

CHAPTER 3

INTRODUCTION TO DEFENSIVE TACTICS

ESTIMATED
STUDENT
EFFORT:

3 hours

SCOPE:

An introduction to the fundamentals of defensive operations at the battalion and regimental levels.

LEARNING
OBJECTIVES:

Upon completion of this chapter, you will be able to:

1. Explain the definition of defense and the seven reasons why a combat unit assumes a defensive position.
2. Identify distinctions between an area defense and a mobile defense.
3. Identify the three defense echelons of an area defense.
4. Identify the concept and the fundamentals of defense.
5. Identify the nature and purpose of a counterattack.
6. Identify the planning factors used to develop defensive scheme of maneuver.
7. Identify types of defensive fires.
8. Describe two variations of the area defense.
9. Identify the categories and phases of defensive fires.
10. Describe how forces are organized for defense.

ASSIGNMENT

STUDY:

Chapter 3

COMPLETE:

Exercises 1 and 2



CHAPTER 3

INTRODUCTION TO DEFENSIVE TACTICS

"In war, the defensive exists mainly that the offensive may act more freely."

Mahan: Naval Strategy, 1911.

Section I. INTRODUCTION

3101. GENERAL

a. The defense is the employment of all means and methods available to prevent, resist, or destroy an enemy attack. Why do we defend? We know that the offense is the decisive form of combat and that we cannot always be in the attack. When we are not attacking, then it naturally follows that we have to be in some type of defensive posture.

b. The mission is the paramount factor that dictates the type of defense to be used and the position or area to be defended. However, considerations such as the composition of opposing forces, the terrain, and security may favor a different type or location of defense.

c. The Marine infantry battalion in the amphibious assault and sustained operations ashore will be required to assume a defensive posture either on order of higher authority or when forced by the enemy to defend. The assumption of a defensive posture may be for one or more of the following purposes:

(1) To gain time pending the development of more favorable conditions for undertaking the offense.

(2) To deny entrance of the enemy into an area.

(3) To economize forces in one area in order to concentrate superior forces for decisive offensive action elsewhere.

(4) To reduce enemy capability with minimum losses to friendly forces.

(5) To trap and destroy hostile forces.

(6) To permit the employment of nuclear weapons.

(7) To ensure the integrity of an objective.

3102. CONCEPT OF DEFENSE

In the defense, the defender takes every opportunity to seize the initiative and destroy the enemy by:

a. Selecting the battle area.

b. Forcing the enemy to fight where and when he is least prepared to do so.

c. Exploiting an enemy weakness.

d. Destroying the enemy through offensive action.

3103. DEFENSIVE ECHELONS

a. General. Defensive echelons include the security area, the forward defense area, and the reserve area. The battalion battle area is that defensive area organized by a single forward committed battalion and extends from the FEBA rearward to the battalion rear boundary or to the limit of the rearward extension of the lateral battalion boundary. Throughout this section, when reference is made to the battle area, it means battalion battle area, unless otherwise indicated. (See figure 18.)

b. Battalion Security Area. The battalion security area extends from the FEBA to whatever distance to the front security elements available to the battalion are employed. Forces in the security area furnish timely information of the enemy; deny him close ground observation of the battle area; and deceive, delay, and disorganize the enemy as much as possible. Security forces in this area may include aerial surveillance, the regimental combat outpost, patrols, and local security elements.

c. Battalion Forward Defense Area

(1) The battalion forward defense area extends rearward from the FEBA to include that area organized by the forward committed companies.

(2) Forces in the forward defense area in the mobile defense warn of impending attack, delay and disorganize the enemy, and canalize the attacking enemy into an area suitable for counterattack by the reserve.

(3) Forward defense forces in the area defense engage the enemy in decisive combat in order to retain specific terrain.

d. Battalion Reserve Area

(1) The battalion reserve area extends from the rear of the forward committed companies (from the limit of the rearward extension of the lateral company boundaries) to the battalion rear boundary.

(2) Forces in the battalion reserve area eliminate penetrations and block of reinforce threatened areas. They destroy or eject the enemy by counterattack to regain control of the battalion forward defense area.

3104. TYPES OF DEFENSE

The basic types of defense are area and mobile. These two forms of defense lie at opposite ends of the scale in conducting defensive operations. Often the most suitable form of defense in a given situation will be a variation of either the area or mobile defense, incorporating elements of both.

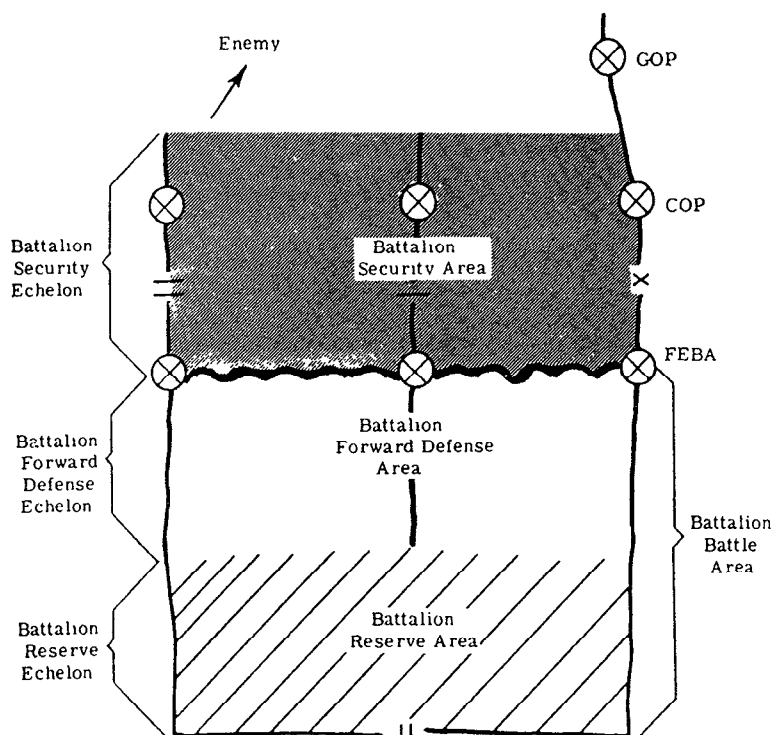


Figure 18. Battalion Defensive Echelons (Schematic-- Not to Scale).

a. The area defense is oriented toward the retention of specific terrain. In this type of defense, forward positions are strongly held and emphasis is placed upon stopping the enemy forward of the battle area. The bulk of combat power is committed in the forward defense area. If the enemy penetrates the area, he is destroyed or ejected by counterattack with the principal objective of regaining control of the forward defense area.

b. The mobile defense is normally conducted by division and higher echelons. It is based upon skillful use of maneuver and fires to destroy the enemy. Minimum combat power is employed in the forward defense area to warn of impending attack, delay and disorganize the enemy, and canalize the attacking forces into areas suitable for counterattack by the reserve (striking force). The bulk of combat power is retained in a strong mobile reserve positioned for offensive action, with the principal objective of destroying the enemy. (See figure 19.)

c. The battalion does not have the capability of conducting a mobile defense; however, it may participate as part of a larger force conducting such a defense. In such an operation, the battalion may be employed as part or all of the security forces, as part of the forward defense forces, or as a part of the reserve. When a battalion is employed on the FEBA, it may accomplish its mission by conducting a delaying action, an area defense, or some variation thereof. The exact method to be employed is established by the higher commander who informs the battalion of the mission he desires accomplished and the concept for the conduct of the mobile defense.

3105. FUNDAMENTALS OF DEFENSE

The battalion commander plans, organizes, and conducts defensive operations by applying the following fundamentals whenever possible.

a. Proper Utilization of Terrain. A battalion in defense takes maximum advantage of military aspects of the terrain so that the enemy is forced to attack organized positions or make a time-consuming maneuver to avoid them. In organizing the defense area, the battalion commander gives primary consideration to those terrain features which must be held or controlled to accomplish his mission. (Review Appendix A at the end of the text material, if necessary.)

(1) Key Terrain. Dominating terrain features are important, but the battalion commander should not be rigidly bound always to seize or hold high ground. He may position his companies on terrain adjacent to, forward of, or in the rear of dominant features, taking advantage of cover and concealment. When nuclear fires are available, he may be able to relinquish it temporarily without seriously jeopardizing the accomplishment of the mission.

(2) Cover and Concealment. Concealment is especially important in modern warfare since it makes target acquisition more difficult for the enemy. The battalion supplements natural cover with field fortifications to develop the strongest possible defensive position.

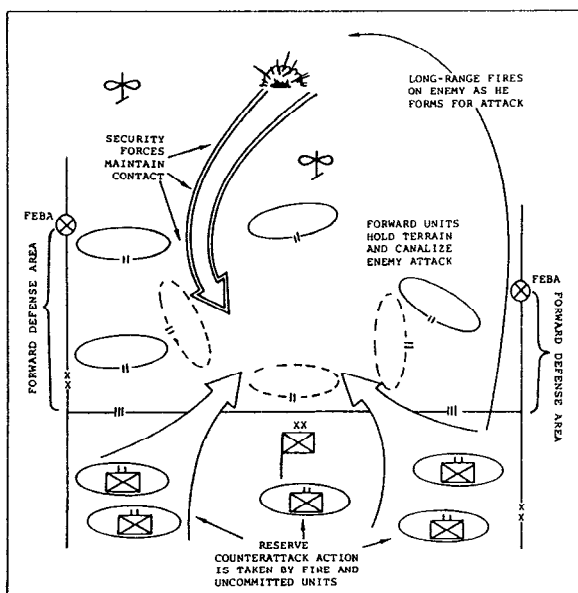


Figure 19. Division in the Mobile Defense.

(3) **Obstacles.** Natural and manmade obstacles are used in organizing the battalion defense so the battalion may cover all avenues of approach economically and effectively. Obstacles assist in canalizing enemy troop movements. To be effective, they must be covered by both direct and indirect fire. If the enemy seeks to bypass them or if he concentrates forces to overcome them, he may increase his own vulnerability.

(4) **Observation and Fields of Fire.** Good observation is essential to accurate delivery of defensive fires and to prevent surprise. It is correspondingly important to deny good observation to the enemy to reduce the effectiveness of his fires. Clear fields of fire are sought particularly in gaps between platoon and company positions. Observations posts are positioned on dominating terrain to provide continuous observation over the battalion area. Helicopters should be used for observation and for positioning and shifting ground observation posts wherever it is practical to do so. Battlefield surveillance radars are emplaced to maintain surveillance over the area under conditions of reduced visibility.

(5) Avenues of Approach

(a) The battalion commander gives attention to approaches suitable for foot or mechanized movement which lead into the battalion defensive position.

(b) Measures are also taken to guard against helicopterborne or parachute landings in the area. The battalion commander examines the terrain to his front, flanks, and within his position to determine likely approach routes for helicopters, as well as for possible landing zones. Observers are located to give warning of the approach of hostile helicopters and automatic weapons are located where they may take enemy helicopters under fire. When potential enemy landing zones are located within a battalion defense area or in an area which may be observed, plans are made to keep these areas under surveillance and to deliver all available fires on enemy landings.

(c) Avenues of approach within and behind the battalion are reconnoitered to determine the best routes for movement of reserves to blocking positions or to positions from which counterattacks may be launched.

b. **Security.** Provisions are made to counter an attacker's inherent advantages of initiative and ability to concentrate his forces, and to force him to attack under unfavorable circumstances. Depending on the mission assigned, security forces seek to deceive the enemy as to the area in which the decision will be sought; to detect the time, direction, and size of the enemy's attack; to disorganize the enemy and canalize him; to force him to present a lucrative target; or to destroy him.

(1) Mobility possessed by enemy forces places emphasis on all-round security. The battalion should be oriented to defend against attacks from any direction. Security of rear area and administrative and logistic installations assumes an increasing importance. Marine aviation and force and division reconnaissance units are employed in security missions. In addition to security forces of higher echelons, the battalion employs outposts, patrols, listening posts, observation posts, surveillance radars, infrared detection equipment, and warning devices which may be improvised.

(2) Depending upon the plan of defense, security forces of higher units may not attempt to force the enemy into early deployment. It may be desirable to permit him to advance close to the defensive area or into areas where defensive fires are most effective.

(3) When nuclear weapons are authorized, security forces have the capability of destroying an enemy attack before it reaches the principal area of defense.

c. Mutual Support. Units and weapons are located and employed so that they can assist one another. This applies to units on the flanks as well as units to the front and rear. It is desirable for a unit to be able to place flanking fires across a part of the front of units on its right and left. Units in depth support units to the front, flanks, and rear. Arrangements are made for mutual support between platoons, between companies, and between battalions. On occasion, when defensive elements are widely dispersed, mutual support by interlocking fires is not always possible. Mutual support then is achieved by positioning or moving units. When the enemy nuclear threat is significant, the defender achieves a compromise between passive security afforded by separation of his units and the loss of solidity of his defensive position. Maximum use is made of helicopters in moving reserve elements and fire support means to assist other friendly units under attack.

d. Defense in Depth. Defensive positions are organized in depth in order to absorb the strength of the enemy attack, to prevent maneuver on rear areas, and to slow or stop him. Defense in depth is also organized to facilitate a counterattack by the defender. Maximum depth of defense is a requirement when the enemy has the capability of rupturing a defensive position with nuclear weapons and the ability to exploit his attack. Positions are prepared to protect key terrain, to reduce overall nuclear vulnerability, and to assist maneuver of the reserve or striking force.

e. All-Round Defense. Battalion defensive positions are organized so they are capable of defending against attacks from any direction. Usually this will entail orientation of the battalion's strength to defend against attacks primarily from one direction, in which case it is necessary to have battalion reserves prepared to occupy previously prepared positions to protect the flanks and rear of the battalion. There will also be situations which require the battalion to give equal attention to the hazards of attack from all directions, causing the establishment of a complete perimeter defense.

f. Coordinated Fire Planning

(1) Coordination of fires of all organic weapons, tanks, artillery, naval gunfire, and close air support is essential to a successful defense. Fire support plans are developed concurrently in response to instructions of the battalion commander. The S-3 maintains close supervision over these plans to ensure complete coordination. Defensive fires are planned to bring the enemy under fire as soon as he comes within observation, to subject him to increasingly heavier fire as he approaches the battalion position, to blunt the nose of the penetration, to seal off the attacker, to break up his assault by placing fires immediately in front of the position, and to destroy him within the position by a combination of fires and counterattack. Fire support plans include Dragons and rocket launchers, antitank units supporting the battalion, and fires of all weapons which may delay or destroy armored vehicles.

(2) When used, nuclear fires dominate the defensive fire support plan. Nuclear fires are planned on all probable areas in which enemy forces are expected. Nonnuclear fires are planned to assist in the defense of unit positions, to cause the enemy to concentrate, and to augment the effects of nuclear fires. Troop safety is a critical consideration in planning nuclear fires.

g. Coordinated Barrier Planning

(1) A barrier system utilizes a series of natural and artificial obstacles which will canalize, direct, restrict, delay, or stop the movement of enemy forces. For a barrier system to achieve maximum effectiveness, it is necessary that planning be coordinated at all echelons of command.

(a) Natural obstacles include steep slopes, rivers, gullies, swamps, heavy woods, thick jungle, deep snow, and manmade objects such as buildings, bridges, fences, and similar construction.

(b) Artificial obstacles include demolished bridges; road craters; abatis; flooded areas; minefields; contaminated areas; wire entanglements; roadblocks; antitank ditches; and log, steel, and concrete structures.

(2) Barriers are used in defensive operations to:

(a) Delay initial enemy advance toward the front or flanks.

(b) Delay movements of penetrating or enveloping forces.

(c) Canalize enemy penetrations into areas where they can be brought under fire and destroyed.

(3) The battalion barrier plan is usually based on the barrier plans of higher echelons. It also contains detailed instructions to the companies concerning their responsibility for construction of barriers, and the location and purpose of each barrier.

(4) The employment of barriers is a vital element of defense and is integrated in the battalion plan of defense. Care is taken to ensure that there are sufficient gaps and lanes in the barrier system to permit movement of friendly forces for patrolling and counterattacking. Obstacles are most effective when covered by fire; therefore, the barrier plan and the fire support plan are carefully coordinated.

(5) An effectively coordinated barrier system is of particular importance when defending on extended frontages and when large intervals exist between defending units.

(6) The demands on manpower, material, equipment, and time impose a limitation on the extent of barrier construction.

(7) Nuclear weapons may be used to create obstacles and to deny areas to the enemy. Care must be taken that craters, fallout, or induced radiation do not interfere with the overall plan of defense.

(8) Maximum use of both direct and indirect fires must be considered when employing barriers.

h. Flexibility. A battalion commander achieves flexibility in defense through centralized control of supporting fires and by withholding an adequate reserve for employment in blocking positions or counterattacking enemy penetrations. Flexibility is enhanced when helicopters are available to move the battalion reserve to counter hostile attacks. They permit the rapid movement of the reserve over difficult terrain to positions from which it may counterattack enemy forces. The use of trucks or assault amphibious vehicles also provides the battalion commander additional flexibility. The varying capabilities of each type of transportation are considered in planning a defense. Counterattack is the decisive element in the defense and is the means by which the defender gains the initiative. Effective communications are essential. A high state of training and discipline contribute to the flexibility of the unit. Speed of reaction is essential. Officers and noncommissioned officers should be able to adjust to the unexpected with a minimum delay. Decisive and aggressive leadership at all levels increases the overall flexibility of the battalion.

i. Maximum Use of Offensive Action. Commanders at each echelon in the battalion, and the troops themselves, are trained to shift rapidly from the defense to offensive action. In fluid situations with wide frontages and great depths, there are many opportunities to regain the initiative by offensive action. Enemy forces are destroyed by fire, and close combat and constant pressure is maintained.

j. Maximum Separation Consistent with Unit Mission. The battalion commander weighs the estimated enemy nuclear threat against the danger of defeat in detail. He disposes his units to provide reasonable, passive protection against nuclear attacks when the estimated nuclear threat is great. On the other hand, he cannot disperse his force so extensively that he no longer can accomplish his mission. It is desirable for the battalion to organize its defense as an integrated unit, and employment of its components is determined by the battalion mission, estimated extent of the enemy threat, terrain, and the situation confronting the battalion commander.

k. Time. Time available for planning and preparation is considered in selecting a form of defense and success is directly proportionate to the degree and amount of planning and preparation completed.

3106 ORGANIZATION FOR COMBAT

a. Organization for combat is the combining of the various means available under a command and control structure to provide the control, coordination, and support necessary to maneuver the combat forces available to gain an advantage over the enemy.

b. Organization for combat follows a logical thought process as do other actions in defense. The available forces are applied against the requirements for the forward defense echelon, reserve echelon, and security echelon.

c. While the commander is analyzing his defense sector, he will visualize the forces required to hold his sector of defense. In determining the forces required, the commander visualizes the deployment of troops two echelons below his. For example, a battalion commander would think in terms of the number of platoons to hold his sector of defense.

d. In the defense, a logical sequence is to allocate forces to the forward defense echelon, reserve echelon, and the security echelon, in that order. The commander may not have sufficient combat forces to satisfy the requirements for each echelon. When this happens, the commander must adjust the allocation of forces to each echelon to produce the best possible organization for combat to accomplish the mission.

e. In organizing for combat, the commander must give consideration to the mission, flexibility in organization, contingencies, and adequate security.

f. Within the infantry battalion itself, the commander has his three rifle companies as the maneuver elements plus organic supporting arms in the form of 81mm mortars and thirty-two Dragon antitank assault weapons. Additionally, he may have weapons attached or in support. The mortar platoon is organized and equipped to operate from a single position but has the capability of firing from four separate section positions. Likewise, the Dragon platoon can be controlled as platoon by the battalion headquarters or the four sections may be employed separately.

3107. PLANNING THE DEFENSE

a. General. Upon receipt of a defensive mission or on a decision to defend, the battalion commander and staff follow the sequence of actions outlined in course 7504, Staff Functioning. As part of the normal planning process, they formulate a plan of defense. This plan consists of a scheme of maneuver for the defense and a plan of fire support. The scheme of maneuver for the defense includes the organization for combat and organization of the ground in the defense area. Elements of the scheme are developed concurrently and are closely integrated. The plan of defense also covers essential details of counterattack planning, security, CSS, and the establishment of the communication system necessary for control.

b. Analysis of Defensive Mission

(1) The first step in developing a plan of defense is a precise analysis of the battalion mission and a consideration of available information of the enemy, weather, terrain, and friendly forces. The commander must study the orders he has received to ensure that he understands all tasks, stated and implied, which the battalion must accomplish. Normally, these tasks are stated in terms of a specific sector which must be defended.

(2) The regimental commander usually designates the general trace of the FEBA and the initial location of the combat outpost, when used. He designates the responsibility of the battalion along the FEBA (and, if appropriate, along the combat outpost (COP) line), by specifying the location of the battalion boundaries and coordinating points. In the mobile defense, the regimental commander may also specify that the battalion will organize a strongpoint within the area of responsibility.

c. Analysis of Sector of Defense

(1) The battalion commander, assisted by his staff and subordinate commanders, performs detailed reconnaissance of the area by ground (foot or vehicle) or air. Based upon this reconnaissance and other information obtained, he and the staff determine which terrain features must be controlled to accomplish the mission. If the seizure or control of a particular feature would afford a marked advantage to either opposing force, it is a key terrain feature and must be controlled by the defender.

(2) The defender is not rigidly bound to occupy each key terrain feature; he may control access to them or, in conjunction with fires, defend them with comparatively small forces. It may be necessary to defend certain key terrain features in greater strength, or the commander may elect or be ordered to relinquish key terrain temporarily as a part of the scheme of maneuver.

(3) After a determination of key terrain, the commander must analyze the avenues of approach into his sector from all possible directions. He also considers routes of maneuver to be used by elements of his force in the counterattack. The commander considers factors affecting observation, fields of fire, concealment, cover, and obstacles in the sector. He also considers possible improvement of the obstacles and the use of barriers to enhance his defense. From this analysis of his defensive sector, he determines how he can make the best use of the terrain within available resources.

(4) Through this process of reconnaissance, estimate, analysis, and evaluation, the staff and commander work together to identify and determine areas of decision to be announced, implemented, and supervised through orders and

actions by the staff and subordinate commanders. Such decisions include the traces of the FEBA and COP, location of company boundaries and coordinating points, key terrain to be defended, routes to be covered, positions of principal weapons, obstacles, central and support installations, organization for combat, prearranged fire plans and counterattack plans, security measures, logistic support schedules, and any delegation of authority and responsibility for the conduct of defense.

d. Determination of Forces to be Employed on the FEBA

(1) Once the commander analyzes the terrain, he then considers the distribution of maneuver forces over major avenues of approach in his assigned sector of defense. One method is to visualize the number of units two levels below his own that will be required on the FEBA to properly conduct the defensive or delay operation as stated in the commander's mission. In the case of the battalion, the commander will visualize the number of platoon-size units required. From this, he can determine the number of companies needed on the FEBA and can assign tentative lateral boundaries for each unit.

(2) The mission, enemy capabilities, terrain, and available forces will also aid in determining:

- (a) Frontages assigned to companies deployed on the FEBA.
- (b) Distribution of available combat power (priority of support).
- (c) Location and size of reserve forces.
- (d) Location, priority of preparation of, and occupation of, blocking positions.

e. Frontage and Depth. In determining the width and depth to assign to a company in defense, the battalion commander considers the ability of the company to defend along the FEBA with the forces available while retaining an adequate company reserve. This determination involves a consideration of the enemy's strength and capabilities relative to those of his own forces and the terrain available for defense.

(1) Frontages assigned forward companies of the battalion should not exceed the capabilities of those companies to achieve mutual support between their forward platoons. A platoon under ideal conditions can occupy 450 meters and cover 750 meters of frontage; thereby achieving mutual support with adjacent platoons across unoccupied areas between them by interlocking the fire of weapons available for employment by the platoon. A company employing two platoons along the FEBA can be expected to defend a frontage of up to 1,500 meters. Conditions that limit fields of fire will reduce the frontage a company can effectively defend. The attachment of additional forces to the company will require an increase in the frontage assigned to that company. (See figure 20.)

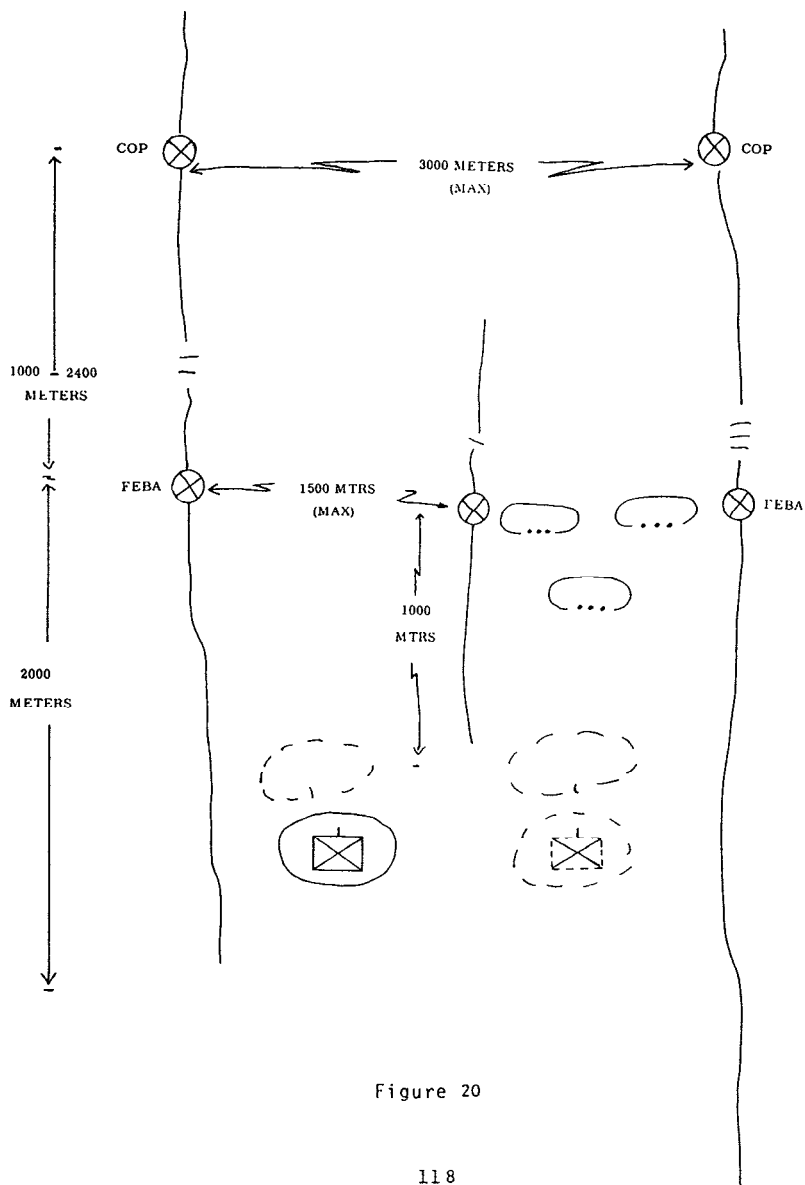


Figure 20

(2) It is desirable to assign narrower frontages to companies defending astride good avenues of enemy approach. The battalion should avoid dividing the responsibility for avenues of enemy approach between two companies and should, if possible, assign responsibility for the defense of each key terrain feature located along the FEBA to a specific company.

(3) Gaps will not be accepted between companies where frontage assigned to a battalion is in excess of 3,000 meters. The battalion will occupy up to 3,000 meters laterally and the remaining frontage will be covered by patrols, out guards, obstacles/barriers, observation, and fires.

(4) The depth assigned to a forward company should provide sufficient terrain in which to dispose the reserve platoon in primary and alternate positions normally 1,100 meters of depth for companies deployed on the FEBA and 900 meters for the reserve company. From these positions, the reserve platoon can achieve mutual support with, and block penetration of, the forward platoons. Terrain suitable for supplementing positions from which the reserve platoon can defend the flanks of the company battle area should also be considered. The depth assigned should also be sufficient to provide suitable terrain within the company battle area for locating the company mortar section and the command post.

(5) In determining the depth to assign the forward companies, the battalion commander also considers where the blocking positions of the battalion reserve must be located to achieve defense in depth within the battalion battle area. The depth assigned forward companies should not include these blocking positions required for the use by the battalion reserve.

f. Dispersion and Mutual Support

(1) The commander is constantly faced with the problem of weighing his vulnerability resulting from concentration against loss of effectiveness and mutual support from dispersion. The defender's nuclear weapons may assist materially in providing a solution to the problem of controlling large areas since they can destroy enemy forces of significant size that may attempt to move through lightly-held areas. Chemical weapons may also be employed in such areas. Dispersion is among or between, rather than within, battalions; and units must be able to operate with substantial gaps among and between them on a battlefield of considerable width and depth. Thus, dispersion presents problems of surveillance, massing nonnuclear fires, and mutual support and reinforcement.

(2) It is desirable for units and weapons to be located and employed so that they can assist one another with direct fire of automatic weapons. As a minimum, mutual support is obtained between platoons by machineguns and other small arms, between companies by the fires of mortars, and between strongpoints by antitank weapons.

(3) Care is exercised to ensure a proper balance between concentration of troops and dispersion of units. Dispersed personnel and equipment at every echelon must be capable of fighting as unit teams to accomplish the mission. The depth of the area assigned to the forward companies is related to the overall depth of the battalion area. The companies are given adequate space to position their weapons, control facilities and logistic elements, and to establish alternate and supplementary positions.

g. Battalion Reserve. The battalion commander initially determines the forces required to defend the FEBA-concurrently, he determines the minimum forces necessary to provide for a reserve force. The reserve force is not residue after the assignment of forces to the FEBA but a deliberately structured force that will have specific missions assigned to which may be included the following:

- (1) Providing the battalion portion of the regimental combat outpost.
- (2) Preparing and occupying blocking positions.
- (3) Conducting counterattacks.
- (4) Assisting forward companies when practicable, through use of organic fire support.
- (5) Providing flank and rear area security.
- (6) Preparing to assume mission of forward company on order.

h. Security Measures. Security measures are taken at all levels of command. The covering force and the general outpost (GOP) are the security echelons of the Corps and division commanders, respectively. These security elements are employed as required with the mission to provide early warning of an approaching enemy, to direct long-range fires against enemy formation, to disrupt and delay the enemy movement, to inflict casualties, and to deceive the enemy as to true location of the main defensive effort. When employed, these security echelons are placed well forward of the regiment's security echelon, the combat outpost (COP).

(1) The COP is a security element of the regiment. The primary mission of the COP is to provide the regiment and battalions timely warning of the enemy's approach and to deny him close ground observation unopposed. The COP is usually manned and controlled by forward battalions, but it may be provided by a single battalion not deployed on the FEBA. The COP will be covered in greater detail in course 7512, Infantry Operations.

(2) During the course of planning for defense of the assigned area, positions which contribute to rear area security are developed. A separate plan for rear area security is not prepared at battalion level. Rear area security measures and missions are included in the operation order. In addition, rear area security measures are integrated into the barrier plan, surveillance plan, fire support plan, and patrol plan. The primary positioning of units and the selection of supplementary positions, as well as the local security measures taken by all subordinate elements, contribute directly to rear area security. A separate rear area security force is not established. Units of the reserve are given a contingency mission of providing rear area security forces as required. When a situation develops which requires the employment of a force against a hostile threat located in the battalion's rear area, the selection of the unit and size of the force to be employed depend on overall friendly capabilities and enemy threats at the time. The demands for attention to primary missions in the defense dictate that no unit commander be designated as battalion rear area security commander. In the event that more than one unit is employed against a hostile force in the battalion rear area, the battalion commander will designate the commander of the force.

(3) Other Security Measures

(a) Units establish local security to prevent surprise and infiltration of their defensive positions. Security provided by forward companies consists of observation posts, listening posts, outguards, and patrols. The forward companies patrol the area between the COP and the FEBA to maintain contact with the COP and to add to the security of the battle area.

(b) The battalion commander is responsible for flank security and establishes it when required. Subordinate units also institute security measures to provide for the security of the flanks of their positions. Defensive measures against airborne attacks, guerrilla action, infiltration, and NBC attack are established. Patrols seek out the enemy and gain information of his activities. Other means that can be used to contribute to security, such as electronic surveillance devices, infrared equipment, illuminants, barbed wire, antipersonnel mines, and alarm devices, are employed forward of and within the battle area. Aviation and reconnaissance units are habitually used also.

(c) Passive security measures are highly important. Emphasis is placed on camouflage and concealment. Positions are entrenched as time permits, and underground shelters are provided whenever possible. Emplacements are provided with overhead protection against the effects of enemy fires.

(4) Barrier Planning. The battalion commander plans for use of obstacles forward of and within his defensive sector which are incorporated in the regiment and/or division barrier system. Care must be exercised in locating the barrier system to avoid interfering with the capability of shifting units rapidly to meet any threat. Barriers are constructed with due regard to the location of defensive positions and the effect on the mobility of friendly forces, particularly in the counterattack. Toxic chemical land mines, when authorized, can be mixed into or used to supplement the barrier system to strengthen obstacles and assist in restricting use of areas by the enemy. Exploding flame devices, flame expedients, and illuminants can be prepared, controlled, and fired by forward elements to create obstacles. Natural obstacles are used to the maximum, since the demands on manpower, material, equipment, and time impose a limitation on the extent of construction of artificial obstacles in a barrier system.

(5) Defense Against Armor

(a) Closely allied to barrier planning and the defensive fire plan is the defense against armor. Natural obstacles and antitank minefields may facilitate the destruction of armor by canalizing it into the fields of fire of antitank weapons and massed artillery. The antitank defense is echeloned laterally and in depth throughout the defensive sector to include use of individual weapons, mines, antitank guns and missiles, tanks, artillery, smoke, and nuclear weapons. Primary attention is given to those avenues of armor approach which present a significant threat to the battalion; however, no area is overlooked in antitank defense planning, since armored forces may be employed successfully over seemingly unfavorable terrain.

(b) Antitank defenses are planned to engage enemy armor as soon as it comes within effective range. They are planned to separate enemy armor from its accompanying infantry and to destroy it forward of the battle area. If enemy armor reaches or enters the battle area, individual strongpoints remain in place and continue to deliver antitank fires. This will canalize armor into terrain where its destruction will be facilitated by offensive action of armored reserves and by antitank weapons positioned in depth. When nuclear weapons are employed, the antitank defense is designed to force enemy armor to mass in order to present a remunerative nuclear target. Antitank fires are integrated with other types of fires and with the barrier system. Rifle company antitank weapons are under the direct control of the company commander who coordinates their employment with battalion antitank weapons.

i. Defense Against Airborne Attack, Helicopterborne Attack, Guerrilla Action, and Infiltration. Positive measures must be planned against enemy airborne, helicopterborne, guerrilla, and infiltrating forces. Defense against airborne and helicopterborne attacks includes all air defense measures by maximum use of forward area weapons having a warning system, troops available to defend objectives, and mobile reserves. A warning system is established throughout the battalion area using security and observation elements already

emplaced. Detailed reconnaissance is conducted to locate probable drop zones and landing areas. Where necessary, patrols, warning devices, roadblocks, and observation posts with night vision devices and radar equipment may be established to cover the area. Measures are taken to provide security for administrative and CSS elements in the area. An illumination plan is prepared. When information indicates that an enemy force has entered the area behind the FEBA, all or a portion of the reserve is given the mission of destroying it. Planned fires support the reserve. Other units within the area remain in position and support the reserve by fire. When the battalion is in regimental or division reserve, it is prepared to perform similar missions for the regiment or division.

j. Defense Against Air Attack. Air defense units may operate in the battalion area under control of a higher headquarters. In this event, the battalion commander coordinates with the commander of these units. The fires of organic individual and crew-served weapons of the battalion may be effectively employed in coordination with air defense weapons to limit or defeat enemy air activity in the area. The battalion's organic weapons can be particularly effective against areas and conditions under which battalion weapons are employed, but must be defined by the battalion commander. Air defense measures taken by the battalion may include passive protection measures, establishment of a warning system, and prescribing clear rules of engagement prior to firing on all attacking aircraft. Locations of forward area air defense weapons are prescribed by battalion and company commanders. Sectors of responsibility, principal directions of fires, and conditions of readiness are specified. Air defense measures taken by the battalion may be prescribed by regimental or higher headquarters.

k. Defense During Reduced Visibility. The enemy may attack using smoke or during periods of reduced visibility. In order to defend against such attacks, increased security measures are adopted and emergency fires are prepared. Security measures include dispatching additional patrols, increasing local security, using organic and attached surveillance devices, using warning devices, and providing for illuminating the area where the enemy may operate. Training in night combat is also essential.

l. Deception. In developing his plan of defense, the battalion commander considers the use of deception measures which may cause an attacker to dissipate or misdirect his effort. The security force employs deception to cause the enemy to deploy his forces prematurely and attack lightly defended objectives. Dummy positions and equipment and simulated activities may accomplish economy of force and cause the enemy to execute unnecessary offensive actions, rendering his force vulnerable to counteraction.

m. Fire Support Plan

(1) Preparation. The defender's knowledge of the terrain and thorough preparation of his fire plan are among his key advantages which must offset the initiative held by the attacker. The battalion commander strives to maximize the effects of his fire to ensure destruction of the enemy. Accordingly, he fully integrates his fire support and battalion-controlled direct fires with the fire plans of his subordinate maneuver elements, adjusting his initial fire support plan or directing changes in fire plans of his maneuver elements as necessary to achieve the highest possible degree of coordination.

(2) Company Fire Plans. Unit fire plans are prepared by each company to include the fires of all of its crew-served weapons and all supporting fires required. These unit fire plans become a part of the battalion fire plan and are reviewed by battalion to ensure that fires are coordinated at unit boundaries. Supporting fires when requested by subordinate units and approved are incorporated into the battalion fire support plan.

(3) Coordinated Fire Plan

(a) The success of a defense is determined in a large measure by the coordination of the fires of the defending force. Every unit is responsible for planning the maximum coordination of fires, to include those of units attached or in support as well as those of organic supporting arms. All fires must be closely coordinated to ensure that maximum effective fire is brought on the enemy throughout the conduct of the defense under any condition of visibility.

(b) The planned fires provide for bringing the enemy under fire as soon as he comes within observation, holding him under an increasingly heavy volume of fire as he approaches the FEBA, breaking up his assault in front of the FEBA, and ejecting him from the forward defense area by a combination of fires and counterattack.

(4) Long-Range Fires. Long-range fires are planned to engage the enemy as early as possible to inflict casualties, to delay his advance, and to disrupt his organization. These fires consist of the fires of supporting weapons within the battle position capable of long-range fire and the fires of the COP. The enemy is fired on by long-range weapons as soon as he comes within range and the volume and destructiveness of fire increase as he continues his advance and comes within range of additional weapons.

(5) Close Defensive Fires. Close defensive fires are planned to destroy the integrity of the attacking force before an assault is possible by inflicting casualties; disrupting command, control, and communications; reducing observation; and neutralizing hostile supporting weapons. They include the fire of all individual and supporting weapons which can be brought to bear on the attacking

force from the time he enters his attack positions throughout the conduct of his assault. Weapons open fire during the close defensive fire phase when the enemy comes within optimum range of the particular weapon. To gain surprise when the enemy is unaware of the location of the battle area, flat-trajectory weapons fire, except designated tanks and Dragons or TOWs, may be withheld until the enemy is most vulnerable to the massed fires of all weapons.

(6) Final protective fires (FPFs) are defensive fires designed to break up the enemy's assault under any condition of visibility. They are a first priority, prearranged barrier of fire laid down just in front of the FEBA and consist of the fires of mortars, artillery, and machineguns. FPFs are delivered on the call of a threatened unit. Authority to call for such fires is normally delegated to platoon commanders.

(7) Fires Within the Forward Defense Area. Fires are planned within the forward defense area to limit penetrations and to support counterattacks. If the enemy succeeds in penetrating, all available fires are used to limit the penetration, prevent enemy reinforcements, and destroy the enemy within the penetration.

n. Organization for Combat. The battalion commander tentatively established his organization for combat early in his planning. However, as he continues to develop his scheme of maneuver, he may adjust his allocation of combat power as certain aspects of the defense are considered. Organic units are assigned. Artillery final protective fires are assigned. Supporting units are integrated into the scheme of maneuver. Specific uses of combat support elements will be covered in other subcourses.

o. Combat Service Support (CSS). The battalion commander considers the impact of CSS requirements and capabilities on the mission and plan of defense. Tactical considerations include location and security of supply elements, evacuation, traffic control, and provision of special supplies and equipment (pioneer and engineer tools, barbed wire, and mines) required for the defense. Supply elements are usually located farther to the rear in defense than in offensive operations. This reduces congestion in forward areas and avoids the probability of loss of CSS elements from a shallow enemy penetration.

p. Alternate Plans. The battalion commander plans for all foreseeable contingencies. He plans alternate and supplementary positions to ensure flexibility and all-round defense. Flexibility is also obtained by maintaining a reserve and by centralizing the control of fire support at the battalion level. Counterattack plans are prepared with the knowledge that they frequently may have to be adjusted to meet circumstances different from those originally envisioned.

3108. OFFENSIVE ACTION IN THE DEFENSE

The offense action most frequently considered as an element of defensive operations is the counterattack. (See figure 21.) The counterattack is an attack by a part or all of a defending force against an enemy attacking force, for such specific purposes as regaining ground lost or cutting off or destroying enemy advance units. The general objective is to deny to the enemy the attainment of his purpose in attacking. In sustained defensive operations, the counterattack is undertaken to restore the battle area and is directed at limited objectives. The counterattack will be covered in much greater detail in course 7512, Infantry Operations.

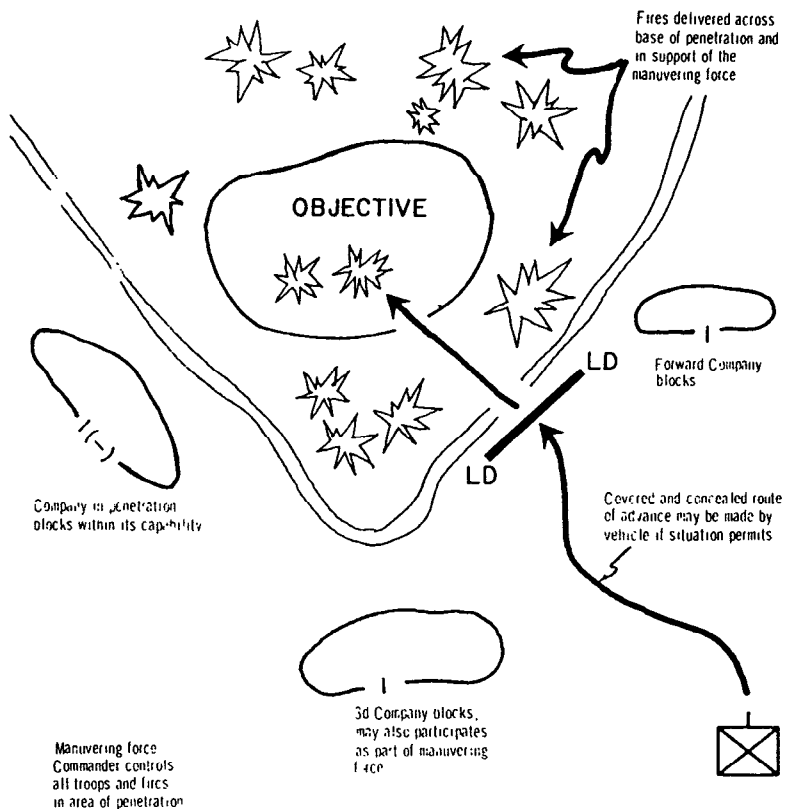


Figure 21. Counterattack by Battalion Reserve.

3109. FORWARD EDGE OF THE BATTLE AREA (FEBA)

The battalion FEBA is an imaginary line across the forward edge of the battalion positions. Its primary purpose is to assist in coordinating the fires of all weapons in defeating an enemy assault. The general trace of the FEBA is indicated to the forward companies by the use of coordinating points on the boundary between them. The exact trace of the FEBA is ultimately determined by the forward companies and their subordinate units. The trace is irregular and designed specifically to promote the most efficient use of flanking fires. Desirable characteristics of the FEBA are:

- a. Observation to the front and flanks.
- b. Good fields of grazing and flanking fires for automatic weapons.
- c. Natural obstacles.
- d. Concealment for air and ground observation.
- e. Avoidance of large salients and reentrants.

3110. CONTROL MEASURES

The means available to the battalion commander to assign portions of the battalion's sector of defense to subordinate units is through control measures. These measures are in addition to those used by the commander in offensive operations.

a. Boundaries

(1) Boundaries define the area of responsibility. They include areas within which units may fire and maneuver without clearance with other units. The boundaries between forward companies divide the battalion frontage according to the natural defensive strength and relative importance of the defense areas. Boundaries are located to avoid division of responsibility for the defense of key terrain features or avenues of approach. Every effort is made to give forward companies equal defensive tasks within their capabilities.

(2) When the combat outpost is controlled by the battalion commander, company boundaries are extended forward to points short of the combat outpost line. If the combat outpost is controlled by the forward company commanders, the boundaries are extended through the COP to the limit of effective ground observation forward of the COP. The extension of the boundary indicates the most forward limit of territorial responsibility. In either event, boundaries extend far enough forward to allow forward companies to position local security. Boundaries are normally located to coincide with easily recognizable terrain features. Boundaries between forward companies are extended to the rear to provide adequate areas for companies to organize their defense.

(3) Coordinating points on boundaries fix the location at which a higher commander desires adjacent subordinate commanders to coordinate their defenses. The regimental commander designates coordinating points on the battalion boundaries at the FEBA and may designate coordinating points along the COP, usually on recommendation of commanders of battalions located along the FEBA. Battalion commanders designate coordinating points on their company boundaries at the FEBA and, when the forward companies control the combat outpost, designate coordinating points on company boundaries at the combat outpost line. (See figure 22.)

(4) A coordinating point should be located at or near a terrain feature easily recognizable both on the ground and on a map. Commanders (or their representatives) coordinate at these points and determine whether the area between their units should be covered by fires, barriers, physical occupation or a combination of these means. When subordinate commanders believe that a coordinating point should be relocated, they recommend a change to the commander who designated it. Battalions may, without permission from higher headquarters, refuse their flanks from designated coordinating points on the FEBA to obtain adequate security. Flanks must not be refused to the extent that dispositions and fires cannot be coordinated with adjacent commanders well enough to achieve a continuous defense. Effective surveillance must be maintained in the gaps between battalions.

b. Assembly Areas. Assembly areas are general locations designated for occupation by reserve elements not employed by blocking positions. Locations selected are based primarily on the reserve element's mission and mobility, concealment and cover provided, and the availability of entry and exit.

c. Blocking Positions. A blocking position is a location organized to deny the enemy access to a given area or prevent the further advance in a given direction.

3111. COUNTERATTACK PLANNING

a. General. Counterattack plans are prepared concurrently with plans for the defense. They are prepared for assumed enemy penetrations within the forward defense area. At the battalion level, a counterattack is a limited-objective attack designed to destroy the enemy within a penetration, or eject him and regain lost portions of the battle area.

b. The counterattack is discussed in detail in course 7512, Infantry Operations.

3112. VARIATIONS OF THE AREA DEFENSE

a. Perimeter Defense

(1) General. The perimeter defense is a method of defending against an attack from any direction simultaneously. Frequently in military operations, units may be required to conduct defensive operations while separated from other friendly units. This may occur when a unit is on a separate mission, when operating as a strongpoint in mobile defense, when cut off from friendly forces by enemy action, or when terrain restrictions, such as woods, jungle, or mountains preclude mutual support between units. Under these circumstances, the isolated unit must deny the enemy the opportunity to attack an open flank. The perimeter defense is similar to an area defense with no exposed flanks. Normally, fire support and CSS units are positioned within the perimeter. (See figure 23.)

(2) Planning the Perimeter Defense. Considerations in planning the perimeter defense are similar to other types of defense. If possible, commanders must provide adequate planning time during daylight hours to ensure that the position is properly organized prior to darkness. Commanders consider the following when planning the perimeter defense:

(a) Security. Active security measures are employed to gain early information of the enemy and provide warning of his approach. Patrols are dispatched both day and night to gain and maintain contact with the enemy. Patrol plans are prepared in detail and carefully coordinated with fire support and barrier plans. Outguards vary in strength from a few men to a reinforced squad. Forward observers for mortars and artillery are located with the outguards. When sufficient numbers of artillery and mortar observers are not available, infantrymen with suitable communications perform their missions. The mission of these outguards is to provide early warning, prevent close observation of friendly positions, and within their capability, delay and disorganize the enemy. Outguards in a particular area are withdrawn into the perimeter when the enemy attacks it in force.

(b) Forward Defense Area.—In the perimeter defense, the forward defense forces are assigned the responsibility to organize and defend specific portions of the FEBA. The frontage assigned to a unit along the FEBA will depend largely on the situation and considerations of METT. As gaps are not acceptable, particularly in close terrain, the frontages assigned to units and the depth of the perimeter are drastically reduced compared to that normally assigned in area defense. Because of the lack of depth and maneuver space, the commander of the perimeter defense force cannot willingly accept a penetration and he must place the preponderance of his forces and weapons on the perimeter.

(c) Rear Area.—Unit reserves, command and control elements, fire support, combat support, and CSS units are located in the rear (reserve) area. The reserve force may consist of a designated reserve unit, a force designated from subordinate units, or a unit organized from headquarters and support personnel and given specific reserve contingency missions. It is highly desirable to maintain a mobile reserve force to facilitate rapid reaction in any direction. In close terrain, covered positions for the reserve echelon must be provided to ensure an ability to function while receiving small arms fire placed on the FEBA.

(d) Fire Support and Target Acquisition.—The employment of organic and attached weapons and surveillance devices is generally as prescribed for the area defense.

1 Machineguns employed on the FEBA are normally employed by squad. Under some circumstances, it may be necessary to split some squads in order to provide effective machinegun coverage. A machinegun squad is split when each of its guns has been assigned a different final protective line or principal direction of fire and sector of fire. The machineguns of the reserve force may be used to augment the FEBA forces.

2 Antitank weapons may be employed on the FEBA to engage point targets to augment organic weapons.

3 Attached tanks may be held in positions of mobile readiness, employed as part of the reserve force, or placed in primary firing positions on the FEBA. If held in reserve, firing positions and routes to these positions should be prepared in advance. Supplementary positions should be prepared to cover all avenues of approach and the tanks should be prepared for rapid employment to support counterattack plans.

4 Employment of indirect fire weapons is planned to permit engaging the enemy as far forward of the FEBA as possible, utilizing a 360° capability. Available fires from outside the perimeter should be coordinated and integrated into the overall defense plan. In close terrain, with limited observation, all personnel of the unit should be familiar with the unit fire plan and the procedures for directing these fires.

5 Surveillance devices are employed to provide early warning of enemy activity. The devices should be located around the FEBA and oriented along the primary avenues of approach.

(e) Administration and Logistics.—In the perimeter defense, resupply is normally accomplished by aerial delivery. Selection of landing zones (LZs) or the capability to construct an LZ in a short period of time is a critical consideration in organizing the defensive position. Landing zones should provide the maximum amount of protection from enemy observation and fire.

(f) Command and Control.—As in other types of operations, units conducting a perimeter defense maintain communications with higher headquarters and supporting and subordinate units. Alternate communication facilities should be provided to the maximum extent possible. An effective communication network within the perimeter enhances the commander's ability to influence the action and reduce unnecessary movement.

b. Reverse Slope Defense.—A reverse slope defense is organized on that part of a slope which is masked from enemy direct fire and observation by the topographical crest. A successful reverse slope defense is based on denying the topographical crest of the hill to the enemy. Once the enemy gains this crest, the defender no longer possesses the advantages offered by the reverse slope; he must launch strong counterattacks to regain the dominant observation offered by that crest. (See figures 23 and 24.)

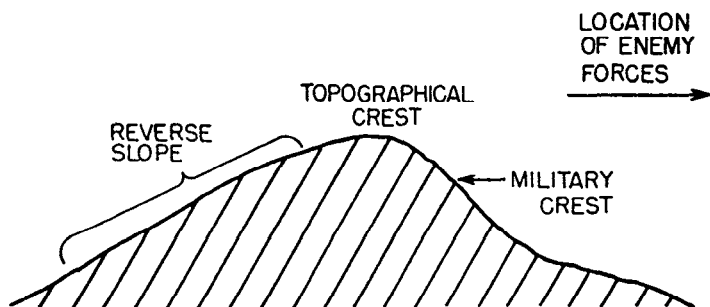


Figure 23. Profile of Hill and Reverse Slope.

81 mm MORTAR
TARGET
81 mm MORTAR
FINAL PROTECTIVE
FIRE
ARTILLERY

135

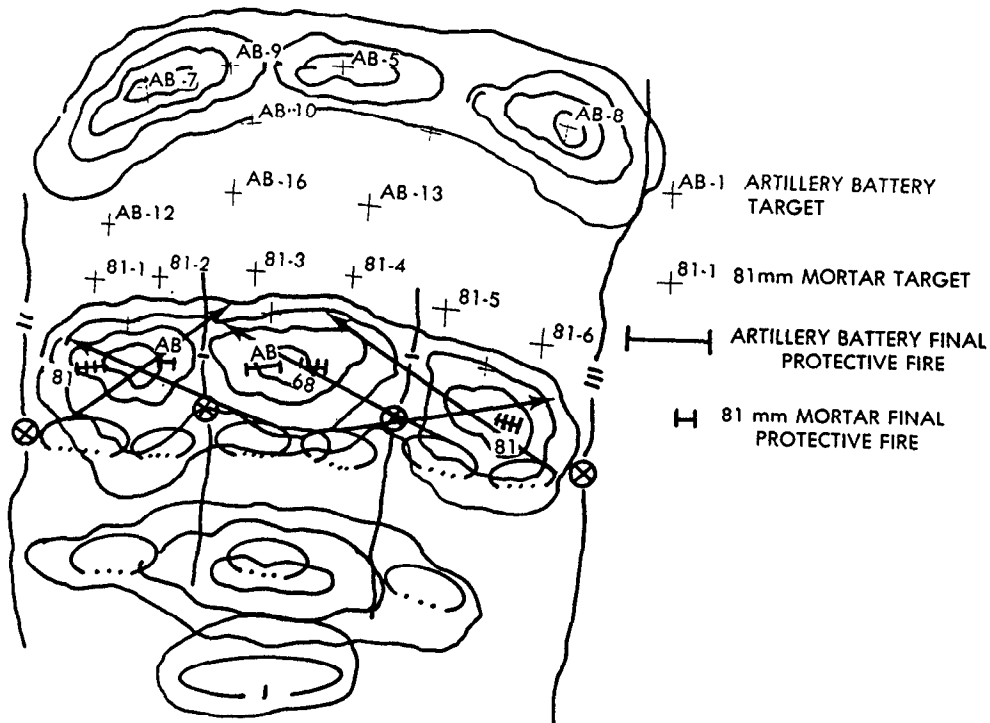


Figure 25. Reverse Slope Defense.

(1) A battalion will rarely conduct a reverse slope defense along its entire front; however, there may be situations when elements of the battalion may be profitably employed on the reverse slope. The battalion commander may adopt a reverse slope position for elements of the battalion:

- (a) When the forward slope is made untenable by enemy fire.
- (b) When the forward slope has been lost or not yet gained.
- (c) When the terrain on the reverse slope affords appreciably better fields of fire than are available on the forward slope.
- (d) When possession of the forward slope is not essential for observation.
- (e) When it is desirable to avoid creating a dangerous salient or reentrant in friendly lines.
- (f) To surprise the enemy and to deceive him as to the true location of the battalion defensive positions.

(2) The advantages of a reverse slope defense are that:

- (a) Enemy ground observation of the battle area is masked.
- (b) Enemy direct fire weapons cannot effectively fire on the position.
- (c) The enemy is deceived as to the strength and location of defensive positions.
- (d) Enemy indirect fire becomes less effective because of a lack of observation.

(e) Tactical surprise is gained by the defender.

(f) More freedom of movement is permitted within the battle area due to the enemy's lack of ground observation.

(3) The disadvantages of the reverse slope defense are that:

(a) Observation of the enemy is limited. The defender may be unable to effectively cover minefields and obstacles to the front.

(b) The effective range of direct fire weapons of the defender is limited by the topographical crest of the hill.

(c) The enemy will hold the high ground in an attack and his attack will be downhill while a counterattack must be made uphill.

(4) A reverse slope defense is organized to impose maximum casualties on the enemy forward of the position, deceive him as to the true location of the forward defense area, obtain maximum effective surprise fires as the enemy crosses the skyline, and deny him the topographical crest.

(a) The defensive position is organized generally according to the fundamentals applicable to all defensive positions. An essential feature of a reverse slope position is the requirement for good fields of fire to the crest of the hill. Fires should be placed on the crest and should cover the area between the FEBA and the crest. Other factors which affect the organization of the reverse slope position are cover and concealment and the location of natural obstacles.

(c) It is desirable that the forward edge of the position be within effective small arms range of the crest; however, it should be far enough from the crest so that fields of fire will provide the defender time to place well-aimed fire on the enemy before he reaches the defensive position. Defensive positions should permit fires to be delivered on approaches around the crest (as well as over the crest) and on the forward slopes of adjacent terrain features.

(c) A reverse slope position is particularly effective when flanking fires from units on adjacent terrain features can be placed on the forward slopes. (See figure 25.)

(d) If the situation will permit, a combat outpost should be established to the front to stop or delay the enemy, disorganize his attack, and deceive him as to where the defensive position is located. When this outpost is withdrawn, it is desirable to maintain observation and security to the front.

(e) Observation and security (O&S) groups will be established on, or just forward of, the topographical crest to give long-range observation over the entire front. These groups, which will usually be provided from the reserve unit,

may vary in size from a few men to a reinforced squad. The O&S groups should include forward observers and may be reinforced with machineguns, antitank weapons, and tanks. Sufficient groups are employed to provide observation across the entire front and security to the main battle position. The number and strength of the O&S groups should be increased at night to provide improved security.

(f) A highly desirable location for reserve elements may be on the military crest of the next high ground to the rear (if it is within supporting range of the forward defensive elements or on the flanks. Counterattack from either of these locations would be effective.

3113. SUMMARY

While continuous emphasis must be placed on offensive operations, we must spend part of the time in defensive positions. Certain basic principles and techniques must be adhered to while in the defense. The defender's advantage over the attacker is the defender's option to select the locale for the battle. To offset the attacker's advantage—exercise of initiative—the best plan of defense must be developed so that it can be executed with the resources available on the terrain that has been selected. A great deal of finesse, precision, detail, coordination, and preparation for contingencies, and superior plan of fire support are required to develop the best plan for a defense. This applies whether the defense is area or mobile, hasty or deliberate, perimeter or strongpoint, or of a river line.

CHAPTER 3 EXERCISE 1: Circle the best answer to questions 1 through 7. Check your answers with the solutions located at the end of the text.

1. The definition of the term "defense" is:
 - a. An economy of force operation in which primary reliance is placed on the use of maneuver elements to inflict maximum punishment to the enemy.
 - b. The employment of all means and methods available to prevent, resist, or destroy an enemy attack.
 - c. An operation conducted to delay the enemy while trading space for time in order to fight a decisive engagement on more suitable terrain.
 - d. A type of delay operation in which primary reliance is placed on the use of maneuver elements to destroy the enemy.
2. Flexibility in the defense is achieved through _____.
 - a. centralized control of supporting fires and an adequate reserve
 - b. superior mobility and adequate command
 - c. adequate combat service support and superior combat power
 - d. decentralized control of security and adequate room for maneuver
3. One of the characteristics of the area defense is that _____.
 - a. offensive actions are conducted forward of the battle area to disrupt and disorganize enemy forces preparing for attacks
 - b. minimum combat power is employed in the forward defense area and strong reserve forces are positioned on key terrain to block enemy penetration
 - c. maneuver of forces and supporting fires are used in offensive actions to delay and canalize the enemy forces into an area preselected for counterattack
 - d. the bulk of the force is committed in the forward defense area to retain specific terrain and maintain the integrity of the FEBA
4. The mobile defense is characterized by a(an) _____.
 - a. minimum of forces deployed in the forward defense area
 - b. decisive battle fought forward of the forward defense area
 - c. arrangement of forces in linear formation
 - d. arrangement of forces in a quadrangular formation
5. Artillery fires used to engage the enemy as early as possible and to delay his advance are referred to as _____ fires.
 - a. close defensive
 - b. within-the-battle-area
 - c. long-range
 - d. final protective
6. In a defensive operation, artillery fires used to destroy enemy attack formations prior to the assault are referred to as _____ fires.
 - a. close defensive
 - b. within-the-battle-area
 - c. long-range
 - d. final protective
7. The counterattack is characterized by _____.
 - a. an attack to regain lost ground
 - b. an attack on enemy assembly areas
 - c. destruction of the enemy within a penetration
 - d. two enveloping attack forces and support forces



CHAPTER 3 EXERCISE 2: Circle the best answer to questions 1 through 7. Check your answers with the solutions located at the end of the text.

1. The exact trace of the FEBA is determined by _____.
 - a. the location of frontline units
 - b. blocking positions
 - c. lateral boundaries
 - d. coordinating points
2. Boundaries dividing forward companies in the battalion frontage are located to _____.
 - a. avoid dividing responsibility for key terrain or avenues of approach
 - b. ensure that each company has the same frontage
 - c. correspond with the disposition of opposing enemy forces
 - d. provide responsibility for fire and maneuver
3. From the following statements, select the one which best describes the perimeter defense.
 - a. A method of defense employed when the enemy has dominant observation over the FEBA and has the ability to place fires on the forward positions thereon.
 - b. A control measure employed to ensure the coordination of a mutual defense between adjacent units.
 - c. That form of defense that is a variation of the mobile defense.
 - d. A variation of the area defense.
4. The variation of the area defense in which the battalion is disposed to meet attacks from all directions simultaneously is _____ defense.
 - a. perimeter
 - b. reserve slope
 - c. strongpoint
 - d. mobile
5. In organizing a reverse slope defense, the battalion commander must _____.
 - a. locate the FEBA 600 to 800 meters from the crest to avoid hostile artillery fire
 - b. design it so as to maintain control of the topographical crest forward of the FEBA
 - c. provide overhead protection to personnel on the FEBA
 - d. provide for additional fire support in defense of the position
6. The main advantage the defender has over the attacker is that the defender _____.
 - a. has the option of selecting the locale for the battle
 - b. can distribute his units and firepower in greater depth
 - c. can rely on the protection afforded by prepared positions
 - d. has comparatively longer range observation and fields of fire
7. Planning for the counterattack should be _____.
 - a. covered in the defensive plan under coordinating instructions
 - b. independent and indifferent to the defensive plans since the counterattack is an offensive action
 - c. concurrent with the defensive plan based on assumed enemy penetrations of the forward defensive area
 - d. part of the plan for security measures



APPENDIX A

TACTICAL APPRECIATION OF TERRAIN AND WEATHER

This appendix is a reprint of a handbook provided the students at the resident school. It contains review material which should be understood prior to analyzing terrain in offensive/defensive tactics.



TACTICAL APPRECIATION OF TERRAIN AND WEATHER

HANDBOOK



TACTICAL APPRECIATION OF TERRAIN AND WEATHER

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SECTION 1

GENERAL

101. INTRODUCTION

a. The study and evaluation of terrain with a view to its use for military operations is one of the most important things leaders of all units must know. History is replete with examples of success in battle due to the careful study and use of terrain just as it is replete with accounts of battles lost because commanders failed to appreciate the terrain. More often than not troop formations, positions to be defended, and locations of weapons are dictated by the ground and these solutions must be read from the ground.

b. In evaluating terrain for military operations there are no rules but there are principles which when intelligently applied to a given situation will bring forth a sound solution. Knowledge and application of these principles alone is not sufficient; they must be so thoroughly understood that if a violation of them is necessary, it is done intelligently.

102. PURPOSE

The purpose of this text is to describe the means of evaluating terrain and to show in general the effects of terrain on tactical dispositions.

103. TERRAIN EVALUATION

Terrain evaluation is the analysis of an area of probable military operations to determine the effect of the terrain on the lines of action open to opposing forces in this area.

104. INFLUENCE OF TERRAIN

a. No commander can afford to neglect any of the factors that may lead to the success of his undertaking. Terrain is one of the most important of these factors. Terrain often exercises a decisive influence on the commander's decision and plan in either the attack or the defense. In the attack, terrain may indicate the objective, the formation, and plan of maneuver; in the defense, it will dictate the choice of positions to be occupied and the dispositions made upon them.

b. The importance of a thorough comprehension and analysis of the terrain over which an operation is to take place is clearly stressed by Captain Ralph Ingersoll in his book "The Battle is the Payoff." He says: "The study and intimate knowledge of terrain is the beginning and end of tactics. Everything to do with the ground, its shape, its contours, its texture, even its color at different hours of the day affects everything both you and the enemy do and can do. The two adversaries have the terrain of the battlefield in common. Other things being anywhere near equal, the victory will go to whichever understands the terrain best."

c. The ability to evaluate terrain in the light of its tactical importance should be constantly developed by every leader from the highest commander down to the squad leader.

105. SOURCES OF INFORMATION

a. Information pertaining to terrain may be obtained from any or all of the following sources:

- (1) Personal reconnaissance, air or ground.
- (2) Maps of all types.
- (3) Aerial photographs.
- (4) Terrain models.
- (5) Higher and adjacent headquarters, particularly engineer units.
- (6) Patrols.
- (7) Friendly natives or undercover agents.
- (8) Enemy prisoners of war.

b. The intelligence officer is charged with the collection of information and production of intelligence concerning terrain not under friendly control and the preparation of studies of such terrain in coordination with the operations officer. The operations officer should particularly concern himself with the effect of the terrain on those courses of action required to accomplish the mission. However, the final responsibility for analysis of terrain rests with the commander.

SECTION 2

TERRAIN COMPONENTS

201. GENERAL

Terrain is made up of various components each of which directly affects tactics and each of which tends to change or modify the effects of the other components. Before attempting to analyze the effects of any particular component on tactics, all available information of terrain should be collected and studied under these two general headings:

- a. Weather, climate, and season.
- b. Topography.

202. WEATHER, CLIMATE, AND SEASON

Weather is the day-to-day changes in atmospheric conditions. Climate is the average weather over an extended period of time. Seasons are characterized by particular conditions of weather, such as summer and winter. Of these three elements, weather is the most important consideration from a tactical viewpoint. For long range planning, or in the absence of weather information, climatological and seasonal data may be used to estimate weather conditions.

a. Weather elements. — Weather may be broken down into atmospheric elements, each of which affects tactics. These elements are:

- (1) Temperature.
- (2) Humidity.
- (3) Horizontal and vertical visibility (fog, haze, heat refraction, clouds).
- (4) Precipitation (kind and amount).
- (5) Wind (strength and direction).
- (6) Phases of the moon.

b. Effects on Tactics.

(1) Weather directly affects visibility, movement, and the use and effect of weapons. Horizontal visibility may be materially reduced (consequently reducing observation of the enemy, or of our own fires) by fog, haze, heat refraction, or precipitation. Vertical visibility may be restricted by fog, precipitation, or a large mass of low lying clouds which reduce the effectiveness of air support and air observation. Ease of movement, both logistical and tactical either on roads or cross-country, may vary drastically from day-to-day as a result of various types and amounts of precipitation and as a result of temperature; a heavy rain may change a passable area into an impassable quagmire; or temperature, by causing streams and marshes to freeze, may aid movement.

(2) Weather affects weapons both in employment and in the effectiveness of the weapon itself. Ballistics of artillery and mortars are greatly influenced by temperature and humidity. Extreme cold weather will require special treatment and handling of gasoline engines, consequently affecting the employment of vehicles. The effects of weather are particularly great in the fields of air and naval support, and chemical, biological, and atomic warfare. Air support may be restricted or prevented altogether by clouds, fog, or heavy precipitation. The effectiveness of naval gunfire support will be greatly reduced by fog, snow, or heavy rainfall which reduces vision; naval gunfire support cannot be delivered as effectively under these conditions, nor can new and previously unreported targets be readily located. Chemical munitions, including smoke, may be greatly reduced in effectiveness by high winds. The direction of winds will also affect the desirability of using some chemical munitions.

(3) Precipitation, wind, and humidity are factors which must be considered in using nuclear weapons. In case of an underground or underwater nuclear explosion, wind will carry a very highly radioactive dust or water for great distances, contaminating areas by ionizing radiation where the dust or water falls out. Rain falling through a radioactive cloud resulting from an air burst, will increase the danger of ionizing radiation in the area under the cloud. Conversely, while the effective radius of thermal radiation for a given nuclear detonation on a clear and dry day may be 3000 meters, this radius may be reduced to 1500 meters by extremely high humidity.

(4) Indirect effects of weather on tactics fall mainly in logistical and personnel fields. Humidity, precipitation, and temperature, for instance, may increase supply and maintenance problems and may reduce the morale and vitality of personnel, particularly if extremes of these conditions extend over a long period of time.

c. Twilights, Morning and Evening. — Although not an integral part of weather, twilights are so closely allied that they are considered under weather in terrain studies. Disregarding effects of weather, such as fog and haze, twilights are the periods of solar illumination prior to sunrise and after sunset. Both morning and evening twilights are divided into three periods: astronomical, nautical, and civil. These periods are defined with reference to the sun's position below the horizon: astronomical 18 degrees - 12 degrees, nautical 12 degrees - 6 degrees, and civil 6 degrees - 0 degrees.

(1) Astronomical twilight affords such meager light, if any, that for military purposes it may be considered as a period of darkness.

(2) Civil twilight affords sufficient light to carry on normal day activities. This period provides sufficient natural illumination of targets to allow efficient observed artillery fire or day bombing.

(3) Nautical twilight provides enough illumination to carry on most types of ground movement without difficulty, and approaches conditions expected under full light of day. Vision is limited to 400 meters or less. For military purposes, during nautical twilight weapons can be employed within the range of vision stated and day-calculations relative to movement will apply, including restrictions on such movement. Bomb loading and repair work cannot be carried on without the use of artificial light. Nautical twilight is most frequently used for military purposes and is expressed as the "beginning of morning nautical twilight" (BMNT) and as the "ending of evening nautical twilight" (ENT).

203. TOPOGRAPHY

Topography consists of the surface aspects of the earth and includes relief and drainage, vegetation, surface materials, and cultural features.

a. Relief and Drainage.

(1) Relief is the term given to the alternate areas of elevation and depression on the earth's surface. Drainage consists of the areas of depression of relief which serve as water run-offs or collection points such as streams, rivers, ponds, and lakes. The higher portions of relief form a network, a study of which will indicate the general shape of the ground. Drainage forms a similar system which interlocks with, or complements, the relief network. These two systems are normally studied together; the latter gives a more complete indication of the shape of the ground. (See fig. 20.)

(2) When making a terrain study major factors to be considered, in addition to the general shape of the ground, are:

- (a) Steepness of slopes.
- (b) Height and size of hill masses.
- (c) Depth, length, and width of drainage features.
- (d) Size of valleys and draws formed by drainage features.

(3) Irregularities in the ground influence tactics by the degree of observation afforded opposing forces, ease or difficulty of movement, and the degree of protection afforded against enemy fires.

(4) Disregarding the effects of weather and of other terrain components, flat ground will provide equal observation to opponents within an area. In rolling or mountainous terrain, the higher ground normally provides better observation.

(5) Advances made parallel to a series of ridges, or parallel to a river or stream, are mechanically easier than movement made perpendicular to them. Steepness of slope may limit movement; tanks, for instance, cannot negotiate slopes steeper than 30 degrees.

(6) Flat ground offers little protection against enemy fire, but rolling ground will offer protection, particularly against flat trajectory weapons. Rolling terrain may reduce the effect of nuclear explosion. It may reduce the shock wave up to 80 percent, ionizing radiation up to 90 percent, and thermal radiation up to 100 percent. The amount of reduction depends upon slope steepness, height and size of hills, and height of burst.

b. Vegetation.

(1) Vegetation may be classified as cultivated and non-cultivated. Cultivated vegetation includes all crops and orchards tended by man, while non-cultivated

includes all types of grasses, bushes, and trees growing without man's assistance. A study of vegetation should include:

- (a) Density of growth.
- (b) Height of growth.
- (c) Types of growth.
- (d) Diameter of tree trunks.

(2) Vegetation may restrict vision or provide concealment. Movement may be made extremely difficult by the density of vegetation or by the diameter of tree trunks. Some protection is afforded by vegetation against the effects of nuclear weapons, for the radius of effective thermal radiation may be reduced by as much as 75 percent in heavily vegetated areas such as jungle.

c. Surface Materials. — Surface materials are studied to determine the trafficability of an area. Trafficability is defined as the extent to which the terrain will permit continued movement of any or all types of traffic. In general, all soils, except very loose sand, afford good trafficability when dry. Unfortunately, however, soils are seldom dry, and water can change a soil from a hard, baked clay to mud. It is important, therefore, to be able to recognize and avoid poor soils when they are wet and near saturation.

(1) Soils that will support vehicular traffic in nearly all conditions are those which are:

- (a) Granular (sands and gravel).
- (b) Permeable.
- (c) Well-drained.
- (d) Noncohesive.

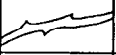
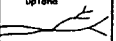

(2) Soils that are completely nontrafficable when wet are those which are:

- (a) Very fine grained (silts and clays).
- (b) Impermeable.
- (c) Poorly-drained.
- (d) Cohesive.

The above characteristics are extremes. Variations in the composition of soil and the amount of water saturation will cause changes in trafficability.

(3) Soil types can be closely determined by study of drainage, slope, aerial-photo soil tones, and vegetation. Granular soils drain off the water quickly, forming

short, stubby, steep-sided gullies, and steep prevailing ground slopes. The soil dries out quickly, photographing in light tone. The drainage net is usually incompletely developed. Plastic, cohesive, impermeable soils do not readily allow the water to filter through, but force it to drain away as runoff. Its cohesive nature holds it together, forming gentle slopes and smooth gully cross sections. Since most of the water runs off, the drainage net becomes extensive and well-developed. Water that is absorbed by the soil is not easily released, and the soil stays wet and impassable for long periods of time, photographing dark. Intermediate grades of soil vary between these two extremes in both trafficability and characteristics. Figure 1 sums up the terrain characteristics of various types of soil.

SOILS		TRAFFICABILITY	RECOGNITION			
Type	Properties		Air Photo soil tone	Drainage development	Slope	Vegetation
Sand or well-graded mixtures	Non-cohesive Permeable Granular Good internal drainage	Usually good	Very light (uniform)	Gullies and drainage practically undeveloped Gullies short and stubby 	Prevailing ground slopes steep	Grass or jack pines in sand Agriculture in mixtures
Sandy clay mixtures Silt	Moderately cohesive Partially impermeable Low plasticity Fair internal drainage	Good when dry Poor during and for a short while after wetting	Generally light to grey (non-uniform)	Moderate development of drainage net and gullies Gullies extend short way into upland 	Slopes highly variable	Rich agriculture Varying dense vegetation and cleared areas
Clays or silty clays	Cohesive Impermeable Plastic No internal drainage Retains water	Good only when dry Poor when slightly wet or damp	Dark (spotty)	Drainage net covers entire area Gullies extend over entire upland 	Steep prevailing ground slopes	Sparse forests Pastures

NOTE: When dry, very loose sands may not support traffic, particularly near the tops of dunes and beach ridges.

Figure 1. — Chart of Terrain and Trafficability Characteristics of Various Types of Soils.

d. **Cultural Features.** — All works of man such as towns, airfields, roads, railroads, and bridges are included under cultural features. Although man-made features affect changes in existing terrain, for military purposes they are studied as an integral part of terrain.

(1) Cities and towns are frequently objectives of attacking forces, because they are centers of population, industry, information, transportation, communications, and supply. They are studied in terms of these factors to assess their value as objectives. FM 30-10, TERRAIN INTELLIGENCE, lists the military considerations and information requirements for important cultural features.

(2) Roads are important routes of communication which are studied because of their tactical and logistical effects on military operations. Among the important military considerations are width of the roadbed, state of maintenance, surface material, permissible loads, steep grades, sharp curves, minimum vertical and horizontal clearances, significant cuts and fills, tunnels, bridges, fords and ferries.

(3) Although railroads are important in almost all military operations, they become increasingly so in areas where trafficability is generally poor and where rail transportation has been used extensively and road transportation is limited. Details to consider are the number of tracks, the location and capacity of sidings, the unloading facilities, steep grades, sharp curves, tunnels, bridges, gauge and passing tracks.

(4) Bridges of all types are important vulnerable points in routes of communication. Details studied should include capacity by weight, width in terms of lanes of traffic (number of tracks), and clearances.

204. TERRAIN COMPARTMENTS

a. Terrain compartments are areas enclosed on at least two opposite sides by features that restrict or prevent ground observation or flat trajectory fire into the area. Compartments may, however, have more than two sides and may be of any size or shape. The compartment includes not only the area enclosed by the restricting features but also the restricting features.

(1) Limiting Features. — These are features which limit or prevent ground observation.

(2) Delimiting Lines. — Delimiting lines are imaginary lines drawn along limiting features, from which ground observation into the compartment is limited.

b. Types of Compartments. — To facilitate analyzing terrain, compartments are divided into three types.

(1) Compartments Formed by Relief and Drainage. — In compartments formed by relief and drainage the delimiting lines are generally behind the military crest. The military crest is a fixed line on the forward slope of a hill or ridge from which maximum observation and flat trajectory fire covering the slope down to the base of the hill or ridge can be obtained. The military crest is not always the topographical crest which is the highest point.

(2) Compartments Formed by Vegetation or Cultural Features. — With this type of compartment delimiting lines run within the edge of the woods or village; the depth at which they run depends on the density of the vegetation or cultural feature and their proximity to each other.

(3) The last type of compartments are those formed by a combination of the above.

Figures 2 and 3 show some types of terrain compartments. In Figure 2, if woods were inserted between A and C, a three-sided compartment would result. If a town were inserted between B and D a four-sided compartment would be formed.

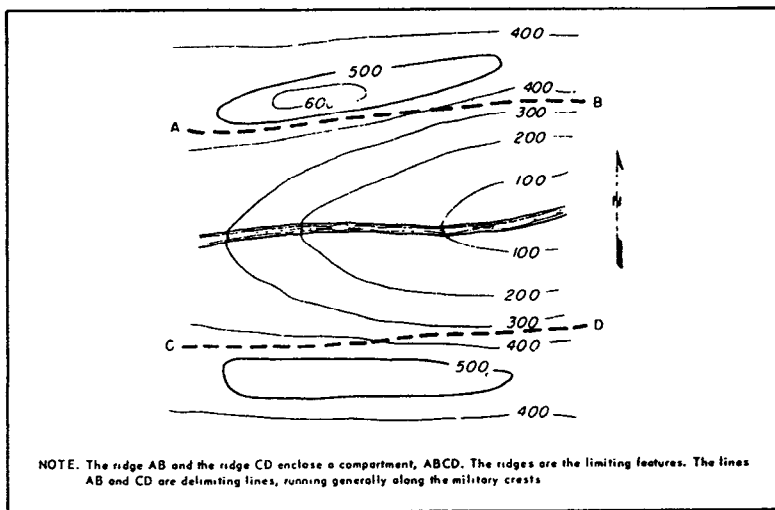


Figure 2. — Terrain Compartment Formed by Relief and Drainage.

c. Classification of Compartments.

(1) Compartments are classified as simple or complex; as corridors and cross compartments. Figures 2 and 3 represent simple compartments. A complex compartment is a compartment having a smaller compartment, or compartments, lying within it. This is the type of compartment most often encountered in the field. Figure 4 shows a complex compartment.

(2) A compartment whose long axis is parallel to the direction of advance of a unit is termed a corridor. A compartment whose long axis is perpendicular or oblique to the direction of advance is called a cross compartment. In Figure 2, if a unit were advancing north or south, it would be moving over a cross compartment, while if the unit advanced from east or west, it would be moving through a corridor. In Figure 3, a unit advancing north would be moving over cross compartments. In Figure 4, a unit advancing north between E and G to Hill 400 would be advancing through a corridor until it reached the river. Then it would be advancing over a cross compartment. Note that there is no physical change in the compartments; corridor and cross compartment are terms which describe the position of the long axis of a compartment in relation to the direction of movement.

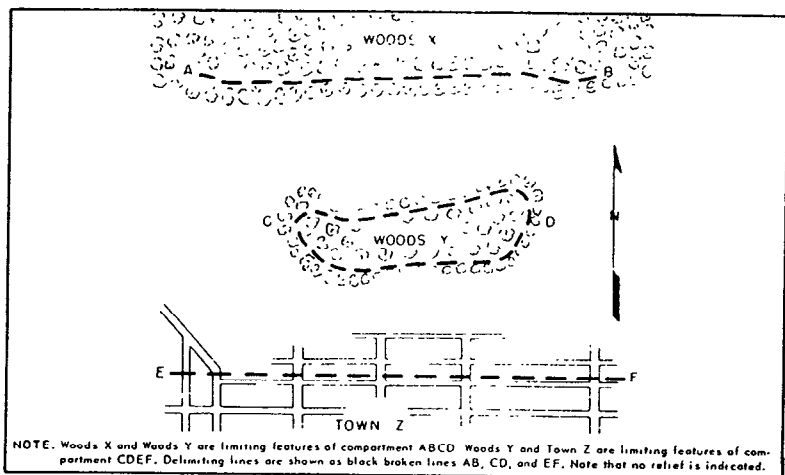


Figure 3. — Terrain Compartments Formed by Woods and Town.

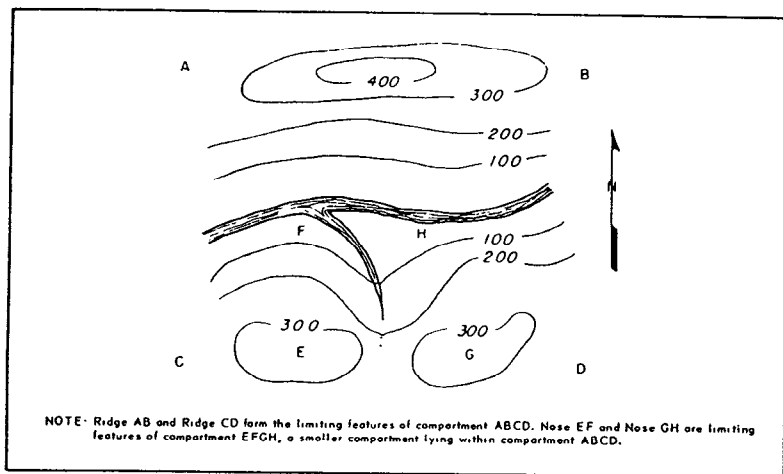


Figure 4. — A Complex Terrain Compartment Formed by Relief and Drainage.

SECTION 3

MILITARY ASPECTS OF TERRAIN

301. GENERAL

Combinations of the components of terrain give certain qualities to an area. These qualities, the tactical aspects of terrain, can be easily remembered by using the word KOCO A -- Key terrain features; Observation and fields of fire; Cover and concealment; Obstacles and Avenues of approach. They represent a change of the topographical and weather characteristics of an area to military characteristics in military terms. Regardless of the type of terrain and the tactical situation, terrain must be evaluated in terms of these military aspects.

302. OBSERVATION AND FIELDS OF FIRE

a. Observation. — Observation of the battlefield is essential in order to bring effective fire to bear upon the enemy, to control the maneuver of one's own troops, and to prevent surprise by the enemy. It is important, also, as the basis for determining terrain compartments.

(1) Observation is classed as long range and short range. Long range observation is that which provides observation in excess of the range of effective small arms fire (500 meters). Short range observation is that observation which covers the immediate foreground and extends to the effective range of small arms fire.

(2) Observation is limited or denied by such factors as fog, heavy precipitation, heat refraction, darkness, vegetation, cultural features, and relief. Those factors must be considered in determining the amount and type of observation within an area.

b. Fields of Fire. — Fields of fire are areas into which our weapons can fire effectively. An ideal field of fire for the defense would be gently sloping ground, fitted to the trajectory of our weapons, on which the enemy can be seen and no protection from our fire. This will rarely be found, and how nearly it can be approached depends primarily on the terrain. Natural fields of fire may, however, be improved by cutting or burning weeds, grass, and crops; by clearing brush and trees; by demolishing buildings; and cutting lanes through woods. Caution must be exercised in such work since obviously constructed fire lanes might disclose the location of positions to an observant enemy. The time and labor available for this type of improvement should be considered in evaluating terrain.

c. Tactical Effects. — Observation and fields of fire are so closely allied that they are considered together. They are not synonymous, but fields of fire are based on observation since the target must be seen in order to bring effective fire upon it. These aspects are particularly important to the defender; the primary terrain consideration in choosing a defensive position are maximum observation and long fields of fire. On the offensive, infantry commanders must be constantly alert to recognize terrain affording those characteristics so that such terrain may be avoided or other measures taken to minimize the effect of enemy fire. He must also make every effort to obtain terrain that will afford him observation and fields of fire in order to control his maneuvers and to obtain maximum benefit from his weapons.

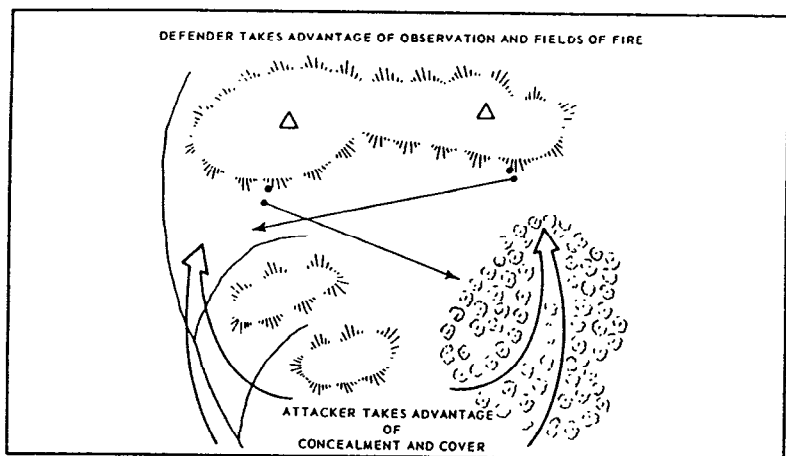


Figure 5. — The Attacker Takes Advantage of Concealment and Cover to Reduce the Effectiveness of the Defender's Observation and Fields of Fire.

303. CONCEALMENT AND COVER

a. Concealment. — Concealment is protection from observation, either air or ground or both. It is provided by vegetation, cultural features, relief and drainage, and by weather conditions such as fog, precipitation, and by darkness. It may frequently be obtained from a proper evaluation of the terrain alone. At other times, artificial means may be necessary to augment natural concealment available.

b. Cover. — Cover is shelter or protection, either natural or artificial, from enemy fire, and is provided by relief and drainage, cultural features, and artificial means. Cover from flat trajectory fire is best exemplified by the concept of reverse slope, that is, when there is a projection of relief between you and the enemy. Cover may provide some protection against nuclear weapons (see para. 203).

c. Tactical Effects.

(1) Concealment is the antithesis of observation and cover is the antithesis of fields of fire. Similar to the manner in which observation is related to fields of fire, concealment is closely related to cover. However, concealment is complementary to cover only so long as the enemy cannot determine that a terrain feature is occupied.

(2) In view of the fact that a defender usually has the opportunity to choose the ground he wishes to defend, it can be assumed that he will take maximum advantage of observation and fields of fire. To reduce the defender's initial advantage, the attacker seeks to take maximum advantage of concealment and cover. He uses concealment to hide his movements and gain surprise; he uses cover to protect his units from enemy fire.

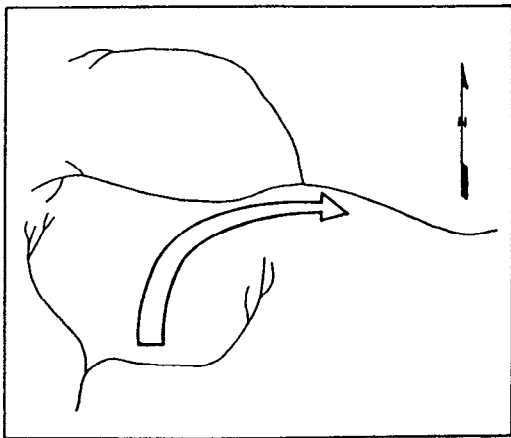


Figure 6. — An Attacker Adopts a Plan of Maneuver Taking Advantage of Obstacles.

(3) The defender must also consider concealment and cover in selecting his position. Because the defender may not need to move about until the battle is in an advanced stage — if he must move at all — he normally has the advantage of concealment and cover, for he can augment natural concealment by camouflage and he can augment natural cover by field fortifications. The attacker must, for the most part, rely on natural concealment and cover.

304. OBSTACLES

a. General. — Obstacles are obstructions that stop or divert movement. Common natural obstacles of military value include mountains, rivers, streams, lakes, marshes, gullies, steep inclines, and heavy wooded areas. Common artificial obstacles include mine fields, out and fills, trenches, antitank ditches or barriers, roadblocks, barbed wire, blown bridges, and road craters. The proper evaluation of natural obstacles permits the most effective use of artificial obstacles.

b. Tactical Effects.

(1) Obstacles perpendicular to an axis of advance generally favor the defending force. Obstacles parallel to the axis of advance may favor the attacker by protecting his flanks, though they may also limit lateral movement. Figure 6 shows a force initially taking advantage of parallel streams. On reaching the east-west river obstacle, the force changes direction and attacks east, thereby using the river as flank protection.

(2) The effectiveness of an obstacle must be carefully examined. Obstacles are rarely, in themselves, absolute blocks to military movement. They must be

kept under observation and military means must be kept at hand to augment their effect. The commander who adopts the attitude that an obstacle is, alone, sufficient to prevent movement of the enemy, stands the chance of being surprised by a movement over or through the obstacle. Surmounting obstacles may provide the basis for gaining surprise. Where an attack through a likely approach may fail due to enemy concentration there, an attack over an obstacle may succeed.

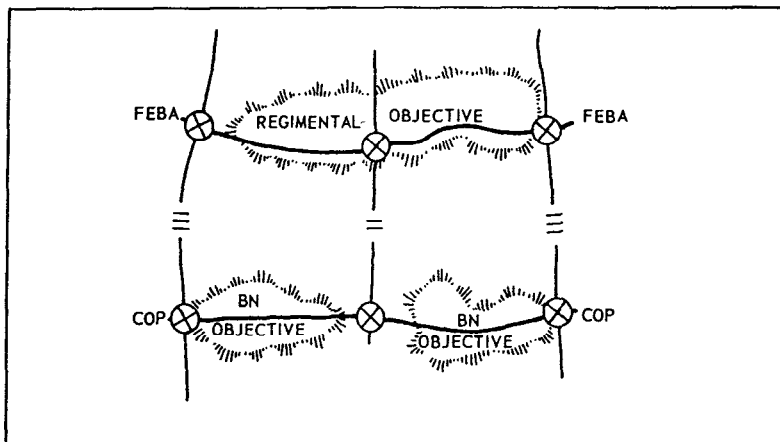


Figure 7. — Key Terrain Tells the Defending Commander where to Dispose his Troops, and Tells the Attacking Commander Objectives to Subordinate Units.

305. KEY TERRAIN FEATURES

a. General. — Key terrain is any locality, or area, the seizure or retention of which affords a marked advantage to either combatant. Usually, factors that make a feature or area critical are superior observation and fields of fire. Obstacles may be key terrain if their retention by one force prevents the movement of the opposing force. In some areas, such as mountainous terrain, where movement depends on established roads and railroads, routes of communication may be key terrain. Cities, as centers of communication, may be key terrain. Their seizure may cut the enemy's lateral communication and thereby reduce his capacity to resist. A bridge over an unfordable river may be key terrain, particularly if its seizure obviates the necessity for an assault crossing. An airfield could be a key terrain feature when its seizure would facilitate the success of local operations or serve as a base to support future operations.

b. Tactical Effect.

(1) In selecting key terrain, the commander is beginning to tie his mission to the ground. Inasmuch as key terrain features offer an advantage to one or both

combatants, it is apparent that the defender will strive to retain them while the attacker will try to seize them. Thus, key terrain is often assigned as objectives of attacking units while conversely, key terrain will aid the defending commander in disposing his forces so as to best maintain his battle position.

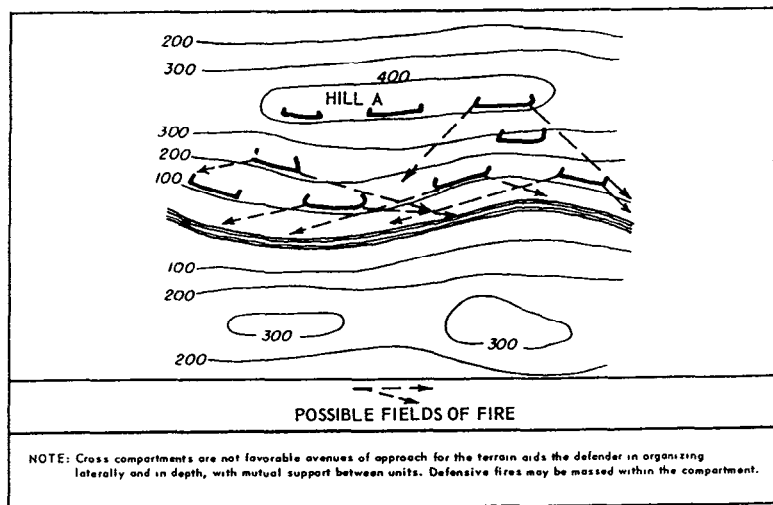


Figure 8. — Cross Compartments.

(2) Selection of key terrain features will vary in accordance with the mission. In the attack, the commander will select key terrain features forward of the line of departure. In the defense, the terrain that must be held in order to maintain the integrity of the battle position will be designated as key terrain.

(3) Selection further varies at different levels of command. For example, at force level a large city may offer a marked advantage as a communications center and as a base for supply and maintenance facilities. At division or regiment, high ground dominating the city by observation and fields of fire may be more important. At battalion and lower echelons, key terrain might be hills and ridges within the general high ground dominating the city.

306. AVENUES OF APPROACH

a. General.

(1) An avenue of approach is a terrain feature, or combination of terrain features, which offers an attacker a favorable route of advance to his objective. Desirable terrain characteristics of an avenue of approach are:

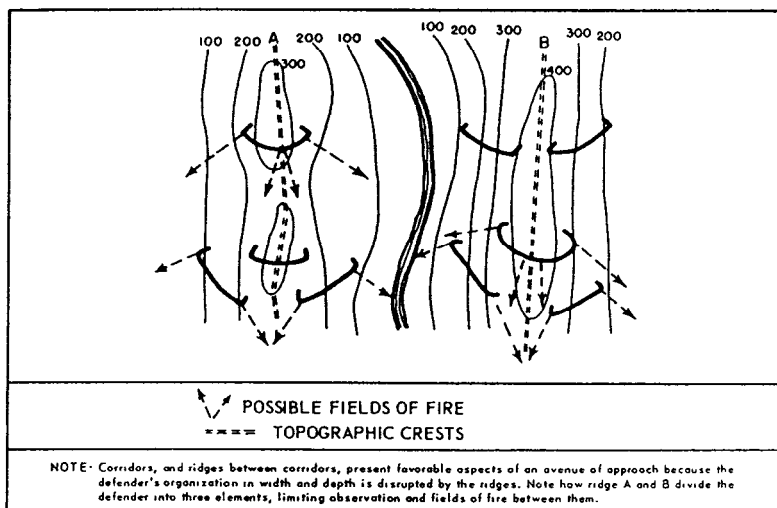


Figure 9. — Corridors and Ridges.

- (a) Ease of movement toward the objective.
- (b) Concealment and cover from the defender's observation and fire.
- (c) Favorable observation and fields of fire for the attacker.

(2) Enemy dispositions, the size of the attacking unit, anticipated rate of advance, amount and type of supporting weapons, and surprise must be considered in selecting the best avenue of approach. However, the following paragraphs pertain to terrain aspects only and in this respect, avenues of approach are based on an analysis of:

- (a) Relief and drainage.
- (b) Trafficability.
- (c) Vegetation.
- (d) Routes of communication.

b. Relief and Drainage. — The effects of relief and drainage on avenues of approach are considered in terms of compartments.

- (1) Cross compartments.

(a) In general cross compartments favor the defender and are not considered as favorable avenues of approach. They afford the defending unit maximum

observation and fields of fire which in turn increases their ability to gain mutual support between units (laterally and in depth). In addition, the defender's flat trajectory fires are largely enfiladed and can be easily massed on points threatened by an attacker. Cross compartments enable a unit to defend on the forward slope and still have cover for reserves to assemble in preparation for a counterattack; or the defense can be moved to the reverse slope while the topographic crest is used for long ranged observation.

(b) A unit attacking a cross compartment may also have good observation and fields of fire — particularly from the viewpoint of overhead fire from flat trajectory weapons — and initially may have concealment and cover. However, once the attack begins, cover is lost. The attacker's frontal fires are pitted against the enfilading fires of the defender, which can be concentrated at that point where the attack threatens most.

(c) Figure 8 shows a schematic defense of a cross compartment. The defender obtains centrally located observation from ridge A, which enables him to coordinate the entire defense. Observation and fields of fire extend across the entire width and depth of the position, facilitating mutual support laterally and in depth. Enfilading fires are obtained, and all fires may be massed where most required. The size of the compartment, irregularities in ground, vegetation, steepness of slope, and other factors will influence the desirability of any particular cross compartment for the defense. For example, a long, uniform slope offers increased fields of fire, while a short irregular slope decreases fields of fire.

(2) Corridors or Ridges.

(a) Corridors, or ridges forming the limiting features of a compartment present favorable avenues of approach. This is based on the fact that the defender's lateral organization of observation and fields of flat trajectory fire is obstructed by limiting features of compartments which decrease the ability of the defender to obtain mutual support between units.

(b) Figure 9 shows a schematic defense of a corridor. The topographic crests divide observation and fields of flat trajectory fire into three sections. The defender no longer has centralized observation nor can he mass all of his fires at any one point. Mutual support between units is limited by topographic crests. Fire becomes more frontal and fields of fire are shortened. Defensive elements located in the low ground lack observation except to their front. The size of the corridor and ridges, the steepness of slopes, vegetation, and other factors will modify the defense. The steeper the slopes and the more pronounced the ridge, the more the defender's fires and observation will be limited.

(c) A corridor is dominated by two axis of observation — the ridges forming the limiting features of the compartment. As long as the enemy retains observation into the corridor, troops cannot advance through the center. Enemy observation into the corridor must be blinded, or the vantage point must be seized.

(d) In advancing through a corridor — along a valley — the best axis of advance is frequently along the shoulders of the ridges forming the corridor. By advancing along the shoulders, the attacker can seize short range ground observation

from the enemy by clearing the slopes up to the military crests, which in turn serves to reduce the effectiveness of the defender's fire into the corridor.

(e) In advancing along the axis of a ridge, the attacker does not get the protection from fire that he gets within a corridor. To minimize effects of enemy fire, the bulk of the troops move just below the topographic crest.

(f) A careful analysis must be made in determining whether to advance along a valley or along a ridge. If enemy ground observation can be denied, a valley approach offers more protection from fire. It will be easier for a commander to coordinate the efforts of the attack echelon, for all of his unit will be in one compartment where he can observe it and where elements of the assault can observe each other. The attacker can mass his fires wherever he so desires. Once having seized or denied ground observation into the valley, it will be possible to supply and support the attack from a centralized route through the valley. On the other hand, if the enemy can maintain continuous observation into the valley; if obstacles render the valley a less suitable approach; or if a particular weapon is not suited for employment in the valley it may be more desirable to attack along the ridge.

(g) The primary advantage of attacking along a ridge is that the attack is made on an axis of dominant observation. Once the ridge is seized, enemy units in adjacent valleys become highly vulnerable to flanking attacks. Furthermore, units in adjacent valleys are in a poor position to contest an advance made along a ridge; consequently, defense of the ridge is largely dependent upon the personnel

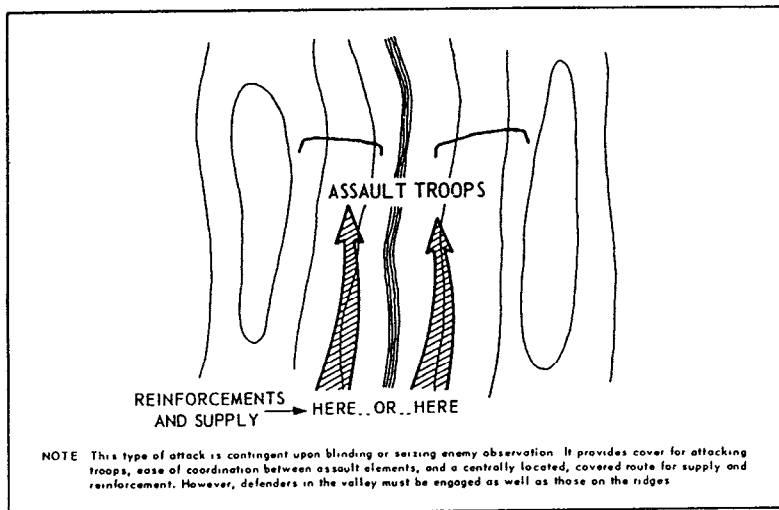


Figure 10. — Attacking Through a Corridor.

located on it. Frequently successful attacks along ridges make defensive positions in adjacent valleys untenable, forcing the enemy to withdraw under the threat of being isolated. Sometimes trafficability is better along ridges than in valleys. A disadvantage of attacking along a ridge is that forces disposed there have less cover from enemy flat trajectory fire than when attacking in a valley. Coordination between elements disposed on either side of a topographic crest is more difficult than when both elements are in the same corridor. Covered routes for supply and reinforcements may not be as centrally located as in a valley approach. Supplies will often be moved through adjacent valleys as soon as possible, and fed laterally up the ridge to the attacking troops.

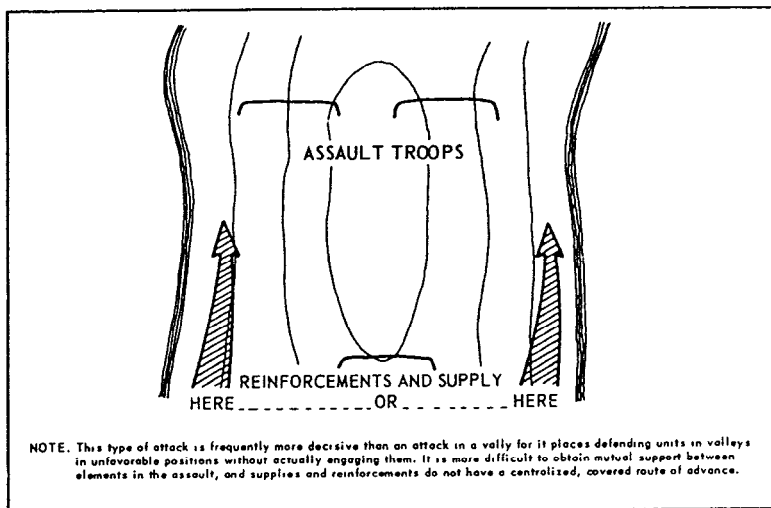


Figure 11. — Attacking Along a Ridge.

c. Trafficability.

(1) Although corridors and ridges may provide favorable characteristics of an avenue of approach, their effect may be completely nullified by the lack of trafficability. The details of determining trafficability are covered in paragraph 203, Section 2.

(2) By combining the trafficability of an area and obstacles such as steep slopes, heavy vegetation, or man-made obstacles, and integrating their effects a "going" map or overlay may be made. A "going" map is a map that has been specially marked to show the effects of trafficability and obstacles on cross-country vehicular movement. An area which is relatively free of obstacles and trafficable provides "good going." An area in which movement is restricted provides "poor going." (See fig. 26.)

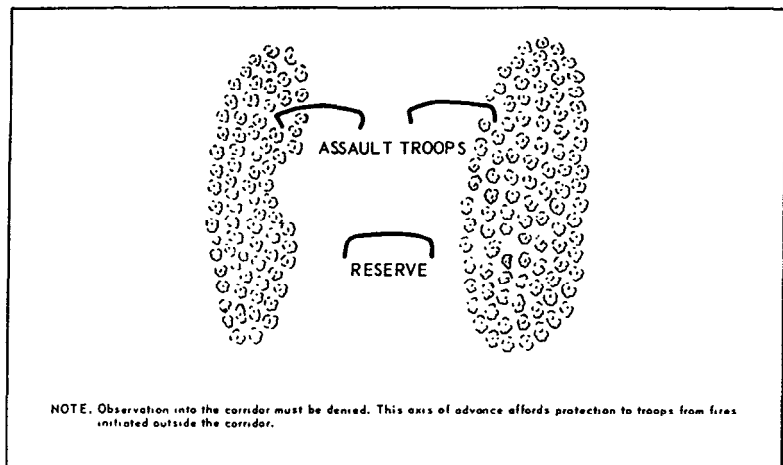


Figure 12. — Attack Through a Corridor Formed by Vegetation.

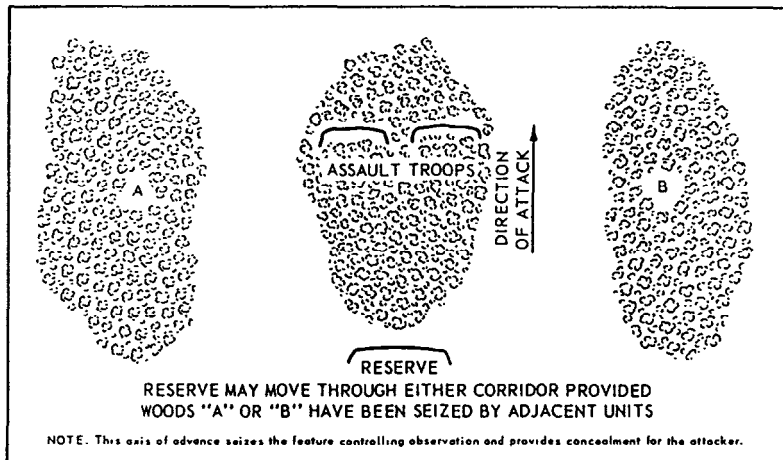


Figure 13. — Attack Through Woods Limiting a Corridor.

d. Vegetation.

(1) Vegetation may influence an avenue of approach in both a favorable and an unfavorable manner. Very dense vegetation may prove to be an obstacle to vehicles, personnel, or both. On the other hand, vegetation may provide concealment for the attacker.

(2) The effect of vegetation in either case is to reduce observation and fields of fire for both the attacker and the defender. The defender may clear vegetation to improve his observation and fields of fire; however, too extreme a clearance will result in giving away his position. The extent of clearing depends on amount of vegetation to be cleared, type of vegetation, density, and length of time the position is to be occupied. In large wooded areas, clearance to the point of obtaining long range observation is largely impractical; thus the defender's long range fires suffer a loss of efficiency. The attacker is able to advance close to the defensive position before observed fires can be placed on him.

(3) Principles applying to compartments formed by relief and drainage apply as well to compartments formed by vegetation or by vegetation and cultural features. Again, the attack in a corridor is dependent on the denial of enemy observation into the corridor, and has the advantage of giving protection against fire from outside the corridor. An attack through woods limiting corridors has the advantages of seizing the features which control observation into the corridor, and of providing concealment. However, control of maneuver becomes more difficult than when using a corridor.

(4) In using woods for an avenue of approach, the following factors should be considered. First, the effectiveness of artillery fired into woods varies with the density of woods and foliage, types of trees, height of trees, and type of fuze used. Second, any patch of woods that can be readily identified and that leads into an enemy position will be included in the defensive artillery fire plan. Small patches of woods may be completely covered by defensive artillery concentrations.

e. Lines of Communications. — Lines of communication include roads, railways, and navigable rivers and canals. Should lines of communication coincide with a favorable avenue of approach, the value of the avenue of approach is greatly enhanced.

Lines of communication are studied and classified in accordance with paragraph d, Sec. 203. The study is facilitated by making special overlays or maps emphasizing the various routes. A study of the general pattern of the most appropriate route will indicate the best avenue of approach from a communications standpoint.

307. HELICOPTER LANDING ZONES

a. Terrain in the objective area influences the size and extent of the landing zones and assignment of missions to subordinate units. Adequate terrain intelligence is needed to permit units to select landing and assembly areas, to plan operations to seize and defend objectives, and to plan reconnaissance of and routes to objectives, assembly areas, or other positions. The nature and extent of obstacles to enemy movement, particularly armor, must be evaluated before preparation of barrier plans. The effects of employment of nuclear weapons by either side must be analyzed.

Selected targets evaluated. Information furnished to plan essential construction, with particular attention to airlanding facilities is obtained. The availability of water supplies and other local resources is evaluated.

b. Intelligence on terrain is disseminated, as available. It should include maps, small and large-scale airphotos of the objective area, airphoto interpretation reports covering enemy installations within and near the objective area, aerial reconnaissance reports, terrain studies, descriptions of obstacles, defensive works, navigational hindrances, and landing areas, as well as large-scale terrain models.

c. Information of a general nature concerning potential helicopter landing zones may be found in the amphibious objective studies. Landing zone data which must be obtained to support planning and operations includes the items listed below.

(1) The geographical location of each helicopter landing site must be identified, using either geographic or military coordinates as directed. As in the case of landing beaches, locate by coordinates only the center of the area described.

(2) Altitude is determined by map inspection or use of altimeter or other barometric instrument by reconnaissance or pathfinder personnel.

(3) The directional orientation of the site and its immediate approaches, with respect to dominating terrain.

(4) Descriptions of prominent terrain, unusual natural or man-made formations, bodies of water, structures, or other landmarks that would tend to help in orientation of helicopter pilots and disembarking troops.

(5) All physical factors of each site affecting either helicopter or ground operations will be obtained as outlined below.

(a) Size. — The size of the helicopter landing site is stated in terms of physical dimensions.

(b) Maximum Absorption of Aircraft. — Helicopter landing zones are selected which can accommodate a required number of helicopters. Unusable portions of the zones must be located and marked. Individual helicopter landing points are selected so that the rotor of one helicopter is no closer than twice the main rotor diameter to an adjacent helicopter.

(c) Surface Material and Soil Trafficability. — Information concerning surface materials present and the soil trafficability within the sites or zones is obtained. The former should be considered in regard to possible rotar wash effect, the latter for vehicular, troop and logistic mobility. Loose debris can cause clogging of engine intakes, temporary loss of visibility, possible bodily injury to troops, or damage to the helicopter. The following specific surface materials should be considered as suggested below.

1 Grass and vegetation from newly mowed fields can clog shielded intakes.

2 Loose dirt and sand can cause damage to engine and rotor blades, temporary loss of pilot visibility and temporary blinding of troops.

3 Snow is not recommended as a landing site surface without prior reconnaissance because the underlying surface may be unsatisfactory.

4 Ashes blown into the eyes of pilots or troops will cause temporary incapacitation.

5 Fire hazard is created by hot exhaust gases in dry grasslands.

(d) Obstacles (natural and manmade). — In the landing zone, obstacles must be evaluated. In order to evaluate obstacles effectively, familiarity with helicopter landing and takeoff characteristics is essential. Although some obstacles may not prevent helicopter landings, they may be of great significance to disembarked ground troops. For example, a line of trees or power lines in the area may prevent helicopter landings while not materially affecting troops activities. Conversely, a deep, precipitous ravine or extensive, swampy border areas may not influence helicopter landings, but would constitute a barrier to ground units.

(e) Slope. — Terrain sloping in excess of 14 percent (8°) is usually considered too steep for mass helicopter landings.

(f) Cultivated Features. — Cultivated areas in use by natives of the region (type cultivation, etc.) must be noted. Vegetative cover can be a restricting factor in the landing of helicopters, particularly in mass landings. High trees at the edge of a site are restrictive. Scattered trees within a potential landing area may be locally restrictive, but may not rule out the use of the area as a whole. Brush, if over 3 feet high is usually considered restrictive to landing helicopters because of likely damage to fuselage and tail rotors. The following specific vegetative types should be evaluated as suggested:

1 Field crops are generally not restrictive except in cases where the crops have supports, such as vineyards. Newly plowed fields are usable but not desirable because of uneven surface and the danger of helicopters sinking into the soil. Cornfields are not restrictive; however, bamboo and like grasses are restrictive.

2 Rice fields are generally restrictive during crop season when paddies are flooded and ground surface is soft; however, off-season use is safe if the paddies are drained and hardened.

3 Grasslands are generally desirable unless associated with meadow marsh, scattered rocks, or broken surface.

(g) Adjacent Terrain and Exits. — Adjacent terrain and exits must be studied in light of the relief, drainage, vegetation, cultural features, communications, routes of approach, observation, visibility, cover, and concealment. The nature and size of exits from the helicopter landing site, both natural and man-made, existing routes of communication, and general area trafficability can then be evaluated.

(h) Other Pertinent Factors. — In response to the requirements of the situation, or as directed by specific Essential Elements of Information (EEIs), it may be necessary to obtain other information.



SECTION 4

TACTICAL EFFECT OF TERRAIN AND WEATHER

401. GENERAL

a. The ultimate object of an analytical study of an area of operations is to determine the effect of weather and its terrain characteristics upon our mission and plan and upon the capabilities of the enemy. The two basic elements upon which this deduction is based are the key terrain features that exist within the area and the best avenues of approach to them. In a defensive situation the mission is accomplished by controlling the key terrain features of the area. This is done by blocking the avenues of approach open to the enemy, and by a proper evaluation and use of the available observation and fields of fire existing under the conditions of weather and terrain at hand. If the mission is offensive, it is accomplished by destroying the enemy's ability to control the key terrain features, usually by seizing and holding them ourselves; utilizing the most effective avenues of approach presented by the conditions of soil trafficability, concealment, obstacles, and cover.

b. The effect of the area of operation on the courses of action open to the enemy assists in determining those courses favored, or not favored, by existing conditions of weather and terrain. The enemy will make every effort to utilize the terrain to his best advantage. However, he may sometimes attack or defend in a less advantageous area in order to gain surprise. It must be kept firmly in mind, in this connection, that no terrain is impassable to a determined attacker, although to cross it may be expensive in time, in lives, or in equipment.

402. THE ATTACK

a. Objectives. — Consistent with the mission of the command, key terrain features may be selected which will assist in the accomplishment of the mission. If the mission is to seize or to secure an area, the key terrain feature or features may be selected with reference to that area. If the mission is to destroy certain enemy forces, key terrain features are selected from which the accomplishment of that mission may be more easily or decisively effected. The key terrain feature, or features, selected may be designated as objectives of the attacking force. Subordinate commands may in turn select key terrain features and assign them as objectives of their attacking units. In this manner commanders can tie their missions to the ground and begin to develop a plan of maneuver.

b. Scheme of Maneuver. — Objectives having been selected, it becomes necessary to select avenues of approach to them. Along that approach which most promises success, the commander will plan his main effort. Thus, by selecting his objectives, his routes to the objective, and the route of his main effort, the commander has begun his scheme of maneuver. There is probably no other single factor that influences a commander's scheme of maneuver more than terrain considerations.

c. Boundaries.

(1) If the avenue of approach selected is in a corridor or along the limiting features of a corridor, the commander places his boundaries so as to secure the

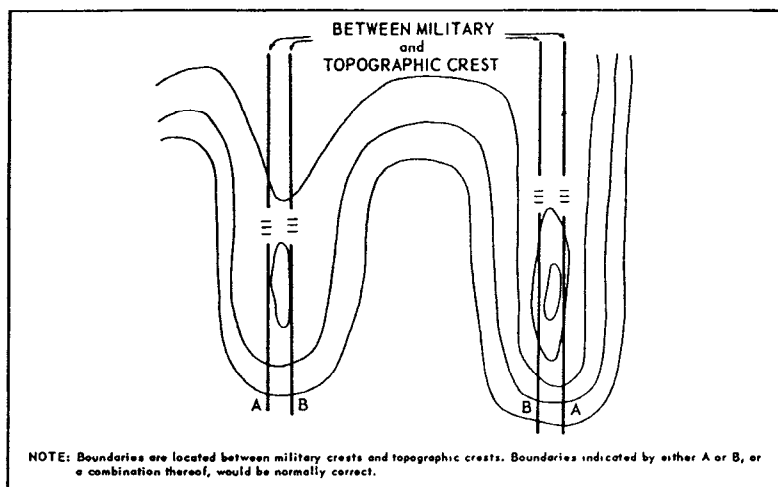


Figure 14. — Possible Boundaries for an Attack Through a Corridor.

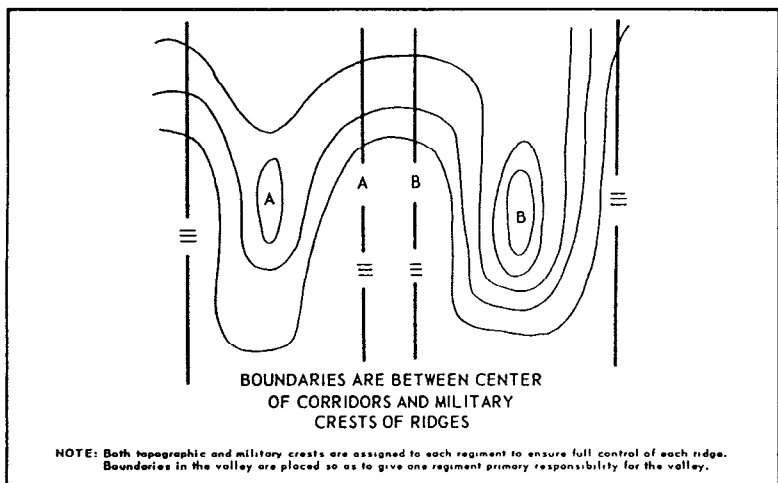


Figure 15. — Possible Boundaries for Attacking Along the Axis of Ridges.

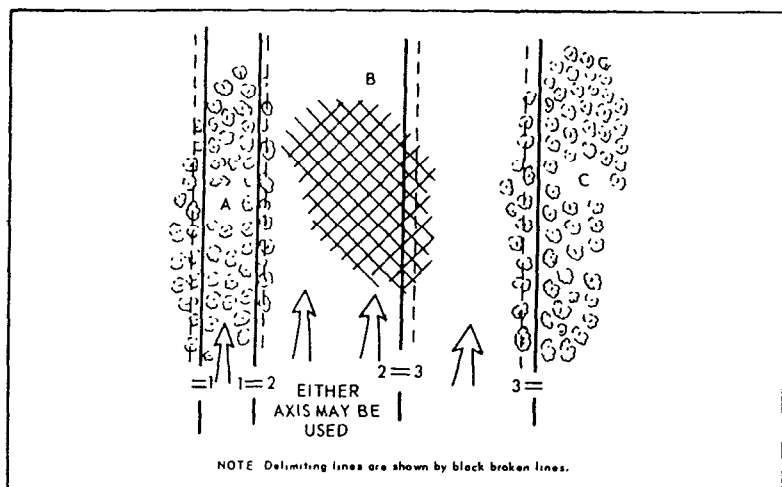


Figure 16. — Attack Boundaries Through Compartments Formed by Vegetation and by Cultural Features.

advantages inherent in those approaches. Primary terrain considerations in locating boundaries in corridors and along ridges are:

(a) Key terrain should not be split between two units.

(b) Sufficient slope must be assigned to enable the attacker to seize, at the minimum, short range observation into corridors.

(c) Topographic crests must be assigned to one unit to insure their control.

(2) Figure 14 shows some possible boundary locations for a regiment attacking through a corridor. By locating the boundaries between the military crests and the topographic crests, enough of the ridges are assigned to this regiment to insure control of short range observation into the corridor thus limiting the defender's flat trajectory fire into the corridor. The boundary line B would assign the topographic crests of the limiting features to adjacent units. The boundary line A would include the topographic crests in the zone of responsibility of this regiment, thus enabling it to control both long and short range observation. Combinations of the boundary lines may be made assigning one or the other of the topographic crests to the regiment.

(3) Figure 15 shows possible boundaries for two regiments attacking on parallel ridges. In order to insure full control of the ridges, each regiment is assigned both the topographic and military crests of their respective ridges. The

boundaries in the valley are so located to insure its control by one of the regiments. If boundary A were assigned, the right regiment would be primarily responsible for the valley. If boundary B were assigned, the left regiment would be responsible for the valley.

(4) Boundaries through corridors formed by vegetation or cultural features would, in principle, be the same as the boundaries illustrated in Figures 14 and 15. That is, in the case of units advancing in corridors, boundaries should extend sufficiently beyond the delimiting lines to insure control of short range observation and to provide maneuver for major subordinate elements. When units are advancing on the axis of limiting features, their boundaries should include enough of the features to insure its control.

Figure 16 shows combinations of boundaries through corridors and along limiting features of corridors formed by vegetation and by cultural features. The First Battalion is attacking on the axis of woods A. The Second Battalion has the choice of advancing through the corridor itself or through town B. The Third Battalion is advancing through the corridor formed by town B and woods C.

403. THE DEFENSE

a. Selection of Position.

(1) In the defense, key terrain features are features which, if not in our possession, render our position untenable. Consequently, they constitute the objectives of an enemy force whose mission is to destroy defending troops or seize

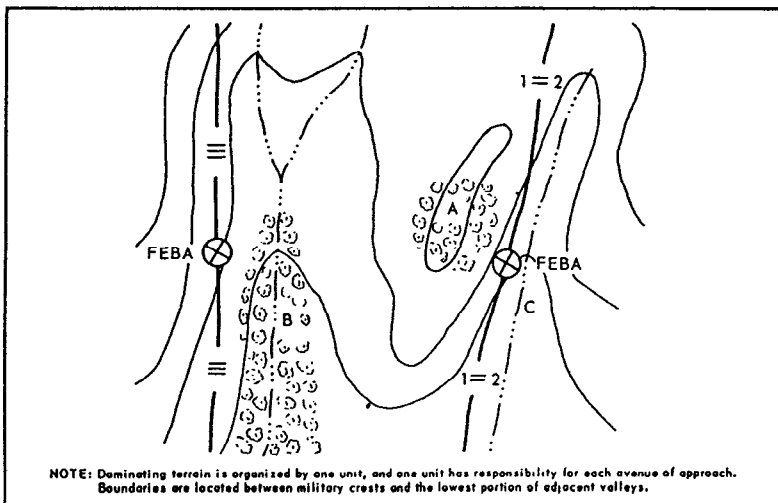


Figure 17. — Boundaries in Defense of Corridors.

their defensive position. The defense is organized, protecting these features, with centers of resistance on dominating terrain. The possession of dominating terrain insures observation and fields of fire as well as covered assembly areas and routes of approach for counterattacking units.

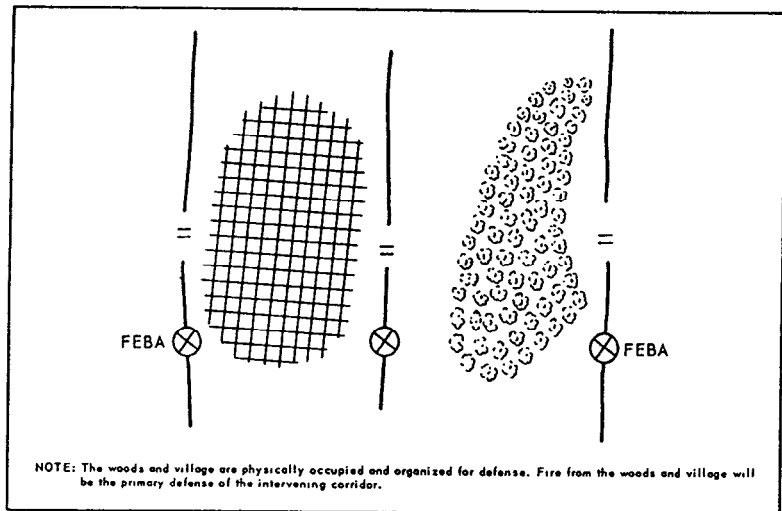


Figure 18. — Boundaries in Defense of Corridors Formed by Woods and Village.

(2) Cross compartments present several aspects favorable to the defender. Their nature often enables the defender to obtain observation and fields of fire throughout his position, facilitates organization laterally and in depth, and provide the defender with successive defensive or delaying positions. The cover or concealment provided by each limiting feature permits the defender to shift reserves and meet or counter the threat of the attacker.

(3) Avenues of approach into a position from the direction of the enemy constitute the weak points of defense. The defensive organization must insure the blocking of these avenues of approach by means of artificial obstacles and by the use of fire. Corridors entering a defensive position break it up so that observation and direct fire used to defend one corridor cannot be used to assist in defending any other part of the position. The defender must try to seek a position without corridors.

b. Boundaries.

(1) In assigning boundaries between units in the defense, the following basic principles apply:

- (a) Responsibility for key terrain should be assigned to one unit.

(b) Responsibility for an avenue of approach should be assigned to one unit, the unit that is most threatened by that avenue of approach.

(2) The application of these principles to units defending a simple cross compartment is dependent not so much on terrain as it is on such factors as the size and strength of the defending unit and the amount and type of supporting weapons.

(3) Simple compartments are rarely found, consequently units find themselves defending complex cross compartments where smaller draws and corridors may extend into their defenses. The attacker can be expected to use these smaller draws as avenues of approach, thereby minimizing the defender's position advantage. In defending corridors emphasis is placed on organizing the limiting features as centers of resistance while fire is primarily relied upon to defend the valleys. The defender endeavors to force the enemy to expend his strength negotiating avenues of approach and then, at the propitious moment, to counterattack him from the high ground.

(4) Figure 17 shows the application of the principles of assigning defense boundaries in corridors. The First Battalion is assigned responsibility for hill A, where it will organize its center of resistance in order to obtain the observation and fields of fire that will control draw B. Draw B provides a possible avenue of approach to hill A; hence, the First Battalion is given responsibility for its defense. The right boundary is located far enough up the slope of the adjacent ridge to give the First Battalion sufficient high ground to insure control of the draw; it is located at some point between the military crest and the lowest portion of the draw. Similarly, since draw C leads back into the Second Battalion area, the Second Battalion is assigned responsibility for its defense.

(5) The same principles apply to boundaries located in corridors formed by vegetation and cultural features. The woods or villages provide the terrain features which control the corridors, and they will be the areas organized and occupied by the defender.

SECTION 5

AIDS TO STUDY OF TERRAIN

501. GENERAL

Although map and aerial photograph reading is a basic military art, there are few individuals who can look at a map and quickly sort out all terrain characteristics necessary for tactical study from the mass of detail shown. This section deals with some techniques that will aid in analyzing an area. For the most part, these techniques deal with methods of marking maps, aerial photos, or overlays in order to emphasize terrain characteristics. The methods described are suggested methods. Individuals should adopt any method or combination of methods that enable them to "see" the terrain to best advantage.

502. EMPHASIZING TERRAIN FEATURES

a. Ridge and Stream Lining. — This consists of emphasizing streams by drawing over them with a heavy blue pencil and emphasizing ridges with brown or red pencils. When emphasizing ridges, heavy lines are drawn along the topographic crests. Ridge lining or stream lining can be used separately, if desired, but the combination of the two is more effective. This method emphasizes the compartmentation of an area, but does not show relative elevations or slope. This method is applicable to aerial photographs. Compare Figures 19 and 20 and Figures 21 and 22 to see the effect of ridge and stream lining.

b. Layer-tinting (Hypsometric Tinting).

(1) Layer-tinting consists of coloring or shading successive elevations of the ground. By selecting a series of colors ranging from yellow through orange, red, and brown to color successive elevations (from the lowest elevation to the highest), following the contouring of the map, a realistic three-dimensional effect is created. It is not necessary to color the entire map — uncolored portions may represent the lowest areas, thus giving the effect of using five colors or dividing elevation into five portions. Care should be taken to color lightly using colored pencils; coloring heavily or using crayons or ink may result in obliterating other terrain details. It is not recommended that more than four colors be used except in areas where relief may be extremely difficult to interpret.

(2) By layer-tinting, the size, slope, and configuration of all the high ground and all the low ground are instantly apparent. A map or overlay of this type is the best manner to describe the relief of an area. Textural material is rarely necessary to supplement it. This method is not applicable to aerial photos. See Figure 23 for an example of layer-tinting.

(3) A modification of layer-tinting may be accomplished by using the same color scheme, but emphasizing the contour lines only. This method is quicker but not as effective.

c. Hill Topping. — Hill topping is a method of accentuating the high ground in an area. It is done by selecting a critical elevation and then coloring or shading all

areas higher than that elevation. This method shows only the size and location of the higher ground within an area. This method is not applicable to aerial photos. Figure 24 shows an example of hill topping.

d. Routes of Communication. — Routes of communication may be emphasized by marking over land routes in black and by emphasizing water routes heavily in blue. Water routes should be marked heavily enough so as not to confuse them with possible stream lining of a map. Emphasis in this manner makes the general pattern of communication routes readily apparent. This method may be used with aerial photos. Figure 25 shows example of emphasizing roads.

e. Going Map. — “Going” may be indicated on a map or overlay by a system of cross hatching in black, with an accompanying legend. A more effective method is to color a map or overlay, using the colors of the conventional traffic light, as follows:

- (1) Green for good going.
- (2) Amber (yellow or orange) for fair going.
- (3) Red for poor going and for obstacles.

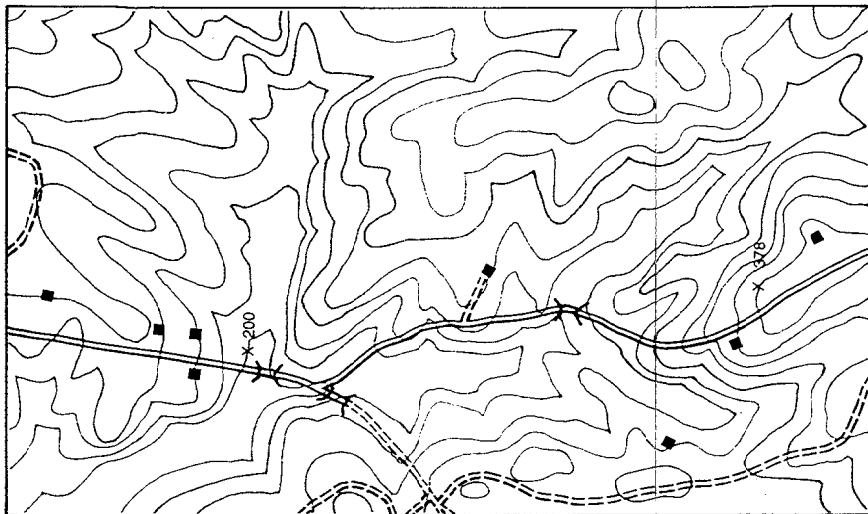


Figure 19.--A Topographic Map Prior to Coloring.

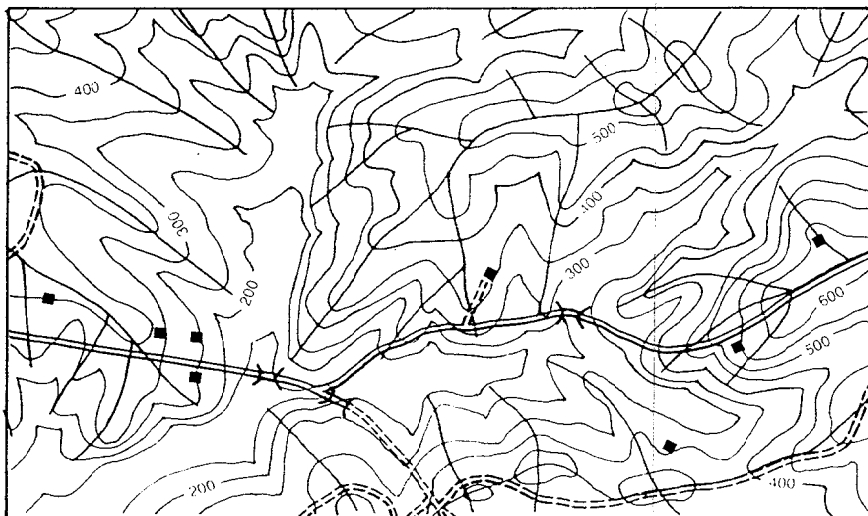


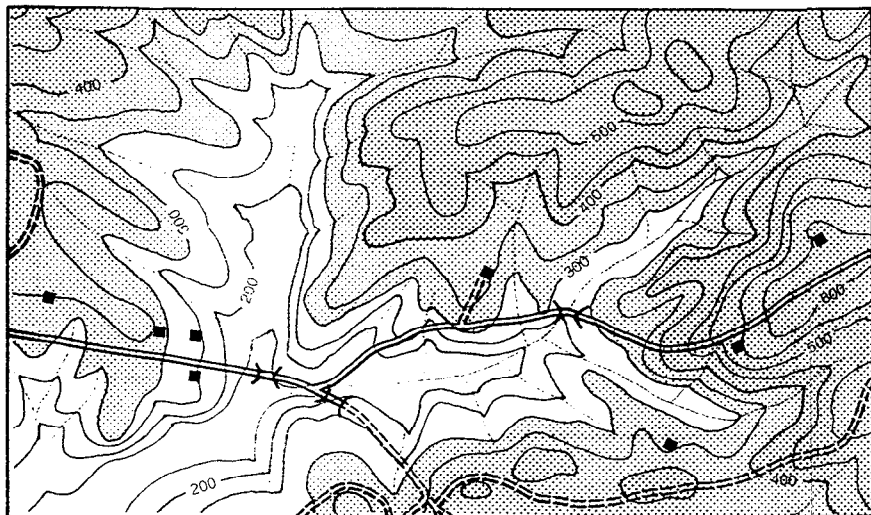
Figure 20 --A Topographic Map That Has Been Ridge and Stream Lined.



Figure 21.--An Unmarked Aerial Photograph.



Figure 22 --An Aerial Photograph That Has Been Ridge and Stream Lined.



NOTE: The uncolored portion represents areas under 200 feet, yellow represents 200 feet to 300 feet, orange represents 300 to 400 feet, red represents 400 to 500 feet, and brown represents all areas over 500 feet.

Figure 23.--A Layer-Tinted Map.

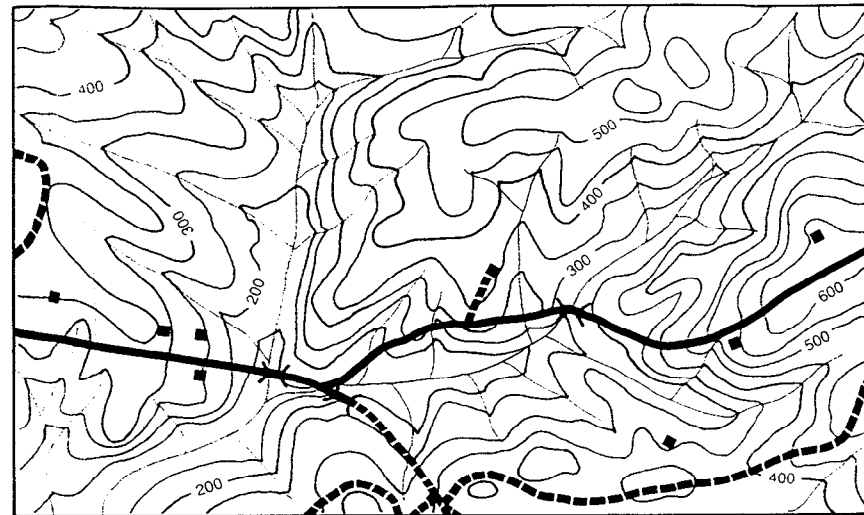
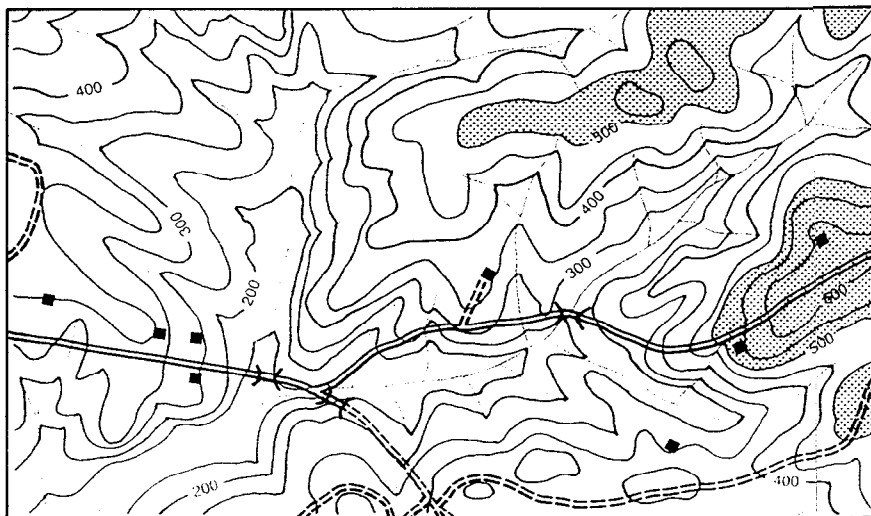
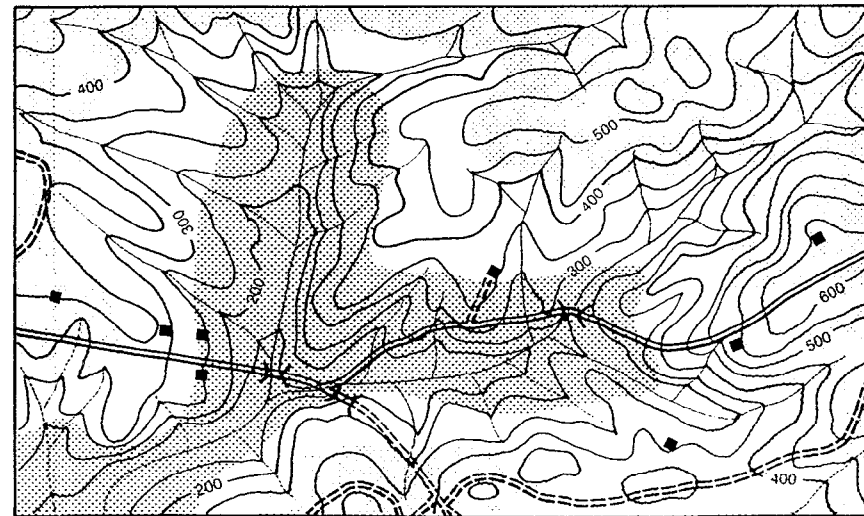


Figure 25.--A Map Where Routes of Communication Have Been Emphasized.



NOTE: All areas over 500 feet have been colored to indicate the size and shape of the high ground.

Figure 24.--A Map That Has Been Hill Topped.



NOTE: Green indicates good going, amber indicates fair going, red indicates poor going or obstacles.

Figure 26.--Going Map.



CHAPTER 1 EXERCISE 1 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	c.	1203g
2.	b.	1203d
3.	d.	1203
4.	b.	1203f
5.	a.	1203b
6.	c.	1203f
7.	a.	1203c
8.	d.	1203h, 1203i

CHAPTER 1 EXERCISE 2 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	d.	1302d
2.	c.	1304b
3.	b.	1304b
4.	b.	1302d
5.	d.	1306b
6.	d.	1306a
7.	a.	1306b
8.	d.	1306c

CHAPTER 1 EXERCISE 3 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	c.	1402a
2.	a.	1402a
3.	a.	1403b
4.	b.	1404a
5.	c.	1403
6.	d.	1405a
7.	a.	1405a
8.	a.	1405b
9.	c.	1405b
10.	b.	1405b

CHAPTER 1 EXERCISE 4 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	c.	1502a(5)
2.	c.	1502a
3.	a.	1503b
4.	c.	1503a
5.	c.	1503a
6.	c.	1503b
7.	b.	1503b

CHAPTER 2 EXERCISE 1 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	b.	2201
2.	d.	2202b
3.	c.	2203f
4.	d.	2203g(1)
5.	c.	2204c
6.	d.	2204f
7.	b.	2205b

CHAPTER 2 EXERCISE 2 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	b.	2402
2.	c.	2402
3.	a.	2401
4.	d.	2404b
5.	b.	2303a
6.	a.	2404a
7.	b.	2405b

CHAPTER 3 EXERCISE 1 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	b.	3101a
2.	a.	3105h
3.	d.	3104a
4.	a.	3104b
5.	c.	3107m
6.	a.	3107m
7.	a.	3108

CHAPTER 3 EXERCISE 2 SOLUTIONS

<u>Question</u>	<u>Answer</u>	<u>Reference</u>
1.	a.	3109
2.	a.	3110a
3.	d.	3112a
4.	a.	3112b
5.	b.	3112d
6.	a.	3113
7.	c.	3111a

COURSE EXAMINATION

ESTIMATED
STUDENT
EFFORT:

1 hour

ANSWER: Questions 1 through 50. Select best answer for each exam item.

SUBMIT: Machine-scored answer sheet;
Course Evaluation Questionnaire.

1. A commander who employs his forces in such a manner as to place the enemy at a disadvantage and thus achieve results which otherwise would be more costly in men and material is practicing the principle of _____.
 - a. the offensive
 - b. maneuver
 - c. mass
 - d. unity of command
2. Which kind of mission is undertaken to gather information about the enemy or a geographical area?
 - a. Reconnaissance
 - b. Surveillance
 - c. Security
 - d. Counterreconnaissance
3. Which of the following is essential to the preservation of combat power?
 - a. Simplicity
 - b. Economy of force
 - c. Security
 - d. Surprise
4. Which of the following is not a fundamental of reconnaissance?
 - a. Maintain enemy contact
 - b. Orient on the location and movement of the intelligence objective
 - c. Develop the situation
 - d. Fix the enemy force by decisively engaging it for exploitation by friendly combat units
5. The individual members of a reconnaissance patrol do not possess the background to determine whether a piece of information is significant or not. This will be done by _____.
 - a. battalion commander and S-3
 - b. battalion commander and S-2
 - c. battalion commander the supporting reconnaissance unit commander
 - d. battalion commander and the G/S-2 of regiment and division
6. What is the major reconnaissance means for an infantry battalion?
 - a. Division reconnaissance battalion assets supporting the infantry battalion
 - b. STA Platoon under control of the battalion S-2
 - c. Patrolling efforts of the rifle companies
 - d. Aerial, force, and battalion reconnaissance assets supporting the infantry battalion
7. Which of the following is the security force which operates forward of a moving main body and is offensive in nature?
 - a. Advance covering force
 - b. General outpost
 - c. Screening force
 - d. Advance guard
8. The regimental command net is normally established in the battalion's _____.
 - a. S-3 section
 - b. communications center
 - c. S-1 section
 - d. S-4 section
9. What is the primary mission of the force reconnaissance company?
 - a. To conduct preassault and deep postassault reconnaissance in support of the landing force
 - b. To reinforce and augment units from the reconnaissance battalion
 - c. To provide distant ground reconnaissance and observation in support of the division
 - d. To conduct long-range patrols of a correct nature to screen the landing force's front

10. Experience has indicated that it is desirable to employ radars _____.
 - a. in well camouflaged sites over trees and foliage
 - b. in widely separated sites to ensure minimum overlapping of coverage
 - c. on prominent terrain features to permit a 360° scan
 - d. in pairs
11. A combat patrol normally is composed of assault, _____ elements.
 - a. security, and command
 - b. security, and support
 - c. support, and command
 - d. scouts, and command
12. The systematic observation of air, surface or subsurface areas, places, persons, or things, by visual, aural electronic, photographic, or other means for intelligence purposes is _____.
 - a. reconnaissance
 - b. surveillance
 - c. security
 - d. counterreconnaissance
13. Who has the responsibility to arrange for the routing of traffic received on the battalion tactical net which is of interest to other staff sections?
 - a. Communications officer
 - b. S-1
 - c. Message center
 - d. S-3
14. Where is the battalion tactical net usually operated?
 - a. In the communications center
 - b. In the message center
 - c. In the S-3 section
 - d. In the radio control center
15. In the field, the tactical air control party is under the control of the _____.
 - a. communications officer
 - b. fire support coordinator
 - c. air officer and forward air controllers
 - d. supported rifle company executive officer
16. In applying the offensive fundamental of developing the situation, actions are taken to determine the enemy characteristics. Which of the following characteristics is not determined.
 - a. Strength
 - b. Location
 - c. Morale
 - d. Composition
17. Which of the following is not a "general rule" of offensive combat?
 - a. Retain the initiative.
 - b. Coordinate the attack.
 - c. Maintain momentum.
 - d. Exploit success.
18. The type of offensive operation which is used when a well-organized enemy position must be destroyed or penetrated is the _____.
 - a. reconnaissance in force
 - b. supporting attack
 - c. movement to attack
 - d. deliberate attack
19. Which type of offensive operation is a limited objective operation by a considerable force that obtains information and locates and tests enemy dispositions, strengths, and reactions?
 - a. Movement to contact
 - b. Envelopment
 - c. Turning movement
 - d. Reconnaissance in force
20. Which maneuver is designed to seize an objective deep in the enemy's rear, and, thereby force him to abandon frontline positions?
 - a. Penetration
 - b. Turning movement
 - c. Pincer
 - d. Envelopment

21. The form of maneuver in the offensive which is delivered along a wide front and is often confined to supporting attacks is the _____.
- frontal attack
 - penetration
 - envelopment
 - turning movement
22. Which of the following is not a means of assistance that the supporting attack renders to the main attack?
- Holding the enemy in position and preventing disengagement
 - Deceiving the enemy as to the location of the main attack
 - Forcing the enemy to commit his reserve prematurely or at an indecisive point
 - Achieving decisive superiority on the enemy or the objective
23. Which tactical control measure is normally used in closely controlled attacks such as the night attack and counterattack?
- Axis of advance
 - Zone of action
 - Direction of attack
 - Route of advance
24. The tactical control measure which is designated as a point where the commander desires his units to make physical contact is the _____.
- coordinating point
 - contact point
 - checkpoint
 - release point
25. A control measure possessing the characteristics of being easily recognizable, providing for the convergence of effort, and causing destruction or capture of the enemy is the _____.
- route of march
 - objective
 - line of departure
 - axis of advance
26. Which tactical control measure allows a commander to bypass the enemy, so long as the enemy does not threaten the accomplishment of the mission and provided such action is promptly reported to the next higher commander?
- Zone of advance
 - Route of advance
 - Axis of advance
 - Direction of attack
27. In normal ground combat, a battalion commander's plan of attack is comprised of a fire support plan and a(an) _____.
- scheme of maneuver
 - attack formation
 - consolidation plan
 - reorganization plan
28. All of the following statements are true about the commander's troop-leading procedure except that it _____.
- ensures concurrent planning by subordinates
 - consists of a scheme of maneuver and plan of fire support
 - ensures best use of time, equipment, and personnel
 - may be modified to fit different situations
29. Which of the following is an appropriate mission for the battalion reserve in the defensive situation?
- Detach elements to reinforce forward companies.
 - Conduct reconnaissance missions forward of the GOP.
 - Prepare and occupy positions on the FEBA.
 - Prepare and occupy blocking positions.
30. The mobile defense is normally conducted by _____ units.
- companies and smaller
 - divisions and larger
 - battalions and smaller
 - regiments and larger

31. The form of defense in which the defender retains the preponderance of his force, as a strong maneuverable reserve, positioned for offensive action, is called a _____ defense.
- area
 - perimeter
 - mobile
 - linear
32. To deny the attainment of the enemy's purpose in attacking is the general objective of the _____.
- block
 - maneuver
 - counterattack
 - movement to attack
33. The battalion barrier plan is usually based on the barrier plan of _____.
- the engineer battalion
 - the enemy
 - higher echelons
 - the rifle companies input
34. In the defense, fire support plans are developed in response to the instructions of the battalion commander. Staff supervision over these plans to ensure complete coordination is maintained by the _____.
- battalion XO
 - S-3
 - battalion CO
 - S-2
35. The maximum frontage a rifle company, under ideal conditions with two platoons forward, can be expected to defend is _____ meters.
- 750
 - 1,000
 - 1,500
 - 2,000
36. In the area defense, enemy targets are first engaged _____.
- as part of the close defensive fires
 - when the FPFs are employed
 - as part of the long-range fires
 - by fires within the battle area
37. When is the enemy attacking force brought under fire in the defense?
- When the defending force becomes threatened
 - When his intentions are apparent
 - When the enemy force has deployed
 - As soon as he comes within observation
38. The commander plans alternate and supplementary positions to ensure _____.
- dummy positions are employed for deception
 - blocking positions are prepared for the reserve force
 - flexibility and all-round defense
 - troops are provided safe resting areas between bombardments
39. Which offensive operation is most frequently associated with the defense?
- Frontal attack
 - Turning attack
 - Pursuit attack
 - Counterattack
40. Two variations of the area defense are _____ defenses.
- separated and rear area
 - perimeter and reverse slope
 - active and perimeter
 - forward slope and reserve slope

41. When enemy ground observation of the battle area is masked, the defense which is designed to impose maximum casualties on the enemy forward of our position and to deceive him as to the true location of the forward defense area is the _____.
- defense of a river line
 - reverse slope defense
 - forward area defense
 - perimeter defense
42. While a battalion commander is analyzing his defense sector, he will visualize the forces required to hold his sector. In determining the forces required, you as the battalion commander will visualize the employment of _____.
- battalions
 - companies
 - platoons
 - squads
43. In determining the forces required to hold his sector of defense, the commander visualizes the deployment of troops _____.
- one level below his own
 - which he has to work with
 - two echelons below his own
 - three echelons below his own
44. What are the three essential elements of a counterattack plan?
- Assembly area, axis of advance, and direction of attack
 - Direction of attack, line of departure, and objective
 - Limit of advance, objective, and boundaries
 - Axis of advance, line of departure, and objective
45. The plan of defense formulated by the battalion commander and his staff consists of scheme of maneuver for the defense and a (an) _____.
- operations overlay
 - terrain analysis
 - intelligence summary
 - plan of fire support
46. When a commander is planning for maximum separation between units he does not accept gaps between _____.
- companies
 - battalions
 - units at any levels
 - the reserve and forward units
47. The COP is a security element of which of the following?
- Company
 - Battalion
 - Regiment
 - Division
48. The primary mission of the COP is to provide the regiment and battalions timely warning of the enemy's approach and to _____.
- engage him in close combat to inflict maximum punishment
 - deny him close ground observation unopposed
 - force him to employ infiltration tactics
 - conduct clandestine reconnaissance operations
49. Avenues of approach are based on analysis of all of the following except _____.
- relief and drainage
 - visibility
 - vegetation
 - routes of communication
50. When making a terrain study, which of the following is not to be considered?
- Steepness and slopes
 - Height and size of hill masses
 - Size of valleys and draws formed by drainage features
 - Relief difference across the area of operations



COURSE EVALUATION QUESTIONNAIRE
TACTICAL FUNDAMENTALS, MCI-7510B (1984)

a. Introduction

To improve the instructional materials and methods of presentation in this course, we ask you to complete this questionnaire.

b. Methods of evaluation

- (1) Please make your written comments on the sheet provided. recommendations
- (2) If you should circle a "Strongly Disagree," please submit comments/recommendations or any other constructive criticism.
- (3) Criteria. -- Abbreviations represent these terms:

SA - Strongly Agree	D - Disagree
A - Agree	SD - Strongly Disagree
U - Undecided	

c. Evaluation. Circle the appropriate abbreviation.

- | | | | | | |
|---|----|---|---|---|----|
| (1) I think that the <u>Purpose</u> of this course has been fulfilled. | SD | D | U | A | SA |
| (2) I think that the course learning objectives stated have been met. | SD | D | U | A | SA |
| My evaluation of testing procedures follows: | | | | | |
| (3) The method of presentation was appropriate to my rank. | SD | D | U | A | SA |
| (4) The level of instruction was appropriate for my MOS. | SD | D | U | A | SA |
| (5) The examples used contributed to the learning process. | SD | D | U | A | SA |
| (6) My overall evaluation of the text is favorable. | SD | D | U | A | SA |
| (7) The lesson exercises contributed to the learning process. | SD | D | U | A | SA |
| (8) The course examination adequately measured understanding of material presented in the course. | SD | D | U | A | SA |
| (9) My goals for taking this course have been attained. | SD | D | U | A | SA |
| (10) My overall evaluation of this course is favorable. | SD | D | U | A | SA |
| (11) I completed this course, including the final examination, in _____ hours. | | | | | |

- d. Comments and recommendations. Your comments and recommendations will be used during the rewrite of this course. All input is appreciated.

- e. Please provide the following:

(1) Rank: _____

(2) MOS: _____

(3) Current assignment: _____

- f. If you have any instructional/administrative problems, write your problem below. Include your name and address so the appropriate division can answer your questions.

Name: _____

SSN: _____

Address: _____
