

ATP 3-09.42

Fire Support for the Brigade Combat Team

MARCH 2016

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This manual supersedes FMs 6-20-40 and 6-20-50, both dated 5 January 1990, and FM 6-20-20 dated 27 December 1991.

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Fire Support for the Brigade Combat Team

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Preface

Army techniques publication (ATP) 3-09.42 provides fire support techniques for the brigade combat team (BCT). This ATP supports Field Manual (FM) 3-09, FM 3-90-1, and FM 3-90-2, Army Doctrine Publication (ADP) and Army Doctrine Reference Publication (ADRP) 3-0, 3-09, and 5-0, and Joint Publications (JP) 3-0, 3-09, 3-60, and 5-0.

The principal audience for ATP 3-09.42 is all members of the Profession of Arms. This includes field artillery Soldiers and combined arms chain of command field and company grade officers, middle-grade and senior noncommissioned officers (NCO), and battalion and squadron command groups and staffs. This manual also provides guidance for division and corps leaders and staffs in training for and employment of the BCT in decisive action. This publication may also be used by other Army organizations to assist in their planning for support of battalions. This manual builds on the collective knowledge and experience gained through recent operations, numerous exercises, and the deliberate process of informed reasoning. It is rooted in time-tested principles and fundamentals, while accommodating new technologies and diverse threats to national security.

Commanders, staffs, and subordinates ensure their decisions and actions comply with applicable United States, international, and, in some cases, host-nation laws and regulations. Commanders at all levels ensure that their Soldiers operate in accordance with the law of war and the rules of engagement. (See FM 27-10.)

ATP 3-09.42 implements standardization agreements (STANAG) 2484 and 2934.

ATP 3-09.42 uses joint terms where applicable. Selected joint and Army terms and definitions appear in both the glossary and the text. For definitions shown in the text, the term is italicized and the number of the proponent publication follows the definition. This publication is not the proponent for any Army terms.

ATP 3-09.42 applies to the Active Army, Army National Guard/Army National Guard of the United States, and United States Army Reserve unless otherwise stated.

The proponent of ATP 3-09.42 is the United States Army Fires Center of Excellence. The preparing agency is the Directorate of Training and Doctrine, United States Army Fires Center of Excellence. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Directorate of Training and Doctrine, 700 McNair Avenue, Suite 128, ATTN: ATSF-DD (ATP 3-09.42), Fort Sill, OK 73503; by e-mail to usarmy.sill.fcoe.mbx.dotd-doctrine-inbox@mail.mil; or submit an electronic DA Form 2028.

Introduction

ATP 3-09.42, *Fire Support for the Brigade Combat Team*, provides BCT fire support considerations for offensive, defensive, and stability tasks, for Defense Support of Civil Authorities, and for tactical enabling and other tasks. It also describes augmentation of BCT fire support from echelons above the BCT and fire support coordination and planning for BCT operations. Appendices provide supplementary information on attack and sensor systems capabilities; examples of format and content for the fires running estimate; fires portions of BCT plans, orders, and annexes to plans and orders, communications, and fire support at battalion and below.

In addition to this manual, FM 3-09 is a must-read for brigade and battalion commanders and staff, because it describes both their supporting field artillery and fire support as key components of successful maneuver operations. FM 3-09 provides background on the capabilities of the field artillery, how it is organized, and how field artillery supports the maneuver commander through the integration of all forms of fires. It also provides a succinct, yet comprehensive discussion of fire support, including topics such as the role of fire support in unified land operations, fire support coordination organizations and key personnel, target acquisition for fire support, fire support attack resources, and fire support planning, preparation, execution, and assessment.

This manual differs significantly from its lineal predecessors in that topics of vital interest to the supported maneuver commander now appear at the front of the manual and those of professional interest to fire support personnel at the back of the manual. In-depth discussion of fire support coordination measures (FSCM), observed fire, and targeting now appears in FM 3-09, and ATPs 3-09.30 and 3-60 respectively.

Chapter 1 briefly describes the organization and capabilities for coordinating fire support and providing indirect fires within the BCT including:

- An overview of the BCT's role, its organization, and considerations for its employment.
- Organization for fire support coordination within the BCT.
- The BCT's cannon field artillery battalion, mortars and electronic attack assets.

Chapter 2 describes fire support considerations for tactical tasks during BCT operations including:

- Offensive tasks – general considerations, movement to contact, attack, exploitation and pursuit, entry operations and the reserve.
- Defensive tasks – general considerations, area defense, mobile defense and retrograde.
- Stability tasks – general consideration, planning and employment.
- Defense Support of Civil Authorities.

Chapter 3 describes fire support considerations for tactical enabling and other tasks during BCT operations including:

- Tactical enabling tasks – reconnaissance, security operations, troop movement, relief in place, passage of lines, encirclement operations, mobility operations; and urban operations – general planning and targeting, target acquisition and observation, lethal fire support in urban areas, urban operations guide sheets, and legal considerations for fire support in urban areas.
- Other operations – air assault operations, fire support while airborne, airborne operations, special operations forces, Marine Corps operations and multinational force operations.

Chapter 4 describes augmentation of the BCT's indirect fire and fire support coordination capabilities with:

- Fire support enablers within the BCT – information collection, reconnaissance, surveillance, and fire support sustainment.
- Augmentation from higher echelons – fires cells at division and corps, the battlefield coordination detachment (BCD) and fire support augmentation from the field artillery brigade; and Army aviation air-ground operations – including mission planning and engagement.

- Army aviation air-ground operations – mission planning and execution.
- Air operations supporting the BCT – organization, planning and requesting air support, air reconnaissance, close air support, joint air attack team operations and the BCT’s role in joint suppression of enemy air defenses.

Chapter 5 describes fire support coordination for BCT operations including:

- BCT fire support coordination organization – main command post fires cell, tactical command post fires element, joint augmentation to the main command post fires cell, subordinate echelon command posts and the BCT’s information system network.
- Duties and responsibilities of key fire support coordination personnel including the BCT commander, fire support coordinator, brigade fire support officer, fires cell personnel, air and missile defense personnel, other BCT staff who interface with the fires cell, and fire support personnel at subordinate echelons.
- Basic fire support coordination techniques; rehearsals – types of rehearsals, conducting the fire support radio rehearsal and field artillery digital rehearsals; clearance of fires and airspace control, the dynamic targeting challenge, and sensor-to-shooter options.
- Strike, counterfire, and Army tactical missile systems considerations for BCT operations.
- Suppression of enemy air defenses – the requirement, planning and execution at the BCT level, and targeting.
- Special considerations – terrain management, survey, meteorology, and laser management.

Chapter 6 describes the planning and integrating of fires in support of BCT operations including:

- Planning fire support – the effects of fires, commander’s guidance for fire support, development of the fire support plan and targeting in BCT fire support planning.
- Fire support planning in a time-constrained environment - fire support planning guidelines and quick-fire planning.
- Planning fire support for BCT operations within the military decisionmaking process - receipt of mission, mission analysis, course of action development, analysis of courses of action (war gaming), course of action comparison, course of action approval and orders production.
- Task-organizing field artillery – within the BCT, role of the field artillery brigade commander, joint and North Atlantic Treaty Organization (NATO) considerations, and mutual support considerations.

Appendix A provides quick reference data for BCT organic and supporting attack systems including field artillery and mortars, mines and obscurants, and electronic attack.

Appendix B provides descriptions and annotated format examples of BCT fire support estimates, plans, orders, annexes, and appendices to plans and orders.

Appendix C identifies the communications nets used for planning and executing fire support.

Appendix D describes fire support planning and execution at battalion and company level. The appendix provides samples of fire support execution matrices and tables of useful technical information.

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.

ATP 3-09.42 becomes the proponent manual for and modifies the term listed in introductory Table I-1.

Table I-1. New or revised Army terms

<i>Term</i>	<i>Remarks</i>
program of targets	Modified definition; formerly found in FM 6-20-20.

Chapter 1

Organization and Capabilities for Fire Support within the Brigade Combat Team

Successful maneuver requires close coordination and effective employment of available fires. Maneuver and fires functions are inseparable and complementary dynamics of unified land operations. This chapter provides a summary of the brigade combat team's (BCT) organization and capabilities for coordinating fire support and for delivering indirect fires and electronic attacks in support of BCT operations. Section I provides a brief overview of the BCT's role, organization and employment in unified land operations. Section II follows with a description of BCT organization and capabilities for fire support coordination. Section III concludes with a discussion of indirect fire and electronic attack capabilities within the BCT. Fire support enablers within the BCT, including information collection, reconnaissance and surveillance, and fire support sustainment are described in Chapter 4.

SECTION I – BRIGADE COMBAT TEAM OVERVIEW

1-1. Infantry, armored, and Stryker BCTs are the Army's combat power building blocks for maneuver, and the smallest combined arms units that can be committed independently. Their core task is to close with the enemy by means of fire and movement to destroy or capture enemy forces, or to repel enemy attacks by fire, close combat and counterattack. BCTs conduct offensive, defensive, and stability tasks, and participate in Defense Support of Civil Authorities. BCTs conduct expeditionary deployment and integrate the efforts of the Army with civilian, joint, and multinational partners

1-2. The BCTs' units and capabilities are tailorable to meet mission requirements. All BCTs include maneuver; field artillery; intelligence; signal; engineer; chemical, biological, radiological, and nuclear (CBRN), and sustainment capabilities. BCTs control, coordinate and direct the efforts of the battalions and companies to fight engagements and perform tactical tasks within division-level battles and major operations.

1-3. The infantry brigade combat team (IBCT) is an expeditionary, combined arms formation optimized for dismounted operations in complex terrain. *Complex terrain* is a geographical area consisting of an urban center larger than a village and/or of two or more types of restrictive terrain or environmental conditions occupying the same space (Army techniques publication [ATP] 3-34.80). The armored brigade combat team (ABCT) seizes enemy territory, destroys the enemy's armed forces, and eliminates the enemy's means of civil population control. ABCTs and IBCTs typically include a field artillery battalion, a brigade support battalion (BSB), and a brigade special troops battalion or brigade engineer battalion in addition to their two or more maneuver battalions and a cavalry squadron. Infantry BCT field artillery battalions are composite units having both the M119-series 105-millimeter (mm) and the M777-series 155-mm howitzer. Armored BCT field artillery battalions have only the M109-series 155-mm howitzer.

1-4. The Stryker brigade combat team (SBCT) is an expeditionary combined arms force organized around mounted Infantry. SBCT units operate effectively in most terrain and weather conditions due to their rapid strategic deployment and mobility. The role of the SBCT is to close with the enemy by means of fire and movement, to destroy or capture enemy forces, or repel enemy attacks by fire, close combat, and counterattack. Stryker BCTs have three maneuver battalions, a cavalry squadron, a brigade engineer battalion, a brigade support battalion and a field artillery battalion equipped with M777-series 155-mm howitzers.

1-5. The BCT can execute combined arms missions without augmentation, but it can also be tailored to meet the precise needs of its missions. The BCT is the largest fixed tactical unit in the Army. However, additional battalions and companies may be allocated via command or support relationships to the BCT or to its organic battalions. Companies can be detached from the battalions as part of force tailoring at the strategic and operational levels and task organization at the tactical level. See Field Manual (FM) 3-96 for more on the organization, capabilities and tactical employment of the BCT.

1-6. The BCT is the Army's primary combined arms, close combat force. BCTs often operate as part of a division or joint task force. Depending upon the mission variables of mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC), the division commands between two and five BCTs and a mix of multifunctional support brigades. The size, composition, capabilities, and other attributes vary significantly among joint task forces based on the mission and various factors of the operational environment. The division or other higher headquarters assigns the BCT its mission, area of operations, supporting elements, and coordinates its actions with other BCTs of the formation. The division or other higher headquarters may augment the BCT with additional capabilities with which the BCT may task organize to accomplish assigned tasks. Division commanders use armored, infantry, or Stryker BCTs supported by multifunction support brigades—field artillery brigades (FABs), combat aviation brigades, maneuver enhancement brigades, battlefield surveillance brigades, and sustainment brigades—and functional brigades such as air defense artillery brigades, engineer brigades, civil affairs brigades, and military police brigades, to accomplish their assigned missions. Sustainment brigades are typically subordinate to the theater sustainment command and provide support to other Army units on an area basis. For more on the organization, capabilities and employment of the FAB, combat aviation brigade, maneuver enhancement brigade, battlefield surveillance brigade, and sustainment brigade see ATP 3-09.24, ATP 4-93, FM 3-04.111, and FM 3-81.

SECTION II – BRIGADE COMBAT TEAM ORGANIZATION FOR FIRE SUPPORT COORDINATION

1-7. 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 (Army doctrine reference publication [ADRP] 3-0). An organization's fires cell is the command post cell responsible for integrating and coordinating the fires warfighting function with ongoing and planned operations.

BRIGADE COMBAT TEAM FIRES CELL

Note: The organization described for the BCT fires cell in the following paragraphs represents a way, not the way. Commanders organize the resources of their unit based on the mission variables.

1-8. The BCT main command post fires cell works closely with battalion fires cells and company fire support teams (FIST). These organizations ensure responsive and effective fire support is provided to their respective maneuver commanders and actions are closely coordinated through the BCT main command post fires cell.

1-9. The BCT main command post fires cell is generally organized with a fire support officer (FSO) and assistants, an air defense airspace management/brigade aviation element (ADAM/BAE), an electronic warfare element, a targeting element, and digital systems operators. References throughout this document to fire support planners include not only members of the fires cell but also the BCT's cannon field artillery battalion commander as the BCT's fire support coordinator (FSCOORD) and members of the targeting working group and targeting board. These personnel are all members of the targeting team.

1-10. The BCT main command post fires cell has resources to integrate and coordinate fires from the main command post and the tactical command post when it is deployed. When the tactical command post is deployed, selected fires cell personnel provide its fires element. An Air Force tactical air control party aligned with the BCT may send selected personnel with the tactical command post.

1-11. Augmentation to the BCT main command post fires cell typically includes an Air Force tactical air control party and, depending upon the mission variables, may include a naval surface fire support liaison officer, a Marine Corps liaison officer, and an Army space support team. Other Army or joint resources and assets can further augment the BCT main command post fires cell as needed. The functions of the BCT main command post fires cell and duties and responsibilities of its personnel are described in Chapter 5.

BATTALION FIRE SUPPORT COORDINATION ORGANIZATIONS

1-12. Fire support personnel manning the battalion's main command post fires cell, company FISTs, and platoon forward observers are assigned to the BCT's cannon field artillery battalion. These fire support personnel habitually associate with supported battalions and companies or platoons for training, but for combat operations will be deployed by the BCT commander and the FSCoord when and where needed based on METT-TC.

BATTALION FIRES CELLS

1-13. Fires cells in the BCT's maneuver battalions and cavalry squadron provide a fire support coordination capability for battalion operations and are organized with an FSO and noncommissioned officer (NCO), an electronic warfare NCO, and digital systems operators. The fires cell may also have an Air Force tactical air control party (TACP).

FIRE SUPPORT TEAM AND OBSERVERS

1-14. Company FIST headquarters personnel and platoon forward observers enable effective artillery and mortar support for the maneuver force. The observers are the ears and eyes of the field artillery and a major source of information for field artillery and maneuver commanders as the observers execute assigned tasks and respond to enemy actions.

Fire Support Team

1-15. A fire support team is a field artillery team providing support to each maneuver battalion and selected units to plan and coordinate all available supporting fires, including mortars, field artillery, naval surface fire support and close air support integration.

1-16. FISTs are assigned to the BCT's cannon field artillery battalion and provide the maneuver companies with fire support coordination, precision targeting, type 2 and 3 terminal attack control, and effects assessment capabilities. The use of precision target location tools is the preferred method of establishing accurate target location. These tools include a targeting device or a precision targeting device, a forward entry device, and imagery based mensuration tools. The observer may have an optical device using a laser range finder for distance and an Azimuth Vertical Angle Module to acquire direction and vertical angle. Each FIST's fire support vehicle, if provided, possesses a target acquisition and communications suite with the capability for laser range finding and designation for laser-guided munitions.

Observers

1-17. Effective field artillery fires require qualified observers to call for and adjust fires on located targets. Forward observers, forward air controllers, naval gunfire spotter teams, joint fires observers (JFO) and joint terminal attack controllers (JTAC) train together and work effectively as a team to request, plan, coordinate, and place accurate fires on targets that create the effects desired by the BCT commander.

1-18. A *forward observer* is an observer operating with front line troops and trained to adjust ground or naval gunfire and pass back battlefield information. In the absence of a forward air controller, the observer may control close air support strikes (JP 3-09). Platoon forward observers are assigned to the FIST supporting each infantry company or cavalry troop in the BCT and to the battlefield surveillance brigade.

1-19. Forward air controllers (airborne), JTACs, and naval gunfire spotter teams may not always be available when and where their support is required. Therefore field artillery observer teams must be proficient in planning and executing close air support when a JTAC is not available, Army aviation engages

the enemy in contact with friendly ground forces, and naval gunfire. With additional training and certification, the forward observer can qualify as a JFO.

1-20. A *joint fires observer* is a trained 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 (JP 3-09.3). The JFO is not an additional Soldier in the Army fire support organization, but rather an individual who has received the necessary training and certification to be awarded the JFO's additional skill identifier. A JFO is not a certified JTAC.

- *Terminal guidance operations* are those actions that provide electronic, mechanical, voice or visual communications that provide approaching aircraft and/or weapons additional information regarding a specific target location (JP 3-09).
- *Terminal attack control* is the authority to control the maneuver of and grant weapons release clearance to attacking aircraft (JP 3-09.3).
- A *joint terminal attack controller* is a qualified (certified) Service member who, from a forward position, directs the action of combat aircraft engaged in close air support and other offensive air operations. A qualified and current joint terminal attack controller will be recognized across the Department of Defense as capable and authorized to perform terminal attack control (JP 3-09.3).

1-21. Air Force JTACs, if available from the battalion Air Force TACP can deploy forward with a maneuver company and position where they can best support the operation. Tactical air control party JTACs provide the commander and the subordinate and supporting units with recommendations on the use of close air support and its integration with ground maneuver and other attack resources. JTACs also perform terminal attack control of individual close air support missions. Duties and responsibilities of the JTAC are discussed in Chapter 4.

UNTRAINED OBSERVERS

1-22. Occasionally the cannon field artillery battalion may need to process fire missions from untrained observers. An untrained observer is anyone not military occupational specialty qualified in requesting and adjusting indirect fire. Often these are critical requests where the requestor is under fire. Field artillery battalion and battery fire direction centers should be identified as the primary handlers of untrained observer missions. For more information on untrained observer procedures, see TC 3-09.81. For more on observers see the discussions in Chapters 4 and 5 of this manual and in ATP 3-09.30.

SECTION III – INDIRECT FIRE AND ELECTRONIC ATTACK ASSETS

1-23. One method of massing combat power initiates Army long-range indirect fires as the enemy comes within range. In extreme cases, airburst artillery and mortar fires have been called in on friendly positions to successfully defeat an enemy attack when adequate overhead protective cover was available for friendly forces and the unit was in danger of being overrun. Electronic attack begins at the point the commander believes it to be most effective to disrupt the enemy's command and control.

CANNON FIELD ARTILLERY BATTALION

1-24. The BCT's cannon field artillery battalion provides responsive and accurate field artillery fires to the BCT and its subordinate units according to the commander's scheme of maneuver. The field artillery battalion also provides counterfire against enemy mortar, artillery, and rocket elements in the BCT's area of operations. The field artillery battalion is able to operate over a widely dispersed area due to its communications capability, organic radars, and support from the BCT's sustainment and surveillance and reconnaissance capabilities.

1-25. The BCT cannon field artillery battalion coordinates with fires cells at BCT and battalion level; and FISTs and forward observers at company level. The field artillery battery's fire direction center controls the battery's firing and is required to maintain the current tactical situation, commander's guidance for fires, the five requirements for accurate fires and respond to the supported unit and higher headquarters. Each firing platoon has personnel and equipment to determine firing data and conduct fire missions.

1-26. A *fire mission* is the specific assignment given to a fire unit as part of a definite plan; an order used to alert the weapon and battery area and indicate that the message following is a call for fire (TC 3-09.81). A *call for fire* is a request for fire containing data necessary for obtaining the required fire on a target (FM 3-09).

1-27. The BCT's field artillery battalion typically has an organic command relationship, but the BCT commander may assign a support relationship directly to subordinate units of the BCT. A FAB, United States (U.S.) Marine Corps, or multinational artillery units may reinforce a BCT field artillery battalion.

ARMORED BRIGADE COMBAT TEAM CANNON FIELD ARTILLERY BATTALION

1-28. The armored BCT cannon field artillery battalion is restructuring from two firing batteries of eight M109-series Paladin self-propelled 155-mm howitzers to three firing batteries of six M109-series self-propelled howitzers. The firing batteries are manned and equipped to operate as two 3-gun firing platoons.

STRYKER BRIGADE COMBAT TEAM CANNON FIELD ARTILLERY BATTALION

1-29. The Stryker BCT cannon field artillery battalion has three 6-gun lightweight M777-series 155-mm towed howitzer firing batteries. Each firing battery is organized with two 3-gun firing platoons.

INFANTRY BRIGADE COMBAT TEAM CANNON FIELD ARTILLERY BATTALION

1-30. The infantry BCT cannon field artillery battalion is restructuring to a composite battalion of two 6-gun M119-series 105-mm towed howitzer batteries and one 6-gun M777-series 155-mm towed howitzer battery. The firing batteries in a battalion are organized into two 3-gun firing platoons. Selected airborne battalions are organized with fewer guns. Table 1-1 provides a summary of howitzer distribution within the BCTs.

Table 1-1. Distribution of howitzers within the BCT

<i>Indirect Fire Weapons</i>	<i>Quantities</i>	<i>Unit Distribution</i>
ABCT		
155-mm howitzers (M109-series)	18	3x6 cannon field artillery battalion.
SBCT		
155-mm howitzers (M777-series)	18	3x6 cannon field artillery battalion.
IBCT		
105-mm (M119-series) and 155-mm (M777-series) howitzers	6, 12, or 18	3x6 cannon field artillery battalion. Selected airborne units are 2x6 (1 105-mm battery, 1 155-mm battery) or 1 battery of 105-mm howitzers.
Legend ABCT – armored brigade combat team IBCT – infantry brigade combat team		SBCT – Stryker brigade combat team mm - millimeters

A COMMON ORGANIZATION FOR CANNON FIELD ARTILLERY BATTALIONS

1-31. All cannon field artillery battalions are organized with a headquarters and headquarters battery and one to three firing batteries. The typical BCT field artillery battalion includes three firing batteries, a target acquisition platoon headquarters team, weapon locating radar sections (radar types and numbers vary), two survey teams, a counterfire operations section, one or more fire support platoons, and a lightweight counter mortar radar section. The number and composition of fire support platoons and fires cells vary based upon the type of unit supported. The battalion is typically augmented with a forward support company from the BSB.

Headquarters and Headquarters Battery

1-32. The headquarters and headquarters battery typically consists of a battery headquarters, battalion command section, and personnel, intelligence, operations, supply, and communications sections, a fire support platoon, a medical platoon, and a unit ministry team.

Target Acquisition Platoon

1-33. Each BCT field artillery battalion has a target acquisition platoon organized and equipped to quickly detect, and accurately locate, classify, and report indirect fire from enemy mortars, artillery, and rockets to permit their immediate engagement with counterfire. The information provided includes the point of origin, predicted point of impact, radar cross section, and velocity. Table 1-2 provides a summary description of radar capabilities.

1-34. The platoon consists of counterfire radars, lightweight countermortar radars, and a survey section. Some units may retain a meteorology section until the Computer Meteorological Data-Profiler (AN/GMK-2) fielding is complete. The survey section provides common grid for field artillery firing units and mortars when assets are available. The meteorology section provides meteorological support to artillery and mortars to enhance the accuracy of their fires. The lightweight countermortar team provides direct support and is positioned by the controlling cannon field artillery battalion for the most effective radar support commensurate with the terrain, combat mission, and responsiveness to the higher headquarters. Chapter 5 provides a summary discussion of survey and meteorology.

Note: The AN/GMK-2 Computer Meteorological Data-Profiler is a weather measurement system developed to provide meteorological data to support artillery and target acquisition units. It is currently being fielded as one per each BCT cannon field artillery battalion and one per FAB. The AN/GMK-2 interfaces with the Advanced Field Artillery Tactical Data System (AFATDS) via local area network connection and is operated by the AFATDS Operator. Once fielding is complete, the AN/GMK-2 will replace the meteorological sections. See the discussion on meteorology in FM 3-09 and chapter 5 of this ATP.

Table 1-2. Target acquisition radar capabilities

Radar	Unplanned Search Sector	Range	Optimized to Detect	Number of Radars			Organic To
				ABCT	SBCT	IBCT	
AN/TPQ-36 ¹	1600 mils	0.75-24km	Shorter range, high-angle, lower velocity weapons such as mortars and shorter-range artillery	(1)	(1)	(1)	Cannon Field Artillery Battalion
AN/TPQ-37 ¹	1600 mils	3-50 km	Longer range, low angle, higher velocity weapons such as long-range artillery and rockets.	(1)	(1)	(0)	Cannon Field Artillery Battalion
AN/TPQ-50 ²	6400 mils	0.5-10 km	Shorter range, high-angle, lower velocity weapons such as mortars	4	4	4	Cannon Field Artillery Battalion
AN/TPQ-53 ³	1600 mils	60 km	Longer range, low angle, higher velocity weapons such as long-range artillery and rockets	(2)	(2)	(1)	When fully fielded, will replace both the AN/TPQ-36 and AN/TPQ-37 radars
	6400 mils	20 km	Shorter range, high-angle, lower velocity weapons such as mortars and shorter-range artillery				
<p>Note 1: Information on the AN/TPQ-36 and -37 is found in ATP 3-09.12.</p> <p>Note 2: The AN/TPQ-50 Lightweight Counterfire Radar allows the detection, location and classification of threat indirect fire such as mortars, cannon field artillery, and rockets. The capabilities of the AN/TPQ-50 and the AN/TPQ-53 are similar in the sense that they both can detect in 360 degrees the same types of indirect fire although the AN/TPQ-50 has a much shorter range, because of the AN/TPQ-50's smaller size, however, they can be positioned in a location where a detection capability is required much more quickly than the larger radars.</p> <p>Note 3: The AN/TPQ-53 Counterfire Target Acquisition Radar is a mobile radar set that automatically locates single or multiple threat mortar, artillery, and rocket launched weapons. The AN/TPQ-53 can provide a net-ready system with increased range and accuracy throughout a 1600 mils search sector as well as 6400 mils coverage for locating mortar, artillery, and rocket firing positions. The AN/TPQ-53, currently in fielding, will replace the AN/TPQ-36 and -37 radars.</p> <p>Note: Because the AN/TPQ-36 and AN/TPQ-37 radars cannot radiate in friendly fire mode (used only for indirect fire registration missions) and hostile fire mode at the same time, the commander must issue specific guidance as to when the friendly fire mode should be used. However, the AN/TPQ-50 and AN/TPQ-53 radars can radiate while performing both missions. The Q-53 must be in the 1600 mils mode to perform concurrent friendly and hostile missions.</p>							
ABCT – armored brigade combat team				IBCT – infantry brigade combat team			
AN/TPQ – Army/Navy (Marine) transportable radar special purpose (multipurpose)				km – kilometers			
				SBCT – Stryker brigade combat team			

1-35. To increase counterfire responsiveness, radars can be linked digitally and via voice directly to dedicated firing units or given quick-fire channels. Additionally, radars in friendly fire mode can assist in registering friendly indirect fires by providing accurate actual burst, datum-plane, or predicted-impact location data; enabling friendly firing elements to determine registration corrections for nonstandard conditions. This secondary task is performed only when the commander deems it absolutely necessary since it takes the radar away from its primary mission and exposes its location—any time the radar is radiating it is vulnerable to hostile acquisition. This secondary task determination is made based on mission variables of METT-TC, availability of observers, and the ability of the supported unit to meet the requirements for accurate fire.

1-36. The target acquisition platoon deploys in whole or part within tailored force packages. Once in theater, the cannon field artillery battalion controls the employment of the platoon and any additional counterfire radars augmenting the BCT. Counterfire radars require external security assets provided by the supported unit. For greater detail on field artillery weapon locating radar organization, capabilities, and employment see ATP 3-09.12.

Rocket Artillery and Mortar Warn

1-37. Rocket, artillery, and mortar warn (RAM Warn) techniques provide Soldiers with automated warnings and enhanced alerting capabilities. RAM Warn integrates the BCT organic sensors, commercial off-the-shelf warning systems and communication devices, and the forward area air defense system computer with RAM Warn software. The RAM Warn capability is integrated into the ADAM element architectures to provide warning to forces and assets as determined by the commander. RAM Warn integrates and operates with automated command systems. Without detection capabilities and automated command systems, RAM Warn is inoperable. The RAM Warn system is generally designed to be used in fixed and semi-fixed sites, however there may be situations in a fluid, maneuver where the RAM Warn system may be employed. The mission command automation system includes the forward area air defense workstation that is located with the ADAM element in the fires cell. The forward area air defense workstation provides an overall command capability for the RAM Warn system by integrating software, sensors and the warning systems. The forward area air defense workstation interfaces with the Army mission command network by interfacing with the air and missile defense workstation.

1-38. The fires cell and ADAM personnel share responsibility for the planning, coordinating and synchronizing of RAM Warn operations for the BCT. The field artillery battalion has responsibility for the emplacement of sensors and relays.

1-39. The fires cell plans, coordinates, and synchronizes sensor coverage with the ADAM element and the field artillery battalion. The fires cell must advise the commander and ensure the primary mission of the weapon locating radars is to the counterfire fight.

1-40. The ADAM element plans and coordinates the emplacement of the warning systems and develops and executes the RAM Warn architecture. The ADAM element coordinates with the fires cell for weapon locating radars cover to support the RAM Warn task. The ADAM element emplaces the indoor and outdoor RAM Warn antenna masts and radios at the area which the commander wishes to have warning capability for enemy indirect fire.

1-41. The field artillery battalion coordinates its weapon locating radar coverage with the brigade fires cell, and executes the BCT sensor coverage plan. The field artillery battalion also plans, coordinates, and employs retransmission teams and emplaces sensor and retransmission RAM Warn masts and radios as required. The retransmission teams belong to the field artillery battalion and the primary purpose is to retransmit radio communications from the firing batteries to the battalion fires cell, coordination must be made and the commander advised if RAM Warn retransmission will interfere or affect retransmission of the battalion's fires communication. For greater detail on RAM Warn organization, capabilities, and employment see ATPs 3-01.60 and 3-09.12.

Cannon Field Artillery Battery

1-42. The field artillery batteries vary slightly but typically consist of a battery headquarters, supply section, two firing platoons and their headquarters. Each firing platoon has a fire direction center, three firing sections, and an ammunition section.

1-43. The battery headquarters has personnel and equipment to perform administration, sustainment, and limited defense against chemical, biological, radiological, and nuclear attack. The supply section provides limited sustainment support; each ammunition section has personnel and equipment to provide limited ammunition support (some units may consolidate ammunition sections at battalion level).

1-44. The battery typically has two firing platoons operating independently in separate locations with a platoon fire direction center controlling the howitzers. The platoon fire direction centers are equipped with the AFATDS computer that provides the primary digital interface among command posts, fire direction centers, and howitzers. In a platoon-based unit, the platoon leader and platoon operations center execute mission command. The functions of the platoon operations center include technical and tactical fire direction. The platoon operations center is a fire direction center with added responsibilities. The platoon operations center is not a separate element and does not require a separate vehicle. Additional functions of the platoon operations center are executing orders from higher headquarters, coordinating logistics, and all the other operational functions normally performed by a headquarters based on guidance from the battery

commander/platoon leader. The numbers of howitzers in each platoon and employment method may vary based on the tactical situation or mission requirements. Howitzers normally position individually and work together under the lead of the senior section chief. If the platoon divides into pairs or groups, a designated senior section chief acts as team leader.

1-45. Section operations are the least preferred method of operation because the section is isolated and must provide for its own defense. This method requires the highest degree of crew training and does not provide for mutual support against air or ground threats. For more on the BCT's cannon field artillery battalion, see FM 3-09, FM 3-96, and ATP 3-09.23.

MORTARS

1-46. 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 and can rapidly be brought into action. Mortars are ideal weapons for attacking targets on reverse slopes, in gullies, in ditches, in built up areas, and in other areas that are difficult to reach with low-angle fire. The proliferation of handheld global positioning system devices and the fielding of the new mortar fire control system partially compensate for the fact that mortar positions are seldom surveyed. 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:

- *A priority target* is a target, based on either time or importance, on which delivery of fires takes precedence over all the fires for the designated firing unit or element (FM 3-09).
- *Final protective fire* is an immediately available prearranged barrier of fire designed to impede enemy movement across defensive lines or areas (JP 3-09.3).

MORTARS WITHIN THE BCT

1-47. Mortars are organic to all BCT maneuver battalions, cavalry troops, and to rifle companies in the Stryker and infantry BCTs. In maneuver units, mortar platoons or sections are found at battalion level and mortar sections are found at company level in airborne, ranger, air assault, and infantry rifle companies, and in cavalry troops. BCT organic mortars can include 60-mm at company level, with both 81-mm and 120-mm mortars at maneuver battalion and cavalry squadron level. See ATP 3-09.30, ATTP 3-21.90, and FM 3-09 for additional information on mortars and their capabilities.

ELECTRONIC ATTACK

1-48. *Electronic attack* is the 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). Electronic attack includes:

- Actions, such as jamming and electromagnetic deception, taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum.
- Employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (for example, lasers, radio frequency weapons, particle beams).
- Offensive and defensive tasks to include countermeasures.

1-49. Within the BCT military intelligence company the Signals Intelligence collection platoon contains collection assets – one AN/MLQ-40 Prophet control team and three Prophet collection teams. During operations, these assets normally support subordinate BCT elements. The Prophet control team provides mission management, correlates direction finding data, performs analysis, and reports information on enemy emitter activity and emitter location. The Prophet control team provides technical channels and authority for collection teams.

1-50. The Prophet collection teams operate mounted or dismounted using systems from the Prophet sensor vehicle or signals intelligence equipment provided by other military intelligence units. Prophet collection teams work independently or in tandem to detect, intercept, and exploit enemy signal emitters. Prophet provides indications, warning, location, tracking, and identification of threat emitters. Information collected

from the Prophet can cue other battlefield sensors (for example, tactical UAS and radars) as well as provide additional data that may confirm indications and detections from other battlefield sensors. Additionally, information collected from the Prophet can be used by the Electronic Warfare Officer to support electronic attack. For more on the relationship between intelligence and electronic warfare see ATP 2-19.4.

Chapter 2

Fire Support for Tactical Tasks During Brigade Combat Team Operations

Unified land operations describes how the Army seizes, retains, and exploits the initiative to gain and maintain a position of relative advantage in sustained land operations through simultaneous offensive, defensive, and stability operations in order to prevent or deter conflict, prevail in war, and create the conditions for favorable conflict resolution (Army Doctrine Publication [ADP] 3-0). Army forces engage in *decisive action*—the continuous, simultaneous combinations of offensive, defensive, and stability or defense support of civil authorities tasks (Army Doctrine Reference Publication [ADRP] 3-0). This chapter describes fire support considerations for brigade combat team (BCT) execution of these tasks. Section I begins with a summary discussion of the effect of fires in support of maneuver. Sections II, III, and IV describe fire support considerations for offensive, defensive, and stability tasks. Section IV concludes the chapter with a brief discussion of Defense Support of Civil Authorities.

SECTION I – THE EFFECTS OF FIRES IN SUPPORT OF MANEUVER

2-1. The maneuver and the fires functions combine to create conditions that enhance the ethical and effective application of available combat power in the BCT or other supported commander's area of operation. The maneuver commander employs supporting field artillery fires to destroy, neutralize, and suppress enemy forces. Fire support personnel and engineers work together to combine the effects of indirect fires and engineer obstacles to enable decisive friendly actions to set the stage for successful maneuver operations. Maneuver elements force enemy units into kill zones or concentrated formations where fires can create maximum effectiveness. Combining maneuver with responsive fire support makes destroying larger enemy forces feasible and enhances the protection of friendly forces. The maneuver commander employs nonlethal actions to subvert enemy actions and deny enemy objectives. The maneuver commander also employs nonlethal actions to engage the indigenous population and institutions in the operational environment, thus ensuring freedom of action and reduction of civilian interference.

2-2. Army Techniques Publication (ATP) 3-60 and Field Manual (FM) 3-09 provide detailed discussion on the effects of fires. The rules of engagement, clearance of fires, collateral damage, and target location error are critical considerations during all operations where fires are employed in support of maneuver.

RULES OF ENGAGEMENT AND FIRE SUPPORT COORDINATION MEASURES

2-3. *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 (Joint Publication [JP] 1-04). 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 (JP 3-0).

2-4. The joint force commander, theater army, corps, or division commander may prohibit or restrict BCT attacks on specific targets or objects without specific approval based on political considerations, military risk, collateral damage risk, the law of war, and rules of engagement. Targeting limitations generally fall into two categories: no-strike entities on a no-strike list and restricted targets on a restricted target 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 rules of engagement (JP 3-60).
- 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 or directed by higher authorities (JP 3-60).

2-5. No-strike entities are protected from the effects of military operations under international law or the rules of engagement. Attacking these entities (for example, cultural and religious sites, embassies belonging to noncombatant countries, hospitals, and schools) may violate the laws of war or interfere with friendly relations with other nations, indigenous populations, or governments. No-strike lists are not target lists, since the entities on the no-strike list are not targets. The lists are continuously updated with the latest information. For more information on no-strike entities and no-strike lists, see the discussion in JP 3-60 and Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3160.01A.

2-6. The BCT commander, the staff, fire support coordinator (FSCoord), brigade fire support officer (FSO) and fires cell planners will encounter detailed rules of engagement during some operations (for example during urban or stability operations) including lists of protected or restricted sites and areas. War gaming must identify situations in which the descriptive restrictions for various fire support coordination measures (FSCM) (described in FM 3-09) may need refinement, and when chain of command decisions or exceptions are required. The FSCoord and fires cell planners will frequently have to recommend which type of FSCM is appropriate for various unique situations. Bursting radius, delivery errors, and standard deviations will need to be accounted for more frequently. Reference cards, standard operating procedures (see ATP 3-90.90), and rehearsals are critical to ensuring that clearance of fires does not become a slow and cumbersome process. Streamlined clearance of fires channels may need to be established that are limited to specific fire support tasks. Check firing procedures may need greater planning, coordination, and rehearsal. See ATP 3-60, FM 3-09, JP 3-09, and JP 3-60 for additional information on rules of engagement and FSCMs.

CLEARANCE OF FIRES

2-7. *Clearance of fires* is the process by which the supported commander ensures that fires or their effects will have no unintended consequences on friendly units or the scheme of maneuver (FM 3-09). Commanders are responsible for the clearance of fires.

2-8. The center of this process is in the BCT main command post current operations cell. 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 FSCoord, chief of fires, FSO, and fires cell plan and coordinate all fire support impacting in the supported commander's area of operations, including the fire support requested by the supported unit. Airspace coordination, which should always be a part of the clearance of fires, is assisted through the staff process. The FSCoord and fires cell planners ensure that fire support will not jeopardize troop safety, will interface with other fire support means, will ensure the most responsive fires possible, and will not disrupt adjacent unit operations. Control measures (see the discussion in FM 3-09) are vital to the successful clearance of fires. See the detailed discussion on clearance of fires in Chapter 5 of this manual and in FM 3-09.

COLLATERAL DAMAGE

2-9. *Collateral damage* is unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time (JP 3-60). Such damage is not unlawful so long as it is incidental to striking a legitimate military target and is not excessive relative to the proportional military advantage anticipated from the attack.

2-10. The FSCoord, brigade fires support officer and fires cell planners should consider such matters as the potential for collateral damage, the possibility of hazardous material contamination, the effects on the civilian populace, and any other possibilities that may affect the achievement of tactical, operational and strategic objectives. Tactical events in an urban environment (see chapter 3) contain the real potential for

the elevation to the operational or strategic level—particularly events such as civilian casualties or damaged infrastructure—the BCT commander may find that targeting guidance must be provided in greater than usual detail.

2-11. Injury to the civilian population and damage to infrastructure should be avoided if possible. Unseen dangers, such as underground gas, water, and electrical lines need to be considered. A natural gas explosion or an electrical fire in the vicinity of a protected structure or friendly troops can become a rules of engagement violation if not anticipated. Detailed maps of underground utilities are useful references for fires cell planners and targeting officers to minimize collateral damage.

2-12. Precision-guided munitions, including precision munitions, are preferred for use against targets in restricted areas:

- A *precision-guided munition* is a guided weapon intended to destroy a point target and minimize collateral damage (JP 3-03). Precision-guided munitions include those munitions that home on reflected electromagnetic energy (such as the Hellfire missile), precision munitions, and video-guided munitions (such as the Maverick air-to-surface missile).
- A *precision munition* is a munition that corrects for ballistic condition using guidance and control up to the aimpoint or submunitions dispense with terminal accuracy less than the lethal radius of effects (FM 3-09). Precision munitions include those munitions with precision and near-precision capabilities.

2-13. Munitions with a precision capability such as the global positioning system-aided Excalibur 155-mm projectile, guided multiple launch rocket system (MLRS) rockets, and the advanced precision munitions initiative 120-mm mortar rounds have a circular error probable of less than 10 meters. Munitions with a near-precision capability, such as those with the M1156 Precision Guidance Kit, have a circular error probable between 10 and 50 meters. Circular error probable is an indicator of the delivery accuracy of a weapon system, used as a factor in determining probable damage to a target. Circular error probable is the radius of a circle within which half of the rounds fired at a target will impact. Even at the munitions' largest anticipated delivery error, the aimpoint is within the munitions' anticipated radius of direct effects. The employment of precision munitions requires the use of current cryptological key information.

2-14. The proximity of friendly and enemy units necessitates careful coordination of lethal fire support. The rules of engagement and the BCT commander should specify the amount of risk and the collateral damage that is acceptable. For example, the potential for collateral damage to adjacent buildings may prevent engagement with artillery. Such damage might cause noncombatant and friendly troop casualties and unintentional rubble. Commanders can offset these effects by carefully placing artillery positions, repositioning artillery as targets change, and using mortars. Mortars have a steep angle of fall and short minimum ranges. Collateral damage concerns may also cause commanders to restrict attacks to certain times of day, give warning prior to an attack so that noncombatants can evacuate the area, or even abort an attack unless the desired effect(s) can be created without unacceptable damage or injury.

2-15. Large numbers of civilians may be expected to operate in the target areas soon after combat operations have ceased. Depending on building construction, commanders may prohibit or limit illumination, obscurants, and other munitions because of fire hazards. For example, structure fires in an urban area are difficult to control and may affect friendly units. Conventional high explosive (HE) munitions may work best against concrete, steel, stone, and other reinforced structures.

2-16. Greater concerns exist for the safety and health (environmental matters) of the populace and the protection of critical infrastructure and cultural structures. For example, the BCT civil affairs operations officer, civil affairs element planners, augmenting civil affairs teams, information operations officer, and the BCT legal section will play a greater role for the expert advice they can provide regarding these elements of the urban environment. Nonetheless, all members of the staff ensure that operations minimize collateral damage. That responsibility does not end with identifying potential collateral damage. The goal, as always, is successful mission accomplishment. The commander's intent guides the BCT staff in developing courses of action that address collateral damage concerns (short- and long-term) yet accomplish the mission. This requires a keen understanding of the ethical and legal issues and both friendly and enemy weapon systems' effects in an urban environment.

2-17. The technical methods detailed in the collateral damage estimation methodology enable a reasonable determination of collateral damage inherent in weapons employment. The collateral damage estimation methodology thereby addresses the law of war requirement for reasonable precautions to minimize effects of combat on the civilian or noncombatant population. The supporting technical data, mitigation techniques, and logic of the methodology recognize the intelligence limitations of what can reasonably be known about a given target, its surroundings, and collateral structure composition; the fidelity of available weapon's empirical data; and the operational realities and uncertainties of ordnance delivery in a combat environment. Collateral damage estimation methodology is fully detailed in CJCSI 3160.01A.

TARGET LOCATION ERROR

2-18. *Target location error* is the difference between the coordinates generated for a target and the actual location of the target. Target location error is expressed primarily in terms of circular and vertical errors or infrequently, as spherical error (JP 3-09.3):

- Circular error is the error of the coordinates in the horizontal ground plane; vertical error the error of the coordinates in the vertical plane (elevation).
- Spherical error is the error of the coordinates in 3-dimensional spherical spaces (the combined error of the circular and vertical errors).

2-19. Target coordinates and associated target location error need to be of sufficient accuracy to enable the desired effects to be created on the target. Determining the size and disposition of the target on the ground is also necessary so that accurate firing data can be computed. Determining the appropriate time and type of attack requires that the target size (radius or other dimensions) and the direction and speed of movement are considered.

2-20. The level of precision and accuracy required for the target coordinate and target location error will be tactical situation dependent. Where there is not a risk of fratricide or collateral damage, time to engage should not be sacrificed if the current coordinates, target location error, weapon systems and munitions will create the desired effects on target. Global positioning system-aided munitions (such as guided MLRS) can be delivered at night or through weather on a set of coordinates but their effectiveness depends on a small target location error. Urban operations usually also require a very accurate target location with low target location error.

2-21. The observer must locate targets using the most accurate means available. Precision munitions offer both an increased probability of achieving first-round effects on a target and increase the probability that collateral damage can be minimized. Because precision munitions are inherently more accurate, target location error must be minimized to create the desired effects on the target. The method of target location is normally a grid location, as both polar and shift from known point imply a large target location error. Grid locations are transmitted using the military grid reference system with the 100,000-meter grid square designators and a ten-digit or better grid using a target mensuration system. Target elevation should be in meters mean sea level or height above ellipsoid using the most current datum available. The observer must specify the datum used, so that the fire direction center can make any necessary conversions.

2-22. There are six categories of target location error (see table 2-1) ranging from 0 to greater than 305 meters used to facilitate the communication of targeting accuracy. The categories are used to classify the accuracy of any coordinate generating system. These categories range from best (Category I), to worst (Category VI). See JP 3-09.3 for specific details.

Table 2-1. Target location error categories (JP 3-09.3)

TLE Categories (reference circular error on the ground)	CAT I CE 0-20 ft. 0-6 m			CAT II CE 21-50 ft. 7-15 m			CAT III CE 51-100 ft. 16-30 m			CAT IV CE 101-300 ft. 31-91 m			CAT V CE 301-1000 ft. 92-305 m			CAT VI CE >1000 ft. (>305m) or Large Elliptical Error		
	CE 90	VE 90	SE 90	CE 90	VE 90	SE 90	CE 90	VE 90	SE 90	CE 90	VE 90	SE 90	CE 90	VE 90	SE 90	CE 90	VE 90	SE 90
Circular, vertical, spherical error predictions.																		
CAT – category CE – circular error ft. – feet m – meters										SE – spherical error TLE – target location error VE – vertical error								

2-23. The effectiveness of precision-guided munitions depends on a host of situation variables. Digital point positioning database errors, global positioning system jamming, slant range, altitude, beam divergence of a laser spot, target movement and aim point on the target all have significant effects on the accuracy of the coordinate generated. For example, portable tactical imagery targeting software and hardware are capable of Category I target location coordinates, but a joint terminal attack controller (JTAC) may not be able to produce a Category I solution for a vehicle parked in a field that is not adequately depicted in the automation system. Likewise a fixed-wing aircraft with a targeting pod may be capable of Category II coordinates, but not be able to generate a Category II solution for a target or aim point that is not sensor significant such as a bunker, trench line, or emplacement with overhead cover and concealment. Moreover, observers, fire cells, and fire support weapons system operators must make sure they are all using the same coordinate datum plane (typically World Geodetic System 1984, see the discussion on common grid in Chapter 5).

2-24. *Mensuration* is the process of measurement of a feature or location on the earth to determine an absolute latitude, longitude, and elevation (JP 3-60). Point mensuration has always been an important part of targeting, since the points measured represent the desired points of impact for the munitions employed. As the accuracy of weapons delivery has improved, the importance of mensuration has grown in proportion and is a vital part of targeting.

2-25. *Target coordinate mensuration* is the process of measurement of a feature or location on Earth to determine an absolute latitude, longitude, and height. For targeting applications, the errors inherent in both the source for measurement as well as the measurement processes must be understood and reported. Mensuration tools can employ a variety of techniques to derive coordinates. These may include, but are not limited to, direct read from Digital Point Positioning Database stereo-pairs in stereo or dual mono mode, multi-image geopositioning, or indirect imagery correlation to the Digital Point Positioning Database (CJCSI 3505.01B).

2-26. Target location error should only be communicated when it will significantly affect the likelihood of mission success or failure. For example general target location error category is not required to either approve a mission or successfully engage a target with close air support. For more on target location error and its significance see FM 3-09, Army techniques publications (ATP) 3-09.12, 3-09.32 and 3-60, and JP 3-09.3.

SECTION II – FIRE SUPPORT CONSIDERATIONS FOR BCT OFFENSIVE TASKS

2-27. Effective offensive action capitalizes on accurate and timely intelligence and other relevant information regarding enemy forces, weather, and terrain. The commander maneuvers forces to advantageous positions before contact. Long-range artillery systems (cannon and rocket, naval surface fire support, and air support—rotary and fixed wing) engage the enemy throughout the depth of the enemy's defensive positions to shape the optimum situation for the decisive operation.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR THE OFFENSE

2-28. An *offensive task* is a task conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers (Army Doctrine Reference Publication [ADRP] 3-0). Surprise, concentration, tempo, and audacity characterize effective execution of offensive tasks. See FM 3-90-1.

SURPRISE

- 2-29. To achieve surprise in the offense commanders use inherent fire support capabilities that:
- Rapidly and discreetly shift fires to or mass the effects of fires in an unexpected sector or to capitalize on an identified enemy vulnerability.
 - Use short, intense programs of fires against key enemy functions (high-payoff targets) to deny or limit the enemy's capability to respond to the situation effectively or in time.
 - Deceive the enemy as to the types, numbers, locations, and intentions of friendly fire support and target acquisition assets.
 - Forego a preparation to achieve surprise in initiating an attack.

CONCENTRATION

- 2-30. To enhance the concentration of combat power, commanders:
- Allocate available fire support assets.
 - Assign priorities of fire and quick-fire channels.
 - Mass fires and focus target acquisition and intelligence collection assets to gain and maintain the tactical advantage.

TEMPO

- 2-31. To enhance the tempo, commanders:
- Develop comprehensive and detailed plans to ensure the mission and intent of the supported commander is understood.
 - Use a decentralized organization for combat and decentralized fire planning and fire control methods to facilitate rapid, flexible delivery of fires.
 - Prepare on-order missions that facilitate transition to subsequent phases and sequels or to a new task.
 - Ensure that fires in support of shaping operations facilitate the main effort and set the stage for rapid transition to the subsequent operational phases.
 - Deliver effective fires that help to create new opportunities for maneuver.
 - Rapidly shift fires in response to enemy actions or to exploit an enemy vulnerability.

AUDACITY

- 2-32. To facilitate audacity during the offense, commanders:
- Weight the decisive action with additional fire support assets by limiting, as necessary, the fire support allocated to a less important area.
 - Place fire support assets well forward and move them closely behind lead maneuver units.

- Use field artillery raids to strike high-payoff targets.
- Integrate information operations to create a holistic effect.

CONSIDERATIONS FOR FIRES IN SUPPORT OF OFFENSIVE TASKS

2-33. ADRP 3-90 provides guidance in the form of combat-tested concepts and ideas modified to exploit emerging Army and joint offensive capabilities. FM 3-90-1 provides guidance for conduct of the offense during Army operations. ADRP 3-09 provides a summary discussion of fires in support of offensive tasks. FM 3-09 describes offensive task considerations for all field artillery units.

General Offensive Task Fire Support Planning Considerations

2-34. Some general fire support planning considerations for BCT offensive tasks:

- Synchronize targeting working group and targeting board sessions with the air tasking order cycle. Refine the high-payoff target list at each session.

Note: The *air tasking order* is a method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities, and/or forces to targets and specific missions (JP 3-30). A *high-payoff target list* is a prioritized list of high-payoff targets by phase of the operation (FM 3-09). A *high-payoff target* is a target whose loss to the enemy will significantly contribute to the success of the friendly course of action (JP 3-60).

- Ensure that fire plans address the commander's fire support guidance and allocation of resources. Fires cells must allow enough time both to update fire support computers for rehearsals and convert them back for actual operations.

Note: A *fire plan* is a tactical plan for using the weapons of a unit or formation so that their fire will be coordinated (FM 3-09). A fire plan typically includes the plan for direct fires and the fire support plan.

- Determine the times that all fire support systems must be ready to fire based on the scheme of maneuver.
- Recommend how and when to shift the priority of fires. Also, determine what will be the trigger for shifting the priority of fires.
- Consider developing an interdiction plan to disrupt enemy preparation of the objective.
- Plan fires short of the line of departure or line of contact. Plan defensive fires (for example, final protective fire (FPF) for unit assembly areas and trains).
- Plan fires en route to the line of departure or line of contact including:
 - Fires to support a hasty defense if the attack fails.
 - Fires to limit enemy efforts at counter-reconnaissance.
- Plan fires from the line of departure or line of contact to the objective:
 - Provide priority of fires to lead elements.
 - Consider using fires to suppress enemy direct fire weapons.
 - Consider using obscurants to limit enemy observation of friendly maneuver elements.
 - Consider using obscurants to screen friendly breaching, clearing, or gap crossing operations.
 - Consider planning fires on exposed flanks to disrupt counterattacks.
 - Consider task organization of observers to ensure that all critical targets are observed.
- Ensure preparation fires are tied to maneuver events (that is, not just timed); advantages must outweigh the loss of surprise:
 - Fires must be accurate to be effective; consider how successful reconnaissance efforts have been—and whether there will be a need to adjust preparation fires before executing the assault.

- Ensure that ammunition is available to accomplish the commander's guidance for fires. Consider whether the enemy will be able to recover from the effects of the preparation prior to the assault.
- Determine when and how to shift fires (particularly priority targets en route) —
 - Use time (at a predetermined time, fires will shift); location (fires shift when maneuver reaches a certain location, such as a phase line); on call (the maneuver commander directs when the fires shift); or event (a predetermined event signals shifting of fires).
 - Ensure that the method to be used in shifting fires is understood by all fire support assets, from observer to delivery means.
- Plan fires on the objective:
 - Consider fires to delay enemy reinforcements and resupply by ground or air.

Note: *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 (FM 3-09).

- Consider fires to suppress enemy direct fire weapons.
- Consider obscurants to screen friendly forces or obscure hostile ground observation when consolidating on the objective.
- Designate a signal for lifting or shifting fires. Ensure that the signal is understood by maneuver elements.
- Plan fires in support of a hasty defense upon successful attack of the enemy objective.
- Plan fires beyond the objective:
 - To divert, delay, disrupt, or limit enemy reinforcements.
 - To block avenues of approach for counterattacking forces. Consider using field artillery-delivered scatterable mines to assist in this effort.
 - To disrupt or delay enemy retreat.
 - Ensure that subordinate elements maintain communications and report unit locations and status hourly.

FIRES FOR SUPPRESSION

2-35. Suppression in field artillery fires renders a target ineffective for a short period of time producing at least 3-percent casualties or materiel damage. The effect of suppressive fires lasts only as long as the effects from fires are present on the weapon or system.

2-36. Suppression by direct and indirect fires, electronic attack, or obscurants on enemy personnel, weapons, or equipment can be used to prevent effective fire on friendly forces. These fires help to isolate the main objective and tend to fix enemy forces during supporting attacks. Suppression protects and allows maneuver forces to close with the enemy and destroy him with direct fire. Planning for an attack involves the use of suppressive fires on known and suspected enemy direct fire positions. Suppressive fires are critically important in open terrain where enemy weapons can engage at maximum range.

GENERAL EMPLOYMENT CONSIDERATIONS

2-37. *Strike* is an attack to damage or destroy an objective or a capability (JP 3-0). Strikes by field artillery assets are one of the BCT's principal means of influencing ongoing action. The fire support planners must also retain sufficient assets to conduct strikes, applying the massed effects of fires at critical times and places to support the decisive operation.

2-38. The BCT commander employs available responsive air, surface, and naval fire support during the offense to protect and ensure freedom of maneuver to forces in contact with the enemy. Each of the four basic joint fire support tasks (see JP 3-09) and fires principles (see ADRP 3-09) must be considered when determining fire support requirements.

2-39. Fire support planning and its coordination with maneuver forces occurs continuously in order to facilitate reaction to enemy action or counteraction and to mitigate the risk of fratricide. The FSCOORD and fires cell planners work with the BCT commander and staff to ensure the integration of fire support into a naturally dynamic scheme of maneuver.

2-40. Cyber electromagnetic activities perform several functions to support the offense. For example as the friendly force moves through the enemy's security zone and closes with the enemy's main defensive positions, jamming resources concentrate to disrupt enemy's ability to react. This includes neutralizing enemy fire control, target intelligence, and intelligence-gathering systems.

TARGET ACQUISITION IN SUPPORT OF OFFENSIVE TASKS

2-41. The effective assignment of target acquisition assets enables responsive fires during offensive tasks. Quick-fire nets allow the observers to communicate with specific field artillery or mortar fire units. These kinds of communication arrangements enhance responsiveness. Communication planning should also include communications nets for the clearing of targets for air assets.

2-42. During offensive tasks, target acquisition radars support the protection of friendly forces by locating enemy indirect fire systems. In offensive tasks, particular attention must be given to planning target acquisition that enables future operations. For example, fires cell targeting officers focus on the identification of enemy indirect fire assets. They must identify and coordinate the use of the terrain for the radar and recommend radar zones to the BCT commander. Detailed planning should provide for continuous coverage of the supported command's area of operations.

2-43. Control and cueing for radars should be decentralized during offensive tasks. The field artillery controlling headquarters should designate cueing agents that can directly contact the radar through the radar deployment order. The radar deployment order identifies the cueing agents and their priorities to the radar section. See ATP 3-09.12 for additional information on target acquisition.

GENERAL CONSIDERATIONS FOR A CANNON FIELD ARTILLERY BATTALION IN SUPPORT OF OFFENSIVE TASKS

2-44. For cannon field artillery battalions, offensive tasks frequently involve forward, rearward, and lateral movement to better provide supporting fires to the attacking force. During periods of rapid advance, large areas of terrain may be available and position areas for artillery may be relatively easy to find. When advances stall, or attacking forces are counterattacked, available terrain may be limited. General considerations for the cannon field artillery battalion during offensive tasks include:

- Position firing units to effectively support the maneuver commander's fire support requirements.
- Plan for rapid movement along multiple routes using all available resources.
- Position firing units to range beyond maneuver objectives.
- Identify requirements for extended range munitions.
- Coordinate for external radar support, if needed.
- Designate and position combat mission configured loads of artillery ammunition.
- Ensure logistics support plans address security, movement, and recovery of unused ammunition.
- Plan for unit defense in a 6400-mil (360-degree) environment.
- Plan and execute radar zones.

2-45. Requirements for radar positioning and movement are identified early in the operations process (see chapter 6) and tied to specific events. This allows continuous coverage by facilitating mutually supporting coverage between radars. The field artillery battalion commander monitors this process closely to ensure that the use of terrain, movements, and radar zones are properly coordinated. General considerations for target acquisition during all types of offensive tasks include:

- Execute target acquisition in support of the supported command's operations.
- Position observers and radars to support the observation and collection plans.
- Plan for frequent repositioning of target acquisition assets.

- Use call for fire zones to provide target acquisition coverage on suspected enemy firing positions.
- Coordinate radar employment across the supported command's area of operations to ensure there are no gaps in coverage.
- Position radars to maximize range and provide maximum flexibility.
- Position radars to cover critical point targets that are vulnerable to indirect fire.
- Plan for 6400-mil (360-degree) coverage and flank security.

FIRE SUPPORT CONSIDERATIONS FOR MOVEMENT TO CONTACT

2-46. A *movement to contact* is an offensive task designed to develop the situation and establish or regain contact (ADRP 3-90). FM 3-90-1 provides a comprehensive discussion of movement to contact. FM 3-09 provides a summary description of fire support considerations for a field artillery battalion supporting a maneuver unit during movement to contact.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR MOVEMENT TO CONTACT

2-47. Responsive fires facilitated by a clear understanding of the fire support task(s) for each phase of the operation are critical to success. For example when planning and conducting a movement to contact fires cell planners should if possible, plan and coordinate fires from available reinforcing (R), general support-reinforcing (GSR), or general support (GS) assets—especially long ranges fires such as those from the MLRS—that may be needed to support counterfire once contact is made with the enemy, or to interdict enemy reserve forces responding to the developing situation.

2-48. Considerations for a cannon field artillery battalion supporting a maneuver force movement to contact include:

- Provide responsive fires for each phase of the operation.
- Plan and providing counterfire (see chapter 5).
- Plan for screening obscuration. See also ATP 3-11.50 for more information on battlefield obscuration.
- Ensure coordination requirements necessary to maintain synchronization of successive priority targets.
- Position fire support assets well forward to facilitate communications, allow for massing of fires, preclude untimely displacements, and exploit weapons ranges.
- Position observers effectively and maximizing use of lead maneuver forces to call for fires.
- Position fire support teams (FIST) and observers forward and along the BCT's flanks to observe and execute any priority targets.
- Ensure that all observers and subordinate leaders understand the fire support task(s) for each phase of the operation.
- Plan fires on key known, suspected, or potential enemy positions.
- Plan fires to support blocking and fires to support future operations.
- Plan fires on critical points along the axis of advance, to include the flanks.
- Plan for suppression of enemy air defenses (see the discussion in chapter 5).
- Plan fires to support reconnaissance assets.
- Assign priority of fires as designated by the BCT or supported commander.
- Refine all targeting data based on the reconnaissance effort and operational changes as the situation develops.
- Synchronize the positioning and movement of cannon field artillery batteries and platoons with the tempo of the BCT or other supported unit and its fire support requirements.
- Ensure that firing batteries are positioned to support the BCT at points of vulnerability, such as obstacles, canalizing terrain, bridges, or gap crossings.

- Position a cannon field artillery battery or platoon to follow close behind the advance guard to provide responsive fires to lead elements.
- Consider fires to support deception efforts.
- Plan fires to support a possible transition to a hasty defense.
- Once contact is made, be prepared to shift control of all available fires to the observer who is in the best position to control fires against the enemy.

2-49. Cannon field artillery battalion target acquisition assets focus on locating enemy indirect fire systems throughout the movement to contact. During a movement to contact the FAB can support the BCT with radar coverage to allow the BCTs' organic radars to continue to maneuver with the BCT. It can also provide radar coverage to help protect vulnerable assets. As the situation develops surveillance, reconnaissance and target acquisition assets will transition to support shaping and counterfire missions. Considerations for target acquisition during movement to contact include:

- Position observers, including manned and unmanned aircraft forward and along the supported unit's flanks to detect enemy forces.
- Position radars as far forward as possible to maximize range and provide maximum flexibility.
- Position radars to cover critical friendly assets that are vulnerable to enemy indirect fire from bypassed regular or irregular forces.
- Ensure coordination requirements necessary to maintain synchronization of successive priority targets.

2-50. For more on cannon field artillery battalions, see ATP 3-09.23. For more on field artillery target acquisition, see ATP 3-09.12. For more on observed fire, see ATP 3-09.30. For a discussion of the division artillery (DIVARTY) and the FAB and its role in supporting the BCT's cannon field artillery battalion during movement to contact, see FM 3-09 and ATP 3-09.24.

FIRE SUPPORT TASK ORGANIZATION CONSIDERATIONS

2-51. Consider supporting the movement to contact with a decentralized task organization that best enables immediate indirect fire support to maneuver battalions from supporting cannon field artillery batteries or platoons. Such fires can help meet the BCT commander's overall close support, counterfire, and other fire support requirements.

2-52. Other fire support means, such as close air support, naval surface fire support, and appropriate aspects of cyber electromagnetic activities, are allocated if they are available and applicable to the needs of the commander. Consider attaching assets to the security or reconnaissance forces. Coordinate for available support from Army aviation attack/reconnaissance helicopters (see chapter 4).

FIRE SUPPORT CONSIDERATIONS FOR THE ATTACK

2-53. An *attack* is an offensive task that destroys or defeats enemy forces, seizes and secures terrain, or both (ADRP 3-90). Coordinated maneuver supported by fires characterizes the attack. FM 3-90-1 provides a comprehensive discussion of the attack. FM 3-09 provides a summary description of fire support considerations for a field artillery battalion supporting a maneuver unit during the attack.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR THE ATTACK

2-54. In addition to the considerations for planning an attack identified in FM 3-09, fire support planners should also:

- Plan electronic attack of high-payoff targets.
- Plan for illumination fires.
- Plan fires to support consolidation.
- Use fires to deceive the enemy as to the location of the main effort.

2-55. During the attack, cannon field artillery battalion target acquisition assets must focus on identifying enemy systems that can interdict the supported maneuver unit as it moves toward the objective. Radars and

observers linked to fire support systems enable the supported unit's attack. Specific considerations for target acquisition during the attack include:

- Integrate primary and alternate observers to engage targets.
- Use unmanned aircraft systems to conduct reconnaissance of target areas of interest.
- Ensure radars are in position in time to support the assault on the objective and subsequent consolidation.
- Coordinate radar employment across the supported command's area of operations to ensure there are no gaps in coverage.
- Plan call for fire zones on suspected and known enemy indirect fire systems.
- Plan for critical friendly zones over breaching sites and gap crossings.
- Position target acquisition to support higher echelon operations.
- Ensure adequate sensor-to-shooter linkage.
- Coordinate FAB radar coverage across the supported command's area of operations to ensure there are no gaps in coverage.
- Use echeloned movement to provide continuous radar coverage to the supported force.
- Provide FAB radar coverage for the BCTs or other supported units to allow movement of these subordinate unit assets forward during the attack.
- Coordinate surveillance, reconnaissance, and target acquisition requirements with the military intelligence brigade and division, corps, joint task force, or other supported command G-2/S-2.
- Position radars as far forward as possible to maximize range and provide maximum flexibility.
- Position radars to cover critical friendly assets.

2-56. For more on cannon field artillery battalions see ATP 3-09.23. For more on field artillery target acquisition see ATP 3-09.12. For more on observed fires see ATP 3-09.30. For a discussion of the DIVARTY and the FAB and its role in supporting the BCT's cannon field artillery battalion during an attack, see FM 3-09 and ATP 3-09.24.

FIRE SUPPORT CONSIDERATIONS SPECIFIC TO THE MAIN EFFORT

2-57. *Preparation fire* is normally a high-volume of fires delivered over a short period of time to maximize surprise and shock effect. Preparation fire can include electronic attack and should be synchronized with other electronic warfare activities (FM 3-09).

2-58. The extent and the length of the preparation is determined from the effects desired from fires and the fire support assets available to execute the preparation. Preparation fires initially focus on the destruction of high-payoff targets (that is, key enemy forces that most impact the scheme of maneuver). For example, during a penetration attack, the preparation fires may attack enemy positions able to engage the flanks of the friendly attacking force. Preparation fires may also:

- Weaken or neutralize enemy reserves.

Note: Destruction in artillery fire renders a target out of action permanently or ineffective for a long period of time, producing at least 30-percent casualties or materiel damage. Destruction is also a type of artillery fire adjustment for destroying a given target. Neutralization in artillery fire renders a target ineffective for a short period of time, producing at least 10-percent casualties or materiel damage.

- Emplace field artillery delivered scatterable mines to block enemy routes into or out of the objective.
- Deceive the enemy as to the BCT's actual intentions.
- Destroy enemy security forces.
- Obscure friendly movements and deployments.

- Attrite enemy indirect fire assets.
- Deny or delay the enemy the ability to provide a clear situational picture to their higher command headquarters.

2-59. Units may substitute other types of planned fires for a preparation. Units can aggressively use series, groups, and programs of targets to support each echelon of maneuver throughout the attack. The fire support planners plan these fires to suppress enemy forces on the flanks of the penetration, fix enemy forces away from the penetration, and prevent reinforcement by follow-on forces. These fires help block enemy movement of reserves, destroy threat command and control facilities, neutralize enemy field artillery, and prevent the escape of retreating elements.

Echelonment of Fires

2-60. Echelonment of fires is a technique for integrating and synchronizing maneuver and fires. Echelonment of fires is the execution of a schedule of fires fired from the highest caliber to the lowest caliber weapon, based on risk estimate distances (see ATP 3-09.32) and weapons system range capabilities, as the maneuver force moves toward an objective (see figure 2-1). Echelonment of fires helps to ensure that ground forces are able to move to an objective without losing momentum, helps set the conditions for the direct fire fight, and reduces the risk of friendly casualties. Echelonment of fires is accomplished when the maneuver commander wishes to conduct preparation fires on an objective.

2-61. Not all offensive tasks warrant preparation fires. Some considerations for conducting preparation fires are:

- Will the loss of surprise from the preparation be offset by the damage done to the enemy?
- Are there enough targets and means to warrant a preparation?
- Can the enemy recover before the preparation fires can be exploited?

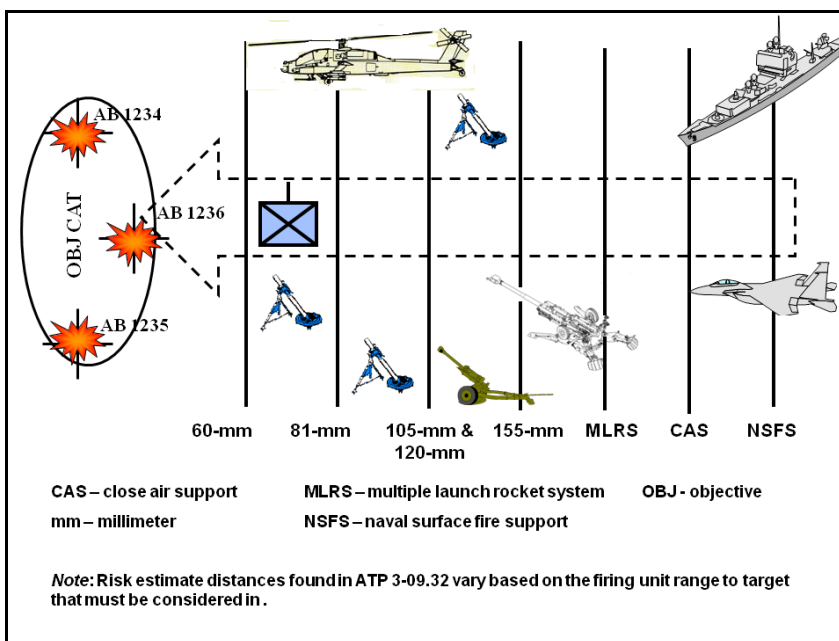


Figure 2-1. Echelonment of fires

2-62. Echelonning a preparation is a 9-step process. The process is outlined in Table-2-2 on page 2-14 and described in greater detail in the paragraphs that follow.

Table 2-2. 9-step process for echeloning a preparation

NINE STEPS FOR ECHELONING A PREPARATION

- Determine what assets, to include ammunition, are required and what assets are currently available or allocated.
- Verify risk estimate distances and attack criteria with the commander.
- Plan targets.
- Develop a communications plan.
- Determine what the rate of movement will be.
- Develop the schedule of fires and decide how the preparation schedule will be initiated.
- Brief the plan and confirm the method with the commander.
- Complete the scheduling worksheet(s) within AFATDS or manually using DA Form(s) 4656 (*Scheduling Worksheet*).
- Rehearse and refine the plan.

Step 1

2-63. The fire support planners must determine what fire support assets and capabilities (lethal and nonlethal, including appropriate aspects of cyber electromagnetic activities) are available for the preparation. In making this determination, the brigade FSO, information operations officer, and fires cell planners should consider:

- Does the naval gunfire gun-target line support use of naval surface fire support in the preparation?
- During what air tasking order cycle must the preplanned close air support request be submitted?
- What are the ammunition constraints and limitations and can they be adjusted (controlled supply rate may restrict or limit the use of certain types of ammunition)?
- What are the dud rates and self-destruct times of improved conventional munitions? These types of munitions may be best suited to the flanks and beyond the objective and not on the objective.

Step 2

2-64. Verify risk estimate distances (see ATP 3-09.32) and the commander's attack criteria. Risk estimate distances allow the commander to estimate the risk in terms of percent of friendly casualties that may result from the employment of lethal munitions within close proximity of friendly forces. Risk estimate distances are based on the amount of risk the maneuver commander is willing to accept. The risk is usually expressed as the probability of incapacitation, which is the probability that a soldier will suffer an incapacitating injury.

Step 3

2-65. Plan targets on the objective, to the flanks of the objective, and beyond the objective. Timely and accurate intelligence is critical to this step. Weapons and ammunition should be matched to the appropriate target.

Step 4

2-66. Develop a communications plan to support fires. The preparation may involve many fire support assets over a considerable distance; reliable and redundant means of digital and voice communications are essential. Consider establishing both a ground and air retransmission capability.

Step 5

2-67. Determine the force's rate of movement. This rate will vary depending on the type maneuver force and the terrain. A fully mechanized force travels much further and faster than a light infantry force. The rate of movement of combined heavy and light forces is also different. The S-2 or intelligence cell's intelligence preparation of the battlefield (see ATP 2-01.3, and ATP 2-19.4) should assist in determining a reasonable rate of movement. Caution is advised, however, because a movement rate can change. Subordinate and supporting units' movements must be closely monitored, and the brigade FSO and fires cell planners must develop a plan to alter the schedule of fires based on the movement rate. *Intelligence preparation of the battlefield* is the systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations (ATP 2-01.3).

Step 6

2-68. Develop the schedule of fires. Normally, fires begin before H-hour and may extend beyond it. Firing may start at a prescribed time or it may be held on-call until needed. The preparation may be phased as:

- In Phase 1, attack fire support means and observation capabilities, including field artillery headquarters and command posts. Consider adding air defense targets in this phase as well.
- In Phase 2, attack main command posts, communications facilities, assembly areas, and reserves.
- In Phase 3, attack defensive areas in the forward positions and targets that pose an immediate threat to attacking units or forces.
- The attacking force is most vulnerable to counterattack during reorganization. Include fires in the plan to cover reorganization.

Step 7

2-69. Brief the plan. The brigade FSO should back-brief the commander and S-3 before completing the schedules of fire using AFATDS or manually using DA Forms 4656 (*Scheduling Worksheet*). During the fire support portion of the operations order brief, be thorough—it is critical that the subordinate and supporting commanders understand the preparation sequence and their responsibilities. A sketch may be helpful.

Step 8

2-70. Complete the schedules of fires via AFATDS or manually using DA Forms 4656 (*Scheduling Worksheet*). Ensure that all elements receive a copy of the worksheets.

Step 9

2-71. Rehearse and refine the plan. The rehearsal (see chapter 5) should cover all fire support tasks and not just the echeloning of fires.

Fires in Support of a Blocking Operation

2-72. Fires in support of a blocking operation isolate the enemy main effort and fix other enemy forces to prevent them from interfering with supporting attacks. Scatterable mines, if used, must be coordinated with the engineer coordinator, approved by the proper authority, and that information is disseminated to all units.

Fires to Weight the Decisive Action or Main Effort

2-73. Give priority of fires to the decisive action or main effort. Consider weighting the main effort with close air support sortie distribution. A continuous flow of preplanned close air support sorties (push close air support) allows the main effort force to respond to contingencies that develop during the course of the operation, and retain the initiative.

2-74. Synchronize fires on the objective to suppress, neutralize, or destroy enemy forces that most affect the BCT's closure on the objective. Targets should be tied directly to the scheme of maneuver. Plan fires to prevent the enemy's reinforcement of the objective.

2-75. Consider suppression of enemy air defenses to support friendly close air support and attack helicopter operations. Some suppression of enemy air defenses may be appropriate for electronic attack assets. Obscurants may be used to screen enemy ground observers from viewing friendly aircraft. Consider using airspace coordination areas (ACA) to provide reasonably safe operating airspace for aircraft to maneuver and attack targets.

FIRE SUPPORT TASK ORGANIZATION CONSIDERATIONS SPECIFIC TO THE ATTACK

2-76. Allocate fire support assets to weight the main effort. At BCT level, assigning priority of fires, allocating close air support sorties, and using other fire support means weights the main effort. If possible, position fire support assets supporting secondary efforts where the assets can also support the main effort.

FIRE SUPPORT CONSIDERATIONS FOR EXPLOITATION AND PURSUIT

2-77. The fire support planning aspects of an exploitation are very similar to those of a pursuit. *Exploitation* is an offensive task that usually follows the conduct of a successful attack and is designed to disorganize the enemy in depth (ADRP 3-90). Exploitation takes advantage of a weakened or collapsed enemy to achieve the total disintegration of the enemy.

2-78. *Pursuit* is an offensive task designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it (ADRP 3-90). The BCT normally conducts a pursuit operation as part of a division, corps, or higher echelon pursuit; functioning as either the direct-pressure or encircling force. The pursuit normally follows a successful exploitation.

Note: The *direct pressure force* is a force employed in a pursuit operation that orients on the enemy main body to prevent enemy disengagement or defensive reconstitution prior to envelopment by the encircling force. It normally conducts a series of attacks to slow the enemy's retirement by forcing the enemy to stand and fight (FM 3-90-1).

2-79. FM 3-90-1 provides a comprehensive discussion of exploitation and pursuit. FM 3-09 provides a summary description of fire support considerations for a field artillery battalion supporting a maneuver unit during exploitation and pursuit.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR THE EXPLOITATION AND PURSUIT

2-80. Considerations for a cannon field artillery battalion supporting a maneuver unit during exploitation and pursuit include:

- Plan for continual forward displacement of field artillery.
- Position firing units well forward in the supported unit formation.
- Suppress bypassed enemy pockets of resistance.
- Plan for the delivery of scatterable mines.
- Plan and coordinate for the use of fixed and rotary-wing aviation assets.
- Coordinate with the BCT's Air Force Staff Weather Officer (SWO) to obtain weather effects assessments for aviation assets and sensors based on current and forecasted weather conditions.
- Plan for greater use of available radio retransmission capabilities.
- Plan for increased use of Class III and Class V supplies; air transportation of supplies may be required.
- Plan for the enemy to seek cover among indigenous civilian populations and for enhanced collateral damage prevention and clearance of fires.

2-81. Considerations for cannon field artillery battalion target acquisition during exploitation and pursuit include:

- Use unmanned aircraft to help provide timely and accurate information about enemy locations and activities.
- Coordinate with the BCT SWO to provide a weather effects assessments for unmanned aircraft and sensor payloads based on current and forecasted weather conditions.
- Focus target acquisition assets on acquiring enemy indirect fire systems.
- Position radars to cover critical friendly assets that are vulnerable to indirect fire from bypassed enemy regular or irregular forces.
- Monitor radar acquisitions for indications of scatterable mine emplacement by the enemy.
- Integrate reconnaissance, surveillance and targeting acquisition with FAB strikes.
- Position radars as far forward as possible to maximize range and provide maximum flexibility.

2-82. For more on cannon field artillery battalions see ATP 3-09.23. For more on field artillery target acquisition see ATP 3-09.12. For more on observed fires see ATP 3-09.30. For a discussion of the

DIVARTY and the FAB and its role in supporting the BCT's cannon field artillery battalion during pursuit and exploitation, see FM 3-09 and ATP 3-09.24.

FIRE SUPPORT CONSIDERATIONS SPECIFIC TO THE EXPLOITATION

2-83. The commander directs the BCT into exploitation through the use of a fragmentary order. As a minimum, this order addresses:

- Commander's intent.
- The BCT's maneuver formation.
- Subordinate and supporting unit objectives and tasks.
- Modifications to the task organization.
- Updated information collection plan (see the discussion in chapter 4 and FM 3-55).
- Revised control measures.
- Bypass criteria.
- Guidance for the seizure of key terrain or facilities.
- Scheme of fires.

2-84. The FSCOORD and fires cell planners develop a fire support plan (see chapter 6) that provides decentralized and immediate responsive fires to the lead units. The plan focuses on the engagement of high-payoff targets ahead of the BCT. Air defense assets continue to provide all-around air defense. Logistics planners support the movement of assets and their displacement to maintain support responsiveness. Increased ammunition, fuel, petroleum, oil, and lubricant requirements are anticipated and supported as far forward as necessary. Due to the potential of bypassed enemy forces, logisticians are concerned with the security of main supply routes.

2-85. In fire planning for the exploitation, consider:

- Fires not only in front of the force, but also to the flanks and rear.
- Massed fires on choke points and key terrain to canalize, slow, and block the enemy's movements.
- Fires to suppress bypassed enemy pockets of resistance until friendly maneuver elements are safely past; suppressive and other fires may then be needed to support follow-on force actions against the bypassed forces.
- Fires that do not create obstacles to friendly forces and limit forward progress. Deep shell craters or improperly placed scatterable mines can hinder forward movement.

2-86. Complete fire support coordination as early as possible. Use on-order measures to facilitate rapid emplacement and movement of assets. Consider using restrictive fire lines (RFL) in situations where friendly forces are converging or are operating in close proximity to one another in an area not clearly delineated by unit boundaries or other control measures.

2-87. Maintaining BCT momentum is primarily an exercise in the movement of assets and timing. The ability of the sustainment structure to move forward with fuel, ammunition, and maintenance support not only determines the limits of advance for the BCT, but also may limit available fire support from the BCT's field artillery battalion and other supporting field artillery. Consider aerial resupply for units in exploitation to help sustain the operation

FIRE SUPPORT TASK ORGANIZATION CONSIDERATIONS SPECIFIC TO THE EXPLOITATION

2-88. Exploiting units should have as much air support (both fixed- and rotary-wing) as possible. These aircraft can:

- Operate effectively when enemy defenses are crumbling.
- Quickly deliver massive amounts of ordnance.
- Operate across wide sectors.
- Seek out, follow, and destroy withdrawing enemy forces.
- Block avenues of approach for counterattacking enemy forces.

2-89. Other fire support required for exploitation forces should be mobile and possess the flexibility to respond quickly to the needs of maneuver. On-order priorities of fire and on-order missions for fire support are designated to quickly shift priorities to units within the exploitation force or follow-and-support force if necessary. Control of assets should be decentralized due to the need for responsive fires and the decreased requirement for massed fires.

FIRE SUPPORT CONSIDERATIONS SPECIFIC TO THE PURSUIT

2-90. In planning fires for the pursuit:

- Provide fires to slow the enemy's retreat and to allow the enveloping force to catch up. If scatterable mines are used to slow the retreat, ensure that safety zones are disseminated.
- Provide fires to prevent enemy reinforcement.
- Use obscuration to slow and disrupt the enemy's retreat.
- Maximize the use of available close air support and attack helicopters.
- Plan for continual displacement of mortars and field artillery. Subsequent positions must be coordinated through fires cells as early as possible.
- Plan for greater use of available radio retransmission capabilities.
- Provide fires to fix bypassed enemy forces until friendly follow-on elements can engage. Consider designating areas around bypassed pockets of resistance as free-fire areas.
- Ensure that all FSCMs are well forward to allow for the speed of the operation.
- Plan RFLs when necessary between the encircling and direct-pressure forces.
- Plan for increased petroleum, oil, lubricants and ammunition usage. Air transportation of supplies may be required. Use captured enemy materiel and stocks of supplies when possible and approved.
- Plan the use of manned and unmanned reconnaissance aircraft.
- Engage command and control elements with fires to disrupt the enemy's attempts to consolidate and reorganize.

FIRE SUPPORT TASK ORGANIZATION CONSIDERATIONS SPECIFIC TO THE PURSUIT

2-91. Fire support organization for combat must be decentralized to increase responsiveness of fires. The BCT commander, along with the FSCoord, should consider the appropriate command or support relationship for field artillery units supporting the force conducting a pursuit.

2-92. Air support must be responsive to effectively slow the enemy's retreat. Fixed- and rotary-wing aircraft on ground or air alert may be necessary to provide the degree of responsiveness required.

FIRE SUPPORT CONSIDERATIONS FOR ENTRY OPERATIONS

2-93. *Forcible entry* is the seizing and holding of a military lodgment in the face of armed opposition (JP 3-18). A *lodgment* is a designated area in a hostile or potentially hostile operational area that, when seized and held, makes the continuous landing of troops and materiel possible and provides maneuver space for subsequent operations (JP 3-18).

GENERAL FIRE SUPPORT CONSIDERATIONS FOR ENTRY OPERATIONS

2-94. During the initial stages of air assault or airborne operations, commanders may require positive clearance of fires because of the amount of air assets in the area. Elements are extremely vulnerable during the landing, at the landing zone, drop zone, or airhead. Fires in preparation for an assault or supporting an assault are normally delivered by close air support or naval surface fire support and are normally controlled from an airborne platform.

2-95. Survey is generally not initially available; units must rely on hasty survey techniques until organic survey assets are deployed and operational. Prior coordination for available survey information is vital. Field artillery and mortars should be placed on a common grid as soon as possible.

2-96. Available ammunition may initially be limited. Units may be forced to rely more on fires to suppress (rather than neutralize or destroy) in order to conserve ammunition.

2-97. Other considerations for BCT fire support during entry operations include:

- Plan fires to separate the enemy's forces by echelon to buy time and allow maneuver forces to expand the lodgment.
- Plan for use of attack/reconnaissance helicopters.
- Conduct entry operations during periods of limited visibility to take advantage of our night vision capabilities.
- Conduct initial reconnaissance for positioning by map or air. Displacement may be by air.
- Decentralize control of battery movement.
- Plan for encirclement operations, breakout operations, and linkup operations.
- Plan for 6,400-mil firing requirements.

FIRE SUPPORT TASK ORGANIZATION CONSIDERATIONS FOR ENTRY OPERATIONS

2-98. Initially consider decentralization of fire support assets. As the situation develops, fire support assets and fires can be centralized to complement joint fires, if employed.

FIRE SUPPORT CONSIDERATIONS FOR THE RESERVE

2-99. A *reserve* is that portion of a body of troops that is withheld from action at the beginning of an engagement, in order to be available at a decisive moment (ADRP 3-90). Because the time, place, and circumstances for committing the reserve is difficult to predict, units frequently rely on hasty fire support planning techniques to modify established fire plans or to create new fire plans immediately prior to the reserve's employment. For more on the reserve see ADRP 3-90, FM 3-90-1, and FM 3-96.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR UNITS IN RESERVE

2-100. To support commitment of the reserve during movement, plan fires:

- To deceive the enemy that the reserve is to be committed elsewhere. Fires that support deception may be massed fires and obscurants delivered on forward enemy elements.
- At the breakthrough point or at the point of assault to create a hole in the enemy defenses.
- For suppression throughout the breakthrough area.
- On the enemy's flanks and rear where counterattacking forces are committed.
- On the way to the objective.
- On bypassed enemy elements.
- On the objective to suppress, neutralize, or destroy targets.
- To strike at objectives in depth as enemy dispositions are revealed. This is to support the committed reserves and to break up the enemy's coordination of the attack.
- Beyond the objective to prevent counterattacks, to help consolidate on the objective, and to prevent enemy reinforcement of the objective area.

2-101. Plan for FSCMs such as:

- Coordinated fire lines that are placed well forward to ensure that the force will not outrun them.
- Restrictive fire areas (RFA) that may safeguard friendly strong points.

2-102. Ensure fires are continuous until the maneuver closes. Plan and integrate graphic control measures to facilitate rapid clearance of fires upon commitment of the reserve. Plan to rearm, refit, and refuel fire support assets before assuming on-order missions.

FIRE SUPPORT TASK ORGANIZATION CONSIDERATIONS FOR UNITS IN RESERVE

2-103. When the BCT is designated as a reserve force, the division commander may assign its fire support assets other support relationships prior to the brigade's commitment. For example, the division may

assign a general support (GS) or other support relationship to the BCT's field artillery battalion during the initial phases of an operation with an on-order mission to return to the BCT's control when the reserve is committed. This requires increased coordination between the brigade FSO, fires cell planners and the supporting field artillery unit(s) to:

- Ensure that fire plan changes are properly coordinated.
- Position and resource field artillery units.
- Time the implementation of the field artillery on-order missions to allow enough time for all planning, movement, and digital communication synchronization actions to be completed.

2-104. The FSCOORD and fires cell planners should ensure that all supporting fire support units establish their requirements for fuel, ammunition, and other resources necessary to support the reserve mission. Planners should consider:

- Mission variables of METT-TC and the scheme of maneuver.
- Targeting responsibilities and procedures.

2-105. Because reserve tasks often involve tactical movements and passage of lines, planners should review the BCT and higher headquarters task organization for the following fire support considerations:

- Positioning.
- Movement.
- Order-of-march organization.
- Route priorities.
- Passwords.
- Communications information.
- Fire support battle handover procedures (for example, target lists, priority targets, triggers, key observers).
- Liaison.

2-106. The FSCOORD and fires cell planners play a key role in ensuring that sustainment arrangements for supporting fire support units are properly coordinated based on the task organization and mission variables of METT-TC. Because reserve tasks usually involve rapid, flexible movement, the brigade fires cell planners should verify that BCT and supporting field artillery and sustainment unit leaders have established adequate communications and, as appropriate, synchronization with brigade support area activities and movements.

SECTION III – FIRE SUPPORT CONSIDERATIONS FOR BCT DEFENSIVE TASKS

2-107. The defense's inherent strengths include the defender's ability to occupy positions before the attack and use the available time to prepare the defenses. The defender does not wait passively to be attacked but aggressively seeks ways of attriting and weakening attacking enemy forces before the initiation of close combat. The defender maneuvers to place the enemy in a position of disadvantage and attacks the enemy at every opportunity, using fires, electronic warfare, and joint assets, such as close air support.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR THE DEFENSE

2-108. A *defensive task* is a task conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability tasks (ADRP 3-0). ADRP 3-90 provides guidance in the form of combat-tested concepts and ideas modified to exploit emerging Army and joint defensive capabilities. FM 3-90-1 provides guidance for conduct of the defense during Army operations. ADRP 3-09 provides a summary discussion of fires in support of defensive tasks.

FIRE SUPPORT AND CHARACTERISTICS OF THE DEFENSE

2-109. FM 3-09 describes defensive task considerations for all field artillery units. Characteristics of the defense include preparation, security, disruption, mass, and flexibility.

Preparation

2-110. The defender often has the opportunity to select the defensive terrain and has time to prepare and improve defenses. Fire support planners make maximum use of any time available to plan and coordinate supporting fires to:

- Prepare observation posts, marking triggers and target reference points, and to study the terrain on which the defensive operation will be fought.
- Prepare engagement areas to facilitate fires by coordinating obstacle and fire support plans and by emplacing sensors.
- Prepare and harden artillery and target acquisition positions (primary, alternate, supplementary, and successive) in conjunction with the engineer coordinator.
- Conduct rehearsals on the actual terrain.
- Identify likely position areas for enemy artillery and other high-payoff targets.

Security

2-111. Fire support must complement and support all security operations, protective measures, appropriate aspects of information operations, and cyber electromagnetic activities designed to provide security for supported units and to eliminate threats. Fires cell planners' considerations may include:

- Fires to support security forces.
- Counterfire against enemy artillery and mortars before they can move into range of friendly forces.
- Fires to support deception activities.
- Recommend locations of rocket, artillery and mortar warning (RAM Warn) towers (see ATP 3-01.60).
- Operations security techniques to protect friendly forces and information.

Disruption

2-112. Fire support plays a key role in disrupting an attacker's tempo and synchronization. Targets are planned and selected to prevent from the enemy from massing overwhelming combat power along the selected line defense. Methods of disruption include fires to:

- Engage the enemy before threat attack preparations can be completed (for example, fires to support spoiling attacks or destroy key sustainment sites).
- Destroy enemy reconnaissance forces.
- Separate enemy forces, isolate enemy units, and destroy or degrade high-payoff targets.
- Support counterattacks designed to defeat the enemy before the enemy can consolidate any gains.
- Disrupt enemy efforts to reorganize for another attack or to prepare a coordinated defense.

Mass and Concentration

2-113. Fire support plays an essential role in a unit's ability to mass overwhelming combat power at critical places and times. Massed fires:

- Assist an outnumbered defender in repelling 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 weight another area.

- Create an important demoralizing psychological effect that is not created from smaller-scale fires.
- Create synergistic effects, as the strengths of the various types of fires can complement each other and offset one another's weaknesses.
- Used in depth create gaps or separations in attacking units and result in significant attrition of enemy forces before they close with friendly forces.

Flexibility

2-114. Fire support planning and execution must address the need for flexibility in defensive operations. The enemy usually has the initiative and will attempt to prevent friendly forces from identifying the main effort until it is too late to react. Fire support personnel must be able to:

- Quickly shift fires to critical points throughout the area of operations.
- Shift from executing fires in support of shaping operations to fires in support of the main effort or to provide fires needed in the brigade support area.
- Execute successive or concurrent programs or fire plans (for example, suppression of enemy air defenses and counterfire programs) and from planned fires to immediate fires.
- Shift fires from support of the defense to support of the counterattack and offense.

FIRE SUPPORT PLANNING CONSIDERATIONS FOR DEFENSIVE TASKS

2-115. General fire support planning considerations and implied techniques for defensive tasks include:

- Synchronize the targeting cycle with the air tasking order cycle.
- Post current maneuver graphics, FSCMs, fire support unit locations, and ranges of fire support systems and target locations.
- Check the target overlay periodically to ensure that the current enemy situation is reflected in targeting.
- Ensure fires are integrated into the obstacle plan.
- Base fire plans on the BCT commander's guidance for fires and allocation of resources.

Note: Fire plans (to include munitions such as scatterable mines) must be entered into the Advanced Field Artillery Tactical Data System (AFATDS) and the other Army Battle Command System automation devices in time to conduct technical rehearsals and prepare for firing.

- Check communications systems with all elements.
- Identify requirements for positioning primary and alternate observers forward of friendly maneuver forces. Ensure that extraction guidelines are established and understood.
- Develop alternate plans in case these forward observers are forced to withdraw prior to execution of fire support tasks.
- Determine the time needed for all fire support systems to be ready based on the scheme of maneuver. Ensure that these times are met.
- Determine how and recommend when to shift the priority of fires. Determine what will be the trigger to shift the priority of fires.

2-116. Additional general planning considerations for BCT fire support of defensive tasks may include:

- Plan fire support early and throughout the area of operations.
- Plan fires in support of security forces.
- Plan fires in support of counterreconnaissance. Consider augmenting forward elements with observers and the use of precision munitions, if available.
- Plan fires to support delaying actions, to disrupt or limit the momentum of the enemy's attack, to reduce the enemy's combat power, to separate enemy forces from each other, and to force the enemy commander to deploy forces early.

Note: When applicable, fires may also support efforts to divert an enemy's attack.

- Locate and destroy high-payoff targets to support both friendly shaping operations and the decisive action or main effort.
- Position observers on templated avenues of approach.
- Plan fires on key choke points.
- Plan scatterable mines and obscuration to separate enemy lead elements from follow-on forces.
- Ensure that fire support assets are identified and directed to support the counterfire battle.
- Plan counterpreparation fires.
- Coordinate common sensor boundaries to delineate radar responsibilities.
- Plan fires to support the decisive action or main effort:
 - Mass fires to limit, disrupt, delay, divert and destroy enemy capabilities.
 - Plan fires to assist maneuver during retrograde operations.
 - Position alternate observers to those observers responsible for observing key areas or executing critical fire support triggers.
 - Plan fires on obstacles and assign alternate observers to execute the fire plan.
 - Coordinate with the engineer coordinator to integrate fires and obstacles to create the intended effect.
 - Incorporate the effects of the terrain when targeting in support of obstacles to create the desired effect. Fires placed incorrectly may cause the enemy to take an alternate course of action that is detrimental to the BCT operation plan.
 - Consider the use of obscurants to support the obstacle plan.
- Plan fires in support of engagement areas to:
 - Canalize the enemy.
 - Plan groups of targets for simultaneous engagement within engagement areas.
 - Plan series of targets to preclude enemy movement out of engagement areas.
 - Mass fires in engagement areas.
 - Plan coordinated attack in engagement areas with air assets. Review planning procedures for joint air attack team operations.
 - Consider the use of illumination in engagement areas.
- Plan fires in support of the defense to:
 - Integrate fire support into the direct fire defensive plan.
 - Suppress enemy indirect and direct fire weapons.
 - Assign priority targets and FPFs to battle positions, strong points, or perimeter defenses.
 - Plan for the use of obscurants during periods of limited visibility to degrade enemy night vision capabilities.
 - Plan for contingencies to reallocate fire support assets to strengthen vulnerabilities.
- Plan to support hasty attack:
 - Use quick fire planning techniques.
 - Place coordinated fire lines close to forward defensive positions to facilitate rapid engagements.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR DEFENSIVE TASKS

2-117. The commander and staff determine the organization and array of forces, obstacle placement effects, and fire support tasks. The plan is based on the BCT commander's concept of the operation and visualization as to how the engagement will progress. Subordinate plans require the application of available resources to defeat enemy forces within the security, main effort, and brigade support areas. These considerations include:

- Determine what effects the contribution of fires to shaping operations must create on enemy formations by avenue of approach.
- Determine how the effects from fires will support the main effort.
- Define the task(s) and purpose for subordinate units.
- Establish priorities for sustainment.

2-118. The staff concurrently develops plans to integrate obstacle and fire support plans with the scheme of maneuver. The commander drives integration by stating the desired effects from fire support and from obstacles. The commander states how to mass the effects of direct and indirect fires, including appropriate aspects of information operations and cyber electromagnetic activities, in conjunction with obstacles to shape the battlefield to support the main effort.

2-119. Fire support systems support security forces by using both precision and area munitions to destroy enemy reconnaissance and high-payoff targets, and by delivering on-call fires at appropriate times and places. Fire support facilitates the withdrawal of security forces once their mission has been accomplished.

2-120. Air support can play an important part in delaying enemy forces that are following or attempting to bypass defending forces. Fixed-wing air support operating with Army helicopters form joint air attack teams employed to search out and attack high-payoff target sets. Air interdiction operations contribute to denying the enemy any advantage associated with the freedom of movement. Field artillery fires and electronic attack suppress enemy air defenses while available air resources operate in the target area(s).

2-121. During close combat, fire support assets continue to target enemy combat units to kill the enemy, force early deployment, and to disrupt the timing and cohesion of the enemy's attack thereby denying an ability to mass threat combat power.

2-122. Fire support assets extend the attack to enemy follow-on forces by engaging them well before they are committed to close combat. High-value targets such as command and control facilities and logistic sustainment sites are attacked, further isolating the attacking forces. A *high-value target* is a target the enemy commander requires for the successful completion of the mission (JP 3-60). Such attacks deny the enemy's ability to sense, control and synchronize efforts to overwhelm the friendly defense force.

2-123. The BCT commander employs responsive fire support (from available air, ground, and sea resources) during the defense to protect and ensure freedom of maneuver to forces in contact with the enemy. The fire support planners take advantage of the range and flexibility of fire support weapons to mass fires at critical points, such as obstacles, and to generate effects from fires in engagement areas that slow and canalize the enemy and provide better targets for direct fire systems. Fire support systems cover barriers, gaps, and open areas within the defensive area. Tasks assigned to fire support systems include:

- Mass fires to suppress enemy direct and indirect fire systems to facilitate defensive maneuver, especially counterattack and disengagement.
- Attack enemy field artillery and forward air defense systems.
- Neutralize or isolate enemy forces that have penetrated the defensive area and impede the movement of enemy reserves.
- Separate attacking enemy combat vehicles from dismounted infantry, thus disrupting the enemy's combat power.
- Close previously breached obstacle gaps with artillery delivered mines.

GENERAL CONSIDERATIONS FOR THE CANNON FIELD ARTILLERY BATTALION IN SUPPORT OF DEFENSIVE TASKS.

2-124. Repositioning to alternate or supplemental positions may often be reactive during early stages of the defense. In response to shallow enemy penetrations, the field artillery battalion normally repositions its weapons systems laterally, away from the point of penetration. This allows field artillery systems to provide fire support throughout the area of penetration. The field artillery battalion may also experience rearward movement until the friendly maneuver force stabilizes the line, slows the enemy advance, or is able to better anticipate enemy actions.

2-125. During defensive tasks, the field artillery battalion should coordinate for engineer support and Class IV materials to harden positions and reduce the effectiveness of enemy fires. Plan for the use of direct fire in support of battery or platoon defenses. Radar critical friendly zones may be used to increase protection of key friendly units. Anticipate the need for survivability moves after firing units have provided extended or intense fires (planned or unplanned). Review emergency destruction procedures.

2-126. Additional considerations during defensive tasks include:

- Plan alternate and supplementary positions for each location.
- Use manned and unmanned aircraft systems to reconnoiter routes and field artillery position areas.
- Engage with the BCT SWO to obtain weather effects assessments for the employment of manned and unmanned aircraft systems based on current and forecast conditions.
- Conduct ground reconnaissance, selection, and occupation of alternate and supplementary positions.
- Engage approaching enemy formations at maximum range with indirect fires and close air support.
- Plan targets, FPFs, observer positioning, triggers, and fires in support of all engagement areas for all phases of the defensive operation, to include each counterattack option of the striking force.
- Recommend FSCMs to support each phase of the defensive operation including all planned counterattack options.
- Plan for and provide counterfire.
- Ensure the integration of fires in support of obstacles.
- Coordinate with the supported command's fires cell to ensure the obstacle plan integrates field artillery fires with engineer obstacles and for the employment of scatterable mines.
- Develop the fire support plan to include priorities of fires, targets on point obstacles and obstacle belts, and groups of targets.
- Coordinate with the BCT and subordinate unit fires cells for close air support and Army aviation attacks where the enemy is in contact with friendly forces.
- Coordinate with the BCT and subordinate unit FSOs and fires cells to plan for and mass all available fires to support disengagements.
- Ensure that forward positioned observers are resourced with adequate security, mobility, and situational understanding.
- Provide field artillery illumination to assist friendly force night operations, to mark locations or targets, to provide friendly direction orientation, or to degrade enemy night vision equipment.

2-127. The primary role of weapons locating radars in the defense is to provide target intelligence and information to allow for counterfire mission processing. Target acquisition planners must also consider transitions to offensive tasks such as counterattacks. Positioning, task organization, and on-order missions should facilitate transitions. General consideration for target acquisition during defensive tasks include:

- Employ target acquisition assets to provide coverage of named areas of interest, target areas of interest, and critical assets.
- Engage with the BCT SWO to obtain weather effects assessments for Army and Joint (such as aviation systems) target acquisition assets based on current and forecast conditions.
- Integrate radar placement and acquisition data into fire planning.
- Coordinate target acquisition assets to locate targets in a 6400-mil (360-degree) area of operations.
- Assist the supported command's fires cell in the development of an observation plan that:
 - Ensures that obstacles are under continuous observation.
 - Ensures that responsibility for related fire support tasks are identified and coordinated.
 - Includes priority intelligence requirements.
 - Addresses both military and civilian activity

- Is objective-oriented.
- Focuses on monitoring critical areas.
- Rehearse the observation plan to ensure that all targets are adequately observed, that triggers are effectively coordinated, and that backup plans are adequate.
- Employ radar in support of higher echelon shaping operations.
- Link unmanned aircraft systems with MLRS or High Mobility Artillery Rocket System (HIMARS) units to rapidly engage targets.
- Position observers to see both targets and trigger lines.
- Ensure adequate sensor-to-shooter linkage.
- Use echeloned movement to provide continuous radar coverage to the supported force.
- Coordinate surveillance, reconnaissance, and target acquisition requirements with the BCT or other higher headquarters G-2 or S-2.
- Integrate air assets into counterfire operations.
- Coordinate weapons locating radar employment across the supported command's area of operations to ensure there are no gaps in coverage.

FIRE SUPPORT CONSIDERATIONS FOR AREA DEFENSE

2-128. An *area defense* is a defensive task that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright (ADRP 3-90). FM 3-90-1 provides a comprehensive discussion of the area defense. FM 3-09 provides a summary description of fire support considerations for a FAB, MLRS or HIMARS battalion or cannon field artillery battalion supporting a maneuver unit during an area defense.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR AN AREA DEFENSE

2-129. Fire support in an area defense is used to deceive, defeat, delay, destroy, disrupt, divert, neutralize, and suppress enemy forces. Fire support personnel and engineers work together to combine the effects of indirect fires and engineer obstacles to disrupt, turn, block or fix the enemy's ability to counter friendly actions thereby setting the stage for successful maneuver operations. Maneuver can also force enemy units into kill zones or concentrated formations where fires can create maximum effectiveness. Fires across the entire enemy force cause the enemy to deploy early into an attack formation. Fires in the economy of force areas are dense enough to delay or divert enemy supporting formations. When the enemy masses, threat formations must be attacked repeatedly and effectively with massed fires to reduce the momentum. Fires directed against an attacker's follow-on forces keep them from influencing the immediate battle.

2-130. Field artillery units may initially be positioned forward to allow for fires ranging farther into enemy formations. Forward positions should be placed on routes that facilitate displacement. Positions should be selected to provide good cover and concealment to minimize their vulnerability to enemy air attack and attack by enemy ground reconnaissance forces.

2-131. Coordinate the movement of firing batteries to support the accomplishment of fire support tasks. Ensure that movements are coordinated with the scheme of maneuver to avoid confusion and possible interference with planned maneuver actions. As the operation develops, field artillery units may find themselves astride an enemy route of advance. When possible, these field artillery units should reposition along the flanks or in other better-protected areas. This gives maneuver forces room to operate and reduces untimely artillery unit displacements during the battle.

2-132. Radars should be focused on the enemy's main effort. This is where the enemy can be expected to concentrate indirect fire weapons. Weapon locating radars should be positioned to maximize coverage immediately forward of the friendly defenses.

2-133. As defensive forces reposition to meet an enemy main effort, target acquisition elements should also be repositioned. Displacement of these resources should be staggered so that some coverage is always available. Coordinate for radars from the DIVARTY or a supporting FAB to supplement the BCT's radar coverage.

2-134. The handoff of the battle from security forces to defensive main effort forces is a critical point in the defense. Effective control is especially important to ensure a smooth changeover and continuous and effective fire support. Communications must be established between defensive main effort and covering forces before control of the operation changes. This is best achieved when both the defensive main effort force field artillery and the covering force field artillery monitor the same networks (generally those used by the covering force field artillery).

Radio communications should prevent:

- Covering force field artillery having to change frequencies at a critical time.
- Issuing additional signal operating instructions extracts to units in the covering force. This reduces the possibility of signal operating instructions compromise.
- Early use of the defensive main effort force networks and possible detection by enemy jammers or direction-finding equipment before the defensive main effort fight.

2-135. The heavy use of close air support and Army aviation may be needed during combat operations. Enemy air defenses must be suppressed to let friendly aircraft operate in the airspace above or near those enemy defenses and their associated equipment and facilities. This requires a coordinated effort between air and land elements to locate enemy facilities and to plan and execute suppression of enemy air defenses with all available lethal and nonlethal means. Targets of concern to the air elements are processed at the BCT fires cell and then assigned to appropriate fire support or electronic attack assets.

2-136. Because fire support resources are limited, the BCT commander must indicate the priority for suppression of enemy air defenses and plan accordingly. Individual requests by flight leaders for fires in support of suppression of enemy air defenses are treated as targets of opportunity.

2-137. Counterpreparation fires may be used if the BCT commander desires. Acquisition resources and targeting efforts are directed toward detecting enemy forward elements, indirect fire support means, observation posts, command posts, and reserves.

Note: Counterpreparation fire is intensive prearranged fire delivered when the imminence of the enemy attack is discovered (FM 3-09). Counterpreparation fire is designed to break up enemy formations; delay movement of reinforcements or reserves; disorganize the enemy's system of command, communications, and observation; decrease the effectiveness of artillery preparation; and impair the enemy's offensive spirit.

2-138. Use the memory aid AWIFM to assist fire support planners in organizing for combat (see the discussion on this memory aid as part of task-organizing field artillery within the BCT in chapter 6). Fire support is allocated with priority to the most vulnerable area. Usually, this area coincides with the enemy's most likely avenues of approach and main effort. Fire support for the defense in general is most responsive when centrally controlled. Planners should consider weighting the most vulnerable areas of the defense with immediate responsive fires. Field artillery, close air support sorties, attack helicopters, electronic attack, electronic warfare support, and information collection (see the discussion in chapter 4 and FM 3-55) and target acquisition assets can be used to provide responsive support to forces bearing the brunt of the enemy's attack. Fire support must be allocated as early as possible in the planning process for defensive operations to allow commanders enough preparation time.

2-139. Considerations for the field artillery battalion supporting a maneuver force area defense include:

- Plan counterfire (see chapter 5).
- Ensure adequate field artillery battalion fires are available for the battle handover and withdrawal of the security forces.
- Plan to forward position field artillery battalion firing units in support of security area operations.
- Engage approaching enemy formations at maximum range with indirect fires and close air support.
- Engage with the BCT SWO obtain weather effects assessments for all close air support assets based on current and forecast conditions.
- Develop clear triggers to adjust FSCMs and priorities for fires.

- Develop and rehearse the observation plan to ensure that all targets are adequately observed, that triggers are effectively coordinated, and that alternate plans are adequate.
- Coordinate the movement of field artillery batteries to support fire support tasks; ensure movements are coordinated with the scheme of maneuver to avoid confusion and possible interference with planned maneuver actions.
- Provide fires as an economy-of-force measure that augments maneuver assets and frees them for other critical areas.
- Plan fires for suppression of enemy air defenses.
- Ensure the integration of fires in support of the obstacle plan:
 - Reinforces or reestablishes obstacles with scatterable mines (see appendix A).
 - Coordinates the use of rotary-wing and fixed-wing close air support to support the obstacle plan.
 - Assists the maneuver commander and staff in developing priorities of fires for individual obstacles and obstacle belts and groups.
 - Assists in the development of an observation plan that ensures obstacles are under continuous observation, and that responsibility for related fire support tasks are identified and coordinated.

2-140. During area defense the BCT commander directs reconnaissance, surveillance and target acquisition assets to determine the locations, strengths and probable intentions of the attacking enemy force before and throughout the defense; placing a high priority on early identification of the enemy's main effort. Focus target acquisition assets on locating high-payoff targets that may include enemy fire support systems. Specific considerations for field artillery battalion target acquisition systems during area defense include:

- Integrate primary and alternate observers to engage high-payoff targets.
- Position radars to maximize range and acquire enemy indirect fire systems.
- Position radars to cover infantry defiles and strong points.
- Employ allocated unmanned aircraft systems to conduct reconnaissance, detect enemy indirect fire systems, and other enemy forces.
- Plan for radar critical friendly zones.

2-141. For more on cannon field artillery battalions see ATP 3-09.23. For more on field artillery target acquisition see ATP 3-09.12. For more on observed fires see ATP 3-09.30. For a discussion of the FAB and its role in supporting the BCT's cannon field artillery battalion during an area defense see FM 3-09 and ATP 3-09.24.

FIRE SUPPORT CONSIDERATIONS FOR MOBILE DEFENSE

2-142. A *mobile defense* is a defensive task that concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force (ADRP 3-90). FM 3-90-1 provides a comprehensive discussion of the mobile defense. FM 3-09 provides a summary description of fire support considerations for a FAB, MLRS or HIMARS battalion, or cannon field artillery battalion supporting a maneuver unit during a mobile defense.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR A MOBILE DEFENSE

2-143. The effectiveness of a mobile defense is based to a large extent on the carefully planned fires of all weapons. Upon its commitment, the striking force is the main effort in a mobile defense and requires continuous and concentrated fire support during the conduct of the counterattack. The commander weights the main effort, in part, by the allocation of priority of fires upon commitment. The BCT commander must be able to shift fire support rapidly from the fixing force to the striking force.

2-144. Striking forces may operate at considerable distances from the fixing force. Additional combat power must be provided to the striking forces. This is done through the decentralization of assets. The degree of decentralization depends largely on the amount of fire support available. The BCT commander

takes precautions to prevent fratricide as the striking force approaches the fixing force's engagement areas and while supporting air and field artillery assets interdict enemy movements.

2-145. Considerations for a field artillery battalion supporting a maneuver force mobile defense include:

- Provide fires to assist maneuver forces in moving and disengaging.
- Provide counterfire.
- Provide timely cannon field artillery battalion fires to suppress enemy air defenses.
- Plan for the use of screening obscuration to support both the fixing and striking force.
- Synchronize the positioning and movement of the cannon field artillery battalion subordinate firing units and radars with the scheme of maneuver.
- Position ammunition stocks for each phase of the operation.

2-146. Specific considerations for cannon field artillery battalion target acquisition assets supporting a mobile defense include:

- Plan for frequent repositioning based on movement of the forward line of own troops.
- Position observers forward and along the flanks of both the fixing and striking force to observe and execute priority targets.
- Position radars as far forward as possible in the fixing force to maximize range and provide maximum flexibility as the striking force maneuvers to destroy enemy formations.
- Position radars to cover critical point targets.
- Employ unmanned aircraft systems forward of advancing maneuver units to detect enemy forces.
- Use unmanned aircraft systems to conduct reconnaissance of target areas of interest that include enemy indirect fires assets.
- Continually review timelines and coordination requirements necessary to maintain synchronization of observers/triggers, shooters, and decision makers for successive priority targets during for both fixing and striking forces.
- Monitor radar acquisitions for indications of scatterable mine emplacement by the enemy.
- Integrate reconnaissance, surveillance and target acquisition with the fixing force to slow and disorganize repositioning and withdrawing enemy forces.
- Engage with the BCT SWO to obtain weather effects assessments for all unmanned aircraft assets based on current and forecast conditions.

2-147. For more on cannon field artillery battalions see ATP 3-09.23. For more on field artillery target acquisition see ATP 3-09.12. For more on observed fires see ATP 3-09.30. For a discussion of the FAB and its role in supporting the BCT's organic cannon field artillery battalion during a mobile defense see FM 3-09 and ATP 3-09.24.

FIRE SUPPORT CONSIDERATIONS FOR RETROGRADE

2-148. A *retrograde* is a defensive task that involves organized movement away from the enemy (ADRP 3-90). Retrograde includes delays, withdrawals, and retirements. Retrograde operations gain time, preserve forces, place the enemy in unfavorable positions, or avoids combat under undesirable conditions.

2-149. FM 3-90-1 provides a comprehensive discussion of the retrograde. FM 3-09 provides a summary description of fire support considerations for a field artillery brigade, MLRS/HIMARS battalion or cannon field artillery battalion supporting a maneuver unit during a retrograde.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR RETROGRADE

2-150. General fire support considerations for a cannon field artillery battalion supporting a maneuver force retrograde are the same as those for a mobile defense.

2-151. During a retrograde target acquisition-specific considerations for a cannon field artillery battalion may include:

- Positioning long-range radars rearward to provide extended coverage for the supported command during the retrograde.
- Planning call for fire zones on probable enemy field artillery locations.

2-152. For more on cannon field artillery battalions see ATP 3-09.23. For more on field artillery target acquisition see ATP 3-09.12. For more on observed fires see ATP 3-09.30. For a discussion of the FAB and its role in supporting the BCT's cannon field artillery battalion during a retrograde see FM 3-09 and ATP 3-09.24.

FIRE SUPPORT CONSIDERATIONS SPECIFIC TO DELAY, WITHDRAWAL, AND RETIREMENT

2-153. A *delaying operation* is an operation in which a force under pressure trades space for time by slowing down the enemy's momentum and inflicting maximum damage on the enemy without, in principle, becoming decisively engaged (JP 3-04).

2-154. Key fire support considerations for a field artillery battalion supporting a maneuver force delaying operation include:

- Engage the enemy well forward, before threat forces get to friendly delaying positions. Inflict maximum casualties to reduce enemy combat power, disrupt the approach, and suppress and destroy accompanying indirect fire assets.
- Plan massed fires on avenues of approach and canalizing terrain to destroy high-payoff targets, limit enemy maneuver, and prevent the enemy attack from gaining momentum from any limited successes.
- Plan and designate priority targets along routes from one delaying position to the next.
- Plan the use of obscurants to support disengagements and to screen friendly movements.
- Mass all available fires to support disengagements.
- Ensure that alternate firing units are designated for FPFs.
- Synchronize the positioning and movement of field artillery assets with the scheme of maneuver to ensure responsive continuous fire support across the width of the delaying force, and to ensure that field artillery units can move in synchronization with area of operations changes and not be overrun or exposed to enemy direct fire.
- Cover obstacles, barriers, gaps, and flanks with scatterable mines and other fires.
- Ensure that forward positioned observers are resourced with adequate security and mobility, and that they receive timely situational awareness information to prevent them from being isolated or destroyed.
- Initially position fire support assets well forward to exploit range.
- Plan fire support on main enemy avenues of approach. Later, position fire support assets in depth to provide maximum continuous fire support.

2-155. A *withdrawal operation* is a planned retrograde operation in which a force in contact disengages from an enemy force and moves in a direction away from the enemy (JP 3-17). The fire support planning aspects of a withdrawal are very similar to those of a delay.

2-156. The fire support planners must plan for a withdrawal under pressure. When a unit must withdraw while under attack, fire support is used to slow the enemy's concentration of forces. Consider the use of precision-guided munitions against high-payoff targets.

2-157. Fire support considerations for supporting a maneuver force withdrawal include:

- Mask the movement of friendly forces with smoke during both day and night operations.
- Use fire support to slow the enemy; scatterable mines are particularly useful.
- Cover obstacles with fires and observation.
- Jam enemy command networks.

- Use fires to support units in contact.
- Provide FPFs.

2-158. All available fire support assets must be responsive to the withdrawing force. The security force must be weighted to increase combat power. Reserves of the withdrawing unit may remain well forward to assist by fire or to launch spoiling attacks.

2-159. A *retirement* is a form of retrograde in which a force out of contact moves away from the enemy (ADRP 3-90). Consider fire support for security forces covering the retirement. The security forces may have to engage enemy forces, such as special operations forces, air assaults, and long-range fire support assets.

2-160. If the BCT is moving to a new area, the retirement may transition into a movement to contact. Task organization of the BCT, as it moves along the retirement route, should ease transition into the next operation.

SECTION IV - FIRE SUPPORT CONSIDERATIONS FOR STABILITY TASKS

GENERAL

2-161. *Stability tasks* are tasks conducted as part of operations outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment and provide essential government services, emergency infrastructure reconstruction, and humanitarian relief (ADP 3-07). The BCT commander employs responsive fire support (from available air, ground, and sea resources) during execution of stability tasks to protect and ensure freedom of maneuver to forces in contact with the enemy.

2-162. Field artillery tasks conducted in support of stability tasks are essentially the same as those for offensive and defensive tasks. Restraint is vital in the employment of fires during stability tasks. Such restraint typically concerns the munitions employed and the targets engaged to obtain desired effects. Having the ability to employ a weapon does not mean it should be employed (FM 3-09).

2-163. In addition to collateral damage considerations, the employment of fires could have second and third order negative effects. 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 is a conscious decision within an overall ethical framework; it increases the legitimacy of the organization that uses it while potentially damaging the legitimacy of an opponent.

2-164. The actions of field artillery personnel and units are framed by the disciplined and ethical application of force including specific rules of engagement. Successful employment of field artillery battalion weapons and munitions in support of BCT operations requires a common understanding by commanders and their field artillery 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. Field artillery battalion personnel must be properly trained in the rules of engagement and quickly informed of any changes. Rules of engagement may vary, but should always be consistent with the inherent right of self-defense. Given timely and accurate intelligence to determine targets and their locations, precision munitions may create the desired effects while mitigating adverse effects. Key considerations for employment of field artillery fires during stability tasks include:

- Stability tasks are often conducted in noncontiguous areas of operation. This can complicate the use of FSCMs, the ability to mass and shift fires, and clearance of fires procedures.
- During execution of stability tasks the enemy may be difficult to define or isolate. The enemy, for example, may be a set of ambiguous threats and opponents. The BCT S-2, S-3, FSCoord and fires cell planners work closely with the information operations officer, the civil affairs officer and other information-related personnel and nonlethal asset managers as well as host nation police or paramilitary elements.

- What constitutes key terrain may be based more on political and social considerations than physical features of the landscape. Fires may be used more frequently to defend or deny the use of key sites than to seize them.
- Rules of engagement are often more restrictive than in normal combat operations. They may vary with the particular situation. Commander's guidance for the application of fires requires careful consideration during development and wide dissemination to all levels.
- Increasing the proportion of precision-guided munitions, including precision munitions, used in fires or employment of electronic attack may be necessary to limit collateral damage.

2-165. Fires can have a long-term adverse impact on achievement of the desired end state. The political nature of and the need to maintain legitimacy in stability operations requires the BCT FSCOORD and fires cell planners to understand the cumulative undesirable effects of collateral damage. Such effects may wear down a population's support for friendly forces. The BCT commander must weigh the risk of any long-term effects of employing fires.

2-166. The BCT commander integrates fire support into the tactical plan in accordance with the rules of engagement and any restrictions such as no-fire areas (NFA) imposed within the area of operations. Considerations include:

- Procedures for the rapid clearance of fires.
- Close communication and coordination with host country officials.
- Increased security for field artillery firing positions.
- Probable restricted use of certain munitions such as improved conventional munitions and scatterable mines.

2-167. As during offensive and defensive tasks, establish FSCMs for stability tasks to facilitate the attack of high-payoff targets throughout the area of operations. Restrictive FSCMs provide safeguards for friendly forces and noncombatants, facilities, or terrain. For example, NFAs and restrictive fire areas (RFA) may be used not only to protect forces, but also to protect populations, critical infrastructure, and sites of religious or cultural significance. For detail on FSCMs see FM 3-09 and JP 3-09.

PLANNING AND EMPLOYMENT

2-168. The accuracy and timeliness of fire support assumes increased importance during execution of stability tasks because of the need to safeguard the population and prevent collateral damage. The Army automation systems give the BCT commander and fire support planners clear and timely information. The brigade fire support planners must make special provisions for integrating fire support with the appropriate aspects of information operations and cyber electromagnetic activities.

2-169. The BCT commander considers the physical and cultural limitations of the area of operations, such as the presence of noncombatants and cultural or religious sites. The establishment of clear guidance and clearance of fires procedures are critical and dependent on the stipulations outlined in the rules of engagement. Due to the political nature of stability tasks, rules of engagement may restrict the use of lethal fires. Planning and delivery of fires must preclude fires on protected targets, unwanted collateral damage and the political ramifications of perceived excessive force. Where fire support is used in stability tasks, the BCT FSCOORD and fires cell planners should:

- Understand the restrictions on the use of munitions such as improved conventional munitions and scatterable mines.
- Use precision munitions with smaller bursting radii to reduce collateral damage and injury to civilians.
- Maximize the use of FSCMs to minimize collateral damage. The protected target list may be extensive. Plan for NFAs or RFAs. Synchronize both restrictive and permissive FSCMs consistent with the rules of engagement.
- Plan and rehearse a clearance of fires drill. Clearance of fires may include coordination with designated civilian organizations and multinational forces.
- Establish liaison with any multinational artillery organizations to facilitate calls for fire and clearance of fires. Liaison teams may have to train multinational personnel in these procedures.

- Establish communications and close coordination with host country officials, forces and area control centers.
- Continuously update fire support plans in regard to the changing civil-military situation, protection requirements, and viable threats.
- Consider distribution of the fire support plan down to task force, company, platoon, check point, patrol, and sustainment convoy levels.
- Develop an observation plan to identify targets for precision munitions.
- Use illumination for demonstrating deterrent capability, for observing congested areas, for supporting friendly base security, or in support of patrolling maneuver forces to inhibit the threat's night activities.
- Use fires to protect the force. Plan fires for forward operating base defense.
- Plan for the use of weapon locating radars for protection, to document violations of cease-fire agreements, and to fix responsibility for damage and civilian casualties.
- Develop and maintain a 6400-mil (360-degree) firing capability.
- Increase local security for field artillery weapons positions.
- Conduct presence missions as a show or demonstration of force.
- Consider nonstandard field artillery support relationships.

SECTION V - CONSIDERATIONS FOR DEFENSE SUPPORT OF CIVIL AUTHORITIES

2-170. *Defense support of civil authorities* is support provided by U.S. federal military forces, Department of Defense civilians, Department of Defense contract personnel, Department of Defense component assets, and National Guard forces (when the Secretary of Defense, in coordination with the Governors of the affected states, elects and requests to use those forces in Title 32, United States Code, status) in response to requests for assistance from civil authorities for domestic emergencies, law enforcement support, and other domestic activities, or from qualifying entities for special events. Also known as civil support (Department of Defense Directive 3025.18). See also ADRP 3-28.

2-171. For Army forces, four core tasks are associated with the Defense Support of Civil Authorities:

- Provide support for domestic disasters.
- Provide support for domestic civilian law enforcement agencies.
- Provide support for domestic chemical, biological, radiological, or nuclear (CBRN) incidents.
- Provide other designated support (for example, national special security events and critical infrastructure protection).

2-172. BCT fire support organizations, as any Army element, may be directed to employ the resources under their control to conduct Defense Support Of Civil Authorities for the purpose of saving lives, preventing human suffering, or mitigating great property damage.

Note: The text gives examples of support that may be affected by duty status (U.S. Code Titles 10 and 32 and State Active Duty status. Duty status is particularly important when conducting homeland operations as Army National Guard Soldiers in State Active Duty status are usually the first Army responders. Army National Guard Soldiers in State Active Duty status may be able to perform tasks that Title 10 Active Army Soldiers may not. Law enforcement functions are particularly sensitive to duty status. The Army does not employ civil affairs within the homeland as these functions fall to civil authorities.

2-173. The BCT fire support organizational structure and field artillery battalion personnel can contribute in nontraditional ways during Defense Support Of Civil Authorizes operations For example, the cannon field artillery battalion can provide effective mission command, observation posts, convoy operations, local security, sustainment operations, and liaison to assist civil-military affairs. Field artillery battalion personnel can also provide area presence, patrolling, and command post support. They can provide site security and operate aid distribution sites in accordance with the missions given the BCT commander.

2-174. The BCT fire support organization, density of radios, and availability of FIST fire support vehicles enable fire support personnel to work as liaison teams. Fire support personnel can serve in command nodes, augment or work closely with civil affairs teams, and support civilian liaison and information centers.

2-175. While Defense Support Of Civil Authorities operations focus on protection and alleviating human suffering, the prevention of looting and the protection of supplies and infrastructure may also be necessary. Fire support personnel assist the BCT commander in obtaining and developing specific rules of engagement based on higher headquarters guidance and the mission variables of METT-TC, and in disseminating rules of engagement to all fire support personnel. For more on defense support for civil authorities see ADRP 3-09, FM 3-09, ADRP 3-28 and ATP 3-28.1.

Chapter 3

Fire Support for Tactical Enabling and Other Tasks

Tactical enabling and other tasks encompass a wide range of special purpose tasks the brigade combat team (BCT) may routinely undertake during the course of unified land operations. These tasks enable BCT execution of the tactical tasks – offensive, defensive, stability and Defense Support of Civil Authorities discussed in Chapter 2. Section I begins by discussing fire support considerations for the various tactical enabling tasks. Section II follows with a discussion of fire support considerations for urban operations. Section III concludes the chapter with a discussion of fire support considerations for air assault operations, fire support considerations while airborne, and fire support considerations for airborne, special operations forces, amphibious, Marine Corps, and multinational force operations.

SECTION I – FIRE SUPPORT CONSIDERATIONS FOR TACTICAL ENABLING TASKS

3-1. Tactical enabling tasks include reconnaissance, security operations, troop movement, relief in place, passage of lines, encirclement operations, and mobility operations,

FIRE SUPPORT CONSIDERATIONS FOR RECONNAISSANCE

3-2. Reconnaissance provides information concerning the disposition of an enemy force, the enemy's intent, terrain conditions, and indications of chemical, biological, radiological, nuclear (CBRN) contamination. Reconnaissance is the precursor to all operations and may be accomplished through passive surveillance, technical means, human interaction, or by fighting for information. In coordination with the S-3, fire support coordinator (FSCOORD), brigade fire support officer (FSO), and fires cell planners, and other staff, the BCT S-2 plans information collection to help gather combat information.

3-3. The FSCOORD and fires cell planners coordinate the S-3's tasking of sensors during development of the information collection plan with the BCT S-2, military intelligence company commander, and the cavalry squadron to acquire high-payoff targets by using air and ground observers and radars. The commander can use air reconnaissance to augment ground reconnaissance and can employ aerial sensors on unmanned aircraft systems in advance of ground maneuver reconnaissance. This allows aerial observation of named and targeted areas of interest and can cue the attack of targets. The staff refines target data based on the reconnaissance effort and situation changes. Reconnaissance helps locate and identify high-payoff targets that may include enemy fire support systems, thus enabling counterfire.

3-4. Fire support contributes to reconnaissance efforts. Based on the mission variables of METT-TC and in coordination with the S-2, S-3 and other staff, the BCT, FSCOORD, and fires cell planners plan fires in support of reconnaissance efforts. For example, fires cell planners can task weapon locating radar sections to cover key portions of the cavalry squadron's area of operations. Company fire support teams (FIST) and observers can be allocated to support the cavalry squadron. Fire support considerations supporting reconnaissance may include:

- Orient on the location or movement of the reconnaissance objective.
- Report all information quickly and accurately.
- Help the reconnaissance force retain freedom of maneuver.
- Attack selected enemy information collection and target acquisition assets with fires.
- Provide immediate responsive fire support to reconnaissance force(s).

- Provide fires in support of deception.
- Provide fire support assets to the supported reconnaissance force.
- Position field artillery units to support reconnaissance elements.

FIRE SUPPORT CONSIDERATIONS FOR SECURITY OPERATIONS

3-5. Security operations are efforts by a commander to provide early and accurate warning of enemy operations, to provide the protected force with time and maneuver space to react to the threat, and to develop the situation to effectively employ the protected force. There are five tasks in security operations: screen, guard, cover, area security, and local security.

3-6. The screen, guard, and cover security tasks, respectively, contain increasing levels of combat power and provide increasing levels of security for the main body. Usually more combat power in the security force means less for the main body, however field artillery fires can be shifted rapidly from one area to another to provide support to maneuver forces where it is most needed. Area security preserves the commander's freedom to move reserves, position fire support means, provide for mission command, and conduct sustaining operations. Local security provides immediate protection to the friendly force (see FM 3-90-2). As these tasks contain increasing levels of maneuver combat power, the availability of fire support increases as determined by the main body commander. Providing adequate indirect fire support to the security force may require the main body to position its artillery well forward in its formation.

FIRE SUPPORT CONSIDERATIONS FOR SCREEN TASKS

3-7. The fire support and task organization considerations for screening operations are very similar to those of guard operations. Because screening forces often involve relatively fewer forces covering more terrain, responsive fire support is even more critical. Sensor-to-shooter linkages, quick fire channels, and coordination for pre-clearance of fires may be used to facilitate effective fire support. Quick-fire planning procedures may be used more frequently to modify fire support plans as the screening force situation develops. Positioning and security for the field artillery supporting screening forces should be given detailed consideration, as there may be greater risk of enemy penetration of the screening force.

FIRE SUPPORT CONSIDERATIONS FOR GUARD TASKS

- 3-8. Some general fire support considerations for a guard force include:
- A field artillery force attached to a guard force must be as mobile as the supported force; in a fast movement to contact over extended distances, mobile field artillery units are necessary to keep up with the maneuver force.
 - Positioning field artillery units is best done through close coordination between the maneuver and the field artillery headquarters. The brigade FSO and fires cell planners are in the best position at the BCT command post to locate, plan, and coordinate subsequent position areas.
 - Position main body field artillery elements to support guard forces whenever possible. This may require nonstandard field artillery command or support relationships for the main body field artillery.
 - Unmanned aircraft systems and other information collection systems may be used to help develop the situation; other aerial sensor information from higher headquarters may be linked directly or indirectly to security elements.
 - Engage with the BCT SWO to obtain updates of weather effects assessments for all unmanned aircraft assets and attack helicopters based on current and forecast conditions.
 - If available, FIST observers or attack helicopters designate targets for laser-guided munitions.
 - Engage enemy command and control vehicles before the situation develops to allow the supported force to gain and retain the initiative.
 - The advance guard must have enough firepower to destroy smaller-size elements; the limited number of maneuver units over a large area requires very responsive fire support.
 - Fires are required to prevent decisive engagement of security forces or to support decisive engagements when unavoidable.

- Fires are required for suppression, screening (smoke), and illumination to allow freedom of movement.
- Scatterable mine deliveries may be used to delay enemy forces and deny them the unrestricted use of terrain.
- The use of scatterable mines, particularly long-duration mines, must be coordinated with the engineer coordinator and S-3 to ensure that mine use does not impact future operations.

3-9. As guard forces operate at some distance from the main body, field artillery units may need to be attached to the supported force. Air support, to include close air support and air reconnaissance, also must be allocated to security forces, as security forces may become engaged with a far superior force.

FIRE SUPPORT CONSIDERATIONS FOR COVER TASKS

3-10. General fire support considerations for the force executing a cover task include:

- Plan for a hasty attack or hasty defense.
- Plan for a passage of lines by main body forces.
- Plan unmanned aircraft systems and air reconnaissance to help locate the enemy before physical contact.
- Plan fires to suppress and disrupt enemy security elements once contact has been made.
- Prepare simple fire plans. Modification of fire plans must be expected throughout the covering force operation; most fires will be against targets of opportunity.
- FSCMs should be permissive and on-order, but well in front of the covering force.
 - Coordinated fire lines should be established in conjunction with phase lines.
- Plan and coordinate positions for field artillery units by brigade FSOs and fires cell planners with the BCT S-3. Displacements will be frequent and positions must be coordinated well in advance.
- Provide immediately responsive field artillery fires to covering force elements; destruction of the enemy reconnaissance capability is a fundamental of security operations.
- Plan for close air support sorties and attack helicopter assets responsive to the covering force.
- Provide fires to support deception.
- Engage with the BCT SWO to obtain updates of weather effects assessments for all unmanned aircraft, air reconnaissance, close air support and attack helicopter assets based on current and forecast conditions.

3-11. Although the covering force is a self-contained force, it operates as a thin force over a relatively wide front. Fire support allocations to the covering force must make up for the combat power imbalance. For field artillery, this means decentralization of assets. If possible, a mixture of cannon field artillery and multiple launch rocket system (MLRS) assets in the covering force helps to deceive the enemy as to the composition of the force. The mix of systems, which may be achieved through cross-attachment, maximizes the capabilities and mitigates the limitations of each weapon system:

- Cannon field artillery weapons provide rapid response time and a mix of munitions.
- The MLRS has mobility and massive firepower that makes it well suited to augment other field artillery fires.
- The large 'danger close' requirement is a consideration in MLRS dual-purpose improved conventional munitions employment.
- The use of M31A1 guided-MLRS unitary rockets provides considerably more utility for danger close situations enabled by much smaller risk estimate distances (see appendix A and ATP 3-09.32).

3-12. Other fire support allocations to the covering force may include close air support on ground or strip alert, attack helicopters, electronic attack, and information collection and target acquisition assets (such as unmanned aircraft systems). Position field artillery elements within the main body to be responsive to covering force units when possible.

FIRE SUPPORT CONSIDERATIONS FOR AREA AND LOCAL SECURITY

3-13. Fire support considerations for area and local security operations are similar to those for the brigade support area. See Joint Publication (JP) 3-10 for details on threat levels.

Fire Support Considerations for the Brigade Support Area

3-14. Field artillery and attack aviation (when available), with their ability to rapidly provide responsive fires, are key to defeating enemy actions in the brigade support area while preserving the integrity of ground combat forces for decisive and shaping operations.

3-15. The principles of fire support planning and coordination in brigade support areas do not differ significantly from those in the forward areas. There is, however, a difference in the facilities available. Command posts in brigade support areas may have only limited manpower and limited communications facilities.

3-16. The FSCoord and fire cell planners should plan the use of any available assets such as mortars and combat aviation that can be on-call or re-tasked. Attack helicopters and fixed-wing close air support can rapidly respond and, because of the ability of the aircrews of these aircraft to better discriminate between enemy targets and friendly forces, may reduce the likelihood of fratricide.

3-17. With few exceptions, field artillery assets are not to be employed against a Level I threat or against Level II threat forces that can be defeated by base or base cluster units or by the reaction force. However, enemy forces of battalion size or larger that could comprise a Level III threat are of sufficient size and capability to warrant the employment of indirect fire, Army aviation, or air support assets against them.

3-18. The forces already on station are initially responsible for fighting the threat to the brigade support area. The immediate problem for brigade support area operations is how to manipulate the limited resources, including fire support, in order to apply them at the right time and place. Considerations that affect the application of fire support for brigade support area operations include:

- The reduction of fire support for the decisive or shaping operations; field artillery units positioned to provide fires to the brigade support area may not be able to provide fires for the main and supporting efforts.
- Weather effects on the employment of weapon systems and joint fire support assets.
- The suitability of fire support as determined by the overall tactical situation.
- Counterfire coverage of the brigade support area.
- Weather effects on the employment of weapon systems and joint fire support assets.
- The responsiveness of the available weapon systems.
- The precision capability and the collateral damage effects of the weapon systems.
- The existence of communications networks to facilitate fire support activities.
- The availability of observers to identify targets and adjust fires.
- A dedicated source to conduct calls for fire must have eyes on the target. Aerial observers from the combat aviation brigade, capable of directing artillery, attack aviation, and joint fire support assets are often the best observers against brigade support area threats.
- Clearance for fires into the brigade support area must be obtained; the BCT S-3 must rapidly deconflict who owns the ground and coordinate unit positioning, routes and activities.

3-19. Due to the risk of fratricide, the applicable fire support coordination measures (FSCM) for brigade support area operations are typically restrictive measures such as RFAs. When such FSCMs are needed, the FSCoord and BCT fire cell planners, should recommend them for approval by the BCT commander.

3-20. The procedures for establishing FSCMs in the brigade support area must become part of the overall planning process. Forces employed to deal with a Level III force in the brigade support area normally are given an area of operations.

3-21. The establishment of a boundary within the brigade support area and the possible addition of a task force FSO to the responding reaction force require close coordination with the brigade support area command post.

3-22. Fire support coordination and other control measures should be regularly reviewed by higher headquarters, posted on brigade support area (brigade special troops battalion or brigade engineer battalion) command post operations maps, entered into the Advanced Field Artillery Tactical Data System (AFATDS), and then given to any supporting component forces and reaction forces.

3-23. Supporting field artillery and mortars must be positioned to support brigade support area operations. Coordinating the positioning of field artillery and mortars with the brigade special troops battalion or brigade engineer battalion S-3, battalion FSO and fires cell is necessary to avoid fratricide of brigade support area units and to avoid destruction of critical sustainment supplies should nearby field artillery and mortars units receive counterfire. This action also facilitates the ability of the brigade support area (brigade special troops battalion or brigade engineer battalion) command post to coordinate terrain management, movement control, and sustainment.

3-24. The fire support planners are responsible for continuously evaluating the fire support assets available for brigade support area operations. When fire support to the main effort and to shaping operations changes the status of fire support assets available to the brigade support battalion (BSB), the fire support planners must update this list. This enables effective fire support that can be quickly provided to counter a Level III threat or a Level II threat that cannot be defeated by base or base cluster forces or by the designated reaction force.

3-25. For more on brigade support area operations see FM 3-90-1. For more on BCT brigade support area operations see FM 3-96. For more on threat levels see JP 3-10.

High-Value Asset Security

3-26. The increased number and relative importance of field artillery, aviation, communications, information collection, and target acquisition systems for BCT operations has led to increased emphasis on their security. The BCT can potentially have up to one-third of its ground combat power allocated to security missions. Examples of high value fire support-related assets that may require additional security include:

- Field artillery weapons systems and munitions.
- Weapon locating radars.
- BCT unmanned aircraft system sites.
- Division and corps unmanned aircraft systems.
- Patriot batteries.
- Air defense radars.
- Forward arming and refueling points.
- Enhanced position location reporting system nodes.
- Joint network node locations.
- Retransmission sites.

3-27. The BCT S-3, with input from the staff, develops an overlay that depicts all high-value assets in the BCT area of operations and ensures that overlay is distributed to subordinate commanders. The BCT S-3 assigns tasks for protection of high-value assets to subordinate commanders as an area security mission. The FSCoord and fires cell planners recommend FSCMs and fire support asset positioning to support the protection of the high-value assets using considerations similar to those for brigade support area operations. See FM 3-96.

FIRE SUPPORT CONSIDERATIONS FOR TROOP MOVEMENT

3-28. Troop movements include administrative movements, tactical road marches, approach marches, occupation of assembly areas and combat formations. See Army Doctrine Reference Publication (ADRP) 3-90 and FM 3-90-2 for additional information.

FIRE SUPPORT CONSIDERATIONS FOR ADMINISTRATIVE MOVEMENT

3-29. An administrative movement is most appropriate in conventional, contiguous areas of operation where enemy resistance has been defeated or destroyed. It is not appropriate for non-contiguous areas of operation or where forces may be subject to ambush or attack. There are generally no fire support considerations during administrative movements. However, the required fire support posture in the arrival area will likely dictate the composition of the elements in the movement. ATP 4-16 describes movement control and convoy planning.

FIRE SUPPORT CONSIDERATIONS FOR TACTICAL ROAD MARCH

3-30. The *tactical road march* is a rapid movement used to relocate units within an area of operations to prepare for combat operations (ADRP 3-90). During a road march, units move on designated routes using roads and trails. Units normally move by tactical road marches to assembly areas to prepare for combat operations. See ATP 4-01.45 for planning tactical road marches.

3-31. Fire support planning and allocation of forces will primarily address potential threat. The FSCoord and fire cell planners plan and coordinate fire support for the conduct of the march. They also coordinate with the appropriate command post of units areas through which the BCT will move, recommend FSCMs and help clear fires during the movement. Fire support considerations include:

- If task organized into combined arms formations, consider moving supporting artillery prior to the main body so they are set to provide fire support if needed.
- Plan on-call targets on key terrain along the routes.
- Place all weapon locating radars during the move to facilitate positioning, centralized control, and to provide coverage of the BCT's route.
- Plan radar critical friendly zones at rest, refuel, and maintenance halts.

3-32. Units conducting tactical road marches may or may not be task-organized into a combined arms formation. Depending on the nature of the follow-on mission, and the mission variables of METT-TC, the field artillery organization will often be relatively centralized.

FIRE SUPPORT CONSIDERATIONS FOR THE APPROACH MARCH

3-33. Fire support for an approach march involves coordinating the movement of fire support assets as part of a combined arms force over a relatively long distance with the intent to reposition the force. The movement involves planning that readily supports the transition to the type of operation to be executed from the approach march. Fire support considerations for the approach march include:

- Ensure that fire support assets travel with their supported maneuver units.
- Give priority of fires to security and reconnaissance units.
- Position artillery to provide support to advance and flank guard units. This may require non-standard or on-order command or support relationships for field artillery units during the movement.
- Plan fires to protect the force where movement is restricted and possible choke points exist.
- Plan fires for suppression and smoke, if necessary, to screen movement.

3-34. Units conducting an approach march are task-organized before the march begins to allow them to transition to an on-order mission without making major adjustments in organization. The BCT's field artillery battalion and reinforcing artillery units march within their supported unit's column.

FIRE SUPPORT CONSIDERATIONS FOR OCCUPATION OF AN ASSEMBLY AREA

3-35. Fire support considerations for the quartering party are similar to those for forces conducting a reconnaissance. Although the quartering party is small enough to move quickly while still maintaining a significant self-defense capability, fire support may be limited to the fires from both indirect fire units in range and responding combat aviation units. The quartering party must be aware of how to contact any fire support units and, as a minimum, conduct radio checks with those units. In the assembly area position, final protective fire (FPF), as available, should be planned. Field artillery positions within the assembly area

should allow early movement from that area to primary positions to support the future operation. Determine the likely azimuth of fire for the FPFs and the initial positions to be occupied.

FIRE SUPPORT CONSIDERATIONS FOR COMBAT FORMATIONS

3-36. The BCT uses six basic formations—column, line, echelon, box, wedge, and vee. The BCT commander and staff must determine when, where, and how the BCT transitions into different movement formations based on the terrain and anticipated situation. The BCT commander ensures that subordinate and supporting units maintain the flexibility to adapt to new formations based on changes in the terrain and enemy situation. See also FM 3-90-1 and FM 3-90-2.

3-37. The BCT commander and staff consider the movement of fire support assets along with maneuver forces to ensure that responsive fires are available at all times. Personnel conducting the planning include the BCT S-3, S-2, field artillery battalion commander (FSCoord) and fires cell planners, together with subordinate and supporting unit commanders, FSOs, and fires cells. All must integrate fire support into all tactical movement planning to synchronize the movement and positioning of fire support assets, ensure effective fires, and to avoid unnecessary road congestion. The BCT's field artillery battalion S-3, acting for the field artillery battalion commander and in close collaboration with the brigade FSO and fires cell planners at the BCT main command post, is normally the lead in coordinating the movement of BCT fire support assets and firing units.

FIRE SUPPORT CONSIDERATIONS FOR A RELIEF IN PLACE

3-38. The BCT FSCoord and fire cell planners recommend FSCMs and identify the artillery and other fire support units that are available to support the relief. The fire support assets of both the relieved and relieving units support the relief action.

3-39. Until the transfer of command, all artillery remains under the relieved commander's control. Units plan their fires to deceive the enemy and expedite the relief. Normal patterns of activity should be maintained (for example the average number of rounds fired per day or hour per day prior to the relief should be fired during the relief). Fire support units should not be relieved at the same time as the maneuver units they support.

3-40. Relieving artillery units do not normally occupy the firing positions of the relieved artillery unit unless the terrain limits the number of firing positions available. Artillery is normally relieved last. The relief plan must specify the method used in relieving artillery units. If possible, the relieved unit's artillery and other fire support assets remain in place until all other relieved elements displace and are available to reinforce the fires of the relieving unit. The relieving unit's artillery is normally the first unit into the area of operations and the relieved unit's artillery is the last force out of the area of operations. If the purpose is to continue the attack, then the artillery of both forces generally remains in place to support the subsequent mission.

3-41. The relief plan must specify the technique used in relieving artillery units. Coordinate for target handover and clearance of fires. Relieving firing units should establish firing positions near the positions of the relieved unit and integrate their fires with that of the relieved unit. Occupation of firing positions at night or during periods of reduced visibility enhances operational security.

FIRE SUPPORT CONSIDERATIONS FOR PASSAGE OF LINES

3-42. Once the passage of lines is ordered, the FSCoord and brigade FSO of the passing force in a forward passage of lines should send a liaison section to the fires cell of the force in contact. In a rearward passage, the FSCoord and brigade FSO of the stationary force should send a liaison section to the fires cell of the passing force.

GENERAL FIRE SUPPORT CONSIDERATIONS FOR PASSAGE OF LINES

3-43. The commander, FSCoord, brigade FSO, fire cell planners, and liaison officers of the units involved in the passage of lines define and assign mutually agreed upon fire support responsibilities to

facilitate the passing force. The important point to remember is that each unit will be in the area of operations of another unit for a period of time and that detailed coordination is vital to ensure that each of the two units understands how the other operates. Because of the greater range of field artillery systems, the transfer of control between the two units' fires cells may occur prior to the maneuver transfer of control. This sets the conditions for the passing maneuver elements to execute the passage of lines with fire support systems in place. The units must do at least the following:

- Exchange unit standard operating procedures and resolve differences in operating procedures.
- Exchange existing targets and fire plans.
- Provide status of unit information collection (see the discussion in chapter 4 and FM 3-55) and target acquisition assets.
- Exchange attack guidance and casualty criteria.
- Exchange control measures in effect; for example, passage points, passage lanes, contact points, and no-fire areas (NFA).
- Coordinate recognition signals.
- Provide information on obstacles and barriers.
- Coordinate position areas.
- Provide meteorological information to the passing force, if necessary. Engage with the BCT SWO to provide weather effects information to the passing force as required.
- Provide available survey control to the passing force.
- Exchange signal-operating instructions and resolve communications differences; for example, frequencies, call signs, challenge and password, and secure settings.
- Coordinate security measures in effect.
- Exchange intelligence.
- Coordinate automated database and electronic addressing information.
- Coordinate clearance of fires.

FIRE SUPPORT CONSIDERATIONS FOR FORWARD PASSAGE OF LINES

3-44. Fire support considerations for a forward passage of lines include:

- Obscure the enemy's forward observation of the passage.
- Plan fire on high-payoff targets; for example, enemy direct fire systems, command and control, enemy fire support assets, and enemy air defense targets.
- Plan fires to support the deception plan.
- Plan obscuration fires to screen friendly movement through passage points.
- Plan fires to interdict enemy counterattacks and reinforcements in the area of passage.
- Mass indirect fires.
- Ensure the stationary force supports the main effort while the passing force indirect fire assets complete the passage.
- Ensure counterfire is planned and controlled by the stationary force.
- Plan radar critical friendly zones at passage points.
- Plan appropriate FSCMs such as:
 - On-order coordinated fire lines.
 - Consider the use of RFAs, RFLs, and NFAs.
- Ensure the passing force plans fires to support operations after the passage of lines.
- Plan the allocation of covering air and missile defense forces to defeat enemy air threats.

3-45. The field artillery of the passing force should be infiltrated early from the assembly area to the designated primary positions to support the operation. These positions should be near the passage lanes but not so close that they interfere with the maneuver force movement. On a forward passage, position priority goes to the passing force. During the passage of lines, the passing force fires cell and command post collocate with the stationary force fires cell and command post. Position areas forward of the passage

points are selected on the basis of anticipated rate of movement of the maneuver forces and terrain availability. Also, select position areas away from passage points.

FIRE SUPPORT CONSIDERATIONS FOR REARWARD PASSAGE OF LINES

3-46. Fire support considerations for a rearward passage of lines include:

- Plan obscuration to conceal movement through passage points.
- Plan massed fires to disengage forces.
- Plan fires to support obstacle and barrier plans.
- Plan fires to support the deception plan.
- Plan FSCMs to include:
 - Restrictive fire lines at passage points.
 - On-call coordinated fire lines.
- Ensure the stationary force supports the decisive operation while the passing force indirect fire assets complete the passage.
- Ensure counterfire is planned and controlled by the stationary force.
- Plan radar critical friendly zones at passage points.
- Plan fires on passage points to be fired after friendly units have passed through; consider scatterable mines to close passage lanes.
- Ensure the stationary force plans fires to support operations after the passage of lines.
- Plan the allocation of covering air and missile defense forces to defeat enemy air threats.

3-47. The field artillery of the stationary force should be positioned well forward to provide fires to support the withdrawal of the passing force. Again, these positions should be away from passage lanes. In the rearward passage, the stationary force has positioning priority. As the passing force artillery moves through, it should position behind the stationary artillery and move laterally away from the passage lanes.

ARTILLERY RAID

3-48. An artillery raid is a type of attack that uses field artillery as its primary attack mechanism. An artillery raid is frequently conducted by platoon or battery sized field artillery units. Artillery raid missions are conducted to achieve tactical or operational objectives and involve the rapid movement of artillery assets by air or ground into a position to attack a high-payoff target with artillery fires. Artillery raids entail sending firing elements forward—often beyond the security area—to engage enemy targets beyond the maximum range of positioned field artillery weapons. Normally the raid is extremely short and should not involve sustained operations. Detailed planning, surprise, and speed in execution are the key factors in the successful conduct of an artillery raid. Because the target is likely to be perishable, the raid is planned and executed in a compressed timeline. For more information on raids in which specific types of field artillery units participate, see the Army techniques publication (ATP) specific to that type of unit.

FIRE SUPPORT CONSIDERATIONS FOR ENCIRCLEMENT OPERATIONS

3-49. When providing fire support to an encircling force, use the general considerations for supporting offensive tasks. If the encirclement is to be reduced by fire support alone, a high degree of centralized control is necessary to permit timely massing of fires. Where a combination of fire support and maneuver is employed, a more decentralized control is viable.

3-50. When providing fire support for a friendly encircled force, use the general considerations for supporting defensive tasks. The fire support systems of an encircled force should be positioned to provide support at vulnerable points along the perimeter and to mass fires.

FIRE SUPPORT CONSIDERATIONS FOR ENCIRCLEMENT OF AN ENEMY FORCE

3-51. Fire support considerations for a reduction of encircled forces include:

- Plan for linkup operations as the friendly forces close with each other to complete the encirclement of the enemy.
- Coordinate with all available fire support units and staff for additional fire support. Know the various systems capabilities and limitations, for example, the large probable error in range of naval gun fire due to its flat trajectory.
- Establish appropriate FSCMs:
 - Restrictive fire line(s) between converging forces should be considered.
 - An airspace coordination area (ACA) in the vicinity of a penetration may be necessary if close air support is used.
- Concentrate massed fires at the penetration point to open a gap for the attacking force and to help maneuver forces divide the encirclement into smaller pockets.
- Provide fires to disrupt enemy attempts to break out.
- Consider using scatterable mines to delay enemy relieving forces; short duration scatterable mines may be used to help hold the shoulders of the penetration dividing the enemy.
- Consider selective reduction by focusing fires to destroy a specific enemy capability. For example, destroying enemy air defenses allows close air support and attack helicopters to more easily strike enemy units.

Fire Support Considerations For Linkup Operations

3-52. The BCT may conduct linkup operations on its own or as part of a larger force to complete the encirclement of an enemy force, assist breakout of an encircled friendly force, or join an attacking force operating in the enemy's rear. The initial conduct of the linkup is normally executed as a movement to contact or an attack, depending on the enemy situation and the mission. Each force monitors the progress of the other and makes adjustments to their plans as necessary. Control measures to include FSCMs are adjusted as required to reduce the risk of fratricide. FSCMs are changed and emplaced based on the progress of the operation and the enemy situation. Once the linkup has occurred, the BCT executes other future operations as planned or directed by the higher headquarters.

3-53. Forces linking up exchange as much information as is practical before an operation. Fire support planners must consider:

- Fire support needed before, during, and after the linkup.
- Recognition signals and communications needs from both forces.
- Future operations following the linkup.

3-54. Other fire support considerations in a linkup operation may include:

- In the case of a moving force linking up with a stationary force, the brigade FSO of the moving force should, if possible, send a liaison section to the fires cell of the stationary force.
- Consider appropriate FSCMs:
 - Restrictive fire lines between converging friendly forces, as required.
 - On-order coordinated fire lines or RFAs.
 - Free fire areas around bypassed or encircled enemy forces.
- Ensure fire support personnel are continuously aware of the progress of the linkup forces.
- Ensure the controlling headquarters clears targets beyond the RFL.
- Ensure fires for smoke and illumination do not cause adverse effects on the other friendly forces.
- Consider the use of fires to keep the enemy force between the two friendly forces from escaping.
- Consider the use of scatterable mines to block enemy withdrawal.
- Position indirect-fire weapons to allow them to mass fires at linkup points.
- Ensure positions afford easy access to routes to be used after the linkup.

FIRE SUPPORT CONSIDERATIONS FOR FIGHTING ENCIRCLED

3-55. The brigade FSO assists the field artillery battalion commander (FSCOORD) to control fire support for the BCT commander. At lower levels, commanders may place mortars from various units under centralized control, especially if there are insufficient artillery assets. The centralization of mortar control may require collocating firing units.

Fire Support Considerations For Breakout from Encirclement

3-56. Considerations for fire support during a breakout from an encirclement include:

- Plan fires to support the immediate defense and the breakout.
- Coordinate with fire support units and staff outside the encircled force for additional fire support.
- Use appropriate FSCMs. Consider:
 - RFAs around encircled forces without AOs where only calls for fire by that encircled force are permitted.
 - Restrictive fire lines between converging breakout and linkup forces.
 - ACAs in the vicinity of a breakout point may be necessary if close air support is used.
- Concentrate continuous massed fires at the breakout point to open a gap for the rupture force.
- Ensure that radar sectors of search and indirect fires cover 6,400 mils (360 degrees).
- Use electronic attack to deceive the enemy as to the location of the breakout.
- Plan for linkup operations.
- Reorganize available fire support.
- Provide fires to support defense in other areas to delay or disrupt enemy attempts to attack.
- Consider the use scatterable mines in areas other than the breakout point or to help hold the shoulders of the breakout gap.
- Support the deception plan.
- Consider designating critical friendly zones and no-fire areas for the breakout force.

3-57. Fire support for a breakout must have centralized control to ensure that the maximum amount of combat power is brought to bear at the breakout point. Initially, the priority for fire support is with the force to conduct the rupture and should focus on suppressing and obscuring the point of penetration. Fire support assets move as part of the main body and rear guard so security forces have adequate fire support. Target identification difficulties resulting from close proximity and intermixing of forces, as well as the rapidly changing ground situation during the execution of a breakout, make close air support difficult. See FM 3-90-2.

FIRE SUPPORT CONSIDERATIONS FOR MOBILITY OPERATIONS

3-58. Commanders conduct mobility operations to mitigate the effects of natural and manmade obstacles to enable freedom of movement and maneuver. Mobility operations include breaching operations, clearing (area and routes), gap-crossing, the construction of combat roads and trails, forward airfields and landing zones the traffic operations.

FIRE SUPPORT CONSIDERATIONS FOR BREACHING OPERATIONS

3-59. The BCT plan must synchronize combat multipliers to isolate the point of penetration. As a general rule, obstacles are covered by fire; a primary role for the field artillery is to suppress the weapons systems that can engage the rupture force. The BCT staff integrates maneuver, close air support, artillery, mortars, Army aviation, electronic attack, the employment of scatterable mines, air defense, obscuration, and deception to create the conditions for the success of the BCT breaching operation. Additionally, the BCT must continue to fight well beyond the breach area to stop the enemy from counterattacking or repositioning to reinforce the enemy unit targeted for penetration. Detecting and engaging the enemy's reserve is a primary concern for the BCT. The fire support planners must carefully balance resource requirements (such as Army indirect fires and close air support) for isolating the point of penetration with

the requirements of the element conducting the breach. The breaching fundamentals are suppress, obscure, secure, reduce, and assault. They can be remembered with the memory aid SOSRA:

- Suppress:
 - Suppress enemy's direct fire systems near the breach site.
 - Suppression must also be effective against the enemy's indirect fires.
 - The FSO should designate the breach site as a critical friendly zone (CFZ) for radar.
 - Suppress the enemy to allow the follow-and-support force to get into the support by fire position.
- Obscure:
 - Reduce effectiveness of direct fire weapons against the breach and assault elements.
 - Screen the follow-and-support force movement to the support by fire position, if necessary.
 - Smoke should be used with fog or darkness to maximized effectiveness.
 - The commander must decide on the priority for smoke vs. HE or DPICM.
 - Smoke may attract enemy attention or degrade friendly target acquisition or control.
- Secure
 - Mortars and field artillery continue suppression and obscuration as necessary while maneuver forces secure the breach site.
 - Support stay-behind forces.
- Reduce
 - As maneuver forces with engineer support reduce the obstacle and creates lanes the field artillery and mortars should continue suppression fires and be prepared to lift or shift fires.
 - Close air support and attack helicopters should disrupt enemy counterattack forces.
 - Upon reduction of the obstacle and after a foothold is established on the far side of the obstacle, obscuring smoke should be lifted.
- Assault
 - As the maneuver force assaults through breach to destroy enemy field artillery and mortars should continue suppression fires and be prepared to lift or shift fires as maneuver force approach the enemy battle positions.

3-60. Key fire support tasks in support of a breaching operation include:

- Mortars – provide suppression and obscuration or screening fires.
- Field artillery–isolate the breach area and suppress the enemy; provide obscuration/screening fires, and in coordination with the S-3, establish/manage radar critical friendly zones (described in FM 3-09 and ATP 3-09.12).
- Close air support – isolate and suppress the enemy; disrupt the enemy counterattack.
- Attack helicopters – isolate and suppress the enemy; disrupt the enemy counterattack.
- Intelligence – locate and identify high-payoff targets among enemy units in the vicinity of the breach area.
- Electronic attack – identify, locate, and jam the enemy communications associated with units in the vicinity of the breach area.
- Obscuration (projected and generated) – isolate the breach area.
- Scatterable mines – prevent repositioning of enemy forces without hindering friendly actions on the objective; disrupt the enemy counterattack.

3-61. Fires cell planners work closely with the S-2 during intelligence preparation of the battlefield (see ATP 2-01.3 and ATP 2-19.4) and information collection. Scouts and other observers can often provide accurate targeting. The FSCoord and fires cell planners may designate the reduction area (or points of breach) and support-by-fire positions providing cover as radar critical friendly zones so that they are treated as priority targets for counterfire support. The key is getting targeting information into the fire support system and executing fires at the critical time. Scouts and other observers can also be effective in setting and controlling fires for obscuration within the breach area by adjusting fires and correcting for the actual conditions of wind speed and direction.

3-62. In accordance with the scheme of fires, tasks to be executed by fire support (to include mortars) in support of the breach may include:

- Provide fires for obscuration and suppression.
- Destroy or suppress artillery and mortars.
- Destroy or suppress antitank weapon systems.
- Destroy or suppress dismounted infantry positions.
- Delay, disrupt, and neutralize repositioning forces.
- Destroy, suppress, or obscure enemy observation posts.

3-63. The BCT commander designates and assigns priority targets to make indirect fires more responsive to maneuver unit execution. FISTs and observers employed at company level can effectively engage such targets during a maneuver force breaching operation.

3-64. The FSCOORD, brigade FSO, fire cell planners and battalion or battery fire direction center personnel monitor the command network and lift and shift fires at the critical time, should the executor at company level be unable to execute.

3-65. Indirect fire weapons systems cross the obstacle with the forces they support to extend the breach and ensure continuous support of follow-on operations. Positioning is critical at the breach area. Fire support assets should be positioned to support the breaching operation, but not interfere with the approach, the breach, or assault forces.

3-66. Breaching operations consume a significant amount of ammunition. Planning considers pre-positioning stocks of smoke, high explosive (HE), and precision munitions.

3-67. In coordination with the BCT S-3, the FSCOORD and fires cell planners consider the requirements for protection at the breach area. They also plan for radar zones and consider the enemy phases of fire for defensive operations. The FSCOORD and fires cell planners consider radar critical friendly zones and FSCMs (described in FM 3-09 and ATP 3-09.12) between the enemy and the breach area, and the support and breach force positions. They also consider establishing NFAs or RFAs around scouts or other observers, and RFLs for forces converging on the objective.

3-68. The BCT commander may give the priority of indirect fires to the unit most likely to encounter an obstacle. The fire support planners maintain a focus on the critical tasks and continuously adjust the plan as required in order to accomplish the mission. Fire support planning guidelines for breaching operations include:

- Use intelligence preparation of the battlefield techniques (see ATP 2-01.3 and ATP 2-19.4) to designate enemy high-value targets and identify high-payoff targets for attack.
- Plan electronic warfare assets to defeat the improvised explosive device threat, disrupt enemy information collection (see the discussion in chapter 4 and FM 3-55), reconnaissance and surveillance efforts, and detect enemy use of the electromagnetic spectrum for targeting purposes.
- Use scouts or other observers to identify and monitor target around the breach area prior to arrival of main body.
- Refine targets based on intelligence and the knowledge of the actual breach area.
- Plan target handoff with observers or scouts.
- Position primary and alternate observers focused on identification of high-payoff targets.
- Plan priority of fires to the rupture force and then to the follow-and-assume force.
- Plan and firing smoke to cover movement of the follow-and-assume force into the support-by-fire position. Fires for obscuration or screening should start before the follow-and-assume force enters the direct fire range of enemy systems.
- Determine the placement (wind condition), density, and timing of obscuration smoke on enemy positions and screening smoke between the enemy and the reduction area.
- Plan triggers to lift or shift fires from obscuration to suppression when necessary.

- Plan FSCMs such as RFAs and RFLs and radar critical friendly zones (described in FM 3-09 and ATP 3-09.12) at the breach area, support-by-fire position(s), and the objective, once it has been secured by the rupture force.
- If necessary, position the brigade FSO or the assistant FSO as an alternate observer.
- Recommend that the BCT focus mortars on antitank weapon systems and dismounted infantry, and suggest additional smoke, if required.
- Use signals to communicate when the conditions have been met to commit the breach force.

3-69. Once the follow-and-assume force is deployed, it must rapidly develop and disseminate a fire plan designating sectors of fire and observation to ensure all possible enemy positions are covered. Observation is particularly critical. Field artillery observers with the follow-and-support force initially bring indirect fires on enemy positions to fix them in place. The observers should also cue the BCT's field artillery battalion and its reinforcing artillery to prepare immediate counterfire. The follow-and-assume force then adjusts the mortar or field artillery-delivered obscuration. The follow-and-assume force is responsible for controlling fires for suppression and obscuration and for setting the conditions for the breach (described in FM 3-90-2).

3-70. The BCT commander may split allocation of indirect fire support suppression capabilities between two lead elements by giving priority of field artillery support to one company and priority of mortars to another. Effective suppression must be applied against the enemy's fires, since the rupture force will be exposed for a lengthy period. Air support and electronic attack is planned for and employed, if available.

3-71. Field artillery and mortars provide smoke for obscuration. BCT field artillery and subordinate unit mortar platoons or sections should be positioned to fire the mission. Obscuration fires can be fired simultaneously with suppressive fires so that the smoke builds before the friendly forces move forward. Smoke is targeted and adjusted to obscure or screen the breach from direct fire. It is difficult to use smoke to obscure enemy fires on the obstacle during the breach because of the close proximity to friendly troops. Using a combination of HE and smoke as the last rounds completed during a preparation on the assault objective establishes a haze over the barrier, offering some obscuration to conceal the breach area. If wind conditions are favorable, the follow-and-assume force may establish a smoke line using smoke pots. See the discussion on smoke employment in Appendix A for details.

3-72. Fire control measures are essential, as both the follow-and-assume and the rupture forces are firing on the enemy when the operation begins. Suppression of overwatching enemy positions continues, and other enemy forces remain fixed by fires until the breach has been achieved and the enemy is destroyed or dislodged. The rupture force should assume control for direct fire on the assault objective as follow-and-assume force fires are lifted or shifted. See also ADRP 3-90, FM 3-90-1, FM 3-90-2, FM 3-96, ATP 3-34.22, and Army tactics, techniques, and procedures (ATTP) 3-90.4.

CLEARING (AREA AND ROUTES)

3-73. Clearing eliminates or neutralizes an obstacle. Follow-on engineers usually perform this operation. It is not done under fire. If the encountered obstacles are covered by fire, combined arms breaching operations may be necessary. See the fire support considerations for previously described breaching operations.

GAP-CROSSING

3-74. A *gap-crossing operation* is a mobility operation consisting of river crossing, brigade-level crossing, and special gap crossing operations conducted to project combat power across a linear obstacle (wet or dry gap) (ATTP 3-90.4).

3-75. A gap-crossing is centrally planned and controlled as an offensive operation that requires the allocation of external crossing means and a force dedicated to establishing and securing the bridgehead. A gap-crossing requires specific procedures, detailed planning and different technical support than other tactical operations. It requires special equipment or materiel that is limited or nonexistent as organic assets in the BCT. The BCT must anticipate and plan for gap crossings. ATTP 3-90.4 provides details.

3-76. Fire support considerations for a gap-crossing include:

- Designate obstacle clearance sites as critical friendly zones and NFAs.
- Plan suppressive fires on enemy elements capable of placing direct or indirect fires (for example high-value targets) on the planned crossing point(s).
- Plan electronic warfare assets to defeat the improvised explosive device threat, disrupt enemy information collection (see the discussion in chapter 4 and FM 3-55), reconnaissance and surveillance efforts, and detect enemy use of the electromagnetic spectrum for targeting purposes.
- Make fires immediately available to crossing forces within the gap. If necessary, have reinforcing artillery fire while organic artillery is crossing.
- Assign priority of fires to assault forces.
- Assign nonstandard command or support relationships to supporting units; change the priority of calls for fire, fire planning, and other inherent responsibilities as necessary.
- Plan fires for smoke and suppression in greater than normal amounts if necessary.
- Use smoke to screen both actual and deception crossing sites.
- Use smoke to obscure enemy direct fire positions in the gap crossing area until the crossing forces can engage them.
- Suppress enemy forces in the gap crossing area until the assault force can provide these fires.
- Use all available targeting assets to develop targets in the gap-crossing area.
- Have indirect fire weapons cross the gap with the forces they support.
- Plan to take advantage of the visibility conditions that will prevail during the gap crossing or that can be produced to help support the gap-crossing.
- Consider that the width of the gap-crossing area affects the planning. The amount of time necessary to cross a gap, hence the vulnerability of the crossing force, affects the types and volume of fires requested.
- Plan fires to suppress enemy defense and gap crossing sites and to seal off exit bank positions.
- Plan fires to facilitate the assault force securing the exit from the gap-crossing site.
- Plan the use of preparations, groups, and series of fires (see ATP 3-09.30) to support the operation as the assault force is securing the gap-crossing site.
- Plan and use on-order FSCMs (described in FM 3-09).
- Plan fires at depth to isolate the gap-crossing site from enemy reinforcement.
- Use close air support and attack helicopters to assist with expanding the gap-crossing site.
- Engage with the BCT SWO to provide weather effects assessments for close air support and attack helicopter assets.
- Plan suppression of enemy air defenses.

OTHER MOBILITY OPERATIONS

3-77. The degree of fire support required for other mobility operations such as the construction of combat roads and trails, forward airfields and landing zones, and traffic operations is dependent upon mission variables. Fire support planning and asset requirements are similar to those for security operations.

SECTION II – FIRE SUPPORT CONSIDERATIONS FOR URBAN OPERATIONS

3-78. Urban operations are typically planned and conducted on or against objectives on terrain where man-made construction or the density of population are the dominant features. The fire support planners recommend fire support tasks to support the BCT's scheme of maneuver. Often, the role of fire support in an urban environment is to enable BCT subordinate and supporting units to get into or around the urban area with minimal casualties. This enables the respective unit commander to have maximum combat power with which to close with the enemy and finish the fight. Appropriate FSCMs (described in FM 3-09) are essential because fighting in urban areas results in opposing forces engaged in close combat. *Close combat*

is warfare carried out on land in a direct-fire fight, supported by direct and indirect fires, and other assets (ADRP 3-0).

PLANNING

3-79. Planning considerations for fires in support of urban operations include:

- Exchange fire support and observer plans with adjacent units.
- Conduct target mensuration for precision munitions.
- Coordinate for collateral damage estimates as necessary.
- Develop an observer plan to include observation posts in buildings, location of laser designators, and overwatch of trigger points and gun-target lines.
- Plan electronic warfare assets to defeat the improvised explosive device threat, disrupt enemy information collection (see the discussion in chapter 4 and FM 3-55), reconnaissance and surveillance efforts, and detect enemy use of the electromagnetic spectrum for targeting purposes.
- Identify location of hazardous sites; both above and below ground such as fuel and industrial storage tanks, gas distribution lines, and any other area where incendiary effects of detonating artillery and mortar rounds will start fires.
- Identify the general construction or composition of the buildings and road surfaces (may impact the type of munitions used).
- Where does building masking, overhead power lines, or towers degrade global positioning system and compass functioning?
- Will the use of obscurants and illumination favor friendly units or the threat?
- Will buildings or structures require fire support personnel to carry or use equipment not normally carried such as field expedient antennas, climbing rope, wire gloves, axes or sledgehammers?
- Plan for radar coverage.

3-80. The FSCOORD and fires cell planners often find their major challenges to be in providing fire support to numerous smaller engagements that, while separate, are part of coordinated, larger unit operations. Prioritizing fire support, sustaining fire support, and positioning and repositioning fire support assets take on greater significance in urban operations. The FSCOORD, fires cell planners and other staff should thoroughly examine priority of fires considerations when war gaming various courses of action.

3-81. *Target development* is the systematic examination of potential target systems—and their components, individual targets, and even elements of targets—to determine the necessary type and duration of the action that must be exerted on each target to create an effect that is consistent with the commander's specific objectives (JP 3-60).

3-82. Targeting translates the BCT commander's targeting guidance and desired effects to define high-value targets, and from these, further refine selection to identify high-payoff targets. There are heightened concerns for collateral damage in urban areas. When developing target lists the fires cell planners and targeting officers must remember that destructive weapons are not the only means for engagement of targets. Electronic attack and appropriate aspects of information operations and cyber electromagnetic activities can be used as well. Consequently they must ensure all means of combat power are integrated into the operation and appropriate techniques for their employment are in place and rehearsed. For more on targeting see chapter 6 of this ATP, ATP 3-60, FM 3-09, and JP 3-60.

CHARACTERISTICS OF URBAN TARGETS

3-83. The enemy has many covered and concealed positions and movement lanes and may be on rooftops, in buildings, and in sewer and subway systems. Aerial observers are extremely valuable for targeting because they can see farther to detect movements, positions on rooftops, and fortifications. Engagements on rooftops are planned for to clear away enemy forward observers, snipers, communications and radar equipment. Engagement areas are planned on major roads, at road intersections, and on known or likely

enemy positions. Also, restrictive FSCMs, such as RFAs and NFAs (see FM 3-09), are needed to protect civilians and identified restricted areas.

3-84. Identifying and anticipating kill zones or engagement areas is critical to ensuring that indirect fire assets are in position to provide supporting fires. Practically, the ability and the utility of massed fires is affected in an urban environment. The natural restrictions in place due to the obstructive nature of urban terrain and the small-unit operations prevalent in urban combat require an innovative and limited approach to the delivery of fires. However, major road networks that offer high-speed avenues of approach into and through an area are suitable for targeting to restrict the flow of enemy forces and supplies into the combat area.

3-85. Intelligence preparation of the battlefield (see ATP 2-01.3 and ATP 2-19.4) leads to the identification of time-sensitive high-payoff targets and is an important consideration for the BCT FSCOORD and fires cell planners. The BCT commander or higher headquarters normally provides specific targeting guidance and prioritization for time-sensitive targets (see ATP 3-60.1) within the BCT's area of operations.

FRATRICIDE PREVENTION MEASURES

3-86. Fratricide prevention is a matter of concern in all operations. The risk of fratricide is much greater when visual identification and precise navigation are inhibited, by either distance or reduced visibility. In urban operations, the very nature of the physical terrain creates a situation of reduced visibility, resulting in unique and significant challenges to combat identification and fratricide prevention. The challenge is the need to minimize fratricide without unreasonably restricting the BCT's ability to accomplish its mission.

3-87. There are two basic causes of urban fratricide—procedural and technical. Procedural causes are typically failures of fire support coordination. Technical failures may include failures of controlling equipment or mechanical malfunctions.

WEAPONS EFFECTS

3-88. Because the conduct and coordination of indirect fires in urban areas is difficult, fires in support of the maneuvering elements is closely coordinated and planned in detail. Planning and coordination includes considerations of force protection, weapons effects, psychological effects on the populace, and the potential for collateral damage (see chapter 2). For air-delivered munitions, terminal control (see chapter 4) and positive guidance are required to ensure the delivering platform has acquired the correct target. Effective airspace coordinating measures (ACM) (see FM 3-52) can ensure other missions (for example, strike coordination and reconnaissance missions) can transit or operate in the airspace above and around the urban area.

3-89. The effects of lethal munitions can be significantly different in urban environments. The characteristics of the urban terrain and the small unit house-to-house nature of urban combat affect both the results and employment of weapons. Specific weapons effects considerations for urban operations include the risk estimate distance and quantity of the munitions, the construction of the building(s), and the ability to engage the target.

3-90. Calculated risk estimate distances are often not valid in urban operations. Buildings provide cover that can reduce blast and shell fragment effects risk distances to a few meters. Inaccurate or stray fires may occur due to projectiles deflecting off buildings, wires, or other objects. Bomblets, scatterable mines, illumination, and other ordnance payloads may also be diverted by objects or may have irregular patterns due to swirling upper- or lower-level winds around large or tall structures.

TARGET ACQUISITION AND OBSERVATION CONSIDERATIONS

3-91. Urban military operations are involved with physical terrain, noncombatants, and infrastructure. Urban combat almost always will affect all three in greater or lesser degree, and the lethal and collateral effects of fires have the potential for great destruction and loss of life. In order to maximize desired effects of fires on the threat while at the same time minimizing undesired adverse effects on the built-up area and its inhabitants, these fires must often be as precise as technology and planning will allow.

TARGET ACQUISITION

3-92. Target acquisition in an urban environment faces several challenges. Sensors and reconnaissance have difficulty penetrating the urban environment's increased cover and concealment limiting both target acquisition and battle damage assessment. Moving personnel or vehicular targets are normally the easiest to acquire. However, the cover and concealment provided by urban terrain gives moving targets short exposure times, requiring firing systems to act rapidly on targeting data. In specific circumstances, weapon locating radar target acquisition may be more effective in locating hostile firing weapons because of the increased use of high-angle indirect fires.

3-93. Targeting challenges are met by innovatively integrating reconnaissance capabilities. These capabilities include not only the standard reconnaissance assets of the BCT, but those from the division, corps, theater army and joint forces as well. Air Force reconnaissance and surveillance systems contribute significantly to assessing the urban area. These information collection systems include manned and unmanned aircraft systems. These information systems are vulnerable to weather and SWOs should be leveraged to provide weather effects assessments for both the platforms and sensors based on current and forecast weather conditions. Air Force reconnaissance and surveillance systems can provide vital data to help assess threat intentions, threat dispositions, and an understanding of the civilian population. These systems also can downlink raw information in real-time to Army intelligence processing and display systems, such as the common ground station or division tactical exploitation system.

OBSERVATION

3-94. Ground observation may be limited. Consider placing observers on overlooking terrain outside the city and using external routes for observer movement.

3-95. Allow additional time for observer relocations when rubble, downed electrical wires, snipers, and other obstacles and impediments to movement may exist. Observers may need to take routes around obstacles. Elevators typically should not be used to avoid becoming trapped in the event of power failure. This can require time-consuming stairway climbs to gain an adequate vantage point. Fatigue may become a problem.

3-96. Forward observers should be positioned where they can get the maximum observation so that target acquisition and adjustments in fire can best be accomplished. This is not necessarily on the tops of buildings. Forward observers may be placed on upper floors of buildings to improve visibility. The observers on rooftops are vulnerable to both enemy aircraft direct fire and artillery or mortar airbursts.

3-97. Ground observation is limited in urban areas. Adjusting fires is difficult since buildings may block the view of adjusting rounds; therefore, the lateral method of adjustment may be most useful in urban operations. The impact of initial rounds may be adjusted laterally, until a round impacts on the street perpendicular to the forward edge of the battle area. When rounds impact on the perpendicular street, they are adjusted for range. When the range is correct, a lateral shift is made onto the target, and the guns fire for effect. Adjustments may be made by sound although this can be deceptive due to echoes off of buildings. Using airburst rounds is another technique for adjustment.

3-98. Consider the use of aerial observers. Aerial observers are effective for seeing behind buildings immediately to the front of friendly forces. These observers are extremely helpful when using adjusted fire because the observer may actually see the adjusting rounds impact behind buildings. Aerial observers can also relay calls for fire when communications are degraded due to power lines or masking by buildings. Illumination rounds fired to burn on the target can mark targets (both visual and infrared) in the daylight amid the smoke and dust of urban combat.

3-99. Forward observers must be able to determine where and how large are the dead spaces. Dead space is the area in which indirect fires cannot reach the street level because of buildings. This area is an enemy safe haven that is protected from indirect fires. For mortars and high-angle artillery fires, the dead space is about one-half the height of the building. For low-angle artillery fires, the dead space is about five times the height of the building behind which the target sits.

LETHAL FIRE SUPPORT IN URBAN AREAS

3-100. The physical aspects of the urban environment, such as the height and concentration of buildings, cause significant masking and dead space. Buildings that stand three or more stories tall hinder close indirect fires. Tall buildings can potentially mask several blocks of area along the gun-target line of artillery firing at low angles of elevation. The urban environment also affects the type and number of indirect fire weapon systems employed. Commanders may prefer high-angle fire because of its ability to fire in close proximity to friendly occupied buildings. More artillery systems may need to be used to ensure the responsiveness (rather than the weight) of fires. Careful positioning of artillery and mortar systems reduces the amount of dead space and permits units to establish more direct sensor-to-shooter links.

3-101. BCT commanders may consider reinforcing units, to include mortar platoons, from units in reserve. This will increase the number of systems available to support maneuver units. MLRS dual purpose improved conventional munitions rockets (M26, M26A2 and M30) may be of limited use in urban areas due to their dud rate. Guided-MLRS unitary rockets (M31 or M31A1) are well suited for this environment due to their precision munition capabilities and low collateral damage. Requirements for high-angle fire necessitated by confined urban terrain and an increase in point targets make the vertical attack capability option afforded by Excalibur and guided-MLRS unitary rockets especially useful.

3-102. Structures affect Army aviation attacks where the enemy is in contact with friendly ground forces. Vertical structures interrupt line of sight and create corridors of visibility along street axes. The result is shortened acquisition and arming ranges for supporting fires from attack helicopters that affect engagement techniques and delivery options. Pilots maintain line of sight long enough to acquire targets, achieve weapons delivery solutions, and fly to those parameters. Tube-launched, optically tracked, wire-guided heavy antitank missile systems require 65 meters to arm. The Hellfire missile requires at least 500 meters to reliably arm and stabilize on the intended target. Thus, attack helicopters firing from longer ranges actually improve the probability of a hit. Heavy smoke and dust rising from urban fires and explosions may hinder target identification, laser designation, and guidance for rotary- and fixed-winged aircraft. The close proximity of friendly units and noncombatants requires units to agree on, disseminate, and thoroughly rehearse clear techniques and procedures for marking target and friendly locations.

3-103. All BCT field artillery battalions should address urban operations in their tactical standard operating procedures. The application of these standardized techniques facilitate coordination should the field artillery battalion's command or support relationship change. These techniques are tailored to the supported corps, division, BCT or other unit as needed to ensure maximum coordination. Tactical exercises without troops are excellent methods for leaders to review unit urban operations tactics and techniques.

AMMUNITION AND SUPPLIES

3-104. In the absence of attack helicopters, close air support, and related fire support assets, ammunition expenditure is likely to be high. Moving large convoys through rubble urban terrain and along narrow city streets can affect the sustainment effort. The BCT supporting field artillery battalions may need to rely on several smaller sustainment convoys. Increased time is allowed for in the planning of logistics activities. Pre-stocked supplies, locally available supplies, and infrastructure services for power and transportation should be used as much as possible. Use local water supplies once they have been certified. Security and the risks of sabotage must be considered in the use of all locally procured items.

3-105. Precision fire provided by Army aviation attack or appropriate joint fires may be employed to engage observable targets and minimize collateral damage. Remote designators need to be close enough to accurately designate, but far enough away not to be acquired by the laser-guided munition during its flight path. Consider using precision-guided munitions to defeat enemy forces in buildings or in fortified positions and to target small enemy positions, such as snipers or crew-served weapons.

3-106. Considerations for the use of laser designators in urban terrain include:

- Correct positioning of aerial attack-by-fire positions and observation posts that meet any applicable angle-T requirements.
- Focus on key buildings, avenues of approach, complexes, or terrain where use of precision-guided munitions is anticipated.

- Intervening tall structures may degrade the effectiveness of the laser designator.
- Maintaining a continuous laser track on moving targets is difficult.
- The presence of large expanses of polished, flat, highly reflective surfaces such as windows may reflect laser energy and pose a hazard to friendly troops.
- The presence of highly absorptive surfaces such as open windows or tunnels may degrade designator effectiveness.
- Because of a fluid forward line of own troops, designators may have to reposition more often.
- Weather effects on the employment of laser designators and range finders.

3-107. The mix of munitions used by indirect fire systems will change somewhat in urban areas. BCT and subordinate and supporting unit commanders rely on their FSOs to understand ammunition effects and to correctly estimate the number of volleys needed for the specific target coverage. Increased use of certain munitions (for example Excalibur and other HE or smoke rounds, and precision guidance kit, delay and concrete-piercing fuzes) should be anticipated.

3-108. Special considerations apply to shell and fuze combinations when buildings limit effects of munitions:

- Indirect fires may create unwanted rubble and collateral damage. Precision and precision-guided munitions can be used to minimize rubbing.
- The close proximity of enemy and friendly troops requires careful coordination of fires.
- Swirling winds may degrade smoke operations.
- White phosphorus may create unwanted fires and smoke.
- Fuze delay should be used to penetrate fortifications or tops of buildings.
- Point detonating fuzes on delay typically penetrate only the first wall or roof of a structure. The MK399 concrete piercing fuze is used when added penetration is necessary.
- Use of visible illumination may favor the defender who lacks night vision devices.
- Illumination rounds can be effective; however, friendly positions should remain in shadows, and enemy positions should be highlighted.
- Tall buildings may mask the effects of illumination rounds. Illumination rounds fired to burn on the ground or on a building can also be used to mark targets for aerial support.
- Airbursts (variable time or time fuze) and improved conventional munitions are effective for clearing those antennas and enemy observers located on rooftops and for suppressing enemy fires.
- Variable time fuzes may detonate prematurely due to the proximity of other structures.
- Observer-adjusted time fuzes may be better to use among buildings with varying heights.
- If the area will be crossed by friendly or civilian personnel, units may choose not to use improved conventional munitions due to the dud munitions hazard or if the enemy has several building floors for overhead protection.
- Scatterable mine effectiveness is reduced when delivered on a hard surface.

DIRECT FIRE

3-109. Artillery may be used in the direct fire mode. BCT commanders, in consultation with their FSCoord and fires cell planners, determine the parameters under which field artillery assets can be used as direct fire platforms. Normally, field artillery is employed in direct fire only where tanks, Bradley fighting vehicles, and other direct fire systems are not available to engage the target. In this case, subordinate and supporting unit commanders, in coordination with their respective FSCoord and fires cell planners, direct the employment of individual howitzer sections to support the unit in contact. Field artillery commanders should identify their most proficient direct fire sections.

3-110. Self-propelled systems can take advantage of the systems' mobility to support multiple maneuver elements. Field artillery used for direct fire will likely require shuttling between indirect fire and direct fire positions. One or more sections may need to follow a maneuver force closely if sustained direct fire support is needed. Self-propelled howitzers are effective in neutralizing or destroying bunkers, heavy fortifications,

or enemy positions in reinforced concrete buildings. Concrete-piercing 155-mm rounds can penetrate 36 inches of concrete at ranges up to 2,200 meters. If care is taken, self-propelled artillery can be used to clear or create avenues of approach. Due to the self-propelled howitzer's limited armor protection, infantry will be required to provide security from enemy snipers and antitank teams.

3-111. Although towed artillery can be used in a direct fire role, it is not preferred because it does not have any ballistic crew protection. This lack of protection should not preclude the use of towed artillery if the situation calls for it and the commander is willing to accept increased risk of crew casualties. For some direct fire situations, the light 105-mm howitzer may be more adaptable especially for fires against dismounted infantry on streets or in open areas. Other direct fire considerations include adequate communications, protection and positions. A dedicated radio frequency for the controlling maneuver headquarters speaking directly to the howitzer section is necessary to control fires and prevent fratricide.

3-112. A Bradley fighting vehicle and a squad of dismounted mechanized infantry, or a squad of light infantry with anti-armor weapons should protect each howitzer, regardless of weapon type. The infantry must provide local security and prevent enemy ground assault, sniper fire, and antitank fire (for example, rocket-propelled grenades).

3-113. The infantry must reconnoiter and occupy positions where the howitzer can provide fire support. These positions must be free from enemy direct fire, but still allow direct fire by the howitzer on the target. Although self-propelled artillery systems seem formidable, they provide less crew protection than the Bradley fighting vehicle, and they contain large amounts of onboard ammunition and propellant. Self-propelled howitzers are susceptible to catastrophic destruction by heavy automatic weapons, light cannon field artillery, and antitank fire. The howitzer should provide the necessary support and then move to an alternate position to avoid being identified by the enemy. Overwatching infantry should always move ahead of and with the howitzer to prevent enemy ambushes.

POSITIONING AND MOVEMENT

3-114. The urban area may affect the positioning of artillery. Sufficient space may not exist to place battery or platoon positions with the proper unmasked gun line. This may mandate moving and positioning artillery in sections while still massing fires on specific targets. Commanders protect artillery systems, particularly when task organized into small sections. Threats to artillery include raids and snipers. Therefore, firing units will have to place increased emphasis on securing their positions.

3-115. Use of observation posts and listening posts is more important, as terrain allows the enemy to infiltrate and get closer to artillery positions. Personnel in the open or in vehicles moving through restricted areas are particularly exposed to fires from snipers in tall buildings.

3-116. Field artillery should be positioned outside of town on the edge of the urban area, if possible. Existing structures should be used to harden positions. Barns and other large buildings can be occupied for concealment of weapons and equipment. Units should also be aware of the dangers presented by overhead and underground power lines, gas and water pipelines, and similar hazards, especially when combined with the danger of enemy counterfire.

3-117. When placement in the urban area is necessary, howitzer positions among buildings should, at a minimum, allow for high-angle firing. Masking should be minimized. Positioning of indirect fire assets is difficult because of the predominance of concrete surfaces. Spades can be emplaced against a curb or base plates can be sandbagged if ground is not suitable for normal emplacement.

3-118. Airports, parks, athletic fields, and such may offer good firing positions. Cultivated fields may be too soft and muddy for use.

3-119. Reconnaissance is more difficult. Armed reconnaissance parties may need to clear an area physically before occupation is possible. Maneuver or military police assistance may be required.

3-120. Range requirements must be considered. Counterfire targets outside the urban area may be difficult to range from positions in the city needed for high-angle, close-supporting fires. Firing positions outside the urban area that allow excellent low-angle fires may be too distant to range counterfire targets on the far side of the city. Supplementary positions may be needed for counterfire and other missions.

3-121. Field artillery weapons may be placed in buildings or damaged structures for protection. However, building collapse and fire are possibilities. Overpressure can significantly increase the noise hazard for crews. A 105-mm howitzer battery may have better mobility than larger self-propelled howitzers in confined areas and may be quickly moved by helicopter, unhindered by ground obstacles.

SURVEY AND MAPS

3-122. Map spotting may be difficult in large cities. The maps and diagrams used in urban operations are often a mix of available documents that do not use common datum. Existing survey datum and markers, especially in developing countries, may be inaccurate or altered. City zoning maps, tourist maps, and sketches from reconnaissance teams may be used with military maps. Street signs may be non-existent or may have been altered by the enemy. The BCTs should acquire and disseminate high resolution imagery to subordinate units.

3-123. Maneuver forces may use unit building numbering systems and sketches for clearing areas. The brigade staff, FSCoord and fires cell planners must understand all of these problems and work with survey teams and field artillery battalion fire direction centers to translate target locations and friendly force locations accurately into grid locations on the common datum. Firing units will have the same problems pin-pointing their firing locations. The global positioning system may be greatly degraded due to satellite-to-receiver line of sight masking from buildings. Many more targets will be point targets, requiring increased target location accuracy. Thus, firing unit, observer, target acquisition, and target area survey requirements will increase. Hasty survey techniques may frequently be necessary.

3-124. Hasty survey is hampered by decreased line of sight. Magnetic interference from buildings and power lines may interfere with the establishment of directional control. Establishment of multiple survey control points should be anticipated. Placement of survey control points should be well thought out to ensure that rubble or traffic does not destroy the points. Additional survey assets may be required, and additional time may need to be allotted for survey operations.

WEATHER

3-125. Weather conditions, especially winds, can vary considerably from outside the city to inside the city. Tall skyscrapers, suburban homes, athletic fields, rivers, and other settings all have different atmospheric conditions (especially light and low-level winds). Low-level winds may vary greatly from upper-level winds, and may fluctuate considerably and unpredictably. The FSO and planning cell should engage with the SWO to obtain weather effects assessments based on current and forecast conditions within the urban environment. The FSO should coordinate the placement of any weather capability (such as weather sensors and weather observers including meteorological teams) with the BCT SWO to obtain representative weather conditions.

COMMUNICATIONS

3-126. Structures and urban infrastructure reduce radio ranges. Use of wire, messenger, and visual signals should be increased. Antennas should be set up on upper floors to increase their range. They are vulnerable if positioned on rooftops. Existing civilian telephone systems should be used for unsecured communication. Wire and local area network cables should be routed through sewers and buildings for protection. Generators should be placed near existing walls outside occupied buildings. Units will have an increased dependence on satellite based communication platforms.

COMMANDER'S INTENT

3-127. The BCT commander's intent imparts the vision as to how the operation should progress. Clear understanding of this intent by the FSCoord and fires cell planners ensures effective and timely application of fire support to the operation and immediate and the tailored fires needed to deal with situations as they arise. The FSCoord and fires cell planners use the BCT commander's targeting guidance to develop ammunition requirements and restrictions; for example: point detonating fuzes set on delay, concrete piercing fuzes to penetrate structures, and white phosphorus for incendiary effects against materiel targets.

CONTROL

3-128. Artillery may be placed under a maneuver commander's tactical control for distributed operations. This control is not of just a weapon, but a system, so the howitzers should be controlled through maneuver battalion fires cells because the respective FSO knows the capabilities and limitations of the system. For example, a platoon of three guns may be given a command or support relationship with a company. The company commander then has the option to control the system as a company support-by-fire asset or to place the system in support of the platoon leader requiring the direct fire support. The company commander may designate a platoon to isolate the objective through a support-by-fire mission. The howitzer system would receive its fire commands from the infantry platoon leader that is given the mission. Control of the howitzer system does not normally go below platoon level. In a similar manner, a battery may be given a command or support relationship with a maneuver battalion.

COUNTERFIRE

3-129. Counterfire is difficult in urban environments. Masking can degrade the performance of radars. It will be more difficult for air and ground observers to locate enemy artillery by visual, sound, and flash methods. Radar sites must be carefully selected. If radars are sited too close behind tall buildings, they will be masked and lose some effectiveness. High terrain outside the urban area should be considered, when possible. Counterfire ammunition requirements may increase if the enemy effectively uses buildings and available materials to harden and camouflage those positions. However counterfire may be limited by the rules of engagement and fear of collateral damage.

AIR AND ARMY AVIATION SUPPORT

3-130. Air and Army aviation support is an important aspect of BCT urban operations. Although air-delivered fires from manned and unmanned fixed- and rotary-wing aircraft can positively and directly affect the conduct of BCT actions in the urban area, the ability of aircraft to provide fires may be limited by the structural makeup of the urban location. Fire support planners should consider the use of supporting aircraft to observe, call for, and adjust indirect fires, and report battle damage assessment.

3-131. Air interdiction can be a vital component of shaping operations in urban terrain. Often, air interdiction of the avenues of approach into the urban area isolates the threat by diverting, disrupting, delaying, or destroying threat forces before they can be used effectively against the BCT. Air interdiction is especially effective in major theater war circumstances where restrictions on airpower are limited and the threat is likely to be a conventionally equipped enemy. In addition to shaping and dominating the urban operation through firepower, the BCT commander can use aviation support capabilities to improve and augment the urban transportation and distribution infrastructure. For more on aviation support to urban operations see ATP 3-06.1.

NAVY AND MARINE CORPS FIRE SUPPORT

3-132. United States (U.S.) Navy and U.S. Marine Corps fire support organizations are described in ADRP 3-09 and FM 3-09. See also chapter 4 of this ATP.

NONLETHAL ACTIVITIES

3-133. Aspects of cyber electromagnetic activities (such as electronic attack) and information operations (such as artillery- or air-delivered military information support operations leaflets) are not designed specifically to minimize fatalities, but they may be used with the same intent. Nonlethal activities can help the BCT commander maintain the desired balance between protection, mission accomplishment, and the safety of noncombatants by expanding the number of options available when the use of deadly force poses problems. In determining nonlethal capabilities use and employment, the BCT commander should consider risk, threat perspective, legal, ethical, and environmental concerns, and public opinion:

- The use of nonlethal activities in situations where lethal force is more appropriate may drastically increase the risk to BCT personnel.

- Planning electronic warfare assets to defeat the improvised explosive device threat, disrupt enemy information collection (see the discussion in chapter 4 and FM 3-55), reconnaissance and surveillance efforts, and detect the enemy's use of the electromagnetic spectrum for targeting purposes.
- A threat may interpret the use of nonlethal activities as our reluctance to use force. This may embolden the enemy to adopt courses of action otherwise not considered.
- Some nonlethal activities may have unintended adverse effects on the local population. This may arouse adverse public opinion.
- The targeting working group and targeting board must synchronize the use of nonlethal activities.

URBAN OPERATIONS GUIDE SHEETS

3-134. The guide sheets in Tables 3-1 and 3-2 on page 3-25 are designed to help the FSCOORD, fires cell planners and the field artillery battalion S-3 plan for urban operations. The tables are provided only as guides and may not address all the items applicable to specific situations.

Table 3-1. BCT fire support planners urban operations guide sheet

<ul style="list-style-type: none">• Are the urban operations part of a larger operation, requiring consideration of other fire support requirements and phase transitioning? What are the rules of engagement (indirect and small arms fire)? What are the size and the affiliation of the civilian population? Will a major civilian exodus need to be considered? Is potential civilian sabotage a significant problem?• What buildings and areas have been designated as protected and have some type of applicable restriction concerning fires, and the use or emplacement of field artillery units in their vicinity been identified?• What fire support considerations must be taken into account for identified areas with major hazardous waste potential? Have underground and above ground electric, fuel, gas, and water lines and storage tanks, hubs, or generating facilities been located?• How does the general construction of buildings and roads differ within the area of operations and what are the fire support implications?• What FSCMs have been, or need to be, established? What specific BCT commander's attack guidance is needed to address key fire support restrictions and considerations? How do minimum safe distances need to be adjusted to allow for urban operations conditions and the possibility of secondary explosions?• What is the scheme of maneuver? How will front line traces be reported (grid or reference numbers)? How often must forward line of own troops reports be given?• What maps, sketches, and building/block numbering systems are maneuver forces using to control movement and clearing operations? Do observers, fires cells, and indirect fires units have copies, as necessary? Is a common datum possible? See ATTP 3-06.11.• How will restrictive fire lines be used in urban small team and brigade-level combat?• Has each fire support task been reviewed to ensure that primary and backup triggering observers can view the target and that primary and backup firing units can adequately attack the target from anticipated positions?• Have visibility and masking diagrams been prepared and analyzed to identify dead space and urban areas that may interfere with ground and air attack, observation, and target acquisition assets? Has coordination taken place with the particular element to verify analysis and address implications?• What adjustments have been made and must be made to clearance of fire procedures? Are required radar zones supportable from anticipated radar positions? How much and when will masking interfere with radar support?• Is there any critical terrain necessary for firing or target acquisition elements that must be taken and cleared by maneuver forces to execute any fire support tasks?• Have anticipated fire support tasks involving direct fire been identified and coordinated with the supporting field artillery battalion? Have movement plans and security for direct fire field artillery elements been planned and rehearsed in adequate detail?• How well has the enemy been able to harden positions and reinforce buildings? What are the firing and ammunition implications?• Has targeting involved a 3-dimensional analysis? When and where may below-ground locations (such as basements or subways) and rooftops or multistoried structures present critical fire support issues?• Is the echelons above BCT threat higher or lower in the anticipated urban operations situation? What is the assessment of risk?• What are the implications for fixed-wing and rotary-wing aircraft? What areas may not be appropriate for air attacks?• How will air tactics need to differ for the particular urban operations situations anticipated? What are the
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Table 3-1. BCT fire support planners urban operations guide sheet (continued)

ammunition, observation, and lasing implications?	
<ul style="list-style-type: none"> • What is the external threat and what types of fires are needed outside of the urban area? Are there fire support blocking operations that prevent flanking movements or penetration of support areas or that isolate the battlefield and prevent enemy reinforcement? • What is the external threat and what types of fires are needed outside of the urban area? Are there fire support blocking operations that prevent flanking movements or penetration of support areas or that isolate the battlefield and prevent enemy reinforcement? • How can the BCT use the indirect fires limitations of urban operations on enemy mortars and field artillery to its advantage? • Have the BCT S-2, fires cell targeting officers, and field artillery battalion S-2 analyzed the urban terrain to identify potential enemy indirect fire locations for counterfire targeting? • What is the enemy mortar capability? Does the enemy possess many smaller, highly mobile mortars that can be easily positioned in range and moved around the battlefield? Where are they most likely to be employed and how is the threat countered? • If supporting field artillery is positioned outside of the urban area, what are the impacts on support for the maneuver operation and security for the field artillery unit? • How will limited visibility impact the ability to establish effective triggering decision points? How might the enemy use this to an advantage? 	
ATTP – Army tactics, techniques, and procedures	BCT – brigade combat team
FSCM – fire support coordination measure	S-2 – battalion or brigade intelligence staff officer

Table 3-2. Field artillery battalion commander and S-3 battalion or brigade operations staff officer urban operations checklist

<ul style="list-style-type: none"> • How are fire support tasks pertaining to the urban operation addressed? • What adjustments have been and must be made to clearance of fire procedures? • How will the firing positions, both inside and outside the urban terrain, be used? What are the advantages and disadvantages of each? • Is a 6,400-mil (360 degree) firing capability a requirement? • Does the field artillery battalion operation order include increased use of alternate and supplementary positions to account for masking problems? • Have massed fire requirements been adequately identified and war-gamed to ensure that all necessary units will be able to participate when needed? • Have all fire direction centers been adequately briefed and trained on the block and building reference system used by maneuver forces and fire support personnel? • Is there an increased need to adjust in final protective fire(s)? • Is there an increased need to conduct registrations to account for mapping, survey, meteorological, or global positioning system shortfalls? • Have triggers for unit movements and ammunition resupply been adjusted to account for urban operations factors such as rubble, narrow streets, and smaller resupply convoys? • Have routes been thoroughly researched to identify chokepoints, ambush points, or potentially confusing turns? Is military police support necessary or possible to ensure convoy movement? • Is self-defense direct fire against armor or dismounted infantry expected? Have responsibilities been assigned and rehearsed? What are the ammunition requirements? • What are the sniper/mine/booby trap threats to firing units? • What is the threat from enemy forces using sewers, subways, and other below ground routes? How thoroughly will areas be cleared of enemy troops or partisan forces? • Does meteorological data collection account for atmospheric conditions inside and outside the urban terrain—wind and temperature changes associated with varied structural differences throughout and around the city? • Have potential communication problems been identified and addressed? • Will additional security be necessary for radar, survey, and other small teams operating within urban terrain?

LEGAL CONSIDERATIONS FOR FIRE SUPPORT IN URBAN OPERATIONS

3-135. The large numbers of noncombatants potentially affected by urban operations are a major legal concern and increase the requirement for knowledgeable and active legal support. Whether noncombatants suffer the negative effects of urban combat or benefit from foreign humanitarian assistance, there are legal requirements and ramifications to every aspect of the operation. Further, the impact military operations

have on the local infrastructure must be carefully monitored. Some infrastructure provides service to noncombatants that, if destroyed or significantly curtailed, could result in their displacement or increase the level of human suffering. The laws of armed conflict restrict the targeting of certain infrastructure.

3-136. The law of war consists of a number of general principles that must be considered by the commander in evaluating all uses of force. Four of the most important ones are discrimination, military necessity, unnecessary suffering and proportionality:

- Discrimination – Distinguish between combatants, who may be attacked, and noncombatants who may not be attacked.
- Military necessity – Use only those measures that are necessary for securing the military objective as soon as possible, unless forbidden by international or domestic law.
- Unnecessary suffering – The prohibition of using weapons, projectiles, or other materials, which, by their nature or manner of use, are calculated to cause superfluous injury or unnecessary suffering.
- Proportionality – The injury to persons and damage to property incidental to military action must not be excessive in relation to the direct military advantage anticipated.

RULES OF ENGAGEMENT

3-137. Legal factors are but one element of the rules of engagement; national policy and political objectives also play an essential role in the drafting of rules of engagement. Often the rules of engagement will include some restrictions on weapons and targets, and provide the BCT commander with guidelines to ensure the greatest possible protection of noncombatants consistent with military necessity.

TARGETING CONSIDERATIONS

3-138. One of the major areas of consideration in the law of war is that of targeting. There are few absolutes in targeting, but the application of the general principles applies. Commanders must confirm that targets support military objectives. The following may be considered to be in that category:

- Members of the armed forces having the status of combatants.
- Non-combatants who lose protected status by taking a direct part in hostilities.
- Objects that by their nature, location, purpose, or use, are considered to be either military property, or contributing to the enemy's war effort. Their destruction provides a military advantage.

3-139. Although civilians, noncombatants, and civilian property may not be specifically targeted, incidental injury and collateral damage are not unlawful if caused incident to an attack on a lawful target, and the incidental injury and collateral damage are not excessive in proportion to the anticipated military advantage gained from the attack. Targeting issues are important not only in urban combat operations, but also in irregular situations where an enemy, in violation of the law of war, may use civilians to mask attacks or as unlawful combatants. For more on urban operations see ATP 3-60, ATTP 3-06.11, and JP 3-60. See also FM 1-04.

SECTION III – FIRE SUPPORT CONSIDERATIONS FOR OTHER OPERATIONS

FIRE SUPPORT CONSIDERATIONS FOR AIR ASSAULT AND AIRBORNE OPERATIONS

3-140. Field artillery participation in an air assault or airborne operation is characterized by maximum decentralization of mission command and control of fires. Fire support assets are positioned to support the assaulting force, attack targets in support of shaping operations, suppress bypassed enemy units, and facilitate fire support for future operations. See FM 3-99 for more information on airborne and air assault operations.

3-141. During the initial assault phase of the operation, control and communications may be conducted from an airborne platform as discussed later in this chapter. When the assaulting forces commander and the

FSCoord or FSO are on the ground, the operations and fire support planning and coordination functions are transferred from the airborne platform to the assaulting force. At first, the forces on the ground are concerned with close-in targets. The airborne fires cell initially controlled fires in preparation for the assault and subsequently fires to isolate the landing zone or drop zone. As the airhead matures, the ground commander progressively assumes total responsibility. The airborne command and control system platform usually departs after battle handover to the ground commander has been completed.

3-142. The FSCoord and fires cell planners develop fire support plans for the execution of an air assault operation. Regardless of the type of mission, the force size, or the duration of the operation, the assault force develops five basic plans upon receipt of the warning order. The staging, loading, air movement, landing, and ground tactical plans are developed in a reverse sequence and discussed in that order.

GROUND TACTICAL PLAN

3-143. The ground tactical plan includes the schemes of maneuver and fires that the unit will use on the ground. The plan includes all actions from the time the unit has assembled through the completion of the operation. The most likely infantry operation to occur in the initial stage of an airborne assault is the hasty attack followed by the establishment of a perimeter defense. Control of fire support assets is highly centralized.

3-144. After the assaulting force completes its consolidation of the landing zone or drop zone, the force is reorganized, as necessary, and prepares to implement the ground tactical plan. Depending on the plan, fire support considerations for offensive and defensive tasks apply. Fire planning should emphasize:

- Block enemy avenues of approach to the landing zone or drop zone.
- Eliminate enemy resistance.
- Defend the airhead.

3-145. Control of mortars, especially battalion-level mortars, may initially be difficult due to separated weapon and crew landing locations. Another important consideration is ammunition availability. Knowing the location and amount of mortar ammunition is crucial to coordinating current fire support and facilitating future plans.

LANDING PLAN

3-146. The landing phase, developed concurrently with the ground phase, consists of the time, place, and sequence of the air assault task force arrival into the landing zones. Primary and alternate landing zones are selected for each unit. The assaulting force FSCoord and fires cell planners should review the plan to ensure that fire support personnel and equipment are correctly cross-loaded. The loss of aircraft should not completely disrupt fire support provided to the assaulting force. The FSCoord or FSO should also ensure that all fire support personnel understand their assembly instructions on the landing zone or drop zone. The FSCoord or FSO should also review the pre-assault fire plan to ensure that it supports the assaulting force commander's plan. Consideration should be given to the level of surprise desired, rules of engagement, collateral damage, and airfield, airhead, or drop zone damage.

3-147. If a landing zone or drop zone is expected to be cold, mortars should be sent in early so that mortar sections can set up and prepare ammunition for any enemy reactions to the air assault. If the zone is expected to be hot, mortars may land later to avoid being caught in a direct fire battle. Survey is generally not available on the landing zone or drop zone; hence, hasty survey methods should be relied upon. The field artillery and mortars should be placed on a common grid as soon as possible.

3-148. It may be desirable to make the initial assault without scheduled fires to achieve tactical surprise. Otherwise, planned fires should include targets:

- Of known or suspected enemy forces regardless of size.
- In support of the deception plan.
- For the primary and alternate landing or drop zones.

3-149. Fire support plans should be short in duration and intense in the volume of fire, providing maximum surprise and shock effects. Ordnance for these plans should not create unnecessary obstacles to

landing and maneuver; for example, craters, tree blow down, fires, and low visibility. Consequently napalm and other types of incendiary ordnance are not normally used on the landing zone and its immediate vicinity in the time period just before landing. Fires are lifted and shifted to coincide with arrival times of the aircraft formations.

3-150. The FSCOORD and fires cell planners should carefully consider flight times when scheduling fires for the landing zone. The basis for timing is referred to as H-hour—the time when the first aircraft in the first lift of the operation is to touch down on the landing zone. All times in air assault operations are referenced from H-hour. Times are computed for the entire length of the flight route.

3-151. If directed, serial leaders report on passing communications checkpoints. Thus, fires can be placed on targets of opportunity or on enemy positions that threaten the task force. The FSCOORD and fires cell planners plan ahead to designate the assets and observers who will execute these fires. Fire support personnel should be linked on a common radio network.

3-152. Attack helicopters, or a combination of close air support and Army aviation assets, may provide security during the flight. These assets provide security to the flanks, front, and rear of the aircraft formation. They may be used to selectively jam enemy radar and communications signals. Field artillery, if available, provides fires for suppression of enemy capabilities along the flight routes as planned or as necessary.

3-153. The release point crossing can be used to time the lifting or shifting of field artillery and close air support strikes. The lifting and shifting of fires are critical and should be completed approximately 15 seconds (and normally, not more than 1 minute) before landing. An airspace positive control measure (see ATP 3-52.1, FM 3-52, and JP 3-52) – one that is clearly understood by the lead aircraft and flight commander – should signal the lifting and shifting of fires. Planners should consider using attack helicopters to observe, adjust, and control preparation fires on landing zones.

3-154. Fires to support the consolidation on the landing zone are similar to those planned on any objective or perimeter defense. When forward observers and joint terminal attack controllers (JTAC) arrive on the landing zone, they should be prepared to control and use any close air support or attack helicopter sorties that were planned but not used during the movement phase. Fire support considerations should include planning informal ACAs (see FM 3-09 and FM 3-52) to allow simultaneous attack of targets, fires to isolate the landing zone, FPFs, fires for suppression of enemy air defenses (see ATP 3-01.4), and prearranged signals to lift and shift fires.

AIR MOVEMENT PLAN

3-155. The S-3 air, an air movement officer for each participating unit, and, particularly for airborne operations, an Air Force representative develop the air movement plan. The assaulting force FSCOORD or force FSO should ensure that fire support personnel and equipment are included on load plans and manifests. The air movement plan is based on the ground tactical plan, the landing plan, and the enemy air defense threat. The plan schedules and provides instructions for moving troops, equipment, and supplies from pickup zone to landing zone. It also provides coordinating instructions regarding air routes, checkpoints, speeds, altitudes, formations, actions while en route, and recovery of downed aircraft. Planners select air routes that accomplish the mission while limiting exposure to enemy air defense systems. The assaulting force FSCOORD or fire support officer and fires cell planners should review the fires for suppression of enemy air defenses along the primary and alternate flight routes. If enemy air defense locations are known, it is better to fly around them rather than attempt to suppress them while flying over them. Fire support considerations for air movement include:

- Plan fires to cover primary and alternate pickup zones and landing or drop zones.
- Plan fires along the flight route(s) to aid aircraft flying past areas of known or suspected enemy positions; these fires should be intense and of short duration and should not obscure pilot vision.
- Consider all fire support assets when planning suppression of enemy air defenses including:
 - Electronic attack and other electronic warfare support assets.
 - Chaff airdropped by aircraft to confuse enemy air defense radars.
 - Field artillery, close air support, and attack helicopters.

Note: Close air support and attack helicopters may be the only assets capable of ranging targets along flight routes and on landing zones.

- Consider the weather effects on the employment of all fire support assets.
- Plan on-call fires along the flight route to ensure rapid adjustment on targets of opportunity.
- Execute fires to support the air movement plan under procedural control, under positive control, or a combination of the two based on mission variables of METT-TC:
 - During procedural control, fires are initiated and terminated according to a strict time schedule.
 - During positive control of airspace, fires may be executed with phase lines, air control points or other control measures to initiate, shift, and terminate fires.

LOADING PLAN

3-156. The loading plan establishes the priority of loading and is based on the air movement plan and the likely requirements in the landing plan. The purpose of the loading plan is to ensure that the troops, equipment, and supplies to be moved are loaded on the correct aircraft. It is critical to distribute fire support personnel and their essential items of equipment among the aircraft. Copies of the loading plan are distributed to pickup zone control, unit command and control elements, and the aviation flight leader.

STAGING PLAN (AIR ASSAULT) OR MARSHALLING PLAN (AIRBORNE)

3-157. The air assault staging plan contains the schedule of the arrival of troops, equipment, and supplies at their respective pickup zone. The airborne marshalling plan covers all actions from the time the warning order is received until the units have loaded the aircraft. Special considerations for the fire support planners include:

- Ensure that forward observers and JTACs are included in load plans so that they arrive at the landing or drop zone early in the operation.
- Plan fires for the protection of primary and alternate pickup zones without endangering the arrival and departure of troops and aircraft.

GUIDELINES FOR AIR ASSAULT OR AIRBORNE MISSION BRIEFS

3-158. Before any air assault or airborne operation, the assault task force commander and the staff (including the unit FSO[s]) conduct an air mission brief.

3-159. The assault task force FSO briefs the fire support portion of the air mission brief. At a minimum, the FSO should address the scheme of fires including:

- Fire support tasks.
- Fire support assets available.
- Target locations.
- Purpose of targets.
- Type, amount, and duration of fires.
- Delivery system associated with each target.
- Location of fire support delivery systems.
- Primary and backup executors.
- Method of airspace control (positive or procedural) of aerial fire support.
- Emergency checkfire procedures.
- Signal for last round of landing zone preparation (white phosphorus or other).
- FSCMs in effect.
- Airspace control information including: gun-target line, maximum and minimum ordinates, and close air support attack heading and egress route.
- Plan for suppression of enemy air defenses.

- The communications plan including: signal operating instructions extract; primary and alternate fire support frequencies; retransmission; communications exercise/rehearsal times; network discipline; and backup radios.
- Coordinate with the BCT SWO to provide a weather effects assessment on the employment of fires assets based on current and forecast weather conditions.

OTHER FIRE SUPPORT CONSIDERATIONS FOR AIR ASSAULT OPERATIONS

3-160. To provide targeting information for fires in support of shaping operations for an air assault, the BCT S-2, FSCoord, and brigade fire support planners generally require access to information collection and target acquisition assets from division, corps, theater army and higher echelons. The air assault task force is most vulnerable to enemy indirect fires immediately after landing. Coverage by both BCT-organic and higher echelon information collection and target acquisition assets should be planned to help in the counterfire effort.

3-161. Fire support planners should carefully consider the munitions used for suppression of enemy air defenses to ensure that they provide the required support while not interfering with, or endangering, air assets. Smoke, white phosphorus, variable time-fuzed, and improved conventional munitions are often used to maximize the effects of fires for suppression of enemy air defenses. However, obscuration munitions can also obscure a pilot's view of the target, and improved conventional munitions bomblets can present an aerial hazard during dispersal when improved conventional munitions are used in the vicinity of aircraft operations.

3-162. Use retransmission assets to ensure continuous communication between the FSO controlling the fires during the movement and the assets providing those fires. Plan for the primary or alternate use of visual signals (flares and colored smoke). Coordinate the use of signal operating instructions for the air assault forces and the supporting forces.

3-163. Appropriate load planning is critical (units may not be able to move as a whole). Make reconnaissance by map or by air. Leaders should maintain situational awareness while en route. Displacement can be by air or ground.

3-164. Assault force field artillery may have limited ammunition. Sustainment should include all classes of supply (but primarily Class V), and should be planned, prioritized, and synchronized with the maneuver plan. Medical evacuation will most likely be done with rotary-wing aircraft.

3-165. Guidelines useful for planning fire support for BCT air assault operations include:

- Based on the BCT commander's guidance and mission variables of METT-TC, determine what fire support is required for the mission (such as landing zone preparation, suppression of enemy air defenses, and preparation fire on false landing zones).
- Alert the division, corps and theater army fires cells; request additional assistance if necessary.
- Alert fire support delivery assets (field artillery, mortars, close air support, attack helicopters, naval surface fire support, and electronic attack).
- Query artillery target intelligence and S-2 files to assist in route, pickup zone, and landing zone selection.
- Determine flight routes, both ingress and egress, for the air assault task force with the S-3, S-2, and with the Army aviation unit(s) liaison officer(s).
- Query S-2 for development of targets for fires in support of the loading plan, air movement plan, landing plan, and the ground tactical plan.
- Develop an initial target list.
- Plan fires on known and suspected enemy positions, on key terrain, around the landing zone (fires for suppression of enemy capabilities during the air assault and forces for blocking during consolidation), on and around false landing zones; and in support of the ground tactical plan.
- Determine flight times, phase lines, checkpoints, and code words with the S-3, S-2, and Army aviation liaison officer.
- Determine abort criteria and procedures.

- Develop a tentative fire plan that integrates all available fire support assets.
- Coordinate attack of targets with S-3, S-2, Air Force air liaison officer, Army aviation liaison officer, subordinate and supporting unit FSOs, fires cells and the division and corps fires cells.
- Identify and coordinate ACMs and FSCMs required for the mission.
- Develop an execution matrix (that is, who will initiate and observe fires).
- Develop primary and backup communication plans.
- Send the fire support plan to the appropriate fire direction centers and subordinate and supporting unit fires cells.
- Prepare the fire support portion of the air mission brief.
- Attend the air mission brief and brief the fire support plan.
- Determine the time and place for fire support and combined arms rehearsals.
- Attend rehearsals.
- Continually update the fire support plan (minimize changes after rehearsals).

3-166. The S-3, FSCOORD and fires cell planners should always conduct a fire support coordination meeting with key personnel including the:

- Field artillery battalion fire direction officers.
- Firing battery commanders.
- Company and battalion FSOs.
- Mortar platoon leaders and fire direction officers.
- Assault and attack flight helicopter leads.
- Air Force air liaison officer.

3-167. The S-3 and FSCOORD, brigade fires support officer and fires cell planners should ensure that all participants in the fire support coordination meeting receive a correct and complete copy of the fire support plan including the:

- Target list.
- Schedule of fires (if used).
- Execution matrix.
- Communication plan.
- Graphics showing ingress and egress routes, pickup zone and landing zone, targets, position of delivery assets.
- Gun-target lines and the ACMs and FSCMs both planned and in effect.

OTHER FIRE SUPPORT CONSIDERATIONS FOR AIRBORNE OPERATIONS

3-168. Initial targeting intelligence is acquired through national assets. Targeting is refined using joint, theater army, corps, and division information collection (see the discussion in chapter 4 and FM 3-55) and target acquisition assets. During initial stages of airborne operations, unmanned aircraft systems and aerial observers may be critical target acquisition assets. Radars may not be deployed during the initial stages of an airborne operation; however, they should be deployed in follow-on air-land operations. Priority of radar deployment is based on the enemy counterfire or field artillery threat.

3-169. The FSCOORD and fire cell planners may have to rely on non-field artillery assets (Air Force, Marine Corps, and Navy) in preparation for the assault. Close air support and naval surface fire support are the most likely fire support means. Attack helicopter support may be possible if an intermediate staging base can be established or if ship-borne helicopters are available.

3-170. Long range fires by MLRS or HIMARS may be able to provide all-weather force protection to the landing force. If HIMARS is included in the landing package of an airborne assault, then HIMARS can immediately provide the ground element with precision and significant force projection capabilities.

3-171. Initially, firing batteries may be attached to maneuver battalions for the airborne assault. The batteries revert to field artillery battalion control once the field artillery battalion command post becomes operational and ready to reassume control.

3-172. Mortars may be attached to a field artillery battery during the initial seizure of the airhead or airfield. This allows massing of the limited ground indirect fire assets available to the airborne commander. All indirect fire assets require a 6,400 mill (360 degree) capability. However, positioning of indirect fire assets should not create trajectory or gun-target line problems that interfere with flight landing strip or air landing operations.

3-173. The primary means of communication is typically frequency-modulation radio. Tactical satellite communications, though present, are generally not used in field artillery operations. Satellite communications may, however, provide critical fire support information. Amplitude-modulation radios may be used over long distances. Visual signals and messengers should be prescribed and used for short-distance communications.

3-174. Airborne elements are extremely vulnerable during the initial landing at the drop zone or airhead. Initial reconnaissance is by map or air. Normally, displacement may be by air. Control of battery movement is decentralized.

3-175. Ammunition is very limited in the first stages of an airborne operation; supplies are airdropped or air-landed. After an airdrop, weapons and equipment are thoroughly inspected for damage and are repaired as needed. Medical evacuation is by air.

3-176. Positioning is based on the enemy ground, air, and field artillery threat, as well as on the amount of space provided by the expanding airhead. Defenses with 6,400-mil (360 degree) capability are mandatory. Batteries should be positioned for mutual defense. Units take maximum advantage of intelligence and aerial photographs in preparing for unit defense. Split battery movement techniques may be necessary to maintain a continuous fire support capability.

FIRE SUPPORT CONSIDERATIONS WHILE AIRBORNE

3-177. The Army airborne command and control system allows the commander to operate an airborne command facility to support any tactical operation (for example airborne, air assault, amphibious, or ground operation, including Defense Support of Civil Authorities). The airborne command and control system is an extension of the current airborne mission command capability tailored to employ emerging technology in communications and data processing. It is an airborne command post equipped with the 15B-radio suite. The mission equipment package onboard the aircraft is intended to fulfill the needs of any commander for an airborne mobile command post, from battalion through theater army echelons. It provides the commander an airborne mission command capability with voice and data equipment that provides battlefield information processing and connectivity—capabilities equivalent to that of a tactical command post or command vehicle either while static or airborne. In the static mode, the airborne command and control system will remain inside the UH-60. Quick-erect ground antennas are used, along with a power source organic to the UH-60. These abilities enable the commander to exercise mission command of assigned and attached elements and to coordinate with adjacent, supported, and supporting forces.

3-178. When the BCT uses an airborne command post, the FSCoord, brigade FSO or fires cell representative should be included. Planners should consider placing the ground-based Air Force air liaison officer, subordinate and supporting unit FSOs, and other delivery system representatives on one centralized network, usually the BCT fire support network. Some aircraft may be equipped with high frequency radios for control of air and naval assets. Planners should consider using the BCT fires cell to relay or retransmit communications to the division and corps, theater army fires cells as appropriate for the operation.

3-179. The tactical command post enhances mission command of maneuver and control of fire support. Ground based command posts typically control pre-assault fires assets while the assault forces are airborne. The use of airborne tactical command posts is normally of limited duration. An airborne tactical command post involves higher risks, depending on the status of the enemy air defense system. The BCT FSCoord, brigade FSO, or fires cell representative should expect the commander to direct the attack of specific targets and must be prepared to coordinate those requests.

FIRE SUPPORT CONSIDERATIONS FOR SPECIAL OPERATIONS FORCES

3-180. Special operations forces are units tasked to conduct special military operations in support of national policies and objectives. These operations require highly trained, well-disciplined units that can be employed in any environment, either alone or in concert with other military forces. Special operations forces may support conventional military operations or the forces may conduct independent tasks.

FIELD ARTILLERY FIRES

3-181. Many special operations are out of the range of supporting field artillery fires. However, when such fires are available, they are planned for and integrated into the force's ground tactical plan.

3-182. Coordination and exchange of call signs, frequencies, and target lists occurs before insertion. Not all special operations units receive forward observer and JTAC augmentation. Special operations forces request and adjust all fires as needed.

3-183. Field artillery fires can be used to support the special operations force even if the objective area is out of range. Cannon field artillery and MLRS can be used to fire missions to suppress enemy air defenses as needed during airborne or air assault operations. Field artillery fires can be used to support the exfiltration of special operations elements as they approach friendly lines. These fires can contribute to the deception plan and add combat power to feints used to support special operations. When in range of an objective area, field artillery units can emplace scatterable mines to enhance the security of the special operations force.

3-184. The special operations units use man-portable laser target designators to designate hardened point targets or enemy armored vehicles for laser-guided munitions. Precision-guided munitions include laser-guided munitions or those munitions that may employ inertial measurement units or GPS-aided homing capability instead of a laser-homing capability.

AERIAL FIRES

3-185. Aerial fire support is usually the prime means by which the special operations force is supported because of the distance behind enemy lines at which most special operations take place. Manned fixed-wing aircraft, non-Army armed helicopters, and some unmanned aircraft systems can provide fire support. Army armed helicopters conduct attacks where the enemy is in contact with friendly forces as a maneuver force rather than as a fire support asset.

Fixed-Wing Aircraft

3-186. Fixed-wing aerial fire support may come from Air Force, Navy, or Marine Corps units. The type of unit providing the support, the aircraft, and the mix of ordnance carried all affect fire support planning and coordination. Some aircraft have a night and all-weather strike capability that enables them to support the special operations force during any level of visibility. Operations during poor weather that limit visibility to less than three nautical miles (approximately 5.6 kilometers) are still somewhat restricted, however. The special operations unit FSOs and Air Force tactical air control party must ensure that the correct aircraft are requested and employed effectively against the enemy. The JTACs from the Air Force TACP control fixed-wing aircraft fires against surface targets in the objective area.

3-187. The special operations force can use ground laser target designators to pinpoint targets for air strikes, as well as electronic navigation aids to permit non-visual air strikes (beacon bombing). The special operations assigned Air Force TACP can control a laser-designated standoff air strike.

3-188. If the enemy air defenses are not formidable, or if the defenses can be degraded to a low level, the special operations force uses specially equipped and armed AC-130 aircraft for fire support. These aircraft provide an invaluable combination of firepower, night observation and illumination, communications, and long loiter time. A well-planned and executed program for suppression of enemy air defenses, coupled with electronic countermeasures directed against enemy air defense units, normally permits the use of AC-130 aircraft.

Helicopters

3-189. The attack helicopter has the ability to provide accurate and responsive aerial fire support. Attack helicopters may be used to escort and assist the special operations force as needed. Attack helicopters may also be used to conduct feints and demonstrations to cover the insertion of the special operations force. If attack helicopters are used to support special operations, planned indirect fires are normally delivered along entry and exit corridors.

3-190. Fires from armed helicopters are normally requested and controlled by the special operations JTACs operating on a special ground-to-air network. The laser target designator may be used to precisely identify targets for attack helicopters. Smoke, panels, lights, mirrors, or infrared sources may mark friendly unit locations.

FIRE SUPPORT CONSIDERATIONS FOR AMPHIBIOUS OPERATIONS

3-191. The amphibious operation requires detailed planning, precise timing in air, naval surface fire support, and field artillery support, and effective command relationships. Army field artillery is not simply a passenger on a ship-to-shore transport; it is an active component of that operation. Its active involvement before, during, and after the movement and assault is essential to the success of the amphibious force.

3-192. When coastal topography permits, field artillery can be positioned on offshore islands to provide fire support for the assault element. If included in the landing party, the BCT's field artillery battalion or supporting FAB battalion, if available, ashore provides decisive support with direct and indirect fires during the most critical phase of the amphibious operation. These requirements present the BCT or other Army field commander with unique challenges and require much initiative. The complex nature of amphibious operations makes detailed planning of paramount importance. Centralized control is lost from the time of embarkation aboard ship until reorganization ashore.

3-193. Initial fire planning is for naval surface fire support, attack helicopters, and close air support, because the field artillery is moving ashore. Hasty fire planning may be relied on initially because of lack of intelligence. These fires include landing beach preparation, prearranged close support, and fires in support of shaping operations. In general, these fires neutralize enemy defenses to cover waterborne and helicopter assaults and disrupt enemy command, communications, and observation. Also, they are fired in direct support (DS) or general support (GS) of the landing force.

3-194. Movement plans should provide for early landing of field artillery units and their entry into action. All available fire support systems (such as field artillery, naval surface fire support, and close air support) should be coordinated and synchronized. At first, the supporting arms coordination center plans and coordinates all fires for the landing force. Once ashore, the landing force fires cell assumes responsibility for coordinating all fires. Because of the heavy use of air support, fires for suppression of enemy air defenses should be planned and implemented.

3-195. Initial targeting data typically comes from naval sources. Aerial observers are used extensively. During ship-to-shore movement, observers in ship-based aircraft may provide the only observation capability. Once troops have landed and gained a foothold, ground observers and target acquisition assets assume their normal roles.

3-196. Ballistic meteorological support should be obtained from Navy shipboard meteorology stations in North Atlantic Treaty Organization (NATO) format. Prior coordination with landing force headquarters for available survey information is vital. Hasty survey techniques are used until organic survey assets are ashore and operational. Survey assets should be sent ashore as soon as possible to establish and extend a common grid. A greater degree of decentralization for both tactical and technical fire direction may be necessary to allow for flexibility at first. Inter-Service calls for fire are common. Engineer assets may be used to help stabilize gun positions. This assistance may be necessary because of the terrain (for example, sandy beaches).

3-197. During movement ashore, field artillery should be dispersed throughout the assault elements. Decentralization facilitates this phase of the operation. Personnel should be equipped with life vests and other appropriate life support equipment.

3-198. One of the most critical tasks for fire support during amphibious operations is the early establishment ashore of the landing force ground combat element's Marine Corps fire support coordination centers, which are manned and equipped in a manner similar to that of Army fires cells. When fire support coordination centers are operational, control and coordination of supporting arms can be passed from afloat to ashore. This allows for the balance of centralized and decentralized control that is critical for immediate responsive fires in support of offensive tasks.

SPECIAL CONSIDERATIONS FOR THE BRIGADE COMBAT TEAM

3-199. In amphibious operations (including Navy forces, landing forces, and potentially required support from the Air Force), success requires a common understanding of joint fire support. The amphibious assault is an offensive task. Consequently, the considerations for fires in support of offensive tasks generally apply. Certain characteristics peculiar to the amphibious assault affect fire support coordination in planning and operations and must be considered by the brigade FSO, and fires cell. These include:

- The buildup of combat power ashore is from a base of zero; the fire support planners must plan and integrate supporting arms incrementally as they become available.
- The complexity of the operation makes it difficult to adjust the scheme of maneuver once the assault has begun; the FSCOORD and fires cell planners must place greater emphasis on planned and scheduled fires than for most other offensive operations.
- The difficulty of employing artillery ashore initially in the assault places requires placing greater reliance on mortars, naval surface fires, and offensive air support; the fire support planners must address this lack of the primary supporting arm during their planning.

3-200. Amphibious assaults conducted from over the horizon may stress communications. The fire support planners must understand the communications capabilities of the amphibious task force and the landing force.

3-201. Fire support tasks for pre-D-day operations include:

- Assist the force to gain and maintain air and maritime superiority prior to the assault.
- Destroy or neutralize targets that can prevent the execution of the landing.
- Provide fire support as part of a deception effort.

3-202. Fire support tasks on D-day include:

- Provide immediate responsive fires to the assault elements.
- Isolate the landing area by attacking targets farther into enemy formations with massed surface fires and air support.
- Suppress hostile shore defenses during ship-to-shore movement with intense prearranged fire.

3-203. Fire support tasks post-H-hour include:

- Provide counterfire to protect friendly units during initial advance inland and consolidation.
- Break up enemy counterattacks.
- Continue to provide responsive fires to the lead elements.

NAVAL SURFACE FIRE SUPPORT FOR BCT OPERATIONS

3-204. Navy vessels that mount guns and land attack missiles can be used to support ground forces. Principal surface fires resources include the Airborne Early Warning Ground Environment Integration Segment (referred to as AEGIS) weapons system equipped guided missile cruisers and guided missile destroyers. The Airborne Early Warning Ground Environment Integration Segment weapons suite includes Tomahawk land-attack missiles, the 5-inch 54 or 62-caliber Mark 45 lightweight gun, and the Standard missile system in surface-to-surface mode. The Tomahawk and Standard missile are contained in the vertical launch systems on the cruiser and destroyer platforms. Large volumes of highly destructive, flat-trajectory fire characterize naval gunfire. Although these ships have a formidable fires capability, a single

vessel does not have the gun or missile magazine capacity to provide the sustained volume of fire required to support land component offensive operations. Single 5-inch gun mounts on destroyers lack a sufficient rate of fire over an extended period to support volume fire requirements. Gun ammunition is routinely replenished at sea, but due to the time off the gun line and the magazine capacity, sustained fire support operations typically require two to three ships to maintain one ship on the gun line. See Appendix A for technical information on naval gunfire. The fire support planners must be aware of the employment considerations and procedures peculiar to naval gunfire in support of ground forces. See ATP 3-09.32.

3-205. Naval surface fire support can assist the BCT by attacking targets to generate the BCT commander's desired effects. Naval gunfire and missile fire support is especially critical during forcible entry operations and subsequent operations when the BCT is within range of naval support. This support can play a vital role in reducing enemy capabilities by destroying enemy installations before the initial entry, protecting and covering the initial entry, and supporting land force offensive or defensive actions during subsequent operations. Fire support ships may be assigned in DS or GS of the BCT in much the same way that field artillery support relationships are assigned.

Direct Support

3-206. A ship in the DS role may be made available to support the BCT and can deliver both planned and call fires. Call (on-call in Army terms) fires and calls for fire against unplanned targets are normally requested and adjusted by the firepower control team of the supported unit or by an air spotter. Naval gunfire DS is not the same as field artillery DS. A DS ship will respond to calls for fire from units other than the supported unit when ordered to do so by the fire support group commander, the division or corps naval gunfire liaison officers, or the BCT naval gunfire liaison officer. DS makes fires provided by ships responsive typically to the needs of a battalion-size ground force.

General Support

3-207. A ship is usually placed in GS of committed BCTs, divisions and corps. The Naval gunfire officer of the unit being supported directs the fires for a GS ship. The primary purpose of a GS ship is to allow the supported commander to add depth to the fires of the DS ships without the necessity for requests to higher echelons. GS makes fires provided by ships responsive to the needs of a BCT or regiment-size or larger ground force. An air observer normally adjusts the fires of a GS ship or a liaison officer assigns the fires of the ship to a battalion shore fire control party.

REQUESTING NAVAL GUNFIRE SUPPORT

3-208. BCT personnel may request and conduct fire support missions using naval gunfire even in the absence of Navy personnel. See ATP 3-09.32 for requesting naval surface fire support. The naval gunfire communications interface is:

- Net: Naval gunfire ground spot net.
- Frequency: 2-30 megahertz high frequency.
- Compatible equipment.
 - Marine—PRC-104, GRC-193, MRC-138.
 - Army—PRC-104 (a), GRC-193.
 - Air Force—PRC-104, MRC-107/108, GRC-206.

NAVAL GUNFIRE SUPPORT PERSONNEL

3-209. Members of the air-naval gunfire liaison company (ANGLICO) are specially trained in conducting naval gunfire. However, the procedures are simplified and standardized so that any trained BCT observer (for example a FIST or forward observer) can effectively adjust the fire of a ship.

3-210. ANGLICO personnel are available to advise unit commanders from company through BCT levels on how to best use the naval air and gunfire support available to them. Liaison personnel can give unit commanders and their fire support personnel information on weapon ranges, ammunition effects, and all-weather bombing capabilities. For maximum effectiveness, ANGLICO support should begin during the

planning phase of an operation. ANGLICO task-organized teams should be attached to the units they will support as soon as possible. ANGLICO personnel at all levels — company through BCT — are trained as naval gunfire spotters and forward air controllers and can request and control missions for the units they support.

NAVAL SURFACE FIRE SUPPORT CONTROL MEASURES

3-211. FSCMs used by the Navy for its operations are identical to those used by the FSCoord and fires cell planners to control other surface-to-surface fires. Those peculiar to naval operations that limit ship movement or affect the fire support provided (zone of fire, fire support area, fire support station) are described in FM 3-09 and JP 3-09. For more on Amphibious Operations see JP 3-02.

FIRE SUPPORT CONSIDERATIONS FOR MARINE CORPS OPERATIONS

3-212. A Marine Expeditionary Force is a combined arms force of 20-90,000 Marines and sailors consisting of four components: a headquarters group, a Marine Division, an aircraft wing, and a logistics group. The Marine Expeditionary Force possesses the capability to project offensive combat power ashore while sustaining itself in combat without external assistance for a period of 60 days. The Marine Expeditionary Force can be employed in its entirety or has the capability of forming task-organized Marine air ground task forces (MAGTFs) of lesser size including:

- A Marine Expeditionary Brigade, which is a MAGTF about one-third the size of a Marine Expeditionary Force built around a regimental landing team of 15,000 Marines and Sailors.
- A Marine Expeditionary Unit, which is, a MAGTF about one third the size of a Marine Expeditionary Brigade built around a battalion landing team of 2,200 Marines and sailors.
- A smaller special-purpose MAGTF for non-standard missions.

3-213. The size and composition of any MAGTF will be dependent upon the mission assigned. For example the Marine Expeditionary Unit is capable of rapid response in a variety of possible contingencies and if the situation requires, can serve as the forward element of a larger MAGTF.

MARINE AIR-GROUND TASK FORCE FIRE SUPPORT COORDINATION

3-214. The fire support coordination center is the primary fire support coordination agency for the MAGTF. It is responsible for planning, executing, and coordinating all forms of fire support within the MAGTF's area of operations. The fire support coordination center is organized and supervised by the Marine Corps fire support coordinator and is collocated with the appropriate-level operations officer.

MARINE AIR-GROUND TASK FORCE ARTILLERY AND AVIATION

3-215. Artillery support is provided to the MAGTF by Marine Corps artillery regiments. Marine Corps artillery regiments are organized with two to four battalions; each battalion has three or four batteries of six lightweight M777-series 155-mm howitzers and one rocket battalion equipped with the High Mobility Artillery Rocket System (HIMARS). Marine Corps 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 Corps artillery headquarters facilitates a mutual understanding of each Service's procedures.

3-216. The 60-mm mortars organic to the rifle company and 81-mm mortars organic to the infantry battalion provide mortar support the MAGTF. The towed airmobile or air transportable RT120/M327 rifled 120-mm mortar is currently being added to artillery regiments. That mortar fires both standard and global positioning system-guided precision extended range munitions.

3-217. The joint force commander has the authority to assign Marine Corps artillery units a tactical mission to support an Army ground unit such as the BCT or to reinforce Army artillery such as the BCT's field artillery battalion. Army forces can receive the same direction to support Marine Corps forces. The supporting artillery unit provides liaison as required. All aspects of fire support doctrine apply and are

exercised with little dissimilarity by Army and Marine Corps artillery units. One exception is that the Marine Corps artillery unit cannot provide FSOs or forward observers to supported Army maneuver units. Army fire support personnel who are attached to the Army maneuver unit provide these fire support functions. The Marine Corps artillery's firing unit, linked by frequency-modulation radio communications, performs firing operations.

3-218. The primary mission of the MAGTF air combat element is to support the MAGTF. The joint force commander has the authority to apportion Marine Corps air support when the MAGTF commander identifies excess sorties that are not required to support MAGTF operations. There are six functions of Marine Corps aviation: offensive air support, antiair warfare, assault support, aerial reconnaissance, electronic warfare and control of aircraft and missiles. For more on operating with Marine Corps forces including their organization and capabilities see FM 3-09, ATP 3-52.2, and Marine Corps Warfighting Publication (MCWP) 3-16.

FIRE SUPPORT CONSIDERATIONS FOR MULTINATIONAL FORCE OPERATIONS

3-219. The key to effective fire support in a multinational environment is the understanding of the nature of the multinational force. If the force is an alliance, such as NATO, then the mechanism for coordination and synchronization should be incorporated into member nation doctrine through the inclusion of standardization agreements (STANAGs). If the force is a coalition force, then the multinational force commander should create a coalition agency for the control of multinational fire support. The mechanism for controlling fires throughout the multinational force will have to be developed. If a lead nation is established, then at national contingency level, the lead nation's procedures will be used. In those elements below national contingency level, national procedures are used.

3-220. There are two ways of controlling fires: either the lead nation can provide its tactical fire control systems to the other nations at national contingency level; or if there is no lead nation or the lead nation is unable to provide tactical fire control systems, then competent and well-trained liaison officers must be used. An exchange of liaison personnel down to the lowest possible echelon along the common boundary will ease synchronization and fire support coordination. These liaison officers must understand the doctrine and procedures of their own nation and be capable of representing their commanders. Liaison personnel must not only be tactically and technically competent, but also ideally, should be proficient in the language of the force to which they are providing liaison. They must also be properly equipped with communications assets, transportation and necessary supplies, references, and checklists for sustained operations.

3-221. The types and capabilities of fire support available from other nations will be varied. Fire support planners must understand each nation's fire support assets and capabilities in order to assist the BCT commander in assigning missions to units. This is necessary to prevent the assignment to a member nation force of a mission that it cannot support. Out of national pride, a member nation force may be unwilling to decline the mission or to even mention its unsuitability for the mission.

3-222. The FSCoord and fires cell planners should know as much as possible about the fire support available to the multinational force. As early in the planning process as possible, and as soon as countries are identified, they should begin developing a profile on each nation's capabilities. Early exchange of liaison officers can greatly facilitate development of the profiles. Each profile should include:

- What assets are available, their capabilities, and munitions types.
- Both lethal and nonlethal assets; information collection and target acquisition assets; meteorological support; and fire support related or capable sustainment elements.
- The training of each unit by asset.
- When each asset will be available.

3-223. The FSCoord and fires cell planners should ensure that all FSOs and fires cell personnel, including those of subordinate and supporting units, understand the important role liaison officers serve (both those sent out and those received). They must ensure liaison officers are properly used and incorporated into the fire support planning process. The staff sections, cells, or elements that, when available, normally combine to integrate fire support operations at the BCT include:

- Fires cell.
- Air Force TACP consisting of the air liaison officer and JTACs.
- Army aviation liaison officer.
- Air defense officer.
- Naval gunfire liaison officer.
- S-3 (movement and maneuver) including the information operations officer.
- S-3 Air and the Army aviation liaison officer.
- S-2.
- BCT staff weather officer.
- Military intelligence company commander.
- Maneuver enhancement brigade liaison officer.
- Functional and support brigade liaison officers.
- Tactical military information support operations detachment commander.
- BCT targeting working group and targeting board.

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Chapter 4

Augmenting Fire Support

Most brigade combat team (BCT) operations are planned and executed as part of an integrated joint operation. The BCT plans to employ fire support assets from echelons above the BCT, including those from a supporting field artillery brigade (FAB) and Air Force, Navy, or Marine Corps aviation. The enemy must maneuver to mass and bring to bear sufficient combat power. During maneuver, the enemy is vulnerable to detection and concentrated firepower. The BCT augmented with joint fire support resources can rapidly shift emphasis from shaping operations to decisive operations. The ability to capitalize on the inherent flexibility and speed of the fires system enables the timely exploitation of the enemy's vulnerabilities as they are presented. Additionally, the tactical agility of the BCT allows it to destroy enemy formations disrupted by Army and joint fire support and exposed to rapid maneuver. Joint capabilities combined with BCT capabilities provide an effective counter to the array of conventional and irregular threats posed to the BCT.

The four sections of this chapter are devoted to augmenting BCT organic capabilities for fire support. Section I begins the chapter by describing fire support enablers within the BCT. Sections II and III discuss BCT fire support augmentation from higher Army echelons and Army Aviation air-ground operations. Section IV concludes the chapter with a discussion of air operations supporting the BCT.

SECTION I – FIRE SUPPORT ENABLERS WITHIN THE BRIGADE COMBAT TEAM

INFORMATION COLLECTION

4-1. The BCT commander's intent, concept of operations and intelligence preparation of the battlefield (see ATP 2-01.3 and ATP 2-19.4) focus efforts of the intelligence staff and facilitate identification of high-payoff targets within the high-value targets.

4-2. To support situational awareness, the BCT information collection team receives digital reports from the cavalry squadron and other reporting elements. *Information collection* is an activity that synchronizes and integrates the planning and employment of sensors and assets as well as the processing, exploitation, and dissemination of systems in direct support of current and future operations (FM 3-55). It is important to involve the BCT Staff Weather Officer to provide weather effects assessments for the information collection assets based on current and forecast weather conditions in order to optimize information collection.

4-3. The team uses near real-time moving target indicators, imagery from synthetic aperture radars, preprocessed communications intelligence, common ground station reports, and electronic intelligence and imagery from the tactical exploitation of national systems. The organic capability to exploit imagery from organic sensors allows the S-2 to annotate and disseminate imagery intelligence to subordinate elements:

- The Joint Surveillance Target Attack Radar System (JSTARS) common ground station provides JSTARS intelligence feeds and joint tactical terminal feeds of theater and national intelligence broadcasts to the BCT main command post.
- The unmanned aircraft systems ground control station, combined with an unmanned aircraft system remote video terminal, brings in imagery to the command post from unmanned aircraft.

The ground control station is not strictly a video tool; it allows unmanned aircraft to be controlled and vectored by an operator.

4-4. The cannon field artillery battalion S-2, with the aid of the BCT fires cell, assesses intelligence reports and information to enhance the common operational picture and nominate targets to the BCT. They work with the BCT S-2 and intelligence staff to focus priority intelligence requirement-based collection efforts to identify and locate high-payoff targets within the high-value targets. The BCT's cannon field artillery battalion uses this enemy focused intelligence in the development and execution of artillery fires supporting BCT offensive and defensive tasks.

4-5. The BCT main command post fires cell is fully networked with the BCT S-2 and the military intelligence team and will work closely with all fire support providers to manage the attack of targets and to produce battlefield damage assessment of targets once attacked. The military intelligence company is organized with a mission management capability to provide dynamic tasking of organic information collection assets in response to targeting priorities and target attack needs. The information collection team uses combat information from organic and external collectors that is routed to cue unmanned aircraft systems, or other sensors necessary to update and refine target attack information. Special consideration is given to high-payoff targets. One such focus is the counterfire program that is so essential to BCT survivability and flexibility. Depending on the magnitude of the indirect fire threat, a large portion of the BCT's information collection capabilities may be dedicated to counterfire programs. An early focus on mitigating the indirect fire threat will improve the BCT's survivability.

4-6. Targeting is a fundamental task of the fires warfighting function that encompasses many disciplines and requires participation from many staff elements. The BCT main command post fires cell coordinates target acquisition, target disseminating and target engagement functions for the BCT commander. The intelligence officer provides the fires cell and members of the targeting working group and targeting board (S-3, fire support coordinator (FSCOORD), brigade fire support officer (FSO), fires cell planners and targeting officers, air liaison officer, electronic attack officer, and others) with information and intelligence for targeting the threat's forces and systems with direct and indirect fires. This includes identification of threat capabilities and limitations.

4-7. When high-value targets are identified, the targeting working group and targeting board determine which critical components of high-value targets can be successfully identified, targeted, and attacked to create enemy failure. These components become potential high-payoff targets. For more information on intelligence support to targeting, see Army doctrine reference publication (ADRP) 2-0, ATPs 2-01, 2-01.3 and 2-19.4.

4-8. The intelligence officer ensures the information collection plan supports the finalized targeting plan. Subtasks of intelligence support to targeting include providing intelligence support to target development and to target detection. This is a drill-down effort to identify and locate critical enemy elements or nodes within the functioning network of high-value targets that can be attacked to cause the network to fail. This can be a campaign-like effort with support from many sources including:

- Direct observation by special operations forces, scouts, and forward observers.
- Electronic intelligence sources such as the Prophet radio frequency intercept system.
- Human intelligence sources employed by the BCT military intelligence tactical human intelligence platoons.
- Weapon locating radars.
- Unmanned aircraft systems.
- Higher headquarters and joint sources.
- Maneuver formations down through the squad level.

RECONNAISSANCE AND SURVEILLANCE

CAVALRY SQUADRON

4-9. The primary mission of the cavalry squadron is to obtain information that answers the BCT commander's critical information requirements. The squadron is optimized for conducting reconnaissance and counter-reconnaissance throughout the BCT's area of operations.

ENGINEER

4-10. The BCT's engineer company provides engineer reconnaissance capabilities that enable the collection of tactical and technical information (such as detailed information on complex obstacles or a proposed crossing site) to support the BCT's freedom of maneuver and the protection of friendly forces and facilities.

BRIGADE SPECIAL TROOPS BATTALION OR BRIGADE ENGINEER BATTALION

4-11. The brigade special troops battalion found in the Army National Guard includes a military intelligence company and a chemical, biological, radiological, nuclear (CBRN) reconnaissance platoon. The brigade engineer battalion found in the Active Army provides organic engineer, military intelligence, signal (antitank company–Stryker BCT only), planning, and execution capabilities to the BCT. See ATP 3-34.22.

4-12. The military intelligence company provides all-source analysis and information collection integration for the BCT. It also has the ground collection platoon with: signals intelligence, measurement and signature intelligence, and human intelligence assets; and the tactical unmanned aircraft system platoon for reconnaissance, target acquisition, and battle damage assessment tasks. Tactical human intelligence from the military intelligence company and any units operating in the BCT area of operations provides invaluable information and intelligence to the collection effort. Due to their cultural awareness and their close engagement with local populations, these teams provide the commander unique insights and valuable information for satisfying commander's critical information requirements and for providing input to decision making.

4-13. The BCT military intelligence company provides signal intercept support that is capable of establishing a signal baseline that can detect signal emissions broadcasting in sufficient strength to reach the intercept system. The intercepted signal can be attacked or exploited for content by linguists. Emissions tracked by multiple systems produce grid locations. For more on the CBRN reconnaissance platoon and the military intelligence company see ATP 3-90.61.

UNMANNED AIRCRAFT SYSTEMS

4-14. The primary mission of the unmanned aircraft system is to perform information collection using an electro-optical or infrared mission payload. Unmanned aircraft systems are capable of locating and recognizing major enemy forces, moving vehicles, weapons systems, and other targets which contrast with their surroundings. Some unmanned aircraft systems that employ synthetic aperture radar and ground moving target indicator sensors should overcome the effects of well-camouflaged enemy forces. Unmanned aircraft system capabilities are maximized when employed as part of an overall collection plan; and when integrated with and cued by other intelligence systems in a synchronized effort to support the BCT commander's needs.

4-15. Unmanned aircraft system capabilities make them ideal for conducting brigade reconnaissance and target acquisition. Should the BCT commander direct, an unmanned aircraft system mission planning and control section can be provided to the target acquisition platoon of the cannon field artillery battalion to assist in conducting close support, counterfire, and suppression of enemy air defenses operations. The mission planning and control section consists of a ground control station and associated personnel and supporting equipment. The cannon field artillery battalion S-3, S-2, BCT SWO, and targeting officer can provide the mission planning and control section the information required to plan and execute the unmanned aircraft system mission. When provided unmanned aircraft system support, the cannon field

artillery battalion can: acquire and locate enemy assets to facilitate counterfire; acquire and transmit targetable data to support the attack of high-payoff targets and targets of opportunity; and provide target designation, surveillance and battle damage assessment. This arrangement allows the BCT reconnaissance elements to concentrate on collecting combat information while fire support staffs support them with target acquisition, fires, and battle damage assessment. Acting together, the BCT information collection and target acquisition staff, and cannon field artillery battalion delivery units constitute a highly capable reconnaissance-strike capability. Air Force, Navy, Marine Corps, Coast Guard and Special Operations Command unmanned aircraft systems that may be available to the BCT are described in FM 3-04.155. See also ATP 3-04.64.

CAVALRY SQUADRON

4-16. Each cavalry troop and maneuver company fire support team (FIST) has the capability to laser-designate targets for precision-guided munitions. The FIST also supports troop operations by aiding in the employment of supporting mortars and close air support. The cavalry squadron may also have operational control (OPCON) of some of the BCT elements that also have the capability to employ precision-guided munitions. Supporting fires allocated to cavalry squadron operations will be specified in fire support tasks. The BCT commander can direct the cavalry squadron to employ part or all of its assets in the counterfire fight if a significant enemy indirect fire threat exists.

4-17. The target location accuracy in an initial contact report may not be sufficient to generate an immediate fire mission or other tactical response. The brigade FSO must be aware of this and ensure that fires cell planners and targeting personnel work closely with the cavalry squadron fires cell personnel to see that minimum target selection standards are met or cross-cue other sensors to gain an accurate target location.

SENSOR INPUTS

4-18. Direct sensor input to the cannon field artillery battalion may be necessary to support counterfire, counterreconnaissance, or close combat in order to fully exploit the Advanced Field Artillery Tactical Data System (AFATDS) digital architecture to provide timely and responsive fire support. The BCT main command post fires cell must constantly monitor the execution of current operations and consider the full range of both lethal and nonlethal attack options to meet the commander's guidance to create desired effects. The brigade FSO, fires cell planners and the targeting working group and targeting board assist in determining how to best create the BCT commander's desired effects.

FIRE SUPPORT SUSTAINMENT

4-19. Sustainment of fire support is one of the four basic fire support tasks described in Joint Publication (JP) 3-09. In the BCT, fire support sustainment is focused on the BCT's field artillery battalion.

4-20. The brigade support battalion (BSB) organic to the BCT performs selected consolidated functions. The BSBs generally have an organic distribution, maintenance, and medical company and a number of forward support companies. The forward support companies are assigned to the BSB and can be in direct support DS or under the OPCON or tactical control of the brigade's maneuver battalions and cavalry squadron as well as the BCT's cannon field artillery battalion.

4-21. BCTs have a significant organic capability to sustain their own operations. This capability serves to ensure freedom of action, extend operational reach, and prolong endurance. Although BSB capabilities and structure differ somewhat depending upon the type of BCT (armored, infantry, or Stryker), core capabilities include maintenance, medical, supply, and distribution. Logisticians maximize throughput distribution to increase the level of support to the Soldier. The BSB commander, as the senior logistics commander and single logistics operator for the BCT, is responsible for all sustainment support of the BCT. The BSB support operations officer is the principle staff officer who coordinates, synchronizes and executes the brigade support plan. The BCT S-4, in coordination with the BCT S-1, develops the support plan and communicates mission requirements to the support operations officer. The support operations officer coordinates external support from the sustainment brigade.

4-22. The principal source of support to the cannon field artillery battalion is the BSB, which provides responsive logistical support by positioning a forward support company with the field artillery battalion. The forward support company commander assists the field artillery battalion S-4 in creating the logistics support plan. The forward support company executes the plan in accordance with the battalion commander's intent. The S-4 coordinates all external sustainment from the BSB support operations officer. For more on BCT sustainment operations see FM 3-96 and Army techniques publications (ATP) 4-90 and 4-93.

4-23. The firing platoon can provide fires without its parent battery or battalion. Logistical support of the detached platoon can be a significant challenge. Distributed operations must be carefully planned and specific resources identified and allocated to support the platoon during mission execution. The extensive requirement for artillery ammunition resupply may require supplemental transport to be provided by the supported commander. Support considerations may include:

- Stockpiling ammunition.
- Throughput deliveries.
- Aerial resupply.
- Supply point distribution.

SECTION II – ASSISTANCE AND AUGMENTATION FROM HIGHER ARMY ECHELONS

FIRES CELLS AT DIVISION AND CORPS

4-24. The corps and division fires cells synchronize all fire support for the command to include Army, joint, and unified action partners. Through targeting, cyber electromagnetic activities are integrated and synchronized by the electronic warfare officer. Corps and division fires cells also participate in assessment (battle damage, munitions effectiveness, reattack recommendations); develop planning guidance; provide target intelligence for planning and execution and coordinate with the battlefield coordination detachment (BCD) collocated with the respective joint air operations center. For more on the fires cell at division and corps echelons see ADRP 3-09 and FM 3-09.

BATTLEFIELD COORDINATION DETACHMENT

4-25. The BCD's mission is to provide Army forces liaison at the joint air operations center or United States (U.S.) Air Force air and space operations center. The detachment provides critical and continuous coordination between the air and land commanders. Its staff clearly articulates the Army forces commander's or land component commander's requests for air operations support for the ground operations to complement the joint forces commander's desired end state.

4-26. For more on the BCD, see ADRP 3-09, FM 3-09 and ATP 3-09.13. See Appendix A for additional joint or Army attack systems and their capabilities.

FIRE SUPPORT AUGMENTATION FROM THE FIELD ARTILLERY BRIGADE

4-27. A division, corps, joint force land component command, or joint task force may have one or more field artillery brigades (FAB) assigned, attached, or placed under its OPCON, however a Regular Army FAB is normally assigned to a corps while a National Guard FAB is attached or OPCON to a National Guard division headquarters. FABs are task-organized to accomplish assigned tasks. The FAB's supported commander assigns the FAB its mission. The supported commander provides guidance necessary to coordinate the FAB's actions with BCTs and other supporting elements of the command.

4-28. The FAB may be designated by the corps commander as the force field artillery headquarters (FFA HQ). A FAB is not always designated by the corps commander as the FFA HQ because there may be more than one FAB controlled by the corps.

4-29. The FAB's main command post fires cell includes operations and counterfire, target processing, and fire control elements. These three elements form the nucleus of the FAB main command post's current operations integrating cell. Each of the other elements in or working closely with the fires cell (fires, information operations, air defense airspace management [ADAM], air support and liaison) assists these current operations core elements by providing additional expertise or dedicated manpower on an as needed basis.

Note: Depending on mission variables and the desires of the FAB commander, the targeting element may be part of either the fires cell or the intelligence cell.

4-30. FAB organic assets include a BSB, a signal network support company, a target acquisition platoon and a headquarters and headquarters battery. The FAB and each of the subordinate elements can be augmented (task organized) as required. This may include a combination of one to five MLRS or HIMARS or cannon field artillery battalions, as well as other enablers, such as counterfire radars, information collection, information operations, and cyber electromagnetic activities assets.

MLRS AND HIMARS BATTALIONS

4-31. The MLRS and HIMARS systems assigned to FABs support BCT operations as needed. For example a FAB MLRS battalion or battery (equipped with either tracked M270A1 or wheeled M142 launchers) may reinforce the cannon field artillery battalion of a BCT conducting a division's decisive operation. In very rare cases, an entire FAB could support the operations of a single BCT (such as when a BCT is the covering force for a corps). For more information on MLRS and HIMARS operations and munitions capabilities, see FM 3-09 and ATP 3-09.60.

FIELD ARTILLERY BRIGADE CANNON FIELD ARTILLERY BATTALIONS

4-32. Cannon field artillery battalions typically have a command or support relationship with a BCT or a FAB. A cannon field artillery battalion assigned or attached to a FAB is typically further given a command or support relationship to support the whole force or to augment the fires of a specified field artillery unit. Based on the mission variables of METT-TC, the division may augment a BCT's field artillery battalion with one or more FAB cannon field artillery (155-mm) battalions. The FAB cannon field artillery battalion may be either self-propelled or towed:

- The M109-series self-propelled 155-mm cannon field artillery battalion is restructuring from two 8-gun firing batteries to three 4-gun firing batteries.
- The M777-series towed 155-mm howitzer field artillery battalion has three 4-gun firing batteries.

TARGET ACQUISITION PLATOON

4-33. Each FAB has an organic target acquisition platoon that includes radar sections, a target processing section, and a combined meteorology and survey team:

- The radar platoon is organized and equipped to detect, locate, classify, report, and communicate the point of origin, predicted point of impact, radar cross-section, and velocity of indirect fire systems; it can also confirm the actual air burst or impact location of friendly fires.
- The target processing section recommends and coordinates radar sectors of search, monitors operations, develops targets, requests battle damage assessment and acts as net control station for the target acquisition command and intelligence net.
- The combined meteorology and survey teams provide the meteorological support and common survey needed to ensure the accuracy of indirect fires; survey data can be provided to other systems (such as signal) when assets are available.

SECTION III – ARMY AVIATION AIR-GROUND OPERATIONS

4-34. Combat aviation brigade attack and reconnaissance helicopter elements and armed unmanned aircraft systems may assist the BCT by conducting attacks where enemy forces may be either in contact or out of contact with friendly ground forces in support of BCT operations. See Appendix A for additional joint or Army attack systems and their capabilities.

MISSION PLANNING

4-35. Although integrated air and ground missions are conducted with or under the control of the BCT and its subordinate and supporting units, direct coordination between Army aviation aircrews and FISTs, FSOs, forward observers and others at the company level is usually required. The minimum information requirements the Army aviation team must be provided by the supported unit to ensure accurate and timely support include:

- The situation including friendly forces' location, enemy situation highlighting the known enemy air defense threat in the supported unit's area of operations, mission request procedures, and tentative engagement area coordinates.
- BCT and its subordinate and supporting unit graphics update using the maneuver control system, or aviation mission planning system, or by radio communications update of critical items such as limit of advance, fire control measures (including FSCMs), and maneuver graphics.
- Fire support coordination information including the location, call sign and radio frequencies of the BCT's field artillery battalion, other supporting artillery, and maneuver battalion mortars.
- Ingress and egress routes into the area of operations including passage points and air routes to the holding area or landing zone.
- Call signs and frequencies of the unit(s) in contact down to the company level so air-ground coordination can be done on command frequencies and to better enable situational understanding for all elements involved.
- Global positioning system and single-channel ground and airborne radio system time coordination: care must be taken to ensure that all units are operating on the same time.

4-36. The air mission commander and ground unit key leaders must consider the risk to friendly forces before weapon selection and engagement. For risk estimate distances for armed helicopter weapons, see ATP 3-09.32.

ENGAGEMENT

4-37. During engagement, open communications and continuous coordination with friendly ground elements are required to ensure the BCT commander's desired effects are achieved. Coordination of both direct and indirect fires produces the most efficient results in the least amount of time with the least risk. This coordination includes both aviation assets (fixed- and rotary-wing) and cyber electromagnetic means that may be employed.

TARGET IDENTIFICATION AND MARKING

4-38. Positive target identification and location are essential for achieving the desired effects on the target and in reducing the risk of fratricide. Techniques that can be effective during air-ground operations with Army aircraft include:

- Reference point technique—uses a known point or an easily recognizable terrain feature.
- Grid technique—uses grid coordinates to define the point.
- Operational area and terrain technique—uses terrain and graphics available to both air and ground units.
- Phase line technique—uses graphics available to both air and ground units.

4-39. There are various ways to mark a location or target. Techniques include:

- Mark friendly positions.
- Mark enemy positions.
- Mark by direct fire.
- Use Infrared marks.
- Mark by indirect fire
- Use backup marks.

4-40. Artillery or mortar fires are effective means of assisting aircrews in visually acquiring targets. Before choosing to mark by artillery or mortars, observers should consider the danger of exposing these supporting arms to enemy indirect fire acquisition systems and the additional coordination required. Marking rounds (usually smoke or illumination set to burn on the ground) should be delivered as close to the target as possible. Marking rounds are most effective when delivered within 100 meters of the target, but those within 300 meters are generally effective enough for direct-fire armed aircraft. If the situation requires a precise mark, observers or spotters can adjust marking rounds early to ensure that an accurate mark is delivered. This action may, however, alert the enemy to an imminent attack. When marking rounds are used to indicate the cessation of indirect fires so that aircraft can attack the target, the marking round should be the last round fired.

Note: The marking of friendly positions is the least desirable method of target location information and should be used with extreme caution.

4-41. Target marking aids aircrews in locating the target that the unit in contact desires them to attack. Ground commanders should provide the target mark whenever possible. Target marks should be planned to include sufficient time before weapons employment to ensure target acquisition by aircrews. The target mark can be provided by direct or indirect fire weapons or from an aircraft with a forward air controller (airborne) onboard. To be effective, the mark must be timely, accurate, and easily identifiable. Target marks may be confused with other fires on the battlefield such as suppression rounds, detonations, and marks on other targets. Although a mark is not mandatory, it assists in achieving aircrew accuracy, enhances situational understanding, and reduces the risk of fratricide.

4-42. The air mission commander provides battle damage assessment to the ground commander who determines if reattack is required to achieve desired effects. Support continues until the desired effects are created. See FM 3-04.111 for more on Army aviation operations and FM 3-04.126 for additional information on marking friendly and threat positions for identification by aircrews.

SECTION IV – AIR OPERATIONS SUPPORTING THE BCT

4-43. Air support by other Service manned and unmanned aircraft may extend the reach of BCT-directed fires. The theater air control system and the Army air-ground system bring together the Air Force and Army components to conduct air support for the Army and suppression of enemy air defenses support for Army aviation and the Air Force during joint operations. For more on the theater air control system and the Army air-ground system, see ATP 3-52.2.

PLANNING AND REQUESTING AIR SUPPORT

4-44. The BCT FSCOORD, fires cell planners, and targeting officers identify targets to be attacked with air assets. Fire support personnel develop a prioritized initial target list (the development process includes predicting the target types and the confirmed targets that will logically be expected to move before they are attacked) and send the list through channels for review and evaluation by higher headquarters. Both the current Air Force tactical intelligence database and the current tactical air reconnaissance operations database can provide useful target information during the initial planning for BCT operations. Refinement of target information is a continuous process up to the time of the launch of attack aircraft. Information for the initial target list should include the:

- Target type.
- Desired effects; for example, disrupt, delay, or destroy.
Time on target expressed as a specific time, a not-later-than time, or an inclusive time period.
- Air request number.

4-45. Certain types of targets may be dynamic in nature; or certain attack considerations may affect how, when, and where the target is attacked. In these instances, mission-type requests are acceptable, but not optimal. A request for effects on a target remains the best way for a supported commander to obtain desired results. The requesting commander should provide sufficient information outlining the desired effects and any external or self-initiated tactical restrictions or limitations. This allows close air support to best support the commander's intent while simultaneously giving the air support as much flexibility as possible. Ground commanders should be aware that immediate close air support requests might have to be filled by aircraft loaded with less-than-optimum munitions.

AIR RECONNAISSANCE SUPPORT FOR BCT OPERATIONS

4-46. Air reconnaissance is available for use by Army intelligence and targeting agencies. Air reconnaissance is ideal for target detection and surveillance and for information collection in areas that Army assets cannot adequately range or cover.

AIR RECONNAISSANCE CAPABILITIES

4-47. The Air Force employs a mix of manned and unmanned aircraft systems, overhead national assets, and other sensor platforms to collect a wide variety of intelligence data including photo imagery and electronic reconnaissance. Any type of aircraft can accomplish weather and visual reconnaissance. Unmanned aircraft systems provide medium to high altitude, heavy payload, multi-mission and surrogate satellite support across all mission areas with flight duration in excess of 24 hours. Unmanned aircraft systems are capable of employing the widest variety of sensors and payloads in support of joint forces, including the BCT.

4-48. Reconnaissance aircraft will use electro-optic, infrared, electronic, and synthetic aperture radar imagery sensors to collect data on enemy targets. Unmanned aircraft systems are capable of providing near real-time data from sensors data-linked via line of sight or satellite to ground control stations.

REQUESTING AIR RECONNAISSANCE FOR BCT OPERATIONS

4-49. A *request for information* is any specific time-sensitive ad hoc requirement for intelligence information or products to support an ongoing crisis or operation not necessarily related to standing requirements or scheduled intelligence production (JP 2-0). A request for information can be initiated to respond to operational requirements and will be validated in accordance with the combatant command's procedures.

4-50. Once validated, an information requirement becomes a collection requirement. The BCT S-2 coordinates with the S-3 to determine if organic assets are capable of satisfying the requirement. If organic assets are not available to satisfy the request, then the request is forwarded to a higher echelon for consideration. The BCT S-2 who requires air reconnaissance also coordinates with the BCT Air Force air liaison officer. Before forwarding a request for air reconnaissance up the chain, the S-2 should consider whether the information can be obtained by using Army assets or if the information required is already available in the Air Force or joint intelligence database. Essentially there are two types of aerial reconnaissance collection requests: pre-planned and ad hoc.

Planned Collection Requests

4-51. Planned collection requests are those required by the BCT and its subordinate and supporting units for planning and conducting future operations or to meet existing standing requirements for indications and warnings and operations security. Coupled with continuous assessment, planned information collection enables the seamless transition from pre-planned missions to dynamic tasking and cross-cueing of

information collection assets. Collection requirements for target development, target verification, and combat assessment are typical pre-planned requirements.

4-52. Digital technologies enable the BCT to receive an ever-increasing amount of intelligence by using intelligence reach, priority intelligence requirements, and information requirements. Potential sources of information at echelons above the BCT include:

- Integrated broadcast service.
- Air Force U-2 reconnaissance aircraft.
- Air Force E-8 JSTARS.
- Air Force RC-135 Rivet Joint.
- Air Force RQ-4 Global Hawk.
- Guardrail common sensor signal intercept.
- National agency databases.
- Theater databases.
- Non-Department of Defense intelligence databases.
- Multinational databases.
- Combat aviation brigade attack/reconnaissance aircraft (see FM 3-04.111 and FM 3-04.126).
- Special operations forces.

Ad Hoc Collection Request

4-53. An ad hoc collection request is a collection requirement that is submitted outside the normal information collection planning cycle (after the air tasking order and daily collection plan have been published). Simply put, it is getting information collection integrated into a time-sensitive operation. Proper coordination through the chain of command is vital throughout the collection management process and ad hoc collection requests are no different. BCTs must ensure they have coordinated their ad hoc collection requests with their higher headquarters information collection planners. This makes the ad hoc collection process quicker and ensures proper prioritization of ad hoc collection requests with existing requirements already tasked for collection during the air tasking order cycle. Unmanned aircraft systems are ideally suited for ad hoc missions that were not anticipated due to rapidly changing tactical situations. As with any ad hoc mission, however, the supported unit will have to take a predesignated payload that may not be the payload of choice. For more on requesting air reconnaissance support for BCT Operations, see ATP 2-19.4. For more on air reconnaissance see JP 2-01.3.

Note: The airspace element in the BCT is the air defense and airspace management/brigade aviation element (ADAM/BAE) typically located in the brigade main command post. The combat aviation brigade, DIVARTY and the maneuver enhancement brigade have the smaller ADAM with similar airspace capabilities. The ADAM/BAE has established communication links with the airspace control authority normally located at an established air operations center. The ADAM/BAE integrates information systems that interact with the joint network (Link-16) to provide a three-dimensional, joint, integrated, near-real-time, common air picture. With these systems, the ADAM/BAE coordinates immediate and planned ACMs and FSCMs as required to support operations. The ADAM cell receives airspace requirements from subordinate brigade elements and coordinates these ACMs and FSCMs via the Air and Missile Defense Work Station with the next headquarters airspace element. The AFATDS feeds the gun-target line and trajectory information into the Tactical Airspace Information System and the Air and Missile Defense Work to provide input to the air picture. Planned ACMs appear in the published airspace control order (ACO). BCT subordinate elements request immediate ACMs via digital or voice communications. The ADAM/BAE coordinates the immediate ACM requests with the division airspace element in the Joint Air-Ground Integration Center. Approved requests appear on the common air picture. The ADAM/BAE continuously plans for, monitors and controls the operations of all airspace users in the BCT's airspace that may affect the combat aviation brigade or BCT operations.

CLOSE AIR SUPPORT FOR BCT OPERATIONS

4-54. *Close air support* is air action by fixed- and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces that require detailed integration of each air mission with the fire and movement of those forces (JP 3-0). Based on threats and the availability of other means of fire support or supporting arms, synchronizing CAS in time, space, and purpose with supported ground forces may be the most detailed and continuous integration task performed by commanders and staffs.

KEY CLOSE AIR SUPPORT PERSONNEL AND THEIR RESPONSIBILITIES

4-55. All participants in CAS are responsible for effective and safe planning and execution. Each participant must make every effort to identify friendly units, enemy forces, and civilians prior to targeting, clearing fires, and weapons release.

Air Force Air Liaison Officer

4-56. The BCT commander establishes the priority, timing, and desired effects to be provided by close air support within the area of operations. The Air Force air liaison officer advises the BCT commander on the capabilities and limitations of airpower, and assists the BCT commander, S-3, S-2, FSCOORD, and brigade FSO in planning, requesting, and coordinating close air support. The Air Force air liaison officer leads the BCT's TACP (described in chapter 1); its members provide the primary terminal attack control (see the discussion in chapters 1 and 5) for close air support.

Joint Terminal Attack Controller

4-57. Joint terminal attack controllers (JTAC) provide recommendations to the BCT and subordinate commanders on the use of close air support and its integration with ground maneuver. The JTAC also validates targets of opportunity, submits immediate requests for close air support, controls close air support with the supported commander's approval, and performs battle damage assessment. Currently, most JTACs are enlisted airmen. The JTAC must:

- Know the enemy situation, selected targets, and location of friendly units.
- Know the supported unit's plans, position, and desired effects.
- Validate targets of opportunity.
- Advise the commander on proper employment of air assets.
- Submit immediate requests for close air support.
- Control close air support with the supported commander's approval.
- Perform battle damage assessment.

Joint Fires Observer

4-58. JTACs cannot be in a position to see every target on the battlefield. Trained joint fires observers (see the discussion in chapters 1 and 5), in conjunction with JTACs, assist maneuver commanders with the timely planning, synchronization and responsive execution of all joint fires. See also FM 3-09 and ATP 3-09.30.

Forward Air Controller and Forward Air Controller (Airborne)

4-59. A *forward air controller* is an officer (aviator/pilot) member of the tactical air control party who, from a forward ground or airborne position, controls aircraft in close air support of ground troops (JP 3-09.3). A *forward air controller (airborne)* is a specifically trained and qualified aviation officer, normally an airborne extension of the tactical air control party, who exercises control from the air of aircraft engaged in close air support of ground troops (JP 3-09.3).

Tactical Air Coordinator (Airborne)

4-60. A *tactical air coordinator (airborne)* is an officer who coordinates, from an aircraft, the actions of other aircraft engaged in air support of ground or sea forces (JP 3-09.3). The JSTARS performs tactical air

coordination (airborne). In the absence of a JSTARS, a forward air controller (airborne) provides communications relay between the Air Force TACP and attack aircraft as well as other agencies of the tactical air control system. Tactical air coordination (airborne) also expedites close air support aircraft-to-forward air controller hand-off during heavy traffic close air support operations.

Company Fire Support Team

4-61. The company FIST (see chapter 1) plans, coordinates, and executes fire support for the company commander's concept of operations. In the absence of an Air Force TACP, the company commander may use the FIST to coordinate close air support. Non-JTAC-qualified personnel providing terminal attack control of a close air support mission may increase the risk of fratricide. The decision to use non-JTAC-qualified personnel for terminal attack control of close air support must be balanced against potential loss of friendly forces to enemy action. Regardless, FIST personnel provide qualified and expert targeting information that close air support and other fire support personnel can use.

Qualified Helicopter Aircrews

4-62. Qualified helicopter aircrews can also function as a forward air controller (airborne); providing the ground commander with an additional capability for terminal attack control of close air support. A heliborne JTAC may also direct the terminal attack control of close air support. This provides the ground commander flexible and responsive terminal attack control across a larger area of operations and is especially useful when JTACs are limited and Army aviation support is available.

PLANNING AND COORDINATING CLOSE AIR SUPPORT FOR BCT OPERATIONS

4-63. At the BCT level, the joint fire support planning team [includes the](#) Air Force TACP personnel, the FSCoord, brigade FSO, fires cell planners and ADAM/BAE, the targeting working group and the targeting board. Close air support planning is an integral part of the BCT military decisionmaking process (MDMP) and is crucial in developing the overall BCT fire support plan. Integrating and coordinating air support with surface fires is a major challenge. The overarching goal is to integrate fire support with maneuver in such a way that the BCT commander's desired effects from air support are achieved without suspending the use of other means of fire support or unnecessarily delaying the scheme of maneuver. An additional goal is to offer a reasonable measure of protection to supporting aircraft from friendly surface fires and enemy fires. It is important to leverage and exploit weather effects information provided by the SWO based on current and forecast weather conditions impacting the employment of close air support assets.

PREPLANNED CLOSE AIR SUPPORT

4-64. Forward as preplanned requests those planned close air support requirements that can be foreseen early enough to be included in the joint air tasking order or the mission order. See figure 4-1.

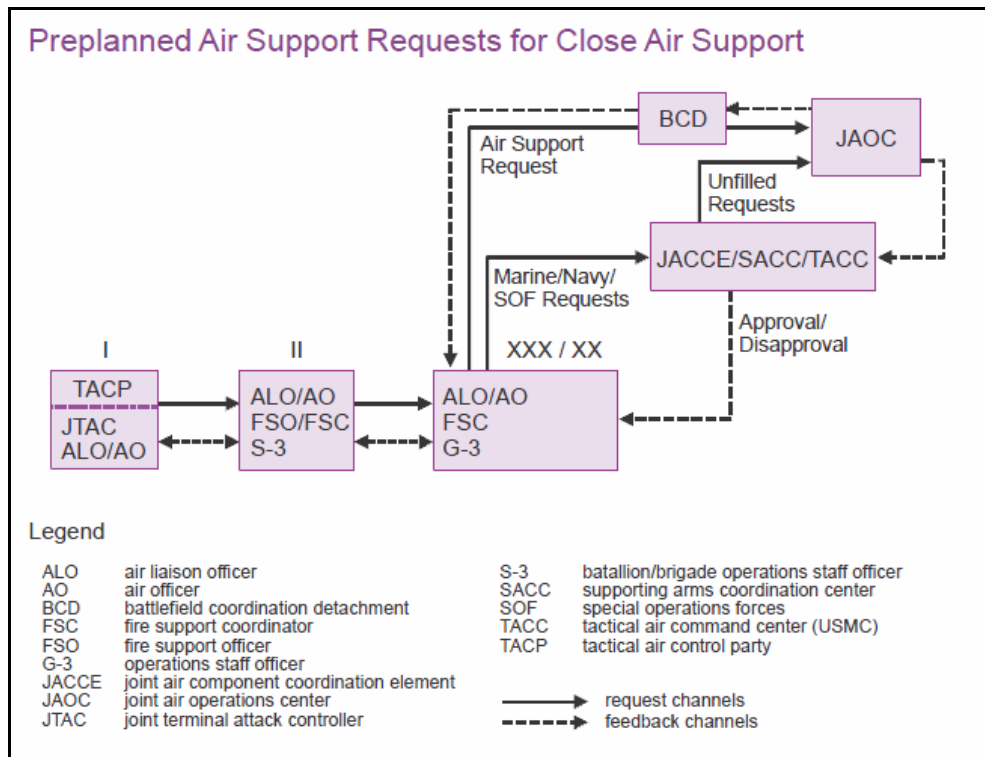


Figure 4-1. Preplanned close air support request channels (JP 3-09.3)

4-65. The BCT S-3, Air Force air liaison officer, FSCOORD and fires cell planners must ensure that information needed to prepare the joint air tasking order (such as potential targets, desired effects, timing, and priority) is forwarded as soon as it is known. They update and refine their requests regularly as the time approaches, in accordance with the air tasking order-planning cycle. Preplanned requests may be filled with either scheduled or on-call air missions.

Scheduled Requests

4-66. Scheduled requests require the BCT S-3, Air Force air liaison officer, FSCOORD and fires cell planners to identify the target and the desired time on target well in advance. Scheduled requests provide a higher likelihood that the aircraft will have the proper weapons load for the assigned targets.

On-Call Requests

4-67. On-call requests identify an anticipated requirement for close air support during a period of time, with the exact time and place to be coordinated as the operation develops. On-call close air support allows the BCT S-3, Air Force air liaison officer, FSCOORD and fires cell planners to indicate a time frame, probable target type, and place where the need for close air support is most likely. On-call aircraft are configured with the proper ordnance for anticipated targets (for example, with anti-armor munitions) and maintain an alert status for a specified period of time. On-call requests can specify either ground or airborne alert.

IMMEDIATE CLOSE AIR SUPPORT

4-68. Immediate requests (figure 4-2 on page 4-14) for close air support frequently occur during close combat. If on-call close air support is not available, the Air Force air liaison officer advises the BCT S-3, FSCOORD and fires cell planners to divert preplanned close air support missions and forwards the request to the air support operations center.

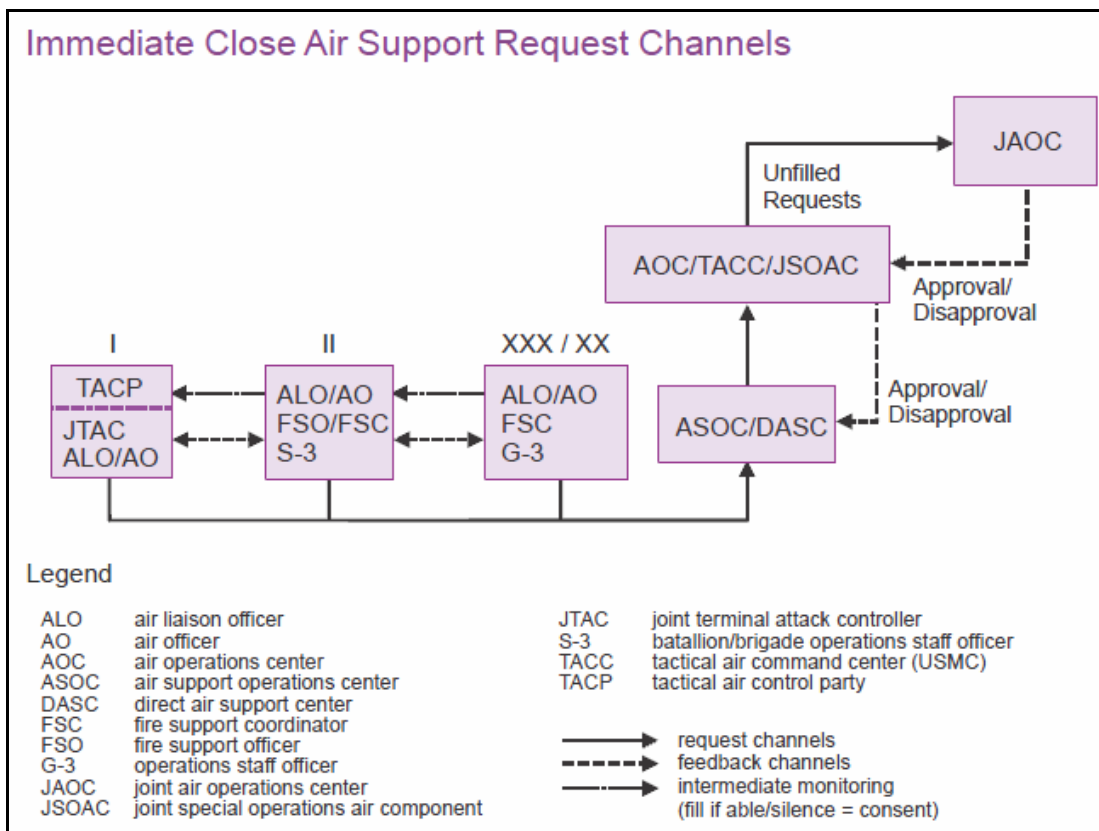


Figure 4-2. Immediate close air support request channels (JP 3-09.3)

4-69. The *air support operations center* 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 combat element (JP 3-09.3). During the execution phase of the joint air tasking order, the joint force air component command or joint force command staff may need to redirect joint air missions to cover immediate requests for high priority close air support. The joint force air component command may also seek additional support from another component to cover the immediate request. However, diverting aircraft from preplanned scheduled close air support missions is a zero-sum process. Preplanned requesters lose the same amount of firepower gained by the immediate requester.

CLOSE AIR SUPPORT EXECUTION DURING BCT OPERATIONS

4-70. Close air support is an example where decentralized execution nodes (air support operations center, TACP, and JTACs) are embedded with ground forces to plan and control joint fire support. Execution begins with a target being identified, tracked, and nominated by a unit or agency within the BCT. Close air support requires detailed integration of each air mission with the fire and movement of those forces therefore there are two processes that are continuous and overlapping in the successful attack of the target with close air support. They are coordination and close air support terminal attack control resulting in successful target engagement.

4-71. Through effective coordination, the close air support team can successfully achieve the BCT commander's desired effects for close air support. Key issues, such as battle tracking; target nomination; airspace coordination, synchronization, weapons release authority, assessment of tactical risk, types of terminal attack control, and which JTAC provides terminal attack control must be clearly understood.

4-72. Once a target is identified, it is nominated to the JTAC to engage with close air support. The BCT or subordinate or supporting unit commander nominates close air support targets based on previously planned

targets or from spot reports and targets of opportunity received during operations. The nomination can occur before or after the aircraft arrive at the contact point.

TYPES OF TERMINAL ATTACK CONTROL

4-73. There are three types of terminal attack control (Types 1-3). The commander considers the situation and issues guidance to the JTAC based on recommendations from the staff and associated risks identified in the tactical risk assessment. The intent is to offer the lowest level supported commander, within the constraints established during risk assessment, the latitude to determine which types of terminal attack control best accomplish the mission.

Type 1 Control

4-74. Use Type 1 control when the JTAC or forward air controller (airborne) requires control of individual attacks and the situation requires the JTAC or forward air controller (airborne) to visually acquire the attacking aircraft and visually acquire the target for each attack. Analysis of attacking aircraft geometry is required to reduce the risk of the attack affecting friendly forces. Language barriers when controlling multinational aircraft, lack of confidence in a particular platform, ability to operate in adverse weather, or aircrew capability are all examples where visual means of terminal attack control may be the method of choice.

Type 2 Control

4-75. Use Type 2 control when the JTAC or forward air controller (airborne) requires control of individual attacks and is unable to visually acquire the attacking aircraft at weapons release or is unable to visually acquire the target. Examples of when Type 2 control may be applicable are night, adverse weather, and high altitude or standoff weapons employment. Successful attacks depend on timely and accurate targeting data that may be provided by another source (such as a JFO, a scout, FIST, unmanned aircraft system, or special operations forces, or other assets with accurate real time targeting information). There are three key considerations for employing Type 2 control:

- Aircraft navigation or weapons system accuracy if employing unguided munitions.
- Time of flight for standoff weapons incapable of receiving in-flight targeting updates.
- Availability of digital or data link systems capable of displaying aircraft track and sensor point of interest.

4-76. When employing unguided munitions using Type 2 control, consideration must be given to host aircraft navigation and weapons system accuracy. Inaccurate navigation or weapon systems can result in large miss distances and possible collateral damage.

4-77. Weapon time of flight will be a factor relative to movement of enemy targets and friendly forces when employing standoff weapons incapable of receiving in-flight targeting updates. Detailed planning and preparation by both the JTAC and the aircrew are required to identify situations and locations conducive to standoff weapons attacks, and to address flight profile and deconfliction (aircraft, weaponry, and terrain) considerations. Digital or data link systems capable of displaying aircraft track and sensor point-of-interest significantly enhance situational awareness and the effectiveness of terminal attack control.

Type 3 Control

4-78. Type 3 control is used when the JTAC or forward air controller (airborne) requires the ability to provide clearance for multiple attacks within a single engagement subject to specific attack restrictions. Type 3 control does not require the JTAC to visually acquire the aircraft or the target; however, all targeting data must be coordinated through the BCT or other supported commander's staff.

4-79. During Type 3 control JTACs provide attacking aircraft targeting restrictions (such as time, geographic boundaries, final attack heading, and specific target set), and then grant a broad weapons release clearance. The JTAC will monitor radio transmissions and other available digital information to maintain control of the engagement. The JTAC maintains abort authority. Observers may provide targeting

data and the target mark during Type 3 control. It is not unusual to have two types of control in effect at one time for different flights.

4-80. Battle damage assessment is the final step in determining if the BCT commander's desired effects have been achieved by close air support. The damage assessment must be passed to both the aircraft and the supported commander and entered into the intelligence system as soon as possible. This assists the unit commander in determining whether to reattack the target either with close air support or another fire support means. See ATP 3-09.32 and JP 3-09.3 for additional information on control of close air support.

JOINT AIR ATTACK TEAM OPERATIONS SUPPORTING THE BCT

4-81. A *joint air attack team* is a combination of attack and/or scout rotary-wing and fixed-wing close air support aircraft operating together to locate and attack high-priority targets and other targets of opportunity (JP 3-09.3). 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, electronic attack and electronic warfare support systems, and ground maneuver forces against enemy forces. JTACs may perform duties as directed by the air mission commander in support of the ground commander's scheme of maneuver.

4-82. The use of a joint air attack team provides a method for integrating multiple assets to mass fires on an enemy force. Joint air attack team fires are integrated, mutually supportive, and synergistic, not simply deconflicted. The BCT or other land force commander typically determines when to employ a joint air attack team but any commander may request one. A joint air attack team can be employed anywhere on the battlefield. Close air support procedures may be required, depending on the proximity of friendly forces and the requirement for detailed integration. Usually a joint air attack team is planned and may be placed on the air tasking order, but variations can be quickly organized based on the situation and available communications means. Normally, the joint air attack team is employed close to friendly troops as an integrated member of the combined arms team. However, a joint air attack team can operate independently, away from ground units. The joint air attack team is most effective against moving targets in open areas. It is least effective when attacking targets that are in camouflaged, dug-in positions.

4-83. The joint air attack team provides the BCT commander with a flexible force component that can engage the enemy high-payoff targets in the BCT area of operations. Each Service component involved retains OPCON of its respective units during a joint air attack team operation. A joint air attack team can facilitate shaping operations and respond to threats throughout the BCT's area of operations. The BCT is responsible to synchronize maneuver with the delivery of joint air attack team fires to maximize the effects on the enemy. The aviation commander coordinates the joint air attack team and makes the tactical plan. Army and Marine attack helicopters provide fires, target acquisition, mission coordination, and mutual defense. They are aerial maneuver units capable of rapid reaction and not restricted by terrain. Navy, Marine, and Air Force fixed-wing elements can achieve a synergistic effect when combined with attack helicopters. The air mission commander executes the joint air attack team engagement. The aviation commander and the air mission commander may be the same person.

4-84. The supported BCT commander determines when to employ a joint air attack team, requests the assets and integrates the joint air attack team, other combat units, and supporting fires into the concept of operations. Indirect fire assets augment the fires of the joint air attack team. Fires cells develop plans for supporting joint suppression of enemy air defenses that facilitate aircraft ingress and egress and necessary FSCMs to allow the simultaneous attack by aircraft and indirect fires.

PLANNING CONSIDERATIONS FOR A JOINT AIR ATTACK TEAM SUPPORTING THE BCT

4-85. The BCT staff identifies the requirement for joint air attack team planning through their intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4). This analytical approach can nominate appropriate targets and engagement areas for joint air attack team employment. The identification of key intelligence trigger events (which signal the buildup of a likely enemy target) is essential to effective joint air attack team employment. Joint air attack team task assignment considerations include:

- Identify the presence of massed enemy armored or mechanized vehicles.
- Identify, locate and classify moving targets.

- Determine the availability of joint air attack team assets.
- Can the enemy be flanked?
- Plan to gain local air superiority.
- Plan to suppress enemy helicopters
- Prepare for a change in mission (for example counterattacks, exploitations, and pursuits).
- Isolate the engagement by attacking follow-on elements.
- Weather effects on joint fires assets.

4-86. The BCT is the lowest echelon at which a joint air attack team is planned and coordinated. Coordination with the appropriate BCT subordinate or supporting unit is required if the joint air attack team is to be employed in that unit's area of operations. In such cases execution may be handed off to that subordinate or supporting unit.

4-87. The coordination process for joint air attack team tasks takes place in the BCT main command post fires cell under the supervision of the FSCoord, brigade FSO, the Air Force air liaison officer, and the BCT brigade aviation officer or Army aviation liaison officer.

4-88. The FSCoord, fires cell planners, targeting working group and targeting board plan and coordinate the use of fires and appropriate aspects of information operations and cyber electromagnetic activities to complement the joint air attack team.

4-89. The FSCoord and fires cell planners determine the need, availability, and positioning of artillery, commensurate with the enemy update, to support the joint air attack team. They coordinate with the Army aviation liaison officer or brigade aviation officer to provide call signs and frequencies to the BCT's cannon field artillery battalion and supporting artillery. They also assist the Air Force air liaison officer, ADAM/brigade aviation element (BAE), and Army aviation liaison officer in deconflicting aviation and close air support initial positions from artillery positions and the development of airspace coordination areas (ACA) to support the mission. The FSCoord and fires cell planners also:

- Determine the requirement for suppression of enemy air defenses.
 - Air routes
 - Attack by fire and support by fire positions.
- Consider the use of unmanned aircraft for route reconnaissance.
- Coordinate for marking rounds in the target area with the joint air attack team commander and forward air controller.
- Consider the use of radar critical friendly zones to protect attack helicopters in their battle positions.
- Consider use of guided munitions to minimize target obscuration that might adversely impact pilot view of the target.
- Determine when and how priorities of fires shift.
- Recommend and integrate FSCMs to enhance the success of the mission. ACAs should be coordinated with the Air Force TACP and ADAM/BAE.
- Determine and disseminate laser pulse repetition frequency codes.
- Establish a quick fire channel if necessary.

PREPARATION FOR A JOINT AIR ATTACK TEAM SUPPORTING THE BCT

4-90. The preparation phase includes briefing the plan, ensuring dissemination of the plan to subordinate units that may affect the joint air attack team engagement, reconnaissance, and rehearsal.

4-91. The aviation commander, after completing a reconnaissance, provides feedback to the Air Force air liaison officer, FSCoord, brigade FSO, brigade aviation officer, and the Army aviation liaison officer. If refinements to the plan are needed, they are made and rapidly disseminated.

4-92. Rehearsals are crucial to check communications channels, movement routes, and battle positions, time required to move assets forward, graphical control measures, and the fire plan. The joint air attack team rehearsal participants should include the:

- Aviation commander (joint air attack team commander).
- Attack helicopter unit leader.
- Brigade FSO and, as appropriate, the subordinate and supporting unit FSOs.
- Air Force air liaison officer.
- Air Force staff weather officer assigned to support the BCT.
- Army aviation liaison officer.
- Cannon field artillery battalion or battery fire direction center.
- Aerial observer (if available).

EXECUTION OF JOINT AIR ATTACK TEAM TASKS

4-93. During the execution phase, the aviation commander is the director and coordinator of the team effort. En route to the target or engagement area, the aviation commander contacts the ground commander for a tactical update. The aviation commander establishes direct communication with the fire support assets committed to in the joint air attack team operation. The BCT or supported ground commander monitors the appropriate nets to keep abreast of the joint air attack team's status and to assist the aviation commander as needed.

4-94. Applying Army indirect fires, joint fires, and Army aviation against the same target set cannot be accomplished without a detailed unit airspace plan. Airspace control requirements to execute a joint air attack team are complicated and must be fully developed, distributed, and rehearsed. Air corridors, ACAs, initial points, and battle positions must all be included in the unit airspace plan. Rehearsing this plan is essential to a successful joint air attack team engagement. See ATP 3-09.32, for additional information on joint air attack team planning and execution.

JOINT SUPPRESSION OF ENEMY AIR DEFENSES IN THE BCT OPERATIONAL AREA

4-95. During an air operation, enemy air defense systems become high-payoff targets. Joint suppression of enemy air defense typically includes all related activities provided by one component of the joint force in support of another. Joint suppression of enemy air defenses requires joint interaction to suppress enemy surface-to-air defenses having an influence on the operational and tactical portion of the operation. The greatest indirect fire suppression capability of ground and naval forces is against those threats that can be engaged by observed fire.

4-96. The FSCOORD and fires cell planners ensure that target queries for suppression of enemy air defenses are conducted for each air interdiction and planned close air support request. Attack of targets for joint suppression of enemy air defenses must be synchronized with the planned air strike. The sources for development of targets for joint suppression of enemy air defenses in decisive operations are primarily ground observers and Army electronic, imagery, or templating techniques. Targets to be suppressed in support of air interdiction attack missions are provided primarily by air support air reconnaissance flight reports or other aircraft reports available from the BCD intelligence division. Targets are attacked either as acquired or as part of a scheduled program. The FSCOORD and fires cell planners coordinate the synchronization of programs for suppression of enemy air defenses with the Air Force air liaison officer, Air Force staff weather officer, brigade aviation officer, and Army aviation liaison officer.

4-97. Targeting for suppression of enemy air defenses should cover those targets capable of affecting aircraft ingress and egress routes. The destruction of the enemy capability requires attacks of firing systems as they are located, command or control nodes, and target acquisition sites that comprise the enemy air defense high-value targets. This information is available from the BCT or other appropriate level Air Force air liaison officer, or may be found in the air tasking order. Joint suppression of enemy air defenses can be accomplished through destructive and disruptive means.

Destructive Means

4-98. Destructive means seek the destruction of the target system or operating personnel. The effects are cumulative and increase aircraft survivability, but destructive means may place large demands on the available combat power of the BCT, division, or corps providing the suppression of enemy air defenses.

Disruptive Means

4-99. Disruptive means temporarily deny, degrade, deceive, delay, or neutralize enemy air defense systems to increase aircraft survivability. Disruptive means are either active or passive:

- Active disruptive means include electronic attack; expendables (chaff, flares, and decoys); tactics such as deception, avoidance, or evasive flight profiles; and unmanned aircraft systems. Passive disruptive means include emission control, camouflage, infrared shielding, warning receivers, and material design features.

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Chapter 5

Coordinating Fire Support

Fire support coordination is the planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons (Joint Publication [JP] 3-09). Brigade combat team (BCT) fire support coordination includes fire support coordinator (FSCoord), brigade FSO, and fires cell management of delivery assets and sensors and direct coordination with the BCT commander, the staff, and the commanders and staff of the BCT's subordinate and supporting units. The coordination requires continually refining fire support plans and managing fire support assets as the operation unfolds. The BCT commander's ability to orchestrate and employ all available resources, to include fire support and related resources, and to synchronize fire support with on-going maneuver is enabled by both adaptive fires planning and well-executed fire support coordination. Fire support coordination is central to the effectiveness of the fire support system. Formal coordination binds fire support resources together in a common effort so that the employment of each fire support asset is synchronized with the BCT commander's concept of operations. Effective coordination during both planning and execution is required to ensure that a suitable weapon or group of weapons adequately attacks high-payoff targets at the correct time and place. In coordinating fire support, cooperation among the various fire support coordination organizations is necessary for the effective delivery of fires.

This chapter describes fire support coordination for the BCT. Section I begins the chapter by describing fire support coordination organizations organic to the BCT. Section II describes the duties and responsibilities of key fire support coordination personnel. Sections III, IV, V, and VI follow with discussions on fire support coordination techniques, rehearsals, the clearance of fires, airspace control, and sensor-to-shooter operations. Section VII describes strike, counterfire and Army Tactical Missile System (ATACMS) considerations for BCT operations. Section VIII describes suppression of enemy air defenses, and Section IX concludes the chapter with a discussion of special considerations for fire support coordination: terrain management, survey, meteorology, and laser management.

SECTION I – BCT FIRE SUPPORT COORDINATION ORGANIZATIONS

MAIN COMMAND POST FIRES CELL

5-1. The BCT main command post fires cell plans, coordinates, integrates, synchronizes and deconflicts the employment and assessment of fires for both current and future operations. The fires cell integrates the fires warfighting function into BCT operations and is generally organized with a fire support officer (FSO) and assistants, an air defense airspace management (ADAM)/brigade aviation element (BAE), an electronic warfare element, a targeting element, and digital systems operators. The Air Force TACP typically collocates with the fires cell. The fires cell plans, prepares, coordinates and integrates the execution and assessment of fires including artillery, mortar, radar, electronic attack, air support, naval surface fire support, and other joint assets.

5-2. A *fire support officer* is the field artillery officer from the operational to tactical level responsible for advising the supported commander or assisting the senior fires officer of the organization on fires functions

and fire support (Army doctrine reference publication [ADRP] 3-09). The BCT fires cell is led by the brigade's fire support officer (FSO).

Note: The functions of the fires cell and the duties and responsibilities of its personnel as described in the following paragraphs represent a way, not the way. Commanders organize the resources of their unit based on the mission variables of mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC).

5-3. The fires cell's general functions are identified in ADRP 3-09. Additional functions for the BCT main command post fires cell include:

- Work with the S-9, information operations officer, public affairs officer and brigade judge advocate to integrate fires with electronic attack, information operations (see FMs 3-13 and 3-53) and military information support operations into the BCT's targeting.
- Collaborate with the S-2 in intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4).
- Coordinate and plan for target acquisition to provide coverage of named areas of interest, target areas of interest, and critical assets.
- Provide input to the BCT's common operational picture to enhance situational understanding.
- Brief the BCT commander on the recommended fire support plan.
- Disseminate the approved fire support plan to BCT fire support organizations, the BCT's field artillery battalion, the DIVARTY and the field artillery brigade (FAB) (as necessary), and the division and corps or other supported headquarters fires cells.
- Lead the BCT targeting working group.
- Ensure battalion fires cells plan fires in accordance with the BCT commander's guidance.
- Prepare the fires portion of the BCT operation plan (OPLAN) or operation order (OPORD) to include describing the scheme of fires to support BCT operations.
- Ensure compliance with the no-strike list and recommending FSCMs.
- Manage the establishment of and changes to FSCMs (described in FM 3-09).
- Coordinate terrain for the positioning of field artillery assets.
- Coordinate with the BCT SWO to provide weather effects assessments based on current and forecast weather conditions for all fires assets.
- Coordinate clearance for attacks against targets (clearance of fires).
- Coordinate airspace requirements (see FM 3-52).
- Submit airspace control means requests to integrate airspace requirements (see FM 3-52).
- Coordinate assessment of fire support.
- Develop fire support and cyber electromagnetic measures of performance and measures of effectiveness for BCT assessment (see chapter 2).
- Coordinate requests for additional fire support to include joint fires.
- Develop and refine Advanced Field Artillery Tactical Data System (AFATDS) targeting guidance for each approved course of action.
- Conduct brigade fire support rehearsals.
- Develop target criteria for input into AFATDS for each approved course of action.
- Recommend the high-payoff target list, target selection standards, attack guidance matrix, targeting synchronization matrix (see chapter 2) and fire support and cyber electromagnetic tasks for the BCT OPLAN or OPORD.
- Prepare products for the targeting working group and targeting board (see ATP 3-60).
- Implement targeting guidance in AFATDS.
- Provide reactive counterfire guidance and radar deployment instructions (see ATP 3-09.12) to the BCT's field artillery battalion.
- Provide and disseminate early warning of enemy indirect fire attack.

- Update and purge targeting files.
- Maintain interoperability with collection assets.

TARGETING, THE TARGETING WORKING GROUP, AND THE TARGETING BOARD

Role of the BCT Main Command Post Fires cell in Targeting

5-4. The fires cell is the centerpiece of the brigade targeting architecture, focused on the attack of target sets using lethal, nonlethal, or a combination of attack systems. Targeting collaboratively plans, coordinates, and synchronizes available fire support resources including electronic attack, with information operations in an integrated fashion with the other warfighting functions to support BCT operations. The cell plans, synchronizes, coordinates, and integrates fires matched to a wide range of targets and target systems. Along with the brigade S-3 and S-2, the fires cell plans, coordinates and synchronizes the acquisition of high-payoff targets and the use of the lethal and nonlethal effects of fires with the scheme of maneuver. The fires cell recommends targeting guidance to the commander. It identifies relevant high-value sets, and from these develops high-payoff targets and selects the most effective means for attack. The brigade's targeting working group and targeting board (see ATP 3-60) bring together representatives of all staff sections concerned with targeting; synchronizing contributions of the entire staff. For example cyber-electromagnetic activities are synchronized with Army indirect fires and joint fires through targeting. Targeting decisions developed in BCT targeting working group sessions supporting the OPLAN or OPORD are approved by the BCT commander or targeting board, and incorporated into targeting guidance in the AFATDS. The brigade legal section provides legal review of plans, targeting and orders. The fires cell also coordinates target acquisition, target dissemination and target engagement functions for the commander.

Note: Although unit tables of organization and equipment may identify separate fires elements within the fires cell for lethal and nonlethal effects, that partition does not limit personnel serving in the respective element to only lethal or nonlethal concerns or tasks. Targeting selects and prioritizes all targets and recommends the appropriate response (lethal, nonlethal or a combination thereof) to engage a target. Operations may combine offensive, defensive, and stability tasks; though simultaneity is not absolute. The higher the echelon, the greater the possibility of simultaneous offense, defense, and stability tasks; subordinate BCTs perform some combination of offensive, defensive and stability tasks but perhaps not all three simultaneously (see ADRP 3-0). The preponderance of lethal or nonlethal engagement means employed will likely vary based on circumstances. Personnel in both lethal and nonlethal elements must be prepared to plan, coordinate, and possibly execute both lethal and nonlethal engagements.

Targeting Working Group and Targeting Board

5-5. The BCT's targeting working group and the targeting board are critical to facilitating the targeting process and integrating targeting with BCT operations. The working group and the board have the purpose to focus and synchronize the BCT's combat power and resources toward finding, attacking, and assessing current high-payoff targets.

5-6. The BCT's targeting working group is a grouping of predetermined staff representatives concerned with targeting (see ATP 3-60). The targeting working group meets to provide analysis, coordinate and synchronize targeting and to provide recommendations to the targeting board. The brigade FSO leads the targeting working group in the absence of the FSCOORD.

5-7. The BCT's targeting board is a temporary grouping of selected staff representatives with delegated decision authority to provide targeting decision recommendations for command approval. When the process or activity synchronized requires command approval, a board is the appropriate forum. The brigade executive officer or S-3 typically leads the targeting board. The BCT FSCOORD or brigade FSO assists the executive officer or S-3 with the targeting board.

5-8. BCT targeting working group and targeting board success requires focus, participation by all warfighting functions and staff representatives, preparation by all participants, and the rapid development and dissemination of required products. Collectively, the targeting working group and targeting board:

- Identify relevant high-value targets.
- Develop, verify, and update the high-payoff target list.
- Verify, update, and recommend tasking of information collection and target acquisition assets for each high-payoff target.
- Allocate delivery systems to engage each target.
- Confirm assets have been tasked to assess whether the BCT commander's desired effects have been achieved.
- Recommend allocation of BCT assets, and request higher-level support.
- Create, update, and manage the targeting synchronization matrix and the information collection plan.
- Identify target nominations for attack by division, corps, or joint assets in coordination with the ATO cycle.
- Synchronize Army indirect fires, joint fires, and cyber-electromagnetic activities.

AIR DEFENSE AIRSPACE MANAGEMENT ELEMENT

5-9. Army components of the theater air ground system (see ATP 3-52.2) include airspace elements, fires cells, ADAM/BAEs, and Army air and missile defense command, BCDs, ground and reconnaissance liaison detachments, and air defense artillery fire control officers that collectively coordinate and integrate airspace use and are organic to Army brigades and higher.

5-10. Within the BCT main command post fires cell, the ADAM/BAE are responsible for integrating brigade airspace, to include air and missile defense and aviation functions. The ADAM/BAE coordinates with higher, subordinate and adjacent elements to maximize the efficiency of airspace control and the lethality of weapon systems occupying or transiting the airspace. See Army techniques publication (ATP) 3-01.50 and training circular (TC) 1-400 for detailed information on operation and functions of the ADAM and the BAE.

5-11. The fires cell coordinates and deconflicts fire support coordination measures (FSCM) with airspace coordinating measures through close interface with airspace elements and the tactical air control party (TACP). The airspace element works with the fires cell to integrate FSCMs with the unit airspace plan. Although the airspace element reviews and integrates the fire support overlay with other airspace requirements, FSCMs are normally sent to higher, lower, and adjacent headquarters through fire support channels. Both the fires cell and the airspace element send related control or coordination measures through their respective channels. The airspace element and the fires cell ensure the standard operating procedures and the airspace control appendix address the procedures for forwarding FSCMs and associated airspace coordinating measures through appropriate coordination channels. The airspace element and the fires cell review the airspace control orders to ensure that the airspace coordinating measures avoid unnecessarily interfering with fires. Conflicts between the fire support plan and the unit airspace plan will be deconflicted at the appropriate echelon prior to submission to the BCD for inclusion into the airspace control order.

5-12. Rocket, artillery, and mortar (RAM) warning (collectively referred to as RAM Warn) provides the BCT Commander or subordinate units with accurate localized warning upon detection of indirect fire attacks. The BCT ADAM element within the fires cell is responsible for recommending employment options to the BCT commander and functional dissemination of RAM Warn. RAM Warn is a mission command-enabled function harnessing detection from existing sensors within the BCT (to include the target acquisition radars) of indirect fire threats forecasted to impact within the designated radar zone. The ADAM element receives the detection message from the radar system through the Forward Area Air Defense Command and Control System in the command post, and pushes the warning message to two RAM Warn towers for localized warning. Successful warning cannot be achieved without a linked sense function from localized radar and integrated Forward Area Air Defense Command and Control System. Employment considerations for the RAM Warn towers are limited to the 17-kilometer reach of the Forward Area Air Defense Command and Control System to the towers. The audible warning capability of each

tower is limited to within 500 feet of the placement of the tower. The commander designates priority for RAM Warn tower location within the BCT area of operations. Any personnel within the BCT headquarters company can be responsible for setting up and emplacing the RAM Warn towers. See ATP 3-01.60.

5-13. Employment considerations for RAM Warn do not dictate positioning of weapons locating radar systems. Positioning of weapons locating radar systems is intended to best enable counterfire detection and delivery and counter air threat detection.

BRIGADE AVIATION ELEMENT

5-14. The BCT main command post fires cell's ADAM and BAE are responsible for integrating brigade airspace, to include air and missile defense and aviation functions. The BAE's major function is to incorporate aviation into the ground commander's scheme of maneuver. The BAE provides employment advice and initial planning for aviation missions, unmanned aircraft systems, airspace planning and coordination, and synchronization with the air liaison officer and the fires cell. The brigade aviation element also coordinates directly with the aviation brigade or the supporting aviation task force for detailed mission planning. During combat operations, the BAE works in conjunction with the fires cell and TACP to integrate functions for deconflicting airspace, clearance of fires, dynamic targeting, dynamic re-tasking of aviation and fires assets, and for command and control of airspace users operating in the BCT area of operations.

5-15. Although the BCT S-3 has overall responsibility for coordinating, deconflicting, and managing all airspace within the BCT's area of operations, the ADAM/BAE is responsible for integrating the use of airspace for BCT operations. See TC 1-400 for additional information. See FM 3-52, ATPs 3-52.1 and 3-52.2, ATP 3-01.50, TC 1-400, and Joint Publication (JP) 3-52 for more on the integration of fires and airspace control.

ELECTRONIC WARFARE ELEMENT AND WORKING GROUP

5-16. *Electronic warfare* is military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy (JP 3-13.1). An electronic warfare element is an organic organization in brigade, division, and corps and theater army command staffs. Within the BCT main command post, the electronic warfare element normally collocates with and is an integral part of the fires cell. The element is responsible to the G-3 or S-3 and is primarily involved with planning and monitoring electronic operations and activities, however it plays an important role in requesting and integrating joint air and ground electronic warfare assets and manages electronic warfare from within the mission command cell.

5-17. The electronic warfare working group includes representation from across the staff and helps to facilitate Army and joint integration, synchronization, and deconfliction of electronic warfare actions with the other warfighting functions. The senior electronic warfare officer heads this working group and is accountable to the S-3 for integrating electronic warfare requirements. Working within the mission command cell the electronic warfare officer coordinates directly with the FSCOORD or brigade FSO, fires cell personnel, and targeting working group to integrate electronic warfare into targeting.

TACTICAL COMMAND POST FIRES ELEMENT

5-18. Selected personnel from the main command post fires cell man the fires element of the tactical command post if one is deployed. An Air Force TACP aligned with the BCT may send selected personnel with the tactical command post. The fires element in the tactical command post tracks and maintains situational understanding of all fire support assets. Its main function is to execute current operations; focusing on the main effort.

5-19. Functions of the fires element in the tactical command post include:

- Monitor the tactical situation and adapting the fire support plan accordingly.
- Maintain and update unit information and digital and voice communications status.
- Ensure tactical fire control with supporting field artillery and target acquisition assets.
- Monitor processing of planned fires in the fire support plan.

- Coordinate clearance of all indirect and joint fires with units.
- Maintain and update the current active NFA list.
- Maintain digital link to field artillery and target acquisition assets.
- Track and maintain situational understanding of close air support.
- Track and maintain situational understanding of naval surface fire support.
- Send fire missions to the cannon field artillery battalion fire direction center for processing.
- Request assessment reports.
- Ensure mission fired reports and artillery target intelligence reports are received and processed.

JOINT AUGMENTATION TO THE BCT MAIN COMMAND POST FIRES CELL

5-20. Augmentation to the BCT main command post fires cell normally includes an Air Force TACP and, depending upon the mission variables, may include a naval surface fire support liaison officer, a Marine Corps liaison officer, and an Army space support team.

AIR FORCE TACTICAL AIR CONTROL PARTY

5-21. A *tactical air control party* is a subordinate operational component of a tactical air control system designed to provide air liaison to land forces and for the control of aircraft (JP 3-09.3). When resourced, a United States (U.S.) Air Force TACP collocates with the fires cell at the BCT main command post.

An *air liaison officer* is the senior tactical air control party member attached to a ground unit who functions as the primary advisor to the ground commander on air power (JP 3-09.3). The Air Force air liaison officer advises the BCT commander and staff on air support for BCT operations. The air liaison officer leverages the expertise of the TACP with linkages to the higher headquarters tactical air control parties to plan, coordinate, synchronize, and execute air support. The air liaison officer also maintains situational understanding of the total air support picture. The BCT SWO provides all weather effects assessments based on observed and forecast weather conditions for all air support assets.

5-22. The TACP working with the BCT is sufficiently resourced to support BCT operations from both the tactical and main command posts. When the tactical command post is deployed, the BCT's TACP can be split into two smaller tactical air control parties, one coordinating and executing close air support in the close, decisive fight from the tactical command post, and the second assisting the BCT executive officer and staff in coordinating and executing BCT operations from the main command post. The battalion-level TACP includes an air liaison officer and joint terminal attack controllers (JTAC) with the added responsibility of terminal attack control. Air Force JTACs are required at each maneuver battalion company and cavalry troop and are employed by the company commander to provide close air support to support the company. Tactical air control parties coordinate activities through the joint air request net and the advanced airlift notification net.

5-23. Tactical air control party functions include:

- Serve as the Air Force commander's representative, providing advice to the BCT commander and staff on the capabilities, limitations, and employment of air support, airlift, and reconnaissance.
- Provide an Air Force coordination interface not only with the BCT fires cell, but also those of the battalion fires cells.
- Assist in the synchronization of air and surface fires and preparing the air support plan.
- Provide direct liaison for local ADAM activities.
- Facilitate the planning of air support (see chapter 4) for future operations and advise on the development and evaluation of close air support, air interdiction, air reconnaissance, joint air attack team operations and joint suppression of enemy air defenses programs.
- Provide terminal attack control for close air support and operate in the joint air request net.

NAVAL SURFACE FIRE SUPPORT LIAISON OFFICER AND THE AIR NAVAL GUNFIRE LIAISON COMPANY (ANGLICO)

5-24. The naval surface fire support liaison officer supervises a naval surface fire support team that may be collocated with the BCT main command post fires cell. This team advises the BCT commander and staff on the planning, preparation, execution, and assessment of naval surface fires.

5-25. Members of the ANGLICO are specially trained in conducting naval gunfire. However, the procedures are simplified and standardized so that any trained observer (for example, a fire support team (FIST) or forward observer) can effectively adjust the fire of a ship.

5-26. ANGLICO personnel are available to advise unit commanders from company through brigade levels on how to best use the naval air and gunfire support available to them. Liaison personnel can give unit commanders and their fire support personnel information on weapon ranges, ammunition effects, and all-weather bombing capabilities. For maximum effectiveness, ANGLICO support should begin during the planning phase of an operation. ANGLICO task-organized teams should be attached to the units they will support as soon as possible. ANGLICO personnel at all levels, maneuver company through BCT, are trained as naval gunfire spotters and forward air controllers and can request and control missions for the units they support.

MARINE CORPS LIAISON OFFICER AND THE FIREPOWER CONTROL TEAM

5-27. A U.S. Marine Corps liaison officer or a liaison team may augment the BCT main command post fires cell based on METT-TC to coordinate naval and U.S. Marine Corps air support to the BCT. The fires cell processes requests for naval or U.S. Marine Corps air support through this liaison officer or liaison team.

5-28. A firepower control team may be attached to the maneuver battalion to perform terminal control of naval or U.S. Marine Corps air support. In the absence of an observer from the firepower control team, the company fire support team (FIST) with JFO or the JTAC may control naval or U.S. Marine Corps air.

BCT SUBORDINATE ECHELON COMMAND POSTS

5-29. The fire support organizations at battalion level and below coordinate fires to include organic mortars and any additional fire support allocated by the BCT fires cell. The battalion FSO plans fires in support of all battalion tasks and advises the commander concerning the capabilities, limitations and effective use of available fire support resources. The FSCOORD, assisted by the brigade FSO, advises the BCT commander on training, personnel management, maintenance, and equipment readiness for all subordinate fire support organizations.

5-30. The battalion fires cell provides a fire support coordination capability within the cavalry squadron and maneuver battalion headquarters. The battalion fires cell works closely with the BCT main command post fires cell to coordinate and synchronize maneuver and fires. The cell not only assists the battalion in executing its respective part of the BCT's fire support plan, but also assists the maneuver battalions and cavalry squadron in executing their own fire support plans. Until Army force structure changes provide a fires cell and FISTs, predeployment training for the Soldiers of the Engineer battalion or the BSTB concerning fire planning and the call for fire is strongly recommended.

5-31. The battalion fires cell monitors priority of fire for indirect fire and electronic attack systems, and recommends priority of search for weapon locating radars. Through the AFATDS, the battalion fires cell provides the company FIST with digital linkage to the battalion mortars as well as to fire support assets available at the BCT or higher levels.

5-32. FISTs deploy to the maneuver companies and the cavalry troops for tactical operations. The FISTs deployed to infantry companies include platoon forward observers for each of its platoons. See chapters 3 and 4. See FM 3-96, FM 3-90.5, FM 3-20.96, and ATP 3-90.61 for details on the BCT's combined arms battalion and cavalry squadron role.

5-33. The Air Force TACP, when assigned, is the Air Force liaison element to the battalion. The tactical air control party at battalion level advises the commander on the capabilities and limitations of air power and

assists him in planning, requesting, and coordinating close air support and provides primary terminal attack control of close air support for the battalion.

THE BCT INFORMATION SYSTEM NETWORK

5-34. The BCT uses a federation of information networks that collectively are an integral component of the mission command system. They enable the BCT to share the common operational picture with subordinate and controlling headquarters. The common operational picture conveys the BCT commander's perspective and facilitates subordinate and superior situational understanding.

SECTION II – DUTIES AND RESPONSIBILITIES OF KEY FIRE SUPPORT COORDINATION PERSONNEL

BCT COMMANDER

5-35. The BCT commander defines the role of fire support for the BCT in a particular operation and clearly articulates it in commander's planning guidance. The commander must visualize and articulate what fire support is to do as part of the concept of operations. The BCT's cannon field artillery battalion commander, as the BCT's FSCOORD, is responsible for advising the commander on the best use of available fire support resources. The brigade FSO is responsible for developing the fire support plan based on the commander's planning guidance and commander's intent for the BCT operation. The BCT commander's planning guidance provides the staff, FSCOORD, and fires cell planners and targeting officers and fire support personnel of the BCT's subordinate and supporting units with general and specific guidance, restrictions for the employment of fires, and the desired effects from fires.

5-36. The guidance should include instruction for synchronizing and focusing Army indirect fires and joint fires with maneuver and with the other warfighting functions. Army indirect and joint fires include a range of capabilities to create a wide range of lethal or nonlethal effects. For example, an indirect fire engagement to achieve lethal effects on a target may occur over the span of munitions from using a single guided munition round such as Excalibur to battalion mass fires using area munitions. Army indirect and joint fires are purposely tailored in their lethality, precision, intensity, duration, and method of delivery to best support the commander's intent and concept of the operation. The fires create discrete effects matched to the target or threat type, and minimize collateral damage. The BCT commander's guidance for fire support should also include instruction for:

- Integration and synchronization with cyber-electromagnetic activities.
- Priority of fires.
- High-value targets (part of the planning guidance for the intelligence warfighting function).
- High-payoff targets to include methods of engagement and desired effects.
- An observer plan.
- Release authority by weapon system and munitions.
- Employment of precision-guided munitions.
- Requirements, restrictions, and priorities for specified munitions.
- Task and purpose of fires; identify any essential tasks for fire support.
- Counterfire.
- Target acquisition radar zones including critical friendly, call for fire, artillery target intelligence, and sensor zones.
- Sensitive sites.
- Suppression of enemy air defenses.
- FSCMs.
- Attack guidance.
- A no-strike list including cultural, religious, and historical areas.
- Restricted target list including high-density civilian areas.

FIRE SUPPORT COORDINATOR

5-37. The BCT's cannon field artillery battalion commander is the brigade's FSCOORD. As such, the field artillery battalion commander is the BCT commander's primary fire support advisor and brings a professional assessment of the current and near-term capabilities of the field artillery unit and of other fire support assets supporting the force. The FSCOORD is specifically responsible for all fire support planning, coordination, and fire support integration in the execution of assigned tasks for the BCT. The FSCOORD's job is to take the commander's visualization and articulation of what fire support is to do as part of the concept of operations and make it happen. The FSCOORD needs to position himself so the supported commander can best use fire support during the fight.

5-38. All field artillery personnel in the BCT are assigned to its cannon field artillery battalion. As the field artillery battalion's commander, the FSCOORD's inherent duties include consolidated and focused fire support specific training, equipment issue, certification, standardization, readiness, and personnel management oversight (assignment, and professional development of all 13-series career management field Soldiers) for all field artillery personnel and equipment within the BCT. Any additional responsibilities and authority given to the FSCOORD should be fully delineated by the BCT commander. This will ensure full cooperation and compliance by the commanders of subordinate units (such as those of the brigade special troops battalion, maneuver battalions, and cavalry squadron) that are assigned, attached, or placed under the operational control (OPCON) of the BCT. The BCT FSCOORD is responsible to:

- Facilitate establishing standard operating procedures for fire support across the brigade (to save time and ensure a single standard).
- Ensure the five requirements of accurate fire are met including:
 - Accurate target location and size (FISTs and forward observers, the target acquisition platoon, scouts and other observers).
 - Accurate firing unit location (firing unit and fire direction centers).
 - Accurate weapons and munitions information (firing units, fire direction centers, cannon field artillery battalion S-4, and brigade support battalion [BSB]).
 - Accurate meteorological information (target acquisition platoon and fire direction centers).
 - Accurate computational procedures (fire direction centers and fires cells).
- Ensure efficiently resourced training packages (limit requirements for unit tasking(s) and reduce coordination requirements among units)

Note: Predicted fire is the delivery technique of applying accurately computed corrections (not determined by firing) to standard firing data for all nonstandard conditions (such as weather, weapon, ammunition, rotation of the earth) to deliver accurate surprise fire on any known target in any direction from any weapon limited only by the characteristics of the weapon and ammunition used.

5-39. The brigade FSO and the other BCT fire support personnel assist the FSCOORD in these duties. The BCT commander may direct the FSCOORD to conduct the training and certification or to assist in the training and certification of unit mortars. See ADRP 3-09 and FM 3-09 for further discussion of the authority that may be given to the FSCOORD.

BRIGADE FIRE SUPPORT OFFICER

5-40. The brigade FSO, in the absence of the FSCOORD, personally represents the FSCOORD to the brigade commander. More than any other officer, the FSO must understand the FSCOORD's intent in supporting the maneuver plan. In addition, the FSCOORD must ensure that the brigade FSO is equally conversant on the FSCOORD's assessment of fire support assets supporting the maneuver force. The brigade FSO assists the FSCOORD to plan and coordinate the fires warfighting function for BCT operations. The brigade FSO's duties and responsibilities are similar to those of the chief of fires (deputy FSCOORD) at corps and division echelons as identified in ADRP 3-09. The brigade FSO leads the BCT main command post fires cell and works closely with the FSCOORD and members of the BCT staff to

ensure mutual understanding of all aspects of fire support planning, preparation, execution and assessment for BCT operations. The duties and responsibilities of the brigade FSO include but are not limited to:

- Plan, prepare, execute, and assess all aspects of fire support for BCT operations and address them in rehearsals.
- Work with the air and missile defense officer in synchronizing and integrating fires warfighting function capabilities with the other warfighting functions in support of BCT operations.
- Develop with the BCT commander, FSCoord, and S-3 a scheme of fires to support the operation.
- Plan and coordinate fire support tasks in close coordination with the S-3 to support timely development of the field artillery operations order or field artillery support plan.
- Develop a proposed high-payoff target list, attack guidance matrix, target selection standards, targeting synchronization matrix, and fire support execution matrix.
- Coordinate the positioning of fire support assets for BCT operations.
- Provide information on the status of fire support attack assets, target acquisition assets, and field artillery ammunition.
- Recommend FSCMs to support current and future BCT operations and address them in rehearsals.
- Recommend and implement the BCT commander's counterfire (including radar zones) and other target engagement priorities.
- Recommend to the BCT commander the establishment, responsibilities, authorities, and duties of a force field artillery headquarters as necessary.
- Integrate and synchronize Army indirect fires, joint fires, and multinational fires with the other warfighting functions.
- Direct and supervise the main command post fires cell to provide fire support for BCT operations and in the development of respective products to support OPLAN or OPORD development, including Annex D (FIRES) as necessary.
- Advise the BCT commander and staff of available fire support capabilities and limitations.
- Lead the targeting working group in the absence of the FSCoord.
- Coordinate the targeting process. Direct the attack of targets by fires in accordance with the BCT commander's established priorities and desired effects.
- Work with the chief of staff or executive officer, and S-3 to integrate all types of fire support into the BCT commander's concept of operations.
- Participate in the BCT's military decisionmaking process (MDMP).
- Coordinate requirements for fire support personnel to support mortar training and calls for indirect fire by maneuver personnel.
- When directed, accompany the BCT commander in the command group during the execution of tactical operations.
- Facilitate the synchronization and integration of fires and maneuver.
- Develop an internal battle rhythm to receive running estimate information and rehearsal times synchronized with BCT and subordinate unit battle rhythms.
- Establish, in conjunction with the BCT S-6, a communications plan for primary, alternate, contingency, and emergency means for fire missions and reporting.
- Coordinate the deliver function of targeting. Direct the attack of targets by fires in accordance with the priorities and desired effects established by the BCT commander.
- Keep the BCT commander, FSCoord and staff informed of the current status, location, and activity of all fire support assets.
- Work with fires cell targeting officers and the field artillery battalion S-2 to keep maneuver S-2s informed of enemy indirect fire capabilities and limitations.
- Ensure battalion FSOs are aware of assigned fire support and field artillery tasks, and are refining targets in accordance with top-down fire planning.

OTHER FIRES CELL PERSONNEL

ASSISTANT BRIGADE FIRE SUPPORT OFFICER

5-41. Assistant brigade FSOs assigned within the BCT main command post fires cell enable 24-hour operations. The assistant brigade FSO focuses on developing and refining the plans and products needed for the MDMP. A primary area of concentration is targeting, including assessment of system performance and attack effectiveness. The assistant brigade FSO actively participates with the S-2 and intelligence staff in intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4) to identify appropriate high-value targets and refine intelligence, sensor, and acquisition information, and works with fires cell targeting officers, the targeting working group and the targeting board to select high-payoff targets from among high-value targets. The assistant brigade FSOs process and perform staff coordination to ensure fire support is incorporated into BCT operations as required and fire support related assessment is conducted as appropriate. An assistant brigade FSO may deploy with the command group supporting the BCT deputy commander or function as a shift leader in the tactical command post fires element. The assistant brigade FSO's duties and responsibilities include:

- Assist the brigade FSO in performing duties and act as the brigade FSO in that individual's absence.
- Assist in the development of the fires input to the BCT OPLAN or OPORD and the fire support annex, if used. The high-payoff target list, target selection standards, attack guidance matrix, targeting synchronization matrix and fire support execution matrix may be included either in the main body of the OPLAN or OPORD or in the fires annex.

TARGETING OFFICERS

5-42. The BCT main command post fires cell may have one or more targeting officers who collect, analyze, refine and process the information required for target attack. They use the information provided by information collection (see the discussion in chapter 4 and FM 3-55) systems and target acquisition radars, as well as those assets available through reach-back to locate high-payoff targets for attack. The targeting officers oversee the BCT certification program for and supervise and conduct target coordination mensuration and collateral damage estimation when required. The targeting officer(s) provide recommendations and advice to the S-3, plans officer and the targeting working group and board (see ATP 3-60) during the MDMP (see chapter 6). They contribute to the development of targeting and assessment guidance to be entered into the AFATDS as well as to be distributed within mission orders. They assist in providing counterfire guidance, including radar deployment instructions, to the field artillery battalion S-2 and targeting officer. The targeting officer(s), together with the S-2, and S-3 develop the high-payoff target list, attack guidance matrix, target selection standards, targeting synchronization matrix, and fire support related measures of performance and measures of effectiveness for assessment.

5-43. During operations, targeting officer(s) present target identification and location requirements to the targeting working group based on updated targeting priorities. The targeting officers prepare products for the targeting working group and board. They direct updating and purging of targeting files. The targeting officer(s) ensure that interoperability is maintained with information collection assets. The targeting officer(s) provide information to the S-2 and develop the guidance to be entered into the AFATDS so that the fires cell receives targeting information from intelligence automations systems. Targeting officer duties and responsibilities include:

- Coordinate with the S-2 to identify and refine high-payoff targets.
- Advise the S-2 and information collection planners to ensure that the BCT information collection plan is synchronized with the fire support plan.
- Advise the brigade FSO on issues concerning targeting and fire support.
- Participate as a member of the targeting working group and board.
- Manage changes to the radar azimuth of search and to radar zones.
- Oversee the certification program for target coordinate mensuration and collateral damage estimation.

- Supervise or conduct target coordinate mensuration, munitions effects analysis (weaponing) and collateral damage estimation as necessary.
- Develop and manage the high-payoff target list, target selection standards, attack guidance matrix, and targeting synchronization matrix.
- Coordinate radar cueing schedules to ensure they are deconflicted with the pattern analysis of enemy indirect fires.
- Coordinate the positioning and status of target acquisition assets.
- Recommend and implement together with the counterfire officer, the commander's counterfire guidance (including radar zones) and other target engagement priorities.
- Advise and assist the fires cell planners and electronic warfare officer to coordinate and integrate indirect and joint fires including electronic attacks and facilitating electronic warfare support operations.
- Interface with the fires cell personnel in subordinate units.

ELECTRONIC WARFARE OFFICER

5-44. The electronic warfare officer integrates and synchronizes cyber electromagnetic activities for BCT operations. In addition to the electronic warfare officer's responsibilities identified in FMs 3-38 and 6-0 and in ATP 3-36, the electronic warfare officer's responsibilities include, but are not limited to:

- Support the BCT S-2 during intelligence preparation of the battlefield (see ATP 2-01.3 and 2-19.4).
- Coordinate with the BCT fires cell staff and the spectrum manager concerning friendly electronic order of battle, radar frequencies, and location information for inclusion in the airspace control and radar deployment orders. This helps mitigate fratricide of friendly radars.
- Work with the brigade FSO to integrate electronic attack with lethal fire support.
- Prioritize electronic attack targets with the brigade FSO.
- With the spectrum manager, deconflict electronic attack and electronic warfare support operations.
- Maintain a current assessment of available electronic warfare resources.
- Coordinate with other command post cells and participate in BCT working groups as required to ensure electronic warfare integration into BCT operations.
- Serve as the electronic warfare subject matter expert on existing electronic warfare rules of engagement.
- When designated, serve as the jamming control authority.
- Prepare, submit for approval, and supervise the issue and implementation of fragmentary orders for BCT electronic warfare operations.

FIRES CELL OPERATIONS NCO

5-45. The fires cell operations NCO is the senior enlisted assistant to the brigade FSO. The fires cell NCO understands and actively participates in the MDMP, in production of the OPLAN or OPORD, and may act as shift leader; either in the main command post fires cell or in the tactical command post fires element. Major responsibilities of the fires cell operations NCO include:

- Ensure the fires cell is fully manned for 24-hour operations and its equipment is fully functional.
- Perform fires cell digital network management and troubleshooting to ensure internal and external connectivity.
- Supervise the enlisted personnel in the fires cell and process administrative matters pertaining to the fires cell.
- Manage fires cell situational understanding input to the BCT common operational picture.
- Manage FSCMs (described in FM 3-09) and ensure they are disseminated throughout the BCT.
- Prepare required reports in accordance with BCT standard operating procedures.

- Maintain necessary files and documents.
- Develop and enforce the fires cell standard operating procedures.

FIRE SUPPORT NCOs

5-46. The fire support NCOs function as enlisted assistants to the brigade FSO. One or more may deploy with the FSCoord and the command group. When not deployed with the FSCoord they assist the shift leaders as needed in either the fires cell operations element (tactical command post) or fires cell plans and targeting element (main command post) to enable 24-hour operations. A fire support NCO's duties and responsibilities include:

- Manage the fires cell operations.
- Disseminate and manage running estimates.
- Manage the AFATDS, Effects Management Tool, and the Joint Automated Deep Operations Coordination System (as available).
- Track the BCT's FSCMs.
- Coordinate with the ADAM/BAE for the management of airspace coordinating measures (described in FM 3-09 and FM 3-52).
- Supervise the enlisted personnel in the fires cell.
- Maintain necessary files and documents for unit historical records.
- Manage the fires digital folders, files and other documents.
- Assist in the BCT FIST certification.
- Oversee and manage the BCT program for training and certification of JFOs.
- Assist the targeting officer in overseeing the certification program for target coordinate mensuration and collateral damage estimation.

TARGET ANALYST NCO AND TARGETING NCO

5-47. The target analyst NCO and the targeting NCOs, together with the targeting officers, provide a 24-hour capability to plan and coordinate targeting operations. Their primary responsibilities include:

- Operate and maintain the targeting AFATDS.
- Maintain the targeting common operational picture display.
- Maintain the target production display.
- Update and purge targeting files as directed by the targeting officers.
- Ensure targets that are acquired are processed to the appropriate fire support assets in accordance with the targeting synchronization matrix.
- Ensure essential voice and digital connectivity within and outside of the fires cell.

FIRE SUPPORT SPECIALIST

5-48. Fire support specialists work under the supervision of the fire support operations NCO. They support the operations and plans and the targeting elements as directed. Their responsibilities include:

- Operate the fires cell's AFATDS.
- Support the development of fire support planning and targeting products as directed by the plans and targeting officer and targeting officers.
- Operate and maintain voice communications equipment.
- Maintain updated unit information on the FISTs, radar, battery and mortar locations, and the digital and voice communication status.
- Maintain the current NFA list.
- Perform fire mission processing.
- Coordinate clearance of fires with adjacent units.
- Operate and maintain voice communications equipment.
- Operate assigned vehicles.

BRIGADE COMBAT TEAM STAFF WEATHER OFFICER

5-49. The staff weather officer (SWO) provides weather effects assessments for all fire support assets to the FSO to leverage in support of planning and coordinating the fires warfighting function for BCT operations. The current and predictive weather effect assessments for fires assets should be integrated and exploited in all aspects of fire support planning, preparation, execution and assessment for BCT operations. The duties and responsibilities of the SWO include but are not limited to:

- Provide weather effects assessments for all fire support assets based on the assets combat critical weather sensitivity thresholds.
- Assess weather effects on the scheme of fires and planned positioning of fire support assets for BCT operations.
- Provide weather effects assessments for all fire support and target acquisition assets.
- Provide weather effects assessments in support of rehearsals.
- Provide weather effects assessments focused on the impact to the synchronization of Army indirect fires, joint fires, and multinational fires.
- Develop and provide weather information and products in support of respective products in support of Fires input to OPLAN and OPORD development.
- Provide weather effects assessments in support of all aspects of the targeting process.
- Provide weather effects assessments to enable the synchronization and integration of fires and maneuver.

AIR AND MISSILE DEFENSE PERSONNEL

5-50. The BCTs have an ADAM/BAE that combines air and missile defense and aviation personnel along with enhanced digital capabilities to provide the BCT with an enhanced capability to perform airspace control and maintain a near-real-time airspace picture for airspace management.

AIR DEFENSE AIRSPACE MANAGEMENT OFFICER

5-51. The air defense airspace management officer leads the ADAM element and is the BCT's senior air defense coordinator and planner. Responsibilities include:

- Coordinate with the division and corps staff on all airspace control aspects.
- Coordinate with the FSO and FSCoord in synchronizing and integrating fires warfighting function capabilities and synchronizing and integrating the fires warfighting function with the other warfighting functions in support of BCT operations.
- Recommend employment considerations for RAM Warn.
- Plan, coordinate, integrate, and control the ADAM element for the BCT to include:
 - Develop air defense plans.
 - Recommend the air defense artillery task organization, scheme of air defense operations, and reconnaissance and surveillance planning.
- Provide integration and coordination tasks between the BCT and any augmenting air and missile defense assets and units not directly task-organized to the BCT's subordinate units.
- Provide the commander with synchronization and control of aviation operations in support of the BCT.
- Assist the BCT staff with the airspace control of unmanned aircraft system operations, airspace management, tactical employment of aviation assets, and positioning of forward arming and refueling points.

AIR AND MISSILE DEFENSE PLANS OFFICER

5-52. The air and missile defense plans officer assists the air and missile defense coordination officer. The plans officer assumes those duties and responsibilities in the air and missile defense coordination officer's absence.

MISSION COMMAND SYSTEMS INTEGRATOR

5-53. The mission command systems integrator is responsible for establishing, integrating, and maintaining all of the ADAM's voice and data communications network architecture. Responsibilities include:

- Oversee the network and automation management, information security, and connectivity to automation and communications systems within and external to the BCT.
- Coordinate and work closely with the communications officer and signal company to:
 - Monitor network performance and database configuration.
 - Plan system reconfigurations caused by changes in the tactical situation, communications connectivity, and system initialization.
- Assist in the performance of assistant division air defense officer duties when all communication links are active.

OPERATIONS SERGEANT AND EARLY WARNING SYSTEM SECTION CHIEF

5-54. The operations sergeant and early warning system section chief, in addition to the standard duties of an operations sergeant, operates in the ADAM during the periods of high-intensity operations. Responsibilities include:

- Operate the ADAM's various automation systems such as the Air and Missile Defense Work Station, Air Defense System Integrator, forward area air defense command and control processor, and the ADAM's radio systems.
- Supervise database updates, report generation and distribution, database replication, plotting of friendly and enemy unit movement, and generating graphics pertaining to the air battle.
- Supervise engagement operations, emplacement, and march order; setting up, and connecting necessary computers and radios; and limited troubleshooting to allow for normal operations.

ASSISTANT OPERATIONS SERGEANT AND EARLY WARNING SYSTEM SECTION CHIEF AIRSPACE CONTROL

5-55. The assistant operations sergeant and early warning system section chief airspace control operates in the ADAM during periods of high-intensity operations. This individual assumes the duties and responsibilities of the operations sergeant and early warning system section chief in that individual's absence.

SENIOR EARLY WARNING SYSTEM OPERATOR

5-56. The senior early warning system operator operates the Air and Missile Defense Work Station, Air Defense System Integrator, forward area air defense command and control processor, and the element's radio systems during operations. These responsibilities include supervision of:

- Database updates, report generation and distribution, database replication, plotting of friendly and enemy unit movement, and generating graphics pertaining to the air battle.
- Engagement operations.
- Emplacement, operation, and march-order of necessary computers and radios.
- Limited troubleshooting to allow for normal operations.

EARLY WARNING SYSTEM OPERATOR

5-57. The early warning system operator mans the air and missile defense workstation, air defense system integrator, forward area air defense mission command processor, and the associated radio systems. The operator is also responsible for the emplacement and march order; set up, and connection of necessary computers and radios, and limited trouble shooting to allow for normal operations.

OTHER BRIGADE COMBAT TEAM STAFF WHO INTERFACE WITH THE FIRES CELL

5-58. The brigade aviation element was discussed earlier in chapter this chapter. Other personnel and sections include the information operations officer, the civil affairs operations officer, public affairs officer, military information support operations NCO, and the brigade legal section.

INFORMATION OPERATIONS OFFICER

5-59. The information operations officer plans, prepares, executes and assesses the synchronization of information-related capabilities through the IO working group (see FM 3-13), which includes representatives from military information support operations, public affairs, civil affairs, and other information-related capabilities owners in support of BCT operations. The IO officer also ensures information operations integration into targeting. The IO officer and select information-related capability owners, such as civil affairs, public affairs and military information support operations are part of the targeting working group and targeting board (see ATP 3-60). The fire support organizations at battalion level and below coordinate Army and Joint indirect fires delivering the full range of lethal and nonlethal effects when directed.

5-60. The BCT information operations officer is the staff officer responsible for planning, coordinating, and synchronizing information-related capabilities for BCT operations. Responsibilities of the information operations officer include, but are not limited to:

- Coordinate appropriate aspects of information operations with the brigade FSO and fires cell.
- Evaluate enemy, adversary and third-party information efforts as well as monitor and assess the effectiveness of friendly information operations on target groups.
- Participate in the BCT targeting working group and targeting board (see ATP 3-60); nominate information-related capabilities targets arising from the information operations working group (see FM 3-13).

S-9—CIVIL AFFAIRS OPERATIONS OFFICER

5-61. The civil affairs operations officer brings considerations of effects on the civilian population (see FM 3-57) during targeting. The civil affairs operations officer's responsibilities include, but are not limited to:

- Integrate civil affairs objectives and civil considerations with the BCT's mission analysis and targeting.
- Develop civil affairs related measures of performance and measures of effectiveness.
- Advise the commander on the effect of military operations on the civilian populations.
- Minimize civilian interference with operations. This includes dislocated civilian operations, curfews, and movement restrictions, or deconflicting civilian and military activities with due regard for the safety and rights of refugees and internally displaced persons.
- Advise the commander on the long- and short-term effects (economic, environmental, and health) of military operations on civilian populations.
- Coordinate for the integration of civil information from supporting civil affairs units into the common operational picture.
- Support protection of culturally significant sites.
- Integrate the civil affairs methodology with targeting to create nonlethal effects.

PUBLIC AFFAIRS OFFICER

5-62. The BCT public affairs officer provides the BCT commander with the expertise and guidance to conduct public affairs activities and enhance the command's ability to acquire, process, and deliver information. Because information—through mass media and information technologies—reaches the public immediately, The public affairs officer must assist the commander to anticipate and respond to media impact on internal and external publics.

5-63. The public affairs officer also provides advice to the targeting working group and the targeting board (see ATP 3-60) on the public affairs implications of targeting decisions. For more on public affairs, see FM 3-61.

MILITARY INFORMATION SUPPORT OPERATIONS NCO

5-64. The military information support operations NCO provides the necessary operations subject matter expertise support to targeting, and planning, execution, and assessment for all BCT military information support operations (see FM 3-53). Responsibilities include:

- Recommend military information support operations employment for inclusion into the attack guidance matrix, target selection standards, targeting synchronization matrix and fire support tasks.
- Develop and recommend supporting military information support operations objectives and potential target audiences to the information operations officer, S-9, electronic warfare officer, brigade FSO and BCT commander.
- Develop military information support operations measures of performance and measures of effectiveness and monitoring the effectiveness of those operations for BCT assessment.
- Coordinate resources from or for supporting military information support operations elements at division and corps headquarters.

BRIGADE LEGAL SECTION

5-65. The brigade legal section includes two judge advocates: a brigade judge advocate and a trial counsel, as well as a senior paralegal NCO and a number of paralegal Soldiers. The brigade judge advocate serves as the commander's legal advisor and officer in charge of the brigade legal section. The brigade legal section advises the commander and staff on operational law, military justice, administrative law, fiscal law, and other areas of the law as required.

SECTION III – BASIC FIRE SUPPORT COORDINATION TECHNIQUES

5-66. Fire support coordination ensures the integration of fire support assets to match the most effective available engagement means with the designated target to achieve the BCT commander's desired effects needed to support operations. Recommended guidelines for coordination are to:

- Position indirect fire weapons systems and units to support the BCT commander's concept of the operation and to engage high-payoff targets.
- Coordinate naval surface fire support and planned and immediate close air support to achieve the BCT commander's intent and concept of operations.
- Ensure that the fire support planners and observers know the locations of maneuver boundaries and FSCMs.
- Position primary and alternate observers where they can see their assigned targets and trigger points, communicate with fire support assets, and respond to the BCT commander and subordinate and supporting unit commanders.
- Establish field artillery and mortar priority targets and FPFs.
- Plan illumination to facilitate direct fire at night if night vision devices are not available.
- Provide survey and meteorological support to mortars.
- Use the fire support execution matrix to execute fire support and remain flexible to enable execution of the branches or sequels to the current plan.
- Coordinate with the field artillery battalion command post to develop the attack guidance matrix using the munitions effects database in the AFATDS.
- Compute ammunition requirements needed for generating desired effects via the attack of expected enemy target categories and provide this assessment to the BCT commander so that the commander can formulate attack guidance.
- Identify issues that require the BCT commander's attention or additional guidance, such as fire support tasks that may be unsupportable.

- Disseminate target priorities to the BCT staff and to the lowest levels of the BCT's subordinate and supporting units, including fire support organizations, and mortars.
- Develop and disseminate field artillery-delivered scatterable mine safety boxes in coordination with the BCT engineer coordinator and the S-3.
- State the BCT commander's attack guidance by defining how, when, and with what restrictions the commander wants to attack different targets and identify the targeting priorities; enter resulting data into the AFATDS database.
- Require refinement by lower fire support echelons to be completed by an established cut-off time.
- Verify or update target locations and trigger points during refinement.
- Determine risk estimate distances and advise the BCT commander regarding acceptable risk related to delivery of indirect fires for units in close contact.
- Consider limiting the number of targets to 10 to 15 per maneuver battalion, with no more than 45 to 60 for the entire BCT.
- Use the fire support execution matrix to brief the fire support portion of the OPLAN or OPORD during the combined arms rehearsal.
- During the combined arms rehearsal, rehearse the fire support portion of the OPORD directly from the fire support execution matrix.
- Conduct rehearsals with the Soldiers who will execute fire support tasks (such as the platoon forward observer who will initiate fires on a target rather than the company FSO).
- Ensure that methods for battle tracking and clearance of indirect fires are clearly understood by fires cells and maneuver commanders.
- Verify the acquisition ranges of counterfire radars and field artillery and mortar delivery system coverage based on the effects desired and appropriate shell and fuze combinations.
- Prioritize requirements for counterfire radar coverage and allocate radar zones to reflect the developed situation template, protection priorities, and the scheme of maneuver.
- Explain fire support-related combat power in terms of the required effects to be generated for the operation to identify fire support contributions to the scheme of maneuver. Useful information may include:
 - The number and type of missions possible.
 - Field artillery battery and battalion mortar volleys available by the type of ammunition and the effects expected.
 - Minutes of smoke available and allocation.
 - Minutes of illumination available and allocation.
 - Number of available scatterable mines by type, size, density, and safety zone.

5-67. Fire support personnel must strive to maximize the time available to those who must prepare for and execute fire support tasks. The planning method selected is dependent upon the commander's evaluation of the time available and the unit's level of proficiency. Some units use a rule of thumb of one-third—two-thirds to allocate the time from the commander's receiving the mission until issuing the order to subordinate commands, so that two-thirds of the time available can be used to prepare to execute the operation. Other units believe that this is a disproportionate rule of thumb that results in complex orders and plans that are too difficult to execute. Those units emphasize maximizing the time available for preparation and executing a simple plan against a small number of targets. These units allow a commander only one-fifth of the time to issue the order. This technique reduces the number of targets for potential engagement – an extensive list with a large number of detailed targets often simply can't be executed. Develop a very simple fire support plan and groups of targets at company, battalion, and brigade level. The commander's concept moves from higher to lower where each echelon adds and adjusts targets and sends them back up the chain for integration, deconfliction, simplification and approval. Then the targets are sent from higher to lower echelons again for final planning and preparation.

SECTION IV - REHEARSALS

5-68. The brigade FSO and fires cell planners should participate in the BCT commander's rehearsal. Both fire support and maneuver actions should be rehearsed to reinforce understanding of the scheme of maneuver and its associated fire support plan. See FM 6-0 for a detailed discussion of rehearsals.

TYPES OF REHEARSALS

5-69. BCT fire support personnel may be involved in several types of rehearsals. The most common types are combined arms rehearsals, fire support rehearsals, and field artillery tactical and technical rehearsals. Multiple rehearsals ensure that maximum integration and synchronization in supporting the scheme of maneuver with fires is achieved. However, when time is limited, the number and scope of rehearsals are reduced. In these cases, rehearsals may focus on fire support tasks or particular aspects of the maneuver plan and the associated fire support plan. Combined fire support and field artillery rehearsals may be conducted.

COMBINED ARMS REHEARSALS

5-70. The fire support plan may be rehearsed as part of the BCT's combined arms rehearsal. Key fire support players include the FSCoord, brigade FSO, main command post fires cell including the ADAM/BAE, Air Force TACP, BCT staff weather officer, subordinate and supporting unit fires cells, FSOs, and mortar platoon leaders, the Army aviation liaison officer, military intelligence company commander, chemical, biological, radiological, nuclear (CBRN) officer, and the engineer coordinator. Assigned and attached combined arms units that comprise or support the BCT will participate when possible. Normally, the BCT S-3 directs the rehearsal using a synchronization matrix or execution checklist; the brigade FSO should use the fire support execution matrix. The rehearsal is normally executed by reciting or performing:

- Actions to occur.
- Possible friendly initiatives.
- Possible reactions to enemy initiatives.
- Control measures.
- Significant events relative to time or phases of the operation.

5-71. At a minimum for each phase or time period of the operation, the brigade FSO should verify:

- Grid locations for high-payoff targets.
- Trigger points for each target and the target engagement criteria.
- A primary and an alternate observer for each target.
- Primary and backup communications links for each observer.
- Each target has a task (including effect to be achieved) and a purpose, and that targeting priorities are clearly outlined.
- The method of engagement (at my command, time on target, or when ready).
- Attack guidance, such as unit(s) to fire, shell and fuze combination, and number of volleys, is specified for each target.
- The movement plan specifies when and where units will move.

FIRE SUPPORT REHEARSALS

5-72. The fire support rehearsal should last no more than 90 minutes and should ensure the synchronization of the fire support effort with the maneuver plan. Fire support rehearsals focus on the execution of fire support tasks, the fire support execution matrix, the effectiveness of FSCMs, and the timing and synchronization of all fire support efforts with each other and with the maneuver operation. Fire support rehearsals serve to refine fire support, ensure understanding by all fire support personnel, and prove the feasibility of executing fire support.

5-73. A fire support rehearsal may include all key maneuver and fire support personnel involved in planning and executing the fire support plan, to include the organic and supporting field artillery battalion command post. The BCT commander, executive, S-3, and subordinate battalions attend the fire support rehearsal. BCT staff officers attending include the air liaison officer, engineer, CBRN officer, and brigade aviation officer. Subordinate units often bring personnel that include the S-3, FSO, scout and mortar platoon leaders. The BCT field artillery battalion commander as the BCT's FSCOORD usually supervises the fire support rehearsal for the BCT commander and is assisted by the BCT FSO.

5-74. The fire support rehearsal may also be limited in scope. Two examples of fire support rehearsals that are limited in scope are one that is focused only on BCT-level fire support participants (for example the BCT S-3, fires cell, electronic attack officer, Army aviation liaison officer, Air Force air liaison officer), and one that is centered on the BCT through the battalion, company fire support network of fire cells, FISTs and observers. Key participants include:

- Cannon field artillery battalion commander (BCT FSCOORD).
- Brigade FSO and assistant brigade FSOs.
- ADAM representative.
- Subordinate and supporting unit FSOs.
- Company and team FSOs.
- Field artillery battalion S-3, fire direction officer, and firing platoon fire direction officers.
- BCT Air Force air liaison officer.
- BCT staff weather officer.
- BCT brigade aviation officer or Army aviation liaison officer.
- Counterfire radar section leaders.
- Any other personnel who have responsibility to execute a portion of the fire support plan.

5-75. A fire support rehearsal may be used to prepare for a combined arms rehearsal or it may be used after a combined arms rehearsal to refine and reinforce key fire support tasks. If the fire support rehearsal is held first, changes from the combined arms rehearsal may require a second fire support rehearsal. If a combined arms rehearsal is not conducted, a fire support rehearsal may serve as the primary preparation for execution of the fire support plan. The field artillery tactical rehearsal may be held either before or after the fire support rehearsal. The field artillery technical rehearsal is always held after target refinement cutoff time.

5-76. Units may use the fire support execution matrix as a fire support rehearsal script. Organic and supporting field artillery battalions may use the field artillery battalion OPLAN or OPORD as the fire support rehearsal script.

5-77. The FSCOORD or brigade FSO establishes the time for all key participants to conduct the rehearsal. The FSCOORD or brigade FSO begins the rehearsal by announcing key times or phases of the operation. Each participant then executes the actions to be taken (normally, short of actually delivering fires on the appropriate target). Actions of rehearsal participants are in Table 5-1.

5-79. Fire support personnel, especially the BCT fires cell staff, may participate in field artillery tactical and technical rehearsals conducted by the BCT's field artillery battalion and supporting units from higher headquarters. Field artillery tactical rehearsals are focused on the execution of field artillery tasks and the positioning and movement of field artillery units. Fire support involvement is critical in addressing firing priorities, backup plans to generate desired effects, proper entry of commander's guidance's into the AFATDS, and terrain management issues. Field artillery technical rehearsals may focus on digital communications, on critical sensor-to-shooter linkages, or on the fire direction processes.

5-80. When time is limited, the FSCoord and brigade FSO may direct a single rehearsal that addresses both fire support and field artillery actions. The scope of a combined fire support/field artillery rehearsal varies, depending on the time available and the overall BCT rehearsal plan. However, the combined rehearsal generally focuses on the most important fire support tasks and on the coordination necessary between key fire support and field artillery participants. When a combined arms rehearsal isn't conducted and a combined fire support/field artillery rehearsal serves as the primary fire support rehearsal; the BCT S-2 and S-3, and other members of the BCT main command post fires cell (for example Air Force air liaison officer, electronic attack officer, brigade judge advocate, targeting officers and others) should participate whenever possible.

CONDUCTING THE FIRE SUPPORT RADIO REHEARSAL

5-81. The BCT fire support radio rehearsal is conducted not only to verify the same information as previously described, but also to verify the communication links for mission execution. It will usually be conducted on the BCT fire support net, but if the BCT is operating in a single-channel mode, an alternate frequency will be used.

NET CALL AND AGENDA REVIEW

5-82. The radio rehearsal begins with the brigade FSO or an assistant brigade FSO conducting a net call. Each of the subordinate and supporting unit FSOs will ensure that their company FSOs are present. Stations will respond in established order. At the completion of the net call, the BCT's field artillery battalion fire direction officer will give a time hack using global positioning system time as the standard.

5-83. The brigade FSO reviews the rehearsal agenda including:

- Fire support task review in accordance with the scheme of fires.
- FSCoord's guidance.
- Consolidated target list review (field artillery battalion fire direction officer).
- FSCMs and priority of fires by phase.
- Fire support task execution, including target, trigger, location, observer, delivery system, attack guidance, and communications network.
- Critical friendly zone and call-for-fire zone review.
- Issues.
- Digital execution.

FIRE SUPPORT TASKS AND THE FIRE SUPPORT COORDINATOR'S GUIDANCE

5-84. The brigade FSO then states the number of phases in the operation and the fire support tasks for each phase in accordance with the scheme of fires. At this time, the FSCoord and brigade FSO may provide any additional guidance as required. Following the BCT fire support tasks, subordinate and supporting unit FSOs state their respective unit's fire support tasks.

5-85. The FSCoord and brigade FSO review the overall mission for the cannon field artillery battalion and the fires warfighting function. The FSCoord or the FSO provides any necessary fire support task guidance.

TARGET LIST REVIEW, PRIORITY OF FIRES, AND FIRE SUPPORT COORDINATION MEASURES

5-86. The cannon field artillery battalion fire direction officer then announce the BCT consolidated target list by target number, grid, munitions, volume of fire, and special instructions.

Note: Subordinate and supporting unit fire supporters conduct target refinement prior to the BCT integrated rehearsal so that any changes will have been synchronized prior to the BCT radio rehearsal.

5-87. After completion of the target list, all major stations (FSCOORD and subordinate and supporting unit FSOs) acknowledge receipt. Any elements requiring clarification of the target ask for that clarification at this time.

5-88. After the target list has been verified, the brigade FSO states the priority of fires by phase and the FSCMs in effect for that phase. The brigade FSO (or fires cell representative) reads the consolidated NFA list to ensure that all subordinate and supporting unit fires cells, FISTs, and firing units (including mortars) have an accurate list. Following the review, all agencies may recommend adding or deleting NFAs for the commander's approval.

FIRE SUPPORT TASK EXECUTION

5-89. The FSCOORD, brigade FSO, or the BCT S-2 then drive the rehearsal by stating the sequential critical enemy events or critical friendly events and the association time with those events.

5-90. Rehearse target execution in accordance with the scheme of fires. Battalion FSOs announce the activation and deactivation of their associated radar zones.

5-91. When appropriate, the primary observer (subordinate or supporting unit FSO if that observer is not required to be on the net) executes the assigned target by stating:

- Observer-primary.
- Target number.
- Target description.
- Location.
- Trigger.
- Attack guidance.
- Delivery system.
- Communication networks.
- Call for fire.

5-92. The BCT's field artillery battalion fire direction officer repeats the call for fire and then issues a message to the observer that includes time of flight. The fire direction officer will also read the primary shooter, volume of fire, and ammunition for the fire support task.

5-93. Following the message to observer, the alternate observer announces the responsibility for execution and provides the same information as the primary observer but no call for fire is sent.

COUNTERFIRE RADAR ZONE MANAGEMENT AND CONCLUSION OF THE RADIO REHEARSAL

5-94. Just as with all other fire support actions, cueing the radar, refinement of zone location and activation of zone should occur at the appropriate trigger during the rehearsal: The BCT fires cell targeting officer reviews the consolidated critical friendly zones, call-for-fire zones, and their activation triggers.

5-95. After all actions have been rehearsed in the sequence they will be executed; and all the objectives of the rehearsal have been met, the brigade FSO clarifies any remaining issues. The FSCOORD or brigade FSO then restates guidance as needed and provides concluding remarks.

FIELD ARTILLERY DIGITAL REHEARSALS

5-96. At the completion of the voice rehearsal, conduct a digital rehearsal of the fire support plan from sensor-to-shooter. Observers responsible for target execution execute their targets digitally. Conduct Level III full-scale digital dress rehearsals in conjunction with combined arms, fire support, or field artillery tactical rehearsals or are conducted separately. The rehearsals involve the use, in real-time, of fire support platforms over actual or similar terrain. These rehearsals are generally conducted in a deliberate or hasty defense or for a limited offense. Level III rehearsals are time and resource-intensive and, although the most desirable, are rarely feasible. When conducted, some of the more significant benefits of a Level III rehearsal 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 mass during critical periods.
- Rehearsal of triggers on the ground, both for movement and for the initiation of fires by primary and backup sensors or observers.

5-97. Level II digital rehearsals are conducted separately from combined arms or field artillery tactical rehearsals. Level II rehearsals are conducted from actual fighting position areas, where electronic movement of units and icons on 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 between AFATDS operational facilities. Targets outside the range of friendly assets cannot be processed in the AFATDS, even for rehearsal purposes. For these targets, their information should be verified by voice (for example target number, grid, trigger, attack guidance, firing units).

5-98. Level I full digital rehearsals are conducted separately from combined arms or field artillery tactical rehearsals in a manner similar to that of a normal command post exercise from an assembly area. The database can be rehearsed completely by electronically moving units and icons on the AFATDS situation screen. Movement of the icons on the screen gives rehearsal participants an electronic visualization of how the operation is expected to unfold and how the fire support plan will be integrated. However, before conducting this type of rehearsal, units must be certain that the rehearsal will not interfere with actual missions.

INTEGRATED DIGITAL AND TACTICAL FIRE SUPPORT AND FIELD ARTILLERY REHEARSALS

5-99. The AFATDS offers a unique ability to merge digital and fire support and field artillery tactical rehearsals. Individual preferences should be reflected in unit standard operating procedures emphasizing particular strengths and weaknesses.

5-100. The rehearsal net must allow all participants to monitor the rehearsal. Regardless of the net, the BCT main command post fires cell should be the net control station and run the rehearsals. To provide the conceptual framework, the rehearsal should begin with the brigade fire support officer or other fires cell representative providing a brief description of the BCT commander's concept of the operation and supporting scheme of fires; followed by a phase-by-phase overview of the operation. Topics to be addressed for each phase of the operation include:

- Friendly or enemy action that initiates each phase (BCT fires cell representative).
- Threat situation (field artillery battalion S-2). For both Level I and III rehearsals the S-2 moves enemy icons on the AFATDS current situation screen and sends status either to selected units or to a distribution list that includes all AFATDS operational facilities.
- Concept of operations (BCT fires cell representative).
- The commander's intent for fires during that phase (BCT fires cell representative).
- Fire support tasks for that phase.

Note: Fire support tasks are related in time and space and should be discussed in relation to each other. For AFATDS purposes, fire support tasks identify the unit that has priority of fires. 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 or observers; delivery units(s); and time-space relationship between unit response time, duration of fires, and scheme of maneuver.

5-101. After review of each fire support task, process the missions from the sensor or observer to the delivery system level. In particular, validate the mission value; system preferences (AFATDS selects the fire support system); delivery system attack methods (shell, fuze, unit, volleys); proper intervention points; target coordination requirements; and mission routing functions.

5-102. After review of each fire support task, the cannon field artillery battalion S-3 discusses field artillery actions and field artillery tasks to support each phase of the operation to include movements required during the phase, their triggers, and their relationship in time and space to fire support tasks. For the Level I and III rehearsals, displacing firing units change their grid location and send their status to selected units or to a distribution list that will update AFATDS operational facilities. Address sustainment requirements in the phase at this point in the rehearsal.

DIGITAL REHEARSAL CHALLENGES

5-103. 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 the Level I and III rehearsals, AFATDS operational facilities electronically move unit icons in the AFATDS from assembly areas or battle positions into planned battle positions to range targets for the rehearsal.

Note: To process targets in the AFATDS, units must be able to range the respective targets.

5-104. Preferably, rehearsal missions must be distinctly separate from actual 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 rehearsal information. Alternatively, non-participating net members may have to leave the net for the duration of the rehearsal.

5-105. 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.

5-106. Although the AFATDS permits dividing an operation plan into distinct phases, creating and switching among multiple phases of a plan during rehearsals creates the potential for introducing database errors. Therefore, phases within a plan should be kept to a minimum and created only when necessary.

SECTION V - CLEARANCE OF FIRES AND AIRSPACE CONTROL

5-107. The BCT commander is responsible for the clearance of fires within the BCT's area of operations. The BCT commander conducts clearance of fires so that fires used to engage the enemy will not result in casualties to friendly forces and noncombatants.

5-108. Commanders clear fires through staff processes and the use of control measures, by embedding the processes in automated battle command systems, or through active or passive recognition systems. During planning and execution the BCT commander, S-3, FSCOORD and fires cell planners use all of these means in various combinations to set the conditions for clearance of fires. Even with automated systems, clearance of fires remains a command responsibility at every level; commanders must assess the risk and decide the extent they will rely on automated systems to assist in the clearance of fires.

CLEARANCE OF FIRES

5-109. The FSCoord and fires cell planners coordinate all fire support impacting in the BCT area of operations. They ensure that fire support meets established troop safety criteria, is fully integrated with maneuver, and is compatible with adjacent unit operations.

5-110. The first step in clearance of fires is the application of maneuver control measures. See ADRP 1-02, ADRP 3-90, and FM 3-90-1.

5-111. The next step is proper use of FSCMs (see FM 3-09). FSCMs are either permissive or restrictive. The primary purpose of a permissive FSCM is to facilitate the attack of targets. The establishment of a restrictive FSCM imposes certain requirements for specific coordination before the engagement of those targets affected by the measure. The primary purpose of a restrictive FSCM is to safeguard friendly forces. Permissive FSCMs (for example the fire support coordination line and coordinated fire line) should be established far enough out to permit necessary friendly maneuver during offensive operations and established closer to friendly forces during defensive operations. Permissive FSCMs should be established to maximize the portion of the area of operations in which targets can be engaged with minimal clearance. Restrictive FSCMs, such as NFAs, should be established to protect forces, facilities, and civilians—restrictive measures should not remain in effect for the entire operation without being checked and updated. They should be established with an effective date-time group and a projected cancellation date-time group. NFAs should be kept as small as possible to avoid creating safe havens for enemy forces. During the MDMP (see chapter 6), specific criteria should be developed to trigger the changing of FSCMs.

Note: A coordinated fire line only applies to surface-to-surface fires; all close air support missions will have to be cleared.

5-112. The BCT commander, with advice from the FSCoord and brigade FSO, establishes all FSCMs within the BCT's area of operations. The FSCoord and brigade FSO base their recommendations on the most effective way to control and coordinate fire support assets in conjunction with the BCT commander's guidance, location of friendly forces, concept of the operation, and anticipated enemy actions. FSCM locations are disseminated by automation systems, message or overlay through both maneuver and fire support channels to higher headquarters and to adjacent, subordinate and supporting units and staff, including all fire support units and staff. Knowledge of the various FSCMs (described in FM 3-09) is necessary for the effective use of fire support.

5-113. All FSCMs are developed to complement the BCT commander's concept of operations. The size of subordinate units' areas of operation is a key consideration in the placement of FSCMs, which in turn influences the allocation of target acquisition and fire support assets. The BCT commander establishes a change to an FSCM through the BCT S-3 and the operations cell at the recommendation of the FSCoord and brigade FSO. The operations cell informs the BCT fires cell of the change and the effective date-time group. Conditions that dictate the change of a FSCM should be coordinated with the BCT's Air Force TACP and the ADAM/BAE. As conditions are met, the new FSCM's effective time can be projected and announced. Following direction to execute the change, the operations cell should confirm with the fires cell that the BCT's Air Force TACP and the ADAM/BAE have informed the appropriate control nodes. This action ensures that affected sorties are aware of new FSCM locations.

5-114. Once established, FSCMs are disseminated, stored and displayed on automation systems. Paper maps, manual firing charts, and overlays must be updated with the FSCMs. Graphic portrayal includes, at a minimum, the visual code, the abbreviation for the measure, the establishing headquarters, and the effective date-time group. Often, the date-time group is shown as a from-to time. Usually, FSCMs are labeled at each end of a line or within the graphic, space permitting. Details on FSCMs and their use are described in FM 3-09, ADRP 1-02, and JP 3-09.

5-115. Make a determination as to which fires will be considered pre-cleared. In some very specific instances, fires can be cleared during the planning phase of the operations process, for example:

- Fires into a planned call-for-fire-zone resulting from a radar acquisition from that planned call-for-fire zone.
- Fires on a planned target with a definable trigger, against a specific enemy, and according to the scheme of fires.
- Airspace integration is always a consideration. It may be possible to establish airspace coordinating measures or procedures (see FM 3-09 and FM 3-52) for rapidly providing relative safety for friendly aircraft.

CLEARANCE OF FIRES DRILL

5-116. Clearance of fires should be a drill in all command posts and operations centers. Fires clearance should occur at the location with the most current information. However, as fire support requests can come from many channels, clearance of fires must be a staff drill in all command posts and operations centers. The best method is a redundant drill where a call for clearance is transmitted over two nets; the fire support net and a maneuver net. Initiating the drill is the responsibility of the BCT main command post fires cell. Staff members that may be required to participate in the clearance of fires drill may include (but are not limited to) the BCT S-3, FSCoord, brigade FSO, brigade judge advocate, information operations officer, ADAM/BAE, Air Force air liaison officer and command post shift leaders. Clearance of fires in an urban environment (see chapter 3) is often complicated by strict rules of engagement and collateral damage considerations. The staff section(s) required to participate in the clearance of fire drill depends on the operational environment within which the BCT is operating and should be included in the BCT's tactical standard operating procedures.

5-117. Facilitate positive clearance of fires through prior planning, rehearsals, and careful placement of FSCMs. However, the clearance of targets of opportunity often presents challenges. Fires on targets of opportunity must be delivered on short notice without undue delay and without jeopardizing friendly force security. For positive clearance of fires, the following should be obtained:

- Best available method of target location.
- Positive identification of targets as enemy.
- Eyes on target, if at all possible.
- Clearances from appropriate external elements if the target is outside unit boundaries.

AIRSPACE CONTROL

5-118. BCT airspace control involves detailed coordination and integration to enable effective use of close air support, indirect fires, air defense artillery, tactical fire and maneuver operations and Army aviation (including unmanned aircraft systems). Airspace control helps minimize the risk of fratricide and increases overall force effectiveness.

5-119. Maneuver commanders exercise airspace control within their assigned areas of operation through the integration of both positive and procedural control methods. Both methods of control are fully compatible and should be used in concert to effectively perform airspace control. Typically higher command authority directs many positive and procedural control methods. The air tasking order, published daily by the joint force air component commander, directs tactical identification friend-or-foe use, and assignments in each theater, as well as projecting ground combat movements. The airspace control order (published either as part of the air tasking order or separately) notifies appropriate theater air-ground system nodes of the effective times, altitudes, distances, and the controlling agency for all airspace control measures. It may also include FSCMs, air defense control measures, and any other pertinent airspace information deemed necessary by the airspace control authority to limit fratricide and maximize combat effectiveness.

Note: Army airspace users are ground forces operating in an inherently joint environment. Commanders are responsible for integrating Army airspace users, regardless of who controls the airspace, within the larger unified action framework. Commanders continuously integrate airspace users throughout their areas of operations while conducting operations. This affords commanders the flexibility and responsiveness to capitalize on opportunities and operate in a manner consistent with mission command (see FM 3-52). Army aviation and fires are included airspace users under the term ground forces. Airspace elements do not routinely manage the flight path or trajectory of individual airspace users. Rather, airspace elements integrate airspace use for flight paths and trajectories in planning and execution to manage risk. Only when two or more airspace users conflict do airspace elements direct changes in flight path or, in the case of fires, coordinate with the fires cell to alter the trajectory or timing of fires. The commanders' mission priorities and risk guidance are the basis for any changes. Pilots, unmanned aircraft system operators, and weapon system controllers still maintain the responsibility to make the directed changes to their flight path or trajectory.

5-120. Although the BCT commander has the responsibility for airspace control, the S-3 has overall authority for coordinating, deconflicting, and managing all airspace within the BCT's area of operations (including that of the BCT's subordinate and supporting units). The BCT's ADAM/BAE is responsible for integrating the use of airspace for BCT operations. The BCT airspace control working group, managed by the airspace element, consists of an air liaison officer and representatives from the airspace element, aviation element, air defense airspace management, fires cell, tactical air control party, and unmanned aircraft systems element. The brigade aviation officer is the airspace control officer for the brigade S-3. They provide staff functions within the BCT's main command post for planning and executing airspace control for the BCT commander and S-3. Subordinate and supporting units submit airspace control means requests to the BCT ADAM/BAE for processing and subsequent forwarding to higher headquarters airspace control elements. Further information on airspace control for the BCT can be found in FM 3-52 and ATPs 3-52.1, 3-52.2, 3-52.3, and 3-91.1.

SECTION VI - SENSOR-TO-SHOOTER OPERATIONS

5-121. The decision to establish a sensor-to-shooter link is made during the MDMP (including targeting). The continuous process continues to be refined after the initial plans have been developed.

5-122. Target acquisition systems and equipment (sensors) perform the key tasks of detecting, locating, tracking, identifying, and classifying targets. Fire support typically involves the employment of both air-to-surface and surface-to-surface lethal and nonlethal weapons. Air Force, Navy, Marine Corps, and Army aircraft perform air-to-surface fires. Surface-to-surface fire support typically includes Army and Marine Corps cannon, rocket, and missile artillery, and naval surface fire support systems. The fleeting nature of some enemy systems requires near real-time sensor-to-shooter links. Target acquisition systems must be capable of distinguishing between friendly and enemy activity. Special arrangements must be made with host nation military forces, multinational forces, joint Services, and national and local authorities to set up communications, identify liaison personnel, and establish procedures. Figure 5-1 displays the sensor-to-shooter challenge.

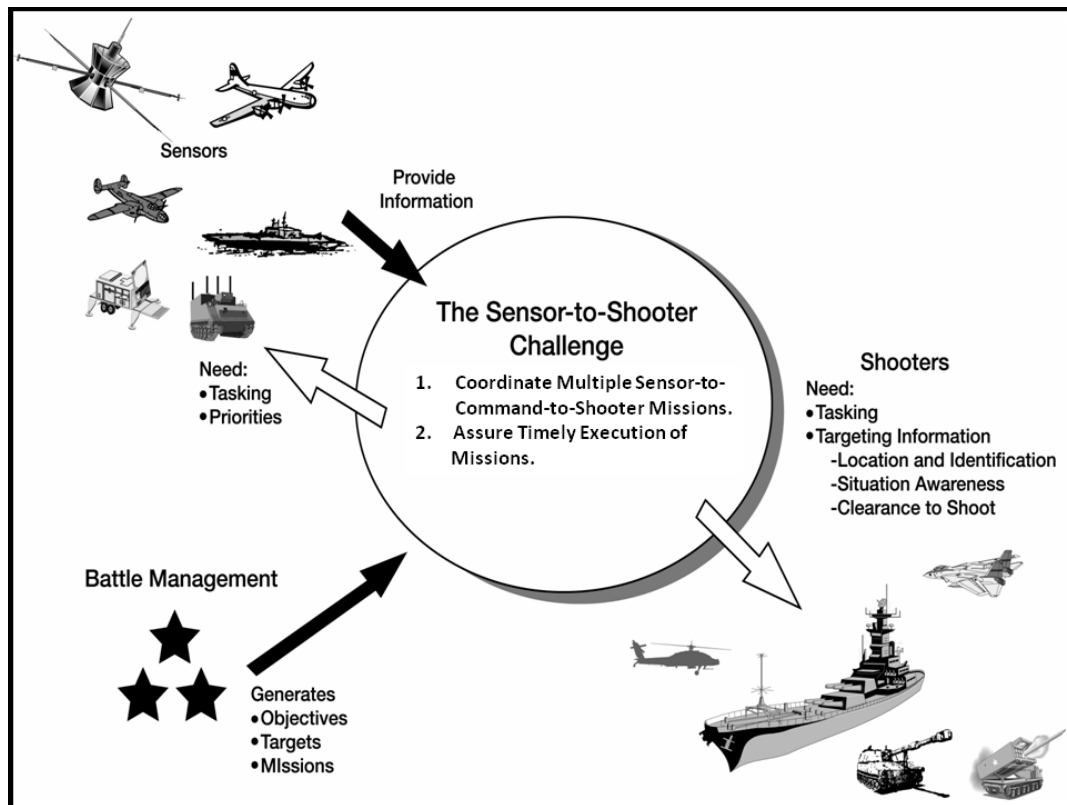


Figure 5-1. Sensor-to-shooter challenge

5-123. Individual sensors and shooters should be tasked with and provided with the necessary priorities and targeting information they need to carry out multiple missions against multiple targets to achieve the commander's desired effects. For each mission, information linkages must be established between sensors and shooters to enable the timely execution of missions, especially time-critical missions. Because, ideally, the sensors can be time shared among many shooters, effective and efficient implementation of these linkages and the ability to pass information through them will inevitably require the establishment of execution controllers.

DYNAMIC TARGETING CHALLENGE

5-124. Some of the most challenging threats are those that are highly mobile, display low signatures, and possess a highly lethal capability. Examples of targets of this type include a surface-to-surface missile launcher or a surface-to-air missile system. Because these targets are typically single vehicles, they are difficult to acquire when inactive, provide the least precise targeting when mobile, and pose a significant threat to defended areas or assets if left unengaged. For these target types, the precise, responsive attack of the system and its infrastructure (such as sustainment, command and control, target acquisition, weapons systems) is the rule. The challenge is to fit the engagement cycle for these time-sensitive targets into the target's movement and firing cycle. See figure 5-2 on page 5-30. For more on dynamic targeting, see ATP 3-60.1.

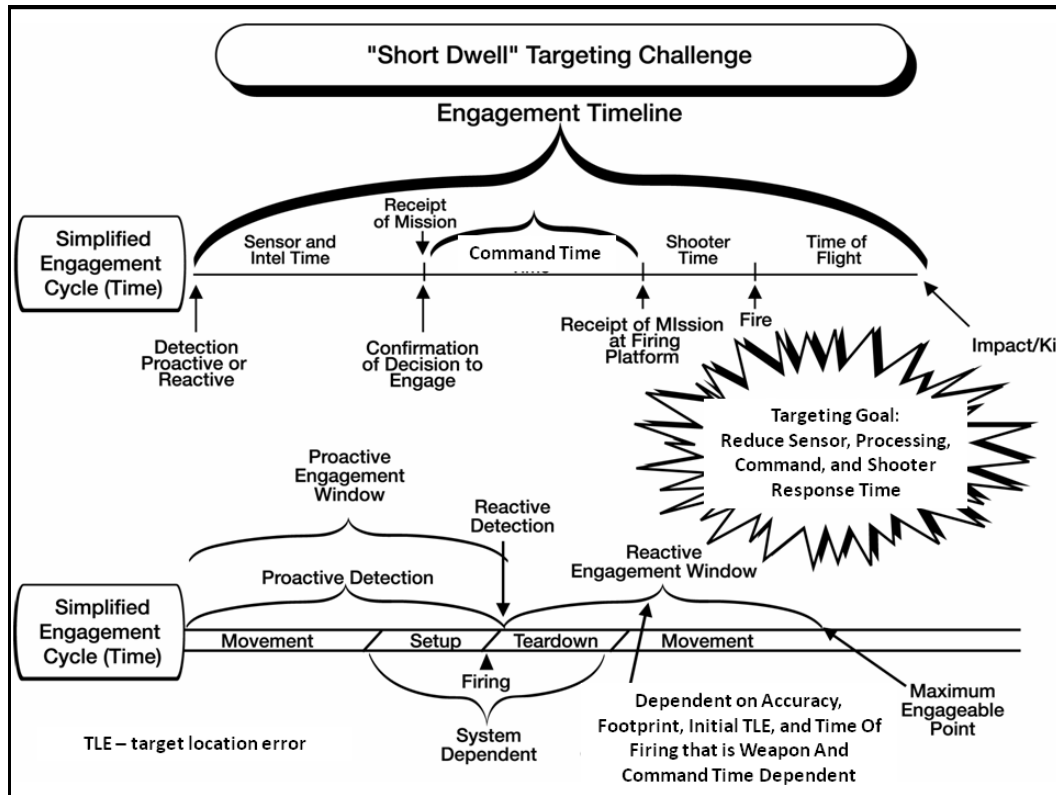


Figure 5-2. Short dwell targeting challenge

SENSOR-TO-SHOOTER OPTIONS

5-125. In order to meet the sensor-to-shooter and short dwell targeting challenges, it is necessary to develop sensor-to-shooter linkages. Linkages may be established in varying levels of control ranging from decentralized to centralized methods.

5-126. The following four options discuss techniques for sensor-to-shooter linkages from a decentralized method to a more centralized method of control. Based on the tactical mission and the decisions made during the MDMP (see chapter 6), the assignment of a nonstandard command or support relationship may be required to accomplish the desired sensor-to-shooter linkage.

OPTION 1

5-127. Option 1 is a descriptive phrase—not a mission or tactical task—of a direct communications link between a reliable target acquisition sensor and a delivery system. See figure 5-3.

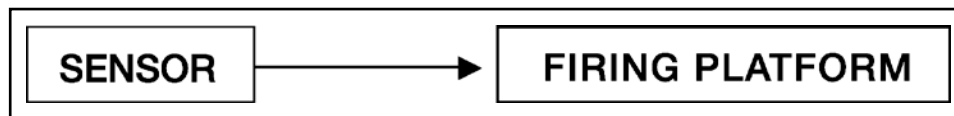


Figure 5-3. Option 1: sensor-to-shooter

5-128. The sensor provides input to a firing platform instead of to an intelligence gathering organization or device. The firing platform receives what is essentially a fire order from an agency or device designed to input spot reports and requests for fire.

5-129. The following considerations apply:

- The sensor is capable of locating and describing the target to standards that warrant immediate attack.
- The firing platform can perform technical fire direction.
- The commander establishing the sensor-to-shooter link can task the sensor.
- The sensor possesses compatible communications with those of the firing platform.
- The distance between the sensor and the shooter allows direct or automatic relay communications.
- A separate communications network exists between the sensor and the shooter.
- The commander establishing the sensor-to-shooter link can task the firing platform.
- Specific targets or target areas of interest are pre-designed to focus the sensor and orient the shooter.
- Fires against expected targets or target areas of interest are pre-cleared.
- Airspace, if necessary, is pre-cleared.
- The total time from sensor acquisition to effects on the target is less than the estimated target dwell time.
- A well-defined start time and a clear end-state for this relationship are established for the sensor-to-shooter link.

OPTION 2

5-130. Option 2 is also a descriptive phrase—not a mission or tactical task—of a direct communications link between a reliable target acquisition sensor and the lowest level tactical headquarters that can perform technical fire direction. See figure 5-4.

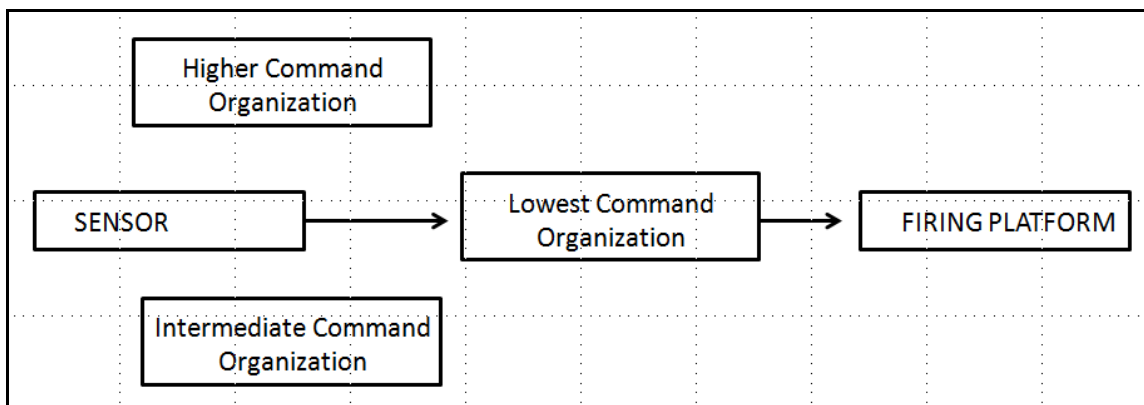


Figure 5-4. Option 2: sensor-to-shooter

5-131. The sensor bypasses normal reporting channels and communicates with (sends data to) a command post or device that it would not send data to under normal circumstances.

5-132. The following considerations apply:

- The sensor is capable of locating and describing the target to standards that warrant immediate attack.
- The commander establishing the sensor-to-shooter link can task the sensor.
- The sensor possesses compatible communications with those of the tactical headquarters element with which it is communicating.
- The distance between the sensor and the tactical headquarters element allows direct or automatic relay communications.

- A separate communications network is established between the sensor and the tactical headquarters element.
- The commander establishing the sensor-to-shooter link can task the tactical headquarters element and the firing platform.
- Specific targets or target areas of interest are pre-designed to focus the sensor and orient the shooter.
- Fires against expected targets or target areas of interest are pre-cleared.
- Airspace, if necessary, is pre-cleared.
- The total time from sensor acquisition to effects on the target is less than the estimated target dwell time.
- A well-defined start time for this relationship, and a clear end-state, are established for the sensor-to-shooter link.

OPTION 3

5-133. Option 3 is a non-standard support relationship given to intelligence and field artillery organizations in order to minimize the attack time against high-payoff targets with short dwell times (see figure 5-5).

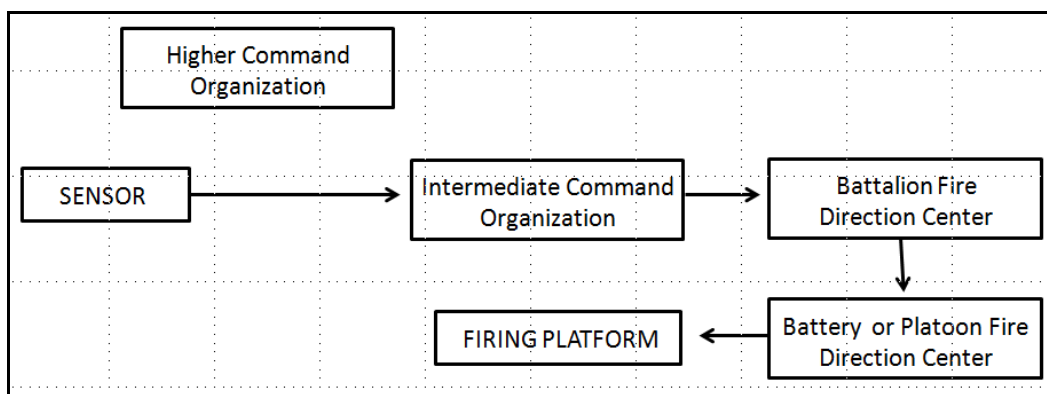


Figure 5-5. Option 3: sensor-to-shooter

5-134. The sensor bypasses normal reporting channels and communicates with a tactical headquarters organization or device that it would not send data to under normal circumstances. However, the information enters the fire support system at some echelon higher than in option 2.

5-135. The following considerations apply:

- The sensor is capable of locating and describing the target to standards that warrant immediate attack.
- The commander establishing the sensor-to-shooter link can task the sensor.
- The sensor possesses compatible communications with those of the tactical headquarters element with which it is communicating.
- The distance between the sensor and the tactical headquarters element allows direct or automatic relay communications.
- A separate communications network is established between the sensor and the tactical headquarters element.
- The commander establishing the sensor-to-shooter link can task the tactical headquarters element and the firing platform.
- Specific targets or target areas of interest are pre-designed to focus the sensor and orient the shooter.
- Fires against expected targets or target areas of interest are pre-cleared.
- Airspace, if necessary, is pre-cleared.

- The total time from sensor acquisition to effects on the target is less than the estimated target dwell time.
- A well-defined start time for this relationship, and a clear end state, are established for the sensor-to-shooter link.

OPTION 4

5-136. Option 4 is a variant of a quick fire channel applying both to individual sensors and tactical units. See figure 5-6.

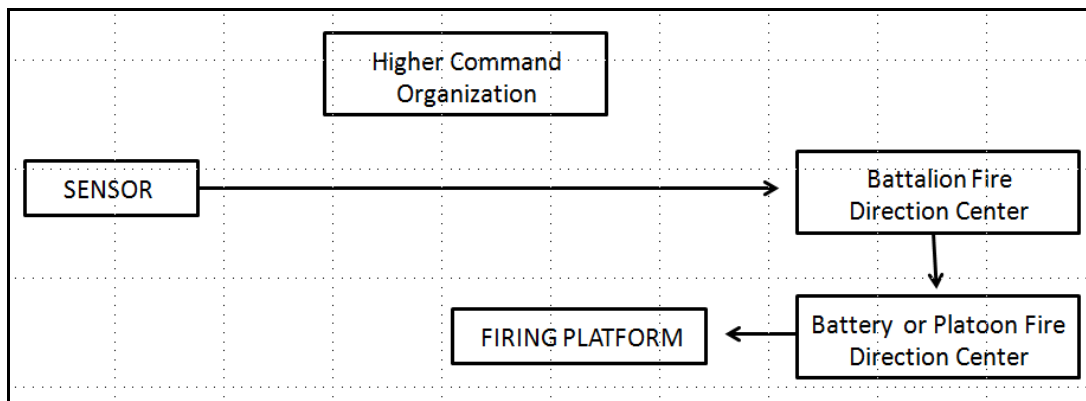


Figure 5-6. Option 4: sensor-to-shooter

5-137. The sensor bypasses normal reporting channels and communicates with a tactical headquarters organization or device that it would not send data to under normal circumstances. The information enters the fire support system at the echelon tasked to provide the quick fire channel.

5-138. The following considerations apply:

- The sensor is capable of locating and describing the target to standards that warrant immediate attack.
- The commander establishing the sensor-to-shooter link can task the sensor.
- The sensor possesses compatible communications with those of the tactical headquarters element with which it is communicating.
- The distance between the sensor and the command and control element allows direct or automatic relay communications.
- A separate communications network is established between the sensor and the tactical headquarters element.
- The commander establishing the sensor-to-shooter link can task the tactical headquarters element and the firing platform.
- Specific targets or target areas of interest are pre-designed to focus the sensor and orient the shooter.
- Fires against expected targets or target areas of interest are pre-cleared.
- Airspace, if necessary, is pre-cleared.
- The total time from sensor acquisition to effects on the target is less than the estimated target dwell time.
- A well-defined start time for this relationship, and a clear end state, are established for the sensor-to-shooter link.

SECTION VII - STRIKE, COUNTERFIRE AND ARMY TACTICAL MISSILE SYSTEM CONSIDERATIONS FOR BCT OPERATIONS

STRIKE

5-139. A strike is a component of offensive and defensive tasks, usually conducted at echelons of division and above by a supporting FAB. The primary purpose of a strike is to generate tactical or operational effects against the enemy in areas outside of the BCT area of operations. Strike supports both shaping and decisive operations according to the division or other FAB-supported commander's intent. For example, if a FAB-supported commander is seeking to dislocate the enemy, a BCT may conduct a turning movement (shaping) to expose an enemy force to strike attacks to defeat the enemy force (decisive). In another operation, the strike may attack enemy command posts or communications sites to disrupt an enemy force (shaping) so that a BCT may close with and destroy the enemy force (decisive). Simultaneous attacks in depth, executed at increasingly longer ranges with precision-guided munitions, are key elements for BCTs' divisions, corps, and joint force commanders in shaping the operational environment and accelerating the enemy's defeat.

5-140. A strike is generally focused on a specific enemy capability and is a deliberate action to eliminate the capability represented by the target. Such strikes function with a timeline of several hours to several days—a strike is not a fire mission against a target of opportunity. As part of shaping operations, indirect fire strikes are conducted to improve friendly force ratios, protect the force, and provide for successful air and ground maneuver.

5-141. The rapid and aggressive movement of field artillery assets well forward in the supported unit area of operations to achieve range on the identified target is characteristic of strike preparation. This is accomplished either by assigning a mission to supported unit subordinate elements to support the striking field artillery unit's movement forward, or by task organizing maneuver or other security assets (for example infantry/armor, military police, or air defense artillery) to the striking field artillery unit to allow the unit's commander to position forces for the strike.

5-142. Field Artillery strike operations have three primary advantages over attack aviation operations. First, there is no risk to aircrew conducting the strike. Second, there is very little delay, usually minutes, between acquisition of the target and delivery. Third, there is little the target can do to defend itself once acquired, except to move outside of the range of lethal effects. For many types of targets, that is impossible. The primary disadvantage of field artillery strike is the latter—if the target can move or maneuver, it can often avoid being engaged. Strike or shaping operations in support of a BCT may include air interdiction, strike coordination and reconnaissance, and the use of FSCMs such as a kill box.

5-143. *Air interdiction* is air operations conducted to divert, disrupt, delay or destroy the enemy's military surface capabilities before it can be brought to bear effectively against friendly forces, or to otherwise achieve objectives that are conducted at such distances from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required (JP 3-03).

5-144. *Strike coordination and reconnaissance* is a mission flown for the purpose of detecting targets and coordinating or performing attack or reconnaissance on those targets (JP 3-09.3). The specific geographical area for a strike coordination and reconnaissance mission may be defined by a box or grid where potential targets are known, suspected to exist, or where mobile enemy surface units have relocated because of surface fighting. Typical strike coordination and reconnaissance tasks include sequencing and deconflicting multiple attacking flights through the target area while providing prioritized targeting guidance and enemy air defense updates to maximize the effect of each sortie.

5-145. A *kill box* is a three-dimensional permissive fire support coordination measure with an associated airspace coordinating measure used to facilitate the integration of fires (JP 3-09). For more on air interdiction, strike coordination and reconnaissance, and the employment of the kill box see JP 3-0, JP 3-03, ATP 3-60.2 and ATP 3-09.34.

COUNTERFIRE OPERATIONS

5-146. *Counterfire* is fire intended to destroy or neutralize enemy weapons (JP 3-09). The counterfire battle is not a separate battle, but one aspect of the overall combined arms fight. Depending upon the mission variables of METT-TC, the BCT's execution of counterfire can be supported by resources from echelons above the BCT.

5-147. Where more than one field artillery battalion is available to support the counterfire effort, the FSCoord may recommend to the supported maneuver commander the establishment of a counterfire headquarters to control the counterfire effort. Counterfire has two complementary components: proactive and reactive.

PROACTIVE COUNTERFIRE

5-148. Proactive counterfire is, in reality, nothing more than targeting. In proactive counterfire enemy indirect fire systems, including their command and control, sensors, platforms, and logistics, are targeted and attacked before they engage friendly forces. The proactive measures consist of zone management, site analysis, and position survivability considerations. Proactive counterfire process begins with targeting during the military decisionmaking process and continues throughout the operation. The BCT intelligence officer and the fires cell targeting officers develop named areas of interest and target areas of interest where the enemy indirect fire assets are expected. The objective of proactive counterfire is to identify, locate, and attack the enemy's indirect fire capability before it can impact friendly operations.

5-149. Proactive counterfire in support of BCT operations uses organic target acquisition and fires capabilities, as well as allocated division, corps or joint assets to acquire and engage attack components of the enemy's indirect fire system. Examples of target sets include cannon, rocket, and missile delivery units, prepared launch sites, artillery ammunition storage facilities, fire direction centers, counterfire radars, forward observers, fixed or rotary wing airfields, and fire support communications infrastructure.

REACTIVE COUNTERFIRE

5-150. In reactive counterfire, the BCT field artillery battalion (or supporting FAB battalion) provides immediate indirect fires to neutralize, destroy, and suppress enemy indirect fire weapons once acquired. The fire support systems respond primarily to enemy mortar and artillery fires during or immediately following enemy engagement of friendly forces.

5-151. Reactive counterfire usually requires quick response capabilities for optimum effectiveness and can benefit from the establishment of quick fire channels. In reactive counterfire, the BCT cannon field artillery battalion or FAB battalion serves as the counterfire headquarters by planning coordinating, and delivering fires in reaction to enemy indirect fire activity. As with proactive counterfire, the field artillery battalion or counterfire headquarters employs organic and allocated target acquisition assets to accurately locate firing enemy indirect fire systems and establishes necessary sensor-to-shooter links to rapidly attack the enemy systems.

INTEGRATION AND SYNCHRONIZATION WITH THE SCHEME OF MANEUVER

5-152. As part of the combined arms battle, counterfire must be properly integrated and synchronized with all aspects of the BCT commander's plan. The BCT commander, who has overall responsibility for the planning and conduct of counterfire, receives input and recommendations from the FSCoord (the BCT cannon field artillery battalion commander), brigade FSO, S-3, S-2 and other staff officers involved in counterfire operations. The commander issues decisions and guidance as necessary to direct counterfire efforts, to ensure effective coordination occurs, and to ensure that counterfire is synchronized with all other battlefield operations. Supporting reinforcing (R) field artillery units receive this counterfire guidance through the BCT.

5-153. Counterfire responsibility for the fire support planners includes:

- Support the BCT commander's protection priorities.
- Develop and disseminate intelligence and order of battle information on the threat's indirect fire system.
- Advise the BCT commander in establishment of attack guidance for counterfire targets.
- Coordinate the BCT's counterfire with higher echelon counterfire activities.
- Integrate counterfire into the BCT OPLAN to enable the BCT operation.
- Achieve indirect fire superiority within the BCT's area of operations.

The BCT commander establishes the unit protection priorities. These priorities are normally stated in terms of what and when assets, functions, or positions are critical to the BCT's mission. Information on the enemy indirect fire system includes all systems in the BCT's area of operations, as well as any outside the area of operations, that can impact the BCT's mission including:

- Indirect fire weapon systems—mortars, cannons, rocket, and missile launchers.
- Target acquisition assets—observers, radars, sound or flash systems, and electronic intelligence.
- Command and control elements relevant to counterfire operations.
- Enemy indirect fire tactics.
- Enemy counterfire tactics—to include use of lethal and nonlethal ground and air forces against friendly field artillery.

PLANNING AND TARGETING FOR BCT COUNTERFIRE OPERATIONS

5-154. The counterfire process begins with BCT commander's guidance, intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4) and selection of high-value targets and tentative high-payoff targets (see ATP 3-60) early in the MDMP and continues throughout operations. The fire support annex to the BCT OPORD and its supporting field artillery battalion OPORD (or field artillery support plan) are MDMP products that detail planned BCT counterfire operations (see appendix B for examples).

5-155. If the enemy indirect fire threat is significant, the BCT commander may direct air, ground, and electronic information collection (see the discussion in chapter 4 and FM 3-55) and target acquisition assets (see ATP 3-09.12) to find and target the threat. The BCT S-2 and fires cell planners and targeting officers develop named areas of interest and target areas of interests where the enemy indirect fire assets are expected. The BCT S-3 assigns units to detect enemy activities in the selected named areas of interest. Tasks that are given to the cavalry squadron, the military intelligence company, and maneuver units form the basis of the brigade's information collection plan.

5-156. Information feeds from the manned and unmanned aircraft systems, and electronic, communications, and human intelligence sources populate the intelligence database in the BCT's intelligence cell. The intelligence system generates target nominations that are digitally transmitted to the AFATDS in the fires cell for mission processing. Sensors providing information on targets not meeting the target selection standards are used to cue other sensors to validate the target.

5-157. The flexibility of unmanned aircraft systems makes them a key resource to be cross-cued to locate enemy indirect fire targets. Once located, field artillery, close air support, or maneuver assets may engage the targets. Unmanned aircraft systems may loiter over the area to provide near real time battle damage assessment. Table 5-2 on page 5-37 provides an example technique that has been successfully used in training exercises to attack indirect fire targets located by unmanned aircraft systems with field artillery.

Table 5-2. Counterfire technique with an unmanned aircraft system (example)

Step	Description
1	A digital call for fire is sent from the battalion or squadron fires cell to the BCT fires cell
2	The unmanned aircraft system mission planning and control site mission payload operator inputs the appropriate battery's location into the workstation, allowing the ground control station software to match the gun target and observer target lines; hence the corrections from the tactical unmanned aircraft system mission planning and control site are identical to the corrections from the battery location.
3	The battery fires on the target; as rounds impact the target area, the mission payload operator captures the 10-digit grid of the impact on the workstation, and the software derives the correction
4	Subsequent corrections derived by the mission planning and control site are verified by the battalion or squadron FSO and sent digitally to the BCT fires cell. Simultaneously, voice commands are used to ensure positive observation of the target and target area to capture corrections and adhere to the rules of engagement
5	The mission planning and control site mission payload operator provides combat assessment for the mission, and the battalion or squadron FSO transmits battle damage assessment to the BCT fires cell.
BCT – brigade combat team FSO – fire support officer	

Note: Adjusting fires by means of an unmanned aircraft is a highly difficult task, the skills for which should be developed at home station prior to deployment. Target location error for unmanned aircraft systems must be considered. Even under optimal conditions, unmanned aircraft systems will not be able to produce precise measured coordinates needed to attack point targets. Use digital imagery workstations to produce targetable coordinates. Generally speaking, the smaller the unmanned aircraft system sensor depression angle, the greater the error.

CANNON FIELD ARTILLERY BATTALION ROLE IN BCT COUNTERFIRE OPERATIONS

5-158. The field artillery battalion's counterfire responsibilities will vary depending on mission variables of METT-TC and guidance from the BCT commander. However, the reactive component of BCT counterfire operations is normally the cannon field artillery battalion's responsibility.

5-159. The key counterfire personnel are the FSCOORD/cannon field artillery battalion commander, S-3, fire direction officer, S-2, target acquisition platoon leader, targeting officer, radar section leader, and liaison officer (from a R field artillery battalion, if available). The field artillery battalion S-3, based on the supported commander's guidance, considers counterfire in all phases of operations. The FSCOORD directs measures to decrease the field artillery battalion's vulnerability to detection and minimize exposure to enemy fires.

5-160. Products of the MDMP (see chapter 6) include the field artillery battalion OPORD and its supporting target acquisition tab/annex that identify the requirements for the counterfire radars. The field artillery battalion S-2 and targeting officer (working with the BCT S-2 and fires cell targeting officers) develop the radar deployment order to detail positioning, coverage, and zones for radar. The radar deployment order is normally part of the target acquisition tab/annex to the field artillery battalion OPORD (field artillery appendix/field artillery support plan to the BCT fire support plan if other field artillery units are supporting the BCT operation; see the examples in appendix B).

5-161. The operations and intelligence element of the field artillery battalion command post ensures counterfire is executed to quickly counter enemy artillery and mortars before they can inflict significant damage.

5-162. Counterfire radars organic to the target acquisition platoon of the field artillery battalion normally send fire missions based on radar acquisitions to the fire direction center at the designated field artillery battalion tactical operations center. Counterfire targets are usually generated from critical friendly zones or call for fire zones (see FM 3-09 and ATP 3-09.12). If the situation warrants, a quick fire channel can be established from the radar directly to a firing battery or platoon. Quick fire channels, when directed, are established for a specified period to achieve specific mission requirements. Pre-clearance of such targets needs to be defined in precise terms that identify the conditions under which the target is pre-cleared for engagement.

5-163. Acquired counterfire targets may be engaged by the cannon field artillery battalion or forwarded through field artillery and fire support channels for attack by other assets. The BCT's cannon field artillery battalion commander has additional options for executing BCT counterfire operations when a reinforcing field artillery battalion is provided:

- The BCT fires cell passes all counterfire missions to the R field artillery battalion. This allows the BCT's cannon field artillery battalion to concentrate on providing close fires.
- The radars send all acquisitions directly to the R field artillery battalion; this normally lowers mission-processing time.

SPECIAL CONSIDERATIONS FOR CONTROL OF WEAPON LOCATING RADARS

5-164. Cannon field artillery battalion target acquisition assets must support the BCT commander's intent. The FSCOORD, brigade fires support officer, and fire cell planners recommend an organization for combat for the BCT's radar assets to best meet the BCT commander's requirements and mission. The cannon field artillery battalion coordinates radar management with supported G-2s or S-2s, G-3s or S-3s and fires cells. Control options for weapon locating radars include centralized control at the field artillery brigade, decentralized control, and a combination of centralized and decentralized control.

5-165. A radar execution matrix is a useful tool for both planning and execution of the operation. See ATP 3-09.12 for an example combined weapon locating radar deployment order and execution matrix.

Centralized Control at the BCT Fires cell or BCT Field Artillery Battalion

5-166. BCT target acquisition assets may be held under the centralized control of the BCT fires cell or the BCT's field artillery battalion. Centralized control optimizes coverage to support the BCT commander's intent. When the BCT has control of target acquisition assets, the BCT's organic cannon field artillery battalion should provide the target-processing element from the target acquisition platoon with its associated equipment to the BCT fires cell.

5-167. The BCT fires cell does not have sufficient quick reaction organic target processing capability without augmentation. Regardless of which headquarters exercises control, the cannon field artillery battalion may be tasked to provide survey and logistical support and maneuver battalions or the cavalry squadron may be tasked to provide security support because of the dispersal of radars across the BCT area of operations. Under centralized control, the BCT S-2, brigade FSO, and fires cell planners work with the ADAM, brigade aviation officer and BAE, field artillery battalion S-2 and targeting officer, and cannon field artillery battalion command post personnel to:

- Designate a general position area, sector of search, and zones for each of the radars.
- Coordinate terrain management including the positioning of radar and priority for movement, sectors of search, and radar zones with the ADAM/BAE, cannon field artillery battalion S-2 and S-3, and supported and supporting units.
- Designate cueing agents.
- Establish cueing guidance.
- Establish sensor-to-shooter linkages.
- Deconflict airspace.
- Coordinate dynamic retargeting.
- Coordinate the dynamic re-tasking of aviation and fires assets.
- Coordinate the clearance of fires.
- Control radar movement.

Centralized control at the division artillery or field artillery brigade

5-168. The division commander may direct the division artillery or a supporting FAB to control counterfire for the division. The division commander will specify the degree of control the division artillery or FAB will exercise over the BCTs' organic field artillery assets. When a FAB is acting as the division force field artillery headquarters, target acquisition assets may be held under the centralized control of that FAB. Centralized control (the division artillery or FAB develops the entire radar coverage plan for the

division or other supported command) optimizes coverage to support the commander's intent. When the FAB has control of all division target acquisition assets, the BCT cannon field artillery battalion should provide the target-processing element from the target acquisition platoon (together with its associated equipment) to the BCT fires cell. The BCT fires cell does not have sufficient quick reaction organic target processing elements and thus does not have target-processing capability without augmentation.

5-169. The fire direction center of the BCT's cannon field artillery battalion has this capability. Regardless of which headquarters exercises control, FAB-subordinate field artillery or BCT cannon field artillery battalions may be tasked to provide logistical, survey, and security support because of the dispersal of radars across the BCT area of operations. Under division artillery or FAB centralized control, the division or FAB S-2, S-3, and operations and counterfire, target processing, and fire control elements (as available) in the division artillery or FAB main command post work with FAB-subordinate and BCT cannon field artillery battalion S-2s and targeting officers and cannon field artillery battalion command post personnel to:

- Designate a general position area, sector of search, and zones for each of the radars; establish clear priority for changes and coordinate them with subordinate, supported, and supporting units.
- Establish cueing guidance.
- Designate cueing agents.
- Establish sensor-to-shooter linkages.
- Control radar movement.
- Designate who receives targets.

Decentralized control

5-170. Decentralized control can be accomplished by attaching radars to a reinforcing (R) FAB battalion, BCT field artillery battalion or possibly to BCT cannon field artillery battalion batteries. Under decentralized control, target acquisition assets are provided to subordinate units for their control and employment. When attached, the radar is considered an integral part of the support package to the field artillery battalion or battery. The cannon field artillery battalion S-2, in conjunction with the targeting officer, controls the radar (executing the same responsibilities as the field artillery brigade S-2, S-3, and target processing and fire control elements).

5-171. Counterfire radar sections are responsible for covering the supported maneuver battalion or cavalry squadron area of operations or a specified zone of responsibility. The brigade FSO and fires cell planners coordinate mission requirements and priorities with the cannon field artillery battalion S-2 based on the BCT commander's guidance and intent. Normally the BCT's cannon field artillery battalion retains centralized control of its counterfire radars. However, the division commander may direct that BCT counterfire radars may be placed under the control of a FAB multiple launch rocket system (MLRS) battalion or other fires unit from the division or corps based on METT-TC, while any remaining counterfire radar(s) are kept under control of the FAB.

A combination of centralized and decentralized control

5-172. Any combination of centralized and decentralized control of radars may be used according to the situation. For example, one of the counterfire radars and a howitzer battery may be in direct support (DS) of a BCT subordinate maneuver battalion or cavalry squadron, while the remaining counterfire radar is kept under control of the cannon field artillery battalion.

5-173. Although the FAB has organic radars, the division or corps may task the BCT to cover division or corps target areas of interest within the BCT area of operations with BCT information collection and target acquisition assets (see chapter 1 and ATP 3-09.12), including the BCT cannon field artillery battalion's radars.

5-174. Reinforcing (R) units from a FAB may or may not require both target acquisition assets and additional processing capability to effectively perform counterfire. Closely linked to BCT maneuver through the fires cell, the FSCOORD, brigade FSO, and cannon field artillery battalion S-3 must provide and coordinate the following for the R FAB unit:

- Commander's guidance for counterfire, to include required search zones and cueing guidance.
- Intelligence support from division and corps or other supported headquarters controlled assets. Counterfire targets from intelligence assets, FAB artillery target intelligence files, and those of higher headquarters must be expeditiously forwarded to the BCT main command post fires cell and to the BCT's cannon field artillery battalion.
- Terrain management, to include position areas for BCT field artillery and acquisition assets forward in the division, corps, or other supported command's area of operations.
- Traffic and movement priorities for units and ammunition.
- Survey and meteorological support for BCT field artillery units.

5-175. An automated (digital) capability must be provided to non-automated multinational field artillery brigades and battalions to maximize communications with counterfire radars and the BCT cannon field artillery battalion's command post. If available, the BCT cannon field artillery battalion should provide adequate AFATDS devices with operators to the supporting multinational field artillery unit. For more on field artillery target acquisition see ATP 3-09.12. For more on BCT cannon field artillery battalion counterfire operations, see ATP 3-01.60 and ATP 3-09.23.

ARMY TACTICAL MISSILE SYSTEM CONSIDERATIONS FOR THE BCT

5-176. The ATACMS is primarily a corps, division, and FAB asset, though it may be fired at targets identified by the BCT. Regardless of the source of the target, firing of the missile will likely occur from within division and corps areas of operation. Key information needed to coordinate ATACMS fires includes:

- The target location and the location of the firing element.
- Where the target is in relationship to areas of operation and FSCMs.
- The time when the firing will occur.

5-177. Most of the airspace coordination and deconfliction for ATACMS occurs at corps and higher levels. The division and corps keep the theater army informed of the location of ATACMS equipped launchers within its area of operations. The division and corps also clear their airspace in response to requests from theater army or as a result of division or corps initiated ATACMS mission. The division and corps fires cell, ADAM, airspace element, and Air Force TACP are integral to airspace coordination and should be collocated to facilitate rapid information exchange.

5-178. Airspace coordination begins during the decide function of targeting. The FSCoord and brigade FSO use the planned positions of the MLRS platoons equipped with ATACMS to coordinate airspace coordinating measures with the ADAM/BAE and division or corps airspace elements. In the detect function, trigger events from sensors alert the BCT main command post fires cell to initiate ATACMS missions against planned targets or targets of opportunity. The BCT main command post fires cell immediately notifies the airspace element, ADAM/BAE and Air Force TACP. Airspace deconfliction continues throughout the operation. As MLRS platoons relocate, the BCT main command post fires cell in conjunction with the ADAM/BAE must accomplish the necessary airspace coordination.

5-179. The Platoon Area Hazard, Target Area Hazard and Munitions Flight Path are geometries automatically created by AFATDS for ATACMS missions. Distribution of the generated area hazards and munitions flight path geometries can be setup to auto distribute to the Tactical Airspace Integration System for airspace integration. For more detailed information concerning ATACMS airspace integration see FM 3-52.

SECTION VIII - SUPPRESSION OF ENEMY AIR DEFENSES

5-180. *Suppression of enemy air defenses* is activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means (JP 3-01). The effective employment of air assets gives the BCT commander a powerful source of fires. Army aviation and the air

platforms of other Services, particularly the Air Force, enable the ground commander to quickly influence operations and add depth to the battlefield.

REQUIREMENT FOR SUPPRESSION OF ENEMY AIR DEFENSES

5-181. The availability of fires from air assets also gives the BCT commander the corresponding responsibility to protect those assets. This obligation is significant in view of the increasingly sophisticated threat that faces U.S. forces. Threat forces have the capability to field effective integrated air defense networks consisting of weapon systems, radars, and command posts that present a formidable all-altitude protection umbrella.

5-182. Enemy air defense systems will be found during offensive and defensive tasks. However, threat air defense capabilities in stability tasks also pose a significant hazard to friendly air assets. These air assets must be able to survive to contribute their full combat potential. Therefore, suppression of enemy air defenses is a critical function that must be accomplished quickly and efficiently.

5-183. Suppression of enemy air defenses must be synchronized with elements of the fire support system and with joint and multinational forces to produce maximum combat power. Unity of effort and synchronization of fire support resources requires detailed planning and coordination and precise timing.

PLANNING AND EXECUTION FOR SUPPRESSION OF ENEMY AIR DEFENSES

5-184. Planning for suppression of enemy air defenses starts with the Army or Air Force unit that requests air operations. First consideration is given to those suppression means organic to or available to the requesting unit. When requirements for suppression of enemy air defenses exceed the availability or capability of these means, use the theater and Army air-ground system structure to request or coordinate joint support.

5-185. The BCT FSCoord and brigade FSO direct BCT participation in suppression of enemy air defenses through the BCT main command post fires cell, targeting working group, and targeting board. Suppression of enemy air defenses requires the coordination of all fire support means including electronic attack, and electronic warfare support capabilities. The S-2, in conjunction with the intelligence cell, gives the S-3, FSCoord, brigade FSO, targeting working group, and targeting board information on the projected enemy defense threat. The fires cell integrates these data, plus airspace use information and weather effects information, into the plan for suppression of enemy air defenses.

5-186. Suppression of enemy air defenses is supported by the coordinated use of air- and ground-based acquisition platforms, which include helicopter and fixed-wing assets. Plan disruptive efforts to complement destructive efforts and include electronic attack and electronic warfare support capabilities. Use electronic attack to degrade jammable threats and neutralize enemy systems when destruction is not feasible. To prevent fratricide of friendly air defense and target acquisition radars, the BCT main command post fires cell staff, together with the ADAM officer, the electronic warfare officer, and the spectrum manager coordinate the friendly electronic order of battle, radar frequencies, and location information for inclusion in the airspace control order.

5-187. The division and corps plan and conduct localized suppression to protect aircraft that are required to penetrate the forward line of own troops. This entails suppressing the enemy air defense systems along the routes to (ingress) and from (egress) the attack objective as well as systems surrounding the objective when they are within range of Army attack means. A corridor may have to be established to protect helicopters participating in air assault operations. Effective targeting for the suppression of enemy air defenses is synchronized with the commander's maneuver and air operations and supports air assets in contact with the enemy air defenses threat.

SECTION IX - SPECIAL CONSIDERATIONS

5-188. The field artillery has special considerations that must be addressed to enable it to fulfill its role to the supported commander. These considerations include terrain management, survey, artillery meteorology, and laser management.

5-189. Terrain management is the responsibility of the unit that controls the ground in a particular area or sector. This is usually an Army maneuver unit, however, especially during stability operations, the controlling agency could be a host nation government or military force, or a United Nations-affiliated military force or civilian relief organization.

5-190. In field artillery survey, *common grid* refers to all firing and target-locating elements within a unified command located and oriented, to prescribed accuracies, with respect to a single three-dimensional datum. (Note: the U.S. Marine Corps terminology is common survey) (FM 3-09). Common grid should be extended into the target area. Common grid is required for the massing of fires and to achieve first-round fire for effect capability.

5-191. Current meteorological data must be applied for accurate artillery fires, battlefield forecasts, radiological fallout predictions, and target acquisition. This information is in the form of meteorology messages provided by the field artillery battalion headquarters.

5-192. Laser technology is involved in the employment of many precision-guided munitions and requires synchronization between laser-guided weapons, laser target designators, laser spot designators, and other laser systems. Laser management is crucial to the successful, safe, and legal use of laser systems on the battlefield.

TERRAIN MANAGEMENT

5-193. The BCT main command post fires cell assists the BCT S-3 with terrain management for BCT field artillery assets, and for any other fire support assets, such as electronic attack transmitters, that are operating in the BCT area of operations. The BCT FSCOORD and brigade FSO provide overall supervision and coordination to ensure that all fire support-related terrain management issues are properly addressed and synchronized. BCT main command post fires cell personnel work closely with the cannon field artillery battalion and BCT subordinate and supporting unit fires cells in coordinating terrain management for field artillery elements.

5-194. Terrain management involves the planning and coordination of positions and movements for field artillery units, radar sections, and other field artillery elements. The BCT main command post fires cell and the cannon field artillery battalion S-3 work together during the MDMP (see chapter 6) to identify the general field artillery positioning and movement requirements necessary to support the BCT commander's intent and concept of operations. Early in the MDMP process, they try to identify the possible field artillery units involved, the general position areas required in the BCT area of operations, subordinate and supporting unit areas of operations, the general times when these locations will be required, and the possible routes needed for movement. This information is used by the BCT main command post fires cell and the cannon field artillery battalion staff to begin the detailed planning and information gathering necessary to identify specific issues or requirements, the feasibility of the general positioning and movement plan, and the detailed coordination requirements necessary for terrain management. As the MDMP progresses, field artillery positioning and movement plans and information becomes more detailed, and the BCT main command post fires cell and cannon field artillery battalion S-3 may use warning orders to alert subordinate and supporting unit fires cells and field artillery units of terrain management issues (positioning and movement considerations).

5-195. The cannon field artillery battalion S-3 collects all the information and advice, finalizes the cannon field artillery battalion movement requirements and plans, and passes them to the BCT main command post fires cell as part of the cannon field artillery battalion OPORD. Because the BCT and the organic cannon field artillery battalion MDMPs are integrated processes, the BCT main command post fires cell will already know most of the information and will have begun most of the terrain management coordination required.

5-196. The BCT main command post fires cell reviews the terrain management requirements and ensures that the BCT S-3 is aware of them and that they are properly coordinated and synchronized as part of the overall division and corps terrain management plans. The BCT main command post fires cell is in the best position to monitor the current locations of all friendly units while simultaneously understanding field artillery requirements. Based on METT-TC and guidance from the BCT commander, FSCOORD and fires cell planners in coordination with subordinate, supported and supporting maneuver and fire support, prioritizes the movement and positioning of field artillery to support BCT operations. During the MDMP, the BCT main command post fires cell facilitates the exchange of terrain management information between the BCT and the field artillery battalion staffs and the subordinate and supporting unit fires cells. This includes rapid resolution of any critical terrain management issues that could impact the BCT plan. This problem identification and resolution is one of the key terrain management functions of the BCT fires cell.

5-197. Usually, the BCT main command post fires cell and cannon field artillery battalion S-3 identify and coordinate general position areas for BCT-controlled field artillery assets. They identify and authorize the direct liaison necessary between R FAB units and BCT subordinate and supporting unit fires cells to coordinate terrain management. The FAB battalions will then conduct direct coordination with the appropriate subordinate or supporting unit to obtain the specific locations or routes needed for the field artillery battalions, radars and other field artillery assets under BCT control. The BCT and FAB fires cells assist corps and division fires cells and FAB battalions with detailed terrain management. However, for major BCT force movements, or when space in the area of operations is constrained, the BCT main command post fires cell and the organic cannon field artillery battalion S-3 will usually conduct more detailed terrain management, identifying specific positions, routes, and times for positioning and movement activities.

SURVEY

5-198. Field artillery survey sections (found in the target acquisition platoons of FABs and BCT cannon field artillery battalions) provides common grid using the improved position and azimuth determining system-global positioning system or, in the case of the U.S. Marine Corps, differential global positioning system 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 target acquisition elements. When survey control is not immediately available, efforts should be directed toward establishing common directional control in the position area by any hasty survey means available.

5-199. Establishment of common grid and map datum is a critical command responsibility. Survey planning begins with understanding the BCT commander's intent and concept of the operation and the BCT FSCOORD and brigade FSO's guidance for survey. During planning, full consideration must be given to the BCT commander's concept for the operation, priorities, tactical situation, survey control available, desired accuracy, number of installations, and the mission variables of METT-TC. This information can be translated into survey requirements for the target acquisition sensors and the designated attack systems, which must be on a common grid by the time required. Aggressive survey planning that answers who, what, where, when, why, and how is essential to ensure mission success. See FM 6-2 for more on field artillery survey.

ARTILLERY METEOROLOGY

5-200. Command Profiler Block III or Computer Meteorological Data-Profiler (AN/GMK-2) is the next evolutionary block of the Profiler system and is designed to reduce the logistical footprint to a laptop configuration located in the command post. Command Profiler is a weather measurement system developed to provide meteorological data to support artillery and target acquisition units. The system receives Navy Operational Global Atmospheric Prediction System initialization data via a Global Broadcast Service satellite link. Command Profiler provides meteorological data messages covering up to 500 kilometers. The Command Profiler is currently being fielded one per each BCT cannon field artillery battalion and one per FAB.

5-201. Command Profiler interfaces with the AFATDS via local area network connection and is operated by the AFATDS operator. Once fielding is complete, the Command Profiler will replace the meteorological sections.

5-202. In those units that still have meteorological sections, it is the responsibility of the cannon field artillery battalion commander (coordinating with the meteorology section leader and the S-3) brigade FSO, and fires cell planners to position the meteorology sections to best measure the atmosphere for support of all firing units involved. In the BCT, meteorology sections are assigned to the target acquisition platoon of the cannon field artillery battalion.

5-203. Planning for employment of the meteorology section begins with the BCT commander's intent, the BCT FSCoord and brigade FSO's guidance for meteorology, and the battlefield weather conditions. During the planning, full consideration must be given to the:

- BCT commander's concept.
- Mission priorities (type of meteorological data required).
- Tactical situation and security.
- Prevailing winds (determine meteorology section location).
- Location of units supported.
- Location of other meteorology sections.
- Communications facilities.

LASER MANAGEMENT

5-204. The BCT FSCoord and fires cell planners must ensure that fire support personnel understand the legal and safety issues involved in the use of laser equipment. Protocol IV to the Geneva Conventional Weapons Convention provides guidance on the use of lasers (it specifically prohibits the use of lasers specifically designed to cause permanent blindness). Soldiers must be well trained to safely operate and employ laser target designators and laser-guided weapons. Improperly employed laser target designators and laser-guided weapons can result in fratricide.

5-205. Laser-guided munitions also involve the use of laser codes that laser target designators require to work with laser-guided weapons. Some munitions and equipment are incapable of using all available codes. Additionally, certain codes (low code, high pulse repetition frequency, or faster pulse rate) are preferred for laser systems requiring precision guidance.

5-206. Laser-guided bomb codes are set on the bombs before takeoff and cannot be changed in the air. Codes must be briefed to air crews, forward air controllers, field artillery units, the BCT and subordinate and supporting unit fires cells or ground observers in situations where communications cannot be established or authorized during execution of the mission. Coordination is necessary to ensure the various fires cells and observers are not using codes that conflict or interfere with each other. Additional information on laser-guided munitions can be found in JP 3-09.3.

Chapter 6

Planning and Integrating Fires for BCT Operations

The brigade combat team (BCT) generates the necessary combat power to win battles and engagements. This chapter focuses on planning fire support for BCT operations. Section I begins the chapter with an overview of fire support planning. Sections II and III follow with discussions on fire support planning in a time-constrained environment and fire support planning within the military decisionmaking process (MDMP). Section IV concludes the chapter with a brief discussion on task-organizing BCT field artillery.

SECTION I –PLANNING FIRE SUPPORT

FIRE SUPPORT PLANNING PRINCIPLES

6-1. Successful fire support planning is the result of the fire support coordinator (FSCOORD), brigade fire support officer (FSO) and fire cell planners, aggressively contributing to the BCT commander's planning and decision-making process. In making this contribution, they employ principles of fire support planning, coordination, and execution as a guide.

6-2. In advising the BCT commander on the application of fire support, the FSCOORD and brigade FSO also review fire support requirements against basic fire support planning principle (explained in greater detail in FM 3-09) that guide fires cell planners in the development of fire support plans:

- Plan early and continuously.
- Ensure the continuous flow of targeting information.
- Consider the use of all capabilities.
- Use the lowest echelon capable of furnishing effective support.
- Furnish the type of support requested.
- Use the most effective fire support means.
- Avoid unnecessary duplication.
- Coordinate airspace.
- Provide adequate support.
- Provide for rapid coordination.
- Protect the force.
- Provide for flexibility.
- Use fire support coordination measure.

COMMANDER'S GUIDANCE

6-3. The purpose of commander's guidance is to focus staff activities in planning an operation. An *operation* is 1. a sequence of tactical actions with a common purpose or unifying theme (JP 1). 2. A military action or the carrying out of a strategic, operational, tactical, service, training, or administrative military mission (JP 3-0).

COMMANDER'S INTENT AND CONCEPT OF OPERATIONS

6-4. The *commander's intent* is a clear and concise expression of the purpose of the operation and the desired military end state that supports mission command, provides focus to the staff, and helps subordinate

and supporting commanders act to achieve the commander's desired results without further orders, even when the operation does not unfold as planned (JP 3-0). The *concept of operations* is a statement that directs the manner in which subordinate units cooperate to accomplish the mission and establish the sequence of actions the force will use to achieve the end state (Army doctrine reference publication [ADRP] 5-0). Understanding the commander's intent, concept of operations and operational requirements for the maneuver elements is necessary for the FSCoord and fires cell planners to provide sound advice to the commander and the staff. They focus how to employ available fires to achieve the BCT commander's desired effects. The *scheme of fires* is the detailed, logical sequence of targets and fire support events to find and engage targets to accomplish the supported commander's intent (FM 3-09). The scheme of fires is planned to support the commander's scheme of maneuver and is built on the fire support tasks developed by the FSCoord, brigade fires support officer, and fires cell planners.

COMMANDER'S GUIDANCE FOR FIRE SUPPORT

6-5. The BCT commander's guidance is directly linked to the commander's intent and desired end state. It is used to focus staff planning and execution activities. The BCT commander's guidance for fires provides the staff, FSCoord and fires cell planners, and subordinate and supporting units with the general guidelines and restrictions for the employment of fires and their desired effects.

6-6. The guidance emphasizes in broad terms when, where, and how the BCT 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 the commander envisions the operation unfolding and the impact that fires will have on its success. Priority of fires is the commander's guidance to the staff, subordinate commanders, fires planners, and supporting agencies to organize and employ fires in accordance with the relative importance of the unit's mission.

FIRE SUPPORT PLAN

6-7. A plan is a continuous evolving framework of anticipated actions that maximizes opportunities. It guides subordinates as they progress through each phase of the operations. Any plan or order is a framework from which to adapt, not a script to be followed to the letter.

6-8. Fire support is a force multiplier and can rapidly increase combat power to weight decisive operations. It is imperative that fire support considerations are included in the planning of all operations. The FSCoord, FSO, and fires cell planners at each echelon of command recommend effects, capabilities, and techniques for delivering fires that will support the commander's guidance and assist the unit in achieving its objectives. Field artillery personnel integrate all available fire support resources and synchronize them in accordance with the commander's intent, concept of operations and priority of fires.

6-9. *Fire support planning* is the continuing process of analyzing, allocating, and scheduling fires to describe how fires are used to facilitate the actions of the maneuver force (FM 3-09). Fire support planning is focused on using the timely and effective delivery of fires to enhance the actions of the maneuver force. It involves the assignment of command or support relationships and positioning of field artillery units. It also identifies the types of targets to attack and the collection assets that acquire and track the targets, specifies the fire support assets to attack each identified target, and establishes the criteria for target defeat. The objective of fire support planning is to optimize the application of combat power. Fire support planning is performed as part of the operations process. Fire support planning includes developing fire plans (target lists and overlays) and determining forward observer control options to ensure fire support is integrated into the commander's scheme of maneuver and can be executed in a timely manner.

6-10. Fire support planning is normally developed by the higher headquarters and further refined by subordinate headquarters. This is sometimes referred to as top down planning, bottom up refinement. For example there is usually not enough time during preparation for combat for the brigade FSO to wait for platoon forward observers and company FSOs to identify, consolidate, and forward targets for inclusion into the brigade fire support plan. Fire support plans developed by the brigade FSO include the commander's intent and can be refined by the subordinate battalion and company FSOs.

6-11. A *fire support plan* is a plan that addresses each means of fire support available and describes how Army indirect fires, joint fires, and target acquisition are integrated with maneuver to facilitate operational

success (FM 3-09). The BCT FSCoord and fires cell planners develop an effective and integrated fire support plan to support BCT operations. An effective fire support plan clearly defines fire support requirements, focuses on the tasks and their resulting effects, uses all available acquisition and attack assets, and applies the best combination of fire support assets against high-payoff targets.

6-12. The fire support plan identifies critical times and places where the commander anticipates the need to maximize effects from fire support assets. Fire support planning considers existing limitations on the employment of fires, such as rules of engagement and positive identification requirements, weather effects on fires assets, the presence of special operations forces within the area of operations, desired conditions of subsequent phases, and requirements for collateral damage avoidance. The commander augments maneuver with fires to mass effects, achieve surprise, destroy enemy forces, and obtain decisive results. The commander's guidance gives specified attack criteria for supporting fire support assets, thus focusing fire support planning and integrated and coordinated execution on critical times and events. The specified attack criteria are developed as a function of the commander's guidance, desired effects, and high-payoff targets and attack priorities. Effective fire support planning and coordination ensures that desired effects are achieved on high-payoff targets without wasting assets through repetitive engagements by multiple friendly systems. Continuous planning and coordination facilitates the immediate actions required to support ongoing operations; and anticipates actions that may be required in the future.

6-13. The fire support plan is a significant component of the BCT commander's operation plan (OPLAN) or operation order (OPORD) and Annex D (FIRES) (if used) with its associated appendices, tabs, or enclosures (see appendix B). The development of the fire support plan is the responsibility of the FSCoord and fires cell planners. The brigade FSO's duties include oversight of the development and production of the fire support plan. Execution of the fire support plan is the responsibility of the BCT commander, FSCoord, fires cell planners, and targeting officers. Also, the subordinate and supporting commanders, FSOs, fires cells, and fire support personnel perform tasks leading to fully integrated maneuver and fire support. The essential elements of a fire support plan include but are not limited to:

- Clear and concise articulation of fire support tasks, their purpose, and the desired effects for each task.
- Allocation of all fire support assets.
- Projected changes to the allocation of fire support assets based on tactical contingencies in the OPLAN or OPORD.
- Coordination and synchronization instructions for the timely detection, tracking, and attack of high-payoff targets.
- 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.
- Limiting risk to friendly troops and minimizing the loss of civilian life.

Note: Based on rules of engagement, collateral damage estimation, and target coordination, target coordinate mensuration may be required.

- Establishment and changes in FSCMs (described in FM 3-09).
- Special instructions on rules of engagement, fire support communications, and sustainment.
- Locations of command posts, ammunition supply points, and ammunition transfer holding points.

6-14. Subordinate units do not change the overall plan but provide recommendations and refinements such as improved target locations. Effective fire support planning permits the supported maneuver commander to orchestrate and employ all available fires and related resources in an integrated and synchronized fashion consistent with the concept of operations.

6-15. Fire support agencies should disseminate the fire support plan in digitally formatted messages (as opposed to plain text) to subordinate levels to reduce the probability of errors in transmission. Forward

observers and FSOs at lower levels must verify and refine the plan, and their assigned targets and positioning to ensure they can execute fires needed to support the commander’s intent.

TARGETING AS PART OF BCT FIRE SUPPORT PLANNING

OVERVIEW

6-16. *Targeting* is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities (JP 3-0). A *target* is an entity or object that performs a function for the adversary considered for possible engagement or other action (JP 3-60). See JP 3-60 for additional definitions of target as used in gunnery and military intelligence applications.

6-17. Targeting and its integral functions of decide, detect, deliver, and assess (D3A) (see table 6-1) is an integral part of the operations process. Targeting occurs continuously throughout an operation. Its steps mirror planning, preparing, executing, and assessing. An important part of targeting is identifying potential fratricide and collateral damage situations and implementing fire support coordination and other control measures that both facilitate operations and minimize fratricide and collateral damage.

Table 6-1. Synopsis of targeting

→Decide→		→Detect→	
Determine	Based on	Determine	Based on
<p>What (task): Enemy focused. Determine what fire support and information operations tasks are essential to the success of the operation (enemy formation or function and desired effects from attack).</p> <p>Why (purpose): Friendly focused. Determine the purpose for employment of fires (for example to suppress, neutralize, and destroy enemy fire support systems and control nodes).</p>	<p>Receipt of Mission</p> <ul style="list-style-type: none"> • Commander’s intent. • Concept of operations. • Initial planning guidance. • Guidance for fires. <p>Mission analysis:</p> <ul style="list-style-type: none"> • Specified & implied tasks • IPB • Target Value Analysis. (See ATP 3-60). • High-value targets. 	<p>Who/Where: Focused on detection. Assets are deployed to detect high-payoff targets.</p> <p>Information collection assets identify and locate targets that can be attacked by fires, electronic attack and information-related capabilities.</p>	<p>COA Development.</p> <ul style="list-style-type: none"> • Scheme of Fires. • High-payoff targets. • Target selection standards. • Attack Guidance Matrix. • Fire support tasks. • Electronic attack tasks. • Information operations tasks. • Measures of performance. • Measures of effectiveness. <p>COA Analysis</p> <ul style="list-style-type: none"> • Refine above products. • High-payoff Target List. • Target Synch Matrix. • Airspace control request. • Information requirements. <p>Orders Production</p> <ul style="list-style-type: none"> • Finalize above products. • Fire Support Plan. • Information Collection Plan. • Unit Airspace Plan. • OPLAN or OPORD. • Fires Paragraph 2e. • Annex D Fires, with tabs.
←Assess←		←Deliver←	
Determine	Based on	Determine	Based on
<p>Effect: Identifies whether intended effect achieved by attack means and how well attack means functioned.</p>	<ul style="list-style-type: none"> • OPLAN or OPORD • Task execution. • Effects of fire support. • Effects of electronic attack. • Effects of information-related capabilities. • Combat assessment • Measures of performance. • Measures of effectiveness. 	<p>Who/When: Focused on deliver. Addresses the who and when portion of task (such as the attack of a specified target, duration of attack and effects desired).</p>	<ul style="list-style-type: none"> • COA development • Scheme of Fires • War gaming. • COA decision • OPLAN or OPORD • High-payoff Target List • Attack Guidance Matrix. • Target Synch Matrix. • Information Collection Plan • Unit Airspace Plan
<p>Legend</p> <p>COA – course of action IPB—intelligence preparation of the battlefield</p> <p>OPLAN – operation plan OPORD – operation order</p>			

6-18. The FSCoord, brigade FSO, fires cell planners and targeting officers, targeting working group, and targeting board identify lethal and nonlethal targeting options based on the BCT commander’s objectives. Targeting is an integral part of BCT operations. Like other integrating processes, targeting begins in the planning phases of an operation and it continues 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 generally begins with the MDMP as the BCT staff is developing the OPLAN or OPORD. It does not end when the plan is completed; it continues by continuously validating previous targeting decisions and making new targeting decisions based on changed circumstances or changed guidance. The BCT executive officer, S-2, S-3, FSCoord, brigade FSO, fires cell planners and targeting officers, targeting working group, and targeting board collaboratively develop decide function products such as the high-payoff target list, targeting input to the information collection plan, target selection standards, the attack guidance matrix, and the targeting synchronization matrix. These products collectively address:

- What target sets does the enemy require to ensure success?
- What are the key elements (targets) associated with of each identified target set?
- What targets can 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 is required to successfully attack the target?
- What are the priorities for information collection and target acquisition objectives and asset allocation?
- What intelligence requirements are essential to the targeting effort and how and by when must the information be obtained, processed, and disseminated?
- When, where, how, and in what priority should the targets be attacked?
- What are the measures of performance and measures of effectiveness that determine whether the target has been successfully attacked and whether the commander's desired effects have been created?
- Who or what can attack the targets, and how should the attack be conducted (for example, number and type of attack elements, ammunition to be used) to create desired effects and what are the required assets and resources based on the commander's guidance?
- What are the weather effects on information collection and fires assets?
- 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?

6-19. The detect function includes intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4) and occurs during preparation and execution. The deliver function occurs primarily during execution, although some targets may be engaged while the BCT is planning or preparing for the overall operation. The assess function occurs throughout the operations process, but is most intense following the execution of an attack of the target. Targeting is continuously refined and adjusted between the BCT commander and the staff as the operation unfolds.

6-20. The BCT commander may employ an additional technique (find, fix, finish, exploit, analyze, and disseminate [F3EAD]) that provides the maneuver commander the ability to address certain challenges, particularly those found in a counterinsurgency environment. F3EAD is not a replacement for decide, detect, deliver, and assess (D3A) nor is it exclusive to targeting. Rather it is a technique that works best at the battalion tactical level for leaders to understand their operational environment and visualize the effects they want to achieve. F3EAD is well suited as a means of engaging personalities or high-value individuals. A *high-value individual* is a person of interest who is identified, surveilled, tracked, influenced, or engaged (ATP 3-60). For detailed discussion on D3A and F3EAD see ATP 3-60 and JP 3-60.

SCHEDULING OF FIRE SUPPORT ASSETS

6-21. Once the decisions are made concerning planned targets, the FSCoord and fires cell planners coordinate fire support assets to implement the plan. For example, if mortars and artillery are available assets, the FSCoord and fires cell planners, with input from personnel of those various systems, coordinate which targets and when the mortars and artillery will attack. Units possessing the various fire support means retain the responsibility for the more precise scheduling of their integral fire units.

SECTION II - FIRE SUPPORT PLANNING IN A TIME-CONSTRAINED ENVIRONMENT

FIRE SUPPORT PLANNING GUIDELINES

6-22. Due to time constraints, it may not be possible to accomplish all the actions listed in Tables 6-2 through 6-5 on pages 6-6 through 6-8. However, these techniques serve as guidelines.

Table 6-2. Long range planning

<i>Action</i>	<i>Responsibility</i>
Obtain enemy order of battle and develop situation template.	Plans officer, field artillery battalion S-2, BCT S-2.
Check attack guidance matrix and update as necessary based on current threat.	Plans officer, brigade FSO.
Develop field artillery and mortar force ratios to be used in war gaming and planning.	Plans officer, field artillery battalion S-2.
BCT – brigade combat team S-2 – brigade or battalion intelligence officer FSO – fire support officer	

Table 6-3. Planning for the immediate battle

	Action	Responsibility
1	Receive higher headquarters OPORD.	BCT staff and brigade FSO and fires cell.
2	Conduct mission analysis (higher headquarters mission, intent, and area of operations, tasks, assets available, limitations, risk, and time).	BCT staff, brigade FSO and fires cell.
3	Identify specified/implied tasks for fire support.	Brigade FSO and fires cell.
4	Identify intent for maneuver and fire support guidance, including priorities for support.	BCT commander.
5	Course of action development, war-game, and produce the decision support template. Conduct initial targeting working group session to determine high-payoff targets and plan for attack. Supporting data include responsibilities for observing named areas of interest, target areas of interest, and decision points, recommendations for attack of target areas of interest by weapon system and the associated trigger point, BCT directed obstacles, initial BCT target list and target overlay and input for the initial BCT targeting synchronization matrix.	BCT S-3 and S-2, FSCOORD, brigade FSO, Brigade Judge Advocate, Air Force air liaison officer, engineer coordinator, Army aviation liaison officer, and S-5.
6	Formulate BCT commander's attack guidance (based on field artillery attack matrix and target value analysis). State priorities for support. See ATP 3-60.	BCT commander, FSCOORD, brigade FSO and fires cell.
7	Compute number of field artillery targets available for allocation. Allocate field artillery volleys and targets for planning based on commander's priorities.	Brigade FSO and fires cell, field artillery battalion S-3.
8	Develop commander's attack criteria from BCT commander's attack guidance and enter it into fire support computer.	BCT fire support NCO.
9	Develop fire support execution matrix. Distribute to subordinate and supporting unit FSOs and fires cells and to the division and corps fires cell.	Brigade FSO and fires cell.
10	Conduct rehearsals. Include as many members of the fire support system as possible: subordinate and supporting unit fires cells, forward observers, field artillery battalion S-3 and fire direction officer, mortar platoon leader(s), radar NCO, Air Force air liaison officer, engineer coordinator, Army aviation liaison officer, and others as necessary. If time does not allow for a face-to-face rehearsal, consider using other means such as radio and electronic messaging (dependent on the existing threat). At a minimum, war-game the fire support plan with the brigade FSO, field artillery battalion S-3, and fire direction officer present. The rehearsal should cover (1) Verification of target grids, numbers, and trigger points; (2) Positioning of observers; (3) Positioning and movement of field artillery, mortars, and azimuth of fire; (4) Communication networks and variables; (5) Obstacle plan with fire support; (6) Use of close air support and attack/reconnaissance helicopters; (7) Maneuver and FSCMs, including field artillery, mortar, and air-delivered weapon risk estimate distances.	BCT commander, FSCOORD, brigade FSO and fires cell, field artillery battalion S-3.
11	Integrate weather effects assessments for all fires assets throughout planning.	BCT Staff Weather Officer
ATP – Army techniques publication BCT – brigade combat team FSCM – fire support coordination measure FSCOORD – fire support coordinator FSO – fire support officer		NCO – noncommissioned officer OPORD – operation order S-2 – battalion or brigade intelligence officer S-3 -- battalion or brigade operations officer

Table 6-4. Execution planning

	Action	Responsibility
1	FSCOORD and selected fires cell personnel position themselves where they can best execute the fire support plan (not always with the BCT commander).	FSCOORD, brigade FSO and fires cell.
2	Communicate with: (1) supported commander; (2) subordinate, supporting, and higher echelon fires cells; (3) Field artillery battalion fire direction center, other fire support assets (such as Air Force tactical air control party, Army aviation liaison officer).	Brigade FSO and fires cell.
BCT – brigade combat team FSCOORD – fire support coordinator FSO – fire support officer		

Table 6-5. Provide battle tracking

	Action	Responsibility
1	Brigade FSO and fires cell planners should know the location of all maneuver elements to company level (and their future plans for movement). The location of fire support assets to include, at a minimum: supporting radars; supporting mortars, organic and supporting field artillery battalions (and the ammunition status of these assets); subordinate and supporting unit fires cells and FSO(s); fire support teams and forward observers; and the division and corps fires cells. The assigned targets and primary and secondary observers within their responsibility. The location of all current and proposed FSCMs.	Brigade FSO and fires cell.
2	Clear fires rapidly, positively, and safely within the BCT and respective subordinate and supporting unit's area of operations. Ensure that the BCT commander and subordinate and supporting unit commander approves clearance.	Brigade and subordinate and supporting unit FSO and fires cells
3	Execute fires in accordance with the next higher headquarters fire support execution matrix. Fire support execution matrices should be produced at company level and above.	Brigade FSO and fires cell
4	Change priority targets to support the BCT commander's scheme of maneuver throughout the operation.	Brigade FSO and fires cell
BCT – brigade combat team FSCM – fire support coordination measure FSO – fire support officer		

QUICK FIRE PLANNING

6-23. In developing situations where time is critical, having a quick-fire plan can enable the BCT commander, FSCOORD and fires cell planners to quickly execute fire support for an impending operation. Subordinate battalion or company FSOs develop quick-fire plans to support their respective organizations. Like all fire support plans, the maneuver commander approves the quick-fire plan. In quick-fire planning the FSO assigns targets (and possibly a schedule of fires) to the most appropriate fire support means available to support the operation. In this type of fire support planning, the available time usually does not permit evaluation of targets on the target list and consolidation with targets from related fire support agencies.

6-24. The process of developing a quick fire plan may occur from top down or bottom up. In either case, the procedures are incumbent upon the originator. In the case of a top down plan the FSCOORD and fires cell planners must ensure that the BCT's subordinate battalion fires cells, company or troop FISTs and observers, and its cannon field artillery battalion S-3, fire direction officer, and fire direction center personnel understand the quick fire plan and how it is used. Quick fire planning techniques constitute an informal fire support plan. Quick fire planning differs from deliberate fire support planning in that it is normally done for an unanticipated event or operation and may originate as a bottom-up rather than as a top-down process. The brigade FSO and fires cell planners are responsible for:

- Identifying targets in the target list to be engaged.
- Allocating fire support assets to engage the targets in the plan.
- Preparing the schedule of fires.
- Disseminating the schedule to appropriate units and staff members for execution.

6-25. The five steps of the quick fire planning sequence are:

- Receive the operations order.
- Determine available assets.
- Evaluate FSCM and airspace coordinating measure requirements.
- Plan targets.
- Disseminate the quick fire plan.

RECEIVE THE OPERATIONS ORDER

6-26. The fire support planners begin to develop a quick-fire plan based on the BCT commanders guidance for fires that considers:

- Targets to be engaged.
- Desired effects on targets.
- Order and timing of target engagement.
- Duration of fires.
- H-hour.
- Priority of fires.
- Priority for targeting.
- Priority for execution.
- Time check.
- Estimated rate of movement.
- Need for target adjustment.
- Concept of the operation, to include objective and defensive positions, maneuver control measures, and obstacles.

DETERMINE AVAILABLE ASSETS

6-27. Ensure the BCT warning order is sent to all attack units and staff members. These include the organic cannon and supporting field artillery battalion S-3s, mortar platoon leader(s) as necessary, Air Force air liaison officer, naval gunfire liaison officer, and Army aviation liaison officer (if any are applicable). Obtain the following information:

- From the cannon field artillery battalion—the firing units designated to fire in the quick fire plan schedule.
- From the supported maneuver commander—if the battalion mortars are tasked to engage brigade-directed targets, the availability of the mortar platoon (company FSO to battalion FSO for the mortars if a company operation) for inclusion as a firing unit in the schedule of fires.
- From the BCT fires cell—close air support mission information. Coordinate close air support requirements with the Air Force air liaison officer (for example, aircraft type, ordnance, time on station, laser codes, and control procedures).
- From the OPORD or naval gunfire liaison officer—the availability of naval aircraft and naval surface fire support.

EVALUATE FIRE SUPPORT COORDINATION MEASURE AND AIRSPACE COORDINATING MEASURE REQUIREMENTS

6-28. Evaluate requirements for FSCMs and airspace coordinating measures to control and expedite fires, safeguard troops, adhere to rules of engagement, or meet specific commander's guidance. Identify those FSCMs that may be time or event driven. Identify, recommend, and gain approval on FSCMs, as appropriate, and initiate necessary coordination and dissemination as soon as possible.

PLAN TARGETS

6-29. Plan targets in accordance with the scheme of maneuver, commander's guidance, and allocated assets. Include:

- Asset to be used.
- Shell-fuze combinations.
- Duration of fire for each target.
- Time to fire.

DISSEMINATE THE QUICK FIRE PLAN

6-30. After receiving the commander's approval, disseminate the quick fire plan to attack systems, higher headquarters fires cells, and those who will implement the plan (subordinate and supporting unit FSOs and fires cells). Whenever possible, send the quick fire plan digitally or use Department of the Army (DA)

Form 5368 (*Quick Fire Plan*) (figure 6-1 on page 6-10) as necessary to supporting field artillery battalion command posts and the mortar platoon leader. Ensure that the subordinate and supporting unit fires cells and FISTs understand the quick fire plan. At a minimum, cover:

- Positions or locations of the brigade FSO and assistant brigade FSOs, battalion and company FSOs and forward observers during the conduct of the operation.
- Who is to initiate the quick fire plan or initiate the fire request on specific on-call targets? Include the agency to be contacted, when the target is to be initiated, and the communications network to be used.
- Which unit has priority of fires or priority targets, if applicable?
- The use of methods of control in modifying the plan should it become necessary during the execution of the plan.
- Any additional FSCMs established to support the quick fire plan.
- The fire support attack elements available when additional targets of opportunity arise during the execution of the plan.

6-31. If time allows, conduct a rehearsal to ensure comprehension of the plan. Inform the commander when the quick fire plan is ready. Review the quick fire plan and modify as necessary. Figures 6-1 and 6-2 on page 6-11 provide examples of a DA Form 5368 (*Quick Fire Plan*) transmitted by voice. See figures 6-6 through 6-9 on pages 6-42 through 6-48 for examples of a DA Form 4656 (*Scheduling Worksheet*).

<p>First transmission (warning order) J3B THIS IS D7T, QUICK FIRE PLAN, OVER A2Y TO CONDUCT A HASTY ATTACK, OVER FIRE PLAN NAME JOHN. TIMINGS FROM H MINUS 6 TO H PLUS 7 H-HOUR 0525, OVER.</p>		<p>(If shell-fuze combination other than standard is needed, report as part of the target list; for example, 30 ROUNDS HE VT, OVER Second transmission (target information): TARGET LIST FOLLOWS: (Read target information from appropriate lines in the quick fire plan).</p>			
QUICK FIRE PLAN					
For use of this form, see ATP 3-09.42; proponent agency is TRADOC.					
FIRE PLAN	John	SUPPORTING	A2Y		
		ORIGINATOR	J3B		
		MODIFICATIONS BY			
		D7T			
H-HOUR	0525	SHEET	1		
		OF	1		
		DATE-TIME GROUP			
		260415Z			
TARGET INFORMATION					
L I N E	TARGET NUMBER (a)	DESCRIPTION (b)	LOCATION (c)	ALTITUDE (d)	REMARKS (e)
1	AB0301	PLT w/ Light Tank	225 490	280	
2	AB0302	POL Site	234 576	252	50% WP
3	AB0303	Road Junction	292 866	306	On-Call
4					
<p>PLT – platoon POL – petroleum, oil, and lubricants WP – white phosphorous</p>					

Figure 6-1. DA Form 5368 Quick Fire Plan (example)

SCHEDULE						
L I N E	ORGANIZATION (f)	FIRE UNITS (g)	TIMINGS (h)			REMARKS (j)
			-5	H	+5	
1	1-3 FA (105/155)	A	AB0301 42	AB0302 (a) 18	AB0303 (b) 18	
2		B	AB0301 42	AB0302 (a) 18	AB0303 (b) 18	
3		C	AB0301 36	AB0302 (a) 12	AB0303 (b) 18	
4						(a) 50% WP (b) On call

Figure 6-2. DA Form 5368 Quick Fire Plan reverse (example)

6-32. See Appendix C for a suggested sequence of actions for preparing a quick fire plan.

SECTION III – PLANNING FIRE SUPPORT FOR BCT OPERATIONS WITHIN THE MILITARY DECISIONMAKING PROCESS

6-33. The FSCOORD and the fires cell planners work with the BCT commander and staff throughout the MDMP. Together, they develop effective, integrated, and executable fire support plans to support BCT operations.

6-34. An effective fire support plan clearly defines fire support requirements and focuses on achieving the BCT commander’s stated goals. It is a critical subset of the OPLAN or OPORD. An effective fire support plan reflects a detailed understanding of the BCT commander’s intent. It also requires the expertise necessary to assemble, to coordinate and to direct appropriate information collection, target acquisition, and attack assets toward a common objective. The result is the orchestration of a fully synchronized tactical fires employment program that optimizes combinations of fire support assets that are directed against high-payoff targets and achieve the BCT commander’s desired results.

6-35. An integrated fire support plan provides the focus and timing for acquisition of necessary targeting information and employment of attack systems against high-payoff targets. The plan generates effects when and where needed to support the BCT operation. An integrated fire support plan coordinates and combines with the other warfighting functions to maximize the results of each attack.

6-36. An executable fire support plan ties detect and deliver assets to the high-payoff targets. The plan includes the need for subsequent assessment.

RECEIPT OF MISSION

6-37. Upon receipt of a mission the BCT commander and the staff, including the FSCOORD and fires cell, perform an initial assessment. The fires cell actions (input to the initial intelligence preparation of the battlefield, information collection tasking [see FM 3-55], and warning order) and outputs are identified in Table 6-6 on page 6-12.

Table 6-6. BCT fires cell during receipt of mission

MDMP STEP 1: RECEIPT OF MISSION		
BCT Staff	Key Fires Cell Actions	Fires Cell Output
<ul style="list-style-type: none"> • Alert the staff and other key participant. • Gather the tools. • Update running estimates. • Conduct initial assessment. • Issue the commander's initial guidance. • Issue the warning order. 	<ul style="list-style-type: none"> • Collect higher headquarters operations plan/operations order, maps, current intelligence preparation of the battlefield, and fires running estimate. • Update fires running estimate; gather facts from higher, lower, and adjacent fires cells. • Provide fire support input during formulation of the BCE commander's initial guidance and initial warning order. • Receive intelligence preparation of the battlefield products. • Receive enemy course of action from S-2 and intelligence cell. • Receive high-value targets by phase or critical event from intelligence cell. 	<ul style="list-style-type: none"> • Updated fires running estimate. • Provide updated facts to higher, lower, and adjacent headquarters. • Fire support input to initial intelligence preparation of the battlefield and reconnaissance and surveillance tasking.
<p>BCT – brigade combat team MDMP – military decisionmaking process S-2 – brigade or battalion intelligence officer</p>		

MISSION ANALYSIS

6-38. A thorough mission analysis is crucial to planning. Mission analysis (see table 6-7) consists of the tasks identified in FM 6-0. The fires cell uses the running estimate to record assessments and other information.

Table 6-7. BCT fires cell during mission analysis

MDMP STEP 2: MISSION ANALYSIS		
BCT Staff	Key Fires Cell Actions	Fires Cell Output
<ul style="list-style-type: none"> Analyze the higher headquarters plan or order. Perform intelligence preparation of the battlefield. Determine specified, implied, and essential tasks. Review available assets and identify resource shortfalls. Determine constraints. Identify critical facts and develop assumptions. Begin risk management. Develop initial commander's critical information requirements and essential elements of friendly information. Determine initial reconnaissance and surveillance synchronization tools. Determine initial reconnaissance and surveillance plan. Update plan for the use of available time. Develop initial themes and messages. Develop a proposed problem statement. Develop a proposed mission statement. Present the mission analysis briefing. Develop and issue initial commander's intent. Develop and issue initial planning guidance. Develop course of action evaluation criteria. Issue a warning order. 	<ul style="list-style-type: none"> Understand next two higher headquarters operations and fire support plans. Receive intelligence preparation of the battlefield products including enemy courses of action and high-value targets by phase or critical events from S-2 and intelligence cell. Conduct fires running estimate; organize and analyze facts. Identify specified and implied tasks for fire support. Translate status of fire support assets and resources into fire support capabilities, limitations, and vulnerabilities. Analyze the effects of intelligence preparation of the battlefield on fire support. Develop draft fire support tasks with task, purpose, and effect. Identify long-lead time fire support tasks. Update the fires running estimate. Provide input for restated mission, commander's intent, guidance and warning including: <ul style="list-style-type: none"> Desired effects from fire support. Tentative high-payoff targets from among the high-value targets. Attack guidance. Allocation/positioning of fire support assets. Sustainment for fire support. 	<ul style="list-style-type: none"> Fire support system status. Specified targets from higher headquarters fire support intelligence preparation of the battlefield, for example, historic pattern analysis (point of origin and point of impact locations). Fire support asset range arc depictions. Fire support limitations and constrains. Fire support portion of the mission analysis briefing. Fire support-related input to the commander's critical information requirements. Initial fire support rehearsal guidance and times. Commander's approval of initial fire support tasks or modification. Update fire support input to the warning order after the mission analysis brief. Fire support input to BCT commander's planning guidance. Updated fire support-related operational timeline.

BCT – brigade combat team MDMP – military decisionmaking process S-2 – brigade or battalion intelligence officer

COURSE OF ACTION DEVELOPMENT

6-39. As the staff begins the steps of course of action development (see table 6-8 on page 6-14), the BCT staff, FSCOORD and fires cell planners must conceptualize how to best integrate fire support into the developing course of action. As the staff analyzes combat power, generates options, arrays initial forces

and then begins to develop a scheme of maneuver, the FSCoord and fires cell planners continue to contribute to this integrated planning process.

Table 6-8. BCT fires cell during course of action development

MDMP STEP 3: COURSE OF ACTION DEVELOPMENT		
BCT Staff	Key Fires Cell Actions	Fires Cell Output
<ul style="list-style-type: none"> • Assess relative combat power. • Generate options. • Array forces. • Develop a broad concept. • Assign headquarters. • Develop course of action statements and sketches. • Conduct a course of action briefing. • Select or modify courses of action for continued analysis. 	<ul style="list-style-type: none"> • Assist S-2 and intelligence cell in conjunction with the S-3 in developing the information collection plan and its support for targeting. • Determine where to find and attack adversary or enemy fire support formations. • Identify high-payoff target in those formations. • Refine fire support tasks. • Plan assessment for fire support tasks, including measures of performance and measures of effectiveness. Quantify the execution for fire support tasks. • Analyze relative fires combat power. • Insure BCT staff considers all fire support aspects of combat power. • Develop scheme of fires for each course of action and assess risk, including fratricide. • Nominate high-payoff targets for each course of action. • Integrate information operations and cyber electromagnetic activities input. • Array fire support assets/resources needed to support each course of action and propose generic fire support organization for combat. Identify planned attack locations and sequence of attacks: <ul style="list-style-type: none"> ♦ Allocate assets to acquire targets. ♦ Allocate assets to attack targets. • Insure fire support is integrated with movement and maneuver and other warfighting functions. • Integrate triggers with maneuver course of action. • Prepare scheme of fires for each course of action and sketch for each course of action. • Develop FSCMs. • Use battle calculus. 	<ul style="list-style-type: none"> • For each course of action developed include– <ul style="list-style-type: none"> ♦ Scheme of fires ♦ Initial FSCMs. ♦ Draft high-payoff target list. ♦ Target list worksheet. (digital or manual) ♦ Draft fire support execution matrix. ♦ Target list/overlay. ♦ Draft observer plan. ♦ Draft targeting synchronization matrix or modified (high-payoff target list, target selection standards and attack guidance matrix). ♦ Draft fire support input to the unit airspace plan. ♦ Draft risk management plan. ♦ Fire support-related portions of reconnaissance and surveillance plan. ♦ Initial fire support tasks and associated measures of performance and measures of effectiveness. ♦ Refined asset locations. ♦ Refined FSCMs. ♦ Draft Annex D, Fires. • Begin request of assets for reconnaissance and surveillance, close air support, information operations and cyber electromagnetic activities. • Determine radar positioning and sector search for all radar. • Determine radar maintenance and cueing schedule.
<p>BCT – brigade combat team FSCM – fire support coordination measure MDMP – military decisionmaking process</p>		
<p>S-2 – brigade or battalion intelligence officer S-3 – brigade or battalion operations officer</p>		

6-40. The first three steps of developing a fire support plan: 1) plan how to accomplish each fire support task, 2) allocate or request delivery assets and build an attack plan, and 3) integrate fire support events or actions with maneuver planning, occur at this stage. The remaining two steps: 4) test the feasibility of the plan and 5) assist the S-2 in collection plan refinement are addressed in later stages of the MDMP.

Plan How to Accomplish Each Fire Support Task

6-41. The S-2, S-3, FSCOORD and fires cell planners all work together as they build this part of the fire support plan. They determine what unit or element can best execute the task based on the scheme of maneuver, the capabilities of acquisition assets, and the priorities of the information collection plan. In the case of BCT and field artillery battalion assets, they must also plan the operational requirements for getting them into position to conduct the execution of fires. This interaction also allows the staff to plan, coordinate, and synchronize the information collection plan. This includes development of a proposed organization for combat for BCT fire support assets.

Allocate or Request Delivery Assets and Build an Attack Plan

6-42. If the BCT commander has not directed how to attack a particular high-payoff target, the staff builds the plan to achieve the effects the commander has directed and incorporates it into the attack guidance matrix.

6-43. An *attack guidance matrix* is a matrix, approved by the commander, which addresses which targets will be attacked, how, when, and the desired effects (ATP 3-60).

6-44. The FSCOORD, brigade FSO, fires cell planners and targeting officers, and the targeting working group develop an attack guidance matrix and may develop a targeting synchronization matrix for each course of action to determine when to execute fire support, in conjunction with appropriate aspects of information operations and cyber electromagnetic activities. As the staff discusses and builds the options, they can resolve suppression of enemy air defenses, timing, and other coordination issues. The executive officer leads the staff and the FSCOORD or brigade FSO chairs the targeting working group.

Integrate Fire Support Events or Actions with Maneuver Planning

6-45. At the BCT echelon and below, fires most often provide decisive close support or set conditions that permit the maneuver force to move to a position where it can dominate the enemy. The timing of fires with maneuver is essential for success. The FSCOORD and fires cell planners must fully understand the relative timing of maneuver and fires and establish triggers that reflect this timing. At a minimum, they must develop initial triggers they and the staff can refine during course of action analysis (war gaming).

6-46. A target is not really a target unless it has an observer and a trigger. A multitude of targets—a measles sheet—does not add flexibility to a plan, only volume and complexity. A properly planned target (task and purpose) has a trigger linked to a named area of interest. The trigger may or may not be a decision point on the decision support template, but without a trigger, an observer has a low probability of hitting a target at the correct time. Thus, no trigger—no target. Likewise, no observer—no target. Ultimate responsibility for ensuring a target has an observer and a trigger lies with the maneuver commander assigned the target. Observer-trigger planning must be a formal process with the plan included in the fire support execution matrix. It must be cross-walked with the scheme of maneuver to identify the implied tasks (for example, routes for and security of observers, security of observers), all of which must be addressed and rehearsed. Planning redundancy of observers is an implied task critical to success. Another is ensuring observer responsibility is placed at a level (usually the company team) that can be resourced adequately to perform the mission.

Close Air Support Planning

6-47. Close air support planning is an integral part of the MDMP and is crucial in developing the overall BCT fire support plan. The BCT commander must identify and articulate the desired effects from close air support, with specifics concerning time, place, and desired end state. The BCT commander, FSCOORD, brigade FSOs, and fires cell planners must ensure that close air support planners (Air Force TACP) understand the BCT commander's desired effects, schemes of maneuver and fires, control requirements, and criteria for specific rules of engagement. While the joint forces air component commander determines the actual ordnance close air support aircraft will carry, the requesting BCT commander should ensure the joint force air component commander is provided sufficient information outlining the desired effects and also any external or self-initiated tactical restrictions or limitations. The BCT commander must also provide the risk assessment determination, identifying specific guidance for types of terminal attack control. A

major challenge in the process is integrating and coordinating air support with surface fires. The overarching goal is integrating all close air support assets with other fire support assets and maneuver to achieve the desired effects from the air attack without suspending the use of the other supporting arms or unnecessarily delaying the scheme of maneuver. An additional goal is to offer a reasonable measure of protection to the aircraft from friendly surface fires and enemy fires. Key close air support considerations are commander's intent and desired close air support effects, which unit has priority for close air support, positioning of joint terminal attack controllers, and whether the plan promotes simultaneous engagement of targets by close air support and surface fires. During this step, close air support planners:

- Analyze relative combat power
- Generate options used to develop possible courses of action.
- Develop close air support employment concept (includes best use of close air support and placement of Air Force tactical air control parties).
- Coordinate with the Air Force air liaison officer in developing engagement areas, target areas of interest, triggers, objective areas, obstacle plan, and movement plan.
- Coordinate with the BCT SWO to provide weather effects assessments and running estimates for all fires assets throughout Fires planning and development of the fire support plan.
- Develop the unit airspace plan for close air support.
- Prepare close air support requests for each course of action.
- Prepare course of action statements and sketches (battle graphics).

ANALYZE RELATIVE COMBAT POWER

6-48. By analyzing relative combat power, the BCT staff and fire support planners determine friendly and opposing force strengths and weaknesses, and determine how to best meet the commander's objective. The fire support planners ensure that the BCT staff considers fire support aspects of combat power (for instance close air support aircraft against anticipated enemy surface forces, including air defense threats).

Generate Options

6-49. After determining available courses of action and forms of operations, the BCT staff generates options for meeting mission objectives. As many feasible options as time allows are developed as courses of action. The fire support planners assist the staff in determining decisive points/supporting efforts, on elimination/modification of courses of action, and consideration of the advantages and disadvantages of fire support for each possible course of action.

6-50. The fire support planners also advise on the integration and synchronization of fire support with maneuver and maneuver support and other warfighting functions. They help determine which desired effects might be best generated by fire support in conjunction with the other warfighting functions. An example is whether to use field artillery assets for military deception operations instead of using the artillery to weight the decisive operation. The BCT staff considers these tradeoffs when generating options and reviews them during course of action analysis.

Array Initial Forces

6-51. The fire support planners array the fire support assets needed to support each friendly course of action and propose generic fire support/field artillery organization for combat for each course of action. The fire support planners ensure the BCT staff considers the impact of available fire support resources on force ratios and help determine initial placements.

6-52. BCT planners also consider the deception plan during this step. Because aspects of it may affect target selection and unit positioning; the staff considers major elements of the deception plan before developing courses of action.

Develop the Concept of Operations

6-53. The BCT commander's intent, visualization, concept of operations and guidance for fire support are critical to the development of the fire support plan. As a minimum, the scheme of fires supporting the concept of operations should establish the basis for the employment of fire support.

6-54. Using the outputs from the mission analysis, the BCT S-3, FSCOORD and fires cell planners consider what fire support assets and resources to use and develop the supporting scheme of fires for each course of action. A course of action may include one or more ways to generate the BCT commander's desired effects.

6-55. The scheme of fires states how the BCT commander will integrate fires to accomplish the mission. It is linked to and is simultaneously developed with the course of action for the overall operation. The scheme of fires identifies fire support priorities by critical event, phase, or unit and area. The scheme of fires focuses fire support on the course of action's decisive point, or on fire support to shaping operations that allow the BCT commander the freedom to effectively apply combat power at the decisive point.

6-56. As the scheme of fires is developed, the BCT fire support planners determine how best to position and use fire support assets throughout the operation. The object is to ensure that fire support priorities are consistent with the commander's intent and resources are available when and where needed.

6-57. The first priority of fires is to the decisive operation. The decisive operation determines the outcome of a major operation, battle, or engagement. It leads directly to the accomplishment of a commander's mission. Commanders typically identify a single decisive operation, but more than one of the BCT's subordinate units may play a role in a decisive operation. The decisive point may shift during the execution of the operation in order to exploit an enemy weakness.

Critical Asset List

6-58. The fire support planners review the critical asset list developed during mission analysis to help determine fire support tasks for each course of action. A *critical asset list* is a prioritized list of assets or areas, normally identified by phase of the operation and approved by the joint force commander, that should be defended against air and missile threats (JP 3-01).

6-59. Critical assets are generally specific assets of such extraordinary importance that their loss or degradation would have a significant and debilitating effect on operations or the mission. Critical assets may be added or deleted from the list based on how their loss or degradation would affect the course of action.

TARGETING AND RELATED PRODUCTS

6-60. Army targeting uses the functions of D3A as its methodology. Targeting:

- Integrates and synchronizes fires into unified land operations.
- Uses available capabilities to generate a specific lethal or nonlethal effect on a target.
- Begins during pre-hostilities deliberate planning and continues throughout execution.

6-61. The targeting working group brings various members of the BCT staff together to synchronize targeting and related targeting products. During the development of each course of action, the targeting working group selects potential high-payoff targets for each BCT course of action. The targets are developed from among the identified high-value targets and knowledge of the enemy commander's intent developed during mission analysis. The focus of the effort is to identify the capabilities required by the enemy and the targets that enable the enemy ability to successfully achieve anticipated objectives. Using the information developed, the targeting working group identifies the purpose for attacking targets, and the payoff to be gained. The analysis specifies the particular function, capability, or units to be attacked; when and where they should be attacked, and the desired effects to be achieved by successfully attacking these targets. The targeting working group deconflicts targets, identifies the change in enemy activity desired (develops measures of effectiveness and measures of performance for assessment), and develops plans by which fires, reconnaissance, target acquisition, and intelligence capabilities are positioned to acquire and attack identified high-payoff targets in time and space.

6-62. The fire support planners, including the electronic warfare officer and electronic warfare element, and the information operations officer and the information operations element, submit their requests for this information to the S-2 when nominating targets for engagement by nonlethal means. If these targets are approved, the fire support, electronic warfare, and information operations information requirements needed to assess the effects on them become priority information or intelligence requirements that the S-2 adds to the information collection plan (see the discussion in chapter 4 and FM 3-55). If the BCT does not have the assets or resources to answer the requirements, the target is not engaged unless the attack guidance specifies otherwise or the commander so directs. The targeting working group (see ATP 3-60) performs this synchronization. Fire support planners must synchronize the lethal attack of targets with any directed nonlethal activities.

6-63. Fire support planners at different echelons may desire to engage the same targets or may require different effects. Therefore, targeting includes coordinating and deconflicting targets with higher, adjacent supporting and subordinate echelons. Other staff elements may identify targets for attack using fires or other means. The FSCOORD, fires cell planners, and targeting officers consult with the BCT S-3 and discuss the advantages and disadvantages associated with lethal fires and nonlethal activities to generate the desired effects. The targeting working group and the S-3 recommend for the BCT commander's approval how to best employ available resources to engage these targets.

6-64. Parallel planning must begin as early as possible in the MDMP. The fire support planners exchange and share all pertinent information with subordinate units and adjacent and higher headquarters.

6-65. BCT staff representatives of all warfighting functions will participate in targeting working group sessions and war gaming to ensure a complete understanding of what targets must be engaged and where, when to attack them in time and space, and which system(s) and the tactics used to find and attack them will best achieve the BCT commander's desired effects. Together, they identify the available assets to be allocated, additional assets required, and communication channels needed to provide information on a real-time basis.

6-66. The targets identified are linked to information collection and target acquisition assets in the initial information collection plan (see FM 3-55). The initial information collection plan is developed to identify which assets are available to locate the targets where and when the attacks can be most effective. As requirements for acquisition of targets are developed, information collection and target acquisition assets are committed to find, identify and fix high-payoff targets. Using a systematic process, the fires cell staff focuses targeting resources and refines targeting information so that high-payoff targets can be effectively attacked. The targeting working group will develop and the BCT commander will approve the high-payoff targets, target selection standards and attack guidance that will become part of the fire support plan.

Effects Generated by Attacking the Target

6-67. Targeting systematically analyzes and prioritizes targets and matches appropriate lethal and nonlethal actions to those targets to create specific desired effects that achieve the commander's objectives. (JP 3-60) The commander states clear and simple targeting guidance. The guidance must focus on essential enemy capabilities and functions that could interfere with the achievement of friendly objectives. Based on the BCT commander's targeting guidance, the FSCOORD, brigade fires support officer and fires cell planners and targeting officers link desired effects to actions and tasks.

6-68. Effects refer to the target attack criteria in the attack guidance matrix. The targeting working group should specify attack criteria according to the commander's general guidance. Target attack criteria should be given in quantifiable terms. Attack criteria can be described in standard terms such as destroy, neutralize, or suppress. However, the subjective nature of what is meant by these terms means the BCT commander must ensure the FSCOORD, brigade FSO, fires cell planners and targeting officers, and the targeting working group understand the use of them (see FM 3-09). For example, destruction might be expressed as the elimination of a function (for instance a bridge no longer able to support vehicle traffic) or a percentage of the force. The commander may state that the desired effect on an infantry unit to be destroyed may include killing or wounding 50 percent of the personnel and destroying 20 percent vehicles in the targeted enemy position. Fire support planners must be prepared to advise the commander on the impact of desired effects on ammunition supply and planning. Desired effects may also be described in further detail such as disrupt air landings for 24 hours. Creating this desired effect would likely include

periodic attacks by one or more fire support delivery capabilities (such as close air support and field artillery for example) over that time frame to crater all runways at airfields within a certain radius.

Note: Terms such as destroy, block, turn, or disrupt usually relate to the task and purpose for attacking a target and are generally used in conjunction with the phrase “in order to”. Thus the terms such as block, turn, or disrupt should not be confused with or substituted for terms like harass or damage which might be used to determine the degree or duration of effects on a specific target (see ATP 3-60).

6-69. It is imperative that the FSCOORD, fires cell planners, and targeting officers understand the BCT commander’s desire in terms of clearly stated effects. For example, in major combat operations instead of just delaying a follow-on enemy echelon, the commander should state that the follow-on echelons should be delayed for a specific time period or until a specific event occurs (for example until the first objective has been secured). Whether using the foregoing terms or terms of the commander’s own invention, neither the commander nor the FSCOORD, fires cell planners, and targeting officers should assume definitions are uniformly understood. As with other guidance, dialog should continue until the staff clearly understands the commander’s intended role for fire support in terms of BCT objectives.

6-70. To achieve a desired effect may require multiple engagements or a sequence of engagements whether by fires, information-related capabilities (see FM 3-13). Strikes are coupled to the collection of information and an assessment to determine when the commander’s guidance has been met. For example, the desired effect might be to disrupt an enemy field artillery unit’s ability to shoot effectively. Destroying some or all of key enemy sensors, command, control, or the actual firing assets could achieve these effects. Combining the effects of information operations and cyber electromagnetic activities with fire support might be more effective.

6-71. Military information support operations might be implemented two hours before munitions are put on target (where leaflets are dropped to warn of the impending strike to encourage adversaries to disband). Information collection (see the discussion in chapter 4 and FM 3-55) may be required if the entity to be attacked is mobile.

6-72. A second strike might be planned after the first if the desired effect has not been achieved. While intelligence channels might handle information collection, and information operations synchronization might handle military information support operations, the fire support planners must always be cognizant that the desired effect might be best achieved via the complementary means of various warfighting functions, each amplifying the other. As it impacts the high-payoff target list (and integrating the effects of information operations and cyber electromagnetic activities into targeting), maintaining the equivalence of priority for each separate method’s request is crucial.

6-73. One can reason that delivery of fire support munitions might have a higher priority than dropping leaflets, yet in this example, both actions have equal importance. Maintaining this linkage is the responsibility of the BCT FSCOORD, brigade FSO, fires cell planners and targeting officers, and Air Force TACP working together with the BCT S-2, S-3, information operations officer, S-9, and brigade judge advocate (this is the essence of the targeting working group).

6-74. A method of tying together the relationship of multiple interdependent effects so that the BCT FSCOORD, fires cell planners, and targeting officers resource these requests properly is to include these considerations as either notes or integral components during targeting for development of supporting products such as the high-payoff target list, target selection standards, attack guidance matrix, and targeting synchronization matrix.

High-Payoff Target List

6-75. The high-payoff target list (see table 6-9 on page 6-20) is a prioritized list of high-payoff targets. The high-payoff target list is a dynamic document that is continually refined, during both planning and execution, based on the situation and commander’s guidance. Too many high-payoff targets will dilute the information collection, acquisition, and attack efforts. High-payoff targets are critical to the success of friendly operations based on the BCT commander’s targeting guidance.

Table 6-9. BCT high-payoff target list (example)

Phase of the Operation—1—Isolate the Enemy Unit:		
Priority	Category	High-Payoff Target
1	Fire Support	Insurgent mortars
2	Maneuver	Insurgent teams
3	Command and control	Insurgent cell phone
4	Command and control	Insurgent frequency modulation radio
5	Civilians	Hostile civilian crowds*
*A hostile crowd is defined as 25 or more people with leadership interfering or capable of interfering with BCT operations.		
BCT – brigade combat team		

6-76. High-value targets include those capabilities, functions, or systems that are critical to the enemy in the context of an operation. High-payoff targets are those nodes within the enemy high-value targets that when eliminated cause the set to become dysfunctional, thus enhancing the likelihood of enemy failure and BCT success. Thus, if the BCT commander's desired effect is to delay the enemy force's ability to move mechanized forces across river Y to allow their destruction by air and artillery fires, then two target sets could be 1) the enemy's ability to conduct a river crossing and 2) command and control of mechanized forces listing specific nodes or pieces of equipment to cause a specific effect at a specific time and place. Identify and prioritize target sets for each phase of the operation. Within the sets, rank-order individual targets by target value, sequence of appearance, importance, or other criteria that satisfy the targeting guidance to create the desired effects. In this way, the targeting working group reduces, modifies, and reprioritizes high-value targets while ensuring that high-payoff targets support the BCT commander's concept of operations. For detail on high-payoff targets and the high-payoff target list, see ATP 3-60.

Target Selection Standards

6-77. Target selection standards are criteria applied to enemy activity (acquisitions or combat information) and used in deciding whether the activity is a target. Effective target selection requires a thorough knowledge of enemy doctrine and tactics, an appreciation of the terrain, expertise with the available resources (lethal and nonlethal attack, sensor, and collection), and friendly force vulnerabilities and risk elements. The targeting working group predicts enemy actions following a successful attack. For example, the successful suppression of indirect fires directed against the BCT may require the elimination of a finite number of enemy firing batteries achieved either by destruction, the loss of communications, the abandonment of weapons by their crews, or a combination of effects.

6-78. Target selection standards (see table 6-10 and ATP 3-60) are usually disseminated as a matrix. Military intelligence analysts use target selection standards to develop targets from combat information. Once they are developed the analysts and pass them to fires cells for attack. Attack systems managers, such as fires cells and field artillery battalion fire direction centers, use target selection standards to determine whether to attack a potential target.

Table 6-10. BCT target selection standards (example)

High-Payoff Target	Timeliness	Accuracy
Insurgent mortars	≤10 minutes	≤100 meters
Insurgent teams	≤30 minutes	≤100 meters
Insurgent cell phone	Within 2 hours of H-Hour	Placed/received within 12 km of (named) Airfield
Insurgent FM radio	≤20 minutes	≤150 meters
Hostile civilian crowds	Within 6 hours of H-Hour	Within 12 km of (named) village
FM – frequency modulation H-Hour – The specific hour on D-day at which a particular operation commences. (JP 5-0) km – kilometer(s)		

6-79. Fire support planners use targeting products in developing the fire support plan. These products include:

- High-value targets.
- High-payoff target list.
- Target selection standards.
- Attack guidance matrix.
- Targeting synchronization matrix.

FIRE SUPPORT TASKS

6-80. A fire support task is a task given to a fire support unit or organization that supports the commander's scheme of maneuver. A fire support task is an essential element of the fire support plan. The task must be clear, concise, and include the elements of task, purpose, and effect.

6-81. The task states the supported maneuver task and the type(s) of effects the firing unit must provide for that phase of the operation. The task describes what fire support must accomplish to support the BCT operation. The effect identifies the desired result or outcome the delivered fires are to achieve. See ATP 3-60 and FM 6-0. Using the earlier example of the commander's guidance for fire support to disrupt the enemy's ability to observe our breaching operation the FSCoord and brigade FSO derive the fire support task to be "provide screening and obscuration fires in support of the breaching operation." As the FSCoord and brigade FSO war-game that task during planning, they identify an asset to accomplish it, and describe the desired effect to be achieved by accomplishing of that task.

6-82. The purpose states the supported maneuver commander's purpose and the desired end state for the targeted enemy formation, function, or capability. The purpose describes the why of the fire support task. In this case why is in order to disrupt the enemy's ability to observe our breaching operation.

6-83. As the BCT staff, FSCoord, fires cell planners, and targeting officers build the course of action, they determine how best to achieve the commanders desired effects through ethical and proper application of combat power. Fire support planning gives the fire support planners a realistic appraisal of fire support efforts required to support the operation. It serves as a basis for identifying fire support tasks and for preparing the subsequent fire support plan. The BCT staff and fire support planners determine where to find and attack enemy formations to create desired effects. Regardless of when the execution of fire support tasks begins, they are still synchronized with other combined arms tasks. Considering the enemy course of action developed by the S-2 and the detailed intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4), the BCT staff identifies where the enemy formations, functions or capabilities identified by the BCT commander can be found and attacked. The staff graphically portrays these locations using target areas of interest or engagement areas. Certain sub-elements, capabilities, or equipment sets within the formations may be more vulnerable to attack or provide the highest payoff if attacked. These are further identified or refined as high-payoff targets.

6-84. Fire support, information operations, or cyber electromagnetic-related high-payoff targets can be developed inclusively as part of fire support tasks or they can be developed separately as individual fire support, information operations, or cyber electromagnetic activities tasks. An example of how a fire support task for the BCT's cannon field artillery battalion might be derived from the BCT mission-task statement follows:

Example BCT mission task statement. At 2100Z 17 August 20xx (when) 1st BCT (who) delays (what) enemy force A along route RED (where) until 0500Z18 August in order to prevent enemy force A from interfering with the rapid crossing of 51st (U.S.) Infantry Division over the Blue River (why or purpose).

6-85. After being assigned this task, the BCT commander would give the staff planning guidance to include planning guidance for fires: "FSCoord and brigade FSO...use fires to delay from 2100Z17Aug until 0500Z18Augxx the enemy movement along route RED to prevent enemy forces from interfering with the river crossing". The FSCoord and fires cell planners using mission orders then develop tasks to subordinate units such as the BCT's field artillery battalion.

Example field artillery battalion task: On-order (when) 6th Battalion, 14th Field Artillery (155-mm) (who) strikes enemy forces (what or action) along route RED (where) in order to delay them from interfering with 51st (U.S.) Infantry Division rapid crossing of the Blue River (why/purpose).

6-86. One or more fire support tasks may be developed for each phase of an OPORD or OPLAN. Taken together and considered sequentially the fire support tasks represent a summary of the scheme of fires supporting the OPORD or OPLAN. The scheme of fires paragraph (subparagraph 3e) in the OPLAN or OPORD must be concise but specific enough to clearly state what fires are to accomplish in the operation. The overall paragraph organization should mirror that of the scheme of maneuver paragraph. If the maneuver paragraph is phased or otherwise organized, the scheme of fires paragraph should take on the same organization.

Assist the S-2 in Collection Plan Refinement

6-87. The fire support planners must coordinate with the S-2 to ensure that there are adequate, redundant information collection (see the discussion in chapter 4 and FM 3-55) and target acquisition assets to find, track, and refine for attack the high-payoff targets in the fire support plan for each course of action. They must also understand the BCT fire support system responsibilities to the information collection plan. In many cases, the fire support planners control the most effective acquisition assets in the BCT and must support both the fire support and information collection plan. An example BCT task for possible engagement by fire support, electronic attack, and information-related capabilities is shown in Table 6-11.

Table 6-11. Nested BCT task for possible engagement by fire support, electronic warfare, and information-related capabilities (example)

Joint Force Commander’s Objective: U.S and Allied nationals, facilities and interests in region are protected.		
Joint Force Commander’s Desired Effect: Country X unable to affect our ability to generate combat power (4th order).		
Division/Corps Commander’s Desired Effect: Threat X unable to regain control of airfield (3rd order).		
BCT Commander’s Desired Effect: No effective enemy fires into GERONIMO Forward Landing Site and Route GOLD low water crossings from H-03:00 to H+36 hours, when the enemy is expected to infiltrate additional systems from adjacent areas of operation.		
BCT TASK		
<i>When</i>	<i>Who</i>	<i>What/task and desired effect; When</i>
Prior to H-4:00	1st BCT	Neutralize 91st Battalion indirect fire systems (81-mm motorized) in operational area HOG that can place indirect fires against GERONIMO Forward Landing Site and the Route GOLD low water crossings.
Why/purpose:		
To enable 2nd BCT to seize lodgment, build combat power unimpeded, and transition to offensive operations.(2d order effect)		
BCT – brigade combat team		

6-88. The commander given the responsibility to complete all or a portion of a task plans in greater detail how the task will be accomplished. The planning detail typically increases, as the responsibility for task execution is refined at each echelon. Leaders must ultimately identify the timing and controls to ensure that targets are effectively engaged. Detailed planning and execution is assisted by the use of a planning worksheet. There is no prescribed format for these planning worksheets but items for consideration, particularly for a fire support or field artillery task, might include the **T**arget description, **T**rigger time or event, **L**ocation of the target (may be exact or general), **O**bservers, **D**elivery system, **A**ttack guidance, and **C**ommunications. These considerations may be remembered through the memory aid TTLODAC. A task may also require identification of various control measures (such as FSCMs, airspace coordinating measures, and maneuver control measures) and any other considerations. Commanders adjust the worksheet format as necessary.

6-89. Table 6-12 provides an example worksheet format for an assigned task using TTLODAC. The format may be altered as necessary. Table 6-13 on page 6-24 provides an example of a completed worksheet for an

assigned task using TTLODAC. An alternate format fire support planning worksheet is at Table 6-14 on page 6-25. Table 6-15 on page 6-26 provides an example of a completed combined worksheet for fire support tasks inclusive of information operations.

Table 6-12. Planning worksheet format for a BCT assigned fire support task - TTLODAC (example).

Phase: Descriptor if required.							
Task (what): State the supported or maneuver commander task and the type(s) of effects the fires unit must provide for that phase of the operation (suppress, neutralize, interdict, divert, exploit, deny, delay, deceive, disrupt, degrade, destroy, obscuration, or screening).							
Purpose (why): State the supported/maneuver commander purpose and the desired end state for the targeted enemy formation/function/capability. (There may be more than one task / purpose per phase).							
Priority of fire: State the priority of fire to subordinate units for all fires assets under the unit's command or control.							
ALLOCATIONS: List any additional assets assigned to subordinates for planning. Examples are priority targets, radar zones, attack aviation.							
POSITIONING GUIDANCE: Provide positioning guidance to assets such as mortars or observers required for execution.							
RESTRICTIONS: List all restrictions for the phase.							
Fire Support Task	(T) Target	(T) Trigger	(L) Location	(O) Observer(s)	(D) Delivery System(s)	(A) Attack Guidance	(C) Communications
List the task number the target supports	List the target number or target type	State the trigger (tactical/technical) for the target	Give the target location	State the observer of the target (primary/alternate)	State the delivery system(s) for the target (primary & alternate)	State the attack guidance/ method of engagement for the target	State the frequency and common net the target will be called in on (Primary, Alternate, Contingency, Emergency (PACE))
Notes: This is an alternate location that may include allocation of resources, positioning guidance, restrictions, and coordination information. List information deemed necessary.							

Table 6-13. Completed worksheet for a fire support task – TTLODAC (example)

PHASE II: Assault on Objective Bears							
Task/purpose: Fire Support Task 1: Provide obscuration fires to disrupt the enemy's ability to observe the breaching operation. Purpose 1: Enable the successful breaching operation. Fire Support Task 2: Provide suppressive fires to disrupt the enemy mechanized infantry platoons' ability to place effective direct fire on the breach site. Purpose 2: Enable the successful breaching operation							
Priority of fire: Field Artillery: A Company; Mortars: B Company							
ALLOCATIONS: A Company 1x Critical Friendly Zone; C Company 1x Field Artillery Priority Target							
POSITIONING GUIDANCE: Mortars move along Route REDLEG and occupy mortar firing position 1 (azimuth of fire 1600); in place ready to fire not later than H+ 30 minutes.							
RESTRICTIONS/FSCM: Coordinated Fire Line is Phase Line RED; No-Fire Areas 1 & 2 in effect.							
Task	(T) Target	(T) Trigger	(L) Location	(O) Observer(s)	(D) Delivery System(s)	(A) Attack Guidance	(C) Communications
Fire Support Task 1	AB1000	A Company lead element crosses Phase Line Blue	NG12344567	Primary: A Company; Alternate: C Company	Primary: battalion mortars; Alternate: field artillery	20 minutes x 200 meters length smoke	Battalion mortar net FH800
Fire Support Task 2	AB1005	When support by fire position 1 is set	NG45671234	Primary/Alternate: B Company	Primary: field artillery; Alternate: attack aviation	Battalion 6 rounds high explosive /variable time	Primary: battalion fire support net FH600; Alternate: fire direction net FH700
FH – frequency hopping							

Table 6-14. Alternate fire support task planning matrix worksheet format – TTLDAC (example)

Phase II: Decrease effectiveness of indirect fire on Forward Operating Base Steel.		
Fire Support Task 1: Provide counterfire to disrupt the enemy's ability to place accurate indirect fire on Forward Operating Base Steel. Purpose 1: Allow the unimpeded buildup of combat power.		
Fire Support Task 2: Disrupt the enemy indirect fire system's communications by electronic attack (jamming) causing the enemy to abandon the effort, Purpose 2: Allow the unimpeded buildup of combat power.		
(T) Target	Tasks 1 and 2: 91st Battalion mortar and command and control sections	
(T) Trigger	Task 1: H-10 to H-4.	Task 2: H-8 to H-Hour.
(L) Location	Target areas of Interest 156 and 157.	Operational Area HOG.
(O) Observer(s)	AN/TPQ-50, Q-37, Q-36 and Q-53 radars.	BCT military intelligence company; Prophet and supporting joint force capabilities.
(D) Delivery System(s)	BCT Field artillery battalion. Naval gunfire - USS WINSTON CHURCHILL Approximate gun-target line 0400. Close air support (A-10) H-8 to H-4 (alternate) destroy mortar sections to disrupt fires from 91 Bn mortars	Commando Solo intrudes on threat frequency modulation radio CFF and command and control net with message to disrupt 91 Bn command and control and thus disrupt fires from 91 Bn mortars.
(A) Attack Guidance	Battery 3: variable time Naval gunfire: 6 salvos controlled variable time Close air support: MK 82 (500 pound bomb)	Net intrusion on 91 Bn frequency modulation radio CFF & command and control net with message IJ3210
(C) Communications	Quick fire to A/4-5 Field Artillery on frequency hopping 356 High frequency: 123.456 or 234.678 Ultrahigh frequency: 456.78 (JTAC) Alternate: frequency hopping 207	Frequency hopping: 701 (primary) Ultrahigh frequency: 789.45 (alternate)
Notes: Control measures: Coordinated fire line is phase line ORANGE, on order phase line RED. No-fire areas 101; 102.		
AN/TPQ – Army/Navy (Marine) transportable radar special purpose (multipurpose) BCT – brigade combat team bn – battalion CFF – call for fire JTAC – joint terminal attack controller MK – Mark USS – United States Ship		

Table 6-15. A completed combined worksheet for fire support tasks including information operations – TTLODAC (example).

PHASE: II Decrease effectiveness of indirect fire on Forward Operating Base Steel							
Task/ Purpose: Fire Support Task (FST) 1: Provide counterfire to disrupt the enemy's ability to place accurate indirect fire on Forward Operating Base Steel. Purpose 1: Allow the unimpeded buildup of combat power;							
Information operations Task 1: Engage local leaders to result in an increase in local population providing information on enemy mortar activity. Purpose 1: To reduce enemy mortar activity against Forward Operating Base Steel.							
Fire Support Task	(T) Target	(T) Trigger	(L) Location	(O) Observer(s)	(D) Delivery System(s)	(A) Attack Guidance	(C) Communications
FST 1	1x 82-mm mortar section; 3 passengers & white or gray pickup truck	0600–0900Z	Vicinity of EV 12344567 (Target Area of Interest 156)	Primary: FIST 1 (with joint terminal attack controller); Alternate: Close air support (F-16) call sign Maverick; Q-36	Primary: 1xplt 105-mm; Alternate: Close air support (F-16 x 2);	105-mm 3 x volleys high explosive/ variable time; close air support 1 x joint direct attack munition;	Primary - AFATDS FH300; Alternate - BCT air liaison officer, FH 570.
FST 1	KE2000	1200–1400Z (as acquired)	Named Area of Interest 20	Primary: A Co; Alternate: B Co	Primary: 120-mm mortar; Alternate: 105-mm	5 rounds high explosive	Primary - Battalion Mortar Net FH570; Alternate- Fires Net FH350
FST 1	KE2005	1200–1400Z (as acquired)	Named Area of Interest 21	Primary: A Co; Alternate: B Co	120-mm mortar	5 rounds high explosive	Primary - Battalion mortar net FH570; Alternate - Fires net FH350
IO Task 1	Village chiefs	H-36 – H-24	Villages in Target Areas of Interest 156 & 157	Battalion commander	Bilateral negotiation	Handbill IPJ110	Battalion command FH500
<p>Notes:</p> <p>Priority of fires: Battalion mortars to AN/TPQ-Q-50 radar; field artillery to A Company on-order B Company; close air support to C Company.</p> <p>Allocations: A Company 1x field artillery platoon priority target.</p> <p>Positioning guidance: Battalion mortars occupy mortar firing position 1 not later than H-6</p> <p>Restrictions/ FSCMs: ROA 22 in effect 0600-0900; critical friendly zone 1 in effect; ROA FALCON in effect 1145-1430Z</p> <p>AN/TPQ – Army/Navy (Marine) transportable radar special purpose (multipurpose) BCT – brigade combat team FH – frequency hopping FIST – fire support team FST – fire support task IO – information operations mm – millimeter plt – platoon ROA – restricted operations area</p>							

6-90. Another version of a planning worksheet (see table 6-16) similarly uses the memory aid PLOTCR to describe the task considerations for a given target. The considerations are the **Purpose** of the planned fires, the target **L**ocation, **O**bserver identification, the **T**rigger event or method to initiate target engagement, **C**ommunication means among all agencies to observe the target engagement, and the allocated **R**esources for completion of a task or target engagement. Again, the commander adjusts the format to meet the needs of providing the necessary information to accomplish the task.

Table 6-16. Completed worksheet for a lethal fire support task – PLOTCR (example)

PHASE II: Assault on Objective Bears							
Task/Purpose: Fire Support Task (FST) 1: Provide obscuration fires to disrupt the enemy's ability to observe breaching operations Purpose 1: Enable the successful breaching operation. Fire Support Task 2: Provide suppressive fires to disrupt the enemy mechanized infantry platoons' ability to place effective direct fire on the breach site. Purpose 2: To enable the successful breaching operation.							
Task	Target	(P) Purpose	(L) Location	(O) Observer(s)	(T) Trigger	(C) Communications	(R) Resources
FST 1	AB1000	Disrupt enemy's ability to observe breaching operations.	NG12344567	Primary: A Company; Alternate: C Company	A Company lead element crosses Phase Line Blue.	Primary: Battalion mortar net FH800 Alternate: Field artillery fire direction net FH700	Primary: Battalion mortars; Alternate: Field Artillery 20 minutes x 200 meters smoke
FST 2	AB1005	Disrupt the enemy's mechanized infantry platoons' ability to place effective direct fire on the breach site.	NG45671234	Primary: B Company FIST HQ Alternate: 1/B FO	When support by fire position 1 is set.	Primary: Field artillery fire direction net FH700 Alternate: Battalion fire support net FH600	Primary: Field artillery battalion, 6 rounds high explosive/ variable time; Alternate: Attack aviation
<p>Notes: Priority of Fires: Field Artillery: A Company; Mortars: B Company Allocations: A Company 1x Critical Friendly Zone; C Company 1x Field Artillery Priority Target Positioning guidance: Mortars move along Route REDLEG and occupy mortar firing position 1 (azimuth of fire 1600); in place ready to fire not later than H+ 30 minutes. Restrictions/ FSCMs: Coordinated fire line is Phase Line RED; No-Fire Areas 1 & 2 in effect.</p> <p>FH – frequency hopping FIST – fire support team FO – forward observer FST – fire support task HQ – headquarters</p>							

6-91. As the BCT and subordinate battalion commanders determine their role in accomplishing a fire support task, they must define success of the fire support task to achieve the desired effect to support the task's purpose. By quantifying success, the delivery assets and observation/acquisition assets understand what qualifies as successful completion of the task. It also provides the basis for the assess function in targeting and the decision to reattack or not. Assessments should be quantified in terms of measures of performance, measures of effectiveness or battle damage assessment. Often, but not always, measures of performance are task standards for the delivery assets and measures of effectiveness are task standards for acquisition assets.

Assessment

6-92. As course of action development continues, the fire support planners consider how to assess fire support effectiveness. Assessment occurs throughout the operations process and is continuous. The fire support planners determine:

- Fire support tasks that require assessment.
- Preliminary measures of performance and measures of effectiveness for each fire support task, including fire support-related targets.
- The information needed to make the assessment.
- How to collect the information.

- Who will collect the information?
- How the commander will use the information to support decisions.

6-93. As the BCT staff, BCT FSCOORD, brigade FSO, and fires cell planners build the course of action, they attempt to determine measures of performance to assess how well the task has been executed (are we doing things right?) and measures of effectiveness to assess whether desired effects have been achieved (are we doing the right things?):

- A *measure of performance* is a criterion used to assess friendly actions that is tied to measuring task accomplishment (JP 3-0).
- 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)

6-94. By doing so, the staff is better able to determine methods and feasibility for selecting a method for creating desired effects. The fire support, information operations, and electronic warfare system(s) tasked can thus better plan for success. In determining effects, the staff must focus on what must be accomplished to achieve the desired effect, not what can be accomplished. If the staff determines they cannot create the desired effects with the assets allocated, they must rework the method or request additional assets.

6-95. Information required for the FSCOORD, fires cell planners, and targeting officers to assess fire support effects become fire support, or appropriate aspects of information operations and cyber electromagnetic activities information requirements. The fire support planners submit fire support, and appropriate aspects of information operations and cyber electromagnetic activities information requirements for the course of action the BCT commander approves to the S-2. The FSCOORD, fires cell planners, and targeting officers work with the S-2 to include fire support, and appropriate aspects of information operations and cyber electromagnetic activities-related information requirements for assessment in the information collection plan and the appropriate sections of the OPLAN or OPORD. Assessing all tasks during execution may be impractical. At a minimum, the fire support tasks that support the decisive operation are assessed. For more on assessment see ADRP 5-0.

Assessment of Associated Risk

6-96. The assessment of fire support associated risk during course of action development and course of action analysis focuses primarily on hazards related to executing fire support tasks. However, the fire support planners assess all hazards as they emerge. They also monitor identified hazards and evaluate the effectiveness of controls established to counter them.

6-97. The FSCOORD, fires cell planners, and targeting officers examine each course of action and its associated scheme of fires to determine if the courses of action contain hazards not identified during mission analysis. The planners then develop controls to manage these hazards, determine residual hazards and prepare to test the controls during course of action analysis. The planners also coordinate controls with other staff as necessary.

6-98. The FSCOORD, fires cell planners, and targeting officers consider two types of tactical and accident hazards associated with performing fire support tasks:

- Those associated with the fire support concept itself.
- Those from other aspects of the BCT concept of operations that may affect execution of fire support.

6-99. The FSCOORD, fires cell planners, and targeting officers identify as many of these hazards as possible so the BCT commander can consider them in decisions.

6-100. Thorough planning can reduce, but will never eliminate, unintended consequences. The FSCOORD, fires cell planners, and targeting officers identify possible unintended consequences and focus on those most likely to affect mission accomplishment.

6-101. Since adverse effects of military operations on the environment and civilians can influence fire support, the FSCOORD, fires cell planners, and targeting officers consider the effects of fire support related hazards on the local populace and infrastructure as well as on friendly forces. The fire support

planners assess these hazards, develop controls, determine residual risks, and advise the BCT commander on risk mitigation measures.

6-102. The BCT commander alone accepts or rejects risk. The FSCOORD, fires cell planners, and targeting officers advise the BCT commander concerning risk associated with fire support related hazards and recommend fire support tasks as controls to mitigate it. The commander decides what amount of risk to accept. Fire support risk mitigation may include assistance from other BCT staff. An example of using information operations for fire support accident risk mitigation is the integrated use of civil affairs, military information support operations, public affairs and Soldier and leader engagements or other information-related capabilities to warn the local populace of the accident hazards (for instance those hazards associated with unexploded dual-purpose improved conventional munitions bomblets). When appropriate, the FSCOORD, fires cell planners, and targeting officers all work together with information collection planners to convert risk mitigation measures into fire support tasks. These are assigned to units or placed in the fire support or information annex coordinating instructions. Risk control measures that apply to the entire force are placed in the OPLAN or OPORD coordinating instructions

6-103. The FSCOORD and fires cell planners produce a list of fire support related hazards and assessments of their associated risks. This list becomes the fire support input to the S-3 risk assessment. For more on risk assessment see ATP 5-19.

PREPARING FIELD ARTILLERY TASKS

6-104. Field artillery tasks must accomplish a well-defined result. The BCT commander or brigade FSO may directly state a field artillery task or it may be inferred by the supporting field artillery battalion commander. For example if a fire support task is to be successfully performed, the supporting field artillery task must be successfully executed. Table 6-17 shows an example fire support task, followed by an example of an field artillery task (table 6-18) derived from that fire support task:

Table 6-17. Fire support task (example)

Fire Support Task 1
Task: Degrade enemy Indirect fire system’s ability to place effective fires on the forward operating base.
Purpose: Allow unimpeded buildup of combat power.
Effect: Enemy indirect fire systems are not able to interfere with forward operating base activities.

6-105. After studying the fire support task 1, the field artillery commander derived a field artillery task. See the field artillery task found in table 6-18.

Table 6-18. Derived field artillery task (example)

Field Artillery Task 1
Task: Destroy enemy Indirect fire system’s ability to place effective fires on the forward operating base.
Purpose: Allow unimpeded buildup of combat power.
Effect: All identified mortars destroyed. Assessment sensors include infantry, Army aviation, and scouts.

6-106. After deriving the field artillery task 1, the field artillery commander, as the agent who will execute the mission to achieve the desired effect, plans in detail to include priorities, allocations and restrictions. The planning addresses movement functions and priorities, critical tasks to subordinate firing units during execution of the field artillery task and others tasks required in order to achieve the planning’s purpose. For Field Artillery Task 1, the field artillery battalion command post prescribed priority of fires, priority of survey support, concept of movement, and scheme of fires to achieve the field artillery task’s purpose. Additionally, Field Artillery Task 1 includes primary and alternate position areas, and triggers for movements. The planning worksheets previously described may be used.

6-107. In planning for field artillery task 1, the commander considers the elements of the task – the task description itself, its purpose, and the desired effect. Task describes the objectives that fires must achieve against a specific enemy capability. The task has three parts: targeting objective, enemy formation and

function. Destroy, delay, disrupt or limit are all examples of objectives. Formation is the size of the threat, and function is the capability of this threat to achieve its task and purpose. Destroy is the targeting objective, all enemy indirect fire systems are clearly the enemy formation, and the enemy's ability to place effective fires on the friendly base is the function in Field Artillery Task 1.

6-108. Purpose describes how the task will contribute to achieving the commander's intent. As with a fire support task, this should identify the decisive point that will leverage the targeting effect. It is constructed very similarly, if not identical to Fire Support Task 1, allowing unimpeded buildup of combat power is the purpose of the Field Artillery Task 1.

6-109. Desired effect is contained in the purpose statement and attempts to quantify the successful accomplishment of the task. The desired effect, for example, two 81-mm mortars destroyed, is assessment-oriented and assists in the decision to reattack or not.

6-110. Assessment sensors include infantry, Army aviation, and scouts. Effects are more than destroying the enemy mortar; they are quantifiable and observable. Accurate assessment and confirmation that the system has been destroyed are the end result of the task. Disseminate the developed field artillery task in the field artillery battalion OPLAN or OPORD or in subparagraph 3e of the BCT's OPORD as the field artillery support plan. Using the worksheet matrix technique seems to work well, but unit standard operating procedures will determine this.

6-111. Before publication of the fires annex to the OPORD, the field artillery battalion commander (as the FSCoord) or the brigade FSO (as the FSCoord's representative) participate in the MDMP in the brigade command post. This officer must understand fire support task development. The brigade FSO assists the field artillery battalion command post in parallel planning by providing working knowledge of fire support task development.

6-112. Questions the FSCoord or brigade FSO must ask include: Are any essential tasks identified for field artillery fire support? Which fire support tasks identify the field artillery assets that are required to provide fires in the effects portion of the fire support task? How is the field artillery battalion command post tied into this? How would the fire support task determine movement priorities? What ammunition or other special considerations are there? Is an air assault planned? Answers to these questions assist the field artillery battalion in the battalion's mission analysis and field artillery task development. See also Appendix C.

6-113. Establishing a menu of field artillery tasks with a checklist of considerations for each type of possible mission is another technique for efficient and effective field artillery task production. This menu is not a cookie-cutter technique for field artillery tasks, but, instead, a memory jogger of the normal tasks associated with common missions. A matrix format works well. See table 6-19.

Table 6-19. Field artillery task considerations (example)

Field Artillery Task	Considerations
Destroy mortars	Ammunition, observer plan, positioning of field artillery assets and counterfire radars, azimuths of fire and cuing azimuths, proactive and reactive predictive analysis, sensor-to-shooter architecture, quick fire net(s), fire order (for example destroy mortars), counterfire drill, clearance of fires procedures, maneuver tied into the targeting methodology.
Field Artillery Task	Considerations
Suppress enemy air defenses	Ammunition; observer plan, positioning of field artillery assets and counterfire radars, azimuths of fire and cuing azimuths, sensor-to-shooter architecture, quick fire net(s), fire order (for example destroy air defense systems), suppression of enemy air defenses coverage/plan, clearance of fires procedures, maneuver tied into the targeting methodology.

FIRES IN THE CLOSE FIGHT

6-114. The FSCoord, fires cell planners, and targeting officers use known rates of fire, target descriptions, and other data such as the Joint Munitions Effects computations to conduct detailed analyses

that support military decisionmaking. For fire support planning, this process can help determine how long it will take to engage a target, how much ammunition is required, and where and when fires’ triggers are needed. Although these calculations do not provide certainty, they do improve the likelihood of success. There is a danger in "over quantifying" planning: for example the more you must assume as you calculate, the less realistic and accurate your work may become. The real benefits of these calculations occur with practice. As the staff consistently employs the calculations, the process becomes routine and results in better developed and more detailed plans and orders. Fires cell planners and targeting officers begin such calculations as a part of course of action development. The fire support planning process is streamlined and more effective when the FSCOORD and brigade FSO can rapidly build feasible fire support. This enables the commander to have realistic expectations of fire support.

6-115. These fire support calculations assist in achieving the required effects by helping plan decision points, triggers, and ammunition requirements that can be used with the time, space, and equipment available. The suggested steps are shown in Table 6-20.

Table 6-20. Fire support calculations (example)

Step 1	Care must be taken to translate BCT commander’s guidance into quantifiable effects required to achieve target defeat criteria. The FSCOORD and fires cell planners should consult with the commander and the S-2 for assistance in translating the BCT commander’s guidance into a quantifiable number of enemy soldiers or equipment that should be attacked and the effects required to meet the commander’s criteria. For example, guidance to destroy a threat infantry company defensive position will likely need clarification. Does the commander intend that the position should be engaged to achieve 30% personnel casualties (the AFATDS destruction computation criteria) or will it be necessary to heavily damage each bunker possibly by using precision munitions? Plan for the mortars to engage suitable targets.
Step 2	Equate the required effects to the required ammunition. Determine from a munitions effects database the number of rounds required to accomplish the fire support task (suppress, neutralize, or destroy).
Step 3	Determine the time available to conduct attack. Based on the rate of fire of the selected system(s) (see ATP 3-09.32), determine how long it will take to execute the attack. The time available may be a factor, particularly when engaging a moving target.
Step 4	Determine if the required ammunition can be delivered in the time available.
Step 5	If engaging a moving target, determine the time required for it to pass through a specific point. Determine the maximum number of volleys that can be fired at one target location. Determine the number of volleys that can be delivered in that timeframe.
Step 6	Determine the number of attacks needed to deliver the required ammunition.
Step 7	Determine if time, engagement space, and necessary ammunition are available to execute the attacks.
AFATDS – Advanced Field Artillery Tactical Data System FSCOORD – fire support coordinator ATP – Army techniques publication S-2 – brigade or battalion intelligence officer BCT – brigade combat team	

6-116. Engagement area development occurs in the MDMP. Fire support planning within engagement area development is a critical supporting piece of the BCT operation plan. The engagement area is an area in which the commander intends to trap and destroy an enemy force with massed fires of all available weapons. The fire support planning during the development of an engagement area is vital to achieving the commander’s intent. The process compels the FSCOORD and fires cell planners, and battalion FSOs to consider such factors as the number of indirect fire assets available, the training proficiency of the observer/firing unit, the enemy’s direction/rate of march, trigger and intercept points, terrain analysis, anticipated enemy actions, and the amount of time the enemy can be expected to remain inside the engagement area. The steps of the engagement area development process are listed in table 6-21.

Table 6-21. Engagement area development

Step 1	Visualize how the enemy will or might attack.
Step 2	Select where and how to engage the enemy.
Step 3	Position forces (aviation and indirect fire systems) to engage the enemy.
Step 4	Position obstacles to support direct fire.
Step 5	Plan indirect fires to support direct fire and obstacles.
Step 6	Complete the plan; select/prepare final positions, site obstacles, and triggers.
Step 7	Rehearse.

6-117. Triggers are a physical point on the ground, or an action, or event. During the offensive tasks, a trigger is often a maneuver action or event. In the defense, a trigger is more often a physical spot on the ground. See table 6-22 on page 6-32 for the suggested sequence for trigger development.

Table 6-22. Trigger development

Step 1	Determine the position on the ground where fires will engage the enemy, for example, the impact of high explosive rounds on target or location of illumination rounds employed at night to discover a possible threat.
Step 2	To engage a moving target, determine the enemy rate of movement. This may be done by estimation, on the basis of past experience, from doctrinal literature, or from scout reports of enemy speed.
Step 3	Determine the time of flight of the rounds from the weapon system firing the mission.
Step 4	Determine the processing time. Processing time is the time required from the call for fire to rounds being fired from the weapon system.
Step 5	Determine the total mission time. The total mission time is time of flight plus processing time.
Step 6	Place the trigger point the required distance from a planned target location based on the following: {total mission time x speed of enemy = distance}.

OBSERVATION PLANNING

6-118. For close support, the positioning of ground observers is key to the successful employment of fire support. Observer positioning needs to be top-driven with a requirement to provide detailed refinement in order to ensure effective target attack.

6-119. Use reverse target observer planning (working from the target back to the observer) to verify the feasibility of the observation plan. Observation planning is complex because it depends on leaders across the BCT to ensure success.

Using the 6-step technique

6-120. For this purpose, the 6-step observation planning technique retains flexibility at the lowest level to position observers. Using top down planning, bottom up refinement to position observers optimizes and synchronizes observer positioning across the BCT. Detecting and assessing the effects of fires is critical.

6-121. The 6-step technique provides a methodical approach to produce refined, executable, integrated, and synchronized observation plans. This observation planning technique also provides the observer and commander with data necessary to rapidly adapt that plan during execution if a planned observation post is determined to be unsuitable after using a line of sight and risk estimate diagram.

Step 1: Determine the Desired Effects of Fires

6-122. The first step is to determine what the commander would like fire support to achieve—the desired effects of fires. The BCT's FSCOORD, fires cell planners, and targeting officers develop fire support tasks during mission analysis. In planning for observation, it is important that the FSCOORD and fires cell planners, the BCT commander and the subordinate battalion and company commanders have a common understanding of what fire support must do to support the operation before the fire support planners begin to develop the how to do it. The targeting guidance must be clear, as the desired effects may result in the development of multiple targets used to identify where fires will achieve the effects. For example, a delay effect may require that fire support attack a moving formation several times with different assets in different locations.

6-123. In planning for observation, the FSCOORD, fires cell planners, and targeting officers must consider each target and determine how many observers may be required to meet this task. They must also make an assumption on the number of alternate observers needed to be sure fires achieve the desired effects. As with the development of probable force ratios described in ADRP 3-90, the BCT S-2, S-3, FSCOORD and fires cell planners should look at the enemy capabilities and assess friendly tangible factors (such as equipment, weapon systems, and units) and intangible factors (such as morale and training levels) along with mission variables of METT-TC to determine the number of primary and alternate observers required for each target. The fire support planners must refine that requirement after they determine the attack means and observation suitability in observation planning's Step 2 and determine observation feasibility and further refine an observation course of action in Step 3. During this current step it is simply

important to determine how many tasks are really within the total observation capability of the fire support system.

Step 2: Determine Target Observation Suitability

6-124. Once the target objective for a fire support task is determined, the targeting working group must determine where they can attack the enemy formation to meet the commander’s targeting guidance and create the desired effect. In support of the observer plan, the FSCOORD, fires cell planners, and targeting officers then determine whether or not observation is suitable for that location. That is, whether or not the planned target meets observation requirements and complies with the BCT commander’s risk estimate guidance. To do this, they must first determine line of sight to each target. They simply draw a line out from the target to a point of higher elevation for the area all the way around a target (see figure 6-3).

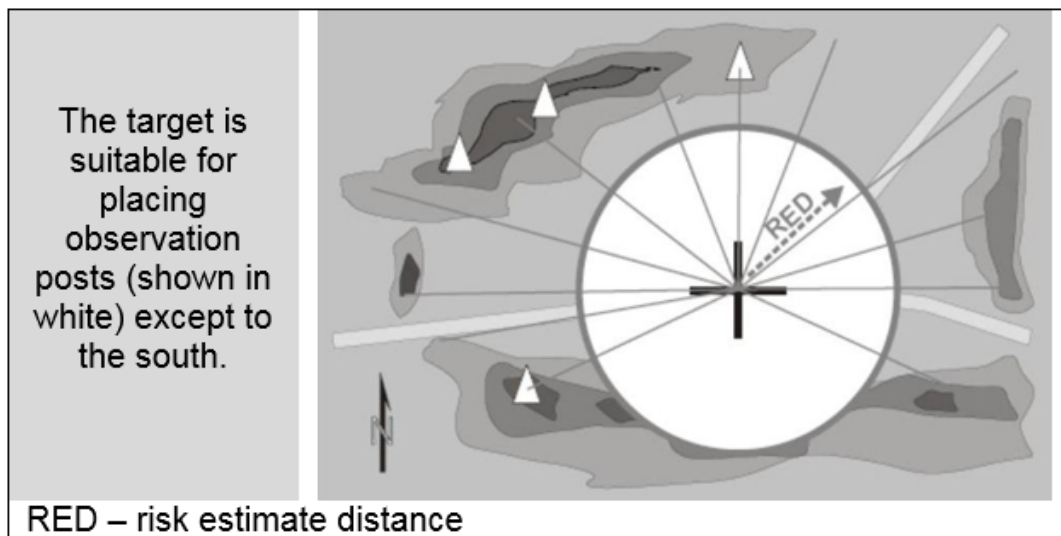


Figure 6-3. Placement of observation posts in relation to target (example)

6-125. Line of sight analysis enables the FSCOORD, fires cell planners, and targeting officers to verify that observers can detect and assess the effects on the target. In many cases line of sight cannot be established at the point the round impacts the target. This is especially the case in areas of very constricted terrain where a moving target is the most vulnerable, such as a narrow pass or defile. In this case, the FSCOORD, fires cell planners, and targeting officers must determine line of sight from where the observer can see the target to trigger fires and from where the observer can see the target area to assess the result. After they have determined line of sight, they must determine how to best attack the target to meet the commander’s targeting guidance and create the desired effects. In preparation of the observation plan, the FSCOORD, fires cell planners, and targeting officers determine the attack method (for example, mortar, cannon field artillery, rocket, or close air support). Risk estimate distances are available from the Air Land Sea Applications center classified website for the annex to Army techniques publication (ATP) 3-09.32. The ATP 3-09.32 risk estimate distances found outside of that annex are generalized and will not apply in all cases encountered on the battlefield. Using risk estimate distance assumptions and tables, the fires cell planners and targeting officers draw a circle around the targets using the risk estimate distance as the radius for the circle. Once the risk estimate surface has been determined for a target (or group of targets), they match the line of sight for each target to the risk estimate ring around the target to ensure that the observer can observe the target without being within the possible effects radius of the delivered munitions. If line of sight is available from the target to a location outside the risk estimate ring, then observation of the target is suitable in that it accomplishes the mission and complies with the BCT commander’s planning guidance for risk to observers. Although this process can be done manually, it can also be done using any terrain-based software.

Step 3: Develop the Observation Course of Action

6-126. With the completion of Step 2, the FSCOORD, fires cell planners, and targeting officers have a line of sight diagram and risk estimate distance ring for each target in the fire plan and have determined that observation of each target is suitable. Now they must work in concert with the BCT S-2 and the S-3 to create a feasible observation course of action that is integrated with the information collection (see chapter 4 and FM 3-55) and maneuver plans.

6-127. The developed course of action must be one that the BCT can accomplish with available time, space, and resources. Figure 6-4 shows the development of a line of sight and risk estimate diagram.

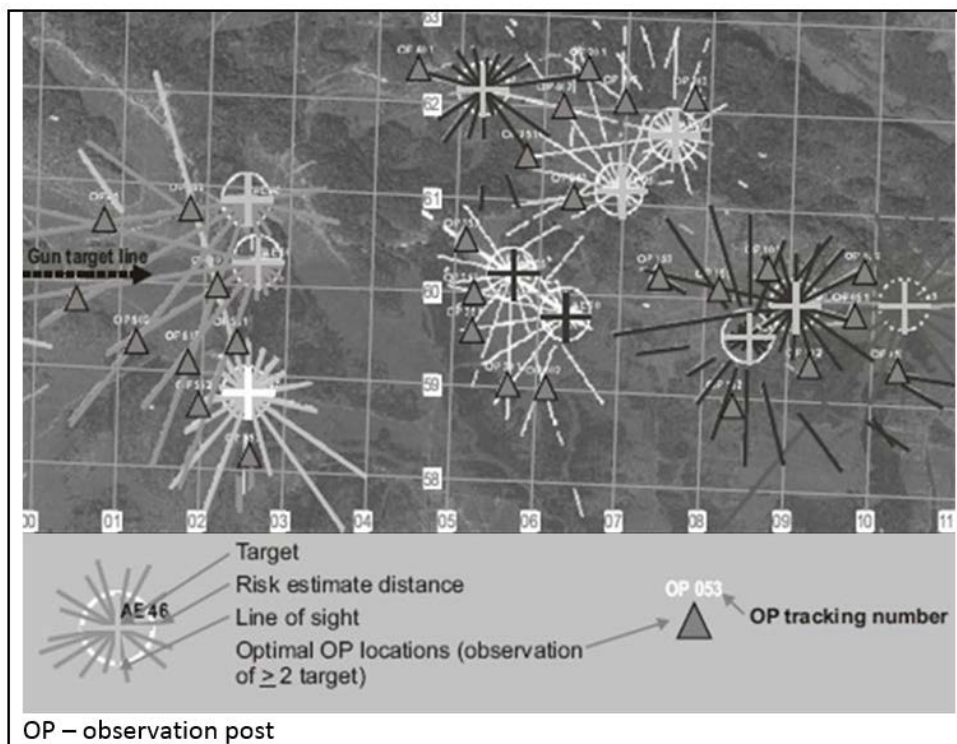


Figure 6-4. Line of sight and risk estimate distance diagram (example)

6-128. During step 3 of observer plan development, the fires cell planners and targeting officers must take the line of sight and risk estimate diagram and look for covered and concealed positions along the line of sight to the target and outside of the risk estimate diagram where an observer could be placed to provide target observation. Remembering the assumed requirement for alternate observers developed in Step 1, they must now look at efficiencies to place a primary observer and at least one alternate for each target to ensure coverage. The fires cell planners and targeting officers develop these efficiencies by analyzing their line of sight diagram and looking at where the line of sight crosses for two or more targets. They place an optimal observation point at each of these locations and assign an observation post tracking number associated with its linked target. Next, they must plan the operational requirements for getting observers into position by integrating their line of sight plan with the information collection plan. The S-2, FSCOORD, fires cell planners, and targeting officers work together to link named areas of interest and target areas of interest to scouts and observer observation posts and target assignments. Then they link further observation posts and observation tasks that battalions must accomplish with the scheme of maneuver.

6-129. During the development of this course of action, especially through the war-gaming phase, the FSCOORD, fires cell planners, and targeting officers must ensure that the time to move to the assigned observation post (whether through scout or observer infiltration or battalion maneuver) and the time to acquire the target meets the timing required for target attack. Concurrently, they must verify that the observation post, while a great position for observation, can be occupied based on the difficulty of terrain that the observer must traverse to get into position. Finally, they must align observation posts to resources.

They should provide for alternate observers, if possible, for each target. Any observation posts assigned to battalions or squadrons must consider FIST and observer survivability as well as the number of maneuver elements to provide security. Additionally, the FSCOORD, fires cell planners, and targeting officers must consider options such as decentralized observer or FIST employment vice centralized employment.

6-130. Once the observation course of action is determined to be both suitable and feasible, the FSCOORD, fires cell planners, and targeting officers must verify with the S-3 and BCT commander that the tactical advantage gained through attacking the targets is acceptable. If the cost in resources is unacceptable, then they must go back to the supported task and determine if there is another means of accomplishing this task without the use of ground-based observers or of developing some risk mitigation measures to increase the acceptability of the course of action.

Step 4: Task Observers and Observation Points in a Top-Down Observer Plan

6-131. Once the FSCOORD and brigade FSO have recommended, and the BCT and affected maneuver battalion and company troop commanders have approved the observer course of action, the S-3 tasks the units to provide observation of key targets. This plan should be incorporated in the fire support plan, which implies that it is also incorporated into the information collection plan. The FSCOORD, fires cell planners, and targeting officers include the target and observation tasking into the fires paragraph and the S-3 tasks observation requirements as a unit-specified task in paragraph 3 of the BCT OPORD. Observers for designated targets must be clearly identified in the OPORD. These fire support tasks, if supporting a BCT essential task, cannot be buried in the fires annex. The best fire support plan is one that is integrated and synchronized with the maneuver forces.

6-132. When the OPORD lists the observer tasking(s), it cannot simply end with a tasked unit, but must provide both the assigned unit and associated observation post. The order should list a primary and alternate observer. Addressing the who of the observer plan, and neglecting the how of the observer plan means that observer positioning is not a synchronized effort, but left to chance. Often, unit assignment of responsibility to execute a target is where the observer planning stops. In Step 4 of developing a top-down observer plan, the tasking for the target must provide the assigned unit a clear task and purpose linked to a target and associated observation points. How the observer gets into position is in accordance with the unit-directed scheme of maneuver. For example, a method for observation might read:

Example method for establishing observation: Task Force 3-316 Infantry maneuvers to and establishes observation of AE0030 from Observation Posts 301 and 302 not later than 0530 hours to neutralize a suspected antitank firing line to limit enemy ability to impede BCT movement along **AXIS ARROW**. Observation posts may disengage once task force trains are in position at Command Post 3.

6-133. This plan is top-down, and it may change as the enemy situation and the maneuver plans of subordinate units are refined from the bottom-up. However, the positioning of observers to accomplish fire support tasks is well defined. Targets and related observation posts are as linked in task and purpose as a maneuver unit being told to occupy an attack by fire position in order to enable the attack to seize an objective. Observation for the attack of targets is part of the information collection plan in its area of operation to prevent fratricide. Observer planning is too important to leave to chance. Top-down tasking of a synchronized observation plan ensures that the plan is part of an overall maneuver plan. The observation plan is however, still an unrefined plan.

Step 5: Refine and Rehearse the Observation Plan

6-134. Target refinement and the combined arms rehearsal are two key events that have the capability of adding to the level of synchronization between maneuver and fire support for the upcoming BCT operation. In relation to planning observation from the target back, a change in target location, if not updated, could invalidate the entire observer course of action. Therefore, during target refinement, the FSCOORD, fires cell planners, and targeting officers must continually go back to Steps 2 and 3 of the process to ensure that changes to the target location do not change the suitability, feasibility, or acceptability of the observation plan.

6-135. This means that the brigade FSO and fires cell planners and affected battalion and company FSOs and fires cells must take each new or refined target and verify that line of sight to an observation post or that any risk to the observer assumptions based on the movement of the risk estimate radius are still valid. The FSCOORD, fires cell planners, and targeting officers must also revalidate risk estimate assumptions based on refined battery location data and update the risk estimate diagram to ensure that the refinement of targets or observation posts does not alter the efficiency of the observation plan. For example, if a battalion has requested to change the example Observation Post 301 to another grid that now causes the observer to only see the primary but not the alternate target, there may be a problem because this desynchronizes the observation plan.

6-136. Finally, as battalions or squadrons add targets, the FSCOORD, fires cell planners, and targeting officers must ensure that each target has an assigned observer (not already tasked as part of the existing observation plan) and is resourced with suitable observation posts. Even if the target is part of a contingency plan, the target must have an observation plan to go with it. A technique for tracking target and observation post refinement is to number targets in 5s (such as AE0005, AE0010), and then with each refinement add 1 number (AE0006, AE0011). The related observation posts can be named along with its corresponding target (such as Observation Post 051 becomes Observation Post 061). As units refine observation posts and targets, the FSCOORD, fires cell planners, and targeting officers must update the risk estimate diagram and ensure that risk estimate diagram is finalized after target refinement cut-off. The plan with the risk estimate diagram also must be distributed before the fire support and combined arms rehearsals.

6-137. The FSCOORD, fires cell planners, and targeting officers work with the commander, S-3 and staff to ensure fire support for shaping efforts creates the conditions for the decisive action to succeed. The primary forums to ensure the synchronization of fire support and observation are the combined arms; the fire support; and the information collection rehearsals. The rehearsals synchronize the target and observation plan refinement process. The fire support community's first opportunity to verify synchronization is the information collection rehearsal. During this rehearsal, the fire support planners should verify that:

- No planned BCT information collection assets are within the projected risk estimate distances for each of the targets.
- Subordinate unit observation tasks and observer locations are in accordance with the observation plan and fire support plan.

6-138. Finally, the information collection rehearsal is a great opportunity to look at other assets that may be positioned in areas where they would have line of sight on a target and could provide alternate observation if necessary.

6-139. During the fire support rehearsal, the FSCOORD, brigade FSO, and BCT commander must ensure each subordinate unit understands techniques for fire support execution (TTLODAC or PLOTCR worksheets) plus rehearsals described for each fire support task. The associated observation plan should address where the observer needs to be, security, communications, how the primary and alternate observers get into position, what the observer is to accomplish, and disengagement criteria if necessary.

6-140. The BCT commander, FSCOORD, and brigade FSO verify that the tasked units not only understand they have an observation tasking, but also they understand and have synchronized observation post occupation and disengagement requirements. Under no circumstances should the tasked unit provide only a general response to how the unit plans to execute a target. The unit response must include the observation post specific location and must identify the observer down to call sign and bumper number if available. Merely stating that a company FIST is a primary observer with the company commander designated as an alternate may be insufficient. Unless these two personnel intend to physically occupy and observe the target, they have not developed their observation tasks in sufficient detail. In support of observer planning during the combined arms rehearsal, the FSCOORD and brigade FSO must identify any unresolved issues developed during the fire support and information collection rehearsals and verify that everyone understands target risk estimate distances and observer maneuver requirements. In the observation plan, the rehearsal is the last chance to synchronize observer actions. If the observation plan and the maneuver plan are not well understood during this rehearsal, the fire support plan is also in jeopardy, as the detect and assess functions of targeting have not been synchronized.

Step 6: Monitor and Adjust Observer Plan Execution

6-141. The ability of fires cells at all levels to monitor the execution of the observation plan is critical to the success of fire support as a whole and contributes to continuous assessment. The FSCOORD, fires cell planners, and targeting officers must be able to monitor the situation and ensure the synchronization of available fire support assets to place the right attack means on the correct target at the precise time. In the case of observer planning, a fire support asset is any assigned observer regardless of branch, rank, or unit. From the FIST or forward observer to each battalion fires cell and BCT, the positioning of observers must be tracked and adjusted. This is because observers may be lost through enemy contact or the targets may change based on enemy action.

6-142. The fires running estimate must include any loss of observation of critical targets during execution. The BCT staff uses the estimate to make adjustments, as necessary, to achieve the desired end state.

6-143. Observation post locations must be known and understood throughout the BCT, not just within the fire support system. The FSCOORD, fires cell planners, and targeting officers must use the risk estimate diagram to ensure that it can provide advice on other observation post locations if maneuver execution renders some planned observation posts untenable. In this case, the risk estimate diagram becomes a tool to maintain observer-positioning flexibility during execution.

ASSIGN HEADQUARTERS

6-144. The BCT staff recommends forces and headquarters to execute each course of action. When approved, these assignments become the task organization. The FSCOORD and fires cell planners identify units to perform fire support tasks and make task organization recommendations based on fire support requirements. The BCT staff tailors employment of fire support assets to mission requirements and type of operation and consider how best to:

- Task-organize and clarify responsibilities and command and support relationships.
- Minimize fratricide risk.
- Synchronize combat power at decisive points.

6-145. The BCT FSCOORD, brigade FSO, and fires cell planners make task organization recommendations based on the fire support capabilities of each headquarters and fire support resources. The fires running estimate, including the vulnerability assessments, provide the information needed to support any fire support related recommendations. Another consideration is the headquarters experience in conducting fire support.

DEVELOP COURSE OF ACTION STATEMENTS AND SKETCHES

6-146. The S-3 prepares a course of action statement and supporting sketch for each course of action for the overall operation. The statement and sketch cover who, what, when, where, and why for each subordinate unit. They also state any significant risks for the BCT as a whole. The FSCOORD and fires cell planners and targeting officers provide fire support input to each course of action statement and sketch. At a minimum, each course of action statement or sketch should include the scheme of fires. This statement may identify fire support tasks for the course of action. The sketches:

- Portray how fire support will assist in mission success.
- Provide an overview of fire support capabilities, limitations, and requirements.
- Show the scheme of fires and information such as FSCMs, command posts, and displacement. The fires cell planners should consult with the field artillery battalion S-3 to verify that the information is complete prior to briefing.

6-147. The desired fires cell output for course of action development is a draft fire support plan for each course of action, branch, or sequel. Fire support tasks should be clearly identified. In some cases, the fire support plans may not change significantly to support different courses of action.

Scheme of Fires and Scheme of Movement and Maneuver

6-148. The scheme of fires paragraph (subparagraph 3e of the OPLAN or OPORD) together with the scheme of movement and maneuver, describes how the BCT as a whole will accomplish the mission and meet the BCT commander’s intent. It provides the sequence of fire support tasks and outlines the who, what, where, when, and why for each fire support task needed for the operation.

Information Collection Plan

6-149. Although the fire support planners are not individually responsible for creating the information collection plan (see the discussion in chapter 4 and FM 3-55), they do assist the S-2 and S-3 in its development. The FSCoord and fires cell planners and targeting officers review the information collection plan to detect, track, and attack the high-payoff targets in the fire support plan, and related reconnaissance, surveillance, and target acquisition assets supporting the fire support tasks. The FSCoord and fires cell planners must then identify the fire support related assets in the information collection plan that must be repeated or explained in more detail in the fire support plan.

Initial fire support plan

6-150. The initial fire support plan includes tasks (with associated measures of performance and measures of effectiveness), the draft target list worksheet, targeting (or modified targeting) synchronization matrix, fire support execution matrix, initial FSCMs, and plans for risk management, observation, close air support, and airspace control.

Draft DA Form 4655-R, Target List Worksheet

6-151. Use the Department of the Army [DA] Form 4655-R, (*Target List Worksheet*), when manually fire planning in the BCT fires cell and field artillery battalion command post. The DA Form 4655-R (*Target List Worksheet*) is a preliminary listing (see figure 6-5) of all targets and their descriptions from which the fires cell and field artillery battalion targeting officers can select and manually plan. ATP 3-09.30 contains the instructions for preparing the DA Form 4655-R (*Target List Worksheet*).

TARGET LIST WORKSHEET										
For use of this form, see ATP 3-09.30. The proponent agency is TRADOC.										
										SHEET 1 OF 1
LINE NO	TARGET NO	DESCRIPTION	LOCATION	ALTITUDE	ATTITUDE		SIZE		SOURCE / ACCURACY	REMARKS
					L	W	L	W		
1	AA3410	82-mm mortars (4 tubes)	14SNG9233443554	340	0440	90	10	1st PH FO		
2	AA3415	Infantry trench line	14SNG9185256035	410	1600	400	50			
3	AA3420	Aircraft landing strip	14SNG9203345044	250	0800	1200	200			
4	AA3425	Regimental CP	14SNG9476534381	270	Radius	800				
5	AA3430	FPF	14SNG8756868955	370	1660	200				
6	AA3435	Road junction	14SNG8857367012	330					TRP A3	
7										

CP – command post	FO – forward observer	FPF – final protective fire
mm – millimeter	PLT – platoon	TRP – target reference point

Figure 6-5. DA Form 4655-R Target List Worksheet (example)

Target Overlay

6-152. The target overlay may be used to supplement the target list worksheet (automated or manual). The overlay is a graphical representation of the target list worksheet. The symbols used on it should be standard military symbols. Plot targets by symbols and target numbers on the overlay. Fire support assets supporting the maneuver unit, as well as all FSCMs, should be plotted on the overlay. The overlay is used as a tool to:

- Resolve duplication of targets.
- Integrate the scheme of fires with the scheme of movement and maneuver.
- Determine the most appropriate unit to engage the target.

DA Form 4656 (*Scheduling Worksheet*)

6-153. The brigade FSO and fires cell planners find the commander's guidance and the fire support requirements in the fire support plan. They analyze this information and the information on the target list worksheet to determine what schedules of fire must be prepared to support the scheme of movement and maneuver. The fires cell then passes these requirements to the cannon field artillery battalion command post that (assuming an automation system is not available) prepares the necessary DA Form 4656 (*Scheduling Worksheet*). Table 6-23 on page 6-40 contains column-by-column instructions for preparing the DA Form 4656 (*Scheduling Worksheet*). Table 6-24 on page 6-41 lists the planning considerations for various field artillery and mortar systems.

Table 6-23. Instructions for preparing DA Form 4656, Scheduling Worksheet

Column	Instructions
Heading	Enter the type of schedule, the supported unit, and the operation order or plan for which the schedule is being prepared
Line Number	This is an administrative control number. Number each line sequentially. This gives all holders of the schedule a means of quick reference for finding which units have been scheduled and specific information that relates to those targets.
Organization and Caliber	Enter the organizational information—to include caliber and weapon type—for each unit in the plan. If needed, add clarifying information such as the number of guns in the firing unit, weapon model, nationality, and sustained rate of fire to assist in planning.
Firing Units	Enter the size and designation of the firing unit. This is normally a battery or platoon, but some systems may use an individual weapon. A commander might also direct that a specific target is to be engaged by a single gun. If the quantity of the firing unit's weapons differs from standard, planners may parenthetically list the number of available weapons as a scheduling reminder.
Scheduling Target	<p>To the upper right of the firing unit's column is an untitled portion of the worksheet. This is referred to as the timing block. Below the timing block is a block of intersecting horizontal and vertical lines called the time matrix. It is used to assign targets to firing units. This assignment is based on the ability of the unit to adequately engage the target as shown by the target overlay. The time matrix graphically portrays time of impact and duration of fires and may refer to a specific shell-fuze combination to be used. This graphic portrayal represents the target to be engaged by either a dot (one volley) or a horizontal line (more than one volley). The interval between the vertical lines is based on the weapon system rate of fire and the number of different systems being scheduled on the same work sheet. For example, for a 155-mm howitzer, the normal interval is 60 seconds. Thus, a target being engaged by three 155-mm volleys would have a duration line three vertical lines long with impacts on each of the vertical lines. Another factor that must be considered in scheduling is the shift time of the weapon system being scheduled. Shift time is the length of time needed for the firing unit to cease firing on one target and commence firing on the next scheduled target.</p> <p>Firing units use the upper portion of the block to establish time to fire or lanyard pull time, so that the rounds impact at the scheduled times.</p> <p>Information on the lower portion of the block is based on time of impact of rounds fired. The purpose of the block is to establish the duration of a particular schedule relative to time. Schedules may start at a specific time (based on an established H-hour) or may be scheduled as on-call (start plotting at time 0). Some schedules may be fired before a scheduled H-hour. The brigade FSO and fires cell planners should avoid creating fire support H-hours that may be confused with maneuver H-hours. The brigade FSO, fires cell planners and the S-3 must conduct close coordination to ensure that H-hour time references are clearly identified, understood, and synchronized for all aspects of the BCT plan.</p>
Remarks	<p>Use the remarks column to amplify information in the time matrix portion of the worksheet and to include information for the engagement of on-call targets. Use a parenthetical letter to refer to the amplifying information in the remarks column. List on-call targets on the line of the firing unit assigned to engage them. List any other amplifying information starting under the last firing unit line. Do not use duration lines or dots for groups of targets (unless fired within a schedule) or for on-call targets because the duration of fire is not specified. If a group of targets is fired outside of a schedule, the unit normally shoots the rounds at the maximum rate of fire or as tube conditions permit. If a group of targets is fired within a schedule, the unit normally shoots at the sustained rate of fire to maintain schedule timing. If a unit is ordered to fire its on-call target while it is firing the schedule, it will:</p> <ul style="list-style-type: none"> • Leave the schedule. • Fire its on-call target at the maximum rate of fire. • Rejoin the schedule at real time. • Report to its controlling headquarters those scheduled targets that were not engaged and those targets on which the commander's desired effects were not created.
Note: It is up to the controlling headquarters to notify the commander and recommend appropriate action to engage these targets.	
<p>BCT – brigade combat team mm – millimeter FSO – fire support officer S-3 – battalion or brigade operations office H-Hour – The specific hour on D-day at which a particular operation commences. (JP 5-0)</p>	

Table 6-24. Weapon shift planning considerations

Weapon	Sustained Rate of Fire (used for planning purposes)	Shift Time*
60-mm mortar (M224)	8-20 rounds per minute (determined by cartridge fired). See TM 9-1010-223-10.	1 minute
81-mm mortar (M252)	8-15 rounds per minute (determined by cartridge fired). See TM 9-1015-249-10.	1 minute
120-mm mortar (M120/121)	4 rounds per minute. See TM 9- 1015-250-10.	1 minute
105-mm howitzer (M119-series)	3 rounds per minute for 30 minutes. TM 9-1015-252-10 (M119A2) or TM 9-1015-260-10 (M119A3)	1 minute
155-mm howitzer (M777-series)	2 rounds per minute (determined by the thermal warning device). See TM 9-1025-215-10.	1 minute (low angle); 2 minutes (high angle)
155-mm howitzer (M109A6)	(Zones 3-7) 1 round per minute (Zone 8) 1 round per minute until limited by tube temperature sensor. See TM 9-2350-314-10-1 and -2.	1 minute
<i>Note:</i> Shift times are based on engaging targets within the traverse limits of a given weapon. The shift times to engage a target outside of traverse limits may vary based upon crew experience and position location conditions.		
mm – millimeter	TM – technical manual	

6-154. If necessary, the BCT fires cell and cannon field artillery battalion command post personnel resolve conflicts due to technical fire control considerations using the brigade FSO’s initial schedule of fires. Schedules of fire may be prepared for any circumstance depending on the situation. Some schedules that may be prepared include:

- Groups (see figure 6-6 on page 6-42).
- Series (see figure 6-7 on page 6-43)
- Programs (see figure 6-8 on page 6-44).
- Smoke and Illumination (see figure 6-9 on page 6-45).
- Preparations.
- Counterpreparations.
- Harassing.
- Interdiction.

6-155. Prepare a separate DA Form 4656 (*Scheduling Worksheet*) for each schedule of fire. The worksheet is the fire planner’s tool for manually organizing the targets on the targeting worksheet into specific schedules. The DA Form 4656 (*Scheduling Worksheet*) provides:

- A specific sequence during which the targets scheduled will be engaged.
- Targets requiring more than one volley. These are scheduled at the sustained rate of fire for the weapon system being used.
- The total expenditure of ammunition by each firing unit on each target.
- The shell-fuze combination for each target if it deviates from the standard of high explosive (HE) with quick fuze.
- Any on-call targets that are to be engaged.
- Any special instructions.
- The fire support assets available.

6-156. Unless otherwise indicated in the **REMARKS** column, all targets will be engaged with HE with quick fuze. For planning purposes, the schedule reflects the time of impact for all targets. Targets that

appear on the automated or manual target list worksheet (DA Form 4655-R (*Target List Worksheet*) but do not appear on the DA Form 4656 (*Scheduling Worksheet*) are on-call.

Groups of Targets

6-157. A *group of targets* is two or more targets on which fire is desired simultaneously. A group of targets is designated by a letter/number combination (ATP 3-09.30). The number of firing units (launchers, howitzers, platoons, batteries, or battalions) available must be considered in planning groups of targets. Including individual targets in a group does not preclude them from being attacked individually. See ATP 3-09.30 and ADRP 1-02.

6-158. List groups of targets on the scheduling work sheet (see figure 6-6). Groups of targets normally are fired on-call of the supported unit. Schedule groups so that initial fires strike the targets simultaneously. On the top line of the scheduling work sheet, enter the group number. Below the group number, list the targets of the group opposite the firing unit assigned the targets. Below each target number, show the number of rounds to be fired. Do not draw a line or dot between the target number and the ammunition. More than one group can be scheduled on the same scheduling work sheet.

(Groups for 1BCT, 531D)		SCHEDULING WORKSHEET				SHEET 1 OF 1	
OPORD 20		For use of this form, see ATP 3-09.42; the proponent agency is TRADOC					
LINE NO	ORGANIZATION AND CALIBER	FIRING UNITS			REMARKS		
			(D1Y)	(D2Y)			
1	6-14 FA (155, SP)	A	AB4074 24(a)	AA4108 30(a)			
2		B	AB4083 24(a)	AA3251 30(b)			
3		C	AB4123 24(a)				
					(a) 50% VT		
/							
BCT – brigade combat team			FA – field artillery		ID – infantry division		
OPORD – operation order			SP – self-propelled		VT – variable time (proximity)		

Figure 6-6. DA Form 4656 Scheduling Worksheet—groups of targets (example).

Series of Targets

6-159. A *series of targets* is a number of targets and/or group(s) of targets planned to be fired in a predetermined sequence to support a maneuver operation (ATP 3-09.30). A series may also be fired on call, at a specified time, or when a certain event occurs. The maneuver commander determines the need for a series on the advise of the FSO. Including individual targets or a group of targets in a series does not preclude these targets from being attacked individually. See ATP 3-09.30 and ADRP 1-02.

6-160. The brigade FSO, fires cell planners, and targeting officers or subordinate and supporting unit FSOs plan series of targets to support the BCT commanders’s scheme of maneuver. A series may be executed on-call or at a specific time or event. The series is scheduled to start at zero. Once a series is begun, targets and groups within the series are fired in a predetermined time sequence. Simultaneous attack of targets in a group within a series is as requested by the initiator or as determined by the field

artillery fire planner. Attack is based on the nature of the targets and the requirements of the BCT commander. Groups need not be fired as groups when fired as part of a series unless requested. As with groups, manual planning and scheduling of a series of targets can be a time-consuming process and may require fires from supporting field artillery units. Prepare a scheduling work sheet for each requested series of targets. See figure 6-7.

(Series Paul, 1BCT, 531D)		SCHEDULING WORKSHEET							SHEET 1 OF 1	
OPORD 20		For use of this form, see ATP 3-09.42; the proponent agency is TRADOC								
LINE NO	ORGANIZATION AND CALIBER	FIRING UNITS	0 1 2 3 4 5 6							REMARKS
			1	6-14 FA (155, SP)	A	AA3151 18 (a)	AA3124 6(b)			
2		B	AA3151 18 (a)	AA3124 6(b)						
3		C	AA3151 18 (a)	AA3124 6(b)						
										(a) 50% VT
										(b) 50% SMK

BCT – brigade combat team **FA** – field artillery **OPORD** – operation order **SMK** – smoke
SP – self-propelled **VT** – variable time (proximity)

Figure 6-7. DA Form 4656 Scheduling Worksheet—series of targets (example)

Programs

6-161. A program of targets is a planned sequential attack of similar targets. Execute a program on call, at a specific time, or when a particular event occurs. See ATP 3-09.30.

6-162. Schedule each type of program starting at zero and extending as long as needed (see figure 6-8 on page 6-44). A line indicates duration of fires. A dot indicates a single volley impacting simultaneously at a given time (for example the single volley may be a battery, battalion, or field artillery brigade volley). Once a program is initiated, fire the targets within the program in a predetermined sequence as show in the schedule. Normally, the lowest echelon that designates and plans programs of targets is the field artillery battalion. There are no special graphics associated with a program of targets. Programs appear on scheduling work sheets and schedules of fires.

(Counter-OP, 1BCT, 531D)		SCHEDULING WORKSHEET							SHEET 1 OF 1		
OPORD 20		For use of this form, see ATP 3-09.42; the proponent agency is TRADOC									
LINE NO	ORGANIZATION AND CALIBER	FIRING UNITS								REMARKS	
			0	1	2	3	4	5	6		
1	6-14 FA (155, SP)	A	AA3232	24 (a)	AA3232	6 (b)					
2		B	AA4091	24 (a)	AA3232	6 (b)					
3		C	AA3063	24 (a)	AA3232	6 (b)					
											(a) 50% VT (b) 50% SMK

BCT – brigade combat team **FA** – field artillery **ID** – infantry division
OP – observation post **OPORD** – operation order **SMK** – smoke
SP – self-propelled **VT** – variable time (proximity)

Figure 6-8. DA Form 4656 Scheduling Worksheet—program of targets (example)

Smoke and Illumination

6-163. Some targets have a specified duration of fire, but the ammunition requirements are unknown, for example, smoke and illumination targets on which expenditures are affected by wind speed and direction. To complete the illumination or smoke schedule, fire support planners:

- Indicate by a horizontal line, the time on target and duration of fire.
- Place the target number above this line.
- Below the line, center a subscript keyed to a remark in the **REMARKS** column that shows the method of engagement (for example, 2-gun illumination, lateral or range spread, first rounds white phosphorus and hexachloroethane smoke, succeeding rounds hexachloroethane).

Note: When scheduling smoke, back off one minute to allow for buildup time (if using hexachloroethane only and not white phosphorus for initial rounds). Buildup time is not to be used when firing on the same target. The BCT commander must realize that because of weather, smoke fires cannot have guaranteed effects. When asking for smoke, the commander must be explicit in the intention. The FSCOORD and fires cell planners and targeting officers must specifically look at alternative methods of achieving the intention if the smoke is not effective. This can be done by planning on-call high explosive targets to suppress selected areas. See figure 6-9.

SCHEDULING WORKSHEET		SCHEDULING WORKSHEET							SHEET 1 OF 1	
(Smoke for 1 BCT, 53ID)		For use of this form, see ATP 3-09.42; the proponent agency is TRADOC								
LINE NO	ORGANIZATION AND CALIBER	FIRING UNITS	0	1	2	3	4	5	6	REMARKS
1	6-14 FA (155, SP)	A		DA3246						(a) 1 st rds WP & HC
				(a)						Succeeding rds HC
2		B		DA4092						
				(a)						

SCHEDULING WORKSHEET		SCHEDULING WORKSHEET							SHEET 1 OF 1	
(Smoke for 1 BCT, 53ID)		For use of this form, see ATP 3-09.42; the proponent agency is TRADOC								
LINE NO	ORGANIZATION AND CALIBER	FIRING UNITS	0	1	2	3	4	5	6	REMARKS
1	6-14 FA (155, SP)	A		DA3251						(a) 4-gun illum, range and lateral spread.
				(a)						
2		B		DB0108						(b) 2-gun illum, lateral spread
				(b)						

BCT – brigade combat team	FA – field artillery	HC – hexachloroethane
ID – infantry division	illum – illumination	OPORD – operation order
SP – self-propelled	WP – white phosphorus	

Figure 6-9. DA Form 4656 Scheduling Worksheet—smoke and illumination (example)

Draft Targeting Synchronization Matrix or modified Targeting Synchronization Matrix

6-164. An excellent planning and preparation tool, the targeting synchronization matrix or modified targeting synchronization matrix graphically communicates the details of the scheme of fires. It represents the attack of targets in time and space. The targeting synchronization matrix links high-payoff targets to targeting and delivery assets and to assessment criteria. It provides a check to ensure that all the links specified in the fire support plan are coordinated. This product incorporates data from the high-payoff target list, the information collection plan, and the attack guidance matrix into one matrix. These provide detailed descriptions of targets, tentative target locations based on intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4), and, in modified form, can provide the task and purpose of each target and link each target to the fire support task it supports. The overlay provides a graphic depiction of the target locations and size, and, when used with the maneuver graphics and the fires paragraph (OPLAN or OPORD subparagraph 3e, Scheme of Fires), gives a clearer understanding of the fire support plan.

Note: The targeting working group (see ATP 3-60) may prepare a targeting synchronization matrix for each course of action, or may use the high-payoff target list, target selection standards, and attack guidance matrix for the war game and prepare a combined targeting synchronization matrix for only the approved course of action.

Draft Fire Support Execution Matrix

6-165. The fire support execution matrix is a concise planning and execution tool for both the offense and the defense that shows the many factors of a sometimes complex fire support plan. This matrix helps the fire support personnel and the commander understand how the fire plan supports the scheme of maneuver. When approved, the matrix becomes the primary execution tool. The matrix can provide a detailed portrayal of the portions of the fire support plan that each BCT subordinate commander, fires cell, FSO and observer is responsible for executing. The matrix can graphically communicate the details of the fires

paragraph and ties executors to targets relative to time or events of the scheme of maneuver. The format for the fire support execution matrix and techniques for its development and use varies according to individual unit tactical standard operating procedures. The matrix is typically set up with the maneuver elements shown along the left side and different phases (phase lines, events, or times) of the mission along the top. Phases should correspond to phases established on maneuver execution matrixes. As a general rule, don't make the matrix any more complicated than circumstances warrant. Table 6-25 is an example of a fire support execution matrix. See also Appendix C for additional examples.

Table 6-25. Fire support execution matrix (example)

PHASES	PHASE I FPOL	PHASE II ATTACK	PHASE III DEFENSE	PHASE IV TO BE DETERMINED
Task Force CONTROL		1 x Platoon Attack Aviation _____ →		
Team A/1-35 Armor	Field Artillery Priority of fires AB1005 (P) _____	1 x Field Artillery Priority Target	AB2010 (P)	
Team B/1-35 Armor	Mortar Priority of Fires 1X Critical Friendly Zone AB 2005 (A)	AB1110 (P)	AB 2010 (A)	
Team C/ 1-6 Infantry	AB1005 (A)		1X Field Artillery priority target AB1115 (A)	_____ →
Team D/ 1-6 Infantry	On-order Field Artillery Priority of Fires AB2005 (P) _____	AB1110 (A) 1 X Mortar Target _____ →	AB1115 (P) Field Artillery Priority of Fires	_____ →
Task Force Mortar (4 x 120-mm)	Mortar Firing Position (MFP) 1 AB 2005 (Platoon 6 rounds of high explosive) _____		MFP 2 AB 2010 (1x 5 minutes 300m smoke screen)	
FIELD ARTILLERY ORGANIZATION FOR COMBAT 4-27 FA (3x6 155 SP) 2d BCT 2-3 FA (3x6 155 SP) R 4-27 FA	MORTARS MFP 1 NV123456 (Azimuth of fire 1600) on-order move to MFP 2 NV345321 (Azimuth of Fire 1700) CLOSE AIR SUPPORT Close air support will be on station at H+30 minutes to H+1 hour (30 minutes). All missions need to be formulated and transmitted by assigned joint terminal attack controllers. Type 1 close air support missions only.		AMMO AVAILABLE Field Artillery: 15xbattalion 6 rounds of high explosive munitions, 5xbattalion 6 rounds of dual-purpose improved conventional munitions, 4x20 minute, 400m Smoke Screens 6 rounds of Excalibur Mortar: 20xplatoon 4s of high explosive 8x5 minute, 300M smoke screens 6 rounds of Excalibur	
FIRE SUPPORT COORDINATION MEASURES Coordinated Fire Line: Phase Line HAROLD on-order Phase Line HOMER No-Fire Area 1: GV435678 (250m Radius) Restrictive Fire Area 1: GV465127 (500m radius) No dual-purpose improved conventional munitions	HIGH-PAYOFF TARGET/ATTACK GUIDANCE 1. Maneuver (Suppress) 2. Fire Support Assets (Neutralize) 3. Air Defense Artillery (Suppress)		COORDINATION INSTRUCTION All company targets need to be submitted to the task force fires cell not later than H-6 Hours. Mortars will use Route SOFTBALL and Route ROAD KING for movement within the area of operations. Voice and digital communications checks will be conducted with the fires cell not later than H-2 hours.	
RESTRICTIONS Field artillery scatterable mine release authority is retained at the division level.	TARGET BLOCK Task Force 1-35 Armor: AB2000-2199 A/1-35 Armor: AB2200-2299 B/1-35 Armor: AB2300-2399 C/1-6 Infantry: AB2400-2499 D/1-6 Infantry: AB2500-2599		REFINEMENT CUTOFF Not later than H-6 hours. FIRE SUPPORT REHEARSAL H-4 hours at the task force command post vicinity GV765432	
(A) – alternate BCT – brigade combat team FA – field artillery FPOL – forward passage of lines m – meters MFP – mortar firing position (P) – primary R – reinforcing				

Initial Fire Support Coordination Measures

6-166. The BCT commander typically establishes all FSCMs on the basis of recommendations by the FSCoord and brigade FSO. The FSCoord and brigade FSO base their recommendations on the BCT

commander's guidance, location of friendly forces, the battle plan, and anticipated enemy actions. Considerations for development of FSCMs are described in chapter 5 of this ATP. See also FM 3-09.

Risk Management Plan

6-167. The FSCoord, fires cell planners, and targeting officers advise the BCT commander concerning risk associated with fire support related hazards. Fire support personnel develop and recommend fire support tasks as controls to mitigate risk (see ATP 5-19).

Draft Observation Plan

6-168. The FSCoord, fires cell planners, and targeting officers use the 6-step observation planning process described earlier in this chapter to develop a draft observation plan. The BCT commander then refines observer locations with positions that are feasible and better synchronized with the maneuver plan.

Draft Plan for Close Air Support

6-169. Close air support planning is crucial in developing the overall BCT fire support plan. The BCT commander must identify and articulate the desired effects from close air support with specifics concerning time, place, and end state. For detail on close air support see ATP 3-09.32, FM 3-09, and JP 3-09.3.

Draft Plan for Airspace Control

6-170. BCT airspace control involves detailed coordination and integration to enable effective use of close air support, indirect fire, organic and augmenting air defense artillery, tactical fire and maneuver operations and Army aviation (including unmanned aircraft systems). The FSCoord, fires cell planners, and targeting officers, TACP, and ADAM/BAE develop the plan to integrate the BCT's airspace for combat operations. Airspace control for the BCT is summarized in Chapter 5 of this ATP; details are provided in FM 3-52 and ATP 3-52.1.

SUMMARY

6-171. At the end of course of action development, the FSCoord, fires cell planners, and targeting officers have synchronized the scheme of fires and associated fire support tasks for each course of action. They know which units will perform each task, where they need to be at the execution time, and when the task is to be executed. They have identified the measures of performance and measures of effectiveness and the source of the information required to assess each task. The FSCoord, fires cell planners, and targeting officers have organized this information for course of action analysis using the fire support concept and sketches, high-payoff target list, attack guidance matrix, targeting synchronization matrix, and other products.

ANALYSIS OF COURSES OF ACTION (WAR GAME)

6-172. Course of action analysis or war gaming (see table 6-26 on page 6-48) identifies which course of action accomplishes the mission with minimum risk of casualties while positioning the BCT to retain the initiative. The war game provides detail and refinement, validates capabilities, and synchronizes the fire support plan. During war gaming and course of action comparison the FSCoord and brigade FSO must understand and be able to brief the BCT commander on the strengths and weaknesses of each course of action from a fire support perspective.

Table 6-26. BCT fires cell during analysis of courses of action

MDMP STEP 4: COURSE OF ACTION ANALYSIS AND WARGAMING		
BCT Staff	Key Fires Cell Actions	Fires Cell Output
<ul style="list-style-type: none"> • Gather the tools. • List all friendly forces. • List assumptions. • List known critical events and decision points. • Select the war-gaming method. • Select a technique to record and display results. • War-game the operation and assess the results. • Conduct a war-game briefing (optional). 	<ul style="list-style-type: none"> • Gather fire support running estimate, fire support portions of event templates, target value analysis results. See ATP 3-60. • Confirm fire support assets for all courses of action. • Validate fire support relevant facts and assumptions. • Determine fire support tasks and the field artillery contribution to fire support tasks. • Develop evaluation criteria to measure the effectiveness of the fire support contributions for each course of action. • Develop a fire support execution matrix for each course of action. • Provide likely adversary fire support actions to the S-2; determine where to find and attack enemy fire support capabilities. • Ensure fire support is integrated into the commander's emerging concept of operations throughout the war game. • Formulate a list of advantages and disadvantages of each course of action from fire support perspective. • Identify synchronization requirements including modifications to fire support coordination and airspace coordinating measures. • Identify decision points, named areas of interest, decisive terrain and additional critical events and how these may influence positioning or posturing of fire support assets. • Identify high-value targets, high-payoff targets, the fire support portion of event templates, and develop a draft high-payoff target list, target selection standards and attack guidance matrix. • Integrate information operations and cyber electromagnetic activities into these targeting products. • Provide recommendations for the commander's attack guidance. • Actively participate in all phases of war-gaming. 	<ul style="list-style-type: none"> • Refined scheme of fires. • Refined draft Annex D (FIRES) and appendices. • Refined draft fire support execution matrix. • Refined draft target list worksheet (automated or manual) and target overlay. • Refined draft targeting synchronization matrix or modified targeting synchronization matrix (high-payoff target list, target selection standards, attack guidance matrix). • Refined draft FSCMs. • Refined draft named areas of interest and target areas of interest.
<p>ATP – Army techniques publication FSCM – fire support coordination measure S-2 – brigade or battalion intelligence officer BCT – brigade combat team MDMP – military decisionmaking process</p>		

6-173. War gaming helps the fire support planners synchronize the fires warfighting function with other warfighting functions. It helps the BCT staff integrate fire support into the overall operation. During the war game, the FSCoord, fires cell planners, and targeting officers address how each element or related activity contributes to the scheme of fires for that course of action and its associated time lines, critical events, and decision points. They revise the scheme of fires associated with each course of action as needed during war gaming.

TEST THE FEASIBILITY OF THE PLAN

6-174. As the BCT staff, FSCOORD, fires cell planners, and targeting officers develop their courses of action, they apply doctrinal or validated planning factors (such as munitions effects tables) and determine whether time, space and ammunition required for execution will create the commander's desired effects by fires. Validated planning factors are preferred, because they reflect the current training status of the units involved. If this information is not available, fire support planners use mission training plans standards or rely on previous experience. The planners must have the fire support planning factors available to create a plan that can be executed and that can meet the commander's guidance. Such fire support calculations, as initially developed earlier, may need to be refined.

6-175. The results of course of action analysis are a refined scheme of fires and associated products for each course of action. During war gaming, the FSCOORD, fires cell planners, and targeting officers refine fire support requirements, related essential elements of friendly information, and high-payoff targets for each course of action and synchronize these items with their results or effects on the S-3 synchronization matrix. This matrix provides the basis for fires input to Paragraph 3e (Scheme of Fires) of and Annex D (FIRES) of the BCT OPLAN or OPORD.

6-176. At this point in the technique, the FSCOORD, fires cell planners, and targeting officers begin to refine the fire support paragraphs to the OPLAN or OPORD. The fire support planners develop specific tasks for fires to create the desired lethal and nonlethal effects.

6-177. The FSCOORD, fires cell planners, and targeting officers may also elect to produce an Annex D, (FIRES). This annex may be necessary to expand on the information contained in subparagraph 3e (Scheme of Fires) of the OPORD. If the information in subparagraph 3e (Scheme of Fires) is deemed adequate, then a separate fires annex is not published.

GATHER THE TOOLS

6-178. The tools needed for an effective war game are the draft fire support outputs from course of action development. The FSCOORD, fires cell planners, and targeting officers must finish course of action development as completely as possible before starting course of action analysis. The war-game step of the MDMP provides the final detail and refinement, validates capabilities, and helps synchronize the fires warfighting function with the other warfighting functions. The purpose of the war game is to analyze a course of action, not to create one. However, the war game may identify a previously unforeseen circumstance (task, requirement, or problem) that requires course of action change or a new course of action.

6-179. The war gaming process provides an opportunity to the fire support planners to finalize the scheme of fires:

- Finalize targeting decisions.
- Visualize and synchronize fire support with maneuver against enemy courses of action.
- Test the scheme of fires.
- Modify the scheme of fires as necessary.

6-180. The war game brings all the members of the targeting working group together to finalize the decisions of the decide function of targeting. For each course of action the FSCOORD, fires cell planners, and targeting officers collect and make available the fires running estimate, fire support portion of event templates and target value analysis (see ATP 3-60) results. For close air support (see JP 3-09.3), important tools that must be gathered include the:

- Air tasking order and special instructions information.
- Decisionmaking matrices.
- Briefing cards and close air support briefs (for example, 9-line briefings).
- Standard conventional load listings.
- Aircraft and weapons capabilities information.

LIST ALL FRIENDLY FORCES

6-181. The FSCOORD, fires cell planners, and targeting officers consider all fire support assets that can be committed to the operation, paying special attention to command and support relationships and constraints. The friendly fire support asset list should be the same for all courses of action.

LIST ASSUMPTIONS

6-182. The FSCOORD, fires cell planners, and targeting officers validate fire support relevant assumptions. Note for record any changes from this review.

LIST CRITICAL EVENTS AND DECISION POINTS

6-183. The FSCOORD, fires cell planners, and targeting officers determine the fire support contribution to BCT essential tasks identified during mission analysis/course of action development (for example fire support-related named areas of interest and target areas of interest, and fire support tasks). For close air support planners, these include the:

- Line of departure or defend no later than times.
- Close air support triggers (named areas of interest and target areas of interest).
- Airspace coordinating measures and FSCMs.
- Suppression of enemy air defenses and marking-round requirements.

DETERMINE EVALUATION CRITERIA

6-184. Before beginning the war game, BCT staff planners develop evaluation criteria to measure the effectiveness and efficiency of fire support contributions for each course of action. They use these to compare courses of action during course of action comparison. These criteria are listed in the fires running estimate and become the outline for the course of action analysis subparagraphs. The FSCOORD, fires cell planners, and targeting officers develop the criteria for evaluating the effects of fires by using fire support-specific criteria that allow them to explain the fire support-related advantages and disadvantages of each course of action. Fire support evaluation criteria that help discriminate among various courses of action may include:

- Lead time required for implementing fire support tasks.
- How swiftly operational advantage in the information environment is achieved for the course of action to succeed.
- The number of decision points that require fire support.
- The cost of fire support versus the expected benefits.
- The risk to friendly assets posed by enemy fire support.

6-185. For close air support planners these criteria may include:

- Timeliness.
- Accuracy.
- Flexibility.
- Mass.
- Desired effects.
- Weather effects on all fires and unmanned aircraft assets based on current and forecast weather conditions.

SELECT THE WAR-GAMING METHOD

6-186. The BCT S-3 or tactical standard operating procedures determine the war game method. See FM 6-0 for the selection of methods.

SELECT A METHOD TO RECORD AND DISPLAY RESULTS

6-187. The FSCOORD, fires cell planners, and targeting officers use fire support execution matrices for each course of action as scripts for the war game. The fire support unit(s) and related activities are synchronized with each other and with the BCT concepts of operations for the different courses of action. Again, FM 6-0 suggests methods of recording and displaying the results. To the extent possible, the FSCOORD, fires cell planners, and targeting officers also include planned fire support counteraction to anticipated enemy reactions as determined by the S-3 and tactical standard operating procedures. For example, for close air support these could include:

- Events logs.
- Timetables.
- Reaction times.

WAR-GAME THE BATTLE AND ASSESS THE RESULTS

6-188. During preparation for war gaming, the FSCOORD, fires cell planners, and targeting officers give the S-2 likely enemy fire support actions and reactions to friendly fires. They also continue to provide input to the S-2 for high-payoff target development and selection.

6-189. The BCT staff analyzes the course of action by war-gaming, conducting a risk assessment, and comparing the war gaming results. The FSCOORD, fires cell planners, and targeting officers participate in the action-reaction-counteraction process. For example, the electronic attack action may be jamming; the enemy reaction may be changing frequencies; the electronic attack counteraction may be jamming the new frequency.

6-190. The FSCOORD, fires cell planners, and targeting officers use the fire support matrices and work sheets to insert fire support tasks into the war game at the time planned. A complete fire support input work sheet allows them to state the organization performing the task and its location. Fire support personnel remain flexible throughout the process and are prepared to modify input to the war game as it develops. The FSCOORD, fires cell planners, and targeting officers also prepare to modify the fire support task(s) to counter possible enemy actions discovered during the war game. Fire support personnel also note any branches and sequels identified during the war game and develop associated schemes of fires as time permits.

6-191. The FSCOORD, brigade FSO, fires cell planners, and targeting officers and the other BCT staff must work together to analyze the courses of action. During the consideration of factors affecting each course of action, these personnel war-game each course against probable enemy actions to see how the battle will progress.

6-192. The FSCOORD, fires cell planners, and targeting officers visualize the battle in depth to determine how fires can support the BCT concept of operations, provide advice to the commander on the fires assets available and recommend the most effective use of these assets. They and the BCT staff war-game each action up to and including mission accomplishment to determine the risks involved and the probable success of each course of action. Their previous assessment of the courses of action may cause them to recommend against the courses of action that prove to be impractical. The FSCOORD, fires cell planners, and targeting officers:

- Attack emerging targets with the most effective system.
- Determine the tasks and requirements for all fire support resources.
- Consider proper distribution of assets for close support of maneuver elements, for counterfire, for interdiction, and for suppression of enemy air defenses.
- Visualize fire support unit movements required to follow the battle flow.
- Consider fire support sustainment needs and their impact on the battle.
- Consider the use of fire support coordination measures.

6-193. The BCT other staff, FSCOORD, brigade FSO, and targeting working group continuously evaluate the integration of fires into the BCT commander's emerging concept of operations throughout war gaming. They begin to formulate a list of advantages and disadvantages of each course of action from a fires point

of view. This interaction between the BCT commander, FSCoord, and brigade FSO results in influencing the commander's options based upon the availability and allocation of fire support assets. The result of war gaming is a course of action that closely integrates fires with maneuver and other warfighting functions. War gaming a course of action should result in:

- Refinements or modifications to the course of action.
- Refinement of fire support, information operations, and electronic warfare tasks begun during course of action development.
- Identification of subordinate-unit tasks and task organization requirements, including a fire support organization for combat to support each course of action.
- Analysis of fire support events two echelons down.
- Identification of synchronization requirements; these include the establishment or modification of FSCMs or airspace coordinating measures.
- An estimate of battle duration for each critical event as well as for the entire battle.
- Projection of the percentage of total enemy forces defeated in each critical event and overall.
- Identification of the required use of other combat capabilities.
- Identification of fire support risks for each course of action.
- Identification of decision points, named areas of interest, target areas of interest, decisive terrain, and additional critical events.

Note: The FSCoord, fires cell planners, and targeting officers must consider how these may influence fire support asset positioning and posturing and the use of attack helicopters and close air support. Close air support specific considerations include whether close air support created the BCT commander's desired effects and was effectively integrated with the ground scheme of maneuver. Due to (sometimes) different radios between supported and supporting units, communications must be determined to be both reliable and effective.

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- Identification of chemical, biological, radiological, nuclear (CBRN) events.

Note: The FSCoord and brigade FSO must be alert to likely times and areas where enemy weapons of mass destruction may be employed.

-
- Identification of additional requirements for sustainment.

Note: The FSCoord and brigade FSO determine the availability and prioritization of fire support assets based upon the projected fire support plan and anticipated munitions required consistent with the sustainment situation. They record the anticipated results to identify course of action strengths and weaknesses from a fire support perspective.

-
- Identification of requirements for deception and surprise – fire support assets may be used to mislead the enemy through the use of false preparation fires and smoke screens.
 - Identification of mission command requirements.
 - Identification of procedural and positive control requirements.
 - Identification of branches (alternatives) and sequels (subsequent actions).

Note: As the FSCoord, fires cell planners, and targeting officers identify possible enemy reactions for each of their own actions they can identify branches that they can later develop and war-game for inclusion in the OPORD or OPLAN.

-
- Identification of commander's critical information requirements.
 - Identification of strengths and weaknesses.
 - Refinement and synchronization of high-payoff targets initiated during course of action development including determining:

- Which target acquisition and information collection assets should be used to find and track the high-payoff targets?
- When to engage each high-payoff target.
- Which system or attack means to use against each high-payoff target.
- The desired effects from each attack.
- Requirements for assessment; which of the high-payoff targets require assessment.

Note: The FSCOORD, fires cell planners, and targeting officers submit assessment requirements for fire support and appropriate aspects of information operations and cyber electromagnetic activities-related targets to the S-2 for inclusion in the information collection plan.

- Which high-payoff targets require special instructions or require coordination.

COURSE OF ACTION COMPARISON

6-194. During course of action comparison (see table 6-27), the BCT staff compares feasible courses of action to identify the one with the highest probability of success against the most likely enemy course of action and the most dangerous enemy course of action. The FSCOORD, fires cell planners, and targeting officers evaluate the advantages and disadvantages of each course of action and present their findings. The staff outlines each course of action in terms of the evaluation criteria established before war gaming and identifies the advantages and disadvantages of each with respect to the others. The FSCOORD, fires cell planners, and targeting officers record this analysis in paragraph 3 of the fires running estimate.

Table 6-27. BCT fires cell during course of action comparison

MDMP STEP 5: COURSE OF ACTION COMPARISON		
BCT Staff	Key Fires Cell Actions	Fires Cell Output
<ul style="list-style-type: none"> • Conduct advantages and disadvantages analysis. • Compare courses of action. • Conduct a course of action decision briefing. 	<ul style="list-style-type: none"> • Participate with BCT staff in comparing strengths, weaknesses, advantages, and disadvantages of each course of action, emphasizing fire support aspects. • Update fire support and information operations estimates. • Brief results of fire support analysis including best course of action from fire support perspective and adequacy of scheme of fires and supporting assets (for example sustainment and protection). • Develop draft fires paragraphs and annexes to include fire support tasks, fire support execution matrix, target list and overlay, targeting synchronization matrix or modified (high-payoff target list, target selection standards, attack guidance matrix). • Integrate information operations and cyber electromagnetic input into targeting products. • Provide inputs to the information collection plan. • Update fire support running estimate. • Assist FSCOORD in briefing fire support plan for each course of action. 	<ul style="list-style-type: none"> • Final drafts of the: <ul style="list-style-type: none"> ♦ Scheme of fires. ♦ Annex D (FIRES) and appendices. ♦ Fire support execution matrix. ♦ Target list worksheet (automated or manual). ♦ Target overlay. ♦ Observer plan. ♦ Targeting synchronization matrix or modified (high-payoff target list, target selection standards and attack guidance matrix). ♦ FSCMs. ♦ Named areas of interest and target areas of interest.
BCT – brigade combat team		FSCOORD – fire support coordinator
FSCM – fire support coordination measure		MDMP – military decisionmaking process

CONDUCT A COURSE OF ACTION ADVANTAGE AND DISADVANTAGE ANALYSIS

6-195. After the analysis, the S-3, S-2, FSCOORD, fires cell planners, and targeting officers compare strength and weaknesses, highlight advantages and disadvantages from the perspective of the fires warfighting function and other warfighting functions, assess risks, and determine which course of action promises to be most successful.

COMPARE COURSES OF ACTION

6-196. The comparison of the courses of action is critical. The staff may use any technique that facilitates reaching the best recommendation and the BCT commander making the best decision. The most common technique is the decision matrix (see FM 6-0 for a detailed discussion of the decision matrix). One fire support criterion for comparison is the course of action's ability to achieve the commander's attack guidance. The result of this consideration is a recommendation to the commander.

DEVELOP A RECOMMENDED COURSE OF ACTION

6-197. The BCT staff develops a recommended course of action. The FSCoord, brigade FSO, and targeting working group further develop and refine draft fire support products for the recommended course of action including:

- High-payoff target list.
- Target selection standards.
- Attack guidance matrix.
- Fire support tasks including appropriate aspects of information operations and cyber electromagnetic activities.
- Measures of performance and measures of effectiveness for assessment.
- Updated fires running estimate.
- Inputs to the information collection (see the discussion in chapter 4 and FM 3-55) plan.
- Scheme of fires (subparagraph 3e) for the OPLAN or OPORD.
- Annex D, (FIRES), if published, to include the fire support and execution matrices, target list and overlay (as necessary), and targeting synchronization matrix (or modified targeting synchronization matrix).

Note: The targeting working group may prepare a targeting synchronization matrix for each course of action, or may use the high-payoff target list, target selection standards, and attack guidance matrix for the war game and prepare a combined targeting synchronization matrix for only the approved course of action.

COURSE OF ACTION APPROVAL

6-198. The inputs to course of action approval and the following step, orders production, are the outputs of course of action analysis and comparison. After completing the course of action comparison, the BCT staff identifies its preferred course of action (see table 6-28) and recommends it to the BCT commander (in a course of action decision briefing, if time permits). The FSCoord and brigade FSO translate the recommended course of action into a fire support recommendation that is hopefully approved by the BCT commander. The BCT commander approves a course of action (as presented, or with directed modifications). It is a summary of the BCT concept of operations, the scheme of fires, and associated fire support tasks including:

- Priority of fires.
- Allocation of fire support resources.
- Fire support organization for combat.
- Command and support relationships.
- Final high-payoff target list, target selection standards, attack guidance matrix, or if used the targeting synchronization matrix.

Table 6-28. BCT fires cell during course of action approval

MDMP STEP 6: COURSE OF ACTION APPROVAL		
BCT Staff	Key Fires Cell Actions	Fires Cell Output
<ul style="list-style-type: none"> • Recommends a course of action, usually in a decision briefing. • The BCT commander decides which course of action to approve. • The BCT commander issues final planning guidance. • Issues warning order to subordinate headquarters. 	<ul style="list-style-type: none"> • Assess implications and take actions as necessary to finalize selected scheme of fires including attendant high-payoff target list, target selection standards, and attack guidance matrix. • Integrate information operations and cyber electromagnetic activities input into these targeting products. • Assist FSCOORD with participation in course of action approval briefing. • Include scheme of fires and fire support tasks. • Assist FSCOORD in helping BCT commander develop refined commander's intent and planning guidance. • Prepare fire support portions of warning order including changes to commander's critical information requirements, risk guidance, time sensitive reconnaissance tasks and fire support tasks requiring early initiation. • Prepare tentative fire support portions of BCT operation order. • Participate in required back-briefs and rehearsals. 	<ul style="list-style-type: none"> • For the approved course of action: <ul style="list-style-type: none"> ♦ Refined scheme of fires. ♦ Refined Annex D (FIRES) and appendices. ♦ Fire support execution matrix. ♦ Target list worksheet (automated or manual). ♦ Target overlay. ♦ Observer plan. ♦ Targeting synchronization matrix or modified (high-payoff target list, target selection standards and attack guidance matrix). ♦ FSCMs. ♦ Named areas of interest and target areas of interest.
BCT – brigade combat team FSCM – fire support coordination measure		FSCOORD – fire support coordinator MDMP – military decisionmaking process

6-199. During the staff's course of action approval briefing to the BCT commander, the FSCOORD and brigade FSO brief the scheme of fires as a part of each course of action brief. The level of detail for this brief, including the portion briefed by the FSCOORD and brigade FSO, varies depending on the BCT commander's level of participation in the war-game and any specific briefing requirements that the commander has issued. Normally, the FSCOORD and brigade FSO cover the key details of the scheme of fires subparagraph 3e, emphasizing each fire support task and any critical fire support restrictions, limitations, or considerations pertinent to that course of action. The fires cell planners and targeting officers generally provide a sketch, map overlay, or terrain model to help convey details of the fire support plan more clearly. If they perceive the need for additions or changes to the BCT commander's intent or guidance with respect to fire support, the FSCOORD and brigade FSO ask for it.

6-200. Once a course of action is approved, the BCT commander may refine the commander's intent and issue additional planning guidance. The FSCOORD, fires cell planners, and targeting officer prepare the fires portions of the BCT order and participate in the required back-briefs and rehearsals. The warning order issued after course of action approval contains information that executing units require to complete planning and preparation. Possible fires input to this warning order includes:

- Fires contributions to the commander's intent/concept of operations.
- Changes to the commander's critical information requirements.
- Additional or modified risk guidance.
- Time-sensitive reconnaissance tasks.
- Fires tasks requiring early initiation.

ORDERS PRODUCTION, DISSEMINATION AND TRANSITION

6-201. Based on the BCT commander's decision and final guidance, the staff refines the approved course of action and completes and issues the OPLAN or OPORD (see table 6-29 on page 6-56). When the BCT

commander approves a course of action, the targeting products for that course of action become the basis for targeting for the operation. The targeting working group and targeting board meet to finalize the high-payoff target list, target selection standards, attack guidance matrix, measures of performance, measures of effectiveness, targeting synchronization matrix, fire support tasks, appropriate aspects of information operations and cyber electromagnetic activities, and input to the information collection (see the discussion in chapter 4 and FM 3-55) plan. They and the fires cell planners and targeting officers also perform any additional coordination required. After accomplishing these tasks, targeting working group and targeting board members ensure that targeting factors that fall within their functional areas are placed in the appropriate part of the OPLAN or OPORD.

Table 6-29. BCT fires cell during orders production

MDMP STEP 7: ORDERS PRODUCTION		
BCT Staff	Key Fires Cell Actions	Fires Cell Output
<ul style="list-style-type: none"> • Refines approved course action into clear concise concept of operations and required supporting information. • Develops OPORD. • Implements risk controls by coordinating and integrating them into appropriate paragraphs and graphics of the order. • The BCT commander reviews and approves order. • BCT commander briefs subordinate commanders and staffs and conducts confirmation briefings. 	<ul style="list-style-type: none"> • Expand scheme of fires into full fire support plan, reflecting current events, guidance and capabilities. • Confirm specific: <ul style="list-style-type: none"> ♦ Command and support relationships. ♦ Field artillery tactical mission assignments. ♦ High-payoff target list, target selection standards, attack guidance matrix, and execution responsibilities. ♦ Integrate information operations and cyber electromagnetic activities input into these targeting products. ♦ Information collection plan. ♦ Assessment requirements. • Assist subordinate staff/units with planning and coordination. • Present fire support portions of OPLAN or OPORD briefing, including fire support tasks. 	<ul style="list-style-type: none"> • Scheme of fires subparagraph 3e to BCT operations order. • Annex D (FIRES) to BCT OPORD (if published). • Fire support execution matrix. • Fire support tasks. • Fire support back brief. • Manage refinement. • Conduct fire support rehearsal.
BCT – brigade combat team	OPORD – operation order	
MDMP – military decisionmaking process	OPLAN – operation plan	

INPUT TO THE OPERATION PLAN OR OPERATION ORDER

6-202. The FSCOORD, fires cell planners, and targeting officers write paragraphs of the base OPLAN or OPORD that discuss fire support. They ensure the fire support input is placed in the appropriate paragraphs of the base order. If the OPLAN or OPORD requires a fire support annex, the fire support planners prepare it.

6-203. Subparagraph 3e of the OPLAN or OPORD states the scheme of fires and associated fire support tasks, including appropriate aspects of information operations and cyber electromagnetic activities. If Annex D (FIRES) is not used, this subparagraph may contain a subparagraph for each fire support component or related activity and follows the same format as Paragraph 3 of Annex D (FIRES). Paragraph 3e (Scheme of Fires) establishes priority of support and refers to appropriate annexes and fires appendixes as required. This paragraph gives the staff and subordinate commands the information needed to synchronize fires with other warfighting functions.

6-204. Placement of fire support tasks in the OPLAN or OPORD varies according to the importance of the task and the complexity of the operation. Fire support tasks may appear in the body of the order – particularly if they are relatively simple or short, as may be the case of a fragmentary or warning order. For complex plans and orders, only the scheme of fires appears in the body. Fire support tasks may be placed under tasks to subordinate units in the base order or in the fires annex.

6-205. The fires annex usually includes a fire support execution matrix and a fire support assessment matrix as appendixes. The resulting OPORD includes:

- Commander's critical information requirements, priority intelligence requirements and information and intelligence requirements.
- Information collection plan.
- Target acquisition tasking(s).
- High-payoff target list.
- Target selection standards.
- Attack guidance matrix.
- Targeting synchronization matrix.
- Measures of performance and measures of effectiveness for assessment.
- Fire support tasks including appropriate aspects of information operations and electronic warfare.
- Target list worksheet(s) (automated or manual).

6-206. FSCMs (described in FM 3-09) are routinely referenced in the OPLAN or OPORD coordinating instructions. Other fire support related information appears in the coordinating instructions when it:

- Affects two or more units.
- Depends on friendly actions.
- Involves synchronization with other warfighting functions.

6-207. The FSCoord and brigade FSO ensure that the cannon field artillery battalion S-3 conducts a parallel planning process—identifying fire support tasks and preparing the field artillery battalion OPORD or field artillery support plan. Identification and coordination of fire support, field artillery, and combined arms rehearsal requirements should also begin.

FIRE SUPPORT PLANS

6-208. The OPORD paragraph 3e scheme of fires paragraph contains the information necessary to understand how fire support will be used to support an operation. The scheme of fires paragraph should include a subparagraph for each type of fire support involved. Appropriate fire support liaison representatives prepare their respective paragraphs. The fire support planners may combine these subparagraphs into an integrated fire support plan. If the integrated fire support plan includes a target list, it reflects only those targets the commander thinks are critical to the operation. The FSCoord, fires cell planners, and targeting officers must also ensure that the integrated fire support plan gives enough of the BCT commander's guidance to ensure sufficient information is available for field artillery automated data processing systems.

ANNEX TO THE OPERATIONS ORDER

6-209. If the operation requires lengthy or detailed plans or if paragraph 3 becomes unwieldy, a separate fires annex to the OPORD may be prepared. Such an annex amplifies the instructions in the OPORD.

APPENDICES TO THE ANNEX

6-210. Specific plans for each type of fire support (such as air support, field artillery support, and naval surface fire support) are prepared, as needed, to amplify the fire support plan. The fire support plan can include planning products such as an observation matrix, fire support execution matrix, radar deployment order and execution matrix (normally taken from the field artillery battalion OPORD), or target acquisition appendix.

SUMMARY

6-211. When the time comes to write input to the body of the order and the supporting Annex D, (FIRES) (if used) nearly all the detailed coordination, synchronization, and deconfliction work is completed. The fire support planners coordinate the fire support plan or annex with organizations involved with executing tasks and with those organizations that fire support will affect. The FSCoord, fires cell planners, and targeting officers also crosswalk the fire support plan or annex with the OPLANs or OPORDs of higher,

lower, adjacent and supporting units. During planning, both the fire support planners and the executing units have made some preparations for the operation based on warning orders and the results of parallel and collaborative planning.

TRANSITION TO EXECUTION

6-212. When the OPLAN or OPORD is issued, the BCT staff, FSCoord, fire support planners, and targeting officer focus their efforts on preparing for the operation. Their actions include but are not limited to:

- Presenting fire support portions of the OPLAN or OPORD briefing. The fire support orders brief will normally include the scheme of fires; fire support tasks/high-payoff targets/high-payoff target list; availability of fire support sustainment assets, status, allocation and priority; clearance of fires procedures; target selection standards, attack guidance matrix; FSCMs; the cutoff time for target refinement; the rehearsal instructions, and the communications/retransmission requirements.
- Distributing the OPLAN or OPORD.
- Assisting subordinate units and staff with planning and coordination.
- Supervising preparations to include implementation of risk management (see ATP 5-19) controls.
- Implementing fire support plans or adjusting for an evolving situation through the S-3's fragmentary orders.
- Validating and refining targeting products on the basis of more accurate/additional information (high-payoff target list, target selection standards, attack guidance matrix) and passing the latest information to fire support command posts.
- Responding to information requests.
- Continuing to develop targets for division, corps or other higher headquarters, supporting field artillery brigade (FAB) units, and the BCT field artillery battalion; ensuring information is passed to firing units.
- Participating in combined arms, fire support and information collection rehearsals.
- Verifying:
 - Specific command and support relationships.
 - The information collection plan.
 - The fire support plan, and the movement, positioning, and protection of fire support assets.
 - Synchronization/integration of fire support with other warfighting functions.
 - Fire support tasks (including appropriate aspects of information operations or cyber electromagnetic activities-related) and friend/threat locations.
 - FSCMs, rules of engagement, and clearance of fire procedures.
 - High-payoff targets, high-payoff target list, target selection standards, attack guidance matrix, and execution responsibilities.
 - The target acquisition plan (target acquisition assets find/track specific targets) and battle damage assessment requirements.
 - Fragmentary order changes have been passed to division and corps, supporting FAB units and the BCT's field artillery battalion.

SECTION III - TASK-ORGANIZING FIELD ARTILLERY

TASK-ORGANIZING FIELD ARTILLERY FOR BCT OPERATIONS

6-213. *Task-organizing* is the act of designing an operating force, support staff, or sustainment package of specific size and composition to meet a unique task or mission (ADRP 3-0). Characteristics to examine when task-organizing BCT forces include, but are not limited to training, experience, equipment, sustainability, operating environment, enemy threat, and mobility. For Army forces task-organizing

includes allocating available assets to subordinate commanders and establishing their command and support relationships. The objective of field artillery task-organization is to ensure that each field artillery unit has an established command relationship or support relationship.

6-214. Commanders should not place artillery in reserve. When the tactical situation dictates, field artillery units can be given a different command or support relationship. See FM 3-09.

6-215. When planning the integration of fires into an operation, the BCT commanders and staff should use the memory aid AWIFM, which stands for:

- Adequate fire support for the committed units.
- Weight to the main effort.
- ImmEDIATE responsive fires
- Facilitate future operations.
- Maximum feasible centralized control.

6-216. The BCT FSCoord and fires cell planners work with the BCT S-3 and other staff and higher headquarters fires cells in providing advice and recommendations to the BCT commander on task-organizing field artillery assets. The planners also work with the division, corps or other higher headquarters fires cell.

6-217. Battalions of one brigade, however, are frequently placed in support of another brigade. For instance, FAB artillery battalions may reinforce the BCT's cannon field artillery battalion, as the mission requires. The supporting commander determines the forces, tactics, methods, procedures, and communications to be employed in providing this support. The supporting commander advises and coordinates with the supported commander on matters concerning the employment and limitations (for example, sustainment) of such support, assists in planning for the integration of such support into the supported commander's effort as a whole, and ensures that support requirements are appropriately communicated within the supporting commander's organization.

6-218. Subordinate units of the brigades may be assigned the full range of support relationships when placed in direct support of another brigade. Depending on the authority to further assign support relationships, the supported brigade may further assign these supporting forces a supporting relationship to specific brigade units.

NONSTANDARD FIELD ARTILLERY SUPPORT RELATIONSHIPS

6-219. Commanders sometimes use a nonstandard support relationship, in many cases simply a variation of a standard support relationship (direct support [DS], reinforcing [R], general support-reinforcing [GSR], or general support [GS]) (described in ADRP 3-0 and supplemented in FM 3-09) when there are not sufficient field artillery assets to cover all the contingencies, or if a field artillery unit is assigned more than one mission. A nonstandard support relationship is also a means by which the commander can tailor the field artillery assets in anticipation of future operations. A nonstandard field artillery support relationship may involve limitations or guidance concerning ammunition, positioning, or other critical factors. Examples of nonstandard field artillery support relationships include:

- 1-3 FA (155, self-propelled) (M109A6): R 1-31 FA; do not exceed 25 percent of the controlled supply rate in support of 1-31 FA.
- 1-171 FA (155, towed) (M777A2): GS; provide liaison officer to the corps fires cell.

ON-ORDER (O/O) FIELD ARTILLERY SUPPORT RELATIONSHIPS AND COMMAND RELATIONSHIPS

6-220. During the course of a major operation, a field artillery unit may change support or command relationships. The assignment of an on-order field artillery support relationship or command relationship, in addition to its initial mission (or relationship), gives the field artillery unit advance notice of the future mission. This facilitates planning for and transition to a follow-on mission. Positioning, ammunition requirements, and timing of the mission change are several of the key considerations for field artillery units that have an on-order task. An on-order task or command relationship is usually stated in the corps, division

or BCT OPORD or fire support plan and the field artillery battalion OPORD or field artillery support plan. Examples of on-order field artillery support relationships and command relationships might be:

- 1-3 FA (155, self-propelled) (M109A6): R 1-31 FA; do not exceed 75 percent of controlled supply rate in support of 1-31 FA; on-order attached to 7 Field Artillery Brigade.
- 1-171 FA (155, self-propelled) (M109A6): R 1-31 FA during covering force; after completing rearward passage, on-order GS 52d Infantry Division.

ROLE OF THE FIELD ARTILLERY BRIGADE COMMANDER IN TASK-ORGANIZING FIELD ARTILLERY

6-221. When a FAB is designated the force field artillery headquarters for a division without a DIVARTY (as may occur with a National Guard division), the BCT fire support planners also work with the FAB commander and the FAB staff. In unusual circumstances, an aviation brigade or FAB may be in direct support of a BCT.

6-222. The FAB has no direct command or support relationship with field artillery battalions organic to BCTs unless the division commander specifies the FAB as the force field artillery headquarters. The supported maneuver commander specifies the commensurate responsibilities of the force field artillery headquarters and the duration of those responsibilities.

6-223. Battalions of the FAB may also be attached, under the OPCON of, or given a support relationship to another brigade. Since the BCT has organic artillery, a supporting battalion from the FAB is normally given a reinforcing support relationship to the BCT's field artillery battalion.

JOINT AND NATO CONSIDERATION FOR TASK-ORGANIZING FIELD ARTILLERY

6-224. If the BCT is operating as part of a joint or multinational operation, the FSCoord and fires cell planners may encounter several other command relationship terms: combatant command, operational command, tactical control, and support. For example, members of the North Atlantic Treaty Organization (NATO) and the United States (U.S.) Marine Corps follow STANAG 2484 artillery tactical tasks and responsibilities. Detailed information on these command relationship terms can be found in FM 3-09, ADRP 1-02, JP 1-02, and JP 3-0.

6-225. OPLANs and OPORDs state the command and support relationships that place the unit under a commanding headquarters. If possible, show all command and support relationships in the task organization.

MUTUAL SUPPORT CONSIDERATIONS FOR TASK-ORGANIZING FIELD ARTILLERY

6-226. Commanders consider mutual support when task-organizing forces and assigning areas of operation. Mutual support has two aspects—supporting range and supporting distance. *Supporting range* is the distance one unit may be geographically separated from a second unit yet remain within the maximum range of the second unit's weapons systems (ADRP 3-0). Supporting range depends on available weapons systems and is normally the maximum range of the supporting unit's indirect fire weapons. *Supporting distance* is the distance between two units that can be traveled in time for one to come to the aid of the other and prevent its defeat by an enemy or ensure it regains control of a civil situation (ADRP 3-0). Supporting distance is a function of terrain and mobility, distance, enemy capabilities, friendly capabilities, and reaction time. See ADRP 3-0 for further information on supporting range and distance.

6-227. Indirect fire support units such as the BCT's organic cannon field artillery battalion are affected by the information system capabilities between supported and supporting units. Fires units may be within supporting range, but if the unit needing support cannot communicate with the supporting force, the proximity of the supporting force may have no effect on the outcome of an operation. See FM 3-09 for a detailed discussion on task-organizing field artillery units.

Appendix A

Attack Systems Capabilities

The four sections of this appendix are designed to be a quick-reference resource of key lethal and nonlethal fire support capabilities that may be available to the brigade combat team (BCT). Section I begins with field artillery systems. Section II is devoted to mortars. Section III is devoted to mines and obscurants, and Section IV concludes the appendix with a discussion of electronic attack. Where feasible, each section that describes weapon systems includes a systems chart or description, and a munitions chart or description.

DANGER CLOSE AND RISK ESTIMATE DISTANCE

For close air support, field artillery, mortars, and naval gunfire, “danger close” is the term included in the method of engagement segment of a call for fire to indicate that friendly forces are within close proximity of the target. The danger close distance is determined by the weapon and ammunition fired. This is not a restriction, but simply a warning to both the maneuver commander and fire support personnel to take proper precautions.

Risk-estimate distances allow the commander to estimate the risk in terms of the percent of friendly casualties that may result from a strike against an enemy in close proximity to friendly elements. Risk-estimate distances are for combat use only. They are not the minimum safe distances for peacetime training use. For peacetime training requirements, begin with Department of the Army (DA) Pam 385-63.

SECTION I - FIELD ARTILLERY

A-1. Field artillery is the BCT commander’s principal means of providing indirect fire support to the BCT. Field artillery can deceive, defeat, delay, destroy, disrupt, divert, neutralize, and suppress enemy forces by attacking enemy command centers, communications and control nodes, field artillery and mortars, target acquisition and reconnaissance assets, battle positions, lines of communication, and to obscure the enemy’s vision, or otherwise inhibit the ability to acquire friendly targets. Field artillery can be used to provide final protective fire (FPF) and to deliver obscurants and illumination. Fire support personnel and engineers work together to combine the effects of field artillery fires and engineer obstacles to disrupt, turn, block or fix the enemy’s ability to counter friendly actions thereby setting the stage for successful maneuver operations. Field artillery delivery systems include cannons, rockets, and missiles. These systems can provide fires under all weather conditions and in all types of terrain. They can shift and mass fires rapidly without having to displace. Field artillery units are usually as mobile as the units they support.

CANNON FIELD ARTILLERY

A-2. The field artillery has various cannon systems designed to support specific types of maneuver forces (see chapter 1). These systems are complemented by a wide variety of munitions to attack the multitude of target types. See Table A-1 for a guide for cannon attack of typical targets.

Table A-1. Guide for cannon attack of typical targets

TARGET TYPE	OBSERVATION	WEAPON	PROJECTILE	HE FUZE	RESULTS DESIRED	REMARKS
PERSONNEL						
In open or in foxhole without overhead cover	Observed	All	HE	Proximity time	Destruction	Massing is required. ¹ TOT missions are most effective. First volley is most effective.
		All	HE	Proximity time	Neutralization	Massing is required except for small targets.
		All	HE	Quick proximity time	Suppression	Response time is critical against active targets. Preferred fuze is proximity.
		All	DPICM	NA	Destruction	Massing is required on large targets. TOT missions are most effective.
		All	DPICM	NA	Neutralization	Cannon battery volleys are sufficient.
In foxhole with overhead cover.	Observed	All	HE	Quick delay	Neutralization	Massing is required. TOT missions are most effective. Consider use of WP to drive personnel out of foxholes.
		All	HE	Proximity time delay quick	Suppression	Response time is critical against active targets. Proximity fuze is preferred. Consider use of smoke for obscuration.
		All	DPICM	NA	Neutralization	Massing is required. TOT missions are most effective.
		All	DPICM	NA	Suppression	Consider use of ICM on intermittent basis for increased effectiveness.
In dugouts or caves	Observed	All (preferably 155-mm or larger)	HE	Delay quick CP	Neutralization or destruction	Use direct fire or assault fire techniques. Fire HE quick at intervals to clear away camouflage, earth cover, and rubble.
Attacking battery position	Observed	105-mm All	Beehive HE APICM	Time	Destruction	Set fuze to detonate on the ascending branch of the trajectory for close-in defense of battery area.
¹ Targets, regardless of type, with an estimated target radius of greater than 250 meters usually require massing for effective attack.						
VEHICLES²						
Tanks	Observed	All	HE	Proximity Time	Suppression	Fire Projectile HE to force tanks to button up and personnel outside to take cover or disperse. WP may blind vehicle drivers and fires may be started from an incendiary effect on outside fuel tanks. WP or HE fires may obscure adjustment.
	Observed	155-mm	DPICM	NA	Suppression	Massing is effective. DPICM is preferred.

Table A-1. Guide for cannon attack of typical targets (continued)

	Observed	155-mm	FASCAM	NA	NA	Both antitank and antipersonnel projectiles should be used.
	Direct Fire	105-mm	HEP, HEP-T, HEAT	NA	Destruction	
Armored personnel carriers	Observed	All	HE	Proximity Time	Suppression	Force vehicles to button up and personnel outside to take cover or disperse.
	Observed	155-mm	DPICM	NA	Neutralization	Massing is effective.
	Observed	155-mm	FASCAM	NA	NA	See remarks for tanks.
	Direct fire	105-mm	HEP, HEP-T, HEAT	NA	Destruction	
Trucks	Observed	All	HE	Proximity Time	Destruction	ICM is preferred munition.
		155-mm	DPICM	NA	Destruction	
<p>²The first objective of firing on moving vehicles is to stop the movement. For this purpose, a deep bracket is established so that the target will not move out of the initial bracket during adjustment. Speed of adjustment is essential. If possible, the column should be stopped at a point where vehicles cannot change their route and where one stalled vehicle will cause others to stop. Vehicles moving on a road can be attacked by adjusting on a point on the road and then timing the rounds fired so that they arrive at that point when the vehicle is passing it. A firing unit or units, if available, may fire at different points on the road simultaneously.</p>						
WEAPONS						
Antitank missile	Observed	All	HE	Quick	Suppression	Response time is critical. Intermittent fire may be required. Change to fuze proximity or DPICM for materiel damage if antitank guided missile platform on vehicle is raised.
Air defense: Tracked	Observed	All	HE	Proximity Time	Suppression	Smoke may also be used to obscure gunner's line of sight to friendly aircraft. ICM is preferred munition. Consider converged sheaf if weapon is point target and accurately located.
		155-mm	DPICM	NA	Firepower kill	
Wheeled	Observed	All	HE	Quick	Neutralization	Response time is critical. Intermittent fire may be required.
		All	HE	Quick	Firepower kill	Same as above.
Towed FA, mortars, multiple rocket launch	Unobserved when located by radar	All	HE, WP	Proximity Time	Firepower kill	WP is used to ignite materiel. See personnel targets for results desired.
		All	DPICM	NA	Neutralization	See personnel targets section for results desired. TOT missions are most effective. Massing is usually required.
		155-mm	FASCAM	NA	NA	Use ADAM projectile in conjunction with HE or ICM for sustained effects.
Self-propelled FA battery	Unobserved	All	HE, WP	Proximity Time	Suppression	WP is used to ignite materiel.
		All (less 105-mm)	DPICM	NA	Neutralization	ICM is preferred munition.
		155-mm	FASCAM	NA	NA	Use ADAM projectile in conjunction with HE or ICM for sustained effects.

Table A-1. Guide for cannon attack of typical targets (continued)

Surface-to-surface missile	Unobserved	All (less 105-mm)	HE	Proximity Time	Firepower kill	Use converged sheaf if time and target location accuracy permit. TLE in excess of 250 meters requires massing of fires. ICM is preferred munition.
			DPICM	NA	Firepower kill	Same as above.
BRIDGES						
All	Observed	All	HE	Quick CP Delay	Destruction	Direction of fire is preferably with long axis of bridge. Destruction of permanent bridges is best accomplished by knocking out bridge support. Fuze quick is used for wooden or pontoon bridges.
FORTIFICATIONS						
All	Observed	All	HE	CP Delay Quick	Destruction	Use highest practical charge in assault and direct fire.
MISCELLANEOUS						
Radar	Unobserved	All	HE	Quick Time Proximity	Firepower kill	Use converged sheaf if time and target location accuracy permit. TLE in excess of 250 meters requires massing of fires. ICM is preferred munition.
		155-mm	DPICM	NA	Firepower kill	Same as above.
Artillery command and observation posts	Observed	All	HE	Quick Time Proximity	Suppression	Intermittent fire may be required. HE is the preferred munition when response time is critical.
		155-mm	DPICM	NA	Neutralization or destruction	
Command post	Unobserved	All	HE	Proximity Time Quick	Suppression	When target contains personnel and light materiel targets, DPICM is the preferred munition.
		155-mm	DPICM	NA	Neutralization or destruction	See above.
Supply installation	Unobserved	All	HE, WP	Quick	Neutralization or destruction	Large target location errors require massing to ensure target coverage.
Boats	Observed	All	HE	Time Proximity	Suppression	Attack as moving personnel target.
ADAM – area denial artillery munition APICM – antipersonnel improved conventional munitions CP – concrete penetrating DPICM – dual-purpose improved conventional munition FASCAM – family of scatterable mines HE – high explosive HEAT – high explosive antitank HEP – high explosive plastic HEP-T – high explosive plastic-tracer ICM – improved conventional munitions mm – millimeter NA – not applicable TLE – target location error TOT – time on target WP – white phosphorous						

A-3. Cannon field artillery munitions normally associated with lethal effects include area-fire high explosive, antipersonnel improved conventional munitions, dual-purpose improved conventional munitions, scatterable mines, white phosphorus used for incendiary effects and marking, and precision munitions.

A-4. Cannon field artillery munitions normally associated with nonlethal effects include 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 field artillery fires are effective against targets from within direct fire range out to more than 30 kilometers. Army techniques publication (ATP) 3-09.32 summarizes the capabilities of field artillery cannon systems and munitions.

M982-SERIES EXCALIBUR GUIDED PROJECTILE

A-5. The M982-series Excalibur is a family of fire-and-forget global positioning system and internal measurement unit guided projectiles that use a jam-resistant global positioning system receiver and a guidance package that enables the projectile to fly with global positioning system accuracy to preprogrammed aimpoints independent of range. The M982 projectile uses a gliding airframe to achieve extended range. The M982-series employs a non-ballistic flight path that reduces the ability of counterfire radars to accurately locate the firing unit and enhances friendly force survivability.

CANNON DANGER CLOSE AND RISK-ESTIMATE DISTANCES

A-6. The danger close distance for cannon field artillery is 600 meters (see ATP 3-09.32). Danger close is a term that is used to alert ground commanders, fire direction centers, and aircrews of the proximity of the intended weapon impact point to the closest friendly forces. Although it is based upon point of impact methodologies in the case of air-to-surface weapons, danger close distances do not necessarily equate to the actual 1/1000 chance of friendly incapacitation in every situation.

A-7. Forward observers or JTACs will pass the phrase “Danger Close” during a fire mission, method of engagement, or close air support attack brief remarks to alert fire direction centers, ground commanders, and aircrews of the proximity of the closest friendly troops to the intended point of weapon impact. Danger Close is simply a warning of the proximity of friendly forces (and possibility of increased risk). Danger close does not restrict ground force maneuver or fires employment.

Note: Danger close is included with method of engagement when the predicted impact of a round or shell is within 600 meters of friendly troops for mortars or artillery and 750 meters for naval surface fires. The creeping method of adjustment (no adjustment greater than 100 meters) will be used exclusively during danger close missions. Do not confuse the danger close method of engagement with risk estimate distances or minimum safe distances.

Risk Estimate Distances

A-8. Risk estimate distances allow the BCT commander, the fire support coordinator (FSCOORD), brigade FSO, fires cell planners, and targeting officers to estimate risk in terms of the probability of friendly casualties that may result from employing weapons against the enemy in close proximity to friendly personnel. Risk estimate distances are the distance, in meters from the intended point of impact at which a specific degree of vulnerability will not be exceeded.

A-9. Unclassified risk estimate distances for unguided cannon field artillery munitions are published in ATP 3-09.32. Actual classified risk estimate distances are determined by using the classified Joint Munitions Effectiveness Manuals Joint Weaponing System (JMEM JWS).

Note: The JMEM JWS calculates the number of munitions required to engage the target. The Joint Technical Coordinating Group for Munitions Effectiveness publishes JMEM. The JMEM JWS was developed to provide a set of data and methodologies that would permit a standardized comparison of weapon effectiveness across all service communities. The system is target oriented, allowing users to determine the effectiveness of weapon systems against a specified target irrespective of the weapon delivery mode. All Services use the JMEM JWS to estimate the effects of their weapon systems against an extensive list of target types.

MULTIPLE LAUNCH ROCKET SYSTEM

A-10. ATP 3-09.32 summarizes the capabilities of field artillery rocket and missile systems and munitions. The detailed discussion of the capabilities of the field artillery rocket and missile systems is found in ATP 3-09.60.

M30, M31, AND M31A1 GUIDED-MULTIPLE LAUNCH ROCKET SYSTEM ROCKET

A-11. The M30 guided-multiple launch rocket system (MLRS) integrates a global positioning system-aided inertial guidance and control package into a dual purpose improved conventional munitions MLRS rocket. Unlike the traditional free-flight M26-series rockets, whose accuracy degrades as the range to the target increases, the guided-MLRS provides consistent improved accuracy from a 15-kilometer minimum range to a maximum range of 84 kilometers. Improvements in accuracy increase lethal effects, while reducing rocket expenditures and reducing the risk of collateral damage that is normally associated with free-flight munitions. Each M30 guided-MLRS rocket contains 404 product improved M77 submunitions effective against personnel and soft-to-lightly armored targets. The M31 and M31A1 guided-MLRS unitary rockets contain 51.5 pounds of explosive in a preformed fragmentation high explosive warhead. In addition to providing point detonating, delay and proximity fuzing options, a vertical attack trajectory option exists to enable employment in urban environments and in maximizing effectiveness of delay and proximity fuze modes.

M39 ARMY TACTICAL MISSILE SYSTEM BLOCK I AND M39A1 BLOCK IA

A-12. The Army Tactical Missile System (ATACMS) Block I can engage unarmored stationary targets to a range of 165 km; the Block 1a extends the range to 300 km. The M270A1 or M142 high mobility artillery rocket system (HIMARS) launchers can fire the ATACMS Block 1a. One M270-series launcher holds two missiles. The second missile can be shot within 20 seconds of the first and at a different target. The M142 launcher holds and fires a single missile.

M48 Quick Reaction Unitary or M57 Unitary Army Tactical Missile System

A-13. The M48 or M57 ATACMS unitary missile (containing a 500 pound-class blast fragmentation warhead) is a highly responsive, near all weather, long-range jam resistant, global positioning system-aided, inertially guided missile with a 300 kilometer range. ATACMS unitary adds a precision strike capability to attack targets in areas of dense foliage, deep snow cover, and built-up urban and protected areas. While the M48 employs a semi-ballistic trajectory, the M57 uses a vertical attack trajectory that is useful in urban and mountainous environments having intermediate crest or target masking situations.

MULTIPLE LAUNCH ROCKET SYSTEM DANGER CLOSE AND RISK-ESTIMATE DISTANCES

A-14. The danger close distance for MLRS precision munitions is 600 meters (see ATP 3-09.32). MLRS risk estimate distances for precision munitions are published in ATP 3-09.32. Actual classified risk estimate distances are determined by using the classified JMEM JWS in compact disc format.

Note: Risk estimate distances are no longer classified for the guided-MLRS Unitary rocket. As soon as the guided-MLRS Alternative Weapon is characterized, its risk estimate distances along with ATACMS risk estimate distances will be declassified for the field.

CAUTION

Do not fire rockets when friendly forces are located beyond the target along the launcher-target line, as rocket debris will extend beyond the target area.

SECTION II - MORTARS

GENERAL

A-15. Maneuver unit mortars provide close, immediate responsive fire support for committed battalions, companies, and troops. These fires can deceive, delay, destroy, disrupt, divert, neutralize, and suppress

enemy attack formations and defenses, obscure the enemy’s vision, or otherwise inhibit the ability to acquire friendly targets. Mortars also can be used to provide FPFs and to deliver obscurants and illumination.

A-16. The maneuver commander decides how and when mortars—a key fire support asset—are integrated into the unit’s operation. Because mortars are fire support assets, the FSCOORD, fires cell planners, and targeting officers should give advice and make recommendations to the BCT commander on mortar employment. The amount of control the FSCOORD and the fires cell planners have over the employment of available mortars is a matter for the supported or owning unit commander to decide.

A-17. Ammunition-carrying capacity limits periods of mortar firing. The capabilities of mortars and mortar munitions are summarized in ATP 3-09.32 See ATP 3-09.30, ATTP 3-21.90, and FM 3-09 for additional information on mortars and their capabilities. Table A-2 identifies the lethal areas of mortar high explosive rounds.

Table A-2. Lethal areas in square meters of mortar high explosive rounds

Weapon	Target	Impact Fuze	Proximity Fuze
60-mm mortar HE (M720) (1 round)	Standing enemy, open terrain	250	600
	Prone enemy, open terrain	100	200
	Crouching enemy, open terrain	1	25 ¹
60-mm mortar HE (M270) (2 mortars, 1 round each)	Standing enemy, open terrain	450	1000 ²
	Prone enemy, open terrain	200	350
	Crouching enemy, open terrain	5	30 ¹
81-mm mortar HE (M374) (1 round)	Standing enemy, open terrain	700	900
	Prone enemy, open terrain	300	600 ¹
	Crouching enemy, open terrain	5	30
81-mm mortar HE (M374) (3 mortars, 1 round each)	Standing enemy, open terrain	1800	2400
	Prone enemy, open terrain	1000	1500 ¹
	Crouching enemy, open terrain	10	85
¹ Against personnel in open positions, use the lowest angle of fall possible. It gives twice the coverage of the steepest angle of fall. ² The M49A1 HE round standard B ammunition for the M224 mortar is only 25 percent as effective as the newer M720 round. mm – millimeter			

MORTAR DANGER CLOSE AND RISK-ESTIMATE DISTANCES

A-18. The danger close distance for unguided mortar munitions is 600 meters (see ATP 3-09.32). Unclassified risk estimate distances for unguided munitions are in published in ATP 3-09.32. Actual classified risk estimate distances are determined by using the classified JMEM JWS.

SECTION III– MINES AND OBSCURANTS

FIELD ARTILLERY SCATTERABLE MINES

EMPLOYMENT CONSIDERATIONS

A-19. The BCT engineer coordinator provides the expertise for employing all types of scatterable mines. The FSCOORD, fires cell planners, and targeting officers provide technical expertise to the engineer coordinator concerning the employment of field artillery-delivered scatterable mines. The Air Force air liaison officer advises the engineer coordinator concerning scatterable mines delivered by the Air Force. As part of the estimate process, the FSCOORD, brigade FSO, and fire cell planners and targeting officers advise the BCT commander of anticipated field artillery-delivered scatterable mine densities and safety zones. The estimated densities and safety zones could affect the use or positioning of field artillery-delivered scatterable mines. The engineer coordinator must seek an alternative scatterable mine delivery means if field artillery-delivered scatterable mines do not meet the commander's density requirement or cannot be used because of range, positioning, or safety limitations. There are two types of cannon field artillery-delivered scatterable mines: an area denial antipersonnel mine, and the remote antiarmor munition system for use against lightly armored vehicles. Both are available only in 155-mm. Scatterable mines have two preset self-destruct times: short duration (4 hours); and long duration (48 hours).

A-20. A theater army, corps, or division commander generally has the authority to employ scatterable mines. The commander may delegate authority for specific operations or limited periods of time.

A-21. Field artillery-delivered scatterable mines enable the BCT or other maneuver commander to emplace a minefield quickly, which makes them best suited as situational obstacles. Like any obstacle, scatterable mines are best used at a choke point covered by effective observed indirect fire and direct fire. The principles of obstacle integration (see ATP 3-90.8) apply even more strongly to scatterable mines because the mines are surface-laid and visible. An undisturbed enemy in column can quickly work through this type of field.

Note: The United States is aligning its antipersonnel landmines policy outside the Korean Peninsula with the key requirements of the Ottawa Convention, the international treaty prohibiting the use, stockpiling, production, and transfer of antipersonnel landmines, which more than 160 countries have joined, including all of our NATO allies. This means that the United States will not employ antipersonnel landmine projectiles outside the Korean Peninsula.

CAPABILITIES

A-22. In the defense, artillery-delivered scatterable mines are used to:

- Develop targets for long-range antitank weapons.
- Close gaps and lanes in other obstacles.
- Delay or disrupt attacking forces.
- Deny enemy unrestricted use of selected areas.
- Disrupt movement and commitment of second-echelon forces.
- Disrupt and harass enemy command and control, sustainment (excluding medical), or staging areas.
- Reinforce existing obstacles.
- Disrupt or delay river crossings.

A-23. In the offense, artillery-delivered scatterable mines are used to:

- Supplement flank reconnaissance and security forces in protecting flanks along avenues of approach.
- Suppress and disrupt enemy security elements.

- Hinder withdrawal of enemy forces.
- Hinder the ability of the enemy to reinforce the objective area.

A-24. Scatterable mines may be all remote antiarmor munition systems, all area denial antipersonnel mines, or a combination of both. If remote antiarmor munition systems and area denial antipersonnel mines are employed on the same target, area denial antipersonnel mines are fired as the last volley.

EMPLOYMENT OPTIONS FOR AREA DENIAL ANTIPERSONNEL MINES

A-25. Area denial antipersonnel mines may be used without remote antiarmor munition systems. There are five basic tasks (described following) for area denial antipersonnel mines (besides augmenting remote antiarmor munition systems on a field artillery-delivered minefield).

Reinforce Antitank Obstacles

A-26. Area denial antipersonnel mines can be used to augment anti-vehicle obstacles by inhibiting dismounted clearing parties. Having area denial antipersonnel mines available for this task allows engineer units to concentrate their efforts on anti-vehicle obstacles such as antitank minefields, abatis, and road craters.

Reinforce Antipersonnel Obstacles

A-27. Area denial antipersonnel mines can be used to augment barbed wire or concertina wire obstacles against personnel. This type of mine can significantly slow enemy attempts to clear the obstacles.

Interdict Unarmored Vehicles

A-28. Area denial antipersonnel mines can be used for interdiction or area denial against a variety of soft targets. These include resupply vehicles; towed field artillery and mortars; and truck-mounted headquarters, communications, and electronic attack assets.

Augment Conventional Fires on Unarmored Targets

A-29. Area denial antipersonnel mines can increase the effectiveness of fires against the same sort of targets it can interdict. These targets can be engaged with high explosives or improved conventional munitions, followed by area denial antipersonnel mines, to limit the enemy's ability to reconstitute or reorganize and displace.

Provide Counterfire or Suppression of Enemy Air Defenses or Field Artillery

A-30. Remote antiarmor munition systems could be delivered after high explosive or dual-purpose improved conventional munitions volleys on enemy air defenses or indirect fire units. This use would prolong the effectiveness of the field artillery attack by disrupting and neutralizing or suppressing the target after firing has ceased. If the enemy indirect fire units are self-propelled, remote antiarmor munition systems could be used in conjunction with area denial antipersonnel mines.

A-31. Scatterable mines may be delivered in conjunction with other munitions. In that way, the mines' use amplifies the effects of other munitions. For example, area denial antipersonnel mines may be fired into a logistical site after dual-purpose improved conventional munitions are fired. If fired in conjunction with other munitions, fire the scatterable mines in the last volley(s).

BASIC USES OF SCATTERABLE MINES

A-32. There are four basic uses of field artillery-delivered scatterable mines:

- Interdiction or area denial.
- Employment as an obstacle.
- Employment to augment an obstacle.
- Employment against targets of opportunity.

Interdiction or Area Denial

A-33. If employed in isolation, field artillery-delivered scatterable mines tend to be of limited use when used for interdiction or area denial. The size and density of field artillery-delivered minefields depend on ammunition availability, trajectory, number of aim points, and the time available to emplace them. Depending upon the mission variables of mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC), commanders may elect not to tie up their supporting artillery for the time required to emplace large high density minefields. Consequently, in order for artillery-delivered scatterable mines to be effectively used for interdiction, planners must mitigate these factors and place right-sized (based on the desired obstacle effect), precisely planned minefields that take advantage of existing natural obstacles (for example restrictive terrain that creates natural choke points) so that the mines are not easily bypassed. Artillery-delivered scatterable minefields may, in fact, be hard to breach when properly tied in with terrain, covered by fire, and employed where they are hard to detect.

A-34. If field artillery-delivered remote antiarmor munition systems and area denial antipersonnel mines are used for interdiction or area denial, three employment guidelines apply. Employ the mines:

- At choke points to keep the enemy from easily bypassing the minefield.
- In high-density fields to prevent breaching.
- When and where mines are hard to detect; for example, in limited visibility (at night or in fog) or where the enemy vehicles will be buttoned up (for instance, in a chemically contaminated area).

A-35. Field artillery-delivered mines are poorly suited for interdicting roads for three reasons:

- The mines tend to break up or malfunction when they land on a hard surface road.
- The mines are easy to see against the uniform background of a road.
- Units on roads and already moving in columns are the best formations for breaching scatterable minefields.

A-36. In summary, field artillery-delivered minefields can be used for interdiction and area denial, but a greater amount of ammunition must be delivered at a carefully chosen place and time. In general, remote antiarmor munition systems and remote antiarmor munition systems are most effectively employed when covered by direct fire. Where direct fires may not be practical, observed indirect fires or accurately placed massed indirect fires can yield equitable effectiveness.

Employment as an Obstacle

A-37. Considerations for employing artillery-delivered scatterable mines include:

- Employ minefields where they can be tied into existing restrictive terrain or to reinforce other tactical obstacles.
- Cover minefields with effective direct fire and observed indirect fire using high explosive-variable time munitions or dual-purpose improved conventional munitions.
- Keep minefields under continuous observation. Use night observation devices or employ illumination on targets at night.
- Design minefields (width, depth, density, and composition) based on the desired effect, intended target, and consideration of the terrain.
- Plan direct and observed indirect fires to defeat enemy breaching assets templated within maneuver formations or at probable breaching locations.

A-38. Scatterable mines in general present a unique planning challenge for fire support personnel because the mines are scattered on the surface of the terrain and are easily visible. This leads to two special considerations: reducing the enemy's ability to see and minimizing indirect fires on top of scatterable mines.

Reduce the Enemy's Ability to See

A-39. Use direct fire to make the enemy close their vehicle hatches. Obscure the minefield with smoke.

Minimize Indirect fires on Top of the Scatterable Mines

A-40. Whether or not to minimize indirect fires on top of scatterable mines is a judgment call. Firing on the minefield destroys breaching parties, but it also makes the minefield easier to breach by possibly destroying the exposed mines.

A-41. One compromise is to concentrate indirect fires on targets immediately beyond the minefield, and direct fire on targets in the minefield. If a mine plow or other mine-clearing vehicle enters the minefield and clears a lane, following vehicles have to bunch up to enter the lane and may present a good target.

A-42. If the enemy clears a lane and is on the verge of breaching the minefield, consider firing a heavy concentration of smoke or dual-purpose improved conventional munitions directly on top of the minefield. The smoke should obscure the remaining mines as well as the clear lane markers that the vehicles are trying to follow. Use of smoke has to be carefully coordinated, as it will inhibit friendly direct fire weapons. However, a fire mission of this type should be on-call in case the enemy places smoke between the friendly maneuver force and the minefield to screen the breaching efforts. If the enemy uses smoke first, it is to friendly force advantage to provide fires for smoke on the minefield or dual-purpose improved conventional munitions to disrupt the enemy's crossing efforts.

A-43. Field artillery-delivered scatterable mines introduce another planning problem – timing. Firing mines too early gives the enemy time to avoid them, limits friendly freedom to maneuver, and can result in the mines self-destructing too early. Firing mines too late can result in their landing behind attacking enemy forces and being of little value.

A-44. For these reasons, the trigger point for firing remote antiarmor munition systems or area denial antipersonnel mines must be very carefully coordinated between the BCT S-2, S-3, engineer coordinator, FSCoord, fires cell planners, and targeting officers. The trigger point for firing field artillery-delivered mines must meet the following criteria:

- The enemy, upon reaching the trigger point, must be committed to the avenue of approach on which the mines will be delivered.
- The trigger point must be far enough forward of the proposed minefield that the minefield can be emplaced before the enemy reaches it.

A-45. The trigger point should be a target area of interest in the BCT S-2's intelligence preparation of the battlefield (see ATPs 2-01.3 and 2-19.4). A *target area of interest* is the geographical area where high-value targets can be acquired and engaged by friendly forces (JP 2-01.3).

A-46. The target area of interest should be under surveillance at all times. The element observing the target area of interest should have the authority to fire the minefield or have a direct communications link to whoever is going to call for the mines.

A-47. The target areas of interest must be far enough beyond the minefield that the minefield will be in place in time in a worst-case scenario. The FSCoord, fires cell planners, and targeting officers should allow for the time it takes to send the call for fire, process the call for fire, execute the mission, and arm the mines.

Employment to Augment an Obstacle

A-48. Field artillery-delivered scatterable mines are optional weapons for closing lanes in existing obstacles or reseeding a breached minefield. Remote antiarmor munition systems and area denial antipersonnel mines used to close a lane(s) in an obstacle should be planned with the same considerations as remote antiarmor munition systems or area denial antipersonnel mines planned as an obstacle. Another consideration in using remote antiarmor munition systems and area denial antipersonnel mines to close a lane is how wide the field artillery minefield should be. A rule of thumb is to use the width of the lane plus the expected delivery error when the mines are fired. Planning considerations to minimize the amount of ammunition used include:

- Get the best possible grid to the center of the lane – use survey if possible; intersection or resection, if necessary.
- If possible, depending on mission variables of METT-TC, adjust the mission in advance onto the center point of the lane and record the adjusted location as a target.

A-49. Planning for using field artillery-delivered mines to close breached obstacles should involve the S-2, S-3, engineer coordinator, FSCOORD, fires cell planners, and targeting officers. This group should identify the most likely points at which the enemy will try to breach the obstacle and how wide the breach will probably be. As with using mines to close a lane, these points should be identified by the most accurate grid attainable, fired in, and recorded as targets. Even if the enemy does not breach at these exact locations, the targets should provide accurate points from which to shift in firing mines.

A-50. The FSCOORD, fires cell planners, and targeting officers must identify which observer is to fire remote antiarmor munition systems or area denial antipersonnel mines to close a breach and under what conditions the obstacle is considered breached. They should also identify an alternate observer to fire the minefield in case smoke screens, communications problems, or enemy fire prevents the primary observer from reseeding the obstacle at the proper time. This will probably require a voice call-for-fire over a command network. For more on minefields and employing minefields as obstacles or to augment obstacles see FM 3-34, FM 3-34.210, ATP 3-90.8, and ATTP 3-90.4.

Employment Against Targets of Opportunity

A-51. Minefields against targets of opportunity (unplanned) must be emplaced immediately because of the fleeting nature of the targets. Minefields may be requested through fire support channels at any level. Once the BCT commander has approved the use of field artillery-delivered scatterable mines, the minefields can be emplaced according to the commander's guidance.

A-52. Normally, these minefields are used against targets that can be observed or that are specifically identified by target acquisition sources, such as radar, sensors, and other acquisition devices. Their processing is similar to that of field artillery target-of-opportunity missions. Fire for effect or observer adjustment is used against either moving or stationary targets. Key considerations for employment of scatterable mines against targets of opportunity include the required density and duration of the minefield, target location, and the fire mission request.

Density and Duration of the Minefield

A-53. Unplanned minefields are standard in density and duration. The given standards depend on the tactical situation and the commander's guidance.

Target Location

A-54. There are differing aimpoint locations for stationary targets and moving targets:

- Stationary target. Place the aimpoint directly over the target center. Locate aimpoints at least to an accuracy of 100 meters (adjust fire) and 10 meters (fire for effect).
- Moving target. Place the aimpoint for a moving target directly in front of the enemy axis of advance – 1,000 meters in front of the enemy target for every 10 kilometers per hour of speed. This allows enough time for mine delivery and arming before enemy encounter.

Minefield Fire Mission Request

A-55. Transmit and process the minefield fire mission request as other requests for target-of-opportunity fire missions. The standard ammunition for adjustment is dual-purpose improved conventional munitions unless the observer requests a different round. Fire the unit's standard minefield in effect unless otherwise directed. The requestor must specify the following:

- Identification (call sign).
- Warning order (include remote antiarmor munition systems, area denial antipersonnel mines, or both).
- Target location (aimpoint).

- Target description.
- Method of engagement.
- Method of fire and control.

A-56. The BCT field artillery battalion or any field artillery battalion receiving the call for fire designates the firing unit(s). On completion of the minefield emplacement, forward the fired data to the corps, division, BCT, maneuver battalion, cavalry squadron or other subordinate or supporting unit fires cell. When AFATDS is not available, record the fired data in Section D of Department of the Army (DA) Form 5032 (*Field Artillery Delivered Minefield Planning Sheet*). The FSCOORD, fires cell planners, and targeting officers compute the safety zone according to the fired data and pass it to the engineer coordinator for dissemination to higher, lower, and adjacent units as appropriate.

FIRING IN ARTILLERY-DELIVERED MINES

A-57. One of the key considerations in emplacing a minefield with indirect fire is to get a precise target location, The three basic ways of doing this, from most desirable to least desirable, are:

- Use target area survey.
- Fire the center grid in with dual-purpose improved conventional munitions in the self-registering (ground burst) mode and have the BCT's cannon field artillery battalion or supporting field artillery brigade (FAB) field artillery battalion fire direction center replot to get the adjusted grid.
- Carefully map-spot the grid through intersection, resection, or terrain association.

A-58. No matter which method is used, the center grid of the proposed minefield should be recorded as a target. This provides a center for fires to emplace remote antiarmor munition systems or area denial antipersonnel mines, a target for smoke or improved conventional munitions to attack breaching forces, and a known point from which to shift in calling fires onto units just beyond or in front of the minefield. The use of field artillery target numbers for scatterable mines planning by the engineer coordinator facilitates coordination.

A-59. In choosing minefield length, width, attitude, and density, the first and most obvious considerations are the tactical requirements for the scatterable mine mission and ammunition availability. These factors, combined with firing unit availability and positioning, time requirements, counterfire risk exposure, and technical considerations such as range and angle of fire, provide an estimate of how many meters of minefield width are available for various densities.

A-60. Create field artillery-delivered minefields by firing on a number of aimpoints. Use AFATDS to divide the target into aimpoints at the battalion fire direction center (for a mass mission) or the battery fire direction center. See the electronic manual EM 0141 for additional information. The AFATDS software provides the operator guidance on how to plan minefields and other fire support by selecting the AFATDS desktop icon "AFATDS opDoc" and following those instructions.

A-61. Field artillery scatterable mine employment is based on a concept known as planning modules. The planning module for remote antiarmor munition systems low angle is 200x200 meters. The planning module for remote antiarmor munition systems high-angle and for area denial antipersonnel mines low- or high-angle is 400x400 meters. This does not mean that the minefield planner cannot request a minefield that is larger than the planning module. In any scatterable mines minefield, the requesting agency defines the minefield size in terms of the length, width, and attitude. The length of the minefield is always the longest axis. The attitude is based on the long axis for a rectangular minefield (side-to-side for a square minefield, although attitude is not usually critical for square minefields). The concept of the planning modules is based on the minefield width. In other words, the width of all minefields must be in multiples of the previously defined planning module. The supporting fire direction center uses the length, width, and attitude provided by the requestor with the planning module factors to determine the technical data required to establish the required minefield and to estimate ammunition and firing unit requirements.

A-62. For most immediate, target of opportunity minefields, unit standard operating procedures should establish a standard size minefield, generally a square such as 400x400 meters. Planned targets may frequently be rectangular, with the long axis positioned to ensure maximum effective coverage based on the

situation and purpose of the minefield. Lane-closing mines should be delivered in a sufficient length and width to cover the lane. Field artillery-emplaced minefields used for interdiction or area denial, or as an obstacle, should be large enough to fill the choke point and tie into natural or manmade obstacles at either end. Minefields should also have enough depth, length, or width (depending on the orientation to the enemy) to present a formidable obstacle that cannot be easily breached.

A-63. For all field artillery-delivered minefields, the fire support planners need to consider delivery errors in determining the size of a minefield. If the aimpoint grid has been determined by survey or by replot procedures after being fired in, the delivery error will probably be small. If the aimpoint location is map-spotted, or the firing unit's survey or meteorological data are suspect, delivery error may be larger. In the latter situation, the planner may want to increase the size of the requested minefield to ensure coverage. Minefield density depends on the intended effect. If a minefield is covered with direct and observed indirect fire (for example, if the enemy is buttoned up and maneuvering), a low-density minefield provides an effective obstacle. If the mines are available, a medium-density field is desirable but not absolutely necessary. Medium-and high-density fields are particularly useful for defending forces that are heavily outnumbered or that need time to move to alternate firing positions or to withdraw to a subsequent battle position. Instructions for completing the firing unit portion of the DA Form 5032 (*Field Artillery Minefield Planning Sheet*) are in TC 3-09.81. An example of the completed front side of the DA Form 5032 (*Field Artillery Minefield Planning Sheet*) is at figure A-1.

FIELD ARTILLERY DELIVERED MINEFIELD PLANNING SHEET		
For use of this form, see ATP 3-09.42. The proponent agency is TRADOC.		
SECTION A-MINEFIELD DATA		
1 TARGET NUMBER AC7021	2 PRIORITY High	3 REQUESTER CDR, 1BCT
4 MINEFIELD END POINTS (COORDINATES) FROM 243 307 TO: 247307		
5 MINEFIELD DEPTH 400 meters	6 MINEFIELD WIDTH 400 meters	
7 ADAM (APERS) DENSITY Low	8 RAAMS (AT) DENSITY Low	
9 SELF-DESTRUCT TIME SHORT <input checked="" type="checkbox"/> LONG <input type="checkbox"/>	10 SCHEDULED MINEFIELD N/A HRS ± MIN ON-CALL <input checked="" type="checkbox"/>	
11 CAUTION NLT EMPLACEMENT TIME N/A	12 APPROVAL AUTHORITY CDR, 2AD	13 DATE-TIME GROUP (DTG) 221320JAN15
14 REMARKS		
SECTION B-G-3/S-3/ENGR		
15 DTG RECEIVED 230638JAN15	16 DTG SAFETY ZONE DETERMINED 230638JAN15	
17 REMARKS		
SECTION C-FC/FSO		
18 DTG TO UNIT 221345JAN15	19 DTG FROM UNIT 230634JAN15	20 DTG TO G3/S3/ENGR 230643JAN15
21 REMARKS G-3 - CPT Edwards notified 230641 S-3 - SSG Jones notified 230641 ENGR - CPT Roberts notified 230641		
SECTION D-FDC DATA		
22 TARGET NUMBER AC7821	23 FIRING UNIT A/6-14FA	24 RANGE TO MINEFIELD CENTER 5830 meters
25 TRAJECTORY ADAM <input checked="" type="checkbox"/> HIGH <input type="checkbox"/> LOW RAAMS <input checked="" type="checkbox"/> HIGH <input type="checkbox"/> LOW		26 DELIVERY TECHNIQUE MET+ VE/TRANSFER <input checked="" type="checkbox"/> OBSERVER ADJUST <input type="checkbox"/>
27 AIMPOINT COORDINATE(S) (LEFT AND RIGHT OR SINGLE) ADAM FROM 243 307 TO 247 307 RAAMS FROM 243 307 TO 247 307		
28 DTG MISSION COMPLETED 230632JAN15		
29 REMARKS		

DA FORM 5032, DEC 2015 AFD LC v1.00

AD – armored division	ADAM – area denial artillery munition	BCT – brigade combat team
CDR – commander	CPT – Captain	DTG – date-time group
ENGR – engineer	FA – field artillery	FC – fires cell
FSO – fire support officer	G-3 – assistant chief of staff, operations	MET – meteorological
N/A – not applicable	RAAMS – remote antiarmor mine system	
S-3 – brigade or battalion operations officer	SSG – Staff Sergeant	VE – velocity error

Figure A-1. DA Form 5032 Field Artillery Delivered Minefield Planning Sheet Front (example)

Safety Zone Determination

A-64. The FSCoord, fires cell planners, and targeting officers are responsible for obtaining safety zones. Safety zones may be computed by the BCT cannon field artillery battalion or other supporting field artillery

battalion fire direction center or by the brigade FSO and fires cell planners and targeting officers by using the safety zone table (see Table A-3). An example of this process is shown in Figure A-2. An alternative method is to use the mine safety template in Figure A-3 on page A-18. See TC 3-09.81 for instruction. The engineer coordinator is responsible for disseminating the safety zones to appropriate units.

Table A-3. Minefield safety zone

Projectile and Trajectory	Range (in kilometers)	Meteorological Data + Velocity Error/Transfer Technique	Observer Adjust Technique
Remote antiarmor munitions systems Low-Angle	4	500 X 500	500 X 500
	7	550 X 550	500 X 500
	10	700 X 700	550 X 550
	12	850 X 850	550 X 550
	14	1000 X 1000	650 X 650
	16	1050 X 1050	650 X 650
	17.5	1200 X 1200	650 X 650
Area denial antipersonnel mines Low-Angle	4	700 X 700	700 X 700
	7	750 X 750	700 X 700
	10	900 X 900	750 X 750
	12	1050 X 1050	750 X 750
	14	1200 X 1200	850 X 850
	16	1250 X 1250	850 X 850
	17.5	1400 X 1400	850 X 850
Remote antiarmor munitions systems or area denial antipersonnel mines High-Angle	4	750 X 750	700 X 700
	7	900 X 900	700 X 700
	10	1050 X 1050	750 X 750
	12	1200 X 1200	750 X 750
	14	1400 X 1400	850 X 850
	16	1500 X 1500	850 X 850
	17.5	1400 X 1400	850 X 850

Using the Safety Zone Table.

A-65. Use the following fired minefield data:

- Type of projectile fired (area denial antipersonnel mines or remote antiarmor munition systems).
- Trajectory (high or low angle).
- Range (to minefield center).
- Technique (meteorological data + velocity error/transfer or observer adjust).
- Aimpoint coordinate(s) (single or left and right).

A-66. Enter the table at the nearest range for the projectile type and trajectory. Use the correct employment technique column to determine the size of the safety zone. Draw the determined safety zone centered over each aimpoint to establish the minefield safety zone

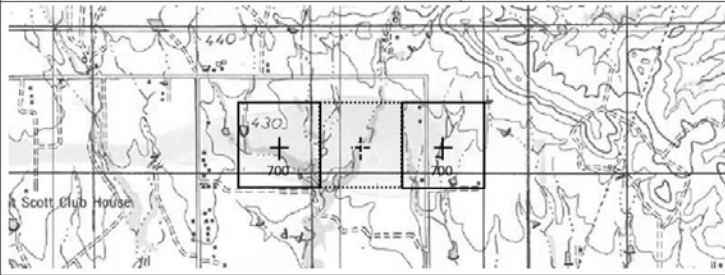
Fired Data		Action
Projectile:	RAAMS	Enter the table at 10 kilometers (closest) for RAAMS, low-angle, and Met+VE. The safety zone for each aimpoint is 700 x 700 meters. Draw the 700 x 700 meter safety zone over the left and right aimpoint. To determine the safety zone for the minefield, draw line connecting the two squares.
Trajectory:	Low-angle	
Range:	9 kilometers	
Technique:	Met+VE	
Aimpoints:	Three (left and right aimpoints given)	
		
<p>Met – meteorology VE – velocity error RAAMS – remote antiarmor mine system</p>		

Figure A-2. Minefield safety zone determination (example)

Using the Mine Safety Template.

Note: the minefield template cannot be copied directly and converted to a training aid due to distortions introduced during the copy process. The template serves as a guide for the training support facility preparing the template. Dimensions of the minefields must be checked against known minefield size prior to the template's use.

A-67. Enter the template (figure A-3 on page A-18) with the following fired minefield data:

- Technique (meteorological data + velocity error/transfer or observer adjust).
- Trajectory (high or low angle).
- Type projectile fired (remote antiarmor munition systems or area denial antipersonnel mines).
- Range (to minefield center).
- Aimpoint coordinates (center or left and right).

A-68. Center the selected template safety zone square over the aimpoint(s). Draw a square to establish the minefield safety zone. See the example completed DA Form 5032 (*Field Artillery Minefield Planning Sheet*) reverse side at figure A-4 on page A-19.

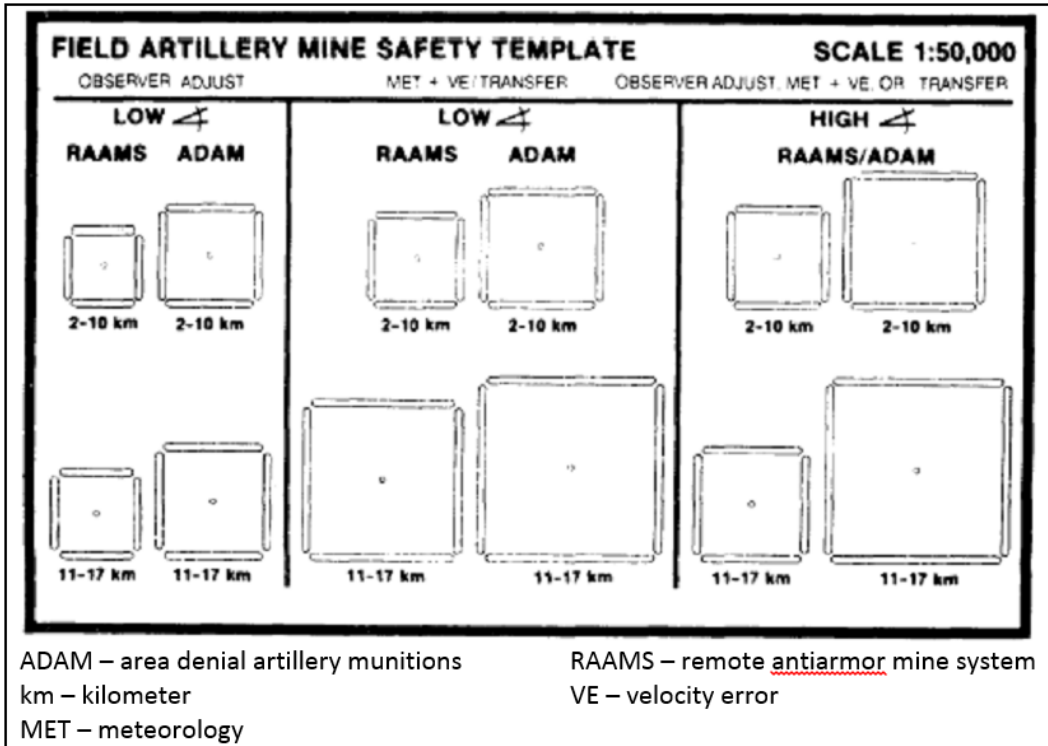


Figure A-3. Field artillery mine safety template (example)

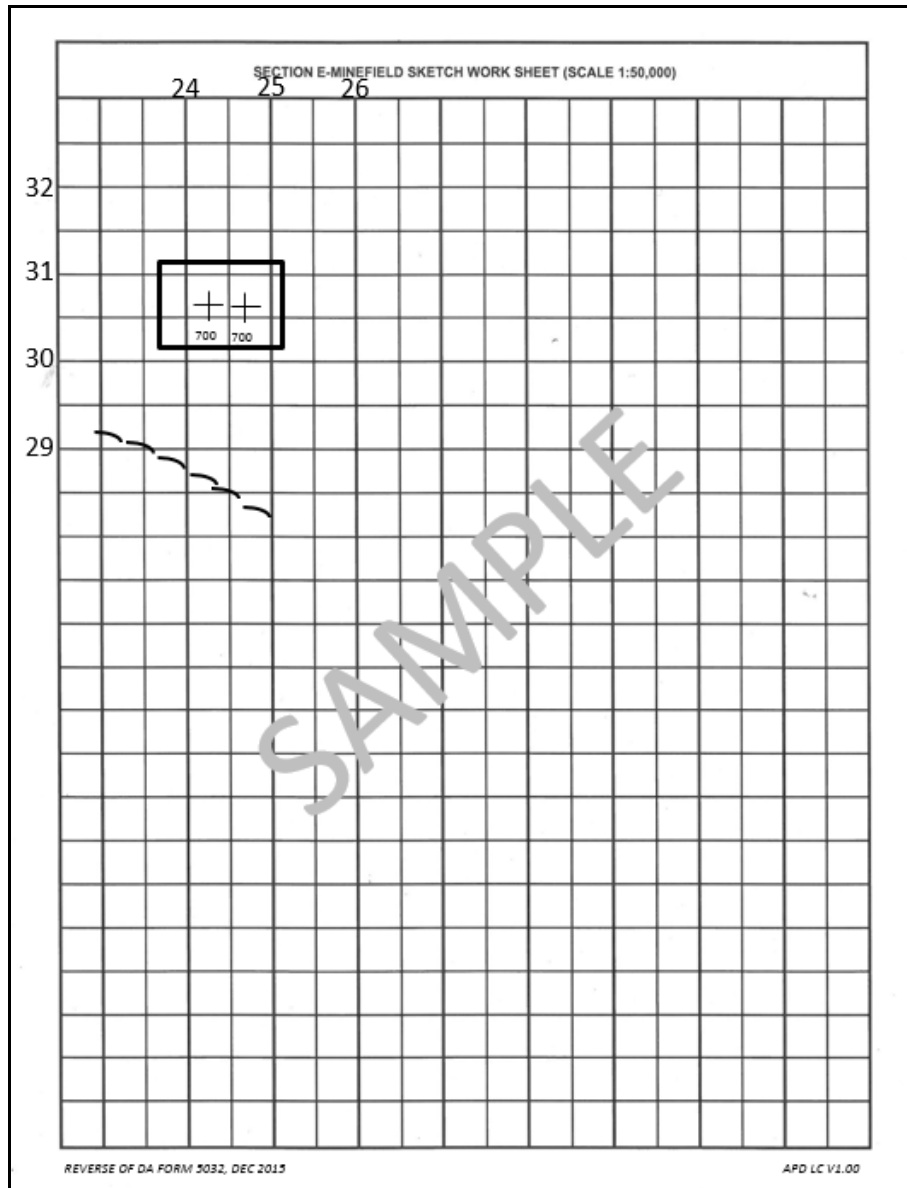


Figure A-4. DA Form 5032 Field Artillery Delivered Minefield Planning Sheet reverse side (example)

Scatterable Minefield Report

A-69. The scatterable mine delivery unit is responsible for initiating the scatterable minefield report, first by radio and later by hard copy. Submit this report through the BCT main command post fires cell to the engineer coordinator. Additional scatterable mine employment and report information can be found in ATP 3-09.30 and TC 3-09.81. Instructions for completing the scatterable minefield report are found in table A-4 on page A-20. An example minefield report is illustrated in table A-5 on page A-21.

Table A-4. Scatterable minefield report instructions

Line	Information Required	Instructions
1	Approving authority	Enter the approving authority; for example, CDR 51ID
2	Target or obstacle	If the minefield is part of an obstacle plan, enter the obstacle number (such as 51XX0157 , which represents 51ID, target number 157). If the minefield is not a part of an obstacle plan or does not have a number, then leave this line blank or enter NA .
3	Type emplacing system	Enter the type of system that emplaced the minefield; for example, Volcano, artillery, or rotary wing emplaced scattering mine system .
4	Type mines	Enter AP for antipersonnel mines or AT for antitank mines. If both are used, enter AP/AT .
5	Self-destruct period	Enter the time period in which the minefield will self-destruct.
6-14	Aimpoint or corner points of minefield	If the system emplacing the minefield uses a single aimpoint to deliver the mines, enter that aimpoint; for example, MB10102935 . If the system has distinct corner points, as does GEMSS, enter those corner points; for example, MB17954790, MB18604860, MB18504890, MB18054895, MB17804850 .
15	Size of safety zone from aimpoint	If an aimpoint is given in line 6, enter the size of the safety zone from that aimpoint. For example, if artillery emplaces a minefield from aimpoint MB10102935 and the safety zone is 1,000 by 1,000 meters, enter 500 meters so that personnel plotting or receiving the information can plot the coordinate and then plot the safety zone 500 meters in each direction from the aimpoint.
16	Unit emplacing mines and report number	Enter the unit emplacing the mines and the report number; for example, B Battery, 6-14 FA-4 (Reports are numbered consecutively.) This would be the fourth minefield that Battery B, 6-14 Field Artillery Battalion has emplaced.
17	Person completing report	Enter the name of the person completing the report; for example, SFC Doe .
18	Date-time group of report	Enter the date-time group of the report; for example, 160735ZJul15 .
19	Remarks	Enter any other items the reporting unit may consider important.
AP – antipersonnel artiy – artillery GEMSS – ground emplaced mine scattering system		

Table A-5. Scatterable minefield report (example)

Line	Information Required	Instructions
1	Approving authority	CDR 51ID
2	Target or obstacle	51XX0157
3	Type emplacing system	Artillery
4	Type mines	AP/AT
5	Self-destruct period	Firing time + 4 hours
6	Aimpoint or corner point of minefield	MB10102935
7	Aimpoint or corner point of minefield	Omitted
(8-14)	(Lines 8-14 omitted in this example)	(Omitted)
15	Size of safety zone from aimpoint	500 meters
16	Unit emplacing mines and report number.	B Battery, 6-14 FA-4
17	Person completing report	SFC Doe
18	Date-time group of report	160735ZJul5
19	Remarks	None

FIELD ARTILLERY EMPLOYMENT TABLES

A-70. The use of the field artillery scatterable mine employment tables is addressed in detail in TC 3-09.81. These tables will assist the selection of the appropriate delivery technique, shell, trajectory, and battery-minefield angle.

OBSCURATION

A-71. *Obscuration* is the employment of materials into the environment that degrade optical and/or electro-optical capabilities within select portions of the electromagnetic spectrum in order to deny acquisition by or deceive an enemy or adversary (ATP 3-11.50). Employ obscurants as necessary to create temporary or sustained effects throughout the operational environment as a means of protecting U.S. forces and their interests. In addition to increased protection, use obscuration to support tactical deception operations, mark targets for lethal fires, mark friendly locations, as a form of prearranged communication, and to potentially support electronic warfare (electronic attacks).

A-72. There are three military applications for obscuration that support unified land operations: protection, marking, and deception. Military applications are selected based on the tactical purpose requirements. See ATP 3-11.50 for tactical decision aids on the employment of obscuration.

A-73. *Protection obscuration* is obscuration effects placed within the area of operations that contribute to the increased protection of United States forces and their interests by defeating or degrading adversary detection, observation, and engagement capabilities (ATP 3-11.50). Based on the objective, protection

obscuration is employed to accomplish effects that are classified as screening, obscuring, or self-defense. With regard to field artillery smoke employment:

- Screening smoke is a smoke curtain placed between friendly and enemy forces to degrade enemy observation and fire. It is primarily intended to conceal friendly forces.
- Obscuring smoke is a smoke curtain placed directly on or near the enemy with the primary purpose of suppressing observers and direct fire weapons systems by minimizing their vision.
- Self-defense smoke is employed on friendly locations.

A-74. During offensive tasks, use obscuration, including artillery-delivered smoke, to conceal units and individual weapon systems. This enables the commander to maneuver the unit behind a screen and deceive the enemy about the unit’s strength and position. Obscurants are also used to blind enemy acquisition means. During defensive operations, smoke is used to separate and isolate attacking echelons, which creates gaps and disrupts enemy movements. Smoke can slow and blind individual units and weapon systems, forcing mechanized infantry to dismount. Also, when fired behind enemy formations, smoke makes the enemy formations easier to see and may also be used to conceal friendly defensive positions.

A-75. *Marking obscuration* is obscuration effects that are employed to mark targets for destruction by lethal fires, identify friendly positions and locations, and provide a form of prearranged area of operations communications (ATP 3-11.50). Marking targets for destruction will be synchronized with other events occurring within the operational environment (close air support, artillery) and accomplished by a projected means of employment (artillery, mortars, or rockets).

A-76. Deception smoke is used in conjunction with other actions to confuse or mislead the enemy. This use is generally in conjunction with other deceptive measures.

EMPLOYMENT CONSIDERATIONS

A-77. To be effective, smoke must be used in sufficient quantities. Factors that affect the amount of smoke used include atmospheric conditions, type of smoke required, size of the area to be obscured, and length of time needed. On the basis of those conditions, excessive amounts of ammunition may be required to meet the commander’s guidance. See tables A-6 through A-9, table A-10 on page A-24, and ATP 3-09.30 for additional employment considerations.

A-78. If not coordinated properly, smoke may adversely affect battlefield systems that must operate in concert, such as close air support, armor, infantry, field artillery, and Army aviation. Smoke hinders visual communications, which causes the unit to rely to a greater degree on radios.

Table A-6. Smoke planning data

Delivery System	Type Round	Time to Build Effective Smoke (Minutes)	Average Burning Time (Minutes)	Average Obscuration Length (Meters) Per Round	
				Wind Direction	
				Cross	Head or Tail
155-mm	WP	½	1 to 1 ½	150	50
	HC	1 to 1 ½	4	350	75
	M825 (WP)	½	5 to 10	350	100 to 200
105-mm	WP	½	1 to 1 ½	75	50
	HC	1 to 1 ½	3	250	50
120-mm	WP	½	2½	100	60
81-mm	WP	½	1	100	40
	RP	½	2½	100	40
60-mm	WP	½	1	75	40

Note: All rounds are fired as standard missions with parallel sheafs under favorable conditions.
 HC – hexachloroethane smoke mm – millimeters RP – red phosphorous WP – white phosphorous

Table A-10. 105-mm quick smoke (white phosphorus – WP) planning data

QUICK SMOKE DATA – 105-mm Shell White Phosphorous (WP)															
Weather Condition	Wind Speed (Knots)	Rate of Fire	Duration Requested by Forward Observer (Minutes)												
			3	4	5	6	7	8	9	10	11	12	13	14	15
			Rounds Per Tube												
IDEAL	5	1 rd per 40 sec	5	7	8	10	11	13	14	16	17	19	20	22	23
FAVORABLE	5	1 rd per 30 sec	6	8	10	12	14	16	18	20	22	24	26	28	30
	10	1 rd per 15 sec	11	15	19	23	27	31	35	39	43	47	51	55	59
	15	1 rd per 10 sec	16	22	28	34	40	46	52	58	64	70	76	82	88
MARGINAL	5	Exceeds rate of fire													
min – minute			rd – round			sec – seconds									

A-79. Mortars can deliver a high volume of smoke at midranges. They are the most rapid and effective indirect fire smoke delivery means.

A-80. Field artillery cannons can deliver smoke out to distant targets. Cannons can deliver hexachloroethane smoke and white phosphorus; however, as smoke is available in limited quantities, its extensive use should be planned in advance.

Obscurant Employment Tasks

A-81. When obscurants are to be used, the FSCOORD, fires cell planners, and targeting officers must do the following:

- Coordinate with the BCT or other supported maneuver commander or S-3 to determine obscurant requirements for the unit.
- Obtain from subordinate and supporting unit fires cells and FSOs their lists of obscuration targets that require engagement beyond their capability.
- Identify the potential sources of obscurants that will support the operation (such as mortars, maneuver combat vehicles, field artillery, and smoke generators, if available).
- Notify field artillery units of calculated ammunition requirements. If insufficient ammunition exists, delete targets or select an alternative delivery source.
- For any delivery source other than field artillery, coordinate with the BCT chemical, biological, radiological, nuclear (CBRN) officer to determine BCT capability to support the requirement.
- For smoke planned at the BCT level, designate the person, event, or time that will initiate the smoke mission and coordinate with the units that might be affected by the smoke.
- Before firing the smoke, check the weather to determine if conditions still support the smoke mission.

SECTION IV - ELECTRONIC ATTACK

A-82. The BCT will have an organic electronic attack capability once future systems are fielded. The BCT has three Prophet systems; they are located in the BCT military intelligence company's ground collection platoon. It collects signal intelligence data that can be used for the dual purpose of electronic warfare support data in support of electronic attack and electronic protection operations. Prophet Block I does not have an electronic attack capability.

COMPASS CALL

A-83. The EC-130H Compass Call is a modified C-130 Hercules aircraft equipped with high, very high, ultrahigh, super-high frequency jamming systems used by the Air Force to disrupt enemy radar and tactical communications through standoff communications exploitation and selected jamming. The modified aircraft uses noise jamming to prevent communication or degrade the transfer of information essential to weapon systems and other resources. It primarily supports tactical air operations but also can provide

jamming support to ground force operations. As an Air Force system, use of Compass Call is planned through the air tasking order process.

COMMANDO SOLO

A-84. The EC-130J Commando Solo aircraft is an airborne, day or night, air refuelable broadcast system. It is equipped with eight transmitters: one medium frequency, one high frequency, four very high frequency and two ultrahigh frequency. Its primary mission is to broadcast military information support operations programs in the radio, television, and military communications bands. Its secondary mission is to provide electronic attack (jam or disrupt radio and television broadcasts). The EC-130 can also monitor and record radio and television broadcasts. A typical mission consists of a single-ship orbit that is offset from the desired target audience.

SECTION V – NAVAL SURFACE FIRE SUPPORT

A-85. Due to its flat trajectory, terrain masking affects naval gunfire 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). Coverage of targets such as roads and airfields is most effective when the gun-target line coincides with the long axis of the target. Very close supporting fire can be delivered when the gun-target line is parallel to the front line of troops. Oppositely, a gun-target line perpendicular to the front trace can endanger friendly forces. Within the limits of hydrographic conditions, the ship can maneuver to achieve a better gun-target line, but ship movement also makes it difficult to adjust fire. Overall, naval and air threats, bad weather, and large range probable errors may make naval gunfire difficult or may cause cancellation of supporting fires. Table A-11 lists information on naval guns.

Table A-11. Naval gunfire weapons

Inches/Caliber	Ammunition*	Full Charge Range (Meters)	Maximum Rates of Fire (Rounds per Minute)
5"(127-mm)/54	HE	23,133	35 or 20
	HC	23,133	
	Illum	18,288	
5"(127-mm)/62	HE	23,660	16-20
	Illum		
HC – hexachloroethane smoke HE – high explosive Illum – illuminating mm – millimeters			
*These weapons have many different kinds of ammunition. The shell types listed are meant to be representational, but are not a complete list. See naval gunfire liaison personnel for full information.			

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Appendix B

Estimates, Plans, Orders and Annexes to Plans and Orders

The brigade combat team (BCT) staff's most important function is supporting and advising the BCT commander throughout the operations process. The primary staff products are information and analysis. Staffs extract relevant information from a vast amount of available information, then collect, analyze, and present it to commanders. This enables situational understanding by commanders and assists commanders in making decisions. A tool used to support this staff function is the running estimate.

Estimates consist of significant facts, events, and conclusions based on analyzed data. They recommend how to best use available resources. Plans and orders are the means by which the BCT commander expresses a visualization, commander's intent, and decisions. Plans and orders focus on results the BCT commander expects to achieve. Plans and orders form the basis the BCT commander uses to synchronize military operations. They encourage initiative by providing the what and why of a mission, and leave how to accomplish the mission to subordinates. Plans and orders give subordinates the operational and tactical freedom to accomplish the mission by providing the minimum restrictions and details necessary for synchronization and coordination.

This appendix describes the preparation and formats for fires running estimates, plans, orders, and annexes to plans and orders; providing annotated formats as examples. Section I begins with the fires running estimate. Sections II and III describe the fire support plan and the fire support annex to the operation plan (OPLAN) or operation order (OPORD). Section IV contains a summary of the field artillery support plan. Section V concludes this chapter with a very brief discussion of the field artillery battalion OPLAN or OPORD.

SECTION I – THE FIRES RUNNING ESTIMATE

GENERAL

B-1. Running estimates parallel the military decisionmaking process (MDMP). Mission analysis, facts and assumptions, and analysis of the mission variables of mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) furnish the structure for running estimates. They recommend how to best use available resources. See FM 6-0 for the format of a running estimate.

B-2. The FSCOORD and fires cell planners maintain the fires running estimate to identify when fire support decisions are needed and to help the BCT commander make them. When the BCT commander is considering a decision, the fires running estimate's presentation always ends with a recommendation. Sometimes the recommendation is implied. For example, when the fires running estimate is presented as part of a situation update, the implicit recommendation is to continue operations according to the present order unless the presenter recommends otherwise. The FSCOORD and fires cell planners maintain only one running estimate.

B-3. The BCT commander is usually not briefed on the entire contents of the fires running estimate. The brigade fire support officer (FSO) or other fires cell representative briefs only those parts of the running estimate relevant to the situation and the issue or decision being addressed. Fires cell representatives focus

on the portions of the running estimate relevant to their respective duties. For example a briefing by a fires cell targeting officer may be focused on high-payoff targets. The particular fires cell representatives base their presentation on the single running estimate maintained by the fires cell.

B-4. The completed fires running estimate contains the information necessary to answer any question the BCT commander poses. Identify any gaps in the fires running estimate as information requirements and submit them to the appropriate agency. The fires running estimate can form the base for the subsequent fires annex to BCT plans and orders. The fires cell maintains the fires running estimate continuously throughout the operations process.

B-5. During assessment, the fires running estimate's focus is on answering priority information requirements, friendly force information requirements, and especially the BCT commander's critical information requirements related to the fires warfighting function.

B-6. During planning, the fires running estimate's focus is on assessing which course of action is most supportable from the fires perspective. When the commander selects a course of action, the fires running estimate focuses on assessing the status of fires assets and resources for that course of action.

B-7. During preparation, the fires running estimate's focus is on any command decisions that affect the ability of the BCT to execute the upcoming operation. The running estimate continues to track the status of fire support assets and resources.

B-8. During execution, the fires running estimate's focus is on anticipated command decisions. These include but are not limited to decision points and decisions regarding whether or not to execute a branch or sequel. The running estimate identifies any variances, assessing their effect on achieving the commander's desired effects and end state, and recommending corrective actions to keep the operation within the BCT commander's intent. Assessment also addresses the supportability of possible sequels and future operations.

B-9. The brigade FSO and fires cell planners may present the fires running estimate in a written form or present it orally. During operations and exercises the running estimate is usually presented orally, supported by charts and other decision support tools. During contingency planning the fires running estimate is usually provided in written form.

B-10. In maintaining the fires running estimate, the brigade FSO and fire cell planners continuously consider the effect of new information and update assumptions, friendly force status, effects of enemy activity, civil considerations, and conclusions and recommendations. As a minimum a fires running estimate continuously assesses:

- Friendly force fire support capabilities with respect to ongoing and planned operations.
- Enemy capabilities as they affect the fires warfighting function for both current operations and future plans.
- Civil considerations as they affect the fires warfighting function for both current operations and future plans.
- The operational environment's effect on current and future operations from the fire support perspective.

B-11. The brigade FSO and fires cell planners prepare updated conclusions and recommendations for the BCT commander as the situation or the BCT commander requires. They maintain the fires running estimate between operations, even when not deployed. At a minimum this includes maintaining a continuous awareness of the current status of BCT and subordinate and supporting unit fire support capabilities. The depth and quality of the fires running estimate always depends on the foundation of prior preparation. Effort expended in maintaining the fires running estimate during lulls between operations always pays off when a new task is unexpectedly received.

B-12. The fires running estimate provides the basis for action. When the fires running estimate reveals a variance that requires correction, the brigade FSO and fires cell planners act within their authority to correct it. When the decision required is outside their authority, they present the situation to the FSCoord and S-3, or to the BCT commander. When the fires running estimate reveals information that answers an information requirement, especially a commander's critical information requirement, fires cell planners

send that information to the command post cell requiring it. The brigade FSO and fires cell planners do more than collect and store information; they process it into knowledge and apply judgment to get that knowledge to those requiring it.

SECTION II - FIRE SUPPORT PLAN

B-13. The fire support plan is an integral part of the OPLAN or OPORD. The fire support plan is normally comprised of the Scheme of Fires paragraph in the OPLAN or OPORD and Annex D, (FIRES) (if used) and its associated appendixes, tabs, and enclosures. The brigade FSO and fires cell planners participate in the MDMP, including the development and dissemination of the BCT fire support plan and, with the cannon field artillery battalion command post, the cannon field artillery battalion OPLAN, OPORD, or field artillery support plan. The BCT commander's selected course of action, concept of the operation, intent, and all guidance given during planning form the basis for development of the BCT OPLAN or OPORD. Paragraph 3 of the OPLAN or OPORD outlines how the BCT commander wants to use fire support and maneuver assets. The fire support plan, prepared by the FSCoord, the brigade FSO and fires cell planners provides the detailed fire support information that supports the BCT OPLAN or OPORD. The field artillery support plan or cannon field artillery battalion OPORD, prepared by the cannon field artillery battalion command post, provides the field artillery unique information. See FM 6-0 for information on preparing an OPLAN or OPORD.

RESPONSIBILITIES

B-14. The brigade FSO and fires cell planners are responsible for preparation of the scheme of fires subparagraph of the BCT OPLAN or OPORD. If the scheme of fires subparagraph needs amplification, the brigade FSO and fires cell planners are responsible for preparation of a fires annex to the OPLAN or OPORD.

Operations Order Scheme of Fires Subparagraph.

B-15. The scheme of fires describes how the BCT commander intends to use fires to support the concept of operations with emphasis on the scheme of movement and maneuver. The scheme of fires states the fire support tasks and the purpose of each and includes the priorities for, allocation of, and restrictions on fires (see FM 6-0). For example, the concept of operation's scheme of movement and maneuver and scheme of fires subparagraphs may state:

Example Scheme of Movement and Maneuver: 1 BCT (*who*) as a shaping operation attacks 150600 May XX (*when*) to destroy enemy forces in zone (*what*) to protect the southern flank of 2 BCT (*why*). 1 Cavalry Squadron attacks to fix enemy forces on Objective HOME in order to protect 1 Infantry Battalion's southern flank. 1 Infantry Battalion attacks to seize Objective BRAVE; on-order assists the forward passage of 2 Infantry Battalion. 2 Infantry Battalion attacks to destroy remaining enemy forces between Phase Line WHITE and Phase Line RED orienting on Objective RUN (*where*).

In this case, the scheme of fires paragraph supporting the BCT's scheme of maneuver might read:

Example scheme of fires: 6-14 Field Artillery (*Who*) places artillery fires on enemy security elements (*What*) in vicinity of Phase Line BLUE (*Where*) to disrupt the enemy's ability to interdict scouts or 1 Infantry Battalion and 1 Cavalry Squadron with indirect fires as they cross Phase Line BLUE in order to enable the scouts to conduct zone reconnaissance and allow 1 Infantry Battalion and 1 Cavalry Squadron freedom of movement (*Why*). Field artillery suppresses all critical friendly zone violations. Priority: Priority of fires to 1 Infantry Battalion, on-order to 2 Infantry Battalion. Allocation: 2 Infantry Battalion is allocated 8 minutes of 600 meters x 50 meters field artillery smoke and 1 x critical friendly zone. 1 Infantry Battalion is allocated 8 minutes of 600 meters x 50 meters field artillery smoke and 1 x critical friendly zone. Each infantry battalion is allocated 2 x field artillery platoon-size priority targets for the operation. The division fire support coordination line is Phase Line Green. 1 BCT coordinated fire line is Phase Line WHITE on-order Phase Line RED. Place 300 meter NFAs around observer and stationary scout positions. Restrictions: Clear all smoke and illumination missions through the brigade fires cell. No dual-purpose improved conventional munitions will be fired on main supply routes. 1 BCT retains release authority for scatterable mines.

B-16. The scheme of fires subparagraph must clearly describe the logical sequence of fire support tasks and their purpose (how they contribute to the BCT scheme of movement and maneuver). For instance each phase of an operation might have one or more fire support tasks described in a sequence of planned execution.

B-17. The scheme of fires subparagraph must be concise, but specific enough to clearly state what fire support is to accomplish in the operation. The primary audience for the fires subparagraph is the subordinate maneuver commanders and their staffs. Indicate which unit has priority of fires. Refer to Annex D (FIRES) and other annexes as required. The overall paragraph organization should mirror that of the scheme of movement and maneuver paragraph. If the movement and maneuver paragraph is phased or otherwise organized, the scheme of fires subparagraph should use the same format.

B-18. If Annex D (FIRES) is not used, include supporting subparagraphs for field artillery support, air support, naval fire support, cyber electromagnetic activities, battlefield obscuration, target acquisition, tasks to subordinate units and coordination instructions (including fire support coordination instructions).

B-19. Field artillery support. Ensure that the allocation of fires supports the BCT commander's concept of operations. For the BCT, most of the fire support information may be contained in a matrix format in this paragraph or in the fire support annex. List tasks to field artillery units in the same order they appear in the task organization. List only those field artillery tasks that are not specified elsewhere. State the BCT commander's guidance on field artillery employment. Give information concerning priority of fires and counterfire. Include information on preparations or counterpreparations and guidance received on the employment of weapon locating radars and other acquisition systems. If necessary, expand the field artillery subparagraph to cover:

- General Material. This may include further subdivision or priorities (such as counterfire or interdiction).
- Organization for Combat. Include this subparagraph only if this information is not clear in the task organization paragraph. List the field artillery units organic to, attached to, or controlled by the BCT. A command or support relationship must be assigned to each unit. List field artillery brigade (FAB) units attached to or controlled by the BCT, and show elements thereof. List units in regimental numerical order. If necessary for clarity, expand the unit weapon system identification by also listing information such as the system model number (for example, M777A2, M109A6). Batteries assigned a separate command or support relationship under direct supervision of the BCT are listed in alphabetical sequence immediately after the parent battalion. Ensure the allocation of fires supports the commander's concept.

B-20. Scheme of Air support. State the allocation of close air support sorties. Show tactical air reconnaissance sorties here or in Annex B (Intelligence).

B-21. Scheme of Naval Fire Support. State the commander’s guidance on the employment of naval gunfire. Give mission statements for all ships providing support. List any instructions or restrictions that differ from those listed in the BCT’s standard operating procedures.

B-22. Coordinating Instructions. Provide miscellaneous instructions that affect more than one field artillery unit such as revisions of missions, instructions on planning of fires, position areas, FSCMs (including the times they are in effect), high-payoff target list, attack guidance matrix, and the establishment of common grid to allow massing of fires. The brigade FSO and fires cell planners may use additional paragraphs as necessary to ensure any additional BCT fire support assets are properly addressed in the OPLAN or OPORD.

B-23. Annex D (FIRES). If the fire support plan requires amplification that is too extensive for the scheme of fires subparagraph, the BCT fires cell may develop a fires annex to the BCT OPLAN or OPORD. The fire support plan may include reference to the field artillery battalion OPLAN or OPORD. An example fires annex is found later in this appendix.

B-24. The fire support plan tells subordinate commanders what they need to do and know to accomplish their missions. It should not address items in standard operating procedures and should not include how-to-implement instructions to individual fire support units and staff. That type of information should be addressed in standard operating procedures or in implementing instructions issued after receipt of the fire support. Once the fire support plan is prepared, it is disseminated as a part of the BCT OPLAN or OPORD. Table B-1 shows the suggested dissemination for the fire support plan. Table B-2 shows the suggested distribution for fire support plans.

Table B-1. Fire support plan dissemination

<i>Plan Level</i>	<i>Copies Provided To</i>
Division and corps operations plan or operations order fire support plan	Commander, corps and division intelligence officer and operations officer, chief of fires, supporting field artillery brigade, subordinate brigade combat teams, and other fire support means.
Brigade combat team operations order fire support plan	Commander, brigade combat team intelligence officer and operations officer, fire support coordinator, brigade fire support officer, subordinate and supporting units, cannon field artillery battalion, and other fire support representatives

Table B-2. Suggested distribution of fire support plans

<i>PLAN</i>	<i>Supported Maneuver Units</i>	<i>Supporting Field Artillery Units</i>	<i>Supporting USAF Units</i>	<i>Naval Gunfire Liaison Officer and Supporting Ships</i>	<i>Supporting Army Aviation Units</i>	<i>Supporting Air and Missile Defense Units</i>	<i>Supporting Ordnance Units</i>
Fire Support Plan	R	R	R	R	R	R	D
Fire Support Annex	R	R	R	R	R	R	D
Field Artillery battalion OPLAN, OPORD, or Field Artillery Support Plan	D	R	D	D			D
Air Support Plan	D		R		D	D	
Naval Surface Fire Support Plan	D			R			
Air and Missile Defense Support Plan	D		D		D	R	R
D – Discretionary R – Required	OPLAN – operation plan OPORD – operation order		USAF – United States Air Force				

SECTION III - FIRES ANNEX

B-25. A fires annex may be needed to expand upon the scheme of fires subparagraph of the BCT OPLAN or OPORD. The BCT S-3, brigade FSO, and fires cell planners must carefully weigh the need for a fires annex and the level of detail required based on the complexity of the operation, deviations from standard operating procedures, BCT commander's guidance, and the time available to develop, publish, and disseminate the OPLAN or OPORD. If the fires subparagraph is adequate, do not publish a fires annex. A fire support execution matrix may be developed as part of the fires annex. A fire support execution matrix may also be used in place of a standard fires annex if the operation is not complicated and when time constraints prevent development of a standard fires annex. FM 6-0 provides fundamental considerations, format and instructions for developing Annex D (FIRES) to the base plan or order.

SECTION IV - FIELD ARTILLERY SUPPORT PLAN

B-26. The BCT field artillery battalion's OPLAN or OPORD is normally used in lieu of a field artillery support plan. If a field artillery support plan is used, it is an appendix to the fires annex to the BCT OPLAN or OPORD. The field artillery support plan provides for coordinated action to carry out the decisions of the field artillery commander in support of the BCT operation.

B-27. The field artillery support plan follows the format of the five-paragraph OPLAN or OPORD and refers to both the BCT OPLAN or OPORD and its fires annex. However, not all of the commanders and staffs of the units (such as a FAB cannon field artillery battalion reinforcing the BCT's cannon field artillery battalion) supporting the force field artillery (only the BCT's field artillery battalion for a simple BCT operation) that is preparing the field artillery support plan will receive copies of the BCT OPLAN or OPORD or its fires annex. Therefore, the field artillery support plan may reiterate critical items of information to ensure that all supporting commanders and staffs receive the information.

B-28. The field artillery support plan should not include information already available in unit standard operating procedures. The purpose of the written plan is to inform subordinate and supporting units of tasks and requirements that are peculiar to a specific operation. The format for a field artillery support plan is illustrated Figure B-1. Explanations are given for the various paragraphs and subparagraphs in the relevant portions of the order.

B-29. Prepare tabs for portions of the plan that are better explained in a different format (for example, as an overlay or a matrix), that are too extensive to be in the plan, that are expected to change, or that are submitted too late to be included in the body of the field artillery support plan. Common tabs include:

- Field artillery support matrix.
- Target lists.
- Fire plan schedules.
- Survey.
- Target acquisition.
- Digital (Advanced Field Artillery Tactical Data System [AFATDS] fire direction system links and subscriber tables).
- Field artillery positioning and movement overlay.

(CLASSIFICATION)
(Change from verbal orders, if any)

Place the classification at the top and bottom of each page of the document. Mark also the proper classification for each paragraph. Include the heading if the plan is distributed separately.

Copy ## of ## copies
Issuing headquarters
Place of issue
Date time group of signature
Message reference number

**APPENDIX (#) (FIELD ARTILLERY SUPPORT) TO ANNEX D (FIRES)
TO [OPLAN] [OPORD] [NUMBER] [CODE NAME] [(CLASSIFICATION OF TITLE)]**

References: *Refer to higher headquarters' OPLAN or OPORD. List any maps, charts, or other documents (tactical standard operating procedures and so on) required to understand the plan or order. Reference to a map includes the map series number, country or geographic area, sheet names or number, edition, scale, and the force common datum (see note below from a global positioning system (specify type of global positioning system and datum used) or from the center of the lower margin on a map. Reference listed here should not be reprinted in tabs unless tabs are separated from the basic document.*

Note: Universal Transverse Mercator coordinates from the same point computed on a different datum may differ as much as 900 meters.

Time Zone Used throughout the Plan or Order: *The time zone that is applicable to the operation. Times in other zones are converted to this zone for this operation. Maintain consistency through all documents.*

1. (U) Situation. *Paragraph 1 includes items of information affecting field artillery operations that may or may not be included in paragraph 1 or in the fires subparagraph of the BCT OPLAN or OPORD or its fire support annex. Discuss, as necessary, the area of interest, area of operations, terrain, and weather. Give an overview of the general situation so subordinate and supporting unit commanders can understand the operational environment. If all organic, attached, or supporting unit commanders do not receive complete copies of the BCT OPLAN or OPORD and fire support plan, then the field artillery support plan must repeat those items critical to the execution of their missions.*

a. (U) **Enemy Forces.** *This subparagraph provides enemy information vital to the field artillery. This includes enemy indirect fire capabilities that may influence field artillery activities, the ground threat, the air threat, and any other enemy information of particular relevance to the field artillery units. Reference may be made to an intelligence annex, an overlay, a periodic intelligence report, or an intelligence summary.*

(1) (U) **General Overview of the Enemy's Disposition and Mission.** *Overview statement.*

(2) (U) **Specific Information of the Threat to the Field Artillery.**

[page number]
[CLASSIFICATION]

Figure B-1. Field artillery support plan annotated format

<p>[CLASSIFICATION]</p> <p>APPENDIX (#)(FIELD ARTILLERY SUPPORT) TO ANNEX D (FIRES) TO [OPLAN] [OPORD] [number] [code name] [(classification of title)]</p> <p>(a) (U) <u>Counterfire</u>. <i>Identify the number of enemy tubes, caliber, weapons types, organization, percent strength, and target acquisition capabilities.</i></p> <p>(b) (U) <u>Ground Threat</u>. <i>Identify enemy ground attack (mounted and dismounted) capabilities.</i></p> <p>(c) (U) <u>Air Threat</u>. <i>Identify high, low, and type of assets.</i></p> <p>b. (U) <u>Friendly Forces</u>. <i>This subparagraph shows the missions of the BCT and its higher headquarters. Missions of adjacent supporting and reinforcing units may also be outlined here. Information should be limited to that which subordinate commanders need to know to accomplish their missions. The BCT commander's guidance for fire support is also included in this subparagraph, as well as the force field artillery commander's (cannon field artillery battalion commander for a simple BCT operation; the force field artillery headquarters for a complex operation) intent.</i></p> <p>(1) (U) <u>Supported Maneuver Unit Mission</u>.</p> <p>(a) (U) <u>Supported Maneuver Unit Intent/Concept</u>. <i>Combine critical information from the BCT commander's intent and the maneuver subparagraph.</i></p> <p>(b) (U) <u>Purpose/Priority</u>. <i>Taken from the fires subparagraph of the BCT order.</i></p> <p>(2) (U) <u>Adjacent and Supporting Units</u>. <i>Field artillery and maneuver to include other Services and multinational forces.</i></p> <p>(a) (U) <u>Maneuver</u>.</p> <p>(b) (U) <u>Field artillery</u>.</p> <p>(c) (U) <u>Force field artillery headquarters intent and concept (if applicable)</u>.</p> <p>c. (U) <u>Attachments and Detachments</u>. <i>This subparagraph should list supporting field artillery assets attached to and detached from the BCT (for instance a FAB radar or a cannon field artillery battalion), including the terms of attachment and effective date-time groups if appropriate. This includes attached target acquisition assets and sensor system downlinks, as well as detached batteries.</i></p> <p>2. (U) <u>Mission</u>. <i>Paragraph 2 is a clear, concise statement of the task(s) the BCT's organic and supporting field artillery is to accomplish. At a minimum, it should answer the questions who, what, when, where, and why. It includes field artillery tasks determined by the BCT commander as a result of the mission analysis. Notice that the mission statement does not explain "how" the mission will be accomplished. That is found in Paragraph 3a (Concept of the Operation). "On-order" missions should be included in the mission statement. Be prepared missions should not be included.</i></p> <p>3. (U) <u>Execution</u>. <i>Paragraph 3 contains the how-to information needed for mission accomplishment.</i></p> <p style="text-align: center;">[page number] [CLASSIFICATION]</p>

Figure B-1. Field artillery support plan annotated format (continued)

[CLASSIFICATION]

**APPENDIX (#)(FIELD ARTILLERY SUPPORT) TO ANNEX D (FIRES) TO [OPLAN]
[OPORD] [number] [code name] [(classification of title)]**

a. (U) **Scheme of fires.** Describe how fires support the commander's intent and concept of operations. Establish the priorities of fires to units for each phase of the operation. The scheme of fires must be concise but specific enough to clearly state what fires are to accomplish in the operation. The cannon field artillery battalion commander (or force field artillery headquarters commander) state with respect to the relationship among the field artillery battalion, the threat, and the terrain; and (briefly) how the cannon field artillery battalion as a whole (or force field artillery headquarters for a complex operation) will achieve the end state. The intent clarifies the purpose of the operation and is stated in enough detail to ensure appropriate action by subordinates in the absence of additional specific instructions.

b. (U) **Concept of the Operation.** The structure is the same as the fires annex scheme of fires paragraph, that is, it retains the same phases. State the purpose of the phase from the "scheme of fires" paragraph and then how the cannon field artillery battalion (or force field artillery headquarters for a complex operation) will support that phase. Name the subunits and the interrelationships of how the field artillery battalion (or force field artillery headquarters) will support the phase. Leave the details for the coordinating instructions paragraph. Provide a narrative of how the field artillery battalion (or force field artillery headquarters) will support the operation from beginning to end.

c. (U) **Organization for Combat.** This subparagraph gives a clear statement of the organization and command and support relationships of the subordinate elements of the cannon field artillery battalion (or force field artillery headquarters for a complex operation). Include anticipated on-order changes to organization or tactical missions in this subparagraph. List those field artillery units that support the maneuver force—direct support (DS), reinforcing (R) and general support-reinforcing (GSR) units. General support (GS) units do not have to be listed unless assigned a nonstandard mission.

d. (U) **Priority of Fires.** State the priority of fires as it applies to the BCT. This is found in the scheme of fires paragraph of the fires annex or the fire support execution matrix. If necessary, refer the reader to the field artillery support matrix.

e. (U) **Tasks to Subordinate Units.** This portion is used to issue instructions unique to subunits and to amplify instructions found in the matrices. For example, "See field artillery support matrix and overlay for movement, position areas, azimuths of fire, and location of sustainment units/functions."

f. (U) **Coordinating Instructions.** The last subparagraph in paragraph 3 includes instructions and details of coordination applicable to two or more field artillery battalion (or force field artillery headquarters) sub-elements. Many issues included in coordinating instructions may also be addressed in tabs to the field artillery support plan. If a separate tab is used, include only items of general interest in the coordinating instructions paragraph. Details of interest only to a particular element are placed in the tab. If a tab is prepared, reference it (for example "See Tab ___") in the body of the support plan. This paragraph should include instructions concerning:

- Target acquisition (includes a counterfire reference grid and instructions to or about specific target acquisition sources).
- Survey includes priorities for survey, accuracy required (if other than standard operating procedures), sources authorized, timing, position requirements, and future plans).
- High-payoff target list (from BCT OPORD/OPLAN or fires cell).
- Attack guidance matrix (from BCT OPORD/OPLAN or fires cell).
- Chemical, biological, radiological, nuclear (CBRN) passive defense (includes contamination avoidance techniques, mission oriented protective posture, operational exposure guides, and decontamination procedures).

[page number]
[CLASSIFICATION]

Figure B-1. Field artillery support plan annotated format (continued)

[CLASSIFICATION]

**APPENDIX (#)(FIELD ARTILLERY SUPPORT) TO ANNEX D (FIRES) TO [OPLAN]
[OPORD] [number] [code name] [(classification of title)]**

- *Meteorology (includes source, type, and times of meteorology messages).*
- *Fire support plan (includes a target list and schedules of fires).*
- *FSCMs.*
- *Commander's critical information requirements.*
- *Information collection tasks (as appropriate, see FM 3-55).*
- *Rehearsals.*
- *Ammunition restrictions (includes expenditure restrictions, approval requirements, and risk limitations for dual-purpose improved conventional munitions based on expected dud rates).*

4. (U) Sustainment. *Write briefly how sustainment assets will support the mission. Provide non-standard operating procedure information. Address only those sustainment aspects that apply to the overall operation. Put the BCT commander's directions regarding sustainment here. Address the pertinent aspects of tactical sustainment functions (for example, manning, arming, fueling, fixing, and moving). At a minimum, give the controlled supply rate and the sustainment locations.*

a. (U) Logistics. *Address any of the sustainment functions that are pertinent before, during, or after the operation. Refer to Annex F (Sustainment) as required.*

b. (U) Personnel. *Refer to Annex F (Sustainment) as required.*

c. (U) Health Service Support. *Refer to Annex F (Sustainment) as required.*

5. (U) Command and Signal. *Write briefly how communications assets will support the mission. Provide non-standing operating procedure information.*

a. (U) Command. *Give the commander's and key leaders planned location during the operation.*

b. (U) Control. *State liaison requirements not covered in the base order.*

c. (U) Signal. *State liaison requirements not covered in the base order.*

ACKNOWLEDGE:
[Commander's last name]
[Commander's rank]

OFFICIAL:
[Authenticator's name]
[Authenticator's position]

ATTACHMENT: *List lower-level attachments as required.*

DISTRIBUTION: *Show only if distributed separately from base order or higher attachments.*

[page number]
[CLASSIFICATION]

Figure B-1. Field artillery support plan annotated format (continued)

SECTION V – FIELD ARTILLERY BATTALION OPERATIONS ORDER

B-30. As an organic unit of the BCT, the cannon field artillery battalion normally prepares an OPLAN or OPORD rather than a field artillery support plan to support the BCT commander's mission. The cannon field artillery battalion OPORD should contain the information found in the field artillery support plan. The cannon field artillery battalion OPORD is based on the field artillery sub-subparagraphs of the BCT OPORD and its fires annex. See FM 6-0 and ATP 3-09.23 for the OPLAN or OPORD format.

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Appendix C

Communications

This appendix addresses the tactical fire support communication nets within the brigade combat team. The tactical radio network is designed around very high frequency radios (such as the Single-Channel Ground And Airborne Radio System nets), high frequency radios, single-channel tactical satellite, and more recently, commercial off-the-shelf radios. Each system has unique and different capabilities and transmission characteristics that commanders consider to determine how to employ each system depending on the units' mission and other factors. The internal brigade signal company assets support communications at brigade command post.

SECTION I – BRIGADE COMMUNICATIONS

C-1. The internal brigade signal company assets support communications and information support at the BCT level. The brigade signal company is unique in structure and capabilities. It consists of the command and network operations sections, and the brigade support battalion, command post nodal, and the signal support platoons.

C-2. The platoons provide support to the BCT for the:

- Joint network node.
- Single-channel tactical satellite.
- Brigade subscriber node that provides secure and non-secure voice, video, and data.
- Enhanced position location and reporting system and enhanced position location and reporting system net control capabilities.
- Wireless network extension and capabilities.
- Single-channel ground and airborne radio system nets.

C-3. The communications equipment used within the force varies from unit to unit. The net structures identified in this appendix identify probable subscribers within a given communications net. Units should consider the recommendations to develop the configuration used within their organization. The best method of providing control without hampering operation is through centralized planning. Execution of these plans should be decentralized. Directed tasks may require the BCT to operate in communications nets with which the BCT is not normally associated. These nets may include, but are not limited to, the DIVARTY (force field artillery) command net, the division fire support net, the corps fire support net, and the FAB command net.

C-4. Fire support nets often used by the BCT are at Table C-1 on page C-2. See also ATTP 3-21.90 and FM 6-02.53 for additional information.

Table C-1. Possible BCT fire support communication net structure

Note: Most non-FA maneuver element subscribers are omitted. FA personnel may also be directed to operate in maneuver nets.	FO	Bn mortar FDC	FIST HQ	Co FSO	Mnvr bn fires cell	Bn FSO	Btry or plt FDC	BCT FA bn CP	BCT fires cell	BCT FSO	Div fires cell (Tactical CP)	Div fires cell (Main CP)	DIVARTY CP
Mnvr co cmd ops net (V)			X ¹	X ¹									
Mnvr co fire control net (V)	X ¹		X	X									
Mnvr bn cmd ops net (V)		X			X ¹	X ²							
BCT cmd ops net (V)								X	X ¹	X ²			
Div cmd ops net (V)											X	X	X
Mnvr bn FS net (V)	X ²	X	X	X ¹	X	X ¹							
BCT FS net (V)					X	X ³		X	X	X ³			
Div FS net (V)								X ⁴	X ⁴	X ⁴	X ⁴	X ⁴	X ¹
Mnvr bn mortar FD net (D)	X	X	X	X ¹	X ¹	X ¹							
Btry cmd net (V)						X ¹	X	X ¹					
BCT FA bn FD nets 1, 2, 3 (D)	X ⁴		X ⁴	X ¹	X ¹	X ¹	X	X	X	X			
BCT FA bn ops/F net (D)					X ¹			X	X				
DIVARTY cmd net (V)						X ¹		X ⁴					X
DIVARTY ops net (D)								X ⁴	X ¹	X ¹	X ⁴	X ⁴	X ⁴
DIVARTY C/F net (V)								X ⁴			X ⁴	X ⁴	X ⁴
1 – As needed					3 – Net used by FSO when separate from fires cell.								
2 – May be entered for voice coordination.					4 – As directed.								
avn – aviation BCT – brigade combat team bde – brigade bn – battalion cmd – command C/F – command/fire cmbt – combat CP – command post D – digital		DIVARTY – division artillery F – fire FA – field artillery FAB – field artillery brigade FD – fire direction FDC – fire direction center FIST – fire support team FS – fire support FSO – fire support officer					HQ – headquarters mnvr – maneuver ops – operations plt – platoon sep – separate TA/intel – target acquisition/ intelligence V - voice						

C-5. The nets used for battalion fire support coordination and fire direction are at Tables C-2 and C-3. Selected battalion mission command and operations nets are at Table C-4 on page C-4.

Table C-2. Fire support coordination nets

Net	Purpose	Subscribers¹
Mnvr co fire control (V)	Control FO parties and process missions from non-FA observers for mortar or FA fires through the FIST.	1. Co FSO 2. FO 3. FIST HQ (NCS) 4. Co mortar section 5. Non-FA observers
Mnvr bn fire support net (V)	1. Calls for fire from non-field artillery observers. 2. Voice fire support coordination among maneuver, fires cells, and field artillery or mortar FDCs.	1. Mnvr bn fires cell (NCS) 2. Mnvr bn FSO 3. Mnvr co FO 4. Mnvr bn mortar FDC and mortar platoon leader 5. FIST headquarters or mnvr co FSOs 6. Any FDC (as required) 7. Any FSO or observer (as required)
BCT fire support net (V)	Voice fire support coordination within the BCT area of operations.	1. BCT fires cell (NCS) 2. BCT FSO 3. Mnvr bn fires cells or FSOs 4. Any fires cell (as required) 5. BCT FA bn command post 6. FA bn commander (as required) 7. Any FSO (as required) 8. Any FDC (as required)
1 – Subscribers vary according to the standard operating procedures and mission variables. BCT – brigade combat team bn – battalion co – company FA – field artillery FDC – fire direction center FIST – fire support team FO – forward observer FSO – fire support officer HQ – headquarters mnvr – maneuver NCS – net control station plt – platoon V – voice		

Table C-3. Fire direction nets

Net	Purpose	Subscribers¹
Mnvr bn mortar fire direction net (D)	Tactical and technical fire direction and calls for fire to the mortar platoon FDC.	1. Mnvr bn fires cell 2. Mnvr bn FSO 3. Mnvr co FO (as required or directed). 4. Mnvr bn mortar FDC (NCS) 5. FIST headquarters or mnvr co FSOs 6. Any FSO or observer (as required)
BCT FA Bn fire direction 1,2,3 nets (D)	Tactical and technical fire direction and calls for fire to FA battalion, battery, or platoon FDCs.	1. BCT FA Bn FDC (NCS) 2. FA plt FDCs or FDOs 3. FIST HQ or mnvr co FSOs (as required or directed) 4. FOs (as required or directed) 5. Weapons locating radar (as required) 6. Bn fires cell or FSO 7. BCT fires cell or FSO 8. Other fires cells or FSOs (as required) 9. FA btry FDCs or FDOs (as required or directed)
BCT FA Bn operations fire net (D)	Tactical fire direction and fire planning.	1. FA bn main CP (FDC) (NCS) 2. BCT fires cell 3. Mnvr bn fires cell 4. Aviation bde fires cell (as required). 5. Other fires cells (as required) 6. FA btry or plt FDCs
1 – Subscribers vary according to the standard operating procedures and mission variables. BCT – brigade combat team bn – battalion co – company CP – command post FA – field artillery FDC – fire direction center FIST – fire support team FO – forward observer FSO – fire support officer HQ – headquarters mnvr – maneuver NCS – net control station plt – platoon V – voice		

Appendix D

Fire Support at Battalion and Below

The battalion and company FSOs are responsible for training their teams in all aspects of their duties and for coordinating fires cell and fire support team (FIST) activities during operations. The FSO ensures that the teams are fully equipped with all materials and equipment listed in the local standard operating procedures, load plan, and modified tables of organization and equipment. These lists normally include such items as digital automation systems, laser codes, binoculars, compasses, maps, overlays, fire plans, coordinate scales, grease pencils, field manuals and ATPs, radios, and combat gear. This appendix provides supplemental information for conducting fire support planning and execution at battalion and company levels. Section I discusses fire support considerations at battalion and company levels. Section II provides additional thoughts on targets and targeting.

SECTION I – BATTALION AND COMPANY FIRE SUPPORT

D-1. The fire support officer must be with the commander when the commander develops the maneuver plan. The fire support officer coordinates, synchronizes, and executes fire support in the plan. The fire support officer identifies observer (including joint fires observer) requirements that can be articulated into a functional maneuver commander's observation plan and then integrated into the maneuver rehearsal.

D-2. The battalion fire support platoon and fires cells are found in the headquarters battery of each brigade combat team (BCT) field artillery battalion and normally include FISTs with joint fires observers. The number and composition of fires cells and FISTs vary based upon the type of unit supported. The fires cells and FISTs have a habitual support relationship with a specific maneuver battalion. Ideally, each FIST has a habitual relationship with a specific company.

BATTALION FIRE SUPPORT PLANNING

D-3. Fire support officers at battalion and company level use the fire support planning questions identified in chapter 6 and supplemented later in this chapter to determine the commander's intent. The answers to these questions help the FSO prepare fire support plans and briefings.

D-4. The fire support officer assists the commander in estimating the situation and in wargaming to develop the commander's concept of the operation. The battalion FSO does not wait for the maneuver commander to complete the scheme of maneuver. Rather, the FSO aggressively inputs fire planning as the scheme of maneuver is being developed to help achieve synchronization. The FSO does this by mentally employing all fire support assets along a proposed course of action in concert with the maneuver commander's other resources. While the commander fights his way through each action in the wargaming process to determine factors critical to success, the FSO mentally considers the factors identified in chapter 6, paying particular attention to:

- Consider proper distribution of assets for close support of maneuver elements.
- Visualize indirect fire unit movements required to follow the battle.
- Position mortars (if authorized) to support the scheme of maneuver.
- Consider sustainment (especially ammunition) and its impact on the battle.

FIRE SUPPORT PLANNING QUESTIONS

D-5. There are certain questions that should be answered to ensure that fire support is coordinated with maneuver. Some of the questions will be answered by the commander. However, most of the information

will come from the various maneuver staff sections, the field artillery or mortar unit, or the FSO's own expertise and experience. The following are some questions to determine the commander's intent for fire support:

Note. Many of the questions should be submitted to the commander in the form of recommendations for his approval.

- What is the offensive (or defensive) task?
- What are the scheme of maneuver (or plan for the defense) and the commander's intent?
- What is the supported unit's operational area?
- How are firing units to maneuver within the supported unit's operational area?
- What is the enemy situation?
- What are the known and suspected enemy locations?
- What are the most likely avenues of approach?
- Where are the designated engagement areas?
- What units are to receive priority of fires?
- What fire support assets provide the priority fires?
- What are the priority targets?
- When is priority shifted to the next priority target?
- Where are special fires to be planned (smoke, illumination, and family of scatterable mines)?
- Is there a requirement to adjust smoke or illumination targets?
- Is there a requirement to register fire support assets?
- How are fire support vehicles (if available) to be used?
- What are the laser locator range finder and designator codes?
- What are the signals or events to commence special fires?
- What maneuver control measures have been established?
- Are any restrictive fire support coordination measures required?
- What additional fire support assets have been allocated (attached or in support) such as close air support, naval gunfire, or Army aviation?
- Are there any peculiar communications requirements?
- Are scouts forward? What are the fire support requirements for the scouts?
- What are the future plans?
- What is the succession of command?
- How much time is available?
- When is the rehearsal?
- What type and how much mortar ammunition is available?
- For automated fire directions systems, what are the defeat criteria for different targets?
- What are the high-payoff target priorities for fire support?
- Where are the obstacles? How are they to be covered?
- What is the breaching plan?
- Have final protective fires (FPFs) been allocated? Where are they to be planned? Are they to be adjusted?
- What are the primary and alternate signals to fire the FPFs?
- How will logistical support for mortars be accomplished?
- Who will control and position mortars?

BATTALION FIRE SUPPORT PLAN

D-6. Paragraph 3e (Scheme of Fires) of the maneuver operation order (OPORD) gives the scheme of fires to support the overall concept of operation. At BCT level FSCoord or the BCT FSO normally writes this

paragraph and ensures it is personally approved by the commander. At battalion level, it is typically the FSO. The scheme of fires describes how the commander intends to use fires to support the concept of operations with emphasis on the scheme of maneuver. The scheme of fires states the fire support tasks and the purpose of each task, and the priorities for, allocation of, and restrictions on fires. The scheme of fires paragraph should include a subparagraph for each type of fire support involved. Appropriate fire support liaison representatives (if available) prepare their respective paragraphs. Refer to Annex D (Fires), if published, as required. The scheme of fires paragraphs and the supporting annex (if any), target lists, schedules, matrices, or other documents make up the fire support plan. The OPORD format is found in FM 6-0. At brigade and higher levels, annexes, appendixes, and tabs are normally written to give more details concerning information in the OPORD. At battalion and lower, a formal written OPORD is often not produced. A fire support plan at battalion level may be an operation overlay with written instructions, a fire support execution matrix (FSEM), and a target list.

D-7. The FSO develops the fire support plan in accordance with the commander's intent and concept of the operation (preparations, counterpreparations, groups, series, and programs of targets). The FSO should:

- Plan targets in depth and other targets that were not planned by the company FSOs but are within the battalion operational area. The battalion FSO begins this fire planning on receipt of the maneuver battalion mission and before the battalion FSO's briefing to the company FSOs or the submission of targets by the company FSOs.
- Coordinate with the FA battalion and maneuver battalion S-2 on all known, suspected, or likely enemy locations; and advise the commander on enemy indirect fire support capabilities and limitations.
- Consolidate target lists from the company FSOs, resolve duplications, and forward the target lists to the brigade FSO and the BCT field artillery battalion fire direction center. Target lists from companies should consist of not more than three to five targets. The battalion FSO should plan no more than 10 to 20 targets. If the number of targets is limited, the fire support plan is more manageable and can be better supported than a fire support plan with a lengthy target list.
- Distribute the consolidated target list to all company FSOs.
- Coordinate requests for additional fire support when the fire support means available at company level are inadequate.
- Develop the battalion fire support plan, and brief the commander and S-3 to obtain approval or further planning guidance.
- Keep the battalion fire support plan current. Adjust the fire support plan as required when intelligence and spot reports are received.
- Keep the commander informed of the capabilities and limitations of all fire support assets that may be made available to the battalion, and advise the commander on all fire support matters.
- Collect information from the various liaison officers, correlate that information, and inform the maneuver commander. As a minimum, this information should include the availability of fire support assets (command or support relationship), suitability, response time, and assigned priorities. The FSO serves as both the FA liaison officer and the representative of the BCT's fire support coordinator. The absence of other liaison or staff officers does not relieve the FSO of his responsibility to keep the maneuver commander informed of all available fire support assets and to keep the FA units informed of the battalion plans and requirements.
- Advise and consult with other fires cell representatives. Supervise the operation of the fires cell.

QUICK FIRE PLAN

D-8. In fire support planning and integration either through AFATDS or manually, a quick fire plan contains all the necessary elements. Fire support officers at a lower echelon (company to BCT) use standardized but flexible techniques to quickly prepare the fire support plan for a maneuver tactical task.

D-9. The maneuver commander must approve the quick fire plan. The FSO develops targets and assigns target numbers to them. In quick fire planning, however, the FSO assigns targets (and possibly a schedule of fires) to the most appropriate fire support means available to support the operation. In fast-moving situations, targets may be developed or planned by the battalion FSO and passed to the company FSOs. The

battalion FSO coordinates fires, while the company FSOs orchestrate the fire plan. In this type of fire support planning, the available time usually does not permit evaluation of targets on the target list and consolidation with targets from related fire support coordination agencies. In a task using a quick fire plan, an FA battery may be directed to provide fire support to a maneuver force. This direct relationship simplifies planning and coordination between the FSO and the battery commander and the fire direction center. See chapter 6 for a full discussion of the quick fire plan at the BCT level. The quick fire plan may also be used at battalion and company levels.

D-10. Table D-1 shows the sequence of actions and possible concurrent activities during the planning and preparation of a quick fire plan at battalion level. The table is based on actions of a battalion commander and the battalion FSO, but the sequence is similar at all levels.

Table D-1. Suggested sequence of actions preparing a quick fire plan (example)

Maneuver Commander or S-3	Fire Support Officer or Forward Observer	FA Battalion S-3 or Firing Unit
1. Briefly describe the task.	2. Inform FA battalion S-3 by situation report and warning order.	3. Inform FA battalion commander and assess BCT priorities.
4. Position mortars and JTACs.	5. Position observers (including joint fires observers) and fire support vehicles.	6. Send availability of firing units and ammunition. Begin positioning.
7. Provide detailed description of task.	8. Assess supportability of the task and inform the maneuver commander.	
	9. Recommend guidance on attack of targets.	
	10. Brief observers.	
11. Re-position mortars as necessary.		12. Re-position firing units as necessary.
		13. Send time check to FSO and firing units.
	14. Give time check to maneuver command, aviation, mortars, and JTACs.	
16. Begin production of target data for firing units.	15. Send target information to mortars, close air support, Army aviation, artillery, and naval gun fire.	17. Begin production of target data for firing units.
19. Prepare mortar ammunition in sufficient quantities.	18. Send schedule of targets to artillery and mortars.	20. Prepare ammunition in sufficient quantities.
21. Mortars and TACP report "READY" on the plan.	22. Brief company FSOs and forward observers.	23. Report "READY" on fire support plan.
	24. Tell maneuver commander "READY" on fire support plan.	
25. Participate in rehearsals	25. Rehearse with all participants.	25. Participate in rehearsals.
	26. Review fire support plan and modify as necessary.	
	27. Join maneuver commander to control fire support plan or go to designated location.	
FA – field artillery FSO - fire support officer	JTAC – Joint terminal attack controller TACP – tactical air control party	

D-11. After the FSO develops the quick fire plan either using AFATDS or manual means, the FSO gets the maneuver commander's approval and forwards the plan to the appropriate fire support agencies. The suggested distribution at battalion level is similar to that of the BCT in appendix B:

- Maneuver commander.
- Mortar fire direction center.
- FA fire direction center.
- Air liaison officer
- Naval gunfire liaison officer.
- Army airspace control officer or aviation liaison officer (if present).

- FISTs.
- Higher headquarters fires cells.

D-12. Once the quick fire plan has been developed, approved, and distributed, the FSO monitors the progress of the operation. The FSO must be prepared to change the original plan as necessary.

FIRE SUPPORT PLAN REHEARSAL

D-13. Rehearsal is a key element to the success of that plan. Rehearsals improve comprehension of the plan and are discussed in detail in chapter 5. Participants who are unclear on specific portions of the plan gain answers through repetition afforded by wargaming the operation. In addition to wargaming possible enemy courses of action, the rehearsal should address other possibilities:

- The use of primary and alternate communications nets.
- Alternate attack systems to be used in the engagement of specific targets.
- Positioning of munitions, observers, and weapon systems.

D-14. The FSEM is ideal for use in the rehearsal, since the rehearsal is normally conducted by performing or reciting the following:

- Actions to occur.
- Possible friendly initiatives.
- Possible reactions to enemy initiatives.
- Control measures.
- Significant events that are to occur in relation to time or phases of an operation.

D-15. There are many ways to conduct rehearsals. When time is limited, there is no time to rehearse everything. Streamline the rehearsal plan and focus the rehearsal on critical events. Some rehearsal methods include:

- Rehearsal on suitable or actual terrain.
- Model rehearsal
- Map rehearsal
- Sand table exercise.
- Radio rehearsal or communications exercise.

D-16. In addition to the fire support plan and maneuver rehearsals, FSOs and FOs also may be key participants in rehearsals of other plans:

- FA support plan.
- Information collection plan.
- Communications plan.
- Special situations.

BATTALION FIRE SUPPORT COORDINATION AND EXECUTION

D-17. The battalion FSO's duties in coordinating and executing fire support include:

- Establish and maintain communication with key personnel, FSOs and fires cells, and units as required.
- Prepare and disseminate fire support documents.
- Monitor status of available fire support assets.
- Receive and act on priorities for fire support requested by the maneuver commander.
- Rehearse the fire support plan with all participants.
- Participate in other maneuver and field artillery rehearsals as required.
- Establish and operate the fires cell in accordance with guidance and SOPs of the supported force commander and the force fires commander.
- Receive and allocate field artillery, mortar, close air support, naval gun fire, aviation, target acquisition, and survey assets as required.

- Establish and allocate priority targets and priority of fires.
- Execute the fire support plan.
- Provide for positive clearance of fires. Ensure the safeguarding of friendly elements.
- Cue target acquisition assets as required.
- Anticipate changes dictated by the developing battle, and recommend revision of the fire support plan if required
- Continually locate and coordinate the attack of targets within the supported unit's operational area.
- Coordinate the attack of targets outside the operational area as required
- Call for, adjust, and direct all types of fire support as required.
- Aggressively prepare and send reports and information to higher and lower fires cells and firing unit headquarters as necessary.
- Be prepared to establish necessary techniques, communications, and capabilities to operate from the tactical command post or from a position or vehicle forward on the battlefield as required.

Maneuver Battalion Tactical and Main Command Post Split Operations

D-18. The supported maneuver battalion may form a tactical command post, such as during fast-moving offensive or retrograde tasks, to maintain communications and facilitate the movement of the main command post. In such circumstances, the commander may designate one of the command post vehicles from the main command post to act as the tactical command post. Some or all of the command group may locate at the tactical command post at various times.

D-19. The command group consists of the commander and those personnel selected to go forward to help control maneuver and fires during battle. The tactical command post typically includes the FSO, the air liaison officer or a joint terminal attack controller, and the S-3.

D-20. There is no requirement for these individuals to collocate. Normally, however, the FSO is either with the commander in the commander's vehicle or in another vehicle nearby the commander during battle. The FSO may occupy the air liaison officer's vehicle as an option if no other vehicle is available.

D-21. Given the limited personnel and equipment resources of battalion fires cells, the FSO must carefully consider how to best use the cell's assets if required to man a tactical CP or go forward in battle. The FSO should have the necessary communications and digital capability available when not physically in the fires cell at the main CP. This will permit digital communications with other FSOs and provide access to the Advanced Field Artillery Tactical Data System. Other requirements for vehicles, radios, and personnel should be included in the tactical standard operating procedure or passed to the commander in the form of a running estimate.

BATTALION FIRE SUPPORT EXECUTION MATRIX

D-22. Chapter 6 describes the preparation of a BCT FSEM. The FSEM explains what aspects of the fire support plan each FSO is responsible for and at what phase during the battle these aspects apply. When approved, the matrix becomes the primary execution tool. A technique is to set up the matrix with the maneuver elements or target executors along the left side and the maneuver control measures (phase lines, events, or times) of the mission along the top. Phases should correspond to phases established on maneuver execution matrices. Format of and information in FSEMs will vary from unit to unit. Standard operating procedures should standardize FSEM preparation to ensure synchronization with maneuver matrices.

D-23. For example, at battalion level the matrix may be used to indicate:

- If priority of an indirect fire support means is allocated to a company or team, indicate the fire support means by an abbreviation of that fire support asset in the appropriate matrix box.
- If an FPF has been allocated, the acronym FPF preceded by the type of indirect fire means responsible for firing that FPF may appear in the box.
- A priority target allocated to a company or platoon may appear in the unit's box as PRI TGT preceded by the means of fire support responsible for firing the target. Once a target is

determined as the priority target, place the corresponding target number in the box. If a certain company FSO is responsible for initiating specific fires, list the target number, group, or series in the box for that FSO. Include in the same box the specific guidelines concerning fires not included on the target list work sheet.

- If an airspace coordination area (ACA) is to be put in effect by a particular FSO, the acronym ACA followed by the code word designated for that ACA may be shown in the box. Also, the time that planned fixed wing air support or attack helicopters are due in the area is listed.
- Other factors that apply to a certain company or team during a specific time frame may also be included in the appropriate box. General guidance may be issued in the written portion of the operation order.

D-24. Figure D-1 shows an example of a completed battalion FSEM for a deliberate attack. In the assembly area, A Company and B Company are allocated field artillery FPFs while C Company is allocated a mortar FPF.

	AA	LD/LC	PL RED	PL BLUE	PL GREEN		
Co A	155 FPF	FA PRI TGT AC 3002	FA GP A3C		MORT SERIES FINISH	MORT FPF	4
Co B	155 FPF	MORT B	MORT B MORT PRI TGT AC3008	MORT A PRI TGT AC3125 MORT B PRI TGT AC3225		155 FPF	3
Co C	MORT FPF	MORT A	MORT A MORT PRI TGT AC3010	FA GP A6C		155 FPF	2
<u>Bn</u> Control		FA GP A4C SERIES JOE	ACA ORANGE, CAS TOT 0800	ACA APPLE, TOT 0815	FA GROUPS A7C, A8C, A9C ACA RAISIN TOT 0900		1
A	B	C	D	E	F	G	
AA – assembly area		ACA – airspace coordination area		<u>Bn</u> – battalion			
CAS – close air support		Co – company		FA – field artillery			
FPF – final protective fire		GP – group		LC – line of contact			
LD – line of departure		MORT – mortar(s)		PL – phase line			
PRI -- priority		TGT -- target		TOT – time on target			

Figure D-1. Battalion fire support execution matrix, deliberate attack

D-25. In Figure D-1, as the units depart the assembly area toward the line of departure or line of contact, priority of field artillery fires changes. Initiate Group A4C and Series JOE in accordance with the guidance of the maneuver battalion commander. If communication with the FSO is lost, unit standard operating procedure specifies that the lead company or team may initiate these fires. The allocation of priorities of fire from the mortar sections are to Company B and Company C.

D-26. As the battalion crosses the line of departure or line of contact, Company A (still in the lead) assumes priority of field artillery fires and is responsible for firing the priority target, Group A3C. Company B

retains priority of Section B mortars with priority target AC3008. Priority of fires for Company C is from Section A mortars, with priority target AC3010. The battalion retains control of the close air support due in the area at 0800. The battalion FSO will place ACA ORANGE in effect to enable the aircraft to attack their target.

D-27. When the lead element crosses Phase Line RED, priority of fires from mortar sections shifts to Company B, with each mortar section responsible for a priority target. Priority for the field artillery fires changes to Company C, and the field artillery is responsible for firing Group A6C. Once again, CAS is due in the area. This time, the TOT is 0815 and the ACA is APPLE.

D-28. As the battalion crosses Phase Line BLUE and begins its final assault on the objective, Company A, with priority of mortar fires, initiates Series FINISH. The battalion FSO initiates Groups A7C, A8C, and A9C that are planned to suppress the objective. Also, CAS is due in at 0900, and the battalion FSO will initiate ACA RAISIN when appropriate.

D-29. Phase Line GREEN is the limit of advance; however, at Phase Line GREEN, priority of fires, FPFs, and the responsibility to initiate certain fires have been allocated (as shown on the matrix) to disrupt the enemy withdrawal and to protect the battalion in case of a counterattack.

COMPANY FIRE SUPPORT PLANNING

D-30. The company fire support officer uses the fire support planning information discussed for both battalion and BCT fire support officers in planning fire support for a company. See Table D-2 for supplemental guidance for company fire support planning.

Table D-2. Company fire support planning guidance

Guidance	Notes
Provide information on the capabilities and limitations of all fire support systems.	Know the systems that may be made available to the company.
Be familiar with enemy indirect fire capabilities and limitations.	Use this information in fire planning to target suspected and likely enemy indirect fire weapon positions. Provide a fires running estimate to the commander. Assist the commander in estimating the situation and in wargaming to develop the concept of the operation. While the commander fights through each action in the wargaming process to determine factors critical to success, the FSO mentally attacks emerging targets with the most effective system.
Keep the maneuver commander informed.	Provide the status, location, and availability of fire support systems, to include their command or support relationship. Know the status of the platoon observers and their locations.
Determine task requirements for all available fire support systems.	This process is both oral and informal. Plan fire support in accordance with the concept of operation by establishing targets that facilitate rapid engagement by both trained and untrained observers. Within a company sector, only a few targets are required to provide for responsive, effective fire support. These targets will normally be at least 500 to 1,000 meters apart. Plan targets on likely enemy avenues of approach and on locations critical to the security of the force. While there is no numerical limit, a company fire support plan of three to five targets is usually enough. A simple fire plan will ensure that the supporting artillery or mortars can execute it without problems. It will also ensure the plan is understood by both fire support and maneuver chains of command.
Complete the company fire support plan.	Resolve duplications and assign target numbers. Brief the company commander to obtain the commander's approval.
Pass targets to the battalion fires cell.	Do this as soon as possible.
Brief FIST personnel on the company fire plan.	The company commander's fire plan includes the plan for direct fires and the fire support plan. Provide a copy of the fire support execution matrix to each platoon and to the company headquarters.
Modify and update target lists and the fire support execution matrix as the situation develops.	Include priority targets if allocated by the battalion fires cell.
In the defense, plan FPFs to stop enemy movement across defensive lines or areas.	Integrate planned FPFs with the commander's defensive plans. The supported company commander or platoon leader in whose area the FPFs are located retains the authority to call for the FPFs.
Give guidance to observers.	Ensure the observers understand their respective areas of responsibility, trigger points, assigned communications net call signs and frequencies, laser codes, automation system addresses, and so forth.
Consider late-breaking intelligence or spot reports in the development of the fire support plan.	Keep the plan current with the situation. Be prepared to develop a quick fire plan if needed.
FPF – final protective fire FIST – fire support team FSO – fire support officer	

COMPANY FIRE SUPPORT COORDINATION AND EXECUTION

D-31. The company FSO's duties in coordinating and executing fire support include:

- Establish and maintain communications with forward observers, battalion FSO, battalion fires cell and FSO, and mortar and artillery units as required.
- Prepare and disseminate fire support documents.

- Monitor the status of available fire support assets.
- Receive and act on priorities for fire support requested by the maneuver commander.
- Rehearse the fire support plan with all participants.
- Execute the fire support plan.
- Provide for positive clearance of fires. Ensure the safeguarding of friendly elements.
- Cue target acquisition assets as required
- Manage lasing operations.
- Anticipate changes dictated by the developing battle, and recommend revision of the fire support plan if required.
- Continually locate and coordinate the attack of targets within the supported unit's operational area.
- Call for, adjust, or direct all types of fire support as required.
- Aggressively prepare and send reports and information to the battalion fires cell and FSO, and firing unit headquarters as necessary.
- Be prepared to operate the laser rangefinder and designator, communications equipment and the fire support vehicle if necessary.
- Be prepared to assume command or control in the platoon or company due to casualties during battle.

COMPANY FIRE SUPPORT EXECUTION MATRIX

D-32. The FSEM for a company may be as simple as a hand-drawn matrix listing the platoons, phase lines, and minimal necessary information. Figure D-2 is an example of a more elaborate completed FSEM for a company. Using this type of format, the FSO can depict fire-support-related information for an operation together with the matrix. A format of this type might be used if a formal written OPORD or separate fire support annex were not prepared.

D-33. The FSEM examples in Figures D-1 (on page D-7) and D-2 are illustrative only. Tailor the matrix preparation, format, and content to unit needs. Identify the FSEM preparation steps in local standard operating procedures.

Commander's Intent for fire support: Smoke on BB1001 to cover our initial movement across the LD. Fire Group B1B on Obj FOX as 2d and 3d platoons cross PL BLUE. Use BB3109 to help block a counterattack from Hill 333.

Tgt#	Grid	Description	Trigger Point	Execution			
				Primary	Alternate		
BB1001	123456	Smoke OP	When 1 st plt is ready to cross LD	1 st plt ldr	FSO		
BB1002 (Group B1B)	123567	Suspected Inf squad		Co Cdr	2d plt		
BB3108 (Group B1B)	135467	AT Position	2d and 3d plts cross PL BLUE	Co Cdr	2d plt		
BB3109	143335	Road junction	If counterattack from Hill 333 at 146476	2d plt ldr	3d plt ldr		
BB2102	136324	Suspected AT Position	If receive fire from position	FSO	XO		
High-payoff targets: All AT positions							
Actions Upon XO monitors 120-mm mortar net for fire support coordination.							
Loss of FSO: Plt ldrs switch to FA net or the mortar net to fire missions.							
Priority of Fire	Cross LD		Cross PL BLUE		Ammunition Available	Day 05	Day 06
	FA	MORT	FA	MORT	FA – HE 1-6 Bn 3 rds	FA net 31-10	45.50
Co	1 st Plt	1 st Plt	2d Plt	2d Plt	FA – Smk 25 min	Mort Net 56.00	44.50
Bn	Co A	Co B	Co A	Co B	Mort – HE 22 plt 6 rds Mort – Smk 20 min	Mort FDC D34	W45
BCT	3-37		3-37			FA FDC F7M33	H6L78
						K98	P72
Coordinating instructions: 1. Shoot 120-mm mortar smoke on BB1001. 2. Group B1B are FA priority targets. 3. Shoot immediately any antiaircraft targets							
AT – antitank BCT – brigade combat team bn – battalion cdr – commander	co – company FA – field artillery FDC – fire direction center FSO – fire support officer HE – high explosive	inf – infantry LD – line of departure ldr – leader min – minute	mm – millimeter mort – mortar obj – objective OP – observation post pl – phase line	plt – platoon rds – rounds smk – smoke XO – executive officer			

Figure D-2. FSEM for a company deliberate attack example

DUTIES OF FIRE SUPPORT TEAM PERSONNEL

D-34. A field artillery FIST plans and coordinates all available company supporting fires, including mortars, field artillery, naval surface fire support, and close air support integration. FISTs assist maneuver NCOs in training the maneuver Soldiers in the call for fire and basic knowledge of indirect fire assets.

D-35. FISTs employed at company level provide maneuver companies and cavalry troops with fire support coordination, targeting, input for terminal attack control, and assessment capabilities. Forward observers are trained to adjust ground or naval gunfire and pass back battlefield information.

D-36. Fire support personnel with additional training and certification may be qualified as joint fires observers. Platoon joint fires observers have target acquisition devices that assist in accurately locating targets and the communications equipment needed to call for fire and conduct terminal guidance operations. The joint fires observer provides the capability to exploit the tactical environment by using supporting air delivered fires.

D-37. A joint fires observer in the company is frequently collocated with the platoon leader. Joint fires observers provide target refinement, submit key targets to the company fire plan (limited fire planning), advise the platoon leader on all indirect fire support matters; prepare, maintain, and use situation maps, designate targets for smart munitions, report combat information, execute planned fires, and request and adjust fires for their supported platoons.

SECTION II - TARGETING AND TARGETS

D-38. There are two targeting categories - deliberate targeting and dynamic targeting. See ATP 3-60 for detailed discussion of the targeting process.

DELIBERATE TARGETING

D-39. Examples of deliberate targeting range from targets on target lists in the applicable plan or order to those targets detected in sufficient time to be placed in the joint air tasking cycle, mission type orders, or fire support plans.

D-40. Planned targets include scheduled and on-call targets:

- Scheduled target – A planned target on which fire is to be delivered at a specific time.
- On-call target – A planned target other than a scheduled target on which fire is to be delivered when requested.

DYNAMIC TARGETING

D-41. Dynamic targeting prosecutes targets of opportunity and changes to planned targets or objectives. A *target of opportunity* is 1. A target identified too late, or not selected for action in time, to be included in deliberate targeting that, when detected or located, meets criteria specific to achieving objectives and is processed using dynamic targeting. 2. A target visible to a surface or air sensor or observer, which is within range of available weapons and against which fire has not been scheduled or requested (JP 3-60). Targets engaged as part of dynamic targeting are previously unanticipated, unplanned, or newly detected.

D-42. Targets engaged as part of dynamic targeting are previously unanticipated, unplanned, or newly detected. There are two types of targets of opportunity: unplanned and unanticipated:

- Unplanned targets – Targets known to exist in the area of operations, but no action has been planned against them. The target may not have been detected or located in sufficient time to meet planning deadlines. Alternatively, the target may have been located, but not previously considered of sufficient importance to engage.
- Unanticipated targets – Targets that are unknown or not expected to exist in the area of operations.

FINAL PROTECTIVE FIRE

D-43. In fire support operations, an FPF is continuous artillery or mortar fires fired on a predetermined target:

- Fire the FPF at the maximum rate of fire until the firing unit is requested to stop, ammunition is exhausted, or the firing unit is forced to move.
- The brigade commander normally allocates field artillery FPFs to battalion, which may allocate to company level.
- The battalion commander normally allocates battalion controlled mortars to company level.
- Authority to shoot an FPF is that of the lowest maneuver commander in whose area the FPF is placed or his authorized representative.

D-44. The FIST has the responsibility to adjust in the FPF when the tactical situation dictates. The FIST may adjust one gun or all guns designated to fire the FPF. Cancel the FPF when it is no longer needed.

D-45. Table D-3 gives information necessary to plan FPFs. The FPF widths in the table are neither precise nor restrictive. The sheafs can be opened or closed to cover the specific terrain on which the FPF is located. The table is derived from data on the bursting diameter of rounds extracted from various sources. The bursting diameter of an HE round is generally considered to be twice the distance from the point of impact at which the round will reliably place one lethal fragment per square meter of target.

Table D-3. Final protective fire planning data

SIZE	TYPE	NUMBER OF MORTARS OR GUNS	APPROXIMATE WIDTH	SIZE
120-mm	M285	6 (platoon)	350	60
120-mm	M285	3 (section)	180	60
81-mm	M29A1	4 (platoon)	160	40
81-mm	M29A1	3 (section)	120	40
81 mm	M252	4 (platoon)	150	50
60-mm	M224	2 (section)	75	30
105-mm	Howitzer	3 guns	105	35
105-mm	Howitzer	6 guns	210	35
155-mm	Howitzer	3 guns	150	50
155-mm	Howitzer	6 guns	300	50

mm – millimeter

TIME-SENSITIVE TARGETS

D-46. A *time-sensitive target* is a joint force commander validated target or set of targets requiring immediate response because it is a highly lucrative, fleeting target of opportunity or it poses (or will soon pose) a danger to friendly forces (JP 3-60). A time-sensitive target is a joint force commander designated target or target type of such high importance to the accomplishment of the joint force commander mission and objectives or one that presents such a significant strategic or operational threat to friendly forces or allies, that the joint force commander dedicates intelligence collection and attack assets to ensure success.

SENSITIVE TARGETS

D-47. Certain targets require special care or caution in treatment because failure to engage them or to engage them improperly can lead to major adverse consequences. Examples include leadership targets (high-value individuals who must be handled sensitively due to potential political repercussions); targets located in areas with a high risk of collateral damage; and weapons of mass destruction facilities where an attack can lead to major long term environmental damage.

TYPES OF TARGETS

D-48. Fire support personnel use standard terms and symbols to prepare maps, charts, and overlays to identify targets by type (point, linear, rectangular circular, FPF, or target reference point). Table D-4 identifies the types of targets. See ATP 3-09.30 for additional information.

Table D-4. Types of targets

Target Type	Dimensions	Notes
Point target.	Less than or equal to 200 meters in width and length	Minimum accuracy of the target location on the target list is a six digit grid.
Linear target	Greater than 200 meters in length and less than or equal to 200 meters in width.	Designate a linear target by two grids or by a center grid, a length, and an attitude.
Rectangular target	Greater than 200 meters in length and width.	Describe on the target list by four grids or by a center grid, a length, width, and an attitude.
Circular target	A circular pattern or vague as to exact composition and has a radius greater than 100 meters.	Designate on a target list by a center grid and radius greater than 100 meters.
Final protective fire	Dependent upon weapon caliber and number of guns firing.	
Target reference point	May also be identified as a point target.	An easily recognizable point on the ground (either natural or man-made) used to initiate, distribute, and control fires. A target reference point can also designate the center of an area where the commander plans to rapidly distribute or converge fires.

Appendix E

Environmental And Terrain Considerations For Fire Support

The sections of this appendix are designed to be a quick-reference resource of information on aspects of environmental and terrain considerations that affect fire support. Section I begins with field artillery operating in mountainous terrain. Section II is devoted to operations in the jungle. Section III is discusses desert considerations.

SECTION I – MOUNTAIN OPERATIONS

E-1. In combat operations, mountains generally are characterized by rugged, compartmented terrain; steep slopes; and few natural or man-made lines of communication. The weather spans the entire spectrum from extreme cold, with ice and snow, to extreme heat in some areas. Vegetation can vary from dense jungle to barren waste. Variability of weather over short periods of time and of vegetation from area to area significantly influences both maneuver and fire support operations.

MUNITIONS

E-2. Munitions effects are affected by the environment and terrain. Intelligence preparation of the battlefield helps determine where and what munitions are most effective.

E-3. In snow:

- Field artillery mines may settle into the snow off-vertical. At temperatures lower than -15°C , very little settling occurs.
- Variable time and time fuzes are most effective in most cases.
- HE – point detonating, HE-delay, and improved conventional munitions are ineffective because at least 40 percent of the effects are muted by the snow.
- The phosphorus in White Phosphorus can burn undetected in snow for up to four days.

E-4. In rocky terrain:

- HE-point detonating is very effective because it produces extra fragmentation from splintering rocks.
- Variable time and time fuzes are very effective because the burst covers a larger area than HE-point detonating on reverse slopes.
- ICM are effective; however, when fired into forested areas, they can hang up in trees.
- Field artillery mines are effective to deny the enemy the use of narrow defiles, valleys, roads, and usable terrain.

E-5. When smoke and illumination are used:

- Swirling winds make smoke employment very difficult to adjust and maintain.
- Close coordination is required with adjacent elements to ensure that- their vision is not obscured or that they are not highlighted.
- Mortars are ideal for targets on reverse slopes and over intermediate crests because of their high-angle fires.
- Airbursts on reverse slopes are extremely effective.

TARGET ACQUISITION AND OBSERVATION

E-6. The following are considerations when forward observers are involved in mountain operations:

- The observers should be positioned on high ground and spread out to overcome terrain masks and compartments.
- The observers may need mountaineering equipment to get to the best positions, or they may be airlifted.
- Terrain sketches and visibility diagrams are useful to deliver fast, accurate fires and to identify blind spots.
- Heavy fogs or low clouds may obscure observation.
- Observers (without laser rangefinders) who are looking up tend to underestimate range, whereas observers looking down tend to overestimate range.
- Sunglasses may be required if terrain is covered with snow.

E-7. Air observers:

- Are very effective to observe beyond terrain masks, in deep defilade, and on reverse slopes.
- Complement the FIST observers.
- Can be used to detect deep targets
- May be confined to valleys and lower elevations because thin air at high elevations makes flying difficult.

E-8. Radar considerations in mountain operations include:

- Radars should concentrate on terrain that can be occupied by artillery and mortars (as determined by IPB).
- Terrain masks can degrade the effective range of the radar.
- Additional use of ground surveillance radars and remote sensors may be required.
- More extensive use of shelling reports may be required.

TARGETING

E-9. The intelligence officer's IPB should identify the following:

- Routes that can be used by the enemy to attack, withdraw, and resupply.
- Likely position areas for enemy indirect fire assets, command and control elements, support assets, and observation posts.
- Terrain that is subject to snows slides, rockslides, or avalanches. These may deny the enemy use of roads and trails and may destroy elements in defilade.

POSITIONING

E-10. Usually, position areas for mortars and artillery are limited and access thereto may be restricted. Because of the need to fire high-angle, it is important that the mortars and artillery be positioned in defilade. to increase their survivability. Positioning considerations include:

- Helicopters should be used to airlift artillery into position areas. These air assets also may be required to provide ammunition resupply.
- Helicopters may be useful in performing survey by use of Doppler radar.
- Positioning along dry river beds is hazardous because of the danger of flash flooding.
- Towns and cities usually have flat areas (school yards, parks, stadiums, and so forth) that can accommodate firing batteries. However, these towns and cities are often enemy objectives and may be targeted.
- Most mountainous flat land is farmland and is difficult for towed artillery to negotiate from spring to fall. However, in winter, if the ground is frozen, farmland provides good firing positions for mortars and artillery.

CLOSE AIR SUPPORT

E-11. Because the terrain forces the enemy to concentrate his forces along roads, valleys, reverse slopes, and deep defilades, close air support is very effective. However, the terrain also restricts the attack direction

of the close air support strikes. The enemy also conducts intelligence preparation of the battlefield to determine the likely direction of the close air support strikes and will weight his air defenses along those routes. The FSO must aggressively identify the enemy air defense systems and target them to enhance the survivability of the close air support assets.

COMMUNICATIONS

E-12. Communications considerations in mountain operations include:

- Place antennas on sides of hills or mountains.
- Make maximum use of directional antennas.
- Plan to use retransmission capabilities.

SECTION II – JUNGLE OPERATIONS

E-13. Jungle operations are usually carried out by infantry forces. Fire support may be limited to indirect fires and air support. Because small-unit operations are commonplace, greater challenges accrue to the fire support personnel at company and battalion levels.

MUNITIONS

E-14. In jungle terrain, most contact with the enemy is at extremely close range. If the friendly force has a substantial advantage in fire support, the enemy will most likely try to come in as close as possible and maintain that close contact. Thus, the friendly force commander cannot use his fire support advantage without inflicting casualties on his own troops. Therefore, a knowledge of the type of munitions best suited for the terrain and how to employ them is vital. For example, in triple-canopy jungle:

- HE-delay penetrates the treetops and splinters the trees, creating additional fragmentation (splintering effect).
- Smoke has limited effectiveness.
- WP is effective as a marking round and in initial adjustments.

TARGET ACQUISITION AND OBSERVATION

E-15. The triple-canopy jungle makes observation beyond 25 to 50 meters very difficult. The jungle also makes map reading, self-location, target location, and friendly unit location very difficult.

E-16. Forward Observers. Experience from World War II (WWII) and Vietnam showed that forward observers must be able to adjust mortar and field artillery fire by sound, because often they cannot see the rounds to adjust them. This sound adjustment is very difficult and requires experience. Greater accuracy can result from the recommended adjustments of two or more forward observers. The battery fire direction center can help by announcing **SPLASH** to let the forward observer know when the round should impact. The observer then counts the seconds until he hears the round detonate. By multiplying the seconds by the speed of sound, the observer can estimate the range to impact. The speed of sound is approximately 350 meters per second. The speed of sound varies according to temperature, wind speed and direction, relative humidity, and air density; but 350 meters per second should be used as a start point.

E-17. The forward observer must determine the observer location and ensure that the battery fire direction center has it plotted. The forward observer then determines the direction to the target and selects a target grid 1,000 meters along the direction to the target. Using that direction and target grid, the forward observer sends a call for fire to the fire direction center. Add 1,000 meters to the forward observer's position for safety.

E-18. When the initial adjusting round impacts, the forward observer uses that impact as a known point. The forward observer determines the direction to the round, measures the difference between the direction to the target and the impact of the initial round, computes the lateral correction, and makes a range correction, if necessary. Using the shift from a known point call for fire, the forward observer sends the data to the fire direction center, reporting the new direction.

E-19. If the FO's position location is poor, the initial round location will be poor too. The forward observer can use the initial round to re-determine his location. For example, the forward observer's call for fire told the fire direction center to fire grid 123456, direction 0200. The round impact is nowhere near the target. The forward observer then determines the direction and range to the burst. The forward observer plots a back-azimuth from the burst and estimates range along that direction to replot the forward observer's position. Then, using the new position location, forward observer reinitiates the mission.

E-20. Vietnam and WWII also showed that the first round in adjustment should be white phosphorous. Because both the forward observer's location and the location of other friendly elements may have been doubtful, white phosphorous was usually fired first to avoid inflicting casualties on friendly personnel. (Using a 200-meter height of burst can help the forward observer see the first round.)

E-21. Creeping fires were also used extensively in Vietnam and WWII. The forward observer adds 300 to 400 meters to the target location in case the forward observer's position location is wrong. Then the forward observer makes corrections of no more than 50 meters until the fires are on target. In Vietnam, this process sometimes started with an air observer and was taken over by the ground observer once the ground observer was able to see the rounds. The air observer was often required to relay fire requests from the ground because the terrain severely limited the ranges of radio communications. The creeping method of adjustment is used exclusively during danger close missions. The observer makes range changes by using corrections of 100 meters or less and creeping the rounds to the target. The observer must know where all friendly troops are to avoid endangering them. All weapons that will fire for effect are used in adjustment. For battalion missions, batteries should be adjusted individually.

E-22. Marking rounds can be fired to help the forward observer determine his own location. The use of marking rounds also helps ensure that the fire direction center knows in what area the friendly unit is, which ensures more responsive fires. A marking round is usually white phosphorous fired 300 to 400 meters forward of friendly units at 200 meters height of burst. The fire direction center plots a target, fires a white phosphorous round, and sends the grid of the white phosphorous impact to the forward observer. The forward observer then has a known position on which to orient.

E-23. Because of the close combat, laser range finders may not be of great use; however, night vision devices are extremely critical.

E-24. Air observers. Air observers can be important in jungle warfare. They can detect enemy movements that ground forces have no way of seeing. They can act in concert with ground observers to deliver accurate fires on enemy elements in close contact with friendly forces. Also, the air observers can relay calls for fire from ground elements to the fire direction center.

E-25. Air observers can help direct close air support assets against enemy targets. Because ground observers cannot see the whole battlefield, the air observer marks targets for the close air support sortie (by use of flares, white phosphorous, or smoke). Caution must be taken, and positive identification of the target must be made.

E-26. Field Artillery Radars. Radars are extremely effective in the jungle, since most indirect fires are high-angle fires. In stability operations, many targets detected by the radars are fleeting in nature (shoot and move) and the radar must be tied in with an indirect fire support asset to ensure quick counterfire.

E-27. Also, most enemy indirect fires will be directed against friendly unit positions. Therefore, the radars should be oriented so as to locate those enemy fires.

E-28. Ground surveillance radars and remote sensors must be used. Shelling reports may not be as effective because the enemy shoots and moves quickly.

TARGETING

E-29. Targeting is very difficult because of the triple canopy and the fluid nature of the conflict. Experience with the particular enemy will provide some targets indicated by the enemy's past performance and techniques.

E-30. Plan targets:

- To support the scheme of maneuver.
- Along roads and trails.
- At likely ambush sites.
- Around clearings.
- At river or stream crossings.
- Around built-up areas.

E-31. Also, isolated units will prepare 360-degree defenses. Plan FPFs to support that defensive posture. Consider recommending to the supporting field artillery battalion commander a munition-specific required supply rate to support the operation.

POSITIONING

E-32. Often, firing positions for field artillery and mortars are very limited; and some positions may be inaccessible by roads. While mortars may be dismounted and airlifted into position, artillery will be severely limited in its movement and ability to position. Platoons may have to be widely separated, increasing the difficulty of mutual defense and resupply. Each position must have 6,400-mil firing capability, regardless of weapon types. Remember that a position occupied too long is subject to ground attack. Also, the enemy will quickly determine the range of weapons in that position and stay out of their range. If global positioning systems are not available, consider using a helicopter-mounted position azimuth determining system or Doppler radar to survey air-inserted mortar positions inaccessible by road.

CLOSE AIR SUPPORT

E-33. Close air support can be effective in the jungle but hard to control because of the inability of the pilot to see the friendly ground elements. Also, because the combat is usually of such close nature, the delivery of the munitions must be closely controlled to avoid injuring friendly personnel.

E-34. Pyrotechnics should be used to mark friendly forces and the target area. An air observer or JTAC, if available, should control the air strike. It is extremely important that the method used for this marking not be duplicated by the enemy. Strict security is required.

E-35. Heavy bombs (2,000 to 3,000 pounds) with fuze extenders can clear away the jungle canopy. Many Air Force cluster munitions are designed to penetrate jungle canopy. Depending on the type and quantity delivered, bomblets are effective against area targets consisting of personnel, light materiel, and armor.

COMMUNICATIONS

E-36. Communications considerations for jungle operations include:

- Remember that communications in a triple-canopy jungle are severely degraded.
- Elevate antennas above the canopy, when possible.
- Use air observers or airborne command platforms as relay stations.
- Consider using directional antennas.
- Plan to use retransmission assets.

SECTION III – DESERT OPERATIONS

E-37. The three types of desert terrain are mountainous, rocky plateau, and sandy or dune-type desert. Fire support planning and considerations vary significantly between operations in each type of desert terrain. Often, those considerations resemble those for other environments, such as arctic and mountain. The type of terrain in the area of operations must be analyzed before effective fire support planning can be performed. Tactics, techniques, and employment of munitions are greatly affected by the different terrain characteristics. Restricted desert terrain can offer significant disadvantages for movement and emplacement of indirect fire systems, depending on the trafficability of the surrounding valley areas.

MUNITIONS

E-38. Mountain Deserts. Munitions effectiveness in mountain deserts is the same as in any mountainous region except that the considerations involving snow usually do not apply. The following are added considerations:

- HE-PD is very effective because of the extra fragmentation created by splintering rocks.
- Improved conventional munitions are very effective.
- Field artillery mines are very effective and should be used to deny the enemy the use of roads, valleys, narrow defiles, and level terrain.
- Smoke and illumination may be degraded by swirling winds. They must be closely coordinated with adjacent units to ensure that the vision of adjacent troops is not obscured or troops are not highlighted. Both smoke and illuminating shells can be used to silhouette the enemy.
- Airbursts on reverse slopes are extremely effective.

E-39. Rocky Plateau Deserts. The following are munitions considerations in rocky plateau desert operations:

- HE-point detonating is extremely effective. It creates extra fragments by splintering rocks.
- Variable time and time fuzes are effective.
- Improved conventional munitions are very effective.
- Field artillery mines are very effective and should be employed with the natural terrain to force the enemy into unnavigable terrain.
- Smoke and illumination may be degraded by high winds but may be used to silhouette the enemy.

E-40. Sandy or Dune Deserts. In sandy or dune deserts, the following are munitions considerations:

- HE with PD or delay fuze is smothered by deep sand, which makes it ineffective.
- VT and time fuzes are very effective.
- ICM and FASCAM are smothered by deep sand, which makes them ineffective.
- Smoke and illumination are effective and can be used to silhouette the enemy.

TARGET ACQUISITION AND OBSERVATION

E-41. Forward Observers. Determining location is often very difficult in rocky plateau and sandy or dune deserts. Maps are often inaccurate, dunes shift, and heat waves hamper distance estimations. Where global positioning equipment is not available, pace count, odometer readings, and resection from available key terrain features may be the best of a few options for self-location essential for day and night navigation.

E-42. Forward observers can detect targets by observing dust clouds created by moving enemy forces. Dust clouds created by impacting rounds sometimes make subsequent adjustments difficult. Usually, adjustment of fires by a forward observer is enhanced when the initial round impacts beyond the target. Laser range finders must be used, especially when heat waves degrade distance estimating by other conventional means.

E-43. The forward observer should consider using smoke behind the enemy to silhouette him. At night, illumination burning on the ground behind the enemy has the same effect.

E-44. The sameness of colors in the desert makes specific targets hard to spot. Laser range finders may need to be adjusted several times a day because of temperature changes.

E-45. Most open desert terrain allows a faster or an unimpeded approach and more maneuver space for mechanized forces. Use of trigger points and long-range observation capabilities is critical for effective engagement with available fire support systems. Fast-moving formations are best engaged with fixed-wing assets and attack helicopters.

E-46. Increased equipment failure can be expected as a result of heat, sand, and dust. Especially susceptible are radios, automation systems, and other electronic equipment.

E-47. Air Observers. Aircraft can be used for target acquisition, coordination of fire support, and adjustment of fires in flat terrain or in a desert of rolling sand dunes. The difficulty of aerial navigation in flat desert terrain is a disadvantage that must be planned for. The absence of terrain features in an open desert makes aircraft more vulnerable to enemy air defense.

E-48. Because of the ability to see great distances and the featureless terrain of an open desert, positive identification of friendly troops requires special measures. More than usual coordination may be required, with prearranged signals and procedures established for friendly force locations. Maintaining continuous communications on fire support and mission command nets with aviation elements operating in sector is even more critical.

E-49. Radars. Radars are highly effective in the desert. However, they may have to be repositioned more often because the flat terrain does not provide adequate screening crests.

TARGETING

E-50. A thorough intelligence preparation of the battlefield must be conducted to:

- Identify passable terrain for wheeled and tracked vehicles.
- Identify likely mortar and artillery positions.
- Assess the impact of wadis, gulches, and other significant terrain on friendly and enemy mobility.
- Identify likely enemy forward observation positions.
- Identify antitank guided missile systems and air defense systems as priority targets.

E-51. Plan the correct munitions for targets:

- Improved conventional munitions and field artillery mines for roads in restricted terrain.
- Field artillery mines to deny the enemy navigable terrain and to try to force him into wadis and gulches.
- Variable time on reverse slopes.
- Variable time and time fuzes on targets in deep, sandy deserts.
- Smoke during the day and ground-burning illumination at night to silhouette the enemy.
- Smoke and white phosphorous against likely enemy observation posts.
- HE with point detonating fuzes on targets in rocky terrain.

POSITIONING

E-52. Common Grid. The limited number of available artillery systems requires the use of a common grid based on the best available survey data. Terrain association techniques (map spots) may be inadequate for positioning indirect fire systems.

E-53. Concealment. The artillery and mortars should move under cover of darkness, because enemy observers can detect the movement or at least the dust from the movement of vehicles. Resupply should also be conducted at night, preferably en route between positions. Appropriate color of equipment and camouflage systems is essential for effective concealment of firing positions.

E-54. Emplacement in wadis and gulches offers the best concealment. However, it entails some degree of risk as the result of unexpected flash flooding (size of wadis is relative to degree of risk).

E-55. Movement. Trafficability through the dunes may be severely degraded. The absence of roads in the direction of our movement will further slow moves.

E-56. Position Area Selection. Positioning on rocky soil away from roads reduces the dust hazard during air assault operations. Sandy deserts may be a problem for some towed artillery and mortars. Solid ground to secure some firing systems' platforms or baseplates and spades may be rare in certain areas.

CLOSE AIR SUPPORT

E-57. Air support aircraft may be more vulnerable because of the lack of covered approaches. Suppression of enemy air defenses is very important. However, the greater visibility common in most deserts allows target engagement from better standoff ranges.

E-58. Detailed planning for close air support is important because of wide dispersion of units. Marker panels or other visual or electronic signatures are required to help the pilot differentiate between friend and foe.

SECTION IV – NIGHT OPERATIONS

E-59. Some specific reasons for night combat include:

- To achieve surprise and to avoid heavy losses that might be incurred in daylight operations over the same terrain.
- To compensate for advantages held by an enemy with superior forces or air superiority.
- To counter the enemy night operations.
- To retain the initiative or freedom of action.
- To exploit the technological advantage of our forces at night over a less sophisticated enemy.

E-60. Movement and land navigation are more difficult at night. This is largely because of problems with terrain recognition. If navigation aids such as global positioning equipment is not available, maintaining direction while moving is extremely difficult at night.

E-61. Target acquisition and engagement ranges are limited to the capabilities of night vision devices. Controlling the direct fires is critical at night. Control requires effective communications to ensure engagement of the correct targets.

FIRE SUPPORT

E-62. The main consideration in supporting night combat with field artillery, mortars, tactical aircraft, and naval gunfire is the ability to detect the target and coordinate the attack. Illumination and smoke assets probably will be in short supply. If their use is critical to the success of an operation, the FSO must know the specific area in which the commander desires to use smoke and illumination and for what purpose. Plan smoke at night to degrade enemy night vision capabilities. If too little ammunition is available, take action to alleviate the shortfall well in advance.

E-63. At night, the adjustment of fires without the aid of radars, artificial illumination, or sound ranging is virtually impossible. If adjustment of fires on critical targets is required, do it during daylight if possible. If not possible to adjust the target during daylight, allocate target acquisition assets for adjustment of fires.

E-64. The FSO plays a critical role if CAS or attack helicopters are used in night operations. These weapon platforms may not be equipped with adequate night vision equipment. Their effectiveness will depend on the ability of the force to illuminate targets. Additional coordination between the FSO, maneuver S-3, or G-3 air, and ALO is needed to integrate sorties and plan illumination for their use.

NIGHT OFFENSIVE OPERATIONS

E-65. In planning a night attack, the commander must decide what type of attack to conduct. His decision is based on the required fire support.

E-66. Illuminated and Non-illuminated Attacks. An illuminated attack is used when the possibility of achieving surprise is remote, when the enemy has night vision devices, and where control of units overrides the need for stealth.

E-67. Commanders often use non-illuminated attacks when the enemy lacks night vision devices but devices are available to friendly forces. Another reason is when friendly forces plan to use stealth to achieve surprise and close on a position before the enemy discovers the attack. Even though the

commander wishes to conduct a non-illuminated attack, always plan for illumination. It is executed only on the commander's authority.

E-68. Execution of Planned Fires. Stealth and surprise may be more important to the attack objectives than the effects expected by preparation fires. Use of preparation fires alerts the enemy to the objectives of the attack and may compromise any night advantages. However, always plan for these fires. The non-illuminated attack with on-call fires offers a better opportunity for surprise.

E-69. Night Offensive Fire Support Considerations. Prearranged visual signals such as hand-held flares can be used for initiating or canceling fires (air support and schedules of fire such as groups).

E-70. When fires are shifted, they should be moved beyond the friendly unit limit of advance. Illuminating fires may not be fired but should be planned. Time illumination over the objective to burn out approximately 300 meters above the ground. Illumination beyond the objective should be allowed to burn on the ground to silhouette the defenders on the objective and to provide a heading reference for friendly forces. Also, illumination can be placed on several locations over a wide area to confuse the enemy as to the exact place of the attack. Once used, illumination should probably be continuous, because friendly troops will have temporarily lost their night vision.

E-71. Smoke can be used to degrade enemy night vision devices. It should be placed in front of the enemy, Smoke also can be used when key terrain is to be bypassed. However, smoke on the objective during the final assault conceals enemy locations. Only thermal devices can see through some types of smoke.

E-72. Place FSCMs on identifiable terrain. Place permissive measures well in front of friendly forces. Restrictive measures should be used minimally and must provide the safety required yet not complicate clearing fires at night. These measures must be disseminated and understood by all friendly elements.

E-73. Plan suppressive fires for the final assault to the objective and beyond the limit of advance to stop enemy force retreat or reinforcement.

NIGHT DEFENSIVE OPERATIONS

E-74. The effective employment of fire support is critical to the successful night defense. As with the offense, daylight planning and coordination considerations are used in addition to considerations for night defense, which include:

- Use on-call fires to engage enemy forces as they attack or probe the defense.
- Plan illumination fires although the appropriate maneuver commander is the approving authority for defensive illumination fires. This is to preclude accidental illumination of friendly activity such as patrols and engineer activities. When used, drop visible illumination above and behind attacking forces to silhouette them.
- Adjust fires, especially FPFs, during daylight, if possible.
- Use smoke to slow, confuse, and disorient attacking forces.
- Plan field artillery delivered mines in coordination with the engineer to separate forces, disrupt formations, and plug gaps in the defense.
- Plan permissive fire support measures as close to friendly troops as possible; however, measures should be placed on positively identifiable terrain.
- Plan restrictive measures, if required, on easily identifiable terrain to provide safety to friendly elements.

SECTION V – CONTINUOUS OPERATIONS

E-75. Physiological aspects of continuous operations include those factors that degrade the Soldier's physical ability to function. Sleep loss and fatigue induced by night operations magnify stress.

E-76. After 48 hours of sustained activity, loss of sleep becomes the most significant degrader of Soldier performance on the battlefield. As sleep loss begins to accumulate, both physical and mental effects are observed in varying degrees.

E-77. Most of the following effects can occur after 24 hours without sleep:

- Tasks may be omitted as a result of a momentary lapse into sleep (falling asleep with eyes open).
- Vigilance decreases rapidly, resulting in missed critical signals.
- Ability to focus on a task for more than a brief period decreases noticeably.
- Memory becomes faulty, particularly short-term memory. This makes it difficult to learn new information, follow instructions, or remember recent decisions.
- Response to events or instructions slows. One seems to be operating in a daze.
- The ability to formulate and make sense from information becomes severely degraded. It takes longer to perform simple tasks such as plotting grid coordinates. Accuracy suffers.
- The ability to reason logically is degraded, which may result in snap judgments.
- Problems with communication arise. One has difficulty understanding or articulating even simple messages.
- A wide range of mood changes, characterized by depression, anger, lack of patience, and euphoria, can occur.

E-78. Sleep loss is cumulative over time. The number of hours needed to recover is directly related to the number of hours sleep was deprived. As a rule of thumb, a minimum of 6 hours rest is required for every 24 hours without sleep.

E-79. Fatigue is the result of excessive work and sleep loss. The latent effects of fatigue may linger for about 3 days following sleep deprivation of 48 hours or more.

SECTION VI – COLD WEATHER OPERATIONS

E-80. Fire planning for cold weather operations is no different than that required for more temperate regions. However, the fire support planner must consider that artillery weapon systems may have limited mobility in snow and ice that will also affect ammunition supply and increase time to accomplish tasks.

MUNITIONS

E-81. The following are considerations in the employment of various munitions in cold weather operations:

- Make maximum use of airburst munitions.
- HE-point detonating, HE-delay, improved conventional munitions, and field artillery delivered mines are ineffective in deep snow and unfrozen bogs. At least 40 percent of the blast from these munitions is smothered by the snow.
- Hexachloroethane smoke is not effective because canisters are smothered in the deep snow.
- White phosphorous is effective; however, phosphorus may burn undetected in the snow for up to three to four days and may be a hazard to friendly troops subsequently moving through the area.
- Overall, variable time or multi-option artillery fuzes are good fuzes for cold weather operations. However, snow and ice may cause them to detonate prematurely. Also, extreme cold may cause a higher dud rate.
- Extreme cold weather will affect the range of weapons.
- Low temperature may cause illuminating rounds to malfunction as the result of freezing the parachute and its components.

TARGET ACQUISITION AND OBSERVATION

E-82. Forward Observers. Considerations for employing forward observers in cold weather operations include:

- Equip forward observers with snowshoes or skis to allow them to move quickly.
- Relieve observers in static positions frequently.
- Update visibility diagrams regularly because drifting snow changes visibility.
- Use amber filters on binoculars and observation devices to reduce the incidence of snow blindness.
- Avoid using ground bursts that may be difficult to observe in deep snow.

E-83. Air observers. Observers in aircraft are valuable because they can see deep and are not as prone to disorientation as are ground observers. However, weather conditions may reduce the availability of aircraft.

E-84. Radars. Consider the following when radars are used in cold weather:

- Extremely cold weather may degrade their operations.
- Remote sensors are rarely effective when used in deep snow.

TARGETING

E-85. Because of terrain and weather phenomena, target detection is difficult. However, ice fogs and snow clouds created by moving enemy formations will reveal targets. Also, tracks in the snow may indicate enemy positions.

CLOSE AIR SUPPORT

E-86. The following are considerations in the use of CAS in cold weather operations:

- Frequent poor weather reduces the availability of CAS.
- The sameness of the terrain makes the marking of targets critical.
- Panels or pyrotechnics must be used to indicate friendly locations.

COMMUNICATIONS

E-87. Effective communications are hampered by:

- Electronic interference.
- Weakened batteries. Conventional dry-cell batteries are 40 percent effective below 0° F, 20 percent effective below -10° F, and 8 percent effective below -30° F. A similar problem exists for nickel-cadmium and lithium batteries.
- Frost from human respiration forms in the radio mouthpiece. Cover it with cloth or a sock.

SURVEY

E-88. Extreme cold in arctic and subarctic regions adversely affects survey equipment operability. Accuracies may be degraded and impact on transfer data, massed fire, and unobserved fire.

FIELD ARTILLERY MOVEMENT

E-89. Considerations affecting planning for field artillery cold weather movement include:

- Consider route reconnaissance in FA ground and air.
- Determine ice thickness and load-bearing capacity before the field artillery crosses frozen lakes and rivers.
- Consider that a vehicle may be required to position towed artillery weapons used in air assault operations conducted into snowy areas.
- Plan for maximum use of aerial resupply.

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Glossary

SECTION I - ACRONYMS AND ABBREVIATIONS

ACA	airspace coordination area
ADAM	air defense airspace management
ADP	Army doctrine publication
ADRP	Army doctrine reference publication
AFATDS	Advanced Field Artillery Tactical Data System
ANGLICO	air naval gunfire liaison company
ATACMS	Army Tactical Missile System
ATP	Army techniques publication
ATTP	Army tactics, techniques, and procedures
BCT	brigade combat team
BAE	brigade aviation element
BCD	battlefield coordination detachment
BSB	brigade support battalion
CBRN	chemical, biological, radiological, nuclear
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
D3A	decide, detect, deliver, and assess
DA	Department of the Army
DS	direct support
F3EAD	find, fix, finish, exploit, analyze, and disseminate (targeting technique)
FAB	field artillery brigade
FFA	force field artillery
FIST	fire support team
FM	field manual
FPF	final protective fire
FSCM	fire support coordination measure
FSCOORD	fire support coordinator
FSEM	fire support execution matrix
FSO	fire support officer
GS	general support (support relationship)
GSR	general support reinforcing (support relationship)
HIMARS	High Mobility Artillery Rocket System
HQ	headquarters
JFO	joint fires observer
JP	joint publication
JMEM JWS	joint munitions effects manual joint weaponeering system
JSTARS	Joint Surveillance Target Attack Radar System
JTAC	joint terminal attack controller

MAGTF	Marine air ground task force
MCRP	Marine Corps reference publication
MCWP	Marine Corps warfighting publication
MDMP	military decisionmaking process
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations (memory aid)
MLRS	multiple launch rocket system
mm	millimeter
NATO	North Atlantic Treaty Organization
NCO	noncommissioned officer
NFA	no-fire area
OPCON	operational control
OPLAN	operation plan
OPORD	operation order
PLOTCR	purpose of the planned fires, the target location, observer identification, the trigger event or method to initiate target engagement, communication means among all agencies to observe the target engagement, and allocated resources for completion of a task or target engagement (memory aid)
R	reinforcing (support relationship)
RAM	rocket, artillery, and mortar
RFA	restrictive fire area
RFL	restrictive fire line
STANAG	standardization agreement (NATO)
SWO	staff weather officer
TM	technical manual
TTLODAC	target description, trigger time or event, location of the target (may be exact or general), observers, delivery system, attack guidance, communications (memory aid)
U.S.	United States
WP	white phosphorus

SECTION II – TERMS AND DEFINITIONS

air interdiction

Air operations conducted to divert, disrupt, delay, or destroy the enemy's military surface capabilities before it can be brought to bear effectively against friendly forces, or to otherwise achieve objectives that are conducted at such distances from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required. (JP 3-03)

air liaison officer

The senior tactical air control party member attached to a ground unit who functions as the primary advisor to the ground commander on air power. (JP 3-09.3)

air support operations center

The principal air control agency of the theater air control system responsible for the direction and control of air operations directly supporting the ground combat element. (JP 3-09.3)

air tasking order

A method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities, and/or forces to targets and specific missions. (JP 3-30)area defense

A defensive task that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright. (ADRP 3-90)

attack guidance matrix

A matrix, approved by the commander, which addresses which targets will be attacked, how, when, and the desired effects. (ATP 3-60)

call for fire

A request for fire containing data necessary for obtaining the required fire on a target. (FM 3-09)

clearance of fires

The process by which the supported commander ensures that fires or their effects will have no unintended consequences on friendly units or the scheme of maneuver. (FM 3-09)

close combat

Warfare carried out on land in a direct-fire fight, supported by direct and indirect fires, and other assets. (ADRP 3-0))

collateral damage

Unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time. (JP 3-60)

commander's intent

A clear and concise expression of the purpose of the operation and the desired military end state that supports mission command, provides focus to the staff, and helps subordinate and supporting commanders act to achieve the commander's desired results without further orders, even when the operation does not unfold as planned. (JP 3-0)

common grid

Refers to all firing and target-locating elements within a unified command located and oriented, to prescribed accuracies, with respect to a single three-dimensional datum. (*Note:* the U.S. Marine Corps terminology is common survey). (FM 3-09)

complex terrain

A geographical area consisting of an urban center larger than a village and/or of two or more types of restrictive terrain or environmental conditions occupying the same space. (ATP 3-34.80)

concept of operations

(Army) A statement that directs the manner in which subordinate units cooperate to accomplish the mission and establishes the sequence of actions the force will use to achieve the end state. (ADRP 5-0)

counterfire

Fire intended to destroy or neutralize enemy weapons. (JP 3-09)

counterpreparation fire

Intensive prearranged fire delivered when the imminence of the enemy attack is discovered. (FM 3-09)

critical asset list

A prioritized list of assets or areas, normally identified by phase of the operation and approved by the joint force commander, that should be defended against air and missile threats. (JP 3-01)

decisive action

(Army) The continuous, simultaneous combinations of offensive, defensive, and stability or defense support of civil authorities tasks. (ADRP 3-0)

defense support of civil authorities

Support provided by U.S. Federal military forces, Department of Defense civilians, Department of Defense contract personnel, Department of Defense component assets, and National Guard forces (when the Secretary of Defense, in coordination with the governors of the affected States, elects and requests to use those forces in Title 32, United States Code, status) in response to requests for assistance from civil authorities for domestic emergencies, law enforcement support, and other domestic activities, or from qualifying entities for special events. Also called DSCA. Also known as civil support. (DODD 3025.18)

delay

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. (FM 3-09)

delaying operation

An operation in which a force under pressure trades space for time by slowing down the enemy's momentum and inflicting maximum damage on the enemy without, in principle, becoming decisively engaged. (JP 3-04)

direct pressure force

A force employed in a pursuit operation that orients on the enemy main body to prevent enemy disengagement or defensive reconstitution prior to envelopment by the encircling force. It normally conducts a series of attacks to slow the enemy's retirement by forcing him to stand and fight. (FM 3-90-1)

electronic attack

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. Also called EA. (JP 3-13.1)

electronic warfare

Military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. (JP 3-13.1)

final protective fire

An immediately available prearranged barrier of fire designed to impede enemy movement across defensive lines or areas. Also called FPF. (JP 3-09.3)

fire mission

The specific assignment given to a fire unit as part of a definite plan; an order used to alert the weapon and battery area and indicate that the message following is a call for fire. (TC 3-09.81)

fire plan

A tactical plan for using the weapons of a unit or formation so that their fire will be coordinated. (FM 3-09)

fire support coordination

The planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons. (JP 3-09)

fire support coordination measure

A measure employed by commanders to facilitate the rapid engagement of targets and simultaneously provide safeguards for friendly forces. Also called FSCM. (JP 3-0)

fire support officer

A field artillery officer from the operational to tactical level responsible for advising the supported commander and assisting the senior fires officer of the organization on fires functions and fire support. (ADRP 3-09)

fire support plan

A plan that addresses each means of fire support available and describes how Army indirect fires, joint fires, and target acquisition are integrated with maneuver to facilitate operational success. (FM 3-09)

fire support planning

The continuing process of analyzing, allocating, and scheduling fires to describe how fires are used to facilitate the actions of the maneuver force. (FM 3-09)

fires warfighting function

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. (ADRP 3-0)

forcible entry

The seizing and holding of a military lodgment in the face of armed opposition. (JP 3-18).

forward air controller

A specifically trained and qualified aviation officer, normally an airborne extension of the tactical air control party, who exercises control from the air of aircraft engaged in close air support of ground troops. (JP 3-09.3)

forward air controller (airborne)

A specifically trained and qualified aviation officer, normally an airborne extension of the tactical air control party, who exercises control from the air of aircraft engaged in close air support of ground troops. (JP 3-09.3)

forward observer

An observer operating with front line troops and trained to adjust ground or naval gunfire and pass back battlefield information. In the absence of a forward air controller, the observer may control close air support strikes. Also called FO. (JP 3-09)

gap-crossing operation

A mobility operation consisting of river crossing, brigade-level crossing, and special gap-crossing operations conducted to project combat power across a linear obstacle (wet or dry gap). (ATTP 3-90.4)

group of targets

Two or more targets on which fire is desired simultaneously. A group of targets is designated by a letter/number combination or a nickname. (ATP 3-09.30)

high-payoff target

A target whose loss to the enemy will significantly contribute to the success of the friendly course of action. (JP 3-60)

high-payoff target list

A prioritized list of high-payoff targets by phase of the operation. (FM 3-09)

high-value individual

A person on interest who is identified, surveilled, tracked, influenced or engaged. (ATP 3-60)

high-value target

A target the enemy commander requires for the successful completion of the mission. (JP 3-60)

intelligence preparation of the battlefield/battlespace

(Army, Marine Corps) The systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations. (Marine Corps) The systematic, continuous process of analyzing the threat and environment in a specific geographic area. Also called IPB. (ATP 2-01.3/MCRP 2-3A)

joint air attack team

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. Also called JAAT. (JP 3-09.3)

joint fires observer

A trained 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 control, and perform autonomous terminal guidance operations. Also called JFO. (JP 3-09.3)

joint terminal attack controller

A qualified (certified) Service member who, from a forward position, directs the action of combat aircraft engaged in close air support and other offensive air operations. Also called JTAC. (JP 3-09.3)

joint terminal attack team

A combination of attack and/or scout rotary-wing aircraft and fixedwing close air support aircraft operating together to locate and attack high priority targets and other targets of opportunity. Also called JAAT. (JP 3-09.3)

kill box

A three-dimensional permissive fire support coordination measure with an associated airspace coordinating measure used to facilitate the integration of fires. (JP 3-09).

lodgment

A designated area in a hostile or potentially hostile operational area that, when seized and held, makes the continuous landing of troops and materiel possible and provides maneuver space for subsequent operations. (JP 3-18).

marking obscuration

Obscuration effects that are employed to mark targets for destruction by lethal fires, identify friendly positions and locations, and provide a form of prearranged area of operations communications. (ATP 3-11.50)

measure of effectiveness

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. Also called MOE. See also combat assessment; mission. (JP 3-0)

measure of performance

A criterion used to assess friendly actions that is tied to measuring task accomplishment. Also called MOP. (JP 3-0)

mensuration

The process of measurement of a feature or location on the earth to determine an absolute latitude, longitude, and elevation. (JP 3-60).

mobile defense

A defensive task that concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force. (ADRP 3-90)

movement to contact

(Army) An offensive task designed to develop the situation and establish or regain contact. (ADRP 3-90)

no-strike list

A list of objects or entities characterized as protected from the effects of military operations under international law and/or rules of engagement. (JP 3-60)

obscuration

The employment of materials into the environment that degrade optical and/or electro-optical capabilities within select portions of the electromagnetic spectrum in order to deny acquisition by or deceive an enemy or adversary. (ATP 3-11.50)

offensive task

A task conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. (ADRP 3-0)

on-call target

Planned target upon which fires or other actions are determined using deliberate targeting and triggered, when detected or located, using dynamic targeting. (JP 3-60)

operation

1. A sequence of tactical actions with a common purpose or unifying theme. (JP 1) 2. A military action or the carrying out of a strategic, operational, tactical, service, training, or administrative military mission. (JP 3-0).

precision-guided munition

A guided weapon intended to destroy a point target and minimize collateral damage. (JP 3-03)

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. (FM 3-09)

preparation fire

Normally a high-volume of fires delivered over a short period of time to maximize surprise and shock effect. Preparation fire include electronic attack and should be synchronized with othe electronic warfare activities. (FM 3-09)

priority target

A target based on either time or importance, on which the delivery of fires takes precedence over all the fires for the designated firing unit or element. (FM 3-09)

***program of targets**

A planned sequential attack of similar targets.

protective obscuration

Obscuration effects placed within the area of operations that contribute to the increased protection of United States forces and their interests by defeating or degrading adversary detection, observation, and engagement capabilities. (ATP 3-11.50)

pursuit

An offensive operation designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it. (ADRP 3-90)

request for information

Any specific time-sensitive ad hoc requirement for intelligence information or products to support an ongoing crisis or operation not necessarily related to standing requirements or scheduled intelligence production. (JP 2-0)

reserve

(Army) That portion of a body of troops which is withheld from action at the beginning of an engagement, in order to be available for a decisive movement. (ADRP 3-90).

retirement

A form of retrograde in which a force out of contact moves away from the enemy. (ADRP 3-90)

restricted target

A valid target that has specific restrictions placed on the actions authorized against it due to operational considerations. (JP 3-60)

restricted target list

A list of restricted targets nominated by elements of the joint force and approved by the joint force commander or directed by higher authorities. (JP 3-60)

retrograde

(Army) A defensive task that involves organized movement away from the enemy. (ADRP 3-90)

rules of engagement

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. Also called ROE. (JP 1-04)

scheme of fires

The detailed, logical sequence of targets and fire support events to find and engage targets to accomplish the supported commander's intent. (FM 3-09)

series of targets

A number of targets and/or group(s) of targets planned to be fired in a predetermined sequence to support a maneuver operation. (ATP 3-09.30)

stability tasks

Tasks conducted as part of operations outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment and provide essential government services, emergency infrastructure reconstruction, and humanitarian relief. (ADRP 3-07)

strike

An attack to damage or destroy an objective or a capability. (JP 3-0)

strike coordination and reconnaissance

A mission flown for the purpose of detecting targets and coordinating or performing attack or reconnaissance on those targets. Also called SCAR. (JP 3-03)

supporting distance

The distance between two units that can be traveled in time for one to come to the aid of the other and prevent its defeat by an enemy or ensure it regains control of a civil situation. (ADRP 3-0)

supporting range

The distance one unit may be geographically separated from a second unit yet remain within the maximum range of the second unit's weapons systems. (ADRP 3-0)

suppression of enemy air defenses

Activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means. (JP 3-01)

tactical air control party

A subordinate operational component of a tactical air control system designed to provide air liaison to land forces and for the control of aircraft. Also called TACP. (JP 3-09.3)

tactical air coordinator (airborne)

An officer who coordinates, from an aircraft, the actions of other aircraft engaged in air support of ground or sea forces. Also called TAC(A). (JP 3-09.3)

target

An entity or object that performs a function for the adversary considered for possible engagement or other action. (JP 3-60)

target area of interest

The geographical area where high-value targets can be acquired and engaged by friendly forces. (JP 2-01.3).

target coordinate mensuration

The process of measurement of a feature or location on Earth to determine an absolute latitude, longitude, and height. For targeting applications, the errors inherent in both the source for measurement as well as the measurement processes must be understood and reported. Mensuration tools can employ a variety of techniques to derive coordinates. These may include, but are not limited to, direct read from DPPDB [Digital Point Positioning Database] stereo-pairs in stereo or dual mono mode, multi-image geopositioning, or indirect imagery correlation to DPPDB. (Chairman of the Joint Chiefs of Staff Instruction 3505.01B)

target development

The systematic examination of potential target systems—and their components, individual targets, and even elements of targets—to determine the necessary type and duration of the action that must be exerted on each target to create an effect that is consistent with the commander's specific objectives. (JP 3-60)

target location error

The difference between the coordinates generated for a target and the actual location of the target. Target location error is expressed primarily in terms of circular and vertical errors or infrequently, as spherical error. (JP 3-09.3)

target of opportunity

1. A target identified too late, or not selected for action in time, to be included in deliberate targeting that, when detected or located, meets criteria specific to achieving objectives and is processed using dynamic targeting. 2. A target visible to a surface or air sensor or observer, which is within range of available weapons and against which fire has not been scheduled or requested. (JP 3-60)

targeting

The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (JP 3-0)

task-organizing

The act of designing an operating force, support staff, or sustainment package of specific size and composition to meet a unique task or mission. (ADRP 3-0)

terminal attack control

The authority to control the maneuver of and grant weapons release clearance to attacking aircraft. (JP 3-09.3)

terminal guidance operations

Actions using electronic, mechanical, voice, or visual communications that provide approaching aircraft and/or weapons additional information regarding a specific target location. Also called TGO. (JP 3-09)

time-sensitive target

A joint force commander validated target or set of targets requiring immediate response because it is a highly lucrative, fleeting target of opportunity or it poses (or will soon pose) a danger to friendly forces. Also called TST. (JP 3-60)

urban operations

Operations across the range of military operations planned and conducted on, or against objectives on a topographical complex and its adjacent natural terrain, where man-made construction or the density of population are the dominant features. (FM 3-06)

withdrawal operation

A planned retrograde operation in which a force in contact disengages from an enemy force and moves in a direction away from the enemy, (JP 1-02)

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1 March 2016

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MARK A. MILLEY
General, United States Army
Chief of Staff

Official:

A handwritten signature in black ink, appearing to read "Gerald B. O'Keefe". The signature is written in a cursive style with a large initial "G" and a distinct "O'Keefe" ending.

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