FM 3-09

Fire Support

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No. 3-09

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Fire Support

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Preface

Field Manual (FM) 3-09 is the Army's keystone doctrine for fire support. This manual is a guide to action for the employment of fire support in decisive action as a part of unified land operations. The foundation of unified land operations is built on initiative, decisive action, and mission command—linked and nested through purposeful and simultaneous execution of both combined arms maneuver and wide area security—to achieve the commander's intent and desired end state (Army Doctrine Publication (ADP) 3-0).

The challenges of future armed conflict make it imperative for the Army to produce leaders and forces that exhibit a high degree of operational adaptability. Achieving the necessary level of operational adaptability requires the Army to build upon a foundation of two broad responsibilities within the framework of full-spectrum operations—

- Army forces conduct combined arms maneuver (CAM) to gain physical, temporal, and psychological advantages over enemy organizations. Applying an expanded understanding of combined arms, Army forces integrate the combat power resident in the Army's six warfighting functions with a wide array of related civil and military capabilities to defeat enemies and seize, retain, and exploit the initiative.
- Army forces conduct wide area security (WAS) to consolidate gains, stabilize environments, and ensure freedom of movement and action.

This publication identifies the principles of fire support, describes the fires warfighting function in terms of its major components, functions, and required products and describes how fire support is employed in terms of the operations process. The scope of this publication is broad in its focus in order to deal with the fire support structure as a complete entity. It gives equal treatment to the diverse assets that are designated as fire support resources. The successful employment of fire support depends on the synchronization of all forms of fire support with all warfighting functions. This fire support keystone doctrinal manual should be used by commanders and staff who must employ fire support within their operations.

Army forces are employed with other Services as part of a joint force. Consequently, this FM is not only based on ADP 3-0, but is also grounded in joint doctrine such as found in JP 3-0, JP 3-09, and JP 3-60.

Fire support is provided by mortars, cannon field artillery, rockets, missiles, naval surface fire support (NSFS), non-Army attack helicopters, fixed-wing aircraft, and unmanned aircraft systems. Fire support may be enhanced by those systems that enable the conduct of electronic attack.

This publication describes the field artillery as the principal means of fire support available to the commander, and charges the field artillery to integrate, coordinate and synchronize all available fire support with the commander's concept of operations. This is the ultimate challenge of fire support. This FM helps commanders and their fire support staff officers and fires unit commanders meet this challenge by providing a clear and concise picture of fire support and why it must work as a unified system.

PURPOSE

The purpose of FM 3-09 is to provide keystone fire support doctrine for United States (U.S.) Army forces. It provides guidance for planning, preparation, execution and assessment of fire support in decisive action.

SCOPE

This Army keystone doctrine for fire support builds on the collective knowledge and experience gained through recent operations and numerous exercises. It is rooted in time-tested principles and fundamentals, while accommodating new technologies.

FM 3-09 is organized into three chapters and two appendixes. Each chapter addresses a major aspect of fire support, while the appendixes address aspects of fire support that complement keystone fire support doctrine. An annotated glossary contains definitions for key terms and revised definitions for selected terms—

- Chapter 1 updates the mission of the Field Artillery, describes fire support, combined arms maneuver and wide area security, and combat power.
- Chapter 2 describes the fires warfighting function. The chapter discusses the fire support structure's four components: control automation systems; surveillance, reconnaissance, and target acquisition; attack resources; and sustainment. The chapter provides new or updated terminology and information on the chief of fires (COF), brigade fire support officer (FSO), and fire support coordinator (FSCOORD) and new or changed terminology such as the types of terminally guided munitions (TGMs), field artillery, and scalable capabilities to address the full range of lethal and nonlethal effects available to the commander.
- Chapter 3 describes the elements of the operations process in terms of fire support planning, preparation, execution, and assessment.
- Appendix A provides an updated description of fire support coordination and other control measures pertinent to fire support. The term "fire support coordinating measure" was changed to "fire support coordination measure" (FSCM) and its definition modified slightly by the 2006 revision of JP 3-0. Terms and definitions for the coordinated fire line (CFL), fire support coordination line (FSCL), kill box, phase line, and zone of fire (ZF) are aligned with JP 3-09. The changed terms and definitions are among those described in Appendix A and are included in the Glossary.
- Appendix B provides a brief discussion of Army command and support relationships, other authorities and task-organizing field artillery for effective fire support. U.S. Army field artillery units are given a command or support relationship. Additionally, four U.S. Army field artillery inherent responsibilities supplement the inherent responsibilities of a command or support relationship. U.S. Marine Corps and North Atlantic Treaty Organization (NATO) field artillery units, however, still use the field artillery tasks and responsibilities in accordance with Standard NATO Agreement (STANAG) 2484. U.S. Army field artillery units may also be given STANAG 2484 field artillery tasks and responsibilities particularly when operating with U.S. Marine Corps or NATO units or as assigned by the supported commander. A section on NATO and U.S. Marine Corps considerations for task-organizing field artillery has been updated.

APPLICABILITY

The intended audience for FM 3-09 is leaders and staff sections in combined arms chains of command. FM 3-09 may also be used by other Army, other Service, and Joint organizations and staff to assist in their planning for fire support for Army operations. This publication applies to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARNGUS), and the United States Army Reserve unless otherwise stated.

This publication implements the NATO standardization agreement (STANAG) 2484 *NATO Field Artillery Tactical Doctrine* (Allied Artillery Publication (AArtyP)-5).

ADMINISTRATIVE INFORMATION

FM 3-09 uses joint terms where applicable. Most terms with joint, NATO, or Army definitions are identified in both the text and the glossary. Text references: Definitions for which FM 3-09 is the proponent publication are printed in boldface in the text. These terms and their definitions will be incorporated into the next revision of FM 1-02. For other definitions in the text, the term is italicized and the number of the proponent publication follows the definition. Glossary references: Terms for which FM 3-09 is the proponent publication (the authority) are indicated with an asterisk in the glossary.

In FM 3-09, the term battalion refers to a battalion, battalion task force, or a cavalry squadron unless differences in capabilities require that a specific organization be named. The term company refers to a company, company team, or troop size organization.

"Adversaries" refers to both enemies and adversaries when used in joint definitions. (FM 1-02)

"Opponents" refers to enemies and adversaries. (FM 1-02)

Headquarters, U.S. Army Training and Doctrine Command is the proponent for this publication. The preparing agency is the U.S. Army Fires Center of Excellence. Send written comments and recommendations on a DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Directorate of Training and Doctrine, U.S. Army Fires Center of Excellence, DOTD, ATTN: ATSF-DD (FM 3-09), 700 McNair Avenue, Suite 128, Fort Sill, OK 73503; or submit an electronic DA Form 2028.

Introduction

Army forces do not fight alone; they fight as part of a joint team. A geographic combatant commander can bring every Service component's capabilities to bear anywhere within his assigned area of responsibility. The combination of Service actions has become inseparable and essential to success of the force as a whole. Army leaders now act in a fully integrated and interdependent joint environment. The actions of other Service components complement and reinforce the actions of land force leaders. Accustomed to being supported commanders in fairly restricted geographical areas of operation (AOs), land force commanders now find themselves both supporting and being supported by air, maritime, space, and special operations forces (SOF) in distinctly different kinds of operations. These operations vary by region and situation, but often confront U.S. forces with complex situations in which conventional and irregular warfare occur simultaneously.

U.S. Army, U.S. Marine Corps, and multinational forces are the decisive component of overseas land conflict. Army forces combine offensive, defensive, and stability operations simultaneously as part of an interdependent joint force to achieve decisive results.

Divisions direct subordinate brigade operations. The division commands a tailored mix of Joint and combined arms forces determined by the geographic combatant command based on the mission and designated by the theater army for tactical land operations. A division force package may include any mix of the heavy, Stryker, and infantry brigade combat teams (BCTs), as well as a variety of functional brigades as described in FM 3-90.6. In addition to BCTs, each division controls a tailored array of support brigades including the fires brigade (FIB), combat aviation, battlefield surveillance (BFSB), and maneuver enhancement brigades (MEB).

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Chapter 1

The Foundations of Fire Support

Chapter 1 addresses the definitions and foundational elements of fire support. Section I provides definitions. Section II describes fire support employment with combined arms. Section III discusses combat power. Section IV describes the fires warfighting function and its relationship to the other warfighting functions. Section V closes this chapter with a discussion of fire support and the principles of joint operations.

SECTION I – DEFINITIONS

FIRES

1-1. *Fires* are the use of weapons systems to create a specific lethal or nonlethal effect on a target (Joint Publication (JP) 3-09).

1-2. *Joint fires* are fires delivered during the employment of forces from two or more components in coordinated action to produce desired effects in support of a common objective (JP 3-0). In this manual, joint fires typically include naval surface fire support (NSFS), fixed- and some rotary-wing air support and indirect fires from other Services. Direct fire is inherent in maneuver operations.

FIRE SUPPORT

1-3. *Fire support* is defined as fires that directly support land, maritime, amphibious, and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives (JP 3-09).

1-4. *Joint fire support* is defined as joint fires that assist air, land, maritime, and special operations forces to move, maneuver, and control territory, populations, airspace, and key waters (JP 3-0).

1-5. The scheme of fires is the detailed, logical sequence of targets and fire support events to find and engage high-payoff targets to accomplish the supported commander's intent.

FIRE SUPPORT OFFICER

1-6. A fire support officer is a field artillery officer from company through theater army responsible for either advising the commander or assisting the chief of fires/brigade fire support officer to advise the maneuver commander on fire support matters.

SECTION II – COMBINED ARMS MANEUVER AND WIDE AREA SECURITY

1-7. Combined arms maneuver and wide area security provide the means for balancing the application of the elements of combat power within tactical actions and tasks associated with offensive, defensive, and stability operations.

1-8. *Combined arms maneuver* the application of the elements of combat power in unified action to defeat enemy ground forces; to seize, occupy, and defend land areas; and to achieve physical, temporal, and psychological advantages over the enemy to seize and exploit the initiative (ADP 3-0).

1-9. *Wide area security* is the application of the elements of combat power in unified action to protect populations, forces, infrastructure, and activities; to deny the enemy positions of advantage; and to consolidate gains in order to retain the initiative (ADP 3-0).

1-10. The combined arms team is formed through organizational design (standing organizations) and temporary reorganization (tailored and task-organized units). Integrating the capabilities of Army forces with those of the other Services maximizes the combat power of Army forces. Teamwork within a staff and between staffs produces the staff integration essential to synchronized operations. A staff cannot work efficiently without complete cooperation among all staff sections. A force cannot operate effectively without cooperation among all headquarters (HQ).

1-11. Effective fire support provides responsive and accurate scalable fires that can deceive, degrade, delay, deny, destroy, disrupt, divert, exploit, interdict, neutralize, and suppress enemy combat formations, systems, functions, and facilities.

FIELD ARTILLERY EMPLOYMENT IN COMBINED ARMS MANEUVER

1-12. The field artillery provides the nucleus for effective fire support coordination through staff personnel, fire support agencies, and attack resources. The integration of fire support is a critical factor in the success of operations. The commander is responsible for the integration of fire support with his whole operation. The chief of fires, brigade fire support officer (FSO), and the fire support coordinator (FSCOORD) advise the commander on the allocation and use of available fire support resources. See Chapter 2.

The mission of the Field Artillery is to deliver fires and integrate those fires and scalable capabilities to enable commanders to dominate their operational environment in unified land operations.

1-13. *Field artillery* is the equipment, supplies, ammunition, and personnel involved in the use of cannon, rocket, or surface-to-surface missile launchers. Field artillery cannons are classified according to caliber as:

- Light — 120-mm and less.
- Medium — 121 to 160-mm.
- Heavy — 161 to 210-mm.
- Very heavy — greater than 210-mm (JP 3-09).

1-14. Fire support synchronizes and integrates Army, joint and multinational fire support assets at the designated place and time. Fires are critical to accomplishing offensive and defensive operations. However, nonlethal effects are also important contributors to decisive action, regardless of which element dominates. Accomplishing the mission by achieving an appropriate mix of lethal and nonlethal effects remains an important consideration for every commander.

SECTION III - COMBAT POWER

1-15. *Combat power* is the total means of destructive, constructive, and information capabilities that a military unit/for formation can apply at a given time. Army forces generate combat power by converting potential into effective action (FM 1-02). Commanders conceptualize capabilities in terms of combat power. There are eight elements of combat power: leadership, information, mission command, movement and maneuver, intelligence, fires, sustainment, and protection. Commanders apply leadership and information through, and multiply the effects of, the other six elements of combat power. The Army collectively describes these six—mission command, movement and maneuver, intelligence, fires, sustainment, and protection—as the warfighting functions. Commanders apply combat power using leadership and information through the warfighting functions. See Figure 1-1.

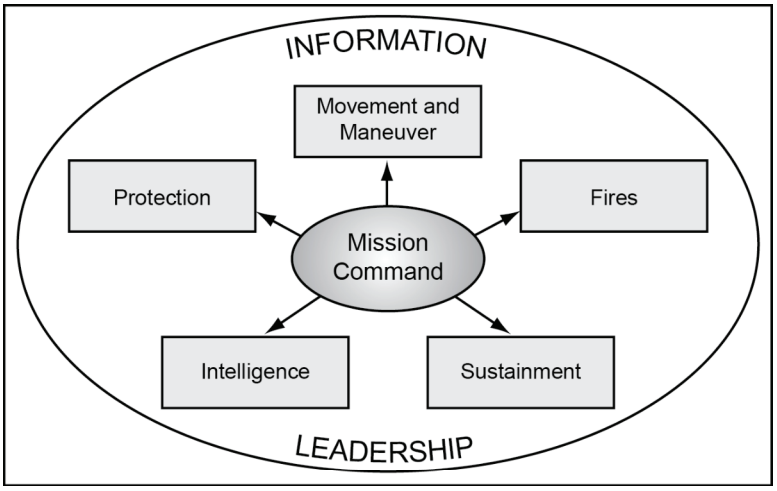

Figure 1-1. The Elements of Combat Power

1-16. A *warfighting function* is a group of tasks and systems (people, organizations, information, and processes) united by a common purpose that commanders use to accomplish missions and training objectives (ADP 3-0).

SECTION IV - THE FIRES WARFIGHTING FUNCTION AND ITS RELATIONSHIP TO THE OTHER WARFIGHTING FUNCTIONS

1-17. The *fires warfighting function* is the related tasks and systems that provide collective and coordinated use of Army indirect fires, air and missile defense, and joint fires through the targeting process. (ADP 3-0) It includes tasks associated with integrating and synchronizing the effects of these fires, as well as scalable capabilities, with the effects of other warfighting functions. Commanders integrate these tasks into the concept of operations during planning and adjust them based on the targeting guidance. Fires normally contribute to the overall effect of maneuver, but commanders may use them separately for decisive and shaping operations. The fires warfighting function includes the following tasks:

- Decide surface targets.
- Detect and locate surface targets.
- Provide fire support.
- Assess effectiveness.
- Conduct air and missile defense.

1-18. Fires are broadly categorized as offensive and defensive fires. These fires are distinguished by their purposes, apply from the tactical to the strategic levels, and are employed in decisive, shaping, and sustaining operations. See Chapter 3 for additional information.

1-19. The fires warfighting function includes tasks associated with integrating and synchronizing the effects of Army indirect fires and joint fires with the effects of other warfighting functions. These activities are integrated into the concept of operations during planning and targeting based on the targeting guidance. The fires warfighting function includes the following Army indirect fires tasks—

- Decide Surface Targets. "Decide" is the first function of the targeting process. It begins with planning. Based on the commander's concept of the operation, intelligence preparation of the battlefield (IPB) is conducted and the staff helps the G-3/S-3 develop the reconnaissance and surveillance plan. The COF/brigade FSO normally leads the targeting working group and directs the targeting process; the deputy commander, chief of staff (executive officer) or operations officer chairs the targeting board. Based on the commander's concept of the operation and his targeting guidance, the COF/brigade FSO and targeting working group determine the targets that if successfully attacked will contribute to the success of the mission. The COF/brigade FSO and

targeting working group recommend how each target should be engaged in terms of the degree and duration of the commander's desired effects; construct a high-payoff target list (HPTL) of prioritized targets; determine target selection standards (TSS); and prepare the attack guidance matrix (AGM) for the commander' approval. Subsequently they prepare a targeting synchronization matrix that includes the prioritized high-payoff targets (HPTs), reconnaissance, surveillance and target acquisition (TA) assets tasked to acquire them, friendly assets tasked to attack them, desired effects and associated measures of performance (MOPs) and measures of effectiveness (MOEs) for assessment, and the assets tasked to conduct assessment. These targeting process products are briefed to the commander and his decisions translated into the operation order (OPORD) with annexes. TSS are criteria, applied to adversary or enemy activity (acquisitions and battlefield information), used in deciding whether the activity is a target. The standards address accuracy or other specific criteria that must be met before the targets can be engaged. The targeting board meets to recommend the working group's proposals and receive the commander's approval or additional guidance. Chapter 3 of this FM and FM 3-60 provide more detail.

- Detect and Locate Surface Targets. "Detect" is the next critical function of the targeting process. The G-2/S-2 is the main figure in directing the effort to detect HPTs identified in the decide function of the targeting process. Execution of the ISR plan begins during preparation and continues throughout execution. Reconnaissance, surveillance, and TA assets that can be tasked to detect HPTs are described in Chapter 2 of this FM. Targets and suspected targets are passed to the targeting working group for comparison with the AGM. Those that meet established criteria are passed to firing units for attack during execution. Chapters 2 and 3 of this FM provide more detail.
- Provide Fire Support. Fires are "delivered" (the third function in the targeting process) on targets during execution. Chapter 2 of this FM describes fire support, including the role and responsibilities of the COF/brigade FSO. Chapter 3 describes planning, preparing, executing, and assessing fire support. Appendix A describes fire support coordination and other control measures. Appendix B describes field artillery inherent responsibilities in Army command and support relationships and the fundamentals of task-organizing field artillery.
- Assess effectiveness. *Assessment* (Army) is the continuous monitoring and evaluating the current situation and the progress of an operation (ADP 3-0). Assessment includes evaluating the operations against MOPs and MOEs which provide a basis for the commander and COF/ brigade fire support officer and fires battalion commander to evaluate the contribution of scalable Army indirect fires and joint fires have made to achieve the desired end state. *Combat assessment* is the determination of the overall effectiveness of force employment during military operations. Combat assessment is composed of three major components: (a) battle damage assessment; (b) munitions effectiveness assessment; and (c) reattack recommendation (JP 3-60).

1-20. The air and missile defense component of the fires warfighting function defeats aerial and missile attack, and surveillance and provides a second line of protection by detecting and destroying incoming enemy rockets, and artillery and mortar projectiles while they are in flight. See FM 3-01 for further information on air and missile defense.

BASICS OF THE FIRES WARFIGHTING FUNCTION

MAINTAIN A BROAD VIEW OF THE FIRES WARFIGHTING FUNCTION

1-21. The Army fires community needs a broad view of today's operational environment due to the rapid increase of threat capabilities to joint, Army, multinational forces, population centers, and critical infrastructures. To defeat these threats, from simple to complicated, it is imperative to provide 360 degree, all-weather, persistent fires coverage. Wide area security and combined arms maneuver require defensive fires to protect friendly forces, population centers and critical infrastructure.

EMPLOY VERSATILE ARMY FIRES CAPABILITIES

1-22. Our foundation for employing versatile Army Fires capabilities is our leaders and Soldiers. Everyone must be skilled at decisive action, not just in one core competency. Joint commanders require Soldiers and leaders who are able to operate anywhere along the spectrum of operations and do so with competence and

professionalism. Through training, education, leader development programs, and operational experience we will give our leaders and Soldiers the skills necessary to perform a broad range of missions and tasks required by mission variables. Mission variables are mission, enemy, terrain and weather, troops and support available, time available and civil considerations (METT-TC). Versatile and adaptive fires also mean providing a range of capabilities to achieve desired precision as well as area effects. See Chapter 2 for a discussion of Army munitions attributes. In order to attain the appropriate fire support mix on the battlefield we will use cannons, rockets, missiles, mortars, and sensors and understand how to access and apply joint, Army, and multinational fires.

IDENTIFY, LOCATE, TARGET, AND ENGAGE THREATS WITH INCREASED DISCRIMINATION

1-23. For the past several years, success on the battlefield has required at times precision and the use of proportional force to gain/maintain the support of indigenous populations, prevent fratricide, and minimize collateral damage. The Army must be able to rapidly discriminate friend from foe on the battlefield as well as provide multi-echelon common operational picture. Due to the urbanization of the combat zones our enemies operate in, this requirement is unlikely to change any time soon.

1-24. In order to achieve this in the operating environment, physical reconnaissance and surveillance will be complemented by intelligence technology – not dictated by it. The ability to use data from both human and materiel sources provide not only better intelligence but also more reliable target and fire-control quality data.

1-25. Army fires combine with joint and multinational assets via an integrated fire control capability to recommend the best weapon to counter evolving threats from land, sea, air and space. Automated aids assist in reducing target location error. Scalable capabilities in our munitions and task-organized composite units assist to achieve the desired effects.

1-26. Electronic attack capabilities must also provide discrete effects to minimize collateral damage, prevent disruption of friendly force operations and prevent the disruption of an increasingly crowded civilian electro-magnetic spectrum. Electronic attack capabilities provide commanders with another option to engage targets in environments with the high potential for fratricide and/or collateral damage.

1-27. Fires create discrete effects proportional to the target or threat type and situation, thus minimizing collateral damage, unintended consequences, and residual hazards.

INTEGRATE JOINT, ARMY, AND MULTINATIONAL CAPABILITIES

1-28. In order to develop a common operational picture and offensive and defensive fires, the capabilities of other Army warfighting functions, special operation forces, joint services, interagency, and multinational partners must be integrated on the battlefield. Although this will create some redundancy across the board, overall it will create an optimal environment because it will mitigate restrictions and resource shortfalls, as well as cover gaps within the area of operations. Indirect fires – artillery, mortar, and naval surface fire support – provide an all weather, 24/7 fires capability for the warfighter. Interoperability will also be key, as well as the ability to attack targets and threats identified and located by organic and nonorganic sensors. This interoperability includes the ability to successfully hand targets off to other organizations throughout the area of operations.

DISTRIBUTE FIRES CAPABILITIES FOR DECENTRALIZED CONTROL OF OPERATIONS

1-29. The goal of distributed fires is to ensure joint, Army, and multinational forces always have timely and responsive fires for combined arms maneuver and wide area security operations. To increase operations for commanders at all echelons, the fires command network must enable centralized as well as decentralized control of operations. Fires capabilities, from precision fires using “one system, one round” to the ability to mass the effects of multiple systems against single or multiple targets, will be distributed throughout the area of operations.

MISSION COMMAND

1-30. The *mission command warfighting function* develops and integrates those activities enabling a commander to balance the art of command and the science of control (ADP 3-0). Through mission command, commanders integrate all warfighting functions to accomplish the mission. Mission command invokes the greatest possible freedom of action to subordinate leaders by empowering them and sharing information to facilitate decentralized execution in concert with the commander's intent.

1-31. Mission command networks and systems is the coordinated application of personnel, networks, procedures, equipment and facilities, knowledge management, and information management systems essential for the commander to conduct operations. The integration of airspace command and control is a component of mission command that is also essential to the fires warfighting function. For more on the Mission Command warfighting function see ADP 3-0. For more on airspace control, see FM 3-52.

MOVEMENT AND MANEUVER

1-32. The *movement and maneuver warfighting function* is the related tasks and systems that move and employ forces to achieve a position of relative advantage over the enemy and other threats (ADP 3-0). Direct fire and close combat is inherent in maneuver.

1-33. Effective maneuver requires close coordination with fires. Maneuver and fires are inseparable and complementary dynamics of combat. Each can create battlefield conditions that enhance the effective application of the other. Fires are a major destructive element of combat power and play a significant role in a unit's ability to destroy the enemy's combat capabilities and his will to fight. Fires delay, disrupt, neutralize, and destroy enemy forces, combat functions and facilities. Fires help breach enemy obstacles, and in combination with engineer obstacles, disrupt, canalize, block, or fix an enemy force. Fires can destroy enemy forces and restrict the enemy's ability to counter friendly actions; thereby setting the stage for successful maneuver operations. Units can use maneuver to force enemy units into kill zones or concentrated formations where fire support can achieve maximum effectiveness and efficiency. One without the other lessens the chances of success. Combined, they make destroying larger enemy forces feasible and enhance protection of friendly forces.

1-34. For more on the movement and maneuver warfighting function see ADP 3-0 and FM 3-90. FM 3-35 discusses Army deployment and redeployment.

INTELLIGENCE

1-35. The *intelligence warfighting function* is the related tasks and systems that facilitate understanding of the enemy, terrain, and civil considerations (ADP 3-0). The intelligence and fires warfighting functions have a dynamic relationship. In order for the commander to apply the required amount of fire support, he must have a reliable picture of the disposition of his adversary or enemy. Intelligence is more than just collection. It is a continuous process that involves analyzing information from all sources and conducting operations to develop the situation. The commander obtains this intelligence picture through intelligence reach support from national resources. Target intelligence can come from many sources such as —

- Direct observation by SOF, scouts, combat observation and lasing teams (COLTs), fire support team (FIST) headquarters and its platoon forward observers (FOs).
- EW sources such as the Prophet radio frequency intercept system.
- Human intelligence sources employed by military intelligence tactical human intelligence platoons.
- Weapons-locating radar (for example the Firefinder AN/TPQ-36 and AN/TPQ-37 counterfire radars and AN/TPQ-48-50 lightweight countermortar radars).
- Unmanned aircraft systems (UAS).
- Forward air controller (FAC) (airborne) (FAC(A)) and strike coordination and reconnaissance aircraft.
- Higher HQ and joint sources including the Joint Surveillance Target Attack Radar System.
- Maneuver formations – in which every Soldier becomes a sensor.

1-36. Information feeds from these sources populate myriad intelligence information systems databases. These databases may generate target nominations that are digitally transmitted to the Advanced Field Artillery Tactical Data System (AFATDS) for mission processing. Assessment of fires on enemy forces, combat functions, and facilities generates additional intelligence.

1-37. For more on the intelligence warfighting function see FM 2-0. See also FM 2-01.3 and FMI 2-01.301 for information on intelligence preparation of the battlefield.

SUSTAINMENT

1-38. The *sustainment warfighting function* is the related tasks and systems that provide support and services to ensure freedom of action, extend operational reach, and prolong endurance (ADP 3-0).

1-39. The sustainment and fires warfighting functions have a dynamic relationship. Fires can be applied to achieve lethal and/or nonlethal effects on enemy or adversary forces, combat functions and facilities that threaten sustainment operations. Supply of ammunition is among the largest and most time-sensitive of sustainment tasks. Field artillerymen in maneuver organizations and in fires brigades and battalions are sustained by personnel services and health service support. Sustainment ensures the endurance of fires that support all operations.

1-40. FM 4-0 describes the sustainment warfighting function; FM 4-90 discusses the brigade support battalion while FM 4-02 addresses the Army Health System.

PROTECTION

1-41. The *protection warfighting function* is the related tasks and systems that preserve the force so the commander can apply maximum combat power to accomplish the mission (ADP 3-0). Within the protection warfighting function air and missile defense is important to the fires warfighting function. Areas of the fires warfighting function, such as counterfire, also contribute to the protection warfighting function.

1-42. *Counterfire* is fire intended to destroy or neutralize enemy weapons. Includes counterbattery and countermortar fire (JP 3-09). Counterfire contributes to the protection warfighting function by providing reactive or proactive fires against enemy indirect fire systems. It protects friendly forces, combat functions and facilities from enemy indirect fires by disrupting, neutralizing or destroying enemy indirect fire weapons systems. The air and missile defense component of the fires warfighting function contributes to the protection warfighting function by defeating aerial attack, missile attack, and surveillance and by detecting and destroying incoming enemy rockets, and artillery and mortar projectiles while in flight.

SECTION V – FIRE SUPPORT AND THE PRINCIPLES OF JOINT OPERATIONS

1-43. The twelve principles of joint operations represent the most important nonphysical factors that affect the conduct of operations at the strategic, operational, and tactical levels. These twelve principles provide guidelines for combining the elements of combat power and for employing fire support.

OBJECTIVE

1-44. Direct every military operation toward a clearly defined, decisive, and attainable objective. Objective means ensuring all fire support actions contribute to the supported commander's mission. The fire support plan must have a clearly defined objective that supports the commander's intent. Objectives allow commanders to focus combat power on the most important tasks. The COF/brigade FSO/FSCOORD translates operational objectives into specific targeting and attack guidance that he recommends to the commander. This guidance includes instructions for attacking predetermined HPTs.

OFFENSIVE

1-45. Seize, retain, and exploit the initiative. Fire support must always be conducted in the spirit of the offense. For example, field artillery is never held in reserve. Effective fire support must maintain responsiveness and fire superiority to allow the supported force to seize and retain the initiative.

1-46. Regardless of whether the force is engaged in the offense or is in a defensive posture, fire support is used offensively to strike HPTs. Fire support must be primarily preemptive, with the ability for rapid reaction to unforeseen requirements. The aggressive application of fires can keep an enemy off balance and in a reactive state. Disrupting his operations throughout the AO with synchronized fires can prevent the enemy from establishing his desired tempo of operations and concentration of forces. The use of clearly stated fire support tasks (FSTs), concise fire plans, and decentralized control of fire support assets and fires are ways to facilitate increased initiative.

MASS

1-47. Concentrate the effects of combat power at the decisive place and time. Fire support weapons and units are normally not physically massed, but they must be able to provide maximum massed fires when and where they are required. The actual methods of achieving massed fires vary with each attack resource. Commanders select the method that best fits the circumstances. Army forces can mass fires quickly and across large distances. Commanders can use fires to achieve mass by—

- Allocating fire support assets to add weight to the decisive operation. This includes attack and TA assets, observers, fire support/liaison teams, and ammunition.
- Assigning priorities of fires and quickfire channels.
- Focusing target acquisition/intelligence assets.
- Concentrating fire support assets on one aspect of fire support such as fires in support of close combat.

ECONOMY OF FORCE

1-48. Allocate minimum essential combat power to secondary efforts. There are rarely enough fire support assets to concurrently support every demand for fire support. A unit might be required to conduct operations with minimum essential fire support and accept risk. Economy of force also implies that the effort allocated to a given FST shall not exceed the effort necessary to produce the commander’s desired effects.

MANEUVER

1-49. Place the enemy in a disadvantageous position through the flexible application of combat power. Fire support plans must have the flexibility to include altered missions, command relationships, and priorities. Fire support units must also displace rapidly, keep pace with the maneuver arms in the current operation, and position as needed to support future operations. Combating a hybrid threat may demand different fire unit positioning considerations within the same AO. Mission variables may require some fires units to be employed as widely separated platoons to achieve the necessary fires range to enable wide area security in one portion of the AO. Another part of the AO may require fires units to position closer to each other to mass fires to support combined arms maneuver.

UNITY OF COMMAND

1-50. For every objective, ensure unity of effort under one responsible commander. Fires must be synchronized with the supported commander's scheme of maneuver. Based on his intent and guidance for fire support, the commander can delegate to his COF/FSO the requisite authority to direct and coordinate all fire support on his behalf. Fires brigades or fires battalions can be designated as a force field artillery HQ to synchronize, coordinate, and employ the fires of multiple units and assets in support of the commander’s concept of operations.

SECURITY

1-51. Never permit the enemy to acquire an unexpected advantage. There are two aspects of security in relation to fire support. The first aspect concerns general security, which fire support helps provide for the supported force. The second aspect is the continued survivability of trained fires personnel, fire support command networks and control facilities, target acquisition, and fire support weapons systems.

SURPRISE

1-52. Strike the enemy at a time or place or in a manner for which he is unprepared. Fire support enables the commander to achieve surprise with the delivery of a high volume of fire or precision munitions on the enemy without warning. Commanders can use fire support to achieve surprise by—

- Rapidly and discreetly repositioning fire support assets and/or shifting and massing fires.
- Using short, intense programs of fires, such as those for suppression of enemy air defenses (SEAD) and counterfire, against key enemy functions at critical times.
- Using terminally guided munitions (TGMs) to strike a target. See Chapter 2 for a discussion of TGMs.
- Deceiving the enemy as to the types, numbers, locations, and capabilities of friendly fire support assets.

SIMPLICITY

1-53. Prepare clear, uncomplicated plans and clear, concise orders to ensure thorough understanding. Fire support coordination is a complex series of interactions. For this reason, the COF/FSO makes every effort to ensure that fire support plans are clear and uncomplicated.

PERSEVERANCE

1-54. Ensure the commitment necessary to attain the national strategic end state. See JP 3-0 for a discussion of perseverance.

LEGITIMACY

1-55. Develop and maintain the will necessary to attain the national strategic end state. See JP 3-0 for a discussion of legitimacy.

RESTRAINT

1-56. Limit collateral damage and prevent the unnecessary use of force. Fire support restraint typically concerns the munitions employed and the targets engaged to achieve lethal effects. Having the ability to employ a weapon does not mean it should be employed. In addition to collateral damage considerations, the employment of some weapons – bombs, artillery, and mortars – could have negative inform and influence activity effects by producing the perception of instability or security concerns. Collateral damage could adversely affect efforts to gain or maintain legitimacy and impede the attainment of both short- and long-term goals. The use of nonlethal capabilities should be considered to fill the gap between verbal warnings and deadly force to avoid unnecessarily raising the level of conflict. Excessive force antagonizes those friendly and neutral parties involved. Restraint increases the legitimacy of the organization that uses it while potentially damaging the legitimacy of an opponent.

1-57. The actions of military personnel and units are framed by the disciplined application of force, including specific rules of engagement (ROE). *Rules of engagement* are directives issued by competent military authority that delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered (JP 1-04). Successful employment of fires requires a common understanding by commanders and their fire support personnel. Commanders must limit collateral damage and apply force precisely to accomplish the mission without causing unnecessary loss of life, suffering, or damage to infrastructure. Fires units and fire support

personnel must be properly trained in the ROE and quickly informed of any changes. ROE may vary, but should always be consistent with the inherent right of self-defense. See Chapter 3 for a discussion of the commander's guidance for fires.

1-58. Given timely and accurate intelligence to determine targets and their locations, TGMs may achieve the desired effects while mitigating adverse effects.

Chapter 2
The Fires Warfighting Function

The fires warfighting function uses a diverse group of systems, personnel, and materiel—most of which operate in different ways in providing different capabilities. Section I begins with mission command as conducted by fire support units. Section II follows with a description of intelligence, surveillance, and target acquisition (TA) operations. Section III is devoted to attack resources, and Section IV concludes with a discussion of sustainment.

SECTION I – MISSION COMMAND OF FIRE SUPPORT ORGANIZATIONS

2-1. Mission command of fire support organizations is enhanced by an arrangement of personnel, automation control equipment, communications, facilities, and procedures employed by a commander and his fire support personnel to plan, prepare, execute, and assess fire support relationships or missions, and tasks.

FIRES UNITS

FIRES BRIGADES

2-2. A fires brigade's (FIB) primary task is conducting strike operations. The FIB is the only Army field artillery organization above the brigade combat team (BCT) and can be directed to execute tasks for any joint, Service, or functional headquarters. The FIB is neither organic to any Army organization or echelon, nor is it focused on any specific region or geographic combatant commander's area of responsibility. A division, corps, joint force land component command, joint task force (JTF) or other force may have a FIB assigned, attached or placed under operational control (OPCON); however, the FIB is normally attached to a division headquarters (HQ). When operating under the control of the joint force commander or another Service, the Army Service component command exercises administrative control over the FIB. Fires brigades are task-organized to accomplish assigned tasks. The brigade's higher headquarters usually assigns the brigade missions in terms of target sets to engage, target priorities, or effects to achieve. The situation may also require the brigade to control joint fires assets.

2-3. The FIB gives the supported commander a HQ to plan, synchronize, and execute close support fires for engaged forces, strike, counterfire, and fires in support of decisive and shaping operations throughout the command's area of operations (AO). The fires brigade is capable of employing or coordinating the employment of Army indirect fires; joint air and surface fires and multinational fires. The FIB has the necessary mission command structure to integrate ground and air forces and function as a maneuver HQ for limited operations. The FIB HQ may require augmentation of intelligence assets, reconnaissance forces and FIST teams (equipment and personnel) while functioning as a maneuver HQ. The FIB's supported commander assigns the FIB its mission and possibly an AO. The supported commander provides guidance on coordinating its actions with BCTs and other supporting brigades in the command. The FIB's supported commander provides supporting units to the FIB as necessary. The FIB might be required to detach some of its subordinate elements to BCTs or other supporting brigades of the command. BCTs, reconnaissance and surveillance brigades, maneuver enhancement brigades, combat aviation brigades, and sustainment brigades can all support FIB operations.

2-4. Fires brigades are characterized by network enabled intelligence, communications, and automation systems that facilitate the efficient application of fires. A FIB with organic, assigned, attached or OPCON high mobility artillery rocket system (HIMARS) or towed howitzer units, and weapons locating radars has air transportable fires assets within a joint operations area.

2-5. Organic FIB assets include a rocket/missile battalion equipped with either the M270A1 track multiple launch rocket system (MLRS) or the M142 wheel HIMARS. The FIB also includes a brigade support battalion (BSB), HQ and HQ battery (HHB), a signal network support company, and a TA battery (TAB).

2-6. The FIB and each of its subordinate organizations can be task-organized as required. This may include a combination of 1 to 5 rocket/missile and/or cannon fires battalions, counterfire radars and other capabilities. Executing field artillery strike operations may require placing additional reconnaissance, surveillance and EW capabilities under the OPCON of the fires brigade HQ. Alternatively, the battlefield surveillance brigade can retain control of surveillance and reconnaissance assets and provide targeting information to the FIB through a support relationship.

Note. Non-BCT cannon battalions assigned or attached to a FIB typically are organized in 3 firing batteries of 4 or 6 guns each. The battalions may have either self-propelled (SP) or towed cannons.

2-7. The FIB is capable of being a supported or supporting unit that is trained, manned, organized, and equipped to provide for the collective and coordinated use of Army indirect fires, joint fires, and control for its own or a supported HQ operations. This includes integrating and synchronizing physical attack, and electronic warfare operations against enemy and adversary command and control. FIBs have the necessary fire support and targeting structure to effectively execute the entire decide, detect, deliver, and assess (D3A) targeting process for their assigned mission. The FIB is capable of providing the division, corps, JFLCC, JTF or other supported commander with the following—

- A force field artillery HQ (if so designated by the commander of the FIB's controlling HQ).
- A HQ able to mission command the full complement of Army and joint fire support capabilities. The FIB table of organization and equipment includes a tactical air control party (TACP) which must be resourced by the U.S. Air Force. This normally occurs when the fires brigade is deployed. Control of multinational fires may require augmentation by personnel with the necessary language skills and communications equipment.
- Technical oversight of all field artillery-specific training within the command.
- Assisting the supported commander in training preparation for deployment of the organization's field artillery personnel.
- The FIB is capable of providing fires and radar coverage —
    - Strike operations and counterfire.
    - Support to decisive and shaping operations.
    - Close support to engaged forces (such as reinforcing fires for BCT organic fires battalions).
    - Suppression of enemy air defenses to support joint and Army aviation attack operations.
    - Support of SOF operating in the AO of the FIB's controlling HQ (for example, division, corps, JTF, or land component HQ AO).
    - Support of other support brigades in the FIB's supported commander's AO.

BCT ORGANIC FIRES BATTALIONS

2-8. The BCT's organic fires battalion provides responsive and accurate field artillery fire support including close support fires and counterfire to the BCT and its subordinate units in priority and for operations as assigned by the BCT commander. The BCT's fires battalion has an organic command relationship but the BCT commander may assign a support relationship.

2-9. The fires battalion also has organic counterfire radars and may be reinforced by a fires brigade, U.S. Marine Corps, or multinational artillery units.

2-10. The BCT fires battalion interacts with the BCT's organic fire support capability at each maneuver echelon—a fires cell (FC) and COLTs at BCT level; FCs in each battalion; and fire support teams (FISTs) and observers at company level. The fires battalion is also able to operate over a widely dispersed area due to its enhanced communications capability, its organic counterfire radars, and support from the BCT's surveillance and reconnaissance capabilities. A forward support company (FSC) performs all logistic

support functions for the HBCT and IBCT fires battalion. The SBCT field maintenance company provides combat repair team support to conduct field maintenance. The field maintenance company provides lift capabilities for the repair shops, recovery of organic equipment, recovery of equipment belonging to supported units, and support of maintenance evacuation.

2-11. For more on fires battalions see FM 3-09.21.

Heavy Brigade Combat Team Fires Battalion

2-12. The fires battalion includes 2 8-gun batteries of M109A6 Paladin SP 155-mm howitzers organized into 2 platoons of 4 guns each. See FM 3-09.70 for additional information on M109A6 Paladin howitzer operations.

Stryker Brigade Combat Team Fires Battalion

2-13. The SBCT fires battalion has 3 6-gun lightweight M777-series 155-mm towed howitzer batteries. This permits each battery to be organized with 2 firing platoons of 3 guns each. The aviation brigade can transport the firing batteries' lightweight 155-mm howitzers by CH-47 helicopter (dependent on environmental conditions).

Infantry Brigade Combat Team Fires Battalion

2-14. The IBCT fires battalion has 2 8-gun M119-series 105-mm towed howitzer batteries organized into 2 platoons of 4 guns each but may be task organized with up to a battery of 155-mm howitzers. The aviation brigade can transport the firing batteries' 105-mm howitzers by either UH-60 or CH-47 helicopter (dependent on environmental conditions).

CHIEF OF FIRES

2-15. **The chief of fires is the senior organic field artillery officer at division and higher headquarters level who is responsible for advising the commander on the best use of available fire support resources, providing input to necessary orders, and developing and implementing the fire support plan.** These duties and responsibilities should be fully delineated by the commander. The COF may be given authority by the commander to 1) provide for consolidated and focused FS-specific training, readiness, and oversight (personnel management, equipment issue, and training); 2) facilitate establishing standard operating procedures across the force (to save time and ensure a single standard); 3) ensure efficiently resourced training packages (limit requirements for force taskings and cut down on coordination requirements between units); 4) support team building, and 5) planning for the allocation of FA assets. The COF is assisted in these duties, particularly in staff functions, by the fire support personnel organic to the force but who initially may not be under the COF's direct control until the commander grants that authority. The COF should be authorized to conduct FS-specific training and recommend to the commander the certification for the various elements of the force's entire FS system, preferably after live-fire exercise.

2-16. The COF plans and coordinates the fires warfighting function. He works closely with the Chief of Staff/Executive Officer and G-3 to ensure mutual understanding of all aspects of planning, preparation, execution and assessment of fire support for operations. The COF's responsibilities include, but are not limited to —

- Developing, with the commander and G-3/S-3, a scheme of fires to support the operation.
- Planning and coordinating fire support tasks.
- Integrating and synchronizing cyber/electromagnetic activities with the concept of operations.
- Developing a proposed high-priority target list, target selection standards, and an attack guidance matrix.
- Identifying named and target areas of interest, high-value targets, high-priority targets, and additional events that may influence the positioning of fire support assets.
- Coordinating positioning of fire support assets.
- Providing information on the status of fire support attack assets, target acquisition assets, and field artillery ammunition.

- Coordinating and synchronizing joint fire support.
- Managing field artillery ammunition requirements, resupply, and re-allocation.
- Recommending fire support coordination measures to support current and future operations and managing changes to them.
- Recommending and implementing the commander's counterfire (including radar zones) and other target engagement priorities.
- Recommending to the commander the establishment, responsibilities, authorities, and duties of a force field artillery headquarters as necessary.
- Planning, preparing, executing, and assessing all aspects of fire support for operations.
- Conducting the tasks associated with integrating and synchronizing scalable Army indirect fires, joint fires, and multinational fires with the other warfighting functions.
- Directing and supervising the fires cell in planning, preparing, executing, and assessing all fire support for operations and the development of respective products to support the operation plan (OPLAN) and operation order (OPORD) development (see Chapter 3).
- Training FC personnel to perform all of their functions.
- Advising the commander and staff of available fire support capabilities and limitations.
- Providing the commander with staff oversight for the field artillery units and fire support personnel in the BCTs. This includes all fires warfighting function related training and readiness including the training, standardization, and readiness of all fire support/field artillery personnel and maintenance and readiness of fire support/field artillery-specific equipment. The extent of such oversight duties and responsibilities should be specified by the commander.
- Leading the targeting working group.
- Participating in the unit military decisionmaking process (MDMP).
- Working with the Chief of Staff/ Executive Officer, and G-3 to integrate all types of fire support into the commander's concept of operation.
- When directed, accompanying the commander in the command group during execution of tactical operations.

FIRE SUPPORT COORDINATOR

2-17. **The fire support coordinator is the brigade combat team's organic fires battalion commander; if a fires brigade is designated as the division force field artillery headquarters, the fires brigade commander is the division's fire support coordinator and is assisted by the chief of fires who then serves as the deputy fire support coordinator during the period the force field artillery headquarters is in effect.** The fire support coordinator is the primary advisor on the planning for and employment of field artillery and fire support. The responsibilities and authority given to the FSCOORD should be fully delineated by the supported commander. The FSCOORD may be given authority by the commander to 1) provide for consolidated and focused FS-specific training, certification, readiness, and oversight (personnel management, equipment issue, and training); 2) facilitate establishing standard operating procedures across the brigade (to save time and ensure a single standard); 3) ensure efficiently resourced training packages (limit requirements for unit taskings and reduce coordination requirements between units); 4) oversee the professional development of the 13-series career management field Soldiers assigned to the BCT, and 5) support team building. The FSCOORD is assisted in these duties, particularly in staff functions, by the brigade FSO and the other fire support personnel organic to the BCT but who initially may not be under the FSCOORD's control unless the brigade commander grants that authority. The FSCOORD may be authorized to conduct FS-specific training and may recommend to the commander the certification for the various elements of the BCT's entire FS system, preferably after live-fire exercises.

BRIGADE FIRE SUPPORT OFFICER

2-18. The brigade FSO is the senior field artillery staff officer responsible for all fires planning and execution. The brigade FSO's duties and responsibilities are similar to those of the COF.

FORCE FIELD ARTILLERY HEADQUARTERS

2-19. **If one is designated by the supported commander, the force field artillery headquarters is normally the senior field artillery headquarters organic, assigned, attached, or placed under the operational control of that command. The supported commander specifies the commensurate responsibilities of the force field artillery headquarters and, if necessary, the duration of those responsibilities.** These responsibilities are based on the mission variables of mission, enemy, terrain and weather, troops and support available, time available and civil considerations (METT-TC), and may range from simple mentoring and technical oversight to established command relationships with all field artillery units organic, assigned, attached or placed OPCON of that command.

2-20. When a FIB is designated as the Force Field Artillery Headquarters (FFA HQ) by a supported division commander, the FIB commander assumes the responsibility as FSCOORD for the division. The division chief of fires serves as the deputy FSCOORD and takes direction and guidance from the FSCOORD. If the FIB is not designated as the FFA HQ, the Division Chief of Fires maintains this responsibility.

2-21. The force field artillery commander recommends for approval a command or support relationship for the U.S. Army field artillery units. U.S. Marine Corps or NATO field artillery units that are attached or OPCON are given field artillery tactical missions and responsibilities in accordance with STANAG 2484, which guides those units. Other multinational field artillery units that are attached or OPCON are given tactical missions and responsibilities in accordance with their national guidance. A FIB assigned, attached or placed OPCON to a division, corps, JFLCC, JTF or other command may serve as that command's force field artillery HQ. The BCT's organic fires battalion, when directed to do so by the BCT commander, may serve as the BCT's force field artillery HQ of any additional field artillery assets attached or placed OPCON to the BCT. The force field artillery HQ functions include:

- Recommending the field artillery organization for combat to the commander.
- Providing mission command for field artillery units organic, assigned, attached, or placed under the OPCON or tactical control of the command (thus providing unity of field artillery command).
- Assists the fires cell in producing Annex D (Fires) for the operations order.
- Training and certification of the field artillery units that are assigned, attached, or placed under the OPCON of the command and mentoring of the commanders and leaders of these field artillery units. This includes field artillery technical oversight of the training and assessment of the fires battalions and other field artillery units organic to BCTs and supporting brigades. Assisting the supported commander in training preparation for deployment of maneuver organization field artillery personnel. The extent of oversight duties and responsibilities must be specified by the division or other supported commander to ensure full cooperation and compliance by the BCT and other supporting brigade commanders.
- Advising the supported commander on field artillery related new equipment fielding and software updates within field artillery units.
- Establishing common survey, metrological, and radar TA plans for the command.
- Planning, preparing, and executing fires for close support of engaged forces, and in support of strike, counterfire, and decisive and shaping operations.
- Providing centralized mission command for the full complement of Army indirect fires, joint fires, and multinational fires provided in support of the command. This is especially useful to the commander in circumstances where major combat operations are likely and when deconfliction of fires across multiple contiguous AOs is required. Centralized mission command of supporting Army

and joint fires is useful when unconventional forces are operating either independently or as the only force integrated within indigenous forces and require dedicated all-weather fires and fire support coordination.

- Working with the command's assistant chief of staff, operations (G-3) and fires cell in planning, coordinating, and executing fire support tasks assigned to the command by its higher HQ. This can include assisting in the development of fire support plans; accepting or passing control of fires during passage of lines operations; facilitating single point of contact for outside agency coordination for strike and counterfire; and coordinating sustainment of fire support for non-organic field artillery units and the command's subordinate units.
- Facilitating and participating in the commander's targeting process.

2-22. Designating a force field artillery HQ for a command improves centralized control of field artillery in the force enhancing—

- The massing of field artillery fires where needed.
- Coverage of the force AO by field artillery fires and radars.
- Rapid shifting of field artillery fires as needed to weight the decisive operation.
- Effective planning for field artillery fires in support of rapid maneuver.
- If so directed by the supported commander, standardization of field artillery training, readiness and maintenance throughout the force.
- Planning the fires and positions of all field artillery units with a general support or general support-reinforcing support relationship to the force.
- Coordinating the counterfire battle for the supported commander.
- Accepting or passing control of fires during passage of lines operations.
- Authorizing changes to approved or doctrinal communications net structures for nets it controls.
- Coordinating the sustainment of subordinate field artillery units.

2-23. Fire support personnel advise the commander on aspects of joint fire support. This includes the apportionment and allocation of fire support assets, recommended target prioritization, logistical considerations, fire planning, target nominations, and target acquisition.

Note. Whether a fires battalion or brigade is organic, assigned, attached, or OPCON, it can only be the force field artillery HQ when the supported commander specifically designates it. See FM 3-09.22 for a discussion of the force field artillery HQ for a supported command.

Theater Army Fires Cell

2-24. The theater army FC plans, coordinates, integrates, and synchronizes the employment and assessment of strategic theater fires in support of current and future theater wide operations. The FC establishes theater targeting guidance and develops theater high-value and high-payoff targets and selects theater strategic targets for attack. The cell coordinates, integrates and assigns joint, interagency and multinational firepower to targets/target systems. It synchronizes theater strategic firepower to include Army, joint, interagency, and multinational component air assets, special operations forces, naval surface fire support, and Army missiles. The cell participates in theater combat assessments (battle damage, munitions effects, re-attack requirements); develops planning guidance; provides target intelligence for theater planning and execution and coordinates with the Battlefield Coordination Detachment (BCD) collocated with the respective air operations center.

2-25. The FC uses the operations process (plan, prepare, execute, and assess) to integrate and synchronize staff activities, tasks and functions. The MDMP/Joint Operations Planning Process provides mechanisms for the cell to synchronize operations. The cell allocates its subordinate sections/elements between participating in theater army planning sessions, preparing or conducting working groups, boards and cells, and supporting the contingency command post when deployed. Within the operations process, the fires cell employs the targeting process (D3A) as the framework for its targeting functions within the joint targeting cycle.

Joint Targeting Coordination Board

2-26. The JFC defines the role and composition of the JTCB. The JTCB's roles typically include reviewing target information, developing targeting guidance and priorities, and preparing and refining joint target lists. A *joint target list* is a consolidated list of selected targets, upon which there are no restrictions placed, considered to have military significance in the joint force commander's (JFC's) operational area. The JTCB maintains a macro-level view of the joint operations area and ensures target nominations and the target nomination list. A *target nomination list* is a target-consolidated list of targets made up of the multiple candidate target lists. A prioritized list of targets drawn from the joint target list and nominated by component commanders, appropriate agencies, or the JFC's staff for inclusion on the joint integrated prioritized target list (JP 3-60).

Battlefield Coordination Detachment

2-27. The battlefield coordination detachment is an Army liaison provided by the Army component or force commander to the air operations center (AOC) and/or to the component designated by the joint force commander to assist in planning, coordinating and integrating air operations. The battlefield coordination detachment processes Army requests for air support, monitors and interprets the land battle situation for the AOC, and provides the necessary interface for exchange of current intelligence and operational data.

2-28. The BCD is collocated with the Joint Force Air Component Commander's (JFACC) joint air operations center (JAOC).

2-29. The BCD's primary mission is to facilitate the synchronization of air support for Army operations. The BCD monitors and interprets the land battle for the JFACC's staff. It passes JFLCC operational data and operational support requirements to the joint force air component and participating multinational forces, to include requests for the following—

- Air support (CAS, air interdiction (AI) and others).
- Airspace requirements.
- Airspace coordinating measures (ACMs).
- Airlift support.
- Manned and unmanned reconnaissance and surveillance.
- Joint suppression of enemy air defenses (J-SEAD).

2-30. For additional information on the BCD see Army tactics, techniques, and procedures (ATTP) 3-09.13.

Special Operations Forces

2-31. The special operations command and control element (SOCCE) is augmented with a special communications package and personnel as required. It may include Special Forces, Ranger, military information support operations, civil affairs, special operations aviation, and other SOF representatives. The SOCCE is normally collocated at corps level and above, with smaller liaison teams operating at division level and below. The SOCCE is the focal point for synchronization with the conventional forces. At corps level the SOCCE coordinates with the corps main command post's movement and maneuver cell and FC to coordinate operations; to deconflict and synchronize fires and their effects, and to reduce the possibility of fratricide. At theater army, such coordination takes place between the SOCCE, the theater army's movement and maneuver and FCs and the BCD. The SOCCE provides Army SOF locations through personal coordination and provides overlays and other friendly order of battle data to the corps and theater army FCs and the BCD.

2-32. For more on the Army SOF see FM 3-05.

CORPS, DIVISION AND BRIGADE ECHELONS

2-33. The fires cell is an organization within a command post responsible for coordinating the activities and systems that provide for the use of Army indirect fires and joint fires. Cyber/electromagnetic activities are integrated and synchronized by the electronic warfare officer through the targeting process.

2-34. A fires element (FE) is a component of the FC. An FE is normally collocated with its parent fires cell but may operate within another command post cell. Any person(s) or portion(s) of the FC operating within another command post cell (for example the plans or future operations cell) becomes the FE of that cell.

Corps Echelon

Corps Command Posts and Fires Cell

2-35. The descriptions of the corps main command post (CP) and tactical command post (TAC CP) fires cell duties and responsibilities assume that the corps HQ will be the JTF HQ—

- The corps main CP fires cell contains fires, field artillery intelligence, and EW elements. These elements are broadly responsible for conducting deliberate fire support planning for the corps, leading the targeting working groups, assisting in the conduct of targeting boards, providing target management for the joint operations area, interfacing with other joint boards/cells, providing input to the air tasking order (ATO), interfacing with the BCD and JFLCC, and coordinating requirements with other components.
- The corps TAC CP's fires cell's general responsibilities include providing feedback to the main CP fires cell, interfacing with the BCD and air support operations center (ASOC), providing the fire support input to the common operational picture, and conducting time sensitive targeting. Normally, the tactical CP fires cell executes destructive fires and commander directed nonlethal activities for a specific operation or for short durations. The fires cell may require additional augmentation from the main CP fires cell, depending on mission requirements. The tactical CP fires cell is led by the deputy COF, who may locate elsewhere as the situation requires. The TAC CP may be deployed in an AO separate from the main CP. When not controlling operations, the TAC CP will normally collocate with the main command post and perform functions designated by the commander.

United States Air Force (USAF) Elements at the Corps

2-36. The corps air liaison officer (ALO), when designated the Expeditionary Air Support Operations Group Commander, commands all Air Force personnel within the corps and is the air component commander's direct liaison to the corps commander. The corps main CP TACP, Air Force weather, and the air mobility liaison officer locate in or adjacent to the current operations, future operations, plans, fires and intelligence cells. Air Force personnel at the corps command posts provide planning expertise to integrate and use air, space, and cyberspace.

2-37. The ASOC is the principal air control agency of the theater air control system responsible for the direction and control of air operations directly supporting the ground forces. It processes and coordinates requests for immediate air support and coordinates air, space, and cyberspace missions requiring integration with other supporting arms and ground forces. The ASOC normally collocates with the Army senior tactical headquarters, normally at corps or division level.

2-38. The USAF is developing the capability for ASOCs to have a habitual relationship with the divisions. When employed, the ASOC and TACP merge to form one combat organization, under the command of a single Airman, but they remain equipped and manned to perform distinct functions in support of BCTs.

Division Echelon

Division Command Posts and Fires Cell

2-39. The fires cell in the division main CP includes fires, field artillery intelligence, combat operations and intelligence center, and EW elements. These elements are broadly responsible for conducting deliberate fire support planning for the division, leading the division targeting process working groups, assisting in the

conduct of targeting boards, providing target management for the division AO, interfacing with other division integrating and functional cells, coordinating with the ASOC, coordinating use of airspace with maneuver and airspace, and interfacing with the corps main and TAC CP fires cells.

2-40. The TAC CP has a small fires cell formed from the main CP fires cell. When the TAC CP is not deployed, these personnel augment the fires cell within the division's main CP. When deployed, the division TAC CP fires cell functions include—

- Executing the division fire support plan.
- Requesting and coordinating CAS and AI.
- Synchronizing destructive Army and joint fire support.
- Conducting destructive fire support assessment and recommending reattack.
- Recommending FSCMs.

USAF Tactical Air Control Parties at Division

2-41. The USAF provides support to the division TACPs and possibly an ASOC. The ALO commands all Air Force personnel directly supporting the division and is the air component commander's direct liaison to the division commander. The TACPs are a point of contact to coordinate preplanned and immediate air requests and to assist in coordinating air support missions. Air Force personnel supporting the division main CP may include air planners, an AI coordinator (collocated with the ASOC), an intelligence officer, an information operations officer, and an air mobility liaison officer.

2-42. The TACP at the main CP is the Air Force element in the division. This TACP is organized as an air execution cell capable of requesting and executing type 2 or 3 control of CAS missions. Manning is situation dependent but as a minimum will include an ALO and joint terminal attack controller (JTAC). Air Force weather and intelligence support may also be incorporated into this TACP. The TACP element locates in or adjacent to the fires cell and provides airpower advice and execution support to the division.

2-43. For more on the TACP see JP 3-09.3 and FM 3-52.2.

Liaison

2-44. Coordination/liaison at division with other organizations essential to effective fire support includes the Air/Naval Gunfire Liaison Company (ANGLICO). The division coordinates naval fire support through the division air/naval gunfire section of the ANGLICO. This U.S. Marine Corps organization also collocates with the division airspace command and control element and the fires cell. The ANGLICO commander serves as the divisional naval gunfire officer. Because of the design of the ANGLICO, the division is normally the highest echelon that establishes liaison with naval fire support assets.

Brigade Echelon

Fires cell

2-45. There is a fires cell in the main CP of both the BCT and FIB.

2-46. For more on the fires cells at the BCT and fires brigade see FM 6-20-40, FM 6-20-50, and FM 3-09.22.

BCT Combat Observation and Lasing Team

2-47. **A combat observation and lasing team is a field artillery team controlled at the brigade level that is capable of day and night target acquisition and has both laser range finding and laser-designating capabilities.** Each BCT typically has four organic combat observation and lasing teams (COLTs) under brigade HQ control. The brigade FSO is responsible for training the COLTs and for ensuring pre-combat checks and conducting mission briefings/rehearsals before employment. The BCT fires cell supervises the planning and execution of COLT employment and ensures the integration of the COLTS into the BCT reconnaissance and surveillance plan. The BCT often employs COLTs as independent observers to weight the decisive operation or key or vulnerable areas. The COLT's self-location and target ranging capabilities can facilitate first round fire for effect (FFE).

Air Force Tactical Air Control Party

2-48. An Air Force TACP is collocated with the fires cell at the BCT and Fires Brigade main CPs. The ALO leads the TACP and is the principal advisor to the brigade commander and staff on air support. He leverages the expertise of his TACP with linkages to the division and corps TACPs to plan, prepare, execute, and assess air support for brigade operations. He also maintains situational understanding of the total air support picture. The TACP aligned with the brigade is sufficiently resourced to support brigade operations from both the brigade's TAC CP and main CP.

Other Joint and Army Augmentation to the Fires Cell

2-49. Joint and Army fires may augment BCT operations. In addition to the Air Force TACP, other joint augmentation includes liaison officers to plan and coordinate NSFS and U.S. Marine Corps support—

- NSFS Liaison Officer. The NSFS liaison officer supervises a NSFS team that may be attached to the BCT fires cell to advise the commander and staff on the planning, preparation, execution, and assessment of naval surface fires.

- Marine Corps Liaison Officer. A U.S. Marine Corps liaison officer or a liaison team may augment the fires cell based on METT-TC to coordinate naval and/or U.S. Marine Corps air support to the BCT. The fires cell processes requests for naval/U.S. Marine Corps air support through this liaison officer and/or team. A firepower control team may be attached to the maneuver battalions and/or reconnaissance squadron to perform terminal control of naval/U.S. Marine Corps air support. In the absence of an observer from the firepower control team, the company/troop FIST, joint fires observer (JFO), or the Air Force JTAC may control naval and/or U.S. Marine Corps air.

Battalion Echelon

Battalion Fire Support Officer

2-50. The battalion FSO plans, prepares, executes, and assesses fire support for the maneuver battalion commander. The FSO advises the commander and his staff on fire support matters. This includes making recommendations for integrating battalion mortars into the scheme of fires and the movement of mortars in the scheme of maneuver.

Battalion Fires Cell

2-51. The battalion fires cell provides an organic fire support coordination capability within the BCT reconnaissance squadron and maneuver battalion HQ. The fires cell assists the battalion in executing its portion of the BCT's scheme of fires as well as their own scheme of fires. The brigade special troops battalion has fire support noncommissioned officers within the S-3 section of the battalion headquarters to help the S-3 plan, prepare, execute, and assess fire support for brigade special troops battalion operations.

Fire Support Team

2-52. **A fire support team is a field artillery team organic to each maneuver battalion and selected units to plan and coordinate all available company supporting fires, including mortars, field artillery, naval surface fire support and close air support integration.** The battalion commander can direct that FISTs be task-organized within the battalion and employed according to the observation plan. FISTs employed at company level can provide the maneuver companies and reconnaissance troops with fire support coordination, targeting, and assessment capabilities. Each fire support team vehicle possesses a target acquisition/communications suite with the capability to designate for laser-guided munitions. A FIST member may conduct target coordinate mensuration if he is trained and certified and the target acquisition/ communications suite is updated with the necessary equipment and software.

USAF Tactical Air Control Party

2-53. The TACP at battalion level advises the battalion commander on the capabilities and limitations of air power and assists him in planning, requesting, and coordinating CAS. The TACP provides the primary terminal attack control of CAS in support of the battalion. Air Force JTACs, if available from the battalion TACP, can deploy forward with a maneuver company or reconnaissance troop and position where they can best support the operation. The JTACs will coordinate closely with the platoon and company JFOs for the effective employment of Close Air Support in support of the maneuver commander.

Company

Company Fire Support Officer

2-54. The company commander is ultimately responsible for integrating fires in support of his scheme of maneuver; the company FSO serves as his principle advisor for fire support. The company FSO must fully understand the company commander's scheme of maneuver. On the basis of the commander's guidance, the company FSO synchronizes fire support within the maneuver plan and presents the fire support plan to the commander for his approval.

Platoon Forward Observer

2-55. Platoon FOs are part of the battalion's FISTs and may be allocated to an infantry company and sent to a platoon. The FOs are the primary fire support observers in the companies. They are normally collocated with the platoon leaders. Forward observers provide target refinement; execute planned fires, and request fires for their supported platoons. The FO may direct CAS in emergencies when no TACP or JTAC is available. With additional training and certification, the FO can qualify as a joint fires observer.

Joint Fires Observer

2-56. A *joint fires observer* (JFO) is a trained and certified Service member who can request, adjust, and control surface-to-surface fires, provide targeting information in support of Type 2 and 3 close air support terminal attack controls, and perform autonomous terminal guidance operations (FM 3-09.32).The JFO is not an additional Soldier in his Army fire support organization, but rather an individual who has received the necessary training and certification to receive the JFO's additional skill identifier. JTACs cannot be in a position to see every target on the battlefield. Trained JFOs, in conjunction with JTACs, will assist maneuver commanders with the timely planning, synchronization, and responsive execution of all joint fires. Autonomous terminal guidance operations independent of CAS requires the JFO to have direct or indirect communications with the individual commanding the delivery system plus connectivity with the JFO's maneuver commander, and/or appropriate weapons release authority. JFOs provide the capability to exploit opportunities that exist in the AO to efficiently assist air delivered fires and facilitate targeting for the JTAC. The goal is to have a JFO-trained and certified Service member with each armor company and each infantry platoon.

2-57. In circumstances where a ground commander may require CAS when no JTAC is available, non-JTAC controllers (such as a JFO) must clearly state "I am not a JTAC" to strike aircraft on aircraft check-in. The observer must make every effort to involve a JTAC/FAC(A) in the situation, provide as much of the 9-line briefing as able, and as a minimum, pass target elevation, target location, friendly location, and restrictions. In these circumstances, CAS aircrew should assist these personnel/units to the greatest extent possible in order to bring fires to bear.

NAVY AND MARINE CORPS FIRE SUPPORT COORDINATION ORGANIZATIONS

NAVY

2-58. Army forces are most likely to rely on Navy fire support coordination during an amphibious operation. The amphibious operation requires detailed planning, precise timing in air, NSFS, and field artillery support, and effective command relationships. Close coordination between supporting and supported arms is always critical.

2-59. Fire support coordination activities in amphibious operations are accomplished by the following agencies—

- Supporting Arms Coordination Center. The supporting arms coordination center (SACC) functions as a fires cell for the Navy forces, and is supervised by the supporting arms coordinator. During amphibious operations, the SACC is the primary agency which coordinates and controls all supporting fires for the amphibious task force commander in order to establish the landing force ashore. The landing force COF advises the supporting arms coordinator to ensure effective integration of the fire support plan that supports naval operations and the landing force scheme of maneuver.
- Tactical Air Control Center Afloat. The tactical air control center afloat controls all air operations within the amphibious operating area or the amphibious objective area until control of these operations is phased to the landing force's Marine Corps tactical air command center (TACC) ashore. The tactical air control center, although usually in close physical proximity to the SACC, is distinct from the SACC. The tactical air control center and SACC personnel work closely together in planning, controlling, and coordinating offensive air support and assault support.

MARINE AIR GROUND TASK FORCE FIRE SUPPORT COORDINATION AGENCIES

Force Fires Coordination Center

2-60. The Marine Air Ground Task Force (MAGTF) command element exercises control of fires through the Force Fires Coordination Center (FFCC). An FFCC is established in every size MAGTF. The focus of the FFCC emphasizes the control of fires rather than the detailed coordination of fires. Some of the primary functions of the FFCC are targeting for the unassigned area of the AO, interfacing with external agencies on FSCMs, deconfliction of airspace, and the allocation of fire support assets.

Fire Support Coordination Centers

2-61. At the division, regiment, and battalion levels the fire support coordination center (FSCC) is the agency that coordinates fire support. The FSCC is a single location in which centralized communications facilities and personnel enable the coordination of all forms of fire support. Supporting arms units provide representatives and equipment necessary for conducting coordination, targeting, and communications functions for their respective arms. The Marine fire support coordinator is the officer in charge of the FSCC and is the direct representative of the commander for planning and coordination of all available fire support.

MAGTF AVIATION

2-62. The primary mission of the MAGTF air combat element (ACE) is to support the MAGTF. There are six functions of Marine aviation: offensive air support, antiair warfare, assault support, aerial reconnaissance, EW, and control of aircraft and missiles.

2-63. The MAGTF ACE provides a Marine air command and control system (MACCS) agency to control and coordinate air operations ashore. Principle MACCS agencies are described below. Army forces may operate jointly with Marine forces in an amphibious operations area while elements of the MACCS provide and control air support to Army forces—

- Tactical Air Command Center. The Marine TACC is the senior MACCS agency and is the functional equivalent of the Air Force AOC and the Navy tactical air control center.
- Direct Air Support Center. The direct air support center (DASC) and the Air Force ASOC perform similar functions. The DASC is the agency responsible for processing preplanned and immediate air support requests, coordinating aircraft employment with other supporting arms, managing terminal control assets, and controlling assigned aircraft in, and transiting through the airspace where the DASC controls air operations.

- Marine Corps Tactical Air Control Party. The Marine Corps TACP establishes and maintains facilities for liaison and communications between supported units and appropriate control agencies. The TACP is also a terminal control agency. The air officer, who informs and advises the supported ground unit commander on the employment of supporting aircraft and requests and coordinates air support missions, leads the TACP.

2-64. For more on Marine Corps fire support coordination see Marine Corps Warfighting Publication (MCWP) 3-16.

AIR FORCE FIRE SUPPORT COORDINATION ORGANIZATIONS

2-65. The Air Force coordinates support through the theater air control system (TACS) described in FM 3-52.2.

AIR AND SPACE OPERATIONS CENTER

2-66. The air and space operations center is the senior U.S. Air Force element of the TACS. It is the operations command center of the Air Force forces. The U.S. Air Force air and space operations center is identified as the joint air operations center during joint operations.

AIR SUPPORT OPERATIONS CENTER

2-67. The ASOC is an operational component of the TACS subordinate to the AOC, and is usually collocated with or close to the fires cell and the airspace command and control element at the theater Army, corps, or division main CP. The ASOC provides primary control of air support to the Army and processes requests for immediate CAS for the supported ground forces. The AOC uses the ASOC's, FACs, TACPs, and ALOs, to extend its coordination effort to the other components.

SECTION II - RECONNAISSANCE, SURVEILLANCE, AND TARGET ACQUISITION

RECONNAISSANCE AND SURVEILLANCE

2-68. The G-2/S-2, G-3/S-3 and COF/brigade FSO (and other staff as needed) integrate and synchronize intelligence operations, reconnaissance, surveillance and fire support assets to capitalize on their different capabilities to support the commander's intent. Ideally, intelligence operations enable the G-2/S-2 to develop the understanding of the operational environment to completely match the actual situation on the ground. See FM 2-0 for detailed information on intelligence operations.

2-69. Reconnaissance, surveillance, and TA augmented by intelligence reach support from national sources are the primary means of collecting information used to produce intelligence. A thorough understanding of joint intelligence capabilities allows the commander to issue necessary guidance to the G-2/S-2 and G-3/S-3 to prepare intelligence operations and develop surveillance and reconnaissance tasks.

2-70. Tactical UASs provide both the supported commander and his organic or supporting field artillery units with near real time information about targets. Long range surveillance resources may be available from the battlefield surveillance brigade and joint SOF.

2-71. Much of the information produced from reconnaissance and surveillance is of a time-sensitive nature. It is essential that the information systems provide for the rapid passage of information to commanders at all levels. After processing by the intelligence staff, information from reconnaissance and surveillance may result in actionable target information.

2-72. The intelligence preparation of the battlefield (IPB) supports running estimates, including the fire support running estimate, and the MDMP. It drives the processes that the commander and staff use to focus information assets and to integrate surveillance and reconnaissance tasks and TA in intelligence operations.

TARGET ACQUISITION

2-73. Target acquisition sources provide the means to successfully detect, locate, identify, track, and classify targets. This section provides an overview of available TA assets. TA sources include ground sources, air sources, SOF, military space systems, national systems, and multinational forces assets.

Field Artillery Target Acquisition Radars

2-74. TA radars are found in the fires brigade's target acquisition battery and in the BCT fires battalion's target acquisition platoon. The fires brigade target acquisition battery has AN/Q-37 and AN/Q-50 radars; the BCT fires battalion target acquisition platoon is equipped with an AN/TPQ-36, an AN/TPQ-37 and AN/TPQ-50 radars (HBCT and SBCT) or AN/TPQ-36 and AN/TPQ-50 radars (IBCT) The AN/TPQ-36 and AN/TPQ-37 are scheduled to be replaced by an enhanced version of the AN/TPQ-36. For more on FA target acquisition radars and their employment see FM 3-09.12.

SPECIAL OPERATIONS FORCES

2-75. SOF elements complement national and theater target acquisition assets to obtain specific, time-sensitive targeting data of strategic and operational significance. These observers use human judgment to defeat enemy deception efforts and transmit a more complete picture of what is happening on the target. These elements are trained to call for fire support and also have JFO trained personnel.

SURVEY

2-76. Common survey is provided by field artillery survey sections (found in TA batteries of fires brigades and TA platoons of fires battalions) using the position and azimuth determining system, conventional means or, in the case of the U.S. Marine Corps, differential global positioning system (GPS) equipment. Survey operations must be started as soon as the requirement for survey has been identified. The goal is to establish survey control before occupation by the firing or acquisition elements. When survey control is not immediately available, efforts should be directed toward establishing common directional control in the position area. An *azimuth* is a horizontal angle measured clockwise from a north base line (FM 3-25.26). This north base line could be a true azimuth, which measured from true north; a grid azimuth, which is measured from grid north; or a magnetic azimuth, which is measured from magnetic north.

2-77. Common grid enables accurate locations for targets and the friendly firing platforms used to attack them. Without a common grid, the fire support assets cannot provide desired effects on targets. Common grid is required for the massing of fires; delivery of surprise observed fire; delivery of effective unobserved fires; and transmission of target data from one unit to another in order to aggressively neutralize or destroy enemy targets. Common grid is based on use of the world geodetic system, coordinate grid system, map projections and common survey.

WORLD GEODETIC SYSTEM

2-78. Within the geodetic system are the datum and ellipsoid. A datum is a mathematical model for the surface of the earth used in mapping a region. There are horizontal datums and vertical datums. A datum can be local or global. Global datums provide worldwide use.

2-79. The World Geodetic System of 1984 (WGS-84) is the global datum used by U.S. forces. The National Geospatial-Intelligence Agency at Fort Belvoir, Virginia, is working to completely reference the world to the WGS-84 Datum. In some parts of the world, the accuracy error caused by using two different datums can be as much as 750 meters. When combining the use of topographic line maps, digital maps or self-location systems, it is critical to know what datum the force is operating on. Vertical datums are used as references for elevation; the most common is mean sea level (MSL). The introduction of GPS technology in the late 1980s made WGS-84 the preferred datum, because GPS receivers compute all positions on WGS-84 latitude and longitude and then convert them to display what datum and coordinate system the user needs.

Note. The Global Area Reference System (GARS) is primarily designed as a management tool and is not to be used for navigation or targeting. It is not a replacement for WGS-84 or the military grid reference system (MGRS) and cannot be used to specify precise target location or for platform/weapon targeting.

COORDINATE/GRID SYSTEM

2-80. U.S. military forces use different coordinate systems. The Army and U.S. Marine Corps use the Universal Transverse Mercator Grid and MGRS, while the Navy uses geographic coordinates (latitude and longitude) expressed in degrees, minutes and seconds. The Air Force uses geographic coordinates expressed in degrees and decimal degrees.

2-81. For more on survey see FM 3-34.331 and FM 6-2 and JP 2-03.

METEOROLOGY

2-82. Field artillery meteorology deals with the tactics, techniques and procedures for determining current atmospheric conditions. Atmospheric conditions along the trajectory of a projectile or rocket directly affect its accuracy and may cause the projectile or rocket to miss the desired point of impact. For example, tests in Southwest Asia have shown that firing artillery at maximum ranges in extreme heat and low air density resulted in meteorology corrections up to 4,700 meters. Meteorology data is one of the prerequisites for accurate predicted fire. With today's emphasis on first round fire for effect and trends toward longer distances, accurate meteorological corrections for artillery fires are crucial. Meteorological conditions that affect accurate predicted fires include—

- Wind. The effects of wind are intuitive. A tail wind causes an increase in range, and a head wind causes a decrease in range. A crosswind blows the projectile to the right or left.
- Air Temperature. As firing tables indicate, an increase in air temperature may increase, decrease, or have no effect on achieved range, depending on the initial elevation and muzzle velocity of the weapon.
- Air Density. Density of the air through which a projectile passes creates friction that affects the forward movement of the projectile. This affects the distance the projectile travels. Given equal deviations from standard of each meteorology effect on the flight of a projectile, air density has the greatest range effect.

2-83. Meteorology conditions at the target location affect the accuracy of terminally guided munitions (TGMs) that are subject to the same effects of wind, temperature, and humidity as a free flight projectile. These effects are moderated by the ability of TGMs to make in-flight corrections using various guidance methods. The greatest effect of meteorology conditions on precision-guided munitions (PGMs) is their ability to acquire targets. PGMs that acquire targets by reflected laser energy or visual means can have difficulty locating targets when the target area is obscured by clouds, blowing sand, or other adverse conditions.

2-84. Meteorology sections are found in the TAB of the fires brigade and in target acquisition platoon of fires battalions organic to BCTs. For more on meteorology see FM 3-09.15. Precision munitions, such as the 155-mm Excalibur projectile, the guided MLRS rocket, or the Accelerated Precision Mortar Initiative 120-mm mortar round are GPS-aided and/or rely on inertial measurement units to home in on the target coordinates.

SECTION III - ATTACK RESOURCES

2-85. This section includes an overview on the main sources of fire support and other attack resources to include field artillery, mortars, rotary- and fixed-wing assets, and NSFS. Cyber/electromagnetic activities are integrated and synchronized through the targeting process.

FIRES AND SCALABLE CAPABILITIES

2-86. In the past, fires have been referred to as being lethal or nonlethal. Fires are now described as having a range of scalable capabilities, from lethal to nonlethal, to provide a wide range of effects. It is acknowledged that the effects of fires still have lethal and nonlethal characteristics (TRADOC Pamphlet 525-3-4). The desired effects of fires on a target may be lethal or nonlethal. Although each situation requires a different mix of violence and restraint, fires that create lethal and nonlethal effects may be used together to complement each other and create dilemmas for the opponent. Lethal effects from fires are at the heart of offensive and defensive actions and their application is critical to success in these operations. However, scalable capabilities should always be considered. Finding ways to accomplish the mission with an appropriate mix of lethal and nonlethal effects is a paramount consideration for every commander. Commanders analyze mission variables to achieve a balance of lethal and nonlethal effects via scalable capabilities. Lethal fires typically have permanent destructive effects. Nonlethal effects neutralize or incapacitate a target without causing permanent injury, death, or gross physical destruction. To differentiate nonlethal actions from the nonlethal effects of fires, fires must have a weapon associated with them that create the desired effects. The nature of the target or threat, mission variables, and desired outcomes determine whether destructive fires or scalable capabilities should be used to achieve the desired effect.

2-87. The commander determines the desired effects for each target. Offensive and defensive operations place a premium on fires to destroy, disrupt, neutralize, interdict, and suppress enemy forces. Fires combined with engineer obstacles and terrain block, canalize, fix, or turn enemy forces. See FM 3-90 for more information on offensive and defensive operations. There are times when a lethal weapon may be employed in a nonlethal manner, for example, in a demonstration of force.

OBSCURATION AND SCREENING FIRES

2-88. Obscuration and screening fires decrease an opponent's capability to visual sight friendly forces and the level of energy available for the functions of seekers, trackers, and vision enhancement devices. Obscurations munitions and projectiles may be placed on or near adversary or enemy positions to minimize an opponent's observation both within and beyond the position area. Screening fires are delivered in areas between friendly and an opponent's forces or in friendly AOs to degrade opponent ground and aerial detection, observation, and engagement capabilities.

ILLUMINATION FIRES

2-89. Illumination fires (visible or infrared) are useful in exposing an opponent at night. Illumination fires may give friendly forces an asymmetric advantage by reducing the enemy forces' ability to operate at night without being targeted and attacked with minimal collateral damage. Infrared illumination enhances the Soldier's use of some night vision devices to more easily locate targets and enable surprise fires on enemy forces not equipped with night vision devices. Illumination fires may also be used for its deterrent effect through its use as a "show of force" or for area denial.

SCALEABLE CAPABILITIES

2-90. Scalable capabilities provide a range of nonlethal to lethal actions commensurate with decisive actions. Scalable capabilities can achieve desired effects while reducing collateral damage. These capabilities assist in protecting joint, Army, and multinational partners and populations residing in the AO. Scalable fires (which are a part of scalable capabilities supporting CAM and WAS) can be addressed in the selection of the appropriate weapon system, number and type of munitions fired and the method used to engage a target. A precision munition might be fired at a well-located target in an urban area rather than firing numerous rounds of area munitions against the same target, possibly causing collateral damage. Even lethal area munitions such as high explosive rounds may be used to achieve a nonlethal effect. For example, a field artillery battalion or battery might mass its fires on a location in view of an opponent and then follow those rounds with a near surface burst illuminating round on the opponent's position. This demonstration may cause a less determined opponent to surrender or cease hostile actions. Nonlethal effects provide a target the ability to return to its preengagement functionality. It is usually measured by

time and level of effort required for recovery of the target. Nonlethal effects typically neutralize or incapacitate a target or modify adversarial behavior without causing permanent injury, death, or gross physical destruction.

THE COMBINED EFFECTS OF SCALABLE FIRES WITH OTHER SCALABLE CAPABILITIES

2-91. Coordinated scalable fires may be used in an operation. For example, a raid to capture a high-value individual may use electronic attack to jam the communications that could be used to alert the target of the raid. TGMs such Excalibur or GMLRS may strike nearby enemy security detachment locations as the raiding force moves in to capture the target. Obscurant munitions may be fired to screen the raiding force as it departs the area with the captive individual.

ARMY MUNITIONS ATTRIBUTES

2-92. Area munitions once fired or launched cannot correct their trajectories for any unanticipated ballistic conditions encountered on the trajectory to the aimpoint. The term "terminally guided munitions" collectively refers to precision munitions, precision-guided munitions, and precision smart munitions.

2-93. **A precision munition is a munition that corrects for ballistic conditions using guidance and control up to the aimpoint or submunitions dispense with terminal accuracy less than the lethal radius of effects.** Even at the munitions' largest anticipated delivery error, the aimpoint is within the munitions' anticipated radius of effects. Dispensed submunitions may be subject to ballistic conditions for which a correction may not have been applied. The Excalibur 155-mm projectile, guided MLRS rockets, and the advanced precision munitions initiative 120-mm mortar rounds are examples of precision munitions.

2-94. A *precision guided munition* is a weapon that uses a seeker to detect electromagnetic energy reflected from a target or reference point and, through processing, provides guidance commands to a control system that guides the weapon to the target (JP 3-03). A PGM typically requires a laser designator in the loop for target designation. Examples of PGMs include the Copperhead projectile and Hellfire missile.

2-95. **A precision smart munition is a munition or submunition that autonomously searches for, detects, classifies, selects, and engages a target or targets. A precision smart munition has a limited target discrimination capability.** Munitions such as the 155-mm M898 sense and destroy armor projectile have this capability.

2-96. A wide range of conventional to precision capabilities will provide effects from precision, to near-precision, and area effects. Currently, precision capabilities have a circular error probable (CEP) of less than 10 meters. Near-precision capabilities have a CEP between 10 and 50 meters. Area capabilities have a CEP greater than 50 meters. Indirect fires capabilities will deliver these wide ranges of capabilities, including multispectral obscurants and illumination, at extended ranges and in close proximity to friendly forces.

FIELD ARTILLERY

ARMY FIELD ARTILLERY

2-97. Field artillery cannon, rocket, and missile systems organic, assigned, attached, or OPCON to FIBs and BCT fires battalions provide continuously available fires under all weather conditions and in all types of terrain. Field artillery can shift and mass fires rapidly without having to displace. Should a maneuver or other supported force displace, field artillery units should be as mobile as the units they support. Field artillerymen at every maneuver echelon man the fires cells, act as forward observers, and are employed as FISTs and COLTs to integrate all means of fire support for the commander and synchronize fire support with the concept of operations.

MARINE AIR GROUND TASK FORCE ARTILLERY

2-98. Army units may also support and be supported by Marine artillery. The U.S. Marine Corps relies on the 155-mm towed howitzer as its cannon artillery weapon. The Marine Corps also has HIMARS. Marine artillery doctrine, tactics, techniques, and procedures are similar to those exercised within the Army. Frequent joint exercises and the permanent exchange of liaison officers between Army and Marine artillery HQ facilitate an understanding of each Service's procedures.

FIELD ARTILLERY MUNITIONS

2-99. Field artillery cannons, rockets and missiles can destroy, disrupt, deny, degrade, neutralize, interdict, or suppress enemy forces and protect friendly operations. A variety of field artillery munitions provide the commander with tremendous flexibility when attacking targets with fires.

Cannon Munitions

2-100. Cannon munitions normally associated with lethal effects include area-fire high explosive (HE), antipersonnel conventional munitions, dual-purpose improved conventional munitions, scatterable mines (SCATMINE), white phosphorus used for incendiary effects and marking, and TGMs. Cannon munitions normally associated with nonlethal effects include hexachloroethane smoke and illumination rounds. These rounds, however, are not classified as nonlethal munitions as the falling canister bodies can injure or kill personnel on the ground. Cannon fires are effective against targets from within direct fire range out to more than 30 kilometers.

Multiple Launch Rocket System Munitions

MLRS Rockets

2-101. MLRS munitions include free flight M26 and M26A2 extended range rockets and M30/ M31/M31A1 guided rockets. These rockets are loaded with dual-purpose improved conventional munitions or unitary HE warheads and are effective against personnel, light armor, soft vehicles, and light structures at ranges from 8 to 70+ kilometers depending upon the selected munitions.

Army Tactical Missile System Missiles

2-102. Army Tactical Missile System (ATACMS) missiles include the M39 Block I and M39A1 Block IA with M74 antipersonnel, antimateriel munitions, and the M48 and M57 Unitary HE warheads. These missiles are effective against targets such as enemy command posts and control nodes, sustainment areas, and artillery, missile and air defense systems at ranges from 25-300 kilometers.

2-103. For more on MLRS and ATACMS capabilities and munitions, see FM 3-09.60.

FIELD ARTILLERY LIMITATIONS

2-104. Field artillery weapons systems and units also have several limitations—

- A firing signature that makes the unit vulnerable to detection by enemy target acquisition assets.
- Limited self-defense capability against ground and air attacks.
- Limited ability to destroy armored, moving targets.

MORTARS

2-105. Mortars are organic to all BCT maneuver battalions and reconnaissance troops, and to rifle companies in the SBCT and IBCT. They are organized as either platoons or sections in maneuver battalions and as sections in airborne, ranger, air assault, light infantry/rifle companies, and in cavalry/reconnaissance troops.

2-106. Mortars 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, and in other areas that are difficult to reach with low-angle fire. The proliferation of handheld GPS devices and the fielding of the new Mortar Fire Control System partially compensate for the fact that mortar positions are seldom surveyed. The impact of mortar rounds must still be adjusted by an observer. Maneuver unit mortars provide close, immediately responsive fire support for committed battalions and companies. These fires neutralize, suppress, or destroy enemy attack formations and defenses, help (in combination with engineer obstacles and terrain) to block, canalize, fix, or turn enemy forces; obscure the enemy's vision, or otherwise inhibit his ability to acquire friendly targets. Mortars can also be used for final protective fire, obscuration, and illumination. The U.S. mortar munitions include a 120-mm precision munition; some multinational mortar units also have terminally guided munitions of different calibers. See ATTP 3-21.90 for information on the tactical employment of mortars.

MORTARS AND THE COMMANDER'S CONCEPT FOR OPERATIONS

2-107. The maneuver commander decides how and when mortars, as a key fire support asset, will be integrated into his concept of operations. However, since mortars are fire support assets, the battalion FSO or company FSO should give advice and make recommendations to the commander on employment of his mortars. The commander may specify mortar support for subordinate units by changing the command or support relationship, by assigning priority of fires or by assigning priority targets such as final protective fires.

FIRE SUPPORT RESPONSIBILITIES AND MORTAR EMPLOYMENT

2-108. The mortar platoon/section leader and the battalion/company FSO have a unique relationship. They must understand the battalion commander's intent for fires and must work closely to see that it is carried out. The mortar platoon/section leader –

- Is primarily a combat leader.
- Is the principal advisor to the battalion/company commander and battalion/company FSO on the tactical employment of mortars.
- Works closely with the battalion/company FSO to ensure mortar fires are planned on appropriate targets and delivered at the correct times.
- Informs the battalion/company FSO of anything that affects the mortar platoon/section's ability to execute the commander's fire support plan.

The battalion/company FSO –

- Plans and coordinates to execute the battalion or company fire support plan and support the commander's intent.
- Recommends to the commander or operations officer the appropriate means to engage each planned target.
- Knows mortar capabilities, limitations, and technical aspects.
- Is not in the mortar platoon/section leader's chain of command but the FSO anticipates requirements and may be given the authority to pass orders, information, and instructions to the mortar platoon/section during the battle.

2-109. For more on mortar capabilities and employment, to include an expanded discussion of mortar tactical missions and inherent responsibilities, see ATTP 3-21.90.

NAVAL SURFACE FIRE SUPPORT

2-110. *Naval surface fire support* is fire provided by Navy surface gun and missile systems in support of a unit or units (JP 3-09.3). EW can also be conducted from naval platforms as an additional capability of NSFS. *Naval gunfire support* is fire provided by Navy surface gun systems in support of a unit or units tasked with achieving the commander's objectives. Naval gunfire support is a subset of naval surface fire support (JP 3-09.3).

2-111. When the number of ships permits, each battalion will be provided a ship in direct support (DS). The DS mission establishes a one-to-one relationship between a NSFS ship and the supported unit. The ship delivers fires on planned targets and targets of opportunity in her zone of fire (ZF), which normally corresponds to the AO of the supported land force unit. When possible, ships capable of performing simultaneous missions will be given a DS mission to allow for maximum firepower to the forward units of the landing force.

2-112. The general support (GS) mission requires a NSFS ship to support the force as a whole. A ship in GS attacks targets in the ZF which corresponds to the AO of the supported unit. Prearranged fires are delivered in accordance with a schedule of fires published in the OPORD and the NSFS plan. Fires may also be allocated to a subordinate unit for a specific mission(s). Upon completion of the mission(s), the ship reverts to GS. Ships in GS support brigade/regiment-sized units or larger.

2-113. Due to its flat trajectory, terrain masking affects naval gunfire (NGF) more than field artillery. Naval gunfire also results in large range probable errors (the dispersion pattern of the naval gun is roughly elliptical with the long axis in the direction of fire). Hence, coverage of targets such as roads and airfields is most effective when the gun-target line (GTL) coincides with the long axis of the target. Very close supporting fire can be delivered when the GTL is parallel to the front line of troops. Oppositely, a GTL perpendicular to the front trace can endanger friendly forces.

2-114. Destroyers and cruisers, which mount the Mark (MK) 45 5-inch lightweight gun system, usually provide NGF support. The MK 45 gun system can provide a rate of fire of 16-20 rounds per minute per gun to a range of approximately 23 kilometers. The latest version of the MK 45 gun mount provides a range of more than 36 kilometers with the Navy's new 5-inch cargo projectile and an improved propelling charge. The gun mount modifications include a new 62-caliber barrel, an ammunition recognition system, a gun/extended range guided munition interface and a new control system. The new mount is designed to be used with the MK 171 extended range guided munition for over-the-horizon range and improved lethality.

2-115. Within the limits imposed by hydrographic conditions, naval surface ships may be positioned for the best support of the ground force. The ability of the ship to maneuver is an important factor in planning for support of maneuver forces. It also allows selection of the most favorable GTL. Ships have a variety of ammunition, from standard HE projectiles to Tomahawk land attack missiles. The variety and quantity of ammunition carried aboard naval vessels depends upon the class of the ship. Ammunition variety, combined with high rates of fire, high muzzle velocity, and precision fire control equipment make naval surface fires particularly suited for attacking targets which present a vertical face on the forward slopes of hills. The position of the ship must be fixed before each firing in order to achieve firing accuracy. In the absence of satellite positioning capability, bad weather and poor visibility make it difficult to fix the ship position, and they reduce the ability of spotters on the ship to engage targets on the shore. Radio communications can be interrupted by equipment limitations, enemy EW, and unfavorable atmospheric conditions. Hydrographic conditions, weather and visibility, and enemy naval and air action affect the employment of naval surface fires.

AIR SUPPORT

2-116. Fixed-wing aircraft perform numerous roles ranging from counterair; to bringing air power to bear against surface targets through strategic attack, interdiction, and CAS; to providing enhanced capabilities for ground forces through surveillance, reconnaissance, target acquisition, and airlift. These roles define the broad purposes or functions of fixed-wing forces and are determined by objectives, not by the platform or weapons system used.

2-117. Fixed-wing air missions may be provided by the Air Force, Navy, Marine, or multinational aircraft. The JFC’s apportionment is the determination and assignment of the total expected air effort by percentage and/or priority that should be devoted to the various air operations and/or geographic operations for a given period of time. Air reconnaissance missions are normally controlled at corps-level or higher. They are flown on request of the ground units according to the priorities set by the JFC. The JFC normally apportions by priority or percentage into geographic area, against mission-type orders, and/or by categories

significant for the campaign. These categories can include strategic attack, interdiction, counterair, maritime support, and CAS. Following the JFC's apportionment decision, the JFACC allocates the apportioned air sorties to the functions, areas, and/or missions they support. Allocation is the translation of the apportionment into total numbers of sorties by aircraft type for each operational task. The JFACC ensures that the best-suited aircraft are used to support each task.

CLOSE AIR SUPPORT

2-118. *Close air support* is air action by fixed- 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 (JP 1-02).

2-119. For maximum effectiveness, all air support missions must be coordinated and synchronized with the other fire support assets. The sorties apportioned and allocated to CAS are distributed to the various ground commanders by the land component commander. The ground commanders determine how the sorties will be used. For more on CAS see JP 3-09.3 and FM 3-09.32.

AIR INTERDICTION

2-120. *Air interdiction* is air operations conducted to divert, disrupt, delay, or destroy the enemy's military potential before it can be brought to bear effectively against friendly forces, or to otherwise achieve objectives. Air interdiction is conducted at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required (JP 3-0).

2-121. For more on AI, see JP 3-03.

STRATEGIC ATTACK

2-122. Strategic attack is offensive action conducted by command authorities aimed at generating effects that most directly achieve our national security objectives by affecting an enemy's leadership, conflict sustaining resources, critical infrastructure, and/or strategy.

COUNTERAIR

2-123. *Counterair* is a mission that integrates offensive and defensive operations to attain and maintain a desired degree of air superiority. Counterair missions are designed to destroy or negate enemy aircraft and missiles, both before and after launch (JP 3-01). Field artillery may conduct counterair missions by striking enemy aircraft bases, helicopter forward arming and refuel points, and missile storage and launch sites.

2-124. The types of fixed-wing aircraft used for air operations in combat vary widely; however, they can be categorized in broad terms as fighter, bomber, attack, or reconnaissance. The flexibility built into most aircraft allows a particular model of aircraft to fulfill multiple roles. The following factors should be considered when planning the employment of aircraft—

- Threat from enemy air defenses and SEAD requirements.
- Safety of friendly troops, to include attack headings, safe separation from munitions, target marks, and friendly position marks.
- Communications compatibility, to include both secure and non-secure.
- Communications jamming.
- Target location and description. In some cases, the pilot must visually see the target to attack the target.
- The pilot in the aircraft can seek, locate, and identify the correct target. He can deliver ordnance on it even though it may not have been accurately located or may have moved.
- The pilot is an excellent source of intelligence for post-strike reporting and acquisition of other targets and general information.
- The aircraft can carry only a limited combination of weapons and fuel, and its time in the target area may be limited.

INTELLIGENCE AND ELECTRONIC WARFARE AIRCRAFT

2-125. Fixed-wing special electronic mission aircraft are theater army assets that serve as intelligence and EW platforms, performing signals intelligence/electronic support and providing EA in support of the commander's concept of operations. Special electronic mission aircraft provide aerial reconnaissance, surveillance communications intercept, and EW support to corps intelligence and EW operations.

JOINT AIR ATTACK TEAM (JAAT) OPERATIONS

2-126. A *joint air attack team* is a combination of attack and/or scout rotary-wing aircraft and fixed-wing close air support aircraft operating together to locate and attack high-priority targets and other targets of opportunity. The joint air attack team normally operates as a coordinated effort supported by fire support, air defense artillery, naval surface fire support, intelligence, surveillance, and reconnaissance systems, EW systems, and ground maneuver forces against enemy forces. Joint terminal attack controllers may perform duties as directed by the air mission commander in support of the ground commander's scheme of maneuver (JP 3-09.3).

2-127. The JAAT provides the commander with a flexible force that can engage the enemy in his AO. Each Service component involved retains OPCON of its respective units during a JAAT operation. A JAAT can engage enemy penetrations in the friendly sustainment area or strike targets in enemy territory in conjunction with the shaping operations of the maneuver force. The supported commander is responsible for the synchronization of maneuver and fires. The role of commanders involved with a JAAT include—

- The supported commander determines when to employ a JAAT, requests the assets and integrates the JAAT, other combat units, and supporting fires into his plan.
- Upon receipt of a JAAT request, the aviation commander assumes responsibility for the coordination and execution of the JAAT. He should be keenly aware of the ground and air tactical plan.
- The air mission commander executes the JAAT engagement (the aviation commander and the air mission commander may be the same person).

2-128. Indirect fire assets augment the fires of JAAT operations. Fires cells develop supporting J-SEAD plans that support aircraft ingress and egress and necessary FSCMs to allow the simultaneous attack by aircraft and indirect fires.

2-129. For more on JAAT operations see FM 3-09.32.

ARMY AVIATION

2-130. Army aviation assets are in aviation brigades found throughout the Army and at every echelon from division to theater command. The aviation brigade is the supported commander's primary integrator of aviation assets. Each aviation brigade is tailored for specific missions.

ATTACK RECONNAISSANCE HELICOPTER OPERATIONS

2-131. Army attack reconnaissance helicopters are employed as maneuver forces in combined arms operations using the doctrine, tactics, techniques, and procedures in FM 3-04.126. Attack operations destroy or defeat enemy forces in order to seize, retain, or exploit the initiative. Army attack/reconnaissance helicopters conduct two basic types of attack—

- Close Combat Attack. *Close combat attack* is a hasty or deliberate attack by Army aircraft providing air-to-ground fires for friendly units engaged in close combat. Due to the close proximity of friendly forces, detailed integration is required (FM 3-04.126). During close combat attack, Army helicopters engage enemy units with direct fire. Close combat attack is coordinated and directed by a team, platoon or company level ground unit using standardized close combat attack procedures in unit standard operating procedures.
- Interdiction Attack. *Interdiction attack* is a hasty or deliberate attack by Army aircraft to divert, disrupt, delay, degrade, or destroy the enemy before they can be used effectively against friendly forces. Interdiction attack is conducted at such a distance from friendly forces that detailed integration with ground forces is not required (FM 3-04.126).

2-132. Attack helicopters are capable of pinpoint destruction using anti-armor missiles or providing suppressive area fires with rockets and cannons. Reconnaissance operations are conducted to obtain information about the enemy and/or terrain to assist in building and sharing the common operational picture and to focus combat power at the decisive point and time.

2-133. Reconnaissance helicopters provide near-real-time intelligence and terminal guidance for a variety of weapon systems—including Hellfire and air delivered precision-guided munitions. Security operations provide reaction time, maneuver space and protection to air-ground maneuver.

2-134. For more on attack reconnaissance helicopter operations see FM 3-04.126.

CONTROL OF ARMY AVIATION ASSETS

2-135. Aviation assets normally remain under aviation brigade, aviation battalion task force, or aviation battalion control. The supported commander decides how supporting aviation assets will be integrated into his overall concept of operations and if and when aviation will provide support.

2-136. For more on the capabilities and employment of aviation brigades FM 3-04.111.

CYBER/ELECTROMAGNETIC ACTIVITIES

2-137. Responsibility for integration and synchronization of cyber/electromagnetic activities resides in the electronic warfare element and is a component of the mission command warfighting function. Unlike inform and influence activities, cyber/electromagnetic activities do not exist within a distinct staff element. Rather, the cyber/electro-magnetic components operate within an existing electronic warfare working group. Cyber/electromagnetic activities are integrated and synchronized in operations through the targeting process.

2-138. In the context of EW, control of the electromagnetic spectrum is achieved by effectively coordinating friendly systems while countering enemy systems. Electronic attack limits enemy use of the electromagnetic spectrum. Electronic protection secures use of the electromagnetic spectrum for friendly forces, and electronic warfare support enables the commander's accurate assessment of the situation. All three are integrated for effectiveness. Commanders ensure maximum integration of communications; intelligence, surveillance, and reconnaissance; inform and influence activities, and cyber/electromagnetic activities.

2-139. Electronic attack is a division of electronic warfare involving the use of electromagnetic energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability and is considered a form of fires (JP 3-13.1).

2-140. Electronic warfare operations rely on the electromagnetic spectrum and include lethal (destructive) and nonlethal attacks against enemy targets in support of operations. Synchronization is achieved by integrating EW with fire support operations to support the commander's concept of operations. EA is especially well suited for targets that cannot be located with the accuracy needed for destructive fires or that require only temporary disruption. EA can be used against computers, but it is not a computer network attack since a computer network attack relies on the data stream to execute the attack. EA can play a role in suppressing enemy air defenses and in countering some guided weapons.

2-141. Synchronization of electronic attack capabilities ensure mission accomplishment and support while preventing electronic fratricide, including fratricide against combined and joint forces, neutral parties and the civilian communications infrastructure, particularly in Homeland Defense and Stability Operations.

2-142. To support decisive action and achieve the goal of electromagnetic spectrum dominance, commanders fully integrate EW capabilities and apply them across the elements of combat power. Management of the electronic battle is synchronized in the electronic warfare element with input from the electronic warfare working group. The electronic warfare element works within the fires cell. The electronic warfare officer (EWO) is responsible for synchronization and integration of electronic attack operations, and deconfliction within the AO.

2-143. The EWO and Electronic Warfare Element responsibilities include, but are not limited to –

- Integrating and synchronizing the cyber/electromagnetic activities.
- Coordinating, preparing, and maintaining the electronic warfare target list, electronic attack taskings, electronic attack requests, and the electronic warfare portion of the sensor/attack matrix.
- Coordinating with other staff when conducting electronic warfare.
- Assessing opponent vulnerabilities, friendly capabilities, and friendly missions in electronic warfare terms.
- Deconfliction, including maintenance of the joint restricted frequency list.
- Electronic warfare mission summaries.
- Requesting electronic attack effects through electronic attack request forms and joint tactical air strike request or joint tactical air support request.
- Electronic attack data message coordination.
- Electronic warfare frequency deconfliction coordination.
- Joint spectrum interference resolution.

2-144. For more on electronic attack, see FM 3-36; for more on the duties of the electronic warfare officer see ATTP 5-0.1.

SECTION IV – SUSTAINMENT

OVERVIEW

2-145. *Sustainment* is (Army) the provision of logistics, personnel services, and health service support required to maintain operations until successful mission accomplishment (FM 4-0).

Organic Support Battalions

2-146. The BSBs organic to BCTs and fires brigades perform selected consolidated functions. These BSBs generally have an organic distribution, maintenance, and medical company and a number of forward support companies (FSCs). The FSCs are assigned to the BSB and can be in direct support (DS), OPCON, or under the tactical control (TACON) of supported maneuver or fires battalions of the brigade. The BSB of the SBCT contains a headquarters and headquarters company, a distribution company, a field maintenance company and a medical company. It does not contain FSCs. The fires brigade's BSB does not have an organic medical company. Health service support Role 1 medical care is provided by a medical treatment team and a medical evacuation squad assigned to the fires brigade HHB. The area support medical company from the multifunctional medical battalion provides Role 2 health service support and force health protection support for the fires brigade. The BSB provides a materiel carrying capability that enables the brigades to conduct sustained operations for a finite period of time. For example the BCT and the fires brigade are organized with self-sustainment capability for up to 72 hours of combat. Beyond 72 hours, echelons above brigade sustainment organizations, such as the sustainment brigade, are required to conduct replenishment of BCT and fires brigade combat loads.

Echelons above Brigade Sustainment Organizations

2-147. Sustainment brigades are subordinate commands of the theater sustainment command which consolidate selected functions. The theater sustainment command uses sustainment brigades to provide support to the JTF, corps, divisions BCTs and other support brigades (for example fires brigade, battlefield

surveillance brigade, maneuver enhancement brigade (MEB). The sustainment brigades are assigned multifunctional and/or single function battalions, groups, and companies tailored and task organized to the specific mission. All sustainment brigades provide area support, although the specific tasks they are assigned may differ.

SUSTAINMENT WITHIN FIRE SUPPORT ORGANIZATIONS

BCT ORGANIC FIRES BATTALIONS

2-148. Direct throughput of supplies to the fires battalion is the rule rather than the exception. The forward support company in the HBCT and IBCT fires battalion is the key sustainment operator at the fires battalion level and provides supply, maintenance, and transportation to the fires battalion. The SBCT BSB task-organizes support to the SBCT's fires battalion.

2-149. The principal source of external support to the fires battalion is the BSB, which provides centralized direct logistical support to the BCT. Additional sustainment support beyond that which can be provided by the BSB must be requested by the BSB support operations officer/BCT S-4 from the sustainment brigade assigned to support the BCT.

2-150. For more on the fires battalion and its sustainment see FM 3-09.21.

FIRES BRIGADE

2-151. The BSB is the core sustainment organization for the fires brigade. The BSB is organic to the fires brigade, and consists of functional and multifunctional companies assigned to provide support to the fires brigade. Additional sustainment support beyond that which can be provided by the BSB is provided by a sustainment brigade on an area basis. Such support is requested by the BSB support operations officer in coordination with the corps, division or other HQs G-4 to which the fires brigade is attached or placed OPCON.

2-152. The fires brigade BSB has forward support companies that are traditionally under the OPCON or TACON of individual fires brigade battalions, but may also be in DS, depending on mission variables. There is one FSC for each fires battalion in the fires brigade. Each FSC has a distribution platoon and a maintenance platoon that provide—

- Food (Class I) and water.
- Fuel (Class III).
- Ammunition (Class V).
- Repair parts (Class IX).

2-153. The FSC provides each fires brigade subordinate battalion commander with dedicated sustainment assets organized specifically to meet his battalion's requirements. The FSC commander receives technical sustainment oversight from the BSB commander.

2-154. Because of their criticality and proximity to combat operations, medical platoons remain organic to fires brigade subordinate battalions.

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Chapter 3

Fire Support and the Operations Process

Fire support follows the *operations process*—the major mission command activities performed during operations: planning, preparing, executing, and continuously assessing the operation. The commander drives the operations process [Army Doctrine Publication (ADP) 3-0]. These four activities serve as a template for coordinating other actions associated with an operation including integrating processes, continuing activities, and actions specific to each operations process activity. Both integrating processes and continuing activities occur throughout an operation. Figure 3-1 illustrates how the integrating processes and continuing activities last throughout the operations process. Commanders synchronize them with each other and integrate them into all operations process activities. Section I begins with fire support planning. Section II describes preparation. Section III describes execution. Section IV concludes this chapter by discussing fire support assessment.

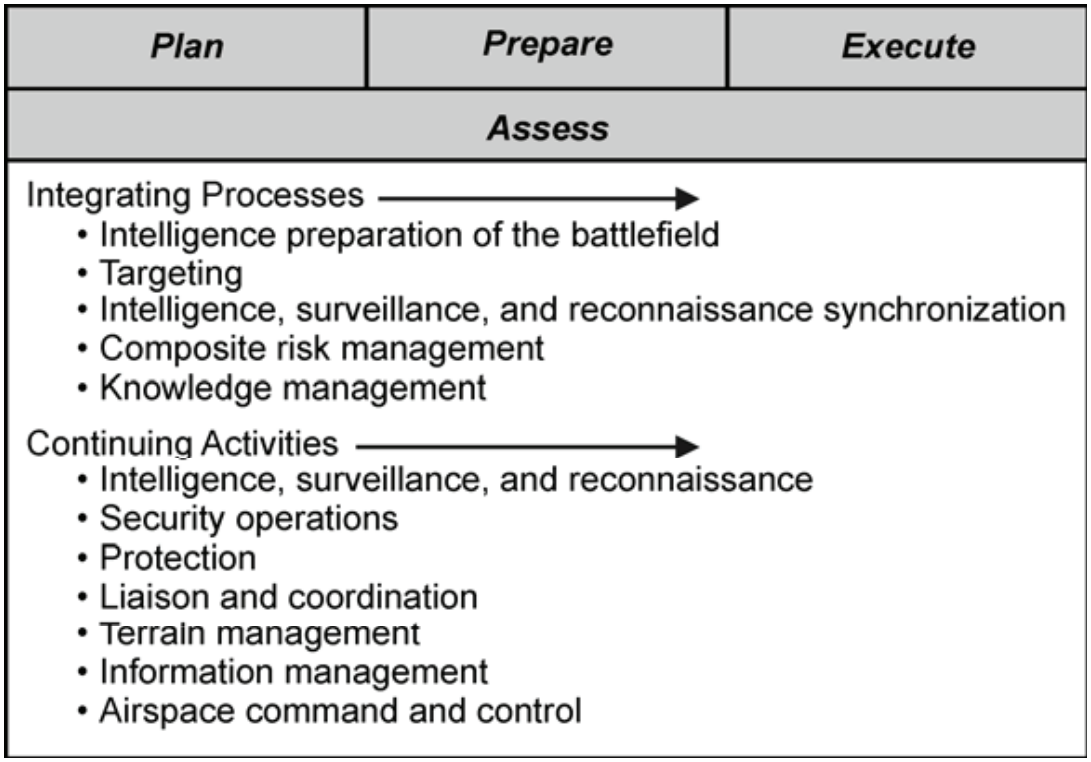

Figure 3-1. Operations and integrating processes

SECTION I – FIRE SUPPORT PLANNING

OVERVIEW

3-1. The commander's ability to orchestrate and employ all available fire support related resources as a system and to integrate and synchronize fire support with his concept of operations results from an established process known as fire support planning and coordination—

- Fire support planning integrates and synchronizes scalable Army indirect fires, joint fires, and multinational fires with the other warfighting functions into the commander's concept of operations. Fire support planners work closely with the electronic warfare element to ensure destructive fires are integrated and synchronized with cyber/electromagnetic activities. The objective of fire support planning is to optimize combat power. It is performed as part of the operations process.
- *Fire support coordination* is the planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons (JP 3-09). It requires continually coordinating fire support plans and managing the fire support assets that are available to a maneuver force.

3-2. Fire support planning and coordination is central to the effectiveness of fire support. Formal coordination binds fire support resources together in a common effort so that the employment of each fire support asset is synchronized with the commander's intent and concept of operations. Effective coordination during both planning and execution is required to ensure that a suitable weapon system(s) adequately attacks the desired targets at the correct time and place. Cooperation among the various organizations is necessary for the effective delivery of fire support. The requirements of fire support coordination are—

- Fire support must operate as a cohesive entity. This means fire support personnel must function with a unity of effort and purpose—the reliable and effective delivery of fire support.
- Fire support must be responsive to the needs of the supported commander. Individual interests and concerns of each fire support coordination organization or asset must be made subordinate to the overall mission and to the maneuver commander.
- Integration of fire support is the responsibility of the maneuver commander. The supported commander charges the COF/brigade FSO to ensure that all available means of fire support are fully synchronized with his concept of the operation. The supported commander retains the authority to direct target priorities, levels of effort, and the sequence of those efforts to his subordinates.

3-3. The COF, brigade FSO and other fire support planners develop an effective and integrated fire support plan to support operations—

- An effective fire support plan clearly defines fire support requirements and focuses on the tasks and their resulting effects. An effective fire support plan uses all available acquisition and attack assets and applies the best combination of fire support assets against HPTs.
- An integrated fire support plan coordinates and combines with the other warfighting functions to maximize the results of each attack in generating desired effects.

THE MILITARY DECISIONMAKING PROCESS

3-4. The *military decisionmaking process* is an iterative planning methodology that integrates the activities of the commander, staff, subordinate headquarters, and other partners to understand the situation and mission; develop and compare courses of action; decide on a course of action that best accomplishes the mission; and produce an operation plan or order for execution (FM 5-0).

COMMANDER'S INTENT

3-5. Fire support personnel must thoroughly understand the commander's intent in order to design a fire support plan that best supports this intent and, as circumstances change, to rapidly and effectively make the necessary adjustments to the plan. Understanding the commander's intent also makes it easier for the COF/FSO, FSCOORD and other fire support personnel to advise the commander and his staff on how to best employ fires to support all phases of the operation and to achieve the desired end state.

COMMANDER'S GUIDANCE FOR FIRE SUPPORT

3-6. The purpose of commander's guidance is to focus staff activities in planning the operations. The commander's guidance for fire support provides the staff, and fire support personnel, and subordinate units with the general guidelines and restrictions for the employment of fires, desired effects and the planning and execution of targeting functions. The guidance emphasizes in broad terms when, where, and how the commander intends to synchronize the effects of fires with the other elements of combat power to accomplish the mission. Commander's guidance should include priorities and how he envisions that fire support will support his concept of operations—

- **Priority of fires is the commander's guidance to his staff, subordinate commanders, fire support planners, and supporting agencies to employ fire support in accordance with the relative importance of a unit's mission.**
- A priority target in fire support automation system processing is a target on which the delivery of fires takes precedence over all the fires for the designated firing unit or element. The firing unit or element will prepare, to the extent possible, for the engagement of such targets. A firing unit or element may be assigned only one priority target. The priority target designation may be based on either time or importance. Priority targets are designated by the maneuver commander. The commander also gives specific guidance as to when the targets will become priority, the munitions to use, the accuracy required, and the desired effects. When not engaged in fire missions, firing units lay on established priority targets. FSOs should note that, although massed fires may achieve the most lethal effect, precision fires may be the most effective means to engage the target while minimizing the risk of collateral damage. Fires batteries may provide a different priority target for each firing platoon or element. A mortar platoon may provide a priority target for each section.

3-7. The JFC may prohibit or restrict attacks on specific targets or objects without specific approval based on military risk, the law of war, ROE, or other considerations. Targeting restrictions are typically identified on two lists—

- No-Strike List. A *no-strike list* is a list of objects or entities characterized as protected from the effects of military operations under international law and/or the rules of engagement. Attacking these may violate the law of armed conflict or interfere with friendly relations with indigenous personnel or governments (JP 3-60). The no-strike list is compiled independently of and in parallel to the candidate target list. It is important to note, however, that entities from the candidate target list may be moved to the no-strike list if, as a result of additional target development, it is determined that attacking them may violate the Law of War. Conversely, targets placed on a no-strike list may be removed from that list and become subject to military action if their status as a protected object or entity has changed. For example, a church that functions as a weapons storage facility or a barracks may lose its protected status and could legally be attacked.
- Restricted Target List. A *restricted target* is a valid target that has specific restrictions placed on the actions authorized against it due to operational considerations (JP 3-60). A *restricted target list* is a list of restricted targets nominated by elements of the joint force and approved by the joint force commander. This list also includes restricted targets directed by higher authorities (JP 3-60). Actions that exceed specified restrictions are prohibited until coordinated and approved by the establishing headquarters. Attacking restricted targets may interfere with projected friendly operations. Targets may have certain specific restrictions associated with them that should be clearly documented in the restricted target list (for example, do not strike during daytime, strike only with a certain weapon). Some targets may require special precautions (for example, chemical, biological, or nuclear

facilities, or proximity to no-strike facilities) due to possible collateral effects of using artillery on the target. When targets are restricted from lethal attacks, commanders should consider nonlethal capabilities as a means to achieve or support the commander's desired objectives. For more on no-strike and restricted targets and legal considerations for targeting see JP 3-60.

FIRE SUPPORT PLAN

3-8. The fire support plan is an integral part of the OPLAN/OPORD. The fire support plan is normally comprised of the Fires paragraph in the OPLAN/OPORD and Annex D, Fires (if used). The development of the fire support plan is the responsibility of the COF/brigade FSO and fires cell. Preparation for and execution of the plan also includes the responsibility for both technical and tactical rehearsals to ensure proper execution. The essential elements of a fire support plan include but are not limited to—

- Clear and concise articulation of FSTs by identifying the task, purpose, and effect of each task.
- Allocation of all fire support assets.
- Projected changes to the allocation of fire support assets based on tactical contingencies in the concept of operations.
- Coordination and synchronization instructions for the timely detection and attack of HPTs.
- Requirements for positioning of assets, the makeup of basic loads, and the controlled supply rate.
- Restrictions on ammunition expenditures, types of fires, areas of employment, and creation of obstacles.
- Establishment and changes in FSCMs.

CONSIDERING EFFECTS IN FIRE SUPPORT PLANNING

3-9. Fire support attack assets can be employed by a commander to create or help create the following effects on an enemy or adversary—

- Deceive. To *deceive* is to cause a person to believe what is not true. Military deception seeks to mislead enemy decision-makers by manipulating their understanding of reality. Uncertainties about the situation and the inability to predict outcomes accurately require adversaries to take risks that can expose them to the effects of friendly fires.
- Degrade. When used in an information context, to *degrade* is to use nonlethal or temporary means to reduce the effectiveness or efficiency of adversary command and control systems and information collection efforts or means (FM 3-13). In a broader sense, lethal means may be employed to reduce an enemy capability.
- Delay. To *delay* is to slow the time of arrival of enemy forces or capabilities or alter the ability of the enemy or adversary to project forces or capabilities. When enemy forces are delayed friendly forces gain time (JP 3-03).
- Deny. When used in an information context, to *deny* is to withhold information about Army force capabilities and intentions that adversaries need for effective and timely decisionmaking (FM 3-13). In a broader sense, lethal and/or nonlethal means may be employed to hinder or prevent the opponent from using terrain, space, personnel, supplies, or facilities.
- Destroy. In the context of defeat mechanisms, to *destroy* is to apply lethal combat power on an enemy capability so that it can no longer perform any function and cannot be restored to a usable condition without being entirely rebuilt (FM 1-02). The amount of damage needed to render a unit combat-ineffective depends on the unit's type, discipline, and morale. Destroying armored or dug-in targets with area fire weapons requires considerable ammunition and time, so forces do not normally attempt it unless they have terminally guided munitions. Precision munitions are an excellent means of destroying well-located stationary point targets. PGMs are typically used against moving or stationary laser-designated point targets. See Chapter 2 for information on precision munitions and precision-guided munitions. When used in the EW context, destruction is the elimination of targeted systems. Enemy systems that use the electromagnetic spectrum can be destroyed by a variety of weapons and techniques, ranging from conventional munitions, Special Technical Operations, and directed energy weapons to network attacks.

- Destruction. **In the context of the computed effects of field artillery fires, destruction renders a target out of action permanently or ineffective for a long period of time, producing 30-percent casualties or materiel damage.**
- Disrupt. Actions supporting disruption will interrupt or impede enemy or adversary capabilities or systems, upsetting the flow of information, operational tempo, effective interaction, or cohesion of the enemy force or those systems (JP 3-03). Any of these may in turn cause enemy forces to commit prematurely or attack in a piecemeal fashion.
- Divert. Diversion causes enemy forces to consume resources or capabilities critical to enemy operations in a way that is advantageous to friendly operations. Diversions draw the attention of enemy forces away from critical friendly operations and prevent enemy forces and their support resources from being employed for their intended purpose. Diversions can also cause more circuitous routing along lines of communication, resulting in delays for enemy forces (JP 3-03).
- Exploit. To *exploit* is to gain access to adversary or enemy command and control systems to collect information or to plant false or misleading information (FM 3-13). In a broader sense, *exploitation* is 1. Taking full advantage of success in military operations, following up initial gains, and making permanent the temporary effects already achieved (see FM 1-02). 2. Taking full advantage of any information that has come to hand for tactical, operational, or strategic purposes (see FM 3-13. 3). An offensive operation that usually follows a successful attack and is designed to disorganize the enemy in depth (JP 1-02).
- Neutralization. **In the context of the computed effects of field artillery fires, neutralization renders a target ineffective for a short period of time, producing 10-percent casualties or materiel damage.**
- Neutralize. To *neutralize* is to render enemy personnel or material incapable of interfering with a particular operation (FM 3-90).
- Suppress. To *suppress* is to temporarily degrade the performance of a force or weapons system below the level needed to accomplish the mission (FM 3-90). Suppression usually lasts only as long as the fires or their effects continue.
- Suppression. The temporary or transient degradation by an opposing force of the performance of a weapons system below the level needed to fulfill its mission (JP 1-02). Suppression usually lasts only as long as the fires or their effects continue. In the context of the computed effects of field artillery fires, suppression produces 3-percent casualties or materiel damage.

THE TARGETING PROCESS

3-10. The targeting process is an integral part of Army operations. Like other integrating processes, targeting occurs continuously throughout an operation. Its steps mirror planning, preparing, executing, and assessing. During planning for a new operation, however, it is primarily the "decide" function that is performed.

DECIDE

3-11. "Decide" begins with the MDMP. It does not end when the plan is completed; the "decide" function continues throughout the operation. The staff develops "decide" information to address—

- What targets should be acquired and attacked?
- When and where are the targets likely to be found?
- How long will the target remain once acquired?
- Who or what can locate the targets?
- What accuracy of target location will be required to attack the target?
- What are the priorities for surveillance, reconnaissance, and TA objectives and asset allocation?
- What intelligence requirements are essential to the targeting effort and how and by when must the information be collected, processed, and disseminated?

- When, where, how, and in what priority should the targets be attacked?
- What are the MOPs and MOEs that determine whether the target has been successfully attacked and whether the commander's desired effects have been generated by doing so?
- Who or what can attack the targets, and how should the attack be conducted (for example, number/type of attack assets, ammunition to be used) to generate desired effects and what are the required assets/resources based on commander's guidance?
- What or who will obtain assessment or other information required for determining the success or failure of each attack? Who must receive and process that information, how rapidly, and in what format?
- Who has the decisionmaking authority to determine success or failure, and how rapidly must the decision be made and disseminated?
- What actions will be required if an attack is unsuccessful and who has the authority to direct those actions?

DETECT

3-12. During MDMP a key resource for fire support planning and targeting is the intelligence generated through reconnaissance and surveillance. The synchronization of reconnaissance and surveillance link acquisition assets to finding specific enemy formations or required information to answer the commander's information requirements. Named areas of interest and target areas of interest are focal points particularly for the surveillance effort and are integrated into the collection management plan.

DELIVER

3-13. "Deliver" occurs primarily during execution, although some targets may be engaged while the supported unit such as a BCT is preparing for the overall operation.

ASSESS

3-14. "Assess" occurs throughout the operations process. Targeting is continuously refined and adjusted between the commander and staff as the operation unfolds.

3-15. For more on the Army targeting process, see FM 3-60.

FIRE SUPPORT COORDINATION PRINCIPLES

3-16. Successful fire support planning is the result of the COF/brigade FSO's aggressive contribution to the commander's planning and decision-making process. In making this contribution, the COF/brigade FSO employs principles of fire support planning, coordination, and execution as a guide. In advising the maneuver commander on the application of fire support, the COF/brigade FSO also reviews fire support requirements against several basic fire support considerations, (discussed later in this chapter), that guide fire support planners in the development of fire support plans—

- Plan Early and Continuously. To effectively integrate fire support with the commander's concept of the operation, planning must begin when the commander states his mission and provides his command guidance. Whenever commander's guidance is needed during the planning of an operation, fire support planners should solicit that guidance from the commander. Planning is continuous and keeps pace with the dynamics of the operation.
- Ensure the Continuous Flow of Targeting Information. The fire support planners should ensure that target acquisition requirements for fire support are identified and focused on detecting high-priority targets. Fire support planners also ensure that target information from all sources is evaluated and routed to the appropriate attack means. This includes information from all echelons and from adjacent and supporting elements.
- Consider the Use of All Fires and/or Scalable Capabilities. The fire support planners consider all fires and scalable capabilities available at all levels. This includes fires and other assets from available joint and multinational forces.

- Use the Lowest Echelon Capable of Furnishing Effective Support. The lowest echelon that has the necessary means to accomplish the mission should furnish the fire support. The fire support planners decide what is needed and, if their assets are inadequate, request additional support.
- Furnish the Type of Support Requested. The fire support requester is usually in the best position to determine his fire support requirements. However, the fire support planners are in a position to weigh the request against the commander's guidance and the current and future needs for fire support. If a request for fire support is disapproved, the fire support planner stops the request and notifies all concerned. When possible and necessary, he substitutes a new fire support means and alerts the agencies that are to provide and receive the support.
- Use the Most Effective Fire Support Means. Requests for fire support are transmitted to the force capable of delivering the most effective fires within the required time. In making his decision, the FSCOORD considers the nature and importance of the target, the engagement time window, the availability of attack assets, and the effects desired. In some circumstances, it may be necessary to sequence the attack by fixing the enemy with immediately available fire support assets while coordinating a subsequent, more detailed attack by more effective assets. An example of this is a situation in which air support is the most desired means but is about 20 minutes away. In this case, indirect fire weapons can fix the target until aircraft arrive. It may be necessary to use multiple assets to achieve the desired effects on a target.
- Avoid Unnecessary Duplication. A key task for the COF/FSO is to ensure that duplications of fire support requests are resolved.
- Coordinate Airspace. All commanders must have the freedom to use airspace to achieve the commander’s objectives and must have maximum flexibility to use assets (organic, supporting and joint) within that airspace. Effective airspace management requires a responsive airspace control system, standardization, minimal restrictions, and continuous coordination among all airspace users. The COF/FSO provides input concerning fire support use of airspace to those agencies (battlefield coordination detachment, tactical air control party, brigade aviation element, air defense airspace management cell, and airspace control) and personnel engaged in airspace management to ensure that conflicts between surface-based indirect fire and air operations are minimized. Using FSCMs and ACMs (described in Appendix A) correctly can prevent fratricide and duplication of effort while increasing the effectiveness of air-to-ground and ground-to-ground ordnance. Planning and coordination are necessary to minimize conflicts between surface-based indirect fire and air operations.
- Provide Adequate Support. The mission and the commander's guidance determine the amount and type of fire support needed for success. The COF/FSO must inform the supported commander when fire support requirements exceed capabilities.
- Provide for Rapid Coordination. Commanders must establish procedures and responsibilities for the rapid coordination of fire support. In some circumstances, coordination of fire support will be detailed and done in advance. In other instances, due to operational circumstances, coordination will be rapid and less detailed. Rigid coordination procedures may delay the delivery of fires and jeopardize the force. The COF/FSOs must know the availability of assets, the concept of operations, the commander's intent, FSCMs in effect, rules of engagement (ROE), and any other restrictions.
- Protect the Force. The COF/FSO must be aware of those situations that increase the risk of fratricide. The primary mechanisms for limiting fratricide are command emphasis, disciplined operations, close coordination among commands at all levels, and detailed situational understanding. Several measures can be used to accomplish this principle. Examples are the use of FSCMs, coordination of position areas with the maneuver forces, the use of restricted firing positions to eliminate or reduce firing signatures, the consideration of the locations of friendly forces during target analysis, and combat identification procedures.
- Provide for Flexibility. The COF/FSO must anticipate and provide for future contingencies. On-order missions and careful positioning of assets give the commander the flexibility to respond to changing battlefield conditions.
- Consider the Use of FSCMs. While planning is done regardless of boundaries and friendly locations, the execution and coordination of fire support must always account for these realities.

To ensure responsive and safe fire support, the COF/FSO must continuously use and update all types of FSCMs. Permissive FSCMs facilitate the rapid engagement of targets throughout the AO while restrictive FSCMs provide safeguards for friendly forces or infrastructures. FSCMs ensure that fire support will not jeopardize troop safety, interfere with other fire support means, or disrupt adjacent unit operations. FSCMs are either permissive or restrictive (see Appendix A). Other control measures such as boundaries also affect fire support.

SECTION II - FIRE SUPPORT PREPARATION

3-17. *Preparation* consists of activities performed by units to improve their ability to execute an operation (ADP 3-0). Preparation includes, but is not limited to, plan refinement; rehearsals; intelligence, surveillance, and reconnaissance; coordination; inspections; and movement. Fire support preparation creates conditions that improve friendly forces' chances for success. It facilitates and sustains transitions, including those to branches and sequels.

3-18. Preparation requires action by fire support personnel at every echelon. Mission success depends as much on fire support preparation as on fire support planning. Fire support rehearsals help staffs, units, and individual fire support personnel to better understand their specific role in upcoming operations, synchronize execution of the fire support plan, practice complicated tasks before execution, and ensure equipment and weapons are properly functioning.

3-19. Fire support preparation activities begin during planning and continue throughout an operation. Many fire support preparation activities continue during execution. Uncommitted forces prepare for identified contingencies and look to the operation's next phase or branch. Committed units revert to preparation when they reach their objectives, occupy defensive positions, or pass into reserve.

REHEARSALS

3-20. The supported unit headquarters normally conducts the combined arms rehearsal after subordinate units have issued their OPORD. This rehearsal ensures that the subordinate unit's plans are synchronized with those of other units in the organization and that those plans will achieve the intent of the higher commander. A fire support rehearsal in coordination with the field artillery technical rehearsal should be conducted prior to the combined arms rehearsal and if possible include members of the operations and intelligence staff and other members of the targeting working group.

FIELD ARTILLERY DIGITAL REHEARSALS

3-21. *Level III digital rehearsals*. Level III full-scale digital technical rehearsals are conducted either in conjunction with combined arms/field artillery tactical rehearsals or conducted completely separately. They involve the use in real-time of fire support platforms over actual or similar terrain. These rehearsals are generally conducted in a deliberate/hasty defense or limited offense. Level III rehearsals are resource and time-intensive and, although the most desirable, rarely feasible at Fires brigade or battalion level. Significant benefits of technical rehearsals include—

- Database verification for fire support digital systems.
- Validation of the supporting communications architecture. Mobile digital platforms that are spread over a geographic area present unique challenges difficult to replicate with static platforms in an assembly area.
- Verification of the maneuver terrain management plan and time-space relationships between field artillery targets and field artillery movement plans. The intent is to ensure units are in place to provide fires during critical periods.
- Rehearsal of triggers (on the ground if possible), both for movement and for the initiation of fires by primary and backup sensors/observers.

3-22. *Level II digital rehearsals*. Level II digital rehearsals are conducted separate from combined arms/FA tactical rehearsals. They are conducted from actual fighting position areas, where "electronic movement" of

units and icons in the AFATDS situation screen would adversely affect the current mission. This may be a partial digital rehearsal in that only actual targets within range of friendly assets can be rehearsed and processed among AFATDS operational facilities such as fires cells or fire direction centers. Targets outside the range of friendly assets cannot be processed in AFATDS, even for rehearsal purposes. For these targets, their information (for example, target number, grid, trigger, attack guidance, and firing units) should be verified by voice or text message.

3-23. *Level I digital rehearsals*. Level I full digital rehearsals are conducted separate from combined arms/FA tactical rehearsals similar to a normal CP exercise from an assembly area. The database can be rehearsed completely by "electronically" moving units and icons in the AFATDS situation screen. Movement of the icons on the screen gives rehearsal participants an electronic visualization of how the operation will unfold and how the fire support plan will be integrated. However, before conducting this type rehearsal, units must be certain that it will not interfere with actual missions.

INTEGRATED DIGITAL AND TACTICAL FIRE SUPPORT/FIELD ARTILLERY REHEARSALS

3-24. The AFATDS offers a unique ability to merge digital and FS/FA tactical rehearsals. The commander's preferences should be reflected in unit SOPs.

3-25. The rehearsal net must allow all participants to eavesdrop and follow the rehearsal. Regardless of the net, the force fires cell should be the net control station and run the rehearsals. To provide the conceptual framework, the rehearsal should begin with a brief description of the concept of operations and supporting scheme of fires followed by a senior HQ fires cell phase-by-phase overview of the operation. Topics to be addressed for each phase include:

- Scheme of maneuver/friendly/enemy actions that initiate each phase (fires cell).
- Enemy situation (unit or force field artillery G-2/S-2). For Level I and III rehearsals, the G-2/S-2 directs the movement of enemy icons on the AFATDS current situation screen and sends the status either to selected units or to a distribution list to update all AFATDS operational facilities.
- Concept of operations (fires cell).
- Commander's intent for fires during that phase (fires cell).
- FSTs for that phase. (Note: FSTs are related in time and space. Therefore, FSTs should be discussed in relation to each other.) Information should also include:
    - Target number and grid coordinates.
    - Purpose of the target.
    - Primary and alternate triggers to include periods of limited visibility and description of how triggers are related in time and space to the scheme of maneuver.
    - Primary and backup sensors/observers.
    - Delivery unit(s).
    - Time-space relationship between unit response time, duration of fires, and scheme of maneuver.
- After review of each FST, missions should be processed from the sensor/observer to the delivery system level. In particular, validate the following:
    - Mission value.
    - System preferences (AFATDS recommends the fire support attack asset).
    - Delivery system attack methods (shell, fuze, unit, volleys).
    - Proper intervention points functioning.
    - Target coordination requirements.
    - Mission routing functions.

- After review of each FST, the artillery S-3 should discuss FA actions and field artillery tasks to support each phase, to include:
  - Movements required during the phase, their triggers, and relationship in time and space with FSTs. For Level I and III rehearsals, displacing firing units change their grid location and send status to selected units or a distribution list to update AFATDS operational facilities.
  - Logistic requirements in the phase to include ammunition resupply triggers and special munition distribution.

Digital Rehearsal Challenges

3-26. The effect of automatic data distribution during digital rehearsals is potentially far reaching. As digital systems are designed to disseminate information automatically, safeguards must be in place to separate digital rehearsals from "real world" events. In Level I and III rehearsals, AFATDS operational facilities electronically “move" unit icons in AFATDS from assembly areas or battle positions into planned battle positions to engage targets for the rehearsal. (Note: AFATDS only processes targets in range of the recommended firing units.) Preferably, rehearsal missions must be distinctly separate from "live missions." Otherwise, digital rehearsal missions and associated "exercise" messages should not be automatically passed to addressees unless they are rehearsal participants or are aware of the rehearsal and able to differentiate between actual and rehearsed information. Alternatively, non-participating net members may have to leave the net for the duration of the rehearsal.

3-27. Safeguards must also be taken to prevent live rounds from being fired at rehearsal targets while maintaining the capability to react to real threats. Units must retain the ability to terminate or postpone rehearsals instantly when an actual fire mission needs to be processed.

3-28. Although AFATDS permits dividing plans into distinct phases, creating and switching among multiple phases during rehearsals create the potential for introducing database errors. Therefore, phases within a plan should be kept to a minimum and created only when necessary.

CLEARANCE OF FIRES

3-29. **Clearance of fires is the process of approving or obtaining approval to attack targets with fires within and outside the boundaries of the supported unit for which the fires are provided.** The supported ground commander is responsible for the clearance of fires, including the integration of fires with other airspace users. The major purpose for clearing fires is to prevent fratricide.

3-30. The commander establishes, or requests higher HQ establishment of control measures (such as graphic control measures, direct fire control measures, ACMs, and FSCMs). These serve as a means of separating units, synchronizing fires and maneuver, facilitating clearance of fires, and preventing fratricide. The commander may not employ indirect fires across boundaries without receiving clearance from the unit into whose AO the fires will impact. He may employ direct fires across boundaries without clearance at specific point targets that are clearly and positively identified as enemy (FM 3-90). Commanders may consider early coordination to also grant clearance for indirect fires against targets that are clearly and positively identified as enemy. Airspace clearance remains necessary in any situation. See Appendix A for additional information on control and coordination measures.

SECTION III – FIRE SUPPORT EXECUTION

3-31. *Execution* is putting a plan into action by applying combat power to accomplish the mission and using situational understanding to assess progress and make execution and adjustment decisions (ADP 3-0).

3-32. Strikes by fire support assets influence the ongoing action. For example, decentralized execution during the offensive operation allows maneuvering elements direct access to sufficient firepower to support their operation. The fire support planners must also retain sufficient assets to mass the effects of fires at critical times and places to support the decisive operation.

3-33. Electronic attack performs several functions to support the commander's operation. For example, in the offense electronic attack resources may concentrate on neutralizing enemy fire control, TA, and intelligence-gathering systems.

3-34. The commander must provide responsive fire support that protects and ensures freedom of maneuver to forces in contact with the enemy throughout the AO.

FIRE SUPPORT FOR OFFENSIVE OPERATIONS

3-35. *Offensive operations* are operations conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. They include movement to contact, attack, exploitation, and pursuit (ADP 3-0).

3-36. **Offensive fires are fires that preempt enemy actions.** Examples of offensive fires include preparation fire, close support fires, interdiction, Army support to offensive counterair operations, electronic attack, and counterfire.

FIRES IN SUPPORT OF THE CONCEPT OF OPERATIONS—OFFENSIVE OPERATIONS

3-37. Supporting the concept of operations during the offense involves attacking targets throughout the AO with massed or precision indirect fires, air support, and electronic warfare assets to prevent enemy reinforcements, disengagement, or resupply. It is important to plan fire support during consolidation to protect friendly units. Other considerations for supporting the concept of operations during the offense include—

- Weight the decisive operation with a preponderance of fire support.
- Consider positioning field artillery well forward to exploit weapons ranges and preclude untimely displacement when fires are needed the most.
- Provide counterfire.
- Disrupt enemy counterattacks.
- Plan fires to support breaching operations.
- Plan fires to obscure enemy observation or screen friendly movements.
- Coordinate SCATMINE operations to seal off objective areas and to disrupt enemy counterattacks.
- Allocate responsive fire support for leading elements.
- Allocate fire support for the neutralization of bypassed enemy combat forces.
- Provide preparation fire, when required, to weaken the enemy's resistance. These fires disrupt, destroy, or damage his defense. TA must be timely and accurate, and adequate attack resources must be made available, or surprise may be jeopardized.
- Plan targets to protect assaulting troops by destroying, neutralizing, or suppressing enemy direct fire weapons.
- Plan fires against enemy reinforcements during the attack and to support friendly consolidations once the objective has been seized.
- Use permissive FSCMs to facilitate the attack of targets. Typically, in offensive operations, permissive FSCMs are located at greater distances from friendly forces.

3-38. The critical characteristics of offensive action are surprise, concentration, tempo, and audacity. These characteristics support the central theme of offensive operations, which is the need to gain and maintain the initiative. See FM 3-90 for additional information on the characteristics of the offense.

3-39. Fire support execution must support these characteristics and support the maneuver force in seizing and maintaining the initiative. Often, fire support planners can support several characteristics of the offense with one fire support tactic or technique (for example, preparation fire may support both surprise and concentration)—

Surprise

3-40. Commanders can use fire support to achieve surprise by—

- Rapidly and discreetly shifting fire support assets and/or shifting and massing the effects of fire support.
- Using short, intense programs of fires against key enemy functions at critical times.
- Using military deception techniques to deceive the enemy as to the types, numbers, locations, and capabilities of friendly fire support and target acquisition assets.
- Changing fire support tactics.
- Foregoing a preparation to achieve surprise in initiating an attack.
- Achieve first round effects on the target through the use of precision fires.

Concentration

3-41. Commanders can use fire support to support achieve concentration by—

- Allocating fire support assets to support the decisive operation. This includes weapon systems, TA assets, observers, liaison teams, priority targets, and ammunition.
- Assigning priorities of fires and quick fire channels.
- Massing fires and focusing reconnaissance, surveillance and TA assets.
- Concentrating fire support assets in support of one aspect of supported unit decisive or shaping operations for brief periods.

Tempo

3-42. Commanders can use fire support to support the tempo of the offense by—

- Using a decentralized organization for combat and decentralized fire support planning and fire control methods to facilitate rapid, flexible execution of fires and immediately available dedicated fires to a designated ground force.
- Using on-order missions to facilitate transition to subsequent phases and branches or a new operation.
- Providing fires either as the decisive operation or, typically, in support of shaping operations that complement the decisive operation, set the stage for rapid transition to the next phase or new operation, and create new opportunities for maneuver.
- Developing a thorough sustainment plan that properly anticipates potential culminating points for the fire support structure.

Audacity

3-43. Commanders can use fire support to support the concept of audacity by—

- Aggressively applying firepower.
- Making well thought-out, risk-taking decisions in the use of fire support assets.
- Limiting the firepower allocated to shaping operations to weight the decisive operation.
- Placing fire support assets well forward and moving them closely behind lead maneuver units.
- Using field artillery raids to strike HPTs.

3-44. For more on fire support for offensive operations see the discussion in FM 6-20-40, FM 6-20-50 and FM 3-09.22.

FIRE SUPPORT FOR DEFENSIVE OPERATIONS

3-45. *Defensive operations* are combat operations conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive and stability operations. These operations include mobile defense, area defense, and retrograde (ADP 3-0). Successful defenses are aggressive. They maximize firepower, protection, and maneuver to defeat enemy forces and regain the initiative. See FM 3-90 for additional information on the characteristics of the defense.

3-46. **Defensive fires are fires that protect friendly forces, populations, and critical infrastructure.** Examples of defensive fires include ballistic missile defense; Army support to defensive counterair operations; air and missile defense; indirect fire protection capabilities; and final protective fires.

FIRES IN SUPPORT OF THE CONCEPT OF OPERATIONS—DEFENSIVE OPERATIONS

3-47. In the defense, general fire support considerations for supporting the concept of operations include—

- Engage critical enemy elements with fire support assets before the attack.
- Plan counterfire against enemy indirect fire systems attacking critical friendly elements.
- Use both lethal and nonlethal attack means to apply constant pressure to the enemy's command and control structure.
- Plan the acquisition and attack of HPTs throughout the depth of the battlefield.
- Provide integrated fire support (including EA) in synchronization with maneuver and electronic warfare countermeasures in the conduct of decisive and shaping operations.
- Retain centralized control of fire support resources in order to concentrate fire at the decisive place and time.
- Provide fires to support counterattacks.
- Plan indirect fires in support of the barrier and/or obstacle plan, and coordinate common survey.
- Coordinate SCATMINE operations for point or interdiction minefields or to close gaps and lanes in front of advancing enemy forces.
- Provide adequate fire support to the forces conducting operations.
- Plan defensive fires in support of patrols, convoys, or quick reaction forces. Such fires, which may include the use of terminally guided munitions (TGMs), obscurants, and illumination.
- Plan counterpreparation fire to disrupt enemy preparations for an attack. **Counterpreparation fire is intensive prearranged fire delivered when the imminence of the enemy attack is discovered. It is designed to break up enemy formations; delay movement of reinforcements or reserve; disorganize the enemy's system of command, communications, and observation; decrease the effectiveness of artillery preparation; and impair the enemy's offensive spirit.**
- Plan for target acquisition to provide coverage of critical friendly zones and control of fires on all avenues of approach.
- Plan permissive FSCMs close to friendly operations. Use no-fire areas (NFAs) to protect forward elements such as COLTs, scouts, long range surveillance units, JTACs, and special operations forces (SOF).
- Plan targets on avenues of approach to disrupt enemy attacks by striking the enemy during his assault. Subsequently, shift the fire to continue attacking him until he is forced to break off the attack.
- Allocate firing units for final protective fires.

FIRE SUPPORT AND CHARACTERISTICS OF DEFENSIVE OPERATIONS

3-48. Successful defensive operations share the following characteristics: preparation, security, disruption, massing effects, flexibility, maneuver, and operations in depth (FM 3-90). Fire support planning and execution must support them.

Preparation

3-49. The defender often has the opportunity to select the defensive terrain, and has time to prepare his defenses. Fire support planners must make maximum use of any preparation time available to plan and coordinate supporting fires by—

- Preparing observation posts (OPs), marking triggers and target reference points, and studying the terrain on which the battle will be fought by COLTs and FISTs.
- Preparing engagement areas to facilitate fires.
- Preparing and hardening artillery and TA positions.
- Conducting rehearsals on the actual terrain.

Security

3-50. Fire support must complement and support all security forces and unit protection plans by—

- Fires to support security forces.
- Fires against enemy artillery and mortars.
- Fires to support deception operations.
- Target acquisition coverage of critical friendly zones.

Disruption

3-51. Fire support (including indirect fires, CAS, and EA) and electronic warfare play a key role in disrupting an attacker's tempo and synchronization by—

- Engaging selected enemy command posts and control facilities and systems.
- Assisting in defeating enemy reconnaissance forces, separating enemy forces, isolating enemy units, and attacking or disrupting enemy systems.
- Employing indirect fires and obscurants in support of counterattacks designed to defeat the enemy before he can consolidate any gains.
- Employing indirect fires and EA at the conclusion of a successful defense to disrupt enemy efforts to reorganize for another attack or prepare a coordinated defense.

Massing Effects

3-52. Fire support plays an essential role in a unit's ability to mass overwhelming combat power at critical places and times. Massed fires—

- Assist a defender to repel an assault.
- Facilitate the rapid destruction of an enemy force when it is most vulnerable or when it is on the verge of gaining a significant advantage.
- Allow a commander to accept risks by using minimal maneuver forces in one area in order to add weight to another area.
- Create an important demoralizing psychological effect that is not achieved from smaller-scale fires.
- When used in depth, create gaps or separations in attacking units, disrupt enemy movement tempo, and result in significant attrition of enemy forces before they close with friendly forces.

Flexibility

3-53. Fire support planning and execution must address the need for flexibility in defensive operations by—

- Quickly shifting fires to critical points throughout the AO.
- Executing successive or concurrent programs or fire plans.
- Shifting fires from support of the defense to support the counterattack and offense.

Maneuver

3-54. Fire support planning and execution supports maneuver in defensive operations by—

- Separating the enemy dismounted infantry from his armor.
- Supporting the obstacle plan by placing fires in front of, on top of, to the side of, and behind obstacles to maximize their effect as combat multipliers.

- Supporting disengagements.
- Channelizing enemy movement into engagement areas.

Operations in Depth

3-55. Fires attack the enemy before he enters close combat. These fires are planned to –

- Disorganize, delay, and weaken the enemy.
- Strip away the enemy reconnaissance elements.
- Impair the enemy vision by causing him to button up in his armored vehicles.
- Support scouts by screening their movement with smoke and suppressing enemy units engaging the scouts.

3-56. For more on fire support for defensive operations see the discussion in FM 6-20-40, FM 6-20-50, and FM 3-09.22.

FIRE SUPPORT FOR STABILITY OPERATIONS

3-57. Fire support considerations for stability operations include the considerations identified for offensive and defensive operations. Commanders must analyze each mission and adapt the mission variables to fit the situation. Characteristics of stability operations include —

- They are often conducted in noncontiguous AOs. This can complicate the use of FSCMs, the ability to mass and shift fires, and clearance of fires procedures.
- What constitutes key terrain may be based more on political, cultural and/or social considerations than physical features of the landscape. Fires may be used more frequently to defend key sites than to seize them.
- ROE are often more restrictive than in major combat operations. Commander's guidance for the application of fires requires careful consideration during development and wide dissemination to all levels. Increasing the proportion of TGMs used in fires and/or employment of nonlethal capabilities may be necessary to limit collateral damage.
- Improper application of fires can have a long-term adverse impact on achievement of the desired end state.
- Use of fires to demonstrate capabilities, show of force, or area denial.
- Use of the D3A targeting methodology to synchronize non-lethal fires and to conduct engagement planning.
- Use of fires for improved night vision capabilities of suspected enemy activities.
- Provide force protection through target acquisition and counterstrike operations with maneuver forces.

FIRE SUPPORT FOR DEFENSE SUPPORT TO CIVIL AUTHORITIES

3-58. The fire support structure and particularly field artillery units usually contribute in nontraditional ways during operations involving defense support to civil authorities. The equipment and organizations available to the units can provide effective mission command, OPs, convoy operations, local security, sustainment operations, and liaison to assist inform activities. See FM 3-28.1 for additional information on defense support to civil authorities.

SPECIAL CONSIDERATIONS

SIMULTANEITY AND DEPTH

3-59. Simultaneous operations conducted throughout the AO disrupt enemy decision cycles and overload the enemy. The purpose of simultaneous attack in depth is to achieve a synergy that paralyzes enemy forces, confuses their decisionmaking cycle, preventing them from reacting appropriately and inducing their early culmination.

FIRES IN SUPPORT OF THE DECISIVE OPERATION

3-60. Fires normally contribute to the overall effect of maneuver but the decisive operation need not be a close operation. Examples of fires as the decisive operation might include destroying a particular target through the use of cannon or rocket/missile-delivered TGMs or air strikes by manned or unmanned aircraft.

FIRES IN SUPPORT OF SHAPING OPERATIONS

3-61. Simultaneous attacks in depth, executed at increasingly longer ranges and with TGMs, are key elements for BCTs, divisions, and corps in shaping the operational environment and accelerating the enemy's defeat. In both offense and defense, shaping operations are conducted to isolate, immobilize, and weaken the enemy in depth, using fire, maneuver, or a combination of the two. Fires in support of shaping operations may be used to limit the enemy's ability to shift forces to meet attacking friendly maneuver forces and to sustain the momentum of the attack. Fires in support of shaping operations disrupt or destroy the enemy's attacking echelons and fire support, mission command, and logistic infrastructure. They are intended to reduce the enemy's combat strength and rate of arrival in the close combat area to a level manageable by BCT and battalion task force commanders.

3-62. As part of shaping operations, fire support can improve friendly force ratios, protect the force, and provide for successful maneuver. Commanders use fire support to strike enemy maneuver units, indirect fire systems, observation units, control and communications facilities, target acquisition assets, and ammunition/logistics sites. Similarly, fire support in shaping operations can interdict enemy maneuver forces, indirect fire systems, surface-to-surface missile systems, and logistic units/facilities; and limit an opponent's freedom of action while simultaneously enhancing friendly options.

3-63. Field artillery systems are fully capable of conducting long-range strikes with fires throughout the supported force AO and massing their effects under all weather conditions, day or night. They provide joint and land component commanders the capability to engage HPTs out to the maximum range of the respective weapons system, when and where required.

FIRE SUPPORT FOR CLOSE COMBAT

3-64. Distances between combatants may vary from several thousand meters to hand-to-hand fighting. Fire support for close combat is undertaken to win the current battle or engagement. Close combat is frequent during urban operations. Particularly during counterinsurgency and/or stability operations these attacks may be ambushes of convoys, patrols or quick reaction forces that occur in built up areas. The use of precision munitions as part of defensive fires in such cases can increase the likelihood of effective fires while reducing the risk of fratricide and limiting collateral damage. Counterfire is used against enemy indirect fire systems to preserve friendly fighting forces and their combat capabilities. Counterfire gives supported elements the freedom to maneuver, while obscurants and illuminating fires hide friendly movements and expose enemy formations at night. At BCT level, close support fires in close combat are normally the main concern of unit mortars, close air support, and organic and reinforcing fires battalions whose fires may be further augmented by fires from a fires brigade. Commanders and planners must ensure that supported forces engaged in close combat receive an appropriate share of available fire support. Plans must also include provision of fire support for security forces and reserves upon commitment.

FIRES IN SUPPORT OF SUSTAINMENT OPERATIONS

3-65. Fire support for sustainment operations is conducted to ensure that friendly forces retain freedom of action to sustain combat forces. Fire support must be responsive to any threat. CAS, field artillery, and mortars are normally the fire support assets available for support of sustainment operations. Army attack aviation may also be available.

3-66. Usually, fire support will be provided to sustainment units on a contingency basis. There may, however, be times when field artillery is positioned in the sustainment area to prepare against a pending threat. Fire support assets located in sustainment areas do not constitute fire support in reserve but are committed field artillery. Considerations concerning fire support for sustainment operations—

- Army aviation or CAS may be the most responsive fire support asset for use in sustainment areas when units are widely separated and range to target is a factor.
- FSCMs must be used to protect friendly units.
- When a BCT is committed against Level III threats, fire support will usually consist of that brigade's organic fires battalion.
- TA and sensor management assets should be an integral part of the fire support plan for sustainment area defense.

FIRE SUPPORT CONSIDERATIONS FOR MULTINATIONAL OPERATIONS

3-67. To maximize fire support, the multinational force must integrate joint and multinational systems and procedures. Special arrangements can include communications, language requirements, liaison personnel, multinational transition teams, and interoperability procedures. See Appendix B for a discussion of NATO field artillery command and support relationships.

3-68. For more on interagency and multinational operations, see JP 3-16.

SECTION IV – FIRE SUPPORT ASSESSMENT

3-69. Assessment involves a comparison of forecasted outcomes to actual events using measures of performance and measures of effectiveness. They often require readjustment as the situation changes and objectives evolve. The commander and staff, COF, and fires cell at each echelon determine fire support related measures of performance and measures of effectiveness during planning. They consider them as early as mission analysis, and include them and related guidance in commander and running estimates. Assessment helps the commander determine progress toward accomplishing tasks and achieving objectives and the end state. It includes evaluating the operation against measures of performance and measures of effectiveness—

- Measure of Performance. A *measure of performance* is a criterion used to assess friendly actions that is tied to measuring task accomplishment (JP 3-0). Measures of performance are criteria that determine whether the FSTs or actions were performed as the commander intended. They confirm or deny that the fire support structure and its subordinate elements are doing things right. For instance a measure of performance might ask, "Were fire support weapons systems employed as the commander intended on the planned target?"
- Measure of effectiveness. A *measure of effectiveness* is a criterion used to assess changes in system behavior, capability, or operational environment that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect (JP 3-0). Measures of effectiveness focus on the results or consequences of friendly fire support action taken. For the commander and COF they answer the question "Is the fire support structure doing the right things?—or, are additional or alternative actions required?" The primary purpose of a measure of effectiveness is to assess progress. For instance a measure of effectiveness might ask, "Did the expected physical or functional damage to the target occur or did the enemy change his behavior?"

FIRES RUNNING ESTIMATE

3-70. A *running estimate* is the continuous assessment of the current situation used to determine if the current operation is proceeding according to the commander's intent and if planned future operations are supportable (FM 5-0). The COF/brigade FSO and fires cell at each echelon analyze the current situation in terms of METT-TC and prepare the fire support running estimate. The COF/brigade FSO and fires cell continuously assess the impact of new information on the conduct of fire support for the operation, updating the estimate and determining if adjustments to fire support for the operation are required.

3-71. Examples of the factors that may be considered in the fires running estimate are:

- The task organization of subordinate forces and their missions.

- The status of field artillery resources, including cannons and MLRS launchers, ammunition, and target acquisition assets.
- The availability of other fire support resources, including mortars, NGF, tactical air support, and Army aviation support.
- In the attack, the enemy dispositions, the degree of protection afforded the enemy, and the number of phases. These will affect the allocation of fire support resources to subordinate units.
- In the defense, the mission of the covering force, the location of the main battle area, the plans for a counterattack.
- Courses open to the enemy artillery commander, especially his most probable course of action. These are derived from the intelligence estimate and knowledge of enemy artillery doctrine. Consideration of this factor results in –
  - The probable enemy artillery plan.
  - Enemy artillery vulnerabilities.
  - Any information requirements on enemy artillery which have significant influence on the tasking of weapons-locating sensors.
  - The allocation of resources, weapons, and munitions for counterfire.
  - The recommended counterfire priorities for each phase of the battle.
  - The identification of new HPTs.
  - The availability and condition of roads, trails, and likely position areas. This leads to the coordination of movement and position areas with the operations staff.
  - Ammunition consumption and resupply rates, re-positioning requirements, and priority of sustainment.
  - Changes to survey and meteorological conditions.

3-72. Commanders typically empower their COF/brigade FSO to make adjustments to fire support for the operation as needed. The commander and COF/brigade FSO monitor the current situation for unexpected fire support successes, failures, or enemy actions that can prevent the operation from progressing toward the desired end state. As the commander and COF/brigade FSO assess progress they look for opportunities, threats and acceptable progress. They accept risks, seize opportunities, and mitigate threats. Throughout the operation the commander, advised by the COF/brigade FSO, visualizes, describes, and directs changes to fire support for the operation.

3-73. The COF at the division through theater army, and the senior fire support officer at the battalion and brigade level, is responsible for mission analysis considering the fires warfighting function. This analysis includes—

- Higher headquarters mission specified and implied tasks.
- Fires running estimate to identify capabilities and limitations including the status of –
  - Field artillery weapons.
  - Field artillery ammunition.
  - Field artillery target acquisition radars.
  - Close air support (CAS) and other related fixed wing support.
  - Other assets allocated from higher HQ.
- Field artillery and mortar survey support requirements.
- Established/recommended fire support coordination measures (FSCMs).
- Impact of rules of engagement on fire support.
- AO geometry, terrain, and weather's impact on fires (such as smoke, CAS, air interdiction, naval surface fire support, laser designation and range finding), both friendly and enemy.
- Reconnaissance and surveillance support and requirements.
- Initial high-payoff target list (HPTL).
- Fire support input to the intelligence preparation of the battlefield (IPB) analysis.
- Recommended fire support tasks and purposes.

Appendix A

Fire Support Coordination and Other Control Measures

The commander is responsible for the clearance of fires. Fires must be integrated with many other airspace users. Clearance of fires ensures fires will attack enemy capabilities without resulting in fratricide. Clearance of fires may be assisted through a staff process, control measures, embedded in automation control systems, or through active or passive recognition systems.

The commander is responsible for the clearance of fires. The COF/brigade FSO and fires cell planners coordinate all fire support impacting in his supported commander's area of operations, including that fire support requested by the supported unit. They ensure that fire support will not jeopardize troop safety, will interface with other fire support means, will ensure the most responsive fires possible, and/or will not disrupt adjacent unit operations. Control measures are vital to the successful clearance of fires by the staff, COF/brigade FSO and fire cell planners. Section I begins with FSCMs. Section II describes boundary and phase line considerations for fire support. Section III closes with a discussion of radar and ACMs.

SECTION I - FIRE SUPPORT COORDINATION MEASURES

A-1. A *control measure* is a means of regulating forces or warfighting functions (FM 1-02).

A-2. A *graphic control measure* is a symbol used on maps and displays to regulate forces and warfighting functions (FM 1-02).

A-3. A *fire support coordination measure* is a measure employed by commanders to facilitate the rapid engagement of targets and simultaneously provide safeguards for friendly forces (Joint Publication (JP) 3-0).

A-4. Locations and implementing instructions for FSCMs are disseminated electronically by message, database update, and/or overlay through both command and fire support channels to higher, lower, and adjacent maneuver and supporting units. Typically FSCMs are further disseminated to each level of command, to include the establishing command and all concerned joint fire support agencies.

A-5. The establishment or change of an FSCM is typically initiated through the operations cell and ultimately approved by the establishing commander. FSCMs enhance the expeditious engagement of targets; protect forces, populations, critical infrastructure, and sites of religious or cultural significance; and set the stage for future operations. Commanders position and adjust FSCMs consistent with the operational situation and in consultation with superior, subordinate, supporting, and affected commanders. The operations cell informs coordination elements of the change and effective time. Conditions which dictate the change of FSCMs are also coordinated with the other agencies and components as appropriate. As conditions are met, the new FSCM effective time can be projected and announced. Following direction to execute the change, the current operations cell should confirm with all liaison elements that the FSCM changes have been disseminated. This ensures that affected units are aware of new FSCM locations and associated positive control measures are being followed, thus reducing the risk of fratricide. FSCMs may be identified using alphanumeric characters, such as "NFA Red 2", to add clarity.

Note. Some automation systems use different symbols or colors to display various FSCMs and control measures. This is primarily done to enhance the system's screen display. For example, in some systems the location of a naval vessel's fire support station (FSS) displays as an "X" rather than the joint doctrine-prescribed dot ("."), the CFL is a solid vice dashed black line, and some restrictive FSCMs are displayed in red rather than the prescribed black color. Personnel using automation systems must be aware of how a given measure displays in their system. Until all automation systems are capable of color displays, the prescribed color will remain as black. Some automation systems display only the type and name of the FSCM. Other information, such as the measure's effective date-time group, is found by opening the properties tab for the given measure. Where an FSCM and a maneuver control measure coincide, the maneuver control measure's graphic depiction is used and the FSCM's identification information is also displayed. For example, a phase line that is also identified as the CFL would use the solid line of a phase line but will include the letters "CFL" followed by the establishing HQ above the line after the phase line name and the CFL's effective date-time group (DTG) below the line.

PERMISSIVE FIRE SUPPORT COORDINATION MEASURES

A-6. Permissive FSCMs facilitate the attack of targets by reducing the coordination necessary for the clearance of fires.

COORDINATED FIRE LINE

A-7. A *coordinated fire line* is a line beyond which conventional indirect surface joint fire support means may fire at any time within the boundaries of the establishing headquarters without additional coordination. The purpose of the coordinated fire line is to expedite the surface-to-surface attack of targets beyond the coordinated fire line without coordination with the land commander in whose area the targets are located (JP 3-09).

A-8. The CFL is usually established by a brigade or division commander equivalent, but it can also be established, especially in amphibious operations, by a maneuver battalion. It is located as close to the establishing unit as possible without interfering with the maneuver forces. There is no requirement for the CFL to be placed on identifiable terrain. However, additional considerations include the limits of ground observation, the location of the initial objectives in the offense, and the requirement for maximum flexibility in both maneuver and the delivery of supporting fires. Subordinate CFLs may be consolidated by higher headquarters (HQ).

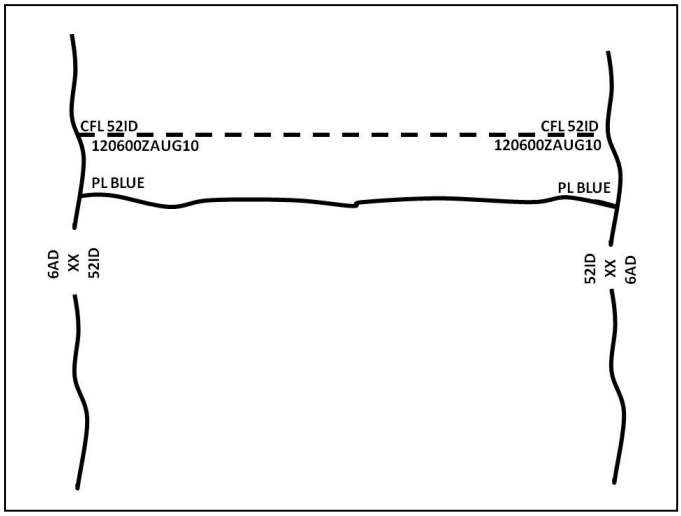

Figure A-1. Coordinated fire line (example)

A-9. The CFL is graphically portrayed (Figure A-1) by a dashed black line, with "CFL" followed by the establishing HQ above the line and the effective date-time group (DTG) below the line. Locations for CFLs are disseminated by message and/or overlay through maneuver and fire support channels to higher, lower, adjacent maneuver, and supporting units.

FIRE SUPPORT COORDINATION LINE

A-10. A *fire support coordination line* is a fire support coordination measure that is established and adjusted by appropriate land or amphibious force commanders within their boundaries in consultation with superior, subordinate, supporting, and affected commanders. Fire support coordination lines facilitate the expeditious attack of surface targets of opportunity beyond the coordinating measure. A fire support coordination line does not divide an area of operations by defining a boundary between close and deep operations or a zone for close air support. The fire support coordination line applies to all fires of air, land, and sea-based weapon systems using any type of ammunition. Forces attacking targets beyond a fire support coordination line must inform all affected commanders in sufficient time to allow necessary reaction to avoid fratricide. Supporting elements attacking targets beyond the fire support coordination line must ensure that the attack will not produce adverse effects on, or to the rear of, the line. Short of a fire support coordination line, all air-to-ground and surface-to-surface attack operations are controlled by the appropriate land or amphibious force commander. The fire support coordination line should follow well-defined terrain features. Coordination of attacks beyond the fire support coordination line is especially critical to commanders of air, land, and special operations forces. In exceptional circumstances, the inability to conduct this coordination will not preclude the attack of targets beyond the fire support coordination line. However, failure to do so may increase the risk of fratricide and could waste limited resources (JP 3-09).

A-11. The FSCL is a term oriented to air-land operations and is normally located only on land, however in certain situations, such as littoral areas, the FSCL may affect both land and sea areas. If possible, the FSCL should follow well-defined terrain features to assist identification from the air. In amphibious operations, the FSCL is normally established by the commander, landing force after coordination with the commander, amphibious task force. Changes to the FSCL require notification of all affected forces within the AO and must allow sufficient time for these forces and/or components to incorporate the FSCL change. Current technology and collaboration tools between the elements of the joint force determine the times required for changing the FSCL. The JFC should establish a time standard in his guidance for shifting FSCLs. Whenever possible; restrictive measures are employed by commanders to enhance the protection of friendly forces operating beyond the FSCL—measures such as restrictive fire areas (RFAs) and NFAs.

A-12. The FSCL is graphically portrayed (Figure A-2) by a solid black line extending across the assigned areas of the establishing HQ. The letters "FSCL" are followed by the establishing HQ above the line and the effective DTG below the line. FSCLs do not have to follow "traditional" straight-line paths. Positioning the FSCL on terrain identifiable from the air is a technique that may further assist in fratricide prevention. Curved and/or enclosed FSCLs have applications in joint operations conducted in non-contiguous AOs and in Wide Area Security.

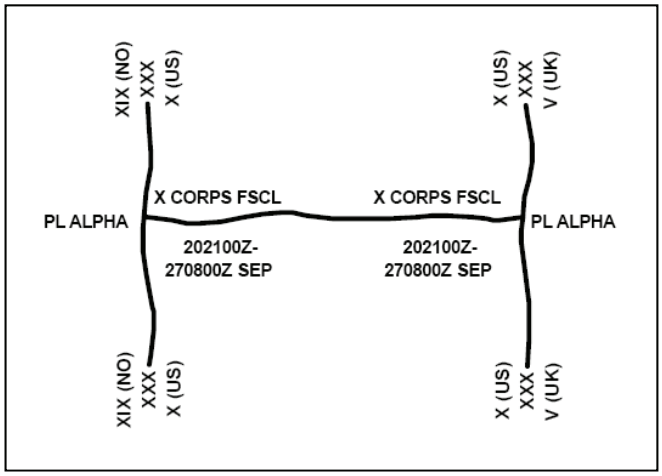

Figure A-2. Fire support coordination line (example)

A-13. Use of an FSCL is not mandatory. Forces engaging targets beyond an FSCL must inform all affected commanders in sufficient time to allow necessary reaction to avoid fratricide, both in the air and on the land. In exceptional circumstances, the inability to conduct this coordination will not preclude the engagement of targets beyond the FSCL. However, failure to do so may increase the risk of fratricide and waste resources. Short of an FSCL, all air-to-ground and surface-to-surface engagement operations are controlled by the appropriate land or amphibious force commander. This control is exercised through the operations staff or with pre-designated procedures. The FSCL is not a boundary—the synchronization of operations on either side of the FSCL is the responsibility of the establishing commander out to the limits of the land or amphibious force boundary. The establishment of an FSCL does not create a free fire area (FFA) beyond the FSCL. When targets are engaged beyond an FSCL, a supporting element's engagements must not produce adverse effects on or to the rear of the line. Engagements beyond the FSCL must be consistent with the establishing commander's priorities, timing, and desired effects and deconflicted whenever possible with the supported HQ.

A-14. The decision on where to place or even whether to use an FSCL requires careful consideration. If used, its location is based on estimates of the situation and concept of operations. Location of enemy forces, anticipated rates of movement, concept and tempo of the operation, organic weapon capabilities, and other factors are all considered by the commander. The FSCL is normally positioned closer to the forward line of own troops in the defense than in the offense; however, the exact positioning depends on the situation. Placing the FSCL at greater depths will typically require support from higher organic HQ and other supporting commanders. Also, when the FSCL is positioned at greater depth, there is greater requirement for detailed coordination with the establishing commander and can slow the expeditious clearance of fires short of the FSCL —

- Air strikes short of the FSCL, both CAS and AI, must be under positive or procedural control to ensure proper clearance of joint fires—for example, JTACs or FAC(A)s. Land commanders must consider the need for extra control measures.
- By establishing an FSCL close-in, yet at sufficient depth so as to not limit high-tempo maneuver, land and amphibious force commanders ease the coordination requirements for engagement operations within their AOs by forces not under their control such as naval surface fire support (NSFS) or AI.
- Coordination of engagements beyond the FSCL is especially critical to commanders of air, land, and special operations forces (SOF) units operating beyond the FSCL. Such coordination is also important when engaging forces are employing wide-area munitions or those with delayed effects. Finally, this coordination assists in avoiding conflicting or redundant engagement operations.
- The establishing commander adjusts the location of the FSCL as required to keep pace with operations. In high-tempo maneuver operations, the FSCL may change frequently. A series of disseminated "on-order" FSCLs will help accelerate the coordination required. The establishing

commander quickly transmits the change to higher, lower, adjacent, and supporting HQ to ensure engagement operations are appropriately coordinated by controlling agencies. Anticipated adjustments to the location of the FSCL are normally transmitted to other elements of the joint force sufficiently early to reduce potential disruptions in their current and near-term operations. Careful planning and coordination is essential for changes to the FSCL. This planning is necessary to minimize the risk of fratricide and avoid disrupting operations.

- Varying capabilities for acquisition and engagement may exist among adjacent commanders in a multinational operation. Normally, corps level commanders may establish an FSCL to support their operations. Layered FSCLs and multiple, separate, noncontiguous corps and/or MEF FSCLs positioned at varying depths create a coordination and execution challenge for supporting commanders (for example, tracking effective times, lateral boundaries, and multiple command guidance). In cases such as these when the components share a mutual boundary, the JFC or JFLCC may consolidate the operational requirements of subordinates to establish a single FSCL. This FSCL may be noncontiguous to reflect the varying capabilities of subordinate commands. A single FSCL facilitates air support, accommodates requirements for subordinate operations throughout the AO, and eases coordination of FSCL changes.

Note. In addition to the FSCL, the U.S. Marine Corps uses a supplemental FSCM called the battlefield coordination line (BCL). Marine units prefer placing the FSCL close to the forward edge of the battle area (FEBA) so that organic indirect fires can range most targets short of the FSCL and organic air assets have maximum freedom to engage targets beyond the FSCL. However, since in many operations the FSCL is controlled by the combatant commander or JTF commander, the FSCL may be placed at a significantly greater distance than the maximum range of U.S. Marine Corps indirect fire assets. Since aviation assets cannot freely engage targets short of the FSCL without coordination, the BCL was developed as a supplemental measure to allow Marine air-ground task force (MAGTF) aviation to attack surface targets without approval of a ground combat element commander in whose area the targets may be located. The MAGTF commander establishes the BCL and disseminates it to the FSCCs of subordinate, adjacent, and higher headquarters, as required. It is further disseminated at each level of command, including the establishing command, to all concerned fire support agencies such as the DASC, TACC, fire direction center, SACC, and NSFS ships. It is graphically portrayed on fire support maps, charts, and overlays by in the same manner as the FSCL (Figure A-2)—a solid black line with the letters "BCL" (instead of the letters "FSCL") followed by the establishing headquarters in parenthesis above the line (for instance "BCL 1 MEF") and effective DTG below the line. The BCL is not currently supported by automated systems for depiction. To facilitate air-delivered fires and deconflict air and surface fires, an airspace coordination area (ACA) will always overlie the area between the BCL and the FSCL. Before firing, the ground commander should thus coordinate with the air combat element (ACE) DASC if surface delivered fires will violate an ACA associated with the BCL. For more on the BCL see MCWP 3-16.

FREE FIRE AREA

A-15. A *free fire area* is a specific area into which any weapon system may fire without additional coordination with the establishing headquarters. It is used to expedite joint fires and to facilitate jettison of aircraft munitions (JP 3-09). Where both surface-to-surface fires and aircraft emergency munitions jettison share a FFA, consider establishing an ACA to assist in deconfliction.

A-16. An FFA may be established only by the military commander with jurisdiction over the area (usually, a division or higher commander). Preferably, the FFA should be located on identifiable terrain; however, it may be designated by grid coordinates or the Global Area Reference System (GARS).

A-17. The FFA is graphically portrayed (Figure A-3) by a solid black line defining the area and the letters "FFA" within, followed by the establishing HQ and the effective DTG (JP 3-09).

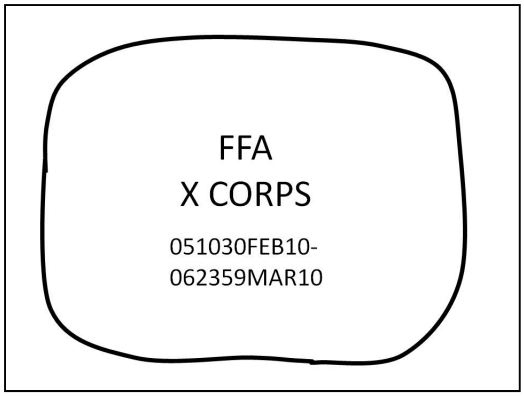

Figure A-3. Free fire area (example)

KILL BOX

A-18. A *kill box* is a three-dimensional area used to facilitate the integration of joint fires (JP 3-09). The kill box is a three-dimensional FSCM used to facilitate the expeditious air-to-surface lethal attack of targets, which may be augmented by or integrated with surface-to-surface indirect fires. While kill boxes are permissive FSCMs with respect to the deliverance of air-to-surface weapons they are also restrictive in nature; trajectories and effects of surface-to-surface indirect fires are not normally allowed to pass through the kill box. A kill box is a unique FSCM that may contain other measures within its boundaries, such as NFAs, restricted operations area (ROAs), and ACAs. Restrictive FSCMs and ACMs will always have priority when established in a kill box.

A-19. When established, the primary purpose of a kill box is to allow lethal attack against surface targets without further coordination with the establishing commander and without terminal attack control. When used to integrate air-to-surface and surface-to-surface indirect fires, the kill box will have appropriate restrictions. The goal is to reduce the coordination required to fulfill support requirements with maximum flexibility, while preventing fratricide. A kill box will not be established specifically for CAS missions.

A-20. Supported component commanders, acting on JFC authority, establish and adjust kill boxes in consultation with superior, subordinate, supporting, and affected commanders. Requirements for kill boxes and other control measures are determined using normal component targeting and planning processes and are established and approved by commanders or their designated staff. The dimensions of a kill box are normally defined using an area reference system such as the GARS but could follow well defined terrain features or may be located by grid coordinates or by a radius from a center point (FM 3-09.34). See JP 2-03 for a more detailed description of the GARS.

A-21. Depiction of a kill box may vary among automation systems. Until the system displays are synchronized, fire support personnel must be aware of the meanings of the system's visual display. Figure A-5 depicts an example kill box depiction on a paper map. A "blue kill box" (BKB) permits air-to-surface fires and typically extends from a maximum altitude to the ground; a "purple kill box" (PKB) permits the integration of surface-to-surface indirect fires with air-to-surface fires typically by specifying a maximum and a minimum altitude where indirect fire trajectories can pass either above the maximum altitude or below the minimum altitude.

A-22. A kill box is graphically portrayed (Figure A-4) by a solid black line defining the area borders and the letters "BKB" (blue kill box) or a "PKB" (purple kill box) within, followed by the establishing HQ, affected altitudes, and the effective DTGs. The DTG times may be written as on-order. The unit identifier for the establishing headquarters will be consistent with designations in OPLANs/OPORDs. A kill box may be identified using alphanumeric characters to add clarity. Units and/or automation systems may add color to the boxes for visual recognition; however, the basic graphic follows the standards of an FSCM. Kill box names will not be used more than once.

Figure A-4. Kill Box (paper overlay example)

RESTRICTIVE FIRE SUPPORT COORDINATION MEASURES

A-23. Restrictive FSCMs are those that provide safeguards for friendly forces and noncombatants, facilities, or terrain.

NO-FIRE AREA

A-24. A *no-fire area* is an area designated by the appropriate commander into which fires or their effects are prohibited (JP 3-09.3). There are two exceptions—

- When the establishing HQ approves joint fires within the NFA on a mission by mission basis.
- When an enemy force within the NFA engages a friendly force and the engaged commander determines there is a requirement for immediate protection and responds with the minimal force needed to defend the force.

A-25. Any size unit may establish NFAs. If possible, the NFA is established on identifiable terrain. It may also be located by a series of grids or by a radius from a center point.

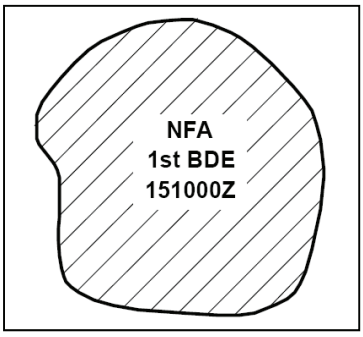

Figure A-5. No-fire area (example)

A-26. The NFA is graphically portrayed (Figure A-5) as an area outlined with a solid black line with black diagonal lines inside. The letters "NFA" are within, followed by the establishing HQ and the effective DTG.

RESTRICTIVE FIRE AREA

A-27. A *restrictive fire area* is 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 headquarters (JP 3-09).

A-28. A maneuver battalion or higher echelon normally establishes an RFA. Usually, the RFA is located on identifiable terrain, by grid, or by a radius from a center point. To facilitate rapidly changing operations, on-call RFAs may be used. The dimensions, locations, and restrictions of the on-call RFA are prearranged.

A-29. The RFA is graphically portrayed (Figure A-6) by a solid black line defining the area and the letters "RFA" within, followed by the establishing HQ and the effective DTG. The restrictions may be included within the graphic if space allows, or reference may be made to a specific OPORD or OPLAN.

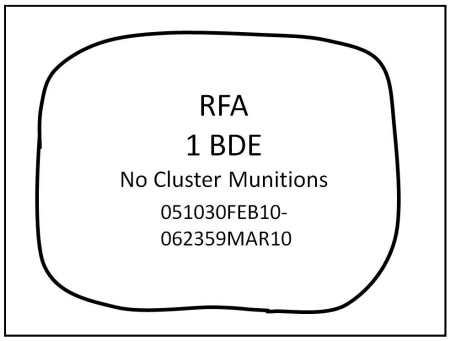

Figure A-6. Restrictive fire area (example)

RESTRICTIVE FIRE LINE

A-30. A *restrictive fire line* is a line established between converging friendly forces — one or both may be moving —that prohibits fires or their effects across that line without coordination with the affected force. The purpose of the restrictive fire line (RFL) is to prevent fratricide and duplication of engagements by converging friendly forces.

A-31. The commander common to the converging forces establishes the RFL. It is located on identifiable terrain when possible. In link-up operations, it is usually closer to the stationary force to allow maximum freedom of action for the maneuver and fire support of the linkup force.

A-32. The RFL is graphically portrayed (Figure A-7) by a solid black line, with "RFL" followed by the establishing HQ above the line and the effective DTG below the line.

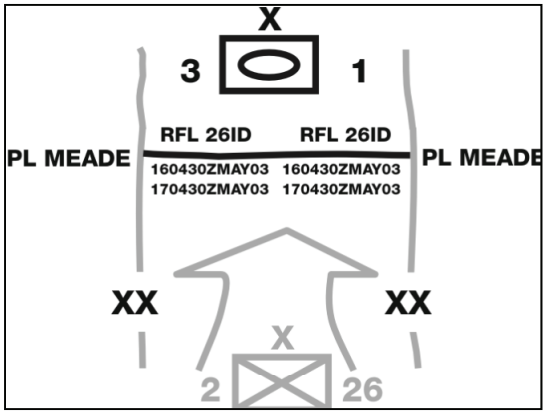

Figure A-7. Restrictive fire line (example)

FIRE SUPPORT AREA AND A FIRE SUPPORT STATION

A-33. A *fire support area* is an appropriate maneuver area assigned to fire support ships by the maritime commander from which they can deliver gunfire support to an operation ashore (JP 3-09). A fire support area (FSA) (Figure A-8) is normally associated with amphibious operations but can be used whenever it is desirable to have a fire support ship occupy a certain geographic position.

A-34. A *fire support station* is an exact location at sea within a fire support area from which a fire support ship delivers joint fire (JP 1-02). This designation is used to station ships within boat lanes of the assaulting force, or in areas where maneuvering room is restricted by other considerations.

A-35. The officer in tactical command, typically the commander, amphibious task force, establishes FSAs and FSSs (Figure A-8). In amphibious operations when engagement groups are formed and separate landing areas are designated, the commander, amphibious task force may assign each engagement group commander the responsibility for control of NGF support within the area.

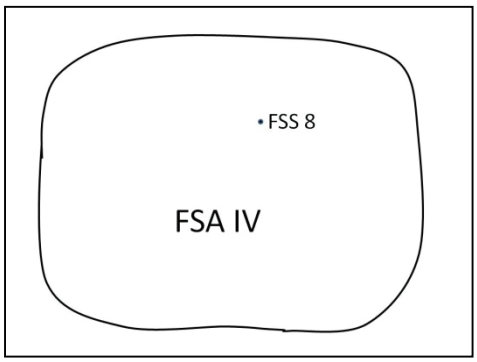

Figure A-8. Fire support area and fire support station (examples)

A-36. FSAs are designed with Roman numerals (for example FSA I, II, III) and are graphically portrayed (Figure A-8) on the NSFS operations overlay. FSS' are designated by numbers (for example FSS 1, 2, or 3) and are shown on the NSFS operations overlay as a black dot indicating the exact position of the ship. Some automation systems display an FSS as an "X" rather than as a black dot (•) to enhance the symbol's visibility.

ZONE OF FIRE

A-37. A *zone of fire* is an area within which a designated ground unit or fire support ship delivers, or is prepared to deliver, fire support. Fire may or may not be observed (JP 3-09). Land is divided into zones of fire (ZFs) which are assigned to gunfire support ships and units as a means to coordinate their efforts with each other and with the scheme of maneuver of the supported ground unit. Units and ships assigned ZFs are responsible for engaging known targets and targets of opportunity according to their mission and the guidance of the supported commander. ZFs are delineated (Figure A-9) by the use of broken lines (solid lines if unit boundaries are used as depicted) and are designated by Arabic numerals (for example ZF3).

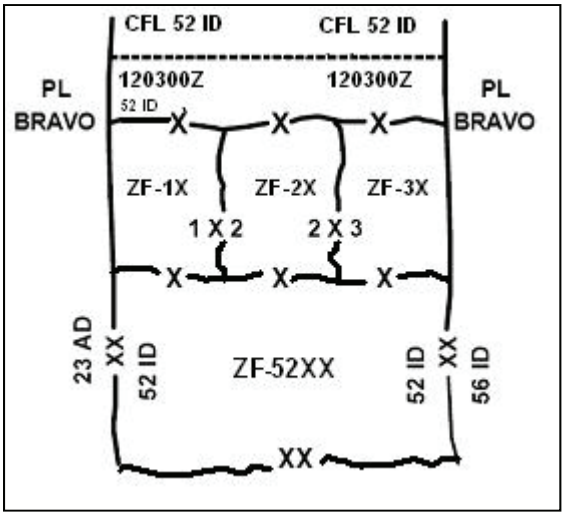

Figure A-9. Zone of Fire (example)

A-38. The commander of the maritime force providing NSFS establishes and assigns ZFs for the forces. The ZF for an artillery battalion or a ship assigned the mission of DS normally corresponds to the AO of the supported unit. The ZF for an artillery battalion or a ship assigned the support relationship or mission of GS should be within the boundaries of the supported unit. When used in conjunction with NGF, the size and shape of a ZF will depend on the following—

- Boundaries. In order to permit ready identification by the spotter and the individual fire support ship, the boundaries of the ZFs should be recognizable both on the terrain and on a map. It may be necessary to divide a large ZF into two or more smaller zones due to considerations discussed below. The boundaries of ZFs of DS ships should correspond to the zones of action of the landing force units supported.
- Size. The size of each ZF should be such that the fire support ships, or ships assigned to observe and/or destroy targets, will be able to accomplish the mission in the time allocated. When ZFs are delineated, known or suspected targets scheduled for destruction in each zone are plotted, and then the number and type of targets are compared to the capability of the ship.
- Visibility. Observation from seaward is a desirable feature for ZFs, since it permits a ship to deliver more accurate and rapid fire.
- Accessibility to Fire. The ZFs must be accessible to the trajectory of the fire support ship(s) assigned to the zone.

A-39. ZFs are also assigned to field artillery units by their higher HQ. The ZF for artillery units assigned to a maneuver unit or assigned the DS support relationship or tactical task corresponds to the AO of the parent or supported unit. The ZF for an artillery unit assigned the R support relationship or tactical task corresponds to the ZF of the reinforced artillery unit. The ZF for an artillery unit assigned the general support-reinforcing (GSR) support relationship or tactical task corresponds to the AO of the supported unit including the ZF of the reinforced artillery unit. The ZF for an artillery unit assigned the GS support relationship or tactical task corresponds to the AO of the supported unit.

A-40. See JP 3-02 for more information on amphibious operations.

SECTION II – BOUNDARY AND PHASE LINE CONSIDERATIONS FOR FIRE SUPPORT

BOUNDARIES

A-41. A *boundary* is a line that delineates surface areas for the purpose of facilitating coordination and deconfliction of operations between adjacent units, formations, or areas (JP 3-0). Boundaries divide up AOs and define responsibility for clearance of fires. Boundaries are both permissive and restrictive in nature—

- They are permissive in that a maneuver commander, unless otherwise restricted, enjoys complete freedom of fire and maneuver within his own boundaries. Thus units may execute joint fires without close coordination with neighboring units unless otherwise restricted.
- They are restrictive in that normally units do not fire across boundaries unless the fires are coordinated with the adjacent unit or the fires are allowed by a permissive FSCM, such as a CFL. These restrictions apply to conventional and special munitions and their effects. When fires such as obscuration and illumination affect an adjacent unit, coordination with that unit is normally required. A commander may employ direct fires without clearance at specific point targets that are clearly and positively identified as enemy. Targets and their triggers should be kept within the same unit's boundary without overriding other tactical or doctrinal considerations. See the Chapter 3 discussion of cross-boundary clearance of fires.

A-42. For more boundaries, see FM 3-90.

PHASE LINES AND TRIGGER LINES

A-43. A *phase* is a planning and execution tool used to divide an operation in duration or activity. A change in phase usually involves a change of mission, task organization, or rules of engagement. Phasing helps in planning and controlling and may be indicated by time, distance, terrain, or an event (FM 1-02).

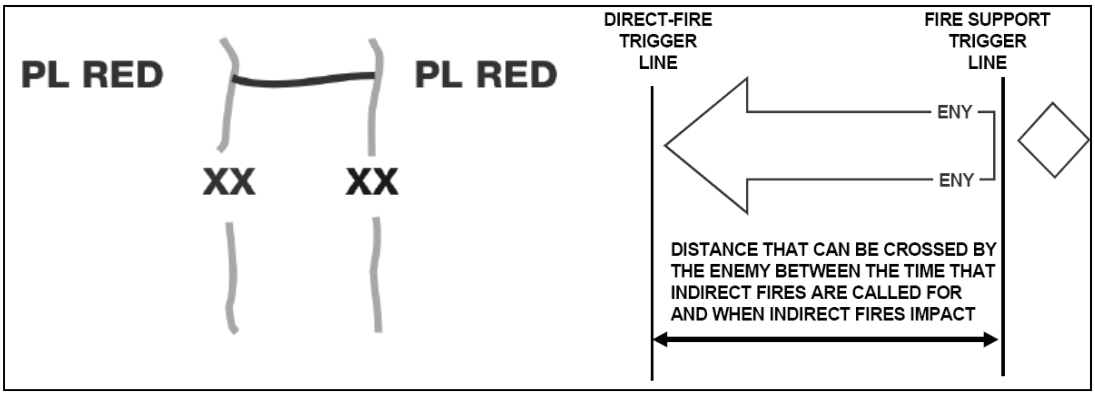

Figure A-10. Phase line and trigger line (examples)

A-44. A *phase line* is a line utilized for control and coordination of military operations, usually an easily identified feature in the operational area (JP 3-09). Phase lines (Figure A-10 left) are easily identifiable from a ground or air vantage point and may include features such as ridge line, tree lines, hilltops, roads and rivers. They can be used to identify limits of advance and coordinate joint fires.

A-45. A *trigger line* is a phase line—located on identifiable terrain that crosses the engagement area—used to initiate and mass fires into an engagement area at a predetermined range for all or like weapons systems (FM 3-90). The commander designates a phase line as the trigger line for his fire support attack assets. He bases the trigger line's location on the factors of METT-TC including such variables as the time of flight for artillery shells, positioning of the guns, and the existence of quick-fire links. A trigger line's location varies from situation to situation. Its position reflects the distance that the enemy force is likely to traverse in the time it takes from when fires are requested to when artillery rounds impact (Figure A-10 right). This gives time for the fire support delivery systems to respond to the initial call for fire. Fires unit commanders must determine the appropriate planning response time for their unit based on their weapon system and training proficiency to recommend the placement of a trigger line.

A-46. The commander can establish another trigger line for his most accurate long-range weapon system in the vicinity of the area where the fire support impacts to capitalize on the asymmetric attack. However, dust and debris resulting from the artillery fire may prevent his direct-fire systems from engaging the enemy. He establishes other trigger lines for shorter range systems. He may give guidance to extremely proficient crews to engage the enemy at longer than normal ranges or give them different engagement priorities than the rest of the force, such as giving priority to engaging air defense or engineer-breaching systems. This could result in losing the effect that the sudden application of massed fires has on an enemy.

A-47. When the enemy reaches these closer trigger lines, the commander establishes a decision point to help him determine if he wants his longer-range systems to continue to fire in depth or to concentrate his fires on a single point. Many factors impact his decision, most of which concern the enemy and how he maneuvers and the effects of the defending force's fires.

A-48. The purpose of each phase line and any actions required by forces affected by the phase line will be specified on the OPORD of the establishing HQ. Any commander given an AO can establish a phase line. For more on phase lines see FM 3-90.

SECTION III - RADAR AND AIRSPACE COORDINATING MEASURES

RADAR

RADAR ZONES

A-49. Zones are a means of prioritizing radar sectors of search into areas of greater or lesser importance. Zones focus radar coverage on the combined arms commander's battlefield priorities. There are no graphics for zones. A zone is a geometric figure placed around an area that designates the area as more, or less, important. Four types of zones can be entered into Firefinder radars. Firefinder radars can store up to nine different zones. There are four different types of zones used with the radar—

- Critical Friendly Zone. A *critical friendly zone* is an area, usually a friendly unit or location that the maneuver commander designates as critical to the protection of an asset whose loss would seriously jeopardize the mission (FM 3-90). Typical critical friendly zones (CFZ) include maneuver assembly areas, command posts, forward arming and refueling points, friendly breaching sites, and other troop concentrations. The maneuver commander may also designate critical civilian infrastructure as a critical friendly zone.
- Call-for-Fire Zone. A *call-for-fire zone* is a radar search area from which the commander wants to attack hostile fire systems (FM 3-09.12). A call-for-fire zone would be placed around an enemy fire support position identified by the commander, COF/brigade FSO and targeting working group as an HPT. The call-for-fire zone provides the second most responsive priority for fires from the radars.
- Artillery Target Intelligence Zone. An *artillery target intelligence zone* is an area in enemy territory that the commander wishes to monitor closely. Any weapon detected in the artillery target intelligence zone will be reported ahead of all acquisitions other than those from critical friendly zones or call for fire zones (FM 3-09.12).
- Censor Zone. A *censor zone* is an area from which radar is prohibited from reporting acquisitions. A censor zone is normally placed around friendly weapon systems to prevent them from being acquired by friendly radar (FM 3-09.12).

COMMON SENSOR BOUNDARY

A-50. A *common sensor boundary* is a line established by the force counterfire HQ (normally depicted using a grid line, phase line or major terrain feature) that divides target acquisition search areas into acquisition management areas for AN/TPQ-36 and AN/TPQ-37 radars (FM 3-09.12). Target duplication between Firefinder radars is likely during combat operations. In addition, the sheer volume of targets being passed from the radars will overwhelm the targeting element, especially if the radars are under centralized control. An effective method of reducing the duplication of these targets for attack is to establish a CSB (Figure A-11).

A-51. For additional information on CSBs, radar zones and their employment, see FM 3-09.12.

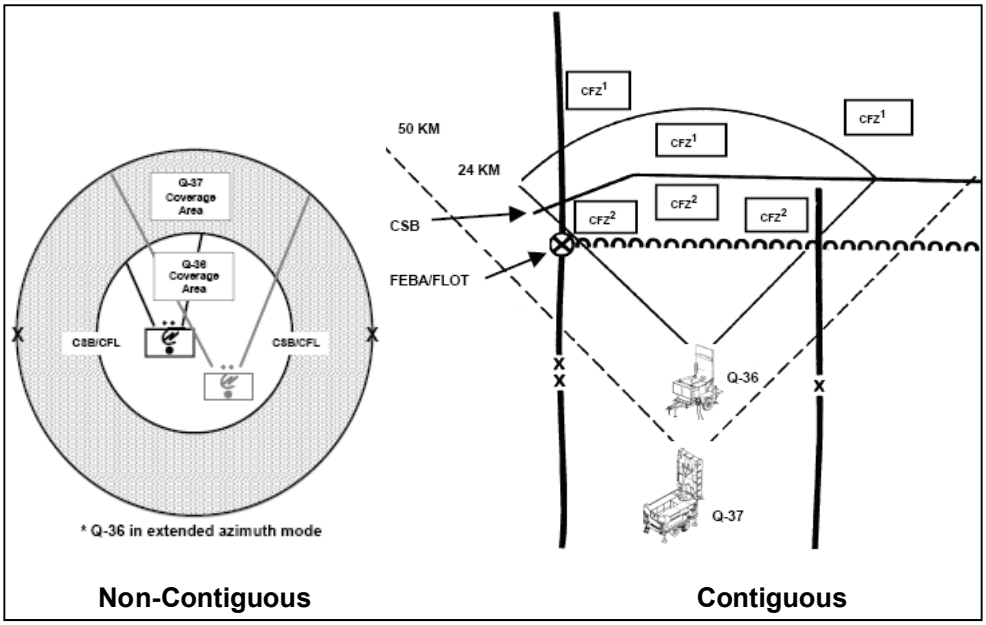

Figure A-11. Common sensor boundaries (example)

AIRSPACE

A-52. *Airspace coordinating measures* are measures employed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces (JP 3-52). A key to effectively coordinating joint fires is to constantly view the operational area as a three dimensional area. ACMs are nominated from subordinate HQ through component command HQ, and forwarded to the airspace control authority in accordance with the air control plan. Most ACMs affect direct and indirect joint fires trajectories and UAS because of their airspace use. Some ACMs may be established to permit surface joint fires or UAS operations. The component commanders ensure that ACM nominations support and do not conflict with joint operations prior to forwarding to the JAOC. The airspace control authority approves formal ACM nominations and includes them in the airspace control order (ACO). The airspace control authority consolidates, coordinates, and deconflicts the airspace requirements of the components and publishes the ACMs in the ACO. The ACO is normally published at least daily and is often distributed both separately and as a section of the ATO. See JP 3-52 and JP 3-30 for further information on the conduct and control of air operations.

Note. Altitude is typically defined as the height above sea level of a given point. Personnel must ensure the altitude is entered and displayed correctly in their automation systems. Some systems may require conversion from feet to meters to permit system entry. Fire support personnel must also be aware that altitude is sometimes expressed as measured from ground level rather than MSL. It may be necessary to express altitude entries in the format processed by the automation system.

AIRSPACE COORDINATION AREA

A-53. An *airspace coordination area* is a three-dimensional block of airspace in a target area, established by the appropriate ground commander, in which friendly aircraft are reasonably safe from friendly surface fires. The airspace coordination area may be formal or informal (JP 3-09.3). A formal ACA requires detailed planning. Vital information defining the formal ACA includes minimum and maximum altitudes, a baseline designated by grid coordinates at each end, the width (on either side of the baseline), and the effective times. When time for coordination is limited, an informal ACA is used. In an informal ACA, aircraft and surface joint fires may be separated by time or distance (lateral, altitude, or a combination of

the two). The informal ACA can be requested by the maneuver commander requesting CAS or employing helicopters, and is approved at battalion or higher level. Both types of ACAs are constructed with the assistance of the air liaison officer to ensure they meet the technical requirements of the aircraft and weapon systems.

A-54. Army airspace users include not only Army aviation but also Air Defense Artillery, Military Intelligence, maneuver, UASs, electronic warfare assets, fire support, and joint and multinational air and ground forces. Maneuver commanders at all levels exercise airspace command and control within their assigned areas through the integration of positive and procedural control. Airspace command and control maximizes the simultaneous use of airspace. At decisive moments, commanders are able to exploit all available combat power—synchronized in time, space, and purpose.

A-55. Fires pass through airspace before impacting. Clearance of fires ensures fires will attack enemy capabilities without resulting in casualties to friendly forces and noncombatants. Clearance of fires may be accomplished through a staff process, control measures, embedded in automation systems, or through active or passive recognition systems.

Note. In NATO field artillery tactical doctrine the ACA is a fire support coordination measure and is defined as "a restricted area or route of travel specified for use by friendly aircraft and established for the purpose of preventing friendly aircraft from being fired on by friendly forces". (AArtyP-5)

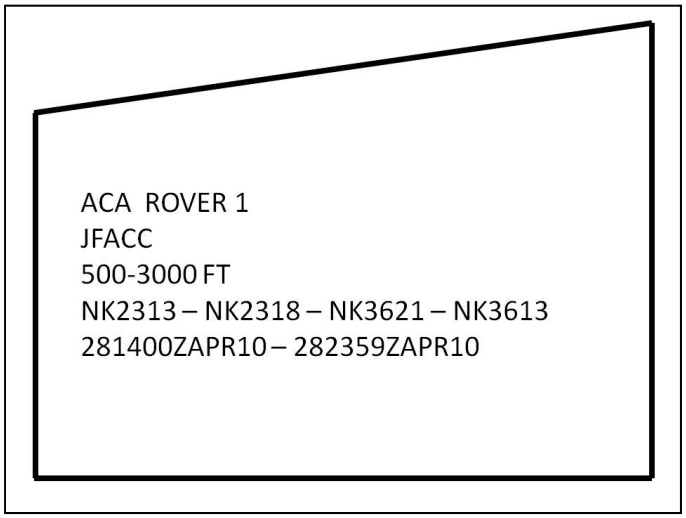

Figure A-12. Formal airspace coordination area (example)

A-56. A formal ACA is graphically shown (Figure A-12) as an area enclosed by a solid black line. Depicted inside the enclosed area are "ACA," the establishing HQ, the minimum and maximum altitudes, the grid coordinates for each end of the baseline and the width of the ACA, the grid coordinates for each point of an irregularly shaped ACA, and the effective DTG or the words "on order." Informal ACAs are not normally displayed on maps, charts, or overlays.

Note: The depiction of ACAs on a two-dimensional surface such as on a map does not display the possibly irregularly shaped ACA dimensions (such as an ATACMS missile or Excalibur flight paths) that may be constructed within automation systems, which can provide information for airspace clearance.

A-57. For additional information on the ACA see FM 3-52, FM 3-52.1, JP 3-09.3 and JP 3-52.

RESTRICTED OPERATIONS AREA

A-58. A *restricted operations area* is airspace of defined dimensions, designated by the airspace control authority, in response to specific operational situations/requirements within which the operation of one or more airspace users is restricted (JP 1-02). Some typical uses are to restrict air operations over ATACMS launch and target areas, UAS launch and recovery areas and areas identified by the area air defense commander as "weapon free" zones (see Figure A-13).

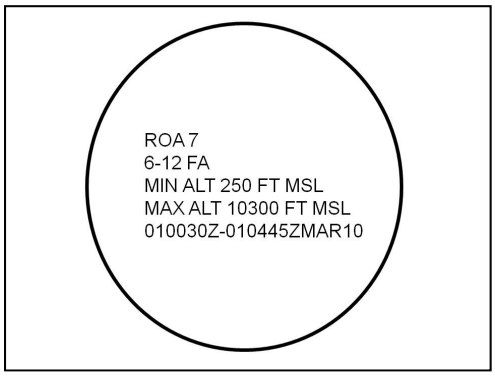

Figure A-13. Restricted operations area (example)

A-59. An ROA is graphically shown (Figure A-13) as an area enclosed by a solid black line. Depicted inside the enclosed area are "ROA," the establishing HQ, the minimum and maximum altitudes, the grid coordinates for each end of the baseline, figure outline grid coordinates, or the center point grid coordinate and radius in meters, and the effective DTG or the words "on order".

Note. The depiction of ROAs on a two-dimensional surface such as on a map does not depict the possibly cylindrical, rectangular, or irregularly shaped three-dimensional ROAs that may be constructed within automation systems, such as AFATDS, that can provide information for airspace clearance.

A-60. For additional information on the ROA, see FM 3-52, FM 3-52.1, JP 3-09.3, and JP 3-52.

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Appendix B

Command and Support Relationships

Command and support relationships provide the basis for ensuring unity of command and unity of effort in operations. Command relationships are used in Army force generation, force tailoring, and task-organizing. Support relationships are used to task-organize Army forces as appropriate. All command and support relationships fall within the framework of joint doctrine. Joint Publication (JP) 1 provides a full discussion of joint command relationships and authorities.

JOINT COMMAND RELATIONSHIPS

B-1. The four types of joint command relationships are combatant command (command authority), OPCON, tactical control, and support. The glossary contains complete definitions and JP 1 discusses each in detail.

B-2. Joint doctrine establishes support as a command relationship. Designating supporting relationships is important, as it conveys priorities to commanders and staffs planning or executing joint operations. The four types of joint support relationships are: general support, mutual support, DS and close support. Each is described in JP 1.

B-3. A joint support relationship is not used when an Army commander task-organizes Army forces in a supporting role. When task-organized to support another Army force, Army forces use one of four Army support relationships.

ARMY COMMAND AND SUPPORT RELATIONSHIPS

B-4. Army command relationships are similar but not identical to joint command authorities and relationships. Differences stem from the way Army forces task-organize and the need for a system of support relationships. Differences allow for flexibly allocating Army capabilities among various echelons. Command and support relationships are the basis for building task organizations—

- *Task-organizing* is the act of designing an operating force, support staff, or logistic package of specific size and composition to meet a unique task or mission. Characteristics to examine when task-organizing the force include, but are not limited to: training, experience, equipage, sustainability, operating environment, enemy threat, and mobility. For Army forces, it includes allocating available assets to subordinate commanders and establishing their command and support relationships (FM 1-02).

- A *task organization* is a temporary grouping of forces designed to accomplish a particular mission (FM 1-02).

COMMAND RELATIONSHIPS

B-5. Command relationships define superior and subordinate relationships between unit commanders. By specifying a chain of command, they unify effort and give commanders the ability to optimize subordinate forces with maximum flexibility. The five types of Army command relationships are organic, assigned, attached, OPCON, and TACON. Command relationships identify the degree of control of the gaining or supported commander. The type of command relationship often relates to the expected longevity of the relationship between the headquarters involved. One of the following command relationships with a tactical unit is established for each field artillery unit—

- **Organic**. Organic means assigned to and forming an essential part of a military organization. Organic parts of a unit are those listed in its table of organization for the Army, Air Force, and Marine Corps, and are assigned to the administrative organizations of the operating forces for the Navy (JP 1-02). A fires battalion is organic to each BCT.
- **Assigned**. Assigned field artillery units operate for long periods under the headquarters to which they are assigned. The gaining organization controls, administers, and provides administrative and logistical support to the assigned unit.
- **Attached**. Attached field artillery units are temporarily associated with the gaining headquarters. They return to their parent unit when the reason for the attachment ends. Subject to limitations stated in the attachment order, the receiving commander has the responsibility to provide the attached unit with sustainment support above its organic capability. However, the attached unit normally retains the responsibility for transfer, promotions, legal, and administrative actions. Fires brigades are typically attached to a division or corps.
- **Operational Control**. Field Artillery units may be placed under OPCON of a gaining headquarters for a given mission, lasting perhaps a few days. OPCON lets the gaining commander task-organize and direct forces. OPCON may be delegated and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Generally, OPCON has the same intent as attachment but without the receiving unit assuming responsibility for administrative or sustainment support. OPCON is often used between maneuver units, but rarely to establish command relationships between maneuver and field artillery units.
- **Tactical Control.** Field artillery units will rarely be placed under TACON as it does not let the gaining commander task organize the unit. Hence, TACON is often used between joint and multinational forces, but rarely between Army forces. Normally, neither OPCON nor TACON conveys a change of administrative control responsibilities.

B-6. The four (4) Army field artillery inherent responsibilities listed in Table B-1 supplement the inherent responsibilities of a command relationship —

Table B-1. Field artillery inherent responsibilities in Army command relationships

If relationship is:		Inherent Responsibilities			
		Answers Calls for Fire in Priority From:	***Has as Its Zone of Fire:***	***Furnishes Fire Support Personnel:***	***Has Its Fires Planned By:***
Command	***Organic***	1. Parent unit. 2. Own observers.[1] 3. Force field artillery headquarters (HQ).[2]	Area of operations of parent unit.	No requirement.[3]	Parent unit.
	Assigned	1. Parent unit. 2. Own observers.[1] 3. Force field artillery HQ.[2]	Area of operations of parent unit.	No requirement.[3]	Parent unit.
	Attached	1. Gaining unit. 2. Own observers.[1] 3. Force field artillery HQ.[2]	Area of operations of gaining unit.	No requirement.[3]	Gaining unit.
	OPCON	1. Gaining unit. 2. Own observers.[1] 3. Force field artillery HQ.[2]	Area of operations of gaining unit.	No requirement.[3]	Gaining unit.
	TACON	1. Gaining unit. 2. Own observers.[1] 3. Force field artillery HQ.[2]	Area of operations of gaining unit.	No requirement.[3]	Gaining unit.

Note 1. Includes all target acquisition (TA) means not deployed with supported unit (radar, UAS), vehicles, air observers, survey parties. In the North Atlantic Treaty Organization (NATO), the gaining unit may not task-organize a multinational unit (see TACON).
Note 2. If designated by the supported commander.
Note 3. Fires brigades and non-BCT fires battalions have organic liaison sections.

SUPPORT RELATIONSHIPS

B-7. A *supporting commander* is, in the context of a support relationship, the commander who aids, protects, complements, or sustains another commander's force, and who is responsible for providing the assistance required by the supported commander (JP 3-0). A *supported commander* is, in the context of a support relationship, the commander who receives assistance from another commander's force or capabilities, and who is responsible for ensuring that the supporting commander understands the assistance required (JP 3-0). Commanders establish support relationships when subordination of one unit to another is inappropriate. They assign a support relationship when—

- The support is more effective when the supporting unit is controlled by a commander with the requisite technical and tactical expertise.
- The echelon of the supporting unit is the same as or higher than that of the supported unit. For example, the supporting unit may be a brigade, and the supported unit may be a battalion. It would be inappropriate for the brigade to be subordinated to the battalion, hence the use of an Army support relationship.
- The supporting unit supports several units simultaneously. The requirement to set support priorities to allocate resources to supported units exists. Assigning support relationships is one aspect of mission command.

B-8. Support relationships allow supporting commanders to employ their units' capabilities to achieve results required by supported commanders. Support relationships are graduated from an exclusive supported and supporting relationship between two units—as in DS—to a broad level of support extended to all units under the control of the higher headquarters—as in general support. Support relationships do not normally alter administrative control. Support relationships [also see tactical tasks for artillery in standardization agreement (NATO) (STANAG) 2484] are used to task-organize for a mission. Field artillery units may be assigned a support relationship of DS, R, GSR, or GS—

- Direct Support. *Direct support* is a mission [the Army designates DS as a support relationship] requiring a force to support another specific force and authorizing it to answer directly to the supported force's request for assistance (JP 3-09.3). *Direct support artillery* is artillery whose primary task is to provide fire requested by the supported unit (JP 1-02). A field artillery unit operating in DS of a maneuver unit is concerned primarily with the fire support needs of only that unit. The fires cell of the supported maneuver unit plan and coordinate fires to support the maneuver commander's intent. The DS artillery unit commander recommends position areas and coordinates for movement clearances where his unit (and any other R, GSR or GS artillery are to be positioned within the supported commander's AO) can best support the commander's concept of the operation. When field artillery units are able to habitually support the same maneuver force, coordination and training are enhanced. A field artillery unit can only be in DS of one maneuver unit at a time; and a maneuver unit can only have one field artillery unit in DS at a time. DS is the most decentralized support relationship.
- Reinforcing. *Reinforcing* is a support mission [the Army designates reinforcing as a support relationship] in which the supporting unit assists the supported unit to accomplish the supported unit's mission. Only like units (artillery to artillery, intelligence to intelligence, and armor to armor) can be given a reinforcing/reinforced mission (JP 1-02). An R support relationship requires one field artillery unit to augment the fires of another field artillery unit. When an organic or DS field artillery battalion requires more fires to meet maneuver force requirements, another field artillery battalion may be directed to reinforce it. An organic or DS field artillery battalion may be supported by up to two reinforcing battalions.
- General Support-Reinforcing. *General support-reinforcing artillery* has the mission [the Army designates general support-reinforcing as a support relationship] of supporting the force as a whole and of providing reinforcing fires for other artillery units (JP 1-02). The first priority of a field artillery unit assigned a GSR support relationship is to furnish artillery fires for the maneuver force as a whole; the second priority is to reinforce the fires of another field artillery unit. A GSR unit remains under the control of the supported maneuver commander or his force field artillery headquarters. The GSR support relationship offers the commander the flexibility to meet the requirements of a variety of tactical situations.
- General Support. *General support* is that support which is given to the supported force as a whole and not to any particular subdivision thereof. *General support artillery* is artillery which executes the fire directed by the commander of the unit to which it organically belongs or is attached. It fires in support of the operation as a whole rather than in support of a specific subordinate unit (JP 1-02). A field artillery unit assigned in GS of a force has all of its fires under the immediate control of the supported commander or his designated force field artillery headquarters. Among Army support relationships, GS provides the highest degree of centralized control of fires.

B-9. The four Army field artillery inherent responsibilities listed in Table B-2 supplement the inherent responsibilities of a support relationship.

Table B-2. Field artillery inherent responsibilities in Army support relationships

If relationship:		*Inherent Responsibilities*			
		Answers Calls for Fire in Priority From:	***Has as Its Zone of Fire:***	***Furnishes Fire Support Personnel:***	***Has Its Fires Planned By:***
Support	***Direct Support (DS)***	1. Supported unit. 2. Own observers.[1] 3. Force field artillery HQ.[2]	Area of operations of supported unit.	No requirement.[3]	Supported unit.
	Reinforcing (R)	1. Reinforced field artillery. 2. Own observers.[1] 3. Force field artillery HQ.[2]	Zone of fire of reinforced field artillery unit.	No requirement.[3]	Reinforced field artillery unit HQ.
	General Support Reinforcing (GSR)	1. Supported unit. 2. Force field artillery HQ.[2] 3. Reinforced unit. 4. Own observers.[1]	Area of operations of supported unit to include zone of fire of reinforced field artillery unit.	No requirement.[3]	1. Supported unit. 2. Force field artillery HQ.[2]
	General Support (GS)	1. Supported unit. 2. Force field artillery HQ.[2] 3. Own observers.[1]	Area of operations of supported unit.	No requirement.[3]	1. Supported unit. 2. Force field artillery HQ.[2]

Note 1. Includes all TA means not deployed with the supported unit (radar, UAS, air observers, survey parties, and so on).
Note 2. If designated by the supported commander.
Note 3. Fires brigades and non-BCT fires battalions have organic liaison sections.

Note. U.S. Army units have a command or support relationship that identifies unit responsibilities. The four Army field artillery inherent responsibilities listed in Table B-2 supplement the inherent responsibilities of a support relationship. U.S. Marine Corps and NATO field artillery units, however, are given field artillery tasks and responsibilities IAW STANAG 2484. U.S. Army field artillery units may also be given STANAG 2484 field artillery tasks and responsibilities when operating with U.S. Marine Corps or NATO units or as assigned by the supported commander.

ON-ORDER VS. BE-PREPARED MISSION

B-10. An *on-order* mission is a mission to be executed at an unspecified time in the future. A unit with an on-order mission is a committed force. The commander envisions task execution in the concept of operations; however, he may not know the exact time or place of execution. Subordinate commanders develop plans and orders and allocate resources, task-organize, and position forces for execution (FM 1-02). A *be-prepared* mission is assigned to a unit that might be executed. It is generally a contingency mission which will be executed because something planned has or has not been successful. In planning priorities, it is planned after any on-order missions (FM 1-02). Since artillery is not placed in reserve, fires battalions may be given on-order rather than be-prepared missions to provide fire support when the time or place of execution is currently unknown. An example of an on-order mission is: "1-52 FA: GSR 1-50 FA; on-order R 1-50 FA."

NONSTANDARD FIELD ARTILLERY SUPPORT RELATIONSHIPS

B-11. Commanders sometimes use a nonstandard support relationship [in many cases simply a variation of a standard field artillery support relationship (DS, R, GSR, GS)] when there are not sufficient field artillery assets to cover all the contingencies, or if a field artillery unit is assigned more than one support relationship. It is also a means by which the commander can tailor his field artillery assets in anticipation of future operations. A nonstandard support relationship may involve limitations or guidance concerning ammunition, positioning, or other critical factors. Examples of nonstandard field artillery support relationships include—

- 110 FIB: GSR 7 FIB; do not exceed 25 percent of the controlled supply rate in support of 7 FIB.
- 1-89 FA (MLRS, M270A1): GS; provide liaison officer to the corps fires cell.

FUNDAMENTALS OF TASK-ORGANIZING FIELD ARTILLERY

B-12. Characteristics to examine when task-organizing the force include, but are not limited to: training, experience, equipage, sustainability, operating environment, enemy threat, and mobility. For Army forces, it includes allocating available assets to subordinate commanders and establishing their command and support relationships. Field artillery is task organized to provide responsive and effective field artillery fires and to coordinate all fire support. The objective of field artillery task organization is to ensure that each field artillery unit (normally not below the battalion level) has an established command relationship and/or support relationship. The COF/brigade FSO and FSCOORD analyze the mission variables (METT-TC), evaluate the field artillery assets available and recommend a command or support relationship for each field artillery unit to the supported commander. The supported commander approves the field artillery task organization which is reflected in the OPORD and fire support plan. There are five fundamentals of task-organizing field artillery:

PROVIDE ADEQUATE FIELD ARTILLERY SUPPORT FOR COMMITTED UNITS

B-13. Field artillery support is most responsive to committed maneuver elements when it is organic, assigned, attached, OPCON to the supported unit and/or has an established support relationship of DS. The minimum adequate support for committed units is considered to be one field artillery battalion per committed brigade.

PROVIDE WEIGHT TO THE DECISIVE OPERATION

B-14. Weight means adding additional fire support resources to support the decisive operation. This fundamental can be implemented in any of the following ways—

- Attaching or placing OPCON additional field artillery units to a committed unit.
- Establishing an R or GSR support relationship for a fires battalion to supplement the fires of another fires battalion that has either a command or a DS relationship.
- Field artillery units can be positioned and assigned azimuths of fire to concentrate their fires in the appropriate area. In this manner, units with a GS relationship can add weight to the decisive operation.
- Ammunition may be allocated to provide for more support for the decisive operation.
- Target acquisition assets may be focused to support the decisive operation.

PROVIDE IMMEDIATELY AVAILABLE FIELD ARTILLERY SUPPORT FOR THE COMMANDER TO INFLUENCE THE ACTION

B-15. The COF/brigade FSO and FSCOORD should recommend retaining some artillery with which the supported commander can influence the action. This is done by assigning artillery units an appropriate command or support relationship, thus making the units responsive to the supported commander.

FACILITATE FUTURE OPERATIONS

B-16. This fundamental is essential to ensure success in the face of unforeseen events and to ensure a smooth transition from one phase of an operation to another. This fundamental can be implemented through the assignment of on-order missions, positioning of artillery, and allocation of ammunition. The assignment of an on-order mission allows a field artillery unit to anticipate and plan for a change of mission. The on-order mission also allows a supported unit to anticipate and plan on the support of a field artillery unit. Another method of facilitating future operations is to modify the current command or support relationship by anticipating requirements such as limiting ammunition expenditures relative to the controlled supply rate.

PROVIDE MAXIMUM FEASIBLE CENTRALIZED CONTROL

B-17. Field artillery is most effective when control is centralized at the highest level consistent with the fire support capabilities and requirements of the overall mission. Centralized control of field artillery permits

flexibility in its employment and facilitates effective support to each subordinate element of the command and to the force as a whole. Army command and support relationships represent varying degrees of centralized control and responsiveness to supported units. The optimum degree of centralized control varies with each tactical situation. Tactical mission planning requires care because of the limited resources available to attack targets and the need for carefully coordinated employment of acquisition, attack, and assessment means. A high degree of centralized control is desired in a defensive situation, since the enemy has the initiative, it may be difficult to accurately predict where and when he will strike (see Chapter 3). A lesser degree of centralized control is required in an offensive situation because the supported force has the initiative (see Chapter 1).

CONSIDERATIONS FOR TASK-ORGANIZING ARMY FIELD ARTILLERY

B-18. Commanders consider mutual support when task-organizing field artillery and assigning areas of operation (AOs) to units including fires brigades and battalions. Although a fires unit may be in supporting range of a supported unit, the communications capability must also be considered. If the unit needing support cannot communicate with the supporting unit, the range capability of a weapon system or its proximity to the supported force may have no effect on the outcome of an operation. For more on mutual support considerations, see FM 3-90.

CONSIDERATIONS FOR TASK-ORGANIZING NATO AND U.S. MARINE CORPS FIELD ARTILLERY

B-19. Relevant NATO terms for command and support relationships affecting fire support include—

- Operational Command. *Operational command* is the authority granted to a commander to assign mission or tasks to subordinate commanders, to deploy units, to reassign forces and to retain or delegate operational and/or tactical control as the commander deems necessary [Note: It does not include responsibility for administration] [Allied Administrative Publication (AAP)-6].
- Tactical Command. *Tactical Command* is the authority delegated to a commander to assign tasks to forces under his command for the accomplishment of the mission assigned by higher authority (AAP-6).
- Operational Control. *Operational Control* is the authority delegated to a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time or location; to deploy units concerned, and to retain or assign tactical control, of those units. It does not include authority to assign separate employment of components of the units concerned. Neither does it, of itself, include administration or logistic control (AAP-6).
- Tactical Control. *Tactical Control* is the detailed and, usually, local direction and control of movement or maneuvers necessary to accomplish missions or tasks assigned (AAP-6).

B-20. For NATO and U.S. Marine Corps forces, STANAG 2484 field artillery tactical tasks define the relationship between formations and supporting arms. The tactical tasks specify fire support responsibilities of a field artillery unit/formation to a maneuver unit/formation or to another field artillery unit/formation. Field artillery tactical tasks include—

- Direct Support. In artillery usage, *direct support* is a tactical task to give one artillery unit the primary task to provide fire requested by the supported unit, other than artillery units, without specifying the command relationship [Allied Artillery Publication (AArtyP)-5].
- Reinforcing. In artillery usage, *reinforcing* is a tactical task in which an artillery unit provides reinforcing fire for another artillery unit (AArtyP-5).
- General Support Reinforcing. In artillery usage, *general support reinforcing* is a tactical task in which an artillery unit fires in support of the force as a whole and, on a secondary basis, provides reinforcing fire for another artillery unit (AArtyP-5).
- General Support. In artillery usage, *general support* is a tactical task in which one artillery unit fires in support of the operation of a formation as a whole (AArtyP-5).

B-21. In NATO and U.S. Marine Corps artillery usage, if one of the above tactical tasks does not satisfy the demands of the situation it may be modified. This modification changes one or more of the inherent responsibilities of one of the four tactical tasks to accurately reflect the required support needed. For example, DS less positioning authority. Adjacent field artillery units at all levels may render mutual fire support across a common boundary. The artillery responsibilities associated with each tactical task are described in Table B-3.

Note. In STANAG 2484 *NATO Field Artillery Tactical Doctrine* (AArtyP-5) field artillery is a combat support[1] arm. The artillery commander is the authority vested in an individual of the armed forces for the direction, coordination and control of artillery forces. He is both an advisor to the supported maneuver commander and a commander in his own right of a variety of fire support units. The maneuver commander at each echelon of command is responsible for integrating fire support within his concept of operations. A specialist staff drawing on several disciplines will help him discharge his responsibility for fire support, providing expert advice, specialist planning and facilitating coordination. Collectively these staff experts are referred to as the FSCC, but they may have a different designation according to an individual commander's preferences or national customs. Generally, the senior field artillery commander, senior artillery staff officer or chief of the FSCC is the commander's chief FSO. During multinational operations, fire support personnel should verify the definitions of operational terms through review of applicable publications or with inquiries to higher HQ.

[1] Although Army doctrine no longer uses the term combat support, joint doctrine will continue to use the term.

Table B-3. STANAG 2484 artillery tactical tasks and responsibilities (NATO/U.S. Marine Corps)

AN FA UNIT WITH A MISSION OF—	*DIRECT SUPPORT*	*REINFORCING*	*GENERAL SUPPORT REINFORCING*	*GENERAL SUPPORT*
Answers calls for fire in priority from—	1. Directly supported formation/unit. 2. Own observers.[1] 3. Force field artillery HQ.	1. Reinforced artillery unit. 2. Own observers.[1] 3. Force field artillery HQ.	1. Force field artillery HQ. 2. Reinforced artillery unit. 3. Own observers.[1]	1. Force field artillery HQ. 2. Own observers.[1]
Has as its zone of fire—	Zone of action of the directly supported formation/unit.	Zone of fire of reinforced field artillery unit or zone prescribed.	Zone of action of the supported formation/unit to include zone of fire of the reinforced field artillery unit.	Zone of action of the supported formation/unit or zone prescribed.
Furnishes observers or surveillance and target acquisition (STA) to—	Observers to each maneuver element and organic STA assets to the directly supported formation/unit. [Y]	No inherent requirement.	No inherent requirement.	No inherent requirement.
Establishes liaison with—	Directly supported formation or unit (battalion, regiment, brigade).[2, 3]	Reinforced field artillery unit.[3]	Reinforced field artillery unit.[3]	No inherent requirement.
Establishes communication with—	The directly supported maneuver formation/unit.	Reinforced field artillery unit.	Reinforced field artillery unit.	No inherent requirement.
Weapons moved and deployed by—	DS FA unit commander or as ordered by force field artillery HQ.	Reinforced field artillery unit or ordered by force field artillery HQ.	Force field artillery HQ or reinforced field artillery unit if approved by force field artillery HQ.	Force field artillery HQ.
Has its fires planned by—	Develops own fire plans in coordination with directly supported formation/unit.	Reinforced field artillery unit.	Force field artillery HQ or as otherwise specified.	Force field artillery HQ.

Note 1. Includes all TA means not deployed with supported unit (radar, tactical unmanned aircraft systems, air observers, survey parties, and so on).
Note 2. U.S. brigade combat team (BCT) fires battalions do not furnish FOs, and/or FSOs since these personnel are organic to the maneuver units.
Note 3. BCT fires battalions do not have liaison personnel.

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Glossary

The glossary lists acronyms and terms with Army, multi-Service, or joint definitions, and other selected terms. Where Army and joint definitions are different, "(Army)" precedes the term. Terms for which FM 3-09 is the proponent manual (the authority), are marked with an asterisk (*). The proponent manual for other terms is listed in parentheses after the definition.

SECTION I – ACRONYMS

AAP	Allied administrative publication
AArtyP	Allied artillery publication
ACA	airspace coordination area
ACM	airspace coordinating measure
ACO	airspace control order
ADP	Army doctrine publication
AFATDS	Advanced Field Artillery Tactical Data System
AGM	attack guidance matrix
AI	air interdiction
ALO	air liaison officer
ANGLICO	air/naval gunfire liaison company
AO	area of operations
AN/TPQ	Army/Navy (Marine) transportable radar special purpose (multipurpose)
AOC	(DOD) air operations center; (USAF) air and space operations center
ASOC	air support operations center
ATACMS	Army Tactical Missile System
ATO	air tasking order
ATP	Army techniques publication
ATTP	Army tactics, techniques, and procedures
BCD	battlefield coordination detachment
BCL	battlefield coordination line (USMC)
BCT	brigade combat team
BSB	brigade support battalion
CAS	close air support
CEP	circular error probable
CFL	coordinated fire line
COF	chief of fires
COLT	combat observation and lasing team
CP	command post
CSB	common sensor boundary
CZ	censor zone
D3A	decide, detect deliver, assess
DA	Department of the Army

DASC	direct air support center
DOD	Department of Defense
DS	direct support
DTG	date-time group
EA	electronic attack
EW	electronic warfare
EWO	electronic warfare officer
FA	field artillery
FAC	forward air controller
FAC(A)	forward air controller (airborne)
FC	fires cell
FE	fires element
FFA	free fire area
FFA HQ	force field artillery headquarters
FFCC	force fires coordination center
FIB	fires brigade
FIST	fire support team
FM	field manual
FO	forward observer
FSA	fire support area
FSC	forward support company
FSCC	fire support coordination center
FSCL	fire support coordination line
FSCM	fire support coordination measure
FSCOORD	fire support coordinator
FSO	fire support officer
FSS	fire support station
FST	fire support task
GARS	Global Area Reference System
GPS	global positioning system
GS	general support
GSR	general support-reinforcing
GTL	gun-target line
HC	hexachloroethane (smoke)
HE	high explosive
HHB	headquarters and headquarters battery
HIMARS	High Mobility Artillery Rocket System
HPT	high-payoff target
HPTL	high-payoff target list
HQ	headquarters
HUMINT	human intelligence

IBCT	infantry brigade combat team
IED	improvised explosive device
IPB	intelligence preparation of the battlefield
JAAT	joint air attack team
JAOC	joint air operations center
JFACC	joint force air component commander
JFC	joint force commander
JFLCC	joint force land component commander
JFMCC	joint force maritime component commander
JFO	joint fires observer
JFSOCC	joint force special operations component commander
JP	joint publication
J-SEAD	joint suppression of enemy air defenses
JTAC	joint terminal attack controller
JTCB	joint targeting coordination board
JTF	joint task force
MACCS	Marine air command and control system
MAGTF	Marine air-ground task force
MCWP	Marine Corps warfighting publication
MDMP	military decision-making process
MEB	maneuver enhancement brigade
MEF	Marine expeditionary force
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations
MGRS	military grid reference system
MK	mark (model)
MLRS	multiple launch rocket system
MOE	measure of effectiveness
MOP	measure of performance
MSL	mean sea level
NATO	North Atlantic Treaty Organization
NFA	no-fire area
NGF	naval gunfire
NSFS	naval surface fire support
OP	observation post
OPCON	operational control
OPLAN	operation plan
OPORD	operation order
PGM	precision-guided munition
R	reinforcing
RFA	restrictive fire area
RFL	restrictive fire line

ROA	restricted operations area
ROE	rules of engagement
SACC	supporting arms coordination center
SBCT	Stryker brigade combat team
SCATMINE	scatterable mines
SEAD	suppression of enemy air defenses
SOCCE	special operations command and control element
SOF	special operations forces
SP	self-propelled
STANAG	standardization agreement (NATO)
TA	target acquisition
TAB	target acquisition battery
TACC	tactical air control center
TACON	tactical control
TAC CP	tactical command post
TACP	tactical air control party
TACS	theater air control system
TF	task force
***TGM**	terminally guided munition
TOE	table of organization and equipment
TSM	target synchronization matrix
TSS	target selection standard
UAS	unmanned aircraft system
U.S.	United States
USAF	United States Air Force
USMC	United States Marine Corps
WGS	World Geodetic System
WP	white phosphorus
ZF	zone of fire

SECTION II – TERMS AND DEFINITIONS

***chief of fires**

The senior organic field artillery staff officer at division and higher headquarters level who is responsible for advising the commander on the best use of available fire support resources, providing input to necessary orders, and developing and implementing the fire support plan.

***clearance of fires**

The process of approving or obtaining approval to attack targets with fires within and outside the boundaries of the supported unit for which the fires are provided.

***combat observation and lasing team**

A field artillery team controlled at the brigade level that is capable of day and night target acquisition and has both laser-range finding and laser-designating capabilities.

***counterpreparation fire**

Intensive prearranged fire delivered when the imminence of the enemy attack is discovered. It is designed to break up enemy formations; delay movement of reinforcements or reserve; disorganize the enemy's system of command, communications, and observation; decrease the effectiveness of artillery preparation; and impair the enemy's offensive spirit.

***defensive fires**

Fires that protect friendly forces, population centers, and critical infrastructure.

***destruction**

(Army) 1. In the context of the computed effects of field artillery fires, destruction renders a target out of action permanently or ineffective for a long period of time, producing 30-percent casualties or materiel damage. 2. A type of adjustment for destroying a given target.

***fire support coordinator**

(Army) The Army brigade combat team's organic fires battalion commander; if a fires brigade is designated as the division force field artillery headquarters, the fires brigade commander is the division's fire support coordinator and is assisted by the chief of fires who then serves as the deputy fire support coordinator during the period the force field artillery headquarters is in effect.

***fire support officer**

(Army) A field artillery officer from company to theater Army level responsible for either advising the commander or assisting the chief of fires/brigade fire support officer to advise the maneuver commander on fire support matters.

***fire support team**

(Army) A field artillery team organic to each maneuver battalion and selected units to plan and coordinate all available company supporting fires, including mortars, field artillery, naval surface fire support and close air support integration.

***force field artillery headquarters**

If one is designated by the supported commander, a force field artillery headquarters is normally the senior field artillery headquarters organic, assigned, attached, or placed under the operational control of that command. The supported commander specifies the commensurate responsibilities of the force field artillery headquarters and, if necessary, the duration of those responsibilities.

***neutralization**

In the context of the computed effects of field artillery fires, neutralization renders a target ineffective for a short period of time, producing 10-percent casualties or materiel damage.

***offensive fires**

Fires that preempt enemy actions.

***precision munition**

A munition that corrects for ballistic conditions using guidance and control up to the aimpoint or submunitions dispense with terminal accuracy less than the lethal radius of effects.

***precision smart munition**

A munition or submunition that autonomously searches for, detects, classifies, selects, and engages a target or targets. A precision smart munition has a limited target discrimination capability.

***priority of fires**

The commander's guidance to his staff, subordinate commanders, fire support planners, and supporting agencies to organize and employ fire support in accordance with the relative importance of the unit's mission. (Marine Corps) The organization and employment of fire support means according to the importance of the supported unit's mission

***scheme of fires**

The detailed, logical sequence of targets and fire support events to find and engage high-payoff targets to accomplish the supported commander's intent.

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