National Training Center
Operations Group

FIRE SUPPORT

Train the Force

CENTER FOR ARMY LESSONS LEARNED

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National Training Center
Operations Group

Fire Support Handbook

“Train the Force”

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Foreword

Nobody can perfectly predict the future, but as we look toward future battlefields, one thing remains constant: the ability to combine arms at the lowest levels is of the utmost importance. No one branch or capability will serve as panacea for all battlefield challenges, but efforts are inextricably linked to one another, just as they always have been. We depend on each other to accomplish the mission.

Fires and movement, by definition, combine to create true maneuver at the lowest echelons. When we employ forces through movement in combination with fires to achieve a position of advantage in respect to the enemy, we are creating forward momentum on the battlefield.

Often, the ability to integrate fires effectively becomes the lynchpin for a successful operation at the National Training Center (NTC). Maintaining a lethal, ready force demands that we continue to effectively train and integrate fires into all operations. In World War I, artillery killed more than small arms. In World War II, General Eisenhower stated, “The speed, accuracy, and devastating power of American artillery won confidence and admiration from the troops it supported, and inspired fear and respect in their enemy.” Although the characteristics of the modern battlefield may have morphed, the true nature of war today is no different. Our ability to affect change in the enemy’s behavior from a distance, and to enable movement to a position of advantage, will shape future engagements.

There is no question that fires will be one key to success when it comes to facing a near-peer threat on the battlefield. That is what we have been training for at the NTC. The fires observer coach/trainers (OC/Ts) here at the NTC have been committed to ensuring brigade combat teams optimize fires within their formation. This publication is a compilation of products used over the last couple of years to sustain/increase fire superiority over potential enemies. Although not all units are able to train at the NTC, we offer this publication to embrace the fires warfighting function to prepare for the reality of combat.

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The National Training Center and Fort Irwin

TABLE OF CONTENTS

Chapter 1
Brigade Combat Team Fire Support Personnel: Duties and Responsibilities 1

Chapter 2
Fire Support Planning 9

Chapter 3
Intelligence/Targeting. 33

Chapter 4
Fire Support Products 47

Chapter 5
Fire Support Coordination Measures 59

Chapter 6
Rehearsals. 61

Chapter 7
Target Acquisition. 69

Chapter 8
U.S. Indirect Fire Systems 75

Chapter 9
Close Air Support 79

Chapter 10
Crater Analysis 83

Appendix A
Example Annex D (Fires) to Operation Order XX-XX. 87

Appendix B
Checklists 99

Appendix C
Field Artillery References. 101

Appendix D
Glossary 103

Appendix E
References 113

FIGURES

Figure 1-1. Joint Fires Problem Statement. 1
Figure 2-1. Running Estimate Example. 16
Figure 2-2. Fires Running Estimate. 17
Figure 2-3. Fires Input to the Military Decision-Making Process 19
Figure 2-4. Applying D3A in the DATE 20
Figure 2-5. Tactical and Technical Triggers 24
Figure 2-6. Triggers in the Offense 25
Figure 2-7. Triggers in the Defense. 26
Figure 2-8. Steps of Engagement Area Development 27
Figure 2-9. Preparing for a Successful Breach 28
Figure 2-10. Smoke Planning Factors. 29
Figure 2-11. Fires in Support of SOSRA. 30
Figure 2-12. Triggers for Smoke 31
Figure 3-1. Targeting Categories. 33
Figure 3-2. Organic Targeting Assets 37
Figure 3-3. Echelons Above Brigade Assets 38
Figure 3-4. Targeting Working Group Agenda 39
Figure 3-5. Targeting Working Group Conceptual to Detailed Planning 40
Figure 3-6. Targeting Working Group Timeline 42
Figure 3-7. Targeting Working Group Responsibilities. 44
Figure 3-8. Decision Brief Agenda. 45
Figure 3-9. Target Synchronization. 46
Figure 4-1. Fire Support Menu/Checklist 49

Figure 4-2. Fire Support Execution Matrix 50
Figure 4-3. Fire Support Execution Matrix (Continued). 51
Figure 4-4. Target Synchronization Matrix 52
Figure 4-5. Target List Worksheet 53
Figure 4-6. Target Selection Standards 54
Figure 4-7. Attack Guidance Matrix. 55
Figure 4-8. High-Payoff Target List 56
Figure 6-1. Types of Rehearsals. 62
Figure 6-2. FA Technical Rehearsal Preparation Timeline 67
Figure 7-1. Mode Selection Guidance. 71
Figure 7-2. Counterfire Battle Drill (A Way) 72
Figure 9-1. Target Location Error Categories. 79
Figure 9-2. Sample DD Form 1972. 81
Figure 10-1. Fuze Furrow and Center-of-Crater Method 83
Figure 10-2. Side Spray Method. 84
Figure 10-3. Ricochet Furrow Method. 84
Figure 10-4. Fuze Tunnel Method. 85
Figure 10-5. Splinter Groove Method 85
Figure 10-6. Main Axis Method. 86

TABLES

Table 1-1. Army Command Relationships. 7

Table 1-2. Army Support Relationships. 8

Table 2-1. Actions by Friendly Forces and Effects on Enemy Forces 9

Table 2-2. Elements of Operations and Subordinate Tasks. 10

Table 2-3. Tactical Shaping Operations and Tasks 11

Table 2-4. Types of Offensive Operations. 21

Table 2-5. Types of Defensive Operations 22

Table 2-6. Trigger Development. 23

Table 7-1. Target Acquisition Radar Capabilities 70

Table 8-1. U.S. Mortar Characteristics. 75

Table 8-2. Howitzer Ammunition and Range Capabilities 76

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The Secretary of the Army has determined that the publication of this periodical is necessary in the transaction of the public business as required by law of the Department.

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CHAPTER 1

Brigade Combat Team Fire Support Personnel: Duties and Responsibilities

Source: Army Techniques Publication (ATP) 3-09.42, *Fire Support for the Brigade Combat Team*, 1 March 2016

Providing fire support can be challenging for a brigade combat team (BCT). The ability to provide fire support is not only technical, there is an art to it as well. See Figure 1-1 for the joint fires problem statement.

Figure 1-1. Joint Fires Problem Statement

FIRE SUPPORT COORDINATOR

The BCT's cannon field artillery battalion commander is the brigade's fire support coordinator (FSCOORD). As such, the field artillery battalion commander is the BCT commander's primary fire support advisor who 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 understand the commander's visualization and articulation of what fire support's role is within 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. The BCT FSCOORD is responsible for the following:

- Facilitating the establishment of standard operating procedures for fire support across the brigade (to save time and ensure a single standard).
- Ensuring the five requirements of accurate fire are met, including:
    - Accurate target location and size (fire support teams [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).
    - Accurate meteorological information (target acquisition platoon and fire direction centers)
    - Accurate computational procedures (fire direction centers and fires cells)
- Ensuring efficiently resourced training packages (limit requirements for unit tasking and reduce coordination requirements among units).

BRIGADE FIRE SUPPORT OFFICER (13A)

In the absence of the FSCOORD, the brigade fire support officer (FSO) 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 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 with planning and coordinating 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 Field Manual (FM) 3-09, *Fire Support and Field Artillery Operations*, 30 April 2020. 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 the following:

- Planning, preparing, executing, and assessing all aspects of fire support for BCT operations and addressing them in rehearsals.
- Working 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.

- Developing a scheme of fires to support the operation with the BCT commander, FSCOORD, and BCT S-3.
- Planning and coordinating fire support tasks in close coordination with the BCT S-3 to support timely development of the field artillery operations order or field artillery support plan.
- Developing a proposed high-payoff target list, target selection standards, and attack guidance, targeting synchronization, and fire support execution matrices.
- Coordinating the positioning of fire support assets for BCT operations.
- Providing information on the status of fire support attack assets, target acquisition assets, and field artillery ammunition.
- Recommending fire support coordination measures (FSCMs) to support current and future BCT operations, and addressing them in rehearsals.
- Recommending and implementing the BCT commander's counterfire (including radar zones) and other target engagement priorities.
- Recommending to the BCT commander the establishment, responsibilities, authorities, and duties of a force field artillery headquarters, as necessary.
- Integrating and synchronizing Army indirect fires, joint fires, and multinational fires with the other warfighting functions.
- Directing and supervising the main command post fires cell to provide fire support for BCT operations and in the development of respective products to support operation plan (OPLAN) or operation order (OPORD) development, including Annex D (Fires) as necessary.
- Advising the BCT commander and staff of available fire support capabilities and limitations.
- Leading the targeting working group in the absence of the FSCOORD.
- Coordinating the targeting process. Directing the attack of targets by fires in accordance with the BCT commander's established priorities and desired effects.
- Working 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.
- Participating in the BCT's military decision-making process (MDMP).
- Coordinating requirements for fire support personnel to support mortar training and calls for indirect fire by maneuver personnel.
- Accompanying the BCT commander during the execution of tactical operations, when directed.
- Facilitating the synchronization and integration of fires and maneuver.
- Developing an internal battle rhythm to receive running estimates of information and rehearsal times synchronized with BCT and subordinate unit battle rhythms.

- Establishing, in conjunction with the BCT S-6, a communications plan for primary, alternate, contingency, and emergency means for fire missions and reporting.
- Coordinating the deliver function of targeting.
- Directing the attack of targets by fires in accordance with the priorities and desired effects established by the BCT commander.
- Keeping the BCT commander, FSCOORD, and staff informed of the current status, location, and activity of all fire support assets.
- Working 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.
- Ensuring battalion FSOs are aware of assigned fire support and field artillery tasks, and are refining targets in accordance with top-down fire planning.

ASSISTANT BRIGADE FIRE SUPPORT PLANS OFFICER (13A)

The plans/targeting officer gives the fire support element (FSE) a 24-hour FSO capability. This officer helps the FSO perform any duties and fills in during FSO absences. This officer also assists 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, the OPORD, or in the fires annex.

FIRE SUPPORT NONCOMMISSIONED OFFICER (13F40)

Fire support noncommissioned officers (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:

- Managing the fires cell operations.
- Disseminating and managing running estimates.
- Managing the Advanced Field Artillery Tactical Data System (AFATDS), Effects Management Tool, and the Joint Automated Deep Operations Coordination System (as available).
- Tracking the BCT's FSCMs.
- Coordinating with the air defense airspace management/brigade aviation element (ADAM/BAE) for the management of airspace coordinating measures.
- Supervising enlisted personnel in the fires cell.
- Maintaining necessary files and documents for unit historical records.
- Managing the fires digital folders, files, and other documents.
- Assisting in the BCT FIST certification.

- Overseeing and managing the BCT program for training and certification of joint fires observers (JFOs).
- Assisting the targeting officer in overseeing the certification program for target coordinate mensuration and collateral damage estimation.

TARGETING OFFICER (131A)

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 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 conducting target coordination mensuration and collateral damage estimation. The targeting officers provide recommendations and advice to the S-3, plans officer, and the targeting working group and board during the MDMP. They contribute to the development of targeting and assessment guidance to be entered into the AFATDS and 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 officers, 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.

During operations, targeting officers 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 officers ensure that interoperability is maintained with information collection assets. The targeting officers 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:

- Coordinating with the S-2 to identify and refine high-payoff targets.
- Advising the S-2 and information-collection planners to ensure that the BCT information-collection plan is synchronized with the fire support plan.
- Advising the brigade FSO on issues concerning targeting and fire support.
- Participating as a member of the targeting working group and board.
- Managing changes to the radar azimuth of search and to radar zones.
- Overseeing the certification program for target coordinate mensuration and collateral damage estimations.
- Supervising or conducting target coordinate mensuration, munitions effects analysis (weaponeering), and collateral damage estimation.
- Developing and managing the high-payoff target list, target selection standards, attack guidance matrix, and targeting synchronization matrix.
- Coordinating radar cueing schedules to ensure they are deconflicted with the pattern analysis of enemy indirect fires.

- Coordinating the positioning and status of target acquisition assets.
- Recommending and implementing, together with the counterfire officer, the commander's counterfire guidance (including radar zones) and other target engagement priorities.
- Advising and assisting 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.
- Interfacing with the fires cell personnel in subordinate units.

BATTALION FIRES CELL: DUTIES AND RESPONSIBILITIES

The battalion FSO establishes and allocates priority targets and priority of fires. The FSO executes the fire support plan, provides for positive clearance of fires, and ensures the safeguarding of friendly elements. When required, the battalion FSO also cues target acquisition assets and anticipates changes dictated by the developing battlefield and recommends revision of the fire support plan. The battalion FSO is continually locating and coordinating the attack of targets within the supported unit's operational area, and also coordinating the attack of targets outside the operational area, as required. The FSO calls for, adjusts, and directs all types of fire support. He aggressively prepares and sends reports and information to higher and lower fires cells and firing unit headquarters as necessary. The battalion FSO must always 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.

COMMAND AND SUPPORT RELATIONSHIPS (SOURCE: ARMY DOCTRINE PUBLICATION (ADP) 3-0, *OPERATIONS,* 31 JULY 2019)

Command and support relationships provide the basis for ensuring unity of command and unity of effort in operations. Command relationships affect Army force generation, force tailoring, and task organization. Command relationships define superior and subordinate relationships between units. When a chain of command is established, the command relationship unifies the effort and the specified authorities provide commanders the ability to employ subordinate forces with maximum flexibility. Army command relationships identify the degree of control of the gaining commander. The type of command relationship often relates to the expected longevity of the relationship between the headquarters involved, and quickly identifies the degree of support that the gaining and losing Army commanders provide. (See Tables 1-1 and 1-2).

Maintaining momentum is key for a BCT throughout a decisive action fight. To maintain the momentum, the BCT must consider multiple mission command posts while maintaining all functions and capabilities of the BCT command post throughout the rotation. The BCT staff must consider how to organize personnel, vehicles, functions, and capabilities to support multiple command posts.

Table 1-1. Army Command Relationships[1]

If relationship is:	Then inherent responsibilities:							
	Have command relationship with:	May be task organized by:*	Unless modified, administrative control (ADCON) responsibility goes through:	Are assigned position or area of operations (AO) by:	Provide liaison to:	Establish or maintain communication with:	Have priorities established by:	Can impose on gaining until further command or support relationship of:
Organic	All organic forces organized within the headquarters (HQ)	Organic HQ	Army HQ specified in organizing document	Organic HQ	N/A	N/A	Organic HQ	Attached; operational control (OPCON); tactical control (TACON); general support (GS); general support- reinforcing (GSR); reinforcing (R); direct support (DS)
Assigned	Combatant command	Gaining HQ	Gaining Army HQ	OPCON chain of command	As required by OPCON	As required by OPCON	Army Service component command (ASCC) or service-assigned HQ	As required by OPCON HQ
Attached	Gaining unit	Gaining unit	Gaining Army HQ	Gaining unit	As required by gaining unit	Unit to which attached	Gaining unit	Attached; OPCON; TACON; GS; GSR; R; DS
OPCON	Gaining unit	Parent unit and gaining unit; gaining unit may pass OPCON to lower HQ*	Parent unit	Gaining unit	As required by gaining unit	As required by gaining unit and parent unit	Gaining unit	OPCON; TACON; GS; GSR; R; DS
TACON	Gaining unit	Parent Unit	Parent unit	Gaining unit	As required by gaining unit	As required by gaining unit and parent unit	Gaining unit	TACON; GS; GSR; R; DS

*(DS only exists at brigade and higher)

Note. In the North Atlantic Treaty Organization (NATO), the gaining unit may not task-organize a multinational force.

Table 1-2. Army Support Relationships[2]

If relationship is:	Then inherent responsibilities:						
	Have command relationship with:	**May be task organized by:**	**Receives sustainment from:**	**Are assigned position or area of operations by:**	**Provide liaison to:**	**Establish or maintain communications with:**	**Can impose on gaining unit further command or support relationship by:**
Direct support*	Parent unit	Parent unit	Parent unit	Supported Unit	Supported unit	Parent unit; supported unit	Supported unit
Reinforcing	Parent unit	Parent unit	Parent unit	Reinforced unit	Reinforced unit	Parent unit; reinforced unit	Reinforced unit; then parent unit
General support-reinforcing	Parent unit	Parent unit	Parent unit	Parent unit	Reinforced unit and as required by parent unit	Reinforced unit and as required by parent unit	Parent unit; then reinforced unit
General support	Parent unit	Parent unit	Parent unit	Parent unit	As required by parent unit	As required by parent unit	Parent unit

Endnotes

1. ADP 3-0, *Operations,* 31 July 2019

2. Ibid.

CHAPTER 2

Fire Support Planning

Source: Army Techniques Publication (ATP) 3-09.42, *Fire Support for the Brigade Combat Team*, 1 March 2016

This chapter begins with an overview of elements of the decisive action and tactical mission tasks reviewed during the Leaders Training Program. It then moves to an overview of developing a fire support plan with the fire support planning principles and the effects for fire support. It includes an overview of the commander's intent, with examples, including the steps for trigger development.

The following tables (Tables 2-1, 2-2, and 2-3), from Field Manual (FM) 3-90-1, *Offense and Defense,* 22 March 2013, provide a quick overview of tactical mission task actions by a friendly force, effects on enemy forces, elements of operations and subordinate tasks, and tactical shaping tasks.

Table 2-1. Actions by Friendly Forces and Effects on Enemy Forces

Actions by Friendly Forces	Effects on Enemy Forces
Attack by fire	Block Canalize
Breach	Contain
Bypass	Defeat
Clear	Destroy
Control	Disrupt
Counter-reconnaissance	Fix
Disengagement	Isolate
Exfiltrate	Neutralize
Follow and assume	Suppress
Follow and support	Turn
Occupy	
Retain	
Secure	
Seize	
Support by fire	

Table 2-2. Elements of Operations and Subordinate Tasks

Elements of Operations	
Offensive Tasks	**Defensive Tasks**
Movement to contact • Search and attack • Cordon and search	Area Defense
Attack • Ambush • Demonstration • Feint • Raid • Spoiling attack	Mobile Defense
Exploitation	Retrograde Operations • Delay • Withdrawal • Retirement
Pursuit	
Forms of offensive maneuver • Envelopment • Frontal attack • Infiltration • Penetration • Turning movement	

Table 2-3. Tactical Shaping Operations and Tasks

Tactical Shaping Tasks
Passage of lines
Reconnaissance operations • Zone • Area • Route • Reconnaissance in force
Relief in place
Security operations • Screen • Guard • Cover • Area (includes route and convoy) • Local
Troop movements • Administrative movement • Approach march • Road march

DEVELOPING THE FIRE SUPPORT PLAN

Fire support is a force multiplier that can add weight to decisive operations where other assets fail. It is therefore imperative fire support considerations are included in the planning of all operations. Fires specialists 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. Fire support planning is often described as being top down, bottom up. The initial fire support plan is developed by the higher headquarters to meet the supported commander's requirements. Subordinate units do not change the overall plan but instead provide recommendations and refinements such as improved target locations. Effective fire support planning and coordination permits the maneuver commander to orchestrate and employ all available fires and related resources in an integrated and synchronized fashion, consistent with the concept of operations. Fire support planning is the continuous process of analyzing, allocating, and scheduling fires to describe how fires are used to facilitate the actions of the maneuver force. Fire support planning:

- Focuses on using timely and effective delivery of fires to enhance the actions of the maneuver force;
- Involves the assignment of mission and positioning of field artillery units;
- Identifies the types of targets to attack;

- Identifies the collection assets that acquire and track 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 as part of the operations process. Fires 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.

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 integrate with maneuver to facilitate operational success. The fire support coordinator (FSCOORD), chief of fires, brigade fire support officer (FSO), and other fire support planners develop an effective and integrated fire support plan to support operations. An effective fire support plan clearly defines fire support requirements, 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.

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 must take into account existing limitations on the employment of fires, such as rules of engagement, positive identification requirements, 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 fires assets, thus focusing the fires planning and coordinated execution on critical times and events. The specified attack criteria are developed as a function of the commander‘s guidance, desired effects, 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.

The essential elements of a fire support plan include, but are not limited to the following:

- Clear and concise articulation of fire support tasks, their purpose, and the desired effect for each task.
- Allocation of all fire support assets.
- Projected changes to the allocation of fire support assets based on tactical contingencies in the operation plan (OPLAN) or operation order (OPORD).
- Coordination and synchronization instructions for the timely detection and attack of high pay-off 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.
- Establishment and changes in fire support coordination measures (FSCMs).

Fire Support Planning Principles

- 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 FSCMs

CONSIDERING EFFECTS IN FIRE SUPPORT PLANNING

ATP 3-60, *Targeting,* 7 May 2015, defines the following list of effects on an enemy or adversary. Fire support attack assets can be employed by a commander to create or help create these effects.

Deceive. Joint Publication (JP) 3-13.4, *Military Deception,* 26 January 2012, defines military deception as actions executed to deliberately mislead adversary military, paramilitary, or violent extremist organization decision makers, thereby causing the adversary to take specific actions (or inactions) that will contribute to the accomplishment of the friendly mission.

Defeat. Defeat is a tactical mission task that occurs when an enemy force has temporarily or permanently lost the physical means or the will to fight.

Delay. To delay is to slow the time of arrival of enemy forces or capabilities, or alter the ability of the enemy or adversary to project forces or capabilities.

Deny. An example of deny is to destroy the threat's communications equipment as a means of denying the enemy's use of the electromagnetic spectrum; however, the duration of denial will depend on the enemy's ability to reconstitute.

Destroy. Destroy is a tactical mission task that physically renders an enemy force combat-ineffective until it is reconstituted.

Destruction. In the context of the computed effects of field artillery fires, destruction renders a target out of action permanently or ineffective for a long period of time, producing 30 percent casualties or materiel damage.

Disrupt. Disrupt is a tactical mission task in which a commander integrates direct and indirect fires, terrain, and obstacles to upset an enemy's formation or tempo, interrupts the enemy's timetable, or causes enemy forces to commit prematurely or attack in a piecemeal fashion.

Divert. A diversion is the act of drawing the attention and forces of an enemy from the point of the principal operation: an attack, alarm, or feint that diverts attention.

Neutralize. Neutralize is a tactical mission task that results in rendering enemy personnel or materiel incapable of interfering with a particular operation.

Suppress. Suppress is a tactical mission task that results in temporary degradation of the performance of a force or weapons system below the level needed to accomplish the mission.

COMMANDERS INTENT

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.

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. Understanding the commander's intent, concept of operations, and operational requirements for the maneuver elements is necessary for fire support personnel to provide sound advice to the commander and staff. Fire support planners focus on how to employ available fires to achieve the desired effect. 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. 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/FSO.

Field Manual (FM) 3-09, *Fire Support and Field Artillery Operations,* 30 April 2020, says the commander must provide clear and concise guidance on the expected effects from fires. Fire support personnel must thoroughly understand the commander's intent, scheme of maneuver, and guidance for fire support. Commanders must ensure fire support personnel understand the larger picture of the battle. It provides the staff and subordinate units with the general guidance and restrictions for the employment of fires, desired effects, and the planning and execution of targeting functions. Commander's guidance for fire support must include the priority of fires. Priority of fires is the commander's guidance to the staff, subordinate commanders, fire support planners, and supporting agencies to organize and employ fire support in accordance with the relative importance of the unit's mission. Mission orders for field artillery units should include the supported commander's intent, concept of operations, priority of fires, fire support tasks, and coordinating instructions.[1]

COMMANDER'S GUIDANCE FOR FIRE SUPPORT (EXAMPLE)

Commander's intent must focus on how fire support will influence and support the scheme of maneuver.

Key Tasks for Fires

- Disrupt enemy defensive preparation through precise counter-engineer fires.
- Provide obscuration and suppression on Objective Mustang to enable X-XX Armor freedom of maneuver to breach.
- Timely and accurate counterfire to protect the force and allow freedom of maneuver.
- Be prepared to provide Excalibur fires.

Purpose of Fires

The purpose of Objective Mustang is to enable freedom of maneuver of X-XX Armor (brigade combat team [BCT] decisive operations [DO]) and enhance force protection by destroying enemy indirect fire systems, disrupting enemy defensive preparation, destroying enemy anti-tank (AT) systems, and obscuring and suppressing enemy direct fire systems on Objective Mustang. Decisive to this operation is obscuration fires.

Priority of Fire

- Priority of fire initially Task Force (TF) 1, 2, then 3, in order.
- When the fixing force penetrates Phase Line (PL) Green, priority of fire shifts to TF 2, 3, then 1, in order.
- Upon commitment of the reserve, priority of fire shifts to Team Armor.

Focus of Fires

Initially the focus of fires is east of the coordinated fire line (CFL) (PL Orange), and named areas of interest (NAIs) 1, 2, 3, and 4, detecting and destroying mission command nodes and fires delivery/detection systems. When X-XX Armor crosses PL Black, the focus of fires shifts to Objective Mustang and the breach location.

Observation Planning

All BCT level targets will have a human observer assigned, and no target will be observed by an echelon above brigade (EAB) asset. TF X-XX Infantry, the BCT reserve, will have their fire support teams (FISTs) reassigned to TF X-XX Armor to provide observation east of PL Orange. The BCT will assign primary, alternate, and tertiary observation post (OP) locations for all BCT level targets, and will establish an in position ready to observe time no later than four hours before the BCT DO line of departure (LD).

High-Value Targets

The high-value targets are engineer assets, mission command nodes, sensors (artillery/air defense artillery [ADA]), and AT positions.

High-Payoff Targets

The high-payoff targets are mission command nodes (including retransmission locations), fire support assets (delivery/sensors), surface to air (SA) and AT positions, and logistic nodes.

Sensor Employment

Establish a critical friendly zone (CFZ) around the BCT main, and establish a call for fire zone (CFFZ) at the identified point of breach. Establish a sensor zone around friendly firing locations.

Special Munitions Employment

Be prepared to fire Excalibur in Ujen and Razish to protect critical infrastructure and limit civilian casualties, which will enable TF X's seizure.

Force Protection Priorities (Fire Support Coordination Measures)

Establish a CFL at PL Orange, and upon TF X's seizure of Razish, the CFL will move to PL Black.

Restrictions

Establish no fire areas (NFAs) for all population centers and sensitive places. Do not employ cratering munitions on main supply routes (MSRs), landing zones (LZs), and/or airstrips.

THE FIRES RUNNING ESTIMATE

A BCT's ability to track equipment down to the team level is crucial to understanding the BCT's capabilities, including the fire support vehicle/Bradley fire support vehicle, lazing equipment, and communications. See Figures 2-1 and 2-2 for different examples of running estimates.

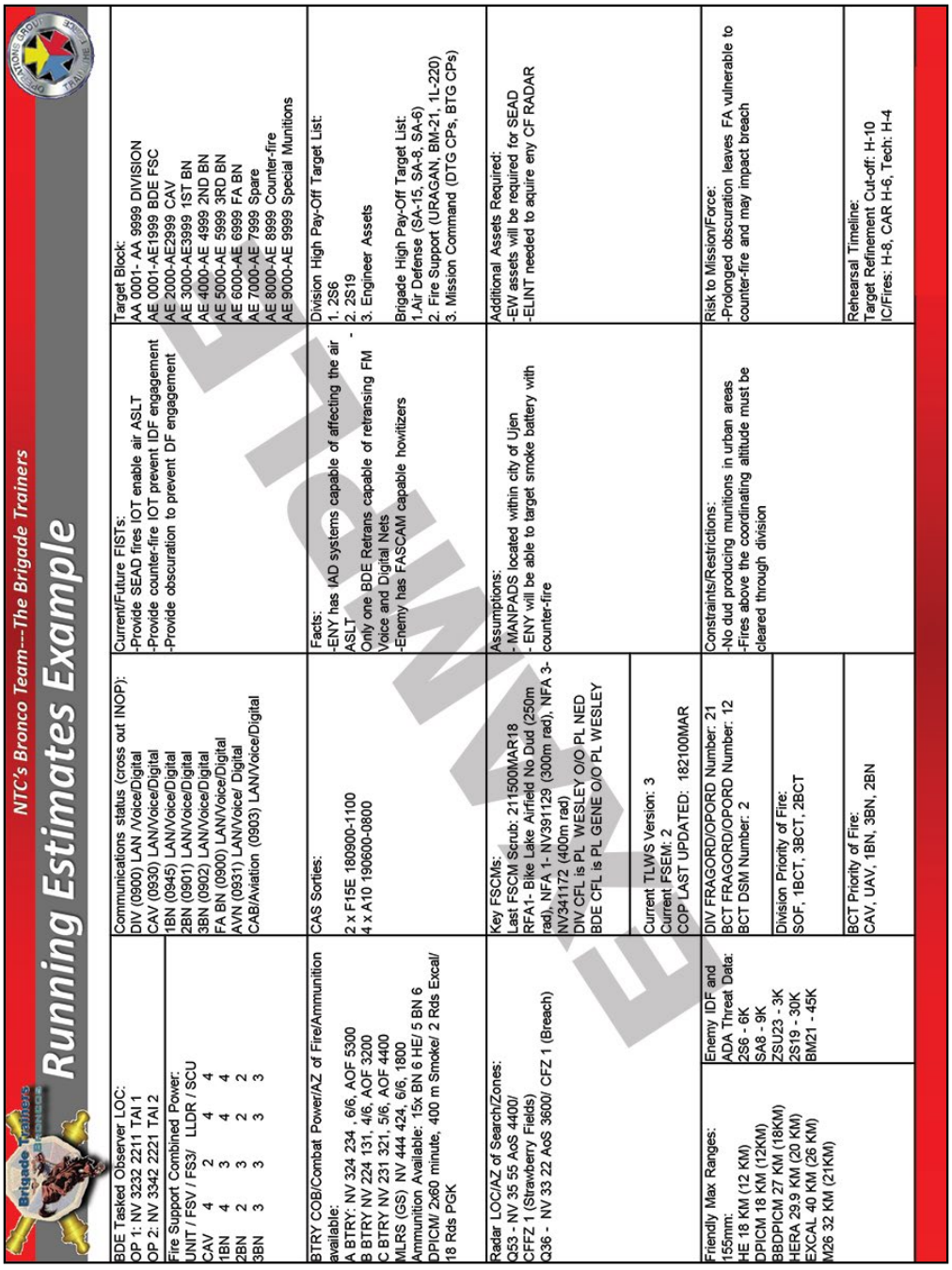
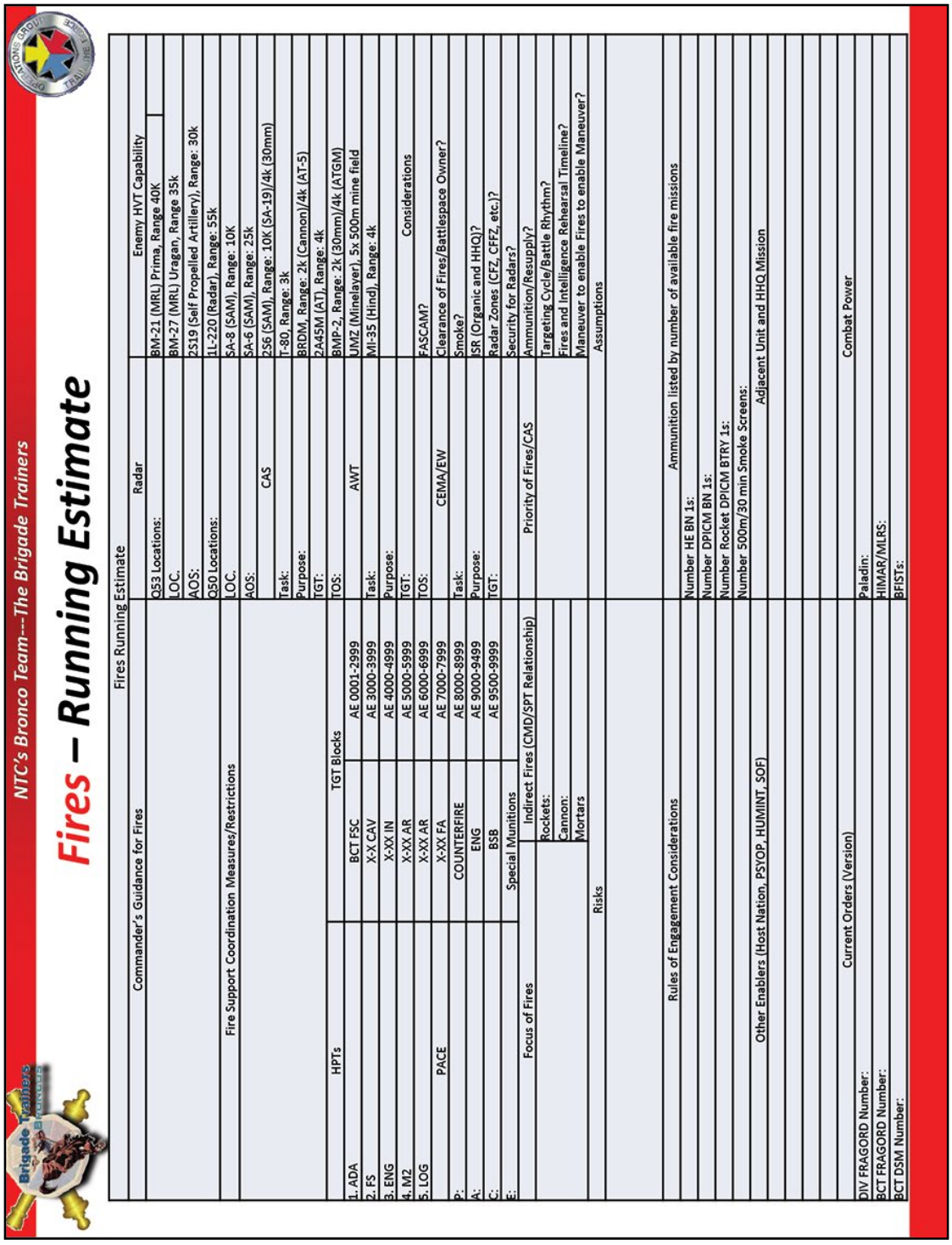


Figure 2-1. Running Estimate Example



NTC's Bronco Team---The Brigade Trainers

Fires – Running Estimate

Fires Running Estimate				
Commander's Guidance for Fires			Radar	Enemy HVT Capability
			Q53 Locations:	BM-21 (MRL) Prima, Range 40K
			LOC.	BM-27 (MRL) Uragan, Range 35k
			AOS:	2S19 (Self Propelled Artillery), Range: 30k
			Q50 Locations:	1L-220 (Radar), Range: 55k
Fire Support Coordination Measures/Restrictions			LOC.	SA-8 (SAM), Range: 10K
			AOS:	SA-6 (SAM), Range: 25k
			CAS	2S6 (SAM), Range: 10K (SA-19)/4k (30mm)
			Task:	T-80, Range: 3k
			Purpose:	BRDM, Range: 2k (Cannon)/4k (AT-5)
			TGT:	2A45M (AT), Range: 4k
HPTs	TGT Blocks		TOS:	BMP-2, Range: 2k (30mm)/4k (ATGM)
1. ADA	BCT FSC	AE 0001-2999	AWT	UMZ (Minelayer), 5x 500m mine field
2. FS	X-X CAV	AE 3000-3999	Task:	MI-35 (Hind), Range: 4k
3. ENG	X-XX IN	AE 4000-4999	Purpose:	
4. M2	X-XX AR	AE 5000-5999	TGT:	Considerations
5. LOG	X-XX AR	AE 6000-6999	TOS:	FASCAM?
PACE	X-XX FA	AE 7000-7999	CEMA/EW	Clearance of Fires/Battlespace Owner?
P:	COUNTERFIRE	AE 8000-8999	Task:	Smoke?
A:	ENG	AE 9000-9499	Purpose:	ISR (Organic and HHQ)?
C:	BSB	AE 9500-9999	TGT:	Radar Zones (CFZ, CFFZ, etc.)?
E:	Special Munitions			Security for Radars?
Focus of Fires	Indirect Fires (CMD/SPT Relationship)		Priority of Fires/CAS	Ammunition/Resupply?
	Rockets:			Targeting Cycle/Battle Rhythm?
	Cannon:			Fires and Intelligence Rehearsal Timeline?
	Mortars			Maneuver to enable Fires to enable Maneuver?
Risks			Assumptions	
Rules of Engagement Considerations			Ammunition listed by number of available fire missions	
			Number HE BN 1s:	
			Number DPICM BN 1s:	
			Number Rocket DPICM BTRY 1s:	
			Number 500m/30 min Smoke Screens:	
Other Enablers (Host Nation, PSYOP, HUMINT, SOF)			Adjacent Unit and HHQ Mission	
Current Orders (Version)			Combat Power	
DIV FRAGORD Number:			Paladin:	
BCT FRAGORD Number:			HIMAR/MLRS:	
BCT DSM Number:			BFISTs:	

Figure 2-2. Fires Running Estimate

FIRES AND THE MILITARY DECISION-MAKING PROCESS

A unit's success is related directly to the staff's ability to execute the military decision-making process. Given the increased complexity of today's operations environment, and the vast array of mission command systems and processes, integration and synchronization of all activities associated with operations are increasingly difficult. The following two figures are tools to assist in providing fires input to the military decision-making process (Figure 2-3), and applying decide, detect, deliver, and assess (D3A) in the decisive action training environment (DATE) (Figure 2-4).

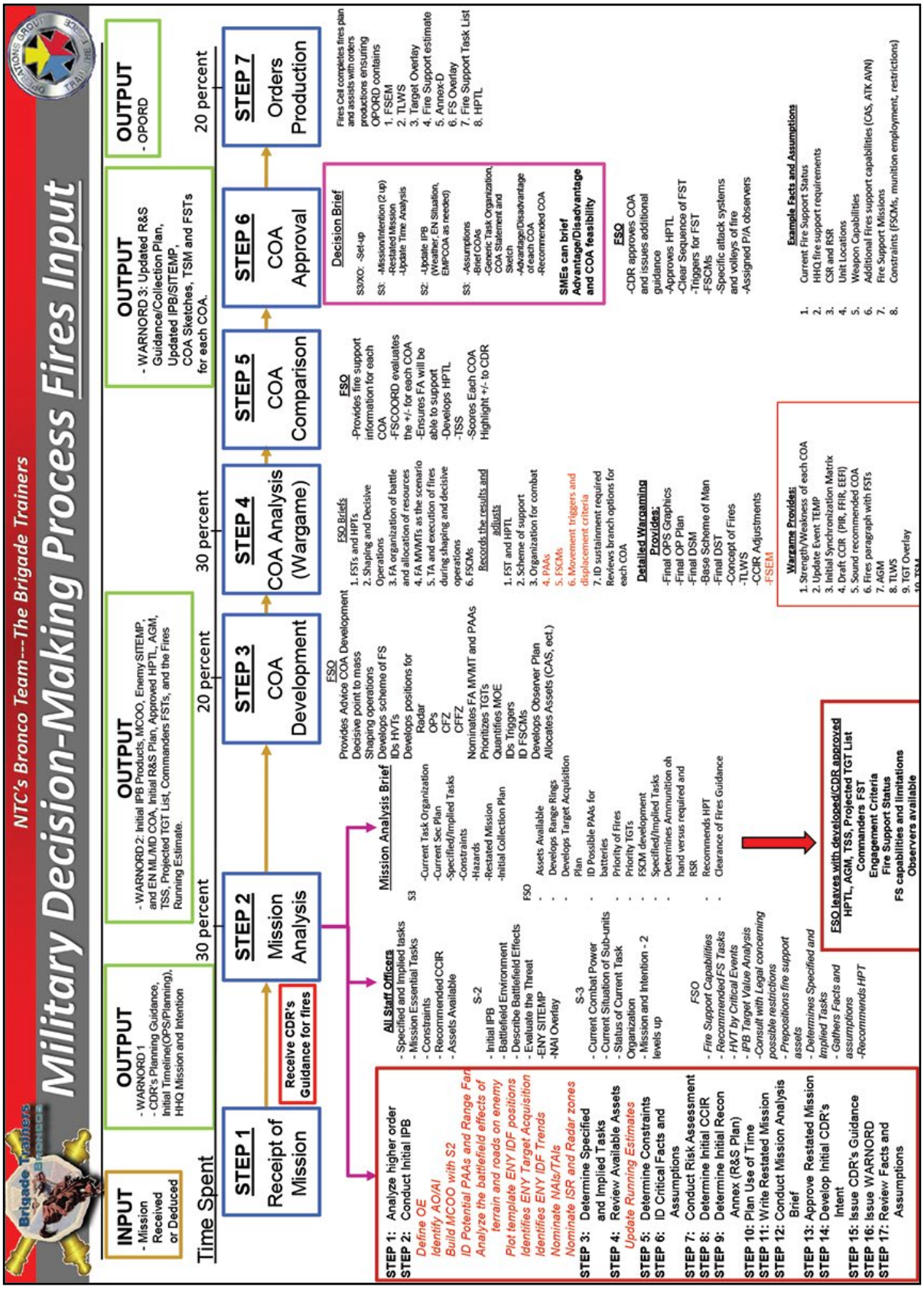


Figure 2-3. Fires Input to the Military Decision-Making Process

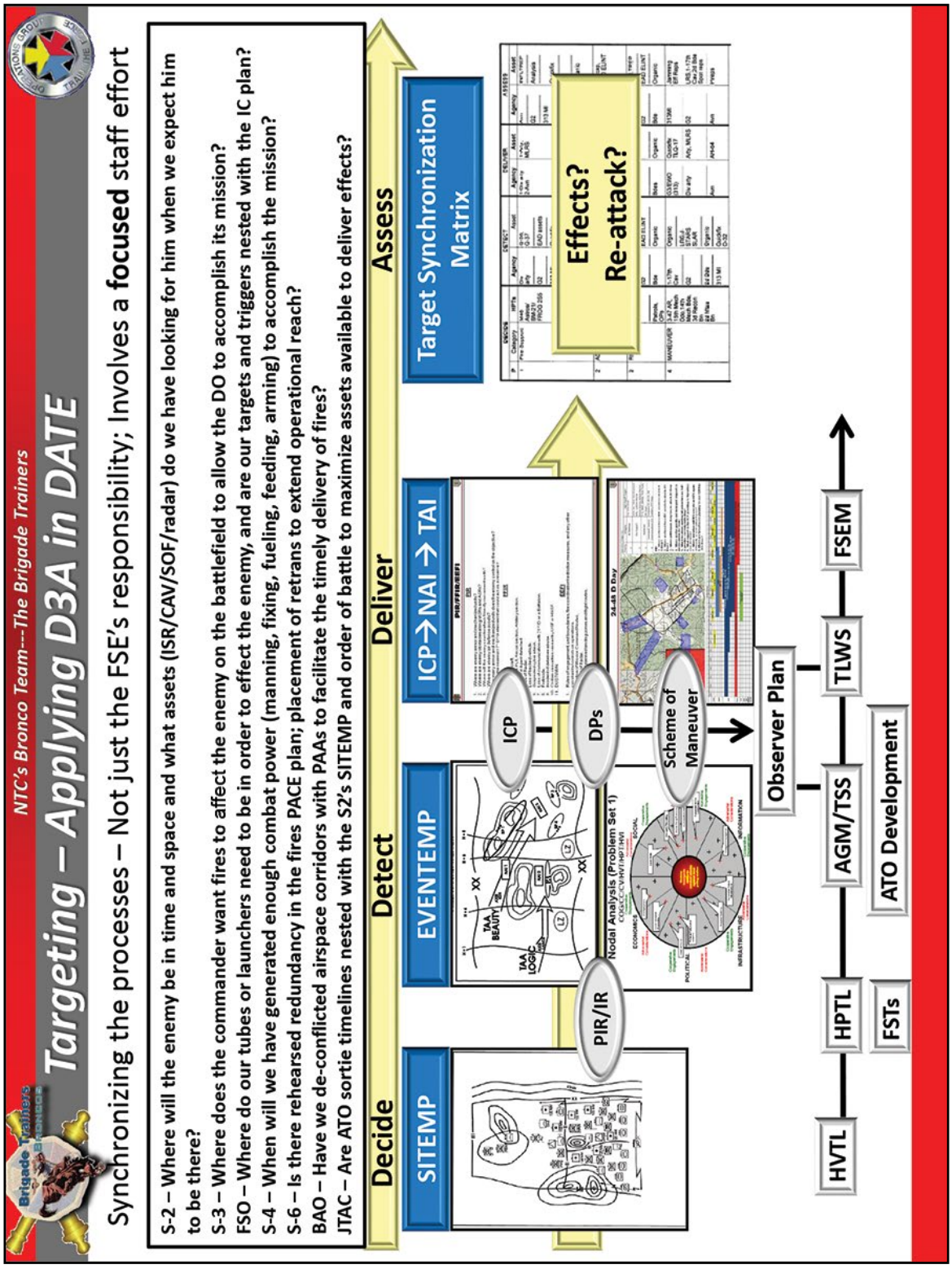


Figure 2-4. Applying D3A in the DATE

OFFENSIVE AND DEFENSIVE FIRE PLANNING

Tables 2-4 through 2-6 and Figures 2-5 through 2-12 are provided for use during fires planning. These tools assist in the development of offensive and defensive fires planning; clarifying the difference between a technical and tactical trigger; trigger development steps (including triggers in the offense and defense); engagement area development; successful breaching preparations; smoke planning factors; fires in support of suppress, obscure, secure, reduce, and assault (SOSRA); and triggers for smoke.

Table 2-4. Types of Offensive Operations

Types of Offensive Operations	
–Movement to Contact –Exploitation –Attack (Hasty/Deliberate) –Pursuit	
Forms of Maneuver: Frontal attack, turning movement, penetration, envelopment, infiltration	
Framework: Main/supporting attack, reconnaissance/security operations, deep operations, rear operations, reserve Characteristics: Surprise, speed, concentration, flexibility, audacity Phases: Rehearsal, reconnaissance, move to LD, maneuver, deployment, attack, consolidation, and reorganization	
Phase	Action to be Taken
Short of the LD/line of control (LC)	Consider planning fires: • To interdict enemy defensive preparations • To support the unit movement to the LD or LC • To support the unit if the attack fails and the enemy counterattacks • To impede enemy patrols and early warning systems
LD or LC to the Objectives	Consider planning (provide priority of fires to lead elements): • Fires to suppress enemy direct fire weapons • Smoke to restrict enemy • Smoke to screen friendly obstacle breaching operations • Fires on exposed flanks Consider placing an observer/long-duration operations overwatch elements. Consider recommending a preparation fire if the advantages outweigh the disadvantages: • Will the enemy be forewarned of an attack if a preparation is fires? • Will the loss of surprise significantly affect the chance for success? • Are there enough significant targets to justify the preparation? • Is there enough fire support ammunition to fire an effective preparation? • Can the enemy recover before the effects can be exploited? Plan the echelonment of indirect systems during assault Mass weapons until assaulting troops reach minimum safe distance (MSD) Shift large caliber weapons, but pick up or continue with smaller weapons Close air support (CAS), 155mm, attack aviation, 105mm, 81mm, 60mm, MK19, M203 Determine when and how you will shift fires. Use one of the following methods: • Time. At a predetermined time, fires will shift. • Location. Fires shift when the maneuver unit reaches a certain location, such as a phase line. • On call. The maneuver commander directs when the fires shift. • Event. A predetermined event signals shifting of fires. **NOTE.** The commander, platoon leader, FSO, FOS, and fire direction center (FDC) must all know what method is being used; consider registering the mortar and artillery tubes.
On the Objective	Consider planning: • Fires to block enemy reinforcement and re-supply by ground or air. • Fires to suppress enemy direct-fire weapons. • Smoke to suppress enemy direct fire weapons. • Smoke to screen friendly/obscure hostile forces when consolidating on the objective. • A signal for lifting and/or shifting fires. • Fires as for the defense when consolidating on the objective
Beyond the Objective	Consider planning: • To impede enemy reinforcements • To block avenues of approach for counterattacking enemy forces • To slow or block enemy retreat

Table 2-5. Types of Defensive Operations

Types of Defensive Operations	
–Mobile Defense (focus on enemy destruction) –Area Defense (focus on retaining terrain)	
Framework: Security, deep, main, rear, reserve Characteristics: Preparation, flexibility, disruption, concentration Planning considerations: Analysis of avenues of approach, security, engagement area (EA) development, use of reserves, integration of obstacles, fire support, protect the force, integration of combat support, seize opportunity to counterattack	
Focus	Actions to be Taken
In front of the position	On avenues of approach: • Target enemy avenues of approach • Integrate fire support with direct fire weapons/integrate fires in support of cavalry (CAV) retrograde • Plan trigger points for possible moving targets/target reference points (TRPs) On key terrain: • Place an observer on terrain where he can provide early warning, target location and laser designation and/or overmatch of the battle • Plan to obscure enemy observation of friendly movement On obstacles: • Coordinate coverage of obstacles with the engineers • Consider the use of smoke to hinder breaching operations If available and in conjunction with the engineer, plan family of scatterable mines (FASCAM) to reseed minefields that the enemy has breached Plan fires to help canalize the enemy Integrate fire support with obstacles to complement direct fire weapons Accurately locate obstacles and preplanned targets (Defense Advanced Global Positioning System [GPS] Receiver [DAGR] grids)
On the position	Consider: • Using groups or series to assist in withdrawal • Using smoke to facilitate disengagement • Planning fires on top of your battle position to help in the disengagement. To deny: o Select the fire support asset to fire the final protective fire (FPF). This selection is based on allocation o Adjust fire onto the FPF to determine actual data to be used o Select the FPF trigger point o Integrate the FPF into the final protective lines of the company direct fire o Determine how the FPF call for fire will be initiated
Behind the position	Consider planning fires: • To support alternate battle positions • To support a counterattack • To delay the enemy as the company withdraws • To prevent reinforcement by the enemy • To obscure enemy observation of friendly movements • To impede enemy reinforcements • To block avenues of approach for counterattacking enemy forces • For reverse breach smoke • To slow or block enemy retreat

TRIGGER DEVELOPMENT

Table 2-6. Trigger Development[2]

Step	Process
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.
2	Determine the enemy rate of movement to engage a moving target. This may be done by estimation based on past experience, from doctrinal literature, or from scout reports of enemy speed.
3	Determine the time of flight of the rounds from the weapon system firing the mission.
4	Determine the processing time. Processing time is the time required from the call for fire to rounds fired from the weapon system.
5	Determine the total mission time. The total mission time is time of flight plus processing time.
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}.

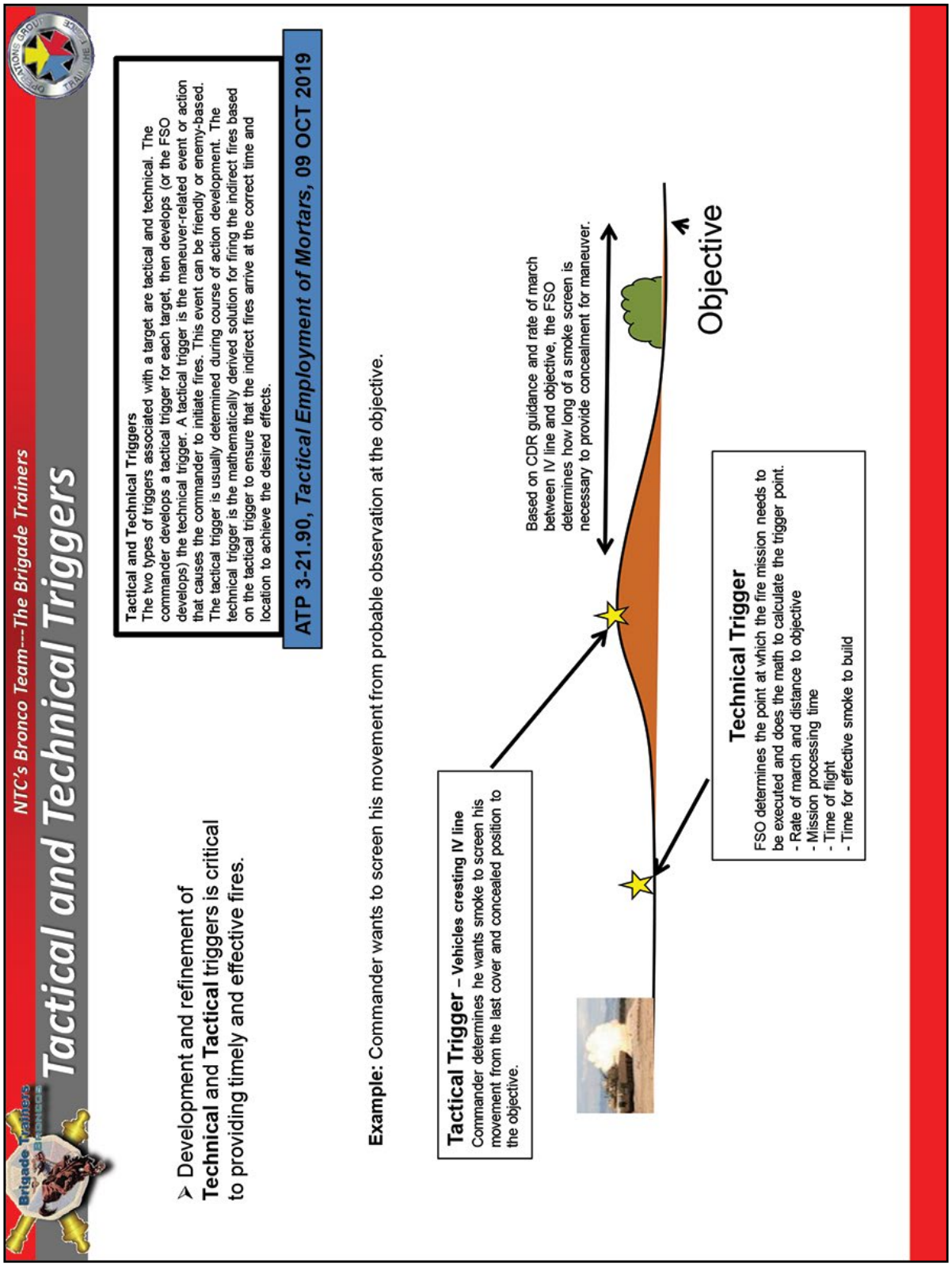


Figure 2-5. Tactical and Technical Triggers

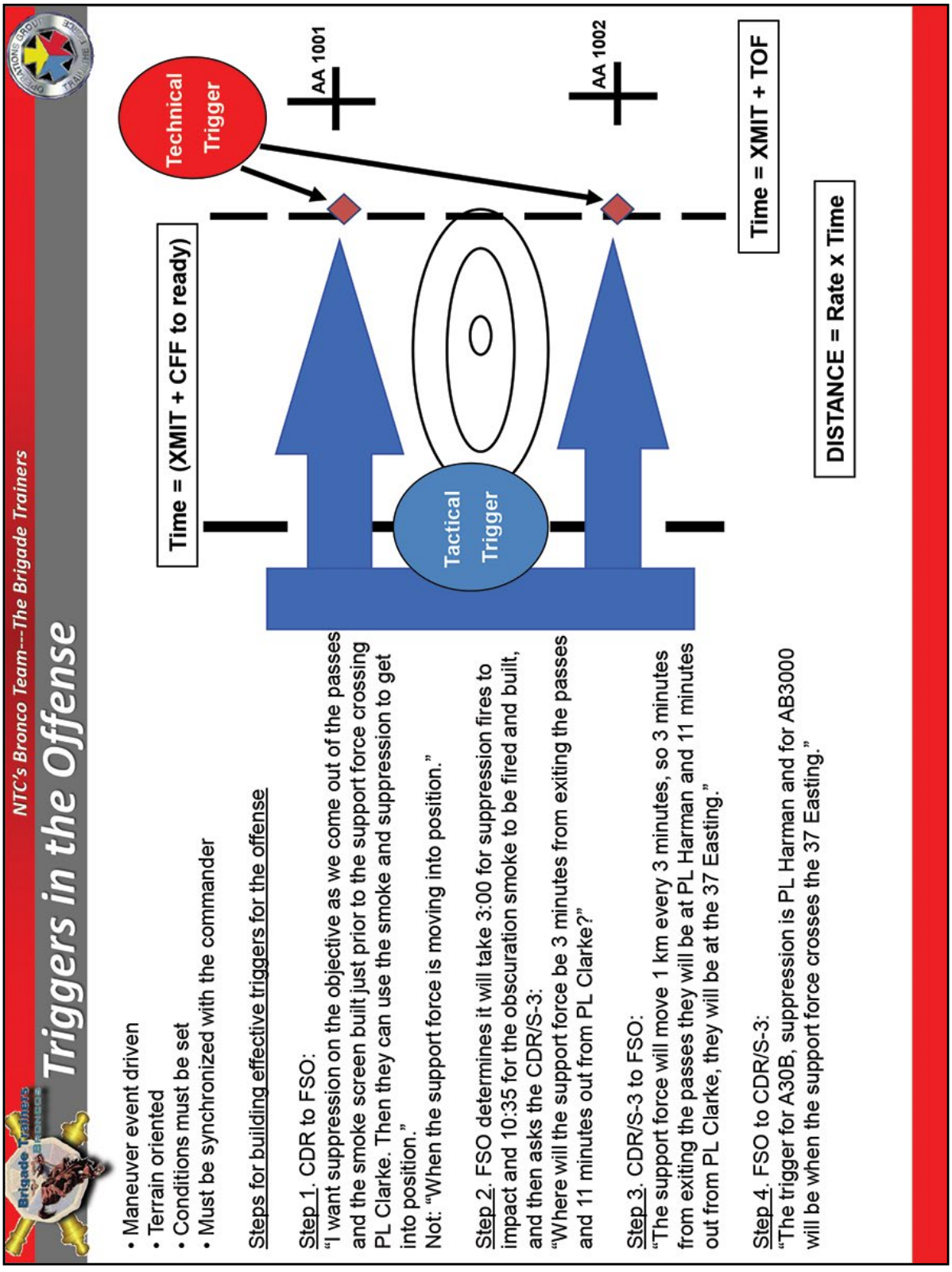


Figure 2-6. Triggers in the Offense

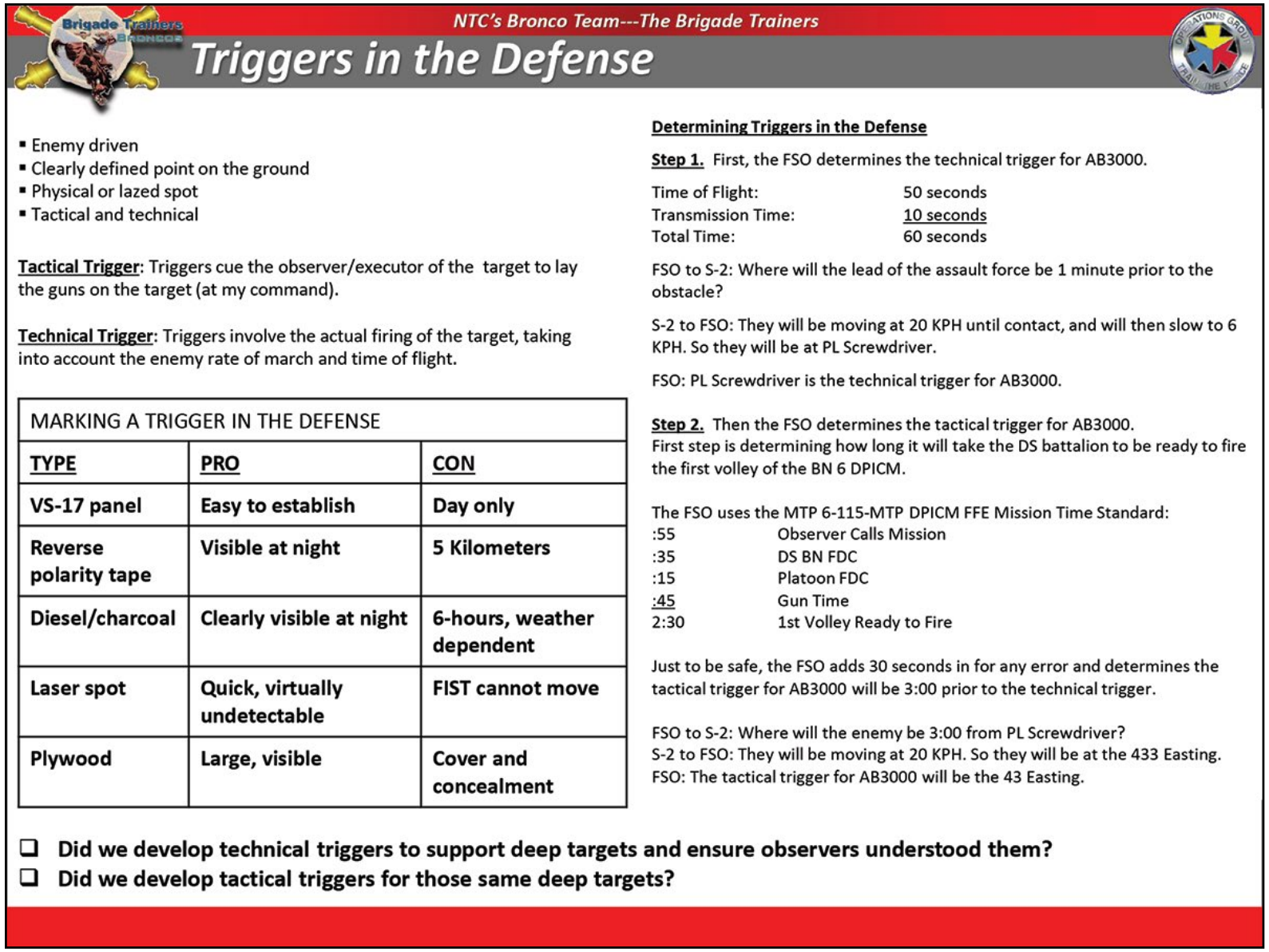


Figure 2-7. Triggers in the Defense

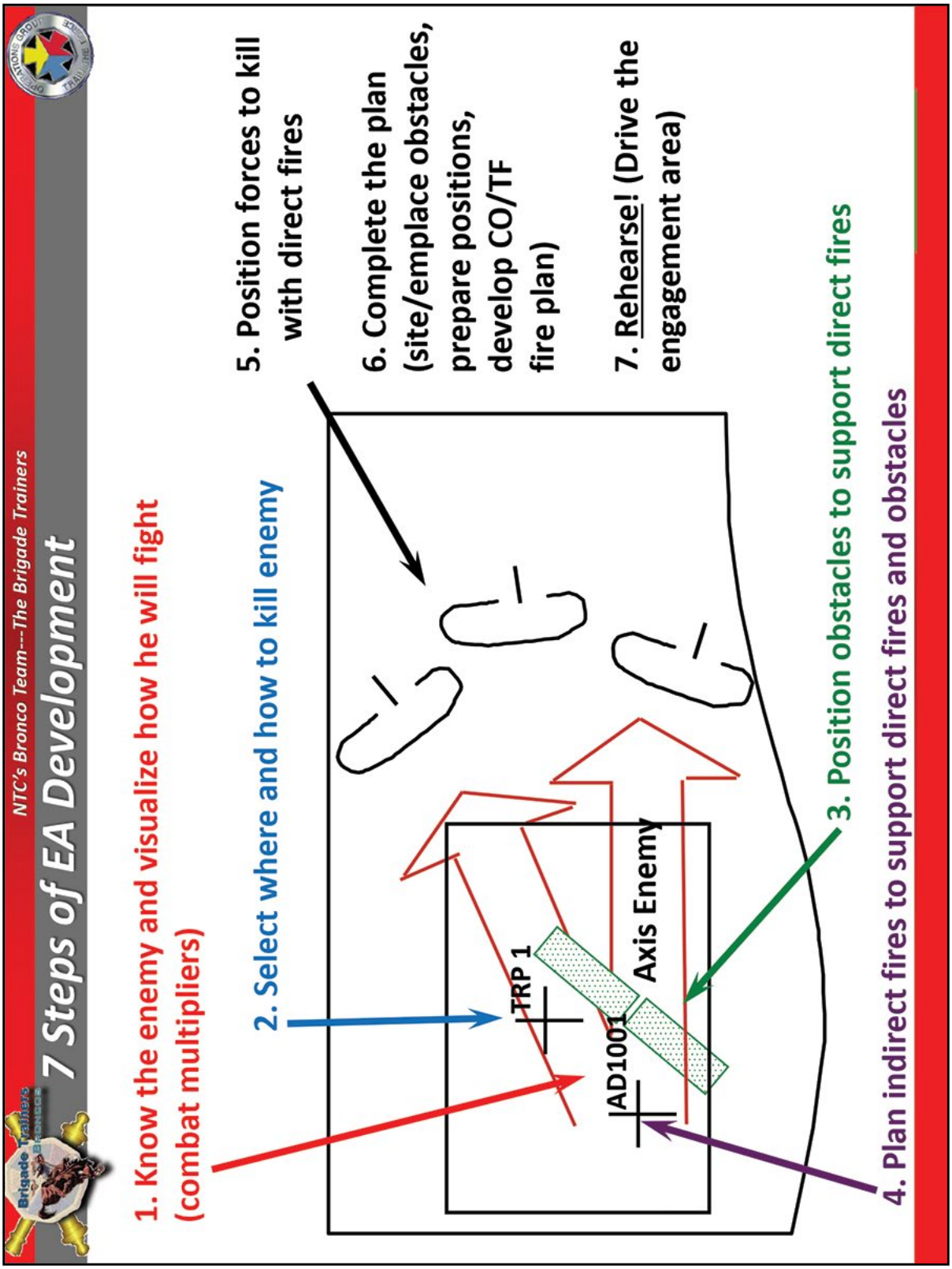


Figure 2-8. Steps of Engagement Area Development

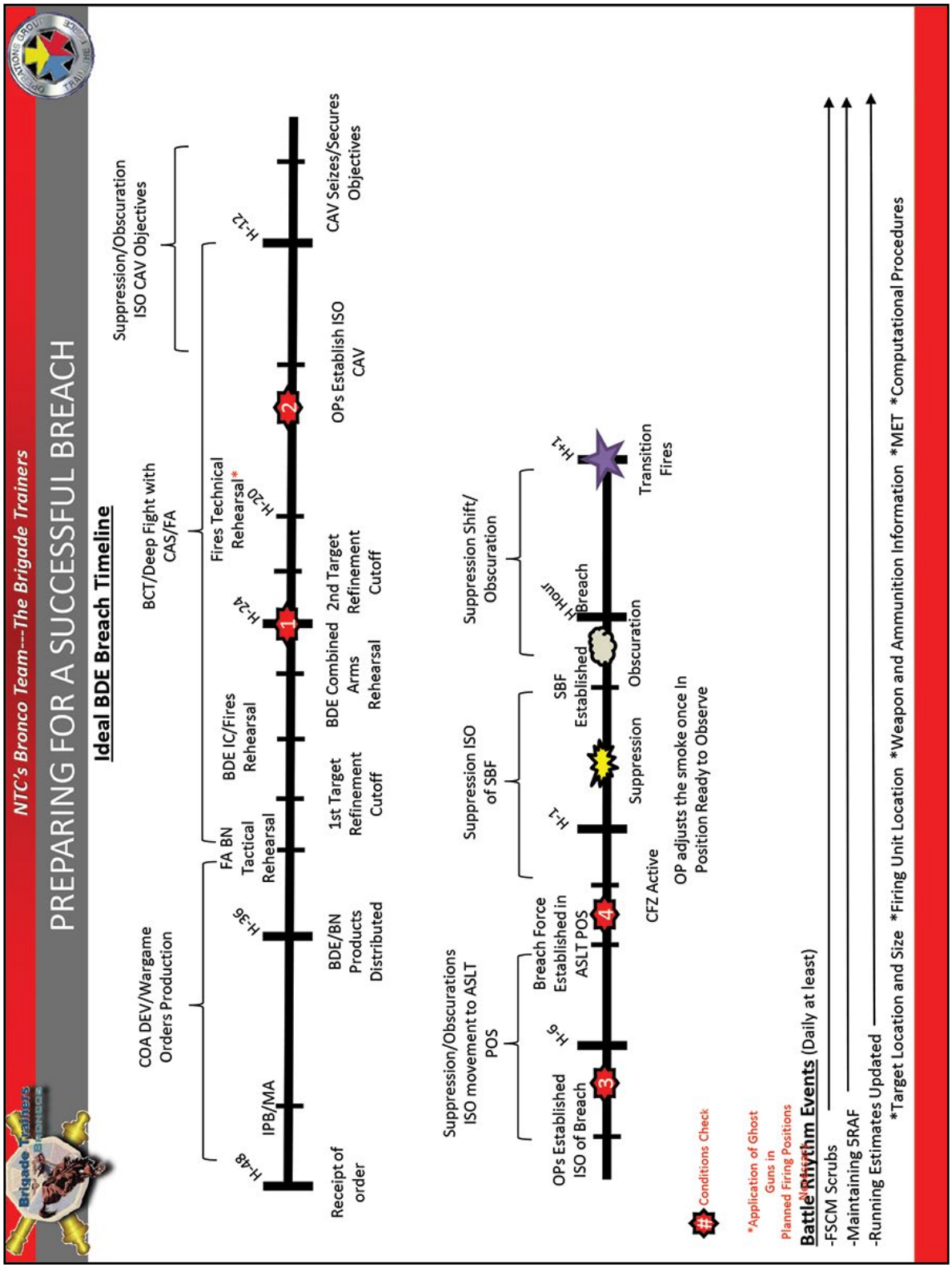
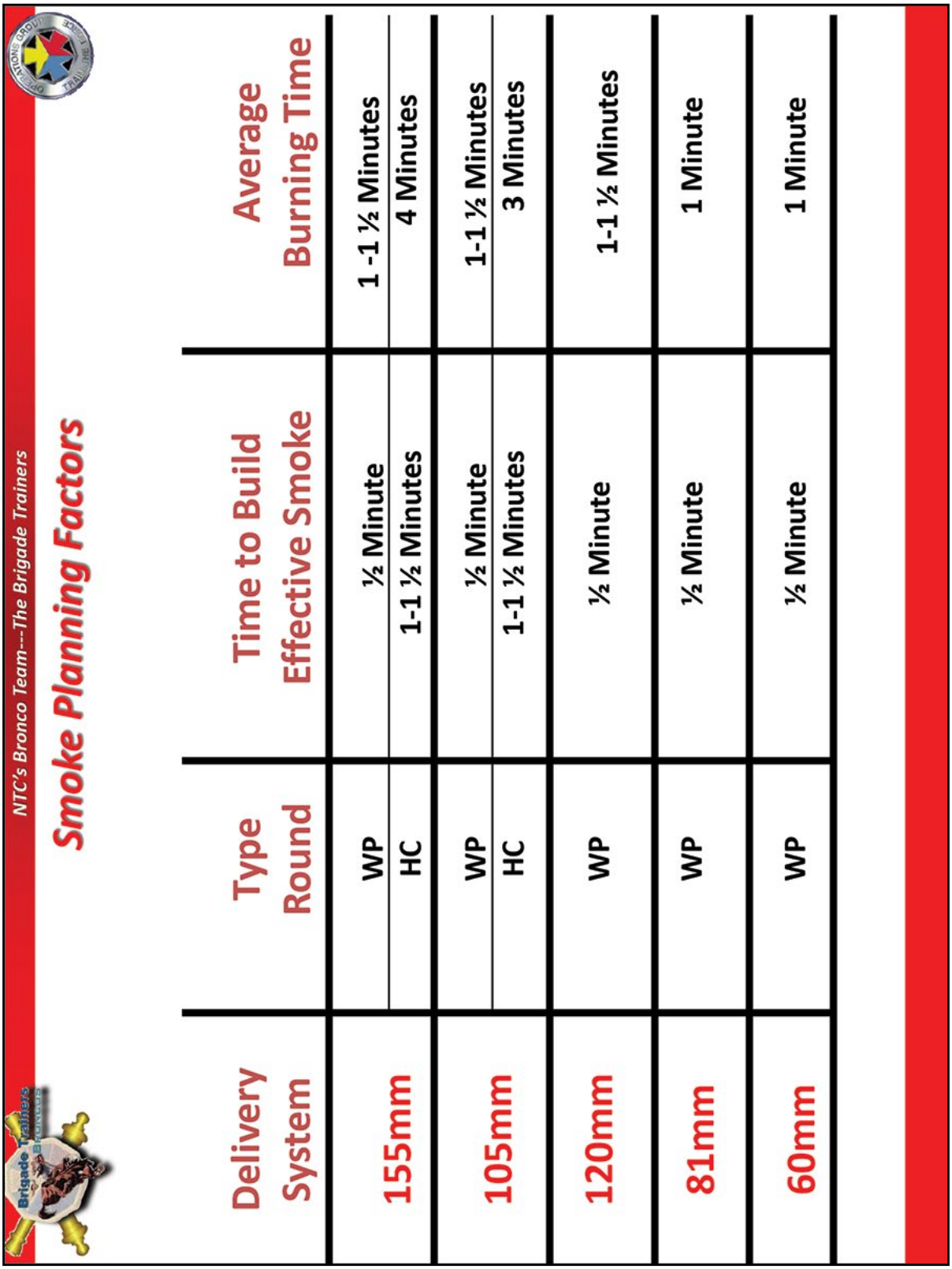


Figure 2-9. Preparing for a Successful Breach



Delivery System	Type Round	Time to Build Effective Smoke	Average Burning Time
155mm	WP	½ Minute	1 -1 ½ Minutes
	HC	1-1 ½ Minutes	4 Minutes
105mm	WP	½ Minute	1-1 ½ Minutes
	HC	1-1 ½ Minutes	3 Minutes
120mm	WP	½ Minute	1-1 ½ Minutes
81mm	WP	½ Minute	1 Minute
60mm	WP	½ Minute	1 Minute

Figure 2-10. Smoke Planning Factors

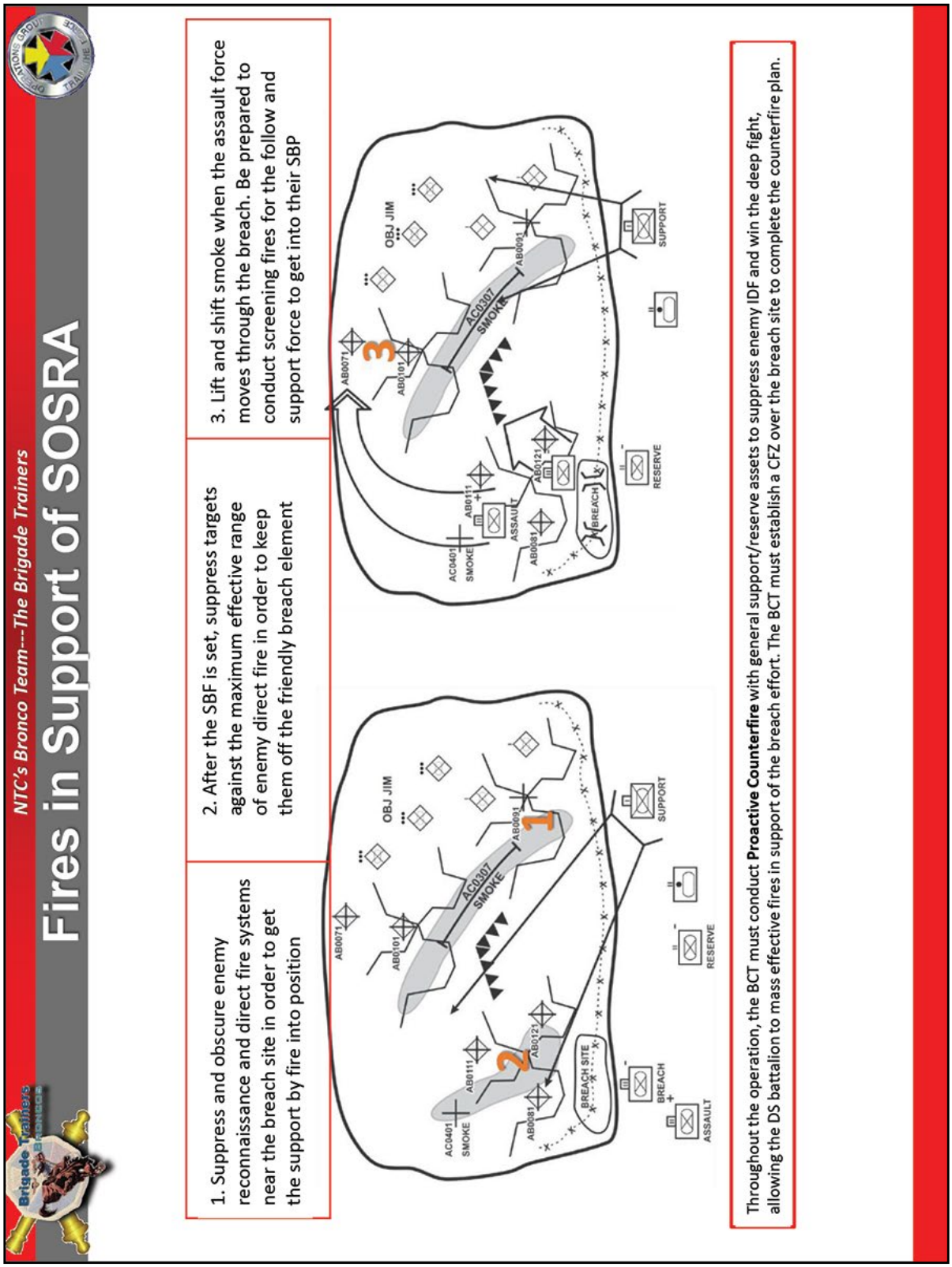


Figure 2-11. Fires in Support of SOSRA

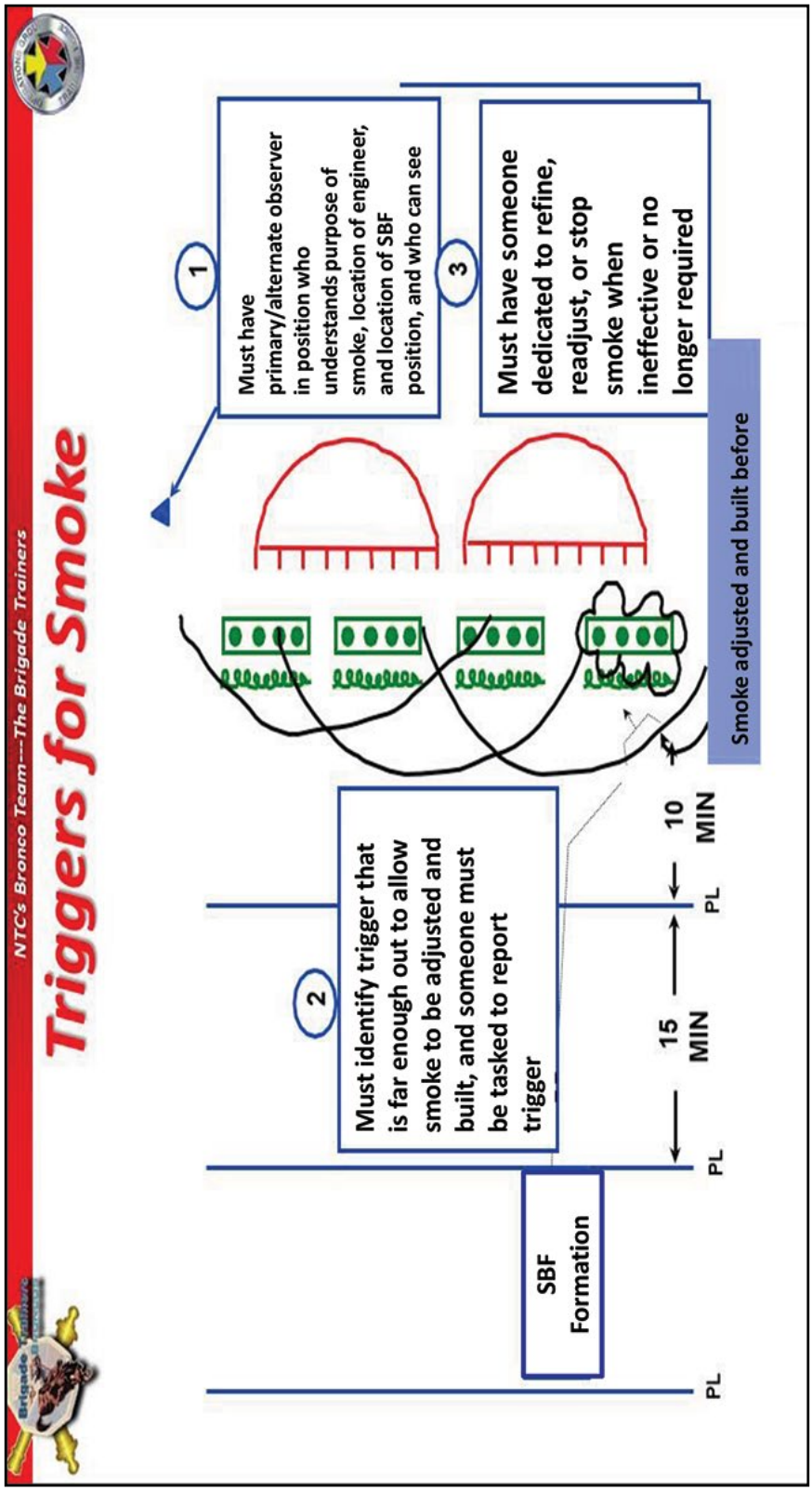


Figure 2-12. Triggers for Smoke

OBSERVATION PLANNING

To ensure the staff addresses all the requirements of an OP, the following checklist for OP selection should be considered.

Step 1. Identify the requirements for a primary and alternate OP (during course of action [COA] development). The OP may be required to assist in the intelligence collection plan or solely to trigger fire support targets.

Step 2. Conduct terrain analysis.

- Terrain analysis software is an effective tool to accomplish this task.
- Line of sight tool can assist with sight analysis.
- Run a line of sight shot from the NAI/target area of interest (TAI) or the target to determine possible OP locations. This method saves time by identifying all possible OP locations.

Step 3. Allocate assets.

- Choose based on the mission of the OP.
- If terminally guided munitions are necessary, than a leader equipped observer is necessary. A reconnaissance observer may need engineer assistance (an engineer reconnaissance team [ERT]), and a surveillance OP may require TF Scout's assistance.

Step 4. Select the OP.

- Select from likely OPs determined during terrain analysis.
- Consider mission and capabilities of the asset (i.e., angle-T, limited visibility, threat situation, and weapon range), and minimum safe distances for munitions to be delivered.

Step 5. Plan movement and occupation of operations. Plan within the scheme of maneuver.

Step 6. Specify tasks to subordinate units. Consider if the observer is a company/team FIST.

Step 7. Confirm requirements of observation plan and disseminate changes.

Step 8. Facilitate, inspect OP, and supervise execution.

Endnotes

1. FM 3-09, *Fire Support and Field Artillery Operations*, 30 April 2020

2. ATP 3-09.42, *Fire Support for the Brigade Combat Team*, 1 March 2016

CHAPTER 3
Intelligence/Targeting

Source: Army Techniques Publication (ATP) 3-60, *Targeting*, 7 May 2015

To enhance understanding, the commander's targeting guidance must be articulated clearly, so that it can be understood by all warfighting functions. This chapter provides a brief summary of the targeting terms and available tools to leverage and enhance the understanding of all warfighting functions. Figure 3-1 provides a quick reference to the types of targeting categories.

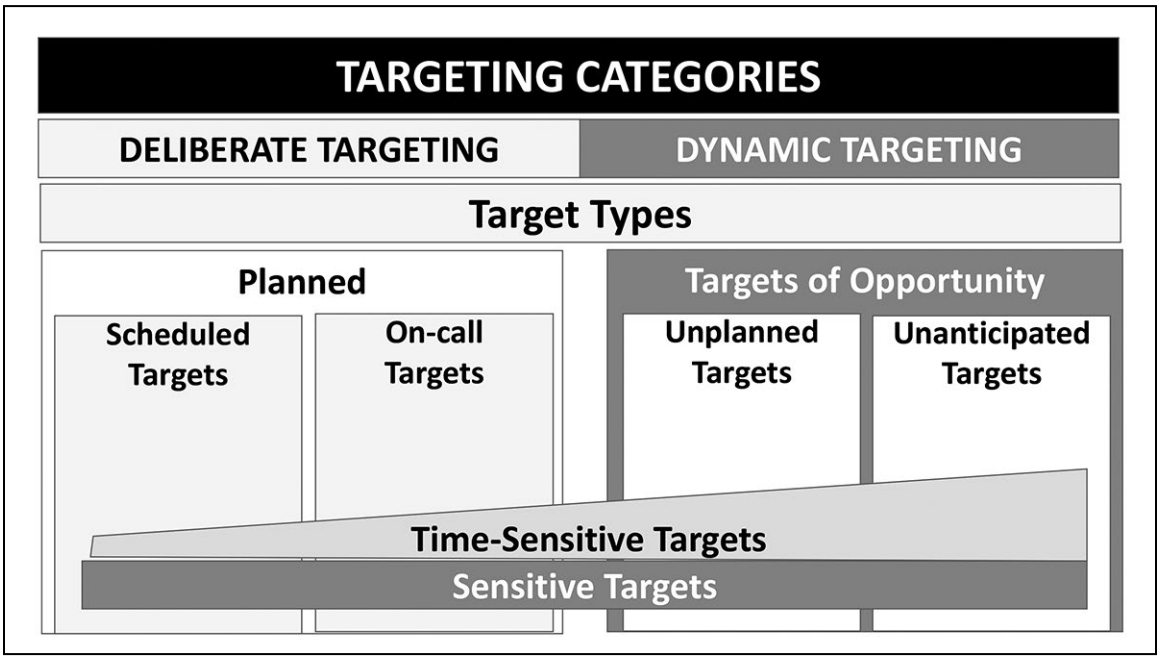


Figure 3-1. Targeting Categories

The enemy presents a large number of targets that can be engaged with available intelligence, acquisition, and attack assets. The targeting process weighs the benefits and the cost of engaging various targets to determine which targets are most likely to contribute to achieving the desired end state. Adhering to the five targeting guidelines below should increase the probability of creating desired effects, while diminishing undesired or adverse collateral effects. These guidelines are–

- Targeting focuses on achieving the commander's objectives. It is the function of targeting to achieve efficiently those objectives within the parameters set at the operational level, directed limitations, the rules of engagement or rules for the use of force, the law of war, and other guidance given by the commander. Every target nominated must contribute to attaining the commander's objectives.
- Targeting seeks to create specific desired effects through lethal and nonlethal actions. Target analysis encompasses all possible means to create desired effects, drawing from all available capabilities. The art of targeting seeks to create desired effects with the least risk and expenditure of time and resources.

- Targeting directs lethal and nonlethal actions to create desired effects.
- Targeting is a fundamental task of the fires warfighting function that encompasses many disciplines and requires participation from all staff elements and components.
- Targeting creates effects systematically. A targeting methodology is a rational and iterative process that methodically analyzes, prioritizes, and assigns assets against targets systematically to create those effects that will contribute to achieving the commander's objectives. If the desired effects are not created, targets may be considered again in the process or operations may have to be modified.

Terms used to describe the desired effects include:

Deceive. Military leaders attempt to mislead threat decision makers by manipulating their understanding of reality.

Defeat. Defeat is a tactical mission task that occurs when an enemy force has temporarily or permanently lost the physical means or will to fight. The defeated force's commander is unwilling or unable to pursue that individual's adopted course of action, thereby yielding to the friendly commander's will, and can no longer interfere to a significant degree with the actions of friendly forces. Defeat can result from the use of force or the threat of its use. Defeat manifests itself in some sort of physical action, such as mass surrenders, abandonment of positions, equipment and supplies, or retrograde operations. A commander can create different effects against an enemy to defeat that force. For example, a commander's employment of field artillery fires to attack an enemy force may result in the enemy no longer having sufficient personnel, weapons systems, equipment, or supplies to carry out its mission. Likewise, the delivery of massed, synchronized, and intense fires can cause enemy personnel to lose the will to continue to fight.

Degrade. To degrade is to reduce the effectiveness or efficiency of a threat.

Delay. To delay is to slow the time of arrival of enemy forces or capabilities or alter the ability of the enemy or adversary to project forces or capabilities. When enemy forces are delayed, friendly forces gain time. For delay to have a major impact, the enemy must face urgent movement requirements or the delay must enhance the effects of friendly operations. When delayed enemy forces mass behind a damaged route segment, a more concentrated set of targets and a longer period of exposure to friendly fires results.

Deny. An example of deny is to destroy the threat's communication equipment as a means of denying his use of the electromagnetic spectrum. However, the duration of denial will depend on the enemy's ability to reconstitute. Denial operations are actions to hinder or deny the enemy the use of space, personnel, supplies, or facilities.

Destroy. Destroy is a tactical mission task that physically renders an enemy force combat ineffective until it is reconstituted. Alternatively, to destroy a combat system is to damage it so badly, it cannot perform any function or be restored to a usable condition without being entirely rebuilt.

Destruction. There are two types of destruction. In the context of the computed effects of field artillery fires, fires destruction renders a target out of action ineffective either permanently for a long period, producing 30 percent casualties or materiel damage. The second is a type of adjustment for destroying a given target.

Disrupt. Disrupt is a tactical mission task in which a commander integrates direct and indirect fires, terrain, and obstacles to upset an enemy's formation or tempo; interrupts the enemy's timetable; or causes enemy forces to commit prematurely or attack in a piecemeal fashion. Disrupt is also an obstacle effect that focuses fire planning and obstacle effort to cause the enemy force to break up its formation and tempo, interrupt its timetable, commit breaching assets prematurely, and attack in a piecemeal effort.

Divert. To divert is to turn aside from a path or course of action. A diversion is the act of drawing the attention and forces of an enemy from the point of the principle operation: an attack, alarm, or feint that diverts attention. Diversion causes enemy forces to consume resources or capabilities critical to enemy operations in a way that is advantageous to friendly operations. Diversions draw the attention of enemy forces away from critical friendly operations and prevent enemy forces and their support resources from being employed for their intended purpose. Diversions can also cause more circuitous routing along lines of communication, resulting in delays for enemy forces. An option for field artillery employment in support of a commander's diversion is to use high explosive fires to encourage an enemy to adopt a different route.

Exploitation. Exploitation is an offensive task that usually follows a successful attack and is designed to disorganize the enemy in depth.

Interdict. Interdict is a tactical mission task where the commander prevents, disrupts, or delays the enemy's use of an area or route.

Neutralize. Neutralize is a tactical mission task that results in rendering enemy personnel or materiel incapable of interfering with a particular operation.

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

Suppress. Suppress is a tactical mission task that results in temporary degradation of the performance of a force or weapons system below the level needed to accomplish the mission .

The commander can also direct a variety of nonlethal actions or effects separately or in conjunction with lethal actions or effects. The commander can also provide restrictions as part of his targeting guidance. Targeting restrictions fall into two categories: the no-strike list and the restricted target list.

The no-strike list consists of objects or entities protected by:

- The law of war
- International laws
- Rules of engagement
- Other considerations

A restricted target list is a valid target with specific restrictions, such as:

- Limit collateral damage
- Preserve select ammunition for final protective fires
- Do not strike during daytime
- Strike only with a certain weapon
- Proximity to protected facilities and locations

Figures 3-2 and 3-3 provide a quick overview of available targeting assets to the targeting working group.

Figure 3-2. Organic Targeting Assets

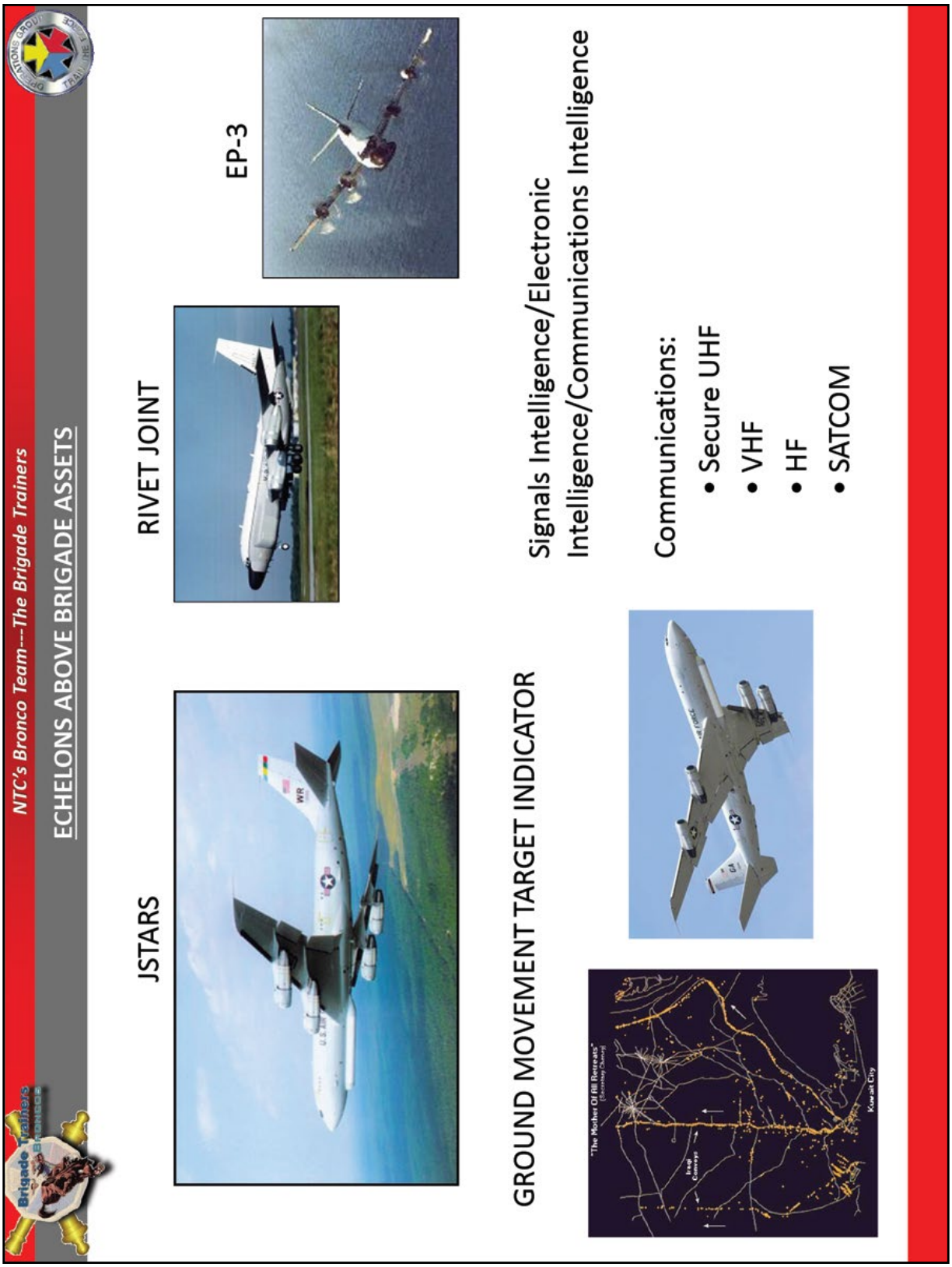


Figure 3-3. Echelons Above Brigade (EAB) Assets

TARGETING WORKING GROUP

Figures 3-4 and 3-5 are examples of a targeting working group agenda and planning structure.

Figure 3-4. Targeting Working Group Agenda

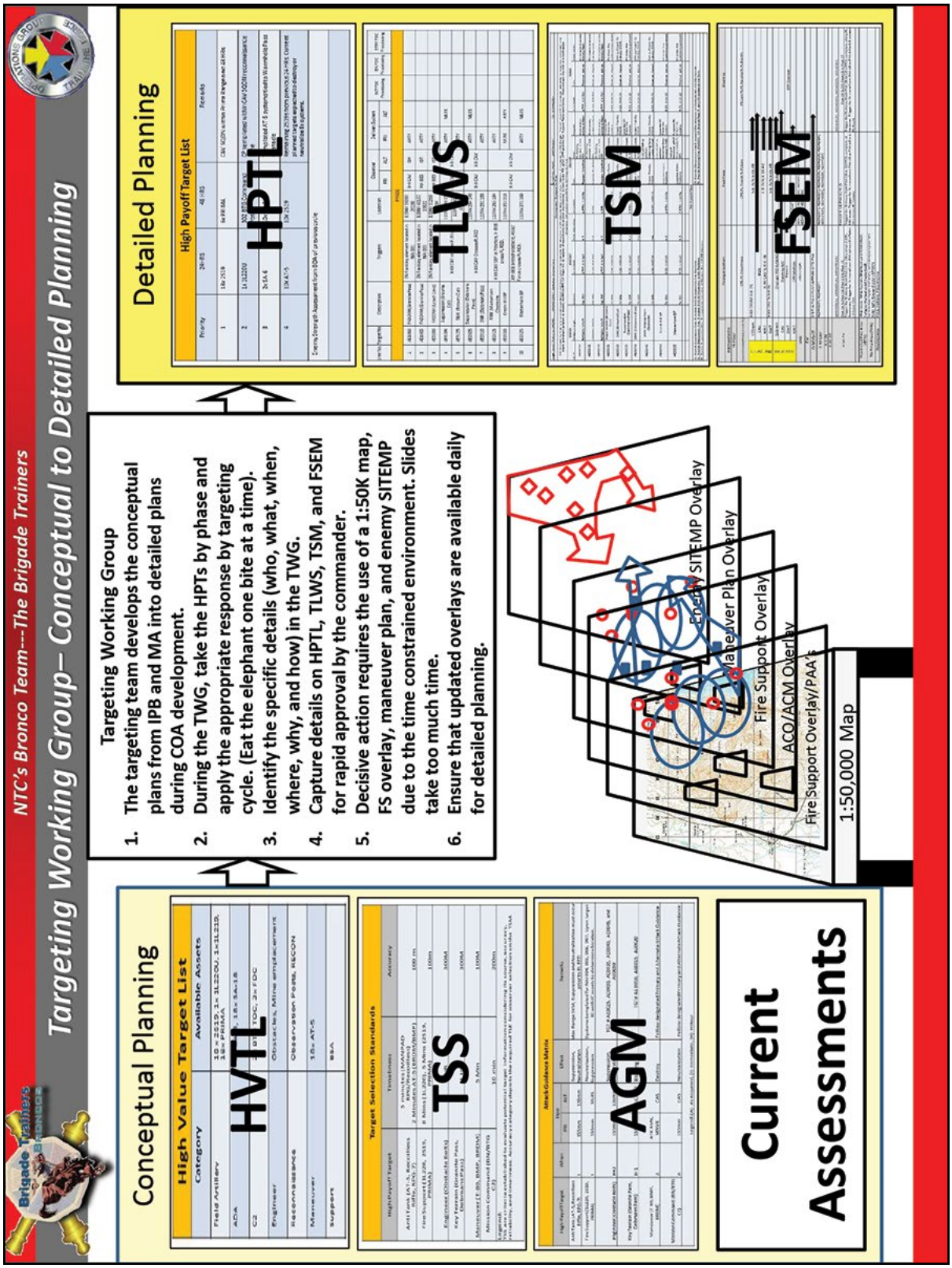


Figure 3-5. Targeting Working Group Conceptual to Detailed Planning

Brigade Fire Support Officer

The brigade fire support officer (FSO) finalizes the engagement guidance formulated by the brigade commander and fire support coordinator (FSCOORD) and leads the targeting working group. Figure 3-6 is a timeline for the FSO to keep in mind as part of the targeting working group. The targeting-specific actions are:

- Developing, maintaining, and updating targeting products, including the high-payoff target list (HPTL), targeting synchronization matrix, sensor-shooter matrix, measures of performance (MOP), and measures of effectiveness (MOE) for lethal and nonlethal effects.
- Conducting engagement assessment in conjunction with the intelligence officer and operations officer.
- Establishing target refinement standards to facilitate completion of the fire support plan before execution.
- Providing target refinement to higher headquarters for established division, corps, and theater army targets.
- Ensuring target nominations are validated and processed and updated to support the air tasking order.
- Coordinating with the air liaison officer (ALO) on use of tactical air assets.

Tactical Air Control Party

- An Air Force tactical air control party (TACP) is collocated with the fires cell at the brigade main command post
- The mission of the brigade TACP is to plan, coordinate, and direct air support for land forces.
- The air component ALO advises the brigade commander and staff on air support for brigade operations.

Targeting Officers

The targeting officer in the fires cell facilitates the exchange of information among the military intelligence company's analysis and control team, brigade intelligence officer, subordinate and supporting unit fires cells, and other staff members as required. The responsibilities are similar to the field artillery intelligence officer at the division and corps. The targeting duties include:

- Helping the brigade intelligence officer develop the information-collection and target-acquisition plans.
- Helping provide staff supervision of target acquisition assets organic to, attached to, or under operational control of the brigade combat team (BCT).
- Coordinating with the brigade intelligence officer for target acquisition coverage and processing of high-payoff targets (HPTs).
- Producing the targeting synchronization matrix for target acquisition assets supporting the BCT.

- Developing, recommending, and disseminating the MOP and MOE to subordinate and supporting elements.
- Developing, recommending, and disseminating approved fire support tasks to subordinate and supporting elements.
- Coordinating and distributing the restricted target list in coordination with the brigade FSO.

Aviation Liaison Officer

- The aviation liaison officer answers any questions that the team may have on the capabilities of Army aviation assets.
- The liaison officer takes the lead in planning attacks on all viable targets with aviation assets.

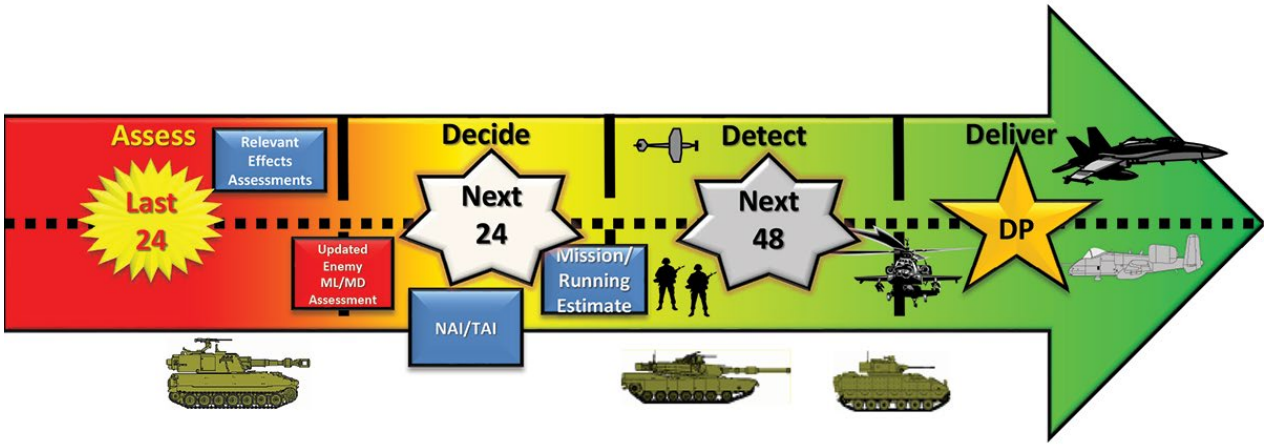


Figure 3-6. Targeting Working Group Timeline

Brigade Intelligence Officer

The S-2 is responsible for preparing the information-collection plan and maintaining information on the current enemy situation. The S-2 provides assessment of possible enemy actions, provides analysis, and identifies targets based on the BCT commander's guidance. Figure 3-7 provides a guide to the responsibilities needed in the targeting working group. Specific targeting responsibilities include:

- Providing enemy capabilities and projected courses of action.
- Providing intelligence preparation of the battlefield (IPB) products to the targeting working group
- Developing and supervising implementation of the information collection plan.
- Advising the operations officer about assessment collection capabilities.
- Developing high-value targets

Brigade Operations Officer

The operations officer's targeting responsibilities include acting as alternate chair of the targeting board. The specific targeting responsibilities include:

- Providing a detailed interpretation of the commander's concept of the operation.
- Providing guidance about which targets are most important to the commander.
- Determining the targets to be engaged immediately and desired effects.
- Coordinating and integrating target engagement with maneuver operations.

Brigade Judge Advocate

The brigade judge advocate's targeting responsibilities include:

- Providing advice on the impact of the rules of engagement on targeting.
- Providing advice on law of war impacts on targeting.

Electronic Warfare Officer

The electronic warfare officer's targeting responsibilities include:

- Ensuring electronic attack can meet the BCT commander's desired effects.
- Planning and coordinating taskings and requests to satisfy electronic attack and electronic warfare support requirements.
- Recommending to the operations officer and brigade FSO whether to engage a target with electronic attack.
- Expediting electromagnetic interference reports to the targeting working group and targeting board.

Liaison Officers

Liaison officer targeting responsibilities include:

- Addressing concerns of their respective commanders. Submitting and explaining the significance of target nominations to support their respective unit's operations.
- Providing feedback to their respective commanders on which targets are added to the HPTL and how they are synchronized with the information collection plan.
- Providing feedback to their commanders on target nominations made to higher headquarters.
- Providing the brigade with required targeting information from their respective subordinate or supporting units and vice versa.

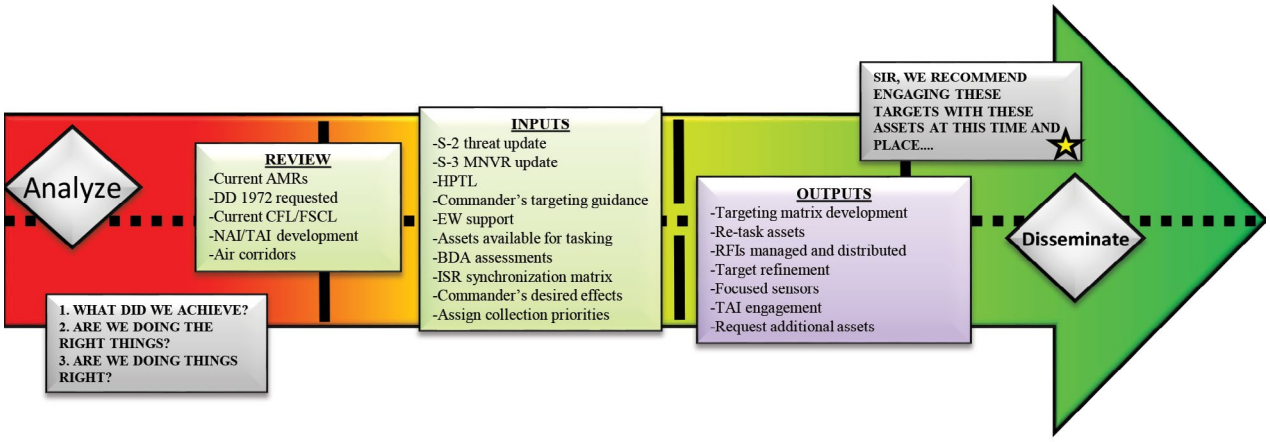


Figure 3-7. Targeting Working Group Responsibilities

Figures 3-8 and 3-9 are examples of the decision brief agenda and target synchronization used within a targeting working group.

Figure 3-8. Decision Brief Agenda

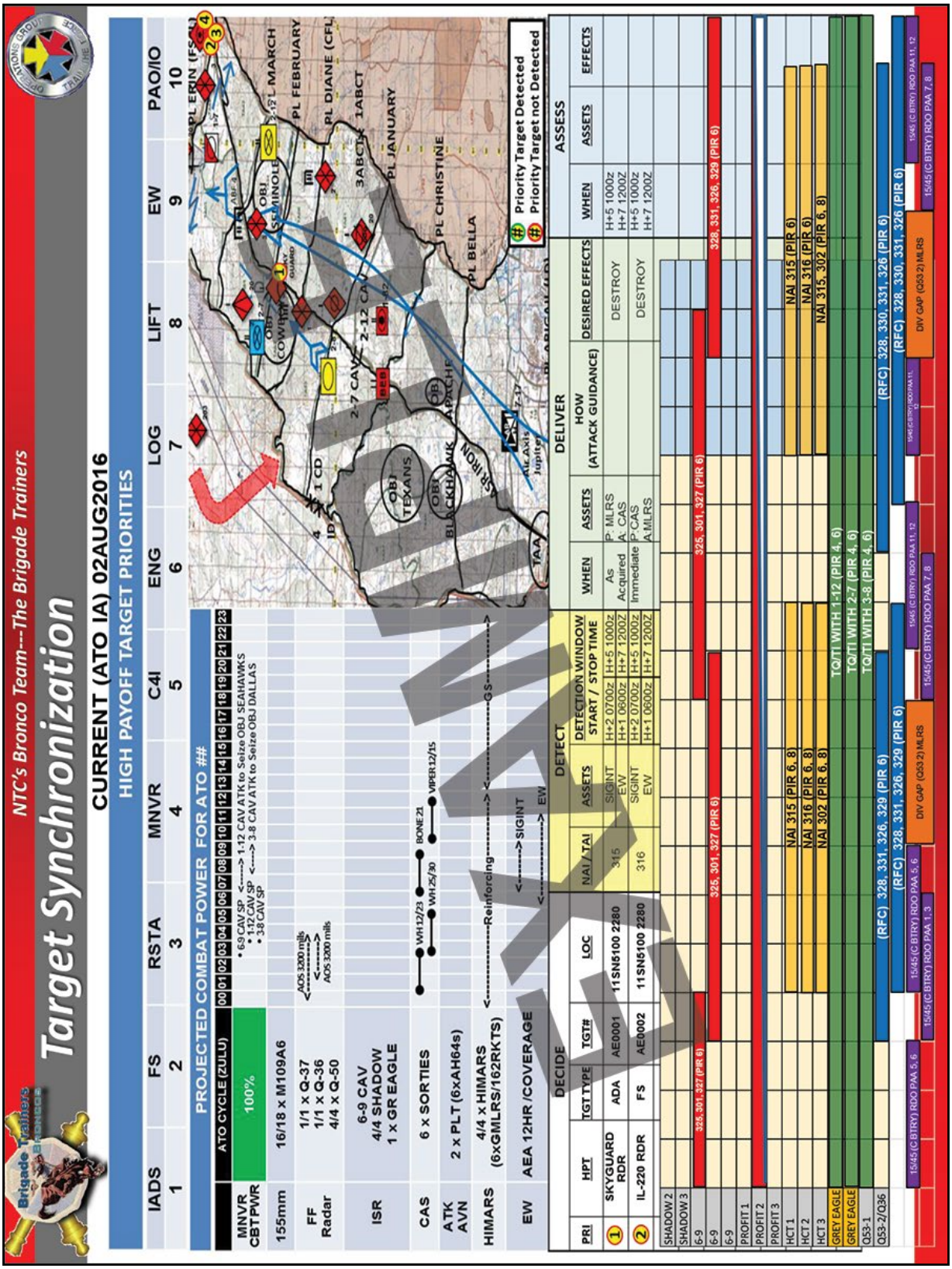


Figure 3-9. Target Synchronization

CHAPTER 4
Fire Support Products

This chapter provides examples of fire support products that were successfully used by rotational units during their decisive action rotation at the National Training Center. It begins with a brief overview of the scheme of fires and concept of fires then moves into examples of fire support products.

SCHEME OF FIRES

The scheme of fires is the detailed, logical sequence of targets and fire support events to find and engage high-payoff targets to accomplish the supported commander's intent.[1] At a minimum, scheme of fires should include:

- Fire support tasks and purpose for that phase;
- Priority of fires to subordinates for each asset, and
- The assessment for each task.

Army Techniques Publication (ATP) 3-09.42, *Fire Support for the Brigade Combat Team,* 1 March 2016, says that the scheme of fires paragraph must be concise, but specific enough to state clearly what fire support is to accomplish in the operation. 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 fire support paragraph should use the same format. The primary audience for the fire support paragraph is the subordinate maneuver commanders and their staff. Fire support tasks presented in the fire support paragraph will not contain all of the details that are listed in the fire support annex. Fire support officers (FSOs) and S-3s should determine what level of detail should be included.

CONCEPT OF FIRES

The scheme of fires must answer the "who, what, when, where, and why" of the fires to be provided, but provide enough flexibility to allow subordinate commanders to determine the "how" to the maximum extent possible by ensuring necessary procedural and positive control.[2] This in turn, requires detailed planning at the lowest levels. As targets are developed, the "how" is answered through bottom up refinement. However, because of the nature of fires and the effects that fires can produce, coordination and synchronization must be ensured by the higher headquarters in order to achieve the commander's intent.

Initially, the concept of fires may include a general narrative for the entire operation that should address the fire support task and purpose, the allocation of assets, the positioning guidance for fire support assets and observers, and attack guidance including the entire scalable range of effects.[3] Additional subparagraphs addressing fire support tasks for each phase of the operation use the following format: task, purpose, execution, and assessment in matrix form.[4]

EXECUTION

Concept of fires. The purpose of fires is to support the decisive effort to secure town XXXX and support the continuing growth of the provincial government of XXXX. The purpose of lethal fires is to increase security in support of: friendly forces development and independent operations, securing effective elections, and essential service development and economic growth throughout country XXX.

Figures 4-1 through 4-8 provide examples of fire support products that have been used successfully by rotations units during decision action rotations at the National Training Center. These examples include a fire support menu/checklist (Figure 4-1), a fire support execution matrix (Figures 4-2 and 4-3), a target synchronization matrix (Figure 4-4), a target list worksheet (Figure 4-5), target selection standards (Figure 4-6), an attack guidance matrix (Figure 4-7), and a high-payoff target list (Figure 4-8).

Figure 4-1. Fire Support Menu/Checklist

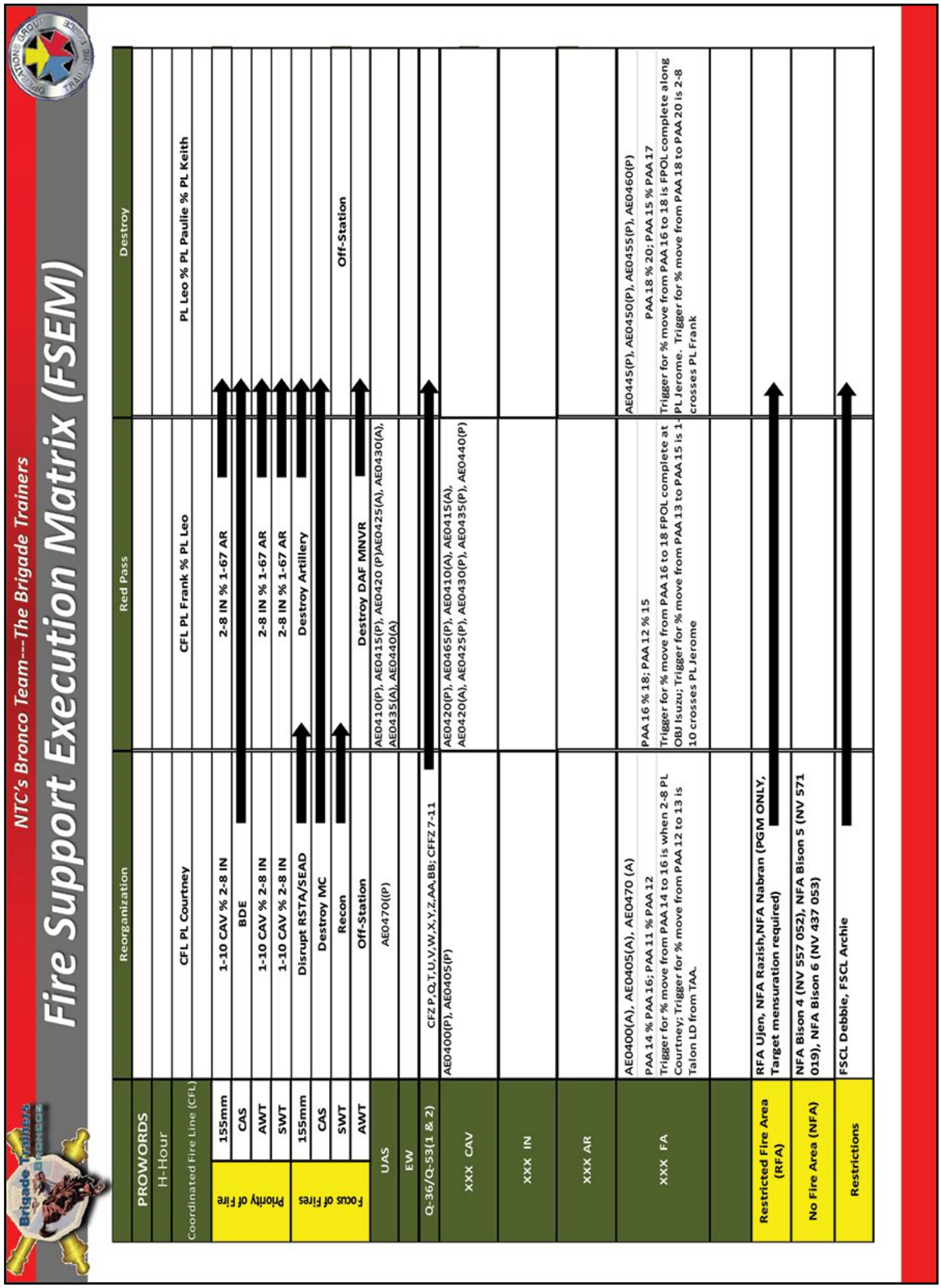


Figure 4-2. Fire Support Execution Matrix

NTC's Bronco Team---The Brigade Trainers

Fire Support Execution Matrix (FSEM) cont.

BCT Commanders Guidance for Fires	Radar
Employ joint fires in order to destroy DAF air defense systems, indirect fire formations, and mission command nodes, and disrupt DAF maneuver formations and reconnaissance assets.	**Q53 Locations:** loc. 11SNV27901091 AOS: 2300 **Q36 Locations:** loc. 11SNV27901091 AOS: 1300
Fire Support Coordination Measures(FSCMs)/ Restrictions	**CAS**
DIV is release authority for FASCAM, All cross boundary fires must be cleared by DIV/ Adjacent unit LNO	**4x F-15E (projected)**
Minimum NFA size is 500 meters in diameter, Employ munitions that limit collateral damage in populated areas	**Time on Station:** **TBD**

HPTs	TGT Blocks		AWT
1. SEAD	BCT FSC	AE 0001-1999	
2. FS	XXX CAV	AE 2000-1999	
3. MC	XXX IN	AE 3000-3999	
4. LOG	XXX AR	AE 4000-4999	
	XXX AHB	AE 5000-5999	2x AH-64D
PACE	XXX FA	AE 5000-6999	TBD
P: BDE FIRES DIG NET XXX	XXX BSB	AE 7000-7999	
A: BDE FIRES VOICE NET XXX	COUNTERFIRE	AE 8000-8999	2x OH-58
C: SVOIP	SPECIAL MUNITIONS	AE 9000-9999	TBD
E: HF Freq. XXXXX			

Fire Support Tasks (FSTs)

Fire Support Tasks (FSTs)	TARGET #	TRIGGER	LOCATION	OBSERVER	DELIVERY	AMMO
Suppress Enemy Air Defenses	As Acquired	PID of DAF ADA systems, Radar signature acquisition	vic. NAI 3076,3074,3075,3073,	UAS (PRI) RJ (EW) (ALT)	3-16 FA (155mm, SP) CAS	BTRY 3 HE 2X GBU-31s
Destroy DAF Artillery	AE0445,AE0450,AE0455, AE0460	PID of Artillery location, Counterfire radar acquisition	vic. NAI 3078, 3079	Q-37 (PRI) COLT 1 (ALT)	CAS 3-16 FA (155mm, SP)	2X GBU-31s BN 7 DPICM
Destroy DAF Mission Control	AE0425,AE0430,AE0435, AE0440	PID of MC	vic. NAI 3076,3074,30753073	UAS (PRI) COLT 2 (ALT)	3-16 FA (155mm, SP) CAS	BN 3 DPICM 4 GBU-31s
Disrupt DAF logistics capabilities	As Acquired	As Acquired	As Acquired	UAS (PRI), COLT	3-16 FA (155mm, SP) AWT (AH-64D)	BTRY 5 HE Pilots Discretion

Figure 4-3. Fire Support Execution Matrix (Continued)

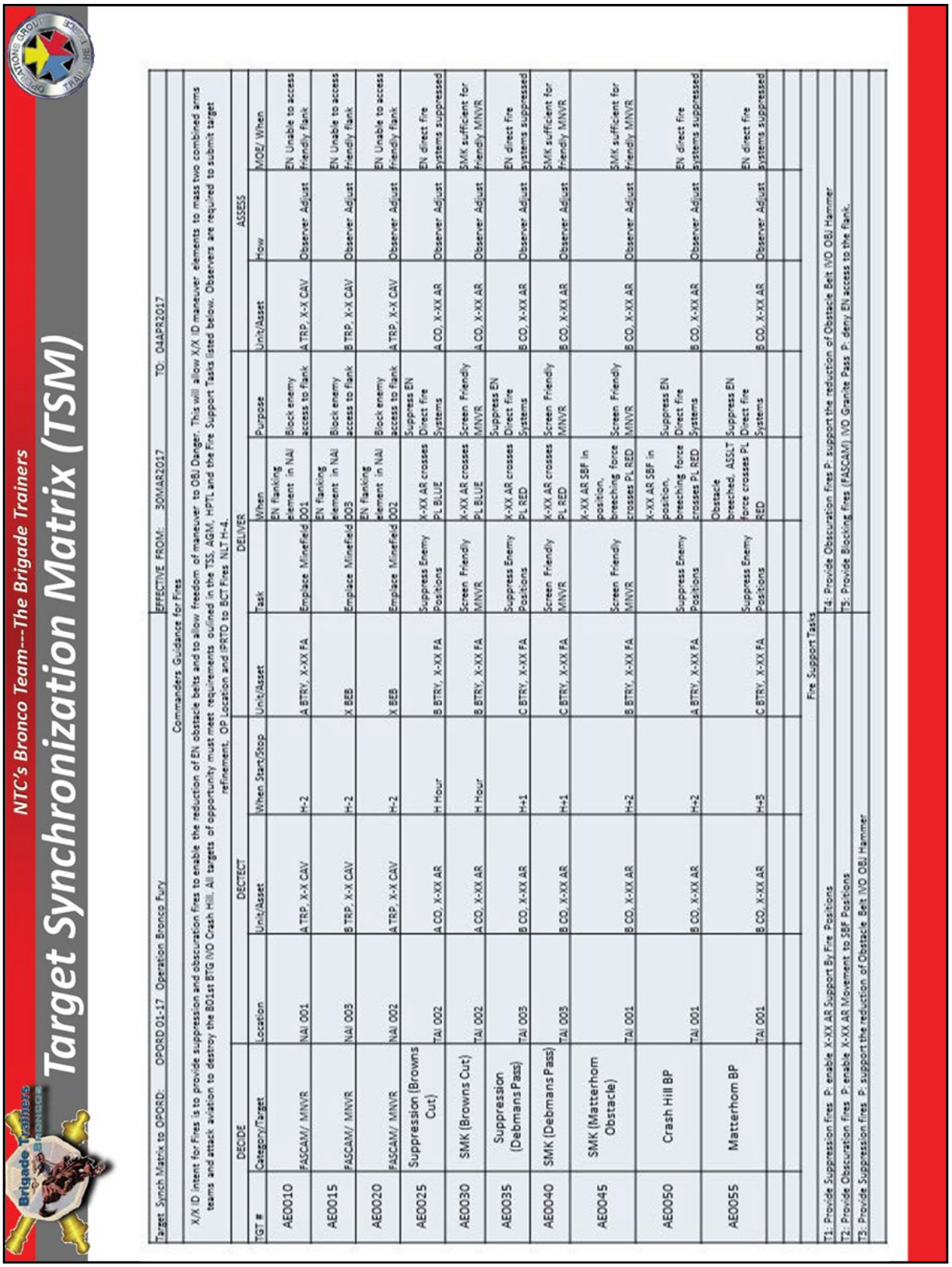
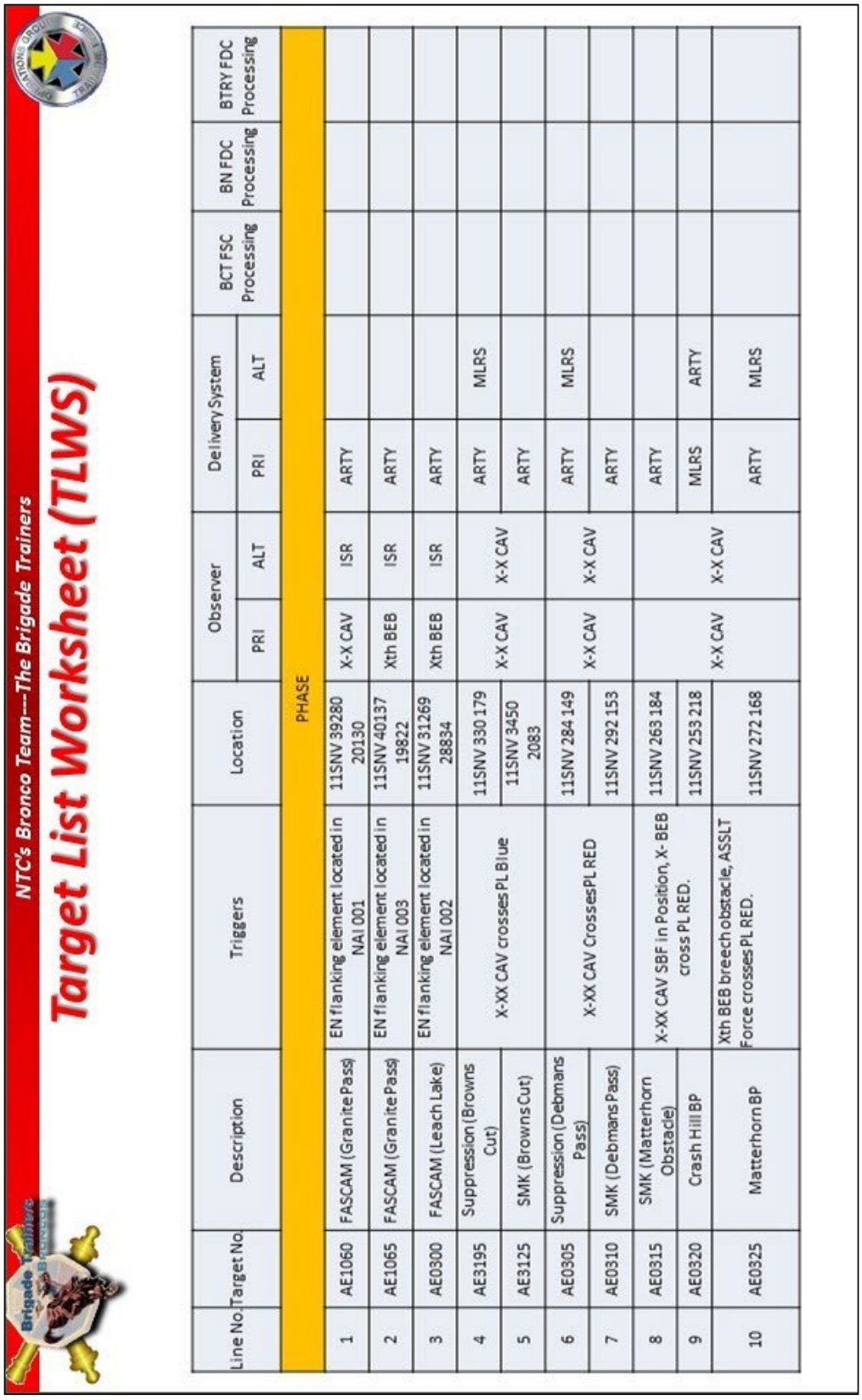


Figure 4-4. Target Synchronization Matrix



Line No.	Target No.	Description	Triggers	Location	Observer		Delivery System		BCT FSC Processing	BN FDC Processing	BTRY FDC Processing
					PRI	ALT	PRI	ALT			
PHASE											
1	AE1060	FASCAM (Granite Pass)	EN flanking element located in NAI 001	11SNV 39280 20130	X-X CAV	ISR	ARTY				
2	AE1065	FASCAM (Granite Pass)	EN flanking element located in NAI 003	11SNV 40137 19822	Xth BEB	ISR	ARTY				
3	AE0300	FASCAM (Leach Lake)	EN flanking element located in NAI 002	11SNV 31269 28834	Xth BEB	ISR	ARTY				
4	AE3195	Suppression (Browns Cut)	X-XX CAV crosses PL Blue	11SNV 330 179	X-X CAV	X-X CAV	ARTY	MLRS			
5	AE3125	SMK (Browns Cut)		11SNV 3450 2083			ARTY				
6	AE0305	Suppression (Debmans Pass)	X-XX CAV CrossesPL RED	11SNV 284 149	X-X CAV	X-X CAV	ARTY	MLRS			
7	AE0310	SMK (Debmans Pass)		11SNV 292 153			ARTY				
8	AE0315	SMK (Matterhorn Obstacle)	X-XX CAV SBF in Position, X- BEB cross PL RED.	11SNV 263 184			ARTY				
9	AE0320	Crash Hill BP		11SNV 253 218			MLRS	ARTY			
10	AE0325	Matterhorn BP	Xth BEB breech obstacle, ASSLT Force crosses PL RED.	11SNV 272 168	X-X CAV	X-X CAV	ARTY	MLRS			

Figure 4-5. Target List Worksheet

Target Selection Standards		
High Payoff Target	Timeliness	Accuracy
Anti Tank (AT-5, Recoilless Rifle, RPG-7)	5 minutes (MANPAD RPG/Recoilless) 2 Minutes AT-5 (BRDM/BMP)	100 m
Fire Support (1L220, 2S19, PRIMA)	8 Mins (1L220), 5 Mins (2S19, PRIMA)	100m
Engineer (Obstacle Belts)	1 HR	300M
Key Terrain (Granite Pass, Debmans Pass)	1 HR	300M
Maneuver (T-80, BMP, BRDM)	5 Min	100M
Mission Command (BN/BTG C2)	10 min	200m

Figure 4-6. Target Selection Standards

Attack Guidance Matrix

High-Payoff Target	When	How		Effect	Remarks
		PRI	ALT		
Anti Tank (AT-5, Recoilless Rifle, RPG-7)	I	155mm	120mm	Suppression, Neutralization	Max Range 5KM, Suppression and Neutralization must occur prior to PL RED
Fire Support (1L220, 2S19, PRIMA)	I	155mm	MLRS	Neutralization, Suppression	Systems templated for NAI 004, 005, 006, 007. Upon target ID with IC assets to determine location.
Engineer (Obstacle Belts)	H+2	155mm	120mm	Suppression, Obscuration	TGT # AE0025, AE0030, AE0035, AE0040, AE0045, and AE0050
Key Terrain (Granite Pass, Debmans Pass)	H-1	155mm	VOLCANO	Blocking	TGT# AE 0010, AE0015, AE0020
Maneuver (T-80, BMP, BRDM)	A	ATK AVN, MNVR	CAS	Destroy	Follow designated Primary and Alternate Attack Guidance
Mission Command (BN/BTG C2)	A	155mm	CAS	Neutralization	Follow designated Primary and Alternate Attack Guidance

Figure 4-7. Attack Guidance Matrix

Figure 4-8. High-Payoff Target List

Endnotes

1. ATP 3-09.42, *Fire Support for the Brigade Combat Team,* 1 March 2016

2. Army Tactics, Techniques, and Procedures (ATTP) 5-0.1, *Commander and Staff Officer Guide*, 14 September 2011

3. Ibid.

4. Ibid.

CHAPTER 5
Fire Support Coordination Measures

Fire support coordination requires continually coordinating fire support plans and managing the fire support assets that are available to a maneuver force. Fire support coordination is the planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons.[1] Fire support personnel must stay abreast of the maneuver situation at all times, and monitor requests for fire support within the unit to prevent fratricide.[2] Fire support personnel advise the maneuver commander of fire support coordination measures that enhance the responsiveness and effectiveness of fires.[3]

Fires planning coordinates, integrates, and synchronizes Army indirect, air and missile defense, joint, and multinational fires with the other warfighting functions into the commander's concept of operations.[4] Fire support planners work closely with the electronic warfare element to ensure destructive fires are integrated and synchronized with cyber/electromagnetic activities. Munitions allocation, along with the commander's guidance for fires, is an important part of fire support planning and coordination (coordination with logistic personnel to see if ammunition is sufficiently available to support the fire support plan). Army Techniques Publication (ATP) 3-09.42, *Fire Support for the Brigade Combat Team,* 1 March 2016, says that, "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 commander's intent and concept of operations. Effective coordination during both planning and execution is required to ensure that a suitable weapon system adequately attacks the desired targets at the correct time and place. In coordinating fire support, coordination among the various organizations is necessary for the effective delivery of fires." Within fire support coordination, it is fundamental that the fire support must:

- Operate as a cohesive entity;
- Be responsive to the needs of the supported commander, and
- Be fully integrated into the supported commander's concept of operations.

The supported commander should direct the fire support coordinator (FSCOORD) and chief of fires/brigade fire support officer to ensure that all available means of fire support are fully synchronized with the concept of the operation. The supported commander retains the authority to direct target priorities, levels of effort, and the sequence of those efforts to his subordinates.

GENERAL GUIDELINES FOR FIRE SUPPORT COORDINATION

- Position field artillery delivery units to engage high-payoff targets.
- If acting as the force field artillery headquarters, provide common grid and meteorological data for units attached to or under its operational control (OPCON) or tactical control (TACON).
- Coordinate with the brigade combat team's (BCT's) fires cell and field artillery battalion (FAB) command post to develop the attack guidance matrix using the munitions effects database in the Advanced Field Artillery Tactical Data System (AFATDS).

- Compute ammunition requirements for generating desired effects via the attack of expected enemy target categories with field artillery. Provide this assessment to the commander for attack guidance formulation.
- Identify issues that require the field artillery commander's attention or additional guidance.
- State the FAB and supported higher headquarters commander's attack guidance by defining how, when, and with what restrictions the commander wants to attack different targets and identify the targeting priorities.
- Require refinement by lower echelons to be completed by an established cut-off time.
- Verify or correct target locations and trigger points during refinement.
- Recommend the risk the FAB and the supported higher headquarters commander should be willing to accept concerning delivery of indirect fires for maneuver units in close combat.
- Use the fire support execution matrix to brief the fire support portion of the operation order (OPORD) during rehearsal. Rehearse the fire support portion of the OPORD directly from the fire support execution matrix.
- Conduct rehearsals with the actual units and Soldiers who will execute field artillery tasks.
- Verify the area of coverage of radars of the units who have a command or support relationship with the FAB.
- Prioritize requirements for radars 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.

Endnotes

1. ATP 3-09.42, *Fire Support for the Brigade Combat Team,* 1 March 2016
2. FM 6-30, *Tactics, Techniques, and Procedures for Observed Fire,* 16 July 1991
3. Ibid.
4. ADP 3-09, *Fires*, 31 August 2012 (Superseded by ADP 3-19, *Fires,* 31 July 2019)

CHAPTER 6
Rehearsals

Rehearsals (Source: Field Manual [FM] 6-0, *Command and Staff Organization and Operations*, 5 May 2014)

Rehearsals allow leaders and their Soldiers to practice key aspects of the concept of operations. These actions help Soldiers orient themselves to their environment and other units before executing the operation. Rehearsals help Soldiers build a lasting mental picture of the sequence of key actions within the operation.

Rehearsals are the commander's tool to ensure staffs and subordinates understand the commander's intent and the concept of operations. They allow commanders and staffs to identify shortcomings in the plan that were not previously recognized. Rehearsals also contribute to external and internal coordination, as the staff identifies additional coordinating requirements.

Effective and efficient units habitually rehearse during training. Commanders at every level routinely train and practice various rehearsal types. Local standard operating procedures (SOPs) identify appropriate rehearsal types and standards for their execution. All leaders conduct periodic after action reviews to ensure their units conduct rehearsals to standard and correct substandard performances. After action reviews also enable leaders to incorporate lessons learned into existing plans and orders, or into subsequent rehearsals.

Adequate time is essential when conducting rehearsals. The time required varies with the complexity of the mission, the type and technique of rehearsal, and the level of participation. Units conduct rehearsals at the lowest possible level using the most thorough technique possible, given the time available. Under time-constrained conditions, leaders conduct abbreviated rehearsals, focusing on critical events determined by reverse planning. Each unit will have different critical events based on the mission, unit readiness, and the commander's assessment

Rehearsal Types (See Figure 6-1 for a visualization of the types of rehearsals).

- Backbrief
- Combined arms rehearsal
- Support rehearsal
- Battle drill or SOP rehearsal

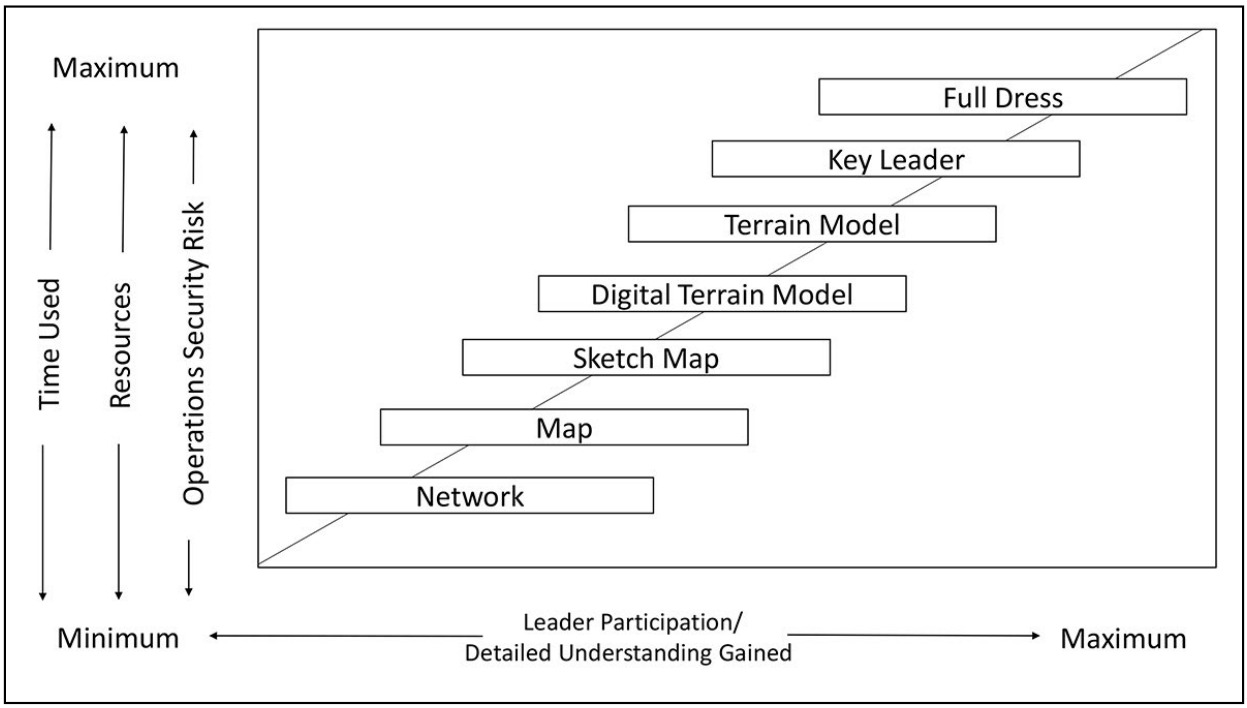


Figure 6-1. Types of Rehearsals[1]

BRIGADE FIRE SUPPORT REHEARSAL RUBRIC (EXAMPLE)

Attendance. Fire support coordinator (FSCOORD), brigade (BDE) S-2 cavalry (CAV) squadron commander, BDE fire support officer (FSO), CAV S-3, BDE S-6, brigade combat team (BCT) judge advocate general (JAG), BCT staff weather officer (SWO), BCT air liaison officer (ALO), counterfire officer, field artillery (FA) battalion (BN) S-3, BN fire direction officer (FDO), all S-2s, special operations forces (SOF) liaison officer (LNO), BDE S-3, collection manager, BCT brigade aviation officer (BAO), BDE fires current operations (CUOPS), non-lethal targets

Products on hand. Fire support execution matrix (FSEM); information collection (IC) matrix; target list work sheet (TLWS); Annex D with target number, trigger, location, observer, delivery system, attack guidance, and communication (TTLODAC); commander's critical information requirements (CCIRs); decision support matrix (DSM) (with priority intelligence requirements [PIRs], secondary intelligence requirements [SIRs], and information requirements [IRs]); decision support template (DST); Excheck (if applicable); high-payoff target list (HPTL); attack guidance matrix (AGM); target selection standards (TSS); and the no strike list (NSL)

Fighting products should drive rehearsal, not scripts

Terrain Model

- Fire support coordination measures (FSCMs), airspace coordinating measures (ACMs), phase lines, boundaries, coordinated fire line (CFL), and fire support coordination line (FSCL)
- Targets
- Named area of interest (NAI)/target area of interest (TAI)
- Radar zones/radar positions
- Templated enemy icons (utilize S-2 Soldiers for this)
- Templated operations
- North seeking arrow
- Position areas for artillery (PAAs)

The CAV S-3/FSO/S-2 briefs PIRs answered in last 12-24 hours and the updated CAV situation.

BCT S-2 Overview

- Overall enemy situation discussed (1-2 minutes)
- Overall scheme of collection discussed (1-2 minute summary)

The BCT Commander or FSCOORD discuss BCT commander's guidance for fires.

The BCT Commander or Secondary Officer (SCO) discuss BCT commander's guidance for surveillance, focus, tempo, engagement/disengagement criteria, and displacement criteria.

The BCT SWO briefs the weather effects for all fires assets and potential adverse impact on relevant aspects of the fire support rehearsal.

Briefed by phase/sub phase in time and space.

The BCT S-3 overviews the concept of operations.

The ALO describes fixed wing airspace plan in time and space. (This must occur, but can occur at relevant time in briefing).

The BAO describes rotatory wing aviation plan in time and space/ACM plan. (This must occur, but can occur at relevant time in briefing). Briefs task and purpose of aircraft, location of targets or engagement areas, number of aircraft on station, weapons configuration, ACMs used (and time to fly air corridor legs), aerial observation (if any), time on station, suppression of enemy air defenses plan, triggers (readiness level upgrade and launch times), communications plan (command, control, air-to-ground and air-to-air), and forward arming and refueling point rotation.

The air defense artillery (ADA) officer briefs the current air threat, air defense capabilities and coordinating measures, and airspace clearance and integration, including indirect fire trajectories.

The BCT JAG briefs applicable rules of engagement (ROE) (i.e., Law of War Considerations for Urban Operations).

The BCT FSO defines close and deep fights via the BDE CFL.

The BCT FSO defines HPTL and priority of fire (POF) for the phase.

DEEP

BCT Collection Manager

- NAI or TAI number and location (group similar and appropriate NAIs)
- Collection assets/capability
- Location of the collection system/sensor and times of collection
- Task of the collection effort (i.e., using signals intelligence [SIGINT], identify enemy 2S6M)
- Purpose (i.e., to identify enemy air defense elements from the 801st Brigade Tactical Group [BTG], answer PIRs, support commander's decision points, and his number one target from the HPTL).
- Triggers (i.e., detection and identification will trigger a specific effort or event)
- Sensor to shooter plan
- Air Assault Cherry/Ice calls
- Armed unmanned aircraft systems (UASs) should detail the process when the UAS transfers from a collection role to that of close air support (CAS)
- In addition, include the information on how the asset transfers to the joint terminal attack controller (JTAC) for command and control (C2) and munitions release

The BCT S-2 defines enemy actions in that phase and how they relate to IC.

- Enemy description
- Time enemy in positon/movement times of enemy
- Activity (defending/moving)
- Forms of contact
- Asset to cue
- Time permits (answering PIRs)
    - How does BCT receive info
    - How is information disseminated
    - Which NAIs trigger TAIs?

- Asset to identify/confirm
    - How does the BCT receive information?
    - How is information disseminated?
    - BCT rehearses attacking high-payoff targets (HPTs) sensor to shooter
    - BCT discusses asset to assess battle damage/effects

CLOSE

BN FSOs describe the TTLODAC for BCT allocated targets/assigned TAIs. (Discussed by actual observer if tactically feasible to attend).

Call for Fire (CFF) rehearsed sensor to shooter for each target.

BN FSOs discuss mortar-firing points

FA BN S-3/FDO discuss:

- Triggers to move batteries/platoons and survivability move criteria
- Sequencing in time and space (batteries unavailable due to ongoing fire missions or movement)
- As part of sensor to shooter CFF, state fire order
- Special considerations (i.e., high angle fire)

Target Acquisition Platoon Leader (TAPL) discusses radar plan in time and space.

- Radar movement plan/locations/azimuth of search (AOS)
- Cueing schedule (in time and space, as triggered by other actions)
- Radar zones (critical friendly zone [CFZ], call for fire zone (CFFZ), artillery target intelligence zone [ATIZ], censor zones)
- Radar support during high volume missions

IC/fires rehearsal must induce friction.

Adjustment of smoke, alternate shooters, alternate observers, sequencing of fire missions (i.e., all guns occupied), and counterfire

The BDE FSO ends by reviewing due outs, target refinement cut-off time (if it did not occur before rehearsal), and fires technical rehearsal time.

FIELD ARTILLERY/FIRE SUPPORT TECHNICAL REHEARSAL

Field artillery/fire support technical rehearsals are used to ensure the fire support plan, firing unit plan, and operations order properly address FA technical fire direction. These rehearsals also exercise the technical fire direction process. FA technical rehearsals focus on:

- The technical execution of fire support tasks and the FA support matrix—sensor-to-shooter links and primary and backup methods (i.e., fire direction center focus). Rehearsal of backups include evaluation of reactions to catastrophic loss of a fire direction center (BN or battery), and loss of digital or voice capability.[2]
- Integration of tactical and technical fire control processes, and computation of firing solutions including the communication and interaction between fire support, fire direction, and firing elements.[3]
- Identification of technical fire direction issues—high angle fire, minimum safe distance and target, ammunition, range, and FSCM conflicts.[4]
- Digital database verification—setup, communications, positions, FSCMs, target and attack guidance, mission routing and intervention points, target list, and scheduling data.[5]
- Digital continuity of operations—minor and catastrophic.[6]
- Digital interface requirements—fire direction system, Advanced Field Artillery Tactical Data System (AFATDS) version differences, and any other digital systems.[7]
- Integration of voice and digital operations from sensor to shooter, including backup plans.[8]
- Injecting stress into the fire support plan to identify risk and opportunities before execution.

FA technical rehearsals include:

- A detailed digital rehearsal, designed to exercise the entire FA digital communications system, verify databases, and ensure interoperability of different digital systems. This rehearsal verifies that nodes can effectively communicate, message formats can be passed, and fire mission routing will execute, as required.
- A rehearsal focused on technical fire direction, including the fire support/operations/fire direction center mission routing and handoff process. Although fire support personnel may be involved, the focus is on the exchange of fire mission data and timing issues rather than the tactical decision-making process.

Note. In AFATDS, a unit cannot rehearse a plan digitally until it is implemented into the current situation. Before each phase can be rehearsed, it must be implemented by the AFATDS operations facilities involved in the rehearsal.

Figure 6-2 provides an example of an ideal BDE planning timeline for a successful FA technical rehearsal.

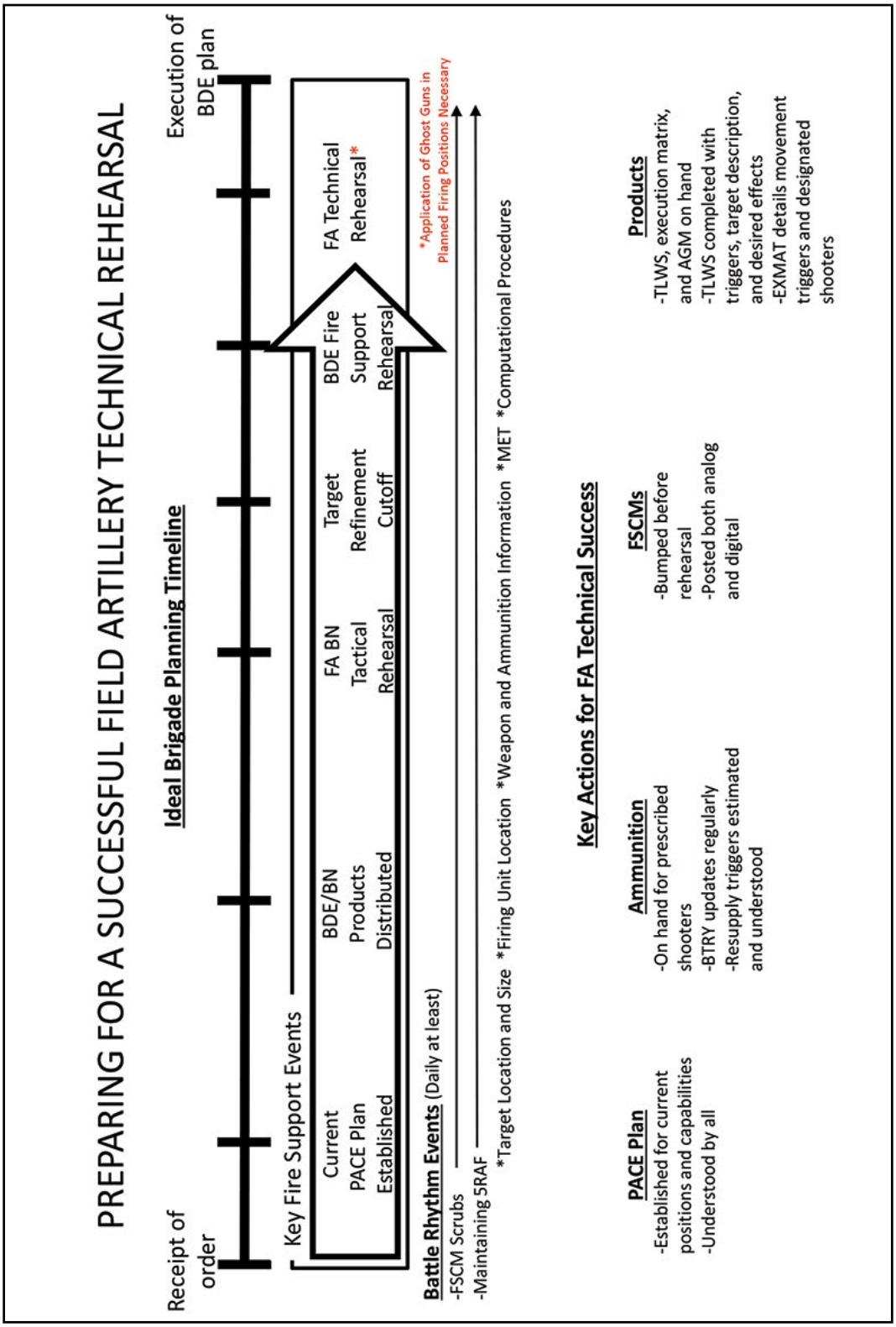


Figure 6-2. FA Technical Rehearsal Preparation Timeline

Endnotes

1. FM 6-0, *Commander and Staff Organization and Operations*, 5 May 2014
2. FM 3-09, *Fire Support and Field Artillery Operations,* 30 April 2020
3. Ibid.
4. Ibid.
5. Ibid.
6. Ibid.
7. Ibid.
8. Ibid.

CHAPTER 7
Target Acquisition

This chapter provides a brief description of radar zones, and an overview of the capabilities of the radar systems within a brigade combat team (see Table 7-1). The chapter continues with an example of a radar deployment order (Figure 7-1), and a flow chart showing "A-Way" to conduct a counter-fire battle drill within a brigade command post, and an example of a radar deployment order.[1] (See Figure 7-2).

RADAR ZONES

Radar zones are a means of prioritizing radar sectors of search into areas of greater or lesser importance. There are two categories of zones: priority and censor. Priority zones focus on locating hostile weapon systems. There are three types of priority zones: critical friendly zone (CFZ), call for fire zone (CFFZ), and artillery target intelligence zone (ATIZ):

- A CFZ is an area, usually a friendly unit or location, which the maneuver commander designates as critical to the protection of an asset whose loss would seriously jeopardize the mission.[2]
- A CFFZ is a radar search area from which the commander wants to attack hostile firing systems. A CFFZ is around an enemy fire support position identified as a high-payoff target. The CFFZ provides the second most responsive priority for fires from the radars.[3]
- An ATIZ is an area in enemy territory the commander wishes to monitor closely. Any weapon detected in the ATIZ will be reported ahead of all acquisitions, other than those from CFZs or CFFZs.[4]

Field Manual (FM) 3-09, *Fire Support and Field Artillery Operations*, 30 April 2020, defines censor zones (CZs) as. "Areas from which the radar is prohibited from reporting acquisitions. A CZ is normally placed around friendly weapon systems to prevent them from being acquired by other friendly radars. Care must be taken when deciding to employ this zone, since the radar ignores all acquisitions coming from the CZ."

Table 7-1. Target Acquisition Radar Capabilities[5]

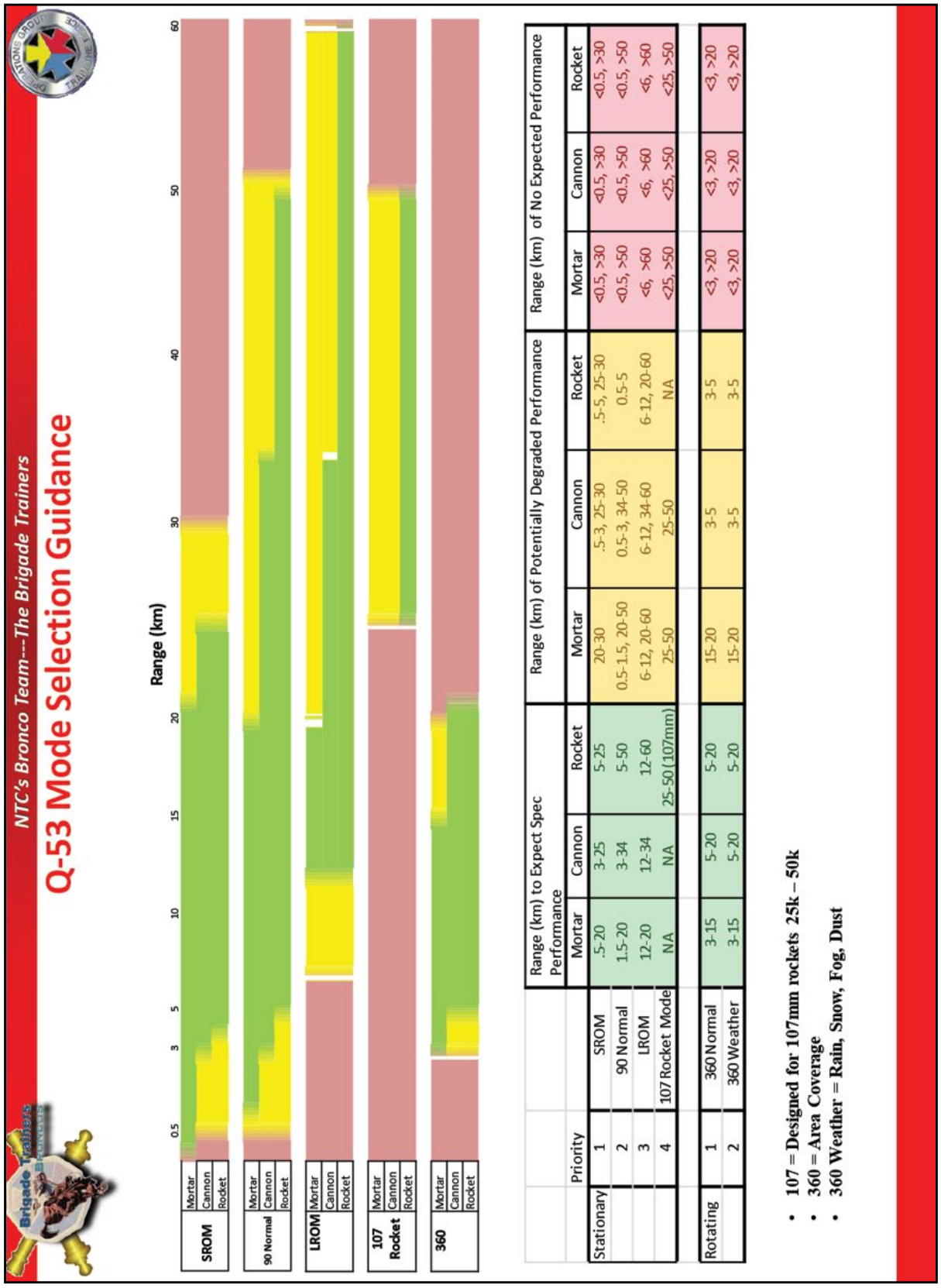
Radar	Unplanned Search Sector	Range	Optimized to Detect	Organic to
AN/TPQ-36	1,600 mils	0.75-24 kilometers (KM)	Shorter range, high-angle, lower velocity weapons such as mortars and short range artillery	Cannon field artillery battalion
AN/TPQ-37	1,600 mils	3-50 KM	Longer range, lower angle, higher velocity weapons such as long-range artillery and rockets	Cannon field artillery battalion
AN/TPQ-50	6,400 mils	0.5-10 KM	Shorter range, high-angle, lower velocity weapons such as mortars and short-range artillery	Cannon field artillery battalion
AN/TPQ-53	1,600 mils	60 KM	Longer range, lower angle, higher velocity weapons such as long-range artillery and rockets	When fully fielded, will replace both the AN/TPQ-36 and AN/TPQ-37 radars
	6,400 mils	20 KM	Shorter range, high-angle, lower velocity weapons, such as mortars and short-range artillery	

Note. Information on the AN/TPQ-36 and -37 is found in Army Techniques Publication (ATP) 3-09.12, *Field Artillery Target Acquisition,* 21 June 2020[6]

Note. 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, it can be positioned in a location where a detection capability is required much more quickly than the larger radars.[7]

Note. 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 6,400 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.[8]

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 1,600 mils mode to perform concurrent friendly and hostile missions.[9]



Priority			Range (km) to Expect Spec Performance			Range (km) of Potentially Degraded Performance			Range (km) of No Expected Performance		
			Mortar	Cannon	Rocket	Mortar	Cannon	Rocket	Mortar	Cannon	Rocket
Stationary	1	SROM	.5-20	3-25	5-25	20-30	.5-3, 25-30	.5-5, 25-30	<0.5, >30	<0.5, >30	<0.5, >30
	2	90 Normal	1.5-20	3-34	5-50	0.5-1.5, 20-50	0.5-3, 34-50	0.5-5	<0.5, >50	<0.5, >50	<0.5, >50
	3	LROM	12-20	12-34	12-60	6-12, 20-60	6-12, 34-60	6-12, 20-60	<6, >60	<6, >60	<6, >60
	4	107 Rocket Mode	NA	NA	25-50 (107mm)	25-50	25-50	NA	<25, >50	<25, >50	<25, >50
Rotating	1	360 Normal	3-15	5-20	5-20	15-20	3-5	3-5	<3, >20	<3, >20	<3, >20
	2	360 Weather	3-15	5-20	5-20	15-20	3-5	3-5	<3, >20	<3, >20	<3, >20

Figure 7-1. Mode Selection Guidance

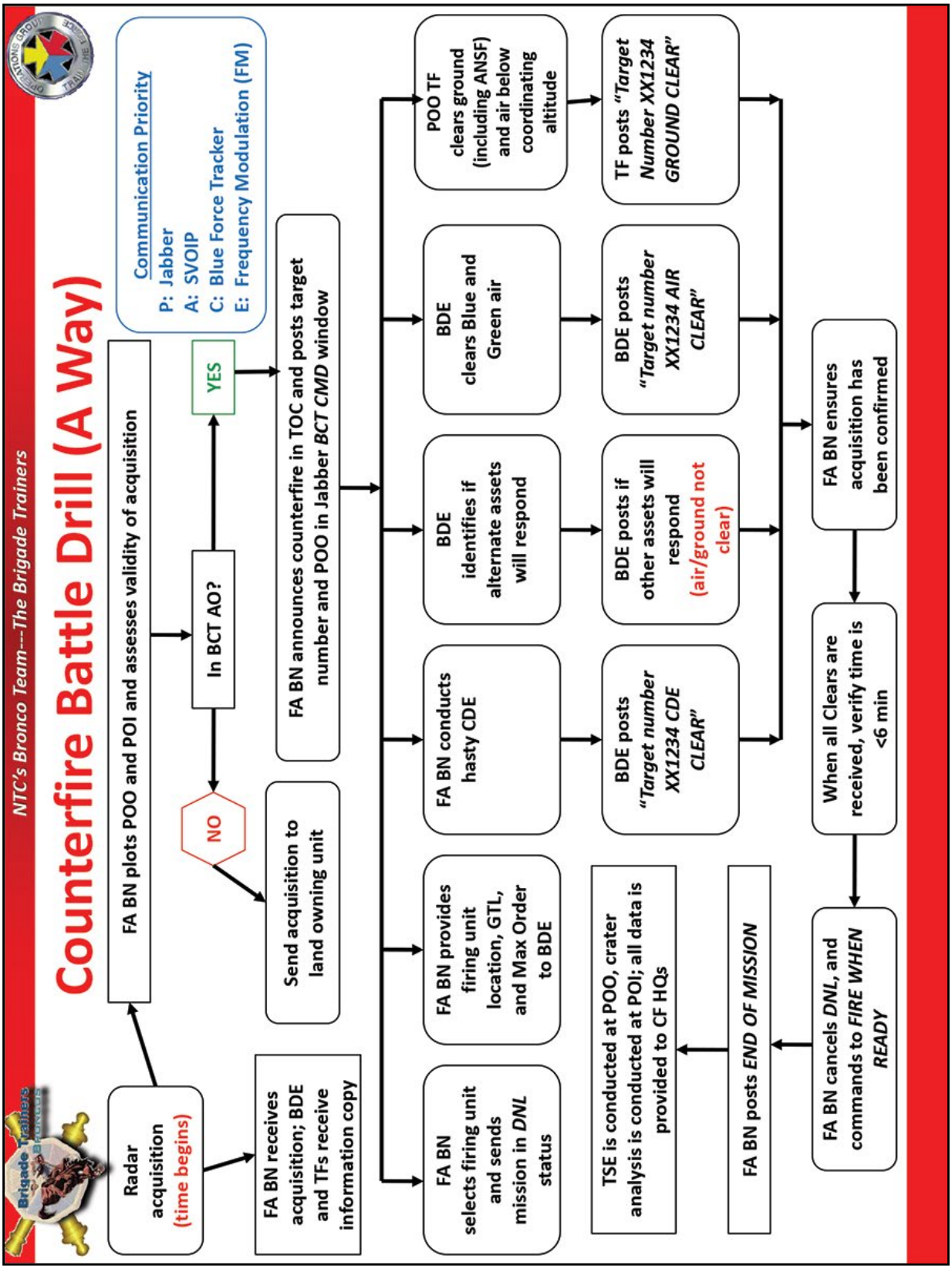


Figure 7-2. Counterfire Battle Drill (A Way)

Endnotes

1. FM 3-09, *Fire Support and Field Artillery Operations*, 30 April 2020
2. Ibid.
3. Ibid.
4. Ibid.
5. ATP 3-09.42, *Fire Support for the Brigade Combat Team*, 1 March 2016
6. Ibid.
7. Ibid.
8. Ibid.
9. Ibid.

CHAPTER 8

U.S. Indirect Fire Systems

This chapter provides a quick glance at some of the U.S. indirect fire systems. Not all are included. Table 8-1 provides a quick reference guide to the U.S. Mortar Characteristics, and Table 8-2 provides a quick reference to the U.S. Howitzer ammunition and range capabilities.

Table 8-1. U.S. Mortar Characteristics[1]

Type	Crew	Weight (Lbs)	Range** (Meters)		Rates of Fire Round/ Minute	Projectiles	Fuzes
			Minimum	Maximum			
M224 60-mm Conventional Mode	3	47	70	3,520	Maximum 30/4 Sustained 20/1	High Explosive (HE) Smoke, White Phosphorus (WP) Illumination, Infrared Illumination	Multi-option (Proximity, Point Detonating [PD], Near Surface Burst [NSB], Delay) PD time Mechanical Time Superquick
M244 60-mm Handheld Mode	3	18	75	1,340	No Limit at Charge 0 or 1	Same as Conventional	Same as Conventional
M252 81-mm	4 (Army) 6 (U.S. Marine Corps [USMC])	93	83	5,792	Maximum 30/2 Sustained 15/1	HE Smoke, WP Smoke, Red Phosphorous (RP) Illumination, Infrared Illumination	Multi-option (Proximity, PD, NSB, Delay) PD Time Mechanical time Superquick
M120/121 120-mm	4	320	200	7,200	Maximum 16/1 Sustained 4/1	HE Smoke, WP Smoke, RP Illumination Infrared Illumination	Multi-option (Proximity, PD, NSB, Delay) PD Time Mechanical Time Superquick
RMSL-6 120-mm	5	1,466	180	6,700	Same as M120/121	Same as M120/121	Same as M120/121

Mortar characteristics are taken from the tabulated data for each mortar system in Field Manual (FM) 3-22.90, *Mortars*, 7 December 2007.

**Range is a function of the ammunition and charge used. Refer to the mortar system's firing table for more information.

Artillery	Ammunition		Range (meters)		Rates of Fire (rounds per minute)	
	Projectile	Fuze	Maximum	Rocket assisted projectile (RAP)	Sustained	Maximum
105-mm M119-series	HE, hexachloroethane smoke (HC), WP, illumination, antipersonnel improved conventional munitions (APICM), dual-purpose improved conventional munitions (DPICM) M825 Smoke, scatterable mines (SCATMINE), Excalibur	PD, variable time (VT), mechanical time (MT), electronic time (ET), mechanical time superquick (MTSQ), Delay Precision guiding kit (PGK) (Only M109A6 and A7; M777 series with shell M795 or M549A1)	11,500 (Charge 7) 14,000 (Charge 8)	19,500	3 for 30 minutes	8 for 3 minutes
155-mm M109A5			18,000 (Zone 7) 22,000 (Zone 8 or modular artillery charge system [MACS] Zone 5)	30,000 (M203 Zone 8 or MACS Zone 5)	(Zones 1-7) 1 round per minute (Zone 8) 1 round per minute for 60 minutes 1 round every 3 minutes thereafter	4 every 2 minutes
155-mm M109A6			18,000 (Zone 7) 22,000 (Zone 8 or Zone 5 MACS) 25,300 with XM982 Excalibur (Zone 4 MACS) 37,500 with M983 and M982A1 Excalibur (Zone 5 MACS) 22,000 (M795 with PGK and Zones 7, 8, or MACS Zone 5)	30,000 (M203 Zone 8 or MACS Zone 5) 27,000 (PGK M549A1 and Zones 7, 8, or MACS Zone 5)	Zones 3-7: 1 round per minute; Zone 8: 1 round per minute until limited by tube temperature sensor	
155-mm M777-series			14,800 (M4 Charge 7 White) 24,000 (M119-series) 30,000 (Zone 5 MACS) 25,400 with XM982 Excalibur (MACS Zone 4) 37,700 with M982 and M982A1 Excalibur (MACS Zone 5)	30,000 (M203 Zone 8 or MACS Zone 5) 27,000 (PGK M549A1 and Zones 7, 8, or MACS Zone 5)	2 in accordance with thermal warming device	

Table 8-2. Howitzer Ammunition and Range Capabilities[2]

Note. Excalibur not authorized for M109A5. See Appendix I, Army Techniques Publication (ATP) 3-09.32, *Multi-Service Tactics, Techniques, and Procedures for Joint Application of Firepower,* 18 October 2019, for detailed discussion of "danger close."

Endnotes

1. Army Tactics, Techniques, and Procedures (ATTP) 3-21.90, *Tactical Employment of Mortars*, April 2011

2. ATP 3-09.50, *The Field Artillery Cannon Battery*, 4 May 2016

CHAPTER 9
Close Air Support

This chapter provides target location errors, and the attributes and types of control of terminal attacks. It also includes a brief description of the close combat attack (CCA) with briefing requirements for a check in, along with a description of the joint fires observer (JFO). This chapter also provides an example of a Department of Defense (DD) Form 1972, Joint Tactical Air Strike Request. Figure 9-1 provides a reference list of target location error categories.

JOINT TERMINAL ATTACK CONTROLLER/FORWARD AIR CONTROLLER (AIRBORNE)

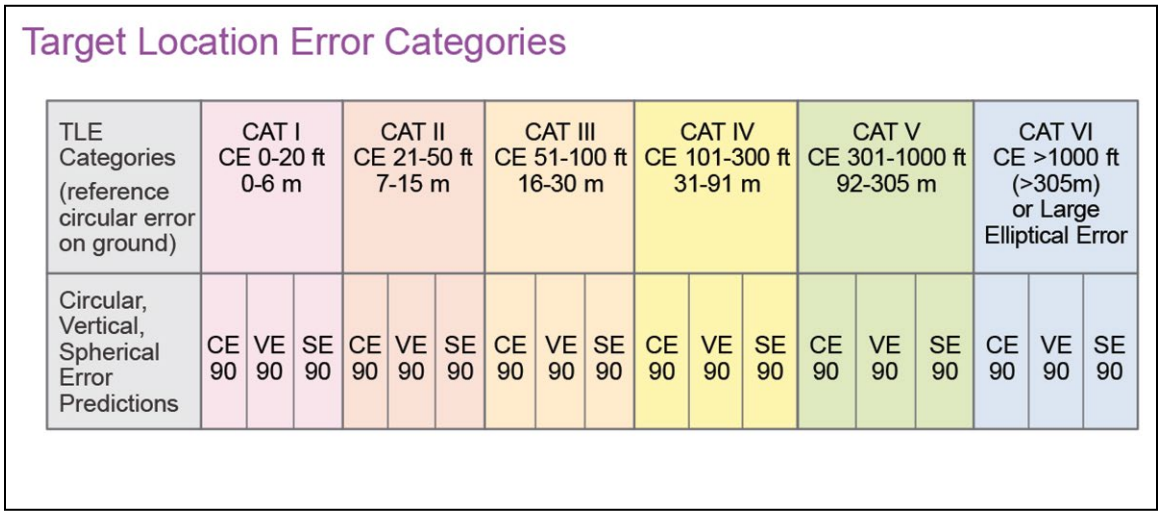


Figure 9-1. Target Location Error Categories[1]

CLOSE COMBAT ATTACK

U.S. Army CCA is a hasty or deliberate attack by Army aircraft providing air-to-ground fires for friendly units engaged in close combat. Because of the close proximity of friendly forces, detailed integration is required.[2] In CCA, the attack team engages enemy units with direct fires that impact near friendly forces. Targets may range from tens to thousands of meters from friendly forces. CCA is coordinated and directed by a team, platoon, or company-level ground unit using the standard CCA brief. Once the aircrews receive the brief from the ground commander, they develop a plan to engage the enemy force while maintaining freedom to maneuver. Because of the aircraft's capabilities and the enhanced situational awareness of the aircrews, terminal control from ground units or controllers is not necessary. CCA is not synonymous with close air support (CAS).[3]

JOINT FIRES OBSERVER

A JFO is a trained and certified service member who can request, adjust, and control surface-to-surface fires.[4] For air-to-surface fires, they can provide timely and accurate targeting information to the joint terminal attack controller (JTAC) or, when approved by the JTAC, to the aircraft directly. Additionally, they perform autonomous terminal guidance operations. The JFO adds joint warfighting capability, but cannot provide terminal attack control during CAS operations.[5]

JTACs cannot be in a position to see every target on the battlefield. Trained JFOs, in conjunction with JTACs, assist maneuver commanders with timely planning, synchronization, and responsive execution of all joint fires and effects.

JFOs provide the capability to exploit opportunities that exist in the operational environment where a trained observer could be used to efficiently support air delivered fires, surface-to-surface fires, and facilitate targeting. JFOs cannot perform terminal attack control of CAS missions, and do not replace a trained and certified JTAC.

DD FORM 1972, JOINT TACTICAL AIR STRIKE REQUEST (JOINT PUBLICATION [JP] 3-09.3, *CLOSE AIR SUPPORT*, 25 NOVEMBER 2014)

DD Form 1972 is used at the battalion level and higher headquarters to submit air support requests when automated systems with an air strike request submission capability are not available. Figure 9-2 is an example of DD Form 1972. Instructions on filling out the form line-by-line can be found in JP 3-09.3.

JOINT TACTICAL AIR STRIKE REQUEST | See Joint Pub 3-09.3 for preparation instructions.

SECTION I - MISSION REQUEST

1. UNIT CALLED: BLACKBIRD | THIS IS: HICKORY FIRES | REQUEST NUMBER: IINAG001 | DATE SENT | TIME | BY: CW2 MOORE

2. PREPLANNED: [A] PRECEDENCE ____ [B] PRIORITY 30 ABCT | IMMEDIATE: [C] PRIORITY ____ | RECEIVED TIME | BY

3. TARGET IS/NUMBER OF
- [A] PERS IN OPEN ____ [B] PERS DUG IN ____ [C] WPNS/MG/RR/AT ____ [D] MORTARS, ARTY 6x S19
- [E] AAA ADA 1x SAB [F] RKTS MISSILE ____ [G] ARMOR 30 x T90 [H] VEHICLES 45x BMP3
- [I] BLDGS ____ [J] BRIDGES ____ [K] PILLBOX, BUNKERS ____ [L] SUPPLIES, EQUIP ____
- [M] CENTER (CP, COM) ____ [N] AREA Fox [O] ROUTE ____ [P] MOVING N E S W ____
- [Q] REMARKS ____

4. TARGET LOCATION IS
- [A] NV 140 160 (COORDINATES) [B] NV 330 310 (COORDINATES) [C] NV 265 195 (COORDINATES) [D] ____ (COORDINATES)
- [E] TGT ELEV 2100' [F] SHEET NO. ____ [G] SERIES ____ [H] CHART NO. ____
- CHECKED BY

5. TARGET TIME/DATE
- [A] ASAP ____ [B] NLT ____ [C] AT 140600LJUL [D] TO 140800JUL19

6. DESIRED ORD/RESULTS
- [A] ORDNANCE ____
- [B] DESTROY X [C] NEUTRALIZE X [D] HARASS/INTERDICT ____

7. FINAL CONTROL
- [A] FAC/RABFAC TypeII [B] CALL SIGN OMEGA 16/17 [C] FREQ (P) OE 05 (314.175)
- [D] CONT PT ____

8. REMARKS

PUC#	14A
THREAT	2S6 UNK SA6, SAB, ZSU23-4, SMALL ARMS, MANPADS
TGT	PRIMA, 2S19, 30x T-90s, 45x BMP3s
FRIENDLIES	COUNTER ATTACK MOVING EAST TO WEST FROM PL SCOTT TOWARDS PL FRANCIS
CLEARANCE	FINAL CLEARANCE AUTHORITY OMEGA 16/17. EXPECT PUSH TO BN JTACs
ORDNANCE	PER 9 LINE
SEAD	REQUESTING EW FOR PROTECTION WHILE ORGANIC FA PROVIDES SUPPORT (EARF+COF ATTACHED)

SECTION II - COORDINATION

9. NSFS | 10. ARTY | 11. AIO/G-2/G-3

12. REQUEST: [ ] APPROVED [ ] DISAPPROVED | 13. BY | 14. REASON FOR DISAPPROVAL

15. RESTRICTIVE FIRE/AIR PLAN: [A] IS NOT IN EFFECT [B] NUMBER | 16. IS IN EFFECT: [A] (FROM TIME) [B] (TO TIME)

17. LOCATION: [A] (FROM COORDINATES) [B] (TO COORDINATES) | 18. WIDTH (METERS) | 19. ALTITUDE/VERTEX: [A] (MAXIMUM/VERTEX) [B] (MINIMUM)

SECTION III - MISSION DATA

20. MISSION NUMBER	21. CALL SIGN	22. NO. AND TYPE AIRCRAFT	23. ORDNANCE
24. EST/ACT TAKEOFF	25. EST TOT	26. CONT PT (COORDS)	27. INITIAL CONTACT
28. FAC/FAC(A)/TAC(A) CALL SIGN/ FREQ	29. AIRSPACE COORDINATION AREA	30. TGT DESCRIPTION	*31. TGT COORD/ELEV

32. BATTLE DAMAGE ASSESSMENT (BDA) REPORT (USMTF INFLTREP)
- LINE 1/CALL SIGN ____ LINE 4/LOCATION ____
- LINE 2/MSN NUMBER ____ LINE 5/TOT ____
- LINE 3/REQ NUMBER ____ LINE 6/RESULTS ____
- REMARKS ____ *TRANSMIT AS APPROPRIATE

DD FORM 1972, MAY 2019 PREVIOUS EDITION MAY BE USED. Adobe Professional 7.0

SAMPLE

Figure 9-2. Sample DD Form 1972

Endnotes

1. Joint Publication (JP) 3-09.3, *Close Air Support*, 25 November 2014
2. Ibid.
3. Ibid.
4. Ibid.
5. Annex 3-0, *Counterland Operations*, 5 Feb 2019

CHAPTER 10

Crater Analysis

Source: Army Techniques Publication (ATP) 3-09.30, *Observed Fires*, 28 September 2017

In crater analysis, the difference in the angle of fall, the projectile burst patterns, the directions of flight, and the fuze settings will help distinguish between enemy batteries firing on a given area. This chapter shows how fire support team (FIST) certified personnel conduct a crater and shell fragment analysis. Refer to Appendix B of ATP 3-09.30 for the complete how to and reporting requirements.

The first step in crater analysis is to locate a usable crater for determining the direction to the hostile weapon. The crater should be clearly defined on the ground, and should be reasonably fresh. Since the crater is the beginning point for plotting the direction to the enemy weapon, the grid coordinates of the crater should be determined as an eight-digit gride, or as accurately as time and method use will allow.

The direction to the firing weapon must be determined by one of the methods shown in Figures 10-1 through 10-6. For low-angle mechanical time super quick crater (artillery), use fuze furrow and center-of-crater method (Figure 10-1) or side-spray method (Figure 10-2). For low angle fuze delay craters (artillery) use the ricochet furrow method (Figure 10-3) For high angle shell craters (mortars) use the fuze tunnel method (Figure 10-4), splinter groove method (Figure 10-5), or main axis method (Figure 10-6).

ARTILLERY SHELL CRATER ANALYSIS

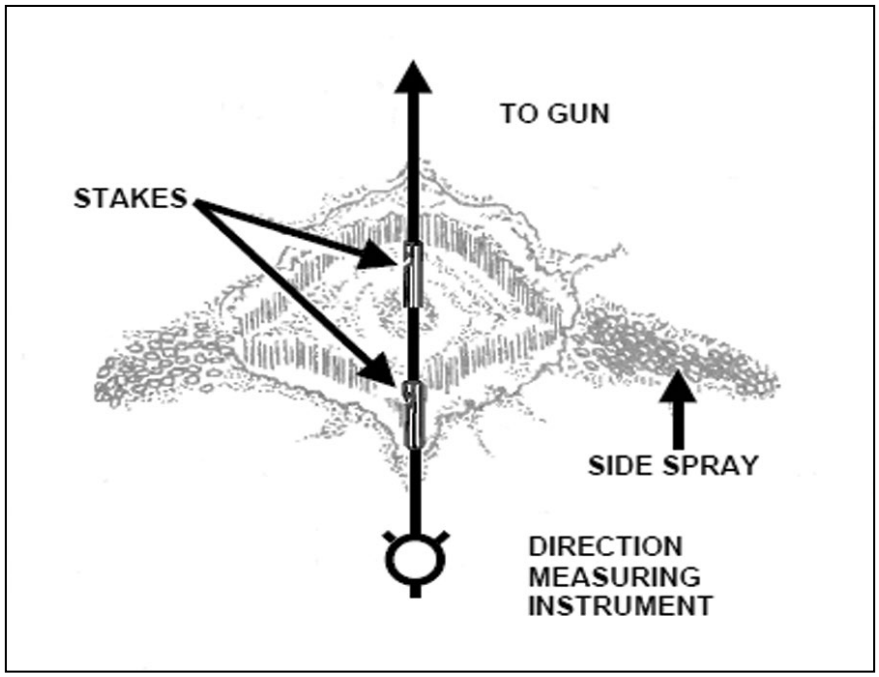


Figure 10-1. Fuze Furrow and Center-of-Crater Method

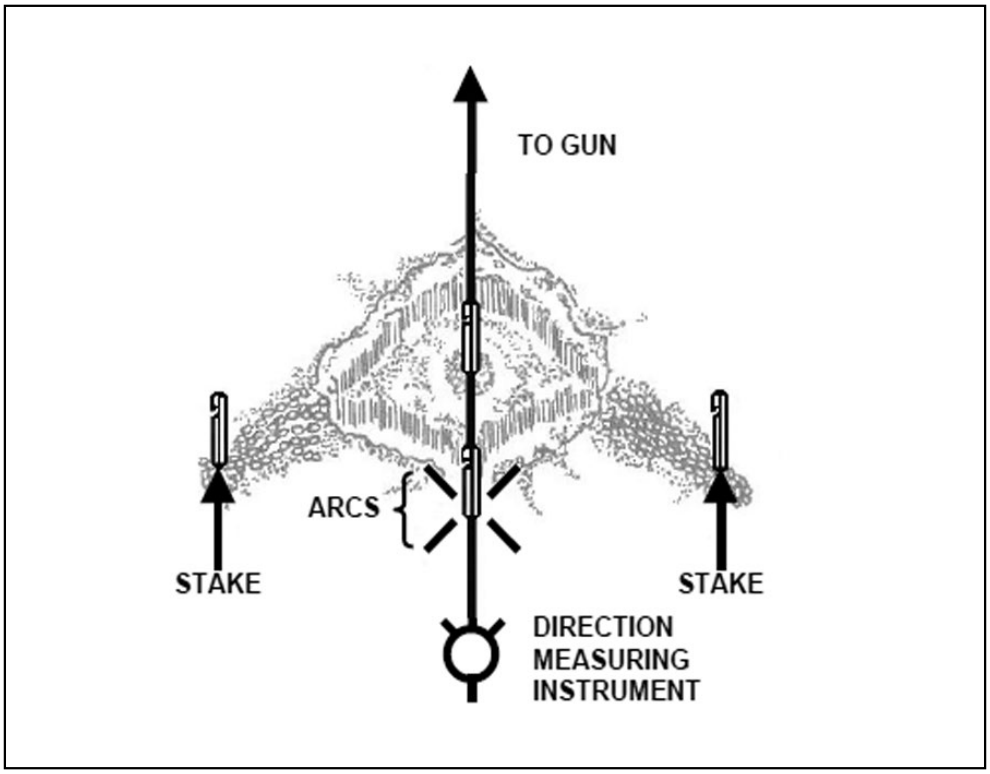


Figure 10-2. Side Spray Method

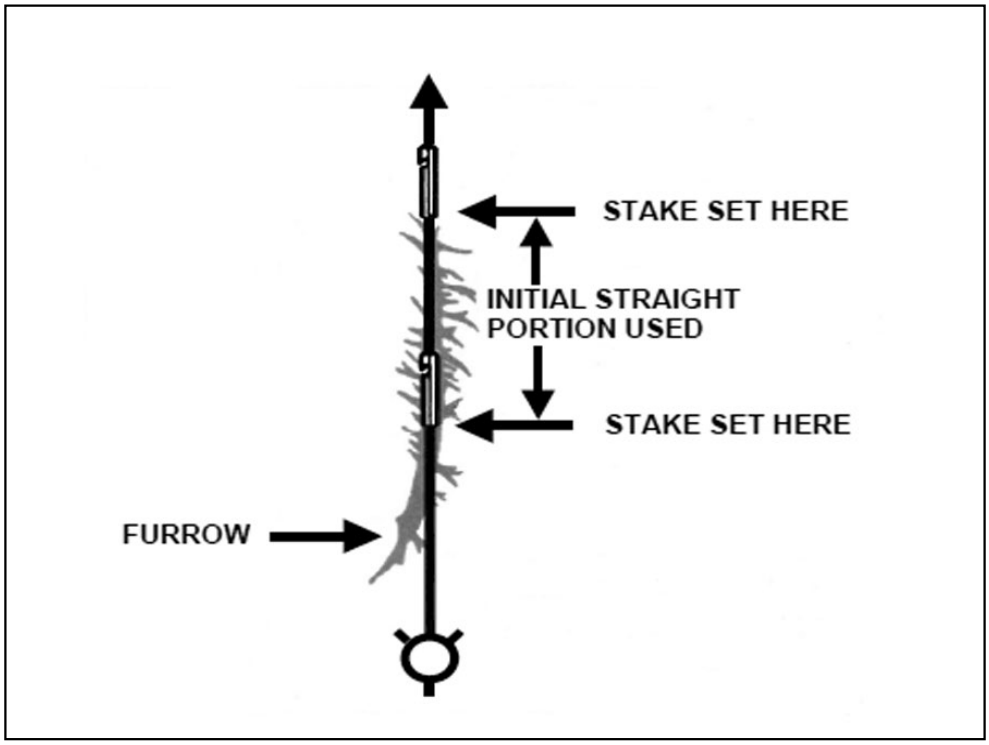


Figure 10-3. Ricochet Furrow Method

MORTAR SHELL CRATER ANALYSIS

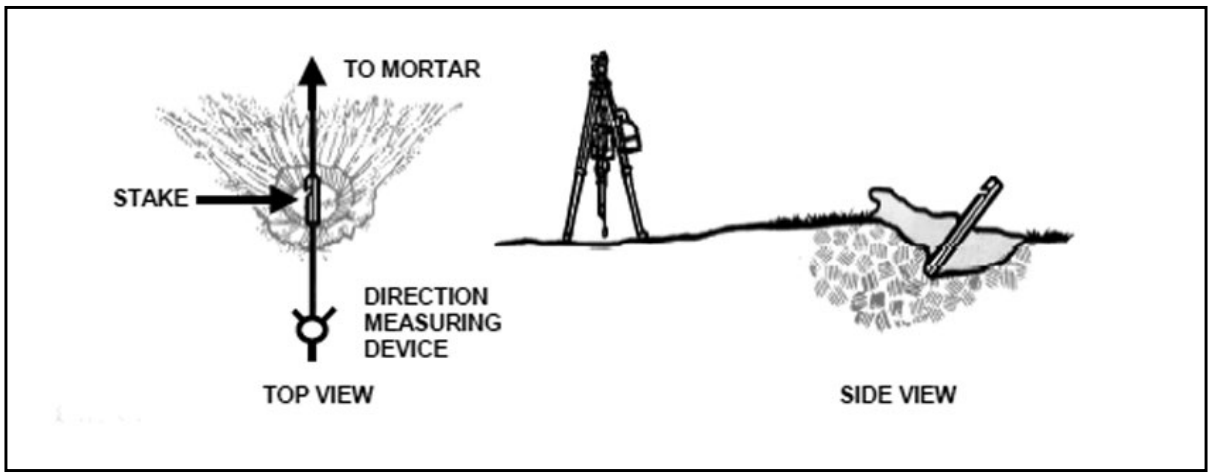


Figure 10-4. Fuze Tunnel Method

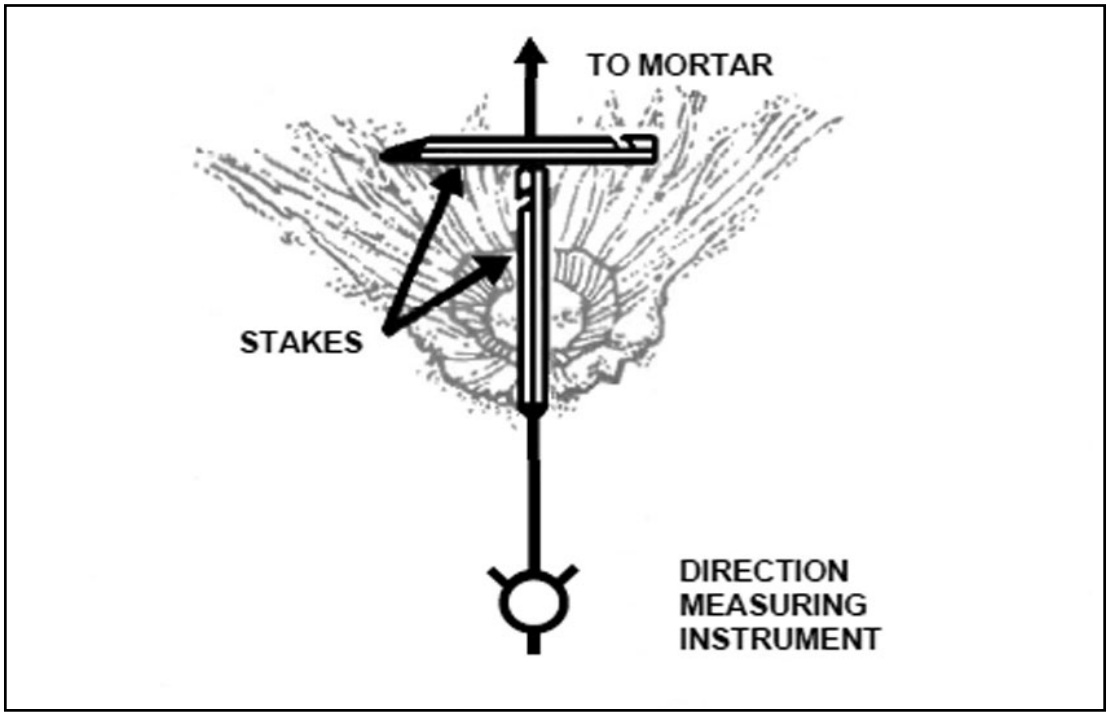


Figure 10-5. Splinter Groove Method

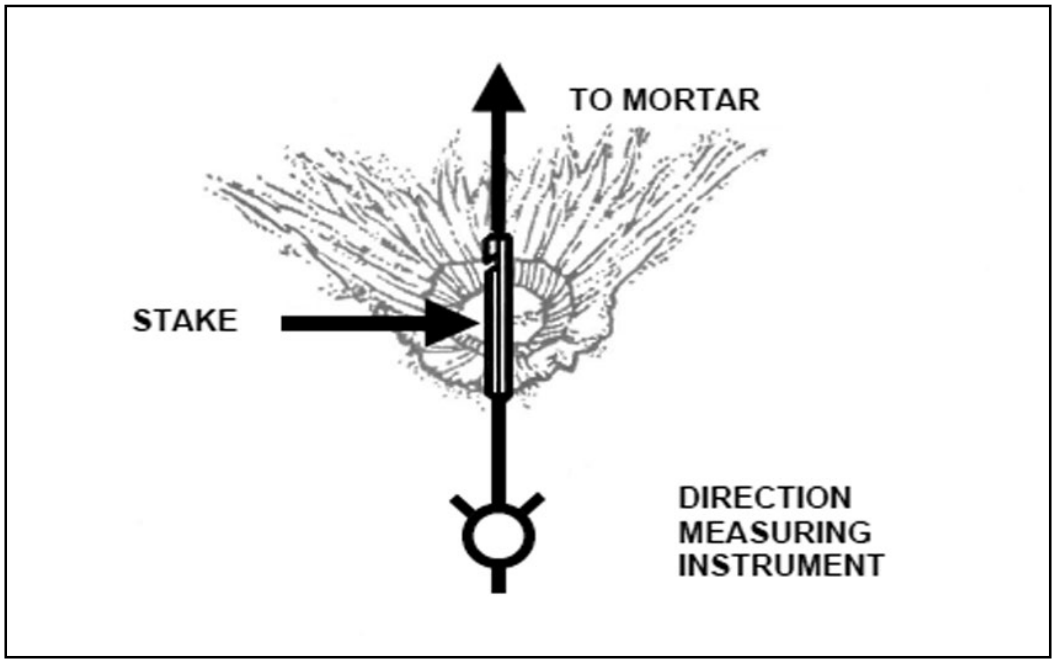


Figure 10-6. Main Axis Method

Note. Retain all fragments found in and around the crater (look for rotating bands, fuzes, and tail fins) and forward to the S-2. Send a shelling report as soon as possible, and include any shell fragments.

APPENDIX A

Example Annex D (Fires) to Operation Order XX-XX

REFERENCES

- Maps. See base operation order (OPORD).
- 52 Infantry Division (ID) Southeast Caucasus Operational Environment Handbook, 14 November 2014.
- Brigade Combat Team (BCT) Tactical Standard Operating Procedure (TACSOP) digital terrain data (DTD)
- Field Manual (FM) 3-0, Operations, 6 October 2017; FM 3-09, Fire Support and Field Artillery Operations, 30 April 2020; Army Techniques Publication (ATP) 3-09.12, Field Artillery Target Acquisition, 24 July 2015; ATP 3-09.32, Multi-Service Tactics, Techniques, and Procedures for the Joint Application of Firepower, 18 October 2019; ATP 3-09.42, Fire Support for the Brigade Combat Team, 1 March 2016: ATP 3-60, Targeting, 7 May 2015; Joint Publication (JP) 3-09.3, Close Air Support, 25 Nov 14; JP 3-60, Joint Targeting, 31 Jan 13

Time Zone Used Throughout the Plan/Order. Uniform (Local)

SITUATION

Enemy Forces. (Refer to Annex B [Intelligence] as required)

- The 801st Brigade Tactical Group (BTG) has support-extensive indirect fires (IDFs) capabilities including 18 2S19 self-propelled artillery and 18 Prima Launchers. Observation for deep strikes may be provided from the observing asset and unmanned aerial vehicles.
- Fire Support. The Donovian military doctrine stresses that fire support combines air assets, surface-to-surface missiles (SSMs), and artillery into an integrated attack throughout the depth and breadth of the enemy's area of operations (AO). This is coordinated through an integrated fires command, to synchronize IDFs for a maneuver force to target key systems of friendly forces individually then to destroy these systems with maneuver when a favorable situation has developed.
- Counterfire. The Donovian Army has one 1L220 and one 1L219 radar system for target acquisition.
- Close Air Support. Recent exercises provided evidence that Donovian pilots remain skillful in conducting air strikes against ground targets and using terrain to mask their approach from radar. Although Donovian pilots maintain an air interdiction capability, the air force primarily supports its ground forces with close air support (CAS). The SU-25 Frogfoot is the primary attack aircraft employed for CAS with forward air controllers

(FAC), providing terminal guidance to the aircraft. Donovian maneuver battalions rarely have a dedicated FAC. However, the BTG commander may allocate a FAC to a battalion when air strikes are planned, or when the BTG commander expects the battalions to require immediate or on-call air support. A representative mix for targeting armor forces in support of Donovian ground forces is: a 30-mm gun, four pods (16) AT-16 antitank guided missiles (ATGMs), and two pods of AS-10 missiles. However, the air force is most likely to be postured to conduct defensive counter air.

- Electronic Attack. The 801st BTG has supposed electromagnetic warfare (EW) capabilities task organized from the 879th Irregular Warfare (IW) Brigade's EW Battalion. Refer to Appendix 12 (Cyber/Electronic Activities) to Annex C (Operations).
- Current Activity. Donovian army forces have been conducting combined arms maneuver exercises for the past five months. Recently, these exercises have risen in scale to multidivisional offensive exercises integrating both surface-to-surface and joint air-to-surface fires. There are also indications that the Donovian army is establishing the infrastructure for tactical assembly areas in numerous locations throughout the Gilan province. These indications support the assessment that the Donovian military is reaching the peak of offensive preparations.
- Enemy Course of Action. Refer to Annex B (Intelligence) as required.

Friendly Forces

- **2/52 ID Mission.** No later than 4 October 2016, 2/52 ID seizes Ujen and Razish to neutralize irregular forces within Erdabil province. Be prepared to conduct a noncombatant evacuation operation (NEO) and defeat invading Donovian forces in order to restore the pre-conflict territorial integrity of Atropia.
    - **2/52 ID Commander's Intent**
        - **Expanded Purpose.** The purpose of this operation is to ensure the territorial integrity of Atropia by defeating invading Donovian forces conducting offensive, defensive, and stability operations in support of the Government of the Republic of Atropia (GoRA). Protect key infrastructure and the civilian populace in conjunction with state department and GoRA authorities in a unified effort.
        - **Key Tasks.** Seize Ujen and Razish, execute an NEO in the vicinity of Razish, win the information operation fight, and defeat Donovian forces in AO Bronco.
        - **End state.** Key terrain of Razish and Ujen secured, and enemy irregular forces denied the ability to disrupt 2/52 ID's defense of the border.
    - **Concept of the Operations.** Seize the initiative. Offense sees Task Force (TF) Bronco attack to seize key urban terrain of Ujen and Razish. Key tasks during this phase are the rapid deployment of information collection (IC) assets and the brigade's isolation of AO Cobra.

- **Commander's Guidance for Fires.** Initially, fires will focus on the deep fight to neutralize enemy air defense artillery (ADA) assets and counterfire against IDF. Fires will transition to also supporting the close fight for 2-30 Infantry (IN) seizure of Razish and Ujen, with screening fires in support of movement and the destruction of armor elements of the 801st BTG. The deep fight will still be supported with blocking fires when additional armor is identified moving through named areas of interest (NAIs).

MISSION

2/52 ID fires provides blocking and destruction fires of Donovian 801st, neutralization fires on ADA in Echo Valley, counterfire on enemy IDF, disruption fires on enemy command and control (C2), and screening fires to support 2-30 IN in support of 2/52 ID seizure of Razish and Ujen, no later than 04 October 2016.

EXECUTION

Scheme of Fires

- Phases of the Operation
    - **Phase I. Deter.** Complete.
    - **Phase II. Seize the Initiative**
        - Fire Support Task and Purpose
            - **Fire Support Task 1.** Blocking fires against reinforcing enemy forces. **Purpose.** Delay second echelon of 801st BTG from entering Bronco AO. **Execution.** 2-606 field artillery (FA) fires family of scatterable mines (FASCAM) along canalized terrain in the vicinity of Brown Pass, Debnams Pass, and Granite Pass after the second echelon's movement, observed as a minimum of eight armored vehicles move into NAI 3 (Brown Pass), NAI 5 (Debnam Pass), or NAI 6 (Granite Pass), have been identified by 2-20 Cavalry (CAV) observers or Grey Eagle.
            - **Fire Support Task 2.** Destruction of the first echelon, three armor platoons, of the 801st. **Purpose.** Allow freedom of movement for friendly assaulting force. **Execution.** 2-20 CAV observes location of the isolated first echelon of the 801st and 2-606 FA provides destruction fires.
            - **Fire Support Task 3.** Neutralize ADA forces in the vicinity of Echo Valley. **Purpose.** Allow friendly air freedom of maneuver. **Execution.** Reinforcing multiple launch rocket system (MLRS) assets conduct neutralization fires against ADA assets as acquired by radar and EW.

- **Fire Support Task 4.** Counterfire to disrupt the enemy's ability to place accurate IDF on friendly forces. **Purpose.** Create IDF superiority and allow freedom of movement for maneuver elements. **Execution.** 2-606 FA and reinforcing MLRS assets conduct proactive and reactive counterfire when locations of 801st IDF and tactical air assets are acquired.
- **Fire Support Task 5.** Obscuration fires. **Purpose.** Provide 2-30 IN freedom of movement toward Razish and Ujen. **Execution.** 2-606 FA and 2-30 IN battalion missile tracking radar assets provide smoke when conditions are set for 2-30 IN maneuver on Razish and Ujen.

▪ **Priority of Fire.** 2-20 CAV, 2-30 IN, 2-77 Armor (AR), 2-40 IN, 2-606 FA, 521 brigade support battalion (BSB)
- **Air Support.** 2-20 CAV, 2-30 IN, 2-77 AR, 2-40 IN, 2-606 FA, 521BSB
- **Attack Aviation.** 2-20 CAV, 2-30 IN, 2-77 AR, 2-40 IN, 2-606 FA, 521 BSB
- **Field Artillery.** 2-20 CAV, 2-30 IN, 2-77 AR, 2-40 IN, 2-606 FA, 521 BSB

▪ **Allocations**
- 2/52 ID is authorized 20 percent from the reinforcing MLRS battery, 18 pods of M26 (108 rockets), 9 pods of M26A2 (54 rockets), and 1 pod of M31A1 (six rockets). Ammunition allocation for supporting reinforcing batteries will reset to the initial 20 percent allocation before the start of each phase in the operation. Reinforcing ammunition will not carry over from phase to phase.
- 2/52 ID nominates targets for 52 ID execution by general support (GS) assets. Submitted targets are outputs from the 2/52 ID targeting meeting, and are submitted to the 52 ID fire support element (FSE) as a target packet. Targets approved for 52 ID execution will be not count against the BCT's reinforcing ammunition allocation. Targets need to be submitted no later than 1400 the day before execution. See Appendix 3 (Targeting) to Annex D (Fires) for further information.

▪ **Positioning Guidance**
- **Direct Support (DS) Field Artillery**. 2/52 ID maintains position authority for their DS field artillery assets.

- **Radars**
  - Q53 begins in Logistics Support Area (LSA) Warrior and will emplace 11S NV 605 075 aircraft on station (AOS) 5700 once security conditions are met by 2-40 IN. Further movements will be sent through the request for deployment order.
  - Q36 beings in LSA Warrior and will emplace vic 11S NV 381 090 AOS 6400 once security conditions are met by 2-77 AR. Further movements will be sent through the RDO.
  - Q50s will be managed by their supported battalions.

▪ **Restrictions**

- **Cross Boundary (CSB).** All BCT boundaries.
- **Fire support coordination line (FSCL).** Phase line (PL) Maria.
- **Restrictive fire line (RFL).** All division and BCT boundaries.
- **Coordinated fire line (CFL).** CFL is PL Courtney. CFL will transition to PL Betty once 2-30 IN begins movement toward Razish.
- **Restrictive fire area (RFA)/No-fire area (NFA).** NFAs will be established over friendly positions forward of the CFL when those locations will be emplaced greater than 5 minutes.
- **Target Information**

Brigade High-Payoff Target List (HPTL) Phase II-A	
Priority	Targets
1	Mission command nodes (BTG command posts [CPs], date-time group [DTG] CPs, retransmission sites)
2	Air Defense (2S6, surface to air (SA)-8, SA-6)
3	Fire Support (PRIMAs, IL-220)
4	Aviation (forward arming and refueling points [FARPs], runways, aviation facilities)
5	EW
6	Maneuver (T-80s, BMP-1, BMP-3, insurgent networks)

- **Phase III. Dominate.** Restore the International Border. To be published
- **Phase IV. Enhance Regional Security.** To be published

- **Endstate.** 2/52 ID fires has supported both the deep and close fight in order to allow 2-30 FA to seize Razish and Ujen.

Scheme of Field Artillery Support. Throughout Operation Atropian Resolve, the 52 Division Artillery (DIVARTY) will conduct decentralized counterfire operations. Each BCT will establish a counterfire headquarters to manage the counterfire fight within their operational environment. Rocket and missile fires will be the primary means of conducting counterfire. Standard firing order for counterfire is six M26A2 or 78 M864 dual-purpose improved conventional munitions (DPICM). Primary support for suppression of enemy air defenses (SEAD) will be rockets followed by cannon. Through an aggressive IC plan, and within ten minutes of the confirmed identification of the SA-6 and SA-8 from the 187th Air Defense Brigade, GS and reinforcing assets will be utilized to fire SEAD to neutralize, destroy, or temporarily degrade the SA-6 and SA-8 threat.

- **Organization for Combat**
  - **Field Artillery**
    - 2-606 FA is DS to 2-52 ID
    - B/2-52 FA is reinforcing to 2-606 FA
  - **Radar**
    - Q-36 and Q-53 are DS to 2-52 ID.
    - One Q-50 is DS to each 2-20 CAV, 2-77 AR, 2-30 IN, and 2-40 IN

- **Miscellaneous**

Unit / 52ID	Target Block		Group		RFA		NFA	
DIVARTY	AA0001	AA1999	A01A	A19A	AAR001	AAR199	AAN001	AAN199
Special Operations Forces (SOF)	AA2000	AA2999	A20A	A29A	AAR200	AAR299	AAN200	AAN299
Counterfire	AA3000	AA3999	A30A	A39A				
Special Munitions	AA4000	AA4999	A40A	A49A				
Preplanned	AA5000	AA5999	A50A	A59A				
52 Combat Aviation Brigade (CAB)	Target Block		Group		RFA		NFA	
2-159 Aviation (AVN)	AC3000	AC3999	A30C	A39C	ACR300	ACR399	ACN300	ACN399
2/52 ID	Target Block		Group		RFA		NFA	
Brigade FSE	AE0001	AE1999	A01E	A19E	AER001	AER199	AEN001	AEN199
2-20 CAV	AE2000	AE2999	A20E	A29E	AER200	AER299	AEN200	AEN299
2-77 AR	AE3000	AE3999	A30E	A39E	AER300	AER399	AEN300	AEN399
2-30 IN	AE4000	AE4999	A40E	A49E	AER400	AER499	AEN400	AEN499
2-40 IN	AE5000	AE5999	A50E	A59E	AER500	AER599	AEN500	AEN599
2-606 FA	AE6000	AE6999	A60E	A69E	AER600	AER699	AEN600	AEN699
Spare	AE7000	AE7999	A70E	A79E	AER700	AER799	AEN700	AEN799
Counterfire	AE8000	AE8999	A80E	A89E				
Special Munitions	AE9000	AE9999						

Scheme of Air Support

- Air Support targeting priorities go to the: ADA, mission command, multiple rocket launchers (MRLs), field artillery, and armored formations. Refer to Appendix 5 (Air Support) to Annex D (Fires) as required.
- **Department of Defense (DD) Form 1972 submittal primary, alternate, contingency, and emergency (PACE).** Primary: 52ID portal. Alternate: Advanced Field Artillery Tactical Data System (AFATDS). Contingency: transverse (private chat).Emergency: secure voice over Internet protocol (SVOIP) 563-0177.
- See Appendix 5 (Air Support) to Annex D (Fires) for additional information.

Scheme of Naval Fire Support. None

Battlefield Obscuration Support. Obscuration will be employed at the discretion of the BCT commander in support of operations. DS FA battalions will plan to have, at a minimum, a platoon allocated to provide responsive counterfire support during obscuration missions. White Phosphorus (M825, M825A2, M110A1, and M60) will not be employed in vicinity of civilian populations or within built up areas.

Target Acquisition. See Appendix 3 (Targeting) to Annex D (Fires) for further information.

Tasks to Subordinate Units

Coordinating Instructions

- **Reinforcing Unit Communications**
  - All reinforcing units (1/B/2-52 FA) will establish and maintain AFATDS and SVOIP communications with 2/52 ID.
  - All reinforcing units (1/B/2-52 FA) will provide mission fired reports (MFR) to 2/52 ID.
- **Fire Support Coordination Measure (FSCM) Establishment**
  - Battalion fire support centers (FSCs) will create FSCMs to support operations. Units will submit all new FSCMs to 2/52 ID FSC 30 minutes before that FSCM scrub.
  - FSCM scrubs will be conducted with all units one hour before technical rehearsals.
  - 2/52 ID will conduct FSCM scrubs with 52ID FSE at 0030 daily, or anytime before a battalion or larger sized operation is conducted, in accordance with Appendix 1 (Fire Support Overlay) to Annex D (Fires). Brigade FSE will review the FSCMs tracked by 52 ID.
  - 2/52 ID commander is the approval authority for pre-planned targets that violate any 2/52 ID FSCMs.
  - Any requests to violate 52ID FSCMs must be routed up through the 52ID battle captain for approval by the 52ID commander.

- **Rules of Engagement.** Refer to Appendix 11 (Rules of Engagement) of Annex C (Operations)
- **RFAs.** 52ID commander has authorized cannon and mortar fires to impact up to the RFA border, and accepts the risk associated from the effects of fires violating RFAs. Rocket fire effects will not violate the established NFAs. Coordination with the establishing headquarters is required before fires or effects may enter an RFA. The employment of munitions will be in accordance with the Laws of Proportionality.
- **Target Packets.** Target packets will be submitted in accordance with Appendix 3 (Targeting) to Annex D (Fires)
- **Clearance of Fires**
    - All cross battalion boundary targets will be coordinated through AFATDS by the BCT FSC.
    - Battalions can clear mortar fires in their battlespace and under 6,000 feet above ground level, as long as fires do not violate FSCMs or ACMs.
    - Battalions will report planned mortar firing points to the BCT. Battalions are responsible for coordinating with the BCT FSC and air defense airspace management (ADAM)/brigade aviation element (BAE) to synchronize the MFPs with the airspace plan.
    - BCTs will clear air below the coordinating altitude in accordance with Appendix 10 (Airspace Control) to Annex C (Operations)
- **Reinforcing Ammunition.** Requests for additional reinforcing battery ammunition will be submitted as a formal request for information (RFI), and will include the ammunition management plan, target list worksheet, fire support plan, and current ammunition allotment remaining.
- **FASCAM Employment**
    - The 52ID commander is the approval authority for the employment of FASCAM. FASCAM requests will be submitted through engineer channels to the 52ID commander for approval. Units are limited to emplacing only two 400x400 medium density field artillery delivered minefields per phase.
    - The “re-seeding” of a field artillery delivered minefield is authorized and counts against the brigade’s limit of two field artillery delivered minefield.
    - The 2/52 ID battle captain will submit a scatterable mines (SCATMINE) warning to 52ID a minimum of 60 minutes before execution of a FASCAM.
- **Precision-Guided Munition (PGM) Capability**
    - 2-606 FA will a minimum of six PGM capable guns at all times. If the battalion is not capable of meeting these requirements, it must be reported to 2/52 ID FSE immediately.
    - Ensure all Global Positioning System (GPS) receivers are appropriately loaded and keyed to protect against jamming and spoofing. Defense Advance GPS Receivers (DAGRs) provide limited direction finding of jamming signals. Unencrypted receivers (i.e., Garmin) do not acquire the military GPS signal and are easily susceptible to jamming and spoofing.

SUSTAINMENT

Logistics

- **Supply.** Refer to Annex F (Sustainment) as required. 2-606 FA radar sections will coordinate Class I and III support from their attached headquarters, initially the 2nd Brigade Engineer Battalion (BEB). FA units with attached radars will work through their habitual support organizations for system repair.
- **Allocation of Ammunition.** The table below lists the controlled supply rate (CSR) to meet mission requirements.

Caliber	Department of Defense Address Code (DODAC)	Nomenclature	Total per tube per day
155	D864	DPICM M864	66
155	D503	RAAMS M718	4
155	**D501/502**	**ADAMs**	**NOT AUTHORIZED**
155	NA28	PGK XM1156	55
MLRS	H104	M26 DPICM	6 pods/supply/day (36 rockets)
MLRS	H186	M26A2 ERDPICM	8 pods/supply/day (48 rockets)
MLRS	HA51	M31A1 Global Positioning System Multiple Launch Rocket System (GMLRS) Unitary	400 Rockets Total Stock
MLRS	PL81	M39 Army Tactical Missile System (ATACMS) block 1	315 missiles Total Stock
MLRS	PL38	M39A1 ATACMS BLK 1A	200 Missiles Total Stock
MLRS	PL65	M57 ATACMS QRU	100 Missiles Total Stock

Personnel. Refer to Annex F (Sustainment) as required.

Health Service Support. Refer to Annex F (Sustainment) as required.

COMMAND AND SIGNAL

Command

- **Location of the Commander and Key Leaders**
  - **Phase I.** Brigade commander and fire support coordinator (FSCOORD) is located with the 2/52 ID Main CP.
  - **Phase II.** Brigade commander and FSCOORD is located with the 2/52 ID Mobile Command Group.
  - **Phase III**. To be published.
  - **Phase IV.** To be published.

Control

- **Command Posts**
  - **Phase I**. To be published.
  - **Phase II.** To be published.
  - **Phase III.** To be published.
  - **Phase IV.** To be published.
- **Reports**
  - **Combat Power Report.** 2-606 FA will report their combat power to the brigade FSE at 2300 daily, or after a change in location or a change in combat power. The report will include the following:
    - Location of firing units and fully mission capable/oh hand status
    - Location of radars and AOS
    - Allocated ammunition remaining
    - Planned moves for firing units and radars in next 24-hour period
    - FSCM scrub with brigade FSE
  - **Radar Movement and Status Report.** Brigade will report when radars move and when they go in or out of action to the 52ID FSE.
  - **AFATDS Reporting.** Battalions will report when they transition AFATDS between the battalion tactical operations center (TOC) and the battalion tactical command post (TAC). Brigades will report when AFATDS responsibilities transition between headquarters, and when target lists are purged to the 52ID FSE.
  - **Fire Support Plan.** Battalions will submit their fire support plans to 2/52 ID for each phase of the operation.
  - **Battle Damage Assessment (BDA) Reports.** Battalions will send BDA reports during end of mission. 2/52 ID will send consolidated BDA reports to the 52ID FSE every 72-hours, no later than 1000.

- **Counterfire Reports.** 2/52 ID FSE will submit counterfire reports to the 52ID FSE every 24-hours, no later than 1000.
- **Reporting PACE.** Primary: AFATDS. Alternate: 52ID Portal/Command Post of the Future (CPOF). Contingency: Transvers (52ID-FIRES room, division [DIV] server: conference.52identxmpp1.52id.army.smil. mil). Emergency: SVOIP 563-0177.

Signal

- 52ID FSE contact information
  - To be published
  - AFATDS unit reference numbers (URNs) and Internet protocol (IP) addresses
    - **Division Tactical Operations Center (DTOC) Operations.** To be published.
    - **DTOC Plans.** To be published.
  - Secret Internet Protocol Router Network (SIPRNET) SharePoint
  - CPOF Folder. "BCT Reports to DIV"
  - **Reporting PACE.** Primary: AFATDS. Alternate: 52ID Portal/CPOF. Contingency: Transvers. Emergency: SVOIP XXX-XXXX
  - **DD Form 1972 submittal PACE.** Primary: 52ID Portal. Alternate: AFATDS. Contingency: Transverse (private chat). Emergency: SVOIP XXX-XXXX

ACKNOWLEDGE:

OFFICIAL:

ATTACHMENTS

Appendix 1—Fire Support Execution Matrix (FSEM)

Appendix 2—Target List Work Sheet (TLWS)

Appendix 3—Concept of Fires Target Number, Trigger, Location, Observer, Delivery System, Attack Guidance, and Communication (TTLODAC)

Appendix 4—Fire Support Overlay

APPENDIX B
Checklists

FIRES BATTLE HANDOVER CHECKLIST

- ☐ Clearly define division (DIV) fire support coordination line (FSCL) and brigade (BDE) coordinated fire line (CFL).
- ☐ Understand trigger to shift, and plan to disseminate that information.
- ☐ Start with a blank fire mission log (add date-time group [DTG] at top).
- ☐ Print out fire mission/counterfire battle drill and ensure everyone understands the process.
- ☐ Get the last ten counterfire missions and plot them on the analog map board (this will allow the fires and S-2 to continue the development of the counterfire fight and attack targets, and provide the BDE commander with an enemy artillery course of action [COA]).
- ☐ Update the ammunition count (rocket/missile and cannon) (analog and digital trackers).
- ☐ Update the howitzer and radar slant.
- ☐ Update current position areas for artillery (PAAs) and howitzer locations.
- ☐ Post the DIV/BDE high-payoff target list (HPTL).
- ☐ Post attack guidance matrix (AGM) and target selection standards (TSS).
- ☐ Update radar azimuth of search.
- ☐ Target handover, if any in queue at the field artillery (FA) battalion (BN) (record on analog fire mission log).
- ☐ Verify communications workspace has same units/unit reference numbers (URNs)/ Internet protocol (IP) numbers as the main command post (Advanced Field Artillery Tactical Data System [AFATDS]).
- ☐ Verify all units in communications workspace are built on the map (AFATDS).
- ☐ Verify AFATDS can talk with all units' built in communications workspace (AFATDS), either by frequency modulation (FM) digital or local area network (LAN), and troubleshoot any connectivity issues.
- ☐ Scrub the fire support coordination measure (FSCM) with the main command post/ tactical command post (TAC) (AFATDS).
- ☐ Load the current airspace control order l into AFATDS.
- ☐ Scrub the target list worksheet with main command post/TAC (AFATDS).

- ☐ Ensure the current fire support execution matrix (FSEM) is on hand.
- ☐ Establish connection with Tactical Airspace Integration System (TAIS).
- ☐ Establish FM voice/digital communications.
- ☐ Establish secure voice over internet protocol (SVOIP) communications with FA BN.
- ☐ Get SVOIP phone numbers for all subordinate fire support cells.
- ☐ Know what the fire support tasks (FSTs) are, and who are they supporting.
- ☐ Post priorities of fire posted, and ensure they are understood.
- ☐ Understand the fire support plan.
- ☐ Get supported times for current to 48-hours out for Shadow, Grey Eagle, MQ-9 Reaper, air weapons team (AWT), electromagnetic warfare (EW) assets (EC-130, Growler, Prowler), Joint Surveillance Target Attack Radar System (JSTARS), Rivot Joint, and supported close air support (CAS) request times.
- ☐ Have an up-to-date copy of the fires overlay with current FSCMs, airspace coordinating measures (ACMs), and maneuver graphics.
- ☐ Confirm urban targeting: PSS-OFF/DIE/DECIDE/GRGs/no-strike list/collateral damage estimation (CDE) certified personnel/legal advisor.
- ☐ Participate in fires technical rehearsal, and have all gun target line (GTL)/maximum ordnance data.

DIGITAL AND ANALOG COMMON OPERATIONAL PICTURE CHECKLIST

- ☐ Maneuver graphics
- ☐ Front line trace maneuver units
- ☐ Friendly observation posts
- ☐ FSCMs/ACMs
- ☐ Battery locations
- ☐ Enemy artillery locations/ranges
- ☐ Enemy observation posts
- ☐ PAAs and battery locations
- ☐ Targets (including FA deliverable mines)
- ☐ Targeted area of interest
- ☐ Radar zones
- ☐ DIV FSCL
- ☐ BDE CFL

APPENDIX C

Field Artillery Manual References

This is a list of artillery manuals, both active and inactive, used by successful units during their National Training Center rotations.

Army Doctrine Publication (ADP) 3-19, *Fires*, 31 July 2019
Army Techniques Publication (ATP) 3-09.02, *Field Artillery Survey,* 16 February 2016
ATP 3-09.12, *Field Artillery Target Acquisition,* 24 July 2015
ATP 3-09.23, *Field Artillery Cannon Battalion*, 24 September 2015
ATP 3-09.24, *Techniques for the Fires Brigade*, 21 November 2012
ATP 3-09.30, *Observed Fires,* 28 September 2017
ATP 3-09.32, *Multi-Service Tactics, Techniques, and Procedures for Joint Application of Firepower*, 18 October 2019
ATP 3-09.34, *Multi-Service Tactics, Techniques, and Procedures for Kill Box Planning and Employment*, 18 June 2018
ATP 3-09.42, *Fire Support for the Brigade Combat Team,* 1 March 2016
ATP 3-09.50, *The Field Artillery Cannon Battery*, 4 May 2016
ATP 3-09.60, *Techniques for Multiple Launch Rocket System and High Mobility Artillery Rocket System Operations,* 29 July 2020
ATP 3-09.70, *Paladin Operations,* 25 September 2015
ATP 3-60, *Targeting*, 7 May 2015
Field Manual (FM) 3-09, *Fire Support and Field Artillery Operations,* 20 April 2020
FM 3-09.15, *Tactics, Techniques, and Procedures for Field Artillery Meteorology,* 25 October 2007 (This product is inactive with no current replacement)
FM 6-22.5, *Combat and Operational Stress Control Manual for Leaders and Soldiers,* 18 March 2009 (This product is inactive with no current replacement).
FM 6-300, *Army Ephemeris 1993-1997*, 23 July 1992 (This product is inactive with no current replacement).
FM 6-20-30, *Tactics, Techniques, and Procedures for Fire Support for Corps and Division Operations,* 18 October 1989 (This product is inactive with no current replacement).
Training Circular (TC) 3-09.81, *Field Artillery Manual Cannon Gunnery,* 1 May 2016
TC 3-09.8, *Fire Support and Field Artillery Certification and Qualification,* 15 November 2013
TC 3.09.31, *Fire Support Training for the Brigade Combat Team Commander*, 15 November 2013 (This product is inactive with no current replacement).

APPENDIX D
Glossary

5RAF	five requirements for accurate fire
AA	assembly area
ACA	airspace coordination area
ACM	airspace coordinating measure
ADA	air defense artillery
ADAM	air defense airspace management
ADCON	administrative control
ADP	Army doctrine publication
ADRP	Army doctrine reference publication
AE	area of engagement
AFATDS	Advanced Field Artillery Tactical Data System
AFSO	assistant fire support officer
AGM	attack guidance matrix
AI	area of interest
ALO	air liaison officer
AMR	air mission request
ANSF	Afghanistan National Security Forces
AO	area of operations
AOS	azimuth of search
APAM	antipersonnel/antimateriel
APICM	antipersonnel improved conventional munitions
AR	armor
ASCC	Army Service component command
ASLT	assault
AT	antitank
ATACMS	Army Tactical Missile System
ATGM	antitank guided missile
ATIZ	artillery target intelligence zone
ATP	Army techniques publication
ATK	attack
ATO	air tasking order
ATTP	Army tactics, techniques, and procedures
AVN	aviation
AWT	air weapons team

BAE	brigade aviation element
BAO	brigade aviation officer
BCT	brigade combat team
BDA	battle damage assessment
BDE	brigade
BEB	brigade engineer battalion
BFIST	Bradley fire support team
BICES	Battlefield Information Collection and Exploitation System
BM	ballistic missile
BMP	Boyevaya Mashina Pehotis (Russian infantry fighting vehicle)
BN	battalion
BRDM	Boyevaya Razvedyuatel'naya Dozornaya Meshinas (Russian combat reconnaissance patrol vehicle)
BSB	brigade support battalion
BTG	brigade tactical group
BTRY	battery
C2	command and control
CAB	combat aviation brigade
CAS	close air support
CAT	category
CAV	cavalry
CCA	close combat attack
CCIR	commander's critical information requirement
CDE	collateral damage estimation
CDR	commander
CE	circular error
CEMA	cyber electromagnetic activities
CF	counterfire
CFF	call for fire
CFFZ	call for fire zone
CFL	coordinated fire line
CFZ	critical friendly zone
CMD	command
CO	company
COA	course of action
COMINT	communications intelligence
CP	command post

CPOF	Command Post of the Future
CSB	cross boundary
CSR	controlled supply rate
CUOPS	current operations
CZ	censor zone
D3A	decide, detect, deliver, and assess
DAGR	Defense Advanced Global Positioning System Receiver
DATE	decisive action training environment
DD	Department of Defense (form)
DEV	development
DIV	division
DIVARTY	division artillery
DNL	do not load
DO	decisive operations
DODAC	Department of Defense address code
DP	decision point
DPICM	dual-purpose improved conventional munitions
DS	direct support
DSM	decision support matrix
DST	decision support template
DTD	digital terrain data
DTG	date-time group
DTOC	division tactical operations center
EA	engagement area
EAB	echelon above brigade
EEFI	essential element of friendly information
ELINT	electronic intelligence
EMPCOA	enemy most probably course of action
EN	enemy
ENG	engineering
ENY	enemy
ERT	engineer reconnaissance team
ET	electronic time
EVENTEMP	event template
EW	electromagnetic warfare
EXMAT	execution matrix
FA	field artillery
FAB	field artillery battalion
FAC	forward air controller

FARP	forward arming and refueling point
FASCAM	family of scatterable mines
FAT	field artillery task
FC	fires cell
FDC	fire direction center
FDO	fire direction officer
FFA	fire-free area
FFE	fire for effect
FFIR	friendly forces information requirements
FIST	fire support team
FM	field manual
FO	forward observer
FPF	final protective fire
FRAGORD	fragmentary order
FS	fire support
FSC	fire support center
FSCL	fire support coordination line
FSCM	fire support coordination measure
FSCOORD	fire support coordinator
FSE	fire support element
FSEM	fire support execution matrix
FSO	fire support officer
FST	fire support task
GMLRS	Global Positioning System Multiple Launch Rocket System
GMTI	ground movement target indicator
GoRA	Government of the Republic of Atropia
GPS	Global Positioning System
GS	general support
GSR	general support-reinforcing
GTL	gun target line
HC	hexachloroethane smoke (rounds)
HE	high explosive
HF	high frequency
HHQ	higher headquarters
HIDACZ	high-density airspace control zone
HIMARS	High Mobility Artillery Rocket System
HPT	high-payoff target
HPTL	high-payoff target list
HQ	headquarters

HUMINT	human intelligence
HVT	high-value target
HVTL	high-value target list
IC	information collection
ICP	information collection plan
ID	Infantry Division
IDF	indirect fire
IN	infantry
IP	Internet protocol
IPB	intelligence preparation of the battlefield
IR	information requirements
ISO	in support of
ISR	intelligence, surveillance, and reconnaissance
IW	irregular warfare
JAG	judge advocate general
JFO	joint fires observer
JP	joint publication
JSTARS	Joint Surveillance Target Attack Radar System
JTAC	joint terminal attack controller
KM	kilometers
KPH	Kilometers per hour
LAN	local area network
LC	line of control
LD	line of departure
LNO	liaison officer
LOC	line of communication
LOG	logistics
LROM	long range optimized mode
LSA	logistics support area
LZ	landing zone
M2	movement and maneuver
MA	mission analysis
MACS	modular artillery charge system
MCOO	modified combined obstacle overlay
MD	most dangerous
MDMP	military decisionmaking process
MET	meteorological effects
MFR	mission fired report
ML	most likely

MLRS	multiple launch rocket system
MNVR	maneuver
MOE	measure of effectiveness
MOP	measure of performance
MRL	multiple rocket launcher
MSD	minimum safe distance
MSR	main supply route
MT	mechanical time
MTP	mission training plan
MTSQ	mechanical time superquick
MVMT	movement
NAI	named area of interest
NATO	North Atlantic Treaty Organization
NCO	noncommissioned officer
NEO	noncombatant evacuation operations
NFA	no fire area
NSB	near surface burst
NSL	no strike list
NTC	National Training Center
OC/T	observer coach/trainer
OE	operational environment
O/O	on order
OP	observation post
OPCON	operational control
OPLAN	operation plan
OPORD	operation order
OPS	operations
P/A	primary/alternate
PAA	position area for artillery
PACE	primary, alternative, contingency, and emergency
PD	point detonating
PGK	precision guiding kit
PGM	precision-guided munition
PIR	priority intelligence requirement
PL	phase line
POF	priority of fire
POI	point of impact
POO	point of origin
POS	position

PSYOP	psychological operations
R	reinforcing
R&S	reconnaissance and security
RAAMS	remote anti-armor mine system
RAP	rocket assisted projectile
RDO	radar deployment order
RFA	restrictive fire area
RFI	request for information
RFL	restrictive fire line
ROE	rules of engagement
ROZ	restricted operations zone
RP	red phosphorous
RSR	required supply rate
SA	surface to air
SAM	surface-to-air missile
SATCOM	satellite communications
SBF	support by fire
SCATMINE	scatterable mines
SCO	secondary officer
SE	spherical error
SEAD	suppression of enemy air defenses
SIGINT	signals intelligence
SIPRNET	Secret Internet Protocol Router Network
SIR	secondary intelligence requirement
SITEMP	situation template
SME	subject matter expert
SOF	special operations forces
SOP	standard operating procedure
SOSRA	suppress, obscure, secure, reduce, and assault
SPT	support
SROM	short range optimized mode
SSM	surface-to-surface missile
SVOIP	secure voice over internet protocol
SWO	staff weather officer
TA	target area
TAC	tactical command post
TACON	tactical control
TACP	tactical air control party
TACSOP	tactical standard operating procedure

TAI	target area of interest
TAIS	Tactical Airspace Integration System
TAPL	target acquisition platoon leader
TF	task force
TGT	target
TLE	target location error
TLWS	target list work sheet
TOC	tactical operations center
TOF	time of flight
TOS	time on station
TRP	target reference point
TSE	tactical site exploitation
TSM	target synchronization matrix
TSS	target selection standards
TST	time sensitive target
TTLODAC	target number, trigger, location, observer, delivery system, attack guidance, and communication
TWG	targeting working group
UAS	unmanned aircraft system
UHF	ultrahigh frequency
UMZ	Universalnyj Minnyj Zagraditel (Ukranian mine laying system)
URN	unit reference number
USMC	U.S. Marine Corps
VE	vertical error
VHF	very high frequency
VT	variable time
WARNORD	warning order
WP	white phosphorous (rounds)
XMIT	transmit
XO	executive officer

Chief of fires	The senior organic fires Army staff officer at division and higher headquarters level who advises the commander on the best use of available fire support resources, provides input to necessary orders, and develops and implements the fire support plan.[1]
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.[2]

Counter-preparation fire	Intensive prearranged fire delivered when the imminence of the enemy attack is discovered.[3] It is designed to break up enemy formations; delay movement of reinforcements or reserve; disorganize the enemy's system of command, communications, and observation; decrease the effectiveness of artillery preparation; and impair the enemy's offensive spirit.
Destruction	In the context of the computed effects of field artillery fires, destruction renders a target out of action permanently or ineffective for a long period of time, producing 30 percent casualties or materiel damage. It is also a type of adjustment for destroying a given target.[4]
Fire support coordinator	The brigade combat team's organic field artillery battalion commander; if a fires brigade is designated as the division force field artillery headquarters, the fires brigade commander is the division's fire support coordinator and is assisted by the chief of fires who then serves as the deputy fire support coordinator during the period the force field artillery headquarters is in effect.[5]
Fire support officer	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.[6]
Fire support team	A field artillery team provided for each maneuver company/troop and selected units to plan and coordinate all supporting fires available to the unit, including mortars, field artillery, naval surface fire support, and close air support integration.[7]
Force field artillery headquarters	If designated by the supported commander, is normally the senior field artillery headquarters organic, assigned, attached, or placed under the operational control of that command. The supported commander specifies the commensurate responsibilities of the force field artillery headquarters and the duration of those responsibilities.[8]
Mensuration	The process of measurement of a feature or location on the Earth to determine an absolute latitude, longitude, and elevation.[9]
Neutralization	In the context of the computed effects of field artillery fires renders a target ineffective for a short period of time, producing 10 percent casualties or materiel damage.[10]
Offensive task	A task conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers.
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.[11]

Priority of fires	The commander's guidance to his staff, subordinate commanders, fire support planners, and supporting agencies to organize and employ fire support in accordance with the relative importance of the unit's mission.[12]
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.[13]
Synchronization	The arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time.[14]
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.[15]
Target coordinate mensuration	The process of measuring 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 and 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.[16]
Weaponeering	The process of determining the specific means required to create a desired effect on a given target.

Endnotes

1. Office of the Chairman of the Joint Chiefs of Staff, *DOD Dictionary of Military and Associated Terms,* June 2020

2. Field Manual (FM) 1-02.1, *Operational Terms,* 21 November 2019

3. Ibid.

4. Ibid.

5. Ibid.

6. *DOD Dictionary of Military and Associated Terms*

7. Ibid.

8. FM 1-02.1

9. *DOD Dictionary of Military and Associated Terms*

10. FM 1-02.1

11. Ibid.

12. Ibid.

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14. *DOD Dictionary of Military and Associated Terms*

15. Ibid.

16. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3505.01D, *Target Coordinate Mensuration Certification and Program Accreditation*, 15 January 2019

APPENDIX E
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November 2020

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