Naval combat forces while underway. Most replenishment cycles involve single-product ships (T-AOs, TAEs, T-AFSs) acting as shuttles between shore logistics support sites and multiproduct ships (AOEs), which consolidate large quantities of fuel, provisions, and parts and which are capable of keeping up with a CVBG during high-speed transits. Single-product ships, while capable of performing UNREP with combat units, cannot keep pace with a transiting CVBG. Conversely, multiproduct ships can act as the link between shore logistics points and forward-deployed units, but are not generally tasked to do so because of their

much greater utility in remaining with the CVBG. Even so, because there are not enough of them to assign one permanently to each CVBG and ARG, AOEs are frequently considered to be theater-level assets that are placed only under the TACON of the CVBG or ARG commander; this results occasionally in the need to "share." UNREP is accomplished by connected replenishment (CONREP) (the horizontal movement of supplies between ships) and vertical replenishment (VERTREP) (done by helicopters). A CVBG may require replenishment every 2 to 3 days (more frequently during periods of high sortie rates) to keep conventionally powered ship fuel inventories above 75 percent. Caught up in a continuous cycle of refueling and reloading, crew rest on logistics ships supporting a CVBG may occur only during transit to and from rendezvous points.

h. Navy composite warfare commander. Because of the complexities of C^2 in modern naval warfare, the Navy uses the "composite warfare commander" (CWC) concept within a task organization. Under this architecture, the officer in tactical command (OTC) may delegate command authority in particular warfare areas to subordinate commanders within his organization. Although he may not delegate control of the offensive mission objectives, he could possibly delegate overall coordination of defensive warfare areas to a CWC, although this is very rare. Thus, the terms CWC and OTC may, in certain circumstances, be interchangeable. Subordinate to the CWC are four principal warfare commanders: the air warfare commander (AWC), the strike warfare commander (STWC), the sea combat commander (SCC), and the command and control warfare commander (C^2WC). The OTC can retain direct command in any one or more warfare areas if desired. The warfare commanders are responsible for collecting, evaluating and disseminating tactical information and, at the discretion of the CWC, are delegated authority to respond to threats with assigned forces. If the warfare commanders are delegated authority to respond to threats in accordance with the rules of engagement (ROE), the CWC can still exercise control using "command by negation." Supporting the CWC and the warfare commanders are the submarine element coordinator (SEC), a cell of the SCC staff, who, when assigned, is responsible for coordinating the actions of support submarines; the screen coordinator (SC), responsible to the SCC and AWC for coordinating ships in the screen; the air element coordinator (AREC), who is responsible for managing and coordinating the distribution of aircraft and keeping the CWC and other warfare commanders and coordinators apprised of air operations; and the LAMPS element coordinator (LEC) who performs a similar function as the AREC for LAMPS helicopters. The supporting coordinators differ from the warfare commands in one very important respect. When authorized by the CWC, the warfare commanders have tactical control assigned and may autonomously initiate action. The supporting coordinators execute policy, but they do not initiate autonomous actions.



LEGEND

OTC: Officer in Tactical Command
AREC: Air Element Coordinator
LEC: LAMPS Element Coordinator
C2WC: Command and Control Warfare Coordinator
STWC: Strike Warfare Commander
AWC: Air Warfare Commander
SCC: Sea Combat Commander

12-7. AIRCRAFT CARRIERS

a. Aircraft carrier. The aircraft carrier is a multipurpose platform that carries various types of aircraft capable of conducting air, strike, surface, and submarine warfare missions simultaneously. The carriers are capable of speeds over 30 knots and have substantial mission endurance (aviation fuel for up to 16 days of 24-hr a-day air operations). In addition to its offensive capabilities, the embarked air wing is also tasked with protecting the carrier and its escort ships and has the ability to provide UNREP and VERTREP support to ships in company.

In a typical battle group, the battle group commander (a rear admiral) is embarked on the carrier. The commanding officer (an O6) and the air wing commander (also an O6) report to the admiral.

Ship type	*Class*	*No*	*Warfare mission*	*Equipment*
CVN	NIMITZ 92,000 tons, 1,040 ft, 134-ft beam, 30+ kn speed, 5,300 crew with air wing.	7	AW, SW, SUW, STW, mine warfare (MIW) (offensive),EW, C^3	CV air wing, 2 reactors produce 280,000 shaft horsepower, 4 shafts, NSSMS, CIWS, UNREP and VERTREP capability

Aircraft type	*Warfare mission*
F/A-18 Hornet	1,360 + mph, 50,000-ft ceiling, combat radius: 400 NM, 575 NM. Carries Sparrow, Sidewinder, Harpoon, high-speed antiradiation missile (HARM), AMRM, JDAM, PGMs.
F-14 Tomcat	1,545 mph, 50,000-ft ceiling, combat radius: 500 NM. TARPS capable. Carries the Phoenix, Sparrow, and Sidewinder missiles, 20-mm cannon. All are configured for bombs and LGBs.
EA-6B Prowler	650 mph/480 mph cruise, 38,000-ft ceiling with 5 ECM pods. Combat radius 955 NM, crew of 4. Carries HARM.
E-6A Tacoma	Modified 707, strategic communications.
E-2C Hawkeye	340 kn, 260 kn cruise, 36k ceiling, ferry range 1,600 NM. APS-145 can track 2,000 targets, control more than 20 airborne intercepts.
P-3C Orion	473 mph, 377 mph cruise. Organized into thirteen 9-plane squadrons. Combat radius 1,000 NM (25,000 ft) with 6 hours on station. Capable of conducting all weather SW operations (search large ocean areas; detect, track, attack and destroy enemy submarines). Can conduct surveillance, escort, SUW, and MIW. Two squadrons (Guam, Rota) of EP-3 variant (COMINT, ESM, and ECM).
S-3B Viking	450 kn., 40k ft ceiling. Initially 187 aircraft built for carrier SW. 16 have been converted into ES-3B electronic reconnaissance. Also used as tankers.
C-2A Greyhound	Carrier onboard delivery (COD): carry personnel, key logistic items, mail, etc.
CH-53E Super Stallion	160 kn, 1,120 NM range. Can move 16-ton payload 50 NM or a 10-ton payload 500 NM. Carries 55 troops.
SH-60B/F Seahawk	150 kn, 5k cruise ceiling. SH-60B is LAMP III version for ships. SH-60F replaces SH-3H Sea King on carriers.
CH-46D/E Sea Knight	130 kn. Can accommodate 25 troops or 15 litters. External lift is approx 3,000 lbs. Aircraft is workhorse that is over 30 years old. Primary VERTREP aircraft.

b. Carrier air wing. Typical wing composition on a carrier includes—

VF (fighter)	14 × F-14 (Tomcat) (sqdn)
VFA (fighter/attack)	36 × F/A-18 (Hornet) (3 sqdns)
VAW (early warning)	4 × E-2C (Hawkeye)
VS (SW)	8 × S-3B (Viking) (including S-3 tanker)
HS (SW/CSAR)	4 × SH-60F and 2 × HH-60H (Seahawk)
VAQ (electronic warfare)	4 × EA-6B (Prowler)
VQ	2 × ES-3

The carrier air group (CAG) commander performs major command functions in directing and administering the employment of embarked aviation squadrons. There are two common methods of organizing aircraft launches and recoveries. *Cyclic operations* consist of several scheduled launch and recovery cycles per flight day. "A cycle" is normally 1 to 1 hours long, which enables 7 or 8 cycles (as many as 190 sorties) in a 12-hour flying day. Cyclic operations provide "predictability" for the flight deck and are sustainable indefinitely, but are inflexible. Aircraft cannot be easily launched or recovered outside of prescribed times because of resultant scheduling problems with fueling, rearming, and deck spotting evolutions for the next cycle. *Flexible deck/battle flexible deck operations* mean that aircraft can land anytime, not just once per cycle. For warfare commanders, "flex deck" operations mean greater flexibility to "get an aircraft now." The downside is that flex deck operations *cannot* be sustained

indefinitely, usually no longer than 24 to 36 hours. While total sorties flown are reduced in flex deck operations, aircraft maintenance and flight deck crew rest requirements remain the controlling factors.

In joint operations, today's CVs and CVNs are capable of performing duties as the JFACC. When the preponderance of assets dictate (i.e., when the CVBG is the first or only force in the AO), the inherent organizational structure onboard can perform the functions of planning, coordinating, allocating, and tasking air assets. CVs and CVNs can facilitate the initial entry of additional forces into the theater; sustain conditions (open sea lines of communications (SLOCs) and establish maritime and air superiority) so additional forces can enter; contribute to the joint force operations; and, once the crisis end state has been achieved, maintain conditions for force withdrawal and transition to peacetime operations. In larger scenarios, the CV or CVN would transfer the role of JFACC to a land component commander (LCC) or a land-based organization as the conflict expanded. With the use of "flyaway" JFACC staffs, CVs can maintain control of joint air operations for longer periods and more complex campaigns. (CVs or CVNs with "flyaway" staff can control 2 CVBG wings, a USAF wing, and an ARG air combat element.)

12-8. SURFACE COMBATANTS

Surface ships are versatile platforms that can operate independently or in company with carrier, amphibious, or convoy forces. Additional missions include shore bombardment, blockade, screening, search and rescue, tracking, ELINT collection, tactical deception, surveillance, evacuation, harassment, and putting forces ashore. The FY96 FYDP called for maintaining a surface combatant force of 110 to 116 ships.

a. Cruisers. The 27-ship Ticonderoga-class gas turbine cruiser (CG) provides the muscle of the surface combatant fleet. The Aegis Weapon System has unprecedented defensive capability against high performance aircraft and cruise missiles. Its SPY-1 radar enables it to control all friendly aircraft units operating in its area and still have the capability to surveil, detect, and track enemy aircraft and missiles. In conjunction with some modifications to the standard missile (SM-2 BLK IVa), Aegis software is expected to yield a robust lower tier, or *area* ballistic missile defense capability. In the upper tier of the Navy's sea-based research and development (R&D) program is a lightweight exoatmospheric projectile (LEAP) that will be a high-altitude, long-range interceptor for possible *theater* ballistic missile defense (TBMD). LAMPS MK III helicopters and a towed array sonar give CGs formidable SW capability. Tomahawk VLS are on 22 of 27 platforms. All cruisers have helicopter decks, and the Ticonderoga class has hangar space for two LAMPS helicopters. While all cruisers are capable of over 30 knots, their endurance depends on their speed: from 2,500 NM at 30 knots to 8,000 NM at 14 knots. Three nuclear-powered cruisers (CGNs) will be decommissioned rather than refueled.

b. Destroyers/frigates (DD/DDG/FFG). The Arleigh Burke (DDG-51) class missile destroyer, originally designed as a replacement for the Adams and Coontz class guided missile destroyers, has also become the replacement for the Leahy and Belknap class cruisers. Although smaller than the Ticonderoga class cruisers, its SPY-1 D Aegis Automatic Data Action System (the ship's combat system) adds an increase in firepower and capability to the surface force nearly equal to that of a cruiser. With a planned DDG-51 class force level of 28 ships by the end of this decade, Aegis-capable ships will compose over half of the entire surface combatant force. The Burke-class primary mission is air warfare (AW), but it possesses extensive submarine warfare (SW) and surface warfare (SUW) capabilities as well.

The Spruance class DD is primarily an SW platform upgraded with missiles to give it strike or SUW capability. These 24 ships are equipped with Harpoon missiles for SUW capability and VLS cells, which can carry up to 60 Tomahawk missiles.

The Oliver Hazard Perry Class FFGs (38 ships) serve primarily as escorts, in drug interdiction operations, or in maritime interdiction operations (blockades). They were built to escort ARGs, UNREP groups, and convoys, with particular emphasis on AW and SW. At sea, FFGs are typically refueled about every 3 days to maintain their fuel inventories above 75 percent, but they are capable of unrefueled operations of 7 to 10 days (or longer), depending on the demands of the tactical situation.

Ship type	*Class*	*No*	*Warfare missions*	*Equipment*
CG (cruiser guided missile)	TICONDEROGA, 9,600 tons, 563 ft, 55-ft beam, 30+ kn, 360 crew	27	AW SUW SW STW EW CCC	VLS, (22 ships) for standard missiles, Tomahawk and ASROC, Harpoon in canisters, 5"/54 cal (two), CIWS, torpedo tubes, ESM and ECM suite, LAMPS
DDG (destroyer guided missile)	BURKE, 8,300 tons, 466 ft, 59-ft beam, 30+ kn, 300 crew	25 (class build of 57 planned)	AW SUW SW STW EW CCC	VLS for Tomahawk, ASROC, standard missiles. Harpoon canisters, 5"/54 cal gun, CIWS, torpedo tubes, ESM
DD (destroyer)	SPRUANCE, 7,800 tons, 563-ft, 55-ft beam, 33 kn, 340 crew	24	SW SUW STW EW CCC	VLS, (24 ships) for Tomahawk, NSSMS, CIWS, 5"/54 cal (2), torpedo tubes, LAMPS, Harpoon canisters
FFG (frigate guided missile)	OLIVER HAZARD PERRY, 3,600 tons, 455 ft, 45-ft beam 29 kn, 210 crew	29 plus 9 reserve	AW SW EW CCC	76-mm gun, LAMPS, CIWS, Harpoon and Standard missiles

12-9. SUBMARINES

a. Attack submarines. Attack submarines (SSNs) are capable of providing long-term, self-sustained, 24-hour per day operations for about 60 days without relief (limited primarily by food on board). SIGINT, ELINT and communications intelligence (COMINT) gathering capabilities, along with reliable satellite ultra high frequency (UHF) and super high frequency (SHF) communications make it an ideal platform for covert I&W missions. They can conduct SW/SUW with the MK48/ADCAP advanced capabilities (ADCAP) torpedo, over-the-horizon (OTH) SUW with Harpoon missiles, or VLS Tomahawk land attack missile (TLAM) strikes (although some SSNs must still launch TLAM from torpedo tubes). Arguably the best platforms for detecting other submarines, SSNs in support of a CVBG are typically tasked with SW as one of their primary missions. Additionally, they are the best covert minelaying platform in the Navy. SSN 751 and later have the best moored mine detection sonar in the fleet, outside of dedicated mine warfare forces. Limitations are the inability to rearm or change weapons load-out at sea, inability to communicate while at deep depths, and the lack of any offensive or defensive weapon to use against aircraft. Fifty-eight total fast attack SSNs will eventually be downsized to a force of approximately 50. Two ex-SSBN and five SSN 637 are equipped to carry sea-air-land (SEAL) dry-deck shelters (DDSs) with swimmer delivery vehicles (SDVs).

b. Ballistic missile submarines (SSBN). The 18-ship Ohio Class SSBN is the only class of ballistic missile submarine left in service and constitutes the most survivable leg of the strategic deterrent triad. An SSBN typically operates in 90-day cycles: 50 to 70 days on strategic deterrent patrol and the remainder on repairing and maintaining the ship and recertifying the next crew for operation. Each hull has two crews assigned to it (a "blue crew" and a "gold crew") that alternate manning the ship for patrol. The last 10 ships of the class are configured for the Trident II D-5 missile; 4 Trident I C-4 ships are to be back-fitted with the D-5 system, and the remaining 4 Trident I ships will eventually be decommissioned.

Ship type	*Class*	*No*	*Warfare mission*	*Equipment*
SSBN (Ballistic Missile)	OHIO 18,700 tons, 560 ft, 42-ft beam, 20+ km, 155 crew	18 (to be reduced to 14)	Strategic nuclear deterrence	24 tubes Trident missiles, 4 torpedo tubes (self defense)
SSN (Fast Attack)	LOS ANGELES 6,900 tons, 360 ft, 33-ft beam, 30+ km, 133 crew	58, gradually being reduced to attain a stable force level of about 50 after FY 2001.	SW SUW STW MIW I&W	4 torpedo tubes, 12 vertical-launch tubes (some ships), Tomahawk (all variants), Harpoon, MK 48/ADCAP torpedoes, mines

NOTE: All Sturgeon Class SSN are to be decommissioned by 1999. New classes include the Seawolf Class SSN-21 (3), and the new attack submarine (NSSN) class.

Missile Type	*Primary Mission*	*Notional Range*
Harpoon	All weather OTH antiship missile capable of being launched from surface ships, submarines, or aircraft.	70 NM
Tomahawk	Long-range, subsonic, land attack cruise missile, unitary or submunition warhead.	900 NM
Standard Missile (SM)	Engage and intercept aircraft, antiship missiles, and surface ships.	40 to 80 NM

12-10. AMPHIBIOUS WARFARE

Amphibious warfare ships provide transportation of Marine forces from the embarkation area and launch the aircraft and landing craft needed for the amphibious operation. The four remaining types of amphibious ships are well deck and flight deck configured, which allow putting Marine forces ashore from OTH using helicopters and LCAC, protecting the identity of the landing site until the last possible moment and reducing the danger to the force. The LHA and LHD classes are "large deck" ships, which can operate helicopters, AV-8s, and V-22s. They carry large numbers of troops (1,000+) and have a large hospital capability. LSD and LPD class ships have half flight ("2-spot") decks for helicopters. Primarily vehicle and heavy equipment lift ships, they carry fewer troops. A typical ARG consists of 3

or 4 Navy ships with embarked MEU (SOC) of approximately 2,500 Marines, including its aviation combat element. (See chap 11 for a better description of amphibious force sizes.)

Ship Type	*Class*	*No*	*Warfare Mission*	*Equipment*
LHA (amphibious assault ship)	TARAWA, 39,000 ton, 820 ft, 126-ft beam, 24 kn, 950 crew, 1,700 troops	5	AMW	5"/54 gun, CIWS, NSSMS, can take LCU or LCAC. AV-8B, good medical capability
LHD (landing hel aslt)	WASP, 40,500 tons, 844 ft, 126-ft beam, 22+ kn, 1,015 crew, 1,875 troops	6, 7 planned	AMW	Same as Tarawa except can take three LCAC, no 5"/54 gun, outstanding C^4I
LSD (dock landing ship)	WHIDBEY ISLAND, 15,800 tons, 609 ft, 84-ft beam, 20+ kn, 340 troops, 340 crew	8	AMW	CIWS, hel and V-22 capable, LCU or LCAC capable
LSD (dock landing ship)	ANCHORAGE, same as WHIDBEY ISLAND	5	AMW	Same as WHIDBEY ISLAND
LPD (amphibious transport dock)	AUSTIN, 17,000 tons, 570 ft, 84-ft beam, 21 kn, 388 crew, 900 troops	11	AMW	CIWS, large flight deck and dedicated air department, large troop capacity. All vessels 21 to 30 years old
LPD (amphibious transport dock)	SAN ANTONIO 25,000 tons, 682 ft, 125-ft beam, 20 kn, 363 crew, 720 troops	12 planned	AMW	Initial delivery FY 03

NOTES: 1. Blue Ridge Class LCC (2) command and control. LCAC: 200 tons, 88 ft, 47-ft beam, 40 kn at 60-ton max payload, range 200 miles at 40 kn.

2. LPD-17 class, new class of ship as functional replacement for four older classes of ships (LST, LSD, LPD, LKA). Crew 495, troops 788, 23,000 tons, 684 ft. Navy plans to build 12.

12-11. AUXILIARY VESSELS

Auxiliary vessels sustain the fleet at sea. The typical combat ship will carry 30 to 90 days of supplies and 3 to 12 days of fuel before the fuel state falls below 75 percent (trigger point for refueling), depending on the size of the ship. *Combat logistics force (CLF) and Military Sealift Command (MSC)* (designated by a T) *ships* sustain forward-deployed ships on station by providing food, ammunition, fuel, and supplies. The combat logistics force consists of oilers (T-AO), combat stores ships (T-AFS), ammunition ships (T-AE), and combination or multiproduct ships (AOE). The oilers, combat stores ships, and ammunition ships belong to MSC, but are under Navy OPCON. *Combat support ships* provide invaluable repair services to ships in remote places of the world where adequate repair facilities are unavailable. This fleet includes three tenders (AS) for in-theater, intermediate-level repair capability and salvage and tug vessels (ATF/ARS/ATS), which can safely remove damaged vessels from a war zone without having to give up a second combatant to provide towing services.

Submarine tenders have large and robust repair departments, and larger amphibious ships (and carriers) have robust medical and dental departments. Supply ships have large supply and deck

departments to facilitate the onload, inventory, storage, handling, transfer and offload of stores, ammunition, and POL.

A number of auxiliary vessels operate regularly under the auspices of the Naval Fleet Auxiliary Force (NFAF). This fleet includes oilers (T-AO) (11), combat stores ships (T-AFS) (8), surveillance ships (T-AGOS) (12), maritime pre-positioning ships (T-AK) (3 sqdns each carrying 30 days worth of equipment for one MEF(FWD) equivalent), 2 hospital ships (T-AH) and fleet ocean tugs (T-ATF). These ships are mostly manned by civilian crews with a Naval detachment embarked.

ShipType	*Class*	*No*	*Warfare Mission*	*Equipment*
AOE (combat support)	SACRAMENTO, 53,000 tons, 795 ft, 107-ft beam, 30+ kn, 600 crew	4	Combat logistics	NSSMS, CIWS, Two CH-46 hels, 190,000 barrels of oil (8.5 million gallons), 2,150-tons ammo, 500-tons dry stores, 250-tons frozen stores
AOE (combat support)	SUPPLY, 48,000 tons, 752 ft, 107-ft beam, 29 kn, 670 crew	3 + 2 planned	Combat logistics	NSSMS, CIWS, 25-mm gun, (2) CH- 46, 150,00-barrels oil, 1,800-tons ammo, 400-tons dry stores, 250-tons frozen stores
T-AFS (combat stores)	MARS, 16,000 tons, 581 ft, 79-ft beam, 20 kn, 430 crew	6	Combat logistics	MSC vessel, loaded with parts and supplies. Ships are 21 to 28 years old.
AS (submarine tender)	L.Y. SPEAR, 23,000 tons, 645 ft, 85 ft beam, 20 kn, 1,325 crew	3	Repair	Virtually no defensive systems. Outstanding at sea repair capability. Can repair surface ships as well.
T-AE (ammunition)	KILAUEA 9,340 tons, 564 ft, 81-ft beam, 20 kn, 100 crew	12	Combat logistics	MSC vessel, 2 CH-46 helicopters, 2,500 tons ammo
T-AH	MERCY 69,000 tons, 894 feet, 105-ft beam, 16.5 kn, 1,275 crew	2	Medical	1,000 beds, 12 operating theaters, heloplatform
T-AO (oiler)	HENRY J. KAISER, 40,700 tons, 678 ft, 98-ft beam, 20 kn, 120 crew	12	Combat logistics	MSC vessel, 180,000 barrels of oil (8-mil gal)

12-12. MINE WARFARE

Naval mines are cheap, reliable, and easy to obtain. The “weapons that wait” can pose a significant threat to military operations where the transportation and sustainability of forces in theater depends on SLOCs. Consider that 93 percent of the sustainment for *all* US and coalition combat forces came by sea during DESERT SHIELD and DESERT STORM. There are three types of mine countermeasures operations, each of which takes a *long time.*

a. Minehunting: methods to determine where (and just as important where not) the mines are located. Usually use sonar or visual means.

b. Minesweeping: active measures to counter mines. Mines may be contact, acoustic, magnetic, seismic, pressure, or a combination thereof. Sweeping may result in the neutralization of some mines. Hazardous to platform and personnel.

c. Mine neutralization: destruction of known mine(s). Accomplished by the AN/SLQ-48 submersible vehicle or Navy mine countermeasures explosive ordnance disposal (EOD) teams.

Ship Type	*Class*	*No*	*Warfare Mission*	*Equipment*
MCM (Mine countermeasures)	AVENGER, 1,050 tons, 224 ft, 39-ft beam, 13 kn, 73 crew	14	MW	Two, 50-cal mgs, AN/SLQ-48 vehicle, AN/SQQ-30 sonar, 3d sonar to back-fitted. Mechanical, acoustic, and influence sweep gear.
MHC (Coastal Hunter)	OSPREY, 840 tons, 188 ft, 36-ft beam, 15 kn, 45 crew	12	MW	Smaller version of MCM AN/SLQ-48 vehicle, AN/SQQ-32. No sweep gear to date

NOTE: USS INCHON (LPH 12) has been redesignated from LPH to MHS-12 and has been reconfigured to serve as an MH-53E platform and the "mother ship" command center for MCM deployments.

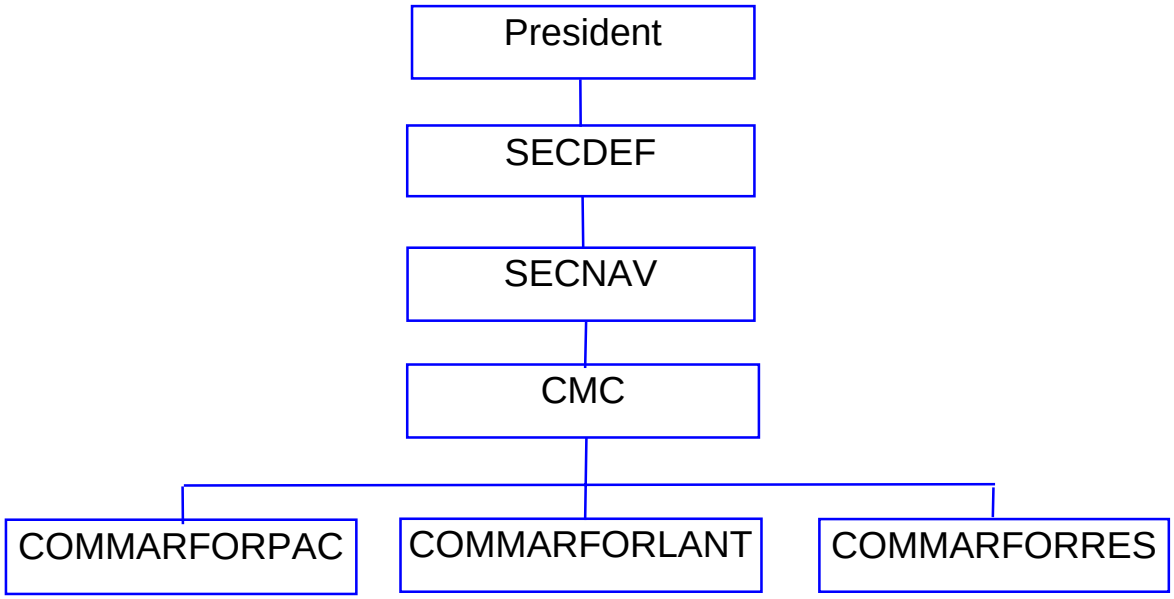
Aircraft type	*Warfare mission*
MH-53E (Sea Dragon)	MIW. AN/AQS-14 sonar (AN/AQS-20 in future), MK 103 MOD 2 mechanical sweep, MK 104 MOD 3 acoustic sweep, MK 105 MOD 2 magnetic sweep. GPS equipped, can search large area in relatively short time. Seven C-5A/B and eight C-141B required to airlift a six-plane AMCM squadron. Currently not capable of night operations.

CHAPTER 13

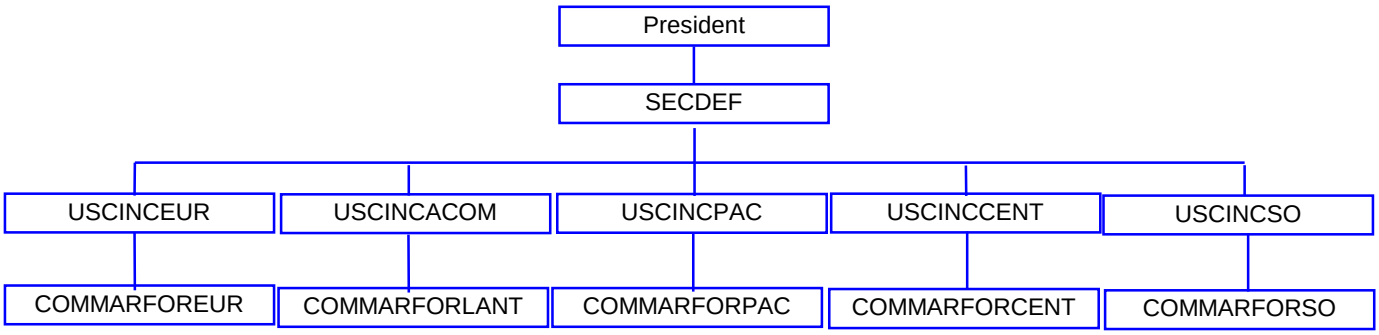
UNITED STATES MARINE CORPS OPERATIONS

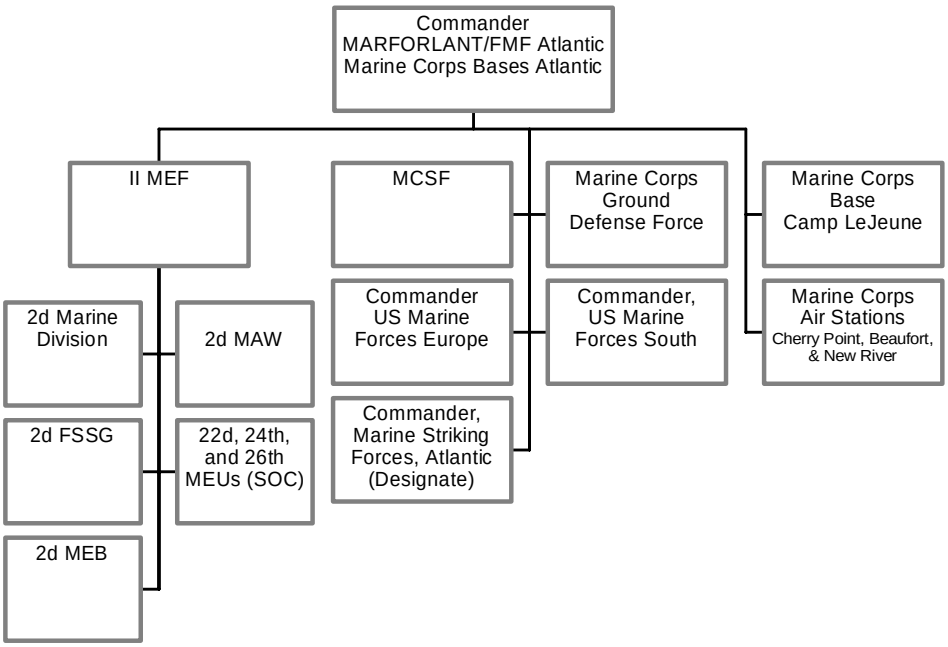
13-1. ORGANIZATION

a. Administrative organization.

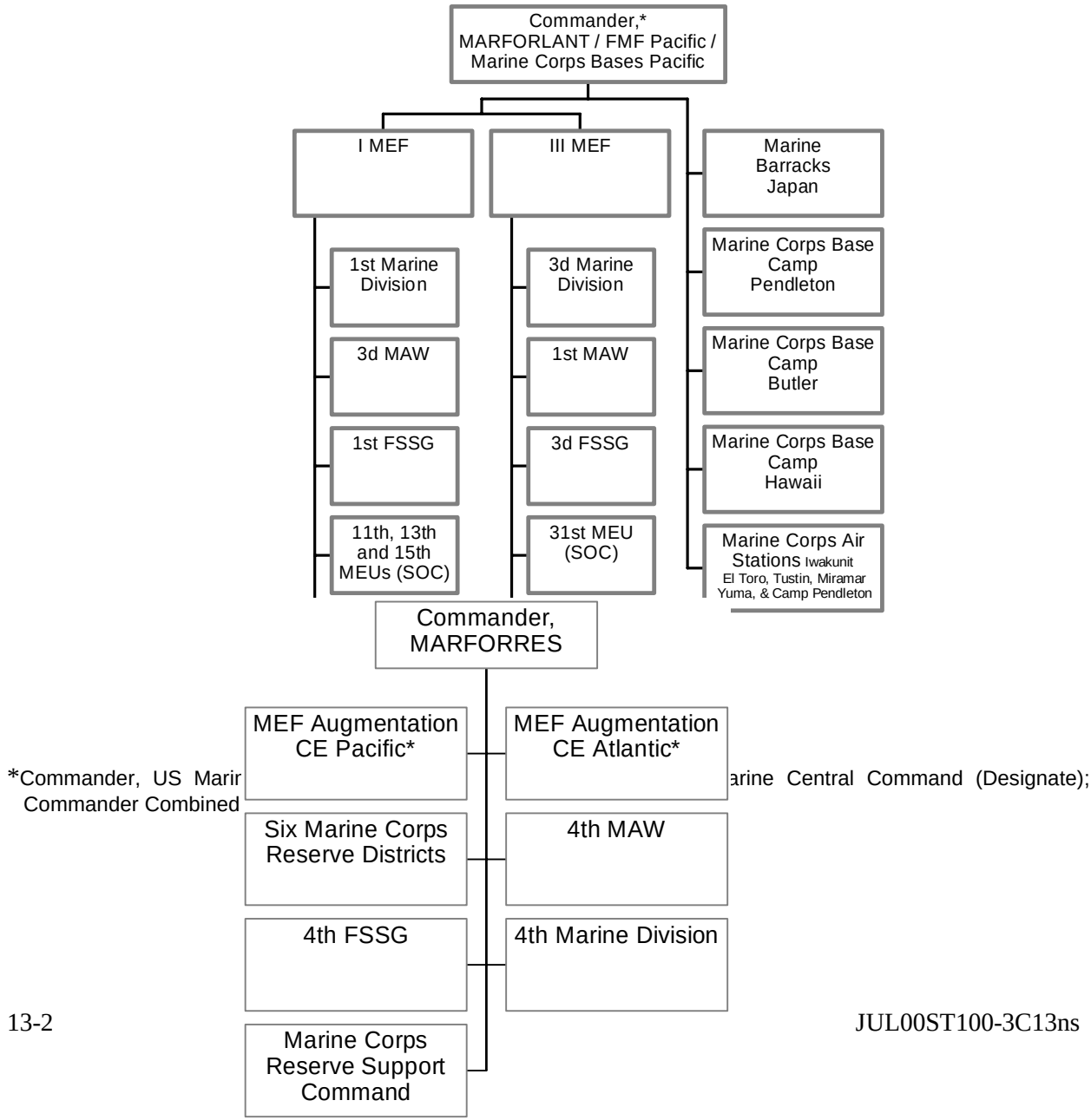


b. Operational organization.





Marine Forces, Atlantic



*Commander, US Marir arine Central Command (Designate); Commander Combined

13-2. MARINE AIR-GROUND TASK FORCE

a. Philosophy. Marine Corps operating forces are organized for warfighting and then adapted for peacetime rather than vice versa. Tables of organization reflect the two central requirements of deployability and the ability to task organize according to specific situations. Units are organized according to type only to the extent dictated by training, administrative, and logistic requirements.

b. Description. The Marine air-ground task force (MAGTF) is the Marine Corps' principal organization for the conduct of all missions across the range of military operations. MAGTFs are balanced combined-arms forces with organic ground, aviation, and sustainment elements. They are flexible, task-organized forces that can respond rapidly to a contingency anywhere in the world and are able to conduct a variety of missions. Although organized and equipped to participate as part of naval expeditionary forces, MAGTFs can also conduct sustained operations ashore. The MAGTF provides a combatant commander or other operational commander with a versatile expeditionary force capable of responding to a broad range of crisis and conflict situations. MAGTFs are organized, trained, and equipped to perform missions ranging from humanitarian assistance to peacekeeping to intense combat and can operate in permissive, uncertain, and hostile environments. They may be shore- or sea-based in support of joint and multinational major operations and/or campaigns. MAGTFs deploy as amphibious, air-contingency, or maritime pre-positioning forces (MPFs), either as part of a naval expeditionary force or by strategic lift. They can present a minimal or a highly visible presence, project combat power ashore in measured degrees, or provide secure staging areas ashore for follow-on forces. MAGTFs are prepared for immediate deployment overseas into austere operating environments, bringing all means necessary to accomplish the missions. When deployed aboard amphibious shipping, MAGTFs maintain a continuous presence at strategic locations around the globe and can be rapidly moved to and indefinitely stationed at the scene of potential trouble. The MAGTF provides the joint force commander (JFC) with the capability of reconstitution, which is the ability of an expeditionary force to regenerate, reorganize, replenish, and reorient itself for a new mission without having to return to its home base.

c. Operations. MAGTF operations are built on a foundation of six special core competencies: expeditionary readiness, combined arms operations, expeditionary operations, sea-based operations, forcible entry from the sea, and Reserve integration.

To carry out their mission, Marine Forces (MARFOR) must be—

(1) Organized, trained, and equipped for combat essential to the prosecution of a naval campaign to seize objectives against the best and most modern equipped enemy.

(2) A balanced force of combined arms and services.

(3) Primarily trained, organized, and equipped for offensive employment.

(4) Adaptable to the active defense of advanced naval bases.

(5) Trained, equipped, and ready for prompt and effective employment in any climate or terrain.

(6) Trained and equipped for airborne operations as required, in accordance with policies and doctrines of the JCS.

(7) Provided with sufficient organic CSS capability to establish and sustain combat power in the execution of normal missions and capable of supporting—

- Supply.
- Maintenance.
- Transportation.
- Deliberate engineering.
- Services.
- Health services.

(8) Provided with organic aviation units primarily organized, trained, and equipped to operate in conjunction with ground units in amphibious operations and capable of performing—

- Offensive air support (OAS).
- Antiair warfare (AAW).
- Assault support.
- Air reconnaissance.
- Electronic warfare (EW).
- Control of aircraft and missiles.

d. Elements. Although MAGTFs are task organized, each MAGTF, regardless of its size or mission, has the same basic structure. Each MAGTF has four core elements: a command element (CE), a ground combat element (GCE), an aviation combat element (ACE), and a combat service support element (CSSE),

(1) The CE is the MAGTF HQ. It is task organized to provide C^2 capabilities (including intelligence and communications) necessary for effective planning, direction, and execution of all operations.

(2) The GCE is task organized to conduct ground operations in support of the MAGTF mission. It is normally formed around an infantry organization reinforced with requisite artillery, reconnaissance, armor, and engineer forces and can vary in size and composition from a rifle platoon to one or more Marine divisions.

(3) The ACE is task organized to support the MAGTF mission by performing some or all of the six functions of Marine aviation. The ACE is normally built around an aviation organization that is

augmented with appropriate air C^2, combat, CS, and CSS units. The ACE can operate effectively from ships, expeditionary airfields, or austere forward operating sites and can readily and routinely transition between sea bases and expeditionary airfields without loss of capability. The ACE can vary in size and composition from an aviation detachment with specific capabilities to one or more Marine aircraft wings (MAWs).

(4) The CSSE is task organized to provide the full range of CSS functions and capabilities needed to support the continued readiness and sustainability of the MAGTF as a whole. It is formed around a CSS HQ and may vary in size and composition from a support detachment to one or more force service support groups (FSSG).

13-3. TYPES OF MAGTFs

Regardless of size, all MAGTFs are "expeditionary" forces. An expeditionary force is a *capability*, rather than a structure. Thus, any size MAGTF could be referred to as a Marine "expeditionary" force. However, to provide a frame of reference for general sizing, MAGTFs are categorized in the following types:

- Marine expeditionary force (MEF).
- Marine expeditionary brigade (MEB).
- Marine expeditionary unit (MEU).
- Special purpose MAGTF (SPMAGTF).

a. Marine expeditionary force (MEF). The MEF, with approximately 45,000 personnel, is the principal Marine Corps warfighting organization. It is capable of missions across the range of military operations, from amphibious assault to sustained operations ashore in any environment. With appropriate augmentation, the MEF CE is capable of performing as a JTF.

(1) *Organization*. There are three standing MEFs: I MEF, based in southern California and Arizona; II MEF, based in North and South Carolina; and III MEF, based in Japan and Hawaii. Each standing MEF (fig 13-1) consists of a permanent CE and one Marine division, one Marine Aircraft Wing (MAW) and one Force Service Support Group (FSSG). These major commands constitute the primary reservoir of combat capabilities from which MAGTFs are sourced.

(2) *Concept of employment*. The size and composition of a deployed MEF can vary greatly depending on the requirements of the mission. It can deploy with not only its own units, but also units from the other standing MEFs, the Marine Corps Reserve, or the other Services and the Special Operations Command. A MEF typically deploys by echelon with 60 days of sustainment. MEFs may conduct sustained operations ashore on completion of an amphibious operation or by deploying from the sea, land, or air and linking up with maritime pre-positioning ships carrying equipment and supplies. For additional information concerning MPF operations, refer to Marine Corps warfighting publication (MCWP) 3-32, *Maritime Prepositioning Force Operations*.

b. Marine Expeditionary Brigade (MEB). The MEB, with approximately 16,000 personnel, is the mid-sized MAGTF and is normally commanded by a brigadier general. It bridges the gap between the MEU, at the tip of the spear, and the MEF, our principal warfighter. The MEB can provide supported

CINCs with a credible warfighting capability that is rapidly deployable and possesses the capability to impact all elements of the battlespace. If required, a MEB CE is capable of assuming the role of JTF headquarters for small operations with additional MEF CE augmentation. As an expeditionary force, it is capable of rapid deployment and employment via amphibious shipping, strategic air/sealift, geographical or maritime pre-positioning force assets, or any combination thereof.

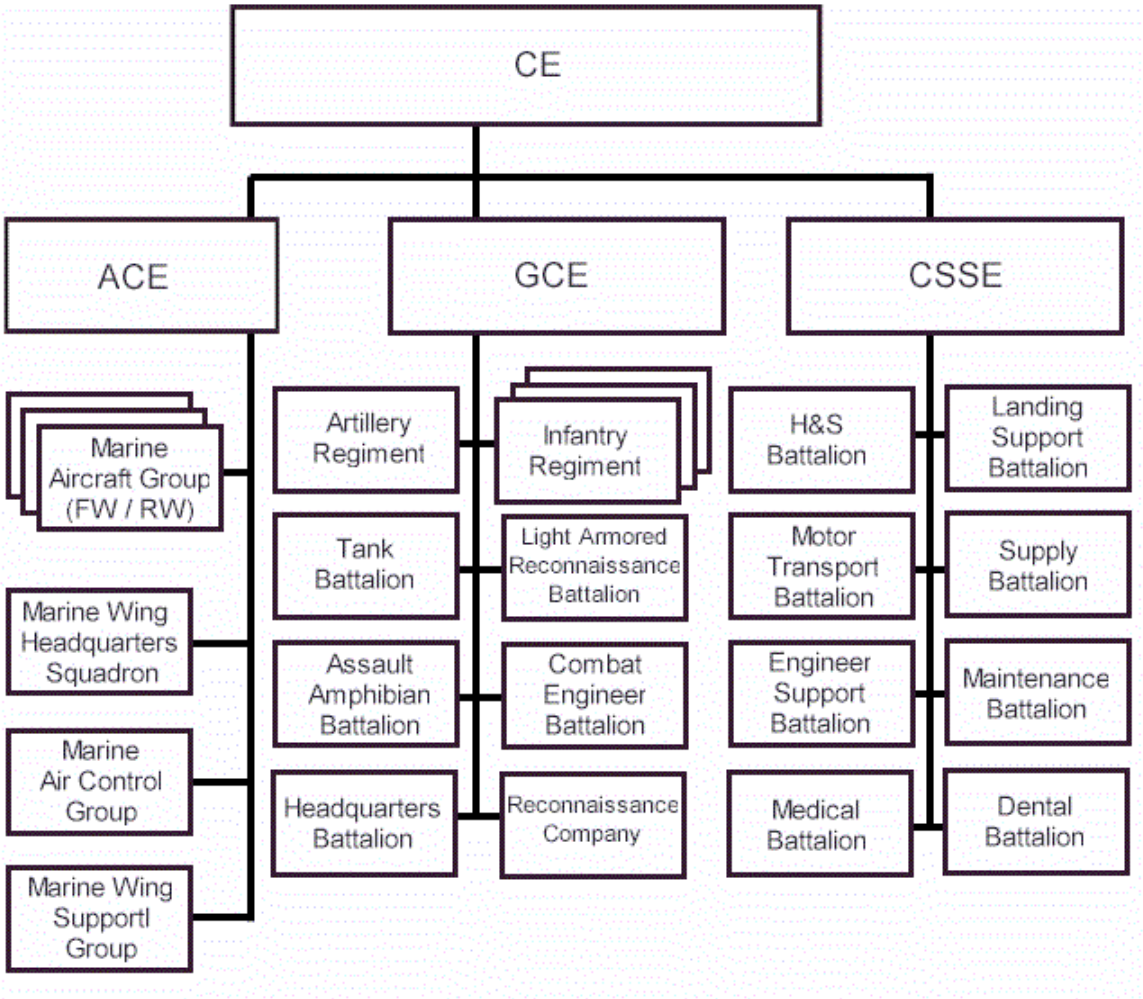


Figure 13-1. Marine expeditionary force.

(1) *Organization.* The MEB (fig 13-2) is a task organized MAGTF normally composed of a CE, a reinforced infantry regiment, a composite Marine aircraft group (MAG), and a brigade service support group (BSSG). The MEB CE is embedded in the MEF CE and identified by line number for training and rapid deployment. There are three standing MEB command elements: 1st Marine Expeditionary Brigade, assigned within I Marine Expeditionary Force and located at Camp Pendleton, CA; 2d Marine Expeditionary Brigade, assigned within II Marine Expeditionary Force and located at Camp Lejeune, NC; and 3d Marine Expeditionary Brigade, assigned within III Marine Expeditionary Force and located in Okinawa, Japan. 1st and 2d MEB CEs were activated in November 1999. 3d MEB CE was activated in January 2000. The composition of a MEB varies according to the mission, forces assigned, and the area of operations. MEB forces are designated in the activation order. The MEB commander task organizes assigned assets into command, ground combat, aviation combat, and combat service support elements.

(2) Concept of employment. The MEB deploys with 30 days of sufficient supplies for sustained operations and is capable of conducting amphibious assault operations and MPF operations. During potential crisis situations, a MEB may be forward deployed afloat for an extended period in order to provide an immediate combat response. A MEB can operate independently or serve as the advance echelon of a MEF. Early command and control forward is critical; therefore, a MEB will be deployed with enabling communications into theater as quickly as possible. The MEB provides operational agility to the MEB commander and supports all warfighting functions: maneuver, intelligence, logistics, force protection, fires, and command and control. The MEB mission is to plan, coordinate, and conduct sustainable combined arms combat and other expeditionary operations across the spectrum of conflict.

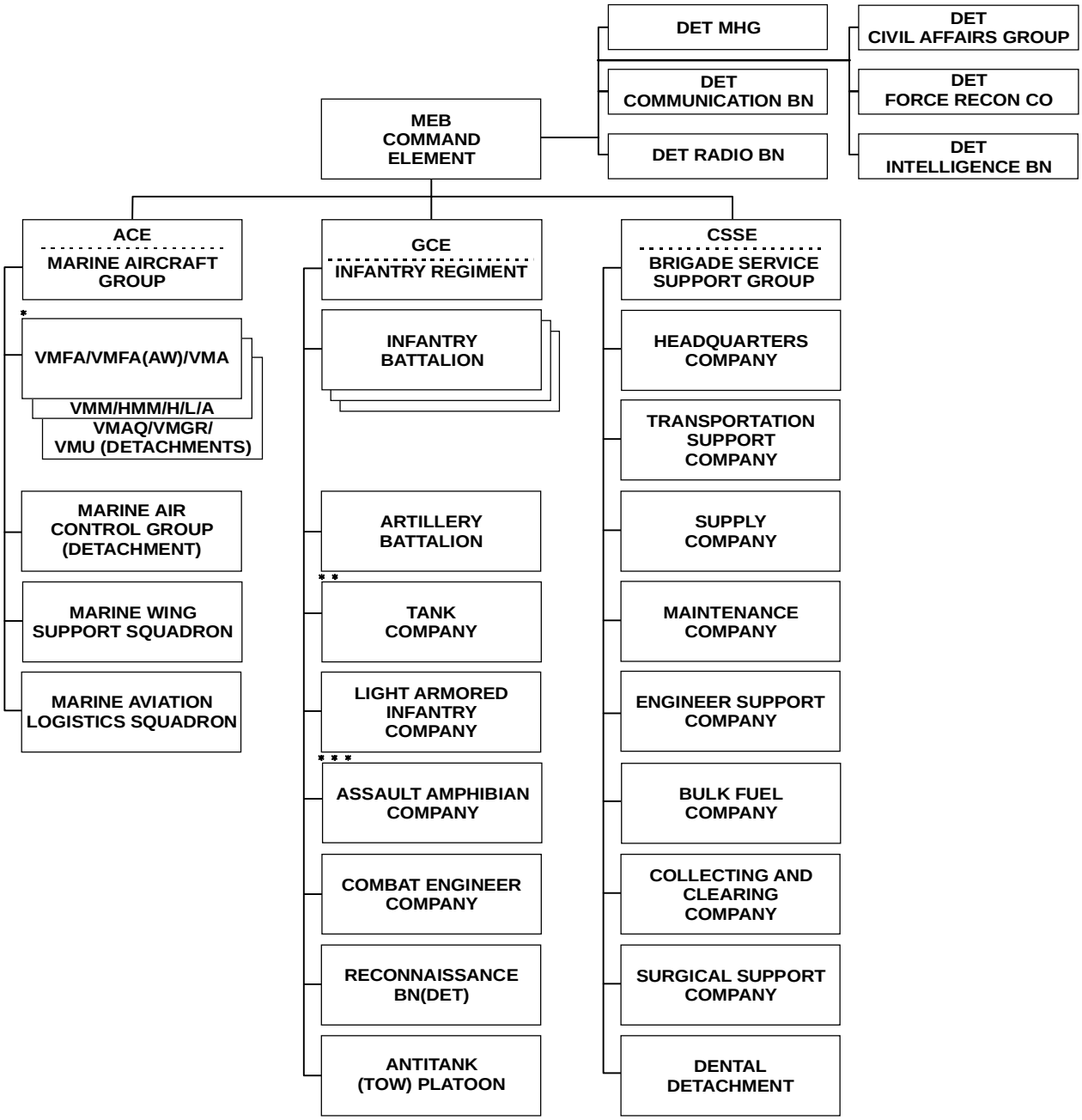
(a) MEB tasks.

- Forcible entry.
- Deploy to CINC's area of responsibility (AOR) as part of joint or combined force.
- Provide a nucleus JTF HQ.
- Enable follow-on forces.
- Be prepared to act as the Marine Corps Service component.
- Be prepared to serve as the advance echelon of a MEF.

(b) MEB signature capabilities.

- Inherently expeditionary combined arms force.
- Robust and scalable Command and Control capability.
- A full-range operational capability…forcible entry to Humanitarian Assistance.
- Task organized for mission accomplishment.
- Capable of rapid deployment and employment via amphibious shipping, strategic air/sealift, or any combination of them.
- Sustainable.
- Brings increased command and control and significantly expanded battlespace functions and capabilities.
- Aviation element is capable of all aviation functions: offensive air support, antiair warfare, assault support, air reconnaissance, electronic warfare, and control of aircraft and missiles.
- Exercise command and control of aircraft and airspace.

- Full spectrum of expeditionary combat service support: supply, maintenance, transportation, general engineering, health services, services, and messing.



Legend

* VMFA: Marine Fixed-Wing Fighter/Attack Squadron
VMA: Marine Fixed-Wing Attack Squadron
VMFA/(AW): Marine Fixed-Wing Fighter Attack Squadron/(All-Weather)
VMAQ/VMGR/VMU (DETACHMENTS): Marine Fixed-Wing Tactical Electronic Warfare/ Aerial Refueling Transport
VMM: Marine Medium Tilt-Rotor Squadron
HMM/H/L/A: Marine Helicopter Medium/Heavy/Light/Attack Squadron
* * In MPF MEB, Tank Battalion vice Tank Company
* * * In MPF MEB, Assault Amphibian Battalion(-) vice Assault Amphibian Company

Figure 13-2. Marine expeditionary brigade.

c. Marine expeditionary unit (special operations capable) (MEU(SOC). The MEU(SOC, with approximately 2,500 personnel, is the standard forward-deployed Marine Expeditionary organization). Marine Corps Forces Atlantic and Pacific maintain forward-deployed MEUs(SOC) in the Mediterranean Sea, the western Pacific, and the Indian Ocean or Persian Gulf region. The MEU(SOC) can be thought of as both a self-contained operating force capable of missions of limited scope and duration and a forward-deployed extension of the MEF.

MEUs routinely receive special training before deploying; the training results in their being certified "special operations capable." To receive the certification, the MEU undergoes an intensive 26-week, standardized, predeployment training program that includes an exercise and a final evaluation. The MEU must demonstrate competence across the entire spectrum of required capabilities, be able to plan and execute any assigned mission within 6 hours of notification, and conduct multiple missions simultaneously. These MEUs are augmented with selected personnel and equipment to provide enhanced conventional and selected maritime special operations capabilities.

(1) *Organization*. There are seven standing MEU(SOC) command elements.

- I MEF: 11th MEU(SOC)
  13th MEU(SOC)
  15th MEU(SOC)

- II MEF: 22d MEU(SOC)
  24th MEU(SOC)
  26th MEU(SOC)

- III MEF: 31st MEU(SOC)

Although each MEU(SOC) is task organized, a typical MEU(SOC) (fig 13-3) includes—

- A standing CE.

- An infantry battalion reinforced with artillery, reconnaissance, engineer, armor, assault amphibian units, and other detachments as required.

- A reinforced helicopter squadron with transport, utility, and attack helicopters, a detachment of vertical and short takeoff and landing (VSTOL) fixed-wing aircraft, and other detachments as required.

- A task-organized CSSE.

- Sustainment for 15 days.

(2) *Concept of employment*. Embarked aboard a Navy amphibious ready group (ARG), a deployed MEU(SOC) provides a combatant commander or other operational commander with a quick, sea-based reaction force for a wide variety of situations. In many cases, the MEU(SOC) embarked on amphibious shipping may be the first US force at the scene of a crisis and can conduct enabling actions for larger follow-on forces. It can provide a visible and credible presence in many potential trouble spots and can demonstrate the willingness of the United States to protect its interests overseas. The MEU(SOC) is organized, trained, and equipped as a self-sustaining, general-purpose expeditionary

MAGTF that possesses the capability to conduct operations across the spectrum of conflict, from military operations other than war (MOOTW) to amphibious and other conventional operations in support of various contingency requirements, including selected maritime special operations, such as—

- Reconnaissance and surveillance.
- Specialized demolitions.
- Tactical recovery of aircraft and personnel (TRAP).
- Seizure and/or recovery of offshore energy facilities.
- Seizure and/or recovery of selected personnel or materiel.
- Visit, board, search, and seizure (VBSS) of vessels.
- In-extremis hostage recovery (IHR).

(3) *Capabilities*. The inherent capabilities of a forward-deployed MEU(SOC) are divided into four broad categories: amphibious operations, direct action operations, MOOTW, and supporting operations.

(*a*) *Amphibious operations:* conducted on short notice, at night under electronic-emissions-controlled conditions using helicopter and/or surface means from extended ranges. Particular emphasis is placed on the amphibious raid, conducted to inflict loss or damage on opposing forces, create diversions, and capture or evacuate individuals and material by swift incursion into an objective followed by a planned withdrawal.

- *Amphibious assault*: the capability to establish a force on a hostile shore.
- *Amphibious raid*: the capability to conduct a swift incursion into or temporary occupation of an objective followed by a planned withdrawal.
- *Amphibious demonstration*: the capability to deceive the enemy by a show of force with the expectation of deluding the enemy into a COA unfavorable to him.
- *Amphibious withdrawal*: the capability to conduct the extraction of forces by sea in naval ships or craft from a hostile or potentially hostile shore.

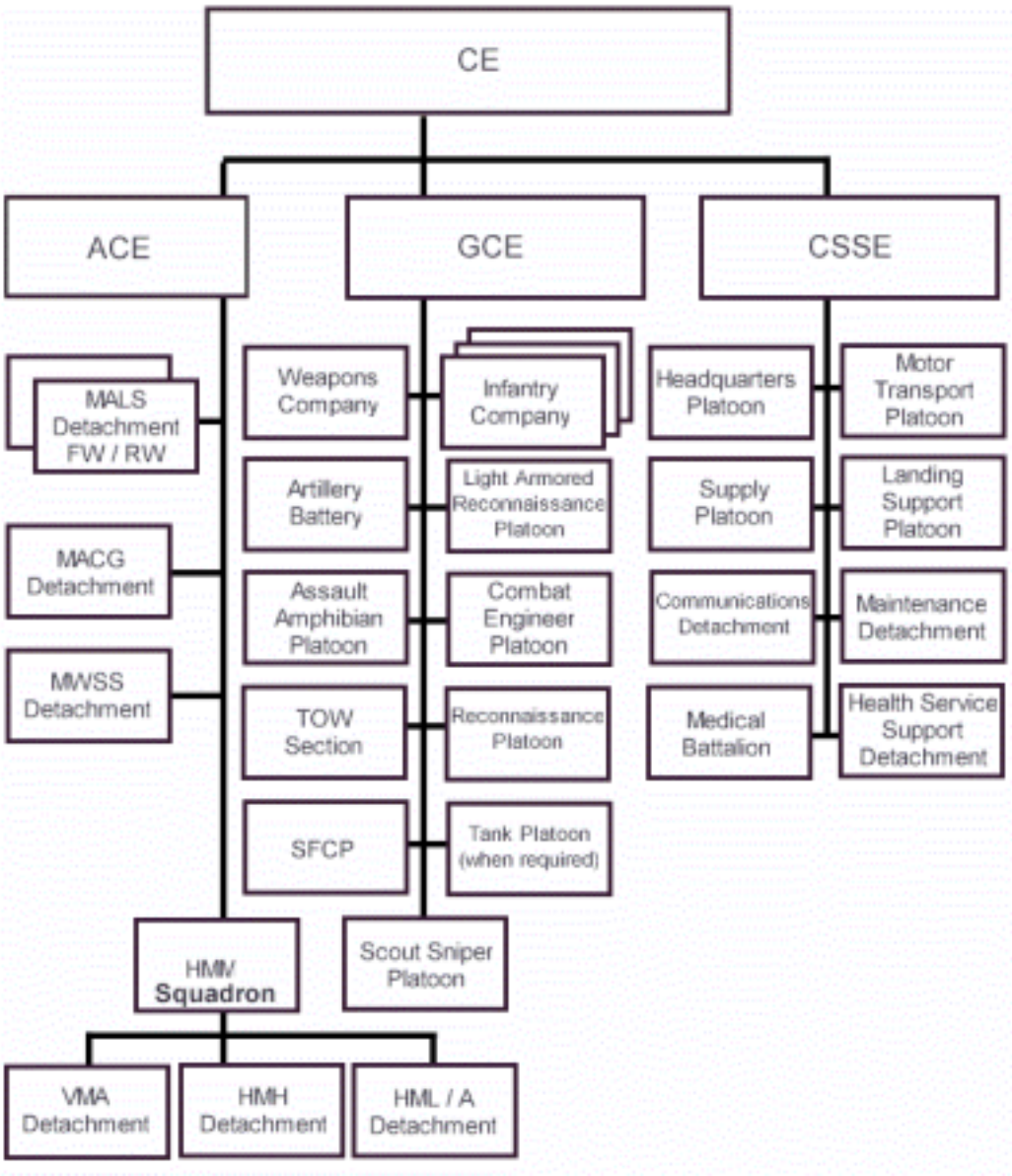


Figure 13-3. Marine expeditionary unit.

(*b*) *Direct action operation:* the capability to conduct short duration strikes and small-scale offensive action by employing precision raids, ambushes, and direct assault using close quarters battle skills; emplacing munitions and other devices; conducting standoff attacks by fire from air, ground, or maritime platforms; or providing terminal guidance for precision-guided munitions. Included in direct action are—

- *In-extremis hostage recovery*: the capability to conduct recovery operations in extremis, by means of an emergency extraction of hostages. Emphasis is placed on employment of reconnaissance assets, isolation and containment of the crisis site, preparation for an emergency assault, and preparation for a hand-off of the crisis when and if national or theater assets arrive.

- *Seizure and/or recovery of offshore energy facilities*: the capability to conduct seizure, recovery, and/or destruction of offshore gas and oil platforms (GOPLAT).

- *Visit, board, search, and seizure operations*: the capability to conduct vessel boarding and seizure in support of maritime interception operations (MIO) on an uncooperative, underway ship. MIO is the act of denying merchant vessels access to specific ports for import or export of goods to and from a specific nation or nations. VBSS occurs when a target merchant vessel fails to properly respond to query, approach, and stopping procedures. The mission of a VBSS force is to take control of a potentially hostile, uncooperative merchant vessel.

- *Specialized demolition operations*: the capability to conduct specialized breaching; to employ specialized demolitions in support of other special operations. This includes an explosive entry capability to facilitate close quarters battle or combat and dynamic assault tactics and techniques.

- *Tactical recovery of aircraft and personnel (TRAP)*: the capability to conduct rescue or extraction, by surface or air, of downed aircraft and/or personnel and equipment; conduct aircraft sanitization; and provide advanced trauma and life support in a benign or a hostile environment.

- *Seizure/recovery of selected personnel or material*: the capability to conduct clandestine seizure and/or recovery of personnel and/or sensitive items in a benign or a hostile environment.

- *Counterproliferation (CP) of weapons of mass destruction (WMD)*: the ability of the MEU(SOC) to conduct or participate in CP WMD operations based on the application of the capabilities of the particular MAGTF.

(*c*) *Military operations other than war (MOOTW):* the capability to conduct operations that focus on deterring war, resolving conflict, promoting peace, and supporting civil authorities in response to domestic crises. ARG or MEU(SOC) support to MOOTW includes—

- *Peace operations*: the capability to conduct peacekeeping and peace enforcement operations conducted in support of diplomatic efforts to establish and maintain peace.

— *Peacekeeping*: the capability to conduct military operations undertaken with the consent of all major parties to a dispute. Peacekeeping is designed to monitor and facilitate implementation of an agreement (cease-fire, truce, or other such agreement) and support diplomatic efforts to reach a long-term political settlement.

— *Peace enforcement*: the capability to apply military force or the threat of its use, normally pursuant to international authorization, to compel compliance with resolutions or sanctions designed to maintain or restore peace and order. This capability includes intervention operations, as well as operations to restore order and forcibly separate belligerents and to establish and supervise exclusion zones for the purpose of establishing an environment for truce or cease-fire.

- *Security operations*: the capability to conduct security operations in permissive, uncertain, or hostile environments to protect US (or designated Allied or friendly nation) property and noncombatants. This capability includes establishing an integrated local security perimeter, screening for explosive devices, and providing personal protection to designated individuals.

- *Noncombatant evacuation operation (NEO)*: the capability to conduct a single- or multiple-site NEO by protecting and evacuating noncombatants in permissive, uncertain, or hostile environments. This capability includes the requirement to provide riot control, a security force, a rescue force, an evacuation control center, medical support, and transportation of evacuees.

- *Reinforcement operations*: the capability to reinforce US (or designated allied or friendly) forces by helicopter and/or surface means. This includes the capability to conduct relief-in-place or a passage of lines, as well as to act as a quick reaction force.

- *Joint/combined training/instruction team*: the capability to provide training and assistance to foreign military forces permitted by US law, using approved programs of instruction concerning weapons, equipment, basic skills, and limited maintenance training. The team can also conduct operational training with the US Navy regarding the use of amphibious platforms and related capabilities.

- *Humanitarian assistance and disaster relief*: the capability to provide services, such as medical and dental care, minor construction repair to civilian facilities, technical information briefings to indigenous people and authorities, humanitarian support to charitable and religious organizations, temporary assistance in the administration of a local government, and assistance to counter the devastation caused by a manmade or natural disaster.

Other support to MOOTW includes combating terrorism, enforcement of sanctions and maritime intercept operations, enforcing exclusion zones, recovery operations, show of force operations, strikes and raids, and rapid crisis response.

(*d*) *Supporting operations*: capabilities that support the full spectrum of MEU(SOC) operations.

- *Tactical deception operations*: the capability to design and implement operations to mislead or deceive opposing forces through electronic means, feints, ruses, demonstrations, or portrayals that cause the enemy to react or fail to react in a manner that assists in the accomplishment of the overall mission.

- *Fire support planning, coordination, and control in a joint or combined environment*: the capability to plan, control, and coordinate naval surface fire, air support, and ground fire support for US or designated allied or friendly forces.

- *SIGINT and EW*: the capability to conduct tactical SIGINT, limited ground-based EW, and communications security (COMSEC) monitoring and analysis. This is accomplished by employing organic collection and direction-finding (DF) equipment as well as through connectivity to national and theater SIGINT and EW assets.

- *Military operations in urbanized terrain (MOUT)*: the capability to conduct operations that employ appropriate tactics, equipment, and supporting arms in densely populated and built-up urban areas.

- *Reconnaissance and Surveillance (R&S)*: the capability to clandestinely obtain specific, well-defined, and time-sensitive information of strategic, operational, or tactical significance. R&S is a human intelligence function that places “eyes on target” in hostile, denied, or politically

sensitive territory when authorized. The R&S capabilities of the MEU(SOC)are similar to those identified as "special reconnaissance" in Joint Pubs 1-02 and 3-05.3.

- *Initial terminal guidance (ITG)*: the capability to clandestinely establish and operate navigational, signal, and/or electronic devices for guiding helicopter and surface waves from a designated point to a specific landing zone or beach.

- *Counterintelligence operations*: the capability to conduct CI and human intelligence operations that protect the MEU(SOC) against espionage, sabotage, terrorism, and subversion by developing and providing information the commander can use to undertake countermeasures to protect resources. This capability includes the employment of trained CI personnel to operate with allied and national intelligence networks.

- *Airfield and port seizure*: the capability to secure airfields, ports, or other key facilities to support MAGTF missions, receive follow-on forces, or enable MPF operations.

- *Limited expeditionary airfield operations*: the capability to conduct tactical air operations at austere locations, including short-field, unimproved runways.

- *Show of force operations*: the capability to engage in show of force operations, to include amphibious demonstrations, presence of forces, or flyovers in support of US interests.

- *JTF enabling operations*: the capability to temporarily provide organic resources, coordination, and C^2 functions to any commander, joint task force (CJTF) to expedite the smooth transition of the JTF HQ into the AO. This capability includes the establishment of a lodgment area to permit the MPF offload and/or the introduction of follow-on forces.

- *Sniping operations*: the capability to locate, identify, and engage targets with precision sniper fire, during daylight or at night, in both urban and rural environments. This capability includes the ability to conduct helicopterborne sniper operations.

d. Special-purpose Marine air-ground task force (SPMAGTF). An SPMAGTF is a non-standing MAGTF formed to conduct a specific mission. It is normally formed when a standing MAGTF is either inappropriate or unavailable. SPMAGTFs are organized, trained, and equipped to conduct a wide variety of missions, ranging from crisis response to regionally focused training exercises to peacetime missions. The designation of an SPMAGTF derives from the mission it is assigned, the location in which it will operate, or the name of the exercise in which it will participate (e.g., "SPMAGTF (X)," "SPMAGTF SOMALIA," "SPMAGTF UNITAS," "SPMAGTF ANDREW," etc).

(1) *Organization*. An SPMAGTF may be any size, but normally it is the size of a MEU (or smaller) with narrowly focused capabilities chosen to accomplish a particular mission. It may be task organized deliberately from the assets of a standing MEF or it may be formed on a contingency basis from an already-deployed MAGTF to perform an independent, rapid-response mission of limited scope and duration. By definition, an SPMAGTF includes all four basic elements of a MAGTF.

(2) *Concept of employment*. An SPMAGTF is generally employed in the same manner as a MEU; however, under certain circumstances it may be deployed by way of commercial shipping or aircraft, strategic airlift, or organic Marine aviation.

13-4. CONCEPT OF OPERATIONS

Amphibious in nature, a combined arms team and a national swing force, the United States Marine Corps is capable of conducting worldwide stability operations, limited objective (forced entry) operations, amphibious operations, and sustained operations ashore. USMC doctrine is based on maneuver warfare. Maneuver seeks to shatter enemy cohesion through a series of rapid, violent, and unexpected actions. Operational mobility, surprise, speed, and flexibility allow the Corps to pit its strengths against enemy weaknesses.

a. Amphibious operations: an attack launched from the sea by naval and landing forces, embarked in ships or craft, involving a landing on a hostile shore. As an entity, the amphibious operation includes the following phases (mnemonic PERMA):

- *Planning*: the period extending from issuance of the initiating directive to embarkation.

- *Embarkation*: the period during which the forces, with their equipment and supplies, are embarked in the assigned shipping.

- *Rehearsal*: the period during which the prospective operation is rehearsed for the purposes of testing adequacy of plans, timing of detailed operations, and combat readiness of participating forces; ensuring that all echelons are familiar with plans; and testing communications.

- *Movement*: the period during which various components of the amphibious task force move from points of embarkation to the objective area.

- *Assault*: the period between the arrival of the major assault forces of the amphibious task force in the objective area and the accomplishment of the amphibious task force mission.

b. Amphibious task force or group: the task organization formed for the purpose of conducting an amphibious operation. The amphibious task force/group always includes Navy forces and a landing force, with their organic aviation, and may include Army and Air Force forces when appropriate.

c. Amphibious objective area (AOA): a geographical area, delineated in the initiating directive, for purposes of C^2 within which is located the objective(s) to be secured by the amphibious TF. This area must be of sufficient size to ensure accomplishment of the amphibious TF mission and must provide sufficient area for conducting necessary sea, air, and land operations.

d. Landing area: 1. The part of the objective area within which are conducted the landing operations of an amphibious force. It includes the beach, the approaches to the beach, the transport areas, the FS areas, the air occupied by close supporting aircraft, and the land included in the advance inland to the initial objective. 2. (airborne) The general area used for landing troops and material either by airdrop or air landing. This area includes one or more drop zones or landing strips. 3. Any specially prepared or selected surface of land, water, or deck designated or used for takeoff and landing of aircraft.

e. H-hour: 1. The specific hour on D-day at which a particular operation commences. The operation may be the commencement of hostilities; the hour at which an OPLAN is executed or to be executed; or the hour that the operation phase is implemented, either by land assault, parachute assault, amphibious assault, or air or naval bombardment. The highest command or HQ coordinating the

planning will specify the exact meaning of H-hour within the aforementioned definition. Normally, the letter “H” will be the only one used to denote the above. However, when several operations or phases of an operation are being conducted in the same area on D-day and confusion may arise through the use of the same hour designation for two or more of them, any letter of the alphabet may be used except A, C, D, E, J, K or others that may be reserved for exclusive use. 2. The specific hour on D-day at which the first waterborne wave lands.

f. Commander, amphibious task force (CATF): the commander who has overall command and responsibility for the amphibious operation from the planning phase, where he shares responsibility with the commander, landing force (CLF), through the assault phase until the amphibious forces are established ashore. He exercises tactical control (TACON) over all amphibious shipping, escorting combatants, and embarked landing forces. After reaching the AOA, he exercises TACON of all ships and aircraft within the AOA. The CATF transfers control of the assault forces to the CLF when the latter has established himself ashore.

g. Commander, landing force: the commander who has command of all the assault forces assigned to the amphibious operation. He shares planning responsibility with the CATF but relinquishes TACON until he has established his HQ ashore and can assume command of the assault operation.

h. Tactical air command center (TACC): the principal US Marine Corps air operation installation from which aircraft and air warning functions of tactical air operations are directed. It is the senior agency of the Marine Corps Air Command and Control System from which the Marine Corps tactical air commander can direct and control tactical air operations and coordinate such air operations with other services. (See Air Force section, discussion of air operations control (AOC).)

13-5. GENERAL INFORMATION

a. Air Contingency Force (ACF): The air contingency force (ACF) is an on call, task organized alert force that is maintained by all three MEFS. An ACF can begin deployment within eighteen hours of notification. It can be dispatched virtually worldwide to respond to a rapidly developing crisis. The ACF is the Marine expeditionary force's force in readiness. It can deploy independently or in conjunction with amphibious forces, maritime propositioning force, or other expeditionary forces. Because it can deploy so rapidly, readiness is paramount. The equipment and supplies intended for use as part of an ACF are identified, and where appropriate, stored and staged for immediate deployment. Personnel continuously focus on their tactical readiness. The ACF is airlifted to a secure airfield and carries its initial sustainment with it.

b. Maritime pre-positioning force (MPF): The maritime pre-positioning force is an integral part of the Marine Corps' expeditionary readiness. The rapid response to regional contingencies is the primary role of the maritime pre-positioning force. It provides a joint force commander with a proven, flexible force that can quickly respond to a full range of missions from combat to humanitarian relief. Fundamental to the maritime pre-positioning force is its interoperability with joint forces and its rapid introduction of combat forces in austere environments. Maritime pre-positioning forces consist of maritime pre-positioning ship squadrons and MAGTFs. Comprised of specially designed ships organized into three squadrons, maritime pre-positioning ship squadrons carry equipment and supplies for 30 days of combat operations. When deployed together, these squadrons provide equipment and supplies to support a Marine expeditionary force. These squadrons are forward deployed to ensure rapid closure to the crisis area within a 10-14 day sailing period. MAGTF personnel are airlifted to a previously seized lodgment, a benign or host nation port and airfield, or an intermediate support base, where they link up with equipment and supplies off-loaded from the maritime pre-positioning ship squadron. If a port is not

available, the squadron may be off-loaded in-stream. A unique characteristic of the maritime pre-positioning force is that the embarked equipment is maintained aboard ship and is combat-ready immediately upon off-load. The entire squadron or any portion of individual ships can be off-loaded to support a wide range of MAGTF missions. The movement of Marine forces and their combat essential equipment must be fully integrated with tactical operations ashore. The maritime pre-positioning force is then capable of integrating with the MAGTF commander's scheme of maneuver, while delivering combat service support and force sustainment enabling a rapid force buildup, or providing support and sustainment for a prolonged period from offshore. Maritime pre-positioning forces can tailor support packages to accommodate a variety of missions to include military operations other than war of varying scope and complexity.

c. Norway Pre-Positioning Program/Norway Air-Landed MAGTF (NALM). Similar in concept to the MPF, this program currently provides pre-positioned supplies and combat equipment in Norway for an airlifted, brigade-sized MAGTF.

d. T-AVB aviation logistics support ship. Two ships (*Wright* and *Curtiss*), in reduced operating status, provide the capability to load the vans and equipment of a Marine Corps aviation intermediate maintenance activity and transport them to the desired theater of operation. They have both a roll-on/roll-off (RO/RO) and a self-sustaining container ship configuration, which permit them to off-load both alongside and offshore. After the aviation equipment is off-loaded, the ships can revert to a standard sealift role to carry 600 containers, if required. Both ships were activated for DESERT STORM.

*e. T-AH hospital ship. (Mercy (*Oakland, CA) and *Comfort (*Baltimore, MD)). Each ship has 1,000 hospital beds and 12 operating rooms. Both ships normally maintain a skeleton crew. Personnel from naval hospitals and clinics in CONUS supply the medical staffs.

f. Aircraft.

Aircraft type	*Warfare mission*
AV-8B (Harrier II)	Mission: attack and destroy surface and air targets under day and night visual conditions; conduct helicopter escort. Combat radius: close air support, 163 NM with 30 minutes loiter time; interdiction, 454 NM unrefueled. VSTOL aircraft, short or vertical takeoff and landing. Ordnance 8,000 lbs., various air-to-ground weapons, including AGM-65 Maverick missiles; 25-mm gun pod, AIM-9 air-to-air missiles.
CH-53E (Super Stallion helicopter)	Mission: heavy lift for transporting materials and supplies. Capable of lifting a 16-ton external load. Typical load would be an M198 howitzer or a light armored vehicle (LAV). Range: 540 NM unrefueled, indefinite when air refueled. Passenger capacity: normal configuration, 37; with centerline seats, 55.
CH-46E (Sea Knight)	Mission: provide medium lift, all weather, day and night, night vision goggle assault transport of combat troops, supplies, and equipment. Range: 132 NM for assault mission. Passenger capacity: max 14 troops with aerial gunners. External lift capability: 4,000 lbs.
AW-1W (Super Cobra helicopter)	Mission: fire support and security for forward and rear area forces, antiarmor, antihelicopter, armed escort, supporting arms coordination, visual reconnaissance. Day and night capable. Self-laser designation capability. Combat radius: 128 NM. Ordnance: 2.75"/5.0" rockets, TOW and Hellfire antiarmor, 20-mm cannon (750 rounds), AIM-9 air-to-air missiles, Sidearm (antiradar).
UH-1N (Huey helicopter)	Mission: airborne C^{2,} combat assault, medical evacuation, supporting arms coordination, fire support, and security for forward and rear area forces. Range: 172 NM. Ordnance: 7.62-mm or .50 caliber machinegun, 20-mm gun pods, 2.75" rockets. Passenger capacity: 6 troops.

F/A-18C (Hornet)	Mission: intercept and destroy enemy aircraft in conjunction with ground or airborne fighter control under all-weather, day and night; conduct close air support and air interdiction and armed escort of friendly aircraft. Combat radius: fighter mission—400 NM; attack mission—575 NM unrefueled. Ordnance: various air-to-ground weapons, air-to-air weapons including AIM-9, AMRAAM, AIM-7, antiradar HARM missiles, 20-mm .gun.
F/A-18D (Hornet)	Mission: conduct all weather, day and night armed reconnaissance, radar search and attack, and interdiction; conduct multisensor imagery reconnaissance; conduct supporting arms coordination. Combat radius and ordnance: same as F/A-18C.
EA6B (Prowler)	Mission: tactical electronic support and electronic warfare; active jamming support for assault support and attack aircraft; SEAD. Range: 850 NM unrefueled. Ordnance: ALQ-99 and ALQ-00 pods, HARM antiradar missiles.
KC-130 (Hercules)	Mission: multirole as an inflight aerial refueling aircraft, a rapid ground refueling (RGR) aircraft, an equipment and personnel transport, a troops and cargo aerial deliverer, an airborne direct air support center, an evacuation aircraft, and an aircraft in support of special operations. Range: tanker mission—1,000 NM; cargo mission—2,875 Passenger capacity: combat troops—92; paratroopers—64.
MV-22 (Osprey)	Mission: same as the CH-46E above. Range: 200 NM with 18 troops. External lift capability: 10,000 lbs. Cruising airspeed: 240 kn. Aerial refuel capable. To replace all CH-46E helicopters. Initial operational capability year 2001.

g. Combat vehicles.

Combat vehicles	*Description*
Amphibious assault vehicle (AAV)	Troop carrier: 18 troops, 3 crew, or 5-tons cargo. C^2 variant and recovery variant. Water: 8 mph. Land: 45 mph. Range: 300 miles (land).
River assault craft (RAC)	Inland coastal and waterway patrol. 35 ft long, 43 mph. GPS, Loran-C. Armament: fore and aft gun tubes for small caliber machineguns. 10 to 15 combat Marines. Range: 400 miles.
Combat rubber reconnaissance craft (CRRC)	Primary functions are reconnaissance and riverine missions. Small, lightweight inflatable boat (35-hp outboard).
Light armored vehicle (LAV)	Assault and reconnaissance vehicle. Provides tactical mobility. Amphibious for river crossings only. 6 mph water, 62 mph land. Variants: C^2, logistics, and recovery. 25-mm cannon, TOW, mortar (81-mm) Air defense vehicle under development.
Main battle tank (M1A1)	120-mm smoothbore main gun. .50-cal machinegun. Sabot and heat rounds. 42 mph maximum ground speed, 30 mph cross country. 289 miles range. 67.7 tons. Four-man crew.

CHAPTER 14

RECONNAISSANCE AND SECURITY

14-1. RECONNAISSANCE

a. Definition. Reconnaissance is a mission to obtain combat information on the enemy and the AO for producing combat intelligence. Combat intelligence, gathered through reconnaissance and other sources, is a key factor in confirming (or denying) our intelligence estimates, assessing tactical risks, and allocating appropriate forces to accomplish the mission. Instructions to subordinates must emphasize the importance of timely and accurate reports of both positive and negative information about the enemy and the AO.

b. Fundamentals of reconnaissance operations.

(1) Employ maximum reconnaissance force forward.

(2) Orient on the location or movement of the reconnaissance objectives.

(3) Report all information rapidly and accurately.

(4) Retain freedom to maneuver.

(5) Gain and maintain contact with the enemy.

(6) Develop the situation rapidly.

c. Reconnaissance frontages. Reconnaissance frontages are influenced by the visibility, terrain, road net, enemy situation, nature of the information sought, and time available. There is no established frontage for a given size of force conducting a reconnaissance mission. If detailed rather than general information is desired, the operation will be more time consuming; therefore, the frontage should be narrower than that for general information. Wider frontages may be assigned when air cavalry units are available. For planning purposes, a heavy cavalry scout platoon with 6 M3 CFVs reconnoiters a zone 3 to 5 kilometers wide, while a battalion scout platoon with 10 HMMWVs operates over a 5- to 7-km front. This would equate to a frontage for a divisional or armored cavalry troop (two scout plts) of 6 to 10 kilometers and for a squadron (three troops) of 18 to 30 kilometers. An ACR with three squadrons could have a frontage of 48 to 90 kilometers.

d. Types of reconnaissance missions.

(1) *Route reconnaissance* is a directed effort to obtain information about a specific route; the obstacles and enemy along that route; and the terrain adjacent to that route, which, if occupied by the enemy, would affect movement along the route.

(2) *Zone reconnaissance* is a directed effort to obtain detailed information of all routes, terrain, obstacles, and enemy forces in a zone defined by boundaries. A zone reconnaissance is assigned when the enemy situation is vague or when information regarding cross-country trafficability is desired. Zone reconnaissance is more thorough and time consuming than other reconnaissance missions.

(3) *Area reconnaissance* is a directed effort to obtain detailed information of all routes, terrain, and enemy forces within a clearly defined area, such as a town, a ridgeline, woods, or other features critical to operations.

NOTE: For more information on reconnaissance and security, see FM 17-95.

14-2. SECURITY

a. Definition. Security is achieved by effective detection of an enemy with sufficient time and maneuver space to react to allow for the avoidance, neutralization, or destruction of the enemy. The key to successful security operations is aggressive action to defeat enemy collection systems through counter-reconnaissance. Security operations must be proactive, and all units are responsible for their own security, regardless of the security provided by other units.

b. Fundamentals of security operations.

(1) Orient on the main body.

(2) Perform continuous reconnaissance.

(3) Provide early and accurate warning.

(4) Provide reaction time and maneuver space.

(5) Maintain enemy contact.

c. Frontage in security operations. The extent of the frontage assigned in security operations depends on the degree of security desired, the length of time the security is required, the enemy capabilities, the terrain (with emphasis on enemy avenues of approach), and the weather. Wider frontages may be assigned when air cavalry or aviation units are available.

d. Degrees of security.

(1) *Screen*. A screen maintains surveillance to the front, flanks, or rear of a stationary force (flanks and rear of moving force) to provide early warning to this force by observing, reporting, and maintaining contact with enemy forces encountered. The screening force is defensive in nature and impedes and harasses the enemy and destroys or repels enemy reconnaissance units. In addition, the screening force maintains its freedom of maneuver and does not become decisively engaged. A screen mission is not assigned to a unit operating to the front of a moving force. A more appropriate mission for a unit operating to the front of a moving force is a movement to contact, zone reconnaissance, or advance guard. For planning purposes, the heavy cavalry scout platoon mans six OPs for short duration (less than 12 hours) or three OPs for long duration (over 12 hours). The battalion scout platoon mans eight OPs for short duration and three OPs for long duration.

(2) *Guard.* To guard is to operate to the flank, front, or rear of a larger moving or stationary force to prevent enemy ground observation, direct fire, and surprise attack. This is done by defeating, destroying, or delaying the enemy within the capabilities of the protecting force. The guard force may accept decisive engagement to protect the main force. Elements of the guard force may reconnoiter,

screen, attack, defend, or delay, as necessary, to accomplish the mission. A guard force normally operates within the range of main body indirect-fire weapons.

(3) *Cover*. To cover is to operate independently as a self-contained force at a significant distance to the flank, front, or rear of the main force. A cover orients in the direction of the enemy to develop the situation early and to deceive, disorganize, and destroy the enemy before he can attack the main body. The covering force will often become decisively engaged with enemy forces.

e. Security forces.

(1) *Screening force*. A commander assigns a screening mission when economy of force requires that an extended area be kept under surveillance and there are few troops available. The force accomplishes the mission by manning a series of OPs that cover avenues of approach into the sector. Mounted, dismounted, and aerial patrols reconnoiter those areas that cannot be observed from the OPs. The commander of the force being screened designates the general trace of the screen, the unit to be screened, and the responsibility for the area between the screening force and the screened units. The screening force commander positions OPs to provide for maximum observation and concealment. To be effective, a screening force must have good communications between OPs; it must also have enough personnel to man the OPs for sustained periods and to conduct mounted, dismounted, or aerial patrolling between the OPs and contact points, consistent with the need for security. The screening force may use air cavalry units to extend reconnaissance and materially increase the effectiveness of the security screen. Under some circumstances the screening force may permit small enemy patrols to infiltrate the security screen so that it can observe larger enemy forces. However, it must also ensure that infiltrators do not join with other infiltrated forces and threaten the screened force. When the flank of a moving force is screened, the screening unit conducts the mission in the same manner as in a mobile flank guard operation except that the screening force normally does not have responsibility for the area between the screened and screening forces, may not be within range of support from the screened force, and occupies OPs in succession along the flank instead of battle positions (BPs).

(2) *Guard force*. A guard force is a security force that operates to the front, flank, or rear of a moving or stationary force to protect that force from enemy ground observation, direct fire, and surprise attack. The guard force provides early warning, reaction time, and maneuver space. The security force normally conducts a guard operation within friendly artillery range. When it makes contact, it defends or delays.

(*a*) *Advance guard*. An advance guard is a security force, primarily offensive in nature, that operates to the front of a moving force to ensure its uninterrupted advance and to protect it from surprise attack. It performs continuous reconnaissance to the front and flanks and pushes back or destroys small enemy groups before they can hinder the advance of the main body. When the advance guard encounters large enemy forces or heavily defended areas, it takes prompt and aggressive action to develop the situation and, within its capability, employs offensive action to defeat the enemy. It employs every means available to determine the location, strength, disposition, and composition of the enemy. The advance guard must be far enough in front of the main body to ensure the commander has freedom of action in the employment of his forces. However, it must not be so far in front that it can be destroyed by enemy attack before assistance can reach it. The main body commander usually specifies how far in front of his force the advance guard is to operate.

(*b*) *Rear guard*. A rear guard is a security force that operates to the rear of a moving or stationary force to protect it from enemy surprise attack or annoyance by defeating, destroying, or delaying the enemy within its capabilities. The rear guard follows the protected force at a distance

prescribed by the main body commander and usually moves over the same route or routes. It is prepared to intercept and engage enemy forces that attempt to attack the rear of the protected force. It must not permit itself to be bypassed or driven into the main body.

(*c*) *Flank guard.* A flank guard operates to the flank of a moving or stationary force to protect it from enemy ground observation, direct fire, and surprise attack by defeating, destroying, or delaying the enemy within its capabilities. It may employ offensive, defensive, or delaying action as necessary to accomplish the mission. During offensive or retrograde operations, the flank guard is mobile when the force being secured is moving. This is known as a mobile flank guard. When the force being secured is conducting defensive operations, the flank guard is normally stationary. The flank guard occupies a series of BPs along the most likely enemy avenues of approach. The main body commander specifies the units to be protected or the zone of responsibility. Normally, the flank guard responsibility begins at the rear of the leading battalion TF and ends at the rear of the other combat elements of the main body (exclusive of the rear guard), unless otherwise specified.

1. A flank guard for a moving force advances systematically to a series of BPs by moving along a designated route parallel to the axis of advance of the main body and clears the area between its route of advance and the main body. The flank guard commander selects his route of advance unless higher HQ has prescribed it. The route of advance should be far enough from the axis of advance of the main body to prevent the flank guard from interfering with the maneuver of the main body. The route should permit rapid access to the line of BPs. During a mobile flank guard operation, the lead unit of the flank guard force secures the area between the main body and the flank guard route of advance and maintains contact with the rear of the leading battalion or TF of the main body. It may be necessary to reinforce the leading unit so it can accomplish its threefold mission. The remainder of the flank guard moves in column and is prepared to secure BPs on order.

2. When planning for the use of the *flank guard in a penetration or when conducting a passage of lines*, special considerations include the relatively narrow front on which a penetration is normally conducted and the limited maneuver room associated with a passage of lines. Initially, when a penetration is made through friendly front lines, the area of responsibility for a division or brigade flank guard starts at the shoulder of the penetration (which is held by friendly forces) and extends forward to the rear of the leading battalion TF or company team of the main body. When the last combat element of the main body moves through the gap, the area of responsibility for the flank guard normally changes to that of an enveloping or exploiting force. The force conducting the penetration and the flank guard unit must closely coordinate movement of the guard unit through the gap of the penetration. The leading element of the flank guard normally follows the leading major command of the penetration force through the gap until the situation permits its movement to the flank. The lead flank guard unit acts as the advance guard for the main flank guard force and secures the area between the rear of the leading battalion TF and the flank guard route of advance. When the remainder of the flank guard unit moves through the gap, it moves to the flank and prepares to seize and occupy blocking positions to meet a counterattack by the enemy.

3. The area of responsibility of a *flank guard for an enveloping or exploiting force* normally starts at the rear of the leading battalion TF and extends to the rear of the last combat element of the protected force.

4. The operations of a *flank guard for a unit performing a retrograde movement* are similar to those of a flank guard for an advancing force. The major difference is that the protected force commander must specify the area of responsibility for the flank guard.

(3) *Covering force*. A covering force is a tactically self-contained security force that operates at a considerable distance from a stationary force. Its missions are to develop the situation early; to defeat hostile forces if possible; and to deceive, delay, and disorganize enemy forces until the main body can react. This mission is not normally assigned to a unit smaller than a brigade or an ACR. A covering force engages in any action necessary for the success of its mission and may be employed when the main force is engaged in offensive, defensive, or retrograde actions. The commander of the force being covered specifies the area to be secured. The covering force should be completely mobile, tank heavy, and reinforced with infantry, artillery, engineers, aircraft, and air cavalry, as required. These forces should be placed under one commander who operates under the direct control of the commander of the forces being covered.

14-3. COUNTERRECONNAISSANCE

Counterreconnaissance is the directed effort to prevent visual observation or infiltration of friendly forces by enemy reconnaissance elements. Successfully countering enemy reconnaissance is the first and possibly most important step in ensuring the main body can successfully execute its mission. The scout platoon plays a vital role in the battalion TF counterreconnaissance fight. Although this paragraph will discuss counterreconnaissance in battalion TF terms, it is equally applicable to the regimental armored cavalry troop or squadron and the divisional cavalry squadron.

The TF counterreconnaissance plan must address how to acquire and defeat enemy reconnaissance elements. The S2 provides key input into the planning process. He identifies avenues of approach into the unit sector, what type of enemy reconnaissance elements might be used in the sector, and when they are most likely to move into the sector. The commander or S3 uses this information to formulate the counterreconnaissance plan and to task units to execute it. Often the counterreconnaissance plan calls on the scout platoon to conduct a screen mission to acquire and identify enemy reconnaissance forces. The S3 may also task maneuver units to conduct patrols to find the enemy. In most cases, the scout platoon cannot be expected to have the capability to acquire, identify, and defeat enemy reconnaissance by itself.

There are several options available to counter the enemy reconnaissance effort:

a. Place a tank platoon OPCON to the scouts who are conducting a screen mission. The tank platoon, which is the reaction force, is positioned forward in the TF area to overwatch the most likely avenue of approach during hours of limited visibility.

b. Use a company team in a forward screen role. This option provides a strong counter-reconnaissance capability, gives a measure of deception, and facilitates early engagement. A company team has the assets to identify and destroy most enemy reconnaissance elements.

c. Designate a company team to provide a reaction force. The company team commander designates one or more platoons as the reaction force. The platoon leader(s) reconnoiters his (their) potential routes. Once a scout platoon acquires and reports an enemy reconnaissance element, the reaction force maneuvers or attacks by fire to defeat the enemy force.

d. Task the scout platoon to acquire and report enemy vehicles and routes for destruction by indirect fires or TF maneuver assets.

Whichever option the commander employs, the counterreconnaissance fight must be firmly controlled, monitored at the battalion TF level, coordinated early, and thoroughly rehearsed. The result

of an effective counterreconnaissance fight is that the enemy reconnaissance effort is blunted, and the enemy is forced to attack without information about the friendly force disposition.

14-4. RECONNAISSANCE AND SURVEILLANCE PLANNING

a. Planning. The G2/S2 is responsible for planning R&S operations. Based on his knowledge of the enemy, weather, and terrain, his goal is to ensure the full surveillance coverage of the battlefield area to the extent that resources will allow. He will ensure special attention is directed to the systematic surveillance of NAIs and target areas of interest (TAIs) developed through IPB to confirm or deny the enemy situation. In R&S planning, the S2 must consider and include the capabilities of all RSTA means under his direct control, as well as those that may support this effort, in providing timely intelligence and targeting information to his commander. Once the G2/S2 has developed the unit R&S plan, subordinate units are tasked through the G3/S3 for the execution of missions, such as planning OPs and deploying patrols and scout sections into specific target areas as outlined in the unit R&S plan. Requirements beyond unit R&S capabilities must be satisfied by requests for information to units that have access to applicable collection assets.

b. The reconnaissance and surveillance overlay. (See FM 34-2-1, chap 6, for a sample R&S overlay.) The S2 and/or S3 plan and publish the R&S overlay. There are two parts to the R&S overlay: the graphic display of deployed or planned deployment of R&S assets and the marginal data consisting of the legend, administrative data, specific instructions to each asset, and the distribution list. The battalion TF R&S overlay is prepared to integrate company team security or countersurveillance plans (LP or OP, local security patrols) with battalion TF assets and those assets provided by the brigade to eliminate gaps in coverage. The brigade S2 consolidates the battalion TF R&S overlay with those from other battalion TFs to reveal possible gaps in brigade total R&S coverage. Similarly, the division consolidates all brigade R&S overlays to identify gaps in division coverage. The tasking matrix attached to the R&S overlay provides the—

(1) Priority of each mission, which corresponds with the PIR number.

(2) NAI number and grid coordinate.

(3) Asset type and collection times for this mission.

(4) SORs.

(5) Reporting requirements.

CHAPTER 15

MILITARY DECISIONMAKING PROCESS TACTICS, TECHNIQUES, AND PROCEDURES

Section I. INTRODUCTION

15-1. GENERAL

This chapter provides various tactics, techniques, and procedures that will help facilitate the problemsolving process; it will not give canned solutions. Our ability to maneuver rapidly on the temporal plain will allow us to get within the enemy's decision cycle and impact his operations. The tactics, techniques, and procedures outlined here allow that.

This chapter provides tactics, techniques, and procedures that can be used by commanders and staffs in executing elements of the military decisionmaking process (MDMP). The procedures and techniques outlined in this chapter are meant to augment those found in FM 101-5 and other existing manuals, not supersede them.

Various members of the faculty developed these procedures and they have proven to be successful in facilitating the MDMP. Some of the examples used are tailored to a specific military situation or problem, but they can be modified to meet the existing situation.

Section II. COMMANDER'S CRITICAL INFORMATION REQUIREMENTS

15-2. DEFINITION AND EXPLANATION

The CCIR are not intended to be all encompassing, but are designed to focus the command on specific information the commander needs personally to make a decision. CCIR are not limited to decisions during execution. The initial CCIR may support the commander's concept development. They change as often as the situation and the commander's personal need for decisionmaking information change.

Much information is important. CCIR provide focus on what the commander needs. Humans can only do about three things at the same time; CCIR help make the commander's load bearable. Long lists of everything that is believed important do not equate to CCIR.

A commander should not develop CCIR that overload him with making decisions that are a part of the plan (i.e., "on order" tasks to subunits). He must accept that the entire plan will not go as originally envisioned and focus his energy on decisions relative to changes in the situation, not on oversupervising execution that is generally going according to plan.

Because the commander commands by personally making critical decisions, CCIR must be developed personally by the commander, with the assistance of the staff. That is not the same as having the staff nominate CCIR for the commander to approve**.** Below is a technique to narrow the focus and increase the relevance of CCIR.

The commander develops a concept that envisions a favorable outcome to a future action. From that vision comes information regarding friendly capabilities, enemy actions, and the terrain that help confirm or deny the vision during execution. Information that confirms the vision becomes a part of the plan: tasks to subordinate units, intelligence collection priorities, R&S plans, radar cueing schedules, etc. Gathering, processing, analyzing, and disseminating this information is important, but since it supports the plan, decisionmaking related to that information is also a part of the plan. Decisionmaking is pushed down to the appropriate levels so subordinates can exercise initiative consistent with the commander's intent.

The commander focuses his CCIR on visualization of those enemy, friendly, or terrain aspects of the future action that would cause the envisioned COA to become invalid or trigger a decision related to the envisioned COA statement (i.e., commit the reserve). The commander, assisted by the staff, develops the potential answers to information requirements that will cause the commander to personally make decisions and issue orders that deviate from the planned COA. The decisions can be related to good things (exploit an opportunity) or bad things (respond to an unexpected enemy action). The commander answers the question "What, if I see it in a certain place at a certain time, will cause me to have to deviate from my current plan (transition to a branch, shift the main effort, commit the reserve, abort an air strike, etc?"

CCIR wording should be in the form of answers, not questions. PIR questions, such as "When and where will the enemy commit his tank reserve?" and "When and where will the enemy use chemical weapons?" and friendly force information requirements (FFIR), such as "any company that drops below 70-percent strength" are useless unless the commander has envisioned specific times, space, and capability answers that would cause him to have to act. As written above, they always require an observer to perform some level of analysis and draw concrete conclusions for something that no one can truly discern in the time required to make a meaningful decision.

Here are several good PIRs:

- Will the 20 Mechanized Infantry Division (MID) division artillery group (DAG) set up in the vicinity of NAI 36 by 252300 Feb? (DP 15, last time information is of value (LTIOV) 260200)

- Will the 2 Tank Division (TD) be employed along AA B or AA C? (DP 12, LTIOV 251800)

- Will the 2 Army employ a forward detachment to secure bridges and crossing sites between Werseberg (NAI 20) and Weisenfels (NAI 21)? (DP 3, LTIOV 251200)

Envisioning and developing answers is not solely a result of the commander's intuition, even though the commander's experience is vital. The staff must give the commander relevant, focused, analytical conclusions so he can orient his vision of how to impose his will over a resisting human enemy.

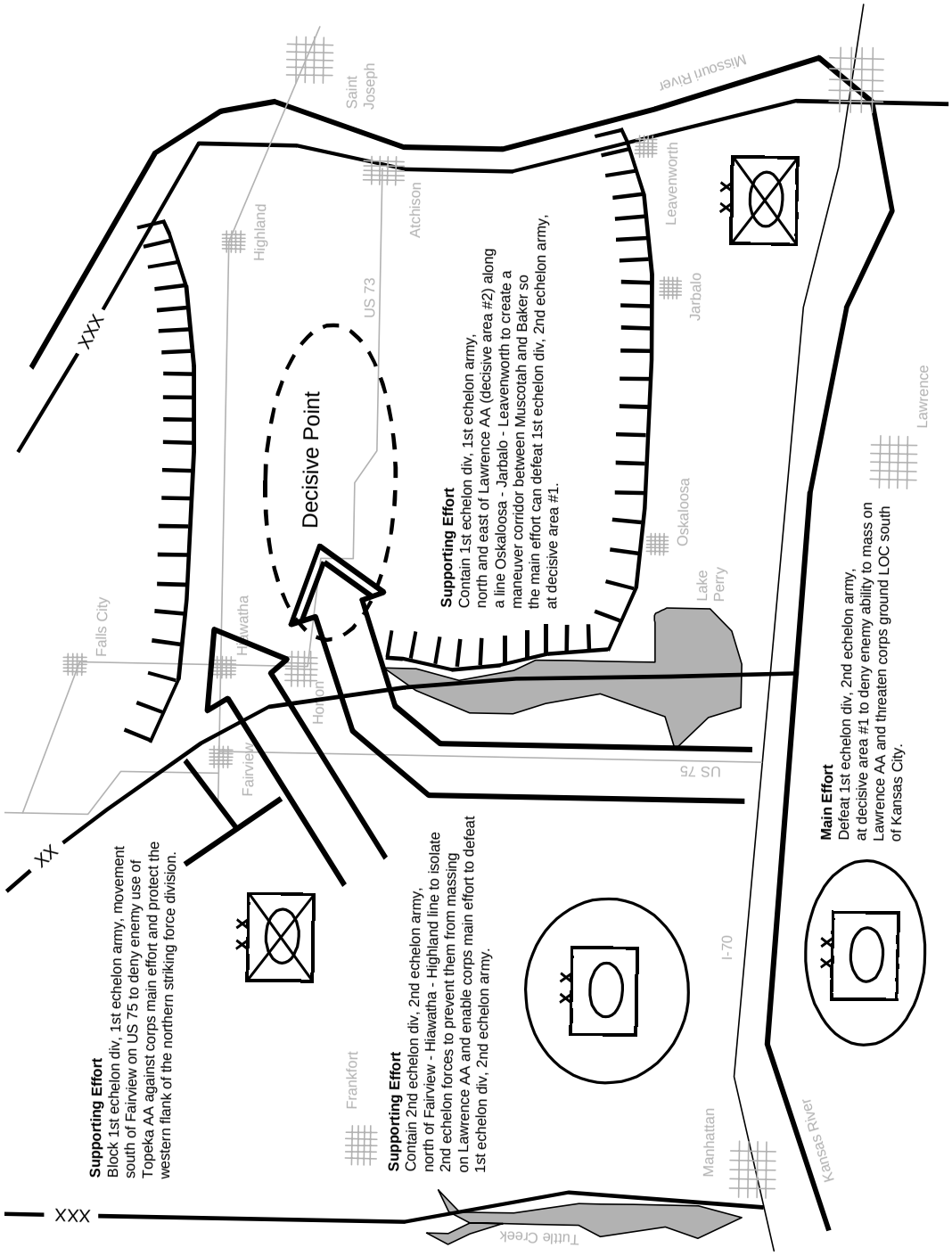
As a way to think about CCIR, visualize the fight in terms of "if," "and," and "then" before categorizing CCIR as PIR, FFIR, and essential elements of friendly information (EEFI). For example, "*if* a certain enemy or friendly situation occurs (in some relative time and space) *and* I have a specific set of capabilities available or not available in time and space to deal favorably with the situation, *then* the commander must make a decision."

The specifics associated with the *if* and *and* answers can then be categorized as PIR, FFIR, or EEFI as appropriate. They should be articulated using descriptive words that do not require further analysis by an observer. The *then* forms the basis for development of a branch or contingency plan. Once articulated

and disseminated throughout the organization, CCIR allow the entire unit to recognize information that is critical to the commander. The commander's intent for CCIR is for anyone who sees it to transmit it unfiltered to the commander. CCIR allow CPs to focus their battle-tracking priorities and anticipate requirements. They also allow subordinate commanders to decide and act in accordance with the commander's intent if there is a loss of communication with the commander or if the situation is now different from the original plan. Most importantly, CCIR extend the commander's personal decisionmaking scope; they allow the entire unit to enhance his efforts to stay ahead of the enemy decisionmaking cycle.

XX
Interdict along LOC north of Falls City on US 73 to deny enemy sustainment of enemy ME and cause the enemy to culminate at the decisive point
XXX
XII
Defend (H+74 to H+120) in sector to defeat 11 TA, enemy northern main effort, north of a line Muscotah - Effingham - Lancaster to deny enemy the ability to mass on the Lawrence AA and threaten our ground LOC south of Kansas City.
X
X
III
X
(Deep)
1- Interdict 1st ech div, 8 CAA, on US 75 west between Sabetha - Auburn to hinder enemy use of western AA and cause enemy to commit main effort on US 73 to the Lawrence AA.
2- Destroy 1st ech bde & DAG of eastern 1st ech div, 11 TA to deny eastern 1st ech div ability to interrupt main effort attack in the decisive point.
3- Destroy 2nd ech bde of 1st ech div, 11 TA, between Baker and Hiawatha to isolate 2nd ech forces and enable corps main effort to defeat 1st ech div, 11 TA, at the decisive point.
SSF
SSF
1- Interdict (H to H+24) recon and FDs from US 77 west of Wymore to SR 99 north of Burchard to SR 4 west of Bernadt to influence the 8 CAA Cdr to adopt the eastern AA.
2- Be prepared to defeat (H+24 to 120) penetrations of PL BLUE at US 59 to deny enemy ability to mass on Lawrence AA and help the eastern mech div to accomplish its purpose (corps res).
3- Be prepared to defeat (H+74 to H+120) penetrations of Muscotah - Effingham - Lancaster line to not let NFC threaten KC and help the corps main effort accomplish its purpose (corps res).
1- Covers (H to H+24) from Tecumeseh - Missouri River north of PL PURPLE to enable the eastern mech div to prepare its MBA.
2- Guard (H+24 to H+120) the corps western flank from Manhattan to Council Grove to protect the corps rear from attacks out of 1st (Centralian) Corps sector.
(Deep)
SSF
1- Interdict TBR of 1st ech div, 8 CAA, to US 75 to the west of Sabetha - Auburn to hinder enemy use of western AA and cause him to commit his main effort on US 73 to the Lawrence AA.
2- Destroy ARAG, 11 TA, north of Baker to enable corps main effort to defeat 1st ech div, 11 TA, at the decisive point.
(Deep)
3- Interdict ground LOC north of Falls City on US 73 to deny enemy sustainment of enemy main effort and cause enemy to culminate at the decisive point.
XX
Western Mech Div
XX
Eastern Mech Div
XX
NSF
XX
SSF
Block (H+24 to H+120) western 1st ech div, 8 CAA, use of US 75 Topeka AA north and east of Marysville - Sabetha - Fairview - Muscotah line to create maneuver space along PL TAN for the corps striking forces and protect their northern flank.
Contain (H+24 to H+120) eastern 1st ech div, 8 CAA, north of PL BLUE from Ozawakie - Oskaloosa - Leavenworth to cause enemy Cdr to commit 2nd ech div, 11 TA, to Lawrence AA and create an assailable flank for the corps striking forces.
Contain (H+74 to H+120) 2nd ech div, 11 TA, north of Wetmore - Powhattan - Robinson - Highland line to protect the northern flank of the corps main effort from 2nd ech div, so it can accomplish its purpose.
Defeat (H+74 to H+120) 1st ech div, 11 TA, north of Muscotah - Effingham - Lancaster line and PL GREEN to deny NCF ability to mass on Lawrence AA and threaten corps ground LOC south of Kansas City.

Section IV. NESTING SKETCH



Section V. COA DEVELOPMENT WORKBOOK

15-3. MISSION ANALYSIS CONCLUSIONS

Prior to COA development, the staff officer must draw certain specific conclusions from his analysis of the mission and the commander's guidance. At a minimum, he must understand the unit purpose, the unit current operation, the most likely enemy COA, the anticipated decisive point, the estimated duration of the current operation, and the critical events of the operation.

a. Step 1: analyze relative combat power.

(1) The staff officer makes a rough estimate of relative force ratios and compares them against historical minimum planning ratios (fig 10-3).

Friendly forces		*Enemy forces*	
Type unit	*Number*	*Type unit*	*Number*

These numbers do not, by themselves, tell him anything about friendly or enemy force capabilities. However, planning without regard to relative combat power capabilities at specific places and times leads to flawed planning assumptions. The numbers derived in this step are tools for planning the array of forces and drawing logical conclusions about estimated combat power capabilities at the start point, decisive point, and end state throughout the COA development process.

(2) He uses the conclusions from mission analysis and the analysis of relative combat power to answer the following questions:

(*a*) *Enemy forces*.

1. Define mission success and mission failure through the eyes of the enemy force commander.

2. Define criteria that will cause the enemy force commander to change his COA or execute a contingency plan.

3. Define the times and places where the enemy commander can decide to change his COA or execute a contingency or counterattack plan.

4. Define the times and places where major enemy maneuver forces are decisively committed (cannot change their COA, even if the commander tries to).

5: Define points at which the enemy commander can mass combat power faster than friendly forces can.

(*b*) *Friendly forces.*

1. Define the space requirements associated with critical events (the minimum space subordinate units require to occupy and the frontage, depth, and size of sectors, positions, or objectives).

2. What is the duration of the current operation, and what are the time, location, and duration of critical events?

3. What is (are) the minimum combat power or resources required to perform critical events and accomplish task and purpose?

4. Define the time and place of decisive commitment (the point during execution where friendly forces lose flexibility to change a COA).

5. Where are the decision points and transition points (transition to a branch or sequel with anticipated capability required to execute)?

6. What are the reconnaissance priorities and what is the time required for reconnaissance over the duration of the operation?

(*c*) *Other conclusions.*

(3) *Analysis of combat power conclusions*. Compare friendly and enemy strengths and weaknesses using the dynamics of combat power (see notes below). List the *conclusions* regarding relative combat power strengths and weaknesses for this operation.

Dynamics of combat power	*Enemy strengths/ weaknesses*	*Friendly strengths/ weaknesses*	*Advantage*	
			Them	*Us*
Maneuver				
Firepower				
Protection				
Leadership				

NOTES: 1. *Maneuver*: explain why each side has positional or mobility advantages or disadvantages in relation to other friendly forces, the enemy, and the terrain.

2. *Firepower*: explain the advantages and disadvantages associated with direct and indirect fire capabilities. Consider weapon system range capabilities, day and night target acquisition capabilities, joint capabilities, and sustainment capabilities.

3. *Protection*: explain the advantages and disadvantages associated with the ability of each side to prevent the enemy from disrupting preparation and execution of the operation. Consider reconnaissance and counterreconnaissance capabilities; passive and active protective engineer, ADA, and signal capabilities; and LOC security capabilities.

4. *Leadership*: explain any factors that may enhance or inhibit the ability of either side to operate at its optimum (or doctrinal) level of proficiency. At the tactical level, unit leadership capabilities are more important than specific leader personalities. The practical experience gained through combat is, in the short term, offset by the higher rate of casualties suffered by unit leaders. Consider how long a force has been in combat, the effect of casualties and replacements, the effect of unit reorganization or organization changes, and communications capabilities. Are soldiers still capable, given their training, experience, and equipment, of doing what their commanders are ordering?

b. Step 2: Generate options.

From the conclusions drawn in step 1, the staff can begin to develop feasible, acceptable options for exploiting enemy weaknesses and capitalizing on our strengths to achieve their purpose. They can establish a relationship between enemy forces, friendly forces, and the terrain to the friendly force decisive point. To develop a plan for friendly forces to impose their will on an enemy, they must visualize the point at which, relative to time, space, requirements, and realistic capabilities, they will start winning and the enemy will start losing. On these two pages the staff would record essential considerations that the COA must address to pass a test of suitability.

Enemy forces		
Strengths	*Mission:*	*Vulnerabilities*
	Objective:	
	Decisive point:	
Most likely COA:		

Other enemy conclusions:

Friendly forces		
Strengths	*Task:*	*Vulnerabilities*
	Purpose:	
	Decisive point:	
	End state:	
Commander's guidance:		
Critical events and essential requirements:		

c. Steps 3 through 5:

- Array forces.
- Develop scheme of maneuver.
- Assign HQ.

(1) *Process*. The staff uses the attached nesting diagram and sketch to record the array of forces.

(*a*) Show most likely enemy COA situation template (SITTEMP) at the decisive point. Portray enemy forces two levels down.

(*b*) Describe the desired effects of combat power at the decisive point.

(*c*) Describe purposes for the main and supporting efforts.

(*d*) Describe the task that provides the estimated minimum effects needed to achieve the purpose.

(*e*) Describe the type and size units capable of accomplishing the tasks and purposes.

(*f*) Describe the C^2 HQ requirements for each unit.

(*g*) Re-evaluate vertical and horizontal nesting of the tasks and purposes for the subordinate unit.

(*h*) From the decisive point, develop the scheme of maneuver by working backward to the start point and forward to the end state.

(*i*) Show array of friendly combat power two levels down. (This means that at brigade level, show maneuver companies, not battalions, on this first sketch.) Array forces independent of the current task organization command and support relationships. Allocate sufficient combat power required to accomplish all critical events. Where requirements exceed available combat power, conduct risk analysis and reassess the COA for feasibility and suitability.

(*j*) Establish minimum control measures required to clearly convey scheme of maneuver and responsibility for terrain.

(*k*) Use stickers and pencil first. Do not commit pen to paper until you are satisfied with array of friendly forces required to accomplish mission.

(*l*) Stay focused on the current operation. Beyond taking a note regarding the requirements, do not get sidetracked by branches or sequels at this point.

HINT: If the staff has determined more than one decisive point or has more than one essential task and purpose for the main and supporting effort forces, it means the members will probably soon realize one or more of the following problems: the COA will fail tests of feasibility or acceptability because they—

- Have incorrectly analyzed the unique contribution of their unit to higher HQ success.
- Have incorrectly analyzed time and space requirements.
- Have incorrectly analyzed subunit capabilities to meet critical requirements.
- Are addressing a branch or sequel rather than the current operation.

- Have made the COA too complicated to articulate and coordinate clearly, concisely, simply, and in a timely manner.

(*m*) *Risk.* The staff analyzes the risks to the force and determines controls required to protect the force. The objective is to minimize the risk to keep it at an acceptable level. A staff officer develops an understanding of the risks by comparing potential enemy threats and the availability of combat power or combat multipliers to mitigate the threats and deciding whether mission success outweighs the risk. He never accepts unnecessary risk.

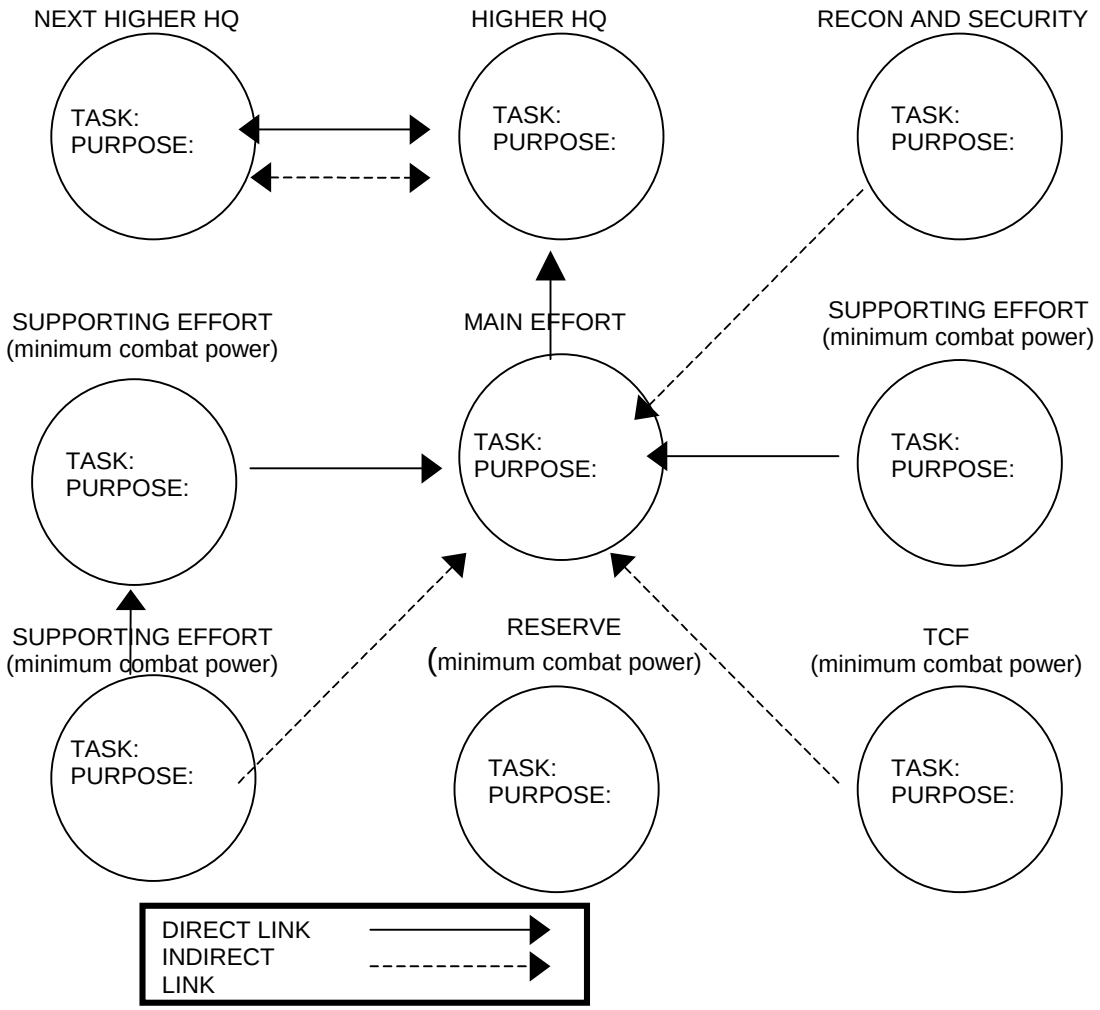
During COA development, the commander and staff continue to identify METT-T hazards and begin development of controls to reduce their risk. Risk should be considered when applying the COA criteria of feasibility and acceptability. Risk to the force due to METT-T hazards must be identified and controlled. The remaining risk (residual risk) is what commanders, leaders, and soldiers must decide to accept or not accept before performing any task or mission. The decision must be based on whether or not potential benefits outweigh potential costs. Effective identification and control of hazards can significantly reduce the potential costs of high-risk missions.

Risk analysis		
Define the METT-T hazard	*Risk reduction control*	*Is risk acceptable or unacceptable w/ controls?*

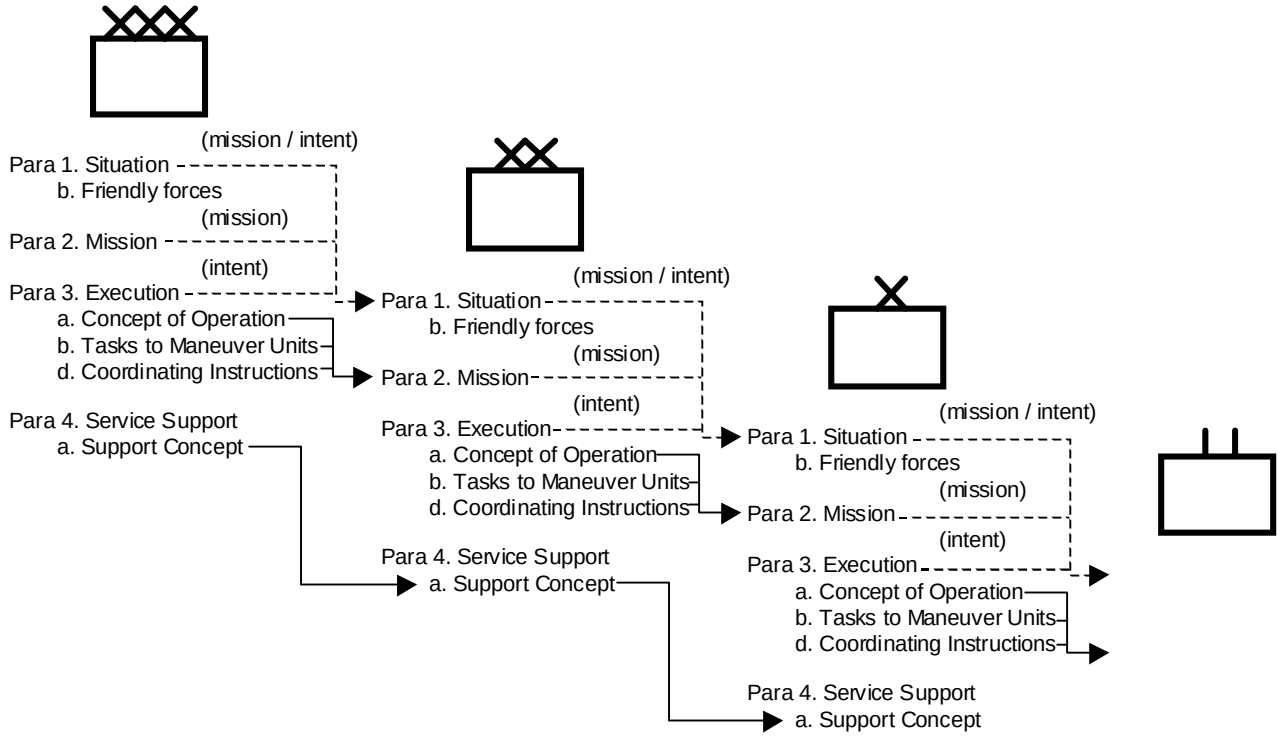
NOTES:

(2) *Recording*: The staff uses the nesting diagram below and a draft sketch to organize and record its array of forces.

(*a*) *Nesting diagram.*



b. Nested concepts. Nested concept (Army)—The means to achieve unity of purpose whereby each succeeding echelon's concept is nested in the other. (FM 101-5-1, p 1-108) This diagram illustrates nested concepts.



d. Step 6: COA statement and sketch.

(1) *The COA statement* must be clear, concise, and easy to read and understand in a single rapid reading by a subordinate. The COA contains proper English sentences and paragraphs. *It does not contain bullets.* The staff officer drafts, revises, and rewrites on scratch paper until he can meet the communication standard. The following outline is useful to practice communicating a COA statement in a clear, logical form. It should not exceed one page.

I. Restated mission statement.

II. Articulate the decisive point.

A. Friendly force location and combat power.

B. Desired effect on enemy force.

C. Terrain and time.

III. How major subordinate maneuver units will achieve the decisive point.

A. Form of maneuver or pattern of defense for force as a whole.

B. Responsibility for critical doctrinal tasks associated with form of maneuver or pattern of defense.

C. Mission essential tasks and purpose for major subordinate maneuver forces.

1. Main effort.

2. Supporting efforts.

3. Deep.

4. Reconnaissance and security.

5. Reserve planning priorities.

6. Fires.

7. TCF.

IV. Acceptable risk.

A. Define the risk.

B. Is this risk worth *your soldiers'* lives?

V. End state.

A. Location and status of major subordinate maneuver units.

B. Location and status of enemy forces.

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(2) *Final COA sketch*. Sketch must clearly convey the scheme of maneuver articulated in the statement using correct graphics (FM 101-5-1). The sketch uses decision graphics to show combat power allocated to accomplish the task and appropriate level command responsibility. It shows units in a manner that conveys relationship to the overall form of maneuver or pattern of defense. Dashed symbols convey the end state. Solid and dashed boundaries convey subordinate responsibility for terrain.

The following, as appropriate, provide a clearer picture of the scheme of maneuver and areas of responsibility:

- Boundaries one level down.
- Main and supporting attacks in the offense.
- Additional PLs.

- Axes of advance.
- Zones and/or sectors.
- Assembly areas.
- Battle positions.
- Engagement areas.
- Objectives.
- Forward edge of battle area (FEBA) or line of departure is line of contact (LD/LC).
- Major manmade and natural obstacles.
- Fire support coordination measures.
- Key terrain.
- Identifying features (cities, rivers, highways, etc).
- Command posts.
- Enemy known or templated positions.

Section VI. ANALYZE THE DYNAMICS OF COMBAT POWER

15-4. COMBAT POWER

Combat power analysis should reflect two separate and distinct components: the measure of absolute combat power and the assessment of relative combat power potential.

Absolute combat power is assessed through the process of correlation of forces that results in absolute force ratios. The application of this method uses numerical values assigned to systems and units. It then compares all enemy systems to friendly systems to generate a numerical ratio. While this method helps determine mission requirements versus on-hand resources, it should not be the end of combat power analysis.

A unit can achieve effects beyond its absolute combat power by maximizing relative combat power potential. Through the application of strengths against weaknesses and the minimization of weaknesses against enemy strengths, the maneuver-oriented unit can attain a relative combat power advantage against a numerically superior force. Relative combat power analysis (RCPA) is a system that attempts to measure combat potential versus absolute value.

RCPA employs inductive reasoning, which causes the commander to think proactively; deductive reasoning leads to reactive thinking. The commander needs to make some assumptions in this method.

He looks for times, places, and events on the battlefield where friendly and enemy forces might be able to concentrate and synchronize their forces to accomplish their purpose. These become potential decisive points, places and times where one side or the other can gain a relative combat power advantage. The commander will then focus on key and potentially decisive points where he can mass the effects of his combat power to gain a relative advantage at a given time and place.

a. Step 1 of RCPA uses the dynamics of combat power—maneuver, firepower, protection, and leadership—to determine the relationship between friendly and enemy forces. The commander uses his estimate, judgment, and experience to assess his own strengths and weaknesses and the enemy strengths and weaknesses using the four dynamics of combat power.

b. Step 2 is the process of comparing strengths and weaknesses. Comparing friendly strengths and weaknesses against enemy strengths and weaknesses helps the commander determine some general factors about his mission by highlighting things he may need or want to accomplish to be successful. It also helps him identify his vulnerabilities relative to the enemy. He can then take steps to reduce those vulnerabilities.

c. The results of this comparison are recorded as deductions and become the basis for *step 3* of RCPA, the formulation of potential tactics, techniques, and procedures (TTP) that pit our strengths against enemy weaknesses and reduce our vulnerabilities. Significant factors are also identified and will be used later in COA development. Table 15-1 shows an example of a relative combat power analysis.

"Relative superiority, that is, the skillful concentration of superior strength at the decisive point, is much more frequently based on the correct appraisal of this decisive point, on suitable planning from the start; which leads to an appropriate disposition of forces..." —Clausewitz

"To maneuver the fractions of the hostile army with the bulk of one's forces. On the battlefield, to throw the mass of the forces upon the decisive point, or upon the portion of the hostile line which is of the first importance to overthrow. To arrange that these masses shall not only be thrown upon the decisive point but that they shall engage at the proper times with ample energy." —Jomini

Table 15-1. RCPA of a Light Infantry Unit Versus a Mechanized Infantry Unit

Combat power	*Enemy forces*	*US forces*	*Deductions*	*TTP*
Maneuver	+Speed on roads. +Tactical mobility. +Can dismount. –Predominately roadbound. –Must resupply.	+ We can shape the battlefield. + All terrain mobility. –Cannot reposition rapidly.	• Force enemy to dismount to equalize the fight. • Organize (org) for two fights: veh and dismount. • Conceal position (pos).	• AT ambush. • Stop veh forward momentum. • Canalize enemy. • Separate armor from infantry (inf) and inf from veh.
Firepower	+More heavy weapons (wpns). +120-mm DS mortars (morts). +Brigade artillery group (BRAG) in support. –80% of major wpns on turrets. –Difficult to preplan fires.	+Numerous AT wpns. +Close terrain. +Can preplan arty. –No rapid fire AT. –80% of major wpns are small arms.	• Arty vs veh. • Mechanized (mech) vs inf. • Deny enemy the combined arms fight. • Arty vs 2d Mech.	• Focus plt on 2 or 3 veh. • Use smoke at AT ambush site. • Target 120-mm and BRAG. • AT ambush veh w/smoke.
Protection	+Enemy under armor. –Time to resupply.	+We have prep time. +Build obstacle (obs) plan. +Prestock ammunition (ammo). –Vulnerable to arty and NBC.	• Must survive arty preparation (prep). • Get enemy out from under armor. • Can't stay in initial pos. • Must conceal to gain surprise.	• Establish hides. • AT ambush from forward (fwd) pos, then fall back. • Sell recon that pos is weak.
Leadership	+Simple attack drills. –Centralized C^2. –Rigid at lower levels. –Less initiative.	+Time to rehearse. +Decentralized C^2. +Small unit initiative. –Large AO.	• Rehearsal to strengthen decentralized execution. • Aggressive counterrecon. • OPs.	• Practice electronic attack. • Rehearse. • EW vs cmd nets.

15-5. CHARACTERISTICS

a. Maneuver effect.

(1) *Unit mobility*:

- Physical fitness.
- Teamwork and esprit.
- Equipment capabilities.
- Equipment maintenance.
- Mobility.

- Tempo and speed.

(2) *Tactical analysis:*

- Intelligence and knowledge of enemy tactics.
- Understanding of terrain effects.
- Understanding of own capabilities.

(3) *Management of resources:*

- Utilization of equipment.
- Utilization of supplies.
- Utilization of time.
- Utilization of soldiers' energy.

(4) *Command, control, and communications:*

- Span of control.
- Standing operating procedures (SOPs) and doctrine.
- Staff efficiency.
- Communications efficiency.

b. Firepower effect.

(1) *Volume of fire*:

- Number of delivery means.
- Supply capability.
- Rate of fire of weapon systems.

(2) *Lethality of munitions*:

- Design characteristics.
- Explosive energy.
- Penetration.

(3) *Accuracy of fires*:

- Weapon and ammunition design characteristics.
- Crew proficiency.
- Terrain effects.
- Visibility.

(4) *Target acquisition*:

- Intelligence and analysis.
- Location and function of forward observers and observation points.
- Transmission of target data.

(5) *Flexibility of employment*:

- Weapons ranges.
- Mobility.
- Fire control systems.
- Tactical employment doctrine.
- Set up to fire time.

c. Protection effect.

(1) *Concealment:*

- Camouflage.
- Stealth.
- Equipment design.
- Enemy intelligence acquisition means.
- Our acquisition and tracking means.

(2) *Exposure limitation:*

- Minimize potential target size.
- Minimize potential target exposure time.

- Complicate potential target tracking.

(3) *Damage limitation:*

- Individual protective equipment design and use.
- Use of natural cover.
- Use of artificial cover.
- Combat vehicle design.
- Medical treatment and evacuation system.
- Equipment repair and cannibalization.
- Alternate C^2 arrangements.
- Personnel replacements.
- Equipment replacements.

d. Leadership effect.

(1) *Technical proficiency:*

- Training.
- Experience.

(2) *Understanding of unit capabilities:*

- Training.
- Experience.
- Selection.

(3) *Communication skills:*

- Selection.
- Training.
- Written, oral, and graphics.
- Subunit teamwork.

(4) *Dedication, commitment, morality:*

- Motivation.
- Training.
- Recent success or failure in combat.

(5) *Understanding:*

- Combat experience.
- Training.
- Luck.

Section VII. CORPS COURSE OF ACTION STATEMENT AND SKETCH

Not later than (NLT) 150900 Aug 98 (H-92), XII (US) Corps defends in sector to defeat the 11 Tank Army (TA) north of a line Muscotah—Effingham—Lancaster to deny the enemy main effort the ability to interdict our corps ground LOC south and west of Kansas City.

Corps employs a mobile defense using two mechanized divisions forward to block and deny the enemy use of the western (Topeka) avenue of approach and contain the eastern (Lawrence) avenue of approach by shaping a salient for the 8 Combined Arms Army (CAA) north of a line Marysville—Sabetha—Muscotah—Valley Falls—Ozawkie—Oskaloosa—Leavenworth. This will enable the corps to employ two striking force armored divisions to defeat the 11 TA and thus cause the enemy to lose its will to fight and culminate offensive operations south of the Northland—Centralia border.

SECURITY OPERATIONS AND MAIN BATTLE AREA FIGHT:

The corps aviation brigade, corps artillery, and assets from the corps MI brigade occupy positions between phase line (PL) ORANGE and PL PURPLE and conduct deep operations into EAs MIAMI, DENVER, and CHICAGO (H to H+2) to interdict the first-echelon divisions of the 8 CAA so the Centralian Territorial Force (CTF) Border Brigade can withdraw and pass rearward to preserve its combat power.

After the rearward passage of the CTF Border Brigade, the corps covering force (a supporting effort with a balanced brigade in the west and an ACR in the east) will conduct covering force operations between PL ORANGE and PL BROWN. The balanced brigade interdicts (H to H+24) reconnaissance units, advance guards, and forward detachments from route 77 west of Wymore to route 99 north of Burchard to route 4 west of Bernadt to influence the 8 CAA Commander to adopt the eastern avenue of approach. The ACR covers (H to H+24) from Tecumseh to the Missouri River north of PL PURPLE so the eastern mechanized division can complete its main battle area (MBA) preparations.

During the corps covering force fight, corps deep operations will be initially directed into EAs TAMPA, DALLAS, and ATLANTA to interdict (H to H+24) the second-echelon brigades of the 4 MID and 79 TD so the 8 CAA Commander will adopt the eastern avenue of approach and allow the covering force to conduct a rearward passage without being under pressure. After completing a successful 24-hour delay, the corps covering force will conduct rearward passage and battle handover with MBA forces at PL PURPLE (battle handover line (BHL)).

The balanced brigade will move to and occupy assembly area (AA) READY and become the corps reserve. Priority of commitment will be to the eastern MBA division to defeat enemy penetrations of PL BLUE and prevent the 8 CAA from seizing crossing sites over the Kansas River in the vicinity of Lawrence. The ACR will occupy a sector on the corps western flank and screen from Manhattan to Council Grove to protect the corps rear area from attacks out of the 1st (Centralian) Corps sector.

Once battle handover with the covering force is complete, the corps will defend in sector with a mechanized division in the east as a supporting effort to contain and a mechanized division (minus) as a supporting effort in the west to block the 8 CAA north of a line running Marysville—Sabetha—Muscotah—Valley Falls—Ozawkie—Oskaloosa—Leavenworth.

The corps will execute a mobile defense by blocking 8 CAA forces in the west while shaping a penetration of the 8 CAA in the east. This will allow the corps to commit its striking force, the main effort, to defeat the 11 TA and bring about the final defeat of the enemy.

A mechanized division (minus) in the west will defend in sector (H+24 to H+120) to block the 4 MID and elements of the 79 TD along a line Marysville—Sabetha—Muscotah—Valley Falls—Ozawkie to deny the enemy use of highways 99, 63, and 75 as avenues of approach to Topeka and the Kansas River to create maneuver space for the corps striking force and initially protect its northern flank once committed.

A mechanized division in the east will delay in sector and contain (H+24 to H+120) the 120 MID, 9 TD, and elements of the 79 TD along a line running Ozawkie—Oskaloosa—Leavenworth. This will cause the North Centralia Force (NCF) Commander to commit the 11 TA to his perceived success in the east and create an assailable flank for the corps striking force.

Two armored divisions, the corps striking force, occupy AAs SPROCKET and TRACK, respectively, and prepare to attack in zone to defeat the 11 TA north of PL GREEN. This will deny the NCF the ability to mass on the Lawrence avenue of approach and thereafter the corps ground LOC south of Kansas City.

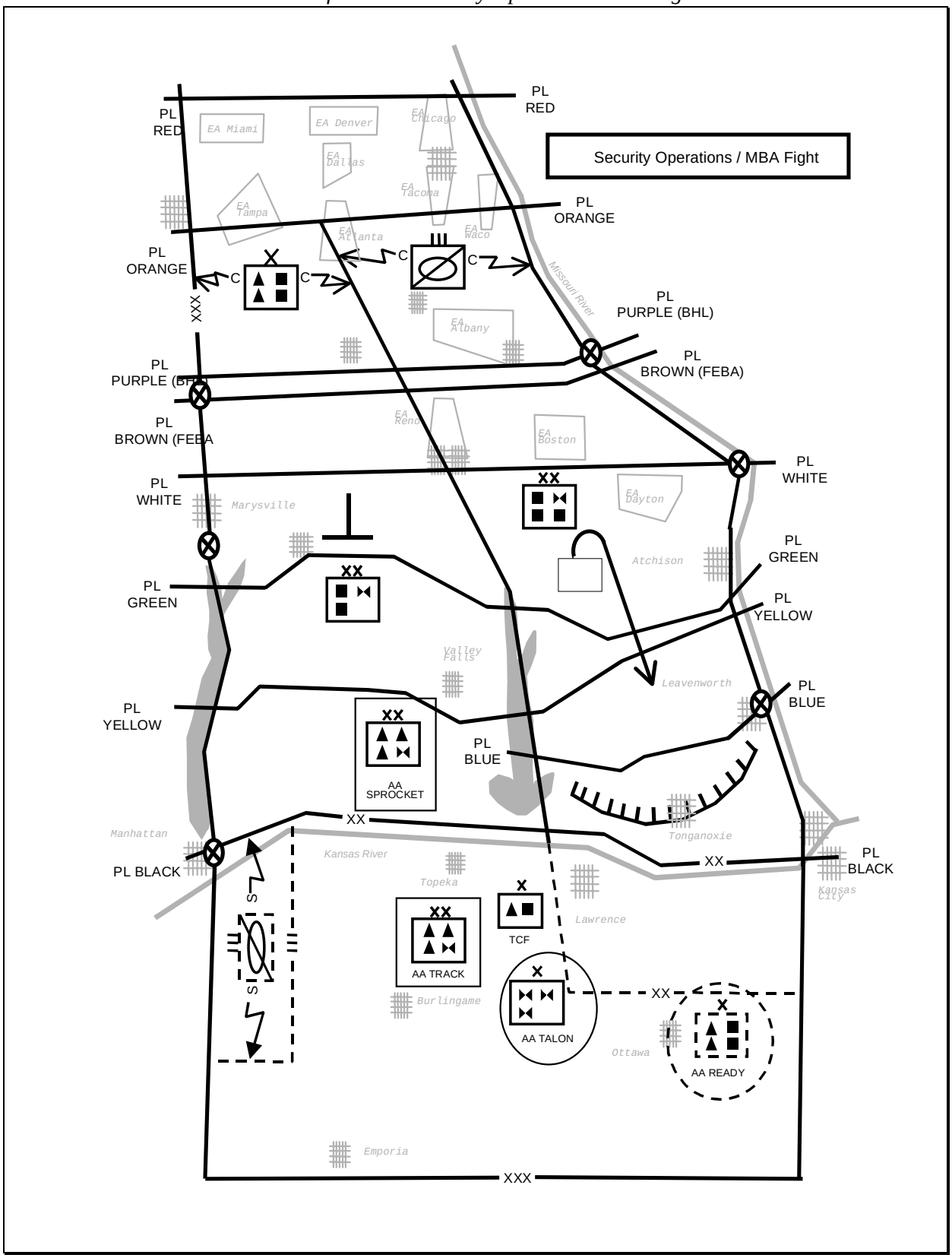
During the corps MBA fight, corps deep operations will initially interdict route 136 (H+24 to H+40) west of EA DALLAS in the vicinity of Tecumseh to deny the 9 TD access to the Topeka avenue of approach. Corps deep operations then shift to interdict the 9 TD (H+40 to H+43) in the vicinity of EAs RENO, BOSTON, and ALBANY to cause a delay in its commitment and allow the eastern MBA division the time to contain the first-echelon divisions. On commitment of the 11 TA, corps deep operations will interdict its first-echelon divisions (H+46 to H+48) in the vicinity of EAs DENVER and CHICAGO, giving the eastern MBA division the time to successfully shape the penetration in the east. Corps deep operations will then shift to EAs TACOMA and WACO (H+52 to H+54) to interdict the second-echelon division and ground LOC of the 11 TA, causing their delayed arrival in the MBA and providing the corps striking force time to begin its movement forward toward the LD/LC and accomplish its purpose.

The corps covering force initially provides forward security to the MBA divisions as they prepare their positions. When the covering force begins its rearward passage, MBA divisions are responsible for providing their own flank and forward security during the course of the operation.

A balanced brigade is assigned as the corps TCF to defeat Level III threats in the corps rear area with priority of protection to the area in and around Topeka. This will allow logistics flow into the corps rear area and allow the unimpeded crossing of the corps main effort striking force across the Kansas River.

The corps aviation brigade initially establishes the corps airfield in AA TALON and deploys forward to support deep operations.

Course of Action. Security Operations/MBA Fight.



COMMITMENT OF THE STRIKING FORCE:

Corps will commit the striking force, as the corps main effort, once the corps MBA forces have successfully contained the 8 CAA attack north of a line running Marysville—Sabetha—Muscotah—Valley Falls—Ozawkie—Oskaloosa—Leavenworth, caused the 8 CAA to assume a defensive posture, and forced the 11 TA to be committed in the eastern portion of the corps sector.

When the striking force is committed, corps deep operations will destroy the first-echelon brigade and DAG of the eastern first-echelon division of the 11 TA in the vicinity of EA DAYTON so the corps main effort can achieve its purpose and deny that division the ability to continue offensive operations.

The corps continues to defend in sector to block and contain the 8 CAA, with a mechanized division (supporting effort) containing in the east and a mechanized division (minus) (supporting effort) blocking in the west. The corps prepares to commit its main effort to defeat the 11 TA to bring about the defeat of the NCF.

Prior to the arrival of the first-echelon divisions of the 11 TA in the decisive area bounded by Horton—Baker—Everest—Lancaster—Monrovia—Effingham—Muscotah, an armored division occupying AA TRACK attacks in zone (H+74 to H+120) as the corps main effort to defeat the western first-echelon division and subsequently defeat the remaining elements of the eastern first-echelon division of the 11 TA. This will deny the NCF the ability to seize crossing sites over the Kansas River in the vicinity of Lawrence and Bonner Springs and prevent it from threatening our ground LOC south of Kansas City.

An armored division occupying AA SPROCKET simultaneously attacks in zone (H+74 to H+120), as the supporting effort, to contain the second-echelon division of the 11 TA north of a line running Wetmore—Powhattan—Robinson—Highland to protect the northern flank of the corps main effort from the second-echelon division of the 11 TA so the corps can accomplish its mission.

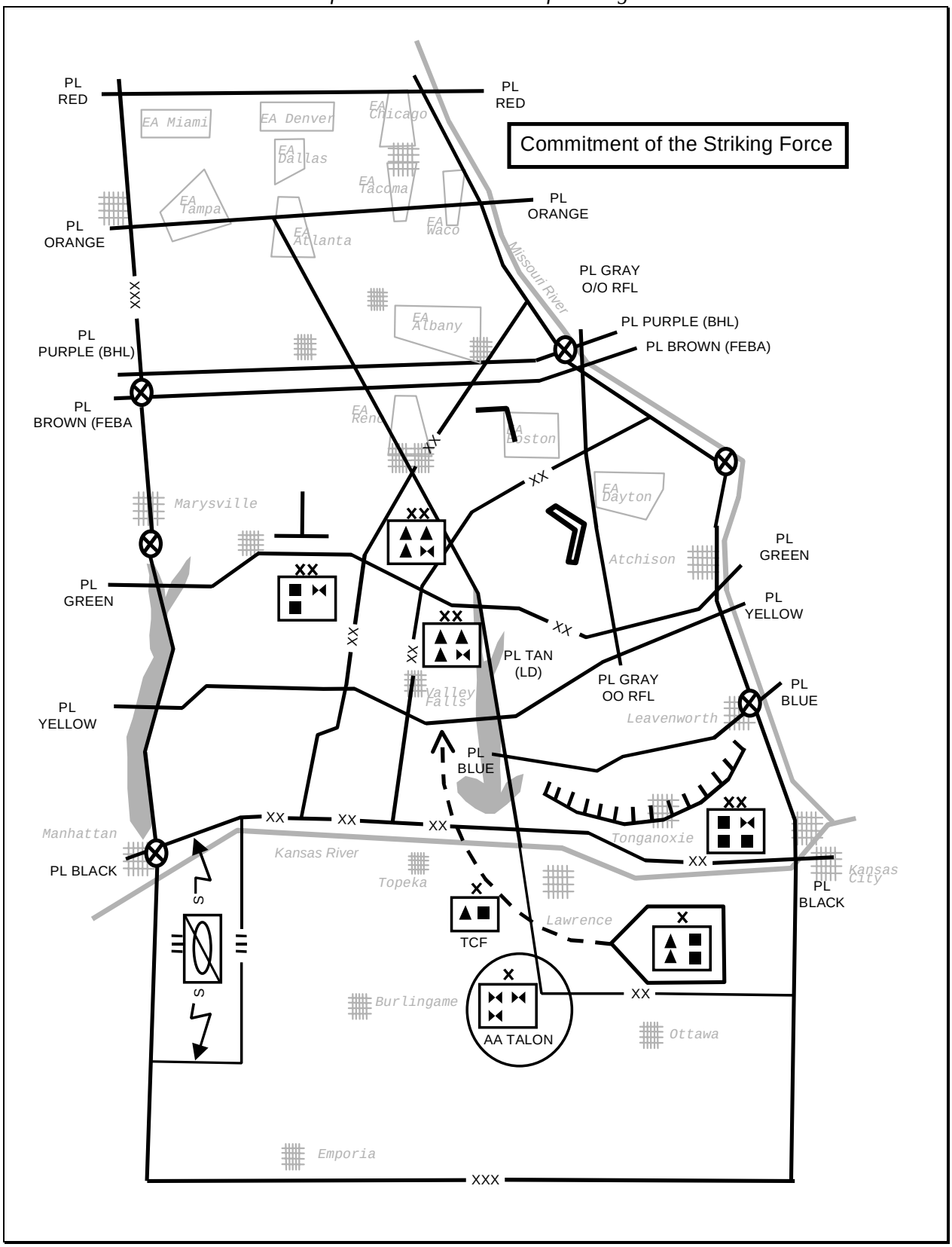
The ACR continues to screen along the corps western flank (H+24 to H+120) between Manhattan and Council Grove to protect the corps rear area from attacks out of the 1 (Centralian) Corps sector. Striking force divisions will be responsible for providing their own forward, flank, and rear security during their commitment. When the operation is completed, the mechanized division (minus) in the western portion of the MBA and the supporting effort of the striking force will defend in sector between PL PURPLE and PL ORANGE so the corps can reconstitute and continue offensive operations.

A balanced brigade will continue to be the corps reserve and will follow the corps main effort with priority of commitment to that division (H+74 to H+120) to defeat the eastern first-echelon division of the 11 TA northeast of Huron.

A balanced brigade will continue to be the corps TCF. Priority of protection continues to be logistics sites south of Topeka and crossing sites over the Kansas River in the vicinity of Topeka.

The corps aviation brigade continues to occupy AA TALON and deploys forward to support deep operations.

Course of Action. Commitment of Striking Force.

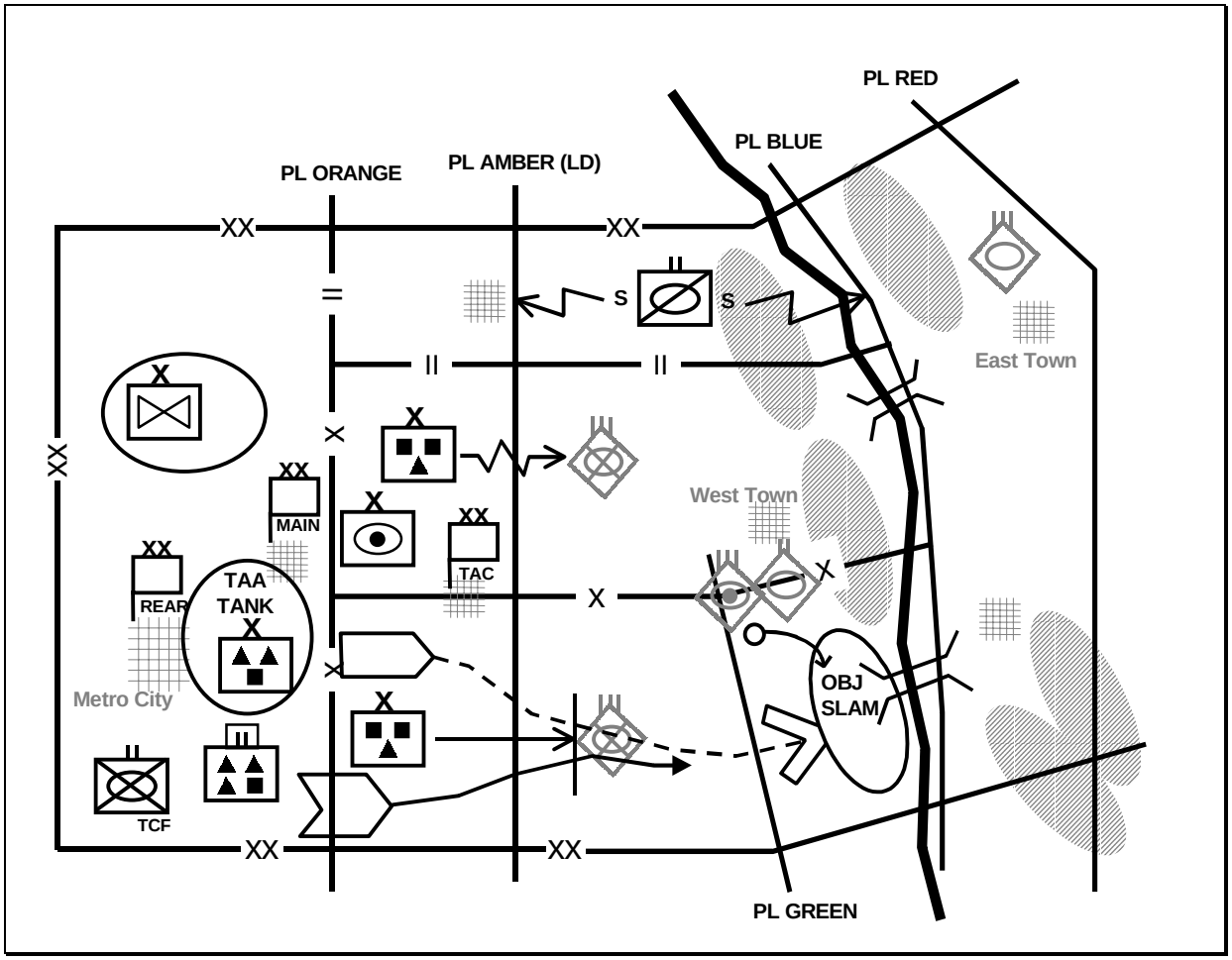


END STATE: At the conclusion of this operation, the corps will have contained and defeated both the 8 CAA and the 11 TA north of a line running Marysville—Sabetha—Muscotah—Valley Falls—Ozawkie—Oskaloosa—Leavenworth, denying the NCF the ability to seize crossing sites over the Kansas River and threaten our rear ground LOC south of Kansas City. The corps will be arrayed with a mechanized division (minus) and an armored division defending in sector along a line Marysville—Sabetha—Falls City—Rulo to defeat the 13 TA if committed in our sector. The remainder of the corps will conduct reconstitution to increase operational readiness to 85 percent in preparation for offensive operations to restore the Northland—Centralia border.

Section VIII. DIVISION COURSE OF ACTION STATEMENT AND SKETCH

130400 Jun 00, a mechanized division attacks to seize objective SLAM to protect the northern flank of the corps main effort. A mechanized heavy brigade (SE1) attacks in the north to fix an enemy MIBR (-), denying them the ability to interfere with the main effort attack in the south. A mechanized heavy brigade (SE2) in the south attacks to penetrate an enemy MIBR in the vicinity of PL AMBER to create sufficient maneuver space that the main effort can pass to the east. Upon FPOL of ME, attacks to clear MIBR in zone from PL AMBER to PL GREEN to protect ME rear and corps ME northwest flank. An armor-heavy brigade, the main effort, passes through the southern mechanized brigade and attacks to seize the terrain in the vicinity of objective SLAM to protect the Corps ME to the south. The division reserve, an armored-heavy TF, initially follows the southern mechanized brigade with priority for planning/commitment to contain enemy forces capable of threatening the main effort passage. Then, if not committed west of PL GREEN, the TF follows the main effort and is prepared to block enemy forces capable of threatening its movement east, ensuring the seizure of objective SLAM. The divisional cavalry squadron screens the division northern flank to provide early warning of any enemy force capable of threatening the SE 1 north flank. Division attack helicopter battalion conducts deep attack along air axis CENTER to destroy the enemy tank battalion to protect ME northern flank. OO, conducts deep attack along air axis NORTH to disrupt enemy tank regiment to provide ME time to seize obj SLAM. Division fires will: 1) conduct counterbattery to neutralize enemy DAG to prevent it from massing fires against the southern two brigades; 2) provide suppressive fires to allow southern lead brigade penetration vic PL AMBER; 3) provide SEAD along axes CENTER and NORTH to provide unimpeded passage of the attack helicopter battalion deep attack. A mechanized company team acts as the division TCF with priority of responding to any Level III threat to the division class III supply, ensuring the uninterrupted flow of class III. Tactical risk is assumed by not having security on the southern division flank. At end state, the ME is consolidated in defenses vic obj SLAM (the corps ME's right flank secured), the southern MIBR is destroyed, and the northern MIBR fixed between PL AMBER and BLUE, the enemy TR in hasty defenses east of PL BLUE, and the division ready to conduct follow-on operations to clear enemy to PL RED.

Divison COA Sketch



Section IX. BRIGADE AND TASK FORCE REHEARSALS

15-6. COMBINED ARMS REHEARSAL

a. General. After receiving an order, subordinate leaders must be afforded the necessary time to complete their own planning prior to the parent unit combined arms rehearsal. This planning window provides time for critical mission analysis, COA development and analysis, and publishing the opeation order (OPORD). This ensures subordinate commanders have time to assign responsibility for specified tasks and resolve issues discovered in the parent commander's OPORD. (Additional information on the combined arms rehearsal can be found in Center for Army Lessons Learned (CALL) Newsletter 98-5, p A-3.)

*b. Who attend*s. The commander, the XO and primary staff, the subordinate unit commanders and their S3s, the S2, and the FSO must attend. The trial counsel or civil affairs officer may be added, depending on the scenario. Other pivotal players in the unit mission must attend as well. These include the normal slice of leadership along with units operating in DS, such as aviation units or combat observation lasing teams (COLTs). Whenever possible, flank units and the higher unit should be invited to attend. When time is short, attendance may be modified.

c. How long. Usually there is insufficient time to rehearse the entire operation. About 1½ to 2 hours is a good rule, but it depends on METT-T. If too much time is consumed, separate BOS support rehearsals and subordinate unit combined arms rehearsals will lack sufficient time. Rank those critical events that the leader must synchronize through visualization. Rehearse the most important event first and, as time permits, continue to rehearse subsequent events. Subordinates should arrive prepared to rehearse the ranked events.

Enemy actions	*Friendly actions*
• Enemy locations. • Enemy formation and movement technique. • Current actions. *The action the enemy can take concerning—* • *Visual contact.* Where are the OP/reconnaissance units, when can they see us, and what will they do? • *Physical contact*. At what point do we come into direct fire range (list each system and system location separately)? • *Indirect fire.* At what point do we come into the indirect fire ranges (list each system separately). • *Obstacles*. When, where, what kind, and how will the enemy establish obstacles? • *Air.* Where and when will the enemy commit air assets by type? • *NBC conditions*. Where and when will the enemy commit chemical weapons? • *EW.* When and where will the enemy employ EW?	• Task, purpose, and end state. • Task organization. • Unit location. • Formation. • Movement technique. • Current actions and responsibilities. *What are the unit's countermeasures concerning—* • *Visual contact* (we see the enemy or he sees us). What are the contingencies? • *Physical contact* (direct fire or confrontation). What actions taken? • *Receive indirect fire*. What actions taken? • *Obstacles* (breach, mark or bypass). What actions taken.? • *Enemy air*. What actions taken? • *NBC conditions.* What actions taken? • *EW*. What actions taken?

The detail: In figure 15-1 the TF 1-1 Commander explains the actions of his unit. The TF is attacking as part of a brigade deliberate attack. The TF 1-1 Commander is addressing from the time the breach is complete and marked through his establishment of support by fire (SBF) 4. The battlefield conditions necessary for his success are establishment of SBF Mech and suppression of the two northern enemy platoons by direct and indirect fire from SBF Mech. The southern enemy platoon has been isolated by a smoke screen and suppressed by direct and indirect fire from SBF Mech. The breach team has the breach open and marked. The brigade commander directs TF 1-1 to pass through the breach to continue the attack. The 1-1 TF commander might state and show the following at the brigade combined arms rehearsal:

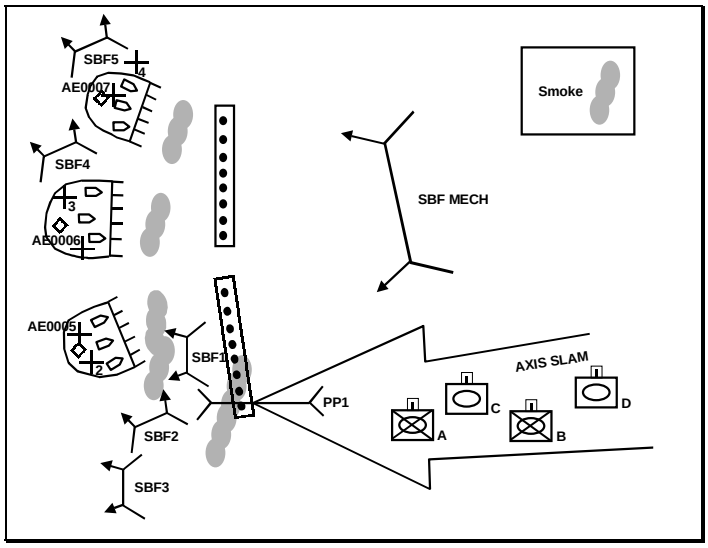


Figure 15-1. Task force rehearsal sketch.

"My task and purpose are * * *. The task organization has not changed and I anticipate my objective to be * * *. The conditions for success are the establishment of SBF Mech in the north the suppression and isolation of * * *. We will move from the assault position on axis SLAM to passage point (PP) 1 in a column formation using traveling overwatch.

"Team (Tm) ALPHA Mech task and purpose are * * *. It will lead the TF through the breach to establish SBF 1, orienting direct fires between target reference points (TRPs) 2 and 3. As Tm ALPHA Mech moves through the breach, his FIST will call target AE0005 to support the movement of his team and Tm CHARLIE Tank through the passage. Tm CHARLIE task and purpose are * * * and it will follow ALPHA through the passage. Once Tm CHARLIE clears the breach, it will bound forward to and occupy SBF 2. Once Tm CHARLIE is set in SBF 2, Tm ALPHA will shift fires north, orienting between TRPs 3 and 4. From SBF 2, Tm CHARLIE will begin assaulting north, orienting on TRP 3. Tm BRAVO Mech will follow Tm CHARLIE through the breach and occupy SBF 3, which is oriented northwest to block possible commitment of the combined arms reserve. Tm BRAVO task and purpose are * * *. At this point I will have three companies through the breach; the fourth, Tm DELTA Tank task and purpose are to move to occupy SBF 2 and be ready to follow and support. Tm DELTA will have the forward aid station (FAS) moving behind it for initial establishment in the vicinity of SBF 2. Tm CHARLIE will continue assaulting north across objective SOUTH. As it reaches the northern edge of objective SOUTH, Tm CHARLIE will call target AE0006, and SBF Mech will shift fires to objective NORTH. Once Tm CHARLIE is on objective CENTER, Tm ALPHA will lift direct fires. This will allow Tm CHARLIE to move across objective CENTER. If Tm CHARLIE becomes combat ineffective at any point, I have the flexibility to either commit Tm DELTA or bring up Tm ALPHA from SBF 3. As Tm CHARLIE reaches TRP AE0003, Tm DELTA will move off SBF 2 and follow Tm CHARLIE's route across objective SOUTH. As Tm CHARLIE secures objective CENTER, it will establish SBF 4 to block the movement of the combined arms reserve if it is committed this late. We will then pass Tm DELTA through to continue to objective NORTH and establish SBF 5. The move onto objective NORTH is the key for SBF Mech to lift fires from objective NORTH."

Visual contact. "As we enter the breach area, my lead company will be able to assess the effectiveness of the smoke and adjust as necessary. I will use my mortars to mark the TRPs."

Physical contact. "I will establish a casualty collection point (CCP) behind SBF2, and, as soon as possible, move casualties back to the FAS behind Tm DELTA."

Receive indirect fire: **"**We will depend on survivability moves and counterbattery radar to handle any indirect fires."

Obstacles. "We will use our tank plows to defeat these obstacles or any family of scatterable mines (FASCAM) used to close the breach. Every new team through the breach will lead with a plow tank to replow the breach and ensure it stays open. Any hasty protective obstacle breaches will be marked according to the brigade SOP. As Tm ALPHA moves off SBF 2, Tm CHARLIE will send a guide back to lead it through any obstacles Tm CHARLIE breached."

Enemy air. "Tms ALPHA, BRAVO, and CHARLIE will have Stingers oriented on enemy air corridors."

NBC conditions. "We will assume MOPP 4 in the assault position."

EW. "If we experience jamming we will work through it according to SOP."

d. Result. By clearly articulating his actions, each subordinate commander adds to his and the unit's visualization of the battlefield. This includes spatial relationships and the actions of each unit. He is able to display the timing of key events and the criticality of his unit or action to mission accomplishment. Players at the rehearsal must be prepared to discuss in detail how their units will perform and react to projected enemy actions. Situational awareness must be rehearsed by identifying critical locations, conditions, and events as they will present themselves in the battle.

15-7. BRIGADE COMBAT SERVICE SUPPORT REHEARSAL

a. General. The brigade CSS rehearsal ensures that the CSS effort is synchronized within the unit and that the CSS effort supports the commander's intent. Brigade CSS rehearsals normally occur immediately following the combined arms rehearsal. The players include key CSS leadership from across the units. (Additional information on the CSS rehearsal can be found in CALL Newsletter 98-5, p A-7.)

b. Who attends. Units must remember this is the brigade commander's rehearsal, even though the brigade S4 normally conducts it. Each TF sends the XO, S4, battalion motor officer (BMO), support platoon leader, medical platoon leader, and HHC commander. The forward support battalion (FSB) sends the commander, S2/S3, all company commanders, the supply platoon leaders and sergeants, the ambulance platoon leaders and sergeants, the medical evacuation (MEDEVAC) team leader, the shop officer, the maintenance officer, and the repair control supervisor. The brigade staff sends the XO and representatives from the S4, S2, brigade engineer, FSO, and S3. Also attending is platoon leadership from any specialty platoons, such as MP, chemical, etc. When time is short, the attendance may be modified.

c. How long. A good rule is 1 to 1 ½ hours. Time dedicated to the CSS rehearsal is very expensive because of the nature of ongoing CSS activities. Participants must arrive on time and be ready to rehearse. The timing of the rehearsal must be carefully coordinated. A convenient time is normally immediately following the combined arms rehearsal, because most of the players are already there. Since key players like the TF or battalion XO, the S4, and HHC commander must attend both TF rehearsals and brigade CSS rehearsals, the brigade must coordinate the timing of the rehearsal early enough for the TF or battalion to incorporate it into the timeline.

d. Script. The brigade logistics synchronization matrix drives the rehearsal as the agenda.

(1) TTP. Divide the mission into three phases: before, during, and after. Use line of departure (LD) time to divide between the before and during phases. Use achievement of the commander's end state or an "on order" mission to begin the after phase. Move through your response sequence one time per phase to ensure all players are represented.

As the enemy is deployed, the S2 should address likely avenues of approach, intelligence updates concerning Levels I and II threats, refugee activity, and deep artillery and aviation threats. Units may provide a current status update; for example, the TFs and battalions successively lay out current assets, unit locations to include the battalion aid station (BAS) and unit maintenance collection point (UMCP); and their current combat power. The FSB S3 briefs current brigade support area (BSA) locations, critical logistic activities within the next 24 hours, critical shortages, and throughput locations and times.

The staff rehearses the branches in the same sequence they were rehearsed at the combined arms rehearsal.

(2) Brigade CSS rehearsal action checklist.

(*a*) *Maneuver TF.*

- *TF XO.* Unit task and purpose (stated once), unit location, unit actions (approach march, assault, etc).

- *TF S4.* Combat trains location, combat trains movements, combat trains CP actions (movements, reports, possible emergency requests).

- *Medical platoon leader.* FAS and main aid station (MAS) location, displacement routes, triggers, and setup times for ambulance exchange points (AXPs).

- *HHC commander.* Location of field trains, resupply actions, logistics package (LOGPAC) status.

- *Support platoon leader.* TF resupply and movement actions as described by the HHC commander.

(*b*) *Artillery battalions.*

- *Battalion XO.* Locations of batteries and key actions.

- *Battalion S4.* Resupply actions.

- *Service battery commander.* Location, LOGPAC status, and resupply actions as described by the S4.

(*c*) *Engineer battalion.*

- *Battalion XO.* Location of units and key actions.

- *Battalion S4.* Resupply operations.

- *HHC commander.* Locations of field trains, LOGPAC status and resupply operations described by the S4.

(*d*) *Forward support battalion.*

- *S3.* BSA location and unit disposition, critical supply activities, and CSS synchronization matrix.

- *A Company (Co) Commander. A*ctivities and movements for classes I, II, III, and IV.

- *B Co Commander.* Class IX activities, maintenance support posture, and movements.

- *C Co Commander.* Class VIII and blood resupply activities and AXPs.

- *Ambulance platoon leader.* Show AXPs and routes as described by the C Co

Commander.

(*e*) *Specialty units.* Only respond if they have critical issues or actions that impact on a specific event; i.e., air corridors change or the main support battalion (MSB) has a resupply push package set for a specific trigger.

e. Detail. Every functional area must be addressed. Units must articulate en route requirements; i.e., refuel on the move (ROM), recovery, evacuation, etc. Units must move physically on the terrain board or sketch map to show the relationship between positions and functions of the logistics effort. Specific times, grids, communications nets, and requirements must be stated. Critical points, such as trigger points, control measures, and coordination points, must be confirmed. Interactive coordination must occur throughout this process.

The senior logisticians present should ensure actions "during" the battle contribute to the logistics preparation of the battlefield for the next fight. These include hasty displacement plans, alternate communications means, alternate routes and locations, response to rear threats, use of aerial resupply and evacuation, and security measures.

Walk through key events such as medical evacuation from point of injury to the forward support medical company across all phases emphasizing the connectivity of the AXP and potential reconstitution. Players must “see” the operation from all aspects.

The FSB commander and the support operations officer should discuss each set of branches, particularly if the branch affects division or corps throughput. The focus must be on continuing to logistically shape the battlefield for future operations.

Logistic actions on the objective should reflect the same level of detailed coordination as the preceding phases. Focus on recovery of combat, clearing casualties, and pre-positioning class IV and other commodities. Concentrate on speed of recovery from losses and reestablishment of the brigade logistics base. Identify dedicated routes for both access and egress and emphasize route discipline. Ensure units know the location of obstacles and minefields.

f. The results. Two critical products should result from the CSS rehearsal: a validated CSS annex for brigade and FSB orders and a finalized brigade CSS synchronization matrix. The CSS rehearsal validates the who, what, when, where, and how of support. It will demonstrate that supporting plans integrate the logistic imperatives of anticipation, integration, continuity, responsiveness, and improvisation. It helps subordinates visualize the conditions for actions and triggers for change. After the rehearsal is complete, the recorder should restate any changes, coordination, or clarifications directed by the commander and estimate the time that a written fragmentary order (FRAGO) to codify the changes will follow.

15-8. THE BATTALION OR TASK FORCE CSS REHEARSAL

a. General. The battalion or TF CSS rehearsal is in much greater detail than its brigade counterpart. How CSS tasks will be accomplished must be laid down by unit and event. Individual sections and units are addressed for each task. Most often the rehearsal occurs just prior to LOGPAC handoff at the logistics release point (LRP). The only shortcoming with this technique is that the unit supply sergeant and support platoon leader are not able to attend because they are usually on the road with the LOGPAC at that time.

b. Who attends. The XO, S4, command sergeant major (CSM), BMO, mortar and scout representatives, and the medical platoon leader attend from the TF. Having the S3 air and chaplain attend is helpful as well. The HHC commander or XO attends. The company first sergeant must attend. He may bring the company medic and mechanic sergeants. Any slice units (ADA, for example) must provide a platoon leader, sergeant, etc.

c. *The detail.* Use the same agenda that was used in the TF combined arms rehearsal. The details of who does what by bumper number and name must be presented. The S4 controls the rehearsal just as the XO did the combined arms rehearsal.

d. Actions checklist.

- *Team or company specialty platoon first sergeant or platoon sergeant.* Unit task and purpose (stated once), unit location, unit actions, (assault, LOGPAC, fueling, etc).

- *Unit medic.* CCP locations, evacuation routes, AXPs.

- *Maintenance team chief.* Location of recovery, location of maintenance.

- *TF S4.* Combat trains location, combat trains movements, combat trains CP actions (movements, reports, possible emergency requests).

- *TF S1.* Replacement activities.

- *Medical platoon leader.* FAS and MAS locations, displacement routes, triggers, setup times, and AXPs.

- *BMO.* Location and organization of UMCP.

- *HHC commander.* Location of field trains, resupply actions, and LOGPAC status.

- *Support platoon leader (if available).* TF resupply and movement actions as described by the HHC commander.

15-9. BRIGADE FIRE SUPPORT REHEARSALS

a. Who attends. Although this is an FS rehearsal, the brigade S3 must be closely involved to ensure the synchronization of the FS plan with the maneuver plan. Whenever possible, the brigade commander should participate as well. Normally the brigade sends the XO, the S3, the S4, the S2, the brigade engineer, the brigade FSO, and a representative from the FSB. Key representatives from the DS artillery battalion include the commander, the S3, the S2, the battalion fire direction officer (FDO), the radar warrant officer (WO), and the MLRS liaison officer (LNO). From the maneuver TFs, the commander (if available), the S3, the FSO, the scout platoon leader, and the mortar platoon leader should attend, as well as a COLT representative, the Army aviation LNO, and USAF air liaison officer (ALO). The DS artillery battalion commander normally commands this rehearsal for the brigade commander; he is assisted by the brigade FSO.

b. How long. Plan for 1 to 1½ hours for the FS rehearsal. There is seldom time to rehearse every target; at a minimum, rehearse the priority targets. The FS rehearsal ensures synchronization of the FS effort within the unit and that the fire support plan supports the commander's intent. Fire support rehearsals normally occur after the combined arms rehearsal. The technique selected for the rehearsal is

usually the radio technique, although the terrain model technique works as well. Performing the brigade FS rehearsal to the howitzer level is a very effective technique, but it carries a high cost in the amount of time required.

c. *TTP.* Units must gain proficiency on the radio technique at the home station. Attempting to perform this technique for the first time in the field is inviting disaster. Use the crawl—walk—run method: try the technique face to face the first time to work out the bugs. In the walk phase, move the players into different rooms of the same building, then, for the run, move them out to radios.

d. The script. The agenda used in FS rehearsals is the Fire Support Matrix. Prior to the rehearsal, the DS FDO will announce the brigade consolidated target list by number and grid and list any special instructions for the targets. Establish your response sequence early. Include an intelligence update. The fire support coordinator (FSCOORD) states the fire support coordinating measure (FSCM) in effect at the starting point of the rehearsal and provides last minute guidance.

If the FS rehearsal occurs prior to the combined arms rehearsal, selection of branches to rehearse is done by the FSCOORD. If it occurs after the combined arms rehearsal, the sequence the branches are rehearsed mirrors that of the proceeding combined arms rehearsal.

e. The detail. The DS artillery battalion S2 advances the enemy or the friendly force one critical event at a time. When the S2 finishes describing the event, all fire supporters will execute the portion of the FS plan triggered by the action.

Friendly unit actions

- *When* are the conditions or trigger?
- *Where* is the target and from where will it be observed?
- *Who* is responsible for the target, the backup, and which radio net and backup?
- *Why* (purpose of the target)?
- *What* are the desired effects?

f. TTP. Often when using the radio technique, it becomes difficult to keep the rehearsal moving because the players cannot see each other. Establishing a response sequence by SOP will help significantly. One technique is for the units to respond as they are deployed front to rear, ensuring units with no targets state so and backup observers are allowed to fire targets. The shortcoming to this technique is that backup observers often call the target prior to the primary, but this technique does ensure every "looker" rehearses every target for the phase. Another technique is to fire the targets in the probable order in which they will be fired. This normally takes longer and often leads to some confusion about which unit follows in the sequence.

The following uses the previous deliberate attack example. The response sequence is front to rear; several units were left out for brevity. The sequence COLT, TF Mech, TF 1-1,* * *, ALO, * * *, and S2. The DS battalion S2 states: "It is now H+6. SBF Mech has been established. All three enemy platoon positions are being obscured by smoke and suppressed by SBF Mech. TF 1-1 is moving on Axis SLAM just approaching PP1."

The brigade COLT would respond: "This is brigade COLT 2. I am backup for target AE0005 vicinity NA123456. TF 1-1's closure on PP1 is the trigger to fire. I will observe the target from vicinity NA345678 and call it on FS net * * *. The alternate method is * * *. The target purpose is * * *. The desired effects are * * *. Break * * *. FDC, this is COLT 2, fire target AE0005, over." The FDO would repeat the call for fire and issue a message to observer to include time of flight. The observer would end the mission.

The TF Mech FSO would respond: "*No action.*"

The TF1-1 FSO would respond: "This is TF 1-1 FSO. I am the priority for target AE0005. Our closure on PP1 is the trigger to fire target AE0005, NA 123456. ALPHA Team FIST will observe the target from vicinity NA234567 and call it on FS net * * *. The alternate method is * * *. The target purpose is * * *. The desired effects are * * *. Break * * *. FDC, this is TF1-1 FSO, fire target AE0005, over." The FDO would repeat the call for fire and issue a message to observer to include time of flight. If the ALPHA Team FIST were participating, he would then fire the target instead of the TF FSO. The observer would end the mission.

The ALO would state: "This is the brigade ALO. TF 1-1 closure on PP1 is my trigger. Four A-10s with Mavericks are at initial point (IP) CHEESE." The ALO would continue with the magnetic heading from the IP to the target, the target description, location, and elevation; the method of marking location of friendlies; the egress; and the time from IP to target. Any SEAD or airspace coordination area changes in support of CAS should be rehearsed with the CAS mission.

The S2 states: "Radar, this is the S2. TF 1-1 closure on PP1 is my trigger. Call for fire zone number 1 and critical friendly zones 4, 5, and 6 are in effect now. Que radar schedule JANE, 12 minutes, over."

The radar technician would respond: "S2, this is radar tech. Call for fire zone number 1 and critical friendly zones 4,5, and 6 are in effect. Que radar schedule JANE, 12 minutes, out."

For each target rehearsed address grid location, trigger point, engagement criteria, primary and backup observer and communications method, method of engagement, and attack guidance. Ensure the DS battalion S3 presents the battery movement plans and out-of-action cycles. Rehearse the radar target handoff and include clearing the fires at the TF level if the TF FSO is involved. Have the radar technician insert one or two acquisitions per phase of the rehearsal.

g. The result. This rehearsal ensures the validity of the FS plan. It will illustrate why fires are needed in relation to specific maneuver events and what they are intended to accomplish. It crosswalks lookers with shooters and ties them to a condition or event on the battlefield. It will ensure that FS will perform the missions assigned and meet the commander's intent. When properly performed, the rehearsal practices the redundancy of observers and nets by having both the backup and primary shoot the targets. The FS plan is validated with the scheme of maneuver, the commander's intent, and attack guidance. It ensures the obstacle plan is coordinated with the FS plan and that both support the maneuver plan. Finally it ensures the control measures for protecting and controlling aerial and ground forces are in place, integrated, and understood by all.

h. TF fire support rehearsals. The TF FSO normally runs this rehearsal. Involvement should be from the TF FSE all the way to the observers, including the S3, USAF, and S2. Lookers include scouts, the company fire support team (FIST), and the platoon leadership responsible for a target. Shooters include the mortar platoon. This is often difficult in a compressed time sequence because many of the lookers are maneuver units that have already crossed the LD. The format for the rehearsal is exactly like that of the brigade rehearsal.

Section X. STANDARD BRIEFING FORMAT

15-10. PURPOSE

This section contains guidelines for developing field grade presentation skills associated with tactical problems.

15-11. SCOPE

This guidance is appropriate for all presentations, including mission analysis, COA, decision, and OPORD briefings, as well as for tactical rehearsals. It applies to both the CGSC classroom and the field.

15-12. THE CARDINAL RULES

a. Determine the critical elements to be briefed BEFORE you start talking.

b. Speak clearly and confidently to your audience, not to your notes and mapboard.

c. Relate everything to terrain and time.

d. Do not waffle.

e. A good, feasible concept, clearly presented, has a better chance of being understood than a great concept that is poorly communicated.

15-13. TECHNIQUE

a. The situation and field grade analysis of the commander's (or audience's) information requirements, given the situation, determines what information is briefed, not a "standardized" set of topics or slides.

b. *Before the briefing—*

(1) *Organize* maps, overlays, current combat power status, and the current CCIR.

(2) *Position the audience*. Always strive to give briefings from a position where the actual terrain, or a portion of it, can be observed. Ensure all can see map(s) and overlay(s), even if all must stand instead of sit.

(3) *Rehearse* the presentation, including a checklist of the most important conclusions you need your audience to understand. Have an assistant critique the logic flow of your briefing. Not every staff officer needs to brief. Consolidate critical conclusions. Fewer presenters are better than more.

Average human beings can only remember about five important things at a time. The average attention span is less than 1 hour. Do not overestimate the ability of your audience to understand, from a single briefing, everything you know after working the issue in great detail.

c. *Provide handouts*.

(1) Create a one-page handout with critical background material that your audience may need to refer to later, but that you do not intend to waste their time by briefing. Provide the handout to the audience prior to the briefing. Examples are weather forecasts, enemy order of battle, projected friendly combat power, task lists, etc. Combine them and do not exceed one page. More than one page means you are giving the audience more raw data information than they need or can process quickly.

(2) For formal orders briefings, provide subordinates a copy of the written order and *require* them to read the base order *prior* to beginning the briefing. Allow time for subordinate and staff coordination after briefing. Require confirmation backbriefs from subordinates after the coordination period, but before subordinates depart the briefing site.

d. Ensure all overlays are posted correctly and clearly marked with correct symbology. Ensure graphics are consistent with higher HQ overlay and across all battle staff and subordinate command overlays. Assign one experienced individual to do the quality control checks.

e. During the presentation—

(1) *Focus on the essentials.* The more information you endeavor to put into your briefing, the more difficult it will become for everyone trying to understand your concept.

(2) *Speak clearly.* Express your ideas concisely with clear diction and correct military terminology. Avoid jargon, cliches, and statements not related to the problem. Clear oral briefs or orders, like any public speaking skill, require practice.

(3) *Speak slowly.* A balance must be found between speaking so quickly that you cannot be followed and so slowly that the audience finds it difficult to concentrate on your material.

(4) *Speak confidently.* Know what you intend to say. Refer to notes when necessary, but do not read from notes or the overlay. After spending hours developing conclusions or a concept, you should be able to talk without notes. Speak directly to your audience, whether it is a higher commander or your subordinate commanders.

(5) *Relate your overlay to the ground.* If briefing on the ground, ensure that your overlay, map, and presentation are oriented to the terrain. For example, "2-45 Infantry is presently here (point to the overlay), which is there (then point to their position on the ground)."

f. Provide feedback.

(1) *Answer questions.* Do not allow questions until the end of the briefing. Although not every staff officer should brief, allow functional area experts to answer specific questions. Assign a scribe, other than the briefers, to take notes. Ensure you have addressed all questions. Close by reviewing open issues and any decisions made by the commander during the brief.

(2) *Focus.* If subordinate commanders are required to provide feedback in the form of a backbrief or rehearsal, keep them focused. Emphasize personal visualization of their unique purpose, their understanding of the enemy and terrain, their vision of decisive actions, and the array of forces to achieve it. Do not allow rambling recitals of specified tasks and general statements from doctrine.

CHAPTER 16

INFORMATION OPERATIONS

"The battlefield is a scene of constant chaos. The winner will be the one that best controls that chaos, both his and that of his enemy." —Napoleon Bonaparte, 1769-1821

16-1. REFERENCES

- JP 3-13.1.
- JP 3-54.
- JP 3-58.
- FM 33-1.
- FM 34-1.
- FM 34-60.
- FM 100-6.

NOTE: This chapter is based primarily on FM 100-6.

16-2. INFORMATION DOMINANCE

Information dominance is defined as “the degree of information superiority that allows the possessor to use information systems and capabilities to achieve an operational advantage in a conflict or to control the situation in operations short of war, while denying those capabilities to the adversary.”

—FM 100-6, p 1-9

As we have come to recognize and depend on air superiority as a key condition for military success, information dominance has taken on a similar importance for military operations. This means that friendly knowledge and understanding of the situation must be more certain, more timely, and more accurate than the adversary's, revealing to the friendly commander the conditions that will lead to success. Creating information dominance has two equally important facets:

- Building up and protecting friendly information capabilities.
- Degrading enemy information capabilities.

The friendly commander achieves information dominance by gaining a knowledge advantage over an enemy.

The knowledge advantage generated by commanders using innovative technical and human techniques permits the force to more readily seize or retain the overall initiative and increase its lethality and survivability. Building a knowledge advantage requires a highly developed sense of what information is required and an ability to manage the use and dissemination of that knowledge to the right place, at the right time, for the desired purpose.

Successful leaders use the knowledge advantage by combining technical and human information capabilities with a broad intent statement and a clearly articulated concept of operation. Like air power, a ground commander can enjoy levels of knowledge advantage ranging from *information supremacy* to *information parity*. An enemy can also achieve a knowledge advantage at our expense. Information dominance can change over space and time; it can also vary by echelon. An Army may achieve information dominance at the operational level but lose it at the tactical level.

16-3. COMPONENTS OF INFORMATION OPERATIONS

The Army recognizes six activities to support information operations (IO): *acquiring, using, protecting, managing, exploiting,* and *denying* information and information systems (INFOSYS). These activities take place within three interrelated components of IO: *operations, relevant intelligence and information (RII),* and *INFOSYS.* These components operate within a battlespace established by the military information environment (MIE). Army organizations conduct these IO activities as part of a dynamic, iterative process to support each component in an integrated full-dimensional operation (fig 16-1).

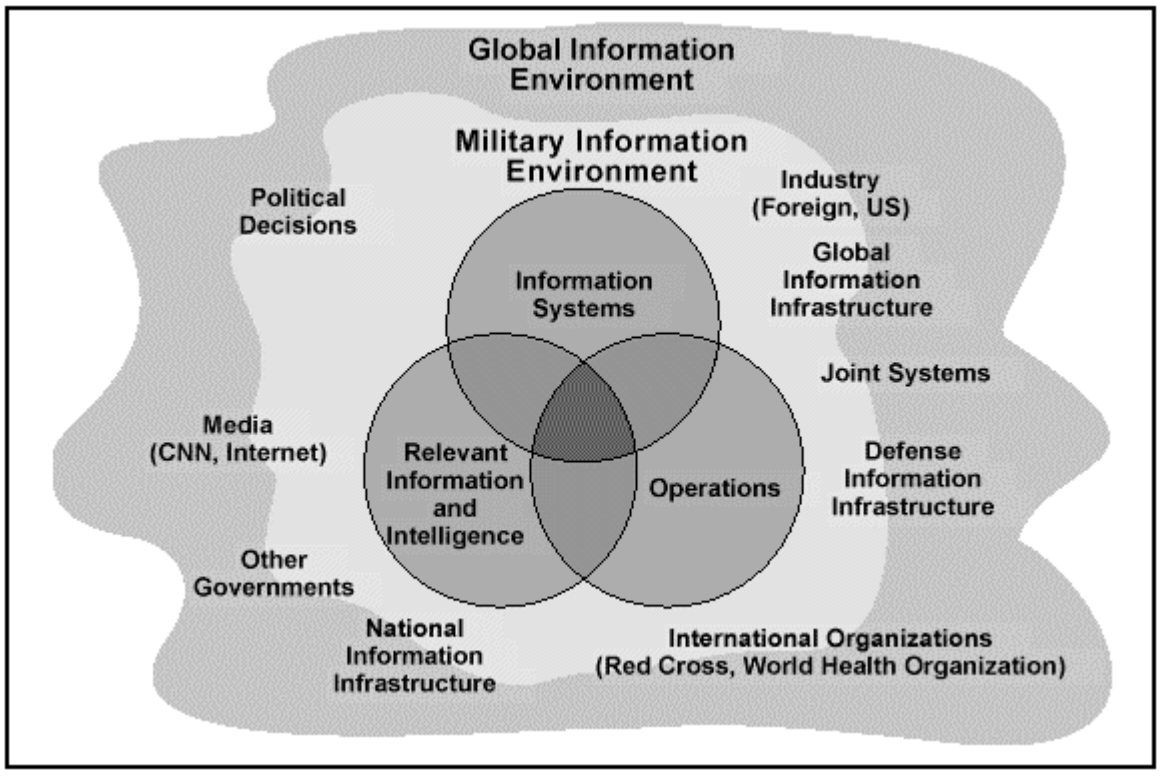


Figure 16-1. Information operations.

a. Information systems. INFOSYS collect, process, store, and disseminate information relating to current and future operations. Automation has made great advances in information processing, but human beings remain the most effective system for determining relevance and fusing information. INFOSYS are those means that enable commanders and their staffs to—

- Monitor the current situation.
- Synchronize operations.
- Integrate and synchronize operations across BOSs.
- Coordinate joint air and naval support.
- Update weapon systems targeting parameters.
- Control close, deep, and rear operations as one operation.

b. Relevant intelligence and information. Leaders have struggled with how to best capitalize on available information throughout the history of organized warfare. The drive to know as much as possible about their own forces—location, combat effectiveness, current activity—and the enemy's—location, disposition, combat effectiveness, intended actions—has been a durable characteristic of successful commanders, regardless of the time period or nationality. Today, commanders operate in an environment increasingly marked by the rapid flow of information and decisions among strategic, operational, and tactical levels.

c. Operations. Civil affairs (CA), public affairs (PA), and C^2W are the three operations the Army currently uses to gain and maintain information dominance and effective C^2.

(1) *Civil affairs operations.* CA support to IO provides an integral role of interfacing with critical actors and influences in the global information environment (GIE). Whether in peace, conflict, or war, conducting military operations, consolidating combat power, and seeking information dominance are improved when leveraging CA support. Although conditions differ across the spectrum of conflict, CA activities establish, maintain, influence, or exploit relations among military forces, civil authorities, and the civilian populace in an area of operations to facilitate military operations. For example, during Operation RESTORE DEMOCRACY, CA activities informed the local populace through the news media, public discussion, and PSYOP informational products and programs about the reestablishment of the legitimate Haitian government. This created an information exchange that promoted understanding of, confidence in, and positive perception of measures supporting military operations.

(2) *Public affairs operations.* Most military operations are conducted under the full glare of public scrutiny. National and international news media coverage plays a major role in quickly forming public debate and shaping public opinion. The news media serves as a public forum for the analysis and critique of goals, objectives, and actions. It can impact political, strategic, and operational planning, decisions, and mission success or failure. The reality of near real-time information, processed and transmitted at greater speeds and to wider audiences than in the past, has bridged the gap between what occurs on the ground and the goals and objectives of the national military strategy. Therefore, the public affairs officer (PAO) monitors public perceptions and develops and disseminates clear and objective messages about military operations. Moreover, commanders must involve themselves also in this dimension of IO. PA personnel—

- Assist the commander by working to establish the conditions that lead to confidence in and support of the Army.

- Support open, independent reporting and access to units and soldiers.

- Seek a balanced, fair, and credible presentation of information that communicates the Army story through an expedited flow of complete, accurate, and timely information.

The commander uses his internal information program (formerly command information) to inform soldiers about where they fit in, what is expected of them, and how they help accomplish the mission. This information also helps soldiers combat the effects of enemy propaganda or misinformation.

(3) *C^2W operations*. C^2W is the warfighting application of information warfare (IW) in military operations. C^2W is defined as "the integrated use of OPSEC, military deception, PSYOP, EW, and physical destruction, mutually supported by intelligence, to deny information to, influence, degrade, or destroy adversary C^2 capabilities, while protecting friendly C^2 capabilities against such actions. Command and control warfare applies across the operational continuum and all levels of conflict." (CJCSI 3210.03, 31 March 1996) C^2W comprises two major branches:

- Command and control-attack (C^2-attack).

- Command and control-protect (C^2-protect).

(*a*) *Branches of C^2W operations*.

1. C^2-attack. The goal of offensive C^2W, specifically C^2-attack, is to gain control over our adversary's C^2 function, both in terms of flow of information and level of situational awareness. With effective C^2-attack, we can either prevent an adversary from exercising effective C^2 or leverage it to our advantage.

C^2-attack can strike at the adversary's capabilities at all echelons, targeting personnel, equipment, communications, and facilities in an effort to disrupt or shape adversary C^2. RII plays a key role in C^2-attack planning and operations with the creation and maintenance of regional databases on personal, historical, and cultural influences, IPB, and BDA—both soft and hard kill. The principal C^2-attack approach for influencing the adversary's C^2 is the synchronized application of the six information activities (acquire, use, protect, manage, exploit, and deny information and information systems).

2. C^2-protect. C^2-protect seeks to maintain effective C^2 of friendly forces by negating or turning to a friendly advantage the adversary's efforts to influence, degrade, or destroy friendly C^2 systems. C^2-protect is divided into active and passive measures and seeks to limit the vulnerability of forces (personnel, equipment, and information) to hostile action, even as deployed forces face ever-expanding threats and adversary capabilities. C^2-protect includes countering an adversary's propaganda to prevent it from affecting friendly operations, options, public opinion, and the morale of friendly troops.

(*b*) *Role of C^2W*. C^2W applies to all phases of operations, including those before, during, and after actual hostilities. Even in stability and support operations, C^2W offers the military commander lethal and nonlethal means to achieve the assigned mission while deterring war and/or promoting peace.

The offensive aspect of C^2W can slow the adversary's operational tempo, disrupt his plans and ability to focus combat power, and influence his estimate of the situation. The defensive aspects of C^2W minimize friendly C^2 system vulnerabilities and mutual interference.

(*c*) *C^2W elements*. The foundation for C^2W is robust and redundant command, control, communications, and computers (C^4) INFOSYS, coupled with seamless, national-to-tactical, relevant information and intelligence support. The building blocks, or elements, of C^2W include—

- OPSEC.
- Military deception.
- PSYOP.
- EW.
- Physical destruction.

The integrated employment of these five elements leads to synergy on the battlefield and results in the most effective execution of C^2-attack and/or C^2-protect tasks. The commander drives this C^2W process to achieve agility by focusing attacks on the adversary's ability to command and control his forces while simultaneously protecting friendly C^2.

1. OPSEC. Operations security is defined as "a process of identifying critical information and subsequently analyzing friendly actions attendant to military operations and other activities; identifying those actions that can be observed by adversary intelligence systems; determining indicators adversary intelligence systems might obtain that could be interpreted or pieced together to derive critical information in time to be useful to adversaries; and selecting and executing measures that eliminate or reduce to an acceptable level the vulnerabilities of friendly actions to adversary exploitation." —Joint Pub 3-54

OPSEC is the key to denial. It gives the commander the capability to identify those actions that can be observed by adversary intelligence systems. It can provide awareness of the potentially friendly indicators that adversary intelligence systems might obtain. Such awareness could be interpreted or pieced together to derive critical information regarding friendly force dispositions, intent, and/or courses of action that must be protected. The goal of OPSEC is to identify, select, and execute measures that eliminate, or reduce to an acceptable level, indications and other sources of information that may be exploited by an adversary.

OPSEC planning is severely challenged by the new family of global commercial capabilities, to include imaging, positioning, and cellular systems that offer potential adversaries access to an unprecedented level of information against friendly forces. The inevitable presence of the news media during military operations complicates OPSEC. The capability of the media to transmit real-time information to a worldwide audience could be a lucrative source of information to an adversary. OPSEC planners, working closely with PA personnel, must develop the EEFI used to preclude inadvertent public disclosure of critical or sensitive information.

Many different measures impact OPSEC. These include counterintelligence, information security (INFOSEC), transmission security (TRANSEC), COMSEC, and SIGSEC. As more of the force is digitized, OPSEC takes on an ever-growing importance.

2. Military deception. Military deception is defined as "actions executed to deliberately mislead adversary military decisionmakers as to friendly military capabilities, intentions, and operations, thereby causing the adversary to take specific actions (or inactions) that will contribute to the accomplishment of the friendly mission." —Joint Pub 3-58, p v

Military deception is the primary means to influence the adversary commander's decisions through distortion, concealment, and/or falsification of friendly intentions, status, dispositions, capabilities, courses of action, and strengths. The goal of deception is to cause the opposing military commander to act in a manner that serves the friendly commander's objectives.

3. Psychological operations. Psychological operations are defined as "planned operations to convey selected information and indicators to foreign audiences to influence their emotions, motives, objective reasoning, and, ultimately, the behavior of foreign governments, organizations, groups, and individuals. The purpose of PSYOP is to induce or reinforce foreign attitudes and behavior favorable to the originator's objectives." —Joint Pub 3-53

PSYOP are based on projection of truth and credible message. PSYOP are an essential tool in both C^2-protect and C^2-attack operations. The Army has shown considerable strength in applying both PSYOP and deception to military operations. PSYOP can proliferate discrete messages to adversary C^4I collectors, enhance joint combat power demonstrations with surrender appeals, and magnify the image of US technological superiority. PSYOP elements must work closely with other C^2W elements and PA strategists to maximize the advantage of IO.

The main objective of PSYOP in C^2-protect is to minimize the effects of an adversary's hostile propaganda and disinformation campaign against US forces. Discrediting adversary propaganda or misinformation against the operations of US/coalition forces is critical to maintaining favorable public opinion.

4. Electronic warfare. Electronic warfare is defined as "any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum (EMS) or to attack the enemy. The three major subdivisions within electronic warfare are electronic attack (EA), electronic protection (EP), and electronic warfare support (ES)." —FM 100-6, p 3-5

(a) *Electronic attack*. EA is the use of jamming, electronic deception, or directed energy to degrade, exploit, or destroy the adversary's use of the EMS. EA can attack the adversary anywhere—from his tactical formations back to his national infrastructure.

(b) *Electronic protection*. EP is the protection of the friendly use of the EMS. EP covers the gamut of personnel, equipment, and facilities. EP is part of survivability.

(c) *Electronic warfare support*. ES is conflict-related information that involves actions tasked by or under the direct control of an operational commander to search for, intercept, identify, and locate sources of intentional and unintentional radiated electromagnetic energy to detect immediate threats. ES is the embodiment of combat information and capitalizes on the timeliness of sensor-to-shooter systems.

5. Physical destruction. Physical destruction is defined as "the application of combat power to destroy or neutralize enemy forces and installations. It includes direct and indirect fires from ground, sea, and air forces. Also included are direct actions by special operations forces."

—FM 100-6, p 3-5

The destruction of a hostile C^2 target means that adversary C^2 capabilities are degraded for a period of time or, if necessary, permanently shut down. Physical destruction is used only after a full, comparative assessment—strategic-through-tactical perspectives—of the tradeoffs between preserving the target versus its destruction.

16-4. IO PLANNING AND EXECUTION

a. Intelligence support to C^2W. C²W is supported by an information system IPB (fig 16-2). This form of IPB is the basis for developing C²W COAs and targeting. The process builds on the standard IPB but requires—

- Understanding the "art" of decisionmaking and leadership.
- Knowledge of the technical requirements of a wide array of information systems.
- Ability to conduct highly technical processing to produce C²W COA templates.

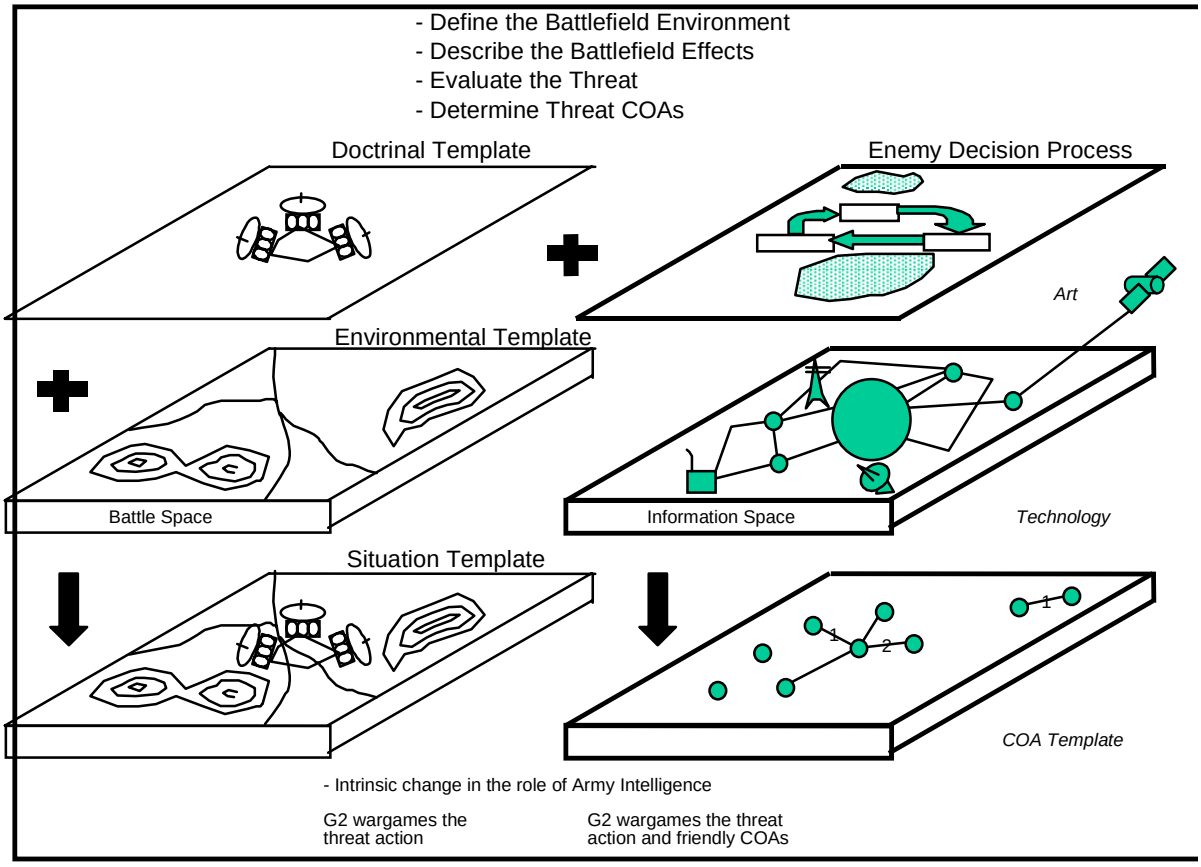


Figure 16-2. IPB of an information system.

b. Common IO planning mistakes to avoid.

- Focus on attack; neglect protect.
- OPSEC, PSYOP, deception separated from physical destruction and EW.
- Attack and protect not connected.
- Fail to plan and coordinate assessment (last step in D^3A process).
- Deception events planned that the enemy does not have the capability to "see" or react to in time for the desired effect.

16-5. IO PLANNING

A dedicated IO officer working directly for the chief of staff (functional area 30) coordinates IO planning above the brigade level. Much as a G3 plans officer plans for the effective employment of subordinate maneuver forces, the IO officer plans for the effective employment of forces operating in the IO realm. These forces may include CA, PSYOP, and EW units. They may also include maneuver and fire support forces executing a feint or demonstration. Just as the G3 planner will avoid dictating how a subordinate maneuver commander should accomplish his mission, the IO officer will recommend missions and tasks without dictating how the subordinate will accomplish them.

In general, the IO planning process follows the MDMP:

- Perform mission analysis.
- Fully develop COAs for each "maneuver" COA.
- Participate in maneuver COA analysis (war gaming).
- Refine selected COA.
- Execute (D^3A).

a. Mission analysis.

(1) *Determine—*

- Enemy collection capability.
- Enemy C^2 capability.
- Friendly C^2 vulnerabilities.

(2) *Identify enemy vulnerabilities*.

- Personality and decisionmaking profiles (use generic if personalities are not available).
- Key information systems and links.

(3) *Know the friendly COA.*

(4) *Propose IO objectives*.

- Recommend the IO contributions to the proposed mission statement.
- Do not make contributions so specific that they dictate COAs.
- Examples:
  - — Reduce effectiveness of 1 Corps reaction to our landing.
  - — Reduce coordination between 1 and 2 Corps.
  - — Reduce effectiveness of 1 Corps artillery.
  - — Reduce, enhance, assure, support * * *.

b. *IO COA development*.

(1) *Propose IO COA statements for each maneuver COA*. Examples:

- Delay to protect beachhead.
- Delay 1 Corps attack to protect the beachhead (sequence in time with other actions).

(2) *Develop IO missions (5Ws (see below)) to support each COA* (could be several missions for each IO COA; some missions may support more than one COA).

(*a*) *Examples*.

- 1 Corps Commander delays deciding to attack the beachhead for 4 hours from H+2 to H+6 to protect the friendly forces.
- 2 Corps Commander decides to move down Route (Rt) 3 rather than Rt 5 at H+24 to give 3d Bde positional advantage.

(*b*) *Five "Ws" of IO missions*.

- "Who" is ENEMY decisionmaker (leader, soldiers, a group of residents, etc.)
- "What" is the decision you want them to make.

- "When" is when you want them to make the decision.
- "Where" is where you want them to make the decision.
- "Why" is the FRIENDLY ADVANTAGE you want to gain (permits nesting).

(3) *Determine appreciations needed to support each COA* (appreciations are what they have to believe to make the decisions that you desire). Example:

1 Corps Commander and staff believe that—

- The beachhead is very wide.
- They are under attack.
- Key subordinates are unprepared.
- Communications with key supporting unit is cut.
- They can't trust the true report and therefore have insufficient information to decide.

Remember, your opponent has a preconception of his situation and information from many sources other than your deception. He may disregard your deception if it does not fit his preconception and his other information.

(4) *Develop critical attack and protect lists to support appreciations above*. Examples:

- Blind Eagle Mountain OP at H; let Hawk Mountain observe landing until H+2.
- Leave security C^2 net in zone E functioning to report ambushes until H+3.
- Leave advanced guard C^2 frequency open to report clear route until H+2.
- Degrade C^2 links to subordinates after H+4.

The key to the critical attack and protect lists is to remember that for perceptions to play a role in decisionmaking, they have to be seen, communicated, understood, and believed in time to affect the decision. That decision also has to be communicated and understood in time to be acted on.

c. *Synchronize each COA.*

(1) *Use a synchronization matrix*.

(2) *Determine IO tasks* (friendly actions that support the appreciations or protections above).

(3) *Coordinate IO coordination and collection of assessments*.

(4) *Plan execution time line*. Account for friendly movement time, time to be seen, time to communicate to decisionmaker, and time to be acted on.

(5) *Conduct IO COA deconfliction*. Does the whole picture make sense (not just the IO piece)? Are you protecting communications links needed for CA, PA, PSYOP, and deception long enough to get the message through? Can you gather assessments through your C^{2-}attack? (Is your IO operation giving you the desired advantage?)

(6) *Conduct risk assessment*. Is risk of failure in task or COA worth the potential payoff? If these tasks are putting friendlies at risk; how do we minimize this risk?

(7) *Refine IO COA statements*.

d. *During and after maneuver war gaming*.

(1) Complete synchronization matrix.

(2) Refine IO COA and publish order and annexes.

(3) Execute in G3 current operations and deep operations coordination cell (DOCC).

(4) D^3A.

e. *Do not forget defensive IO*; your enemies will not be inactive!

- Where are your vulnerabilities (INFOSYS, RII, operations)?
- What are his IO attack capabilities?
- Where and when are his opportunities for—

— Deception. What are *your* preconceptions? How can your opponent take advantage of them?

— Disruption. When is it critical for you to pass and receive information?

— PSYOP. Where do divisions and fears exist in your force?

- How will you counter his attack?

— Command information program.

— Public affairs.

— Redundant communications.

— Alternate CPs, backed-up data.

— Intelligence.

— Counterintelligence.

— Automation security.

— OPSEC.

Goal (purpose):		
COA Name:		
IO Objective (end state):		
Maneuver End State:	*Offensive IO Assets:*	*Defensive IO Assets:*
Destruction Tasks:		
EW Tasks:	*IO IRs*	
PSYOP Tasks:	*Coordinating Instructions:*	
OPSEC Tasks:		
Deception Tasks:		
Civil Affairs Tasks:		
Public Affairs Tasks :		
Other Tasks:		

IO Planning Worksheet

IO Objective:							
Purpose:							
	EW	*PSYOP*	*Deception*	*Physical Destruction*	*OPSEC*	*Civil Affairs*	*Public Affairs*
Task:							

Attack Method							
Defend Method							
Asset							
Counter-action							
BDA							
RF Info							

IO War Gaming Worksheet

Phase			
EW			
Physical Destruction			
OPSEC			
PSYOP			
Civil Affairs			
Public Affairs			

IO Synchronization Worksheet

16-6. INFORMATION MANAGEMENT PRINCIPLES

Information management takes on increasing importance in meeting the challenges of global visibility and rapidly changing information technology and their impact on the GIE. Mountains of data must be acquired and quickly translated into knowledge and understanding. Accomplishing this challenge requires a continuous, cyclical process. Decisionmaking has become increasingly dynamic and multidimensional. Decisions about current operations must occur simultaneously with decisions and planning about future operations. Decisionmaking must match the pace with which situational awareness changes.

a. *Data*. To be useful, data must be—

- Current.
- Timely (available when needed).
- Relevant (pertain to the problem at hand).
- Consistent (conflicting data casts doubt on the validity of both the correct and incorrect data).
- Well presented.

b. Problems.

- Redundancy (allowing everyone in the unit to collect and maintain the same data is wasteful of resources and almost guarantees inconsistency).
- Inconsistency (data from different sources conflict).

c. *Good information management.*

(1) *Centralize data*. All data should not be in one place, but there should be one place to go for each item. For example, the G3 is the place the G4 should go for unit location data. Rather than having the G4 spend resources gathering and maintaining unit location data that will never be as current as the G3's data, make the G3 responsible and use his data. This method is more efficient than having everyone collect it, and it reduces inconsistency.

(2) *Eliminate redundant data*. Index other references to that data back to its one storage location. This makes it easier to maintain and reduces inconsistency. For example, if you pull all of the paper records of a typical soldier and check the age or spelling of his name, you'll find several conflicting entries. If these data were stored in one place, it would be very easy to correct and maintain. This is the concept behind the “common operational picture” (COP).

(3) *Determine best original sources for data and assign responsibility for collecting and maintaining it*.

(4) *Give thought to data presentation* (a situation map may present a clearer, quicker view of the situation than a long paragraph).

(5) *Incorporate feedback* (validation). Review how well your information system supports your needs and improve it.

GLOSSARY

A^2C^2	Army airspace command and control
AA	assembly area; avenue of approach
AADC	area air defense commander
AAG	army artillery group
AAGS	Army air-ground system
AASLT	air assault
AAV	amphibious assault vehicle
AAW	antiair warfare
ABCCC	airborne battlefield command and control center
abn	airborne
AC^2	airspace command and control
ACA	airspace control authority; airspace coordination area
ACE	analysis and control element; armored combat earthmover; aviation combat element
ACF	air contingency force
acq	acquisition
ACR	armored cavalry regiment
ACT	analysis control team
AD	air defense
ADA	air defense artillery
ADAM	area denial artillery munitions
ADC	area damage control
ADCAP	advanced capabilities
ADCOORD	air defense coordinator
ADE	assistant division engineer
admin	administration
ADS	airlift defensive system
AE	aerial exploitation
AECC	air evacuation control center
AEF	aerospace expeditionary force
AEG	air expeditionary group
AES	airlift expeditionary squadron
AEW	aerospace expeditionary wing
AF	air force
AFARN	Air Force air request net
AFB	air force base; assault float bridge
AFDD	Air Force doctrine document
AFFOR	Air Force Forces
AFSATCOM	Air Force satellite communications
AFSCN	Air Force Satellite Control Network
AFSCOORD	assistant fire support coordinator
AFSOC	Air Force Special Operations Command
AGL	above ground level
AGM	attack guidance matrix
AHB	attack helicopter battalion

AHD	antihandling device
AI	air interdiction
AIM	air intercept missile
ALCC	Airlift Control Center
ALLOREQ	air allocation request
ALO	air liaison officer
AMC	Air Mobility Command
AMCM	airborne mine countermeasures
AMD	Air Mobility Division
AME	air mobility element
AMG	antenna mast group
ammo	ammunition
AMOG	air mobility operations group
AMRAAM	advanced medium-range air-to-air missile
AMRM	antiradiation missile
AMW	amphibious warfare
AO	area of operations
AOA	amphibious objective area
AOC	air operations center; air operations control (Air Force term)
AOE	Army of Excellence; fast combat support ship
AOI	area of interest
AOR	area of responsibility
AP	antipersonnel
APC	armored personnel carrier
APDS	armor-piercing discarding sabot
APERS	antipersonnel
APICM	armor-piercing, improved, conventional munition
APOD	aerial port of debarkation
ARAG	army rocket artillery group
ARC	Air Reserve Component
AREC	air element coordinator
ARFOR	Army Forces
ARG	amphibious ready group
armd	armored
ARS	air reconnaissance squadron
arty	artillery
AS	all source; submarine tender
ASAS	all-source analysis system
ASC	air support center
ASETF	air and space expeditionary task force
aslt	assault
ASOC	air support operations center
ASP	ammunition supply point
AT	antitank
ATACMS	Army Tactical Missile System
ATD	antitank ditch
ATF	amphibious task force
ATGM	antitank guided missile
ATI	artillery target intelligence
ATIZ	artillery target intelligence zone

atk	attack
ATO	air tasking order
ATP	ammunition transfer point
ATS	salvage tug
AVIM	aviation intermediate maintenance
AVLB	armored-vehicle-launched bridge
avn	aviation
AW	air warfare; antiair warfare
AWACS	airborne warning and control system
AWC	air warfare commander
AXP	ambulance exchange point
BAS	battalion aid station
BCD	battlefield coordination detachment
BCE	battlefield coordination element
BDA	battle damage assessment
bde	brigade
BFV	Bradley fighting vehicle
BHL	battle handover line
BIDS	Biological Integration Detection System
BMO	battalion motor officer
bn	battalion
BOS	battlefield operating system
BP	battle position
BRAG	brigade artillery group
BSA	brigade support area
BSFV	Bradley Stinger fighting vehicle
BSFV-E	Bradley Stinger fighting vehicle—enhanced
BSSG	brigade service support group
BTD	blade team day
BTH	blade team hour
btry	battery
C&J	collection and jamming
C^2	command and control
C^2-attack	command and control-attack
C^2-protect	command and control-protect
C^2W	command and control warfare
C^2WC	command and control warfare commander
C^3	command, control, and communications
C^3CM	command, control, and communications measures (joint term)
C^3I	command, control, communications, and intelligence
C^4	command, control, communications, and computers
C^4I	command, control, communications, computers, and intelligence
CA	California; civil affairs; combat assessment; counterair
CAA	combined arms army
CAB	command aviation battalion
CAG	carrier air group
cal	caliber

CALCM	conventional air-launched cruise missile
CALL	Center for Army Lessons Learned
carr	carrier
CAS	close air support
CATF	commander, amphibious task force
cav	cavalry
cbt	combat
CBU	cluster bomb unit
CCD	camouflage, concealment, and deception
CCDG	commander, cruiser-destroyer group
CCG	commander, carrier group
CCIR	commander's critical information requirements
CCP	casualty collection point
CDE	chemical defense equipment
cdr	commander
CDS	container delivery system (airdrop)
CE	chemical energy; command element
CEM	combined effects munition
cen	center
CFFZ	call for fire zone
CFL	coordinated fire line
CFV	cavalry fighting vehicle
CFZ	critical friendly zone
CG	commanding general; missile cruiser
CGN	missile cruiser (nuclear powered)
CGS	common ground station
cGy	centigray
cGyph	centigrays per hour
chem	chemical
CI	civilian internee; counterintelligence
CID	Criminal Investigation Division
CINC	commander in chief
CINCTRANS	Commander in Chief, (United States) Transportation Command
CIWS	Close-in Weapon System
CJCS	Commander, Joint Chiefs of Staff
CJTF	commander, joint task force
CLF	combat logistics force; commander, landing force
CLGP	cannon-launched, guided projectile
CMC	Commandant, United States Marine Corps
cmd	command
CMO	civil-military operations
co	company
CO	commanding officer
COA	course of action
COD	carrier onboard delivery
COLT	combat observation lasing team
COMAFFOR	Commander, Air Force Forces
COMINT	communications intelligence
comm	communications

COMMARFORCENT	Commander, Marine Forces, Central Europe
COMMARFOREUR	Commander, Marine Forces, Europe
COMMARFORLANT	Commander, Marine Forces, Atlantic
COMMARFORPAC	Commander, Marine Forces, Pacific
COMMARFORRES	Commander, Marine Forces, Reserve
COMMARFORSO	Commander, Marine Forces, Southern Command
COMMZ	communications zone
COMSEC	communications security
CONREP	connected replenishment
const	construction
CONUS	continental United States
coord	coordinating
COP	command observation post; common operational picture; contingency operation plan
COSCOM	corps support command
CP	command post, concrete piercing; counterproliferation
CPSE	corps psychological operations (PSYOP) support element
CRAF	Civil Reserve Air Fleet
CRC	control and reporting center
CRE	control and reporting element
CRRC	combat rubber reconnaissance craft
CS	combat support
CSAB	combat support aviation battalion
CSAR	combat search and rescue (Navy term)
CSE	combat support equipment
CSM	command sergeant major
CSR	controlled supply rate
CSS	combat service support
CSSE	combat service support element
CTAD	corps target acquisition detachment
CTE	commander, task element
CTF	Centralian Territorial Force; commander, task force
CTG	commander, task group
CTO	corps transportation officer
CTU	commander, task unit
CV	carrier (conventional power)
CVBF	carrier battle force
CVBG	aircraft carrier battle group
CVN	carrier (nuclear powered)
CWC	composite warfare commander
CZ	censor zone
D^3A	decide—detect—deliver—assess
DADS	detailed aircraft decontamination site
DAG	division artillery group
DASB	division aviation support battalion
DCA	defensive counterair
db	decibels
DD	destroyer

DDG	missile (antiair) destroyer
DDS	dry-deck shelter
decon	decontamination
DEDS	detailed equipment decontamination site
dept	department
det	detachment
DF	direction finding
dir	director
DIRMOBFOR	Director of Mobility Forces
DISCOM	division support command
DISE	deployable intelligence support element
distr	distributor
div	division
DIVARTY	division artillery
DIVEN	division engineer
DOCC	deep operations coordination cell
DOD	Department of Defense
DP	decision point
DPICM	dual-purpose, improved conventional munition
DPM	division provost marshal
DRB	division ready brigade
DS	direct support
DSB	division support battalion
DT	dwell time
DZ	drop zone
ea	each
EA	electronic attack; engagement area
EAC	echelons above corps
EAF	expeditionary aerospace force
EBS	expeditionary bomber squadron
EC	electronic combat
ECCM	electronic counter-countermeasures (joint term)
ech	echelon
ECM	electronic countermeasures (joint term)
ECS	engagement control system
EDRE	emergency deployment readiness exercise
EEFI	essential elements of friendly information
EFS	expeditionary fighter squadron
ELINT	electronic intelligence
EMS	electromagnetic spectrum
ENCOM	engineer command
engr	engineer
EO	electro-optical
EOD	explosive ordnance disposal
EP	electronic protection
EPP	electric power plant
EPW	enemy prisoner of war
ES	electronic warfare support

ESM	electronic warfare support measures (joint term)
EW	electronic warfare
EWO	electronic warfare officer
EXTAL	extra time allowance
FA	field artillery
FAC	forward air controller
FAC-A	forward air controller-airborne
FARP	forward arming and refueling point
FAS	forward aid station
FASCAM	family of scatterable mines
FD	final draft; forward detachment
FDC	fire direction center
FDD	Force XXI Digitized Division
FDO	fighter duty officer; fire direction officer
FEBA	forward edge of the battle area
FFA	free-fire area
FFG	missile frigate
FFIR	friendly force information requirements
fig	figure
FIST	fire support team
FISTV	fire support team vehicle
FLIR	forward-looking infrared radar
FLOT	forward line of own troops
flt	flight
FM	field manual
FMF	fleet Marine force
FO	forward observer
FOB	forward operating base
FPF	final protective fires
FPOL	forward passage of lines
FRAGO	fragmentary order
FS	fire support
FSB	forward support battalion
FSCL	fire support coordination line
FSCM	fire support coordinating measure
FSCOORD	fire support coordinator
FSE	fire support element
FSEM	fire support execution matrix
FSO	fire support officer
FSS	fire support section
FSSG	force service support group
ft	foot
fwd	forward
gal	gallon
GBCS	ground based common sensor
GBU	guided bomb unit
GCE	ground combat element

GEMSS	ground-emplaced mine scattering system
genr	generator
GIE	global information environment
GL	grenade launcher
GLO	ground liaison officer
gnd	ground
GOPLAT	gas and oil platform
gp	group
GP	general purpose
GPS	Global Positioning System
GS	general support
GSM	ground station module
GSR	general support reinforcing; ground surveillance radar
HAB	heavy assault bridge
HARM	high-speed antiradiation missile
HC	hexachloroethane (smoke)
HDP	hull defilade position
HE	heavy equipment; high-explosive
HEAT	high-explosive antitank
HEAT-T	high-explosive antitank—tracer
HED	heavy equipment delivery (airdrop)
hel	helicopter
HEP-T	high-explosive plastic—tracer
HF	high-frequency
HHB	headquarters and headquarters battery
HHC	headquarters and headquarters company
HHOC	headquarters, headquarters and operations company
HHS	headquarters and headquarters service
HHT	headquarters and headquarters troop
HIRSS	Hover Infrared Suppressor Subsystem
HMM/H/L/A	Marine helicopter medium/heavy/light/attack squadron
HMMWV	high-mobility, multipurpose, wheeled vehicle
how	howitzer
hp	horsepower
HP	high powered
HPT	high-payoff target
HPTL	high-payoff target list
HQ	headquarters
hr	hour
HSC	headquarters and service company
HTS	high-speed antiradiation missile (HARM) targeting system
HUMINT	human intelligence
HVT	high-value target
hvy	heavy
I&W	indications and warning
ICM	improved conventional munitions
ID	Idaho; identification

IEW	intelligence and electronic warfare
IFV	infantry fighting vehicle
IHR	in extremis hostage recovery
IL	Illinois
illum	illumination
IMIBR	independent mechanized infantry brigade
IMINT	imagery intelligence
inf	infantry
info	information
INFOSEC	information security
INFOSYS	information systems
INS	inertial navigation system
intel	intelligence
INU	inertial navigation unit
IO	information operations
IOE	irregular outer edge
IP	initial point
IPB	intelligence preparation of the battlefield
IR	information requirements, infrared
ISB	intermediate staging base
ISR	intelligence, surveillance, and reconnaissance
ITG	initial terminal guidance
IW	information warfare
J-SEAD	joint suppression of enemy air defenses
JAAT	joint air attack team
JAOA	joint air operations area
JAOC	joint air operations center
JASOP	joint air and space operations plan
JDAM	joint deep attack munition
JFACC	joint force air component commander
JFC	joint force commander
JFLCC	joint force land component commander
JMC	joint movement center
JOA	joint operations area
JOC	joint operations center
JP	joint publication
JPOTF	joint psychological operations task force
JSOW	joint standoff weapon
JSTARS	Joint Surveillance Target Attack Radar System
JTB	joint transportation board
JTF	joint task force
JTIDS	Joint Tactical Information Distribution System
k	one thousand; kilometer
KC	Kansas City
KE	kinetic energy
km	kilometer
kn	knot

LAMPS	Light Airborne Multipurpose System (helicopter)
LANTIRN	low altitude navigation and targeting infrared for night
LAV	light armored vehicle
lb	pound
LC	line of contact
LCAC	landing craft air cushion
LCC	amphibious command ship; land component commander
LD	line of departure
LD/LC	line of departure is line of contact
LDS	lightweight decontamination system
LEAP	lightweight exoatmospheric projectile
LEC	Light Airborne Multipurpose System (LAMPS) element coordinator
LGB	laser-guided bomb
LHA	amphibious assault ship (general purpose)
LHD	amphibious assault ship (with dock)
LKA	attack transport
LNO	liaison officer
LOC	lines of communication
Log	logistics
LOGPAC	logistics package
LPD	amphibious transport dock
LRP	logistics release point
LRSBDS	Long-Range Standoff Biological Detection System
LRSU	long-range surveillance unit
LSD	landing ship, dock
LST	landing ship, troop
LTIOV	latest time information of value
LZ	landing zone
m	meter
M-S	magnetic sensing
MACG	Marine aircraft control group
MACOM	major command
MAG	Marine aircraft group
MAGTF	Marine air-ground task force
maint	maintenance
MAJCOM	major command (Air Force term)
MALS	Marine aviation logistics squadron
MANPADS	man-portable air defense system
MARFOR	Marine Forces
MARFORLANT	Marine forces, Atlanta
MARFORRES	Marine Forces, Reserve
MARLO	Marine liaison officer
MAS	main aid station
MASINT	measurement and signature intelligence
MAW	Marine air wing
max	maximum
MBA	main battle area

MCM	mine countermeasures ship
MCOO	modified combined obstacle overlay
MCWP	Marine Corps warfighting publication
mdm	medium
MDMP	military decisionmaking process
ME	main effort
MEA	munitions effects assessment
MEB	Marine expeditionary brigade
mech	mechanized
MEDEVAC	medical evacuation
MEF	Marine expeditionary force
MEF(FWD)	Marine expeditionary force (forward)
METL	mission-essential task list
METT-T	mission, enemy, terrain, troops, and time available
MEU	Marine expeditionary unit
MEU(SOC)	Marine expeditionary unit (special operations capable)
mg	machinegun
MGB	medium girder bridge
MHC	mine hunter, coastal
MHE	materiel handling equipment
MI	military intelligence
MIBN	mechanized infantry battalion
MIBR	mechanized infantry brigade
MICLIC	mine-clearing line charge
MID	mechanized infantry division
MIE	military information environment
mil	million
min	minimum; minute
MIO	maritime interception operations
MIW	mine warfare
MLC	military load classification
MLRS	multiple launch rocket system
mm	millimeter
MOOTW	military operations other than war
MOPMS	modular pack mine system
MOPP	mission-oriented protective posture
mort	mortar
MOUT	military operations on urbanized terrain
MP	military police
MPA	maritime patrol craft
MPF	maritime pre-positioning force
mph	miles per hour
MRR	minimum risk route
MSB	main support battalion
MSC	major subordinate command; Military Sealift Command
MSR	main supply route
MT	mechanical time
MUG	march unit gap
MUGT	march unit gap time

MWSG	Marine wing support group
NA	not applicable
NAF	numbered air force
NAI	named area of interest
NALE	naval and amphibious liaison element
NALM	Norway Air-Landed Marine Air-Ground Task Force
NAVFOR	Navy Forces
NBC	nuclear, biological, and chemical
NBCRS	nuclear, biological and chemical reconnaissance system
NC	North Carolina
NCA	National Command Authorities
NCF	North Centralia Force
NEF	Naval expeditionary force
NEO	noncombatant evacuation operations
NFA	no-fire area
NFAF	Naval Fleet Auxiliary Force
NFS	northern striking force
NGF	naval gunfire
NLT	not later than
NM	nautical miles
no	number
NODLR	night observation device long-range
NSF	northern striking force
NSSMS	North Atlantic Treaty Organization (NATO) Sea Sparrow Missile System
NTC	night terrain contour
NVG	night-vision goggles
OAS	offensive air support
obj	objective
obs	obstacle
OCA	offensive counterair
OCONUS	outside continental United States
OO	on order
OOTW	operations other than war
OP	observation post
OPCON (to)	(under the) operational control (of)
OPLAN	operation plan
OPORD	operation order
ops	operations
OPSEC	operations security
OPTEMPO	operating tempo
org	organize
ORI	operational readiness inspection
OTC	officer in tactical command
OTH	over the horizon
PA	public affairs
PADS	position and azimuth determining system

PAO	public affairs officer
para	paragraph
pax	passengers
PC	patrol coastal
PD	point detonating
PDDA	power-driven decontamination apparatus
PERMA	planning, embarkation, rehearsal, movement, assault
pers	personnel
PGM	precision ground-mapping; precision-guided munitions
PH	platoon hour
P^h	probability of hit
PI	probability of incapacitation
PIR	priority intelligence requirements
P^k	probability of kill
PL	phase line
plt	platoon
PM	provost marshal
POF	priority of fires
pos	position
POTF	psychological operations task force
PP	passage point
prep	preparation
PST	pass time
PSYOP	psychological operations
PWP	plasticized white phosphorus
pwr	power
R	reinforcing
R&S	reconnaissance and surveillance
RAAMS	remote antiarmor mine system
RAC	river assault craft
RAOC	rear area operations center
RAP	rocket-assisted projectile
RAS	regimental aviation squadron
RC	Reserve Component
RCA	riot control agents
RCPA	relative combat power analysis
rd	round
RDO	radar deployment order
recce	reconnaissance (Air Force term)
recon	reconnaissance
regt	regiment
reinf	reinforcement
REMBASS	Remotely Monitored Battlefield Sensor System
res	reserve
RFA	restrictive fire area
RFL	restrictive fire line
RGR	rapid ground refueling
RII	relevant intelligence and information

RISTA	reconnaissance, intelligence, surveillance, and target acquisition
RLGINS	Ring Laser Gyro Inertial Navigation System
RO/RO	roll on/roll off
ROE	rules of engagement
ROC	rear operations center
ROM	refuel on the move
RP	red phosphorus; release point
RS	radar set
RSR	required supply rate
RSTA	reconnaissance, surveillance, and target acquisition
rt	route
SA	strategic attack
SAG	surface action group
SASO	support and stability operations
SATCOM	satellite communications
SBF	support by fire
SC	screen coordinator
SCC	sea combat commander
SCI	sensitive compartmented information
sct	scout
SDV	swimmer delivery vehicle
SE	supporting effort
SEAD	suppression of enemy air defenses
SEAL	sea-air-land
sec	section
SEC	submarine element coordinator
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
SEE	small emplacement excavator
SFW	sensor-fused weapon
SG	serial gap
SGT	serial gap time
SH	squad hour
SHF	super-high frequency
sig	signal
SIGINT	signals intelligence
SIGSEC	signals security
SINCGARS	Single Channel Ground and Airborne Radio System
SITTEMP	situation template
SJA	staff judge advocate
SLOC	sea line of communication
SM	standard missile
SOA	special operations aviation
SOC	special operations capable (Marine term)
SOCOM	Special Operations Command
SOF	special operations forces
SOLE	special operations liaison element
SOLL	special operations low level

SOP	standing operating procedure
SOR	specific order or request
SORTIEALOT	sortie allotment
SP	self-propelled; start point
SPMAGTF	special purpose Marine air-ground task force
SPOD	sea port of debarkation
spt	support
sqdn	squadron
SR	short range; state road
SSBN	ballistic missile submarine (nuclear)
SSF	southern striking force
SSN	attack submarine (nuclear)
ST	student text
STB	super tropical beach
STF	surface task force
STT	special tactics team
STW	strike warfare
STWC	strike warfare commander
sub	submarine
SUW	surface warfare
SW	submarine warfare
T	towed
T-AE	ammunition ship
T-AFS	combat stores ship
T-AK	auxiliary cargo ship
T-AO	auxiliary oiler
T-ATF	fleet ocean tug
T-AGOS	surveillance ship
T-AH	hospital ship
T-AVB	aviation logistics support ship
TA	tank army; target acquisition; theater army
TAB	target acquisition battery
TAC (A)	tactical attack center (airborne)
TACC	tactical air command center (Marine); tanker airlift control center (Air Force)
TACON (to)	(under the) tactical control (of)
TACP	tactical air control party
TACS	theater air control system
TAGS	theater air-ground system
TAI	target area of interest
TALCE	tanker airlift control element
TALO	theater airlift liaison officer
TARPS	tactical air reconnaissance pods
TASM	tactical air-to-surface missile
TBMD	theater ballistic missile defense
TBR	tank brigade
TCF	tactical combat force
TCP	traffic control point

TCT	time-critical target
TD	tank division
TDIS	time distance
TDP	turret defilade position
TE	tactical exploitation
TECHINT	technical intelligence
TF	task force
TFR	terrain-following radar
tgt	target
TLAM	Tomahawk land attack missile
TLE	target location error
tm	team
TOC	tactical operations center
TOE	table of organization and equipment
TOF	time of flight
TOT	time on target
TOW	tube-launched, optically tracked, wire-guided (missile)
TR	tank regiment
TRANSEC	transmission security
TRAP	tactical recovery of aircraft and personnel
TRP	target reference point
trp	troop
TSOP	tactical standing operating procedures
TSS	target selection standard
TT&C	telemetry, tracking, and commanding
TTF	tanker task force
TTP	tactics techniques, and procedures
TUAV	tactical unmanned aerial vehicle
TVA	target value analysis
TYCOM	type commander
UAV	unmanned aerial vehicle
UHF	ultra-high frequency
UMCP	unit maintenance collection point
UMT	unit ministry team
UNREP	underway replenishment
US	United States
USA	United States Army
USAF	United States Air Force
USCINCACOM	Commander in Chief, United States Atlantic Command
USCINCCENT	Commander in Chief, United States Central Command
USCINCEUR	Commander in Chief, United States Europe
USCINCPAC	Commander in Chief, United States Pacific Command
USCINCSO	Commander in Chief, United States Southern Command
USMC	United States Marine Corps
USN	United States Navy
USS	United States ship
USSOCOM	United States Special Operations Command
USSPACECOM	United States Space Command

USTRANSCOM	United States Transportation Command
VAQ	electronic warfare (plane)
VAW	early warning (plane)
VBSS	visit, board, search, and seizure
VEESS	vehicle engine exhaust smoke system
veh	vehicle
VERTREP	vertical replenishment
VF	fighter (plane)
VFA	fighter/attack (plane)
VHF	very high frequency
vic	vicinity
VLS	vertical launch system
VMA	Marine fixed-wing attack squadron
VMAQ/VMGR/VMU	Marine fixed-wing tactical electronic warfare/aerial refueling transport
VMFA	Marine fixed-wing fighter/attack squadron
VMFA (AW)	Marine fixed-wing fighter attack squadron (all-weather)
VMM	Marine medium tilt-rotor squadron
VOS	vehicle orientation system
vs	versus
VS	submarine warfare (plane)
VSTOL	vertical and short takeoff and landing
VT	variable time
w/	with
WLR	weapons-locating radar
WMD	weapons of mass destruction
WO	warrant officer
WOC	wing operations center
WP	white phosphorus
wpn	weapon
xctry	cross-country
XO	executive officer
yd	yard