Chapter 3

Tactical Movement

Tactical movement is the movement of a unit assigned a tactical mission under combat conditions when not in direct ground contact with the enemy. Tactical movement is based on the anticipation of early ground contact with the enemy, either en route or shortly after arrival at the destination. Movement ends when ground contact is made or the unit reaches its destination. Movement is not maneuver. Maneuver happens once a unit has made contact with the enemy. Because tactical movement shares many of the characteristics of an offensive action, the battlefield is organized in a manner similar to other offensive actions. This chapter discusses the basics and formations of tactical movement.

SECTION I — OVERVIEW

3-1. Movement refers to the shifting of forces on the battlefield. The key to moving successfully involves selecting the best combination of movement formations and movement techniques for each situation. Leaders consider the factors of METT-TC in selecting the best route and the appropriate formation and movement technique. The leader's selection must allow the moving platoon to—

- Maintain cohesion.
- Maintain communication.
- Maintain momentum.
- Provide maximum protection.
- Make enemy contact in a manner that allows them to transition smoothly to offensive or defensive action.

3-2. Careless movement usually results in contact with the enemy at a time and place of the enemy's choosing. To avoid this, leaders must understand the constantly-changing interrelationship between unit movement, terrain, and weapon systems within their area of operations. This understanding is the basis for employing movement formations, movement techniques, route selection and navigation, crossing danger areas, and security (Figure 3-1).
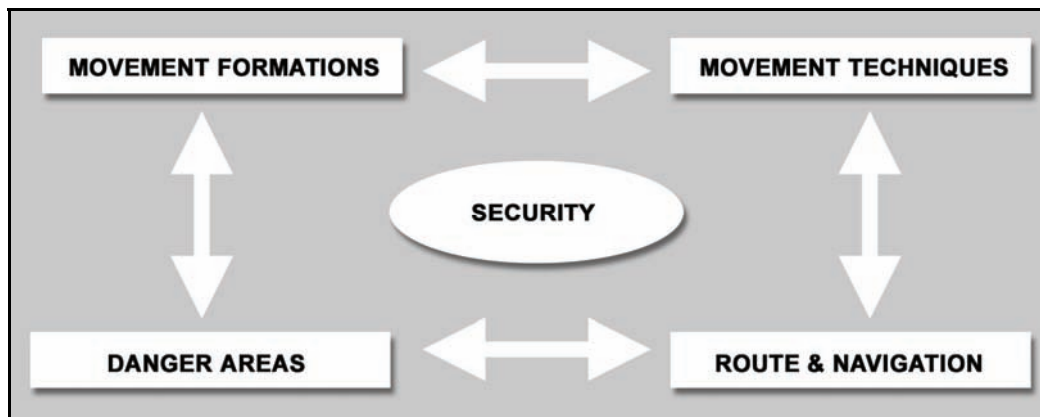

Figure 3-1. Basics of tactical movement.

3-3. Leaders executing tactical movement have three primary goals:

- Avoid surprise by the enemy.
- When necessary, transition quickly to maneuver while minimizing enemy effects.
- Get to the right place, at the right time, ready to fight.

3-4. Units moving behind enemy lines seek to avoid enemy contact. They choose the movement that allows them to retain security and control. To avoid loss of surprise and initiative, casualties, and mission failure, platoons normally—

- Avoid chance enemy contact, if possible.
- Move on covered and concealed routes.
- Avoid likely ambush sites and other danger areas.
- Practice camouflage, noise, and light discipline.
- Maintain 360-degree security.
- Make contact with the smallest element if enemy contact is unavoidable.
- Retain the initiative to attack at the time and place of the unit's choice.
- Take active countermeasures such as using smoke and direct and indirect fire to suppress or obscure suspected enemy positions.

3-5. Infantry platoons primarily move on foot. However, there are circumstances when they will move, and even fight, mounted. Because their units may operate with vehicle support, leaders must be comfortable employing tactical movement with a variety of vehicle platforms.

3-6. In selecting formations and movement techniques, leaders must consider other requirements such as speed and control as well as security. When conducting tactical movement, leaders must be prepared to quickly transition to maneuver and fight while minimizing the effects of the enemy. This requirement calls for the leader to determine which formation or combination of formations best suits the situation.

MOVEMENT FORMATIONS

3-7. Movement formations are the ordered arrangement of forces that describes the general configuration of a unit on the ground. They determine the distance between Soldiers, sectors of fire, and responsibilities for 360-degree security. Movement formations are used in combination with movement techniques (and other security measures), immediate action drills, and enabling tasks. Movement techniques define the level of security one subordinate provides another within a formation. Immediate action drills are those combat actions that enable the unit to quickly transition to maneuver during unexpected enemy contact. Enabling tasks facilitate transitions between other combat tasks. See Section II of this chapter for more on movement formations.

MOVEMENT TECHNIQUES

3-8. Movement techniques describe the position of squads and fire teams in relation to each other during movement. Platoons and squads use three movement techniques: traveling, traveling overwatch, and bounding overwatch.

3-9. Like formations, movement techniques provide varying degrees of control, security, and flexibility. Movement techniques differ from formations in two ways:

- Formations are relatively fixed; movement techniques are not. The distance between moving units or the distance that a squad bounds away from an overwatching squad varies based on factors of METT-TC.
- Formations allow the platoon to weight its maximum firepower in a desired direction; movement techniques allow squads to make contact with the enemy with the smallest element possible. This allows leaders to establish a base of fire, initiate suppressive fires, and attempt to maneuver without first having to disengage or be reinforced.

3-10. Leaders base their selection of a particular movement technique on the likelihood of enemy contact and the requirement for speed. See Section III of this chapter for more on movement techniques.

ROUTE AND NAVIGATION

3-11. Planning and selecting a route is a critical leader skill. One of the keys to successful tactical movement is the ability to develop routes that increase the unit's security, decrease the Soldier's effort, and get the unit to the objective on time in a manner prepared to fight. Good route selection begins with a thorough terrain analysis and ends with superior navigation. Planning and preparation are worthless if a unit cannot find its way to the objective, or worse, stumbles onto it because of poor navigation. See Section IV of this chapter for more on route and navigation.

DANGER AREAS

3-12. When analyzing the terrain (in the METT-TC analysis) during the troop-leading procedures (TLP), the platoon leader may identify danger areas. The term danger area refers to any area on the route where the terrain would expose the platoon to enemy observation, fire, or both. If possible, the platoon leader should plan to avoid danger areas. However, there are times when he cannot. When the unit must cross a danger area, it should do so as quickly and as carefully as possible. See Section V of this chapter for more information on danger areas.

SECURITY

3-13. Security during movement includes the actions that units take to secure themselves and the tasks given to units to provide security for a larger force. Platoons and squads enhance their own security during movement through the use of covered and concealed terrain; the use of the appropriate movement formation and technique; the actions taken to secure danger areas during crossing; the enforcement of noise, light, and radiotelephone discipline; and the use of proper individual camouflage techniques. See Section VII of this chapter for more on security.

3-14. Formations and movement techniques provide security by:
- Positioning each Soldier so he can observe and fire into a specific sector that overlaps with other sectors.
- Placing a small element forward to allow the platoon to make contact with only the lead element and give the remainder of the platoon freedom to maneuver.
- Providing overwatch for a portion of the platoon.

OTHER CONSIDERATIONS

3-15. In planning tactical movement, leaders should also consider the requirements for—
- Terrain.
- Planning.
- Direct fires.
- Fire support.
- Control.

TERRAIN

3-16. The formations and techniques shown in the illustrations in this chapter are examples only. They are generally depicted without terrain considerations (which are usually a critical concern in the selection and execution of a formation). Therefore, in both planning and executing tactical movement, leaders understand that combat formations and movement techniques require modification in execution. Spacing requirements and speed result from a continuous assessment of terrain. Leaders must stay ready to adjust the distance of individuals, fire teams, squads, and individual vehicles and vehicle sections based on terrain, visibility, and other mission requirements.

3-17. While moving, individual Soldiers and vehicles use the terrain to protect themselves during times when enemy contact is possible or expected. They use natural cover and concealment to avoid enemy fires. The following guidelines apply to Soldiers and vehicle crews using terrain for protection:

- Do not silhouette yourself against the skyline.
- Avoid possible kill zones because it is easier to cross difficult terrain than fight the enemy on unfavorable terms.
- Cross open areas quickly.
- Avoid large, open areas, especially when they are dominated by high ground or by terrain that can cover and conceal the enemy.
- Do not move directly forward from a concealed firing position.

PLANNING

3-18. One of the leader's primary duties is to develop a plan that links together route selection and navigation, combat formations, and appropriate security measures with enabling tasks that moves the unit from its current location to its destination. This plan must take into account the enemy situation and control during movement.

DIRECT FIRES

3-19. While moving or when stationary, each Soldier (or vehicle) has a sector to observe and engage enemy soldiers in accordance with the unit's engagement criteria (see Chapter 2). Individual and small unit sectors are the foundation of the unit's area of influence. Pre-assigned sectors are inherent in combat formations. When formations are modified, leaders must reconfirm their subordinates' sectors. Leaders have the added responsibility of ensuring their subordinates' sectors are mutually supporting and employing other security measures that identify the enemy early and allow the leader to shape the fight.

FIRE SUPPORT

3-20. Planning should always include arranging for fire support (mortars, artillery, CAS, attack helicopters, naval gunfire), even if the leader thinks it unnecessary. A fire plan can be a tool to help navigate and gives the leader the following options:

- Suppressing enemy observation posts or sensors.
- Creating a distraction.
- Achieving immediate suppression.
- Covering withdrawal off of an objective.
- Breaking contact.

CONTROL

3-21. Controlling tactical movement is challenging. The leader must be able to start, stop, shift left or right, and control the unit's direction and speed of movement while navigating, assessing the terrain, and preparing for enemy contact. Determining the proper movement formations and techniques during planning is important, but the leader must be able to assess his decision during execution and modify or change his actions based on the actual situation.

3-22. Without adequate procedural and positive control, it is difficult for the leader to make decisions and give orders, lead an effective response to enemy contact, or accurately navigate. Leaders exercise procedural control by unit training and rehearsals in the basics of tactical movement. The better trained and rehearsed subordinates are, the more freedom leaders have to concentrate on the situation, particularly the enemy and the terrain. Leaders exercise positive control by communicating to subordinates. They do so using hand-and-arm signals as a method of communication. They also use the other means of communication (messenger, visual, audio, radio, and digital) when appropriate.

3-23. All available communication is used (consistent with OPSEC and movement security) to assist in maintaining control during movement. March objectives, checkpoints, and phase lines may be used to aid in control. The number of reports is reduced as normally only exception reports are needed. The leader should be well forward in the formation but may move throughout as the situation demands. Communications with security elements are mandatory. Operations security often prevents the use of radios, so connecting files, runners, and visual signals can be used. Detailed planning, briefing, rehearsals, and control are valuable if there is enemy contact. Alternate plans are made to cover all possible situations.

SECTION II — MOVEMENT FORMATIONS

3-24. This section discusses movement formations of Infantry fire teams, squads, and platoons. The platoon leader uses formations for several purposes: to relate one squad to another on the ground; to position firepower to support the direct-fire plan; to establish responsibilities for sector security among squads; or to aid in the execution of battle drills. Just as they do with movement techniques, platoon leaders plan formations based on where they expect enemy contact, and on the company commander's plans to react to contact. The platoon leader evaluates the situation and decides which formation best suits the mission and situation.

3-25. Every squad and Soldier has a standard position. Soldiers can see their team leaders. Fire team leaders can see their squad leaders. Leaders control their units using hand-and-arm signals.

3-26. Formations also provide 360-degree security and allow units to give the weight of their firepower to the flanks or front in anticipation of enemy contact.

3-27. Formations do not demand parade ground precision. Platoons and squads must retain the flexibility needed to vary their formations to the situation. The use of formations allows Soldiers to execute battle drills more quickly and gives them the assurance that their leaders and buddy team members are in the expected positions and performing the right tasks.

3-28. Sometimes platoon and company formations differ due to METT-TC factors. For example, the platoons could move in wedge formations within a company vee. It is not necessary for the platoon formation to be the same as the company formation unless directed by the company commander. However, the platoon leader must coordinate his formation with other elements moving in the main body team's formation. Figure 3-2 illustrates platoon symbols.
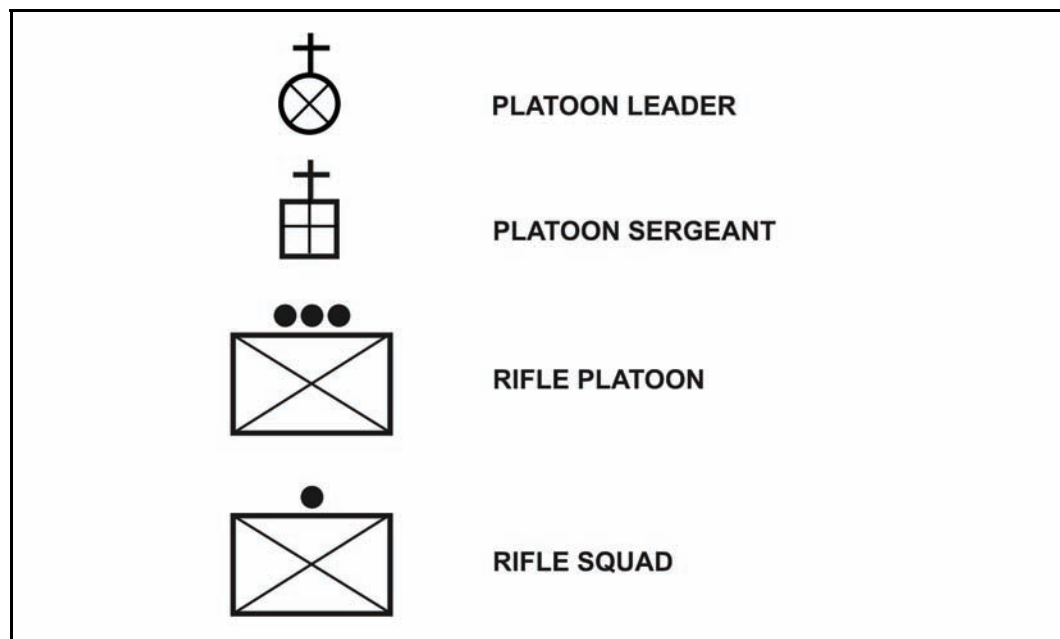

Figure 3-2. Legend of platoon symbols.

> **NOTE:** The formations shown in the illustrations in this chapter are examples only. They generally are depicted without METT-TC considerations, which are always the most crucial element in the selection and execution of a formation. Leaders must be prepared to adapt their choice of formation to the specific situation.
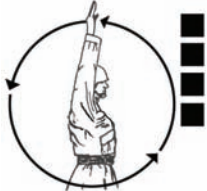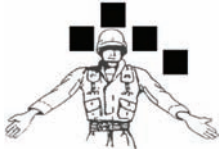
PRIMARY FORMATIONS

3-29. Combat formations are composed of two variables: lateral frontage, represented by the line formation; and depth, represented by the column formation. The advantages attributed to any one of these variables are disadvantages to the other. Leaders combine the elements of lateral frontage and depth to determine the best formation for their situation. In addition to the line and column/file, the other five types of formations—box; vee; wedge; diamond; and echelon—combine these elements into varying degrees. Each does so with different degrees of emphasis that result in unique advantages and disadvantages (Table 3-1).

3-30. The seven formations can be grouped into two categories: formations with one lead element, and formations with more than one lead element. The formations with more than one lead element, as a general rule, are better for achieving fire superiority to the front, but are more difficult to control. Conversely, the formations with only one lead element are easier to control but are not as useful for achieving fire superiority to the front.

3-31. Leaders attempt to maintain flexibility in their formations. Doing so enables them to react when unexpected enemy actions occur. The line, echelon, and column formations are the least flexible of the seven formations. The line mass to the front has vulnerable flanks. The echelon is optimized for a flank threat—something that units want to avoid. The column has difficulty reinforcing an element in contact. Leaders using these formations should consider ways to reduce the risks associated with their general lack of flexibility.

Table 3-1. Primary formations.

Name/Formation/ Signal (if applicable)	Characteristics	Advantages	Disadvantages
Line Formation 	- All elements arranged in a row - Majority of observation and direct fires oriented forward; minimal to the flanks - Each subordinate unit on the line must clear its own path forward - One subordinate designated as the base on which the other subordinates cue their movement	Ability to: - Generate fire superiority to the front - Clear a large area - Disperse - Transition to bounding overwatch, base of fire, or assault	- Control difficulty increases during limited visibility and in restrictive or close terrain - Difficult to designate a maneuver element - Vulnerable assailable flanks - Potentially slow - Large signature
Column/File Formation 	- One lead element - Majority of observation and direct fires oriented to the flanks; minimal to the front - One route means unit only influenced by obstacles on that one route	- Easiest formation to control (as long as leader can communicate with lead element) - Ability to generate a maneuver element - Secure flanks - Speed	- Reduced ability to achieve fire superiority to the front - Clears a limited area and concentrates the unit - Transitions poorly to bounding overwatch, base of fire, and assault - Column's depth makes it a good target for close air attacks and a machine gun beaten zone
Vee Formation 	- Two lead elements - Trail elements move between the two lead elements - Used when contact to the front is expected - "Reverse wedge" - Unit required to two lanes/routes forward	Ability to: - Generate fire superiority to the front - Generate a maneuver element - Secure flanks - Clear a large area - Disperse - Transition to bounding overwatch, base of fire, or assault	- Control difficulty increases during limited visibility and in restrictive or close terrain - Potentially slow
Box Formation 	- Two lead elements - Trail elements follow lead elements - All-around security	See vee formation advantages	See vee formation disadvantages
Wedge Formation 	- One lead element - Trail elements paired off abreast of each other on the flanks - Used when the situation is uncertain	Ability to: - Control, even during limited visibility, in restrictive terrain, or in close terrain - Transition trail elements to base of fire or assault - Secure the front and flanks - Transition the line and column	- Trail elements are required to clear their own path forward - Frequent need to transition to column in restrictive, close terrain
Diamond Formation 	- Similar to the wedge formation - Fourth element follows the lead element	See wedge formation advantages	See wedge formation disadvantages
Echelon Formation (Right) 	- Elements deployed diagonally left or right - Observation and fire to both the front and one flank - Each subordinate unit on the line clears its own path forward	- Ability to assign sectors that encompass both the front and flank	- Difficult to maintain proper relationship between subordinates - Vulnerable to the opposite flanks

FIRE TEAM FORMATIONS

3-32. The term fire team formation refers to the Soldiers' relative positions within the fire team. Fire team formations include the fire team wedge and the fire team file (Table 3-2). Both formations have advantages and disadvantages. Regardless of which formation the team employs, each Soldier must know his location in the formation relative to the other members of the fire team and the team leader. Each Soldier covers a set sector of responsibility for observation and direct fire as the team is moving. To provide the unit with all-round protection, these sectors must interlock. Team leaders must be constantly aware of their team's sectors and correct them as required.

Table 3-2. Comparison of fire team formations.

Movement Formation	When Most Often Used	CHARACTERISTICS			
		Control	Flexibility	Fire Capabilities and Restrictions	Security
Fire team wedge	Basic fire team formation	Easy	Good	Allows immediate fires in all directions	All-round
Fire team file	Close terrain, dense vegetation, limited visibility conditions	Easiest	Less flexible than wedge	Allows immediate fires to the flanks, masks most fires to the rear	Least

3-33. The team leader adjusts the team's formation as necessary while the team is moving. The distance between men will be determined by the mission, the nature of the threat, the closeness of the terrain, and by the visibility. As a general rule, the unit should be dispersed up to the limit of control. This allows for a wide area to be covered, makes the team's movement difficult to detect, and makes them less vulnerable to enemy ground and air attack. Fire teams rarely act independently. However, in the event that they do, when halted, they use a perimeter defense to ensure all-around security.

FIRE TEAM WEDGE

3-34. The wedge (Figure 3-3) is the basic formation for the fire team. The interval between Soldiers in the wedge formation is normally 10 meters. The wedge expands and contracts depending on the terrain. Fire teams modify the wedge when rough terrain, poor visibility, or other factors make control of the wedge difficult. The normal interval is reduced so all team members can still see their team leader and all team leaders can still see their squad leader. The sides of the wedge can contract to the point where the wedge resembles a single file. Soldiers expand or resume their original positions when moving in less rugged terrain where control is easier.

3-35. In this formation the fire team leader is in the lead position with his men echeloned to the right and left behind him. The positions for all but the leader may vary. This simple formation permits the fire team leader to lead by example. The leader's standing order to his Soldiers is: "Follow me and do as I do." When he moves to the right, his Soldiers should also move to the right. When he fires, his Soldiers also fire. When using the lead-by-example technique, it is essential for all Soldiers to maintain visual contact with the leader.
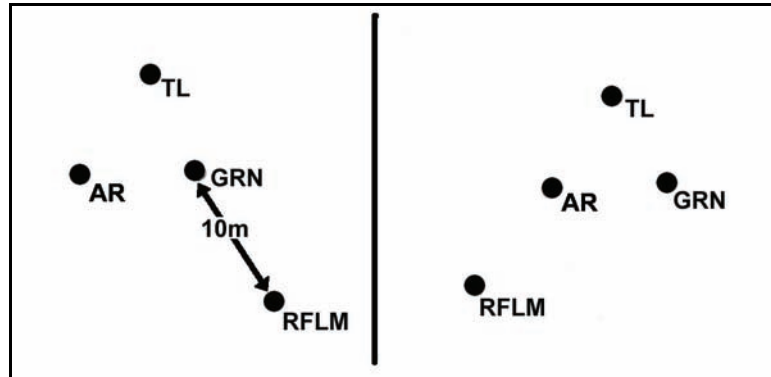
Figure 3-3. Fire team wedge.

FIRE TEAM FILE

3-36. Team leaders use the file when employing the wedge is impractical. This formation is most often used in severely restrictive terrain, like inside a building; dense vegetation; limited visibility; and so forth. The distance between Soldiers in the column changes due to constraints of the situation, particularly when in urban operations (Figure 3-4).
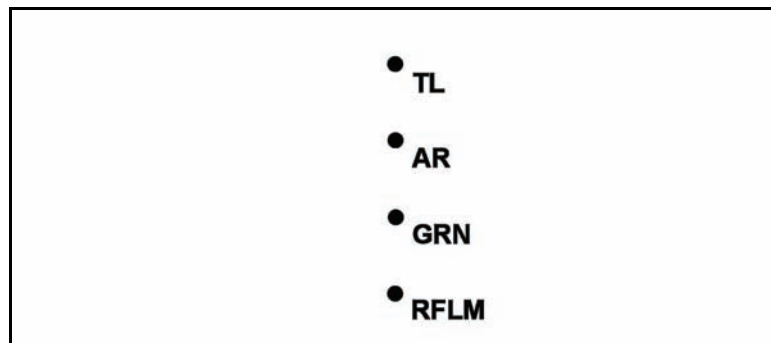
Figure 3-4. Fire team file.

SQUAD FORMATIONS

3-37. The term squad formation refers to the relative locations of the fire teams. Squad formations include the squad column, the squad line, and the squad file. Table 3-3 compares squad formations.

Table 3-3. Comparison of squad formations.

Movement Formation	When Most Often Used	CHARACTERISTICS			
		Control	Flexibility	Fire Capabilities and Restrictions	Security
Squad column	The main squad formation	Good	Aids maneuver, good dispersion laterally and in depth	Allows large volume of fire to the flanks but only limited volume to the front	All-around
Squad line	For maximum firepower to the front	Not as good as squad column	Limited maneuver capability (both fire teams committed)	Allows maximum immediate fire to the front	Good to the front, little to the flank and rear
Squad file	Close terrain, dense vegetation, limited visibility conditions	Easiest	Most difficult formation to maneuver from	Allows immediate fire to the flanks, masks most fire to the front and rear	Least

3-38. The squad leader adjusts the squad's formation as necessary while moving, primarily through the three movement techniques (see Section III). The squad leader exercises command and control primarily through the two team leaders and moves in the formation where he can best achieve this. The squad leader is responsible for 360-degree security, for ensuring the team's sectors of fire are mutually supporting, and for being able to rapidly transition the squad upon contact.

3-39. The squad leader designates one of the fire teams as the base fire team. The squad leader controls the squad's speed and direction of movement through the base fire team while the other team and any attachments cue their movement off of the base fire team. This concept applies when not in contact and when in contact with the enemy.

3-40. Weapons from the weapons squad (a machine gun or a Javelin) may be attached to the squad for the movement or throughout the operation. These high value assets need to be positioned so they are protected and can be quickly brought into the engagement when required. Ideally, these weapons should be positioned so they are between the two fire teams.

SQUAD COLUMN

3-41. The squad column is the squad's main formation for movement unless preparing for an assault (Figure 3-5). It provides good dispersion both laterally and in depth without sacrificing control. It also facilitates maneuver. The lead fire team is the base fire team. Squads can move in either a column wedge or a modified column wedge. Rough terrain, poor visibility, and other factors can require the squad to modify the wedge into a file for control purposes. As the terrain becomes less rugged and control becomes easier, the Soldiers assume their original positions.
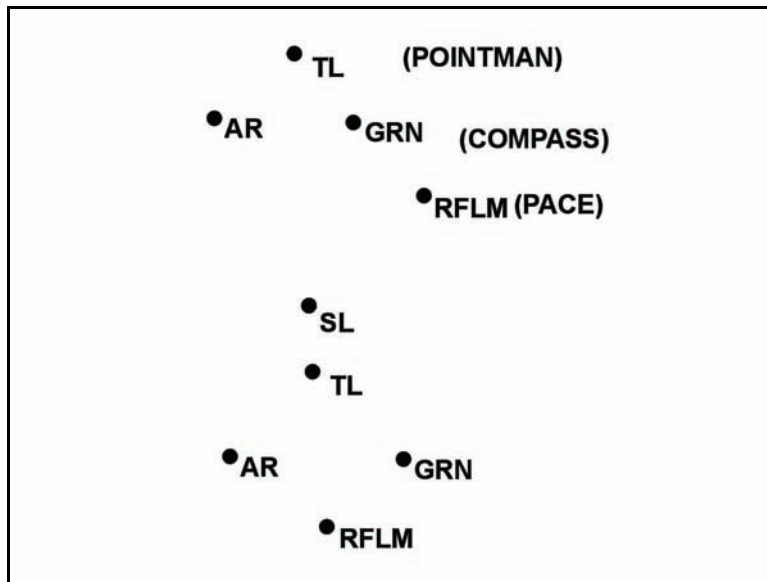
Figure 3-5. Squad column, fire teams in wedge.

SQUAD LINE

3-42. The squad line provides maximum firepower to the front and is used to assault or as a pre-assault formation (Figure 3-6). To execute the squad line, the squad leader designates one of the teams as the base team. The other team cues its movement off of the base team. This applies when the squad is in close combat as well. From this formation, the squad leader can employ any of the three movement techniques or conduct fire and movement (see Section III).

Figure 3-6. Squad line.

SQUAD FILE

3-43. The squad file has the same characteristics as the fire team file (Figure 3-7). In the event that the terrain is severely restrictive or extremely close, teams within the squad file may also be in file. This disposition is not optimal for enemy contact, but does provide the squad leader with maximum control. If the squad leader wishes to increase his control over the formation he moves forward to the first or second position. Moving forward also enables him to exert greater morale presence by leading from the front, and to be immediately available to make key decisions. Moving a team leader to the last position can provide additional control over the rear of the formation.
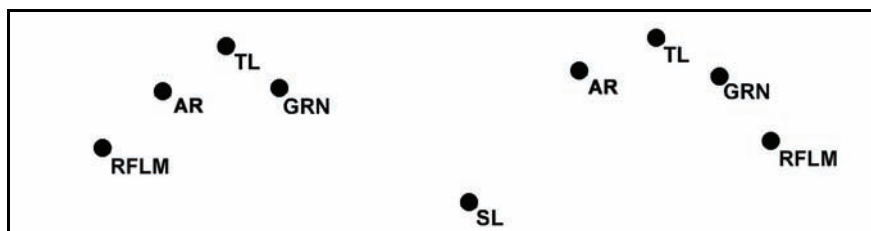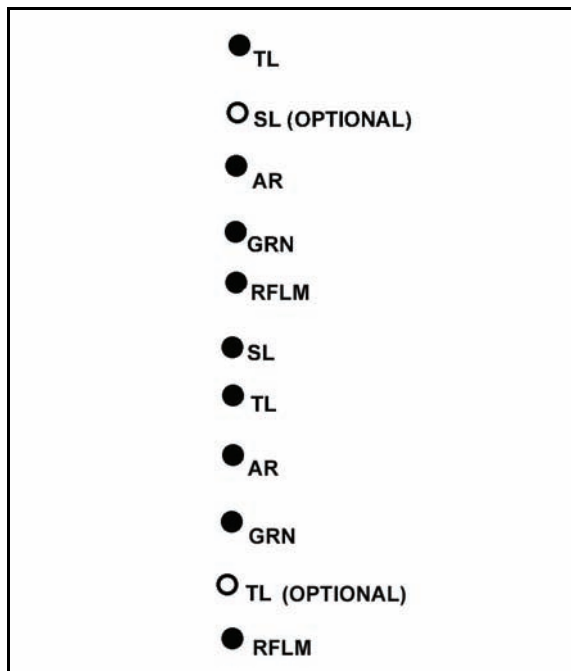

Figure 3-7. Squad file.

WEAPONS SQUAD MOVEMENT FORMATIONS

3-44. The weapons squad is not a rifle squad and should not be treated as such. During tactical movement the platoon leader has one of two options when it comes to positioning the weapons squad. The weapons squad can either travel together as a separate entity, or can be broken up and distributed throughout the formation. The advantage to keeping the weapons squad together is the ability to quickly generate a support by fire and gain fire superiority under the direction of the weapons squad leader. The disadvantage to this approach is the lack of redundancy throughout the formation. The advantage to distributing the weapons squad throughout the rifle squads is the coverage afforded to the entire formation. The disadvantage is losing the weapons squad leader as a single command and control element and the time required to reassemble the weapons squad if needed.

3-45. When the weapons squad travels dispersed, they can either be attached to squads or attached to the key leaders like the platoon leader, platoon sergeant, and weapons squad leader. There is no standard method for their employment. Rather, the platoon leader places the weapons using two criteria: ability to quickly generate fire superiority, and protection for these high value assets.

3-46. Like the rifle squad, the weapons squad, when traveling as a squad, uses either a column or line formation. Within these formations, the two sections can also be in column or line formation.

PLATOON FORMATIONS

3-47. The actual number of useful combinations of squad and fire team combat formations within the platoon combat formations is numerous, creating a significant training requirement for the unit. Add to that the requirement to modify formations with movement techniques, immediate action drills, and other techniques, and it is readily apparent that what the platoon leader needs is a couple of simple, effective strategies. These strategies should be detailed in the unit's SOPs. For a full description of each combat formation and advantages and disadvantages refer again to Table 3-1.

PLATOON LEADER RESPONSIBILITIES

3-48. Like the squad leader, the platoon leader exercises command and control primarily through his subordinates and moves in the formation where he can best achieve this. The squad and team leader execute the combat formations and movement techniques within their capabilities based on the platoon leader's guidance.

3-49. The platoon leader is responsible for 360-degree security, for ensuring that each subordinate unit's sectors of fire are mutually supporting, and for being able to rapidly transition the platoon upon contact. He adjusts the platoon's formation as necessary while moving, primarily through the three movement techniques (see Section III). Like the squad and team, this determination is a result of the task, the nature of the threat, the closeness of terrain, and the visibility.

3-50. The platoon leader is also responsible for ensuring his squads can perform their required actions. He does this through training before combat and rehearsals during combat. Well-trained squads are able to employ combat formations, movement techniques, actions on contact, and stationary formations.

PLATOON HEADQUARTERS

3-51. The platoon leader also has to decide how to disperse the platoon headquarters elements (himself, his RTO, his interpreter, the forward observer, the platoon sergeant, and the medic). These elements do not have a fixed position in the formations. Rather, they should be positioned where they can best accomplish their tasks. The platoon leader's element should be where he conducts actions on contact, where he can supervise navigation, and where he can communicate with higher. The FO's element should be where he can best see the battlefield and where he can communicate with the platoon leader and the battalion fire support officer (FSO). This is normally in close proximity to the platoon leader. The platoon sergeant's element should be wherever the platoon leader is not. Because of the platoon sergeant's experience, he should be given the freedom to assess the situation and advise the platoon leader accordingly. Typically, this means the platoon leader is more toward the front of the formation, while the platoon sergeant is more to the rear of the formation.

BASE SQUAD

3-52. The platoon leader designates one of the squads as the base squad. He controls the platoon's speed and direction of movement through the base squad, while the other squads and any attachments cue their movement off of the base squad.

MOVING AS PART OF A LARGER UNIT

3-53. Infantry platoons often move as part of a larger unit's movement. The next higher commander assigns the platoon a position within the formation. The platoon leader assigns his subordinates an

appropriate formation based on the situation and uses the appropriate movement technique. Regardless of the platoon's position within the formation, it must be ready to make contact or to support the other elements by movement, by fire, or by both.

3-54. When moving in a company formation, the company commander normally designates a base platoon to facilitate control. The other platoons cue their speed and direction on the base platoon. This permits quick changes and lets the commander control the movement of the entire company by controlling only the base platoon. The company commander normally locates himself within the formation where he can best see and direct the movement of the base platoon. The base platoon's center squad is usually its base squad. When the platoon is not acting as the base platoon, its base squad is its flank squad nearest the base platoon.

PRIMARY FORMATIONS

3-55. Platoon formations include the column, the line (squads on line or in column), the vee, the wedge, and the file. The leader should weigh these carefully to select the best formation based on his mission and on METT-TC analysis. A comparison of the formations is in Table 3-4.

3-56. Within these platoon formations, the rifle squads are either in a column or a line. Within the rifle squad formations, the teams are in one of the six formations. Normally the platoon leader does not personally direct fire team formations, but he can do so if the situation dictates. He should at a minimum know the formation of the base fire team of the base squad. The weapons squad travels separately or attached to the rifle squads.

Table 3-4. Comparison of platoon formations.

Movement Formation	When Most Often Used	CHARACTERISTICS				
		Control	Flexibility	Fire Capability/ Restrictions	Security	Movement
Platoon column	Platoon primary movement formation	Good for maneuver (fire and movement)	Provides good dispersion laterally and in depth	Allows limited firepower to the front and rear, but high volume to the flanks	Extremely limited overall security	Good
Platoon line, squads on line	When the leader wants all Soldiers forward for maximum firepower to the front and the enemy situation is known	Difficult	Minimal	Allows maximum firepower to the front, little to flanks and rear	Less secure than other formations because of the lack of depth, but provides excellent security for the higher formation in the direction of the echelon	Slow
Platoon line, squads in column	May be used when the leader does not want everyone on line; but wants to be prepared for contact; when crossing the LD when LD is near the objective	Easier than platoon line, squads on line, but more difficult than platoon column	Greater than platoon column, squads on line, but less than platoon line, squads on line	Good firepower to the front and rear, minimum fires to the flanks; not as good as platoon column, better than platoon line	Good security all around	Slower than platoon column, faster than platoon line, squads on line
Platoon vee	When the enemy situation is vague, but contact is expected from the front	Difficult	Provides two squads up front for immediate firepower and one squad to the rear for movement (fire and movement) upon contact from the flank	Immediate heavy volume of firepower to the front or flanks, but minimum fires to the rear	Good security to the front	Slow
Platoon wedge	When the enemy situation is vague, but contact is not expected	Difficult but better than platoon vee and platoon line, squads on line	Enables leader to make contact with a small element and still have two squads to maneuver	Provides heavy volume of firepower to the front or flanks	Good security to the flanks	Slow, but faster than platoon vee
Platoon file	When visibility is poor due to terrain, vegetation, or light	Easiest	Most difficult formation from which to maneuver	Allows immediate fires to the flanks, masks most fires to front and rear	Extremely limited overall security	Fastest for dismounted movement

Platoon Column

3-57. In the platoon column formation, the lead squad is the base squad (Figure 3-8). It is normally used for traveling only.

TL
GRN
AR
RFLM
SL
TL
AR
GRN
RFLM
PLT LDR
LEAD SQUAD

FO
RTO
AT SPEC
MG CREW
WPNS SL
WPNS SQUAD

TL
GRN
AR
RFLM
SL
TL
AR
GRN
RFLM
CENTER RIFLE SQUAD

PSG
AT SPEC
MEDIC
MG CREW
TL
GRN
AR
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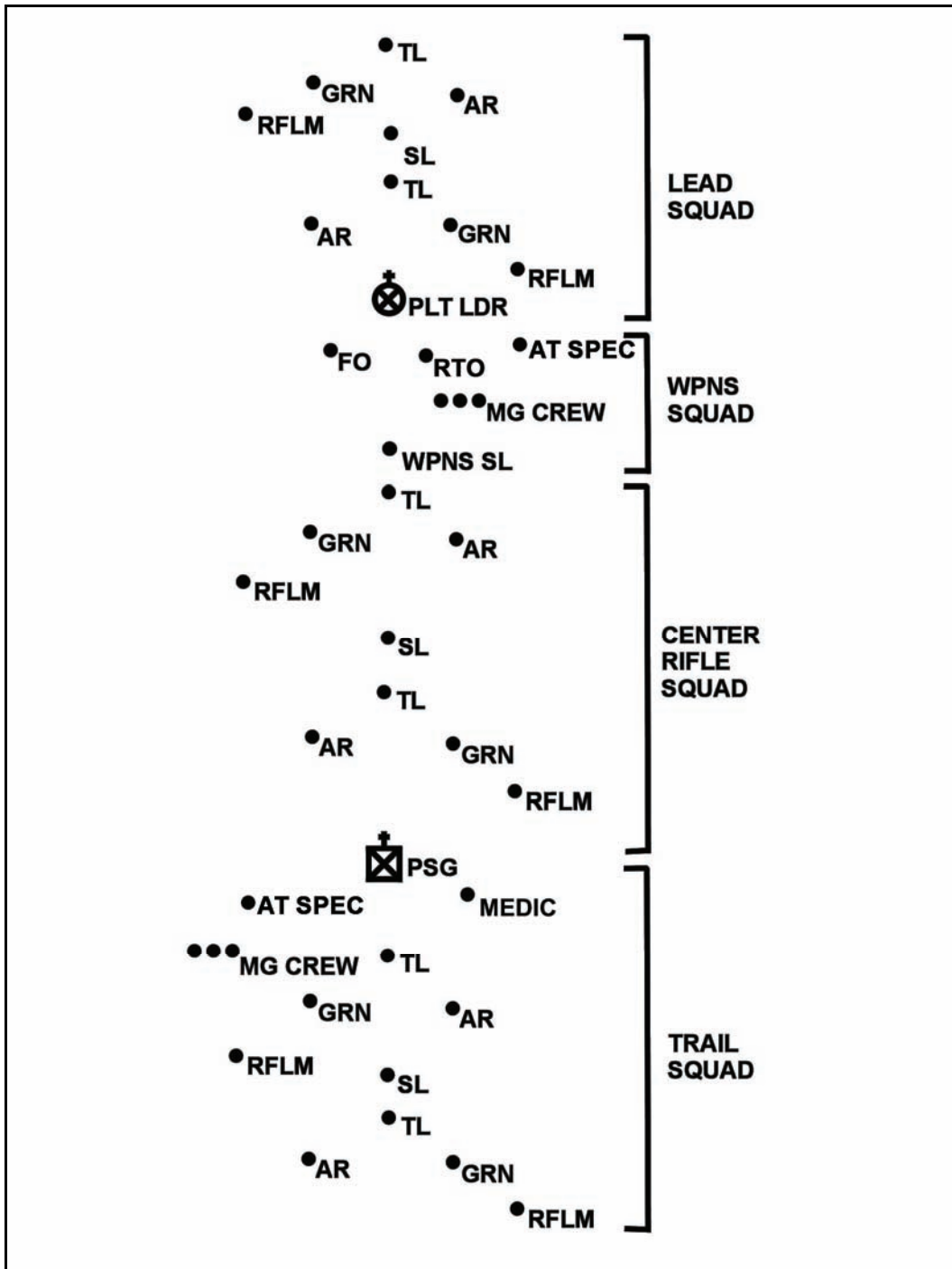SL
TL
AR
GRN
RFLM
TRAIL SQUAD

Figure 3-8. Platoon column.

NOTE: METT-TC considerations determine where the weapons squad or machine gun teams locate in the formation. They normally move with the platoon leader and /or PSG so he can establish a base of fire quickly.

Platoon Line, Squads on Line

3-58. In the platoon line, squads on line formation, when two or more platoons are attacking, the company commander chooses one of them as the base platoon. The base platoon's center squad is its base squad. When the platoon is not acting as the base platoon, its base squad is its flank squad nearest the base platoon. The weapons squad may move with the platoon, or it can provide the support-by-fire position. This is the basic platoon assault formation (Figure 3-9).

3-59. The platoon line with squads on line is the most difficult formation from which to make the transition to other formations.

3-60. It may be used in the assault to maximize the firepower and shock effect of the platoon. This normally is done when there is no more intervening terrain between the unit and the enemy, when antitank systems are suppressed, or when the unit is exposed to artillery fire and must move rapidly.
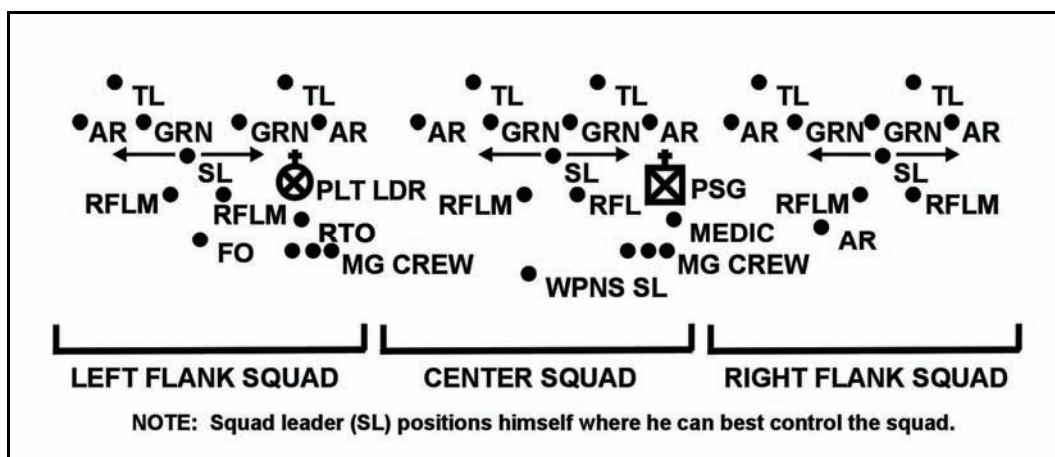
Figure 3-9. Platoon line, squads on line.

Platoon Line, Squads in Column

3-61. When two or more platoons are moving, the company commander chooses one of them as the base platoon. The base platoon's center squad is its base squad. When the platoon is not the base platoon, its base squad is its flank squad nearest the base platoon (Figure 3-10). The platoon line with squads in column formation is difficult to transition to other formations.
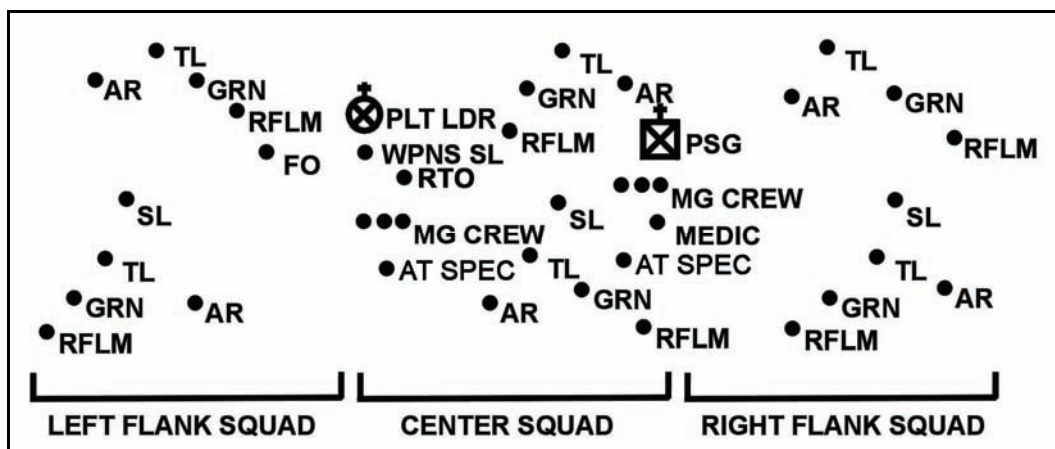
Figure 3-10. Platoon line, squads in column.

Platoon Vee

3-62. This formation has two squads up front to provide a heavy volume of fire on contact (Figure 3-11). It also has one squad in the rear that can either overwatch or trail the other squads. The platoon leader designates one of the front squads to be the platoon's base squad.
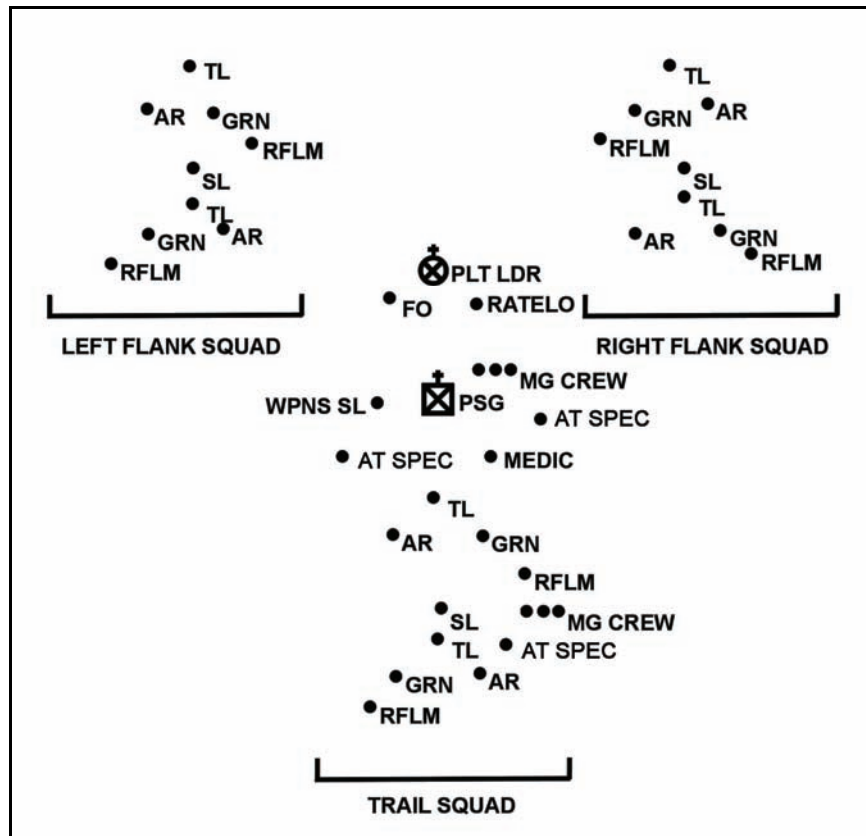
Figure 3-11. Platoon vee.

Platoon Wedge

3-63. This formation has two squads in the rear that can overwatch or trail the lead squad (Figure 3-12). The lead squad is the base squad. The wedge formation—

- Can be used with the traveling and traveling overwatch techniques.
- Allows rapid transition to bounding overwatch.
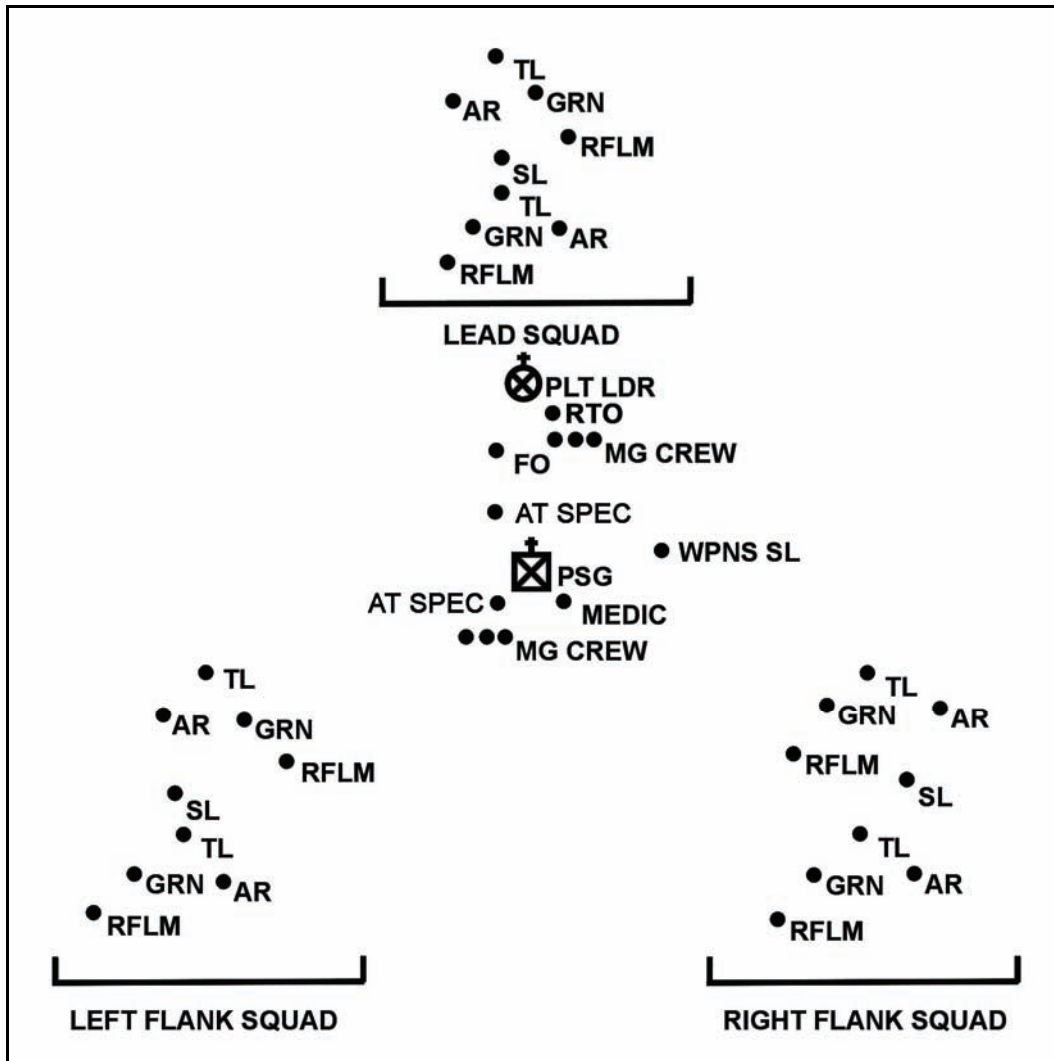
Figure 3-12. Platoon wedge.

Platoon File

3-64. This formation may be set up in several methods (Figure 3-13). One method is to have three-squad files follow one another using one of the movement techniques. Another method is to have a single platoon file with a front security element (point) and flank security elements. The distance between Soldiers is less than normal to allow communication by passing messages up and down the file. The platoon file has the same characteristics as the fire team and squad files. It is normally used for traveling only.
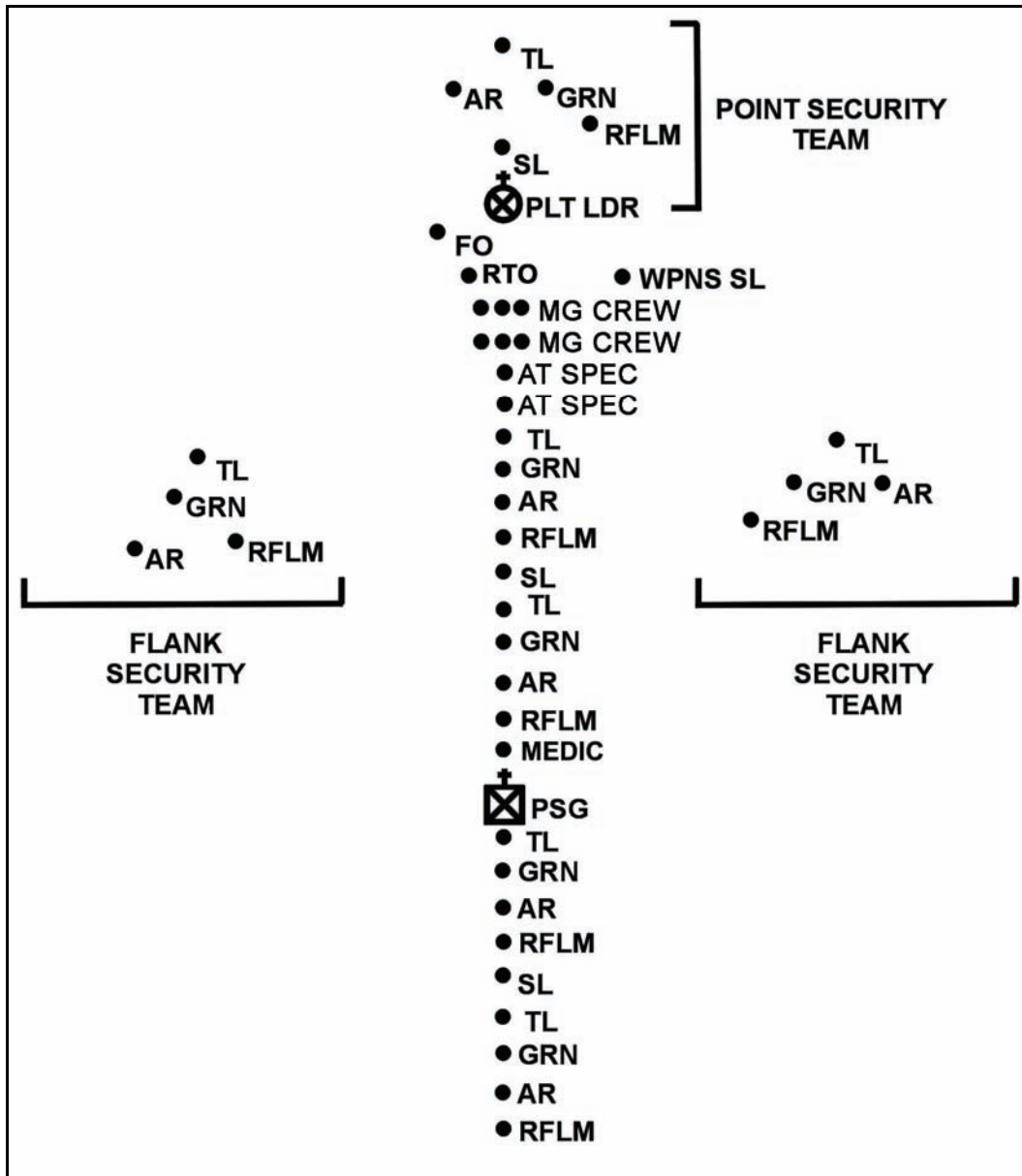
Figure 3-13. Platoon file.

SECTION III — MOVEMENT TECHNIQUES

3-65. Movement techniques are not fixed formations. They refer to the distances between Soldiers, teams, and squads that vary based on mission, enemy, terrain, visibility, and any other factor that affects control. There are three movement techniques: traveling; traveling overwatch; and bounding overwatch. The selection of a movement technique is based on the likelihood of enemy contact and the need for speed. Factors to consider for each technique are control, dispersion, speed, and security (Table 3-5). Individual movement techniques include high and low crawl, and three to five second rushes from one covered position to another (see FM 21-75, *Combat Skills of the Soldier*).

Table 3-5. Movement techniques and characteristics.

Movement Techniques	When Normally Used	CHARACTERISTICS			
		Control	Dispersion	Speed	Security
Traveling	Contact not likely	More	Less	Fastest	Least
Traveling overwatch	Contact possible	Less	More	Slower	More
Bounding overwatch	Contact expected	Most	Most	Slowest	Most

3-66. From these movement techniques, leaders are able to conduct actions on contact, making natural transitions to fire and movement as well as to conducting tactical mission tasks. When analyzing the situation, some enemy positions are known. However, most of the time enemy positions will only be likely (called templated positions). Templated positions are the leader's "best guess" based on analyzing the terrain and his knowledge of the enemy. Throughout the operation, leaders are continuously trying to confirm or deny both the known positions as well as the likely positions.

Methods of Maneuvering Subordinates

3-67. There are two methods of bounding the squads: successive; and alternate bounds. In successive bounds the lead element is always the same; in alternate bounds (called leapfrogging), the lead element changes each time (Figure 3-14).

Successive Bounds

3-68. If the platoon uses successive bounds, the lead squad, covered by the trail squad, advances and occupies a support-by-fire position. The trail squad advances to a support-by-fire position abreast of the lead squad and halts. The lead squad moves to the next position and the move continues. Only one squad moves at a time, and the trail squad avoids advancing beyond the lead squad.

Alternate Bounds

3-69. Covered by the rear squad, the lead squad moves forward, halts, and assumes overwatch positions. The rear squad advances past the lead squad and takes up overwatch positions. The initial lead squad then advances past the initial rear squad and takes up overwatch positions. Only one squad moves at a time. This method is usually more rapid than successive bounds.
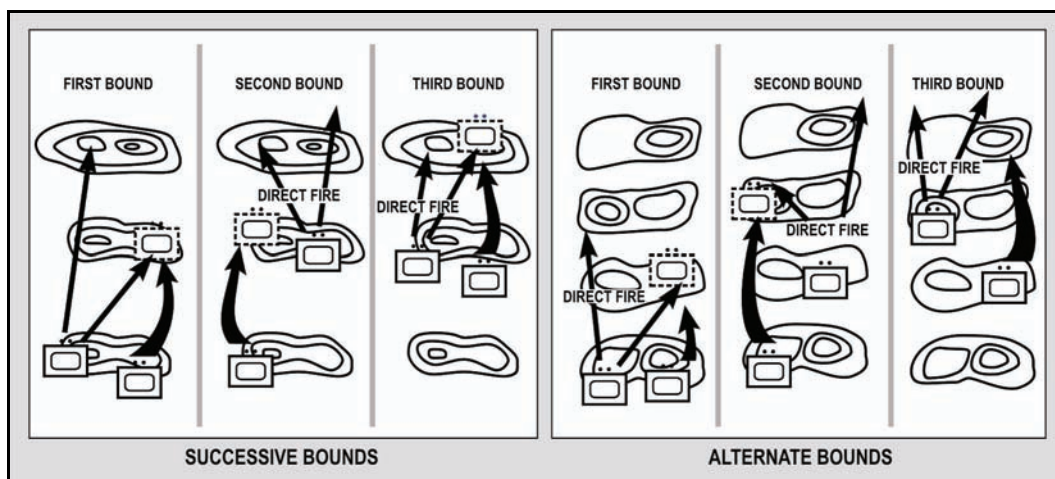
Figure 3-14. Successive and alternate bounds.

SQUAD MOVEMENT TECHNIQUES

3-70. The platoon leader determines and directs which movement technique the squad will use.

SQUAD TRAVELING

3-71. Traveling is used when contact with the enemy is not likely and speed is needed (Figure 3-15).

Figure 3-15. Squad traveling.

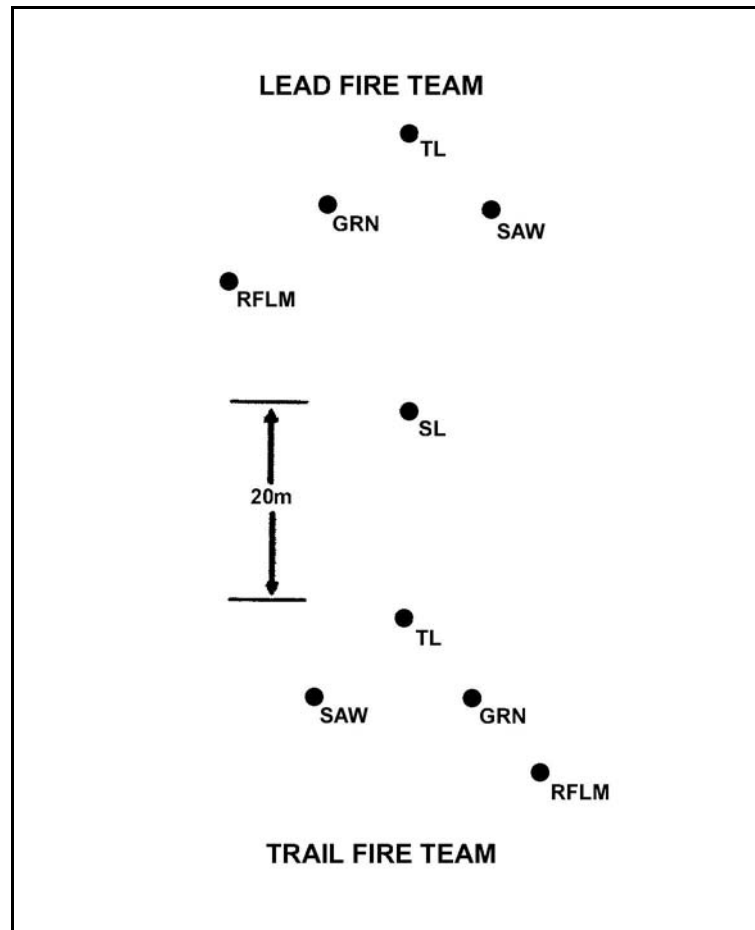## SQUAD TRAVELING OVERWATCH

3-72. Traveling overwatch is used when contact is possible. Attached weapons move near the squad leader and under his control so he can employ them quickly. Rifle squads normally move in column or wedge formation (Figure 3-16). Ideally, the lead team moves at least 50 meters in front of the rest of the element.
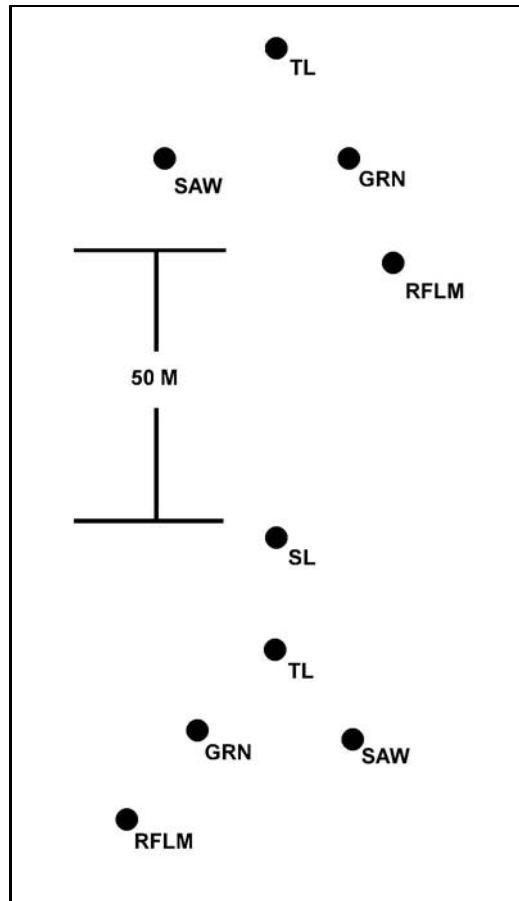
Figure 3-16. Squad traveling overwatch.

SQUAD BOUNDING OVERWATCH

3-73. Bounding overwatch is used when contact is expected, when the squad leader feels the enemy is near (based on movement, noise, reflection, trash, fresh tracks, or even a hunch), or when a large open danger area must be crossed. The lead fire team overwatches first. Soldiers in the overwatch team scan for enemy positions. The squad leader usually stays with the overwatch team. The trail fire team bounds and signals the squad leader when his team completes its bound and is prepared to overwatch the movement of the other team.

3-74. Both team leaders must know which team the squad leader will be with. The overwatching team leader must know the route and destination of the bounding team. The bounding team leader must know his team's destination and route, possible enemy locations, and actions to take when he arrives there. He must also know where the overwatching team will be and how he will receive his instructions (Figure 3-17). The cover and concealment on the bounding team's route dictates how its Soldiers move.
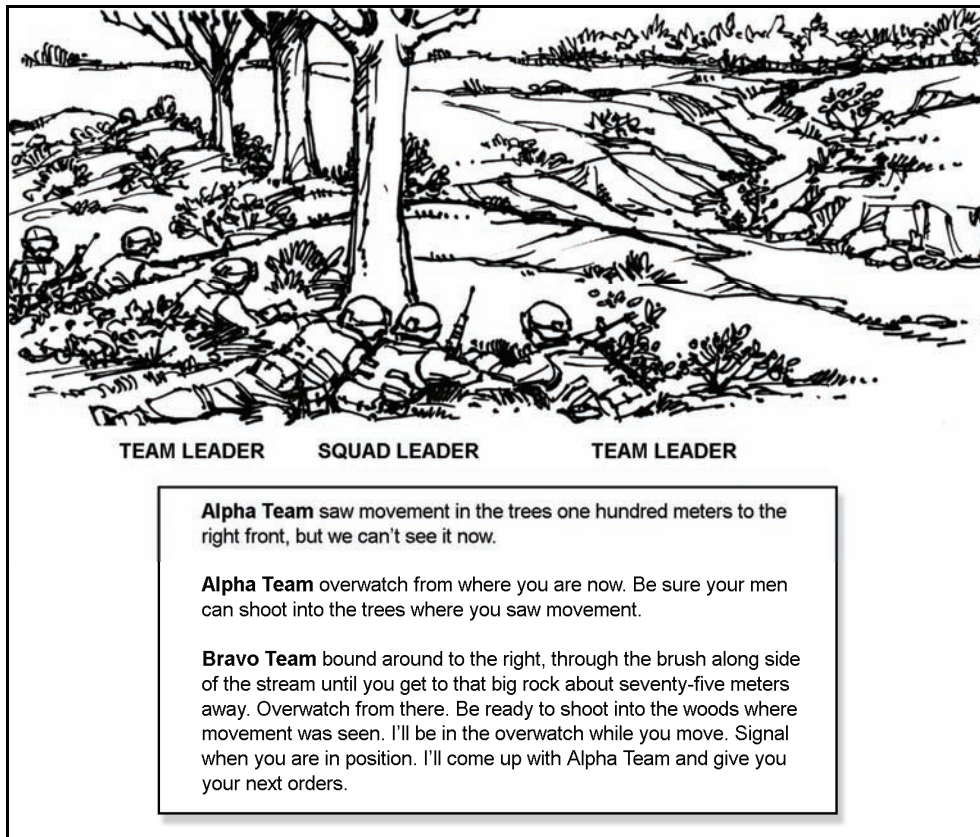
Figure 3-17. Squad bounding overwatch.

3-75. Teams can bound successively or alternately. Successive bounds are easier to control; alternate bounds can be faster (Figure 3-18).
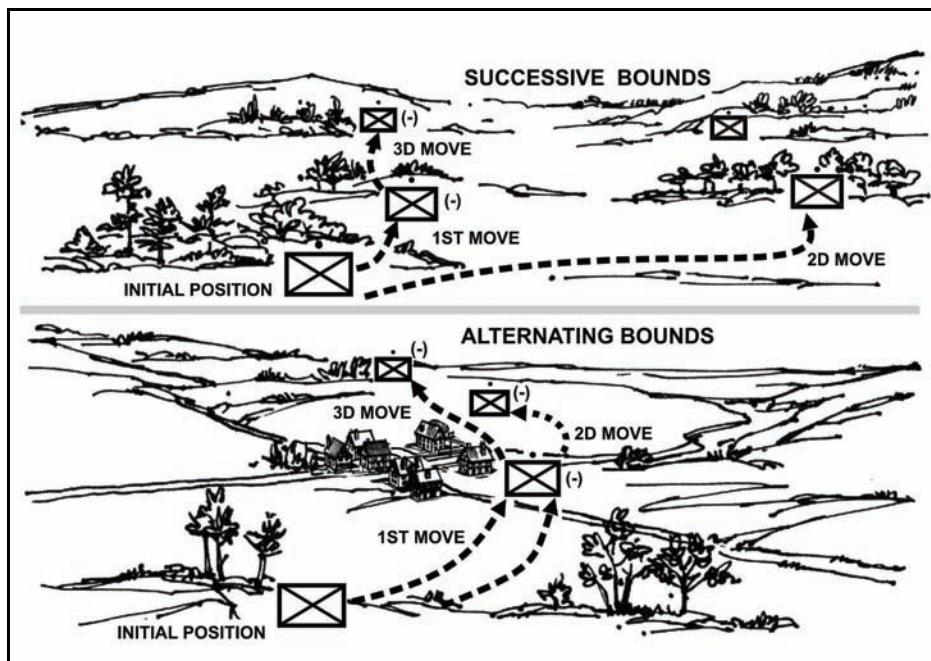
Figure 3-18. Squad successive and alternate bounds.

PLATOON MOVEMENT TECHNIQUES

3-76. The platoon leader determines and directs which movement technique the platoon will use. While moving, leaders typically separate their unit into two groups: a security element and the main body. In most scenarios, the Infantry platoon is not large enough to separate its forces into separate security forces and main body forces. However, it is able to accomplish these security functions by employing movement techniques. A movement technique is the manner a platoon uses to traverse terrain.

3-77. As the probability of enemy contact increases, the platoon leader adjusts the movement technique to provide greater security. The key factor to consider is the trail unit's ability to provide mutual support to the lead element. Soldiers must be able to see their fire team leader. The squad leader must be able to see his fire team leaders. The platoon leader should be able to see his lead squad leader.

TRAVELING

3-78. The platoon often uses the traveling technique when contact is unlikely and speed is needed (Figure 3-19). When using the traveling technique, all unit elements move continuously. In continuous movement, all Soldiers travel at a moderate rate of speed, with all personnel alert. During traveling, formations are essentially not altered except for the effects of terrain.
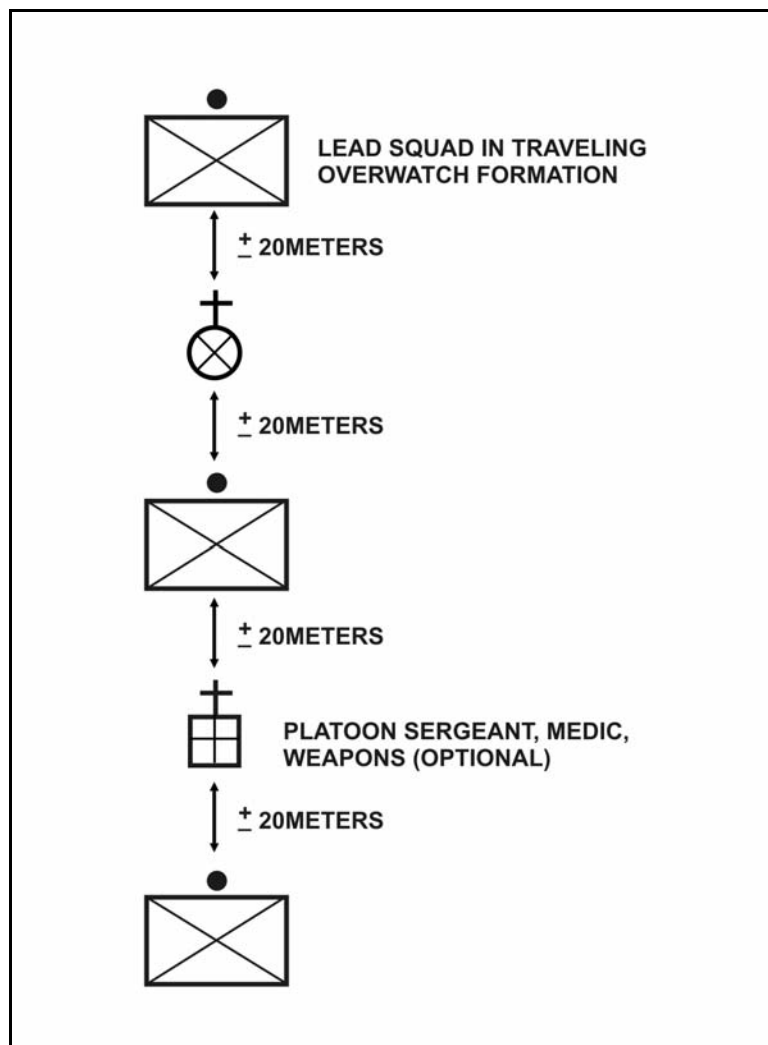
Figure 3-19. Platoon traveling.

TRAVELING OVERWATCH

3-79. Traveling overwatch is an extended form of traveling in which the lead element moves continuously but trailing elements move at varying speeds, sometimes pausing to overwatch movement of the lead element (Figure 3-20). Traveling overwatch is used when enemy contact is possible but not expected. Caution is justified but speed is desirable.

3-80. The trail element maintains dispersion based on its ability to provide immediate suppressive fires in support of the lead element. The intent is to maintain depth, provide flexibility, and sustain movement in case the lead element is engaged. The trailing elements cue their movement to the terrain, overwatching from a position where they can support the lead element if needed. Trailing elements overwatch from positions and at distances that will not prevent them from firing or moving to support the lead element. The idea is to put enough distance between the lead unit and the trail unit(s) so if the lead unit comes into contact, the trail unit(s) will be out of contact but have the ability to maneuver on the enemy.

3-81. Traveling overwatch requires the leader to control his subordinate's spacing to ensure mutual support. This involves a constant process of concentrating (close it up) and dispersion (spread it out). The primary factor is mutual support, with its two critical variables being weapon ranges and terrain. Infantry platoon's weapon range limitations dictate that units should not generally get separated by more than 300 meters. In compartmentalized terrain this distance is obviously closer while in open terrain this distance is greater.

Figure 3-20. Platoon traveling overwatch.

BOUNDING OVERWATCH

3-82. Bounding overwatch is similar to fire and movement in which one unit overwatches the movement of another (Figure 3-21). The difference is there is no actual enemy contact. Bounding overwatch is used w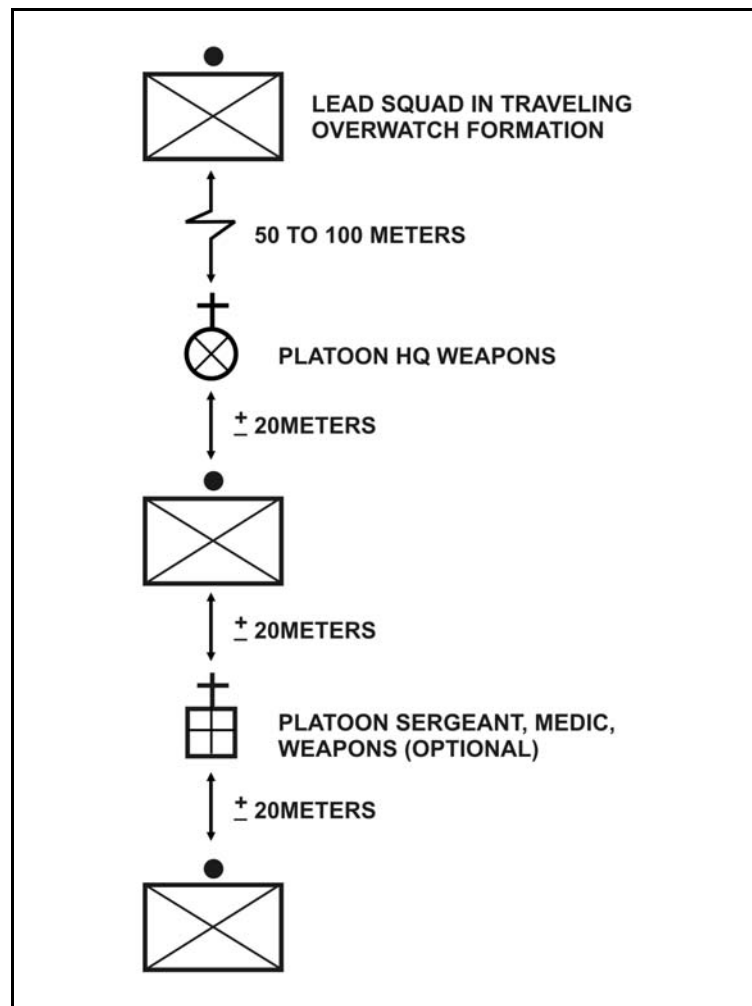hen the leader expects contact. The key to this technique is the proper use of terrain. Subordinate units fall into one of three categories: bounding, overwatching, or awaiting orders.
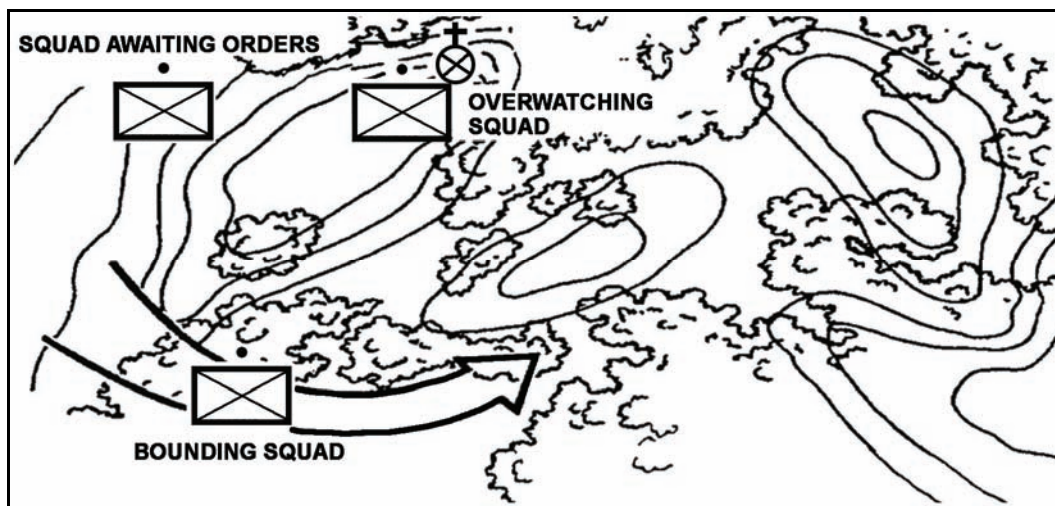
Figure 3-21. Platoon bounding overwatch.

One Squad Bounding

3-83. One squad bounds forward to a chosen position; it then becomes the overwatching element unless contact is made en route. The bounding squad can use traveling overwatch, bounding overwatch, or individual movement techniques (low and high crawl, and three to five second rushes by fire team or pairs).

3-84. Factors of METT-TC dictate the length of the bounds. However, the bounding squad(s) should never move beyond the range at which the base-of-fire squad(s) can effectively suppress known, likely, or suspected enemy positions. In severely restrictive terrain, the bounding squad(s) makes shorter bounds than it would in more open areas. The destination of the bounding element is based on the suitability of the next location as an overwatch position. When deciding where to send his bounding squad, a platoon leader considers—

- The requirements of the mission.
- Where the enemy is likely to be.
- The routes to the next overwatch position.
- The ability of an overwatching element's weapons to cover the bound.
- The responsiveness of the rest of the platoon.

One Squad Overwatching

3-85. One squad overwatches the bounding squad from covered positions and from where it can see and suppress likely enemy positions. The platoon leader remains with the overwatching squad. Normally the platoon's machine guns are located with the overwatching squad.

One Squad Awaiting Orders

3-86. Based on the situation, one squad is uncommitted and ready for employment as directed by the platoon leader. The platoon sergeant and the leader of the squad awaiting orders position themselves close

to the platoon leader. On contact, this unit(s) should be prepared to support the overwatching element, move to assist the bounding squad, or move to another location based on the platoon leader's assessment.

Weapons Squad

3-87. Machine guns are normally employed in one of two ways:
- Attached to the overwatch squad or the weapons squad that supports the overwatch element.
- Awaiting orders to move (with the platoon sergeant [PSG]) or as part of a bounding element.

Command and Control of the Bounding Element

3-88. Ideally, the overwatch element maintains visual contact with the bounding element. However, the leader of the overwatch element may have the ability to digitally track the location of the bounding element without maintaining visual contact. This provides the bounding element more freedom in selecting covered and concealed routes to its next location. Before a bound, the platoon leader gives an order to his squad leaders from the overwatch position (Figure 3-22). He tells and shows them the following:
- The direction or location of the enemy (if known).
- The positions of the overwatching squad.
- The next overwatch position.
- The route of the bounding squad.
- What to do after the bounding squad reaches the next position.
- What signal the bounding squad will use to announce it is prepared to overwatch.
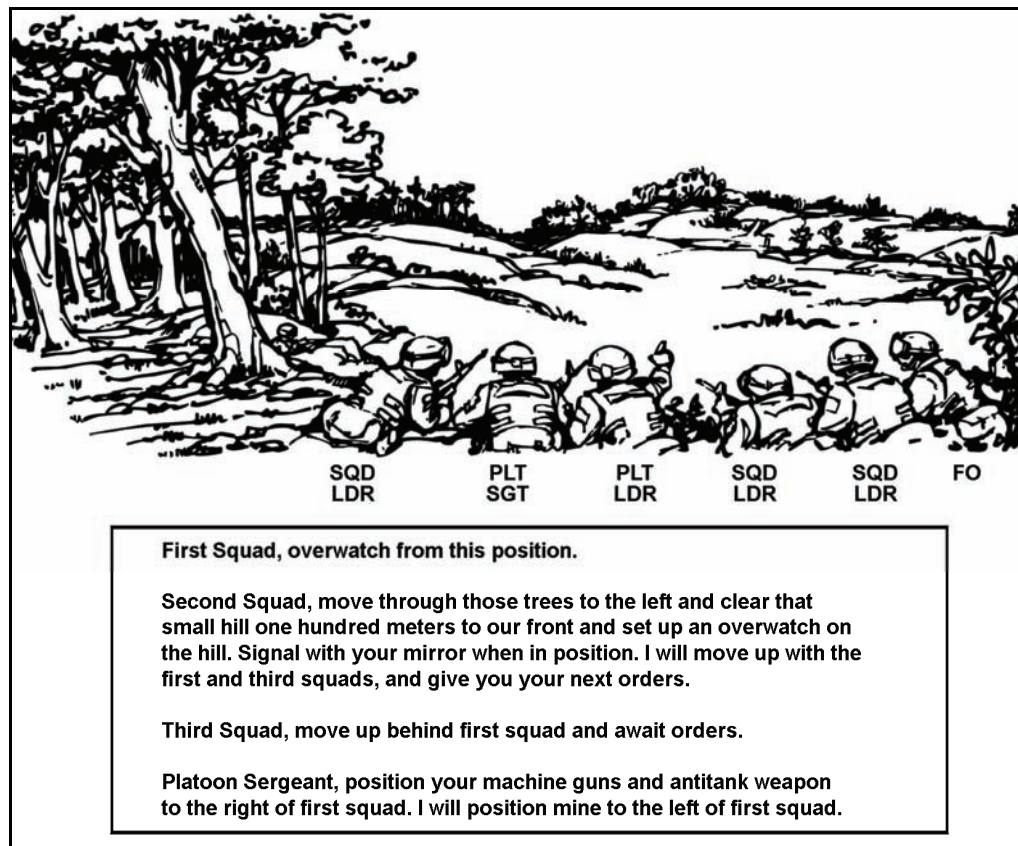- How the squad will receive its next orders.

Figure 3-22. Example of platoon leader's orders for bounding overwatch.

SECTION IV — ROUTE SELECTION AND NAVIGATION

3-89. During planning and preparation for tactical movement, platoon leaders analyze the terrain from two perspectives. First, they analyze the terrain to see how it can provide tactical advantage, both to friendly and enemy forces. Second, they look at the terrain to determine how it can aid navigation. Leaders identify any areas or terrain features that dominate their avenue of approach. These areas are almost always considered key terrain and provide the unit possible intermediate and final objectives.

3-90. Ideally, the leader identifies along his route not only ground that is good for navigation, but also ground that facilitates destroying the enemy should contact occur. If the leader wants to avoid contact, he chooses terrain that will hide the unit. If he wants to make contact, he chooses terrain from where he can more easily scan and observe the enemy. On other occasions, the leader may require terrain that allows stealth or speed. Regardless of the requirement, the leader must ensure that most of the terrain along his route provides some tactical advantage.

3-91. Route Selection and Navigation are made easier with the aid of technology. Global Positioning System (GPS) devices or Force XXI Battle Command Brigade and Below Systems (FBCB2) enhance the Infantry platoon's ability to ensure they are in the right place at the right time and to determine the location of adjacent units.

NAVIGATION AIDS

3-92. There are two categories of navigational aids: linear; and point. Linear navigational aids are terrain features such as trails, streams, ridgelines, woodlines, power lines, streets, and contour lines. Point terrain features include hilltops, and prominent buildings. Navigation aids are usually assigned control measures to facilitate communication during the movement. Typically, linear features are labeled as phase lines while point features are labeled as checkpoints (or rally points). There are three primary categories of navigation aids: catching features; handrails; and navigational attack points.

CATCHING FEATURES

3-93. Catching features are obvious terrain features that go beyond a waypoint or control measure and can be either linear or point. The general idea is that if the unit moves past its objective, limit of advance, or checkpoint, the catching feature will alert them that they have traveled too far.

The Offset-Compass Method

3-94. If there is the possibility of missing a particular point along the route (such as the endpoint or a navigational attack point), it is sometimes preferable to deliberately aim the leg to the left or right of the end point toward a prominent catching feature. Once reached, the unit simply turns the appropriate direction and moves to the desired endpoint. This method is especially helpful when the catching feature is linear.

Boxing-In the Route

3-95. One of the techniques leaders can use to prevent themselves from making navigational errors is to "box in" the leg or the entire route. This method uses catching features, handrails, and navigational attack points to form boundaries. Creating a box around the leg or route assists in more easily recognizing and correcting deviation from the planned leg or route.

HANDRAILS

3-96. Handrails are linear features parallel to the proposed route. The general idea is to use the handrail to keep the unit oriented in the right direction. Guiding off of a handrail can increase the unit's speed while also acting as a catching feature.

NAVIGATIONAL ATTACK POINTS

3-97. Navigational attack points are an obvious landmark near the objective, limit of advance, or checkpoint that can be easily found. Upon arriving at the navigational attack point, the unit transitions from rough navigation (terrain association or general azimuth navigation) to point navigation (dead reckoning). Navigational attack points are typically labeled as checkpoints.

ROUTE PLANNING

3-98. Route planning must take into account enabling tasks specific to tactical movement. These tasks facilitate the overall operation. Tactical movement normally contains some or all of the following enabling tasks:

- Planning movement with GPS waypoints.
- Movement to and passage of friendly lines.
- Movement to an objective rally point (ORP).
- Movement to a phase line of deployment.
- Movement to a limit of advance.
- Linkup with another unit.
- Movement to a patrol base or assembly area.
- Movement back to and reentry of friendly lines.

3-99. Leaders first identify where they want to end up (the objective or limit of advance). Then, working back to their current location, they identify all of the critical information and actions required as they relate to the route. For example, navigational aids, tactical positions, known and templated enemy positions, and friendly control measures. Using this information, they break up their route in manageable parts called legs. Finally, they capture their information and draw a sketch on a route chart. There are three decisions that leaders make during route planning:

(1) The type of (or combination of) navigation to use.
(2) The type of route during each leg.
(3) The start point and end point of each leg.

3-100. The leader assesses the terrain in his proposed area of operation. In addition to the standard Army map, the leader may have aerial photographs and terrain analysis overlays from the parent unit, or he may talk with someone familiar with the area.

3-101. To control movement, leaders use axes of advance, directions of attack, infiltration lanes, phase lines, probable lines of deployment, checkpoints (waypoints), final coordination lines, rally points, assembly areas, and routes.

TYPES OF NAVIGATION

3-102. There are three types of navigation: terrain association; general azimuth method; and point navigation. Leaders use whichever type or combination best suits the situation.

TERRAIN ASSOCIATION

3-103. Terrain association is the ability to identify terrain features on the ground by the contour intervals depicted on the map. The leader analyzes the terrain using the factors of OAKOC and identifies major terrain features, contour changes, and man-made structures along his axis of advance. As the unit moves, he uses these features to orient the unit and to associate ground positions with map locations. The major advantage of terrain association is that it forces the leader to continually assess the terrain. This leads to identifying tactically-advantageous terrain and using terrain to the unit's advantage.

GENERAL AZIMUTH METHOD

3-104.   For this method, the leader selects linear terrain features; then while maintaining map orientation and a general azimuth, he guides on the terrain feature. Advantages of the general azimuth method are that it speeds movement, avoids fatigue, and often simplifies navigation because the unit follows the terrain feature. The disadvantage is that it usually puts the unit on a natural line of drift. This method should end like terrain association, with the unit reaching a catching feature or a navigational attack point, then switching to point navigation.

POINT NAVIGATION

3-105.   Point navigation, also called dead reckoning, is done by starting from a known point and then strictly following a predetermined azimuth and distance. This form of navigation requires a high level of leader control because even a slight deviation over the course of a movement can cause navigation errors. This method uses the dismounted compass and a distance from the pace man (or a vehicle's odometer when mounted) to follow a prescribed route. Point navigation requires the leader to follow these steps:

- Use the compass to maintain direction.
- Use the pace man's pace or a vehicle odometer to measure the distance traveled for each leg or part.
- Review the written description of the route plan to help prevent navigational errors.

3-106.   When performed correctly, point navigation is very reliable, but time consuming. It is best used when the need for navigational accuracy outweighs the importance of using terrain. Point navigation is particularly useful when recognizable terrain features do not exist or are too far away to be helpful. For example, deserts, swamps, and thick forest make terrain association difficult. Using point navigation early on in a long movement can stress the compass man and it may be advisable to switch him. One of the problems with point navigation is negotiating severely restrictive terrain or danger areas.

COMBINATIONS

3-107.   Leaders can benefit from combining the three types of navigation. Terrain association and the general azimuth method enable leaders to set a rough compass bearing and move as quickly as the situation allows toward a catching feature or a navigational attack point. Once reached, leaders switch to point navigation by paying extremely close attention to detail, taking as much time as necessary to analyze the situation and find their point. Terrain association and the general azimuth method allow for some flexibility in the movement, and therefore do not require the same level of control as point navigation. Point navigation, on the other hand, enables leaders to precisely locate their objective or point.

ROUTE TYPES

3-108.   There are three types of routes leaders can choose from: those that follow linear terrain features; those that follow a designated contour interval; and those that go cross compartment. Terrain association can be used with all three route types. The general azimuth method is used with the contour and terrain feature method. Point navigation is used primarily with cross compartment.

TERRAIN FEATURE

3-109.   Following a terrain feature is nothing more than moving along linear features such as ridges, valleys, and streets. The advantage of this method is that the unit is moving with the terrain. This is normally the least physically taxing of the methods. The disadvantage is that following terrain features also means following natural lines of drift, which leads to a higher probability of chance contact with the enemy.

CONTOURING

3-110.   Contouring (remaining at the same height for the entire leg) follows the imaginary contour line around a hill or along a ridgeline. Contouring has two advantages. First, it prevents undue climbing or

descending. Second, following the contour acts as handrail or catching feature. The disadvantage of contouring is that it can be physically taxing.

CROSS COMPARTMENT

3-111.   Cross compartment means following a predetermined azimuth and usually means moving against the terrain. The advantage of this method is that it provides the most direct route from the start point to the end point of the leg or route. There are two primary disadvantages to this type of route. First, this method can be physically taxing. Second, the unit might expose itself to enemy observation.

DEVELOP A LEG

3-112.   The best way to manage a route is to divide it into segments called "legs." By breaking the overall route into several smaller segments, the leader is able to plan in detail. Legs typically have only one distance and direction. A change in direction usually ends the leg and begins a new one.

3-113.   A leg must have a definite beginning and ending, marked with a control measure such as a checkpoint or phase line. (When using GPS, these are captured as waypoints.) When possible, the start point and end point should correspond to a navigational aid (catching feature or navigational attack point).

3-114.   To develop a leg, leaders first determine the type of navigation and route that best suits the situation. Once these two decisions are made, the leader determines the distance and direction from the start point to the end point. He then identifies critical METT-TC information as it relates to that specific leg. Finally, leaders capture this information and draw a sketch on a route chart (Figure 3-23).

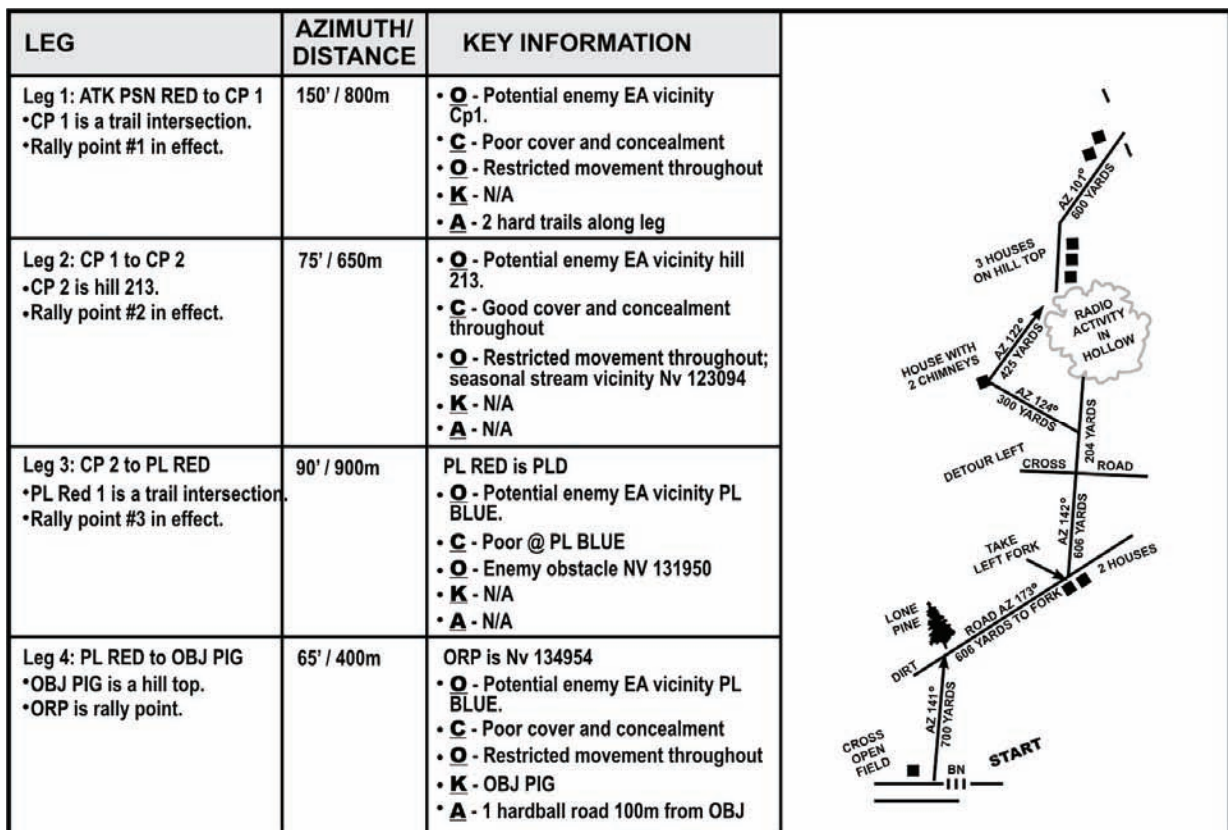| LEG	AZIMUTH/ DISTANCE	KEY INFORMATION	
Leg 1: ATK PSN RED to CP 1 •CP 1 is a trail intersection. •Rally point #1 in effect.	150' / 800m	• **O** - Potential enemy EA vicinity Cp1. • **C** - Poor cover and concealment • **O** - Restricted movement throughout • **K** - N/A • **A** - 2 hard trails along leg	
Leg 2: CP 1 to CP 2 •CP 2 is hill 213. •Rally point #2 in effect.	75' / 650m	• **O** - Potential enemy EA vicinity hill 213. • **C** - Good cover and concealment throughout • **O** - Restricted movement throughout; seasonal stream vicinity Nv 123094 • **K** - N/A • **A** - N/A	
Leg 3: CP 2 to PL RED •PL Red 1 is a trail intersection. •Rally point #3 in effect.	90' / 900m	PL RED is PLD • **O** - Potential enemy EA vicinity PL BLUE. • **C** - Poor @ PL BLUE • **O** - Enemy obstacle NV 131950 • **K** - N/A • **A** - N/A	
Leg 4: PL RED to OBJ PIG •OBJ PIG is a hill top. •ORP is rally point.	65' / 400m	ORP is Nv 134954 • **O** - Potential enemy EA vicinity PL BLUE. • **C** - Poor cover and concealment • **O** - Restricted movement throughout • **K** - OBJ PIG • **A** - 1 hardball road 100m from OBJ	

Figure 3-23. Sketch of legs example.

EXECUTE THE ROUTE

3-115.   Using decisions about the route and navigation made during planning and preparation, leaders execute their route and direct their subordinates. In addition to executing the plan, leaders—

- Determine and maintain accurate location.
- Designate rally points.

DETERMINE LOCATION

3-116.   Leaders must always know their units location during movement. Without accurate location, the unit cannot expect to receive help from supporting arms, integrate reserve forces, or accomplish their mission. To ensure accurate location, leaders use many techniques, including:

- Executing common skills.
- Designating a compass man and pace man.
- Using GPS / FBCB2.

Common Skills

3-117.   All Infantrymen, particularly leaders, must be experts in land navigation. Important navigation tasks common to all include—

- Locating a point using grid coordinates. Using a compass (day/night).
- Determining location using resection, intersection, or modified resection.
- Interpreting terrain features.
- Measuring distance and elevation.
- Employing a GPS / FBCB2.

Compass Man

3-118.   The compass man assists in navigation by ensuring the lead fire team leader remains on course at all times. The compass man should be thoroughly briefed. His instructions must include an initial azimuth with subsequent azimuths provided as necessary. The platoon or squad leader also should designate an alternate compass man. The leader should validate the patrol's navigation with GPS devices.

Pace Man

3-119.   The pace man maintains an accurate pace at all times. The platoon or squad leader should designate how often the pace man is to report the pace. The pace man should also report the pace at the end of each leg. The platoon or squad leader should designate an alternate pace man.

Global Positioning Systems

3-120.   GPSs receive signals from satellites or land-based transmitters. They calculate and display the position of the user in military grid coordinates as well as in degrees of latitude and longitude. During planning, leaders enter their waypoints into the GPS. Once entered, the GPS can display information such as distance and direction from waypoint to waypoint. During execution, leaders use the GPS to establish their exact location.

> **NOTE:** Leaders need to remember that GPS and digital displays are not the only navigational tools they can use. The best use of GPS or digital displays is for confirming the unit's location during movement. Terrain association and map-reading skills are still necessary skills, especially for point navigation. Over reliance on GPS and digital displays can cause leaders to ignore the effects of terrain, travel faster than conditions allow, miss opportunities, or fail to modify routes when necessary.

DESIGNATE RALLY POINTS

3-121.   A rally point is a place designated by the leader where the unit moves to reassemble and reorganize if it becomes dispersed. It can also be a place for a temporarily halt to reorganize and prepare for actions at the objective, to depart from friendly lines, or to reenter friendly lines (FM 1-02). Planned and unplanned rally points are common control measures used during tactical movement. Planned rally points include objective rally point(s) (ORP), initial rally point(s) (IRP), and reentry rally point(s) (RRP). Unplanned rally points are enroute rally points, near side rally points, and far side rally points. Despite the different types of rally points, the actions that occur there are generally the same.

3-122.   Prior to departing, leaders designate tentative rally points and determine what actions will occur there. When occupying a rally point, leaders use a perimeter defense to ensure all-around security. Those rally points used to reassemble the unit after an event are likely to be chaotic scenes and will require immediate actions by whatever Soldiers happen to arrive. These actions and other considerations are listed in Table 3-6.

Table 3-6. Actions at rally point.

Rally Points	Soldier Actions at an RP	Other Considerations
Select a rally point that— • Is easily recognized. • Is large enough for the unit to assemble. • Offers cover and concealment. • Is defensible for a short time. • Is away from normal movement routes and natural lines of drift. Designate a rally point by one of the following three ways: • Physically occupy it for a short period. • Use hand-and-arm signals (either pass by at a distance or walk through). • Radio communication.	• Establish security. • Reestablish the chain of command. • Account for personnel and equipment status. • Determine how long to wait until continuing the unit's mission or linkup at a follow-on RP. • Complete last instructions.	• Travel time and distance. • Maneuver room needed. • Adjacent unit coordination requirements. • Line of sight and range requirements for communication equipment. • Trafficability and load bearing capacity of the soil (especially when mounted). • Ability to surprise the enemy. • Ability to prevent being surprised by the enemy. • Energy expenditure of Soldiers and condition they will be in at the end of the movement.

SECTION V — ACTIONS AT DANGER AREAS

3-123.   When analyzing the terrain (in the METT-TC analysis) during the TLP, the platoon leader may identify danger areas. When planning the route, the platoon leader marks the danger areas on his overlay. The term *danger area* refers to any area on the route where the terrain could expose the platoon to enemy observation, fire, or both. If possible, the platoon leader plans to avoid danger areas, but sometimes he cannot. When the unit must cross a danger area, it does so as quickly and as carefully as possible. During planning, the leader designates near-side and far-side rally points. If the platoon encounters an unexpected danger area, it uses the en route rally points closest to the danger area as far-side and near-side rally points. Examples of danger areas include—

- **Open Areas.** Conceal the platoon on the near side and observe the area. Post security to give early warning. Send an element across to clear the far side. When cleared, cross the remainder of the platoon at the shortest exposed distance and as quickly as possible.

- **Roads and Trails.** Cross roads or trails at or near a bend, a narrow spot, or on low ground.

- **Villages.** Pass villages on the downwind side and well away from them. Avoid animals, especially dogs, which might reveal the presence of the platoon.
- **Enemy Positions.** Pass on the downwind side (the enemy might have scout dogs). Be alert for trip wires and warning devices.
- **Minefields.** Bypass minefields if at all possible, even if it requires changing the route by a great distance. Clear a path through minefields only if necessary.
- **Streams.** Select a narrow spot in the stream that offers concealment on both banks. Observe the far side carefully. Emplace near- and far-side security for early warning. Clear the far side and then cross rapidly but quietly.
- **Wire Obstacles.** Avoid wire obstacles (the enemy covers obstacles with observation and fire).

CROSSING OF DANGER AREAS

3-124.   Regardless of the type of danger area, when the platoon must cross one independently, or as the lead element of a larger force, it must perform the following:

- When the lead team signals "danger area" (relayed throughout the platoon), the platoon halts.
- The platoon leader moves forward, confirms the danger area, and determines what technique the platoon will use to cross. The platoon sergeant also moves forward to the platoon leader.
- The platoon leader informs all squad leaders of the situation and the near-side and far-side rally points.
- The platoon sergeant directs positioning of the near-side security (usually conducted by the trail squad). These two security teams may follow him forward when the platoon halts and a danger area signal is passed back.
- The platoon leader reconnoiters the danger area and selects the crossing point that provides the best cover and concealment.
- Near-side security observes to the flanks and overmatches the crossing.
- When the near-side security is in place, the platoon leader directs the far-side security team to cross the danger area.
- The far-side security team clears the far side.
- The far-side security team leader establishes an observation post forward of the cleared area.
- The far-side security team signals to the squad leader that the area is clear. The squad leader relays the message to the platoon leader.
- The platoon leader selects the method the platoon will use to cross the danger area.
- The platoon quickly and quietly crosses the danger area.
- Once across the danger area, the main body begins moving slowly on the required azimuth.
- The near-side security element, controlled by the platoon sergeant, crosses the danger area where the platoon crossed. They may attempt to cover any tracks left by the platoon.
- The platoon sergeant ensures everyone crosses and sends up the report.
- The platoon leader ensures accountability and resumes movement at normal speed.

NOTE: The same principles stated above are used when crossing a smaller unit (such as a squad) across a danger area.

3-125.   The platoon leader or squad leader decides how the unit will cross based on the time he has, size of the unit, size of the danger area, fields of fire into the area, and the amount of security he can post. An Infantry platoon or squad may cross all at once, in buddy teams, or one Soldier at a time. A large unit normally crosses its elements one at a time. As each element crosses, it moves to an overwatch position or to the far-side rally point until told to continue movement.

CROSSING OF LINEAR DANGER AREAS (PLATOON)

3-126.   A linear danger area is an area where the platoon's flanks are exposed along a relatively narrow field of fire. Examples include streets, roads, trails, and streams. The platoon crosses a linear danger area in the formation and location specified by the platoon leader (Figure 3-24).
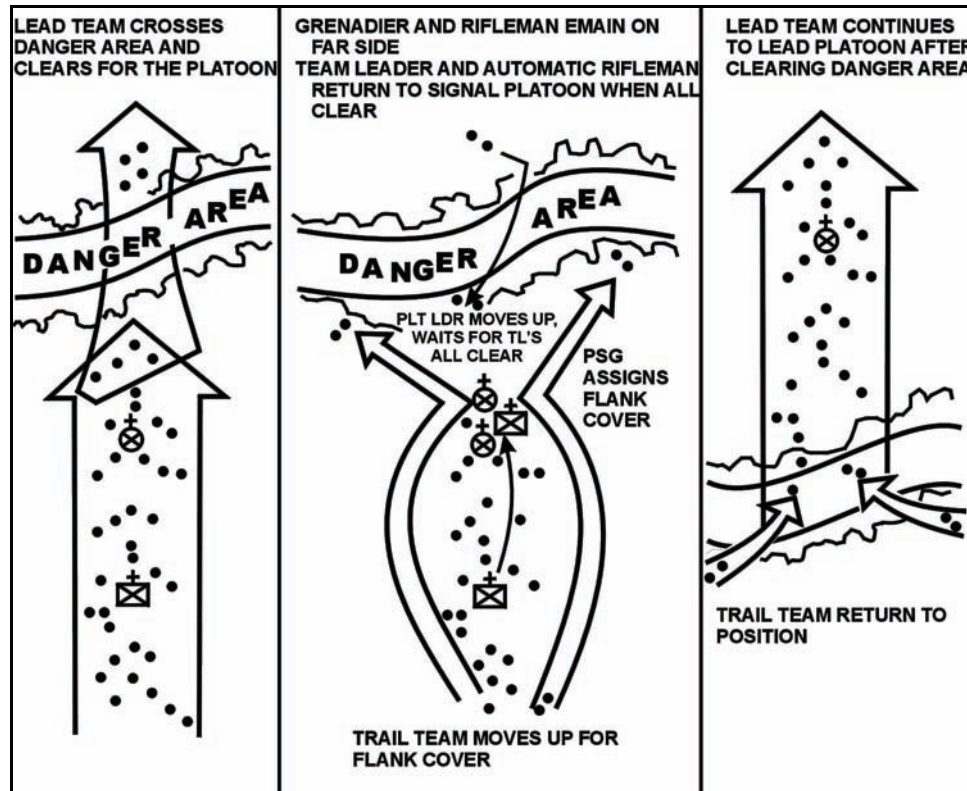
Figure 3-24. Crossing a linear danger area.

CROSSING OF LARGE OPEN AREAS

3-127.   If the large open area is so large that the platoon cannot bypass it due to the time needed to accomplish the mission, a combination of traveling overwatch and bounding overwatch is used to cross the large open area (Figure 3-25). The traveling overwatch technique is used to save time. The squad or platoon moves using the bounding overwatch technique at any point in the open area where enemy contact may be expected. The technique may also be used once the squad or platoon comes within range of enemy small-arms fire from the far side (about 250 meters). Once beyond the open area, the squad or platoon re-forms and continues the mission.
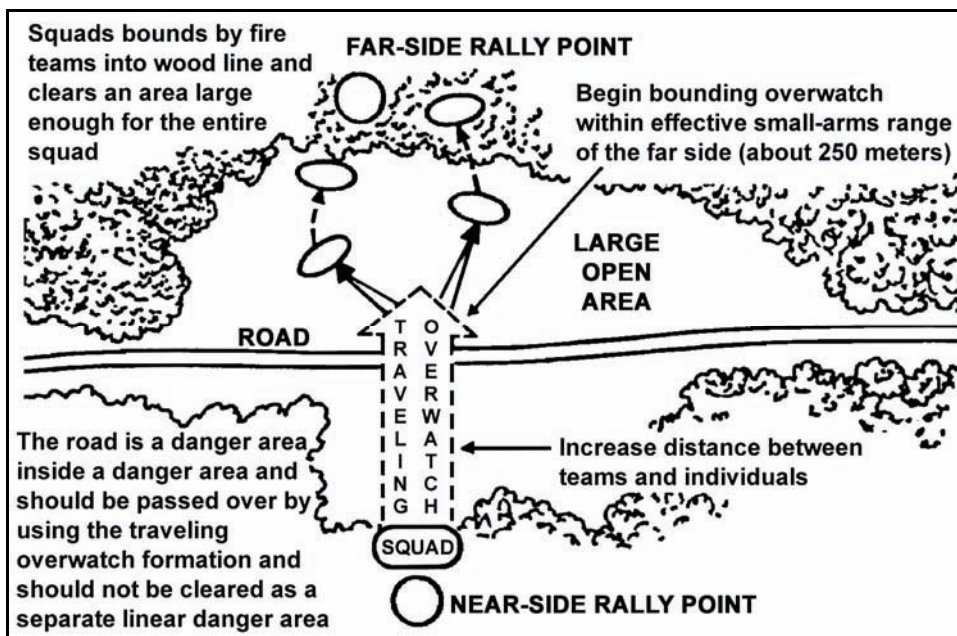
Figure 3-25. Crossing a large open area.

CROSSING OF SMALL OPEN AREAS

3-128.   Small open areas are small enough to bypass in the time allowed for the mission. Two techniques can be used (Figure 3-26).

Contouring Around the Open Area

3-129.   The leader designates a rally point on the far side with the movement azimuth. He then decides which side of the open area to contour around (after considering the distance, terrain, cover and concealment), and moves around the open area. He uses the wood line and vegetation for cover and concealment. When the squad or platoon arrives at the rally point on the far side, the leader reassumes the azimuth to the objective area and continues the mission (Figure 3-26).

Detour Bypass Method

3-130.   The squad or platoon turns 90 degrees to the right or left around the open area and moves in the direction of travel. Once the squad or platoon has passed the danger area, the unit completes the box with another 90-degree turn and arrives at the far-side rally point, then continues the mission. The pace count of the offset and return legs is not added to the distance of the planned route (Figure 3-26).
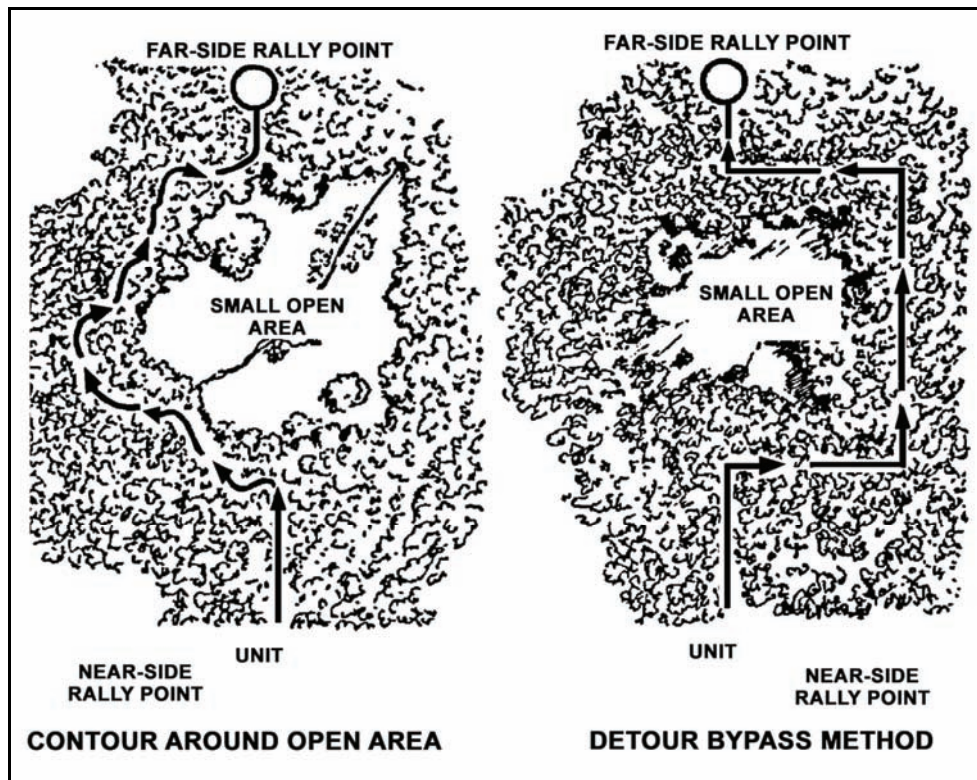
Figure 3-26. Crossing a small open area.

ENEMY CONTACT AT DANGER AREAS

3-131.   An increased awareness of the situation helps the platoon leader control the platoon when it makes contact with the enemy. If the platoon makes contact in or near the danger area, it moves to the designated rally points. Based on the direction of enemy contact, the leader still designates the far- or near-side rally point. During limited visibility, he can also use his laser systems to point out the rally points at a distance. If the platoon has a difficult time linking up at the rally point, the first element to arrive should mark the rally point with an infrared light source. This will help direct the rest of the platoon to the location. During movement to the rally point, position updates allow separated elements to identify each other's locations. These updates help them link up at the rally point by identifying friends and foes.

SECTION VI — MOVEMENT WITH COMBAT VEHICLES

3-132.   There are several options available to the platoon leader when augmented with vehicles. The platoon leader should employ the vehicles in conjunction with the rifle squads so each complements the other. Some options include—

- Employ them to support the Infantry rifle squads.
- Employ them separately to provide heavy direct fires or antiarmor fires.
- Leave in hide positions.
- Displace them to a secure location.

COMBAT VEHICLE AND INFANTRY SQUAD FORMATIONS

3-133.   The principles of METT-TC guide the leader in selecting formations for combat vehicles and Infantry. The same principles for selecting combat formations with Infantrymen apply when selecting combat formations for combat vehicles moving with Infantrymen. The platoon leader can employ a variety

of formations to meet the needs of his mission. The column, line, echelon, vee, and wedge are fundamental movement formations for combat vehicles.

3-134.   After the leader combines the mounted and Infantry elements into one combat formation, it is his responsibility to ensure proper communication and fire control measures are implemented to maximize lethality and prevent fratricide.

3-135.   After selecting the combat formations for the combat vehicles and Infantry, the leader can decide whether to lead with combat vehicles, Infantrymen, or a combination of the two. The default technique is to lead with Infantrymen.

LEAD WITH INFANTRY

3-136.   Infantrymen are better suited for leading combat formations (Figure 3-27) when—
- A route leads through restrictive urban or rural terrain
- Stealth is desired.
- Enemy antitank minefields are templated.
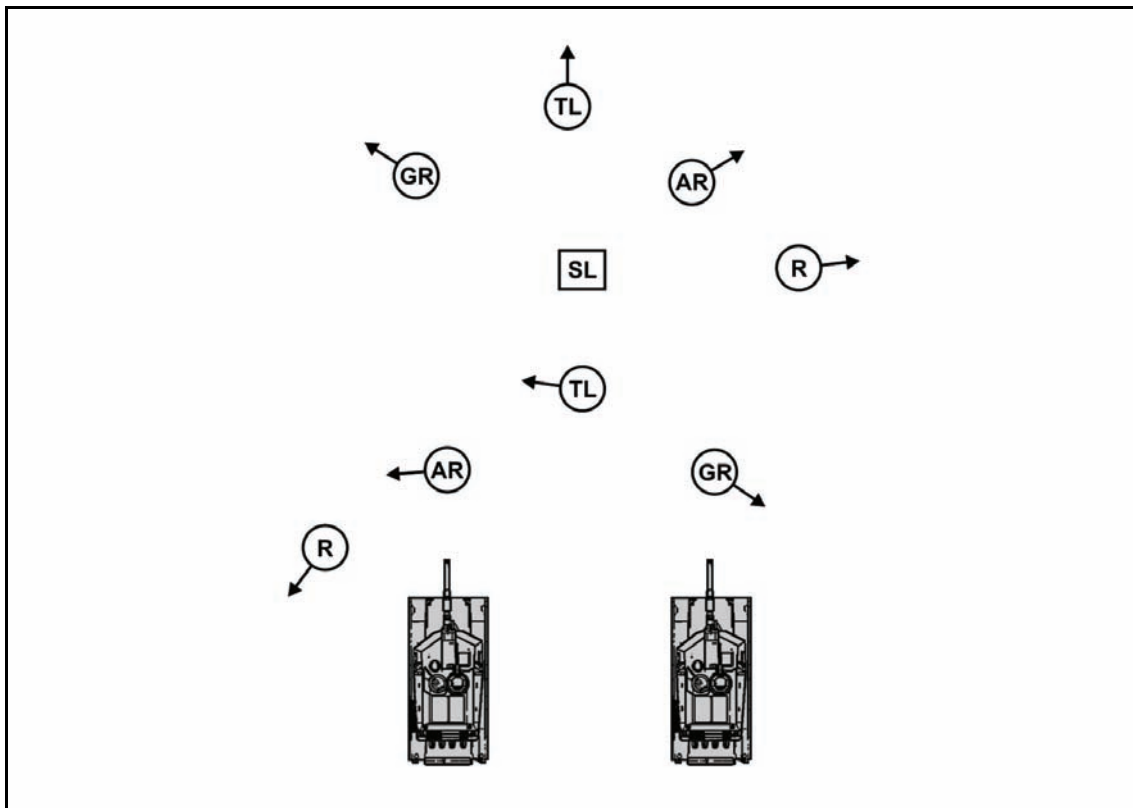- Enemy antitank teams are templated.

Figure 3-27. Lead with Infantry squad.

LEAD WITH COMBAT VEHICLES

3-137.   Infantry leaders may choose to lead with combat vehicles (Figure 3-28) when—
- There is an armored or tank threat.
- Moving through open terrain with limited cover or concealment.
- There is a confirmed enemy location/direction.
- There are templated enemy antipersonnel minefields.
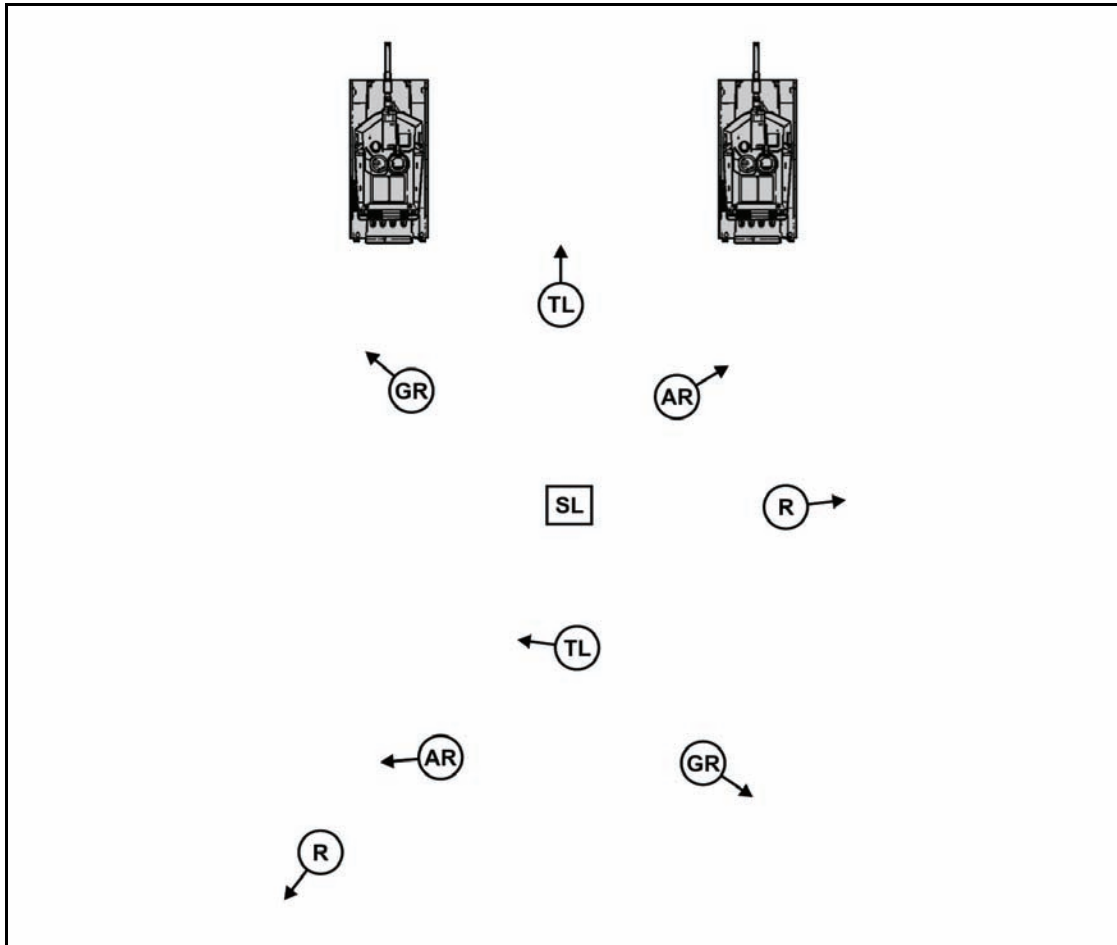
Figure 3-28. Lead with combat vehicles.

LEAD WITH BOTH COMBAT VEHICLES AND INFANTRY

3-138. Infantry leaders may choose to centrally locate the combat vehicles in their formation (Figure 3-29) when—

- Flexibility is desired.
- The enemy location is unknown.
- There is a high threat of dismounted enemy antitank teams.
- The ability to mass the fires of the combat vehicles quickly in all directions is desired.
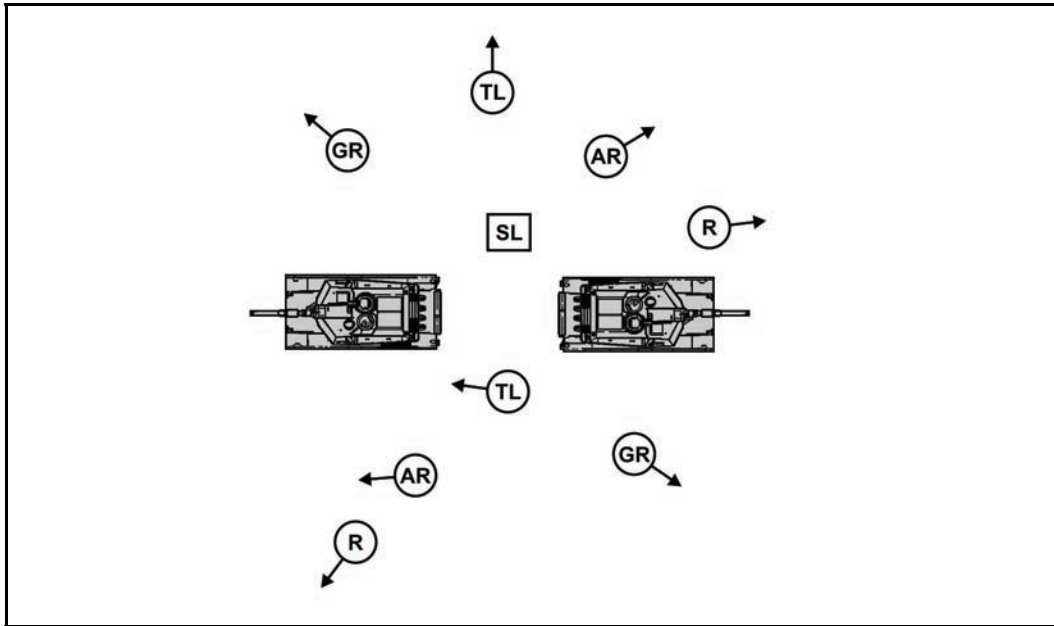
Figure 3-29. Lead with both combat vehicles and Infantry squad.

COMBAT VEHICLE AND INFANTRY PLATOON FORMATIONS

3-139.   Infantry platoons can also incorporate their formations with those of combat vehicular units. The principles for choosing platoon combat formations are the same as squad combat formations. The Infantry platoon can conduct tactical movement with a platoon of combat vehicles (normally four) or a section of combat vehicles (normally two). Figures 3-30 and 3-31 detail some basic Infantry platoon formations with combat vehicle platoon formations.

Figure 3-30. Combat vehicle wedge, Infantry platoon diamond.

Figure 3-31. Combat vehicle echelon right, Infantry platoon column.

MOUNTED TACTICAL MOVEMENT

3-140. Mounted movement is very similar to dismounted movement. Depending on the vehicle type, a platoon may have a squad in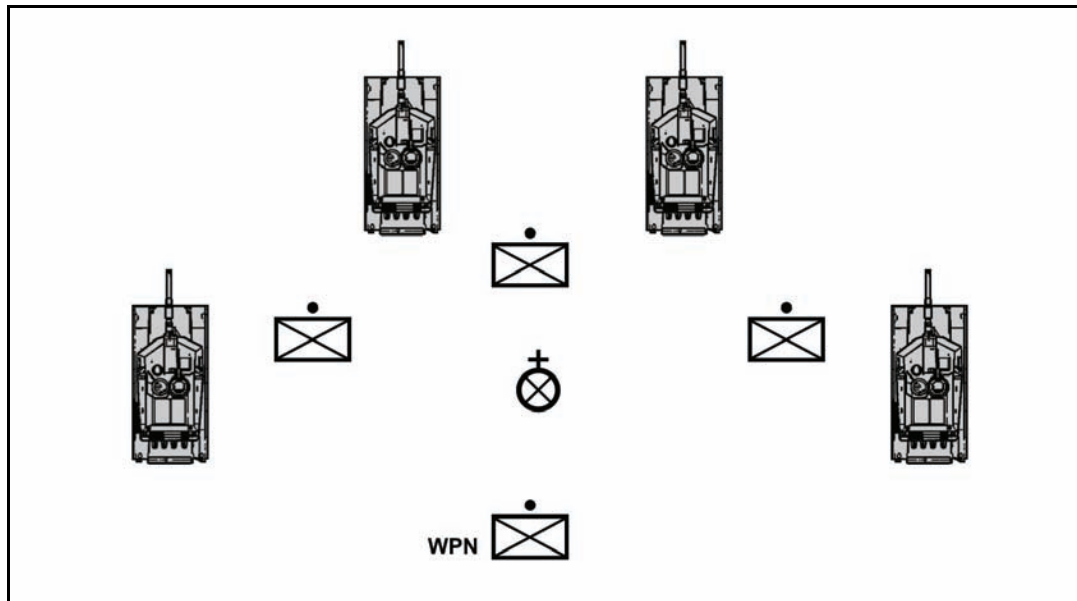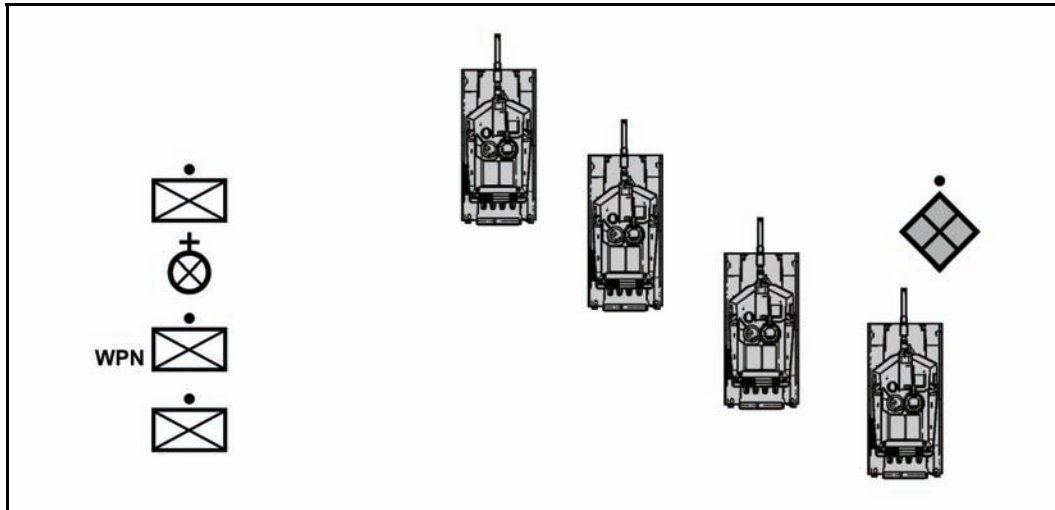 one to four vehicles. Units with more than four vehicles should consider splitting the vehicles into two or more sections and control these sections much the same way squads control their teams.

3-141. Units augmented with four or more vehicles can use any of the seven formations. They use them within the context of the three movement techniques (see Section III) and should be prepared to execute immediate action drills when transitioning to maneuver. When the mounted unit stops, they use the coil and herringbone formations to ensure security.

3-142. In mounted successive bounds, vehicles keep their relative positions in the column. The first and second vehicles operate as a section in moving from one observation point to another. The second vehicle is placed in a concealed position, occupants dismounting if necessary, to cover movement of the first vehicle to an observation point. On reaching this point, occupants of the first vehicle observe and reconnoiter, dismounting if necessary. When the area is determined to be clear, the second vehicle is signaled forward to join the first vehicle. The commander of the first vehicle observes the terrain to the front for signs of enemy forces and selects the next stopping point. The first vehicle then moves out and the process is repeated. Movement distance of the lead vehicle does not exceed the limit of observation or the range of effective fire support from the second vehicle. The lead vehicle and personnel are replaced frequently to ensure constant alertness. The other vehicles in the column move by bounds from one concealed position to another. Each vehicle maintains visual contact with the vehicle ahead but avoids closing up (Figure 3-32). However, as a rule, vehicles always work in pairs and should never be placed in a situation where one vehicle is not able to be supported by the second.

3-143. In mounted alternate bounds, all except the first two vehicles keep their relative places in the column. The first two vehicles alternate as lead vehicles on each bound. Each covers the bound of the other. This method provides more rapid advance than movement by successive bounds, but is less secure. Security is obtained by the vehicle commander who assigns each Soldier a direction of observation (to the front, flank[s], or rear). This provides each vehicle with some security against surprise fire from every direction, and provides visual contact with vehicles to the front and rear.
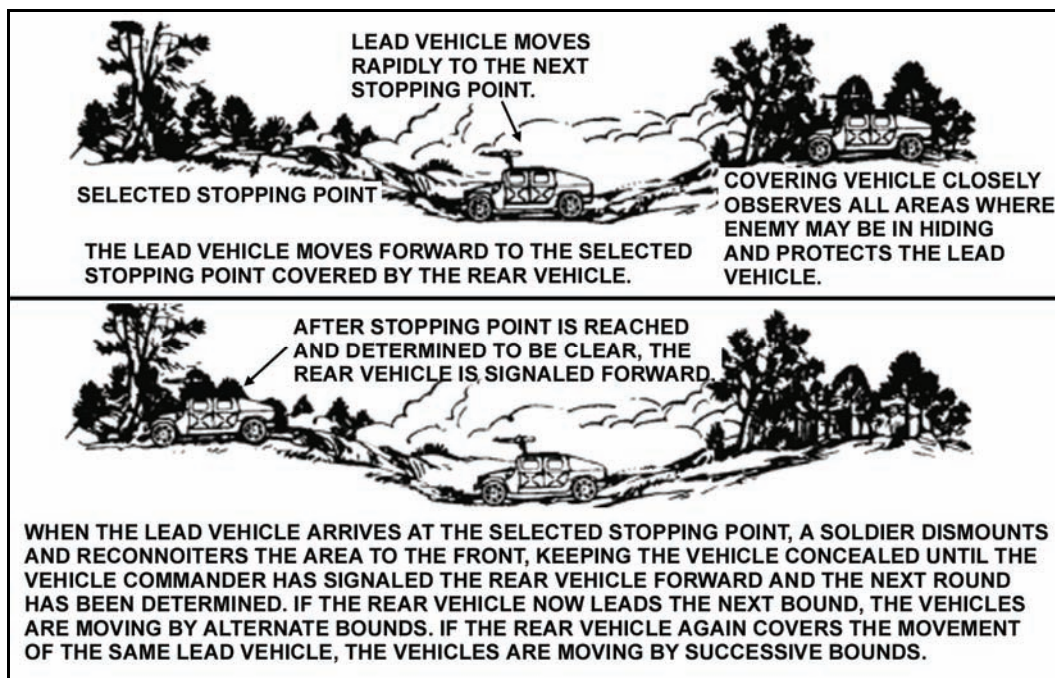
Figure 3-32. Lead vehicle moving by bounds.

CONVOYS

3-144. A convoy is a group of vehicles organized for the purpose of control and orderly movement with or without escort protection that moves over the same route at the same time under one commander (FM1-02).

3-145. The platoon conducts motor marches, usually in trucks. Some of the special considerations may include—

- **Protection.** Sandbag the bottom of the trucks to protect from mines. Ensure crew-served weapons are manned with qualified gunners.
- **Observation.** Ensure Soldiers sit facing outward and remove bows and canvas to allow 360-degree observation and rapid dismount.
- **Inspection.** Inspect vehicles and drivers to ensure they are ready. Perform before, during, and after preventive maintenance checks and services (PMCS). Ensure drivers' knowledge of the route, speed, and convoy distance.
- **Loading.** Keep fire team, squad, and platoon integrity when loading vehicles. Fire teams and squads are kept intact on the same vehicle. Platoon vehicles are together in the same march serial. Key weapons and equipment are crossloaded with platoon leaders and platoon sergeants in different vehicles.
- **Rehearsals.** Rehearse immediate action to enemy contact (near and far ambushes, air attack). Ensure drivers know what to do.
- **Air Guards.** Post air guards for each vehicle, with special consideration on the placement of crew served weapons.

ACTIONS AT DANGER AREAS (MOUNTED)

3-146. Infantry platoons must be prepared to negotiate danger areas when mounted. The discussion of leader and unit action are deliberately generic because of the wide variety of scenarios in which leaders might find themselves.

3-147.   When moving mounted, units normally travel on roads, trails, and in unrestrictive terrain. Mounted units are typically vulnerable in the type of terrain favored by Infantry such as restrictive and close terrain. In addition, areas such as bridges, road junctions, defiles, and curves (that deny observation beyond the turn) are also considered danger areas. When leaders identify a danger area, they determine the appropriate movement technique to employ (traveling, traveling overwatch, or bounding overwatch). They then dismount their Infantry squads and clear the area or do a combination of both.

3-148.   If time and terrain permit, the unit should either bypass a danger area or dismount Infantry to reconnoiter and clear it. However, the distances between covered and concealed positions may make this impractical. If time constraints prevent these options, the unit uses a combination of traveling overwatch and bounding overwatch to negotiate the danger area. As with dismounted actions at a danger area, the leader must be prepared to quickly transition to maneuver in case the unit makes contact with the enemy.

MOUNTED TRAVELING OVERWATCH

3-149.   The lead element moves continuously along the covered and concealed routes that give it the best available protection from possible enemy observation and direct fire (Figure 3-33). The trail element moves at variable speeds providing continuous overwatch, keeping contact with the lead element, and stopping periodically to get a better look. The trail element stays close enough to ensure mutual support for the lead element. However, it must stay far enough to the rear to retain freedom of maneuver in case an enemy force engages the lead element.
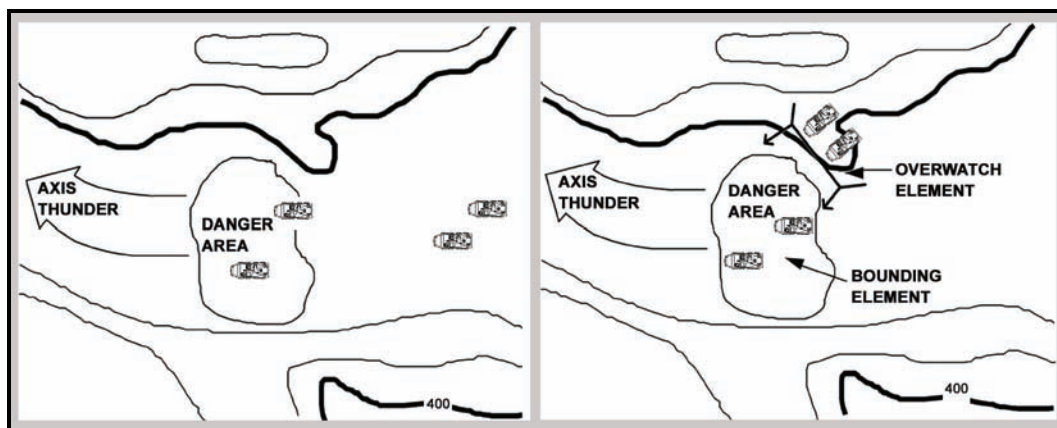

Figure 3-33. Mounted traveling overwatch.

MOUNTED BOUNDING OVERWATCH

3-150.   With bounding overwatch, one section is always stopped to provide overwatching fire. The unit executing bounding overwatch uses either the successive or alternate bounding method.

DISMOUNTING AND CLEARING THE AREA

3-151.   The commander of the lead vehicle immediately notifies the platoon leader when he encounters an obstacle or other danger area. If needed, Soldiers dismount and take advantage of available cover and concealment to investigate these areas (Figure 3-34). If possible, the vehicle is moved off the road into a covered or concealed position. Weapons from the vehicle cover the advance of the dismounted element. Designated Soldiers reconnoiter these places under cover of the weapons in the vehicle. Obstacles are marked and bypassed, if possible. When they cannot be bypassed, they are cautiously removed.

3-152.   Side roads intersecting the route of advance are investigated. Soldiers from one vehicle secure the road junction. One or two vehicles investigate the side road. The amount of reconnaissance on side roads is determined by the leader's knowledge of the situation. Soldiers investigating side roads do not move past supporting distance of the main body.

Figure 3-34. Dismounting and clearing the area.

SECTION VII — SECURITY

3-153.   Maintaining security is a constant theme of tactical movement. Effective security can prevent enemy surprise. Security therefore requires everyone to concentrate on the enemy. Though this seems simple enough, in practice, it is not. This means that leaders and their Soldiers must be proficient in the basics of tactical movement. Failure to attain proficiency diverts attention away from the enemy, thereby directly reducing the unit's ability to fight.

3-154.   Platoons and squads enhance their own security during movement through the use of covered and concealed terrain; the use of the appropriate movement formation and technique; the actions taken to secure danger areas during crossing; the enforcement of noise, light, and radiotelephone discipline; and the use of proper individual camouflage techniques.

3-155.   During planning and preparation for movement, leaders analyze the enemy situation, determine known and likely enemy positions, and develop possible enemy courses of action. After first considering the enemy, leaders determine what security measures to emplace during tactical movement.

ENEMY

3-156.   Leaders have to decide whether they are going to move aggressively to make contact, or stealthily to avoid contact. Either way, the leader has to anticipate enemy contact throughout. If possible, leaders should avoid routes with obvious danger areas such as built-up areas, roads, trails, and known enemy

positions. If these places cannot be avoided, risk management should be conducted to develop ways to reduce danger to the unit. If stealth is desired, the route should avoid contact with local inhabitants, built-up areas, and natural lines of drift.

3-157. Movement techniques help the leader manage the amount of security his unit has during movement. Traveling is the least secure and used when contact is not likely. Traveling overwatch is used when contact is likely but not imminent. Bounding overwatch is used when contact is imminent. Leaders establish the probable line of deployment (PLD) to indicate where the transition from traveling overwatch to bounding overwatch should occur. When in contact with the enemy, the unit transitions from movement to maneuver (fire and movement) while the leader conducts actions on contact (Figure 3-35).
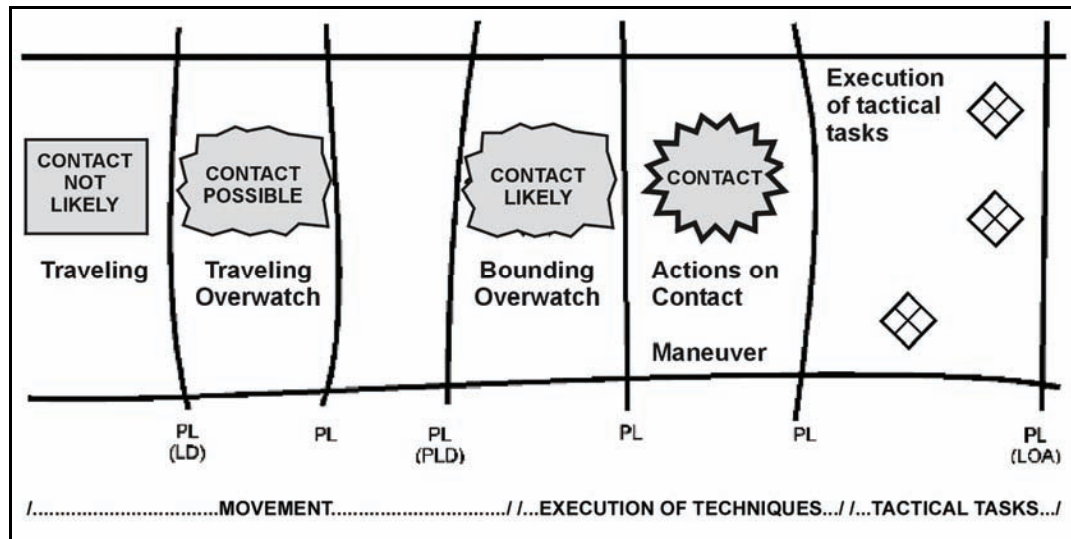

Figure 3-35. Movement to maneuver.

TERRAIN

3-158. When planning movements, the leader must consider how terrain affects security while simultaneously considering the other factors of METT-TC. Some missions may require the unit to move on other than covered and concealed routes. While leaders may not be able to prevent the unit's detection, they can ensure that they move on the battlefield in a time and place for which the enemy is unprepared. Particularly when moving in the open, leaders must avoid predictability and continue to use terrain to their advantage.

CAMOUFLAGE, NOISE, AND LIGHT DISCIPLINE

3-159. Leaders must ensure that camouflage used by their Soldiers is appropriate to the terrain and season. Platoon SOPs specify elements of noise and light discipline.

3-160. If Soldiers need more illumination than an image intensifier can provide in infrared mode during movement, they should use additional infrared light sources. The combination should provide the light needed with the least risk of enemy detection. When using infrared light, leaders must consider the enemy's night vision and infrared capabilities. For instance, an enemy with night vision capability can send infrared light signals, and he can concentrate direct and indirect fire on a platoon that is using infrared light.

SECURITY AT HALTS

3-161. Units conducting tactical movement frequently make temporary halts. These halts range from brief to extended periods of time. For short halts, platoons use a cigar-shaped perimeter intended to protect the

force while maintaining the ability to continue movement. When the platoon leader decides not to immediately resume tactical movement, he transitions the platoon to a perimeter defense. The perimeter defense is used for longer halts or during lulls in combat.

CIGAR-SHAPED PERIMETER

3-162. When the unit halts, if terrain permits, Soldiers should move off the route and face out to cover the same sectors of fire they were assigned while moving, allowing passage through the center of the formation. This results in a cigar-shaped perimeter. Actions by subordinate leaders and their Soldiers occur without an order from the leader. Soldiers are repositioned as necessary to take advantage of the best cover, concealment, and fields of fire.

PERIMETER DEFENSE

3-163. When operating independently, the platoon uses a perimeter defense during extended halts, resupply, and issuing platoon orders or lulls in combat. Normally the unit first occupies a short halt formation. Then after conducting a leader's reconnaissance of the position and establishing security, the unit moves into the perimeter defense.

ACTIONS AT HALTS

3-164. Table 3-7 lists the standard actions taken at halts.

Table 3-7. Actions at halts.

Soldier (or Vehicle) Actions*	Squad Leader (or Section Leader) Actions	Platoon Leader Actions
• Moves to as much of a covered and concealed position as available. • Visually inspects and physically clears his immediate surroundings (a roughly 5-25m radius around his position). • Establishes a sector of fire for his assigned weapon (using 12 o'clock as the direction the Soldier is facing, the Soldier's sector of fire ranges from 10 o'clock to 2 o'clock). • Determines his observation and field of fire. Identifies dead space in his field of fire. • Identifies obstacles and determines enemy avenues of approach (both mounted and dismounted). • Identifies the dominant ground in his immediate surroundings. • Coordinates his actions with the Soldiers (or vehicles) on his left and right. (*These actions occur without leader prompting.)	• Adjusts his perimeter. ▪ If operating independently, the squad leader establishes 360-degree, three-dimensional security. ▪ Attempts to find terrain that anchors his position. ▪ If operating as part of a platoon, the squad leader arrays his teams to best fit into the platoon leader's defensive scheme, based on the platoon leader's guidance. • Visually inspects and physically clears (if required) the squad's immediate surrounding (about 35m, the distance within hand grenade range). • Ensures his squad's individual sectors of fire overlap with each other, creating a seamless perimeter with no gaps of fire coverage. • Identifies his dead space and adjusts his M203 grenadiers accordingly. • Identifies obstacles and the likely enemy avenue of approach (mounted and dismounted). • Identifies the dominant ground in his area of operation. • Coordinates responsibilities and sectors with the units on his left and right.	• Adjusts his perimeter. ▪ If operating independently, he establishes 360-degree, three-dimensional security. ▪ If operating as part of another organization, he arrays his squads to best fit into the controlling commander's defensive scheme. ▪ Supervises the emplacement of the weapons squad's weapon systems. • Dispatches an element (usually a fire team) to visually inspect and physically clear the platoon's immediate surrounding (an area out to small arms range, roughly 100-300m depending on terrain). • Ensures his squads' sectors of fire overlap with each other, creating a seamless perimeter with no gaps of fire coverage. • Identifies his dead space not covered and requests indirect fire support to overwatch dead space in the area of operation. • Identifies obstacles and the likely enemy avenue of approach (mounted and dismounted). • Identifies the dominant ground in his area of operation. • Coordinates with the units on his left and right.

SECTION VIII — OTHER MOVEMENT SITUATIONS

3-165.   The platoon can use other formations for movement.

ADMINISTRATIVE MOVEMENT

3-166.   Administrative movement is normally planned by the S4 as movements in which vehicles and Soldiers are arranged to expedite movement and conserve time and resources. No enemy interference is anticipated when planning administrative movement.

TACTICAL ROAD MARCHES

3-167.   Infantry platoons participate in two types of tactical marches with the company: foot marches and motor marches. Tactical road marches are conducted to rapidly move units within an area of operations to prepare for combat operations. Commanders arrange troops and vehicles to expedite their movement, conserve time, energy, and unit integrity. They anticipate no interference except possible enemy air. For information on dismounted tactical road marches, see FM 21-18, *Foot Marches*.

MOVEMENT BY WATER

3-168.   The platoon avoids crossing water obstacles when possible. Before crossing, however, leaders should identify weak or non-swimmers and pair them with a good swimmer in their squad.

3-169.   When platoons or squads must move into, through, or out of rivers, lakes, streams, or other bodies of water, they treat the water obstacle as a danger area. While on the water, the platoon is exposed and vulnerable. To offset the disadvantages, the platoon—

- Moves during limited visibility.
- Disperses.
- Camouflages thoroughly.
- Moves near the shore to reduce the chances of detection.

3-170.   When moving in more than one boat, the platoon—

- Maintains tactical integrity and self-sufficiency.
- Crossloads key Soldiers and equipment.
- Ensures that the radio is with the leader.

3-171.   If boats are not available, several other techniques can be used such as—

- Swimming.
- Poncho rafts.
- Air mattresses.
- Waterproof bags.
- A 7/16-inch rope used as a semisubmersible, one-rope bridge or safety line.
- Water wings (made from a set of trousers).

MOVEMENT DURING LIMITED VISIBILITY CONDITIONS

3-172.   At night or when visibility is poor, a platoon must be able to function in the same way as during daylight. It must be able to control, navigate, maintain security, move, and stalk at night or during limited visibility.

CONTROL

3-173.   When visibility is poor, the following methods aid in control:

- Use of night vision devices.
- IR chemlights.
- Leaders move closer to the front.
- The platoon reduces speed.
- Each Soldier uses two small strips of luminous tape on the rear of his helmet to allow the Soldier behind him to see.
- Leaders reduce the interval between Soldiers and between units to make sure they can see each other.
- Leaders conduct headcounts at regular intervals and after each halt to ensure personnel accountability.

NAVIGATION

3-174. To assist in navigation during limited visibility, leaders use—

- Terrain association (general direction of travel coupled with recognition of prominent map and ground features).
- Dead reckoning, compass direction and specific distances or legs. (At the end of each leg, leaders should verify their location).
- Movement routes that parallel identifiable terrain features.
- Guides or marked routes. .
- GPS / FBCB2 devices.

SECURITY AT NIGHT

3-175. For stealth and security in night moves, squads and platoons—

- Designate a point man to maintain alertness, the lead team leader to navigate, and a pace man to count the distance traveled. Alternate compass and pace men are designated.
- Ensure good noise and light discipline.
- Use radio-listening silence.
- Camouflage Soldiers and equipment.
- Use terrain to avoid detection by enemy surveillance or night vision devices.
- Make frequent listening halts.
- Mask the sounds of movement with artillery fires.

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Chapter 4

Protection

Protection is the preservation of the Infantry platoon and squad's fighting potential so leaders can apply maximum force at the decisive time and place. Protection is neither timidity nor an attempt to avoid all risk, because risk will always be present. Protection is a warfighting function (WFF) that encompasses the following areas: safety, fratricide avoidance, survivability, air and missile defense, antiterrorism, chemical biological radiological and nuclear (CBRN), defense information operations, and force health protection. This chapter covers the WWF areas of protection that are most relevant to the Infantry platoon and squad: risk management and fratricide avoidance, air defense, and CBRN.

SECTION I — RISK MANAGEMENT AND FRATRICIDE AVOIDANCE

4-1. Risk, or the potential for risk, is always present across full spectrum operations. The primary objective of risk management and fratricide avoidance is not to remove all risk, but to eliminate unnecessary risk. During peacetime leaders conduct tough, realistic training to help units protect their combat power through accident prevention. During combat operations units conduct risk management and fratricide avoidance to enable them to win the battle quickly and decisively with minimal losses. Risk management is an integral part of planning that takes place at all levels of the chain of command during each phase of every operation. This section outlines the process leaders use to identify hazards and implement plans to address each identified hazard. It also includes a detailed discussion of the responsibilities of the platoon's leaders and individual Soldiers in implementing a sound risk management program. For additional information on risk management, refer to FM 5-19, *Composite Risk Management.*.

RISK MANAGEMENT PROCEDURES

4-2. Risk management is the systematic process that identifies the relative risk of mission and training requirements. It weighs risk against training benefits and eliminates unnecessary risk that can lead to accidents. The platoon leader, his NCOs, and all other platoon Soldiers must know how to use risk management, coupled with fratricide reduction measures, to ensure that the mission is executed in the safest possible environment within mission constraints.

STEP 1 – IDENTIFY HAZARDS

4-3. A hazard is a source of danger. It is any existing or potential condition that can cause injury, illness, or death of personnel; damage to or loss of equipment and property; or some other sort of mission degradation. Tactical and training operations pose many types of hazards. The leader must identify the hazards associated with all aspects and phases of the Infantry platoon's mission, paying particular attention to the factors of METT-TC. Risk management must never be an afterthought; leaders must begin the process during their TLPs and continue it throughout the operation. Table 4-1 lists possible sources of battlefield hazards the Infantry platoon and squad might face during a typical tactical operation. The list is organized according to the factors of METT-TC.

Table 4-1. Potential hazards.

Potential Infantry Platoon and Squad Battlefield Hazards
Mission   • Duration of the operation.   • Mission complexity and difficulty/clarity of the plan. (Is the plan well-developed and easily understood?)   • Proximity and number of maneuvering units.
Enemy   • Knowledge of the enemy situation.   • Enemy capabilities.   • Availability of time and resources to conduct reconnaissance.
Terrain and Weather   • Visibility conditions including light, dust, fog, and smoke.   • Precipitation and its effect on mobility. Consider all aspects of the terrain as well as weather and trafficability.   • Extreme heat or cold.   • Additional natural hazards such as broken ground, steep inclines, or water obstacles.
Troops and Equipment   • Experience the units conducting the operation have working together.   • Danger areas associated with the platoon's weapons systems.   • Soldier/leader proficiency.   • Soldier/leader rest situation.   • Degree of acclimatization to environment.   • Impact of new leaders or crewmembers.   • Friendly unit situation.   • NATO or multinational military actions combined with U.S. forces.
Time Available   • Time available for TLP and rehearsals by subordinates.   • Time available for precombat checks and inspections.
Civil Considerations   • Applicable ROE or ROI.   • Potential operations that involve contact with civilians.   • Potential for media contact and inquiries.   • Interaction with host nation or other participating nation support.

STEP 2 – ASSESS HAZARDS TO DETERMINE RISKS

4-4.   Hazard assessment is the process of determining the direct impact of each hazard on a training or operational mission. The following steps should be used when assessing hazards:

- Determine the hazards that can be eliminated or avoided.
- Assess each hazard that cannot be eliminated or avoided to determine the probability that the hazard will occur. A primary consideration is how likely the hazard is to cause injury, illness, loss, or damage.

- Assess the severity of hazards that cannot be eliminated or avoided. Severity is the result or outcome of a hazardous incident that is expressed by the degree of injury or illness (including death), loss of or damage to equipment or property, environmental damage, or other mission-impairing factors such as unfavorable publicity or loss of combat power.
- Accounting for both the probability and severity of a hazard, determine the associated risk level (extremely high, high, moderate, or low). Normally, the highest-level individual risk assessed is also the overall risk. Table 4-2 summarizes the four risk levels.
- Based on the factors of hazard assessment (probability, severity, and risk level, as well as the operational factors unique to the situation), complete the risk management worksheet. Figure 4-1 shows an example of a completed risk management worksheet.

Table 4-2. Risk levels and impact on mission execution.

Risk Level	Mission Effects
Extremely High (E)	Mission failure if hazardous incidents occur in execution.
High (H)	Significantly degraded mission capabilities in terms of required mission standards. Not accomplishing all parts of the mission or not completing the mission to standard (if hazards occur during mission).
Moderate (M)	Expected degraded mission capabilities in terms of required mission standards. Reduced mission capability (if hazards occur during the mission).
Low (L)	Expected losses have little or no impact on mission success.

Figure 4-1. Example of completed risk management worksheet.

STEP 3 – DEVELOP CONTROLS AND MAKE RISK DECISIONS

4-5.   This step consists of two substeps: develop controls and make risk decisions. These substeps are accomplished during the "make a tentative plan" step of the TLP.

Develop Controls

4-6.   After assessing each hazard, develop one or more controls that will either eliminate the hazard or reduce the risk (probability, severity, or both) of potential hazardous incidents. Create as many control options as possible and then select those that best control risks without significantly impeding the training or operational mission objectives. When developing controls, consider the reason for the hazard, not just the hazard itself. For example, driving can be a hazard, but driving in inclement weather or with limited sleep may cause driving to be hazardous.

Make Risk Decisions

4-7.   A key element in the process of making a risk decision is determining whether accepting the risk is justified or unnecessary. Risk decisionmaking should be made at the appropriate level—high enough to tap the experience and responsibility of those making the decision, and low enough to allow for the gaining of experience. As a guide, the leader responsible for executing the training or operational mission is authorized by the command or higher headquarters to make decisions at a specified risk level (extremely high, high, moderate, or low). When a leader is not authorized to make decisions for a risk level, the decision is referred to the next higher level of command. The decision maker must compare and balance the risk against mission expectations. If he determines the risk is unnecessary, he directs the development of additional controls or alternative controls; as another option, he can modify, change, or reject the selected COA for the operation.

STEP 4 – IMPLEMENT CONTROLS

4-8.   Controls are the procedures and considerations the unit uses to eliminate hazards or reduce their risk. The implementation of controls is the most important part of the risk management process; it is the chain of command's contribution to the safety of the unit. Implementing controls includes coordination and communication with appropriate superior, adjacent, and subordinate units and with individuals executing the mission. The implementation of risk controls must be effectively communicated to all personnel, especially those responsible for the actual implementation of the controls. The platoon leader must ensure that specific controls are integrated into OPLANs, OPORDs, SOPs, and rehearsals. The critical check for this step is to ensure that controls are converted into clear, simple execution orders understood by all levels. Examples of risk management controls include:

- Thoroughly briefing all aspects of the mission, including related hazards and controls.
- Conducting thorough precombat checks and inspections.
- Allowing adequate time for rehearsals at all levels.
- Drinking plenty of water, eating well, and getting as much sleep as possible (at least 4 hours in any 24-hour period).
- Using buddy teams.
- Enforcing speed limits, using of seat belts, and driver safety.
- Establishing recognizable visual signals and markers to distinguish maneuvering units.
- Enforcing the use of ground guides in assembly areas and on dangerous terrain.
- Establishing marked and protected sleeping areas in assembly areas.
- Limiting single-vehicle movement.
- Establishing SOPs for the integration of new personnel.

STEP 5 – SUPERVISE AND EVALUATE

4-9. During mission execution, leaders must ensure that risk management controls are properly understood and executed. Leaders must continuously evaluate the unit's effectiveness in managing risks to gain insight into areas that need improvement.

Supervise

4-10. Leadership and unit discipline are the keys to ensuring that effective risk management controls are implemented. All leaders are responsible for supervising mission rehearsals and execution to ensure standards and controls are enforced. Effective supervision assures sustained effectiveness of risk controls. NCOs must enforce established safety policies as well as controls developed for a specific operation or task. Techniques include spot checks, inspections, SITREPs, confirmation briefs, buddy checks, and close supervision.

4-11. During mission execution, leaders must continuously monitor risk management controls to determine whether they are effective and to modify them as necessary. Leaders must also anticipate, identify, and assess new hazards. They ensure that imminent danger issues are addressed on the spot and that ongoing planning and execution reflect changes in hazard conditions.

Evaluate

4-12. Whenever possible, the risk management process should include an AAR to assess unit performance in identifying risks and preventing hazardous situations. During an AAR, leaders should assess whether the implemented controls were effective by specifically providing feedback on the effectiveness of risk controls. Following the AAR, leaders should incorporate lessons learned from the process into the Infantry platoon's SOPs and plans for future missions.

IMPLEMENTATION RESPONSIBILITIES

4-13. Leaders and individuals at all levels are responsible and accountable for managing risk. They must ensure that hazards and associated risks are identified and controlled during planning, preparation, and execution of operations. The platoon leader and his senior NCOs must look at both tactical risks and accident risks. The same risk management process is used to manage both types. In the Infantry platoon, the platoon leader alone determines how and where he is willing to take tactical risks. The platoon leader manages accident risks with the assistance of his PSG, NCOs, and individual Soldiers.

BREAKDOWN OF THE RISK MANAGEMENT PROCESS

4-14. If higher headquarters is not notified of a risk taken or about to be taken, the risk management process may break down. Such a failure can be the result of several reasons, but is usually one or more of the following factors:

- The risk denial syndrome in which leaders do not want to know about the risk.
- A Soldier who believes that the risk decision is part of his job and does not want to bother his leader.
- Outright failure to recognize a hazard or the level of risk involved.
- Overconfidence on the part of an individual or the unit in being able to avoid or recover from a hazardous incident.
- Subordinates who do not fully understand the higher commander's guidance regarding risk decisions.

FRATRICIDE AVOIDANCE

4-15. Fratricide is defined as the employment of friendly weapons with the intent of killing the enemy or destroying his equipment that results in the unforeseen and unintentional death or injury of friendly personnel. Fratricide prevention is the platoon leader's responsibility. Leaders across all WFF assist the

platoon leader in accomplishing this mission. The following paragraphs focus on actions the platoon leader and his subordinate leaders can take with current resources to reduce the risk of fratricide.

4-16. In any tactical situation, it is critical that every Infantry platoon member know where he is and where other friendly elements are operating. With this knowledge, he must anticipate dangerous conditions and take steps to either to avoid or mitigate them. He must also ensure that all squad and team positions are constantly reported to higher headquarters so all other friendly elements are aware of where they are and what they are doing. When the platoon leader perceives a potential fratricide situation, he must personally use the higher net to coordinate directly with the friendly element involved.

EFFECTS

4-17. The effects of fratricide within a unit can be devastating to morale, good order, and discipline. Fratricide causes unacceptable losses and increases the risk of mission failure. It almost always affects the unit's ability to survive and function. Units experiencing fratricide suffer the following consequences:

- Loss of confidence in the unit's leadership.
- Self-doubt among leaders.
- Hesitancy in the employment of supporting combat systems.
- Over-supervision of units.
- Hesitancy in the conduct of limited visibility operations.
- Loss of aggressiveness in maneuver.
- Loss of initiative.
- Disrupted operations.
- General degradation of unit cohesiveness, morale, and combat power.

CAUSES

4-18. The lack of positive target identification and inability to maintain situational awareness during combat operations are major contributing factors to fratricide. The following paragraphs discuss the primary causes of fratricide. Leaders must identify any of the factors that may affect their units and then strive to eliminate or correct them.

Failures in the Direct Fire Control Plan

4-19. Failures in the direct fire control plan occur when units do not develop effective fire control plans, particularly in the offense. Units may fail to designate engagement areas, adhere to the direct fire plan, fail to understand surface danger areas, or position their weapons incorrectly. Under such conditions, fire discipline often breaks down upon contact. An area of particular concern is the additional planning that must go into operations requiring close coordination between mounted elements and dismounted elements.

Land Navigation Failures

4-20. Friendly units may stray out of assigned sectors, report wrong locations, and become disoriented. Much less frequently, they employ fire support weapons in the wrong location. In either type of situation, units that unexpectedly encounter another unit may fire their weapons at the friendly force.

Failures in Combat Identification

4-21. Vehicle commanders and machine gun crews cannot accurately identify the enemy near the maximum range of their weapons systems. During limited visibility, friendly units within that range may mistake each other as the enemy.

Inadequate Control Measures

4-22. Units may fail to disseminate the minimum necessary maneuver control measures and direct fire control measures. They may also fail to tie control measures to recognizable terrain or events.

Failures in Reporting and Communications

4-23. Units at all levels may fail to generate timely, accurate, and complete reports as locations and tactical situations change. This distorts the operating picture at all levels and can lead to erroneous clearance of fires.

Individual and Weapons Errors

4-24. Lapses in individual discipline can result in fratricide. Incidents such as these include negligent weapons discharges and mistakes with explosives and hand grenades.

Battlefield Hazards

4-25. A variety of explosive devices and materiel—unexploded ordnance, booby traps, and unmarked or unrecorded minefields, including scatterable mines—may create danger on the battlefield. Failures to mark, record, remove, or otherwise anticipate these threats lead to casualties.

Reliance on Instruments

4-26. A unit that relies too heavily on systems such as GPS devices, Force XXI Battle Command Brigade and Below System (FBCB2), or Land Warrior will find its capabilities severely degraded if these systems fail. The unit will be unable to maintain complete situational understanding because it will not have a common operations picture. To prevent potential dangers when system failure occurs, the platoon leader must ensure that he and his platoon balance technology with traditional basic Soldier skills in observation, navigation, and other critical activities.

PREVENTION

4-27. These guidelines are not intended to restrict initiative. Leaders must learn to apply them, as appropriate, based on the specific situation and the factors of METT-TC.

PRINCIPLES

4-28. At the heart of fratricide prevention are the following five key principles.

1 - Identify and Assess Potential Fratricide Risks During the TLP

4-29. Incorporate risk reduction control measures in WARNOs, the OPORD, and applicable FRAGOs.

2 - Maintain Situational Understanding

4-30. Focus on areas such as current intelligence, unit locations and dispositions, obstacles, CBRN contamination, SITREPs, and the factors of METT-TC. Leaders must accurately know their own location (and orientation) as well as the location of friendly, enemy, neutrals, and noncombatants.

3 - Ensure Positive Target Identification

4-31. Review vehicle and weapons ID cards. Become familiar with the characteristics of potential friendly and enemy vehicles, including their silhouettes and thermal signatures, combat identification panels, and thermal panels. This knowledge should include the conditions, including distance (range) and weather in which positive identification of various vehicles and weapons is possible. Enforce the use of challenge and password, especially during dismounted operations.

4 - Maintain Effective Fire Control

4-32. Ensure fire commands are accurate, concise, and clearly stated. Make it mandatory for Soldiers to ask for clarification of any portion of the fire command that they do not understand completely. Stress the importance of the chain of command in the fire control process and ensure Soldiers get in the habit of

obtaining target confirmation and permission to fire from their leaders before engaging targets. Know who will be in and around the AO.

5 - Establish a Command Climate That Emphasizes Fratricide Prevention

4-33. Enforce fratricide prevention measures, placing special emphasis on the use of doctrinally-sound techniques and procedures. Ensure constant supervision in the execution of orders and in the performance of all tasks and missions to standard.

GUIDELINES AND CONSIDERATIONS

4-34. Additional guidelines and considerations for fratricide reduction and prevention include the following:

- Recognize the signs of battlefield stress. Maintain unit cohesion by taking quick, effective action to alleviate stress.
- Conduct individual, leader, and collective (unit) training covering fratricide awareness, target identification and recognition, and fire discipline.
- Develop a simple, executable plan.
- Give complete and concise orders. Include all appropriate recognition signals in paragraph 5 of the OPORD.
- To simplify OPORDs, use SOPs that are consistent with doctrine. Periodically review and update SOPs as needed.
- Strive to provide maximum planning time for leaders and subordinates.
- Use common language (vocabulary) and doctrinally-correct standard terminology and control measures.
- Ensure thorough coordination is conducted at all levels.
- Plan for and establish effective communications.
- Plan for collocation of command posts whenever it is appropriate to the mission such as during a passage of lines, or relief in place.
- Make sure ROE and ROI are clear.
- Conduct rehearsals whenever the situation allows adequate time to do so. Always conduct a rehearsal of actions on the objective.
- Be in the right place at the right time. Use position location and navigation devices (GPS or position navigation [POSNAV]), know your location and the locations of adjacent units (left, right, leading, and follow-on), and synchronize tactical movement. If the platoon or any element becomes lost, its leader must know how to contact higher headquarters immediately for instructions and assistance.
- Establish, execute, and enforce strict sleep and rest plans.

SECTION II — AIR AND MISSILE DEFENSE

4-35. Leaders must consider the use of air defense (AD) if evidence exists of enemy forces having the ability to employ fixed- or rotary-winged aircraft, or unmanned aircraft systems (UAS) against friendly forces. Operations in these situations require forces to be thoroughly trained on passive and active AD measures.

4-36. AD assets such as Stingers and Avengers may operate in and around the unit's AO, but the AD is not likely to be task-organized specifically to the Infantry platoon or squad. Therefore, the Infantry platoon and squad must conduct its own AD operations, relying on disciplined passive AD measures and the ability to actively engage aerial platforms with organic weapons systems.

EARLY WARNING PROCEDURES

4-37. Local AD warnings describe with certainty the air threat for a specific part of the battlefield. Air defense artillery (ADA) units use these local warnings to alert units to the state of the air threat in terms of "right here, right now." There are three local AD warning levels:

- **Dynamite.** Enemy aircraft are inbound or are attacking locally now.
- **Lookout.** Enemy aircraft are in the area of interest but are not threatening. They may be inbound, but there is time to react.
- **Snowman.** Enemy aircraft do not pose a threat at this time.

> **NOTE:** The area ADA unit commander routinely issues AD warnings for dissemination throughout the theater of operations. These warnings describe the general state of the probable air threat and apply to the entire area.

PASSIVE AIR DEFENSE

4-38. Passive AD is the Infantry platoon and squad's primary method for avoiding enemy air attack. Passive AD consists of all measures taken to prevent the enemy from detecting or locating the unit, to minimize the target acquisition capability of enemy aircraft, and to limit damage to the unit if it comes under air attack. Target detection and acquisition are difficult for crews of high-performance aircraft, and the unit can exploit this advantage.

Guidelines

4-39. The Infantry platoon and squad should follow these guidelines to avoid detection or limit damage if detected:

- When stopped, occupy positions that offer cover and concealment and dig in and camouflage.
- When moving, use covered and concealed routes.
- Disperse as much as possible to make detection and attack more difficult.
- Eliminate or cover the spoil from dug-in positions.
- Do not fire on a hostile fixed-wing aircraft unless it is clear that the aircraft has identified friendly elements. Premature engagement compromises friendly positions.
- Designate air guards for every position; establish and maintain 360-degree security.
- Establish an air warning system in the unit SOP, including both visual and audible signals.

Procedures

4-40. When the Infantry platoon or squad observes enemy fixed-wing aircraft, helicopters, or unmanned aircraft systems (UAS) that could influence its mission, it initially takes passive AD measures unless the situation requires immediate active measures. Passive AD measures normally mean that friendly unit initiates its react-to-air-attack battle drill; however, the leader can initiate specific passive measures if necessary.

4-41. Passive AD involves these three steps:

- **Step 1.** Alert the friendly unit with a contact report.
- **Step 2.** Deploy or take the appropriate actions. If the Infantry platoon or squad is not in the direct path of an attacking aircraft, leaders have all friendly Soldiers seek cover and concealment and halt with as much dispersion as possible based on the terrain.
- **Step 3.** Prepare to engage the enemy aircraft.

ACTIVE AIR DEFENSE

4-42. Infantry platoons and squads avoid engaging enemy aircraft. If engagement is unavoidable, the friendly unit uses a technique known as volume of fire. This technique is based on the premise that the more bullets a unit can put in the sky, the greater the chance the enemy aircraft will fly into them. Even if these fires do not hit the enemy, a "wall of lead" in the sky can intimidate enemy pilots. This can cause them to break off their attack or distract them from taking proper aim. One of the most important points about volume of fire is that once the lead distance is estimated, Soldiers must aim at the estimated aiming point and fire at that single point until the aircraft has flown past it. Soldiers maintain the aiming point, not the lead distance. Once a Soldier starts firing, he does not adjust his weapon. Leaders establish the aiming point based on the type of aircraft that is attacking (Figure 4-2).
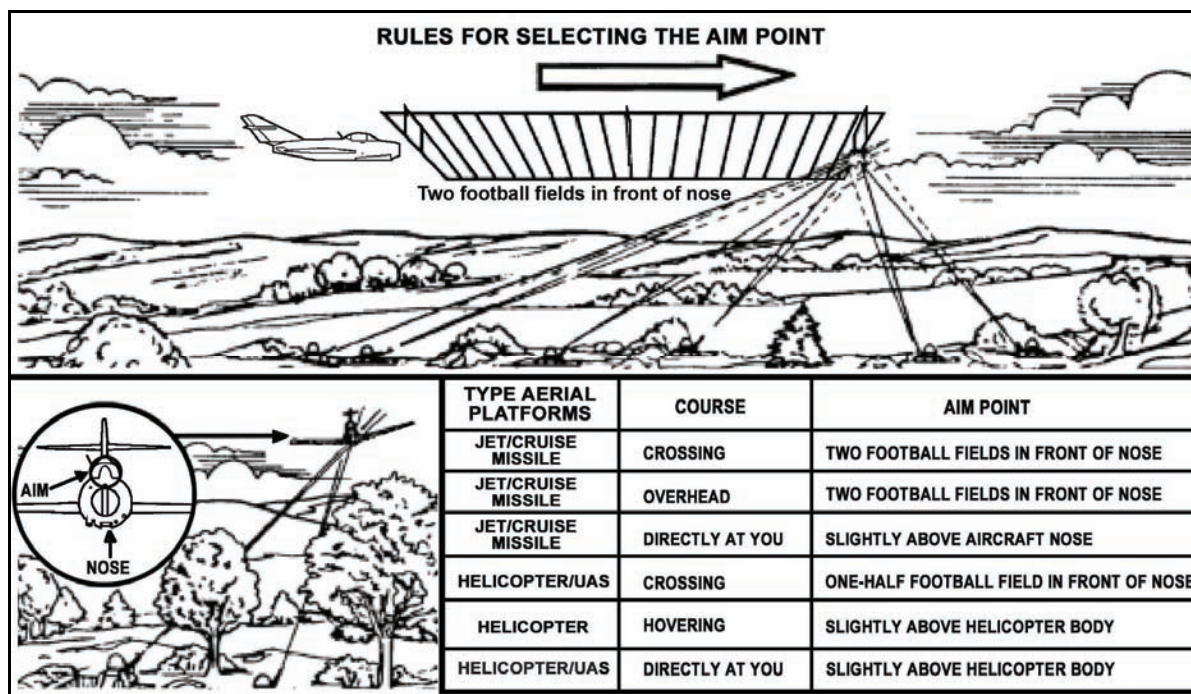

RULES FOR SELECTING THE AIM POINT

Two football fields in front of nose

TYPE AERIAL PLATFORMS	COURSE	AIM POINT
JET/CRUISE MISSILE	CROSSING	TWO FOOTBALL FIELDS IN FRONT OF NOSE
JET/CRUISE MISSILE	OVERHEAD	TWO FOOTBALL FIELDS IN FRONT OF NOSE
JET/CRUISE MISSILE	DIRECTLY AT YOU	SLIGHTLY ABOVE AIRCRAFT NOSE
HELICOPTER/UAS	CROSSING	ONE-HALF FOOTBALL FIELD IN FRONT OF NOSE
HELICOPTER	HOVERING	SLIGHTLY ABOVE HELICOPTER BODY
HELICOPTER/UAS	DIRECTLY AT YOU	SLIGHTLY ABOVE HELICOPTER BODY

Figure 4-2. Volume of fire aim points.

SECTION III — CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR DEFENSE

4-43. Chemical, biological, radiological, and nuclear (CBRN) weapons can cause casualties, destroy or disable equipment, restrict the use of terrain, and disrupt operations. They can be used separately or in combination to supplement conventional weapons. The Infantry platoon must be prepared to operate on a CBRN-contaminated battlefield without degradation of the unit's overall effectiveness.

4-44. CBRN defensive measures provide the capability to defend against enemy attack by chemical, biological, radiological, and chemical weapons and to survive and sustain combat operations in a CBRN environment. Survival and sustainment must use the following principles: avoidance of CBRN hazards, particularly contamination; protection of individuals and units from unavoidable CBRN hazards; and decontamination. An effective CBRN defense counters enemy threats and attacks by minimizing vulnerabilities, protecting friendly forces, and maintaining an operational tempo (OPTEMPO) that complicates targeting.

TENETS OF CBRN DEFENSE

4-45. Protection of the Infantry platoon and squad requires adherence to four rules of CBRN defense: contamination avoidance; reconnaissance; protection; and decontamination.

CONTAMINATION AVOIDANCE

4-46. Avoiding CBRN attacks and hazards is the first rule of CBRN defense. Avoidance allows leaders to shield Soldiers and units, and involves both active and passive measures. Passive measures include training, camouflage, concealment, hardening of positions, and dispersion. Active measures include employing detection equipment, reconnaissance, warnings and reports, markings, and contamination control.

RECONNAISSANCE

4-47. CBRN reconnaissance is detecting, identifying, reporting, and marking CBRN hazards. The process consists of search, survey, surveillance, and sampling operations. Due to the limited availability of the M93 Fox reconnaissance vehicle, commanders should consider as a minimum the following actions when planning and preparing for this type of reconnaissance:

- Use the intelligence preparation of the battlefield (IPB) process to orient on CBRN threat named areas of interest (NAIs).
- Pre-position reconnaissance assets to support requirements.
- Establish command and support relationships.
- Assess the time and distance factors for the conduct of CBRN reconnaissance.
- Report all information rapidly and accurately.
- Plan for resupply activities to sustain CBRN reconnaissance operations.
- Determine possible locations for post-mission decontamination.
- Plan fire support.
- Enact fratricide prevention measures.
- Establish MEDEVAC procedures.
- Identify CBRN warning and reporting procedures and frequencies.

PROTECTION

4-48. CBRN protection is an integral part of operations. Techniques that work for avoidance also work for protection (shielding Soldiers and units and shaping the battlefield). Other protection activities involve sealing or hardening positions, protecting Soldiers, assuming mission-oriented protective posture (MOPP) (Table 4-3), reacting to attack, and using collective protection. Individual protective items include the protective mask, joint service lightweight integrated suit technology (JSLIST) overgarments, multipurpose (rain/snow/chemical and biological) overboots (MULO), and gloves. The corps or higher-level commander establishes the minimum level of protection. Subordinate units may increase this level as necessary, but they may not decrease it.

Table 4-3. MOPP levels.

Equipment	MOPP Ready	MOPP0	MOPP1	MOPP2	MOPP3	MOPP4	Mask Only
Mask	Carried	Carried	Carried	Carried	Worn	Worn	Worn***
JSLIST	Ready*	Available**	Worn	Worn	Worn	Worn	NA
Overboots	Ready*	Available**	Available**	Worn	Worn	Worn	NA
Gloves	Ready*	Available**	Available**	Available**	Available**	Worn	NA
Helmet cover	Ready*	Available**	Available**	Worn	Worn	Worn	NA
*Items available to Soldier within two hours with replacement available within six hours. **Items must be positioned within arm's reach of the Soldier. ***Never "mask only" if a nerve or blister agent has been used in the AO.							

DECONTAMINATION

4-49. The use of CBRN weapons creates unique residual hazards that may force units into protective equipment. When the wearing of protective equipment is necessary, performance of individual and collective tasks can be degraded, and decontamination may be required. Decontamination is the removal or neutralization of CBRN contamination from personnel and equipment. It restores combat power and reduces casualties that may result from exposure, enabling commanders to sustain combat operations. In addition to the effects of CBRN weapons, contamination from collateral damage, natural disasters, and industrial emitters may also require decontamination. Use the four principles of decontamination when planning decontamination operations:

    (1) Decontaminate as soon as possible.

    (2) Decontaminate only what is necessary.

    (3) Decontaminate as far forward as possible (METT-TC dependent).

    (4) Decontaminate by priority.

Levels

4-50. The three levels of decontamination are immediate, operational, and thorough (Table 4-4).

Immediate Decontamination

4-51. Immediate decontamination requires minimal planning. It is a basic Soldier survival skill and is performed IAW STP 21-1-SMCT. The aim of immediate decontamination is to minimize casualties, save lives, and limit the spread of contamination. Personal wipedown with the M291 removes contamination from individual equipment.

Operational Decontamination

4-52. Operational decontamination reduces contact hazards and limits the spread of contamination through MOPP gear exchange and vehicle spraydown. It is done when a thorough decontamination cannot be performed. MOPP gear exchange should be performed within six hours of contamination, if possible.

Thorough Decontamination

4-53. Thorough decontamination involves detailed troop decontamination (DTD) and detailed equipment decontamination (DED). Thorough decontamination is normally conducted by company-size elements as part of restoration or during breaks in combat operations. These operations require support from a chemical decontamination platoon and a water source or supply.

Table 4-4. Decontamination levels and techniques.

Levels	Techniques[1]	Purpose	Best Start Time	Performed By
Immediate	Skin decontamination Personal wipe down Operator wipe down Spot decontamination	Saves lives Stops agent from penetrating Limits agent spread Limits agent spread	Before 1 minute Within 15 minutes Within 15 minutes Within 15 minutes	Individual Individual or buddy Individual or crew Individual or crew
Operational	MOPP gear exchange[2] Vehicle wash down	Provides temporary relief from MOPP4 Limits agent spread	Within 6 hours Within 1 hour (CARC) or within 6 hours (non-CARC)	Unit battalion crew or decontamination platoon
Thorough	DED and DAD DTD	Provides probability of long-term MOPP reduction	When mission allows reconstitution	Decontamination platoon Contaminated unit
[1] Techniques become less effective the longer they are delayed. 2 Performance degradation and risk assessment must be considered when exceeding 6 hours. See FM 3-11.5, *Multiservice Tactics, Techniques, and Procedures Chemical, Biological, Radiological, and Nuclear Contamination*.				

Planning Considerations

4-54. Leaders should include the following when planning for decontamination:

- Plan decontamination sites throughout the width and depth of the sector (identify water sources or supplies throughout the sector as well).
- Tie decontamination sites to the scheme of maneuver and templated CBRN strikes.
- Apply the principles of decontamination.
- Plan for contaminated routes.
- Plan for logistics and resupply of MOPP, mask parts, water, and decontamination supplies.
- Plan for medical concerns to include treatment and evacuation of contaminated casualties.
- Maintain site security.

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