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DIRECT FIRE KILL CHAIN

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DIRECT FIRE KILL CHAIN

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Preface

TC 3-20.31-040 provides the standardized direct fire kill chain for crews, teams, squads, and small units. It provides coordinating principles for the actions of these entities that serve to establish cohesion through a common, standardized engagement process. The concepts in this training circular apply to all direct fire weapons, weapon systems, and small units in the armored brigade combat team, Stryker brigade combat team, and Infantry brigade combat team. This training circular is intended for all Army personnel, commanders, and staffs for use at Soldier through brigade combat team levels.

The principal audiences for TC 3-20.31-040 are all members of the Profession of Arms. Commanders and staffs of Army headquarters serving as joint task force or multinational headquarters also refer to applicable joint or multinational doctrine concerning the range of military operations and joint or multinational forces. Trainers and educators throughout the Army will also use this publication.

Commanders, staffs, and subordinates ensure their decisions and actions comply with applicable United States, international, and, in some cases, host-nation laws and regulations. Commanders at all levels ensure their Soldiers operate in accordance with the law of war and the rules of engagement. (See FM 6-27 for legal compliance.) Paragraph 4-108 and related figure 4-60 of TC 3-20.31-040 implement ABCANZ Standard 2157(R).

The use of a trade or brand name does not constitute endorsement of any specific commercial product, commodity, service, or enterprise by the United States Army.

TC 3-20.31-040 uses joint terms where applicable. Select joint and Army terms and definitions appear in the glossary and the text. Terms for which TC 3-20.31-040 is the proponent publication (the authority) are italicized in the text and marked with an asterisk (*) in the glossary. Terms and definitions for which TC 3-20.31-040 is the proponent publication are boldfaced in the text. For other definitions shown in the text, the term is italicized, and the number of the proponent publication follows the definition.

TC 3-20.31-040 applies to the Active Army, Army National Guard (of the United States), and United States Army Reserve unless otherwise stated.

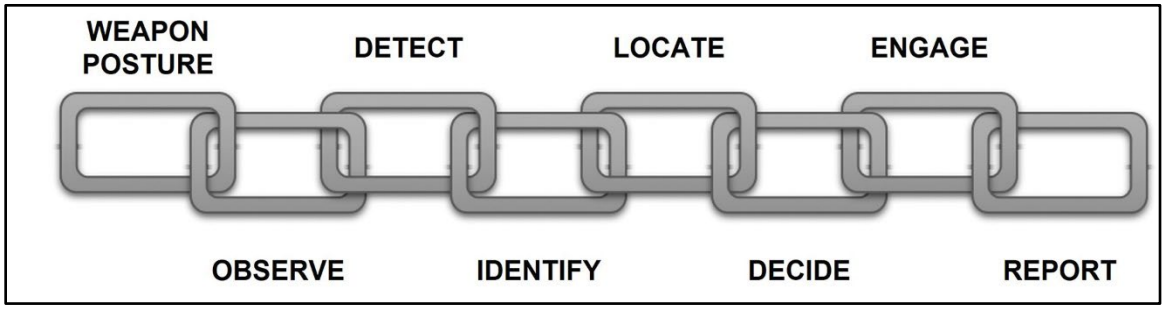
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Introduction

The purpose of the direct fire kill chain is to provide a standard description of all the tasks and actions of the firers, teams, squads, crews, and platoons employing direct fire weapon systems. This allows Soldiers and leaders to maximize the effects of lethal fires against any threat while simultaneously reducing or eliminating fratricide and collateral damage. Introductory figure-1 presents the direct fire kill chain.

The direct fire kill chain (hereinafter the kill chain) is a deliberate, ongoing series of interconnected tasks, actions, and functions that enable the rapid and effective application of the appropriate combat power on a confirmed threat to achieve the desired tactical effects on the target.



Introductory figure-1. Direct fire kill chain

PURPOSE

This training circular describes the kill chain for direct fire weapons as it applies to Soldiers, leaders, crews, squads, and platoons. It provides an overview of the kill chain, including each interconnected task and the specific outcomes they must accomplish regardless of the steps taken to achieve those outcomes.

The kill chain described within this publication represents the standard process for engaging threats with direct fire weapons. It relies upon the firer's knowledge of the unit's combat identification equipment, basic Soldier skills, rules of engagement, doctrine (including tactics, techniques, and procedures), target identification systems, and the available situational understanding systems. This training circular discusses those systems in detail only when they directly impact the kill chain. It assists leaders in making the decision to eliminate threats with lethal direct fire. When appropriate, it identifies publications with additional information about a specific, complex function within the kill chain.

OVERVIEW

The kill chain provides an iterative, standard, and systematic approach to targeting engagement activities. The following chapters describe the basic functions (or links) of the kill chain in detail.

CHAPTER 1—WEAPON POSTURE

This chapter reviews the points at which leaders inform subordinate elements of the weapon posture and rules of engagement for the tactical mission. The weapon posture is a combination of weapon safety status and the appropriate weapons control status based on the likelihood of enemy contact. The unit commander provides the rules of engagement. Together, the weapon posture and rules of engagement enable each maneuver element to establish within the organization the appropriate level of readiness for rapid delivery of judicious and appropriate combat power against hostile contact. The weapon posture reinforces the commander's intent, supports fratricide prevention, and facilitates reduction in collateral damage.

- Source—Operation orders, warning orders, fragmentary orders, rules of engagement, tactical standard operating procedures, threat templates, situation templates, and other information and intelligence.
- Outcome—The small unit knows and reinforces the appropriate weapon posture and rules of engagement, including establishing the appropriate battlecarry for systems with multiple ammunition types (for example, Abrams and Bradley).

CHAPTER 2—OBSERVE

This chapter discusses the continuous process of the Soldier's or collective element's scan or search of specific overlapping sectors of responsibility to achieve visual contact of a potential tactical threat before other forms of contact are known. The observer selects one or more areas for more detailed scrutiny. These areas contain indications of anomalous surroundings and potential threat positions, avenues of approach, and useful terrain to a hostile force attempting to interrupt friendly operations.

- Source—Established sectors of observation within the organization or system, based on capabilities, standard operating procedures, and function.
- Outcome—An area of interest warrants additional scrutiny.

CHAPTER 3—DETECT

This chapter describes the initiation of the target acquisition process (detect, identify, and locate) and the process observers employ to find evidence (target signatures) of a potential threat in the sector of responsibility. The ability of Soldiers to achieve visual contact before a threat gains visual contact enables the unit to deliver appropriate combat power (reciprocating contact) first.

- Source—A target signature or an anomaly discovered by an observer.
- Outcome—An observer found evidence (target signatures) of a potential threat in the sector of responsibility.

CHAPTER 4—IDENTIFY

This chapter reviews the responsibilities of *identification*—the process of determining the friendly or hostile character of an unknown detected contact (JP 3-01). The work of identification includes the interrogation and discrimination of recognizable contacts as friendly, foe, neutral, noncombatant, or unknown. During the identification process, by using intelligence, the known situation, friendly and enemy force dispositions, and other information, the observer also determines the neutral or noncombatant status of a detected contact. The process to identify is a key component of target acquisition (as defined in JP 3-60).

- Source—Analysis of a detected contact's components by both following the combat identification steps to recognize, assess, identify, and discriminate and interrogating the frame, armament, suspension, turret, equipment, and reactive protection.
- Outcome—
  - Recognize the contact's military description.
  - Assess the description's threat level.
  - Identify the model (or common name) and variant.
  - Discriminate the hostile intent as friend, foe, neutral, noncombatant, and unknown.

CHAPTER 5—LOCATE

This chapter covers various methods for determining the location of an identified target description to direct, guide, or orient the appropriate weapons, systems, or combat power. It details how an observer of an identified threat provides that tactical information to the leader in the form of a contact report or, when from a firer, an acquisition report. The determination of a location instigates the element's orientation of optics, sensors, and makeready weapons. The process to locate is a key component of target acquisition (as defined in JP 3-60).

- Source—Discriminated target description information shared with the collective element; the use of digital or analog systems or methods (to determine the location).
- Outcome—The appropriate leader receives information regarding the target description's location, and the appropriate weapon is or systems are oriented on the threat.

CHAPTER 6—DECIDE

This chapter outlines the decisions and process of a leader with the authority to issue a command of execution while that leader determines the appropriate use of combat power, the classification of the threat level, the prioritization of the threats (sequence of engagement), and the fire pattern to apply during the conduct of fire. The command of execution authority bases all decisions on the application of the kill chain principles.

- Source—Contact or acquisition report provided to the leader.
- Outcome—
  - The leader has selected the appropriate combat power, classified the presented threats, prioritized the threats for elimination, and selected the fire pattern that will achieve the desired target effects.
  - The leader and firer completed target confirmation.

CHAPTER 7—ENGAGE

This chapter provides a general overview of the conduct of fire for direct fire engagements. It describes the elements of the fire command for squad, crew, and collective conduct of fire that serve as the structure for applying direct fire against a confirmed threat. TC 3-20.31-043, a subordinate publication to this training circular, provides further information on fire commands and their appropriate use. The fire command cycle continues until the successful accomplishment of the desired effects on the known threats to the satisfaction of the tactical leader's intent, meaning the firing element effectively alters, disrupts, or halts the confirmed target's kill chain and reduces or eliminates the threat to friendly forces.

- Source—The leader's decision to apply combat power against the confirmed target.
- Outcome—The desired target effect is achieved against all known threats.

CHAPTER 8—REPORT

Upon the completion of an engagement, the leader updates higher headquarters on the tactical situation, effects from the application of combat power, and planned or ongoing actions to complete the assigned tactical mission task. This chapter describes digital, analog, and frequency modulation methods of delivery, as well as the common, appropriate, tactically relevant information and intelligence to provide.

- Source—The leader's evaluation of the effects of applied combat power, tactical status of the firing element, and anticipated tactical actions for dissemination.
- Outcome—The appropriate tactical information and intelligence are transmitted to higher headquarters and subordinates to facilitate their visualization of the tactical situation across the area of operations.

Chapter 1

Weapon Posture

The weapon posture combines the senior commander's intent, current and potential threat assessments, and the likelihood of enemy contact. It executes clear use of the rules of firearms safety, weapons control status (WCS), weapon safety status (WSS), and rules of engagement (ROE) (see figure 1-1). The WSS coupled with the WCS provide small-unit leaders with force protection measures that allow for the appropriate level of readiness and clear articulation of the ROE throughout a mission, potential contact with threat forces, and the most likely forms of contact with hostile forces.

Prior to the unit's entering a hostile environment, commanders and leaders review the potential for enemy contact, ROE, and mission objectives. Commanders describe how each unit will posture their weapons and systems to provide the highest degree of force protection that addresses those items. During the orders process for any ongoing or future mission, commanders direct their units' weapon postures.

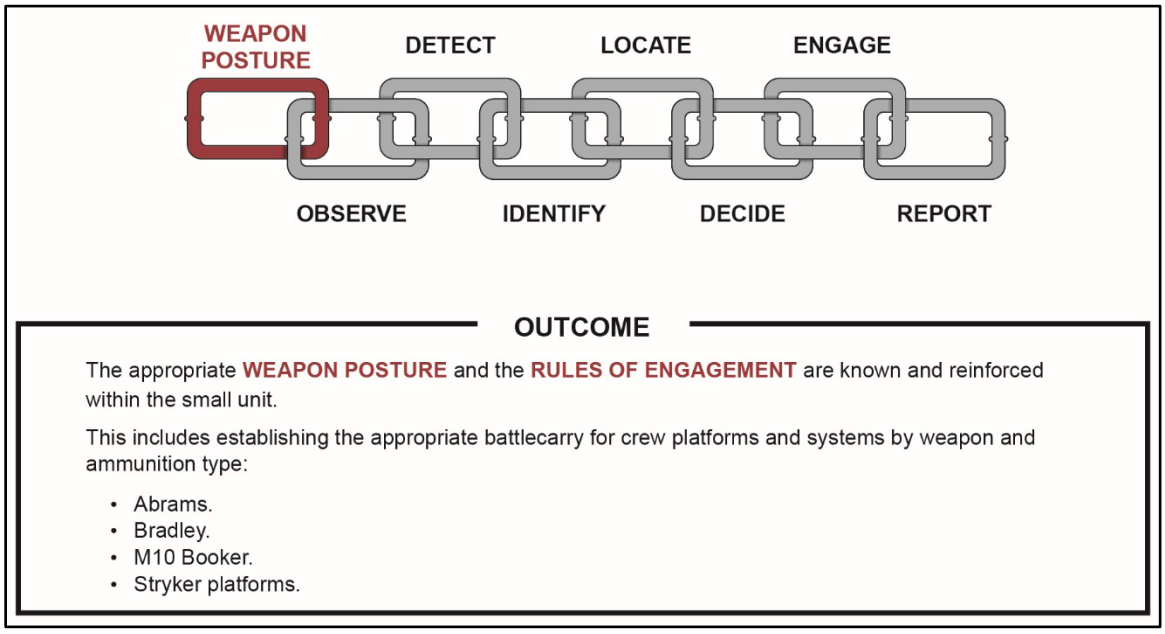


Figure 1-1. Weapon posture function of kill chain

WEAPONS AND WEAPON SYSTEMS HANDLING

1-1. Safe weapons handling procedures offer a standard by which Soldiers are to handle, operate, and employ weapons or weapon systems safely and effectively. Weapons handling comprises three components: the Soldier, the weapon, and the environment.

1-2. The Soldier maintains situational understanding of friendly forces, the weapon's status, and the environment to handle the weapon properly. Smart, adaptive, and disciplined Soldiers are the primary safety mechanism for all weapons under their control.

1-3. The weapon is a Soldier's primary tool to defeat threats in combat. Soldiers maintain knowledge on operating the mechanical and electrical safeties of the weapons or weapon systems they employ, as well as the principles of operation for those weapons to understand how the cycle of function directly impacts the weapon posture.

1-4. The environment is a Soldier's surroundings and mindset. Soldiers remain aware of muzzle discipline, the nature of the target, and what is behind the target. Threats often mix with noncombatants, so Soldiers remain ready to perform rapid discrimination.

WEAPONS HANDLING MEASURES

1-5. To handle weapons safely and effectively, Soldiers maintain cognitive awareness of the four distinct weapons handling measures that build the weapon posture. The weapons handling measures within the weapon posture are—

- Rules of firearms safety.
- WSS.
- WCS.
- ROE.

1-6. The rules of firearms safety are common practices for training and combat. Each weapon's training publication, technical manual, or training strategy lists its applicate rules.

1-7. The leader or commander typically delivers the WSS and WCS initially in the tactical standard operating procedures (SOPs) and then updates them appropriately in the operation order (OPORD), warning order, or fragmentary order (FRAGORD). Transmissions of weapon posture updates occur across digital, analog, face-to-face, or radio methods.

Rules of Firearms Safety

1-8. The rules of firearms safety are standard for any weapon Soldiers may employ or handle. Soldiers adhere to these precepts during training and combat operations, regardless of the type of ammunition. Figure 1-2 shows the four rules of firearms safety, each with a snapshot of Soldier and leader responsibilities.



Figure 1-2. Rules of firearms safety

WEAPON SAFETY STATUS

1-9. The WSS code of colors—green, amber, red, and black—indicates the safety levels of a weapon (see figure 1-3). To place a weapon in each safety level requires a specific series of actions. In training and combat, the colors assign safety levels to the current tasks or actions of Soldiers, small units, or groups.

1-10. WSS ratings depend on the level of safety measures for the weapon itself. Figure 1-3 links general weapon safety conditions to WSS ratings based on the Army-standardized color scheme in FM 1-02.2.

	WEAPON SAFETY STATUS	GENERAL DESCRIPTION
COLOR AMPLIFIER	GREEN	FULLY SAFE
	AMBER	SUBSTANTIALLY SAFE
	RED	MARGINALLY SAFE
	BLACK	NOT SAFE / IN USE

Figure 1-3. Weapon safety status and general descriptions

1-11. All firers and leaders remain fluent in WSS ratings and their pertinence to the employed weapons. They maintain awareness of the firer's responsibility to own each shot or burst. Basic definitions for each WSS rating follow, but the proper reference for a specific weapon's process is its training circular:

- Green—fully safe:
  - The weapon is clear, no ammunition is present (nor magazine or belt), the chamber is empty, and the weapon is on safe.
  - All weapons have an individual task to CLEAR WEAPON.
- Amber—substantially safe:
  - The weapon is clear and verified by a leader, the bolt or slide (depending on the weapon) is forward, and ammunition is introduced to the weapon.
  - This is an administrative and preparatory WSS.
  - Its primary use is for mounted weapons during combat operations under the direction to maintain a substantially safe weapon's abilities to transition and escalate rapidly to red or black status as the situation dictates.
- Red—marginally safe:
  - The weapon is on safe, and depending on the weapon type, the magazine is locked into the well, or the belted ammunition is on the feed tray with the cover closed.
  - For pistols, rifles, carbines, and sniper weapon systems, a round is in the chamber, and the bolt is forward in the locked position.
  - For the M249 and M240 series, the bolt is locked to the rear, and the ammunition is on the feed tray with the cover closed.
- Black—not safe:
  - The weapon is fully prepared to fire, the firer has positively identified the target, the weapon is on fire, the firer's finger is on the trigger, and the firer is in the process of engaging the threat.
  - The color black indicates the actions of the firer when in red status but entering an engagement sequence as part of the engage function of the direct fire kill chain (that is, its use clearly differentiates red WSS from active, deliberate threat engagement).

WEAPONS CONTROL STATUS

1-12. WCS is a tactical method of fire control given by a leader. It incorporates the tactical situation, ROE for the area of operations, and expected or anticipated enemy contact. It outlines the target identification conditions under which friendly elements may engage a perceived threat with direct fire.

1-13. Figure 1-4 describes each standard WCS from both training and combat tactical operations. The descriptions address the threat conditions under which a gunner has the authority to engage a threat target.

WEAPON CONTROL STATUS	ENGAGE ONLY WHEN
WEAPONS HOLD	ENGAGED or ORDERED TO ENGAGE.
WEAPONS TIGHT	Target is POSITIVELY IDENTIFIED AS ENEMY.
WEAPONS FREE	Target is NOT POSITIVELY IDENTIFIED AS FRIENDLY.
Note: When the Weapon Control Status is provided as a stand-alone measure, leaders will include the prefix WEAPONS, as in WEAPONS HOLD, or WEAPONS TIGHT, or WEAPONS FREE, as appropriate for the tactical situation.	

Figure 1-4. Weapons control status

RULES OF ENGAGEMENT

1-14. ROE are Department of Defense directives issued by competent military authority that delineate the circumstances and limitations under which Soldiers initiate and continue combat engagement of encountered forces. They reflect the law of land warfare and the operational considerations, and their primary concern remains the restraints on the use of force. They are the primary means by which leaders convey legal, political, diplomatic, and military guidance to Soldiers. Leaders at every level train Soldiers thoroughly, before their deployments, in the ROE and the laws governing armed conflict. During the conduct of operations, leaders ensure Soldiers properly apply the ROE to preclude inappropriate engagements.

1-15. ROE and tactics, techniques, and procedures depend on the theater. Before a force deploys, the Judge Advocate General's Corps of the Army reviews and approves through the chain of command the rules by which a target may be engaged. These rules address the appropriate escalation of force.

1-16. The rules of interaction (ROI) provide guidance for public interaction in the operational environment. ROI, when applied with effective interpersonal communication skills, improve a Soldier's ability to accomplish the mission while reducing hostile confrontations. ROI founded on firm ROE provide Soldiers with tools to address nontraditional threats such conflict from political, ideological, cultural, and religious tensions. ROI remain regionally and culturally specific. Leaders integrate ROE and ROI into all training appropriately.

WEAPON POSTURE DESCRIPTIONS

1-17. Firers are ultimately responsible for their weapons and the actions conducted with their weapons. They have a legal and an ethical obligation to employ their weapons tactically and systems appropriately. Commanders and leaders provide weapon postures that take all four weapons handling measures into consideration as they apply to force protection and the mission at hand.

1-18. During the development of the unit's tactical SOPs and later in the orders process, commanders use the weapon posture to describe the battlecarry condition of the weapons or weapon systems, the appropriate ammunition and ballistic information for those weapons, and the WSS and WCS. ***Battlecarry*** **is a posture in which a vehicle is prepared for an engagement at all times.** Organizations may standardize the battlecarry information, specifically the prepared ammunition and the tactically relevant engagement distance for the selected ammunition.

1-19. Both a WCS and WSS undergo implementation and remain available to leaders to prevent fratricide and limit collateral damage. The development of these postures or statuses typically addresses a particular area of operations or type of mission. Leaders clearly outline both for all Soldiers, usually in the OPORD, warning order, or FRAGORD. Figure 1-5 depicts the integration of WSS and WCS into the weapon posture.

	WEAPON POSTURE			
	WSS	WCS		
DEFINITION	STATUS	HOLD	TIGHT	FREE
All weapons clear, mechanical and electrical SAFE.	GREEN			
BATTLECARRY, ammunition is PREPARED, ELECTRICAL SAFE MANUAL SAFE (except open bolt weapons) ALERT ANNOUNCED	AMBER	HOLD	TIGHT	FREE
AMMUNITION LOADED, ELECTRICAL SAFE MANUAL SAFE (except open bolt weapons) TARGET DESCRIPTION ANNOUNCED	RED	HOLD	TIGHT	FREE
COMMAND OF EXECUTION GIVEN	BLACK			
ENGAGE ONLY WHEN:		ENGAGED or ORDERED TO ENGAGE	Targets are POSITIVELY IDENTIFIED AS ENEMY	Targets are NOT POSITIVELY IDENTIFIED AS FRIENDLY

Note: **Additional information concerning the conduct of fire can be found within Chapter 8, Engage. Information concerning the specific loading procedures for any weapon may be found in its respective technical manual or training circular for tactical employment.**

LEGEND

WCS WEAPON CONTROL STATUS

WSS WEAPON SAFETY STATUS

Figure 1-5. Weapon posture framework

1-20. Soldiers operating the weapons or weapon systems remain ultimately responsible for each fired munition from their weapons. Soldiers maintain complete understanding of their weapons' cycles of function, capabilities, limitations, and ammunition, the rules of firearms safety, and the applicability of the ROE to the tactical situation in which they are employing those weapons.

1-21. As figure 1-5 shows, when directing a green WSS, a leader does not provide a WCS. A leader issues an order to increase the weapon posture from green status as part of an escalation of force, depending on the ROE and tactical situation.

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Chapter 2

Observe

Within the kill chain, certain principles govern the overall outcome. Soldiers lacking the skills to observe their areas or sectors of responsibility effectively cannot deliver lethal fires on target before the enemy does. The ability to observe correctly with all available sensors and optics increases the firer's and unit's lethality. No other function (or link) of the kill chain can occur without appropriate observation for and detection of threats to the friendly force (see figure 2-1). In relation to the observation of potential threats in the modern battlespace, this chapter describes the roles and responsibilities of all Soldiers as tactical observers, individual firers, members of a cohesive crew or team, and members of a small unit. It discusses a logical process to assist observers in focusing on the most probable threat locations, the various signatures left or emitted by common threats, and general observation challenges and best practices.

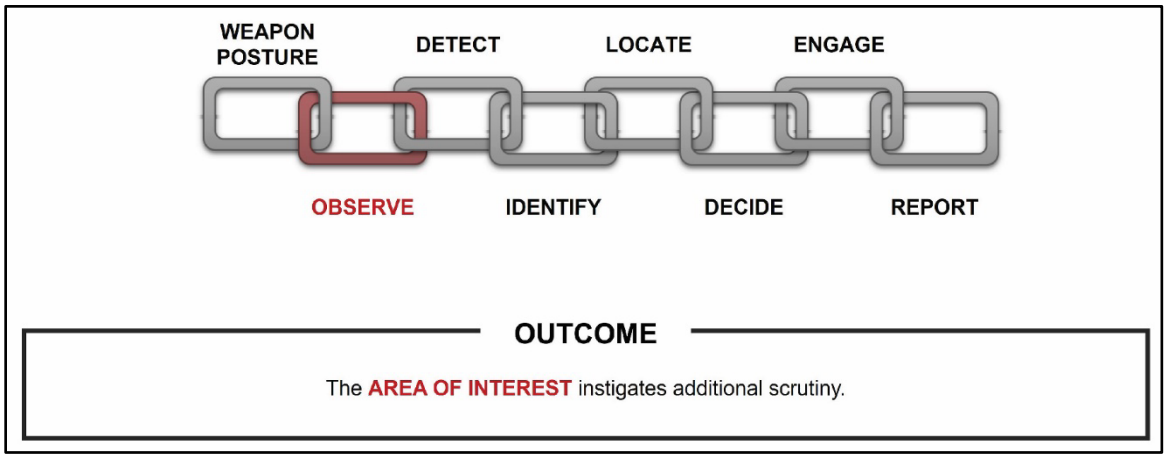


Figure 2-1. Observe function of kill chain

PROCESS

2-1. At the onset of any mission, each Soldier carries the responsibility to search continuously for potential threats to the friendly force, regardless of military occupational specialty. During large-scale combat operations, Soldiers use various search techniques. Whether on patrol, conducting a tactical mission task, performing base defense, force protection, or guard duty, traveling with a unit, or stationary while conducting routine functions, all Soldiers work actively or passively to detect potential threats.

2-2. During combat operations, observation for threats is a continuous function. The three methods of observing assigned sectors of responsibility for potential threats to the friendly force follow:

- Rapid scan:
  - A fast, continuous observation of the sector of responsibility, typically with the use of only the primary optic or naked eye, to discover conspicuous areas, anomalies, positions, avenues of approach, and key terrain.
  - Useful vertically, horizontally, or in depth across the observed area.
- Slow scan:
  - A more methodical observation at a reduced pace, with additional optics or sensors, to develop understanding of the terrain for the ultimate selection of locations for inspection.
  - Useful vertically, horizontally, or in depth, depending on the nature of the observed area.
- Detailed search:
  - A deliberate investigation of the observed area that prompts additional scrutiny for potential target signatures (also known as a search or deliberate search).
  - Provides the most probable locations of potential threats and specific areas of interest to focus target detection efforts.

2-3. The observation process continues until any conspicuous activity, anomalies, potential threat positions, avenues of approach, and key terrain that could serve to interrupt friendly operations undergo correct scrutiny or until the unit observes a potential threat. Upon perceiving any of those conspicuous items, an observer escalates to detect a threat. Figure 2-2 portrays the observation process.

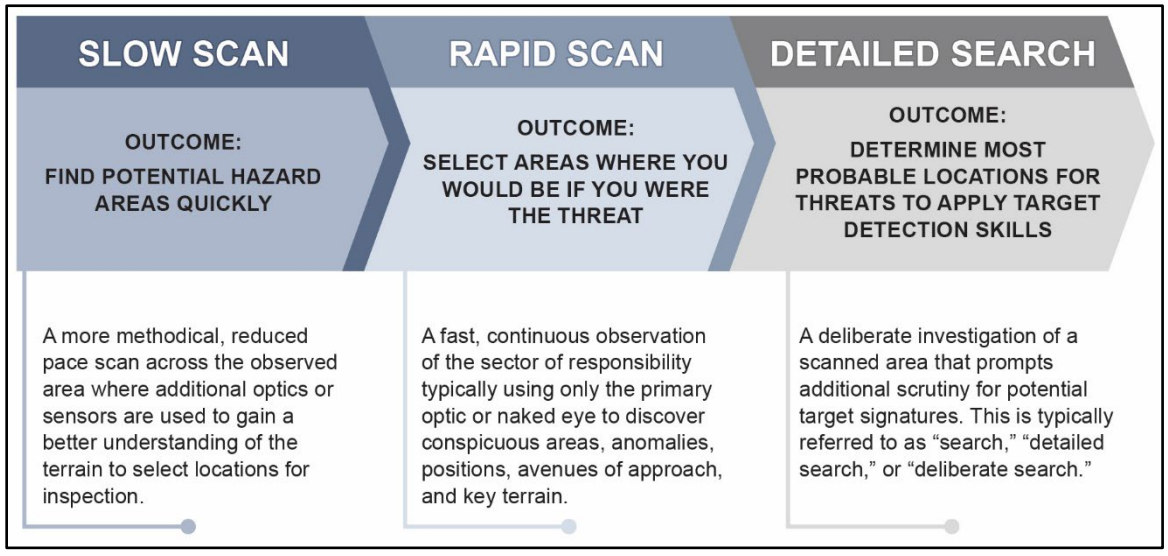


Figure 2-2. Observation process

SCAN

2-4. **A *scan* is the act of observing designated areas in the assigned sector.** A scan or scanning allows an observer to detect anomalies, potential threat positions, avenues of approach, and key terrain that could serve to interrupt friendly operations. Anomalies include irregular shapes, colors, exhaust, heat sources, movement, and actions the element views as incongruous with the surrounding area. Scanning can delimit an area of likelihood for the element to focus its search for potential threat positions. While conducting their scans, observers ask themselves the question, Where would I be if I were the threat?

2-5. In terrain scans, the visibility conditions, element's positioning, fire distribution planning, and optic or sensor capabilities dictate the coverable distance (depth and width). Each element's observation area overlaps adjacent elements' sectors. These factors require the element to coordinate how they will cover their assigned sector for offensive and defensive operations.

2-6. Elements apply various scanning methods in an overlapping manner. Doing so ensures the least amount of dead space and maximizes the use of Soldiers and optics to increase the overall ability of the unit to acquire potential threat positions as rapidly as possible.

2-7. Elements use thermal optics, infrared (IR) night-vision devices (NVDs), machine gun optics, binoculars, and the naked eye to scan during good and limited visibility conditions. Soldiers train to use all available optics and sensors proficiently, so they may switch between types of optics or sensors, particularly during operations with limited visibility.

SCANNING BEST PRACTICES

2-8. Scanning requires patience and correct practice. Some best practices for scanning during combat follow:

- Conduct initial scanning with and without optics or sensors.
- Scan continuously.
- Integrate active listening with visual observation.
- Use scanning methods appropriate for the environment and terrain.
- Practice sector discipline; stay in assigned sector.
- Periodically check the airspace above assigned sector since sectors of responsibility are three-dimensional.
- Vary sensor adjustments for brightness, contrast, focus, polarity, and magnification and between the search and stare modes.

2-9. Collective small units, crews, and teams simultaneously employ multiple scan methods to maximize the results of their observation efforts. Two scanning methods include three patterns for determining potential threat locations:

- Rapid scan:
  - This method is useful for quickly detecting obvious signs of enemy activity.
  - Whether moving or stationary, observers usually employ this method first.
- Slow scan:
  - This method is useful when observers detected no targets with the rapid scan.
  - It is most useful to observers in a defensive position, during a short halt, or with the ability to stabilize the optic or sensor firmly and thereby to reduce jittering or bouncing in the field of view.

2-10. Elements ensure ground reference points are always within their fields of view to maintain directional control and situational awareness (SA) while scanning. The terrain surrounding the potential threat and the threat's domain (ground or air) directly influences which scanning method and pattern will best enable visual contact.

SCAN LIMITS

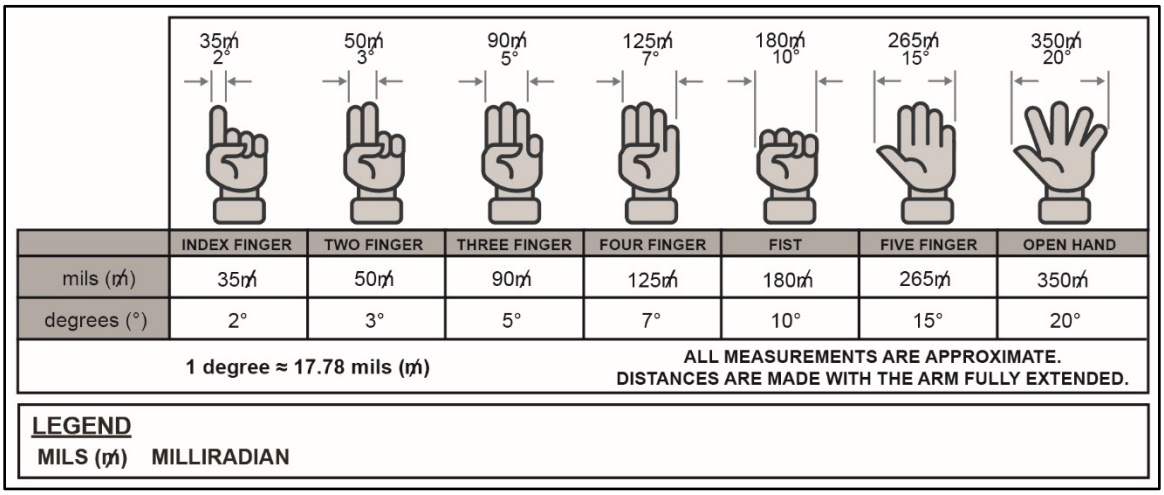
2-11. Each small unit, crew platform, system, and element covers various sectors of observation to provide 360-degree security and to focus observation efforts in the most probable directions of enemy contact. The unit's tactical SOPs typically list sectors of observation, limits, and areas. Alterations to those procedures occur automatically during operations, depending on the terrain, tactical situation, intelligence reports, and related activities.

2-12. This section describes some best practices for observers to review their assigned areas of observation and to detect threats as quickly as possible. These best practices serve to educate observers on the techniques, patterns, and coordination efforts for the efficient and effective completion of this critical force protection task.

Estimation of Scan Limits

2-13. Scan limits are defined in the assigned sector of observation. They typically overlap with those of other observers to ensure redundancy of effort. Environmental conditions, the unit's posture (offense or defense), and other factors often inform the limits. When scanning, observers periodically change their employed techniques as the terrain or situation dictates.

2-14. The discussion of milliradian (mil) or degree measurements include approximate measurements using hasty methods. Figure 2-3 shows rudimentary mil and degree measurements with one's hand and fingers. Observers take hasty measurements for angular distances with one of their arms fully extended away from their bodies in the direction of the area or object they are measuring.



	INDEX FINGER	TWO FINGER	THREE FINGER	FOUR FINGER	FIST	FIVE FINGER	OPEN HAND
mils (m)	35m	50m	90m	125m	180m	265m	350m
degrees (°)	2°	3°	5°	7°	10°	15°	20°

1 degree ≈ 17.78 mils (m)

ALL MEASUREMENTS ARE APPROXIMATE.
DISTANCES ARE MADE WITH THE ARM FULLY EXTENDED.

LEGEND
MILS (m) MILLIRADIAN

Figure 2-3. Fist, hand, and finger hasty milliradian and degree measurement techniques

Horizontal Pattern

2-15. Observers use the horizontal pattern for large distances in the sector of observation. This pattern is applicable to both the rapid and slow scanning methods. It involves a left-to-right, smooth traverse of the sector of observation for the detection of anomalies.

2-16. The horizontal pattern limits in open terrain begin at the visible horizon, from the left-most edge to the right most edge of the assigned sector of observation. The horizontal pattern calls for smooth, lateral left and right eye movements. Periodically, observers scan above the horizon for potential air target signatures across the entire sector.

2-17. Observers scanning with the horizontal pattern follow these procedural steps:

- Oscillate the gaze from left to right, then right back to left, and so on.
- Progressively shift attention from the far horizon inward (that is, closer to one's location) with each pass.
- Once one's focus lies within 100 meters of one's location, increase the distance incrementally outward again to the horizon.
- When one's focus again meets the far horizon, scan approximately 20 degrees above the horizon for possible air threats.
- Estimate 20 degrees by fully spreading the fingers and gauging the tip of the thumb as the upper scan limit (see figure 2-3).

2-18. In the limits of the assigned sector of observation, observers completely understand their own limits, as well as where their limits overlap with those of others and with whom their limits overlap. Horizontal pattern limits are much larger than those in the vertical plane or those apparent while the observer is scanning in depth. When a sector is broad, observers make concerted efforts to conduct their scans across the entire breadth of the sector.

Depth Pattern

2-19. Observers use the depth pattern with the rapid or slow scanning method to review terrain from near to far or from far to near along clearly defined boundaries. These boundaries are where avenues of approach, channels, corridors, gullies, creek or stream beds, low-lying areas, arroyos, or wadis are present.

2-20. The depth pattern has observers begin scanning close to their locations and then follow the low area's structure outward to the far horizon. This pattern is useful for detecting potential threats from reverse slope defense positions that use the natural state of the terrain to advantage.

Vertical Pattern

2-21. Elements may miss aircraft during their scans of the sky when they limit their threat acquisition efforts to areas near the horizon. Conversely, elements will likely miss low-flying aircraft when they expand the upper limits of their acquisition efforts beyond 20 degrees above the horizon.

2-22. An alternate pattern for conducting such a scan is for Soldiers to scan the horizon by shifting their gazes from object to object. They can see more detail this way than with a continuous scan of the horizon. The vertical pattern is preferable in hilly terrain.

Dead Space

2-23. When elements scan in urban terrain, the maximum elevation and depression ranges of their optics and sensors limit threat acquisition and engagement efforts (see figure 2-4). Elements coordinate with adjacent elements to cover dead space and thereby to ensure maximum coverage of the operational environment.

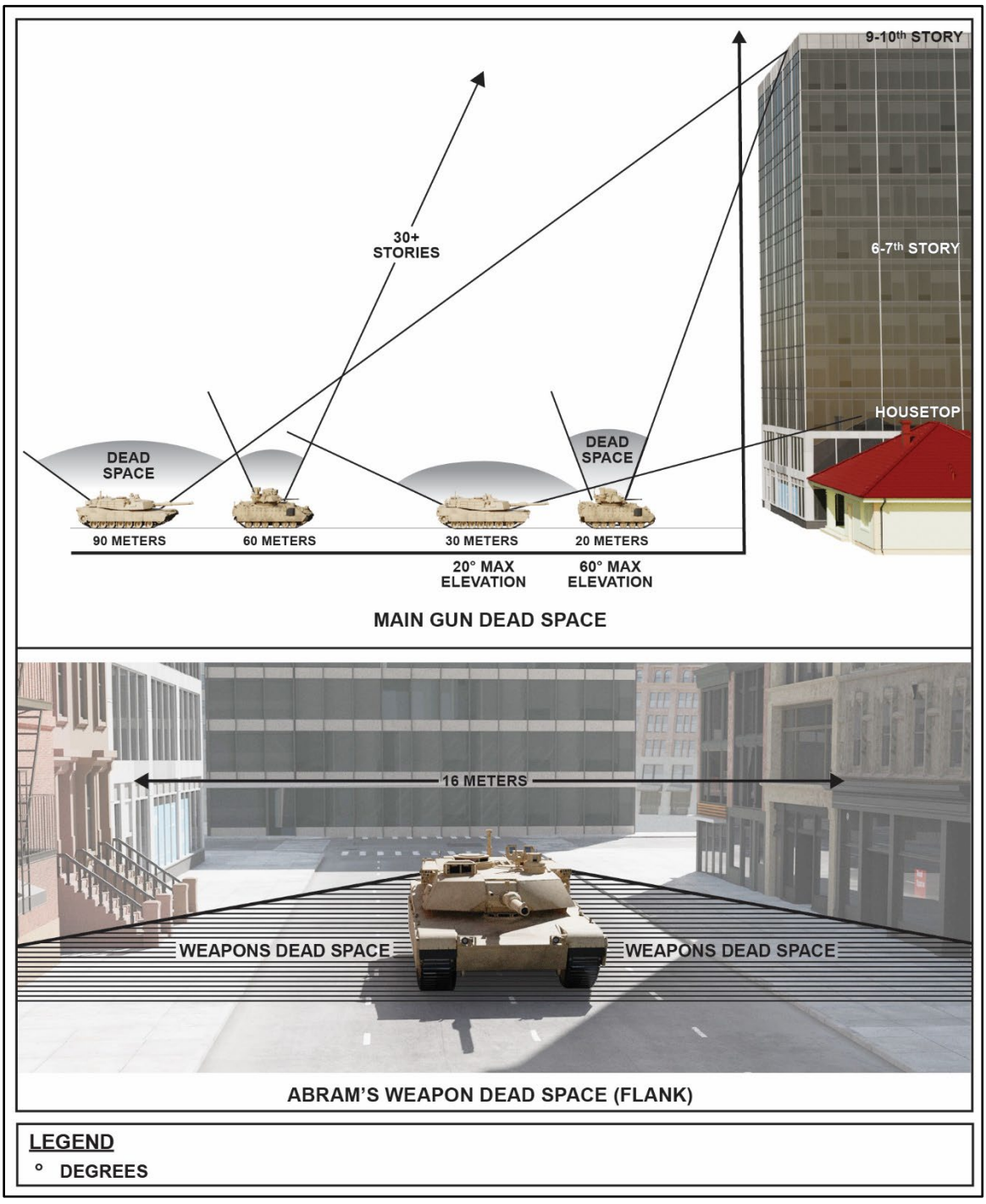


Figure 2-4. Dead space of platform optics and sensors, example

RAPID SCAN

2-24. Elements use rapid scans to recognize conspicuous threats, signatures, and positions (see figure 2-5). A rapid scan is a swift visual sweep of the sector with the naked eye or platform-mounted and hand-held optics in the wide field of view (WFOV).

Individual Observer

2-25. Rapid scans are useful for quickly detecting obvious signs of enemy activity. Whether moving or stationary, observers usually use this scanning method first.

2-26. Rapid scanning involves methodical steps. Soldiers start scanning the center of the sector and rapidly scan from the point nearest to their locations to the point farthest from their locations. They then orient left or right and conduct a rapid scan from near to far. This sweep overlaps the center of the previously scanned sector. Once they complete their scans of one side from the center, they scan the opposite side from the center in the same manner.

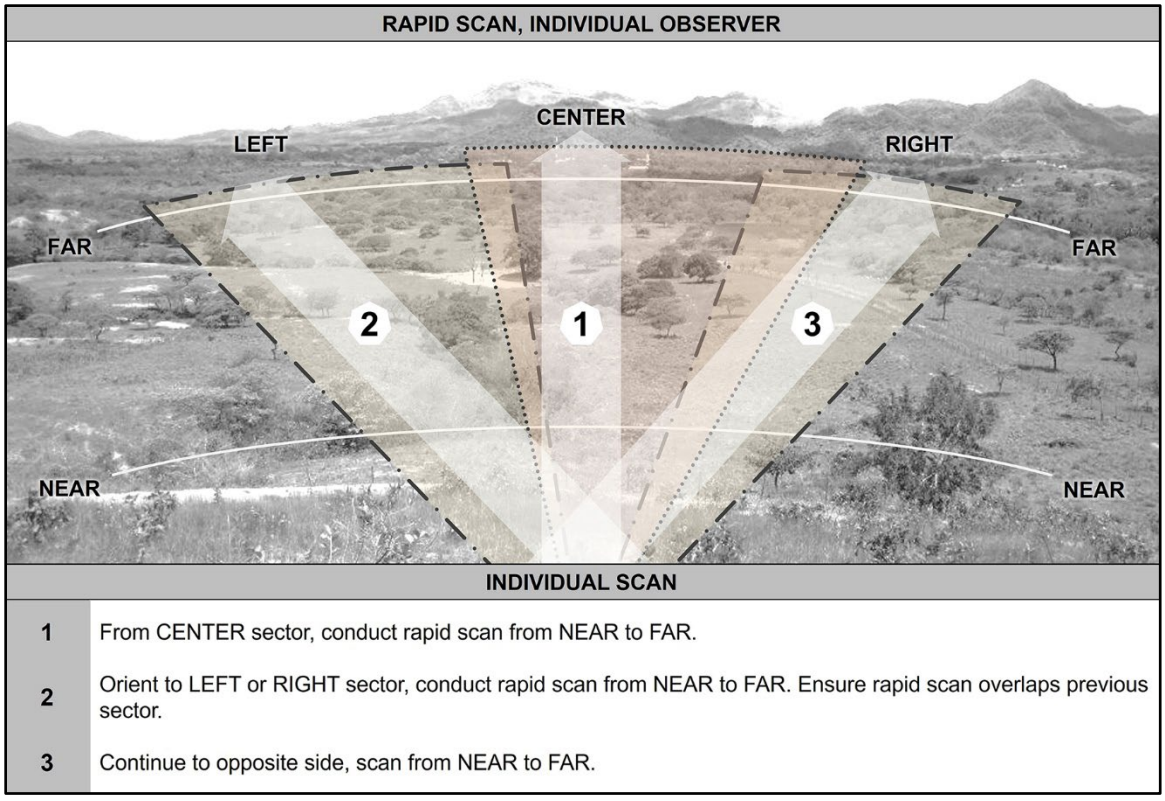


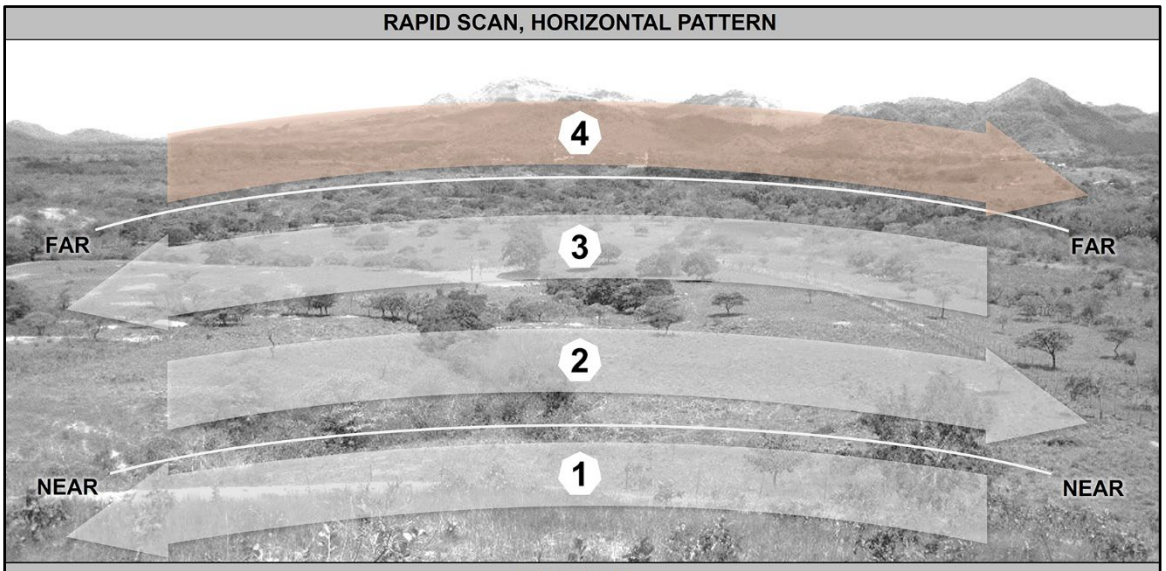
Figure 2-5. Rapid scan by an individual observer, example

Collective Observation

2-27. When members of a team, squad, or crew are collectively observing, they complete their scans as individual observers. As a group, they apply additional rules to maximize their effectiveness. For one, the firer (gunner) always scans from near to far while the other Soldiers scan from far to near. For another, the leader places the weapon system(s) on the nearest target first.

Rapid Scan Using the Horizontal Pattern

2-28. For an open environment, the horizontal pattern of the rapid scanning method is the primary pattern to recognize potential ground and aerial threats. Figure 2-6 provides a general example of a rapid scan using the horizontal pattern.



INDIVIDUAL	
1	From the NEAR, RIGHT side of sector, conduct rapid scan to the opposite side.
2	Move scan FARTHER out (range dependent on terrain). Conduct a rapid scan to the opposite side.
3	Complete the same process in Step 2. Conduct a rapid scan to the opposite side.
4	Complete another horizontal sweep to the opposite side of the sector. Once complete, conduct a search of the horizon for possible air target signatures.

Figure 2-6. Rapid scan by horizontal pattern, example

Rapid Scan Using the Vertical Pattern

2-29. For a restricted or urban environment, the vertical pattern of the rapid scanning method is the primary pattern to recognize potential ground and aerial threats. Figure 2-7 provides an example of a rapid scan using the vertical pattern.

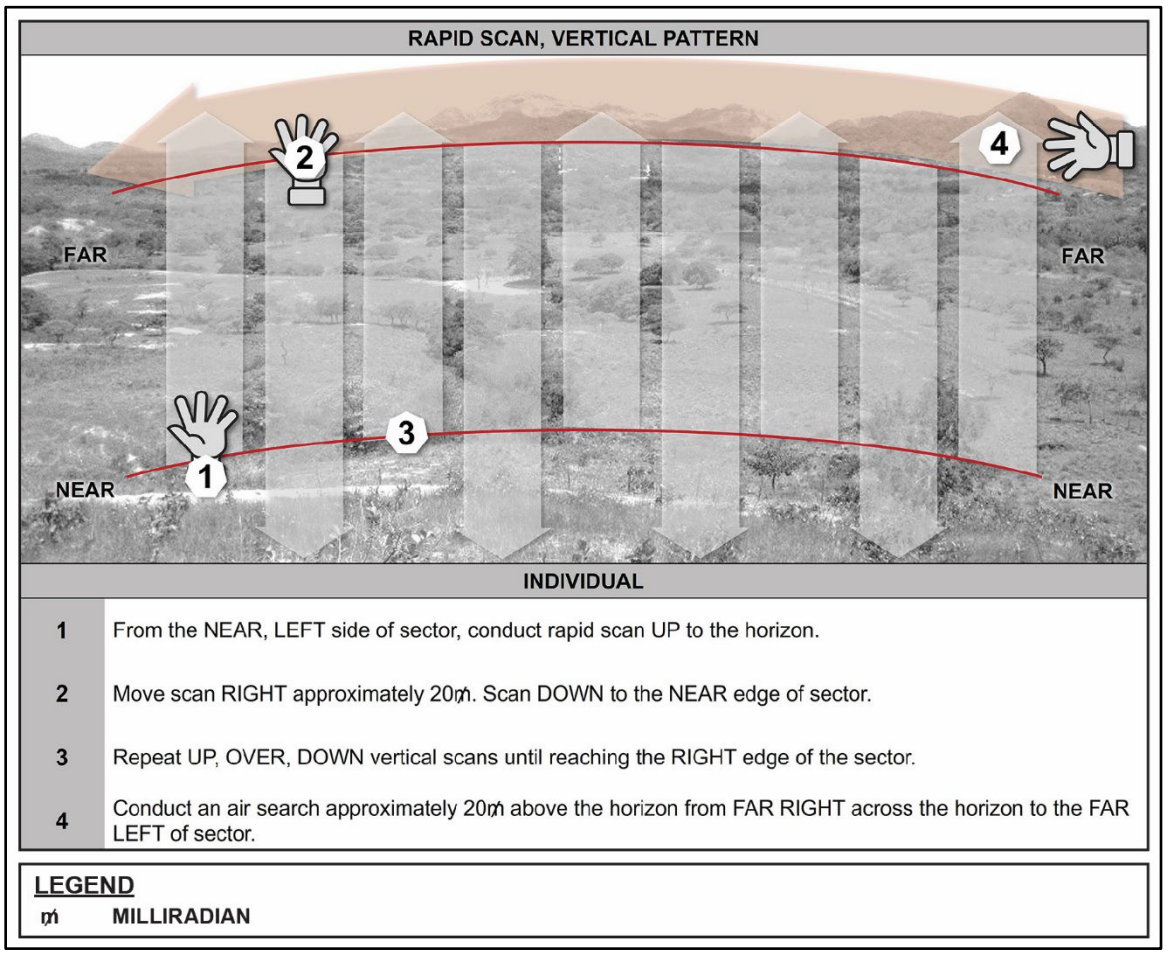


Figure 2-7. Rapid scan by vertical pattern, example

Rapid Scan Using the Depth Pattern

2-30. For an open environment, the depth pattern of the rapid scanning method is an alternate pattern (to the primary horizontal pattern) to recognize potential ground and aerial threats. Figure 2-8 provides an example of a rapid scan using the depth pattern.

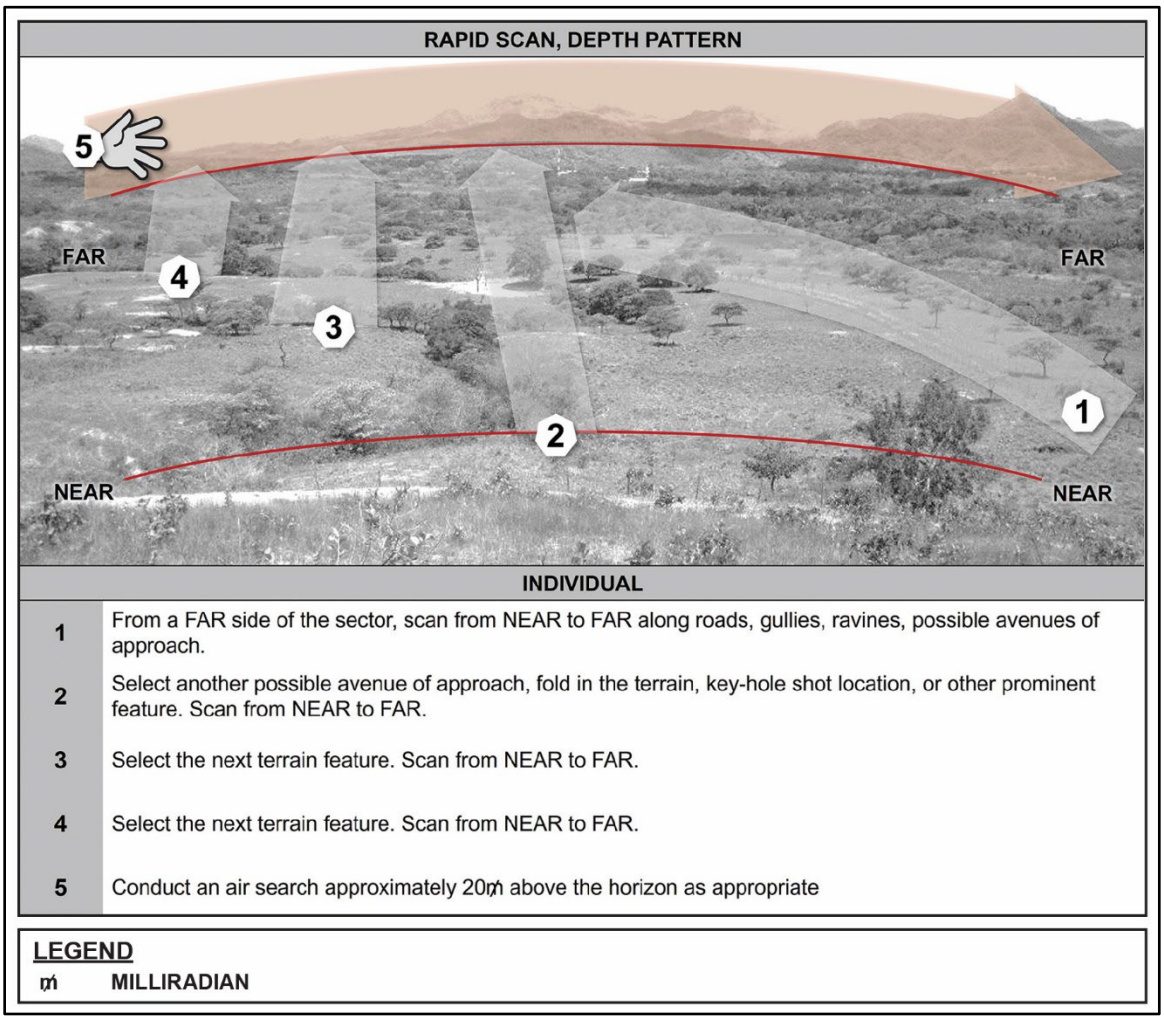


Figure 2-8. Rapid scan by depth pattern, example

SLOW SCAN

2-31. Elements conduct slow scans when no immediate recognition of potential threats or signatures occurs. A slow scan is a thorough visual sweep of the sector in a defined pattern. Elements conduct a slow scan of the terrain by using vehicle optics (day or thermal mode) or hand-held vision enhancers, varying between the WFOV and narrow field of view (NFOV) and digital zooms (see figure 2-9).

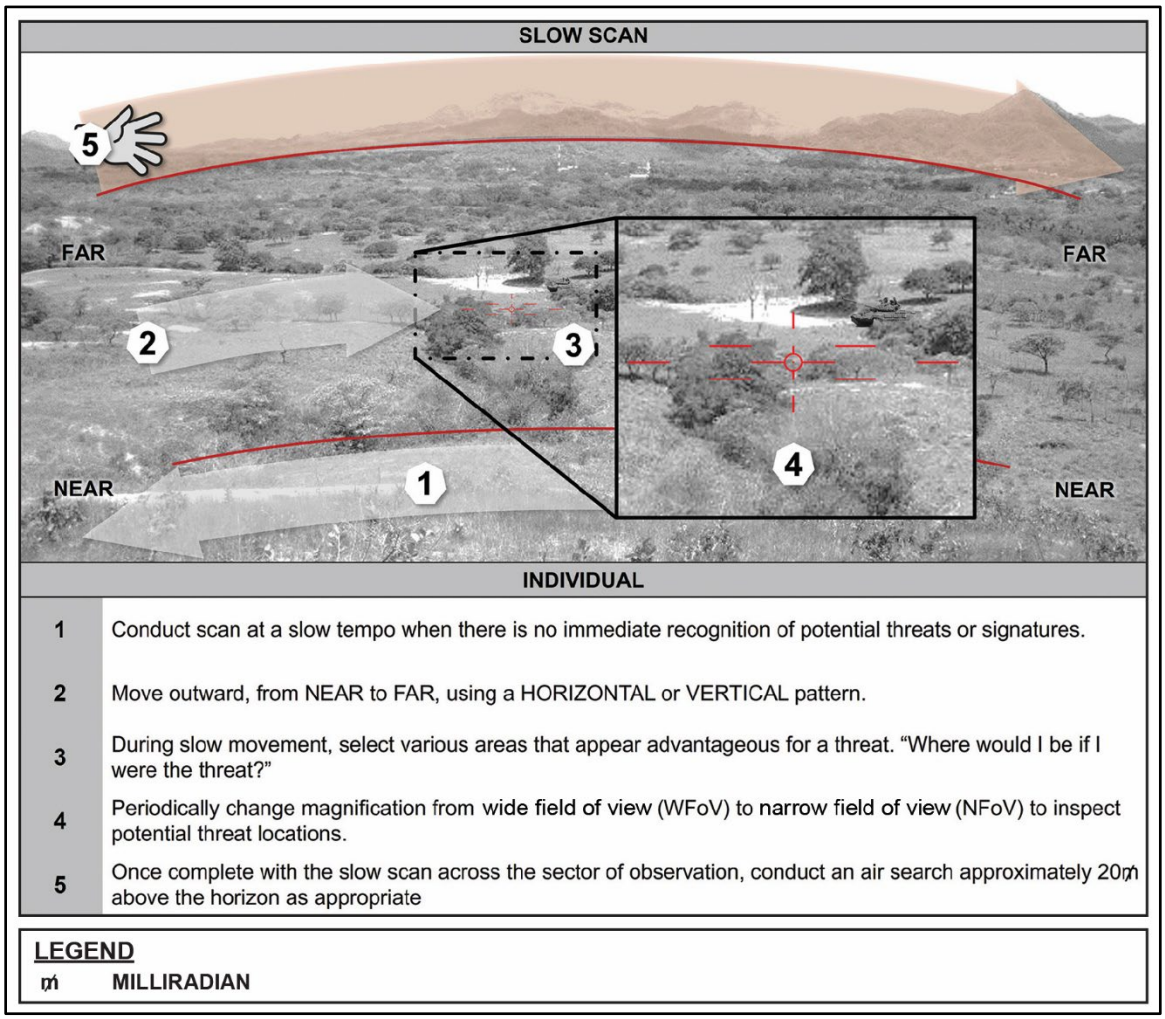


Figure 2-9. Slow scan, example

2-32. Observers periodically change polarity, magnification and zoom, and optic types while conducting a slow scan. They also vary their use of patterns (horizontal, depth, and vertical) during the scan to ensure their thorough assessment of the sector.

SEARCH

2-33. **A *search* is a deliberate and detailed investigation of the areas recognized during the scan as warranting additional scrutiny** (also known as a detailed search or deliberate search). Elements search for key threat signatures in these areas (see figure 2-10). Searches answer the question, Are there signatures in these areas?

2-34. Observers concentrate on one specific area or location and intensively study it for target signatures. The observer changes magnification, polarity, and optic and sensor types appropriately.

2-35. While focusing on the area or location of interest, the individual observer searches for threat signatures in a circular manner. When multiple observers are searching, they alternate between clockwise and counterclockwise searches.

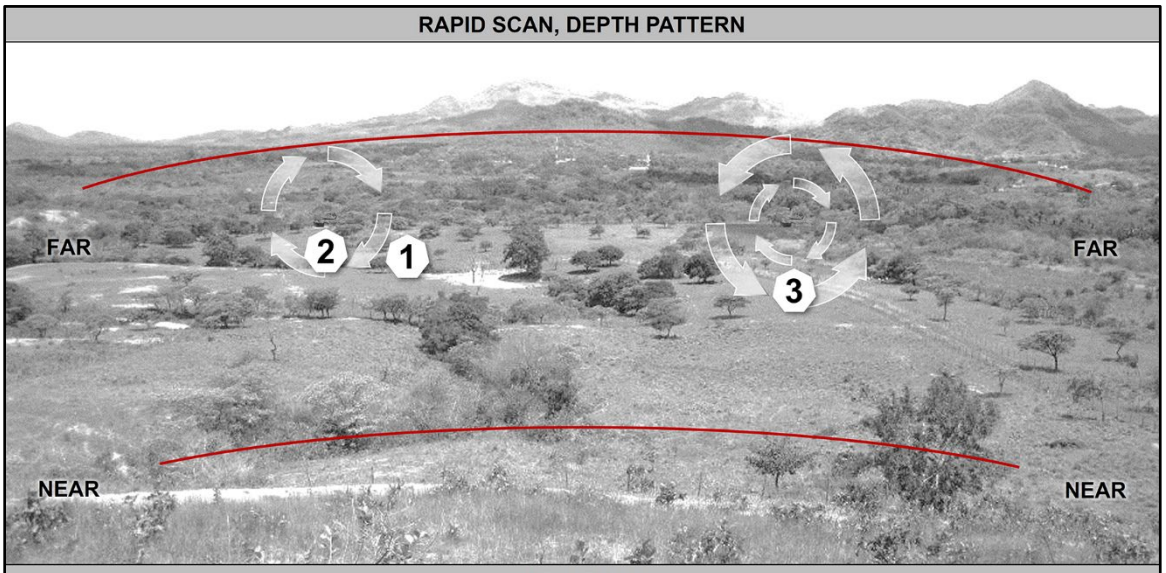


Figure 2-10. Detailed search, example

Chapter 3
Detect

Maneuver warfare, either in the offense or defense, requires Soldiers' active detection of contacts with hostile intent or capability. Soldiers maintain proficiency in the techniques and procedures of rapid detection of potential threats. They provide the information to the appropriate leader for making the appropriate engagement decision. The Soldier's ability to detect contacts rapidly directly impacts the mission, force protection, and engagement decisions against hostile targets to orchestrate the engagement process. The ability of Soldiers and leaders to process the target information accurately and quickly supports friendly force capabilities to fire faster than the threat, engage the threat at the maximum possible range, and hit the threat first.

Within the kill chain, the detect function (or link) begins when a friendly force can see a contact in the sector of observation with the naked eye, optics, or sensors. The detect function ends when the observer finds evidence of a target signature (see figure 3-1).

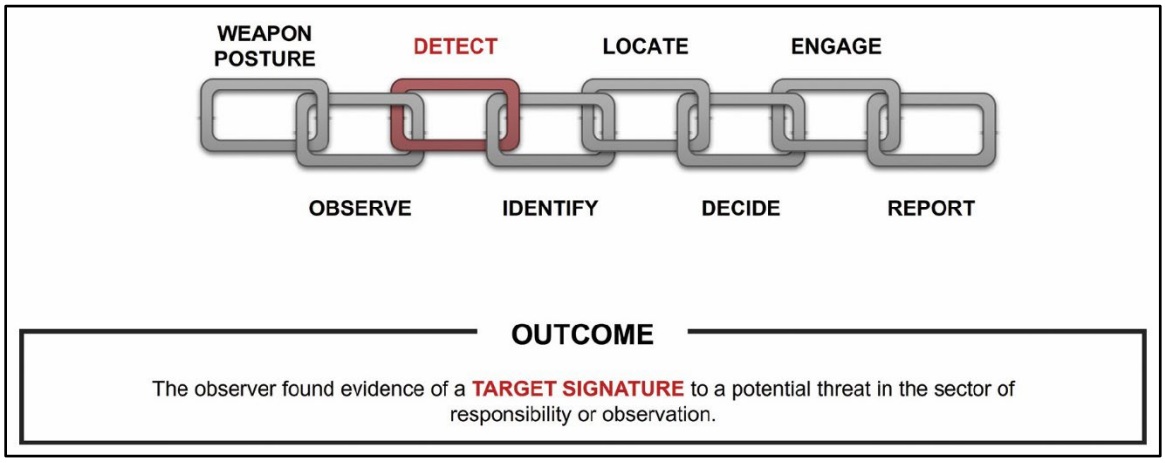


Figure 3-1. Detect function of kill chain

PROCESS

3-1. *Target acquisition* is the detection, identification, and location of a target in sufficient detail to permit the effective employment of capabilities that create the required effects (JP 3-60). It is the discovery of any contact in the operational environment such as personnel, vehicles, equipment, or objects of potential military significance. Three functions (or links) of the kill chain are specific to target acquisition (TA): detect, identify, and locate (see figure 3-2). The detection of contacts that may present threats to the friendly force initiates the TA process. This is a force protection measure, and it leads to lethal delivery of combat power. The faster a unit detects a target, the faster it can positively identify, locate, and appropriately engage the threat. During the application of the kill chain to a tactical situation, many actions (functions) overlap, occur simultaneously, complete sequentially, or integrate with other processes.

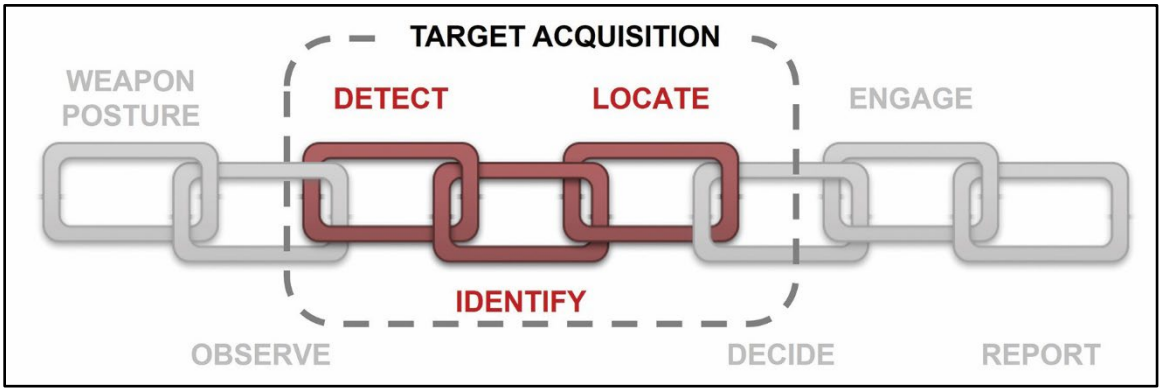


Figure 3-2. Target acquisition process within the kill chain

3-2. The TA process begins after the successful scan and search of the sector of observation, during which the observer selects an area of interest to investigate. The observer's ability to detect potential threats rapidly under any condition is critical to survivability and mission success.

> ***Note.*** Threat detection is the discovery of a target signature in the sector of observation. The significance and relevance of the signature is unknown and cues the observer to gather more information. The detect function (or link) of the kill chain is the threat detection link.

3-3. In accordance with the kill chain, once the observer selects an area of interest to scrutinize for potential threats, the observer begins to acquire targets with threat detection. Effective threat detection requires specific skills that observers master through proper, repetitive application. Threat detection is an active process within the kill chain during combat operations, regardless of whether a threat presence is clear or known. The observer's target detection skills enable all direct fire engagements.

3-4. Threat detection encompasses the observer's ability to employ various optics and sensors to discover subtle target signatures indicative of a potential threat. The observer maintains the capabilities to determine possible threat locations rapidly and to apply detection techniques effectively.

3-5. Soldiers employ all available assets and options to facilitate rapid TA. Leaders often incorporate systems such as unattended ground sensors or unmanned aircraft systems to assist in threat detection in their sectors of responsibility. Soldiers build confidence in TA by successfully recognizing various target signatures and adapting to the detection challenges of the environment, equipment, and other influential factors.

TARGET SIGNATURES

3-6. Target signatures are indicators or clues that aid observers in detecting targets. Most threats (personnel, weapons, and vehicles) have identifiable signatures, which usually result from their design or the environment in which they operate (for example, noise, smoke, dust, a blast, or a flash can all result from the firing of a vehicle's main weapon system). Vehicle movement through built-up areas produces more noise than vehicle movement in open spaces. Different types of aircraft have different signatures (for example, a hovering helicopter's signature differs from that of a fixed-wing [FW] aircraft). Other factors affecting target signatures are visibility, temperature, and weather conditions.

3-7. Observers categorize target signatures by threat type and determine their key characteristics by using their senses of sight, sound, and smell. Figure 3-3 on page 24 groups common target signatures that Soldiers identify by sense and correlates these to each threat type. When composing within the format of the POVA3 mnemonic, the target signature categories are—

- Personnel.
- Obstacles or mines.
- Vehicles.
- Antitank.
- Artillery.
- Aircraft.

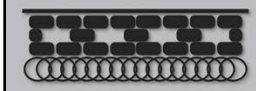
	SIGHT	SOUND	SMELL
PERSONNEL 	Hasty/deliberate fighting positions. Broken vegetation. Footprints. Trash. Spent brass. Audio or video recording equipment.	Voices. Noises associated with movement (breaking vegetation, entering water). Personal equipment. Identifiable phrases.	Fire. Cooking. Tobacco. Body odor.
OBSTACLES OR MINES 	Loose or disturbed dirt in a regular pattern. A destroyed or disabled vehicle that appears to have struck a mine. Dead animal carcasses. Piles of dirt or trash.		Previous explosive device use. Burned vehicles or rubber.
VEHICLE 	Dust signature. Smoke from engine exhaust. Tracks marks on terrain. Thermal hot spots. Maneuver damage. Flash from muzzle. Reflections off glass or glossy surfaces.	Engine noise (at close distance). Weapon discharge. Track noise.	Engine exhaust. Fuel or oil spills. Running engine (at close distance).
ANTITANK 	Fast moving hot spot with a vapor trail. Long thin wires from previously fired antitank guided missiles. Recently destroyed armored vehicles.	Sharp crack of the antitank guided missile being fired. Missile launch “swish” sound.	
ARTILLERY 	Grayish-white smoke cloud. Bright orange flash and black smoke from airbursts.	Loud, dull sound. Rushing noise several seconds before round impacts.	
AIRCRAFT 	Reflections from aircraft. Vapor trails from engine exhaust and fired missiles. Dust and movement from foliage from hovering aircraft.	Aircraft engine noise.	

Figure 3-3. Target signature categories

PERSONNEL

3-8. Areas with potential threat personnel are identifiable by several target signatures. Threat personnel may operate in groups with other soldiers or may intermingle with noncombatants. When threat personnel operate as a small unit, the resulting personnel target signatures include—

- Fighting positions with disturbed earth.
- Small arms spent brass.
- Ripped or torn clothing.
- Trash from food items.
- Footprints in soft or muddy soil.

3-9. Threat personnel who intermingle with noncombatants are often more difficult to detect. In groups of civilians, they are identifiable by the following:

- Extensive interest in friendly forces or action.
- Digital recording equipment.
- Writing or sketching during casual observation of friendly forces.
- Bulky or bulging clothing (as attempts to conceal weapons or explosives).
- Inappropriate quantity or quality of clothing items for the given environment.
- Dark-colored clothing.

OBSTACLES OR MINES

3-10. Obstacles, mines, and improvised explosive devices (IEDs) are difficult to detect by Soldiers on the move. Their target signatures include—

- Disturbed earth.
- Discolored ground in small shapes.
- Small dirt piles.
- Stacked or piled garbage.
- Carcasses of larger animals common in the region.

3-11. Detonated mines or IEDs are identifiable by single or twin large craters, craters with nearby broken track blocks or detached wheels, and craters with remaining electrical wires or explosive residue. Soldiers maintain awareness of the potential for additional mines or IEDs around apparent passageways around previously detonated munitions and craters and related passageways.

VEHICLES

3-12. Wheeled and tracked vehicles have various target signatures, which are most detectible in open areas and on rolling terrain. Their key target signatures include—

- Wheel or track imprints in soft or muddy soil or loose terrain.
- Exhaust smoke plumes.
- Diesel engine noise.
- Sharp angles in their profiles.

3-13. Thermal optics can use the heat from the wheels or tracks, engine compartment, and any vehicle occupants to define the shape and size of the vehicle for the observer.

ANTITANK

3-14. Threat antitank positions afford visual coverage of primary avenues of approach—those that tanks and personnel carriers (PCs) are most likely to use. The surrounding environment typically serves to mask or conceal the positions. During daytime operations, sunlight may reflect off the optics for the guidance systems. Soldiers maintain awareness of any thin wires with destroyed vehicles, which can indicate a wire guided system. Some target signatures of threat antitank positions are—

- Glares or reflections from optics or spotter binoculars.
- Open terrain with few trees on one side of an axis of advance.
- Higher ground with little or no foliage or trees along the route of movement.
- Keyhole positions at which vehicles remain stationary for longer than 30 seconds before continuing movement.

Note. Tying obstacles to the fronts of stationary vehicles creates narrow passages that enable long-range antitank guided missile engagements of fixed small units or vehicles.

ARTILLERY

3-15. Target signatures of threat artillery are specific to prior indirect fires in a specific area. (Self-propelled and towed artillery remain covered while moving in the vehicle group.) Recent target signatures of indirect fires include—

- Craters, especially linear-type craters.
- White lingering smoke.
- Acidic smells.
- Burning vehicles or artificial objects.
- Fragmented missile bodies or component assemblies.

AIRCRAFT

3-16. Rotary-wing (RW) (helicopter) and FW (airplane) aircraft have different target signatures and share few similarities. One way in which RW and FW aircraft match is by the signature of fired munitions. Paragraphs 3-17 through 3-19 separate target signatures of aircraft by type.

Rotary-wing

3-17. RW aircraft for the attack role most likely appear—

- On the back side of wood lines.
- Along ridgelines.
- In significant folds in the terrain.

3-18. A significant target signature of RW aircraft is rotor wash. The downward turbulence of displaced air from the rotating blades significantly moves vegetation when the aircraft is hovering, firing or preparing to fire, and delivering troops or supplies. When RW aircraft fly close to the nap-of-the-Earth or hover close to the ground, the close ground effects can produce rotor wash three times the size of the rotor diameter (see figure 3-4).

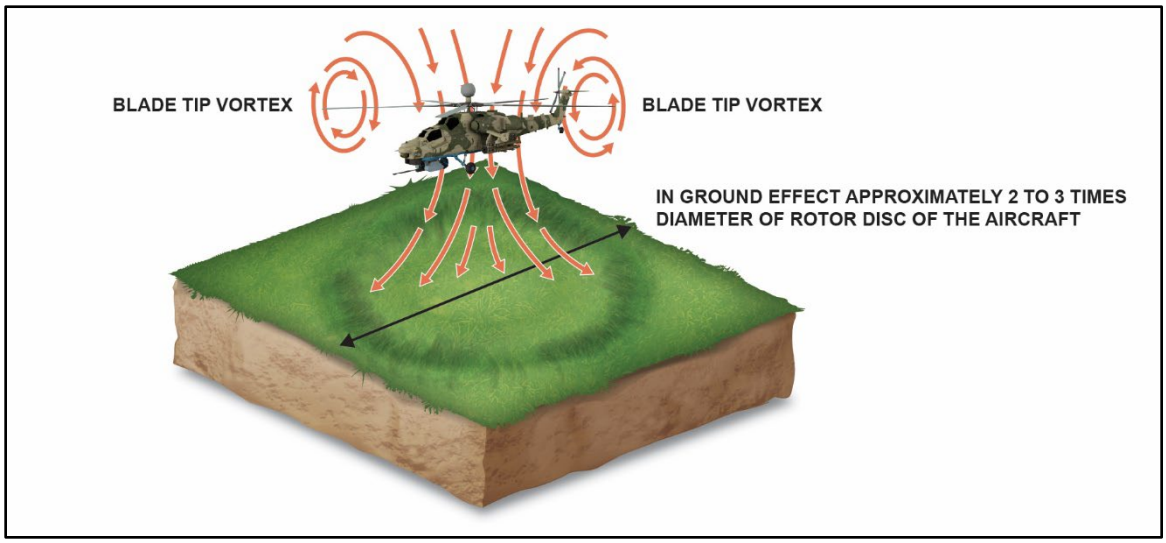


Figure 3-4. Rotor wash, example

Fixed-wing

3-19. In nap-of-the-Earth flight, FW aircraft appear rapidly, have visible exhaust trails, and may produce a sonic boom (depending on the speed). Most aircraft today rely on turbine engines, which produce a distinct, high-decibel whine at any speed. Many low-speed FW utility aircraft have multiengine turboprop designs.

DETECTION CHALLENGES

3-20. Some threats are more difficult to detect than others. Soldiers remain trained to detect and locate targets, and they maintain comprehensive understanding of the detection challenges they face and how to overcome those. Characteristics or types of more difficult targets to detect follow:

- Peripheral (on the edge of the field of view).
- Camouflaged, masked, innocuous in appearance, or blended into the surrounding environment.
- Heard but not seen.
- Small and single (for example, lone dismounted threats, antitank guided missile or rocket-propelled grenade firing positions).
- Small in complex detection environments such as urban or jungle.
- Under less-than-ideal indirect fire illumination.
- Mirage effects from high temperatures and heat waves near the ground (heat shimmers present in the line of sight).
- Natural and artificial obscurants or surroundings.
- Behavioral or physical deficiencies of the observer (for example, fatigue, eye reaction to gun flashes).

Note. As regards indirect fire illumination, when the illumination is in front of the target, the resulting shadow is darker than the target. When the illumination is behind the target (and not in a position to wash out the crew's optics), the target tends to remain distinct from the background. Soldiers keep one eye closed during their illumination searches and never look directly into illumination sources to retain their own night vision.

3-21. These threat detection challenges are surmountable, but they slow the threat detection process, regardless of the Soldier's level of training. Of equal importance to a Soldier's understanding is both why the challenges occur and how to overcome them.

LIMITED VISIBILITY

3-22. Current military-issued optics, thermals, sensors, and illuminators may compound threat detection challenges by how they function. Leaders and Soldiers prioritize developing their familiarity with assigned optics and with which stimulants they are capable of detecting. They develop the abilities to manipulate optic controls, switch between WFOV and NFOV, and transition between thermal and image-intensifying optics. Soldiers increase their proficiency in employing multiple sensors or optics to detect threats within their sectors efficiently, rapidly, and accurately.

ELECTROMAGNETIC SPECTRUM

3-23. The electromagnetic spectrum contains various frequencies and wavelengths of energy (radiation), including radio waves, microwaves, IR, visible light, ultraviolet light, x-rays, and gamma rays. To address threat detection challenges, understanding how best to employ various types of optics relies on knowledge of IR and visible light within the electromagnetic spectrum.

Note. For this section, the term optics applies to all magnifying glass lenses, thermals, illuminators, sensors, and NVDs.

3-24. Figure 3-5 depicts the regions of the electromagnetic spectrum. It emphasizes the IR and visible light wavelength ranges within the spectrum and correlates various, appropriate optics and equipment. Soldiers maintain understanding of what various optics and sensors do and do not allow them to see (that is, observe by sight). Friendly marking systems may not be visible through certain devices, optics, and sensors. This limitation complicates positive identification in all visibility conditions, particularly during day and night thermal optic usage.

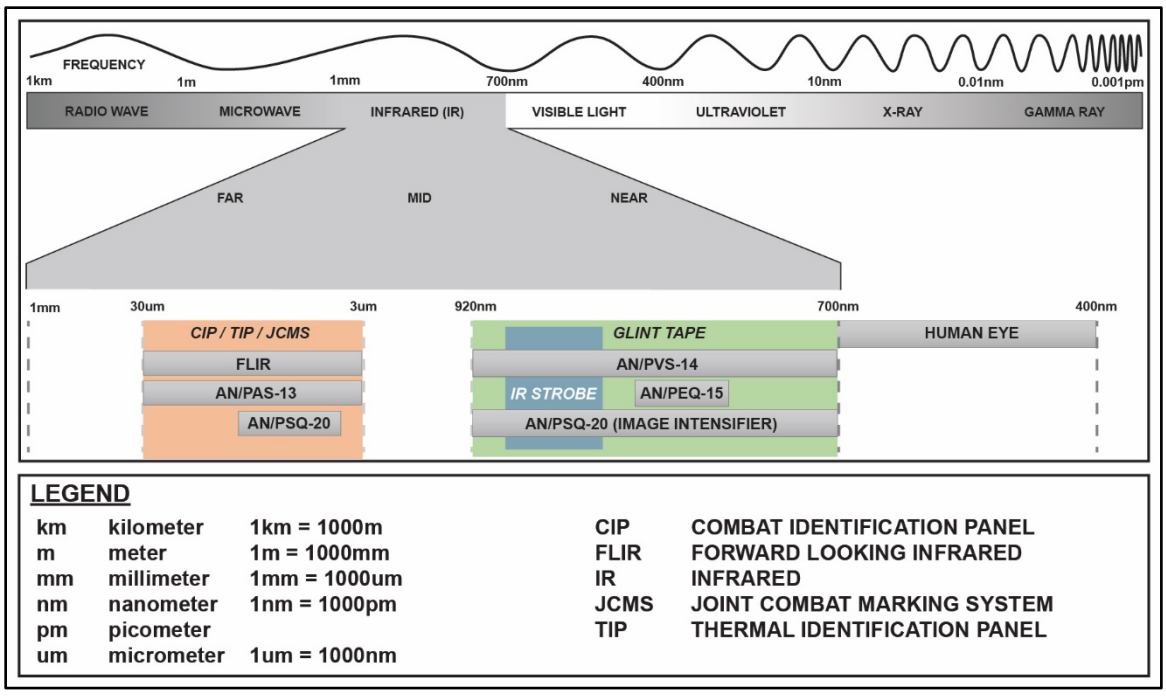


Figure 3-5. Electromagnetic spectrum

3-25. Placement of each wavelength of energy in the spectrum occurs from lowest to highest frequency. As the frequency changes, the characteristics change. The bundling of energy types into groups of frequencies, or bands, with similar characteristics best serves comprehension of those changes.

3-26. Major concerns for the planning and use of thermal and other optics to aid in threat detection lie in how they function and what they allow the user to see. Each device produces a digital representation of the scene or view in focus, which it bases on detectable wavelength frequencies from the electromagnetic spectrum.

3-27. Thermal optic equipment operates in the far to middle bands of the IR range, which is the farthest of the IR wavelength frequencies from visible light. Thermal optics cannot translate (or render viewable) visible light. They cannot allow the user to see IR equipment such as IR strobes or chemical lights, illuminators, or laser pointers. They identify emitted radiation in the form of heat energy only.

3-28. Image-intensifying optic equipment such as NVDs uses the near band of the IR range, which is closest to the visible light wavelength frequency, and visible light to create a digital picture of the view. These systems cannot detect heat or heat sources or render them viewable. For example, they cannot detect heat from fire. However, they can detect the flames (or light).

Thermal Optics

3-29. Some camouflaged targets are difficult to acquire with day optics but remain detectable with thermal optics. Thermal optics operate within the 3- to 30-micrometer frequency of the IR range. They translate emitted radiation (heat) into a digital image, thereby replicating the view with gradient colors that designate specific temperatures. Thermal optics cannot discern IR beacons, reverse polarity paper, or other equipment radiating outside a 3- to 30-micrometer frequency.

Image-intensifying Optics

3-30. Image intensifiers are common to AN/PVS-7 or AN/PVS-14 night-vision goggles (NVGs). These sensor systems operate within the 700- to 920-nanometer frequency of the IR range. Image-intensifying optics are limited to shorter ranges, require ambient light to amplify or intensify the view, and cannot discern thermal signatures.

3-31. Soldiers keep their image-intensifying optic usage to a minimum due to the negative effect on a user's night vision. Proper adjustment, brightness, and donning for the user's nondominant eye serve as guidelines for Soldier use.

Note. When equipped with thermal optics, Soldiers should use them to acquire targets during all visibility conditions. While actively detecting threats, Soldiers switch between other optics and sensors (day, thermal, and image-intensifying) to ensure they observe most of the visible light and IR ranges.

Hybrid and Enhanced Optics

3-32. These optics combine the capabilities of thermal (IR) and image-intensifying optics into a single sensor. These systems such as the AN/PSQ-20 enhanced NVG enable viewing across a wider spectrum of light. They produce a digitally enhanced replication of the view that includes thermal and intensified signatures within the 30-micrometer to 400-nanometer range.

Note. Depending on the equipment, the maximum observable distance may be significantly shorter than the maximum effective range (MER) of the employed weapon or weapon system. The appropriate use of multiple optics and sensors can manage or mitigate this capability gap between the optic and weapon systems.

DETECTION BEST PRACTICES

3-33. Whether a Soldier is dismounted or mounted, threat detection is a critical skill that requires thoughtful application of the sensors, optics, and systems at the Soldier's disposal. Finding potential threats quickly and effectively affords the maximum amount of time to friendly forces to defeat the threat. Leaders and Soldiers maintain familiarity with the following best practices to increase threat detection:

- Scan with the naked eye first and then with magnified optics.
- Practice using image-intensifying and thermal optics in tandem during limited visibility.
- Know the difference in what image-intensifying and thermal optics allow the user to see.
- Practice preference for using thermal optics for TA (detection, identification, and location) and threat engagement, day or night.
- Maintain awareness of the capabilities and limitations of the optics and sensors.
- Overlap search areas with those of other crew members or small units, but do not focus on the same sector.
- Protect and shield the eyes from the blinding effects of the sun, particularly in light-colored environments such as sandy and snowy terrain.
- Practice extreme light discipline during limited visibility.
- Think as the threat and search in the most advantageous areas from their perspective.
- Even though threat detection is much more difficult in a chemical environment, practice detection skills with chemical, biological, radiological, or nuclear (CBRN) gear and maintain awareness of the increased constraints and limitations, day and night.
- Use map reconnaissance to assist in predetermining potential threat locations.
- When conducting air searches, focus on a ground feature to regain focus periodically and to prevent blurred vision.
- Know the assigned area of operations (for example, remain capable of recognizing when a road or market that is usually crowded suddenly seems empty of that usual traffic or activity).

Note. In general, straight lines or right angles do not appear in nature, so the size and shape of a vehicle can stand out from natural surroundings. Sharp angles and distinct straight lines are indicative of an artificial object, even when camouflaged, masked, or hidden.

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Chapter 4
Identify

Identification is the process of accurately characterizing detected contacts in the operational environment to support an engagement decision. Following a particular sequence of actions for identification, observers of a detected contact recognize its target description, assess the level of threat it presents to the friendly force, identify its model or common name and its variant, and discriminate its hostile intent as friend, foe, neutral, noncombatant, and unknown. This systematic approach to achieving combat identification (CID) is a continuous routine and inherent responsibility of all Soldiers. The first letters of the names of each of the steps—recognize, assess, identify, and discriminate—form the mnemonic RAID.

Observers, firers, gunners, and leaders at all levels complete the RAID process to determine the nature and potential hostile intent of detected contacts in the battlespace for the direct support of an engagement decision. Figure 4-1 highlights the identify function of the kill chain and relates the RAID steps to the identification process.

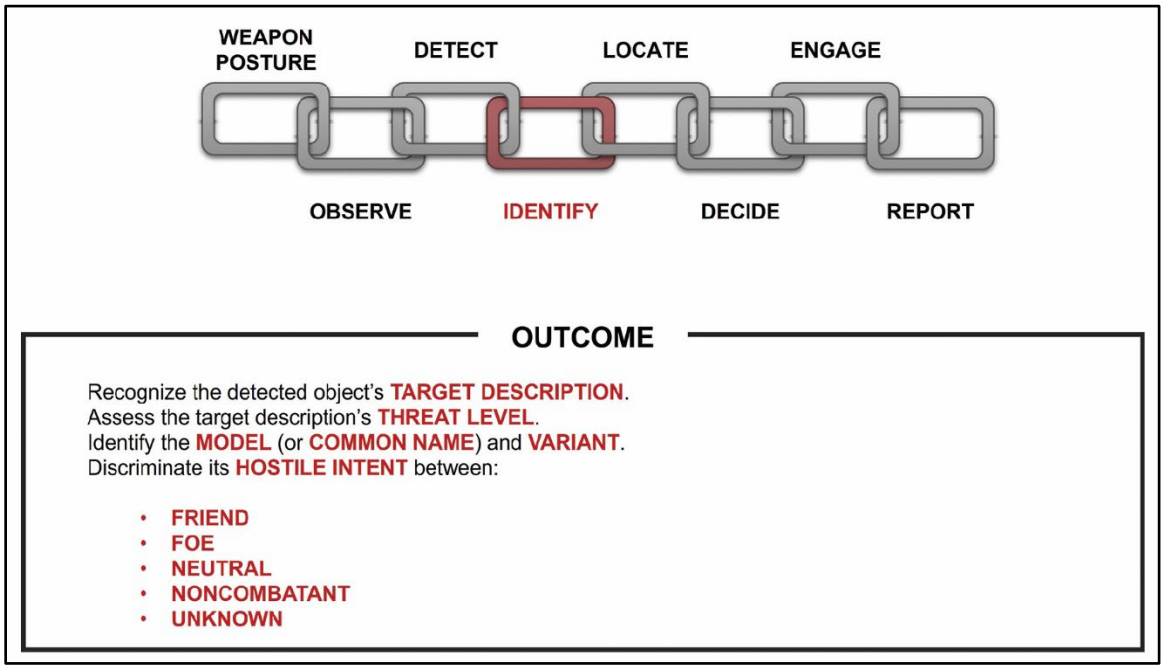


Figure 4-1. Identify function of kill chain

PROCESS

4-1. The identification process has four experience-based steps, RAID, that provide desired tactical outcomes. The outcomes are tactically significant intelligence requirements that develop the tactical situation and enable the effective use of combat power. They provide multiple checks and balances, which serve to reduce or eliminate fratricide and collateral damage during combat operations.

4-2. The outcomes directly relate to the analyzed and interrogated attributes of a detected contact. Figure 4-2 and the following outline the outcomes for each of the RAID procedural steps:

- Recognize—description: The observer reviews the characteristics of the detected contact to determine a military description.
- Assess—threat classification:
  - The observer assesses the threat or danger level the contact's military description presents to the friendly force.
  - Threat level assessments may recur multiple times during the kill chain.
  - The first time an observer assesses the threat levels of multiple detected contacts' military descriptions happens immediately after the observer recognizes them.
- Identify—model and variant:
  - The observer views or perceives the characteristics and capabilities of the components and then uses that information to define the purpose, function, system, and details of the detected contact and to determine its model.
  - Leaders scrutinize the components, characteristics, and capabilities for the specific variant of the model.
  - The model and variant inform the situation template for the commander.
- Discriminate—hostile intent:
  - The firer or leader confirms the contact's hostile intent as friend, foe, neutral, noncombatant, or unknown.
  - The successful completion of target confirmation must occur prior to threat engagement with any form of combat power.

4-3. The observer's experience and assigned position directly relate to the minimum outputs required. For example, a driver who has less experience and authority than the vehicle commander (VC) would also have less of a say in the actions taken against a perceived or confirmed threat.

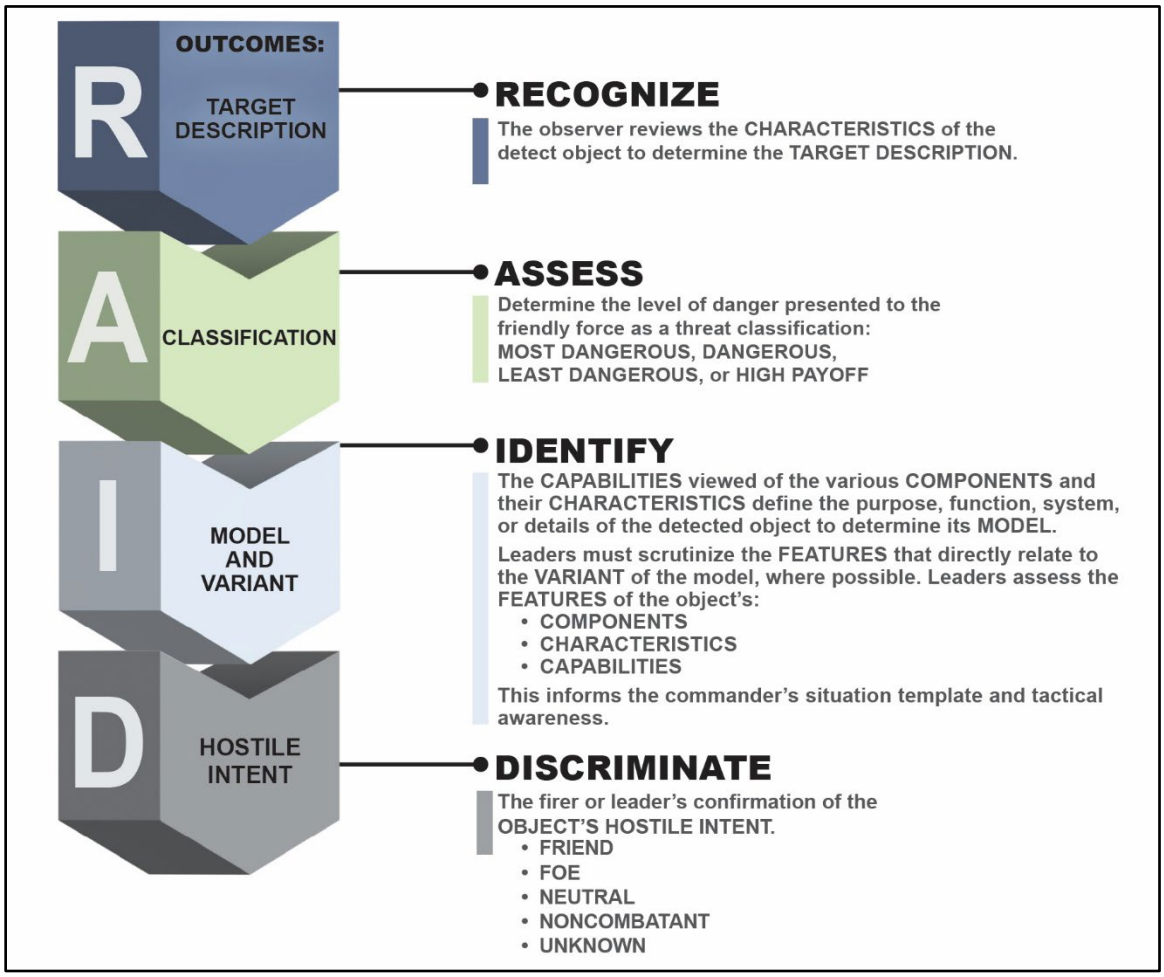


Figure 4-2. Process to recognize, assess, identify, and discriminate

4-4. Upon detection of a potential threat, an observer works to recognize the contact and provide an appropriate military description. With the recognition of multiple contacts, the observer assesses the threat level for each one. Recognition and assessment have their basis in the observer's point of view, which, in turn, depends on the observer's location, the detected contact, and the threat or danger level the contact presents.

4-5. Threat level assessment may recur multiple times during the kill chain, first occurring after the recognition of multiple contacts (which observers then use to structure the appropriate identification and discrimination ordering of those contacts). Figure 4-3 and the example address an observer's failure at both correctly assessing multiple detected contacts and, therefore, appropriately identifying and discriminating them.

Example

An observer recognizes a tank and a PC. The observer fails to assess the danger levels both vehicles' military descriptions present. This oversight error causes the observer to identify and discriminate the PC (that is, the lesser threat) first. The observer identifies the PC as a BTR-80 and discriminates the BTR-80 as a friendly vehicle from a coalition unit operating in the vicinity. The tank, presenting a most dangerous threat classification to the friendly force, has gained an advantage of time within the kill chain to deliver lethal fires on the friendly force.

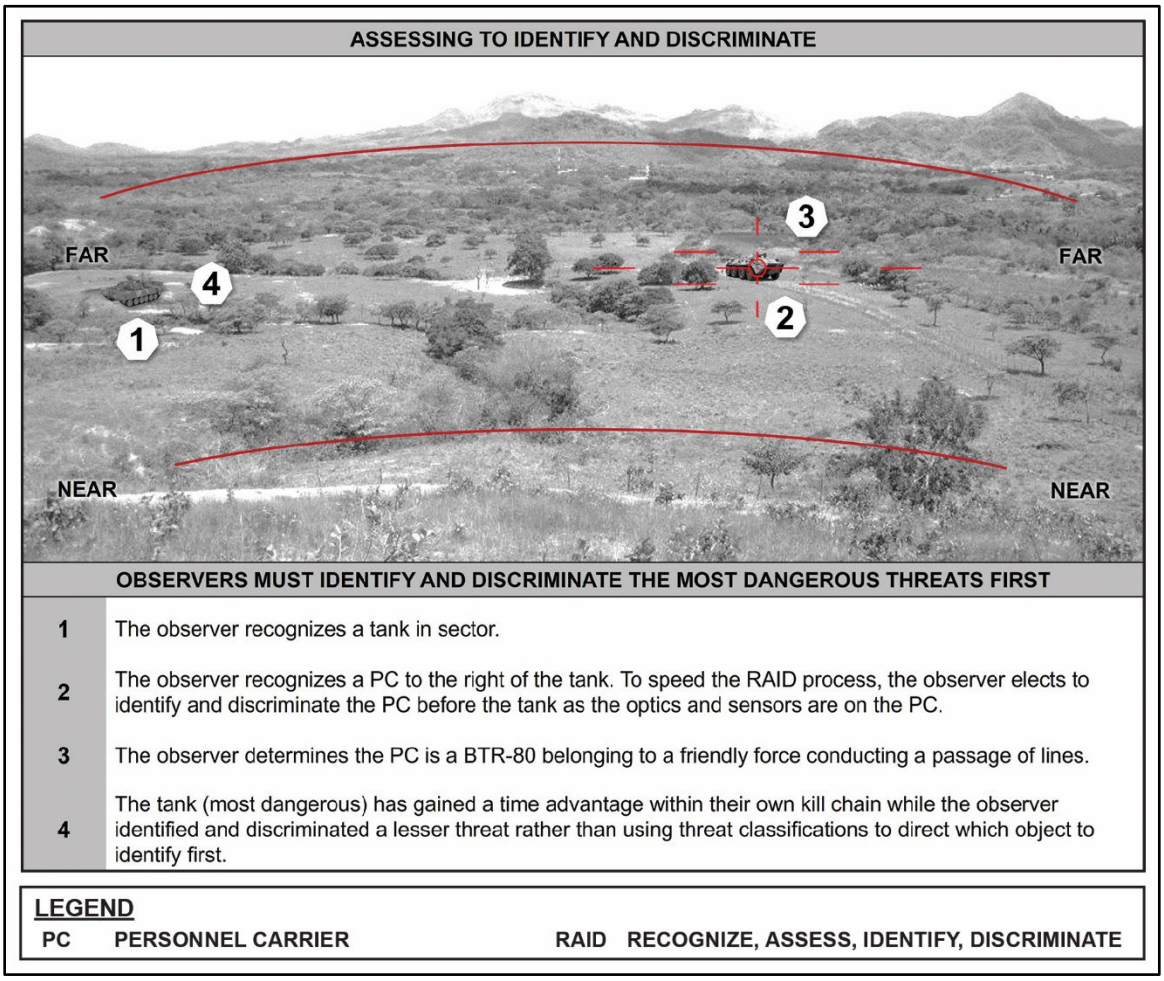


Figure 4-3. Assessment prior to identification and discrimination, example

METHOD

4-6. The RAID procedural steps have observers review components of a contact for characteristics such as shape, capabilities such as function and purpose, and other features. Such observations address the technical question, What is this contact? The observer's conclusions serve in the development of sufficient, accurate tactical knowledge and understanding of a detected contact to support engagement decisions.

4-7. The RAID procedural steps have observers interrogate air and land domain contacts for rapid determination of the requisite information to support engagement decisions. Interrogation of the frame, armament, suspension, turret, equipment, and reactive protection/rotor/wings (known by the mnemonic FASTER) components serves the identification of both air and land domain contacts (see figure 4-4). Interrogation based on FASTER components is an evolution from previous interrogations of the hull, armament, turret, and suspension (known by the mnemonic HATS) and the wings, engine, fuselage, and tail (known by the mnemonic WEFT) components. The interrogation of FASTER components integrates all equipment, vehicles, and aircraft in one process for efficiency and accuracy.

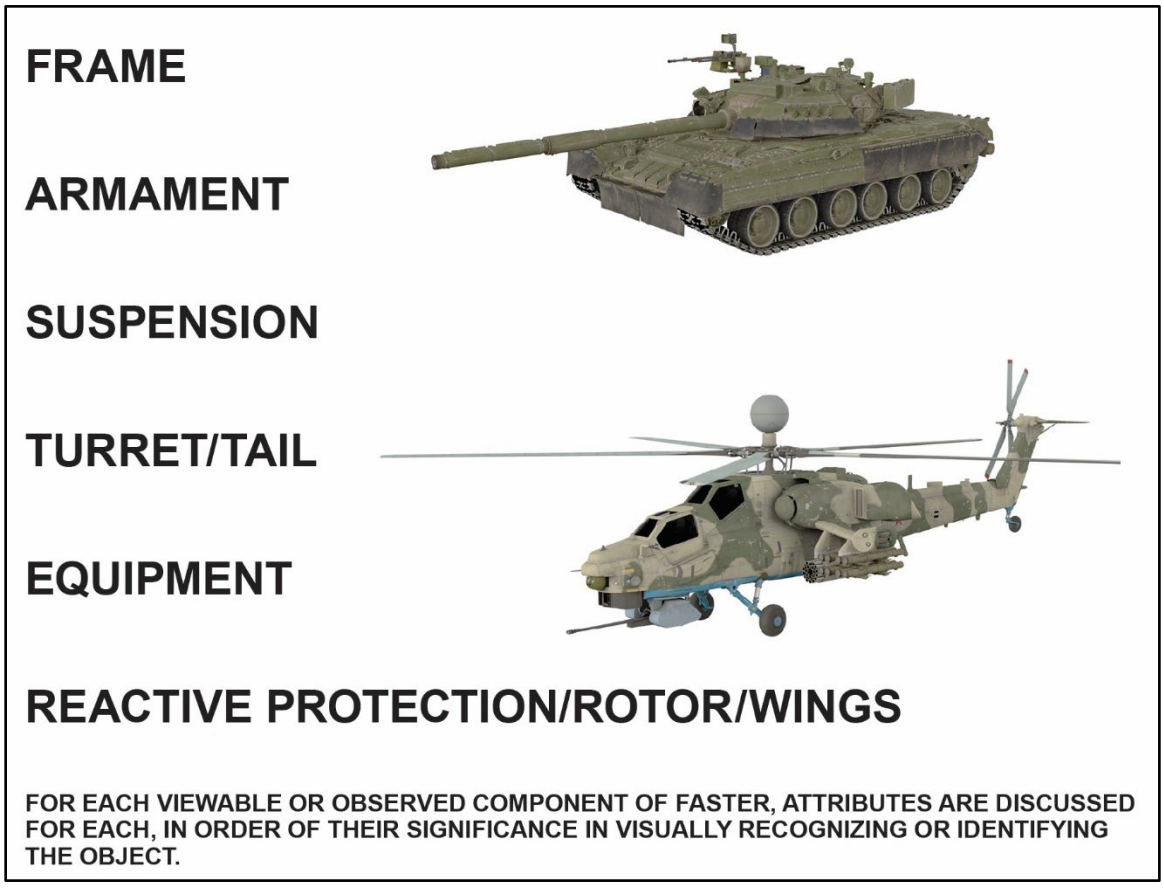


Figure 4-4. General description of interrogation of components using acronym FASTER

INTERROGATION

4-8. When observers detect target signatures while scanning their sectors of responsibility, they immediately begin the work to recognize the tactical military significance of the detected contacts. This requires their use of certain skills to develop specific understanding of the view or scene.

4-9. In accordance with the kill chain, observers analyze detected contacts for specific information to develop their understanding of what the contacts are. An observer poses a series of questions about the nature of a detected contact while engaging active and passive means of discovery and leveraging various, available optics, sensors, and digital systems.

Note. Observers commonly employ the FASTER interrogation method on a detected contact to develop and refine intelligence, to determine the contact's military description, model and variant, and hostile intent, and to yield sufficient tactical knowledge to support an engagement decision.

4-10. Observers employ the FASTER interrogation method on all equipment, vehicles, and FW, RW, and uncrewed aircraft. As part of the process, observers scrutinize the viewable or observable components of detected contacts to develop tactical understanding and acquire information. Information about each component of a detected contact serves in the development of tactical understanding, determination of military significance, purpose, and use, and discrimination of hostile intent.

Note. Components of a detected contact are common segments, workings, mechanisms, or assemblies of a detected contact that observers use to interrogate, recognize, and identify the contact accurately. They render the determination of the contact's operational domain easy.

4-11. The components an observer analyzes with the FASTER interrogation method follow:

- F—frame—The hull for land domain systems and the fuselage for aircraft.
- A—armament—Weapons for all equipment, vehicles, and aircraft.
- S—suspension—Mobility capability of land domain systems and landing gear, skids, or related assemblies for aircraft when on the ground.
- T—turret/tail—Turret for most tracked and wheeled vehicles and tail for FW and RW aircraft.
- E—equipment—Outfitting for all land and air domain systems.
- R—reactive protection/rotors/wings—Reactive protection for land domain systems (vehicles) and rotors and wings for aircraft.

4-12. Attributes are useful in developing technical understanding that incrementally refines an observer's answer to the tactical question, What is this? When analyzed, each component may include up to three distinct attributes:

- Characteristics—The shape, size, number, spacing, or basic configuration of a component, the analysis of which informs the determination of the contact's military description.
- Capabilities—The purpose, function, system, or details of the visible characteristics, the interpretation of which informs the identification of the object's model.
- Features—Specific physical elements seemingly related to the tactical, engagement, protection, maneuver, or communication capability of a component, the changes, additions, alterations, or modifications of which increase the component's capabilities and inform the identification of the object's variant.

4-13. Figure 4-5 demonstrates how the FASTER components apply to the RAID procedural steps in general terms. This publication uses these terms for rapid depiction of the various components, characteristics, capabilities, and features of military equipment.

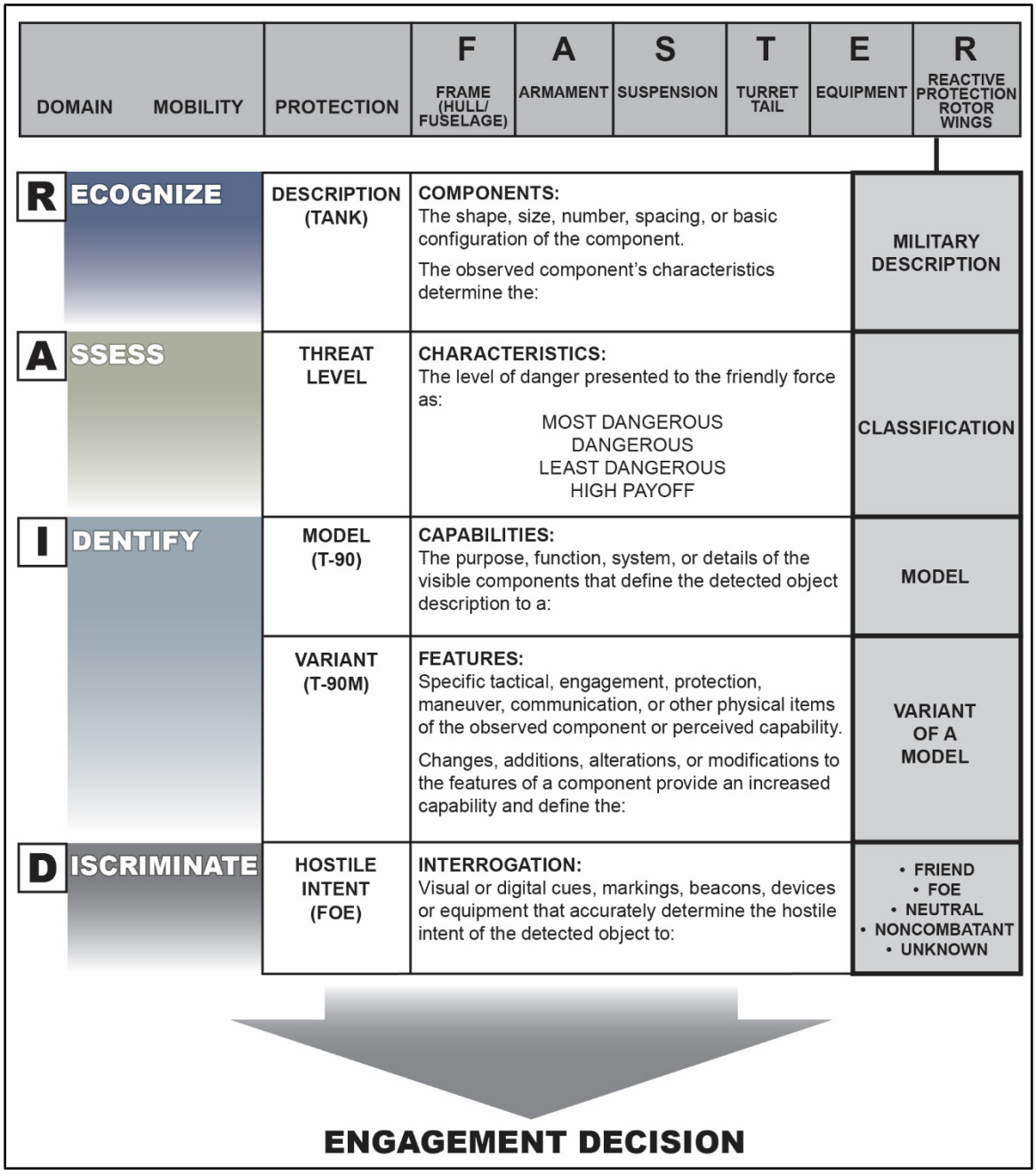


Figure 4-5. Interrogation to recognition and identification crosswalk

4-14. The RAID process leverages the FASTER interrogation method to acquire desired tactical and technical information in a timely manner. This chapter integrates this method to discuss its use in and impact on the engagement decision.

VISUAL RECOGNITION DISTANCES

4-15. To what extent an observer can effectively determine the outcomes of each RAID procedural step depends on several factors. These include the observer's experience, the type of employed optics or sensors, and the quality level of that technology. Figure 4-6 depicts various distances for each step of the recognition phase of RAID: domain, mobility, protection, and military description. This chapter will further introduce each of these concepts and how they serve the observer in the process of recognition.

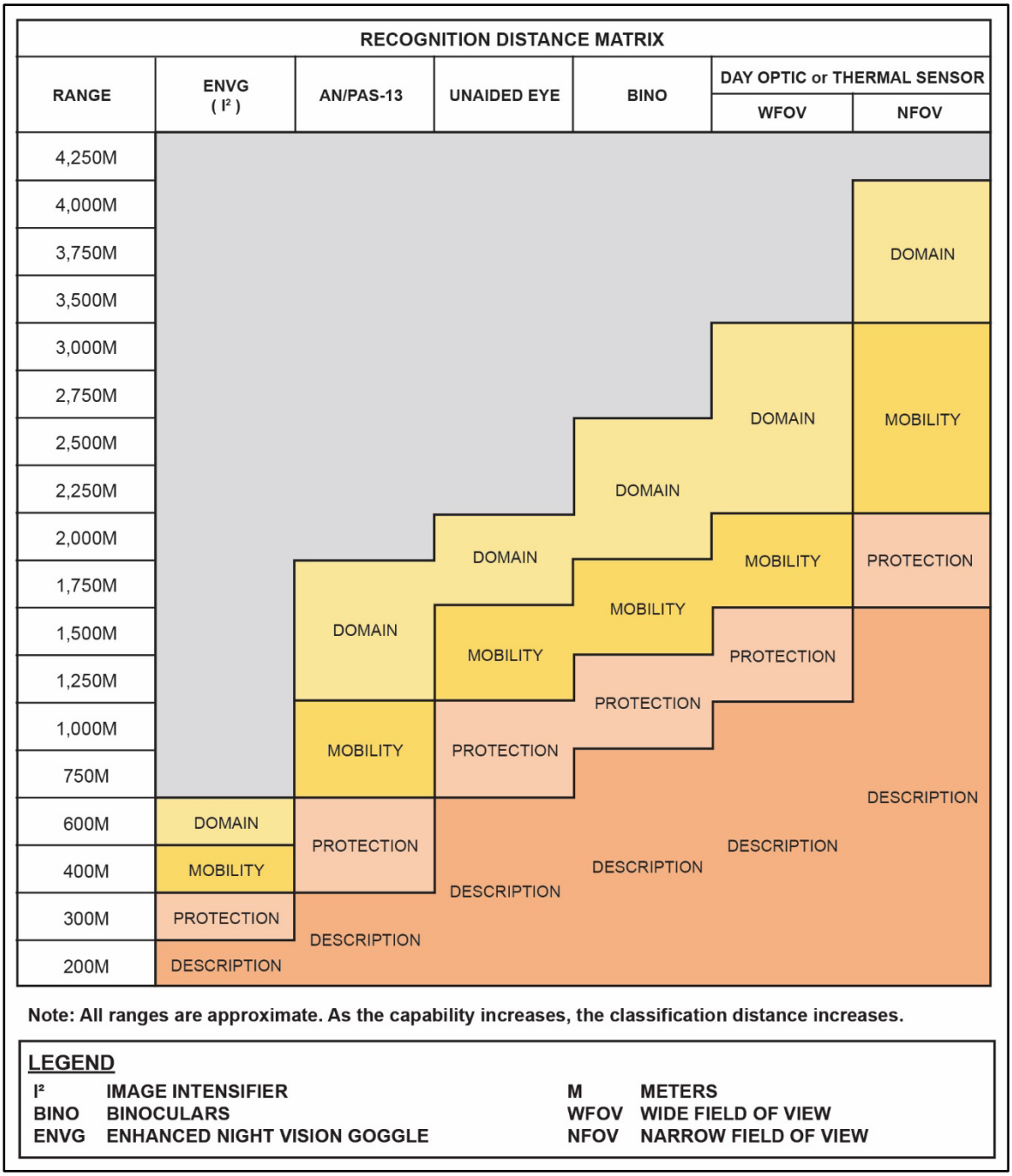


Figure 4-6. Recognition distance matrix

RECOGNIZE THE DETECTED CONTACT

4-16. The first of the RAID procedural steps is to recognize. Observers maintain the capability of recognizing the detected contact accurately and providing a military description. This capacity translates to overmatching a potential threat since it affords the maximum amount of time for making an engagement decision with the appropriate type of combat power. Ultimately, this skill enables the capacity to fire first.

4-17. Observers analyze the components of the detected contact rapidly to determine the most appropriate military description. Typically, they need only view one or two components to describe the contact correctly in military terms. Observers may have visibility of only some of the components from their positions. For the recognition phase of RAID, observers analyze the components and determine the—

- Domain in which the contact is designed or assigned to operate.
- Method of mobility in the domain.
- Level of protection with which the contact is equipped against direct or indirect fire.

4-18. Figure 4-7 provides an example of an observer determining a detected contact is a land domain system (that is, it operates on the ground). Furthermore, observers determine the detected contact is a tracked vehicle (mobility) and is armored (protection). From those three characteristics, the observer recognizes the detected contact and provides the military description tank.

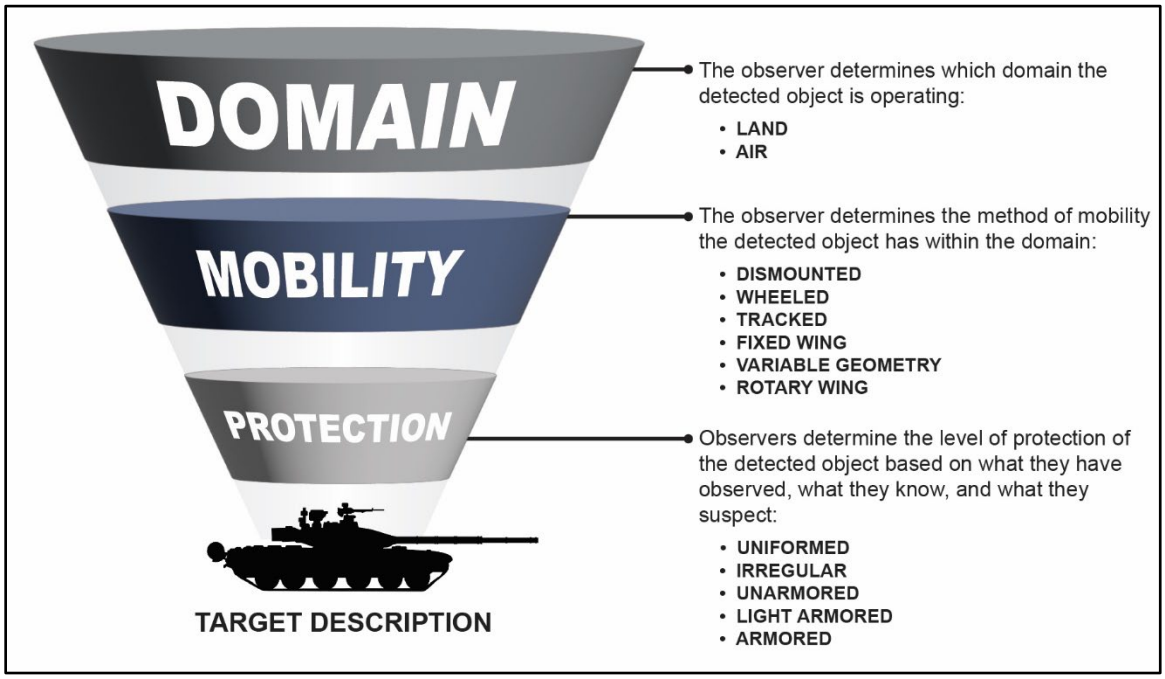


Figure 4-7. Recognition flow chart, example

MILITARY DESCRIPTION

4-19. Observers deliver one of the following reports to inform the unit and leaders of the visual contact:

- Size, activity, location, unit, time, and equipment (SALUTE).
- Size, activity, location, time (SALT).
- Contact.

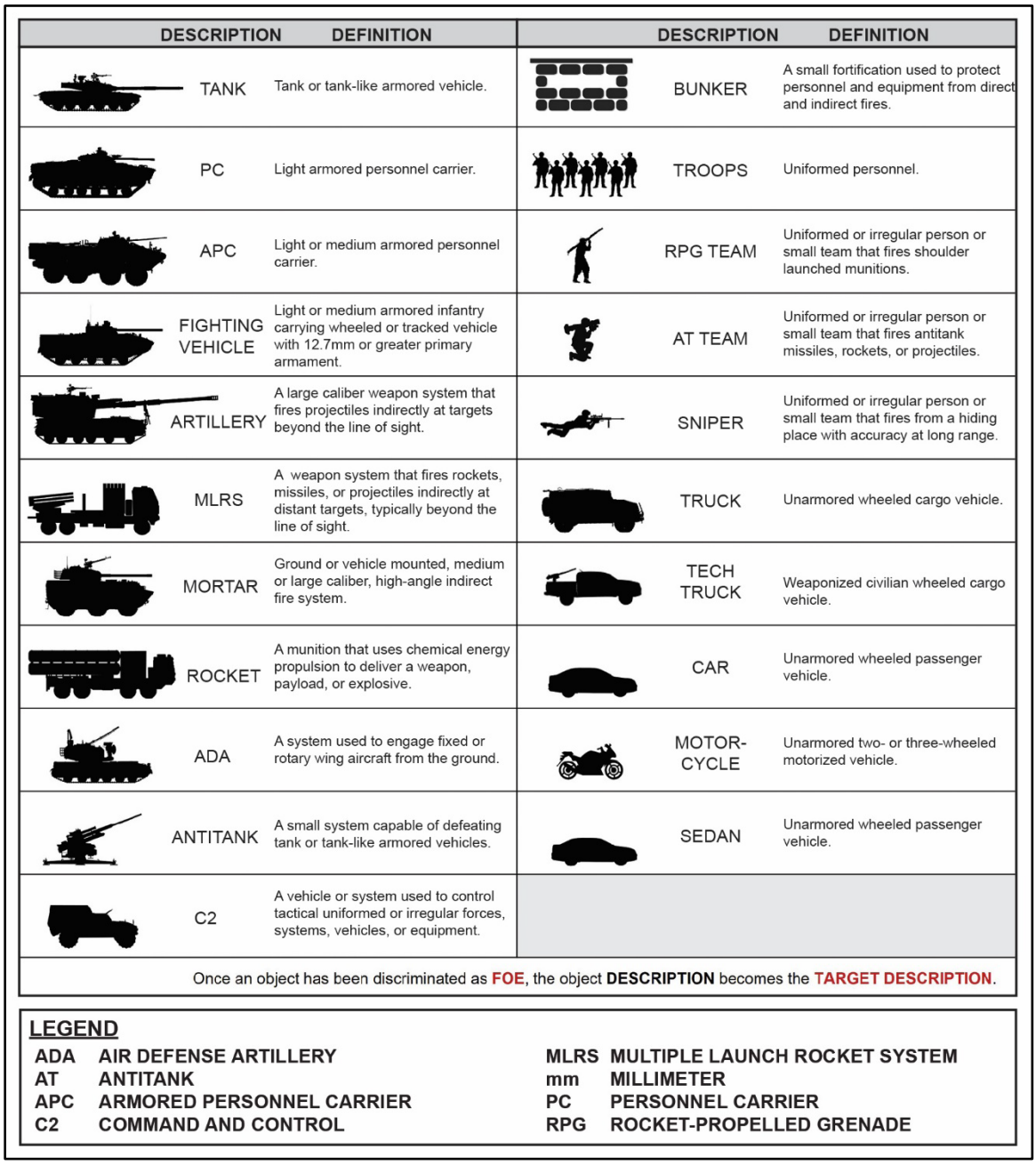
4-20. By means of an example, an observer provides an alert to the unit followed by the military description of the detected contact. This observer might announce CONTACT—PC to inform the unit of visual contact with a PC for instance. The observer might also provide directional information to the contact in relation to the element's primary direction, a cardinal direction, or a target reference point (TRP).

Note. The military description is a common, brief word or phrase (brevity code) that depicts the military capability, function, or purpose of a recognized contact. If the outcome of the discrimination phase of RAID is to discriminate the contact's hostile intent as foe, the military description becomes a target description.

4-21. Figures 4-8 and 4-9 provide the most common military descriptions for air and land domain systems, respectively. This list is not exhaustive. Units may define their own target descriptions within their SOPs or tactical SOPs.

DESCRIPTION	DEFINITION	DESCRIPTION	DEFINITION
 ATTACK CHOPPER	Rotary wing attack helicopter with antitank capability.	 JET	Fixed wing jet aircraft.
 BANDIT	Known foe aircraft, either fixed or rotary wing.	 PLANE	Fixed wing aircraft.
 FAST ATTACK	Fixed wing jet aircraft with antitank capability.	 CARGO CHOPPER	Rotary wing cargo helicopter.
 CHOPPER	Rotary wing helicopter.	 CARGO PLANE	Fixed wing cargo aircraft.
 HELICOPTER	Rotary wing helicopter.		
Once an object has been discriminated as FOE, the object **DESCRIPTION** becomes the TARGET DESCRIPTION.			

Figure 4-8. Military descriptions related to air domain, example



DESCRIPTION	DEFINITION
TANK	Tank or tank-like armored vehicle.
PC	Light armored personnel carrier.
APC	Light or medium armored personnel carrier.
FIGHTING VEHICLE	Light or medium armored infantry carrying wheeled or tracked vehicle with 12.7mm or greater primary armament.
ARTILLERY	A large caliber weapon system that fires projectiles indirectly at targets beyond the line of sight.
MLRS	A weapon system that fires rockets, missiles, or projectiles indirectly at distant targets, typically beyond the line of sight.
MORTAR	Ground or vehicle mounted, medium or large caliber, high-angle indirect fire system.
ROCKET	A munition that uses chemical energy propulsion to deliver a weapon, payload, or explosive.
ADA	A system used to engage fixed or rotary wing aircraft from the ground.
ANTITANK	A small system capable of defeating tank or tank-like armored vehicles.
C2	A vehicle or system used to control tactical uniformed or irregular forces, systems, vehicles, or equipment.

DESCRIPTION	DEFINITION
BUNKER	A small fortification used to protect personnel and equipment from direct and indirect fires.
TROOPS	Uniformed personnel.
RPG TEAM	Uniformed or irregular person or small team that fires shoulder launched munitions.
AT TEAM	Uniformed or irregular person or small team that fires antitank missiles, rockets, or projectiles.
SNIPER	Uniformed or irregular person or small team that fires from a hiding place with accuracy at long range.
TRUCK	Unarmored wheeled cargo vehicle.
TECH TRUCK	Weaponized civilian wheeled cargo vehicle.
CAR	Unarmored wheeled passenger vehicle.
MOTOR-CYCLE	Unarmored two- or three-wheeled motorized vehicle.
SEDAN	Unarmored wheeled passenger vehicle.

Once an object has been discriminated as **FOE**, the object **DESCRIPTION** becomes the **TARGET DESCRIPTION**.

LEGEND

ADA	AIR DEFENSE ARTILLERY	MLRS	MULTIPLE LAUNCH ROCKET SYSTEM
AT	ANTITANK	mm	MILLIMETER
APC	ARMORED PERSONNEL CARRIER	PC	PERSONNEL CARRIER
C2	COMMAND AND CONTROL	RPG	ROCKET-PROPELLED GRENADE

Figure 4-9. Military descriptions related to land domain, example

DOMAIN

4-22. The first step in the recognition phase of RAID has the observer determine the operational domain of the detected contact. This publication covers both land and air domain systems as follows:

- Land—Vehicles, personnel, and equipment intended for operation on the ground, including uncrewed vehicles, robotic vehicles, emerging ground-based technologies, and uncrewed systems operating from a fixed position.
- Air—RW, FW, and variable geometry aircraft intended for operate in the air, including unmanned aerial vehicles of all sizes.

4-23. The determination of whether a detected contact is designed for ground or air operation often occurs with the use of optics or sensors. Figure 4-10 shows maximum recognition distances for determining the operational domain of a detected contact. It provides the ranges for commonly employed optics.

MAXIMUM DISTANCE TO RECOGNIZE DOMAIN						
OPTIC or SENSOR	ENVG (I^2)	HWTS (THERMAL)	UNAIDED EYE (DAY)	BINOCULAR	FLIR WFOV	FLIR NFOV
MAXIMUM RANGE	600m	1,750m	2,000m	2,500m	3,000m	4,000m

LEGEND

ENVG	ENHANCED NIGHT VISION GOGGLE (IMAGE INTENSIFIER, NIGHT USE ONLY)
FLIR	FORWARD LOOKING INFRARED (THERMAL OPTIC, PLATFORM FIRE CONTROL SYSTEM, DAY OR NIGHT USE)
HWTS	HEAVY WEAPONS THERMAL SIGHT (THERMAL OPTIC, SMALL ARMS, DAY OR NIGHT USE)
I^2	IMAGE INTENSIFIER (NIGHT USE ONLY)
m	METER
NFOV	NARROW FIELD OF VIEW
WFOV	WIDE FIELD OF VIEW

Figure 4-10. Determination of a contact's operational domain

4-24. Observers analyze the FASTER components to determine the appropriate domain for operation. The significant components that clearly indicate each domain follow:

- Air domain components:
  - Frame (fuselage).
  - Tail.
  - Rotor or wings.
- Land domain components:
  - Frame (hull).
  - Suspension.
  - Turret.

4-25. The FASTER interrogation method is extremely rudimentary, and observers nearly instantly know a contact's intended domain. However, observers may have some difficulty at extended range or when aircraft are stationary on the ground. They may also need to apply additional scrutiny in the face of insufficient evidence or in the case of a component proving indiscernible from its background or surrounding environment.

MOBILITY

4-26. The second step in the recognition phase of RAID has the observer determine the method of mobility for the detected contact. Each domain has three distinct methods of mobility as follows:

- Land mobility:
  - Dismounted—Soldiers, personnel, civilians, and noncombatants.
  - Wheeled—Trucks, cars, PCs, or other vehicles using two or more wheels and no obvious tracks nor other means of movement.
  - Tracked—Vehicles whose primary propulsion comes from steel, composite, or rubber tracks.
- Air mobility:
  - FW—Aircraft whose stationary wings provide lift.
  - Variable geometry—Aircraft whose wings move in different configurations depending on speed or function.
  - RW—Aircraft whose rotating blades provide lift and movement.

4-27. Observers review each component that clearly articulates a contact's method of mobility. The greater the distance to the contact, the more difficult the observer's task is. For this reason, the determination of a contact's method of mobility often occurs with the use of optics or sensors. Figure 4-11 shows maximum recognition distances for determining the detected contact's method of mobility. It provides the ranges for commonly employed optics.

MAXIMUM DISTANCE TO RECOGNIZE MOBILITY						
OPTIC or SENSOR	ENVG (I^2)	HWTS (THERMAL)	UNAIDED EYE (DAY)	BINOCULAR	FLIR WFOV	FLIR NFOV
MAXIMUM RANGE	400m	1,000m	1,500m	1,750m	2,000m	3,000m

LEGEND

ENVG	ENHANCED NIGHT VISION GOGGLE (IMAGE INTENSIFIER, NIGHT USE ONLY)
FLIR	FORWARD LOOKING INFRARED (THERMAL OPTIC, PLATFORM FIRE CONTROL SYSTEM, DAY OR NIGHT USE)
HWTS	HEAVY WEAPONS THERMAL SIGHT (THERMAL OPTIC, SMALL ARMS, DAY OR NIGHT USE)
I^2	IMAGE INTENSIFIER (NIGHT USE ONLY)
m	METER
NFOV	NARROW FIELD OF VIEW
WFOV	WIDE FIELD OF VIEW

Figure 4-11. Determination of a contact's method of mobility

PROTECTION

4-28. Once observers determine the operational domain and method of mobility of a detected contact, they then look for characteristics and attributes that indicate the level of protection the contact possesses against direct fire. The contact's level of protection limits the possibilities of what system it could be. Figure 4-12 shows maximum recognition distances for determining the level of protection of a detected contact. It provides the ranges for commonly employed optics.

MAXIMUM DISTANCE TO RECOGNIZE PROTECTION						
OPTIC or SENSOR	ENVG (I^2)	HWTS (THERMAL)	UNAIDED EYE (DAY)	BINOCULAR	FLIR WFOV	FLIR NFOV
MAXIMUM RANGE	300m	600m	1,000m	1,250m	1,500m	2,000m

LEGEND

ENVG	ENHANCED NIGHT VISION GOGGLE (IMAGE INTENSIFIER, NIGHT USE ONLY)
FLIR	FORWARD LOOKING INFRARED (THERMAL OPTIC, PLATFORM FIRE CONTROL SYSTEM, DAY OR NIGHT USE)
HWTS	HEAVY WEAPONS THERMAL SIGHT (THERMAL OPTIC, SMALL ARMS, DAY OR NIGHT USE)
I^2	IMAGE INTENSIFIER (NIGHT USE ONLY)
m	METER
NFOV	NARROW FIELD OF VIEW
WFOV	WIDE FIELD OF VIEW

Figure 4-12. Determination of a contact's level of protection

Land

4-29. The following lists the possible levels of protection afforded to land domain systems in relation to their methods of mobility and include general descriptions:

- Dismounted:
  - Uniformed—The detected contact appears as a member of a government's military assigned to dismounted operations.
  - Irregular—The detected contact possesses some level of weaponry but presents no indication of being a member of a government's military.
- Wheeled:
  - Unarmored—The vehicles do not appear to have any form of kinetic or chemical energy weapon protection (for example, civilian, commercial off-the-shelf vehicles), although most military cargo and sustainment vehicles are unarmored (for example, cargo, fuel, flatbed, and troop transport trucks).
  - Light armored—These are typically military vehicles with limited protection against small arms fire, such as those with a minimum level of protection for armored personnel carriers (APCs) and infantry fighting vehicles (IFVs).
  - Armored—A few wheeled vehicles have armored protection (for example, antitank or assault gun systems).
- Tracked:
  - Unarmored—Few unarmored tracked vehicles exist in the modern battlespace, but the type and quantity increase as technology increases.
  - Light armored—Most tracked vehicles are lightly armored, and of these, most are not light, medium, or heavy tanks (main battle tanks).
  - Armored—These vehicles are specific to tank and tank-like systems.

Air

4-30. The following lists the possible levels of protection afforded to air domain systems in relation to their methods of mobility and includes general descriptions:

- RW:
  - Attack—These aircraft are gunships or attack helicopters.
  - Utility—These aircraft are predominantly troop or equipment transport helicopters.

Note. Some RW aircraft serve a dual purpose. The Mi-24 Hind series of helicopters provides both attack and troop transport capabilities. When dual capabilities exist, the most dangerous capability provides the best information for determining the target description, model, and target confirmation.

- FW:
  - Attack—Typically, these are fast-moving FW aircraft with a primary role of air-to-ground attack with small arms, bombs, rockets, or missiles as on-board munitions or armament.
  - Utility—These FW aircraft provide equipment or troop transport capability.
  - Bomber—These are FW aircraft with a primary role of delivering explosive ordnance or munitions on a point or area target.
- Variable geometry:
  - Attack—Typically, these are fast-moving aircraft with a primary role of air-to-ground attack with small arms, bombs, rockets, or missiles as on-board munitions or armament.
  - Utility—These aircraft provide equipment or troop transport capability.

Note. The U.S. Military's Osprey is a variable geometry utility aircraft, though its maneuverability comes from variable geometry wings altering the angle of attack for its large propellers (RW).

  - Bomber—These are aircraft with a primary role of delivering explosive ordnance or munitions on a point or area target.

Note. For the purposes of this publication, bomber descriptions do not go into detail. These aircraft typically operate higher than 20,000 feet above ground level and are not engaged with direct fire.

TARGET DESCRIPTION

4-31. Once observers determine the level of protection, they use all available information to determine the military description of the detected contact. The process itself—all the steps to the recognition phase of RAID—reduces overall the number of possible descriptions. As observers complete each step, the acquired information focuses them on progressively fewer possible descriptions.

4-32. Figure 4-13 provides the maximum range-to-target distances for commonly employed optics by which most observers can still determine the target description. This applies to most targets in the battlespace for kill chain engagements.

MAXIMUM DISTANCE TO RECOGNIZE DESCRIPTION BY OPTIC/SENSOR						
OPTIC or SENSOR	ENVG (I^2)	HWTS (THERMAL)	UNAIDED EYE (DAY)	BINOCULAR	FLIR WFOV	FLIR NFOV
MAXIMUM RANGE	200m	300m	600m	1,250m	750m	1,500m

LEGEND

ENVG	ENHANCED NIGHT VISION GOGGLE (IMAGE INTENSIFIER, NIGHT USE ONLY)
FLIR	FORWARD LOOKING INFRARED (THERMAL OPTIC, PLATFORM FIRE CONTROL SYSTEM, DAY OR NIGHT USE)
HWTS	HEAVY WEAPONS THERMAL SIGHT (THERMAL OPTIC, SMALL ARMS, DAY OR NIGHT USE)
I^2	IMAGE INTENSIFIER (NIGHT USE ONLY)
m	METER
NFOV	NARROW FIELD OF VIEW
WFOV	WIDE FIELD OF VIEW

Figure 4-13. Determination of the contact's target description

ASSESS THE THREAT LEVEL

4-33. The assess phase of RAID occurs when multiple contacts are detected and recognized. Once observers recognize the detected contacts' military descriptions, they assess the threat or danger levels those present. Observers use available information to classify the threat according to the threat or danger level the contacts' military descriptions present from the perspective of the friendly force.

Note. Threat classification is an observer's determination of the threat or danger level a detected contact's military description presents to the observer's element. Observers initially consider each contact hostile until they discriminate otherwise. They use threat classifications when multiple potential threats are present to determine which require immediate attention.

4-34. Assessing the threat or danger level of the detected contact's military description yields one of four distinct threat classifications. Initially, observers consider contacts hostile (that is, a potential threat) until they discriminate otherwise. The four threat classifications follow:

- Most dangerous:
  - A threat capable of defeating the friendly force and preparing to do so.
  - Units immediately defeat these targets.
- Dangerous:
  - A threat capable of defeating the friendly force but not preparing to do so.
  - Units defeat these targets after they have eliminated all the most dangerous targets.
- Least dangerous:
  - A threat currently incapable of defeating the friendly force but coordinating with other threats of a higher classification.
  - Units defeat these targets after they have defeated all the targets with a higher threat classification.
- High-payoff:
  - A threat of tactical importance to the successful completion of the mission, whose destruction would significantly contribute to the success of the friendly course of action and which commanders typically provide in OPORDs or FRAGORDs as part of the commander's intent or concept of operations.
  - Units defeat these targets of opportunity after they have eliminated all the most dangerous and dangerous targets.

4-35. Observes make threat classifications from their perspective and that of their team, crew, squad, or element. Not all threats present the same threat or danger level to all friendly force elements.

Note. For example, the crew of a friendly mine-resistant, ambush-protected vehicle might perceive as most dangerous a rocket-propelled grenade team with shoulder-launched munitions oriented at them, whereas an Abrams tank commander might classify the same threat as dangerous only.

4-36. Assessments may recur multiple times during the kill chain. The first assessment occurs upon the recognition of multiple contacts. Ultimately, recognition provides a clear structure for the appropriate ordering of the identification and discrimination of those contacts.

4-37. Observers may assess the threat classifications of a series of threats out of the sequence RAID indicates. The depiction of assessment within RAID lies at the earliest point at which observers have acquired sufficient technical and tactical information of the detected contacts to make accurate determinations. Leaders use threat classification again later in the kill chain, typically during the decide function. Threat classifications indicate to the leader the most appropriate combat power, method of engagement, and fire pattern.

4-38. Dealing with multiple contacts in a sector with the same threat level may call for adjustments to the assessment's classifications depending on a contact's posture, position, or main armament orientation. Figure 4-14 on page 50 provides an example of the assessment of the threat classifications for multiple targets.

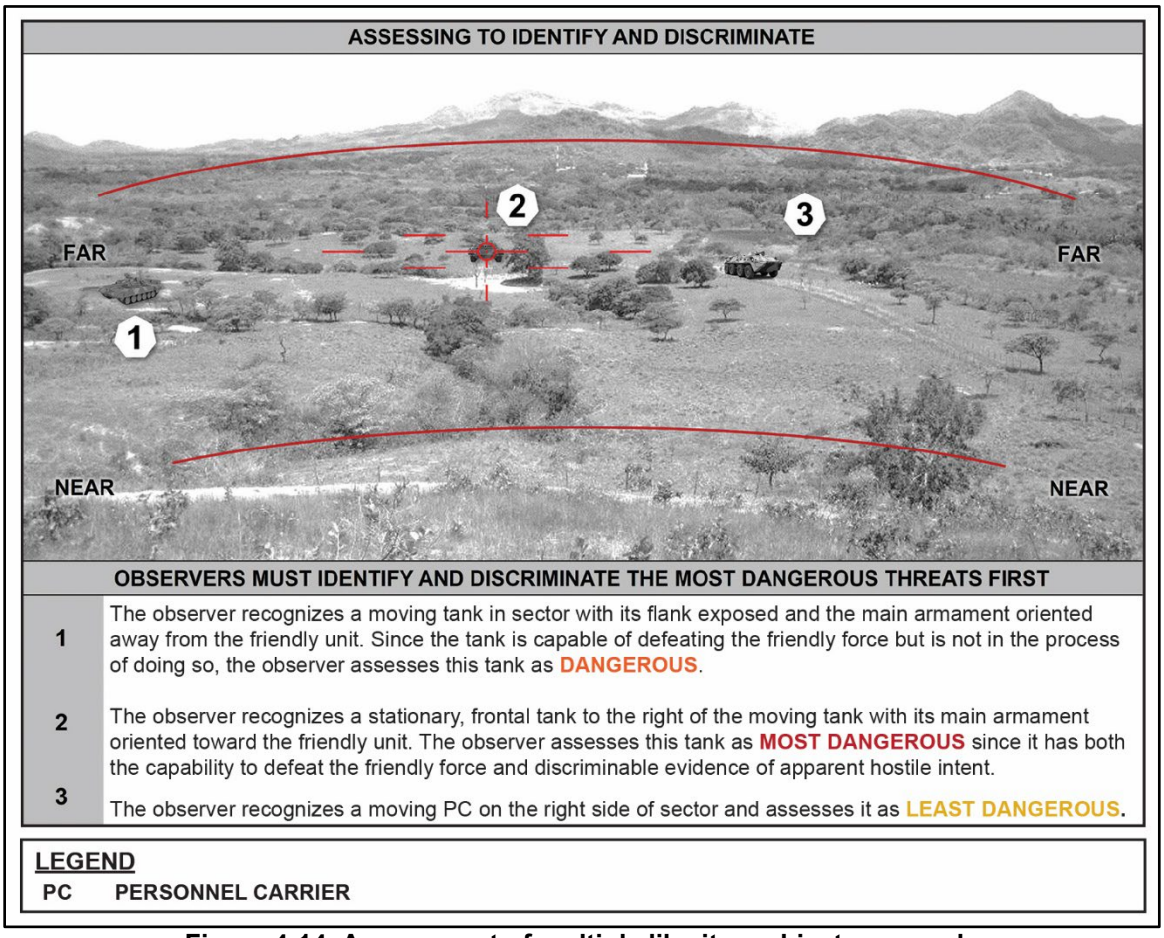


Figure 4-14. Assessment of multiple like-item objects, example

IDENTIFY THE MODEL AND VARIANT

4-39. The identification phase of RAID has observers analyze the characteristics, capabilities, and features of a recognized object's components to determine the object's model or common name and, when possible, variant. For example, all aircraft share several identifying features. These features enable observers to recognize and accurately identify the aircraft. This section reviews the key elements of a detected contact an observer visually interrogates to determine the object's type, model, and variant.

4-40. By isolating the components of a detected contact and their characteristics, capabilities, and features, the observer accurately and rapidly identifies it, which is critical to the unit's success in the battlespace. This identifying information enables the leader or firer to achieve rounds on the target first, the unit to overmatch the threat, and the unit to defeat threats before they deliver combat power against the friendly force.

4-41. Due to the complexity and usefulness of identifying a model to its specific variant, the identification requirement from model to variant is based on the observer's assigned position within the organization, which ties directly to the position's inherent experience demands. The identification of the model is the first experience-based outcome for the identification phase of RAID and the minimum tactical information requirement for a Soldier, observer, firer, gunner, or team leader. The difference between the model and variant follows:

- Model—The designator given by the manufacturer or the country of origin (COO) to a system, vehicle, aircraft, or piece of military equipment.
- Variant—The designator supplemental to the base model that further indicates the possible modifications in technology, combat power, active or passive defense mechanisms, capabilities, and features without instigating a new base model.

4-42. Most military equipment, regardless of the COO, receives a model designator once it enters service. Changes to a model occasion a variant suffix. In the event of a dramatic change, the manufacturer or COO may create a new model.

4-43. In some instances, variants undergo modifications with minor changes that cause them to receive an additional suffix. When that occurs, a version identifier may be assigned. Typically, observers cannot discern changes from version to version for the base model and variant.

Note. For example, few visual cues categorically differentiate an M1A2 SEPv2 Abrams main battle tank from an M1A2 SEPv3. Although the changes between the versions are significant, at a distance, day and night, little visual evidence exists to allow for distinguishing one version from the other.

MODELS AND VARIANTS

4-44. Each COO has varying rules and guidelines for their military naming conventions, including the model and variant designators. Figures 4-15 and 4-16 provide specifics for the U.S. Military's naming conventions for land and air domain systems. They offer general guidance and not definitive standards. They follow basic naming and numbering conventions, but anomalies or alterations do occur.

4-45. Figure 4-15 applies military naming conventions for U.S. RW aircraft to one variant of an AH-64. This is a very common model designator serving as a brief practical example.

AIR DOMAIN

US



TYPE / MANUFACTURER		MODEL NUMBER	VARIANT
A H		6 4	F
PREFIX / NAME		*MODEL NUMBER*	*VARIANT / VERSION IDENTIFIER*
AH	Attack Helicopter	Variant number	**A** Variant designation
CH	Cargo Helicopter	1	**B** 2d Variant
UH	Utility Helicopter	6 4	**C** 3d Variant
OH	Observation Helicopter	4 7	**D** 4th Variant
ACH	Armored Cargo Helicopter	5 8	**E** 5th Variant
MH	Modified Helicopter		**F** 6th Variant
HH	Heavy Lift Helicopter		**+** Improved, Partial Block modification
			Block Upgrade to existing variant.

SUFFIX RULES:
Variant lettering A through Z in alphabetical order until exhausted.

Figure 4-15. U.S. Military model and variant designators in air domain, example

4-46. Figure 4-16 applies military naming conventions for U.S. vehicles to the M1A2 main battle tank. This is a very common model designator serving as a brief practical example.

LAND DOMAIN

US



MODEL		VARIANT		VERSION	
M	**1**	**A**	**2**	**v**	**2**
PREFIX/NAME	*PRIMARY NONSIGNIFICANT NUMBER*	*VARIANT SUFFIX LETTER*	*VARIANT SUFFIX NUMBER*	*VERSION IDENTIFIER*	*VERSION NUMBER*
XM–Experimental	1, 2, 3… 9999 Typically does not exceed 9999.	**A**–Approved or Standard Modification **(SUFFIX-A)**	Sequential number in order of development or production	**V**–Version applied typically an engineering change proposal (ECP) **(LOWERCASE-v)**	Sequential number in order of development or production
M–Type Classified		**E**–Experimental Modification **(SUFFIX-E)**		**E**–Experimental Modification **(SUFFIX-E)**	

SUFFIX RULES:
M1A2 – The M is used when the equipment is TYPE-CLASSIFIED STANDARD.
XM1A3 – XM PREFIX is used for an EXPERIMENTAL MODEL that has not been selected, type-classified, or safety released.
M1**A2** – A SUFFIX LETTER must be used in conjunction with a SUFFIX NUMBER.
M1A2-**3** – A SUFFIX NUMBER may not be used without a SUFFIX LETTER.
M1-**A2** – SPACES and HYPHENS (–) may not be used. When multiple suffixes are used, the SUFFIX-A and NUMBER come ***before*** the SUFFIX-E and NUMBER.
M1**A2E3** – becomes **M1A3** when the experimental model is type-classified. Once SUFFIX-E has been ***TYPE-CLASSIFIED STANDARD***, the SUFFIX-A and NUMBER are used, increasing by 1. The SUFFIX-E and NUMBER are then dropped.

Figure 4-16. U.S. Military model and variant designators in land domain, example

PROCESS

4-47. Once observers recognize the military description, they interrogate the detected contact's components and their characteristics, capabilities, and features to determine the object's model and, when possible, its variant. Observers consider the object's operational domain, method of mobility, and level of protection that the military description provides during their further analysis to acquire additional information.

4-48. Figure 4-17 provides an easily recognized object by its operational domain, method of mobility, and level of protection. Following the FASTER interrogation method upon this detected contact, an observer would then be ready to identify its model and variant, which the figure provides.

LAND DOMAIN

RU



VEHICLE TYPE / MANUFACTURER		MODEL NUMBER	VARIANT	
T		9 0	S	
PREFIX / NAME		*MODEL NUMBER*	*VARIANT / VERSION IDENTIFIER*	
T	Tank	Year approved for final production	A	Variant designation
BTR	Amphibious Armored Transport	Decade or year of production.	S	Designed for EXPORT
BMP	Infantry Combat Vehicle	Variant number	B	2d Variant
BMD	Infantry Combat Vehicle, Airborne		B3	2d Variant, 3rd Upgrade
2A	Towed Artillery System		BM	2d Variant, Modified
2B	Mortar System		K	Command Varian
2K	Air Defense System		M	Modified (Russian "Y")
2S	Self-Propelled Artillery		U	Upgraded
2U	Training System		V	Armor or Armored

Figure 4-17. Identification of model and variant designators using an interrogation method

LAND

4-49. This section focuses the FASTER interrogation method on wheeled and tracked vehicles. It does not account for all possible characteristics, capabilities, and features of these vehicles. Rather, it covers the most common items observers analyze during the identification phase of RAID. Thus, it provides general information for the accurate identification of the models or common names and variants of land domain vehicles and equipment.

4-50. This section describes wheeled and tracked vehicles and equipment (see figure 4-18). It provides an overview of the application of the FASTER interrogation method to both wheeled and tracked vehicles.

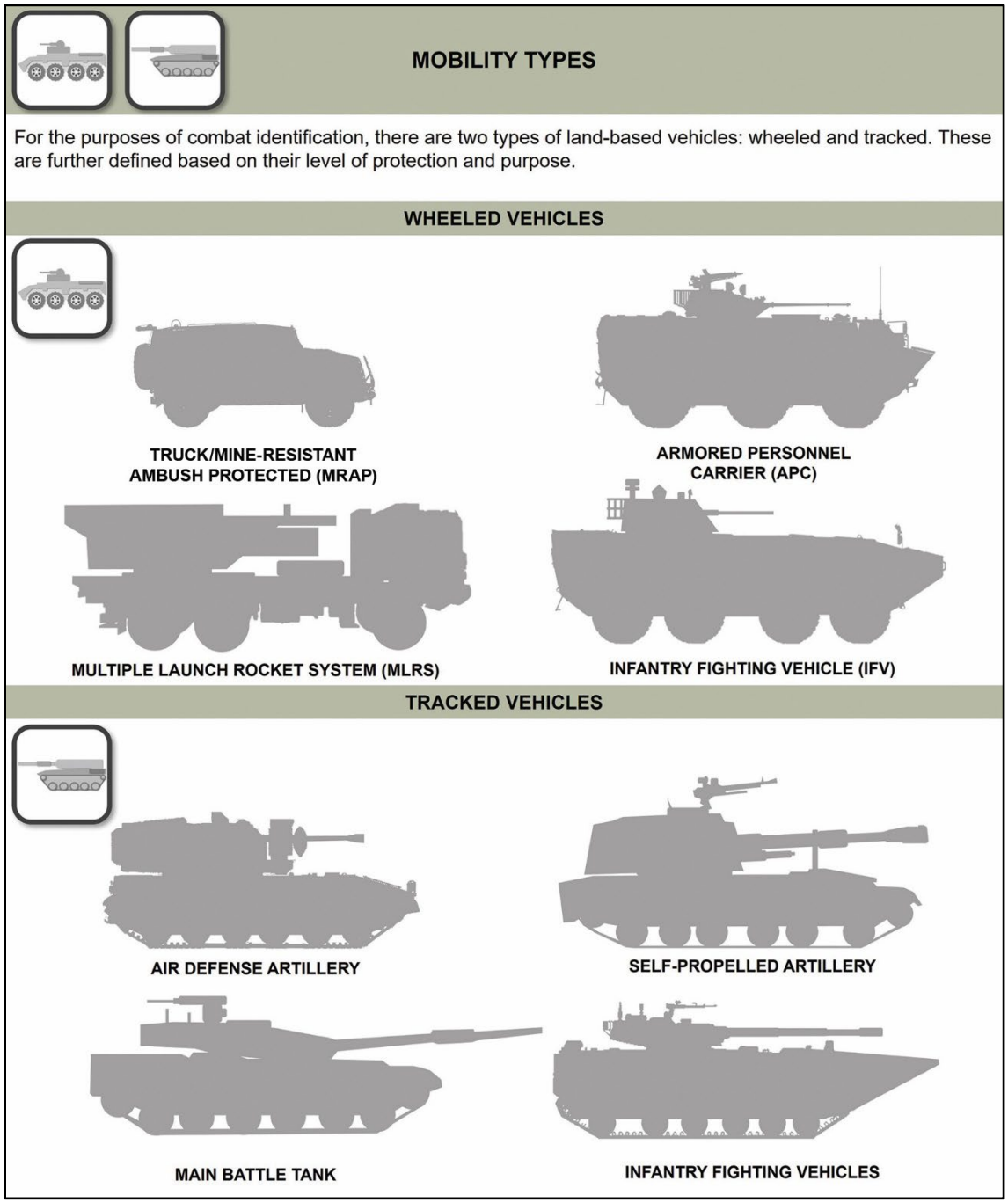


Figure 4-18. Methods of mobility for land domain systems, example

Wheeled Vehicles

4-51. Observers review the components for their characteristics and capabilities to identify a wheeled vehicle's model. They analyze the capabilities and features to identify the variant. Not all variants (of base models) are identifiable from visual cues, particularly at a distance.

4-52. To provide a general overview of these parts, this section portrays them by their associated types of wheeled vehicles. Many terms are common across all types. Figures 4-19 through 4-21 on pages 56 through 58 provide examples of common components of wheeled vehicles and their characteristics, capabilities, and features from the front, isometric, and side views, respectively.

4-53. Rules of thumb for the proper application of visual cues follow:

- Components—Inform the recognition of the target description.
- Characteristics—Inform the identification of the vehicle model or common name.
- Capabilities—Inform the identification of the variant, although they, too, are useful in identifying the vehicle model or common name.
- Features—Specifically indicative of changes in variants for additional information.

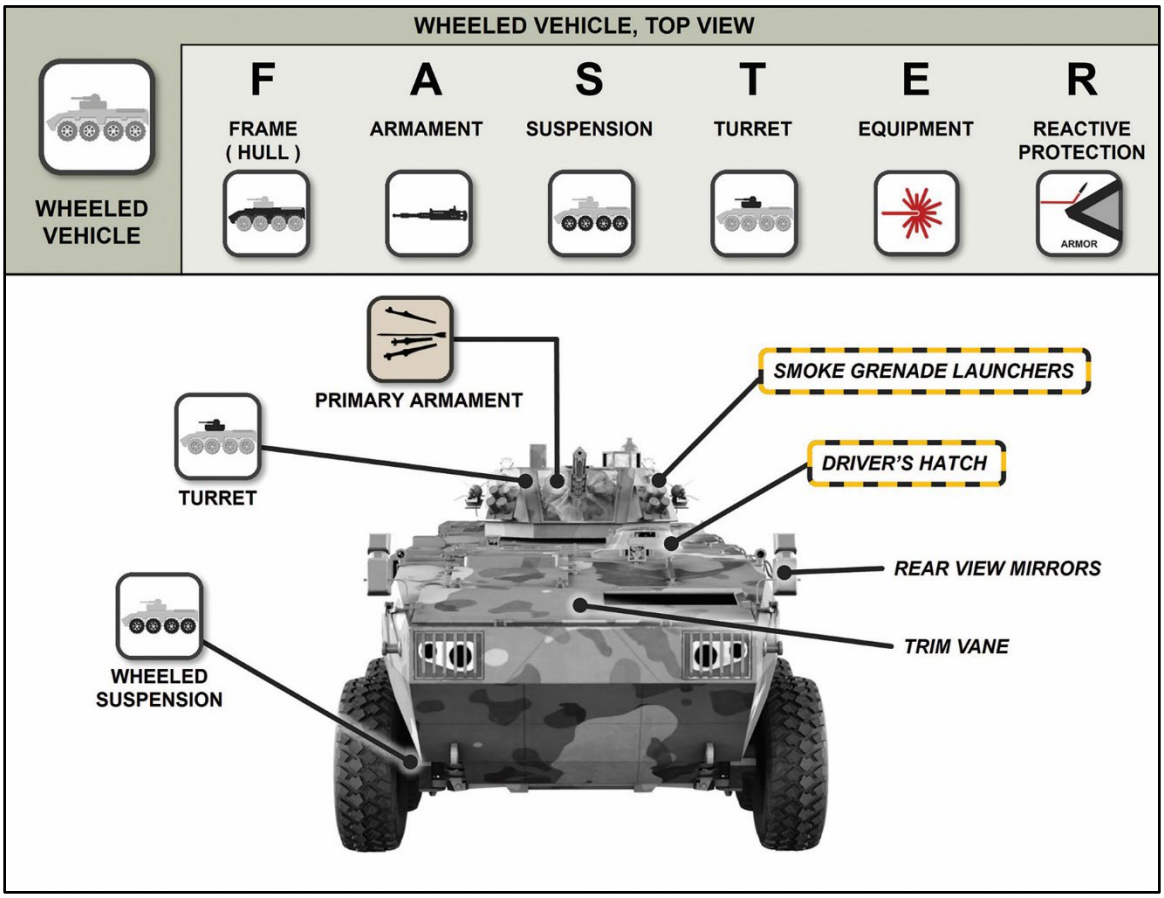


Figure 4-19. Interrogation of wheeled vehicles, front view

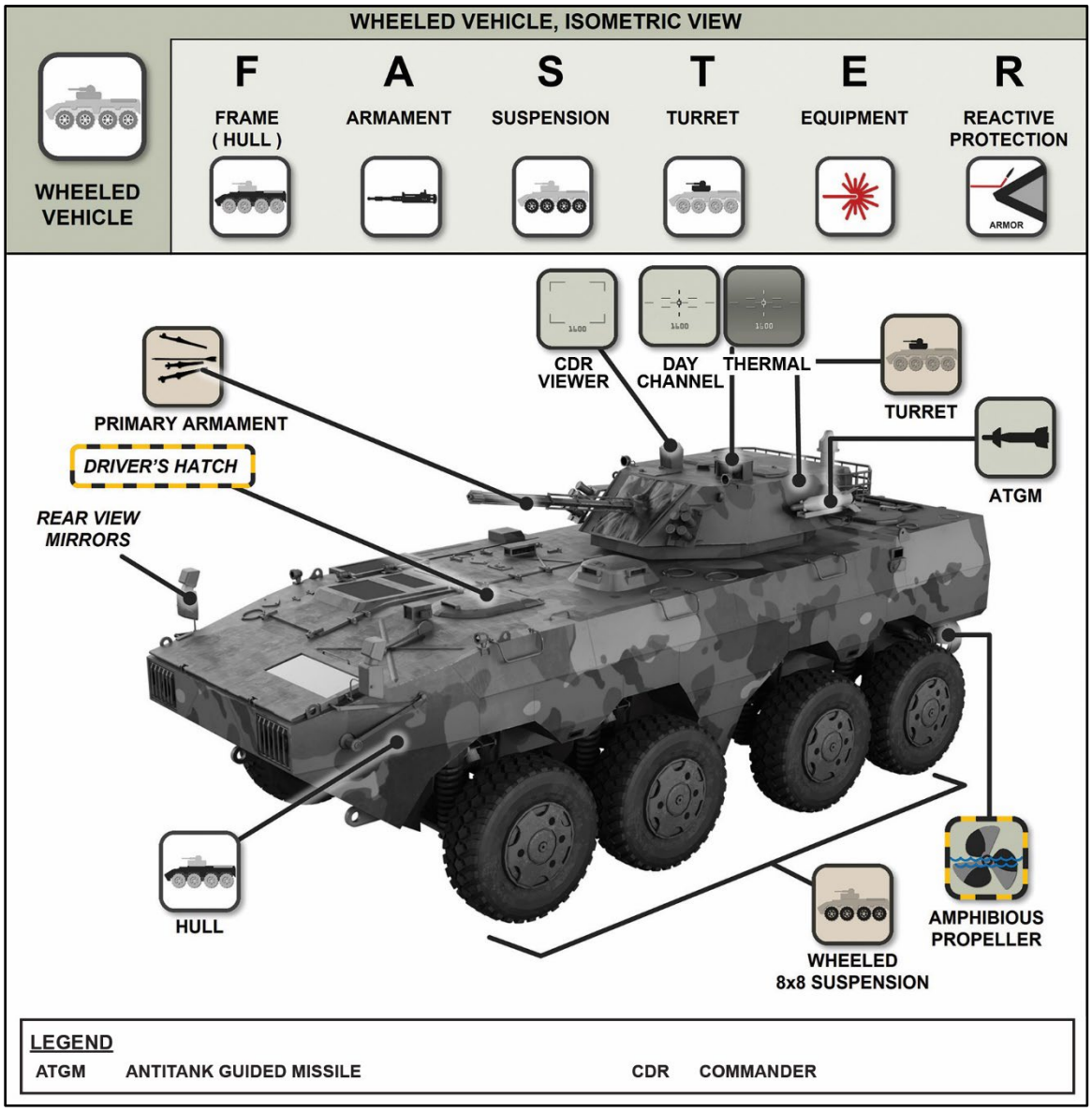


Figure 4-20. Interrogation of wheeled vehicles, isometric view

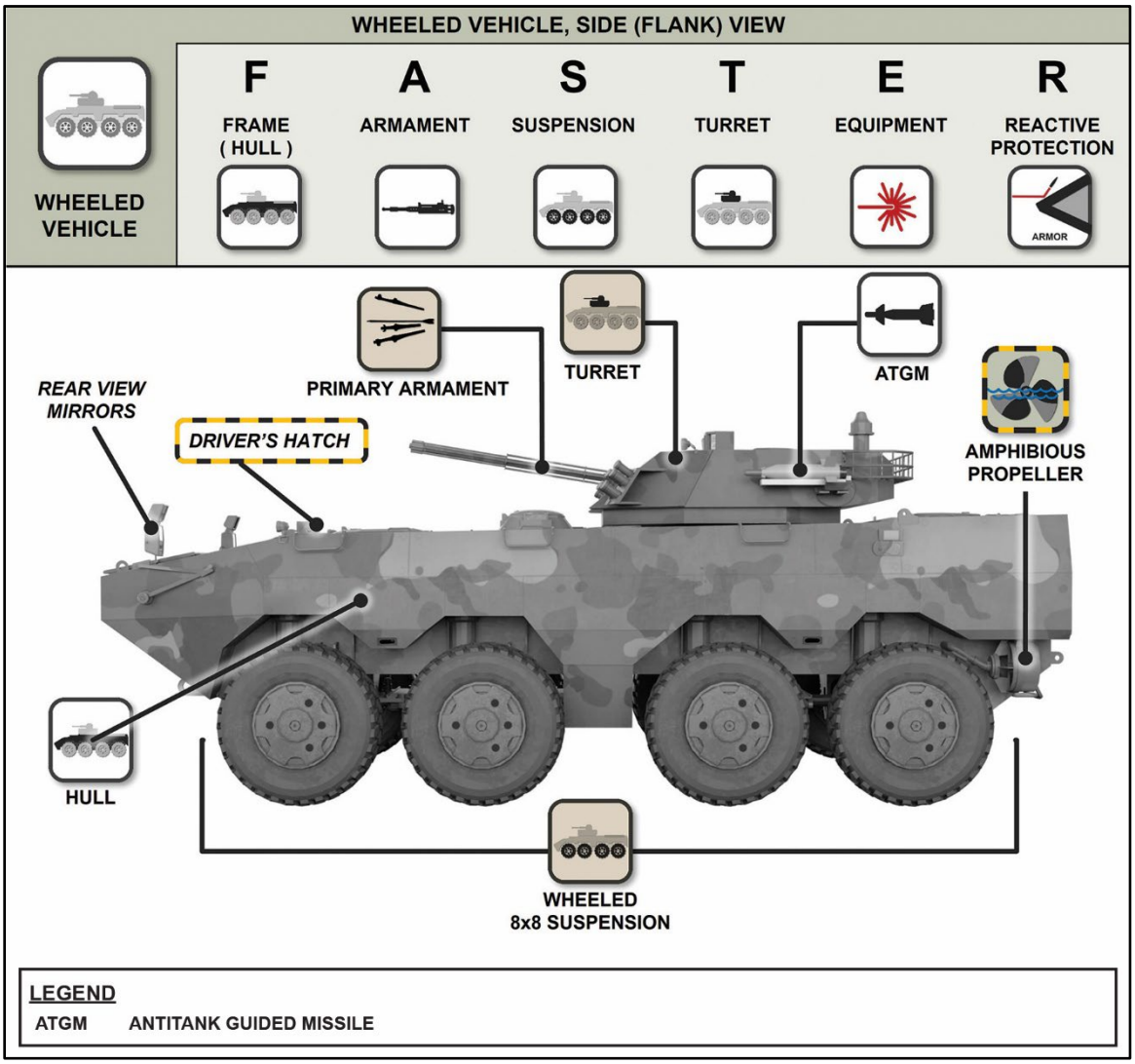


Figure 4-21. Interrogation of wheeled vehicles, side view

4-54. All wheeled vehicles are built with various configurations or layouts. The FASTER interrogation method guides an observer through a comprehensive review of the vehicle's components and their characteristics, capabilities, and features. Figures 4-22 through 4-27 on pages 59 through 64 associate each FASTER component with its most common variations in wheeled vehicles.

4-55. Wheeled vehicles have the same basic features, yet these features differ in design, size, and location. The differences can distinguish and ultimately lead an observer to identify one vehicle from another. Observers isolate the individual components of a wheeled vehicle and interrogate their characteristics, capabilities, and features to recognize and identify the vehicle accurately.

Frame (Hull)

4-56. The frame (or the hull) designs vary in purpose, capability, and function for each wheeled vehicle. Observers analyze the frame component's following characteristics, capabilities, and features (see figure 4-22):

- Shape—The general silhouette and dimensions of the hull.
- Engine—A variety in type (for example, internal combustion, turbine, electric) due to continual technological advancements whose capabilities and features may be most apparent by noise or, in the case of electric motors, lack of noise.
- Exhaust—A key feature of this system being its location on the hull, particularly visible to observers by thermal optics or sensors.

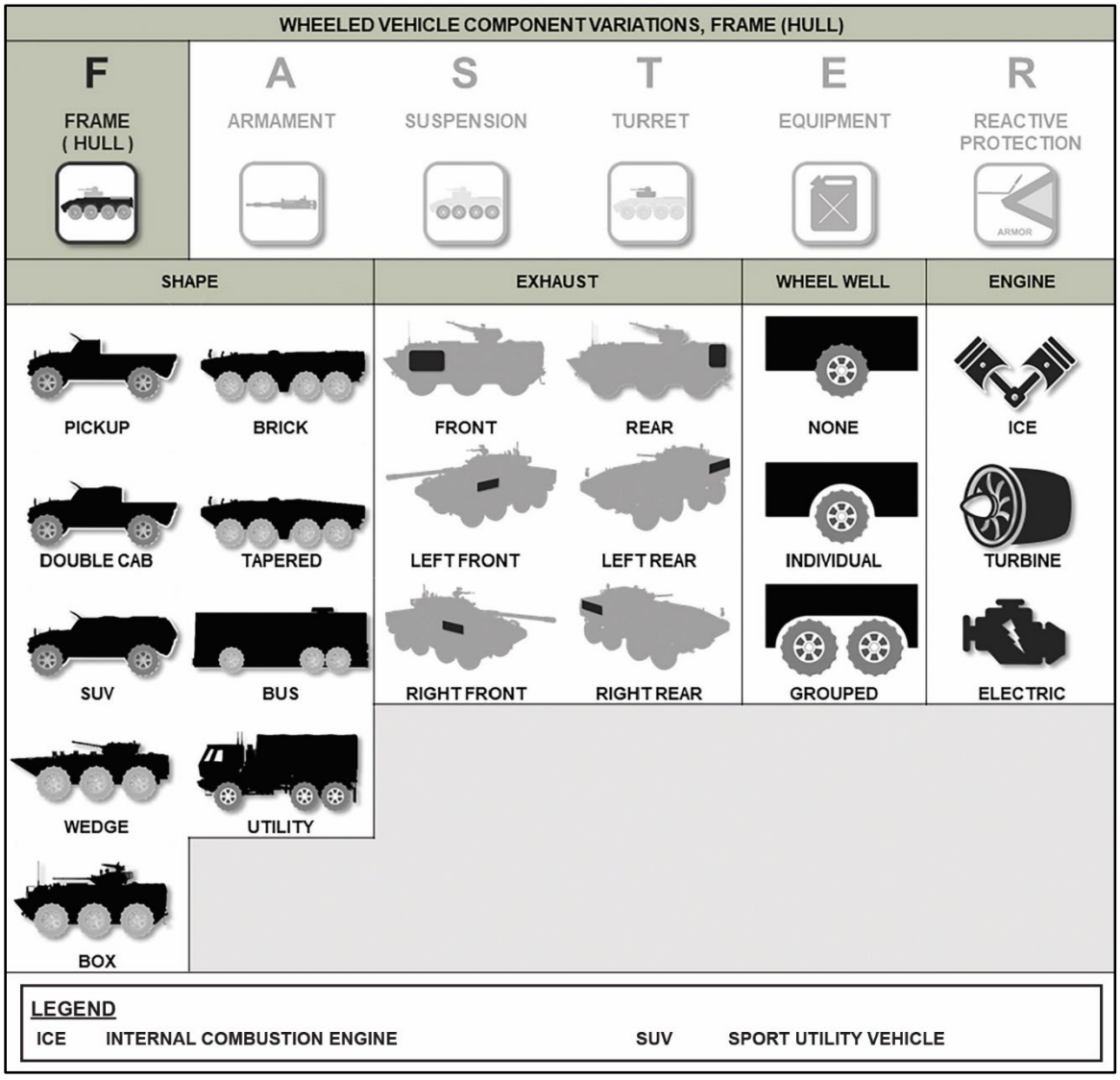


Figure 4-22. Wheeled vehicle hull variations, example

Armament

4-57. Available armament for a wheeled vehicle varies by tactical purpose, capability, and function. Observers analyze the armament component's following characteristics, capabilities, and features (see figure 4-23):

- Primary armament—For direct fire engagements in most cases; systems capable of beyond line-of-sight munitions generally being large caliber.
- Secondary armament—May or may not be present.
- Tertiary—Typically, a coaxial machine gun mounted on turreted systems.
- Indirect—Systems for medium- and large-caliber indirect fire capabilities.
- Missile—Systems for ground-to-air and antitank capabilities.

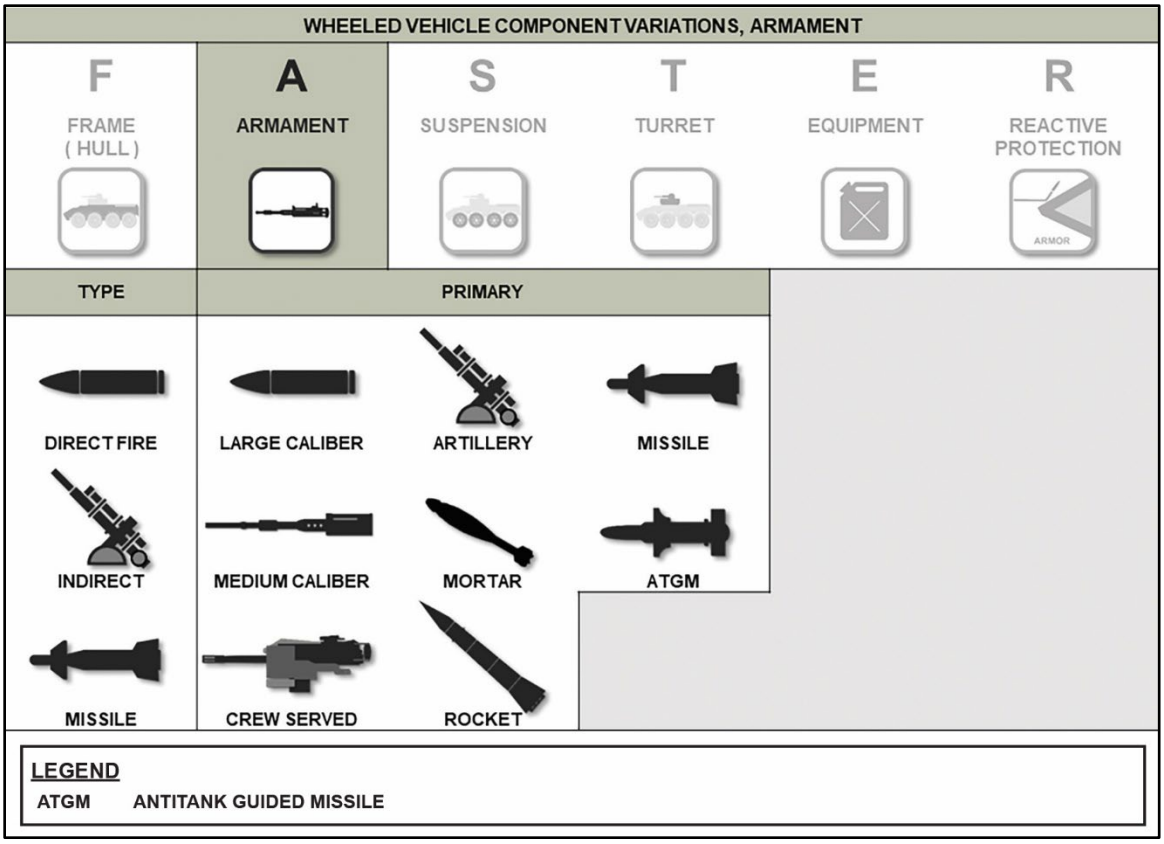


Figure 4-23. Wheeled vehicle armament variations, example

Suspension

4-58. An observer may encounter various suspension designs. Available suspension systems for a wheeled vehicle vary by tactical purpose, capability, and function. Observers analyze the suspension component's following characteristics, capabilities, and features (see figure 4-24):

- Drive train—Nearly all wheeled combat vehicles have four-wheel drive or better capability for supporting tactical movement across all weather and terrain conditions.
- Spacing—This specific design requirement for the wheels provides off-road capability, Soldier egress, and automotive design requirements.

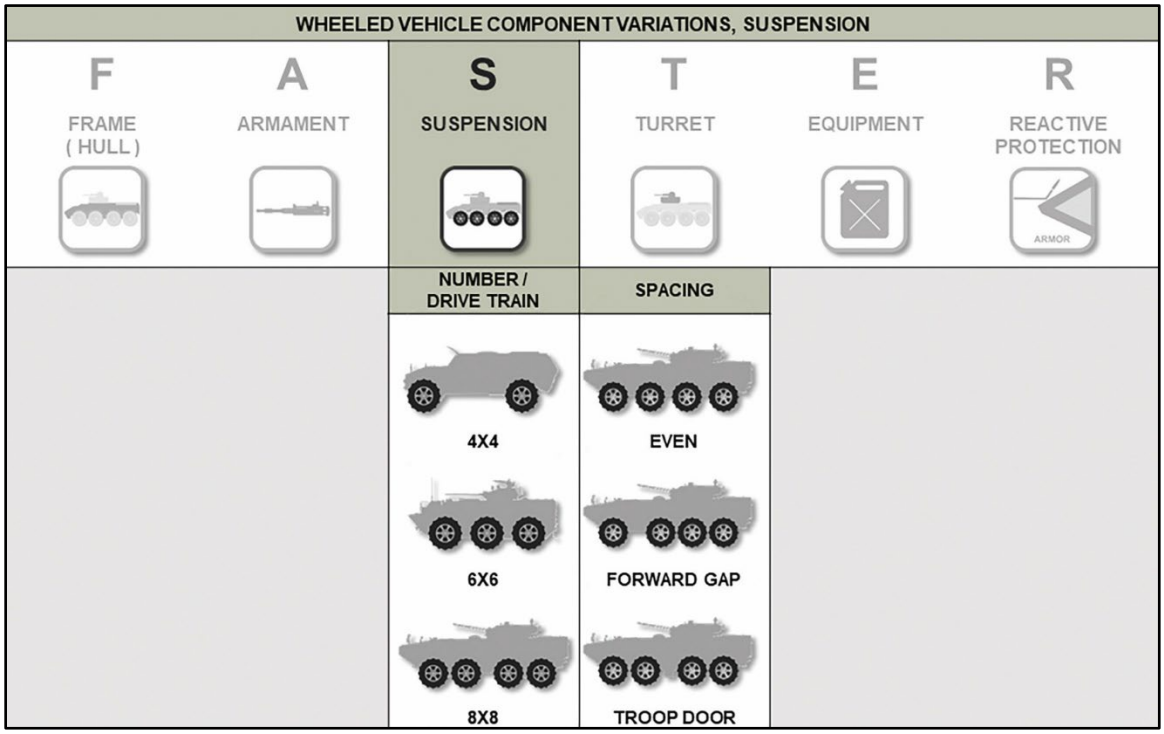


Figure 4-24. Wheeled vehicle suspension variations, example

Turret

4-59. Not all military wheeled vehicles have a turret or traversable system attached to the hull. When integrated into the vehicle, they provide one or more characteristic(s) and capability(ies) to the system itself. The turret does not normally aid the observer in recognizing a vehicle's military description but does suggest a specific model and, at times, a variant. Observers analyze the turret component's following characteristics, capabilities, and features (see figure 4-25):

- Type—When present, this is the rear area of the turret or the turret overhang, which provides limited side storage space for the crew or rudimentary chemical energy warhead protection from chains or a steel cage.
- Shape—This design element provides ballistic protection or silhouette profile reduction, or it enables the integration of additional equipment, systems, ancillary items, and gear.
- Size—This design element typically determines the outfitting of armament, equipment, and reactive protection for the vehicle.
- Weapon station:
  - This device is common to wheeled vehicles without full-sized turrets.
  - It typically supports one weapon or weapon system by way of a pintle mount, gun shield, or remote operation.
  - The integration of a cupola provides 360-degree and limited overhead protection to the crew member.

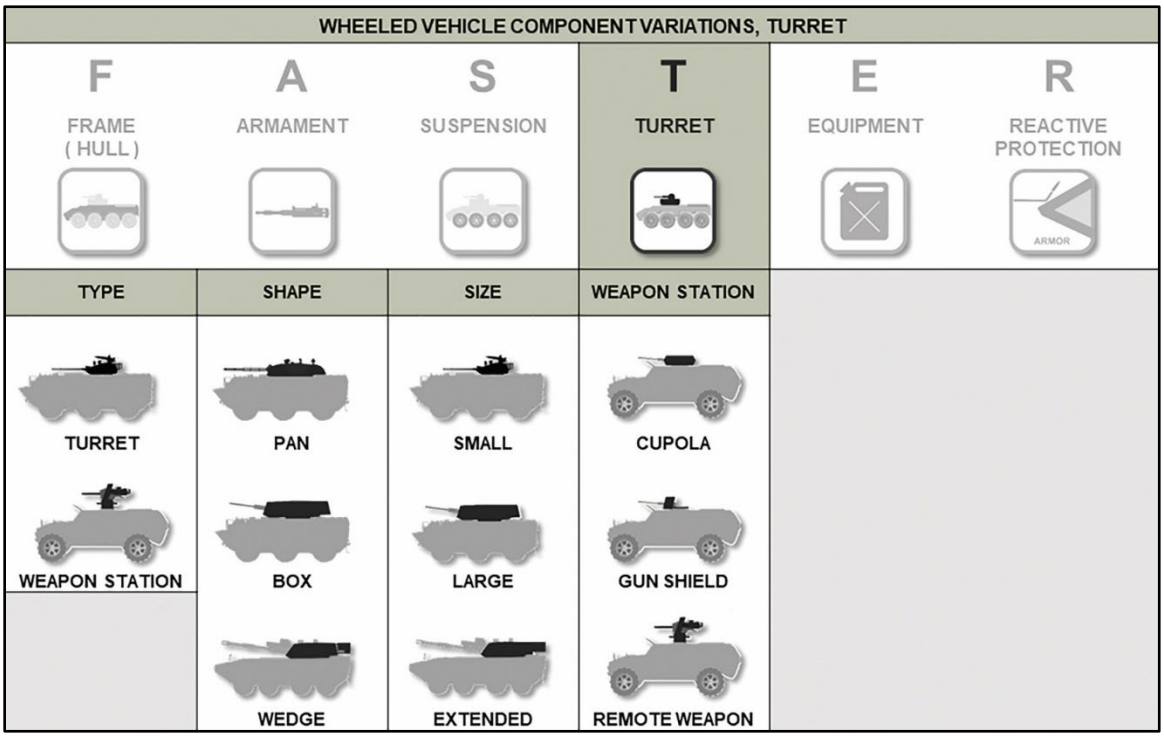


Figure 4-25. Wheeled vehicle turret variations, example

Equipment

4-60. Available equipment options for wheeled vehicles are plentiful. Figure 4-26 provides a snapshot of the key equipment sets viewable to an observer (with and without optics and sensors) for specific vehicle models and variants. The following types of equipment are generic and do not compose a comprehensive list:

- Command and control (C2) or radar—Visible radar, multiple antennas, telescopic antennas, and targeting systems.
- Fording—Any device or equipment that supports the fording operations of the vehicle, such as trim vanes, snorkels, and air intake tubes.
- Recovery—Specially designed systems, gear, or attachments for vehicle recovery, such as tow cables, tow bars, snatch blocks, winches, and cranes, or simple tools such as mounted logs for independent recovery.
- External fuel tanks—Typically rear attachments of common drum containers to support extended range operations, or 5-gallon fuel cans attached to the exterior of smaller vehicles.
- Camouflage systems—Netting, tarps, coverings, or other materials that disrupt a vehicle's shape, color, thermal pollution, or other signatures to reduce the possibility of detection, recognition, or identification.
- CID systems—Standardized systems that support the discrimination phase of RAID to reduce or eliminate fratricide.

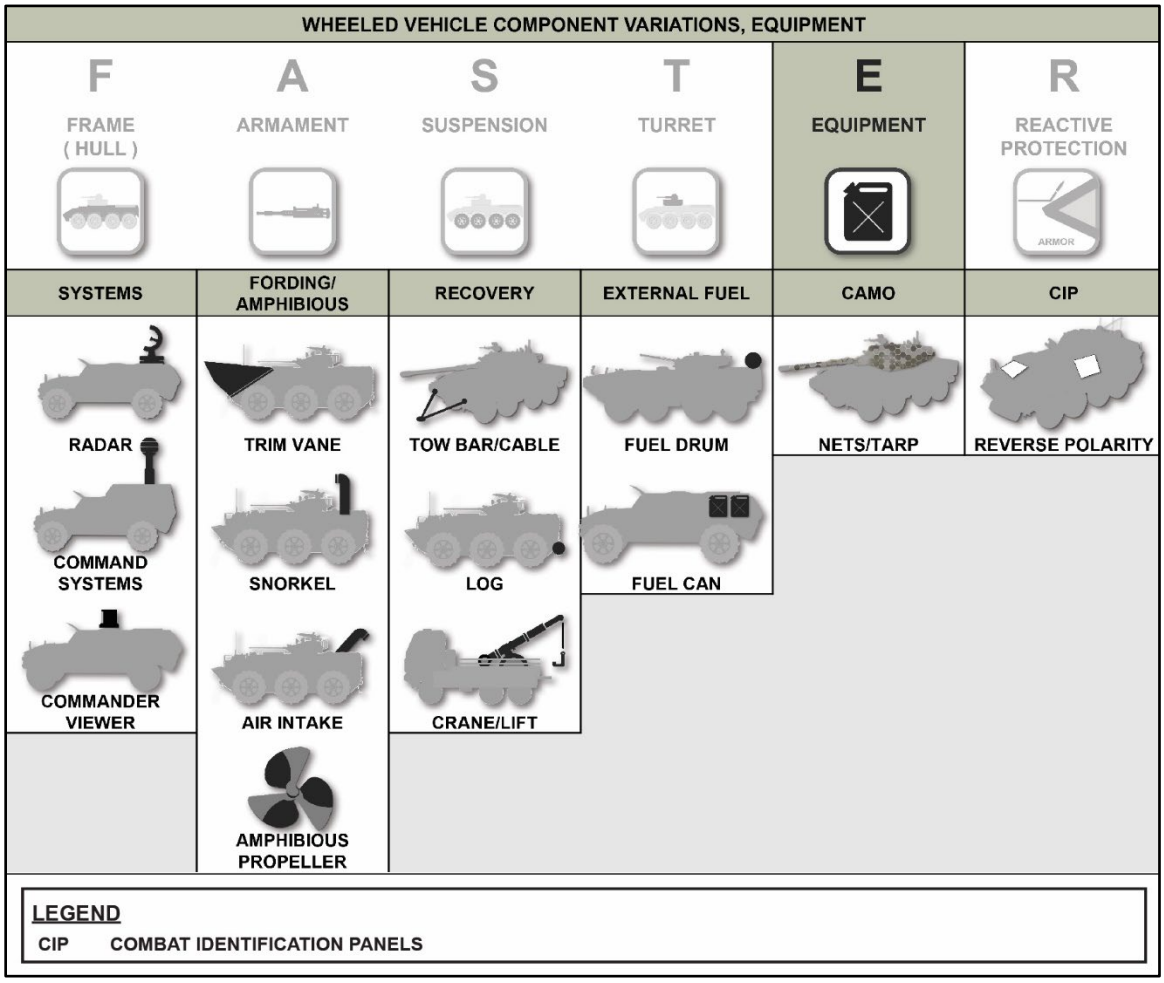


Figure 4-26. Wheeled vehicle equipment variations, example

Reactive Protection

4-61. Recent inclusions in wheeled vehicle designs are passive and active protection systems, additional armor plating, modular armor packages, and other protection systems that increase crew survivability and vehicle preservation. Figure 4-27 provides examples of common protection systems serving as reactive protection components of wheeled vehicles. It includes protection systems that remain viewable at a distance (with and without optics and sensors) for the purpose of identifying models or common names and variants as follows:

- Passive systems alert the crew to combat hazards (for example, laser warning, projectile warning) and warn the crew of potential direct or indirect fire hazards for their actions or defensive measures.
- Soft kill systems alert the crew to combat hazards and engage, discharge, or physically move part of or the entire vehicle in a defensive manner to reduce or eliminate risk to personnel and equipment.

Note. In this publication, active protection systems remain specific to soft kill capabilities (for example, aerial countermeasures, IR decoys, flares, chaff, radar decoys).

- Hard kill systems physically counterattack an incoming threat, thereby destroying or altering its payload or warhead to the point of severely impeding the intended effect on the target (for example, an additional armor package whose function or detonation interrupts, disrupts, or defeats a chemical energy round's jet stream or a long-rod kinetic energy penetrator round, thereby preventing the threat from catastrophically damaging the vehicle), and they react to a kinetic strike of sufficient force to activate the reactive armor composition.
- Add-on, augmenting systems for vehicles' points of vulnerability increase survivability (for example, modular armor, field expedient armor, locally manufactured devices).

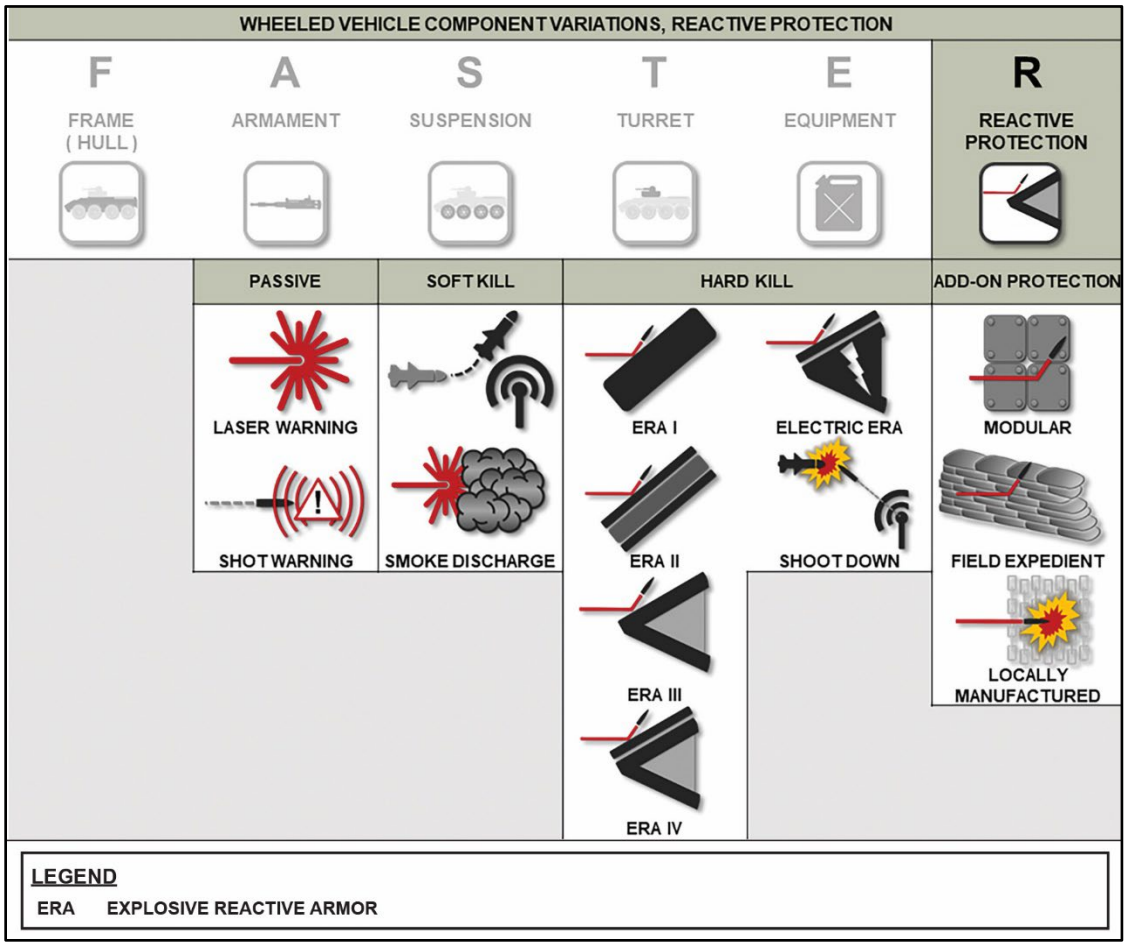


Figure 4-27. Wheeled vehicle reactive protection variations, example

Tracked Vehicles

4-62. Observers review the components for their characteristics and capabilities to identify a tracked vehicle's model. They analyze the capabilities and features to identify a tracked vehicle's variant. Not all variants (to base models) are identifiable from visual cues, particularly at a distance. Figures 4-28 through 4-30 on pages 66 through 68 provide front, isometric, and side views, respectively, of a tracked vehicle as an example to show some components, characteristics, and capabilities.

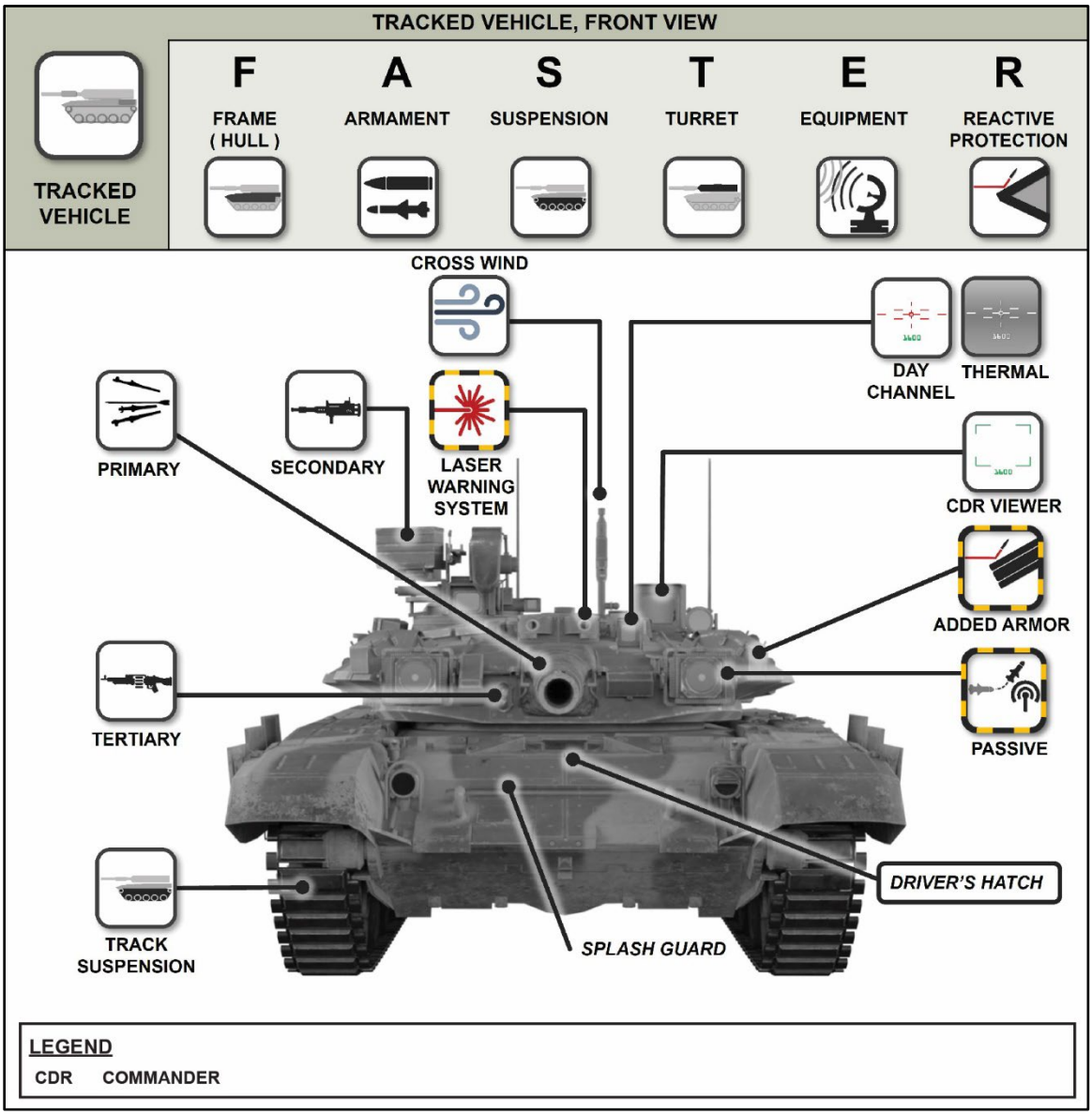


Figure 4-28. Interrogation of tracked vehicles, front view

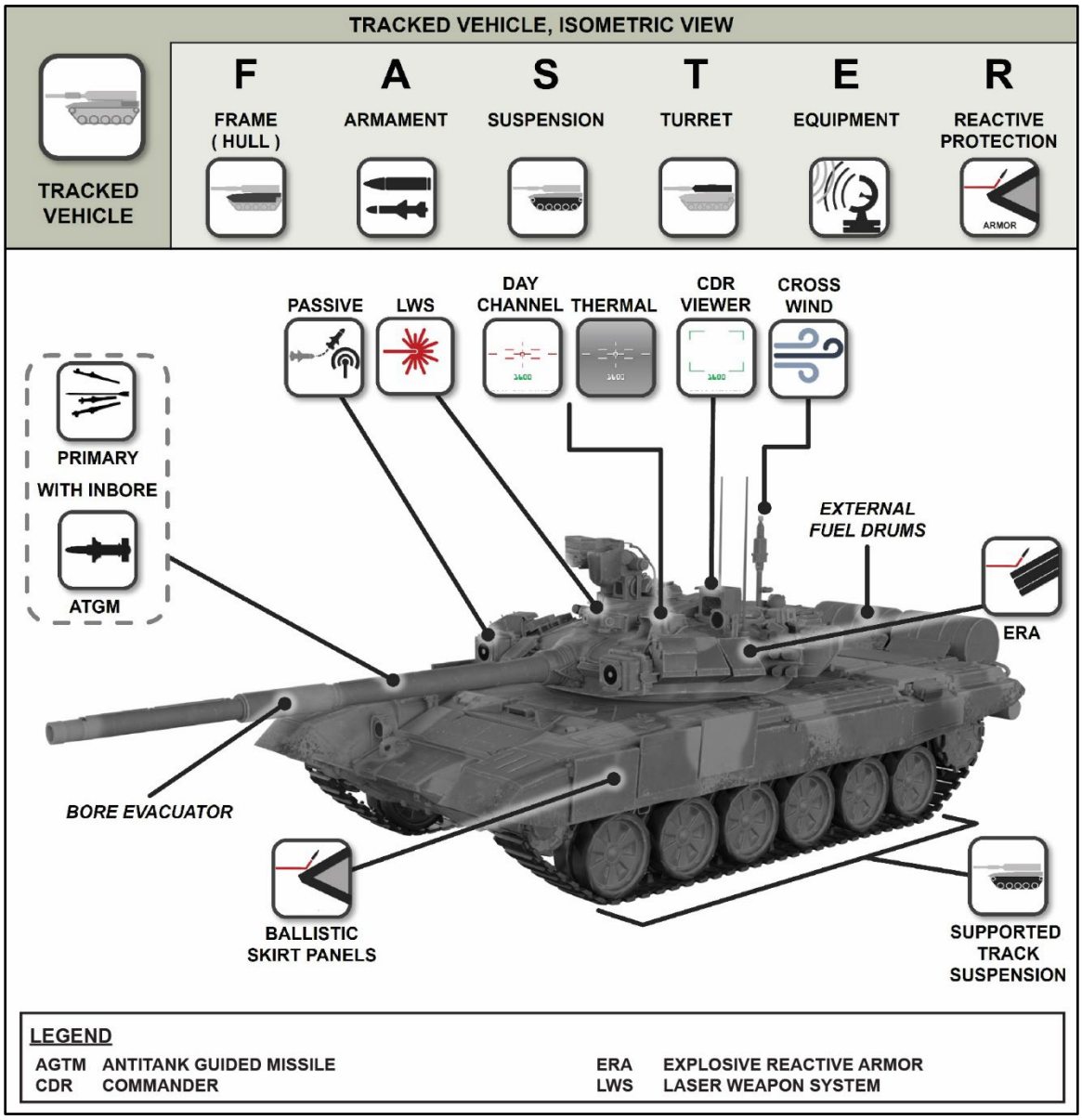


Figure 4-29. Interrogation of tracked vehicles, isometric view

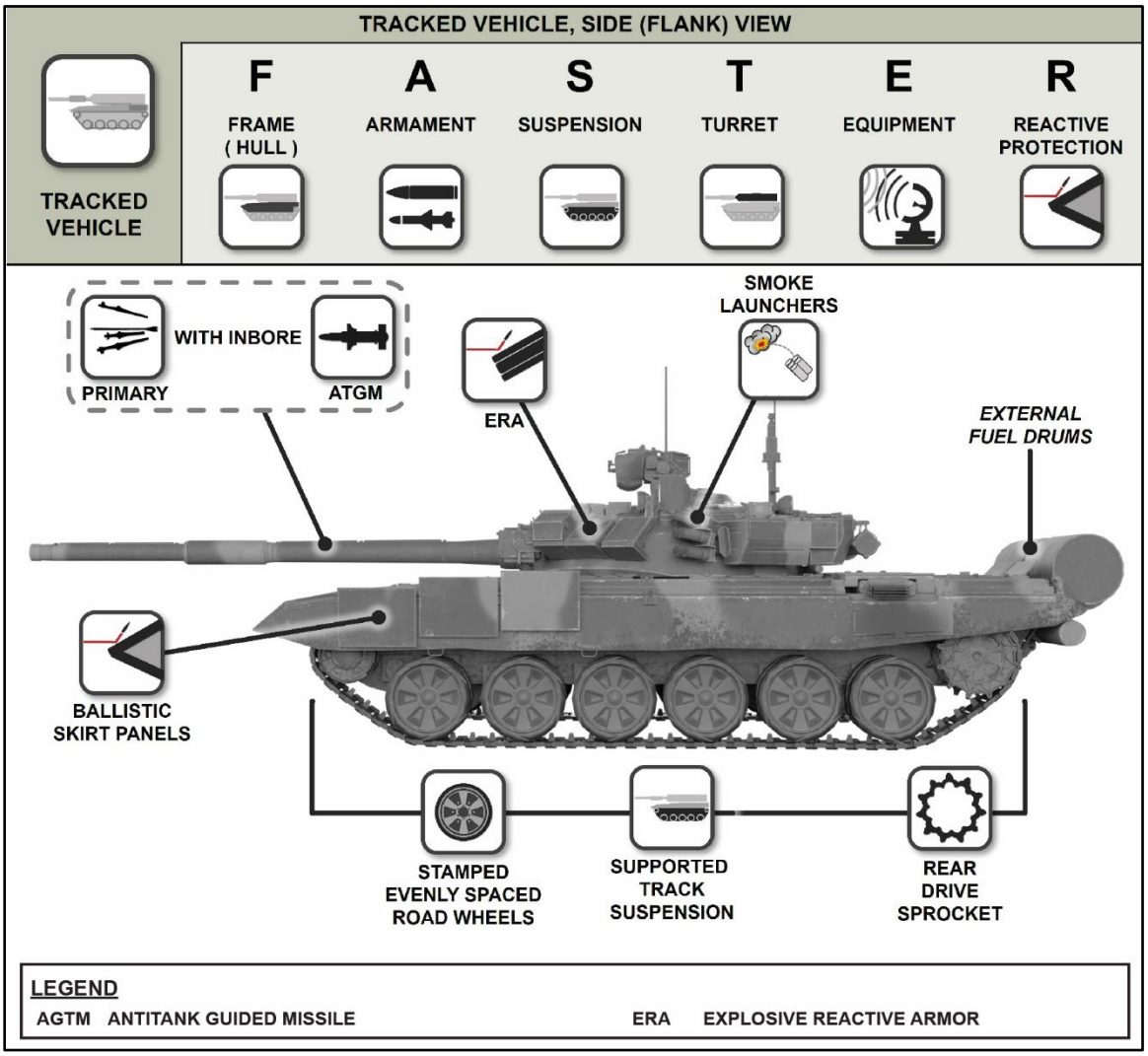


Figure 4-30. Interrogation of tracked vehicles, side view

Frame (Hull)

4-63. The frame (or the hull) designs vary in purpose, capability, and function for each tracked vehicle. Observers analyze the frame component's following characteristics, capabilities, and features (see figure 4-31):

- Shape—The general silhouette and dimensions of the hull.
- Skirts—When these components are present, any visible ballistics' characteristics or capabilities.
- Skirt design—When skirt components are present, their general shape and configuration.
- Exhaust—A key feature of this system being its location on the hull, particularly visible to observers by thermal optics or sensors.
- Engine—A variety in type (for example, internal combustion, turbine, electric) due to continual technological advancements whose capabilities and features may be most apparent by noise or, in the case of electric motors, lack of noise.

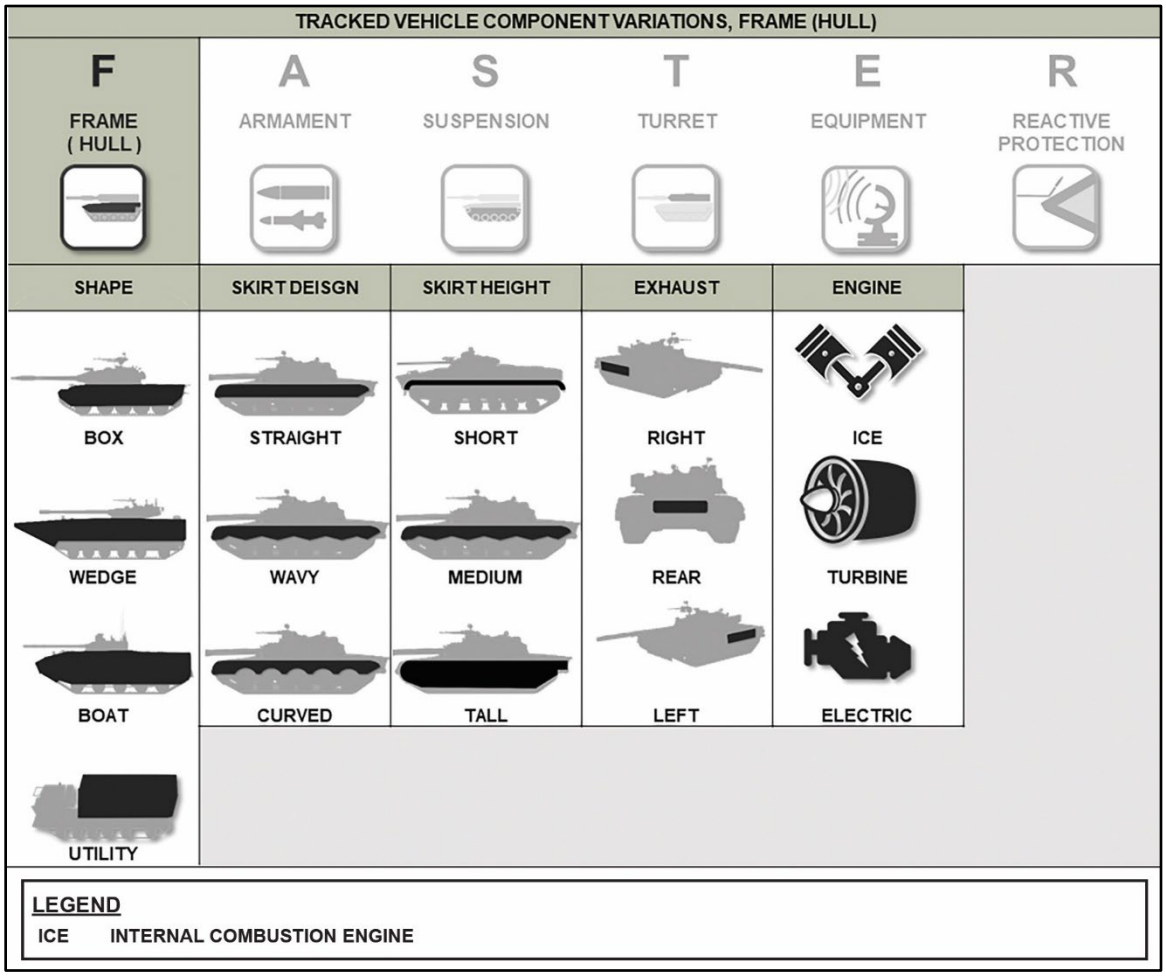


Figure 4-31. Tracked vehicle hull variations, example

Armament

4-64. Available armament for a tracked vehicle varies by tactical purpose, capability, and function. Observers analyze the armament component's following characteristics, capabilities, and features (see figure 4-32):

- Primary armament—For direct fire engagements in most cases; systems capable of beyond line-of-sight munitions generally being large caliber.
- Secondary armament—May or may not be present.
- Tertiary—Typically, a coaxial machine gun mounted on turreted systems.
- Indirect—Systems for medium- and large-caliber indirect fire capabilities.
- Missile—Systems for ground-to-air and antitank capabilities.

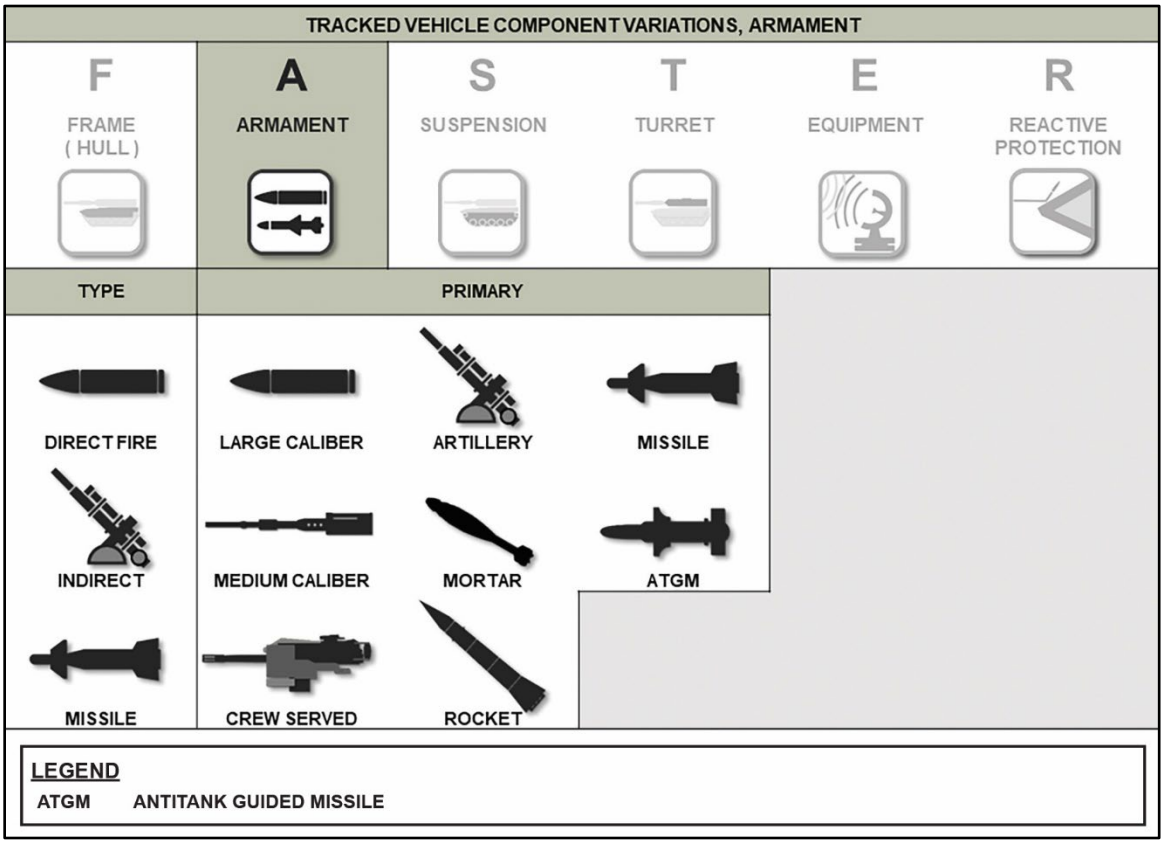


Figure 4-32. Tracked vehicle armament variations, example

Suspension

4-65. An observer may encounter various suspension designs. Available suspension systems for a tracked vehicle vary by tactical purpose, capability, and function. Observers analyze the suspension component's following characteristics, capabilities, and features (see figure 4-33):

- Type—Examples include Christie suspension and support rollers.
- Road wheels—The count (of each wheel) on one side of the vehicle.
- Spacing—This specific design requirement for the road wheels supports the larger weight of the tracked vehicle across terrain types.
- Sprocket—The location (front or rear) for the tracked suspension.

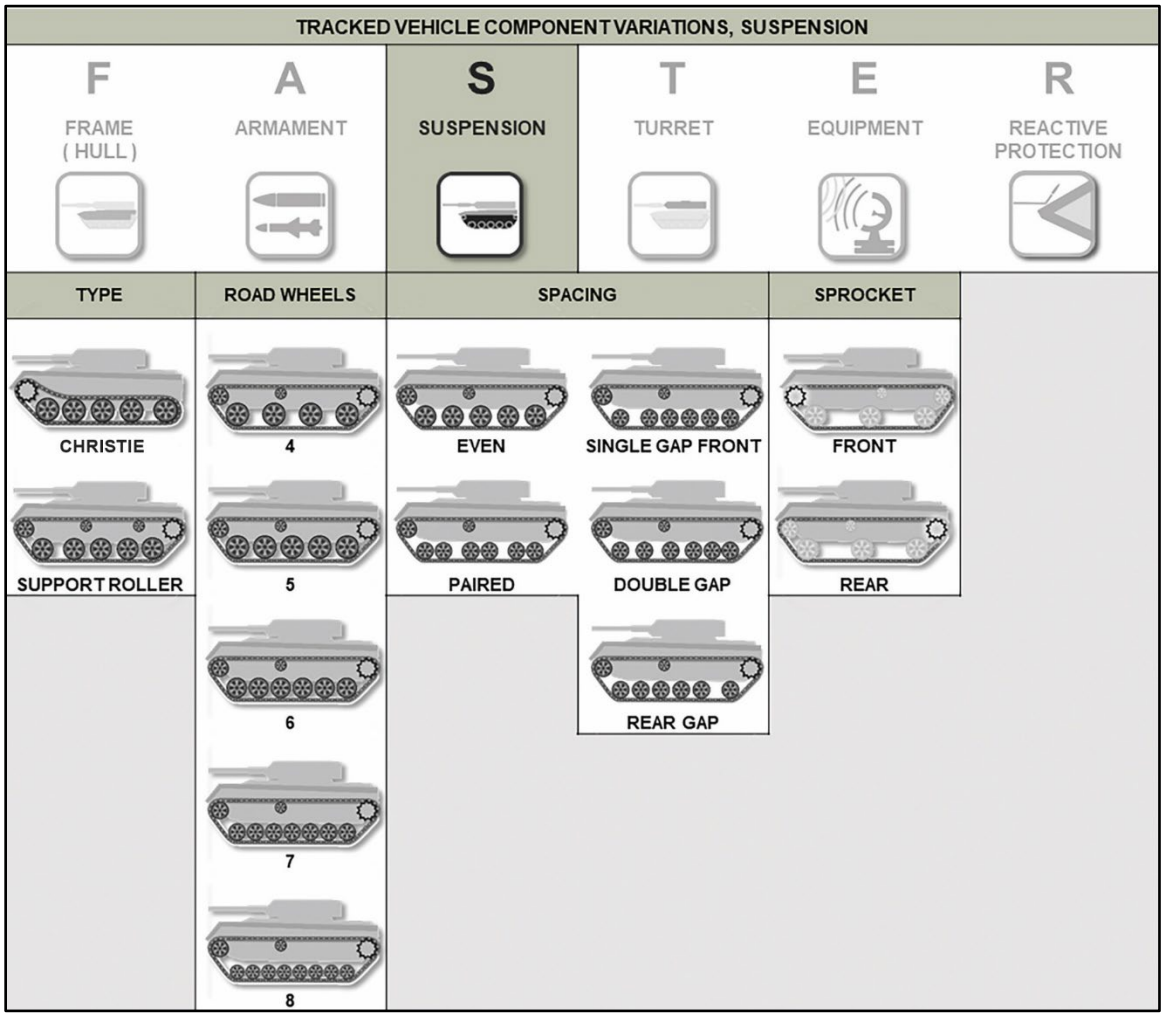


Figure 4-33. Tracked vehicle suspension variations, example

Turret

4-66. Not all military tracked vehicles have a turret or traversable system attached to the hull. When integrated into the vehicle, they provide one or more characteristic(s) and capability(ies) to the system itself. Observers analyze the turret component's following characteristics, capabilities, and features (see figure 4-34):

- Type—When present, this is the rear area of the turret or the turret overhang, which provides limited side storage space for the crew or rudimentary chemical energy warhead protection from chains or a steel cage.
- Shape (pan, box, wedge)—This design element provides ballistic protection or silhouette profile reduction, or it enables the integration of additional equipment, systems, ancillary items, and gear.
- Size (small, large, extended)—This design element typically determines the outfitting of armament, equipment, and reactive protection for the vehicle.
- Weapon station:
  - This device is common to tracked vehicles to support a secondary weapon for VC use.
  - It typically supports one weapon or weapon system by way of a pintle mount, gun shield, or remote operation.
  - The integration of a cupola provides 360-degree and limited overhead protection to the crew member.

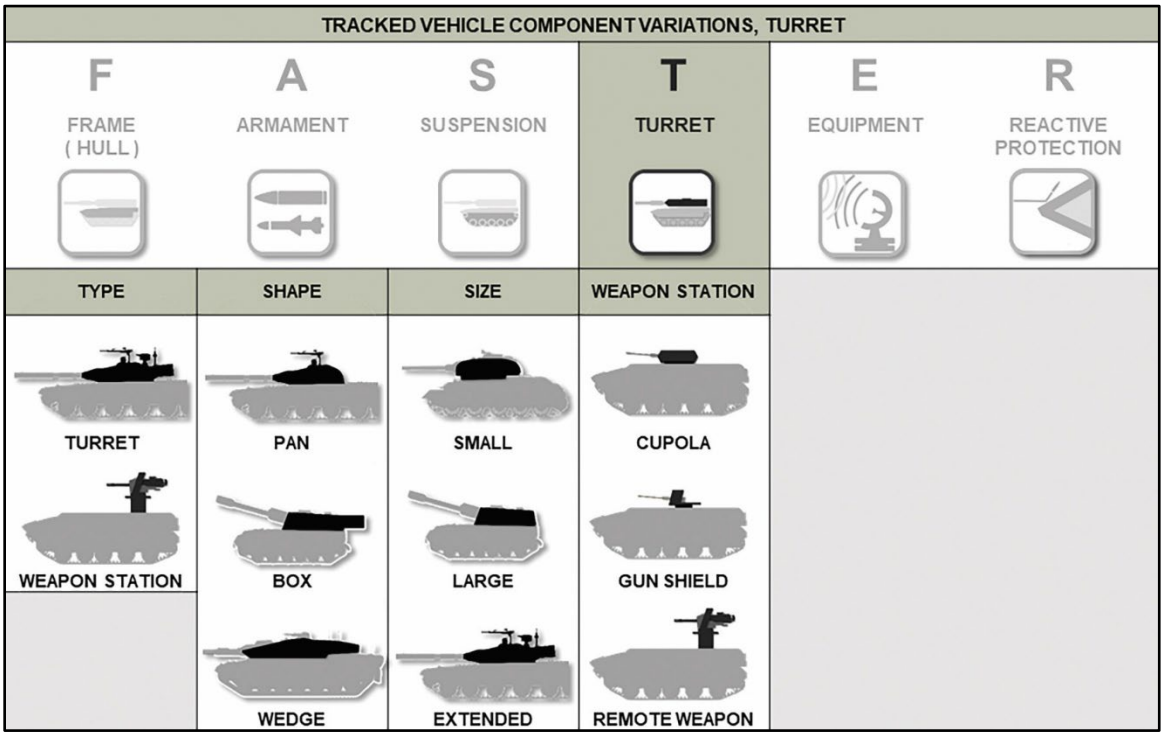


Figure 4-34. Tracked vehicle turret variations, example

Equipment

4-67. Figure 4-35 provides a snapshot of the key equipment sets that are viewable to an observer with and without optics or sensors that directly relate to a vehicle model or variant. The following available equipment options are generic and do not compose a comprehensive list:

- C2 or radar—Visible radar, multiple antennas, telescopic antennas, and targeting systems.
- Fording—Any device or equipment that supports fording operations of the vehicle, such as trim vanes, snorkels, and air intake tubes.
- Recovery—Specially designed systems, gear, or attachments for vehicle recovery, such as tow cables, tow bars, snatch blocks, winches, and cranes, or simple tools such as mounted logs for independent recovery.
- External fuel tanks—Typically rear attachments of common drum containers to support extended range operations, though often detached for combat operations for which enemy contact is likely or expected.
- Camouflage systems—Netting, tarps, coverings, or other materials that disrupt a vehicle's shape, color, thermal pollution, or other signatures to reduce the possibility of detection, recognition, or identification.
- CID systems—Standardized systems that support the discrimination phase of RAID to reduce or eliminate fratricide.

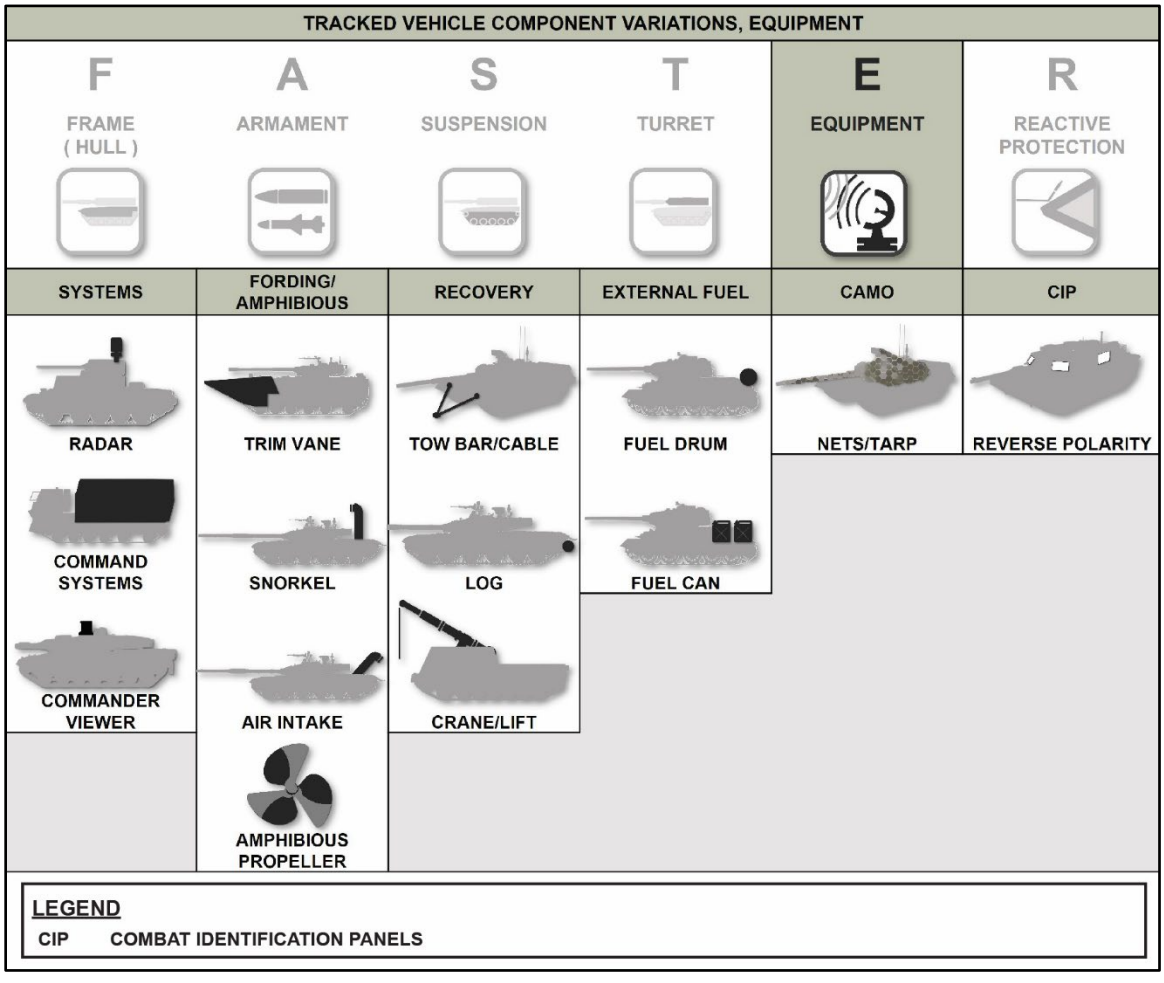


Figure 4-35. Tracked vehicle equipment variations, example

Reactive Protection

4-68. Tracked vehicle designs include passive protection systems, additional armor plating, modular armor packages, and other protection systems that increase crew survivability and vehicle preservation. Figure 4-36 provides examples of common protection systems serving as reactive protection components of tracked vehicles. The following list of passive and soft kill systems is not exhaustive:

- Passive systems alert the crew to combat hazards (for example, laser warning, projectile warning) and warn the crew of potential direct or indirect fire hazards for their actions or defensive measures.
- Soft kill systems alert the crew to combat hazards and engage, discharge, or physically move part of or the entire vehicle in a defensive manner to reduce or eliminate risk to personnel and equipment.

Note. In this publication, active protection systems remain specific to soft kill capabilities (for example, aerial countermeasures, IR decoys, flares, chaff, radar decoys).

- Hard kill systems physically counterattack an incoming threat, thereby destroying or altering its payload or warhead to the point of severely impeding the intended effect on the target.
- Add-on, augmenting systems for vehicles' points of vulnerability increase survivability (for example, modular armor, field expedient armor, and locally manufactured devices).

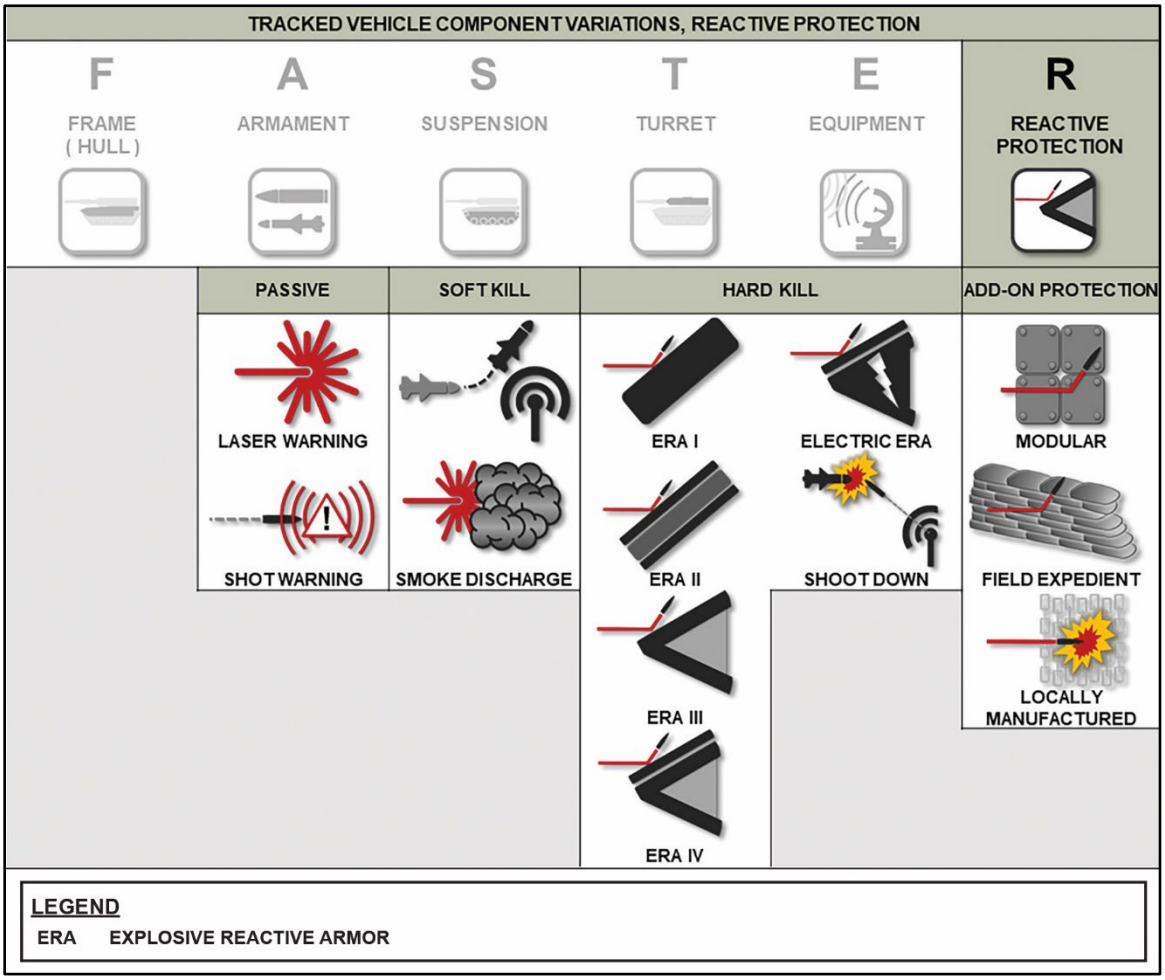


Figure 4-36. Tracked vehicle reactive protection variations, example

AIR

4-69. This section follows the FASTER interrogation method while focusing on aircraft. It presents three types of aircraft: FW, variable geometry, and RW (see figure 4-37).

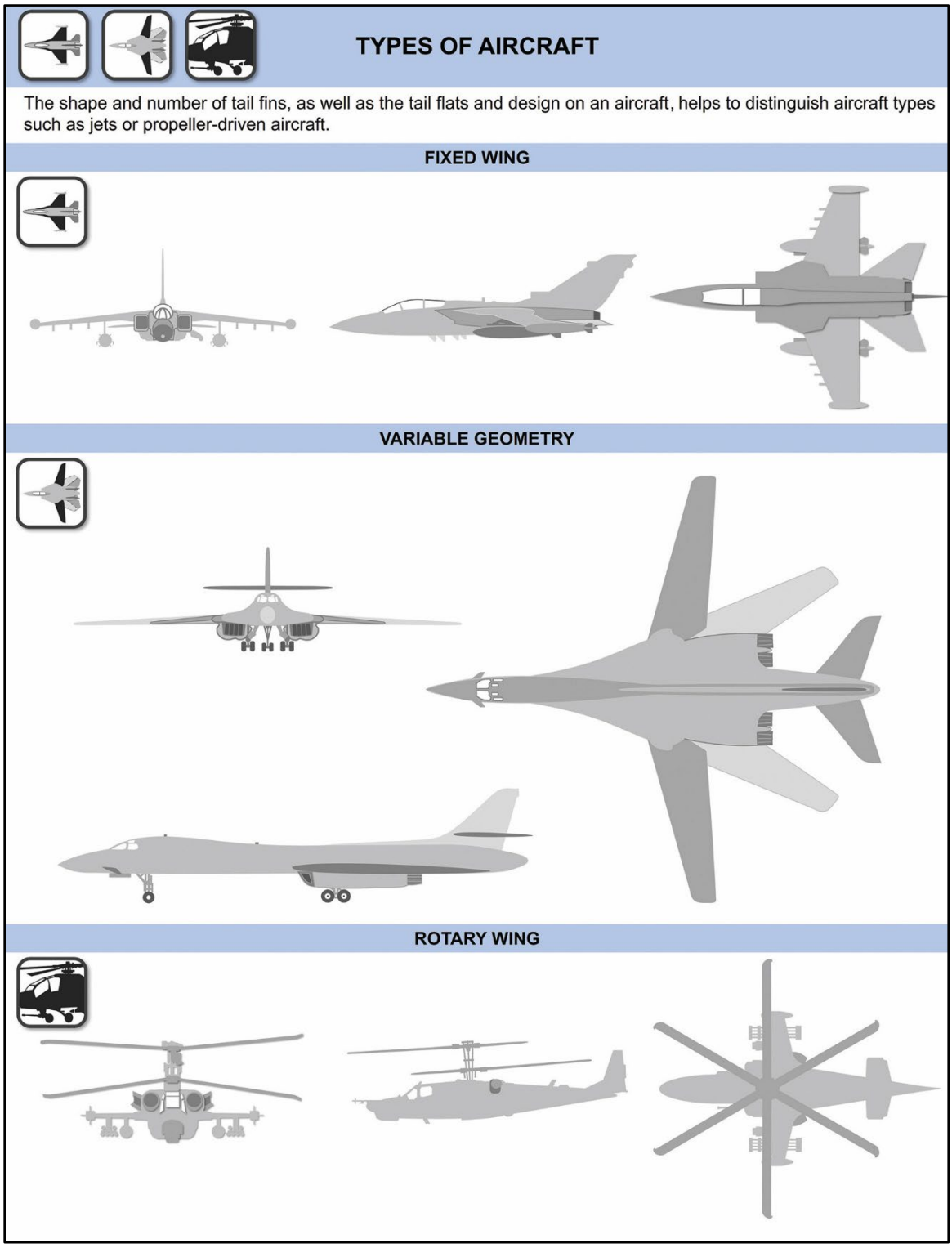


Figure 4-37. Types of aircraft

Fixed-wing

4-70. Observers review the components for their characteristics and capabilities to identify the model of various FW aircraft. They analyze the capabilities and features to identify the variant. Not all variants (to base models) are identifiable from visual cues, particularly at a distance.

4-71. To provide a general overview of these parts, this section portrays them by their associated types of FW aircraft. Many FW aircraft terms are common across all types. Figures 4-38 through 4-40 on pages 76 through 78 provide examples of common components of FW aircraft and their characteristics, capabilities, and features from the front, top, and side views, respectively.

4-72. Rules of thumb for the proper application of visual cues follow:

- Components—Inform the recognition of the target description.
- Characteristics—Inform the identification of the aircraft model or common name.
- Capabilities—Inform the identification of the variant, although they, too, are useful in identifying the aircraft model or common name.
- Features—Specifically indicative of changes in variants for additional information.

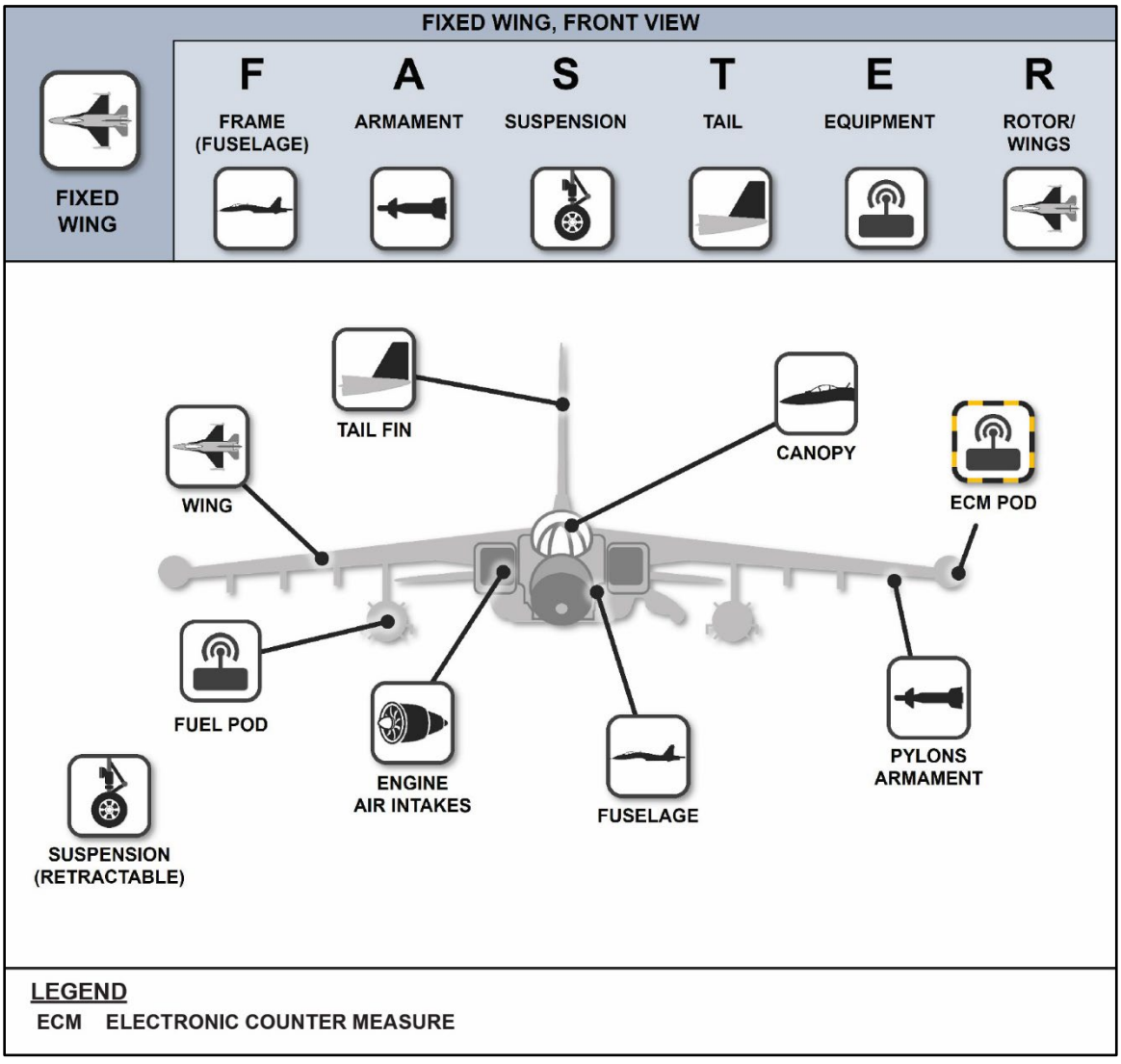


Figure 4-38. Interrogation of fixed-wing aircraft, front view

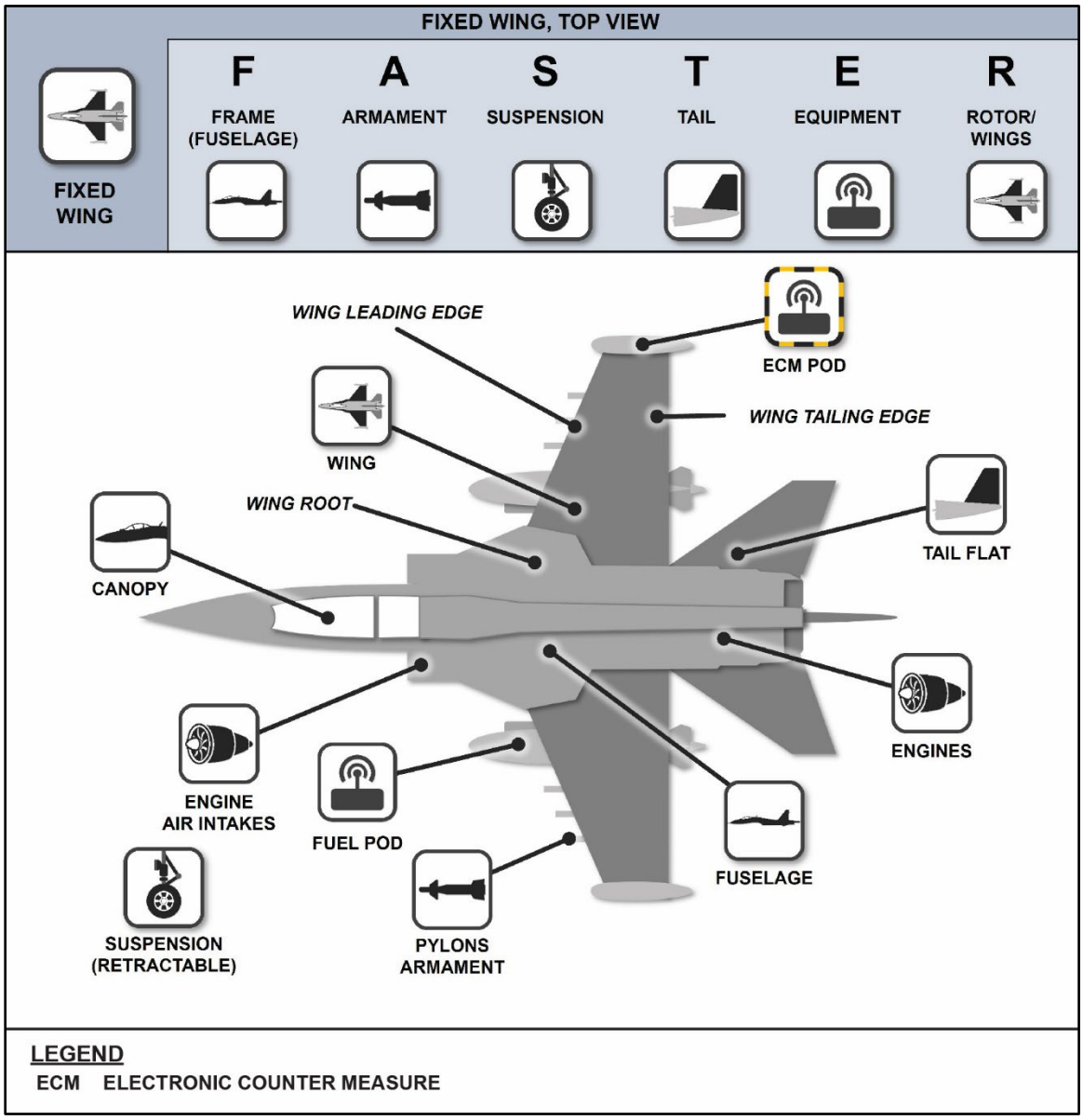


Figure 4-39. Interrogation of fixed-wing aircraft, top view

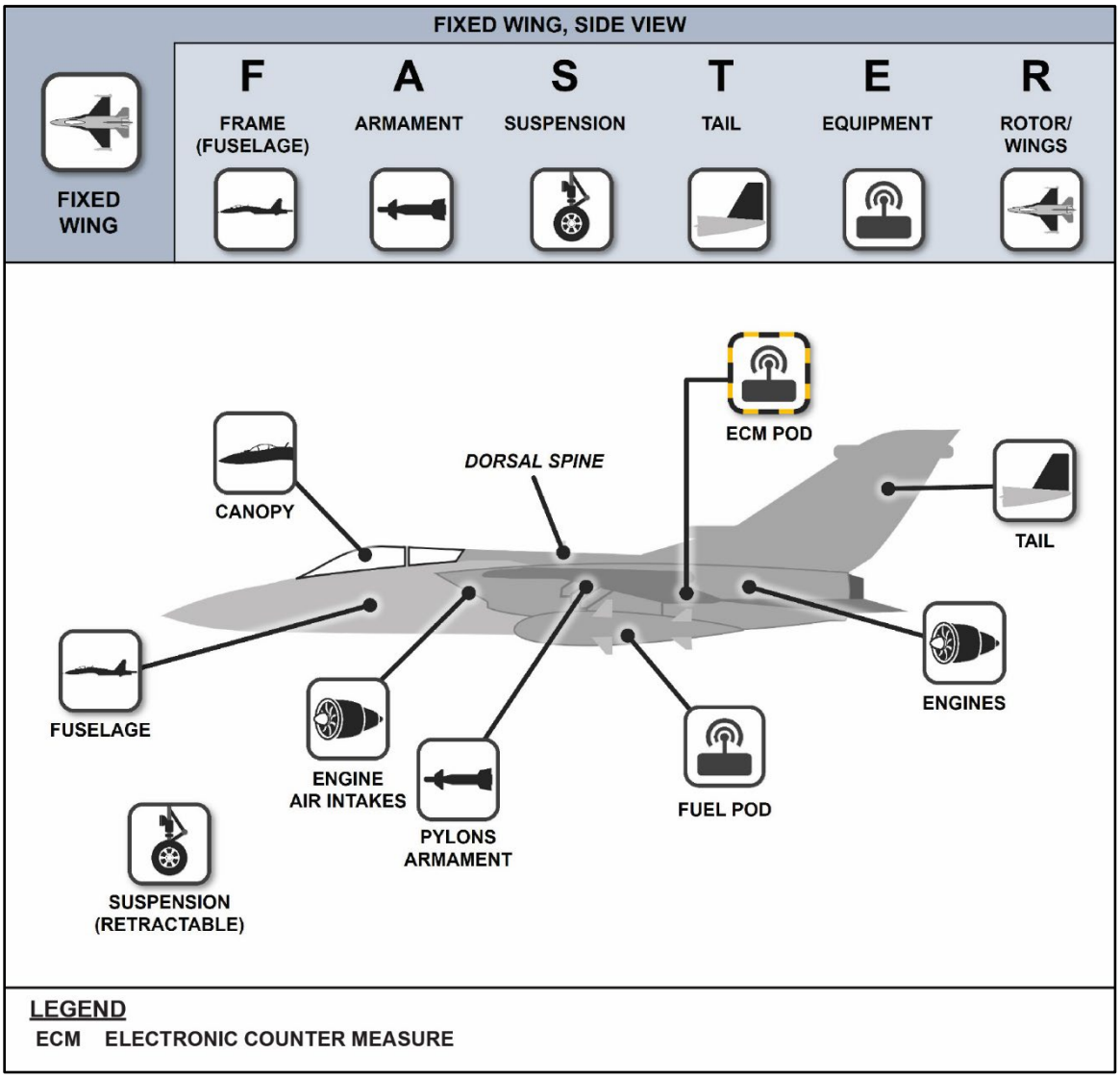


Figure 4-40. Interrogation of fixed-wing aircraft, side view

4-73. All aircraft are built with the same basic design but with various configurations or layouts. The FASTER interrogation method guides an observer through a comprehensive review of the FW aircraft's components and their characteristics, capabilities, and features. Figures 4-41 through 4-46 on pages 79 through 84 associate each FASTER component with its most common variations in FW aircraft.

4-74. Although FW aircraft have the same basic features, they can differ in design, size, and location. The differences can distinguish and ultimately lead an observer to identify one aircraft from another. Observers isolate the individual components of an aircraft and interrogate their characteristics, capabilities, and features to recognize and identify the aircraft accurately.

Frame (Fuselage)

4-75. The frame (or the fuselage) designs vary in purpose, capability, and function for each aircraft. Observers analyze the frame component's following characteristics, capabilities, and features (see figure 4-41):

- Shape and width.
- Canopy or cockpit—Various sizes and design configurations.
- Engine(s) or means of propulsion—Various configurations involve placement, number of engines, and type of engine (jet or propeller).

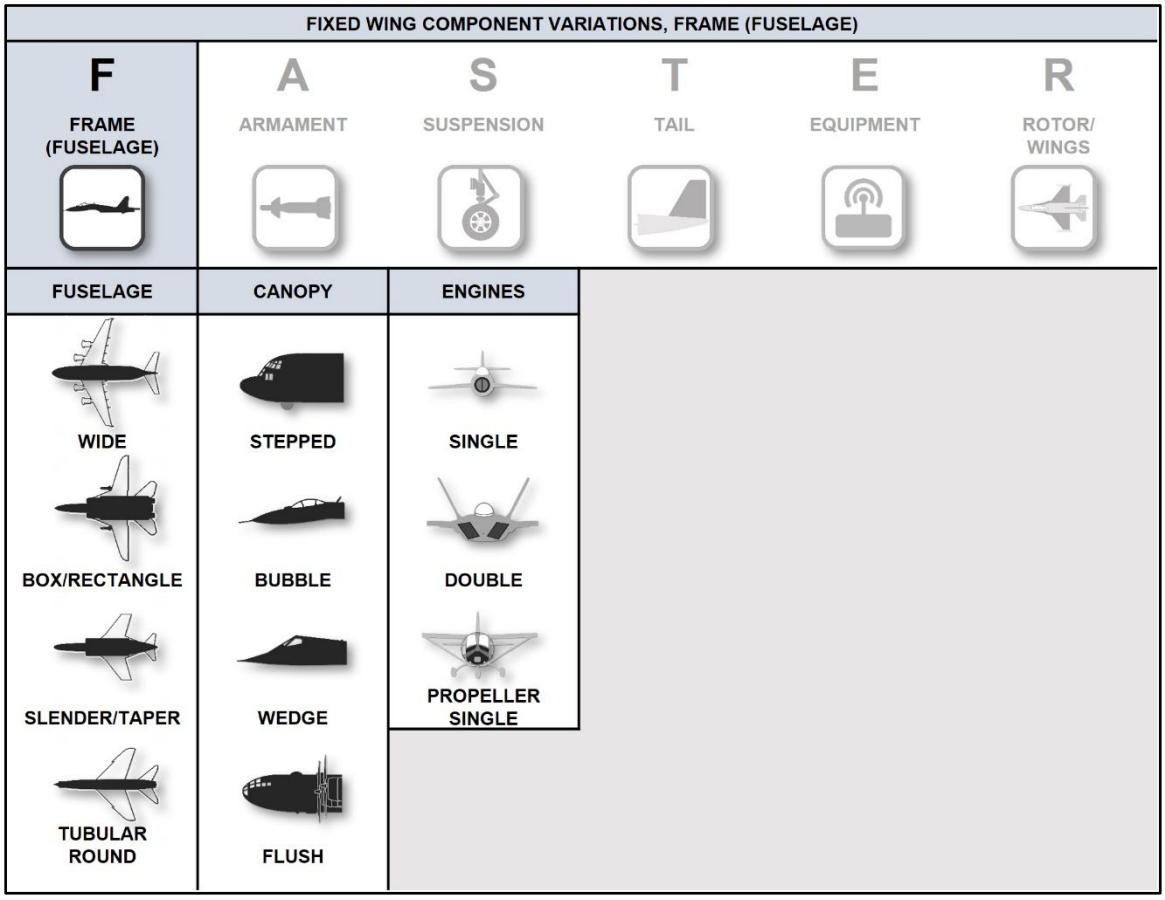


Figure 4-41. Fixed-wing aircraft fuselage variations, example

Armament

4-76. The armament of a FW aircraft contributes to the understanding of the aircraft's role and function. The armament refers to the weapons, munitions, and payload (see figure 4-42). These include the following:

- Machine guns—Typically for employment in slower moving aircraft.
- Cannons—Larger caliber for which muzzle velocity greatly exceeds the FW aircraft's tactical speed.
- Air-to-air missiles—For defeating threat aircraft.
- Air-to-ground missiles—Guided munitions for defeating threat equipment, vehicles, structures, and fortifications.
- Air-to-ground bombs—Unguided munitions for general purpose.

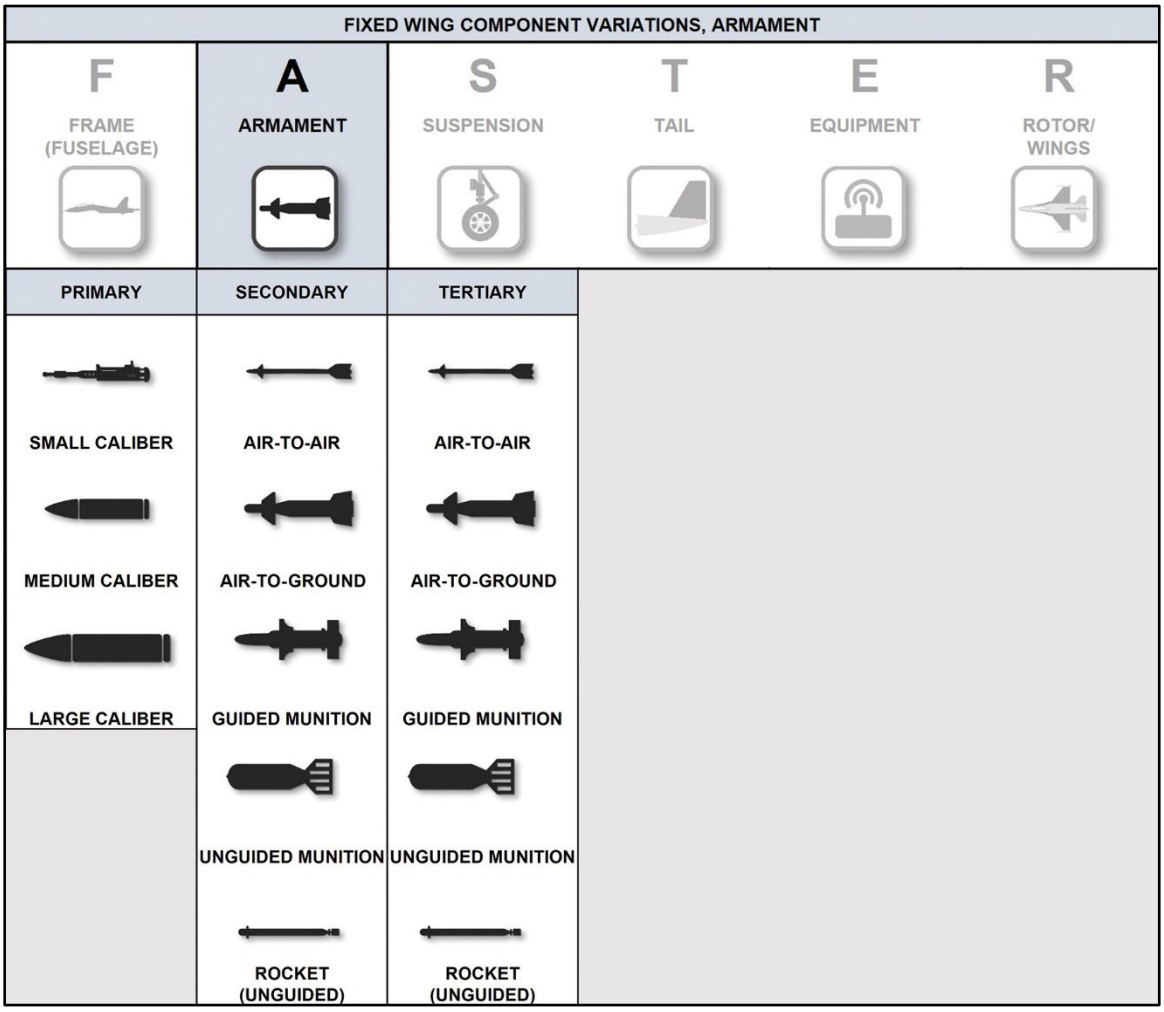


Figure 4-42. Fixed-wing aircraft armament variations, example

Suspension

4-77. Suspension on the FW aircraft refers to the type and configuration of landing gear (see figure 4-43). The most common types of suspension for military aircraft follow:

- Tricycle gear—Employs a third wheel located on the nose of the aircraft (nosewheel) in addition to the two or more main wheels slightly aft of the center of gravity.
- Conventional landing gear—Employs a third rear-mounted wheel (tailwheel) in addition to two main wheels forward of the center of gravity.
- Body or belly gear—Employs additional wheels (usually a dual-wheel assembly) located in the center portion of larger aircraft and retracting forward into a bay in the fuselage.

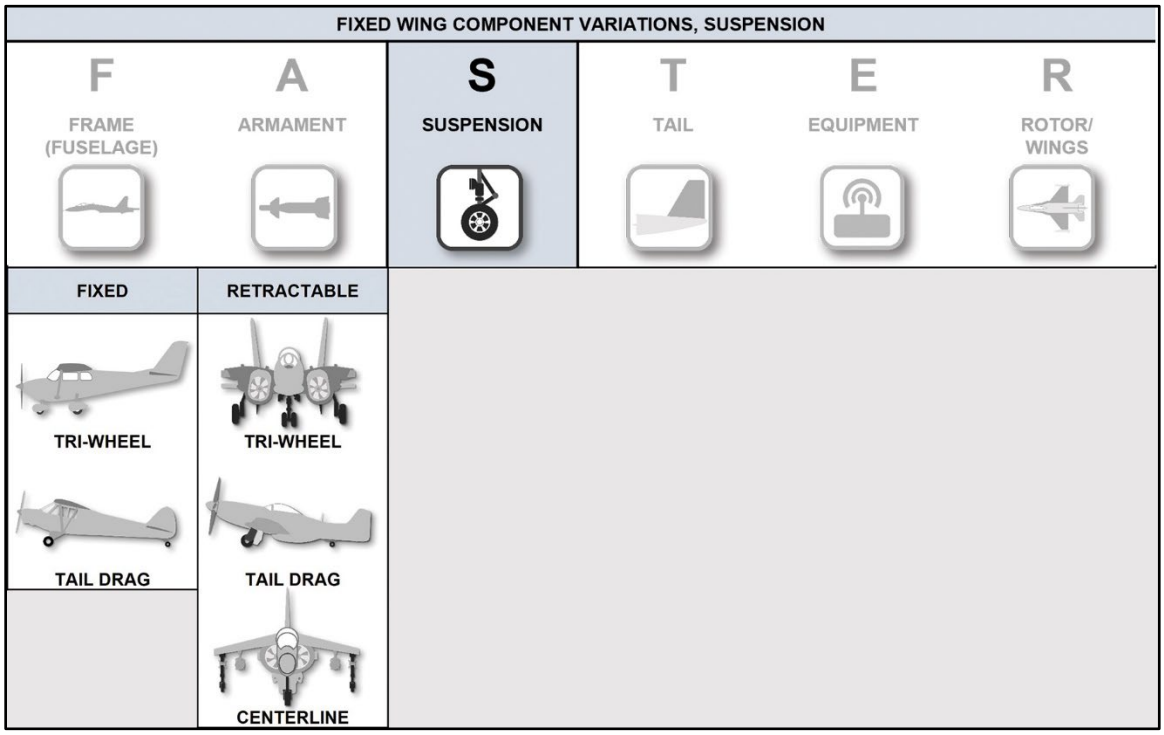


Figure 4-43. Fixed-wing aircraft suspension variations, example

Tail

4-78. The tail (tail assembly or empennage) is used to mount control surfaces for flight configuration that work cooperatively with those control surfaces on other components. The FASTER interrogation method has observers analyze the aircraft tail component by four distinct characteristics (see figure 4-44):

- Design (shape) of vertical stabilizer.
- Number of vertical stabilizers present.
- Design (shape) of horizontal stabilizer.
- Mounting position of horizontal stabilizer.

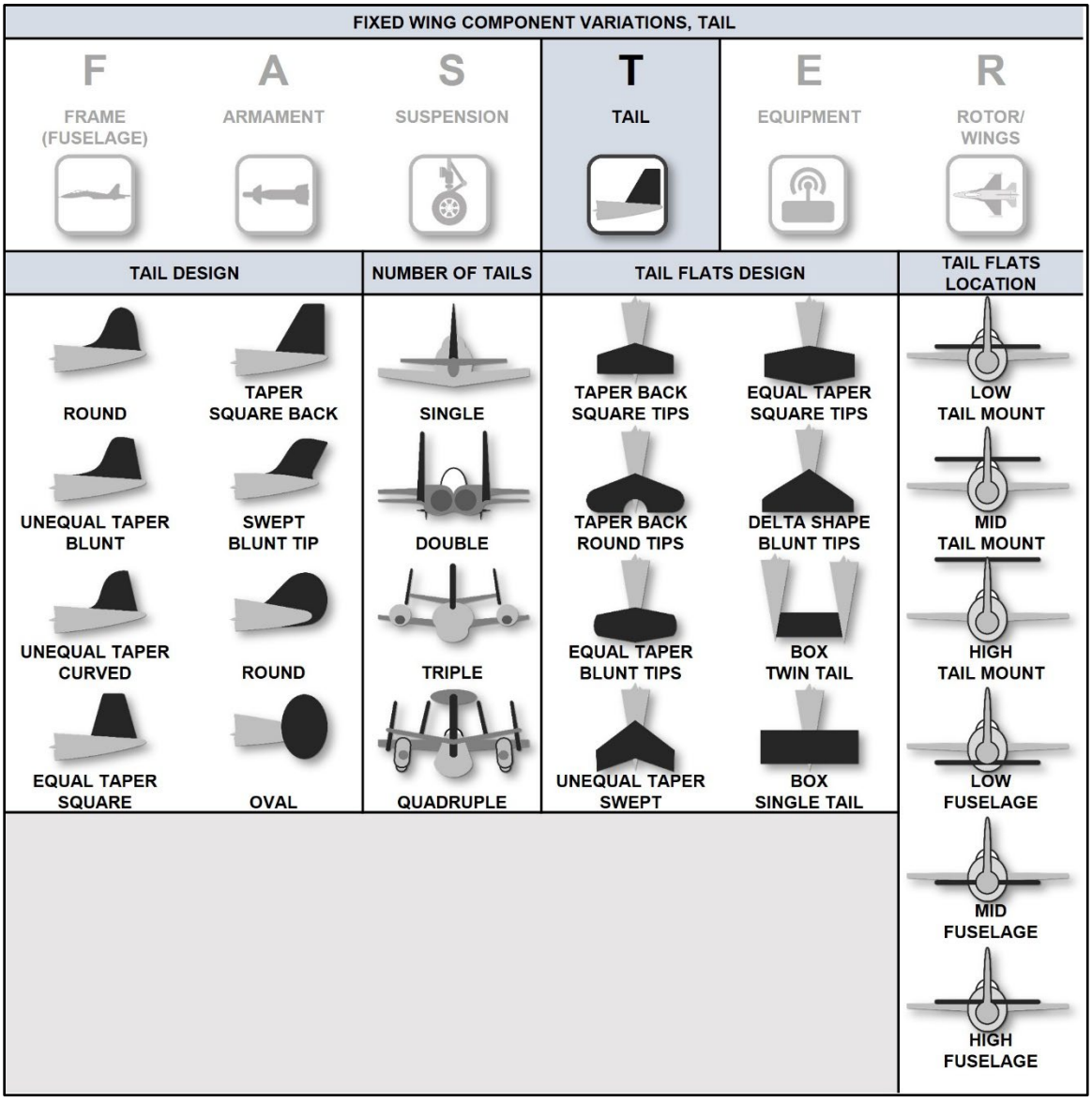


Figure 4-44. Fixed-wing aircraft tail variations, example

Equipment

4-79. Equipment for FW aircraft includes the visible attachments or the ancillary items attached, secured, or mounted to the aircraft that perform specific roles, tasks, or functions. An aircraft's installed equipment can prove difficult to see during flight. Figure 4-45 presents informative items for analyzing the capabilities and features of FW aircraft. For the sake of simplicity, figure 4-45 does not show all possible equipment options, but those an observer can view at a distance. Some of these items are—

- External fuel pods.
- Electronic countermeasures.
- Radar systems.
- Sensors or optics for reconnaissance.

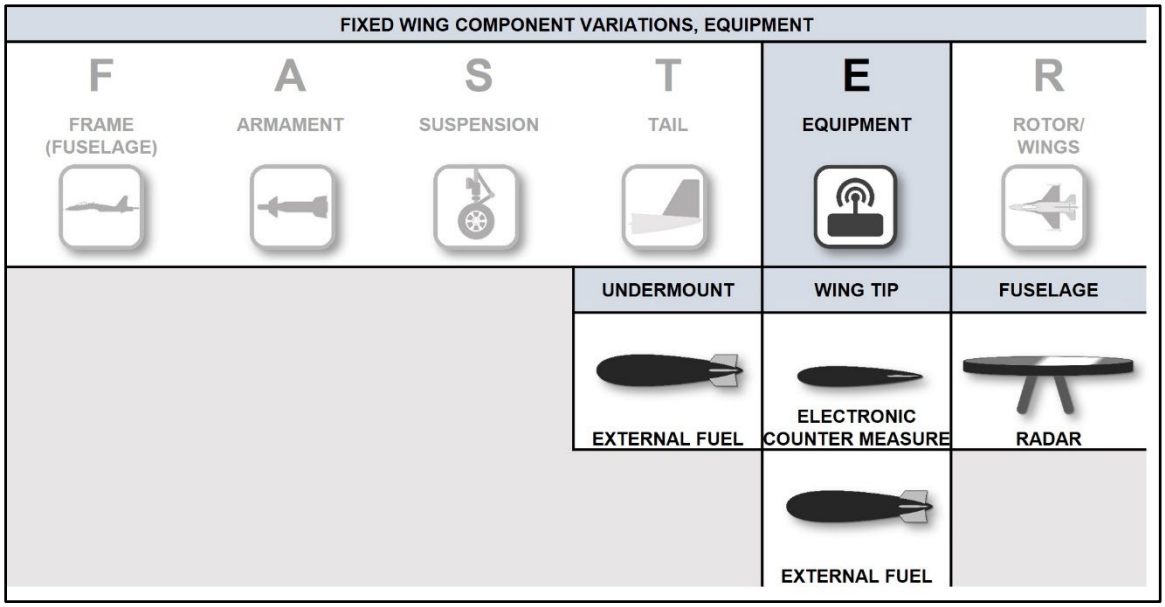


Figure 4-45. Fixed-wing aircraft equipment variations, example

Wings

4-80. Observers analyze the characteristics of the wings on a FW aircraft. Figure 4-46 provides examples of the following characteristics:

- Shape and taper—The overall appearance of the wing from a top view.
- Mounting position—The point on the fuselage where the wings are situated (above, below, or right at the center).
- Slant—An upward or downward angle of the wings from a front view.
- Engines—Mounting positions, number of engines, and type of engine (jet or propeller).

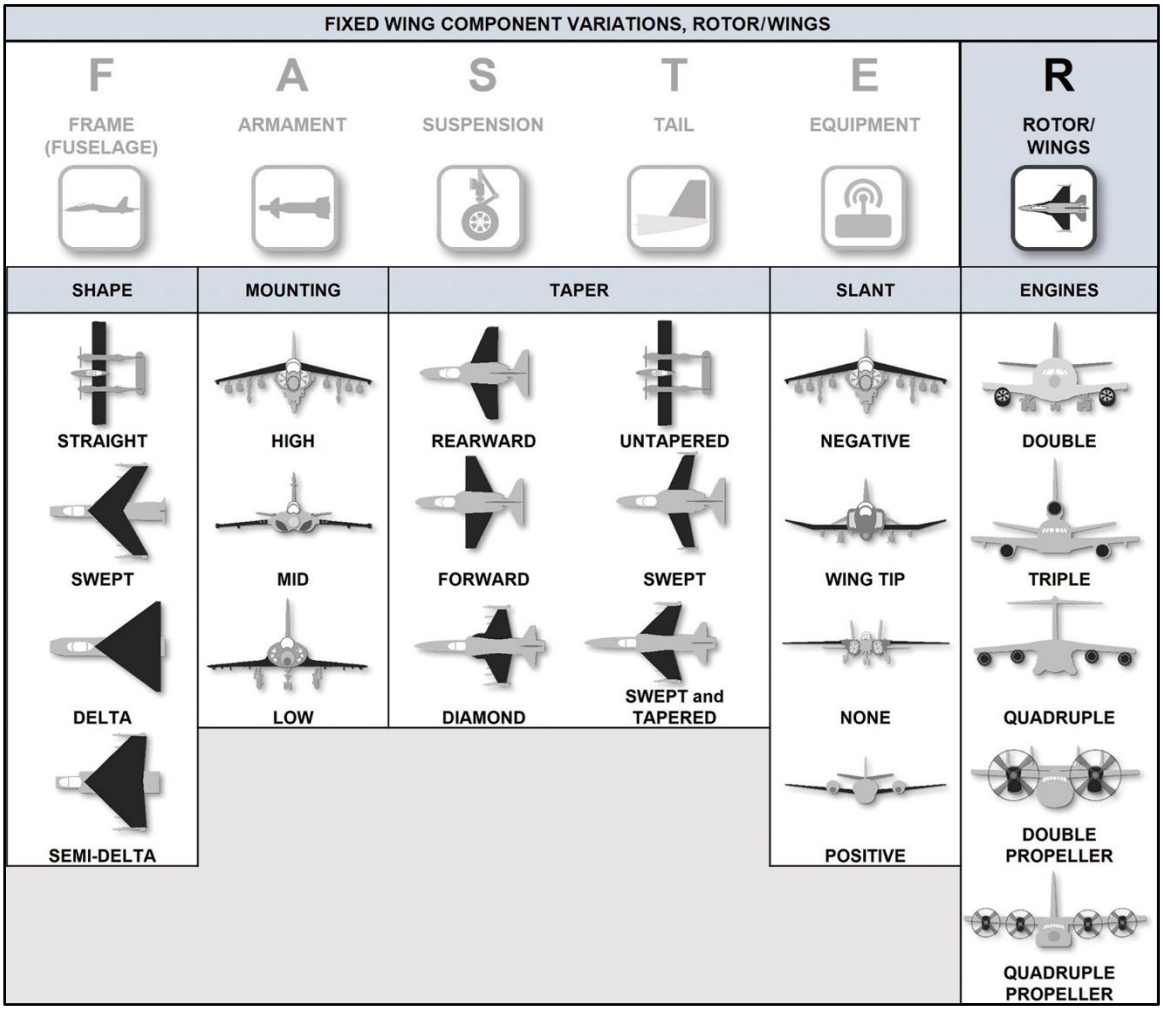


Figure 4-46. Fixed-wing variations, example

Variable Geometry

4-81. Variable geometry aircraft have the same components as FW aircraft. For the sake of brevity, this section will address the wings only (or the rotors or wings FASTER component). Identifiable wing characteristics for military variable geometry aircraft include the following (see figure 4-47):

- Canards or strakes—Additional wing control surfaces located forward of the main wing.
- Shape and taper—The overall appearance of the wing from a top view.
- Mounting position—The point on the fuselage where the wings are situated (above, below, or right at the center).
- Slant—An upward or downward angle of the wings from a front view.

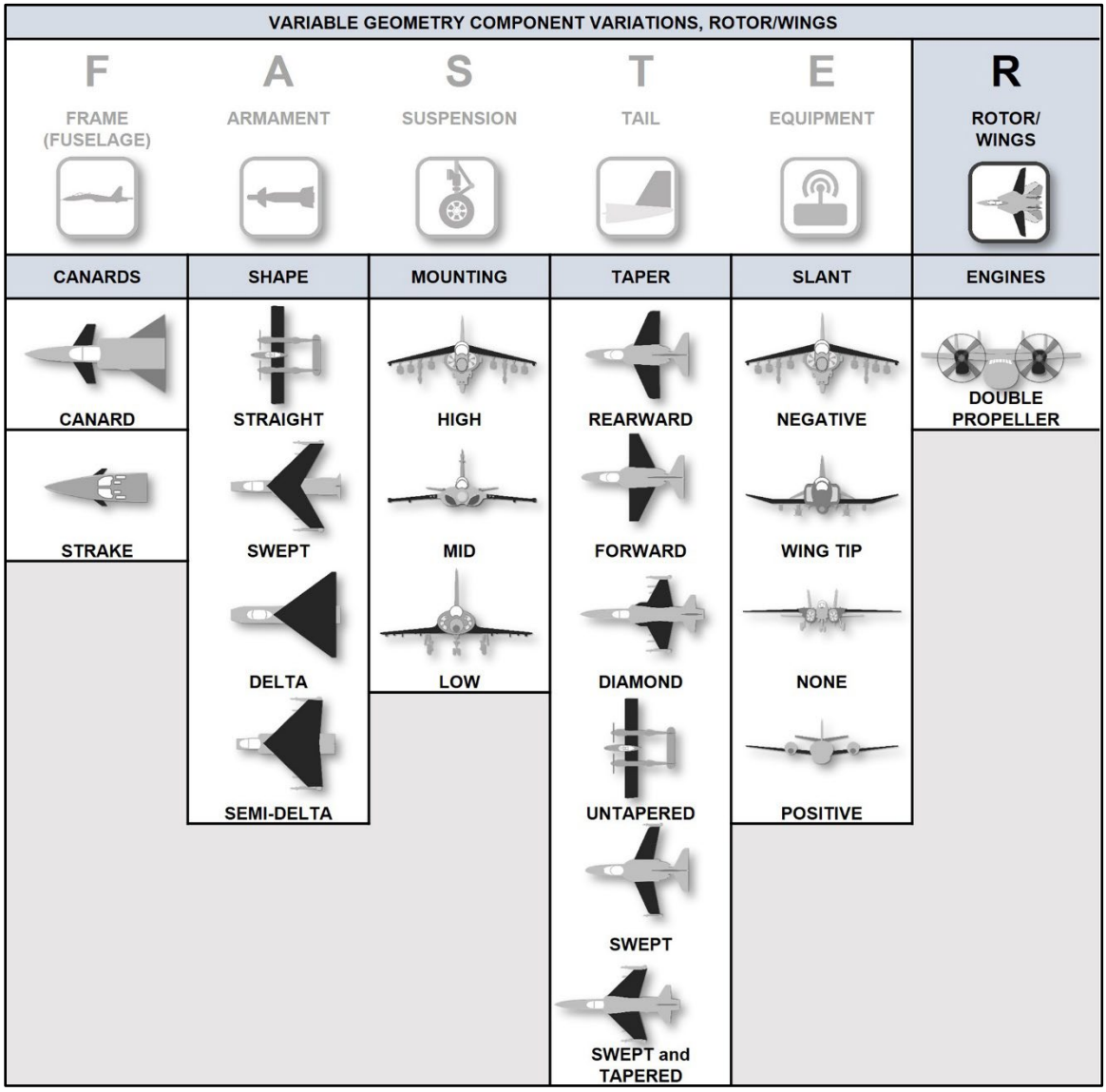


Figure 4-47. Variable geometry aircraft wing variations, example

4-82. Throughout the FASTER interrogation method, observers scrutinize the specific parts of aircraft. To provide a general overview of these parts, this section portrays them by their associated types of variable geometry aircraft. Many variable geometry aircraft terms are common across all types. Figures 4-48 through 4-50 on pages 86 through 88 provide examples of common components of variable geometry aircraft and their characteristics, capabilities, and features from the front, top, and side views, respectively.

4-83. Rules of thumb for the proper application of visual cues follow:

- Components—Inform the recognition of the target description.
- Characteristics—Inform the identification of the aircraft model or common name.
- Capabilities—Inform the identification of the variant, although they, too, are useful in identifying the aircraft model or common name.
- Features—Specifically indicative of changes in variants for additional information.

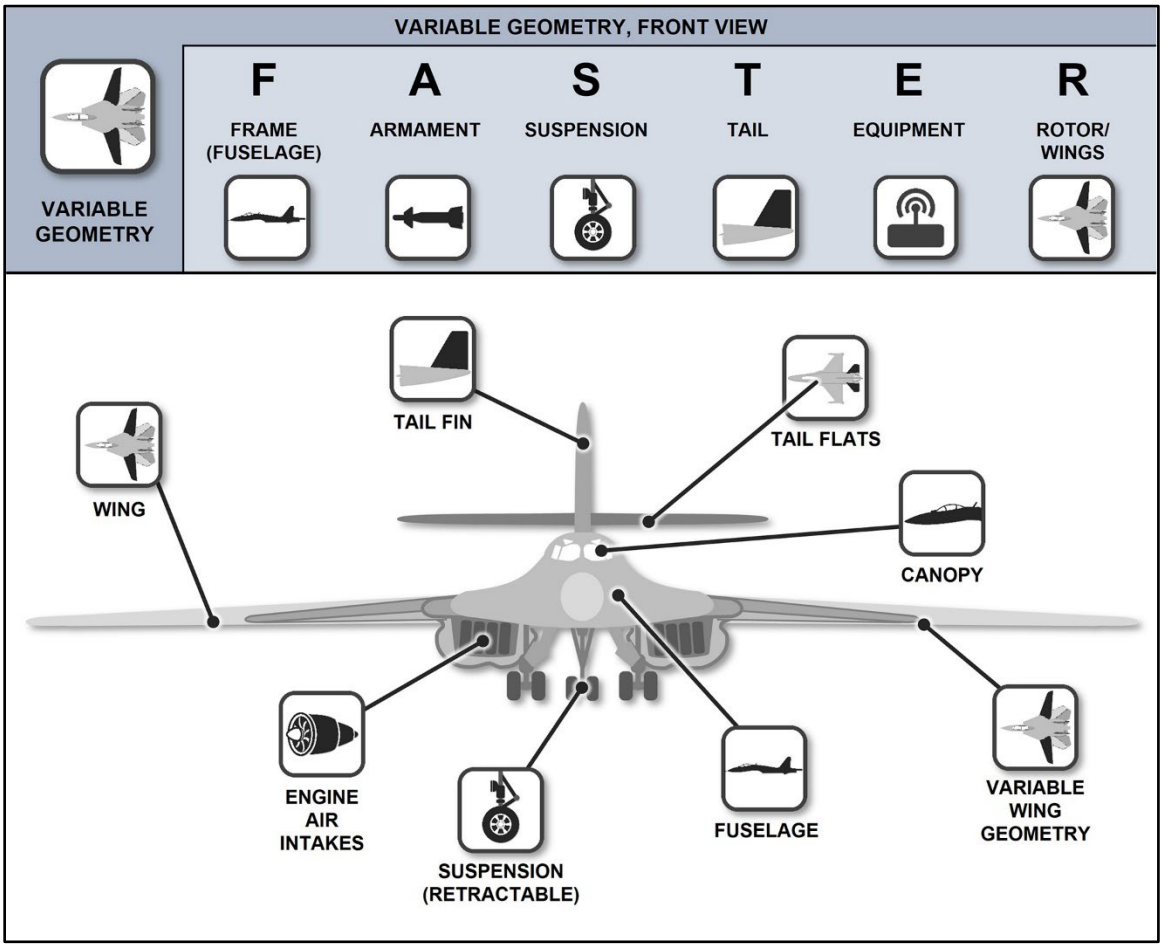


Figure 4-48. Interrogation of variable geometry aircraft, front view

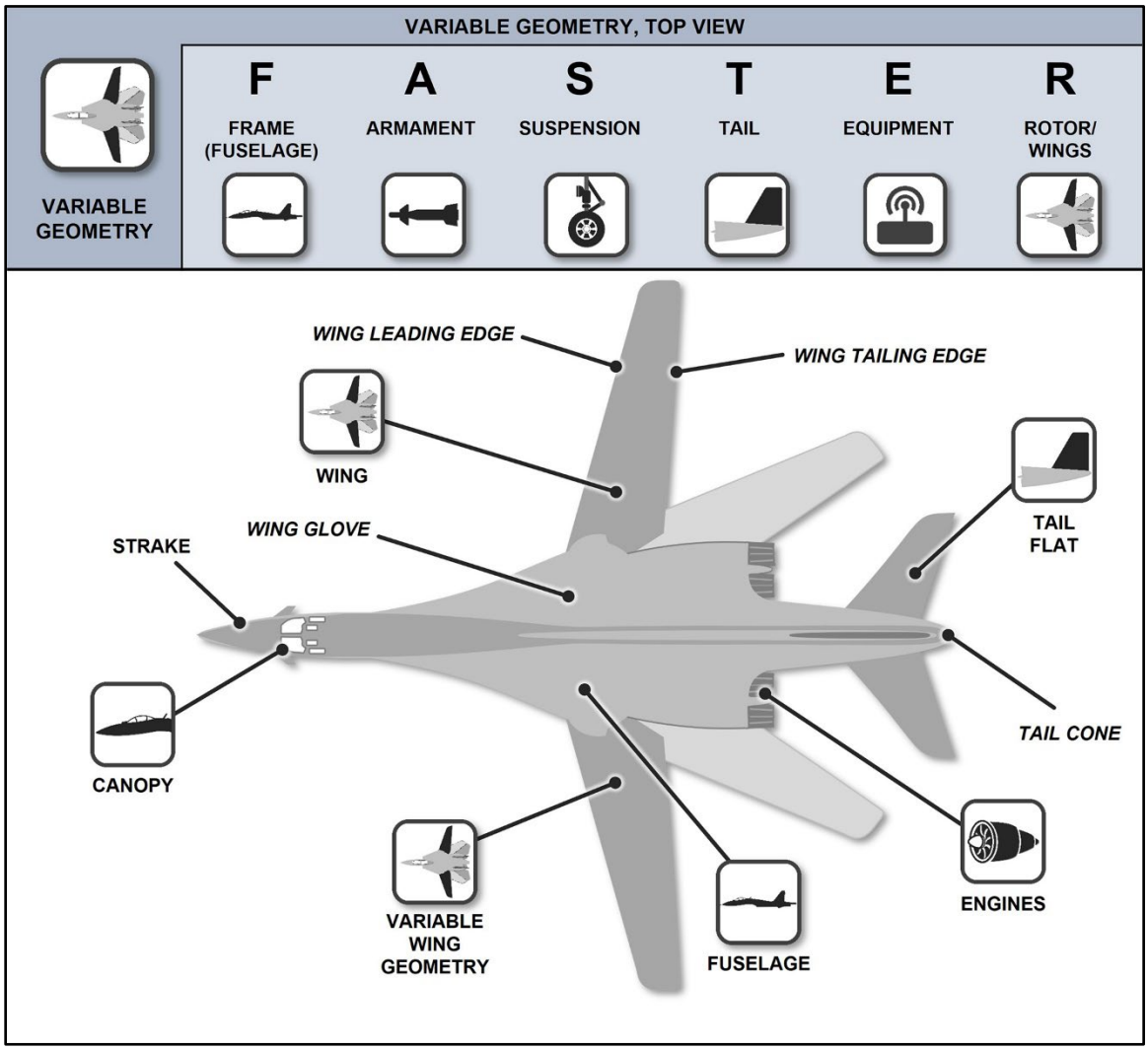


Figure 4-49. Interrogation of variable geometry aircraft, top view

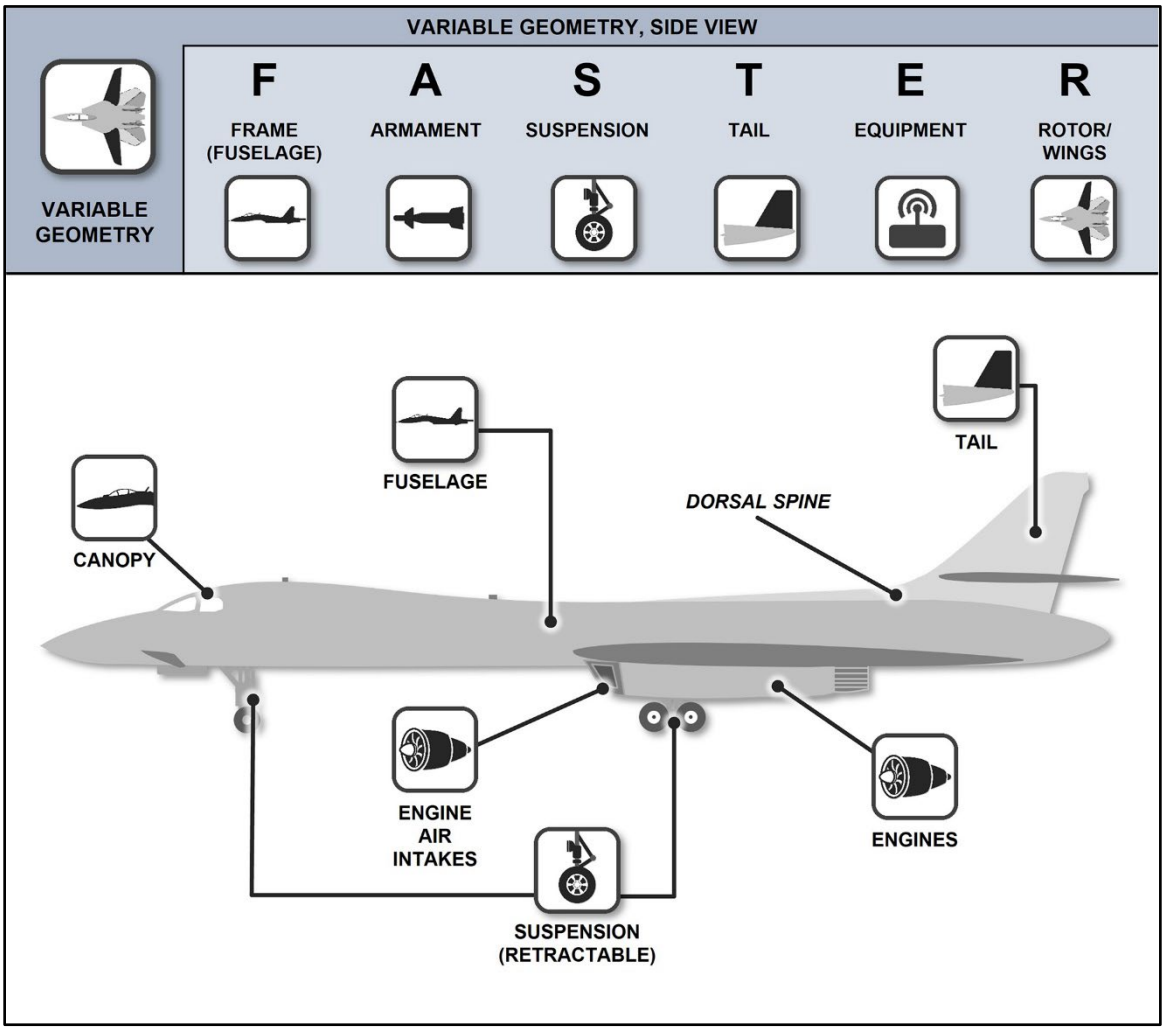


Figure 4-50. Interrogation of variable geometry aircraft, side view

Rotary-wing

4-84. Observers review the components for their characteristics and capabilities to identify the model of various RW aircraft. They analyze the capabilities and features to identify the variant. Not all variants (to base models) are identifiable from visual cues, particularly at a distance.

4-85. To provide a general overview of these parts, this section portrays them by their associated types of RW aircraft. Many RW aircraft terms are common across all types. Figures 4-51 through 4-53 on pages 89 through 91 are examples of common components of RW aircraft and their characteristics, capabilities, and features from the front, isometric, and side views, respectively.

4-86. Rules of thumb for the proper application of visual cues follow:

- Components—Inform the recognition of the target description.
- Characteristics—Inform the identification of the aircraft model or common name.
- Capabilities—Inform the identification of the variant, although they, too, are useful in identifying the aircraft model or common name.
- Features—Specifically indicative of changes in variants for additional information.

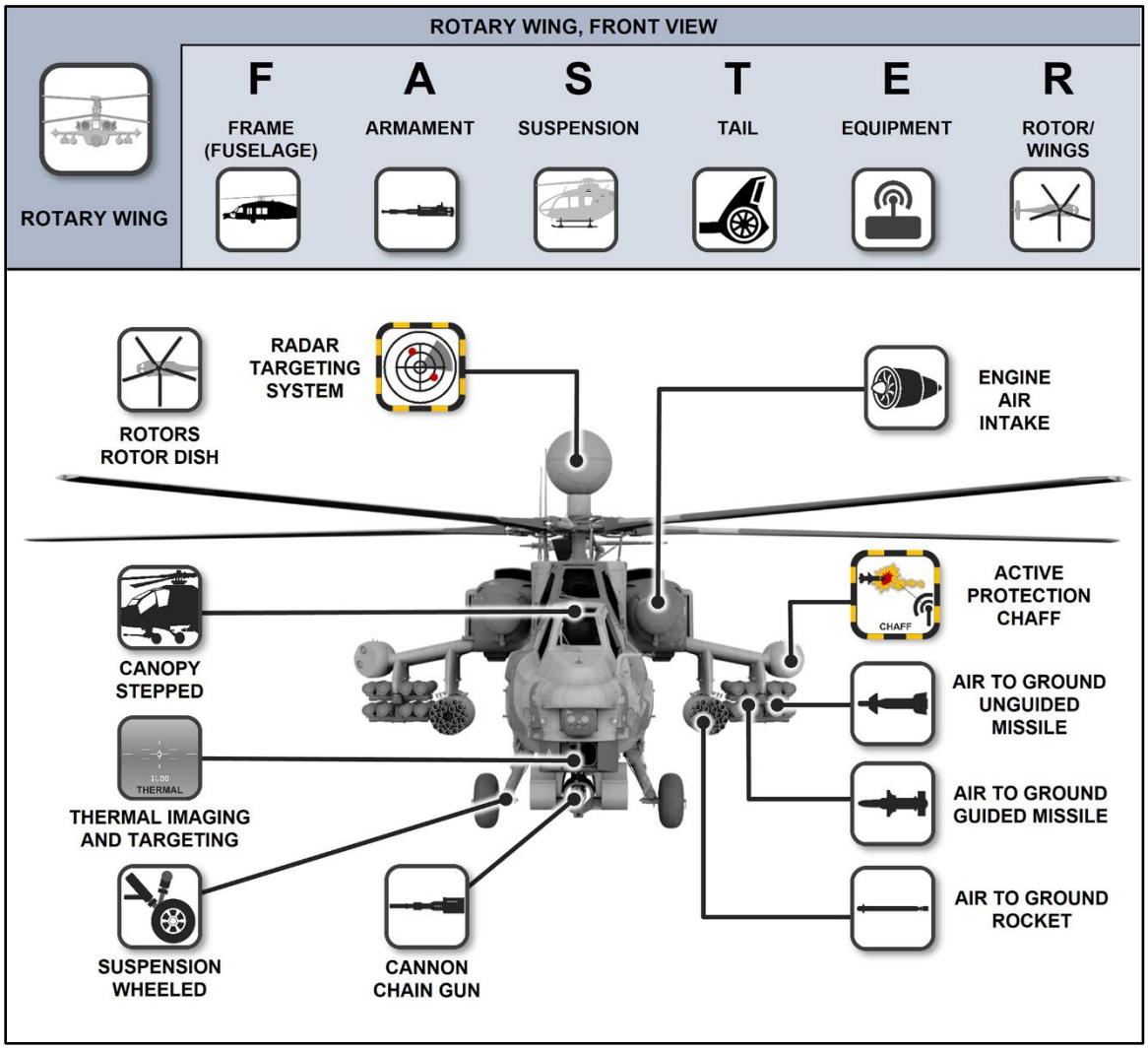


Figure 4-51. Interrogation of rotary-wing aircraft, front view

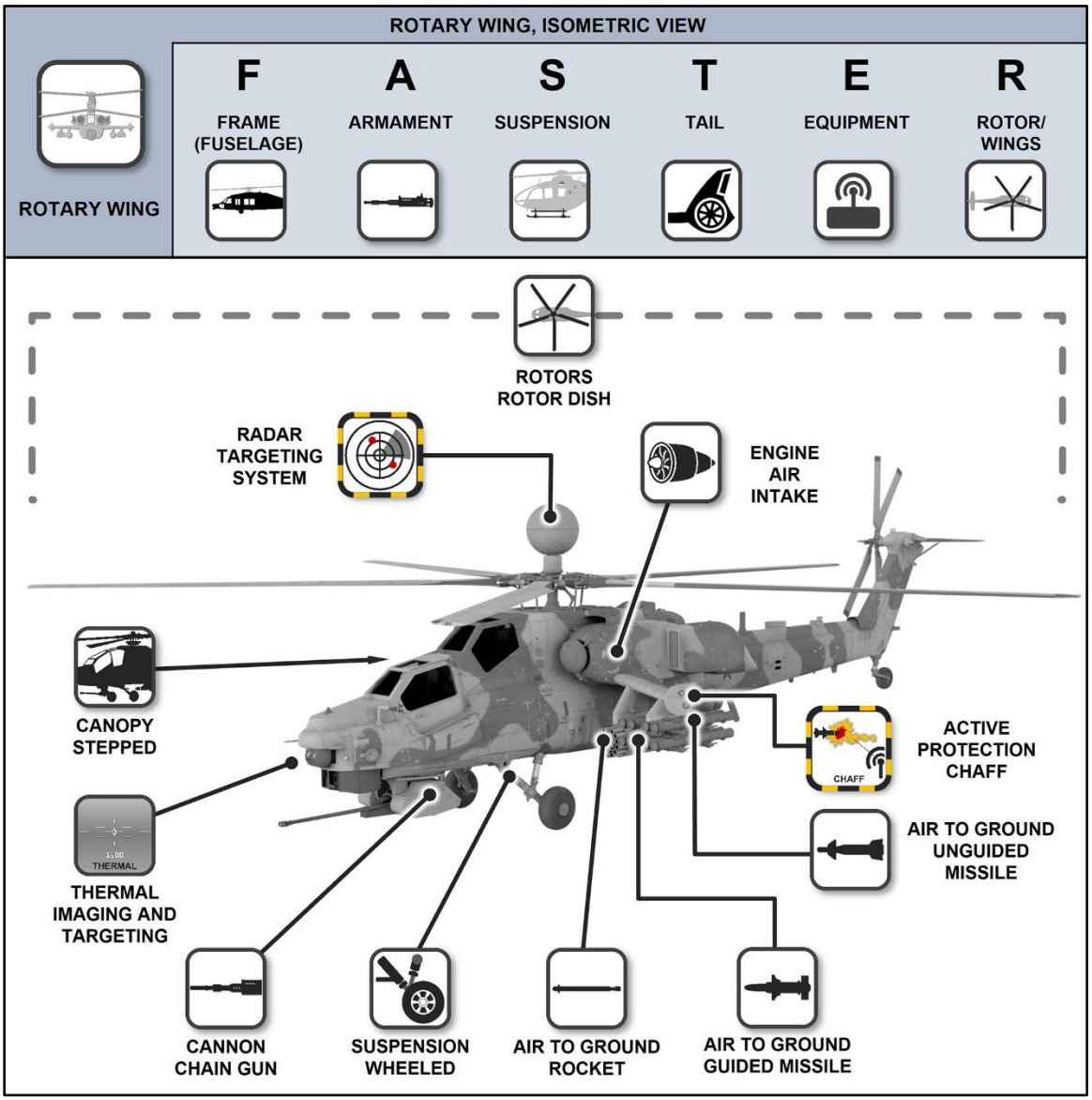


Figure 4-52. Interrogation of rotary-wing aircraft, isometric view

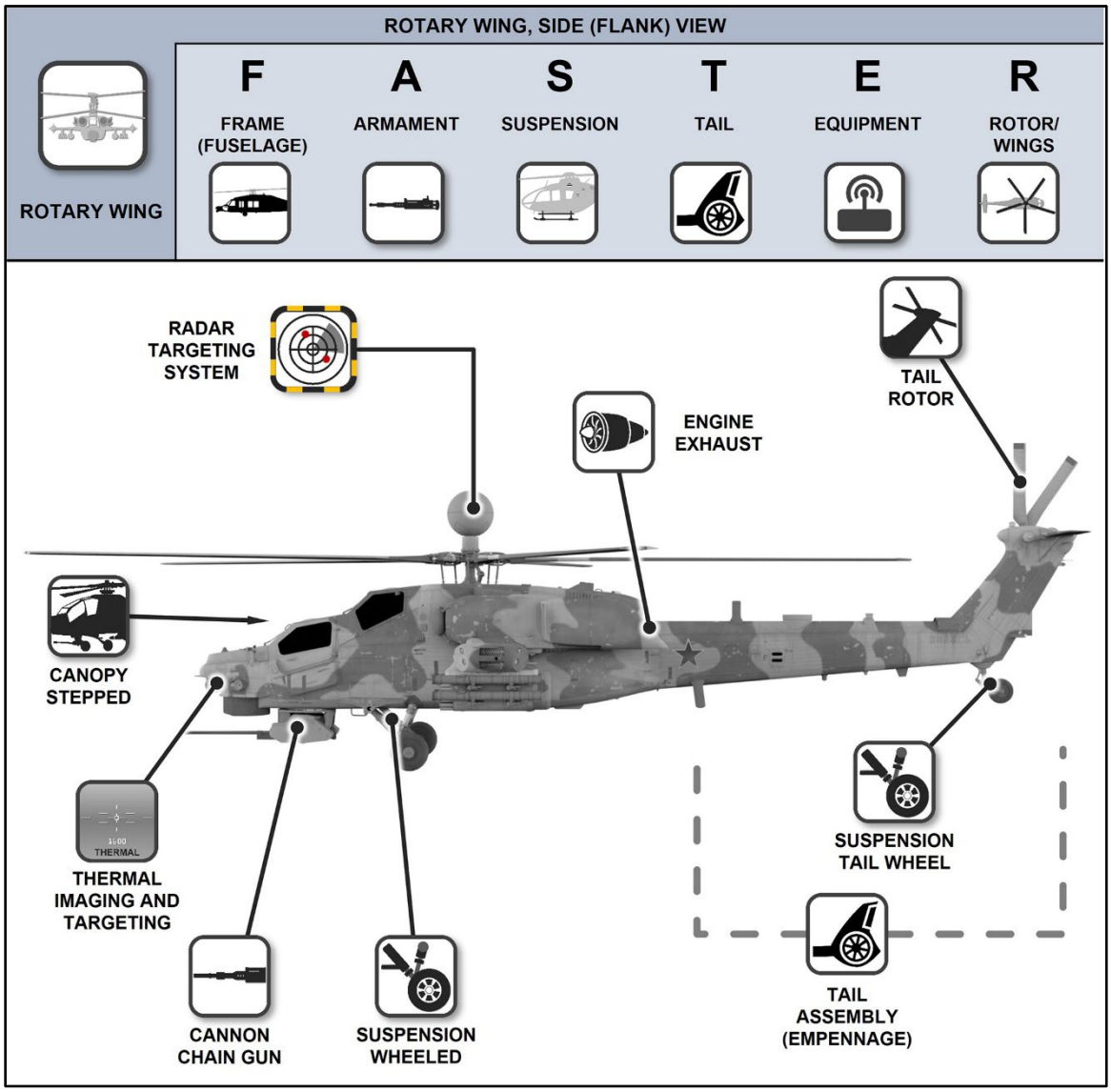


Figure 4-53. Interrogation of rotary-wing aircraft, side view

4-87. All aircraft are built with the same basic design but with various configurations or layouts. The FASTER interrogation method guides an observer through a comprehensive review of the RW aircraft's components and their characteristics, capabilities, and features. Figures 4-54 through 4-59 on pages 92 through 97 associate each FASTER component with its most common variations in RW aircraft.

4-88. Although RW aircraft have the same basic features, they can differ in design, size, and location. The differences can distinguish and ultimately lead an observer to identify one aircraft from another. Observers isolate the individual components of an aircraft and interrogate their characteristics, capabilities, and features to recognize and identify the aircraft accurately.

Frame (Fuselage)

4-89. The frame (or the fuselage) designs vary in purpose, capability, and function for each aircraft. Observers analyze the frame component's following characteristics, capabilities, and features (see figure 4-54):

- Shape and width.
- Canopy or cockpit—Various sizes and design configurations.
- Engines—Various configurations include placement, number of engines, and type of engine (jet, turbine, piston, or propeller).

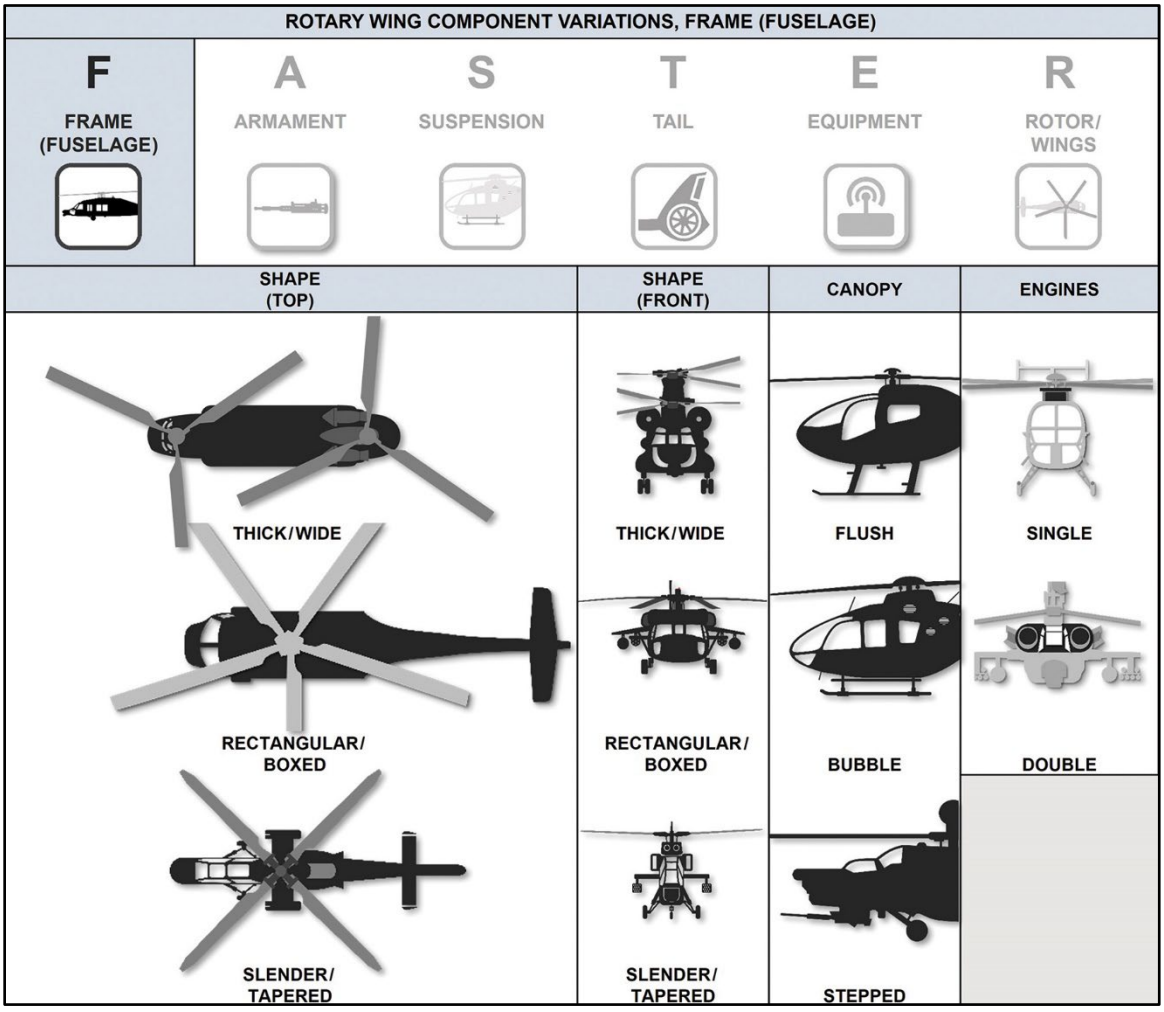


Figure 4-54. Rotary-wing aircraft fuselage variations, example

Armament

4-90. The armament of an RW aircraft contributes to the understanding of the aircraft's role and function. The armament refers to the weapons, munitions, or payload (see figure 4-55). These include the following:

- Machine guns—Typically for employment in slower moving aircraft.
- Cannons—Larger caliber for which muzzle velocity greatly exceeds the RW aircraft's tactical speed.
- Air-to-air missiles—For defeating threat aircraft.
- Air-to-ground missiles—Guided munitions for defeating threat equipment, vehicles, structures, or fortifications.
- Air-to-ground bombs—Unguided munitions for general purpose.

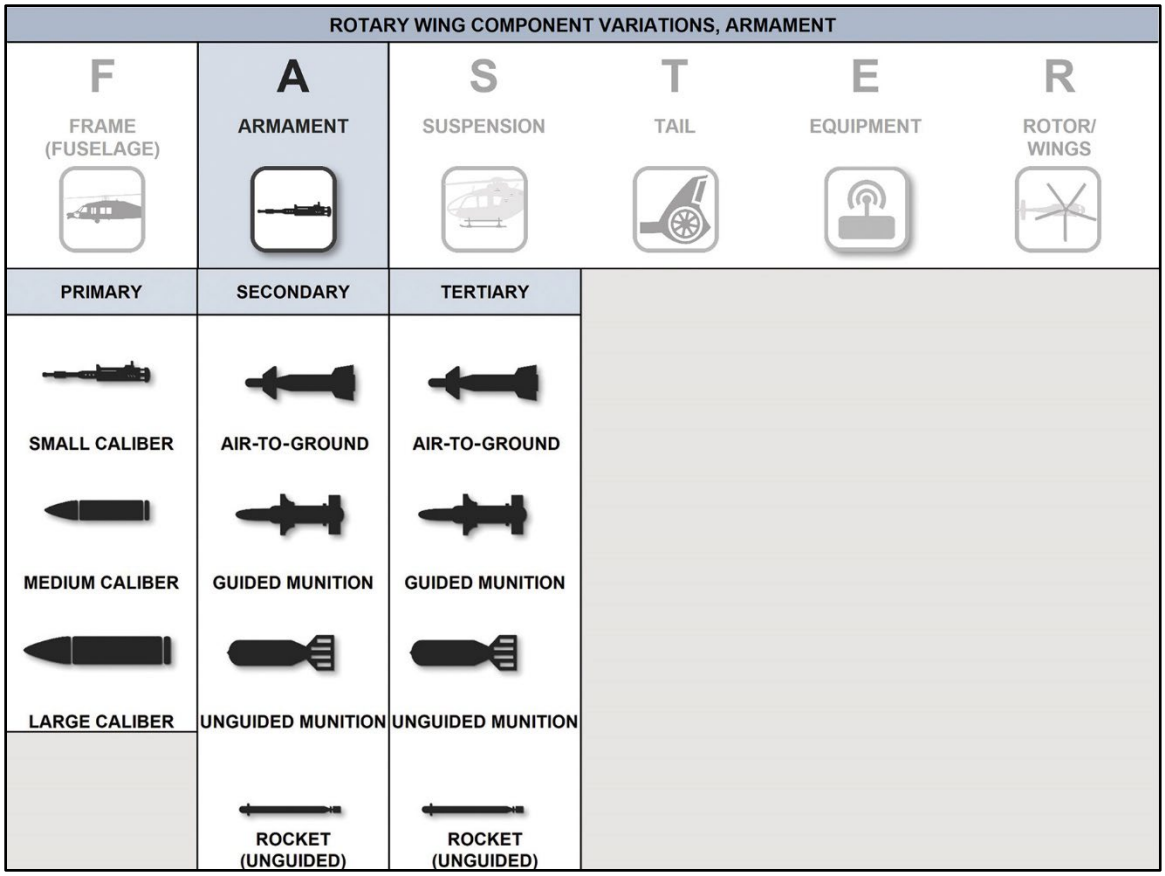


Figure 4-55. Rotary-wing aircraft armament variations, example

Suspension

4-91. Suspension on the RW aircraft refers to the type and configuration of landing gear (see figure 4-56). For military RW aircraft, the most common types of suspension are—

- Tricycle gear—Employs a third wheel located on the nose of the aircraft (nosewheel) in addition to the two or more main wheels slightly aft of the center of gravity.
- Conventional landing gear—Employs a third rear-mounted wheel (tailwheel) in addition to two main wheels forward of the center of gravity.
- Body or belly gear—Employs additional wheels (usually a dual-wheel assembly) located in the center portion of larger aircraft and retracting forward into a bay in the fuselage.

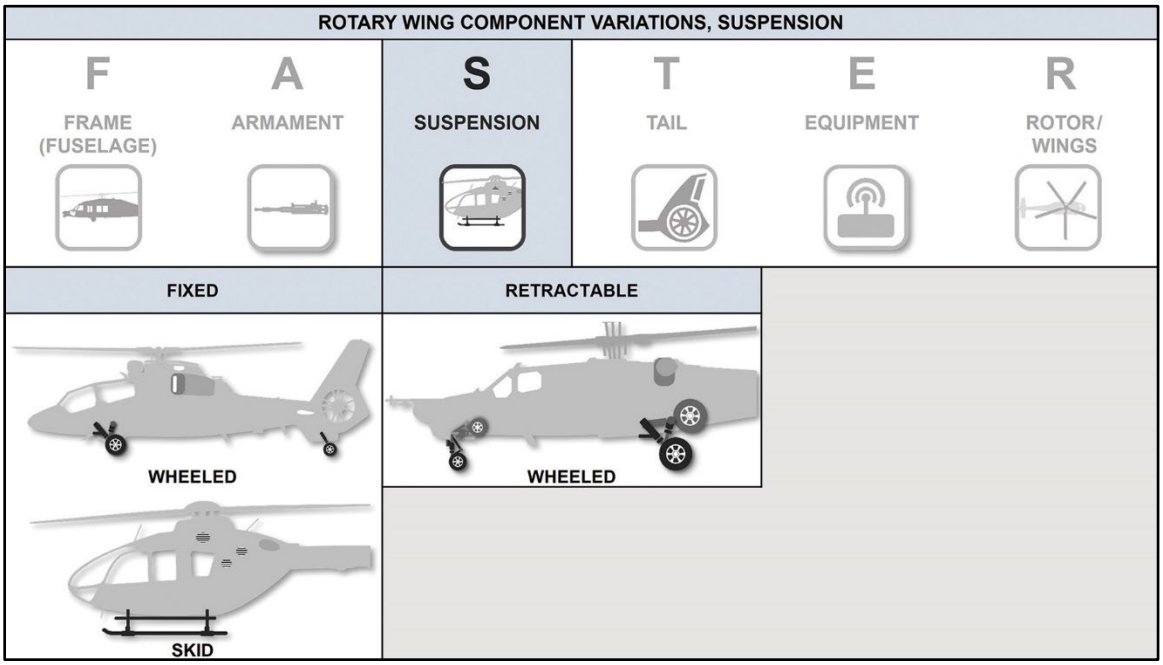


Figure 4-56. Rotary-wing aircraft suspension variations, example

Tail

4-92. The tail (tail assembly or empennage) is used to mount control surfaces for flight configuration that work cooperatively with those control surfaces on other components. The FASTER interrogation method has observers analyze the aircraft tail component by four distinct characteristics as follows (see figure 4-57):

- Type of tail rotor, if present.
- Number of vertical stabilizers, if present.
- Mounting position of tail assembly, if present.
- Design of horizontal stabilizers, if present.

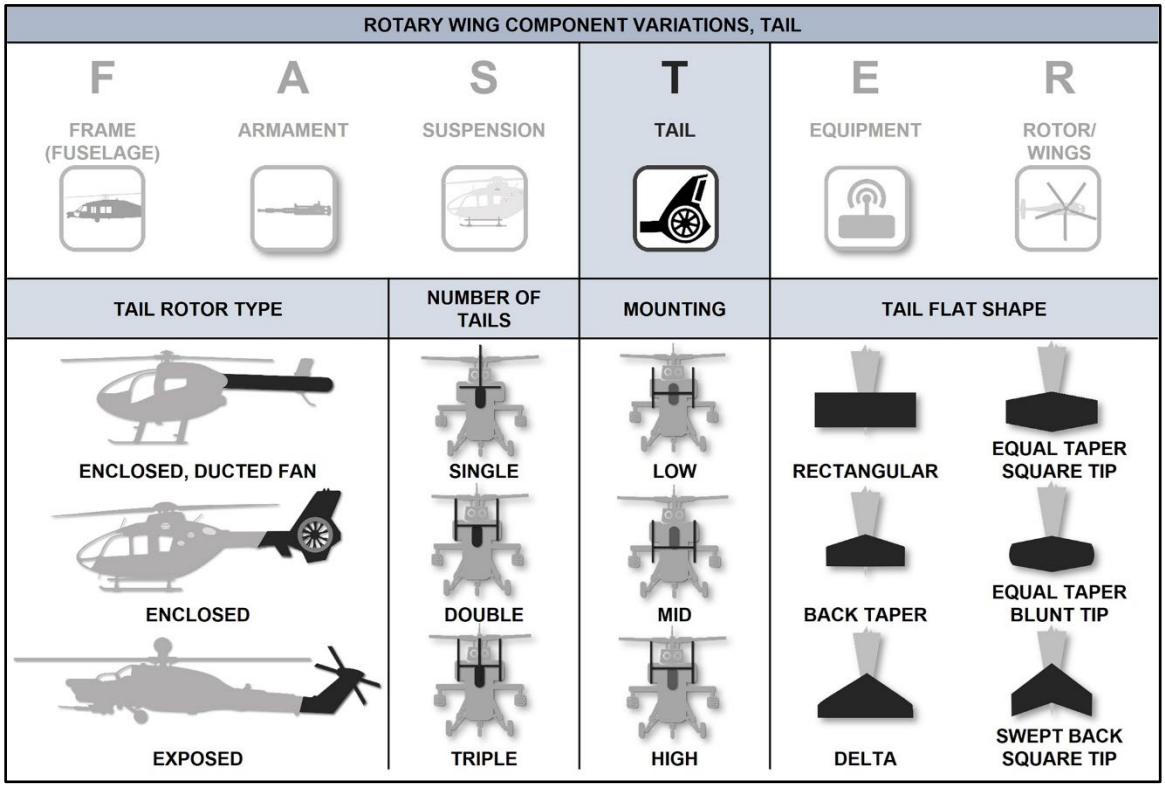


Figure 4-57. Rotary-wing aircraft tail variations, example

Equipment

4-93. Equipment for RW aircraft includes the visible attachments or the ancillary items attached, secured, or mounted to the aircraft that perform specific roles, tasks, or functions. An aircraft's installed equipment can prove difficult to see during flight. Figure 4-58 presents informative items for analyzing the capabilities and features of RW aircraft. For the sake of simplicity, the figure does not show all possible equipment options, but those an observer can view at a distance. Some of these items are—

- External fuel pods.
- Electronic countermeasures.
- Radar systems.
- Sensors or optics for reconnaissance.

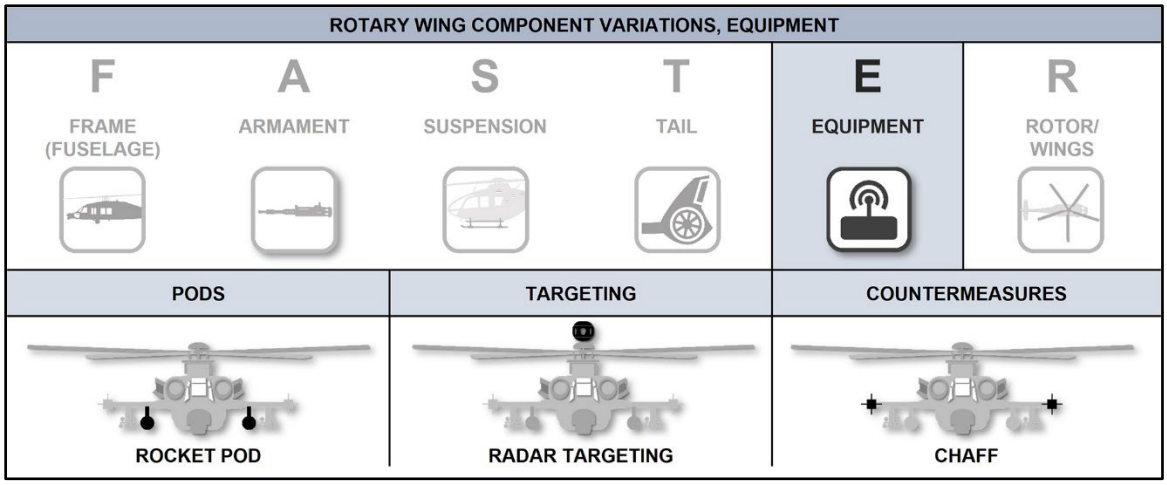


Figure 4-58. Rotary-wing aircraft equipment variations, example

Rotors

4-94. Observers analyze the characteristics of the rotors on an RW aircraft. Figure 4-59 provides examples of the following characteristics:

- Single rotor—For single- and twin-engine configurations.
- Double rotor—To provide sufficient lift and operating surfaces for the aircraft.
- Coaxial—Two rotors working in opposite directions on a single, main hub.

Note. Double rotor systems typically do not require counter-rotation tail rotor assemblies, and coaxial systems never require them.

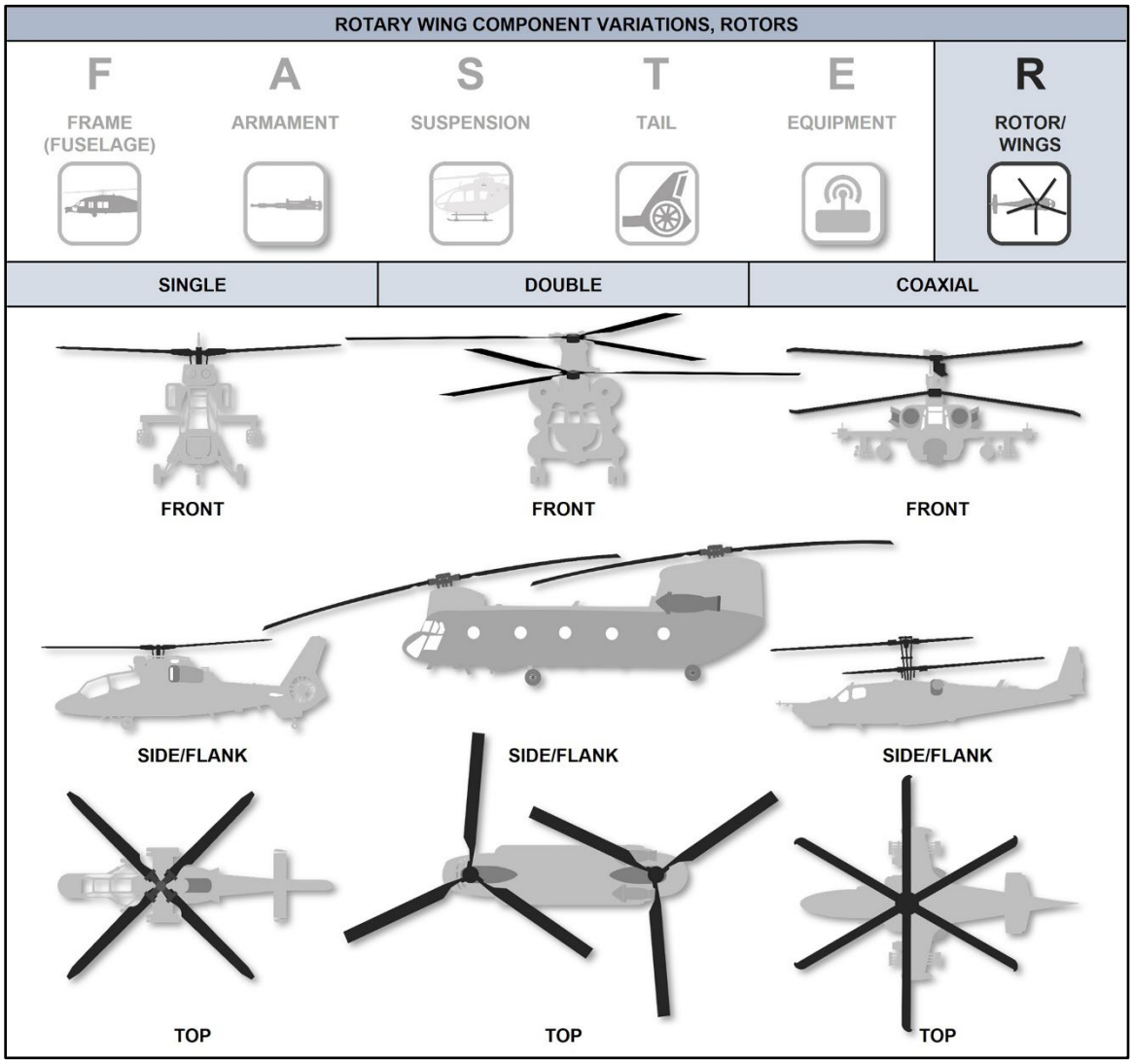


Figure 4-59. Rotary-wing aircraft rotor variations, example

DISCRIMINATE THE HOSTILE INTENT

4-95. After recognizing the potential threat, assessing the threat or danger level it presents to the friendly force, and identifying any vehicle and aircraft models and variants, the firer or leader continues interrogating the potential threat to discriminate its hostile intent. ***Discrimination*** **is the determination of a target as friend, foe, neutral, noncombatant, or unknown.**

4-96. The observer does not generally complete the discrimination phase of RAID. Discrimination is a critical leader task for sergeants and above in gunner, team leader, and senior positions. It has the leader interrogate the detected contact for positive identification. The process ends when the leader can clearly discriminate the contact as friend, foe, neutral, noncombatant, or unknown. This determination directly supports any pending engagement decision.

DANGER

The absence of cooperative and non-cooperative target identification does not necessarily mean the detected contact is a foe. It could be a neutral or friendly element lacking these forms of recognition, identification, and fratricide prevention equipment.

4-97. Leaders interrogate each detected contact for visual or digital cues related to the hostile intent of each. They actively look for markings, systems, placards, flags, or other discriminable evidence of apparent hostile intent, regardless of whether the detected contact's threat classification indicates an inability to harm the friendly force with direct or indirect fires.

4-98. The following defines the hostile intent categories that are the outcomes of successful discrimination:

- Friend—Any U.S. Force, allied force, or U.S. or allied element, vehicle, aircraft, or piece of equipment jointly engaged in combat operations with an enemy in a theater of operations.
- Foe (enemy combatant)—Any individual, vehicle, aircraft, system, or element engaged in antagonistic activities against a friendly force.
- Neutral or noncombatant—Personnel, organizations, or agencies not directly engaged in combat operations include most individuals in a theater of operations, such as the following:
  - Medical personnel, chaplains, United Nations observers, and media representatives.
  - American Red Cross or International Red Cross and Red Crescent Movement.
- Unknown—A detected contact incapable of clear discrimination as friend, foe, neutral, or noncombatant and requiring additional interrogation, information, or intelligence prior to an engagement decision.

JOINT CAPABILITIES RELEASE

4-99. Joint Capabilities Release (JCR) is the Army's next generation friendly force tracking system. This upgrade builds on the SA tool Force XXI Battle Command, brigade and below (FBCB2), which is fielded to every brigade combat team in the U.S. Army. FBCB2 consists of computer hardware and software integrated into various platforms at brigade and below. It interconnects platforms through a communications infrastructure called the tactical internet, which includes the enhanced position location and reporting system (also called EPLRS) and the single-channel ground and airborne radio system (SINCGARS). These nets pass SA data and conduct C2. The primary function of FBCB2 is to send and receive automatic position location reports, C2 message traffic, and graphics. The collection, integration, and display of a common operational picture of the battlespace, which is the same at each user's display, provide SA.

4-100. FBCB2 houses a common database with automated friendly positional information. It displays graphics for friendly forces, as well as for known or suspected enemy forces. Collectively, the FBCB2 system generates the friendly operating picture. It displays relevant information, showing the user's location, other friendly forces' locations, observed or templated enemy locations, and all known obstacles. It also provides standardized reports, allowing leaders to disseminate graphic overlays and written OPORDs and FRAGORDs rapidly. The warfighter receives these data pushes from all other battlespace systems to maintain real-time battle information. These battlespace systems draw from the reports and positional data passed from the lower tactical internet to provide information at higher command levels. They push information such as locations of adjacent units, known and templated enemy positions, graphics, and OPORDs to FBCB2 users.

4-101. Though the system works automatically on vehicles equipped to operate on the tactical internet, it does not provide locations to every friendly element in the battlespace. For example, the system will not automatically track a dismounted rifle squad operating at extended ranges from an M2A3. Also, it does not cover any digitally unequipped units or allied or coalition forces operating next to the platoon. FBCB2 allows for the manual insertion of icons for those elements, based on information received from frequency modulation radio reports, but the system will not update the icons in real time. For this reason, the leader cannot rely solely on FBCB2 to clear fires.

Note. Observed enemy force locations, neutral organizations, civilians, FBCB2-unequipped friendly and coalition units, and other battlespace hazards are not automatically updated in FBCB2; changes to these elements' positions required manual updates by an FBCB2 operator.

Joint Capabilities Release System Considerations

4-102. Two types of incursions occur in an area of operations: known and unknown. OPORDs or FRAGORDs cover known incursions into an area of operations. A mission's OPORD or FRAGORD does not cover unknown incursions into an area of operations.

Known Incursions with Compatible Communications

4-103. An element moving into an area of operations establishes identification before entering the area of operations. The detecting unit, upon establishing a visual, confirms identification with either cooperative or non-cooperative target identification and then populates FBCB2 with an appropriate icon. Handoff and tracking of the element and the movement of the icon continue until the element leaves the area of operations. To ensure continued handoff and tracking of the element, the detecting unit coordinates with adjacent units prior to the entrance of the identified element into neighboring areas of operations.

Known Incursions with Incompatible Communications

4-104. Upon establishing a visual, a detecting unit confirms identification with either cooperative or non-cooperative target identification and then populates FBCB2 with an appropriate icon. As necessary, they establish face-to-face contact in accordance with the mission variables of METT-TC (I): mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations. Handoff and tracking of the element and the movement of the icon continue until the element leaves the area of operations. To ensure continued handoff and tracking of the element, the detecting unit coordinates with adjacent units prior to the entrance of the identified element into neighboring areas of operations.

Unknown Incursions

4-105. When units detect objects in the operational environment, such as personnel, vehicles, military equipment, or other objects of potential military significance, they establish and confirm identification and populate appropriate icons into FBCB2. They determine target discrimination and adjust each object's icon to reflect the friendly, foe, or neutral status. As necessary, they move to positive visual identification of an object in accordance with METT-TC (I). Handoff and tracking of any element and the movement of the related icon continue until that element leaves the area of operations. To ensure continued handoff and tracking of identified elements, units coordinate with adjacent units prior to the entrance of the identified element into neighboring areas of operations.

JOINT COMBAT IDENTIFICATION MARKING SYSTEM

4-106. Several systems that facilitate fratricide reduction are currently available to friendly forces, but not all coalition forces have access to or employ U.S. Government systems. Units operating in multinational missions ensure the provision, during the orders process, of appropriate systems, markings, identifiers, or other friendly methods of discrimination through frequency modulation or digital communications to reduce the potential of fratricide.

4-107. U.S. Forces and allied forces use the Joint Combat Identification Marking System (JCIMS) for quick discrimination of personnel and vehicles. JCIMS kits contain thermal and IR marking devices that enable those forces equipped with thermal optics and NVDs to identify friendly forces by the unique signatures of JCIMS devices.

4-108. Three approved systems compose the JCIMS: combat identification panels (CIPs), thermal identification panels (TIPs), and IR beacons. Each component of the JCIMS has specific techniques Soldiers employ to facilitate accurate target discrimination (see figure 4-60). (See ABCANZ Standard 2157[R] for more information on North Atlantic Treaty Organization [NATO] CID markings.)

SYSTEM	THERMAL	IMAGE INTENSIFIER	REMARKS
Combat Identification Panels (CIP)	YES		Reverse polarity.
Thermal Identification Panel (TIP)	YES		Reverse polarity.
IR Strobes and Lights		YES	I2 only.
Dismounted Combat Identification Marking System (DCIMS)	YES		
Battlefield Target Identification (Battlefield-TI)	YES		
Radio-based Combat Identification (RBCI)	System Dependent	System Dependent	Requires appended technology.
FIELD EXPEDIENT METHODS	**THERMAL**	**IMAGE INTENSIFIER**	**REMARKS**
Markings-Unit	Method Dependent	Method Dependent	Day, unlimited visibility only.
Markings-Panels	Method Dependent	Method Dependent	Day, unlimited visibility only.
Markings-Lights		YES	I2 only.
Markings-Symbols	Method Dependent	Method Dependent	Day, unlimited visibility only.

LEGEND
I2 IMAGE INTENSIFIER IR INFRARED

Figure 4-60. Thermal, image intensifier, and field expedient identification systems

DANGER

The absence of a friendly recognition device never suffices as the sole criterion for engaging a target. Soldiers combine personal observations, knowledge of the situation, ROE, and visual confirmations when deciding whether to engage a target.

Combat Identification Panels

4-109. CIPs are primarily for ground-to-ground identification. By them, a Soldier looking through a thermal optic in NFOV can identify a friendly vehicle up to 1,500 meters away (see figure 4-61). CIPs bolt onto combat vehicles and produce a cold (black) square or rectangular shape against a hot (white) background.

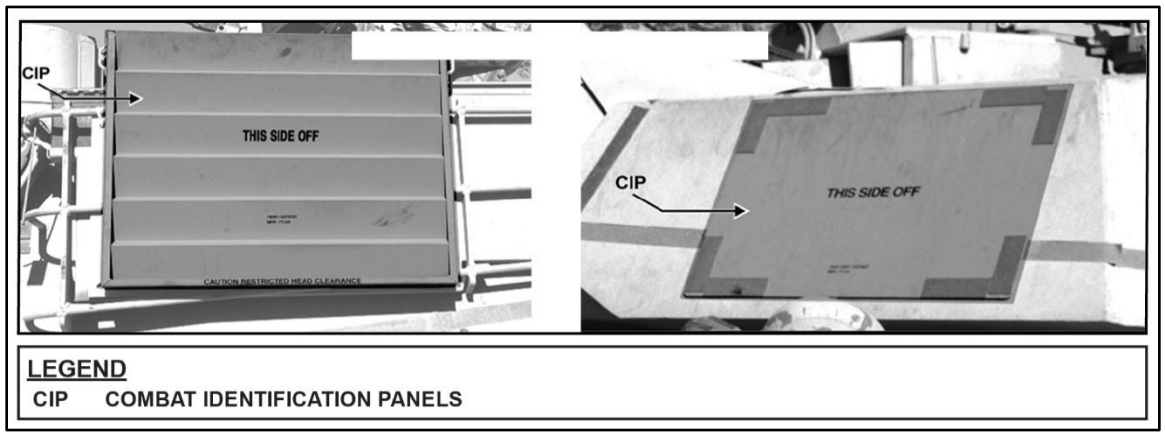


Figure 4-61. Combat identification panel, example

4-110. A CIP's thermal image is opposite that of the surrounding area, known as reverse polarity. Image-intensifying optics such as NVDs do not show a CIP's reverse polarity. Producing the correct image effect requires a CIP's display at a minimum angle. CIPs aid in discriminating a vehicle as friend or foe, but Soldiers use other means of discrimination since the absence of CIPs is not enough to initiate an engagement.

4-111. The CIP is the primary ground-to-ground thermal marking system throughout the combat team. The following considerations govern the proper mounting and display of CIPs:

- Mounted with the thermal film side out at all times during combat operations, unless the current OPORD specifies otherwise.

***Note*.** The variables of METT-TC (I) serve as the determining factors for turning selected panels on a platform on or off.

- Mounted in the prescribed locations on all platforms.
- Kept clear of load plan obstructions to ensure visibility.
- Kept clean and free of dust and mud to maximize effectiveness.
- Checked visibility with a thermal sight prior to combat operations.

DANGER

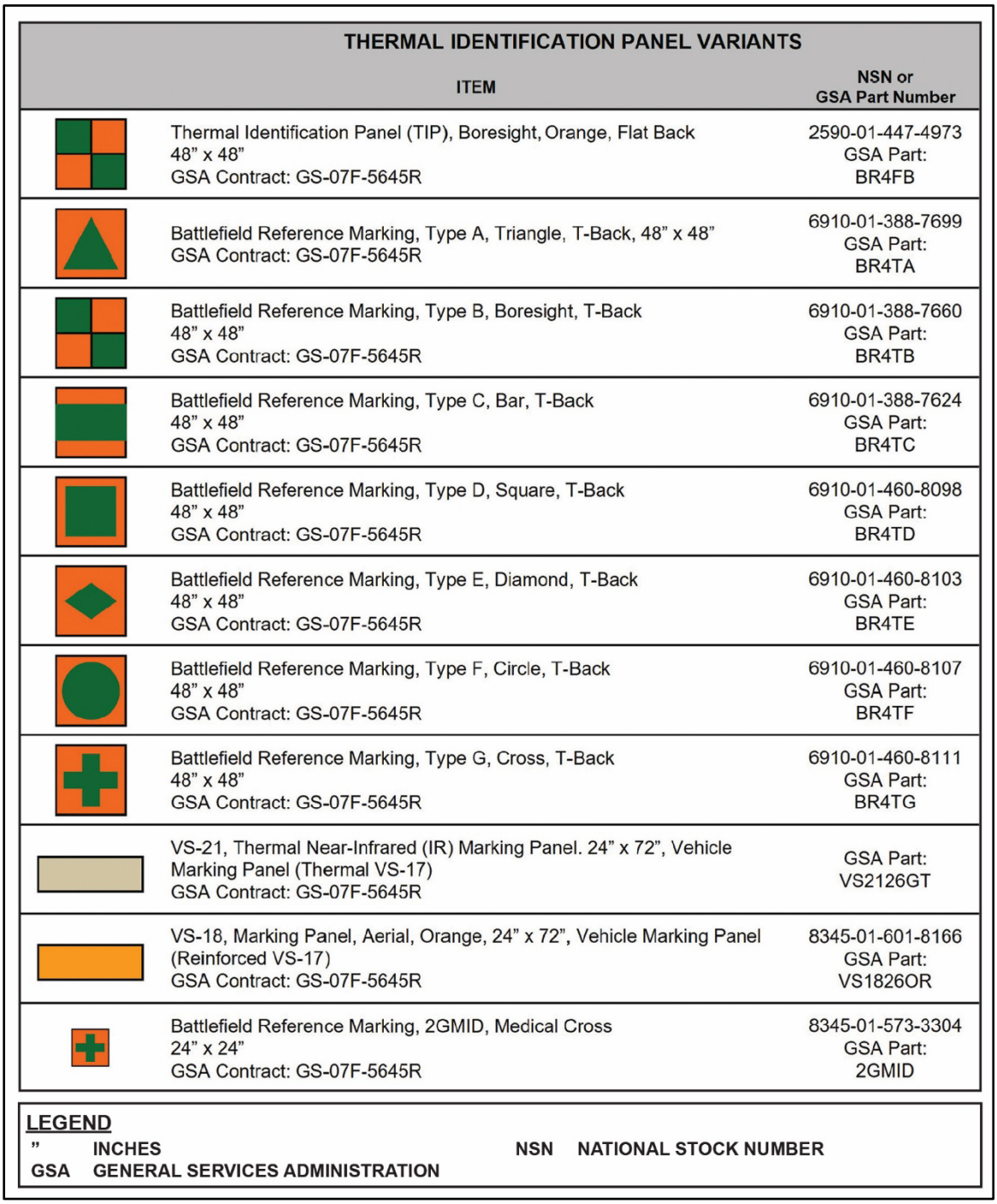
The absence of a friendly recognition device never suffices as the sole criterion for engaging a target. Soldiers combine personal observations, knowledge of the situation, ROE, and visual confirmations when deciding whether to engage a target.

Thermal Identification Panels

4-112. TIPs are cloth panels covered with a thermal film. When attached or secured to the upper surfaces of ground vehicles, they aid recognition from the air. They provide air-to-ground and limited ground-to-ground thermal identification by providing a cold (black) shape, as a CIP does, in the view through aircraft or vehicle thermal sights. Various TIPs are available to assist friendly forces in identification and to mitigate fratricide (see figure 4-62 on page 104).

4-113. The TIP is the primary air-to-ground thermal marking system throughout the combat team. All vehicles have and display TIPs to help mitigate risk of fratricide by aircraft. Mounting TIPs on top of the platform allows their recognition by RW and FW aircraft. The following considerations govern the proper mounting and display of TIPs:

- Mounted with the thermal tape side exposed.
- Draped over an irregular object to create a hump in the middle of the panel.
- Used with the orange (visual) side exposed whenever the factors of METT-TC (I) dictate or whenever the OPORD indicates.
- Used with the orange (visual) side exposed to signal medical evacuation locations.
- Usable as a TRP or as the marker for a passage point, rally point, or obstacle lane.
- Serves OPORD specifications for limited ground-to-ground capability.
- Mounted in the prescribed locations on all platforms.
- Kept clear of load plan obstructions to ensure visibility.
- Kept clean and free of dust and mud to maximize effectiveness.
- Checked visibility with a thermal sight prior to combat operations.



THERMAL IDENTIFICATION PANEL VARIANTS		
	ITEM	NSN or GSA Part Number
	Thermal Identification Panel (TIP), Boresight, Orange, Flat Back 48" x 48" GSA Contract: GS-07F-5645R	2590-01-447-4973 GSA Part: BR4FB
	Battlefield Reference Marking, Type A, Triangle, T-Back, 48" x 48" GSA Contract: GS-07F-5645R	6910-01-388-7699 GSA Part: BR4TA
	Battlefield Reference Marking, Type B, Boresight, T-Back 48" x 48" GSA Contract: GS-07F-5645R	6910-01-388-7660 GSA Part: BR4TB
	Battlefield Reference Marking, Type C, Bar, T-Back 48" x 48" GSA Contract: GS-07F-5645R	6910-01-388-7624 GSA Part: BR4TC
	Battlefield Reference Marking, Type D, Square, T-Back 48" x 48" GSA Contract: GS-07F-5645R	6910-01-460-8098 GSA Part: BR4TD
	Battlefield Reference Marking, Type E, Diamond, T-Back 48" x 48" GSA Contract: GS-07F-5645R	6910-01-460-8103 GSA Part: BR4TE
	Battlefield Reference Marking, Type F, Circle, T-Back 48" x 48" GSA Contract: GS-07F-5645R	6910-01-460-8107 GSA Part: BR4TF
	Battlefield Reference Marking, Type G, Cross, T-Back 48" x 48" GSA Contract: GS-07F-5645R	6910-01-460-8111 GSA Part: BR4TG
	VS-21, Thermal Near-Infrared (IR) Marking Panel. 24" x 72", Vehicle Marking Panel (Thermal VS-17) GSA Contract: GS-07F-5645R	GSA Part: VS2126GT
	VS-18, Marking Panel, Aerial, Orange, 24" x 72", Vehicle Marking Panel (Reinforced VS-17) GSA Contract: GS-07F-5645R	8345-01-601-8166 GSA Part: VS1826OR
	Battlefield Reference Marking, 2GMID, Medical Cross 24" x 24" GSA Contract: GS-07F-5645R	8345-01-573-3304 GSA Part: 2GMID

LEGEND

" INCHES
GSA GENERAL SERVICES ADMINISTRATION
NSN NATIONAL STOCK NUMBER

Figure 4-62. Thermal identification panel common variants, example

Infrared Strobes and Lights

4-114. The IR marking strobes and lights are programmable IR beacons designed for individual friendly CID. The light is visible through image intensifiers and from the ground and air.

DANGER

Never issue and mount an IR strobe or light on every Soldier. Friendly aircraft observers can mistake the resulting IR signatures for gunfire when they appear in a cluster.

4-115. IR strobes and lights are useful in different capacities. Unit leaders ensure IR strobes and lights are present on all vehicles during nighttime operations. Additionally, vehicle-mounted IR beacons help drivers maintain local SA during movements. An IR beacon is worn by one member of every dismounted Infantry squad. Dismounted Soldiers wear IR strobes and lights or keep them in their pockets since they are visible through up to two layers of combat uniform material. Furthermore, IR beacons serve to mark passage points, rally points, obstacle lanes, cache locations, IED locations, contaminated areas, and air-dropped or landed pallets. Buried IR strobes and lights remain visible in up to 4 inches (10 centimeters) of ground covering to newer generation NVGs (image intensifiers).

4-116. The beacons require proper mounting in prescribed locations. The following considerations govern their proper use and maintenance:

- Mounted to the rear of vehicle leader and loader hatches to avoid washing out NVGs.
- Mounted on vehicles no higher than 1 foot (30 centimeters) from the top of the platform.
- Taped to its own battery for security.

Note. Tape can cover the sides of the beacon and still be visible by NVGs. Tape is never to cover the top of the beacon since it degrades the beacon's visibility by RW and FW aircraft.

- Checked illumination and proper mounting during precombat inspection by unit leaders with NVGs to ensure an adequate battery charge for the mission.
- Checked for proper wear and functioning checked by unit leaders prior to the conduct of dismounted operations using the dismounted combat identification marking system (DCIMS).

4-117. Marking beacons are available in smaller versions specifically designed for dismounted personnel. Through image-intensifying optics, friendly observers can recognize an individual Soldier from the ground and air by a properly placed light.

Note. Marking beacons do remain visible to enemy elements as well with night vision capability. For this reason, units tailor their use of the beacons to METT-TC (I).

4-118. Figure 4-63 provides a general list of marking beacons available through standard supply requests. This list is not exhaustive and does not include additional components such as programming modules. The table is for illustrative purposes only.

NSN	COLOR	POWER	FLASH	MOUNTED	DISMOUNTED
6230-01-618-0393	IR, blue, or white	9V	Yes	Yes	Yes
5855-01-587-4822	IR	9V	3 presets	Yes	Yes
5855-01-618-0394	Green	AA	3 presets	Yes	Yes
5855-01-618-0405	IR	AA	3 presets	Yes	Yes
5855-01-540-1898	IR	9V	1 presets	Yes	Yes
6150-01-547-0581		Vehicle power adapter		Yes	

LEGEND

AA	DOUBLE A BATTERY	IR	INFRARED
NSN	NATIONAL STOCK NUMBER	V	VOLT

Figure 4-63. Marking beacon sample list

Dismounted Combat Identification Marking System

4-119. The DCIMS is a shower-cap-like helmet cover with the same thermal film as on a CIP and TIP. It makes possible the identification of individual Soldiers through thermal optics out to a range of 1,500 meters.

4-120. Leaders ensure all personnel have serviceable DCIMSs prior to combat operations. They also ensure personnel have DCIMSs mounted whenever they are operating forward of platforms equipped with thermal sights. The visibility of any DCIMS undergoes precombat inspection by a thermal sight. DCIMSs are kept free of dust and mud.

DANGER

The absence of cooperative and non-cooperative target identification does not necessarily mean the detected contact is a foe. It could be a neutral or friendly element lacking these forms of recognition, identification, and fratricide prevention equipment.

Battlefield Target Identification Device

4-121. The battlefield target identification device works by way of an electronic interrogator on the firing platform sending an encrypted radio wave toward the target. Transponders on the target receive the signal and send an encrypted response signal back to the firing platform, confirming its friendly status. The battlefield target identification device has a range of about 5 kilometers (about 3 miles) and works in adverse weather and in smoke. Audiovisual confirmations on the equipment eliminate human error. Encryption and the narrow beam used reduce the potential of detection by enemy forces. The prominent mounting of the transponder antenna reduces obscuration of an interrogator signal (for example, a tank in a hull-down position).

4-122. Interrogators and responders undergo a precombat inspection. The following checks ensure the proper operation of the system at large:

- The interrogator is aligned with the platform and weapon sights and optics.
- All responder corner cubes are clean and free of mud and debris.
- All responder corner cubes are visible and unobstructed by any loaded equipment.
- The current code is loaded onto all systems.

Radio-based Combat Identification

4-123. Radio-based combat identification (RBCI) is a cooperative target identification capability system, providing positive identification of friendly forces for air-to-ground and indirect fire applications. RBCI is suited for C2, indirect fire, close air support, or support platforms. (A battlefield target identification device, which is a directional system, is better suited for direct fire weapons.) RBCI is an interrogation and response cooperative target identification capability based on Global Positioning System coordinates and provided through a software only upgrade to a SINCGARS and its interface system. When a shooter conducts a digital interrogation of a target's location through RBCI, SINCGARSs within the user-selected footprint (50 and 5,000 meters, centered on the target's location) respond within 2 seconds with location and other data that categorize the target as friendly. For example, upon receipt of a proposed target, the target operations center can perform an initial interrogation of the target's location using the radius of the weapon to the employed.

DANGER

Prior to the firing or release of a weapon, perform a final interrogation to ensure no friendly entities are within the footprint radius of the weapon. Report results to the forward observer or the joint terminal attack controller.

4-124. RBCIs are employable by use of a laser range finder embedded with a compass and vertical angle module to interrogate the area surrounding a potential target. The forward observer, joint terminal attack controller, or target operations center can initiate interrogations without using a laser range finder by manually entering coordinates of potential targets and selecting a footprint radius. Receipt of a proposed target from a forward observer or joint terminal attack controller allows an initial interrogation of the proposed target's location, using the radius of the weapon to be employed. Units limit the number of their interrogations to minimize disruptions to voice transmissions.

Dismounted Soldier Identification System

4-125. The dismounted Soldier identification system is like the battlefield target identification device but uses a laser instead of the millimeter wave band of the radio frequency spectrum for interrogation. These identifiers are not visible through image intensifiers. Extra care when taking the proper precautions ensures the proper operation of the system as follows:

- The interrogator is aligned with the platform and weapon sights and optics.
- All responder corner cubes are clean and free of mud and debris.
- All responder corner cubes are visible and unobstructed by any loaded equipment.
- The current code is loaded onto all systems.
- The interrogators and responders undergo a precombat inspection.

Optical Combat Identification System

4-126. The optical CID system comprises two major components: an interrogator unit that aligns with a weapon sight and a transponder unit or tag that contains a modulated retro reflector. Infantry Soldiers or tank crew members sight their targets and activate the optical CID system. The system's interrogator unit sends an encoded message via laser to the target. With a friendly target, the system's transponder reflects target identification information by laser back to the interrogator unit. A lighted display on the interrogator unit instantly indicates FRIENDLY or UNKNOWN for the target. Extra care when taking the proper precautions ensures the proper operation of the system as follows:

- The interrogator is aligned with the platform and weapon sights and optics.
- All responder corner cubes are clean and free of mud and debris.
- All responder corner cubes are visible and unobstructed by any loaded equipment.
- The current code is loaded onto all systems.
- The interrogators and responders undergo a precombat inspection.

FIELD EXPEDIENTS

4-127. Various field expedient methods mark or identify friendly, joint, coalition, and partner forces in the battlespace. The frequency with which friendly forces employ them continues to increase since the level of technology across the multitude of collaborating friendly forces has not been consistent historically.

Note. Prior to the mission, field expedient methods undergo checks to ensure they are performing to standard and will not violate the thermal discipline to prevent signatures reaching threat forces.

No Power Thermal Tape

4-128. In the absence of a CIP designed specifically for a vehicle, the thermal tape used to cover one side of the CIP can be directly applied to the exterior surfaces of a platform. The most effective use of the thermal tape is to mark the top, sides, and rear of each vehicle on the surfaces angled at approximately 40 degrees.

4-129. Soldiers apply thermal tape to cover their helmets and body armor vests completely. The orders process disseminates the appropriate shape or design of the applied thermal tape.

4-130. The application of thermal tape to locally fabricated CIPs (of fiberglass, plywood, aluminum) employs damaged or replaces lost CIPs. Figure 4-64 addresses the proper use of no power thermal tape.

NO POWER THERMAL TAPE

ITEM	NSN or GSA Part Number
Thermal Roll, GREEN, Hi Tack, roll, 640mm x 50m	GSA Part: MJS-8194
Thermal Roll, GREEN, Thin Adhesive, 640mm x 200m	GSA Part: MJS 8060
Thermal Roll, GREEN, PVC, 640mm x 200m	GSA Part: MJS 8061
Lane Marker, Thermal 24" x 24", MJS 6905 Lane Numbers Selected at Time of Order	GSA Part: MJS 6905
Lane Marker, Thermal 48" x 48", MJS 6906 Lane Numbers Selected at Time of Order	GSA Part: MJS 6906

- Using small or complex shapes should be avoided.
- No power thermal tape should be used with IR strobes and lights to maximize the optics and sensors employed across the entire friendly force.
- Markings should be focused on the sides, rear, and top areas of the friendly element.

LEGEND

"	INCHES	mm	MILLIMETERS
GSA	GENERAL SERVICES ADMINISTRATION	NSN	NATIONAL STOCK NUMBER
IR	INFRARED	PVC	POLYVINYL CHLORIDE
m	METERS		

Figure 4-64. No power thermal tape considerations

Markings

4-131. The unit's SOP defines the unit markings, and units avoid using small or complex shapes. Unit markings distinguish a vehicle as friendly in accordance with a standard. Units focus the markings on the side, rear, and top areas of a friendly element. Leaders and Soldiers maintain understanding of the unit's identification markings through battalion or task force level. Markings provide passive, but inconsistent thermal signatures. Thus, they never serve as the primary means of thermal identification during limited visibility operations.

Panels

4-132. Though they do not produce thermal signatures, VS-17 signal panels do provide a bright, recognizable feature for Soldiers to discriminate friendly vehicles through day sights during unlimited visibility. Units avoid using panels of a small or complex shape. Predominantly, panel application goes on the top or rear only of a vehicle. The OPORD or FRAGORD provides panel configuration and meaning to all friendly forces.

Lighting

4-133. Chemical lights and light-emitting diodes provide a means for marking vehicles at night. Units focus the markings on the side, rear, and top areas of a friendly element. However, chemical lights are not visible through thermal sights. An IR variant is available for use with NVDs. Lighting systems do not permit thermal identification during day or limited visibility operations. Units observe light discipline when applying lighting systems for identification purposes.

Symbols

4-134. Unit symbols are useful for marking friendly vehicles. For example, painting an inverted V on the flanks, rear, and front of a vehicle aids in its discrimination as friendly. Typically, the application of unit symbols occurs in an area of operations and not during training. Units focus the markings on the side, rear, and top areas of a friendly element, and they avoid using small or complex shapes. To maximize the effect with the optics and sensors employed across the entire friendly force, units pair no power thermal tape with IR strobes and lights.

***Note*.** No marking system supports thermal identification through thermal optics during limited or unlimited visibility conditions. Thermal optics typically do not detect field expedient methods at ranges greater than 1,200 meters.

Chapter 5
Locate

Target location **is the determination of the position in relation to the shooter, small unit, and adjacent units of a discriminated threat in the operational environment.** Locating a target or series of targets is the last step of TA, which includes the detect, identify, and locate functions (or links) of the kill chain. The overall outcome of the locate function is to know and relay the location of the discriminated threat(s) and to orient the available weapons or weapon systems appropriately on those targets (see figure 5-1). Weapons orientation may include tactical movement, so the maximum armor protection is also oriented toward the hostile threat's location.

Upon the successful locating of a target, the rest of the unit receives rapid and efficient communication of the target's location. Announcement methods of the target's location depend on the individual's specific position or platform, operation's graphic control measures, unit's SOPs, and available time. This chapter discusses three methods for locating a target, specifically common methods, graphic control measures, and methods supported by systems.

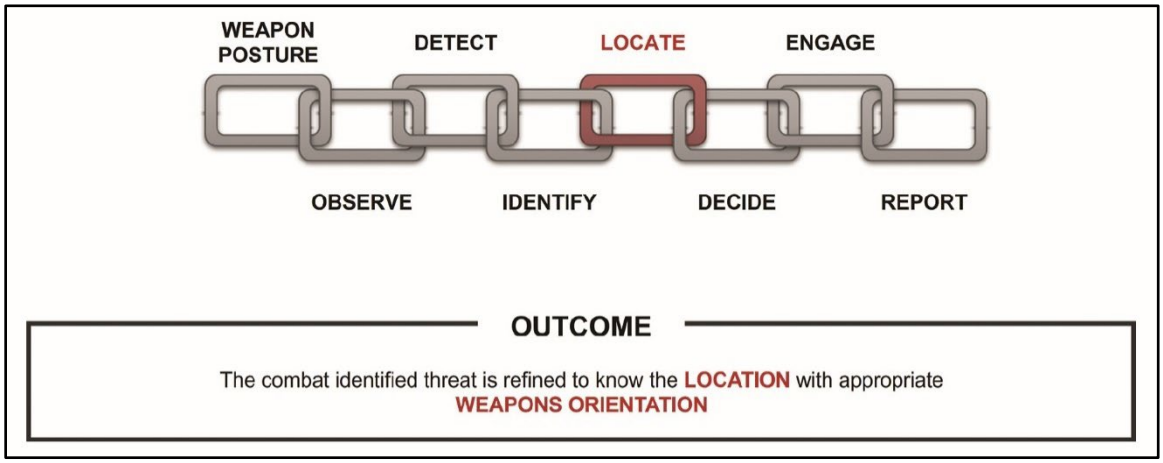


Figure 5-1. Locate function of kill chain

PROCESS

5-1. Locating a target generally occurs by way of one of three methods. Depending on the tactical situation, an individual or a collective crew or small unit may be employing these methods. The methods are useful for defining information derivation. A unit's SOPs may provide other means of communicating a target's location that do not appear among the following:

- Common—Methods with which all Soldiers are familiar:
  - Maps.
  - Grid coordinates.
  - Flags.
  - Unit markings.
  - Unit-determined means of communication.
- *Graphic control measure*—A symbol used on maps and displays to regulate forces and warfighting functions (ADP 6-0).
- Systems—Digital mapping systems, situational understanding systems, and mission command systems with integrated location subsystems.

Note. An external system or input from various onboard systems may provide targeting information.

COMMON METHODS

5-2. Common methods of locating a target include the clock, grid, and orientation methods. Each provides a relatively rapid means for locating a target with a varying level of accuracy. The other two methods for locating a target integrate common methods as well.

CLOCK

5-3. Common usage of the clock method is for the Soldier to relay target locations to other elements in the formation. The twelve o'clock position is based on the direction of personnel or vehicle movement when traveling or on the hull orientation (or the direction in which the front of the vehicle is pointing) when stationary. (See figure 5-2.)

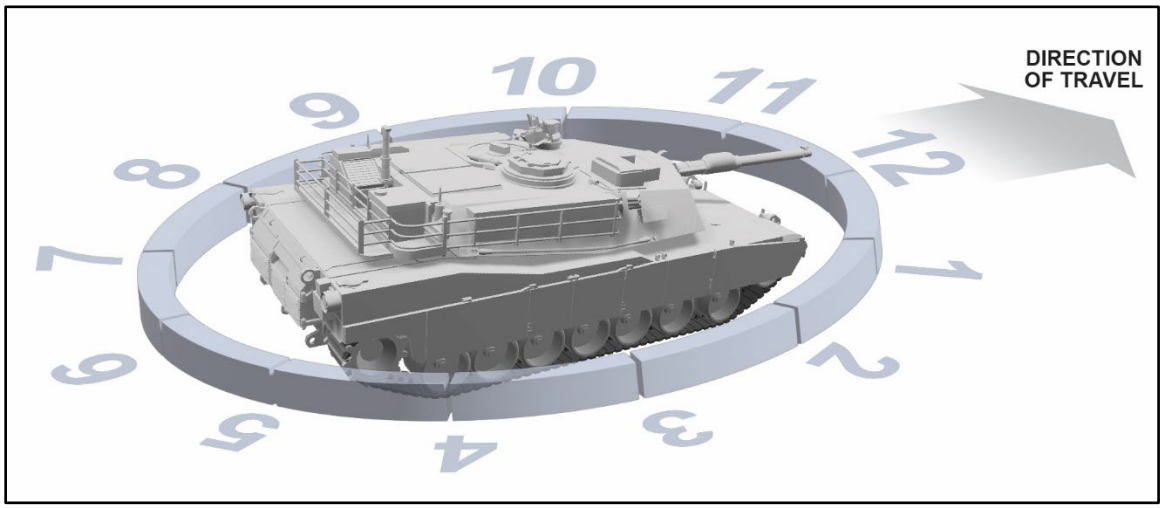


Figure 5-2. Clock method, example

GRID

5-4. The grid method is the least preferred technique due to the length of time it takes to guide the firer onto target. The leader receives the target's location by map grid from an observation post, by the JCR situational understanding system, or by the internal communications systems. The leader then uses the map to assist in the orientation of the firer onto the target area.

ORIENTATION

5-5. Orientation refers to the direction of fire or the point used to assign responsibility for a particular battlespace area covered by direct fire. Means for defining the orientation include—

- Cardinal directions based on true north.
- Tracer ammunition fired on the target.
- IR laser pointer or similar equipment.

GRAPHIC CONTROL MEASURES

5-6. A graphic control measure is a symbol used on maps and displays to regulate forces and warfighting functions. (See ADP 6-0 for more information on graphic control measures.) These symbols provide various means to convey target locations in accordance with the mission's designated graphic control measures. This section details general graphic control measures and how units apply them to maps, digital overlays, sketch cards, DA Form 5517 (*Standard Range Card*), sector sketches, and fire plans to locate targets and articulate target locations.

5-7. For crews and squads who are developing a range or sketch card or a sector sketch, the usefulness of graphic control measures is primarily in defensive positions. When preparing sketches, Soldiers identify specific terrain features, TRPs, and platoon targets in the assigned sector and adjacent sectors. When the leader requires the firer to focus on or shift from a specific point, the firer has the requisite information to begin a target search in the appropriate area.

5-8. A unit's SOPs and tactical SOPs appropriately address common naming conventions for the unit's graphic control measures. Standard naming conventions, when developed logically, facilitate the development of situational understanding within the context of the higher element's mission.

5-9. For the examples in this publication, the standard naming conventions in paragraphs 5-10 through 5-13 apply. Though notional, they provide a logical sequence that allows for rapid visualization of the battlespace. Figure 5-3 provides an example of an operational company overlay employing these standards. This overlay serves throughout this publication to contextualize terms and concepts.

5-10. Engagement area (EA) names are state names. All EAs border other EAs. Adjacent EAs in a cardinal direction remain consistent with the actual state's geography.

5-11. Objective names are professional sport team names from the states whose names the related EAs bear. The placements of multiple objectives directly relate to their actual geographic locations in an EA's namesake.

5-12. Phase line (PL) names are city names from the states whose names the related EAs bear. Multiple PLs within an EA receive names in the same manner but also in relation to their actual geographic locations within the EA's namesake. For example, within EA Colorado, PL Pueblo is south of PL Denver.

5-13. TRPs receive numerical names by order of cardinal directions. Assuming a northward orientation in the overlay, the TRP numbers increase from south, southwest, southeast, west, east, northwest, northeast, to north and terminating at north.

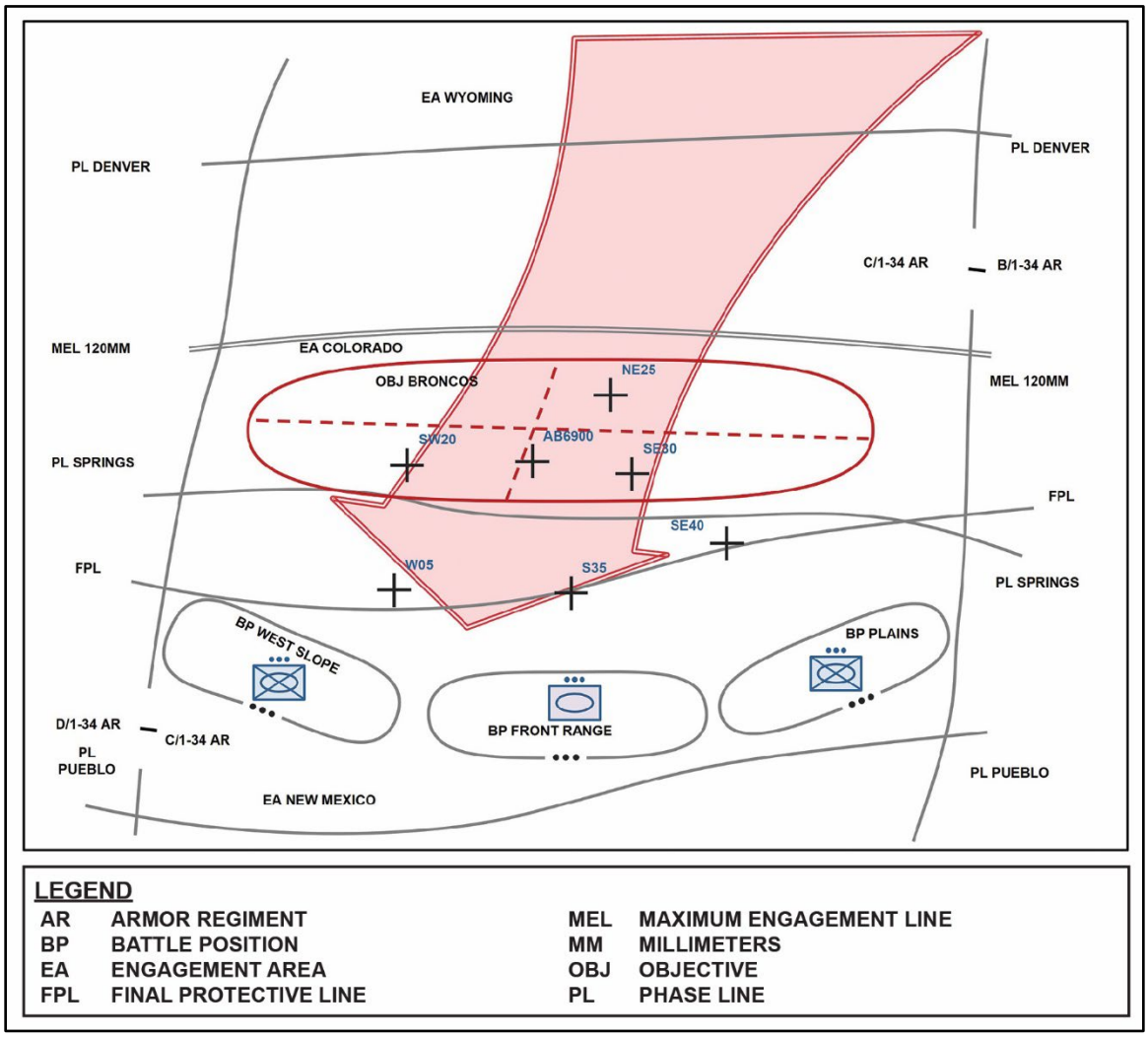


Figure 5-3. Graphic control measures for target location, example

5-14. Figure 5-4 provides an example of a platoon fire plan built upon the company overlay. The platoon fire plan provides useful graphic control measures for locating a target. This example serves throughout this publication to contextualize terms and concepts.

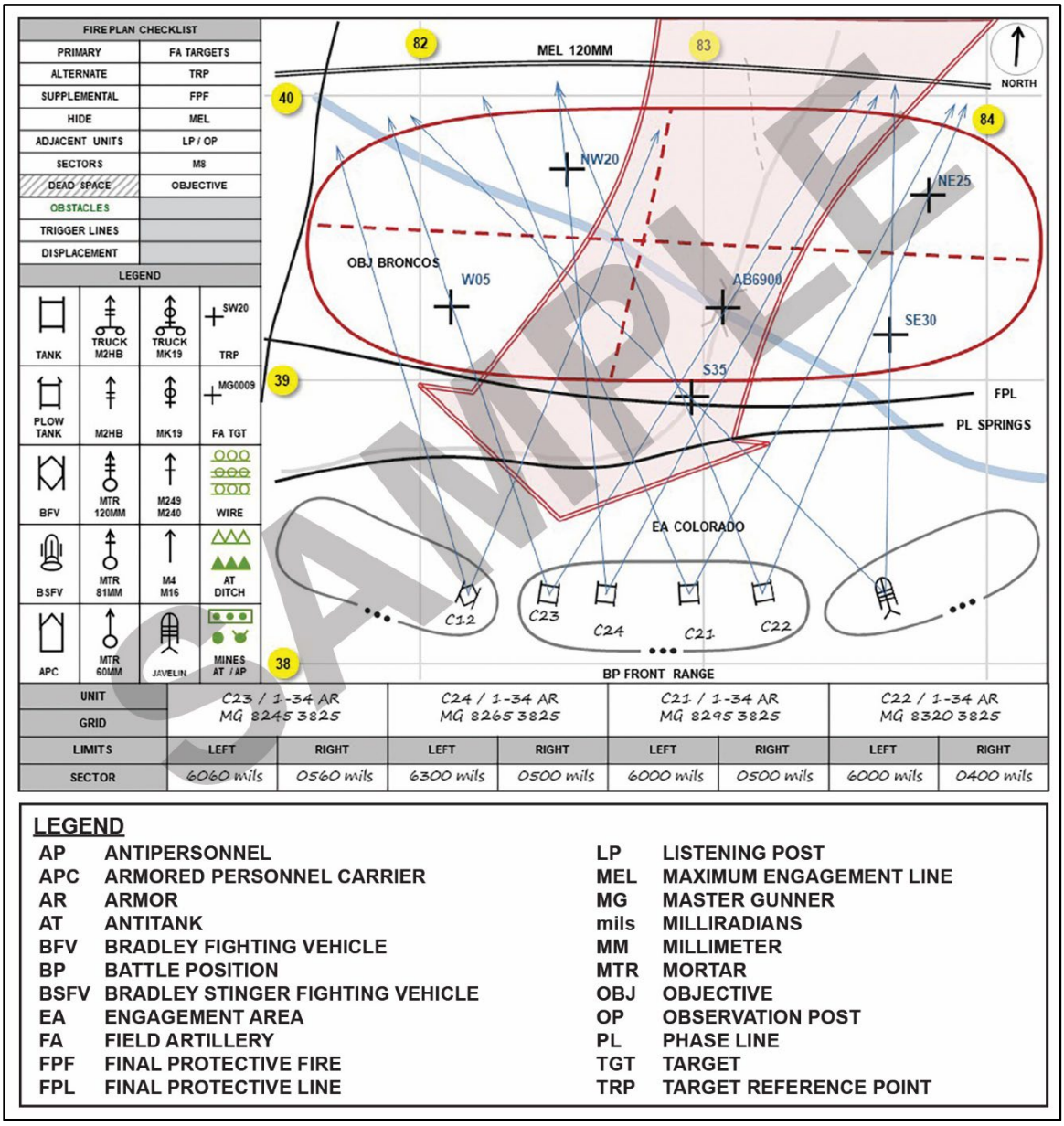
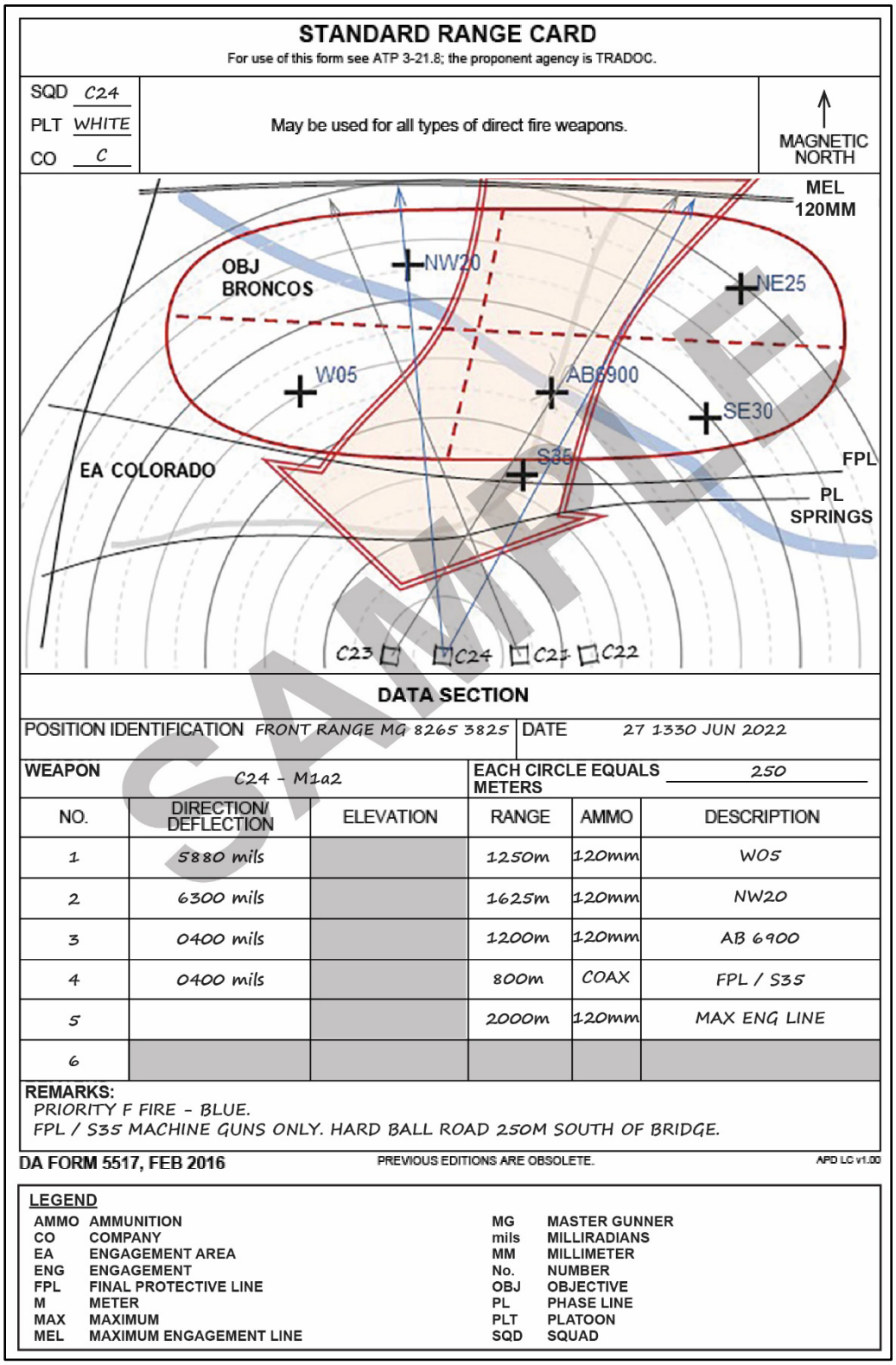


Figure 5-4. Platoon fire plan, example

5-15. The platoon fire plan contains critical graphic control measures from the operational overlay, leader-determined TRPs, and other information. These items support rapid location identification at the small-unit level and provide common terms for clear location articulation to subordinate leaders.

5-16. Figure 5-5 demonstrates how graphic control measures provide sufficient information for determining the range to a threat or threat array on DA Form 5517 and follows standard naming conventions from a notional unit's SOPs.



STANDARD RANGE CARD

For use of this form see ATP 3-21.8; the proponent agency is TRADOC.

SQD C24
PLT WHITE
CO C

May be used for all types of direct fire weapons.

MAGNETIC NORTH

DATA SECTION

POSITION IDENTIFICATION: FRONT RANGE MG 8265 3825 | DATE: 27 1330 JUN 2022

WEAPON: C24 - M1a2 | EACH CIRCLE EQUALS METERS: 250

NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	5880 mils		1250m	120mm	W05
2	6300 mils		1625m	120mm	NW20
3	0400 mils		1200m	120mm	AB 6900
4	0400 mils		800m	COAX	FPL / S35
5			2000m	120mm	MAX ENG LINE
6					

REMARKS:
PRIORITY F FIRE - BLUE.
FPL / S35 MACHINE GUNS ONLY. HARD BALL ROAD 250M SOUTH OF BRIDGE.

DA FORM 5517, FEB 2016 PREVIOUS EDITIONS ARE OBSOLETE. APD LC v1.00

LEGEND

AMMO	AMMUNITION	MG	MASTER GUNNER
CO	COMPANY	mils	MILLIRADIANS
EA	ENGAGEMENT AREA	MM	MILLIMETER
ENG	ENGAGEMENT	No.	NUMBER
FPL	FINAL PROTECTIVE LINE	OBJ	OBJECTIVE
M	METER	PL	PHASE LINE
MAX	MAXIMUM	PLT	PLATOON
MEL	MAXIMUM ENGAGEMENT LINE	SQD	SQUAD

SAMPLE

Figure 5-5. Sector sketch of target location on DA Form 5517 (Standard Range Card), example

5-17. Useful graphic control measures to the engagement process for locating a target or announcing the target's location include the following list of measures that is not exhaustive but does include graphic control measures that provide rapid means for locating targets:

- Areas:
  - An *engagement area* is an area where the commander intends to contain and destroy an enemy force with the massed effects of all available weapons and supporting systems (ADP 3-90).
  - *Objectives* are locations used to orient operations, phase operations, facilitate changes of direction, and provide for unity of effort (ADP 3-90).
  - A *sector of fire* is that area assigned to a unit or weapon system in which it will engage the enemy according to the established engagement priorities (FM 3-90).
- Quadrants:
  - ***Quadrants*** **are four separate sectors, or subdivisions of an area, created by superimposing a pair of perpendicular axes over the terrain.**
  - A terrain-based quadrant is an area of interest divided into four portions based on the terrain and in accordance with the tactical need for mission command purposes.
  - A friendly-forces-based quadrant is an area surrounding a friendly force and divided into four portions based on the tactical need for mission command purposes.
- Points:
  - A *target reference point* is a predetermined point of reference, normally a permanent structure or terrain feature that can be used when describing a target location (JP 3-09.3).
  - Artificial structures.
- Lines:
  - **A *maximum engagement line* is the linear depiction of the farthest limit of effective fire for a weapon or unit**, whose determination depends upon the MER of the weapon or unit and the effects of the terrain.
  - A *restrictive fire line* is a specific boundary established between converging, friendly surface forces that prohibits fires or their effects from crossing (JP 3-09).
  - A *phase line* is an easily identified feature in the operational area utilized for control and coordination of military operations (JP 3-09).
  - *Final protective fire* is an immediately available, prearranged barrier of fire designed to impede enemy movement across defensive lines or areas (JP 3-09.3).

AREAS

5-18. Areas provide a general zone or vicinity in which the target is located. They undergo further division by cardinal direction, near or far, and left or right modifications to define the location better.

Engagement Area

5-19. The degree of relatively unobstructed intervisibility lines available to the unit's weapon systems in their firing positions and the maximum range of those weapons both determine the size and shape of the EA. Typically, commanders delineate areas of responsibility in the EA by assigning each platoon a sector of fire or direction of fire. Paragraphs 5-20 through 5-26 cover these fire control measures. ***Fire control measures* are the means by which the commander or subordinate leaders control fires.**

Objective

5-20. The size and shape of an objective is mission specific. This graphic control measure is useful for orienting fires and in locating. The objective remains divisible into quadrants, sectors, or other partitions as necessary.

Sector

5-21. A sector of fire is a defined area covered by direct fire. Leaders assign sectors of fire to subordinate elements, crew-served weapons, and individual Soldiers to ensure coverage of an area of responsibility. Leaders may limit the sector of fire of an element or weapon to prevent accidental engagement of an adjacent unit. When assigning sectors of fire, commanders and subordinate leaders consider the number and types of available weapons. Also, they consider the acquisition system type and field of view when determining the width of a sector of fire. For example, while unaided vision (or the naked eye) has a WFOV, the ability to detect and identify targets at certain ranges and in limited visibility conditions is restricted. Conversely, most fire control acquisition systems have greater detection and identification ranges than the unaided eye, but they have an NFOV. Means of designating sectors of fire include—

- TRPs.
- Clock directions.
- Terrain-based quadrants.
- Friendly-forces-based quadrants.

Quadrants

5-22. Quadrants subdivide an area into four separate tracts by a pair of perpendicular axes over the terrain, effectively creating a coordinate plane on which to name locations. Quadrants may be based on the terrain, friendly forces, or enemy formations.

5-23. The unit's SOPs establish the method of quadrant numbering. However, units take extra care to avoid confusion during simultaneous use of quadrants based on terrain, friendly forces, and enemy formations.

5-24. Terrain-based quadrants have a TRP, either existing or constructed, as the origin (intersection) of the axes that are dividing the area into four tracts. Both offensive and defensive operations employ this technique. In the offense, the commander defines the origin, or the center of the coordinate plane, with an existing feature or by creating a reference point (for example, ground-burst illumination round, marking smoke round, fire ignited by incendiary or tracer rounds). The axes creating the quadrants run parallel and perpendicular to the direction of movement. In the defense, the commander defines the origin with a TRP.

5-25. In the example in figure 5-6, quadrant markings comprise the letter **Q** and a number (Q1 to Q4). Furthermore, quadrant numbers remain in the same relative positions as on military map sheets (from Q1, indicating the upper left quadrant, and moving clockwise to Q4, indicating the lower left quadrant).

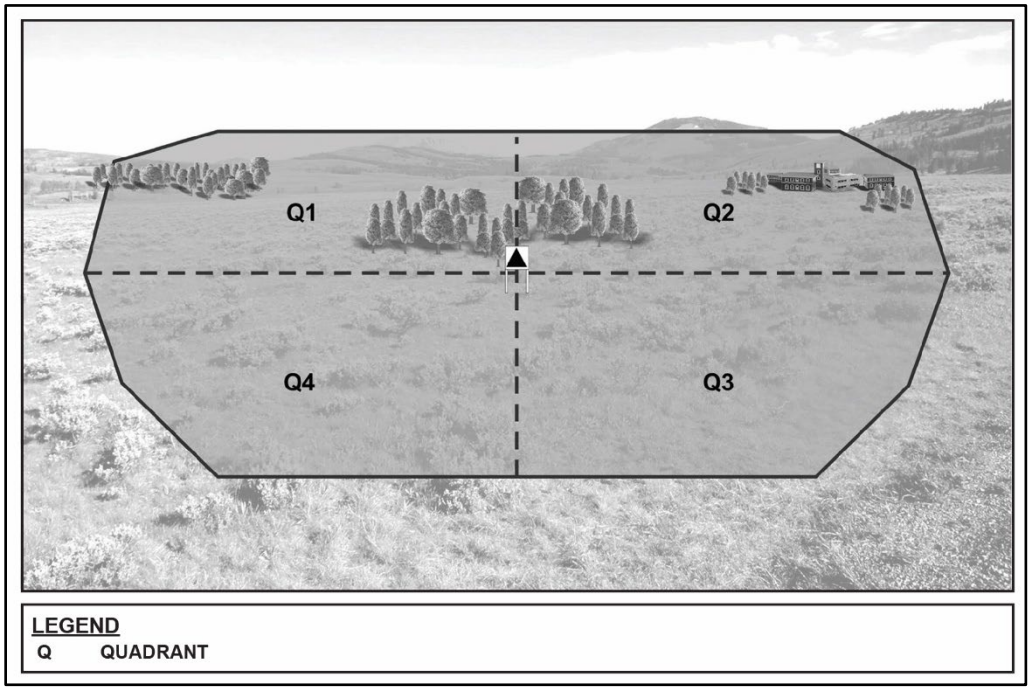


Figure 5-6. Terrain-based quadrants, example

5-26. Friendly-forces-based quadrants cover the unit's formation as the coordinate plane. The origin is the center of the formation, and the axes run parallel and perpendicular to the general direction of travel. For rapid orientation, this technique may serve better than the clock method because different elements of a large formation are rarely oriented in the same direction, and the relative dispersion of friendly forces imposes the parallax effect on the target. Figure 5-7 illustrates the use of friendly-forces-based quadrants.

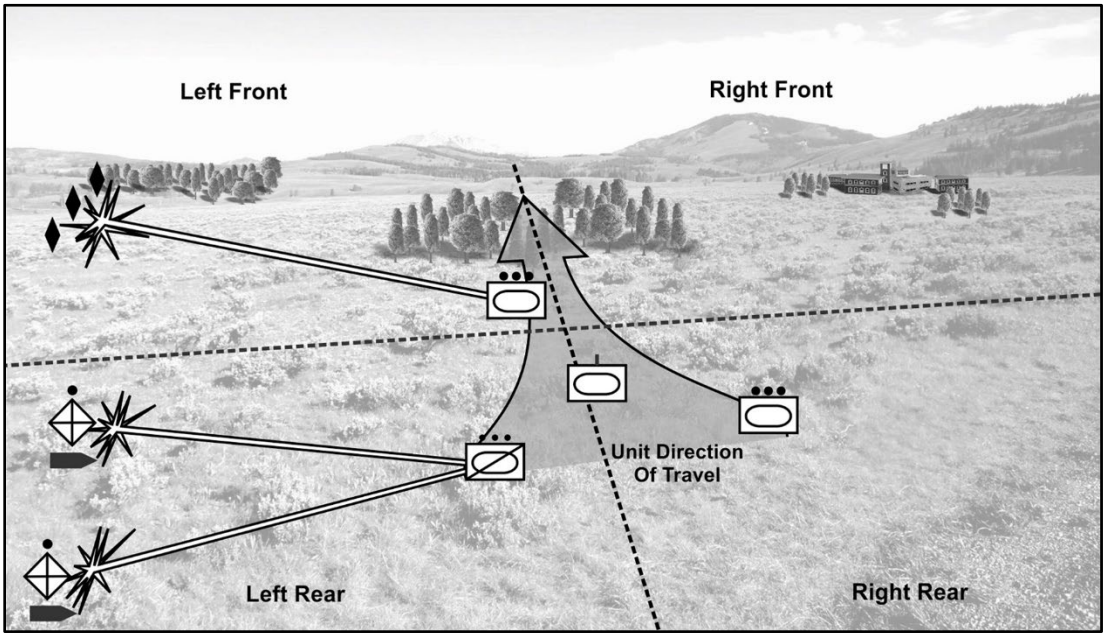


Figure 5-7. Friendly-forces-based quadrants, example

POINTS

5-27. Soldiers can locate a target by the nearest known point in several ways. Soldiers may use TRPs, artificial objects, intersections, terrain features, and other notable identifiers. The most common choices are TRPs and artificial structures. Units select their own types of points to use in accordance with their SOPs and tactical SOPs.

Target Reference Point

5-28. Task force units and below use TRPs. TRPs can delineate sectors of fire in an EA. Their designators follow the standard target symbols or numbers issued by the fire support officer. TRPs can also constitute indirect fire targets.

5-29. A TRP is a recognizable point on the ground leaders use to orient friendly forces and to focus and control direct fires. Leaders designate TRPs at probable enemy locations and along likely avenues of approach. These can be natural or artificial points. Friendly units sometimes construct markers to serve as TRPs. A TRP may be an established site such as a hill or a building, or it may be a feature of a specific point that receives an impromptu designation as the TRP (for example, burning enemy vehicle, smoke generated by an artillery round).

5-30. TRPs should be visible in three observation modes (naked eye, image-intensifying, and thermal optics), so they all friendly forces can see them during day and limited visibility conditions. Examples of TRPs include—

- Prominent hill masses.
- Distinctive buildings.
- Observable enemy positions.
- Destroyed vehicles.

Artificial Structure

5-31. Soldiers can locate a target's general vicinity by nearby artificial objects. These objects are permanent in nature and are not to have been specified as TRPs. Examples include destroyed vehicles, easily identifiable structures, intersections of artificial structures with natural terrain features such as a bridge spanning a river, and intersections of multiple artificial structures such as roads intersecting.

5-32. These items are specific to the firer's perspective, and graphic control measures from the higher element typically do not include them. Generally, the range or sketch cards or the sector sketches for internal use by a small unit or crew identify these.

LINES

5-33. Lines for graphic control measures identify specific lateral locations of tactical importance in the battlespace. In general, lines are not useful for providing pinpoint locations but for focusing fires on a range band in an area of interest, observation, or engagement.

5-34. Graphic overlays and sketches may incorporate numerous types of lines. For the sake of simplicity, this section lists only the most common. Units use other line types or functions as needed to best articulate location information to the friendly force.

Maximum Engagement Line

5-35. The maximum engagement line (MEL) is the depth of the sector and is normally limited to the MERs of the weapon systems. However, the target description and the effects of terrain also influence it. Slope, vegetation, structures, and other terrain features provide cover and concealment that may prevent a weapon from reaching its MER. The use of a map assists in determining the distance to each MEL and ensures the accurate depiction of the MELs on DA Form 5517.

5-36. An MEL serves several purposes. Commanders use one to prevent Soldiers from engaging targets beyond the MERs of their weapon systems, to define criteria for triggers, and to delineate the maximum extent of the battlespace on the sector sketch. It also decreases needless and ineffective ammunition expenditure during an engagement.

Restrictive Fire Line

5-37. A restrictive fire line is a linear fire control measure that prohibits engagement beyond it without coordination. In the offense, the commander may establish one to prevent a base of fire element from firing into the area in which an assaulting element is maneuvering.

5-38. This technique is particularly important when armored vehicles support the maneuver of Infantry squads. In the defense, the commander may establish a restrictive fire line to prevent the unit from engaging a friendly rifle squad positioned in restricted terrain on the flank of an avenue of approach.

Phase Line

5-39. A PL indicates a lateral separation of an area by terrain or by a change in operational function, in maneuver, or in control. Leaders associate PLs to terrain features, mission requirements, and maneuver tactics as necessary.

5-40. PL names from an operational overlay provide a standard method for articulating target locations. PL naming conventions from the unit's tactical SOPs provide rapid situational understanding without map or overlay references and assist in the development of an image of the developing situation in relation to the larger operation.

Final Protective Fire

5-41. Final protective fire serves as a clear barrier on the operational overlay. This prearranged barrier of fire impedes enemy movement across a defensive line or area. Typically, the use of this barrier allows for the retrograde or tactical maneuver of a force while other elements mass fires to deny the enemy the freedom of maneuver. Crew-served weapons, small units, and crews may have a specific area or a portion of the final protective line to orient all available direct fire assets.

Final Protective Line

5-42. The *final protective line* is a selected line of fire where an enemy assault is to be checked by interlocking fire from all available weapons and obstacles (FM 3-90). The unit reinforces this line with protective obstacles and with final protective fire whenever possible. The initiation of final protective fire is the signal for elements, crews, and individual Soldiers to shift fires to their assigned portions of the final protective line. They spare no ammunition in repelling the enemy assault, a particular concern for machine guns and other automatic weapons.

SYSTEMS

5-43. A method that involves a system to locate a target is useful in conjunction with other methods for locating targets. Such a method uses the capabilities of a weapon or platform system to orient the firer or element on the target's location. Its typical use is for crew platforms, although it can prove appropriate for use on dismounted machine guns or antitank weapons.

TRAVERSE

5-44. The traverse method is specific to systems that provide electric, hydraulic, or mechanical means of orienting the applicable main armament. It is a relatively quick method by which the VC digitally orients the primary firer on a target during the engagement.

5-45. The verbal use of this method directs a firer onto a target or the target's location. Traverse commands to the firer are useful when the firer is unclear of the direction to the stated target, has difficulty identifying the target, or is unable to observe the target in WFOV.

TARGET DESIGNATE

5-46. On equipped vehicles, the VC has a target designate capability to locate the target. Using the commander's independent sight, the VC can align the primary weapon system with that independent optic. Certain systems are also capable of determining an approximate range to the target.

5-47. On certain systems, a digital overlay can display information about a target's location, and the information is distributable to other systems in accordance with a unit's SOPs. Units can share the information digitally (thus, rapidly) to support the unit's situational understanding.

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Chapter 6
Decide

Once elements detect and discriminate threats, leaders develop the situation in their sectors of responsibility (see figure 6-1). Leaders make decisions based on the composition, disposition, and availability of combat power. With these variables, leaders prioritize the threats and confirm all the given information is correct. Without situational development, the likelihood of target overkill, fratricide, and collateral damage increases while that of survivability decreases. The situational development process is a series of progressive and interdependent steps (or actions) toward making ROE decisions. Leaders are ultimately responsible for the actions of their elements. However, all Soldiers have the ethical responsibility to identify and discriminate the threats they intend to engage.

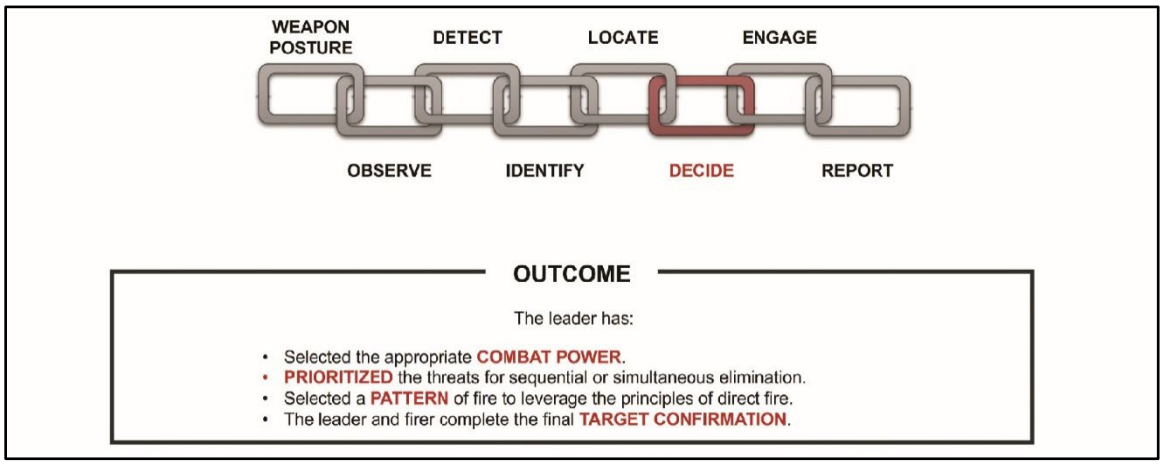


Figure 6-1. Decide function of kill chain

6-1. Leaders are empowered with the responsibility of accurately issuing the necessary commands for effective threat elimination. Their training prepares them to initiate direct fire engagements based on the law of war, fratricide prevention, target discrimination, ROE, unit's SOPs, and commander's intent. To make informed engagement decisions, leaders process all the available information through their situational understanding, their knowledge about the available lethal and nonlethal options and combat power, and their focus on the mission at hand.

6-2. This responsibility includes the decision-making process for which targets to engage, how to engage them, and which control measures will reduce or eliminate fratricide and collateral damage. To accomplish this successfully, leaders follow the steps of the engagement process when developing those answers.

PROCESS

6-3. The decide function (or link) of the kill chain, or the engagement decision, includes three critical steps: prioritize the presented threats; determine the appropriate combat power for eliminating the threats; and confirm the correct identification, classification, and discrimination of each threat before delivering fire commands (see figure 6-2). Leaders complete these steps in sequence and never omit a step.

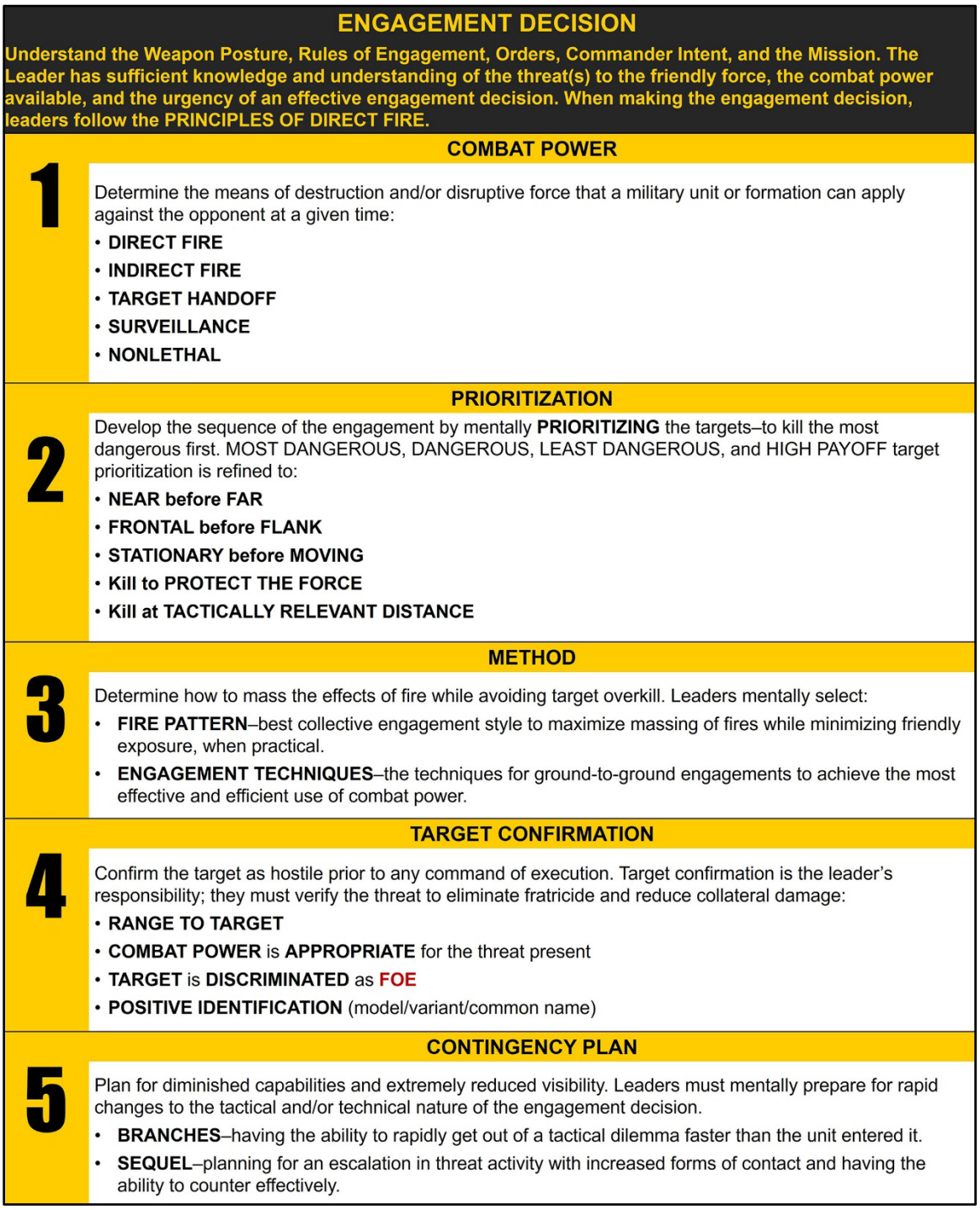


Figure 6-2. Engagement decision process

COMBAT POWER

6-4. *Combat power* is the total means of destructive and disruptive force that a military unit/formation can apply against an enemy at a given time (JP 3-0). It is the selection of the appropriate measures to defeat or eliminate a given threat or series of threats. When selecting the appropriate combat power to employ against threats, leaders or Soldiers consider the tactical situation, available weapons and ammunition, type of threat, range to the target, survivability, any applicable engagement criteria, commander's intent, and ROE.

6-5. When selecting the appropriate combat power (see figure 6-3), leaders and Soldiers choose the weapon, weapon system, and ammunition that—

- Have the capability to achieve the desired effect on the target.
- Cause minimal collateral damage in any environment, including the potential hazards that may traverse beyond the target area.
- Eliminate fratricide, given the proximity of friendly forces, noncombatants, and neutral forces.
- Minimize friendly exposure to the threat.

6-6. Leaders may integrate warfighting functions to engage and defeat the presented threat for several reasons. These include leaders' decisions to conduct target handoff to attack aviation assets, to coordinate for indirect fires (mortar or artillery), or to coordinate for adjacent unit handoff.

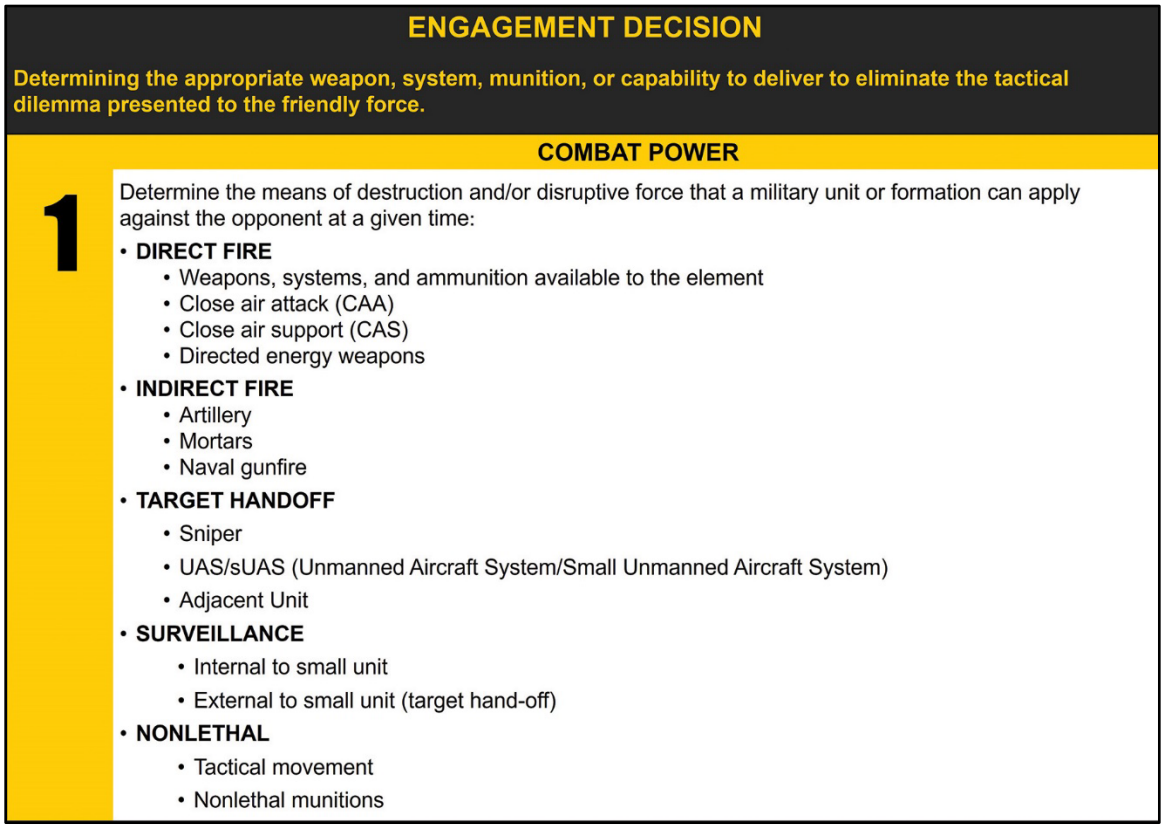


Figure 6-3. Determination of appropriate combat power

6-7. Leaders select the most suitable combat power to employ against each threat and in each tactical situation. That which proves appropriate varies across the following:

- Direct fire:
  - Weapons, weapon systems, and ammunition available to the element—Those organic to the unit, or situations in which the unit leader controls the fires of a weapon, weapon system, or firer external to the unit.
  - Directed-energy weapons—Situations in which the leader directly coordinates the use of a directed-energy weapon system in a controlled manner to defeat the threat, or the leader is not directly coordinating the engagement and combat power selection transitions to target handoff.
  - Close air attack—Situations in which the leader coordinates threat elimination with the pilot in charge of an RW attack aircraft, or the leader is not coordinating the fires and combat power selection transitions to target handoff.
  - Close air support—Situations in which the leader coordinates threat elimination with the appropriate joint tactical air controller, or the leader is not coordinating the fires and combat power selection transitions to target handoff.
- Indirect fire—Coordination through the fire support officer during which a member of the small unit maintains the role of observer and requests for fire support for the following:
  - Artillery.
  - Mortars.
  - Naval gunfire.
- Surveillance—The designation of an element to observe the threat for changes in hostile intent, movement, or significant tactical actions, or situations involving a request for external surveillance support and resulting in combat power selection transitioning to target handoff.
- Nonlethal:
  - Tactical movement—The leader determines a tactical movement or repositioning to gain an advantage based on the mission, commander's intent, and tactical situation.
  - Use of nonlethal munitions—The leader selects this as the best method for threat elimination based on the mission, commander's intent, ROE, and escalation of force guidance.
- Target handoff—Any coordination with a higher headquarters to provide targeting information for an external small unit, asset, or warfighting function to engage with direct, indirect, or nonlethal fires or for external surveillance or monitoring.

Note. When Soldiers acquire targets that they are incapable of destroying or when the ROE preclude the use of the available weapon or weapon system, they announce a contact report. This allows the leader to apply other military options or combat power to the tactical dilemma.

TARGET PRIORITIZATION

6-8. Target prioritization has a leader mentally organize an order sequence in which to kill the presented threats. The following standard order for prioritizing targets serves as a general rule of thumb, which leaders alter as tactical situations dictate (see figure 6-4):

- Near before far.
- Frontal before flank.
- Stationary before moving.
- Most likely to serve the purpose of protecting the force.
- At a tactically relevant distance.

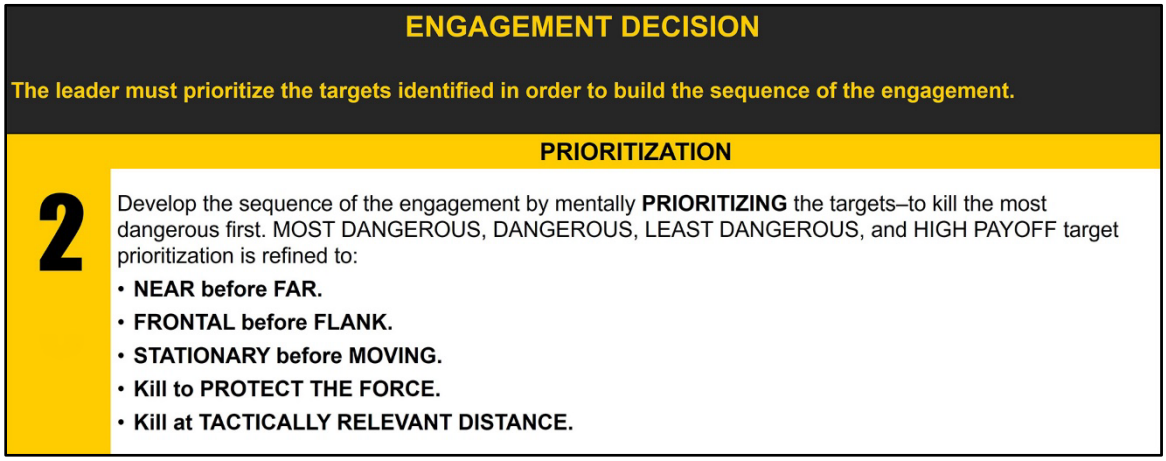


Figure 6-4. Target prioritization

6-9. Target prioritization provides an employable method during the fire command. The standard target prioritization for direct fire engagements establishes a default for all firers to use unless otherwise directed. The method element of the crew or collective fire command establishes the prioritization when a firer's default will differ from the standard listed in paragraph 6-8 or when the default provided in a unit's tactical SOPs differs.

6-10. Firers remain prepared to deviate from target prioritization guidance depending on the fire command, collective fire command, or changes to the target's activities. Threats capable of defeating the unit and in the process of doing so must be addressed first with the application of combat power, tactical movement, or both.

6-11. The order in which the unit engages enemy forces directly relates to the danger the latter present. The threat the enemy poses depends on their weapons, MER, and tactical positioning. In almost all instances of multiple targets presenting threats, units initially concentrate fires to destroy the greatest threat and then distribute fires over the remainder of the enemy force.

6-12. When units encounter multiple targets of the same threat level, they prioritize the targets according to the threat each target presents. Standard target prioritization establishes the order of engagement. Firers engage multiple targets in series, grouped by threat classifications. This series is depicted in figure 6-5.

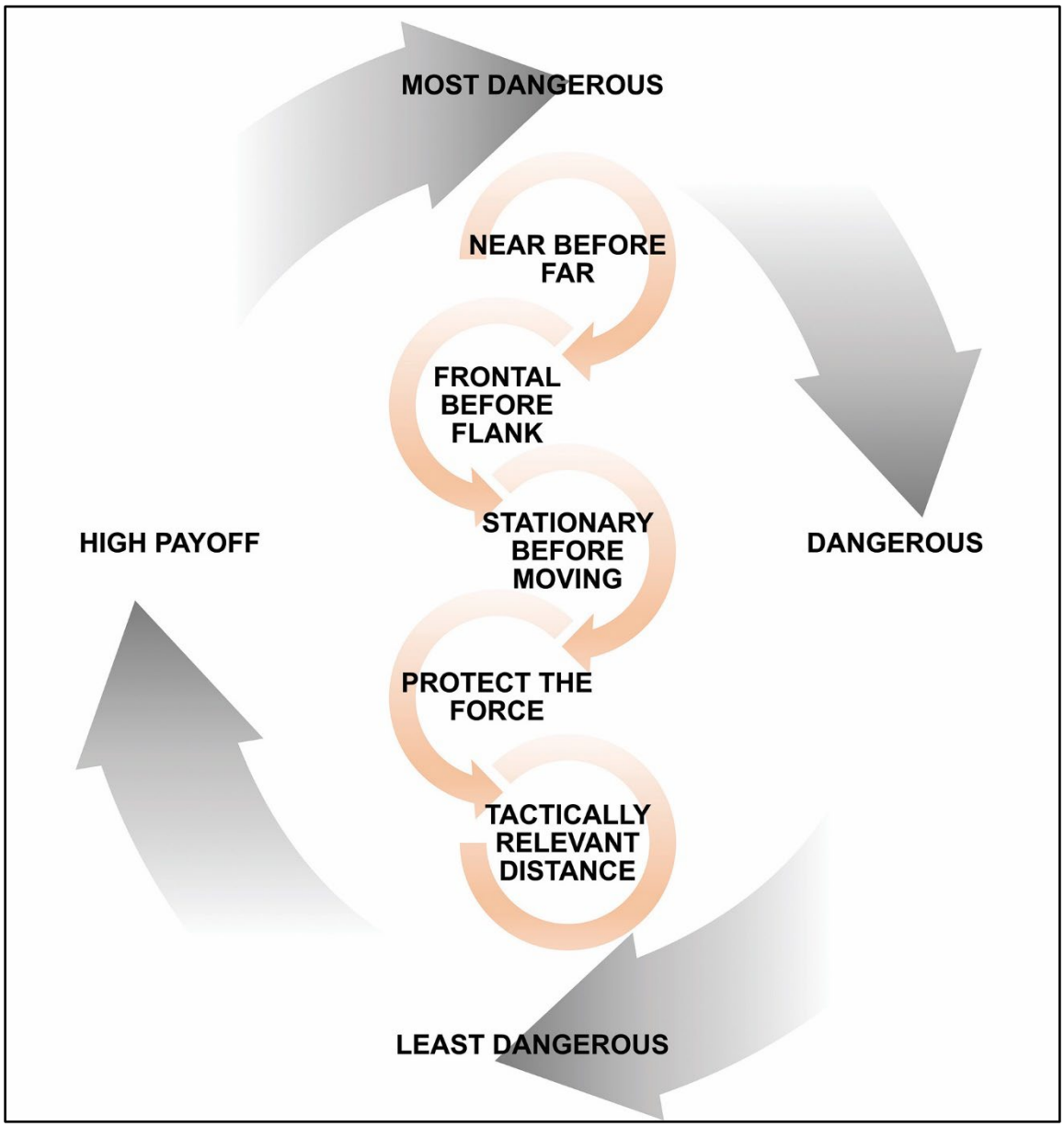


Figure 6-5. Target prioritization by threat classification

Note. For example, a leader may need to engage a dangerous threat prior to a most dangerous threat to protect the force. In this situation, the leader observes a dangerous threat moving rapidly to engage the wingman vehicle but appears to be in its dead space. To protect the force, the leader makes an engagement decision to defeat that dangerous threat before the most dangerous threat in the sector.

METHOD OF ENGAGEMENT

6-13. Friendly forces deliver their combat power to the known threats in the EA by way of the method of engagement. It identifies the way in which the team, crew, squad, or collective small unit is to engage the targets from a collective standpoint, as well as any specific techniques the leader believes will solve the presented threat problem most efficiently.

6-14. The selected combat power may be a combination of direct, indirect, and external warfighting functions. An established method of engagement defines which weapon systems to employ to engage what targets. This enables the crew to destroy multiple targets, thereby increasing the likelihood of their overmatching the threat, affording swift engagements from target to target, and ultimately increasing the unit's lethality.

6-15. An understanding of the tactical situation and presented threats assists the leader in determining the method of engagement against those threats. (See figure 6-6.) The leader mentally determines the—

- Fire pattern that maximizes the effects on the target, based on force capabilities and the presented tactical array, while minimizing the exposure of the friendly force to the threat.
- Engagement techniques the direct fire weapon systems employ to maximize the effects on the target while minimizing the exposure of the friendly force to the threat.

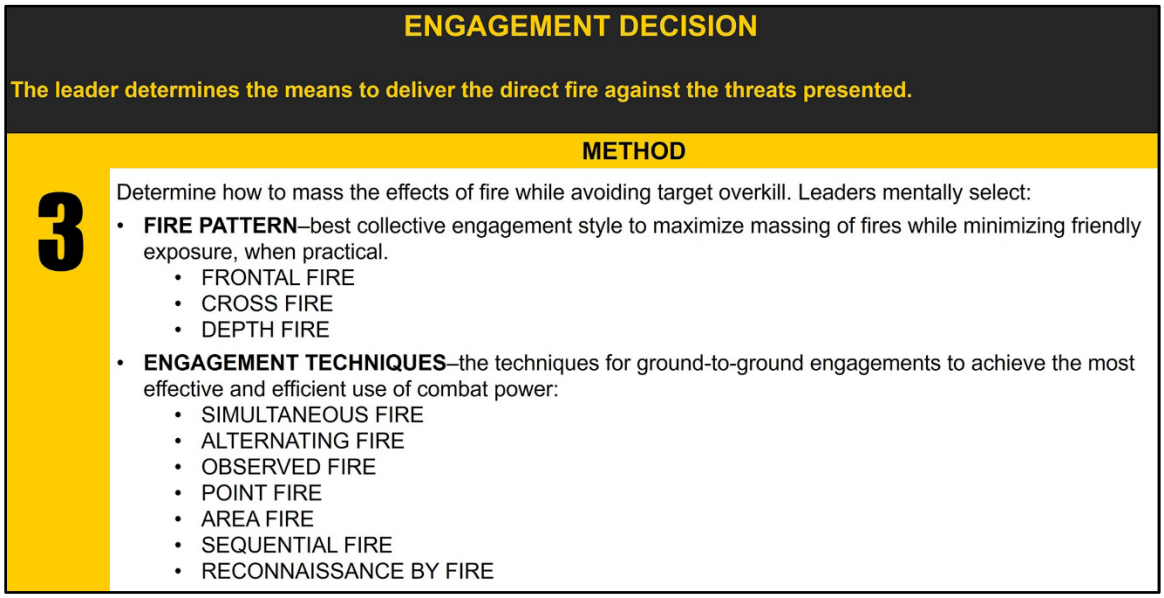


Figure 6-6. Determination of the method of engagement

6-16. Fire patterns and engagement techniques are useful for the effective and efficient distribution of fires within teams, crews, squads, sections, and platoons. A small unit's tactical SOPs describe the standard defaults it is to use. In the defense, those defaults may undergo revision in the orders process or upon the leader's demand as the tactical situation dictates.

6-17. Selecting the appropriate fire pattern and engagement techniques for the tactical situation allows the unit to mass its fires to achieve decisive results. Massing entails the focus of fires on critical points and the distribution of effects. A random application of fires is unlikely to have a decisive effect, making for a piecemeal and disjoined engagement. For example, concentrating the unit's fires at a single target may ensure the target's destruction or suppression, but that engagement technique will fail to achieve a decisive effect on the overall enemy formation or position.

6-18. Conversely, selecting the wrong fire pattern or engagement techniques may result in target overkill. Target overkill wastes ammunition and ties up weapons better employed in other target acquisitions and threat engagements. The requirement to destroy the greatest threats first tempers the idea of having every weapon engage a different target.

FIRE PATTERN

6-19. Leaders of collective small units select a fire pattern for the element to follow with the prescribed or common engagement techniques. The most common fire patterns are—

- Frontal fire:
  - Typical use is against multiple targets arrayed in front of the unit in a lateral configuration.
  - Weapon systems engage targets to their respective fronts.
- Cross fire—Use is against targets arrayed laterally across the unit's front in a manner permitting diagonal fires at the enemy's flank or against obstructions in the battlespace that prevent the unit's use of frontal fire.
- Depth fire:
  - Use is against targets dispersed in-depth and perpendicular to the unit.
  - The friendly unit's weapons in the center of the formation engage the closest targets; the flank weapons engage deeper targets.
  - As the unit destroys targets, weapons shift fire toward the center of the enemy formation.

ENGAGEMENT TECHNIQUE

6-20. ***Engagement techniques*** **are effects-oriented fire distribution measures.** In addition to employing a fire pattern, the leader may employ one or a combination of multiple engagement technique(s) to distribute fires. The most common engagement techniques are—

- Simultaneous fire.
- Alternating fire.
- Observed fire.
- Point fire.
- Area fire.
- Sequential fire.
- Time of suppression.
- Reconnaissance by fire.

Simultaneous Fire

6-21. Simultaneous (or volley) fire rapidly masses the effects of fires and can gain fire superiority. For example, a unit may initiate a support by fire operation with simultaneous fire and then revert to alternating or sequential fire to maintain suppression. Simultaneous fire also negates the low probability of the hit and kill of certain antiarmor weapons. For example, a rifle squad may employ simultaneous fire with its AT4s (antitank) to ensure rapid destruction of a BMP engaging a friendly position.

Alternating Fire

6-22. For alternating fire, a pair of elements continuously engage the same point or area target, one at a time. All size elements, from buddy team through company team, may accomplish alternating fire. Alternating fire permits a unit to maintain suppression for a longer duration than does simultaneous fire. It also forces the enemy to acquire and engage alternating points of fire.

Observed Fire

6-23. Observed fire allows for mutual observation and assistance while protecting the location of the observing elements. Typically, units in a protected defensive position use observed fire when engagement ranges are greater than 2,500 meters. This allows the least amount of friendly exposure to the threat while surgically eliminating targets at the farthest tactically relevant range. Ground and air elements alike employ observed fire. Examples include a tank element lasing and observing while a Bradley fighting vehicle element engages, or a ground element lasing and observing for an attack air element.

Point Fire

6-24. Point fire concentrates the effects of fires against a specific, identified target such as a vehicle, machine gun bunker, or antitank guided missile position. When leaders direct point fire, all the unit's weapons engage the target, firing until either the target is destroyed or the required time of suppression expires. Employing converging fires from dispersed positions makes point fire more effective because the target undergoes engagement from multiple directions. The unit may initiate an engagement with point fire against the most dangerous threat and then revert to area fire against less threatening point targets.

Area Fire

6-25. Area fire distributes the effects of fires over an area with numerous or obscure enemy positions. For a large area, leaders assign sectors of fire to subordinate elements using a terrain-based distribution method such as quadrants. Typically, the primary purpose of area fire is suppression. However, sustaining effective suppression requires judicious control of the rate of fire.

Sequential Fire

6-26. For sequential fire, the subordinate elements of a unit engage the same point or area target, one after another, in an arranged sequence. For example, a mechanized Infantry platoon may sequence the fires of its four Bradley fighting vehicles to gain maximum time of suppression. Sequential fire can also help to prevent the waste of ammunition, as when an Infantry rifle platoon waits to see the effects of the first Javelin before firing another. Additionally, sequential fire permits elements who have already fired to pass on the information they learned from the engagement. For example, a Soldier who missed a BMP with an AT4 forwards the range and lead information for the next Soldier to make appropriate range and lead adjustments when engaging the target with another AT4.

Time of Suppression

6-27. Time of suppression is the commander-specified, requisite period to suppress an enemy position or force. Suppression time typically depends on the time it will take a supported element to maneuver. Normally, a unit suppresses an enemy position by the sustained rate of fire of its automatic weapons. In planning for sustained suppression, leaders consider several factors: the estimated time of suppression, size of the area undergoing suppression, type of target for suppression, range to the target, rates of fire, and available ammunition quantities.

Reconnaissance by Fire

6-28. *Reconnaissance by fire* is a technique in which a unit fires on a suspected enemy position (FM 3-90), the process of engaging possible enemy locations to elicit a tactical response such as return fire or movement. Such a response supports the commander and subordinate leaders in accurate TA and in their ability to mass fires against the enemy element. Typically, a commander directs a subordinate element to conduct reconnaissance by fire. For example, a commander may direct an overwatching platoon to conduct reconnaissance by fire against a probable enemy position before initiating the movement of a bounding element.

DANGER

To prevent fratricide, a crew never engages a target without its discrimination as foe.

Instances may arise in which friendly, neutral, or noncombatant entities appear to have or are actively participating with hostile intent. In such cases, the leader is responsible for making effective decisions that prevent fratricide, reduce or eliminate harm to noncombatants and neutral actors, and reduce or eliminate collateral damage. Leaders maintain clear understanding of the tactical situation and of the nature of the battlespace in which they operate. They maintain the capability of employing nonlethal methods, tactical movement, or actions to eliminate potential or prevent imminent fratricide.

TARGET CONFIRMATION

6-29. All personnel are proactive in reducing the risks of fratricide and noncombatant casualties. Many tools assist in preventing fratricide (for example, training for identifying combat vehicles and aircraft; a unit's ***weapon safety posture*** **[an ammunition handling instruction that allows the commander to control the safety of the unit's weapons precisely]**; the WCS, recognition markings, and common operational picture employing solid tactics, techniques, and procedures that the unit's SOPs reinforce). Yet, the primary means of preventing fratricide and noncombatant casualties are applying the kill chain, understanding friendly force markings and symbols, and properly employing and applying the ROE.

6-30. As part of target confirmation during the decide function (or link) of the kill chain, the leader making the engagement decision is responsible for thoughtful verification of the threat to eliminate fratricide and reduce collateral damage (see figure 6-7). This includes verifying the following:

- Range to the target.
- Appropriate selection of combat power.
- Discrimination of the threat as foe.
- Positive identification of the model or common name and the variant.

ENGAGEMENT DECISION

The leader has a tactical and moral responsibility to complete TARGET CONFIRMATION prior to giving a command of execution to their subordinates. This is critical step in fratricide prevention, whether BLUE on GREEN, BLUE on BLUE, or GREEN on BLUE.

TARGET CONFIRMATION

4

Confirm the target as hostile prior to any command of execution. Target confirmation is the leader's responsibility; they must verify the threat to eliminate fratricide and reduce collateral damage:

- **RANGE TO TARGET**.
- **COMBAT POWER** is **APPROPRIATE** for the threat present.
- **TARGET** is **DISCRIMINATED** as **FOE**.
- **POSITIVE IDENTIFICATION** (model/variant/common name).

Figure 6-7. Target confirmation

6-31. Target confirmation involves the leader's rapid verification of the initial range to the target, identification of the model or common name and variant, and discrimination of the threat as foe. The leader also confirms the selected combat power's effectiveness to accomplish the desired effects on the target. Target confirmation occurs when a firer positively identifies and discriminates a target and again as an implied task to the firer and leader prior to the command of execution.

6-32. Firers also complete target confirmation as they make their final, precise lays to ensure the target is hostile (see chapter 7).

Note. When firers discriminate a target as hostile, they complete their final lays and engage the target on order (command of execution). When firers discriminate a target as friendly or neutral, they announce their confirmations to their leaders with FRIENDLY or NEUTRAL as appropriate. When they cannot determine the nature of a target, they announce UNKNOWN.

6-33. When a discrepancy exists between a leader's and firer's discriminations of a target as hostile, the leader confirms the target is in the firer's field of view and conducts the CID process again. When leaders cannot discriminate a target, they close with the target, let the target close with them, or use another method to discriminate the target as friend, foe, neutral, or noncombatant before issuing the command of execution.

RANGE TO TARGET

6-34. Verifying the range to the target enables first round strikes and reduces collateral damage. Leaders remain mindful of objects along the gun-target line and trajectory, in the background, and to the sides of the engaged targets.

APPROPRIATE COMBAT POWER

6-35. The leader selects the appropriate combat power to use against the threat and verifies the combat power is indeed appropriate. The goal of all leaders is the judicious use of available combat power to manage munitions throughout the longer mission. The appropriate combat power also reduces target overkill, which wastes ammunition resources vital to mission success.

6-36. Using the appropriate weapon for the target increases the probability of rapid enemy destruction or suppression and saves ammunition. The unit has many weapons for engaging the enemy and an equal variety of targeting sensors and optics. The key factors for determining the appropriate weapon and ammunition are the type of target, range to the target, amount of friendly exposure to the threat, available weapons and ammunition, and desired target effects.

6-37. Leaders consider individual crew and small unit capabilities when deciding on the employment of weapons and munition types. The commander task-organizes and arrays forces based on the terrain, enemy, and desired effects of fires. For example, when the commander expects an enemy infantry assault in restricted terrain, the commander employs the Infantry squads, taking advantage of their ability to engage numerous, fast-moving targets most effectively. Subordinate units can then concentrate on their target sets and use adjacent or available warfighting functions more effectively.

DISCRIMINATION OF FOES

6-38. Target discrimination is a leader's legal and ethical responsibility. Therefore, when a leader is unsure, based on the weapon posture, WCS, and ROE, the leader also has a legal and an ethical obligation to fire at known threats only.

6-39. The leader maintains awareness of the current battlespace's situational understanding systems that are available to the friendly and allied forces who are operating in the leader's sector of responsibility. Other technological elements such as JCR may enhance these systems, and the Soldiers' procedures within the small unit may support them. (See chapter 4 for more detailed information on the discrimination process.)

TARGET IDENTIFICATION

6-40. Target identification is the accurate and timely characterization of a detected contact in the battlespace as friend, foe, neutral, noncombatant, or unknown. This aspect of CID is time sensitive and serves as the basis for a Soldier's decision to engage or not. The two types of target identification are cooperative and non-cooperative. In direct fire situations, regardless of the system the Soldier is using to identify a target, the Soldier makes visual positive identification before engaging the target.

Cooperative Target Identification

6-41. Cooperative target identification technologies send a query and receive the response, I am a friend. Cooperative target identification systems may be high technology such as query systems that electronically identify friendly elements, or they may be as low of technology as a sentry issuing a challenge and awaiting a password. Cooperative target identification directly addresses fratricide avoidance by positively identifying friendly elements.

6-42. Cooperative target identification provides an affirmative identification of friendly units equipped as well with cooperative target identification technology. However, the absence of a friendly response does not substantiate a target discrimination of foe. The Soldier would still need to use the direct fire engagement process to identify targets that the cooperative target identification technology has not discriminated as friend. Cooperative target identification technologies are never to serve as the sole criterion for engaging a target. Mechanical issues or enemy action can render the cooperative target identification technology inoperative, or friendly units or allies in the operational environment may not possess compatible cooperative target identification technology. With or without cooperative target identification technology, Soldiers are never to engage unknown contacts in the battlespace before they make visual positive identification.

6-43. Current cooperative target identification technologies include identification, friend or foe systems and battlefield target identification device and RBCI systems. None of the cooperative target identification technologies currently in use or under development truly discriminate friend or foe; they can discriminate friend or unknown only.

Non-cooperative Target Identification

6-44. Non-cooperative target identification devices support target classification by exploiting the physical characteristics of the detected contact. They require no cooperative action or response on the part of the detected contact. They may be active or passive and employ an array of technologies, including those that support the detection and analysis of signal, noise, and radiation emissions or the determination and analysis of physical dimensions and characteristics.

6-45. Non-cooperative target identification systems include—

- Optics (forward-looking infrared, NVGs, and binoculars).
- JCIMSs for vehicles and personnel:
  - CIP.
  - TIP.
  - IR beacon.
  - DCIMS.
  - Automated target recognition device.
- JCIMSs for use with forward-looking infrared optics and NVGs, which assist in friendly identification at the point of engagement.

6-46. Both cooperative and non-cooperative target identification methods are tools for enhancing the direct fire engagement process. However, they are subject to error and require Soldiers to make visual positive identification before engaging the target.

Positive Identification

6-47. *Positive identification* is an identification derived from observation and analysis of target characteristics, including visual recognition; electronic support systems; non-cooperative target recognition techniques; identification, friend or foe systems; or other physics-based identification techniques (JP 3-01). It is the culminating result of target discrimination and identification that enables the leader to make an engagement decision.

CONTINGENCY PLAN

6-48. Not all plans or engagement decisions achieve the desired effects. During any engagement, the enemy, effects of combat power, battlespace conditions, environment, and other key factors influence the engagement's outcome. Contingency planning in this framework incorporates those plausible outcomes during the larger battle or the engagement's second- and third-order effects on the friendly force. The leader mentally plans for battle complexities, possesses the mental agility to adapt to them, and maintains various options for mitigating their impacts on the fight at hand (see figure 6-8).



Figure 6-8. Contingency plans, example

6-49. Effective fire control requires a unit to acquire the target and mass the effects of fires rapidly to achieve decisive results in the close fight. When planning and executing direct fires, the commander and subordinate leaders know how to apply several fundamental principles.

6-50. The principles of direct fire do not exist to restrict subordinates' actions. Applied correctly, these principles help the firing element accomplish its primary goal in direct fire engagement: to acquire first and shoot first. In this way, subordinates retain the freedom to act quickly upon target acquisition. This section emphasizes the following principles:

- Plan for extreme limited visibility conditions.
- Develop contingencies for diminished capabilities.

6-51. Units increase their survivability by allowing their own exposure to the threat, but only so far as is necessary to engage the enemy effectively. Defilade, whether natural or artificial, provides the best cover from kinetic energy direct fire munitions. Crews and squads minimize their exposure by constantly seeking effective, available cover, attempting to engage the enemy from the flank, remaining dispersed, firing from multiple positions, and limiting engagement times.

6-52. At night, limited visibility fire control equipment enables the unit to engage enemy forces at similar ranges as those achieved during daylight operations. Obscurants such as dense fog, heavy smoke, and blowing sand can reduce the capabilities of thermal and image-intensifying optics and sensors. Units develop contingency plans for such extreme limited visibility conditions.

6-53. Although decreased acquisition capabilities have minimal effect on area fire, point target engagements occur at decreased ranges. Typically, firing positions, whether offensive or defensive, adjust closer to the area or point on which the commander intends to emphasize fires. Another alternative is to use visual or IR illumination when insufficient ambient light exists for image-intensifying optics and sensors to function to their maximum capabilities.

6-54. Leaders initially develop plans based on their unit's maximum capabilities. They make alternate plans for implementation in the event of casualties and weapon damage or failure. While leaders cannot anticipate or plan for every situation, they can develop plans for what they view as the most probable occurrences.

6-55. Redundancy in these plans, such as having multiple systems observe the same sector, is an invaluable tool when the situation (and the number of available systems) permits. Designating alternate sectors of fire provides a means of shifting fires when adjacent elements are not mission capable. Examples of contingencies for diminished capabilities include designating certain vehicles or systems to engage targets due to—

- Ammunition shortages or weapon malfunctions.
- Inherent weapon effective range or firepower capability.
- Vehicle fire control system malfunctions.
- Available sensors and optics that provide clear advantage and maximum standoff.
- Availability of external warfighter enablers.

6-56. For the effective application of the principles of fire control, a sequence of commands was developed to define the conduct of fire. The fire command for the team, crew, and small unit contains the conduct of fire for any direct fire engagement. This includes commands for machine gun teams, squads, vehicle platforms, and collective small units through the company team.

Chapter 7
Engage

This chapter provides standard methods for directing and controlling direct fire delivered by the Soldier, team, squad, vehicle, section, and platoon. The engage function (or link) of the kill chain covers the procedural steps from target acquisition, through the placement of direct fires on those targets, to the evaluation of the effects of those fires. This chapter includes considerations for fire distribution and control during offensive and defensive operations. The engage function is the culmination of all the preceding functions in the kill chain (see figure 7-1).

Since this chapter contains a significant amount of commonality across mounted weapon platforms, small teams, squads, and collective small units, it uses the term *leader* and the acronym VC to identify the appropriate position of authority for issuing a command of execution to subordinates. Whenever additional clarity becomes necessary, a specific position is identified.

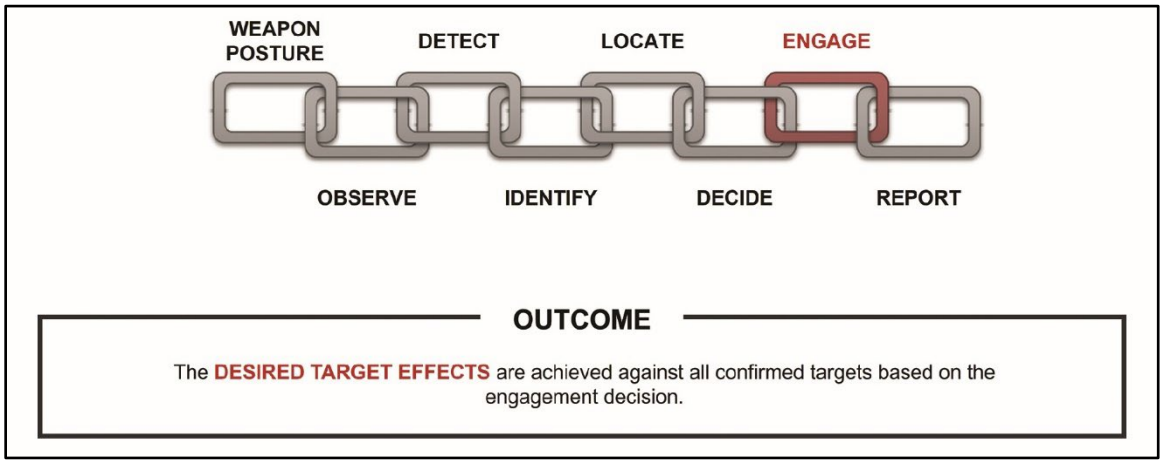


Figure 7-1. Engage function of kill chain (conduct of fire)

PROCESS

7-1. Once the leader has made an engagement decision to employ organic direct fire against the confirmed targets, the team, crew, squad, or small unit commences the engage function of the kill chain. This link provides the conduct of the engagement, termed *conduct of fire*. The leader then issues a fire command to reduce or eliminate the presented threat (see figure 7-2).

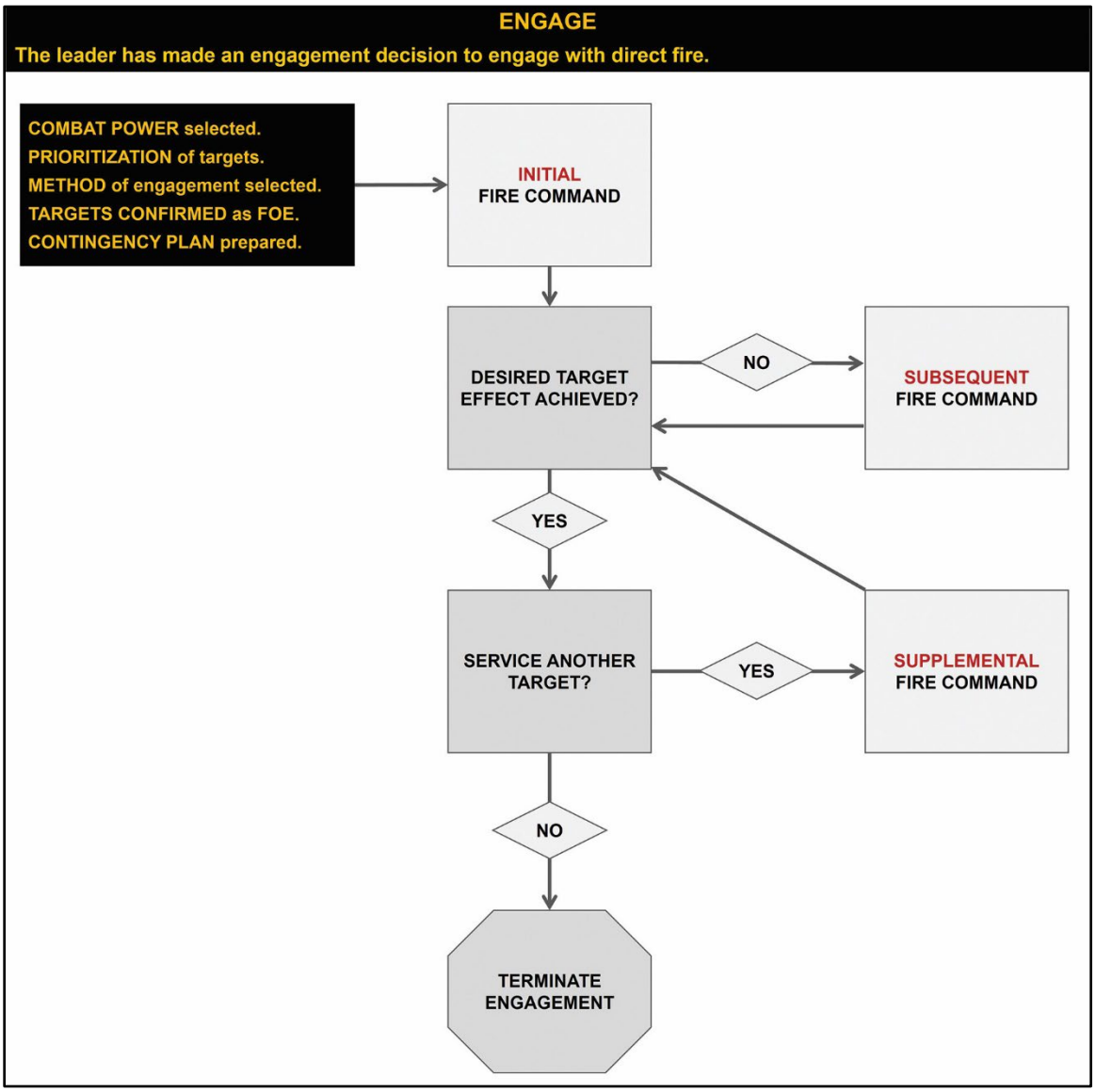


Figure 7-2. Engage function of the kill chain, example

7-2. The conduct of fire provides standard fire commands, elements, terms, modifiers, phrases, actions, and responses for the smooth delivery of lethal fires in an organized manner. During training, firers and small units undergo evaluation of their proper application of the conduct of fire. These standards ensure all members of a collective firing element receive equivalent training, and they allow for the rapid integration of new personnel into the organization. Both practices ultimately serve to reduce or eliminate confusion during engagements.

7-3. During engagements, leaders may use up to three types of fire commands: initial, subsequent, and supplemental (see figure 7-2 on page 140). Training and combat operations make frequent use of the term *engagement*. It has specific meaning within the context of the kill chain in its relationship to the delivery of direct fire.

Note. An engagement is the delivery of direct fire on a target or series of targets from a firer, team, crew, or small unit to alter the threat's engagement decision process against a friendly force. An engagement begins with an initial fire command, may contain one or more subsequent or supplemental fire command(s), and ends with a termination command.

7-4. The three types of fire commands are specific to the firing occasion within the engagement. All engagements begin with an initial fire command. After the successful execution of that command, the outcome and the remaining tactical situation drive the leader's continuing engagement decisions.

7-5. Within the fire commands are a series of standard elements. The elements serve to synchronize effort, understanding, and cohesion across the small unit. This chapter discusses these elements and their general guidelines.

FIRE COMMANDS

7-6. A fire command is a structured order from an authorized leader to deliver combat power against a confirmed target or a series of confirmed targets. A fire command serves to control and synchronize the conduct of the firing of weapons (known as conduct of fire).

7-7. There are three types of fire commands: initial, subsequent, and supplemental. They establish a common language and framework (that is, a conduct of fire) for application during engagements of single or multiple threats. The common language and framework assists coordinated efforts to adjust direct fires and thereby to achieve the desired effects on the targets.

INITIAL FIRE COMMAND

7-8. An initial fire command initiates a direct fire engagement on a confirmed target. In general terms, the initial fire command contains all the requisite elements to answer the following questions:

- Who is firing (alert)?
- What weapons and ammunition are in use (weapon/ammunition)?
- What target (target description) is being engaged?
- How is the target being engaged (method or technique)?
- Where is the target located (direction or elevation)?
- How far is the target from the firer (range)?
- What controls are in place to manage the fire (controls)?
- When are the weapons to be fired, or when are the firers to engage (command of execution)?

SUBSEQUENT FIRE COMMAND

7-9. A subsequent fire command directs the firing element to continue engaging the same target by delivering subsequent rounds. After receiving the evaluation results of the effects of fire, a leader may give subsequent fire commands after any fire command. Leaders give them under the following conditions:

- The previous round or burst does not achieve the desired effect on the target.
- Despite the successful achievement of an effect on a target, additional rounds are necessary to suppress other less dangerous threats in the same vicinity.

SUPPLEMENTAL FIRE COMMAND

7-10. A supplemental fire command transitions a firer to another target (that is, one different than the target just engaged) within an array during an engagement with multiple targets. The transition to another target may involve changes in the employed weapon and ammunition. When leaders decide to transition to another target, they give supplemental fire commands after the execution of any other fire command. Supplemental commands contain all the elements necessary to deliver the following:

- Direct the gunner or firer onto a new target (target description).
- Direct any change of weapon or ammunition type (weapon/ammunition).
- Issue the order to commence firing (command of execution).

FIRE COMMAND USE IN CONDUCT OF FIRE

7-11. The small unit leader or VC is responsible overall for the conduct of fire during all engagements. Firers are responsible for all the rounds fired from their weapons or weapon systems.

7-12. A fire command (initial, subsequent, and supplemental) with an authorized command of execution must be given for each threat engaged. Leaders and firers must confirm the hostile character of each target prior to engaging it. Small unit leaders must use fire commands to authorize subordinates to engage.

7-13. Figure 7-3 shows how the three types of fire commands interact. This flow chart indicates for what purposes a leader might use each type of fire command. The key principles governing the types of fire commands include the following:

- All engagements begin with an initial fire command.
- When leaders decide to continue firing at the same target, they issue a subsequent fire command.
- When leaders decide to engage a different target during the engagement, they use a supplemental fire command to transition fires to the new target.
- When leaders decide to return to a previously engaged target, they issue a supplemental fire command.

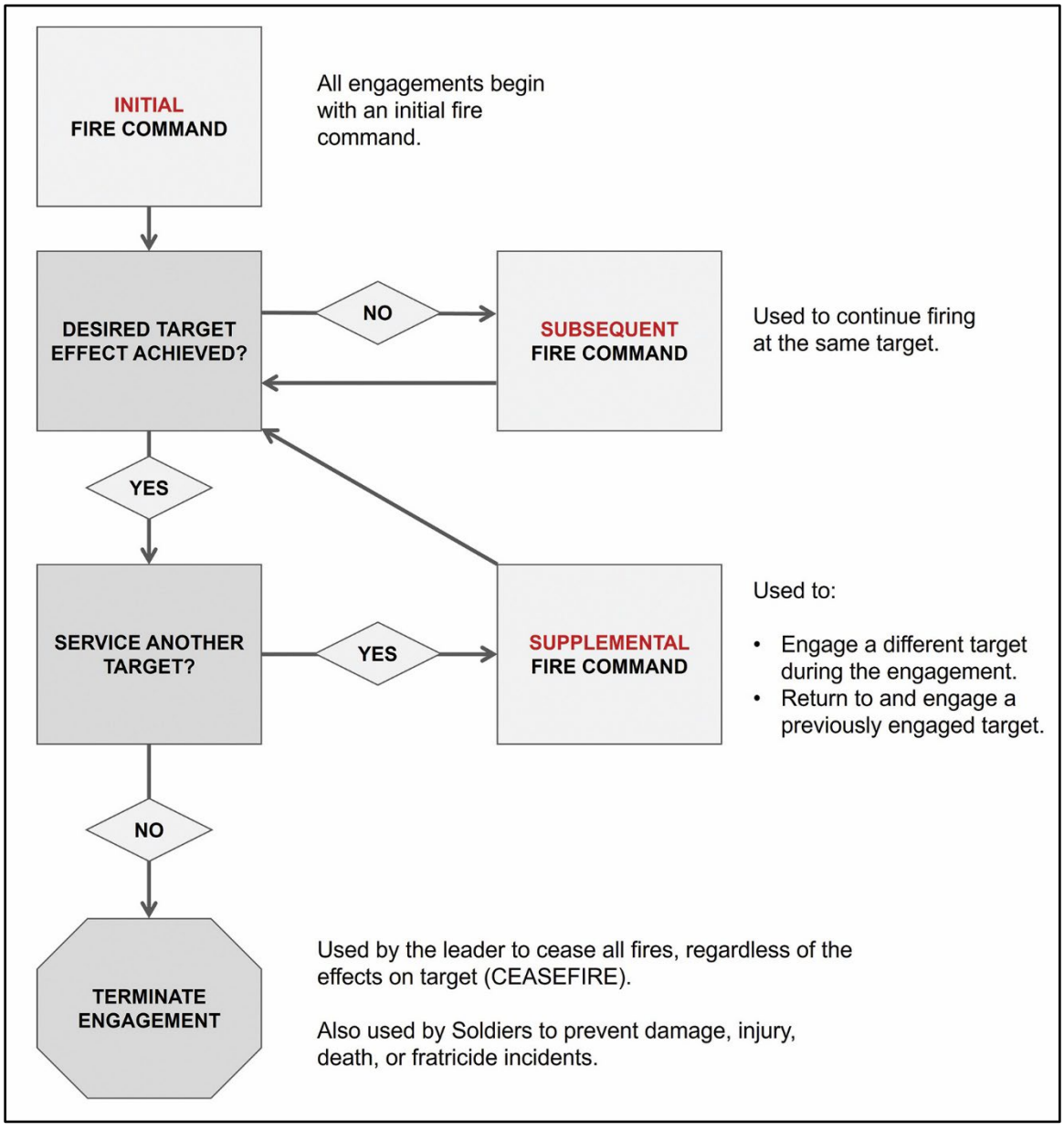


Figure 7-3. Conduct of fire (fire command) flow, example

ELEMENTS OF A FIRE COMMAND

7-14. During engagements, the conduct of fire becomes apparent through fire commands. The fire command contains up to nine distinct elements (see figure 7-4). The nine possible elements are—

- Alert.
- Weapon and ammunition.
- Target description.
- Method.
- Location.
- Range.
- Controls.
- Execution.
- Effects.

7-15. Not all firing occasions require all nine elements of a fire command. The tactical situation or firing element capabilities may render a required element optional because it is already known and understood or because it is automatically input into the fire control system.

7-16. Elements of the fire command are the building blocks to engagements. Nine elements are at the core of every fire command. Leaders may not specifically announce all the elements in every firing occasion, yet they all will be provided through some mode—whether by voice, visuals, or automatic input in the fire control system. The unit's battlecarry SOP may provide some elements such as default firer or weapon and ammunition types. Standard terminology and a logical sequence support effectiveness and speed in engagement.

7-17. These nine elements standardize the fire commands for dismounted small teams and units, crews, sections, and platoons. Their placement falls in a logical, effective order, so a collective fire command from a platoon leader can rapidly transition to a squad leader's fire command to the squad.

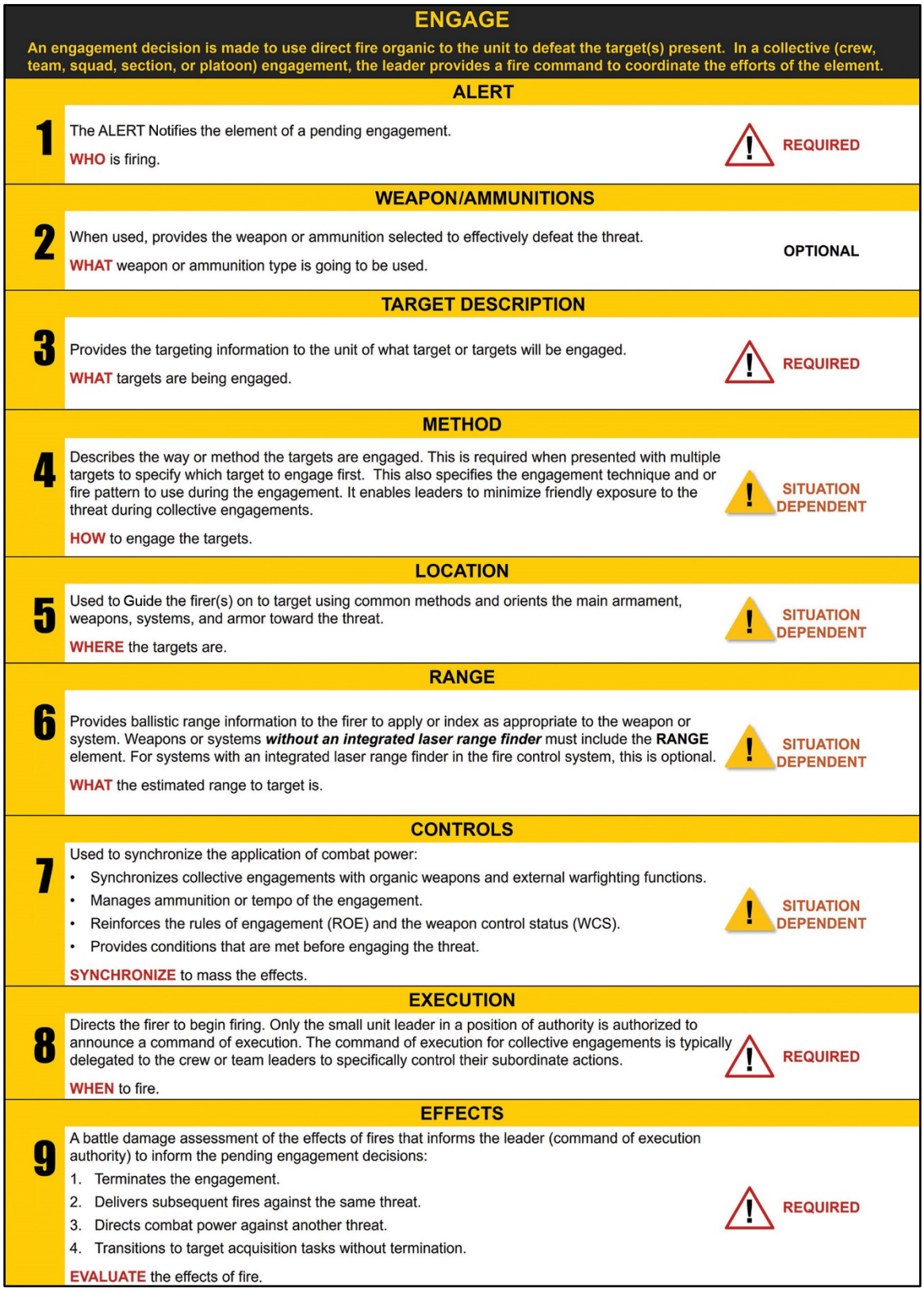


Figure 7-4. Elements of the fire command within the engagement process, example

ALERT

7-18. The first element of the fire command is the alert. All types of fire commands (initial, subsequent, and supplemental) begin with an alert to the firing element. The alert performs two functions: it notifies (alerts) the firing element of a pending engagement, and it identifies which members of the firing element are to fire.

Note. The type of fire command, the unit's SOPs, and the tactical situation notify the leaders of the most appropriate delivery of the alert in each firing occasion since they have multiple options available.

WEAPON AND AMMUNITION

7-19. The second element of the fire command addresses the weapon and ammunition. It identifies to the crew or small unit which weapon and ammunition types to fire during the engagement. Circumstances may allow for the omission of this element.

Note. The determination of the weapon and ammunition types to employ during the engagement of the current threat occurs during the decide function in the kill chain (selection of combat power).

TARGET DESCRIPTION

7-20. The third element of the fire command is a target description. More accurately, the description is of any threats the small unit or crew is to engage. All fire commands, regardless of the firer (for example, leader, Soldier, VC, gunner, loader), are required to have a target description. The purpose of the target description is to identify which target the firer is to engage. This remains true for multiple weapons preparing to engage multiple threats.

Note. When multiple targets have been identified for elimination during the decide function of the kill chain, the leader must include in the method element a modifier that specifies which target to kill first.

METHOD

7-21. The fourth element of a fire command, method, communicates to the firer the way in which the firer is to engage the targets. The determination of the method of engagement occurred during the decide function of the kill chain, and the method element of the fire command delivers it to the crew or small unit.

Note. The method element also communicates the way in which a crew or small unit is to engage multiple targets. The inclusion of a modifier specifies which target to engage first, a prioritization of direct fires against each type of target, the fire pattern to employ, or an engagement technique.

7-22. Once the leader makes the engagement decision, the information from the decide function of the kill chain is applied to the respective element of a fire command. When presented with multiple targets, leaders use the method element to specify information for the components in paragraphs 7-23 through 7-26.

Modifier

7-23. The modifier component pinpoints a specific target of multiple targets to engage first, whether the series of targets are of the same type or of a variety of types. Specifying which target to kill first is necessary for the firer. An example scenario might have two tanks and a PC present. The leader prioritized the tanks first but would need to use a modifier to select the dangerous or the most dangerous threat. Following the rules of direct fire (near before far, frontal before flank, stationary before moving, most likely to serve the purpose of protecting the force, at a tactically relevant distance), the leader uses a modifier as a method after the target description. The leader would direct the firer onto the target to be killed first by announcing GUNNER, SABOT, TANKS AND PC, STATIONARY TANK FIRST. In this way, the leader directs the firer onto the stationary tank of the two tanks present.

Prioritization

7-24. The focus here for the prioritization component is in the context of collective engagements. Leaders use the outcomes from the engagement decision (prioritization and method) to select the most appropriate threat types to kill first in series or sequence. Leaders prioritize a specific target type before all others for the collective efforts to kill. An example scenario might have multiple tanks, IFVs, and trucks moving into the EA. The leader uses prioritization to select the type of target to be engaged first by announcing TANKS, BTRs, AND TRUCKS, TANKS FIRST.

Fire Pattern

7-25. The focus here for the fire pattern component is in the context of collective engagements. Leaders may use one or multiple in one fire command to engage threats.

Engagement Technique

7-26. A leader may elect to prescribe one, depending on the tactical situation, the selected weapon or ammunition for firing, a general goal to conserve ammunition, or a means to minimize friendly exposure to the threat.

LOCATION

7-27. The fifth element of a fire command provides any necessary direction or elevation to a threat, so it is optional. It serves to guide the firer onto the target in various ways. The leader or VC may use direction or elevation terms to assist the firer in acquiring the correct target, or they themselves may perform the action (for example, commander's override, control hand station, commander's handle).

7-28. This element may include elevation to direct the firer onto the desired target more accurately. Elevation is useful to leaders when they are describing a target's location in urban environments and restricted terrain.

7-29. The location element serves to orient weapons and armor protection toward the threat. Leaders use it in crew or team fire commands as well to direct the firing element to sense impacts of small arms

engagements as they can. In collective engagements, leaders use the location element to direct a contact or action drill to orient fires, weapons, and armor protection.

Note. The location element includes the general direction toward which to slew the armament and armor.

RANGE

7-30. The sixth element of the fire command tells the firer what range to set on the weapon sight, to index, or to apply to the fire control system. When announcing the specific range, a leader typically uses even 100- or 1,000-meter increments such as ONE EIGHT HUNDRED, TWO THOUSAND, and so on.

Note. The range element is the estimated range to the target for the engagement. It proves useful when a fire control system does not automatically input an accurate range to the target into a ballistic solution or when that capability is degraded for any reason.

CONTROLS

7-31. The seventh element, controls, enables the leader to manage ammunition and friendly exposure to the threat, to reinforce the ROE, or to create pre-engagement conditions. The controls are specific to the timing of the engagement to enable the massing of fires.

7-32. A fire command may employ multiple controls. Controls in a collective fire command can delegate to a subordinate leader the authority to issue the command of execution.

Note. The controls element provides synchronization instructions (timing) to the collective engagement that cover the limitations, restrictions, and authorizations during the engagement.

EXECUTION

7-33. The command of execution is the eighth element of the fire command. All fire commands (initial, subsequent, or supplementary) require a command of execution for the firer to commence the engagement. Only the small unit leader in a position of authority may announce a command of execution (see AR 600-20).

Note. The command of execution is a lawfully based and ethically driven order to commence firing against a confirmed target. Leaders may delegate the authority to issue a command of execution to a legally responsible subordinate leader.

EFFECTS

7-34. The ninth element of a fire command concerns the effects on the target. Evaluating the recent direct fire engagement is useful for determining the effects on the target and whether additional rounds are necessary to achieve the desired outcome. Further, it alerts the Soldier, team, crew, or small unit of changes to the current engagement and to prepare for additional commands from the leader.

Note. The effects element depends upon an evaluation of the direct fire already delivered against the threat. The evaluation assesses the strike of the round, the kill indicators present at the time of impact, and the resulting level of destruction. When able, the leader provides this element to the crew. However, when a leader is unable to make the proper assessment, the gunner may provide this element. In that case, the element supports the leader's tactical understanding and subsequent engagement decision.

7-35. Leaders and firers visually confirm the effects of fire to build sufficient tactical information to enable subsequent engagement decisions. This evaluation includes observation of the strike of the round or its perceived point of impact in relation to the target, the actions of the threat once struck with those rounds, and a determination of the threat's remaining military capability. Generally, the sensing is a short description that supports the leader's determination of the tactical engagement decision with the highest probability of protecting the force and reducing or eliminating the threat.

7-36. Regardless of the effects on the target, the minimum acceptable result is hitting the target. Against dismounted targets, the desired outcome may be suppression since it affords the friendly force time to maneuver to a position of advantage from which it can defeat the threat. In general, suppression of dismounted targets and hits on all other types of targets create significant tactical events to alter the threat's engagement decision process. This, in turn, can provide the friendly force with more time to reduce or eliminate the threat.

7-37. The threat's engagement decision process or kill chain is comparable to that of the U.S. Army. In a continuous cycle, threat elements perform the same actions to detect, identify, locate, decide to engage, engage, and assess the effects of their fires on their targets.

7-38. Interrupting the enemy's kill chain equates with suppressing the target. Yet, upon target suppression, the enemy may return to the beginning of their engagement decision process. Nevertheless, this still allows the friendly force time to reposition and to deliver more effective fires on the target. Suppressive fires may continue, depending on how rapidly the threat returns to the engage function (or link) of their kill chain, or they may continue until the friendly force succeeds in neutralizing or destroying the threat.

7-39. Suppression is to define the tactical actions of dismounted targets only. The suppression of any other type of target does not necessarily alter the enemy's kill chain. Quite the opposite, it can provide the enemy with useful information that enables them to escalate the progress of their kill chain. This can effectively reduce the remaining time the friendly force has to eliminate the threat before the enemy delivers effective fires.

ONLY DISMOUNTED TARGETS MAY BE CONSIDERED SUPPRESSED

For example, rounds may impact an enemy tank, which then stops moving shortly after the strike. Although the vehicle stops, this does not necessarily mean the successful suppression of the threat. Rather, as part of their kill chain, the enemy may have located the position of the friendly force by its fire. This could mean a loss in the amount of time the friendly force now has to eliminate that enemy tank.

7-40. The effects on the target undergo evaluation by three basic assessments: sensing, kill indicators, and the level of destruction. Figure 7-5 details these outcomes.

EFFECTS ON TARGET						
SENSING	KILL INDICATOR	LEVEL OF DESTRUCTION				
		SUPPRESSION	MOBILITY	FIREPOWER	COMBINED	CATASTROPHIC
DOUBTFUL	IMPACT LEFT/ RIGHT OF TARGET	POSSIBLE				
LOST	UNABLE TO VERIFY STRIKE OF ROUNDS					
OVER	OBSERVED OVER TARGET					
SHORT	IMPACT IN FRONT OF TARGET	POSSIBLE				
TARGET	IMPACT ON TARGET	LIKELY	POSSIBLE	POSSIBLE	POSSIBLE	
	CEASED MOVEMENT	POSSIBLE	POSSIBLE			
	CEASED FIRING	POSSIBLE		POSSIBLE		
	SMOKING FRAME (HULL OR FUSELAGE)	LIKELY	LIKELY			
	SMOKING TURRET	LIKELY		LIKELY		
	VEHICLE/ AIRCRAFT EXPLOSION	YES	YES	YES	YES	YES
	CREW ABANDONS VEHICLE/ AIRCRAFT	YES	YES	YES	YES	YES

Figure 7-5. Evaluation of the effects on the target, example

Sensing

7-41. A sensing is the oral response to a round or series of rounds (such as machine gun burst) from the firer, VC, or leader regarding where rounds struck or passed targets in relation to the target aiming points. When the first round or burst fails to destroy the target, a sensing enables the small unit or crew to adjust fire for subsequent rounds when directed. When part of the collective kill chain, this assessment provides a standardized reporting function to the next higher leader. This, in turn, supports the development of the situation report to the higher headquarters on the actions taken, status of the friendly forces, and estimated effects of the engagement.

7-42. Sensing effectively describes the impact of the rounds in relation to the target. The following are standard descriptions of the impact:

- Doubtful (left or right):
  - The observed impacts are to the flanks of the target.
  - This assessment generally leads to a subsequent fire command for the firing element.
- Lost:
  - The firer or leader either could not observe or determine the impact.
  - Lost rounds typically pass over the intended target.
  - This assessment generally requires a more drastic adjustment in a subsequent fire command to bring the round either on target or on a more observable point (so the firer can assess its impact, and the leader or firer can then make more accurate adjustments).
- Over—The observed impacts (typically above the target or of tracers) indicate a need to drop subsequent rounds (lower the elevation) a known amount to achieve impacts on the target.
- Short:
  - The observed strikes are in front of the target.
  - This assessment generally requires a subsequent fire command to correct an error in the range to the target or made by the firer or crew.
- Target:
  - The observed strikes are on the intended target.
  - After this assessment, the leader ascertains the effects of fire by observing the threat's actions immediately after the strike.

7-43. Sensings are not the only information leaders use to make their next engagement decisions. The type of target, desired outcome, sensing, and threat's actions provide actionable intelligence for the leader. Leaders use the kill indicators to determine whether the direct fires succeeded in suppressing or killing the threat.

Kill Indicators

7-44. When assessing the effects of combat power against a threat, the firer and leader look for signs at the target's location that indicate a change to the threat's military significance based on the threat type by domain.

7-45. Kill indicators for tracked and wheeled vehicle targets can indicate a change in their hostile intent. Examples of these kill indicators follow:

- Vehicle stops moving.
- Vehicle stops firing.
- Vehicle is smoking from what appears to be internal damage.
- Vehicle explodes.
- Crew abandons the vehicle.

7-46. The clear observance of kill indicators does not necessarily validate assumptions or confirm conclusions. For example, a change in the movement of the target does not indicate the successful achievement of a kill but may indicate the successful suppression of the threat. When a vehicle stops moving, a leader may decide to reengage in the event the vehicle has maintained the capability to engage with direct fires, even if in a degraded capacity. For a second example, when a round or missile hits an armored vehicle, an observable explosion with flash occurs. This is the effect of the round impacting the target, not necessarily an indication of damage to the target.

Level of Destruction

7-47. Different characteristics for an adequately engaged target apply when assessing the effects on the target. The leader uses specific indicators to evaluate the battlespace. Levels of destruction aid the leader in determining any subsequent engagement decision. These are suppression and mobility, firepower, combined, and catastrophic kills.

Suppression

7-48. The confirmation of achieved suppression occurs when the firer cannot observe any strikes on the target. Yet, the target has reacted to the contact, and consequently, the threat has altered their engagement decision process.

7-49. The primary objective of suppressive fire is to get the enemy to keep their heads down, which reduces their abilities to shoot, move, or observe within their surroundings. Suppressive fire can be aimed directly at targets (for example, an enemy vehicle) or at an area target (for example, a tree line where enemy troops are hiding).

WARNING

Suppression is applicable to dismounted targets only.

7-50. For the suppression of an area target, the duration of conduct is based on the situation's mission variable requirements, METT-TC (I). The unit maintains its suppression of the target until either it gains a tactical advantage, or another element closes with the target and destroys it. Other elements close with the enemy only after the conduct of coordination and the lifting and shifting of fires.

7-51. Suppressive fire has three purposes:

- To kill or destroy targets as quickly as possible.
- To stop or alter the threat's engagement decision process.
- To allow the maneuver force both to locate and deliver fire on the threat position more accurately.

Mobility Kill

7-52. Mobility kills have been successful when the effects of fire degrade a threat's ability to move under its own power, but the threat is still able to use weapon systems. This does not apply to dismounted targets (see paragraphs 7-48 through 7-51).

Firepower Kill

7-53. Firepower kills prevent a threat's use of weapon systems. This does not apply to dismounted targets (see paragraphs 7-48 through 7-51).

Combined Kill

7-54. Combined kills have been successful when both a mobility and firepower kill render an enemy vehicle ineffective for combat. This does not apply to dismounted targets (see paragraphs 7-48 through 7-51).

Catastrophic Kill

7-55. Catastrophic kills effect the total loss of enemy weapon systems, mobility, and all onboard equipment. This applies to all target types. The sensing of a catastrophic kill announces TARGET, TARGET. The duplicated sensing announcement declares a catastrophic kill.

7-56. Figure 7-6 on page 154 relates the standard elements of a fire command across echelons. Standardizing the fire command structure at crew, squad, and collective levels allows for rapid transmission of the appropriate information to all participating forces.

7-57. In figure 7-6 on page 154, commanders are issuing example initial fire commands. The platoon leader is issuing a fire command based on the platoon's sector of responsibility and the commander's fire command. The squad leader is issuing a fire command to the small unit. In turn, the crew and team leaders issue fire commands specific to their roles in the pending decisive action.

7-58. Also in figure 7-6 on page 154, the command of execution is awaiting the completion of the indirect fire mission on AB6900 to mass fires. Once complete, the commander issues the command of execution to the subordinate leaders.

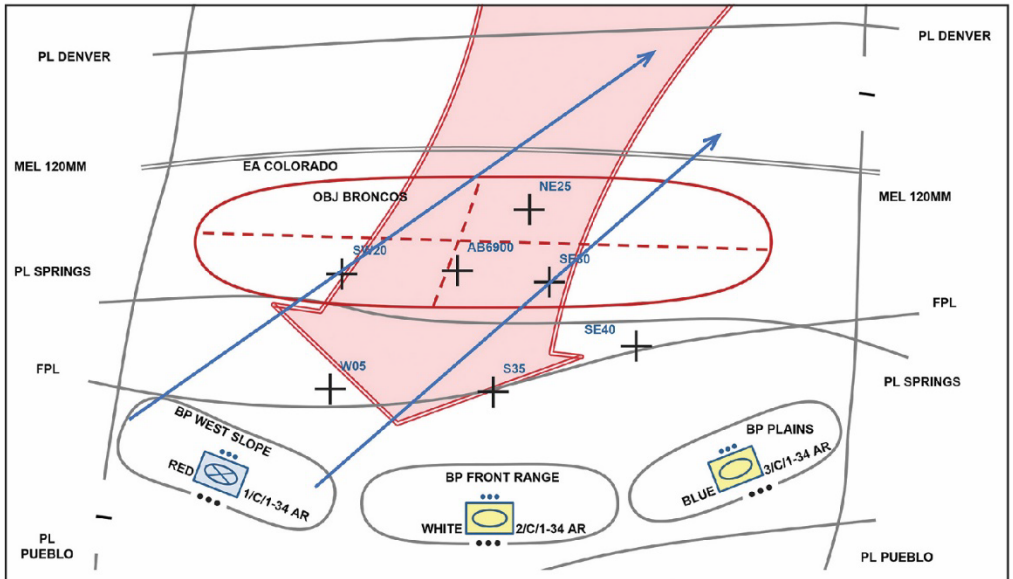
Example

The example in figure 7-6 on page 154 involves an armored brigade combat team Armor company team conducting deliberate defense. The team consists of three platoons:

- RED—Hunter-killer platoon.
- WHITE—Abrams platoon, pure.
- BLUE—Abrams platoon, pure.

Although not a traditional formation, the notional RED platoon consists of two sections. Each section has—

- One Abrams main battle tank.
- One IFV.
- One squad consisting of two fire teams and one antitank team.



ELEMENT	COMPANY/ TROOP	PLATOON (RED)	SECTION (RED ALPHA)	ANTITANK TEAM (RED ALPHA JULIET)	CREW (RED ALPHA TANGO)
ALERT	GUIDONS, GUIDONS, GUIDONS, THIS IS COBRA SIX	RED, THIS IS RED ONE.	RED ALPHA, THIS IS RED ONE	GUNNER	GUNNER
WEAPON/ AMMUNITIONS	MISSILE AND SABOT	MISSLE AND SABOT	MISSILE AND SABOT	JAVELIN	SABOT
TARGET DESCRIPTION	ARMOR AND LIGHT ARMOR APPROACHING PHASE LINE DENVER	MULTIPLE ARMOR MOVING IN SECTOR	MULTIPLE ARMOR	TANKS	TANKS
METHOD	RED, ENGAGE ARMOR; WHITE ENGAGE PC	NEAR TO FAR, FRONTAL, ALTERNATING FIRES. JULIET FIRST	NEAR TO FAR, FRONTAL, ALTERNATING FIRES. JULIET FIRST	NEAR TANK; ALTERNATING FIRES WITH TANGO, WE INITIATE	NEAR TANK FIRST; ALTERNATING FIRES RED JULIET FIRST
LOCATION	VICINITY TRP NOVEMBER ECHO TWENTY-FIVE AND SIERRA THIRTY-FIVE	VICINITY NOVEMBER ECHO TWENTY-FIVE	NOVEMBER ECHO TWENTY-FIVE JULIET LEFT TANGO RIGHT	LEFT OF NOVEMBER ECHO TWENTY-FIVE	RIGHT OF NOVEMBER ECHO TWENTY-FIVE
RANGE					
CONTROLS	WEAPONS HOLD UNTIL ROUNDS COMPLETE ON ALPHA BRAVO SIX NINE HUNDRED; THEN WEAPONS TIGHT	WEAPONS HOLD STAND BY	WEAPONS HOLD STAND BY	WEAPONS HOLD (AWAITING ROUNDS COMPLETE ON AB6900)	WEAPONS HOLD (AWAITING JULIET MISSILE STRIKE)
EXECUTION	ROUNDS COMPLETE, ENGAGE UPON POSITIVE ID	WEAPONS TIGHT, ENGAGE UPON POSITIVE ID	WEAPONS TIGHT; FIRE AND ADJUST	FIRE	FIRE
EFFECTS	SECTOR CLEAR; CEASEFIRE, CEASEFIRE	SECTOR CLEAR; CEASEFIRE, CEASEFIRE	CEASEFIRE, CEASEFIRE	TARGET; CEASEFIRE	TARGET; CEASEFIRE

LEGEND

AR	ARMOR REGIMENT	MM	MILLIMETER
BP	BATTLE POSITION	OBJ	OBJECTIVE
EA	ENGAGEMENT AREA	PC	PERSONNEL CARRIER
FPL	FINAL PROTECTIVE LINE	PL	PHASE LINE
ID	IDENTIFICATION	TRP	TARGET REFERENCE POINT
MEL	MAXIMUM ENGAGEMENT LINE		

Figure 7-6. Conduct of fire synchronization across echelons, example

RESPONSES OF A FIRE COMMAND

7-59. In addition to the nine elements of a fire command, the latter includes responses for responding to, confirming an action for, adding to, repeating, and correcting a fire command. Each Soldier in the small unit or crew has specific duties to perform in response to certain elements of a fire command. The responses and actions of each vary by situation but are essential components to the overall efficiency and effectiveness of the small unit or crew. The three response classification groups are modifier, clarification, and movement.

RESPONSE

7-60. Responses are confirmations of the Soldier's or crewmember's understanding of the fire command or completion of an implied or directed task from the fire command. They can also provide information to the small unit or crew. These responses vary by small unit, weapon system, and echelon. They are essential components of the fire commands and increase the tempo of the engagement by providing rapid confirmation of action to the leader.

7-61. Responses may be oral declarations, actions, or a combination of both. The involvement of ballistics or safety requires an action and an oral response. (See TC 3-20.31-043 for more information.)

MODIFIER

7-62. Modifiers define which target of multiple targets to engage first. They become mandatory for the method element of the fire command when multiple targets are present.

7-63. When there are multiple targets, the requirement for clarity in target identification and accuracy in target description for first engagement, regardless of the firer, increases for leaders. When leaders stipulate modifiers to firers, the firers repeat the given modifier when they identify the target. For example, if the VC announces GUNNER, SABOT, TWO TANKS, LEFT TANK, the gunner then identifies the target, determines the correct range to the target, and responds to the VC's fire command. In this case, the gunner would respond with IDENTIFIED, LEFT TANK, ONE SIX HUNDRED. This response serves as a confirmation of the modifier, especially when the VC is not able to view the firer's actions through an associated optic.

7-64. Some other possible modifiers are—

- NEAR, FAR.
- LEFT, RIGHT, CENTER.
- STATIONARY, MOVING, DEFILADE.
- LEFT TO RIGHT, RIGHT TO LEFT:
  - It directs the gunner to engage the identified targets in a certain order that may differ from the standard of most dangerous to least dangerous.
  - Its most common use is during collective fire with a section or platoon element.
  - Its typical use is in a section or platoon fire command to adhere to that higher element's instruction or the platoon's SOPs.
- NEAR TO FAR, FAR TO NEAR:
  - It directs the gunner to engage the identified targets in a certain order that may differ from the standard of most dangerous to least dangerous.
  - Its most common use is during collective fire with a section or platoon element.
  - Its typical use is in a section or platoon fire command to adhere to that higher element's instruction or the platoon's SOPs.

CLARIFICATION

7-65. Clarification responses allow Soldiers to announce when they have not understood an element (or any portion therein) of a fire command. The Soldier requiring clarification announces the name of the element type that is unclear. For example, a Soldier who has not heard the ammunition element announces AMMO. The leader responds SABOT to this request for clarification.

MOVEMENT

7-66. Movement responses provide guidance or direction to the small unit or crew on required movements for the engagement. Dismounted, mounted, or collective elements use movement responses within their tactical situations. The actual response terminology the elements use is typically common to the organization, basic tactics or movement techniques, or their SOPs.

TERMINATION

7-67. Although terminations of direct fire engagements are not an element of a fire command, every direct fire engagement is terminated with the announcement of CEASEFIRE. This announcement requires all firers who hear it to stop firing immediately. Normally, leaders issue the order to terminate firing once they determine their sectors are clear of threats.

7-68. The termination to any fire command will come from one of three sources: a Soldier, the leader, or a higher authority. A delivered termination cannot be overridden, regardless of the situation.

DELIVERY BY SOLDIER

7-69. A Soldier announces CEASEFIRE after the observation of any unsafe or hazardous conduct that must cease. Any Soldier may announce CEASEFIRE for any act that is injuring or killing friendly, noncombatant, or neutral persons or that is damaging equipment. After the cessation of all fire, Soldiers then announce their position or identity and state the reason for their CEASEFIRE announcement.

DELIVERY BY LEADER

7-70. The leader issues a termination at the reduction or elimination of the threat to avoid the expenditure of additional combat power. The leader may also announce CEASEFIRE to prevent actions or unsafe conduct from injuring friendly, noncombatant, or neutral persons or from damaging equipment.

DELIVERY BY HIGHER AUTHORITY

7-71. The tactical situation, commander's intent, available munitions, and threat activity drive a higher authority's announcement of CEASEFIRE. When a subordinate leader receives the command to cease fire, the leader notifies all subordinates who are actively engaging targets to cease all direct fires. Once all subordinates are in confirmed red (hold) status, the leader reports their weapon posture to the higher authority.

7-72. In the event of an administrative cease-fire, typically during live fire training events, the higher authority may announce CEASEFIRE FREEZE. Immediately, any firing subordinate units are to stop all movement, cease all firing, and leave all firing controls, ballistic solutions, ammunition, and weapon azimuths and superelevations in their immediate state. Units may place weapons in mechanical and electrical safe modes, provided the procedures they use do not move the weapons from their firing positions or change the ballistic solutions or fire control information. The announcement of CEASEFIRE FREEZE is generally for a significant live fire event that requires immediate attention and possible investigation.

Note. For more information on the elements of a fire command and their proper use and for audio examples, refer to the vehicle crew evaluator exportable package available online in the Vehicle Crew Evaluators website.

TERMS OF REFERENCE

7-73. An understanding of specific terms will contextualize the concepts presented within this chapter. TC 3-20.31-043 further discusses the following specific terms:

- Conduct of fire—The specific orders, directions, phrases, terms, modifiers, actions, reactions, responses, and assessments used by two or more Soldiers with synchronized efforts to defeat a threat or threats with direct or indirect fires (also known as fire commands).
- Fire command—A standardized format containing up to nine elements used by a team or crew to deliver direct fire against a threat.
- Engaged target—A threat that has been struck or received direct fires, but the round(s) did not achieve the desired effect.
- Serviced target—A target that has been struck by direct fire and achieved the desired effects.
- Confirmed target—A detected contact that has been interrogated sufficiently to identify its model or common name and discriminated as foe.
- Previously engaged target—A known threat that has received direct fires from the same firer or element within an ongoing engagement.
- Engagement:
  - A series of one or more targets that receive direct fire from a firer, team, crew, or small unit to alter the threat's engagement decision process against a friendly force.
  - Begins with an initial fire command, may contain subsequent and supplemental fire commands, and ends with a termination command.
- Engagement sequence:
  - The order in which multiple targets are engaged with direct fire.
  - May be directed during the conduct of fire or follow standard target prioritization rules of thumb (see chapter 6).

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Chapter 8
Report

Although reports may be provided throughout the kill chain, leaders must deliver updated reports of their tactical situations at every completion of the kill chain (see figure 8-1). The information and intelligence presented in standard formats assist the recipients in visualizing the current or perceived status of the battlespace. Leaders and commanders at all levels are then able to develop the situation from relevant, accurate, and timely information and intelligence. The digital, analog, and radio delivery of reports assists the higher headquarters in maintaining their tactical and operational awareness of the threats units face in the operational environment. Further, this information is capable of dissemination through continuous communication to adjacent and subordinate units, which enables any one unit to fight cohesively and win swiftly.

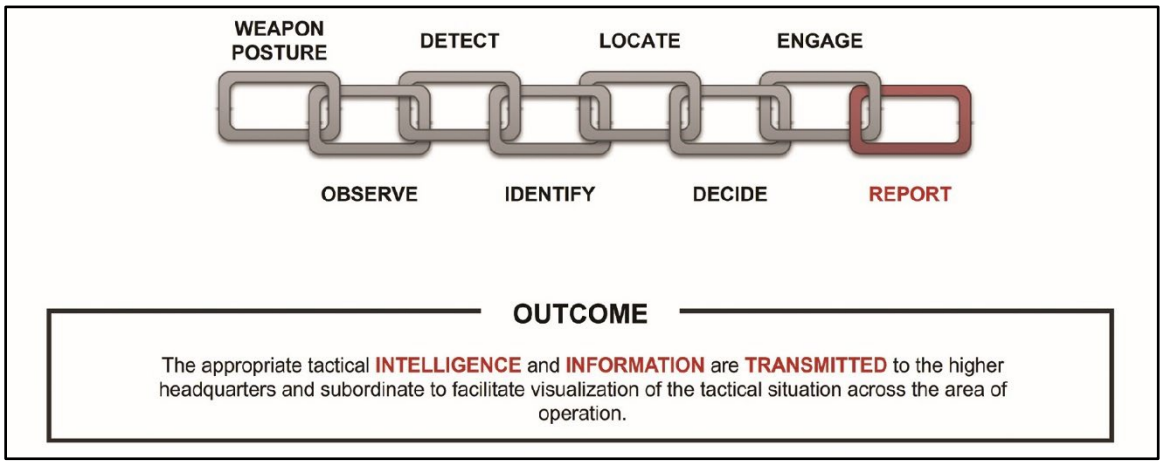


Figure 8-1. Report function of kill chain

PROCESS

8-1. The observer or leader determines the appropriate type of report to submit to the higher headquarters. Each type of report provides specific levels of intelligence. The most common types of reports delivered at the completion of direct fire engagements are—

- Contact report.
- Spot report (SPOTREP).
- Battle damage assessment report.
- Liquids, ammunition, casualties, and equipment report.

8-2. Each report provides specific intelligence to the higher headquarters by which they develop their situational and tactical understanding of the larger battle. This chapter describes the general purpose and content of each report.

8-3. A unit's SOPs and available systems determine the transmission method of reports by radio communications or digital platforms (for example, JCR, Joint Battle Command-Platform [also called JBC-P]). Also, a unit's SOPs may include multiple reporting templates, methods, and time requirements that this publication does not cover. This chapter lists the most common reports only and for reference purposes.

CONTACT REPORT

8-4. Anyone may submit a contact report. It is brief, which is appropriate for its purpose of immediately alerting the commander of contact with the enemy. The contact report provides rapid means to inform others that an observer is experiencing one or more forms of contact with an element of military significance.

Contact Report

The contact report typically provides the following basic information (see also figure 8-2).

LINE 1—CALL SIGN
Announce the call sign brevity code of the reporting unit.

LINE 2—ALERT
Notify the receiving element of the type and urgency of information to follow. The alert for this type of report is CONTACT.

LINE 3—MILITARY DESCRIPTION
Provide the military description of the potential threat that the friendly force has encountered (for example, vehicles, obstacle, troops).

Note. The most common military descriptions appear in figures 4-8 and 4-9 on pages 42 and 43, respectively.

LINE 4—LOCATION
Provide the enemy location from the observer's perspective, position, or location. (See chapter 5 for the different means of providing locations.)

Example: THIS IS RED SEVEN, CONTACT, TANKS, EAST, OUT.

CONTACT REPORT

LINE	CONTENT	REMARKS
LINE 1	CALL SIGN	Call sign of the sending element.
LINE 2	ALERT	CONTACT
LINE 3	MILITARY DESCRIPTION	Military or target description.
LINE 4	LOCATION	The location from the observer's position, location, or perspective.

Note: The CONTACT REPORT is followed by the SPOTREP and BDA. Those follow-on reports provide additional information to the commander to better describe the tactical situation. The follow-on reports are provided as the tactical situation permits.

LEGEND

BDA **BATTLE DAMAGE REPORT** **SPOTREP** **SPOT REPORT**

Figure 8-2. Contact report structure, example

SPOT REPORT

8-5. After it submits the initial contact report, the unit then submits a SPOTREP of intelligence or status regarding events that could have an immediate and significant effect on current and future operations. SPOTREPs assist the higher headquarters in developing the situation and determining the enemy course of action.

LINE 1—DATE-TIME GROUP

8-6. Provide the date-time group (DTG) of the report submission using NATO standard format (see AAP-06). Refrain from using *LOCAL* as an identifier since the letter **L** references UTC+11:00 (Coordinated Universal Time) in east Asia. The letter **J** is not used to designate any DTG time zone. Figure 8-3 is for reference and context only.

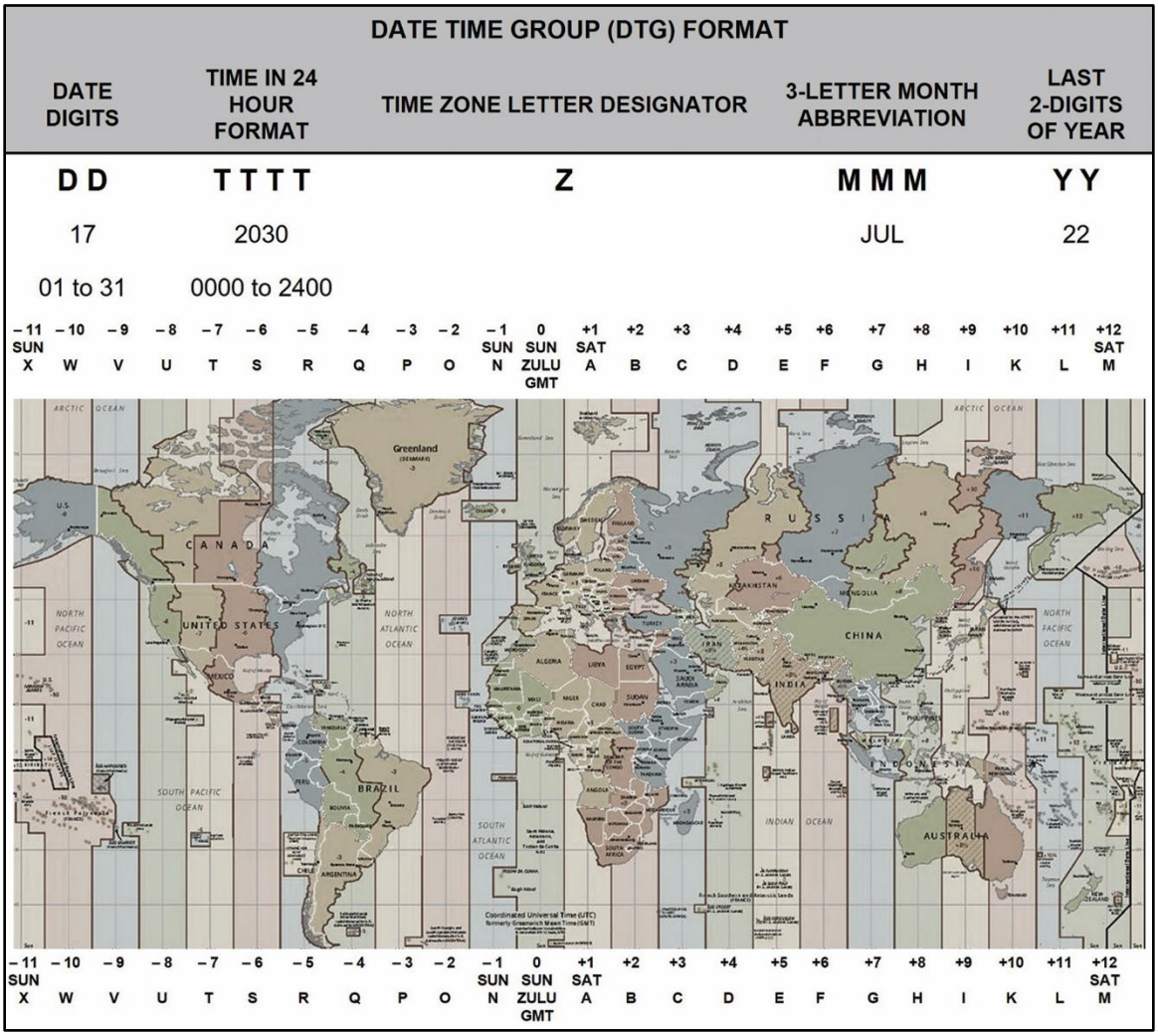


Figure 8-3. Date-time group standardization, example

LINE 2—UNIT

8-7. Provide the reporting unit's identification brevity code or the designation of the unit sending the report in accordance with the unit's SOPs.

Note. After the unit designation, indicate the method of observation: unaided, binoculars, IR, thermal, NVD, UAS (unmanned aircraft system), or other. Follow with any necessary narrative.

LINE 3—SIZE

8-8. Provide the observed size of the detected element in the following sequence.

a. Persons: military, civilian.
b. Vehicles: military, civilian.
c. Equipment: military, civilian.

LINE 4—ACTIVITY

8-9. Describe the observed activity of the detected element. List the applicable brevity codes for the observed activities.

Note. Indicate all activity types and any amplifying subtypes. Add any necessary narrative to clarify, describe, or explain the type of activity.

a. Attacking (direction from).
   (1) Air defense artillery (engaging).
   (2) Aircraft (engaging) (RW, FW).
   (3) Ambush (IED [exploded], IED [unexploded], sniper, antiarmor, other).
   (4) Indirect fire (point of impact, point of origin).
   (5) CBRN.
b. Defending (direction from).
c. Moving (direction from).
d. Stationary.
e. Cache.
f. Civilian (criminal acts, unrest, infrastructure damage).
g. Personnel recovery (isolating event, observed signal).
h. Other (given name and description).

LINE 5—LOCATION

8-10. Use the universal transverse Mercator (UTM) grid zone or the grid coordinate with the military grid reference system (MGRS) grid zone designator of the detected element activity or observed event. Refrain from using any graphic control measure, TRP, or other method to define the location.

8-11. This report also serves to coordinate external warfighting functions. External elements tasked to apply combat power to the threat may not have access to or may not understand the reporting unit's graphic control measures or SOPs. The use of the UTM or MGRS standardizes location reporting.

LINE 6—UNIT

8-12. To the maximum extent possible, describe the detected element, organization, or facility instigating the form of contact. The most detected unit types are—

- Conventional.
- Irregular.
- Coalition.
- Host nation.
- Nongovernmental organization.
- Civilian.
- Facility.

Note. Identify the type of detected element, organization, or facility. In the absence of clear identification, describe in as much detail as possible uniform types, vehicle markings, and other identifying information.

LINE 7—TIME

8-13. Provide the DTG of the observation. This may differ from the DTG of the report submission (from line 1 of a SPOTREP). (See figure 8-3 on page 162 for additional DTG information.)

LINE 8—EQUIPMENT

8-14. List the recognized equipment, either ready for use or already in use, of the observed element.

Note. Identify all equipment types and any amplifying subtype. Add any necessary narrative to clarify, describe, or explain the type of equipment. Provide the nomenclature, type, and quantity of all observed, known equipment. In the absence of clear identification, describe in as much detail as possible the components, characteristics, capabilities, and other identifying information.

a. Air defense artillery (missile, rocket, gun, MANPADS [man-portable air defense system]).
b. Artillery (indirect fire weapon or gun).
   (1) SP (self-propelled) gun or SPA (self-propelled artillery).
   (2) Towed artillery or gun.
   (3) Missile system.
   (4) Rocket system (MLRS [multiple launch rocket system]).
   (5) Mortar system.
c. Armored tracked vehicle.
   (1) Tank.
   (2) IFV or fighting vehicle.
   (3) APC.
   (4) C2.
   (5) Engineering vehicle.
   (6) Transport or utility vehicle.
   (7) Other military description.
d. Armored wheeled vehicle.
   (1) Assault gun.
   (2) IFV or fighting vehicle.
   (3) APC.
   (4) C2.
   (5) Engineering vehicle.
   (6) Transport or utility vehicle.
   (7) Other military description.

e. Wheeled vehicle.
  (1) Gun.
  (2) APC.
  (3) C2.
  (4) Engineering vehicle.
  (5) Transport or utility vehicle.
  (6) Other military description.
f. INF WPN (Infantry weapon).
  (1) Antiarmor missile.
  (2) Antiarmor gun.
  (3) RPG (rocket-propelled grenade).
  (4) HVY MG (heavy machine gun).
  (5) GL (grenade launcher).
  (6) Small arms.
  (7) Other.
g. Aircraft.
  (1) RW.
    (a) AH (attack helicopter).
    (b) UH (utility helicopter).
    (c) Observation helicopter.
  (2) FW.
    (a) Attack.
    (b) Utility or transportation.
    (c) UAS (unmanned aircraft system).
    (d) SUAS (small unmanned aircraft system).
    (e) Other.
h. Mine or IED.
  (1) Buried.
  (2) Surface.
  (3) VBIED (vehicle-borne improvised explosive device).
  (4) PBIED (person-borne improvised explosive device).
  (5) Other.
i. CBRN.

j. Supplies of military significance (see figure 8-4).

CLASSES OF SUPPLY		
CLASS	CONTENT	SYMBOL
CLASS I	RATIONS	
CLASS II	EXPENDABLES	
CLASS III	PETROLIUM, OIL, LUBRICANTS (POL)	
CLASS IV	BARRIER/CONSTRUCTION MATERIALS	
CLASS V	AMMUNITION/EXPLOSIVES	
CLASS VI	SUNDRY	
CLASS VII	MAJOR END ITEMS	
CLASS VIII	MEDICAL	
CLASS IX	REPAIR PARTS	
CLASS X	MATERIAL TO SUPPORT NONMILITARY PROGRAMS	

Figure 8-4. Classes of supply

k. Civilian.
l. Other.

LINE 9—ASSESSMENT

8-15. Provide the apparent reason for or purpose of the detected element activity. List any apparent threats to or opportunities for friendly forces. Assess, from the perspective of the reporting unit, the detected element's actions for potential impacts to the friendly force.

LINE 10—NARRATIVE

8-16. Take the liberty here to offer useful clarifications to the report, so the leader can include pertinent information to the higher headquarters. (Ultimately, it will be up to that leader to decide what information would best contextualize the tactical situation for the commander.)

Note. In narrative form, describe any taken actions in relation to the detected element activity (for example, attack, withdraw, continue to observe). When feasible, state the potential for subsequent reports such as air support request, battle damage assessment, call for fire, casualty, explosive ordnance disposal support, and medical evacuation.

LINE 11—AUTHENTICATION

8-17. Provide any brevity code information that would authenticate the information in the report in accordance with local or the unit's SOPs.

8-18. The element in contact delivers the initial SPOTREP by voice (frequency modulation or ultrahigh frequency). The initial report is for the commander's SA. Digital transmission of free text SPOTREPs affords more in-depth assessments and narratives of contact. An accurate SPOTREP is crucial for the commander to maintain an accurate common operational picture and to assist in future operations.

8-19. Figure 8-5 provides a quick snapshot of the SPOTREP structure. It follows the general guidelines that this section reviews for reference purposes only.

SPOT REPORT (SPOTREP)			
	LINE	CONTENT	REMARKS
	LINE 1	DTG	Date and time group of report submission.
	LINE 2	REPORTING UNIT	Unit making the report.
S	LINE 3	SIZE	Size of the detected unit in military terms.
A	LINE 4	ACTIVITY	Actions of the detected element at the DTG of the report.
L	LINE 5	LOCATION	Universal Transverse Mercator (UTM) or grid coordinate with military grid reference system (MGRS) grid zone designator of the detected element activity or event observed.
U	LINE 6	UNIT	Detected unit, organization, or facility if known.
T	LINE 7	TIME	DTG of observation (different from the time of the report in LINE 1).
E	LINE 8	EQUIPMENT	Equipment observed within the detected element. CLASS I – RATIONS CLASS II – EXPENDABLES CLASS III – PETROLIUM, OIL, LUBRICANTS (POL) CLASS IV – BARRIER / CONSTRUCTION MATERIALS CLASS V – AMMUNITION / EXPLOSIVES CLASS VI – SUNDRY CLASS VII – MAJOR END ITEMS CLASS VIII – MEDICAL CLASS IX – REPAIR PARTS CA CLASS X – NONMILITARY MATERIAL
	LINE 9	ASSESSMENT	Apparent reason for or purpose of the activity observed, and the apparent threats to or opportunities for friendly forces.
	LINE 10	NARRATIVE	Free text for clarifying the report.
	LINE 11	AUTHENTICATION	Authentication by the unit providing the report to confirm the accuracy of the report.

Figure 8-5. Spot report structure, example

BATTLE DAMAGE ASSESSMENT REPORT

8-20. A battle damage assessment report provides a timely and accurate estimate of damage that has resulted from the application of military force, either lethal or nonlethal, against a predetermined objective. It allows the higher headquarters to track the number of destroyed enemy vehicles and eliminated squads, which assists them in their planning for future operations. An accurate assessment updates the common operational picture for the organization and allows the commander to make well-informed decisions.

Battle Damage Assessment Report

LINE 1—DATE AND TIME
The leader provides the DTG for the reportable information. The receiving unit uses this to catalog and cross-reference the intelligence reports.

LINE 2—UNIT
Provide the brevity code or small unit designation. This information builds the intelligence picture and tactical context for the receiving headquarters as they maintain their awareness of the battlespace.

LINE 3—NAME
Provide any applicable target name.

LINE 4—COUNTRY CODE
Provide the two-letter country code for where the action took place.

LINE 5—BASIC ENCYCOLPEDIA NUMBER
Provide the 11-digit alphanumeric code for the targeting information. Enter not applicable (also called NA) or UNKNOWN as appropriate.

LINE 6—LOCATION
Use the UTM grid zone or the grid coordinate with the MGRS grid zone designator of the detected element activity or observed event. Refrain from using any graphic control measures, TRPs, or other methods to define the location.

Note. This report also serves to coordinate external warfighting functions. External elements tasked to apply combat power to the threat may not have access to or may not understand the reporting unit's graphic control measures or SOPs. The use of the UTM or MGRS standardizes location reporting.

LINE 7—TARGET MATERIAL REFERENCE
Provide any available information.

LINE 8—PAGE NUMBER
Indicate the page in the TARGET MATERIAL REFERENCE on which the targeting information appears.

LINE 9—COLLECTION DATE AND TIME
Provide the DTG for the geospatial intelligence imagery or targeting information.

LINE 10—TYPE
Provide the type of geospatial intelligence the report uses or references.

(continued on page 171)

Battle Damage Assessment Report (continued)

LINE 11—QUALITY
Provide the image quality of the geospatial intelligence imagery the report uses, whose typical classifications are GOOD, FAIR, or POOR.

LINE 12—ANGLE
The angle or perspective of the imagery in relation to the target, with typical descriptors of VERTICAL or OBLIQUE.

LINE 13—TIME ON TARGET
Provide the time of the attack's first impact on the target.

LINE 14—DELIVERY SYSTEM
Provide the number and types of all the employed delivery systems.

LINE 15—WEAPONS
Provide the number and type of all the employed weapons for the attack, action, or contact.

LINE 16—AIM POINT NAME
Provide the name or description of the target element.

LINE 17—BATTLE DAMAGE ASSESSMENT ANALYSIS
Provide a narrative of target damage and munitions effects, including the element name, grid reference, physical damage, confidence level, and the necessity for reattack.

Note. Repeat lines 3 through 17 to report mission data for multiple missions. Assign sequential line numbers to succeeding iterations. For example, the first iteration is 3 through 17, second iteration is 3a through 17a, third iteration is 3b through 17b, and so on, successively.

LINE 18—NARRATIVE
Use free text for any additional information that further clarifies the report.

LINE 19—AUTHENTICATION
Provide the reporting unit's authentication information to certify the report's information and sender.

8-21. Figure 8-6 provides a quick snapshot of the battle damage assessment report structure. It follows the general guidelines that this section reviews for reference purposes only.

BATTLE DAMAGE ASSESSMENT REPORT (BDA)

LINE	CONTENT	REMARKS
LINE 1	DATE AND TIME	Military Date/Time Group (DTG)
LINE 2	UNIT	Unit making the report
LINE 3	NAME	Target or installation name
LINE 4	COUNTRY CODE	Two-letter country code
LINE 5	BEN	Basic encyclopedia number: NA or UNKNOWN
LINE 6	LOCATION	UTM or six-digit grid coordinate with MGRS grid zone designator
LINE 7	TM REFERENCE	Target Material (TM) reference
LINE 8	PAGE NUMBER	Page or sheet number from the TM reference
LINE 9	COLLECTION DATE AND TIME	GEOINT collection DTG
LINE 10	TYPE	Type of GEOINT
LINE 11	QUALITY	Image quality: GOOD, FAIR, or POOR
LINE 12	ANGLE	Viewing angle: VERTICAL or OBLIQUE
LINE 13	TOT	Time over Target for attack DTG
LINE 14	DELIVERY SYSTEM	Number and type of delivery system(s)
LINE 15	WEAPONS	Number and type of weapons and fusing
LINE 16	AIM POINT NAME	Name of description of the target element
LINE 17	BDA ANALYSIS	Narrative of target damage and munitions effects to include: element name, grid reference, physical damage, confidence level, and whether re-attack is required
LINE 18	NARRATIVE	Free text for additional information required for clarification of the report
LINE 19	AUTHENTICATION	Unit making the report

LEGEND

GEOINT	GEOSPATIAL INTELLIGENCE	NA	NOT AVAILABLE
MGRS	MILITARY GRID REFERENCE SYSTEM	UTM	UNIVERSAL TRANSVERSE MERCATOR

Figure 8-6. Battle damage assessment report structure, example

LIQUIDS, AMMUNITION, CASUALTIES, AND EQUIPMENT REPORT

8-22. Team leaders submit the liquids, ammunition, casualties, and equipment report to squad or section leaders at the completion of an operation or following enemy contact. This report allows leaders to determine the status of Soldiers and equipment. The information also allows leaders to determine whether they have the combat power and supplies to continue an operation following enemy contact. A unit's SOPs determine the status levels for the report.

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Glossary

The glossary lists acronyms and terms with Army or joint definitions. Where Army and joint definitions for terms differ, *(Army)* precedes the definition. The proponent publications for terms appear in parentheses at the ends of the definitions. An asterisk precedes terms in the glossary for which TC 3-20.31-040 is the proponent.

SECTION I – ACRONYMS AND ABBREVIATIONS

AAP	Allied administrative publication
ABCANZ	American, British, Canadian, Australian, and New Zealand
ADP	Army doctrine publication
APC	armored personnel carrier
AR	Army regulation
ATP	Army techniques publication
BMP	boyevaya mashina pekhoty (Russian, *infantry fighting vehicle*)
BTR	bronetransportyor (Russian, *armored carrier*)
C2	command and control
CBRN	chemical, biological, radiological, or nuclear
CID	combat identification
CIP	combat identification panel
COO	country of origin
DA	Department of the Army
DCIMS	dismounted combat identification marking system
DOD	Department of Defense
DTG	date-time group
EA	engagement area
FASTER	frame, armament, suspension, turret, equipment, and reactive protection
FBCB2	Force XXI Battle Command, brigade and below
FM	field manual
FRAGORD	fragmentary order
FW	fixed-wing
HATS	hull, armament, turret, and suspension
IED	improvised explosive device
IFV	infantry fighting vehicle
IR	infrared
JCIMS	Joint Combat Identification Marking System
JCR	Joint Capabilities Release
JP	joint publication
MEL	maximum engagement line

MER	maximum effective range
METT-TC (I)	mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations
MGRS	military grid reference system
mil	milliradian
NATO	North Atlantic Treaty Organization
NFOV	narrow field of view
NVD	night-vision device
NVG	night-vision goggle
OPORD	operation order
PC	personnel carrier
PL	phase line
POVA3	personnel, obstacles or mines, vehicles, antitank, artillery, aircraft
RAID	recognize, assess, identify, and discriminate
RBCI	radio-based combat identification
ROE	rules of engagement
ROI	rules of interaction
RW	rotary-wing
SA	situational awareness
SALT	size, activity, location, time
SALUTE	size, activity, location, unit, time, and equipment
SINCGARS	single-channel ground and airborne radio system
SOP	standard operating procedure
SPOTREP	spot report
TA	target acquisition
TC	training circular
TIP	thermal identification panel
TRP	target reference point
U.S.	United States
UTM	universal transverse Mercator
VC	vehicle commander
WCS	weapons control status
WEFT	wings, engine, fuselage, and tail
WFOV	wide field of view
WSS	weapon safety status

SECTION II – TERMS

***battlecarry**

A posture in which a vehicle is prepared for an engagement at all times.

combat power

(Joint) The total means of destructive and disruptive force that a military unit/formation can apply against an enemy at a given time. (JP 3-0)

date-time group

(NATO) A group of six digits with a zone time suffix and the standardized abbreviation for the month. The first pair of digits represents the day; the second pair the hour; the third pair the minutes. After the month may be added the last two digits of the year. (AAP-06)

direction of fire

The direction on which a fire unit is laid to the most significant threat in the target area, to the chart direction to the center of the zone of fire, or to the target. (ATP 3-09.50)

***discrimination**

The determination of a target as friend, foe, neutral, noncombatant, or unknown.

engagement area

An area where the commander intends to contain and destroy an enemy force with the massed effects of all available weapons and supporting systems. (ADP 3-90)

***engagement techniques**

Effects-oriented fire distribution measures.

final protective fire

An immediately available, prearranged barrier of fire designed to impede enemy movement across defensive lines or areas. (JP 3-09.3)

final protective line

A selected line of fire where an enemy assault is to be checked by interlocking fire from all available weapons and obstacles. (FM 3-90)

***fire control measures**

The means by which the commander or subordinate leaders control fires.

graphic control measure

A symbol used on maps and displays to regulate forces and warfighting functions. (ADP 6-0)

identification

The process of determining the friendly or hostile character of an unknown detected contact. (JP 3-01)

***maximum engagement line**

The linear depiction of the farthest limit of effective fire for a weapon or unit.

objective

(Army) A location used to orient operations, phase operations, facilitate changes of direction, and provide for unity of effort. (ADP 3-90)

phase line

An easily identified feature in the operational area utilized for control and coordination of military operations. (JP 3-09)

positive identification

An identification derived from observation and analysis of target characteristics, including visual recognition; electronic support systems; non-cooperative target recognition techniques; identification, friend or foe systems; or other physics-based identification techniques. (JP 3-01)

***quadrants**

Four separate sectors, or subdivisions of an area, created by superimposing a pair of perpendicular axes over the terrain.

reconnaissance by fire

A technique in which a unit fires on a suspected enemy position. (FM 3-90)

restrictive fire line

A specific boundary established between converging, friendly surface forces that prohibits fires or their effects from crossing. (JP 3-09)

***scan**

The act of observing designated areas in the assigned sector.

***search**

A deliberate and detailed investigation of the areas recognized during the scan as warranting additional scrutiny.

sector of fire

That area assigned to a unit or weapon system in which it will engage the enemy according to the established engagement priorities. (FM 3-90)

squad

A small military unit typically containing two or more fire teams. (ADP 3-90)

target acquisition

The detection, identification, and location of a target in sufficient detail to permit the effective employment of capabilities that create the required effects. (JP 3-60)

***target location**

The determination of the position in relation to the shooter, small unit, and adjacent units of a discriminated threat in the operational environment.

target reference point

A predetermined point of reference, normally a permanent structure or terrain feature that can be used when describing a target location. (JP 3-09.3)

***weapon safety posture**

An ammunition handling instruction that allows the commander to control the safety of the unit's weapons precisely.

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25 June 2025

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