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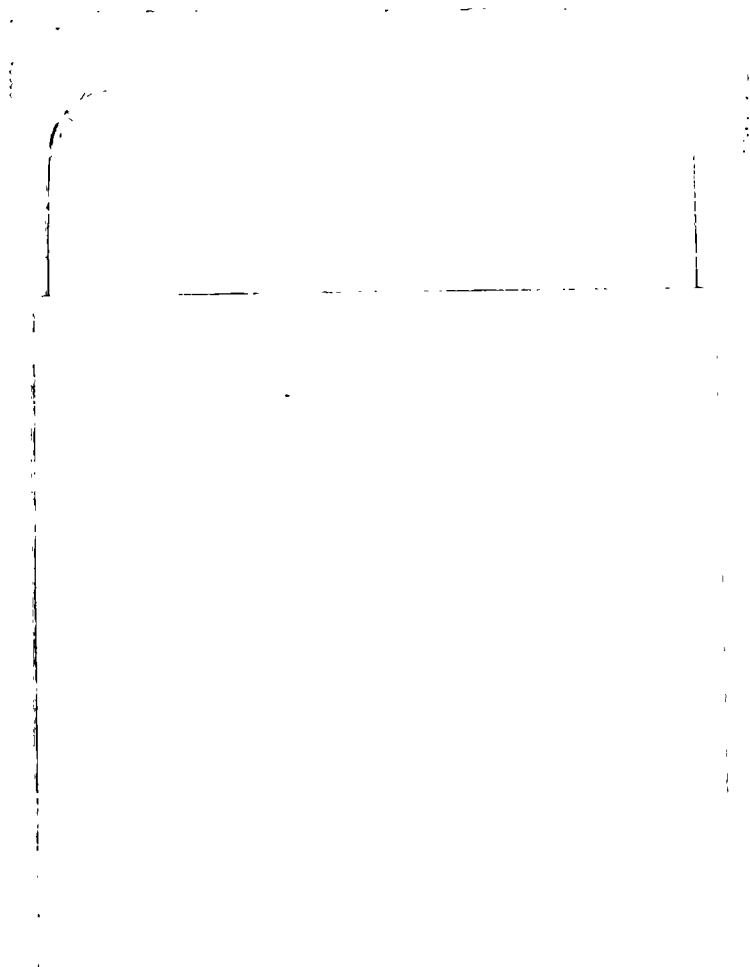
FIELD MANUAL

AIRMOBILE OPERATIONS

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HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1971



PREFACE

The revised FM 57-35 incorporates the latest combat-proven doctrine on airmobile operations. It was compiled as a coordinated effort between the USACDC Infantry Agency and the CONARC Infantry School to keep the manual abreast of rapid advances in airmobility. Major changes in the revised manual are as follows:

- a.* Increased focus on the ground commander's requirements in airmobile operations rather than aviation techniques.
- b.* Expanded coverage on offensive and defensive airmobile operations.
- c.* Added chapter on combat service support incident to airmobile operations.
- d.* Expanded discussion of the roles of attack helicopters in support of ground operations.



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DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 25 March 1971

AIRMOBILE OPERATIONS

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Purpose

This manual provides doctrinal guidance for planning and executing airmobile operations.

1-2. Scope

a. The guidance deals with all aspects of airmobile operations to include the planning and conduct of airmobile operations and follow-on aviation support of the airmobile force. The principles and techniques are applicable to all infantry units, armored cavalry regiments, and selected units of armored divisions.

b. The material presented is applicable to non-nuclear warfare. Appropriate modifying guidance for nuclear warfare and employment of, and protection from, special munitions is integrated throughout the manual. The manual is also applicable to cold war and stability operations.

c. The doctrine in this manual does not change the doctrine, procedures, or command relationships for joint airborne operations, nor does it alter the role of the Air Force in providing the Army with air support, as established by current policy and directives. Joint doctrine, responsibilities, and procedures employed by the U.S. Army

and U.S. Air Force in planning, coordinating, and executing tactical airlift in joint air-ground operations are contained in FM 100-27 and FM 57-1.

d. Users of this manual are encouraged to submit recommendations to improve its clarity or accuracy. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commanding Officer, United States Army Combat Developments Command Infantry Agency, Fort Benning, Georgia 31905. Originators of proposed changes which could constitute a significant modification of approved Army doctrine may send an information copy, through command channels, to the Commanding General, United States Army Combat Developments Command, Fort Belvoir, Virginia 22060, to facilitate review and followup.

e. Certain provisions of this manual are the subject of the international standardization agreements listed below:

<i>Title</i>	<i>NATO STANAG</i>	<i>CENTO STANAG</i>	<i>SEATO STANAG</i>	<i>ABCA SOLOG</i>	<i>ASCC ASG</i>
(1) Aircraft Marshalling Signals	3117	3117	3117	----	----
(2) Safety, Emergency, and Signalling Procedures for Tactical Air Transport Operations	3465	----	3465	127	----
(3) General Rules Covering the Transport of Loads by Helicopter	3468	3468	3468	----	----
(4) Basic Operating Responsibilities and Procedures for the Carriage of Cargo by Helicopter	----	----	----	----	44/24
(5) Personnel Operating Procedures for Helicopters in the Tactical Transport Role	----	----	----	----	44/25A

1-3. Terms

AR 310-25 contains definitions of most terms used in airmobile operations. New terms are explained where first used in the text.

1-4. Characteristics of Airmobile Operations

a. An airmobile operation is one in which combat forces and their equipment move about the battlefield in air vehicles under the control of a ground force commander to engage in ground combat.

b. Airmobile operations are characterized by—

- (1) Surprise.
- (2) Flexibility.
- (3) Maneuver over large areas.
- (4) Precise timing.
- (5) Speed of execution.

c. Airmobile operations are usually executed in lightly defended areas. They can be conducted in areas occupied by well-organized enemy combat forces when preceded by neutralizing air bombardment or intense field artillery fires.

d. Because of the speed of execution of airmobile operations, rapid reaction to the developing situation is essential, and a dependable, effective communication system is required. The success of an airmobile operation will depend on how effectively a commander employs and controls his forces using the communications means available to him.

e. Airmobile operations are especially sensitive to the overall air situation, to include both friendly and enemy air defense capabilities.

1-5. Capabilities and Limitations of Airmobile Task Forces

a. *Capabilities.* An airmobile task force (AMTF) possesses the capability to—

(1) Attack from any direction, strike objectives in otherwise inaccessible areas, overfly barriers, bypass enemy positions, achieve tactical surprise, and cause the enemy to react prematurely or expose himself to other attacking forces.

(2) Rapidly concentrate, disperse, or redeploy to extend its area of influence, to develop enemy contact, or to decrease its vulnerability to enemy attack.

(3) Provide greater flexibility to the force commander in organizing for combat by allowing him to commit a larger assault force while placing reliance on a small, highly mobile reserve.

(4) Maintain a rapid tempo of operations by fighting simultaneously in more than one direction or in more than one area of operation (AO).

(5) Conduct operations in marginal weather, thus facilitating deception and surprise.

(6) Conduct operations independent of a ground line of communication.

b. *Limitations.* Airmobile operations may be limited by—

(1) Weather conditions which would not impede conventional ground combat forces.

(2) Type and quantity of supporting weapons and heavy equipment which can be airlifted into the objective area.

(3) Dependence upon an air line of communication which limits sustained operations or dictates early ground linkup.

(4) The requirement for local air superiority and adequate suppression of enemy ground fires along flight routes.

(5) A limited capability to engage in sustained combat without substantial reinforcements.

(6) Limited ground-vehicle mobility upon completion of the air movement phase of an airmobile operation.

(7) Enemy action during landing, assembly, or takeoff in unsecured areas.

1-6. Missions of an Airmobile Task Force

a. Missions that may be assigned an AMTF include—

(1) Seizure and retention of key terrain.

(2) Envelopment and over-obstacle operations.

(3) Raids.

(4) Counterairborne, counterairmobile, and counter guerrilla operations.

(5) Exploitation of the effects of nuclear and special weapons and conventional bomber strikes.

(6) Reconnaissance and security missions designed to block or screen avenues of enemy approach during an operation, such as covering force, flank guard, and rear area security.

(7) Feints and demonstrations.

(8) Economy-of-force missions.

(9) Counterattack of enemy penetrations.

(10) Relief operations.

(11) Composition of a highly mobile reserve.

(12) Long range patrols.

b. Additional information relative to airmobile forces in offensive, defensive, retrograde, and special operations is contained in chapter 2.

1-7. Concepts of Employment of Airmobile Forces

a. Airmobile forces are employed in the furtherance of a ground combat effort. The fundamental concept of Army airmobility provides for

use of Army aircraft to increase the ground combat element's capability to perform and provide a better balance among the five functions of land combat: Mobility; firepower; intelligence; command, control, and communications; and combat service support. The Army employs this concept by allocating aircraft to ground units, thus enhancing their combat capability; and by organizing, equipping, and training units to use Army aircraft in accomplishing missions.

b. The capability of ground and aviation units to conduct airmobile operations must be highly developed through the conduct of frequent airmobile training and the development of pertinent

unit standing operating procedures (SOP). Subordinate unit SOP are based on those prepared by the headquarters having control over the combined ground aviation units which compose the airmobile force. SOP should include provisions for air movement of assault elements of infantry units utilizing utility and cargo helicopters, to include normal attachments.

c. Combat support and combat service support elements for infantry battalions/brigades must be air-transportable by Army helicopters if adequate support is to be provided throughout the operation.

Section II. COMPOSITION, COMMAND, AND RESPONSIBILITY

1-8. Composition

The composition of an airmobile force is dictated by specific mission requirements. The force must contain ground and aviation units, and it usually has combat support and combat service support units attached, in direct support, or under the operational control of the commander of the ground units.

1-9. Command Relationships

a. Because of the great demand for airlift throughout the field army, aviation elements normally will be available to a ground commander only for the time necessary to accomplish the mission. The lowest level of ground command capable of controlling the operation and coordinating the required support (e.g., coordination of artillery, air defense, air support, regulation of air traffic over the area of operations, and the AMTF plan of maneuver and combat service support with higher, subordinate, and adjacent units) exercises control over the aviation unit. The division tactical operations center (DTC) has the responsibility for coordinating the use of air space. The aviation unit supports the ground force in the manner specified by the headquarters which has control over both forces.

(1) *Operational control* is the authority granted to a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which usually are limited by function, time, or location; to deploy units concerned; and to retain or assign tactical control of those units. Operational control does not include authority to assign separate employment of components of the units concerned. Neither does it, of itself, include administrative or logistic control. Operational control is desirable because it

places no logistical responsibility for the supporting unit on the supported unit.

(2) *Attachment* is the placement of units or personnel in an organization where such placement is relatively temporary. Subject to limitations imposed by the attachment order, the commander of the formation, unit, or organization receiving the attachment will exercise the same degree of command and control over it as he does over units and persons organic to his command. However, the responsibility for transfer and promotion of personnel normally will be retained by the parent formation, unit, or organization. Attachment of an aviation unit to a ground unit requires careful consideration of the logistical responsibilities inherent in such a relationship.

(3) *Assignment* is the placement of units or personnel in an organization where such placement is relatively permanent and/or where such organization controls and administers the units or personnel for the primary function, or greater portion of the function, of the unit or personnel. Aviation units may be assigned to a ground force when the mission of the ground force requires independent action and the time required to accomplish the mission is exceptionally long.

b. Ground and aviation units must be well trained and coordinated to conduct a successful airmobile operation. The directing headquarters must clearly delineate authority and responsibility.

1-10. Responsibilities

a. Overall responsibility for an airmobile operation is vested in the ground commander at the lowest level of command which has the capability to control the operation and provide or coordinate

the required support. In most cases, this is the battalion with its staff and organic or direct support elements.

b. Responsibilities of the aviation mission commander are discussed in chapter 5.

c. In stability operations, U.S. Army aviation units may be deployed to support host country

forces. The responsibility and authority to conduct these operations are normally vested in the senior U.S. military advisor at the level where aviation resources are available. The degree of participation of Army aviation is determined by U.S. policy, the desires of the host government, and the nature of insurgent activity.

CHAPTER 2

TYPES OF AIRMOBILE OPERATIONS

Section I. GENERAL

2-1. Introduction

a. The types of offensive, defensive, and retrograde operations which can be accomplished by a ground force are not materially changed by providing the force with an airmobile capability. The speed, surprise, and flexibility afforded by the airmobile capability allow the commander to react rapidly to new intelligence concerning the enemy and thereby enhance the probability of success.

b. Objectives must be selected which will cause the enemy to react violently, either by diverting strong forces away from another area in which a crucial operation is being conducted, or by withdrawing from an area to avoid destruction.

c. The increased mobility of an AMTF compared to that of a dismounted ground force provides an AMTF commander battlefield flexibility and enables him to conduct operations to a greater depth within his area of operations. Airmobile forces are employed on deep objectives at increased risk. Greater exposure to enemy ground fire, commensurate loss of surprise, possible involvement with enemy reserves, and increased vulnerability to enemy counterattack pending linkup with other ground forces are risks which

must be expected in deep airmobile operations. The prerequisites to success in deep operations are the capability to move forces to an objective area; to operate without ground lines of communication; to provide required combat and combat service support; and to withdraw the force when required.

d. Following the seizure of an objective area, an AMTF may continue the attack, defend, link up with a surface force, or conduct retrograde operations. Because an airmobile force can be readily redeployed, it can provide the commander with a reserve force capable of rapid reaction to a developing situation.

e. Airmobile forces are especially vulnerable to enemy signal intelligence and electronic warfare activities. The susceptibility of radio to intercept and subsequent exploitation is significantly increased in air-to-ground communications due to greater line-of-sight and corresponding effective transmission range. Operations, therefore, can be seriously disrupted unless adequate provisions are made for effective signal security and electronic counter-countermeasures (para 3-7).

Section II. OFFENSIVE OPERATIONS

2-2. General

a. Airmobility enhances the ground combat elements' capability to conduct offensive operations. The airmobile force can be assigned a mission of seizing terrain, developing enemy dispositions, depriving him of required resources, diverting his attention, or destroying his force.

b. Offensive operations include the movement to contact, reconnaissance in force, coordinated attack, exploitation, and pursuit. Airmobile forces are particularly suited to the envelopment form of maneuver. Practical applications could include raids and limited-objective attacks. Since excellent mobility is provided by the use of helicopters, a frontal attack is seldom required and should be

avoided whenever an envelopment can be accomplished. The ability to rapidly reinforce a successful attack is a potential which should not be overlooked in planning.

c. Fire support planning for airmobile operations must be detailed, closely coordinated, and fully integrated. This planning should include all of the available fire support means to include attack helicopters, field and aerial field artillery, air defense artillery used in the fire support role, close air support, and naval gunfire. Airmobile operations may often be conducted beyond the range of direct support (DS) field artillery. In these cases, consideration must be given to pre-positioning DS artillery forward prior to assaults

and/or planning for additional fire support means such as close air support, attack helicopters, or naval gunfire to provide support until the DS artillery can be moved into the area of operation. The supporting range of DS artillery will be one of the initial considerations when conducting airmobile operations. Ideally, all airmobile assaults will be conducted within the supporting range of DS artillery weapons. For a detailed discussion of fire support planning, see paragraph 3-10.

2-3. Considerations Affecting Offensive Operations

a. Gain and Maintain Contact. Airmobile forces have an improved capability to gain and maintain contact with the enemy. Once gained, contact with the enemy may be maintained by constant pressure of airmobile assault operations or aerial surveillance-reconnaissance.

b. Develop the Situation. Airmobile forces are particularly suited to determining the strength, location, composition, and disposition of an enemy that has been encountered, and to conducting rapid airmobile assaults and aerial reconnaissance to further develop the situation.

c. Exploit Known Enemy Weakness. Like other combat elements, the airmobile force must avoid enemy strength and react with maximum speed and combat power to exploit known enemy weakness.

d. Seize or Control Key Terrain. Airmobility reduces the need to seize intermediate terrain features, and permits the assault force to proceed directly to the final objective. Airmobile forces seek to control only those terrain features which may be exploited in the accomplishment of the mission.

e. Retain the Initiative. Bold and aggressive employment of overwhelming combat power, the achievement of surprise, and the exploitation of enemy errors or weaknesses serve to gain or retain the initiative.

f. Neutralize Enemy Capability to React. Every effort is made to disrupt and neutralize the enemy's capability to react. Isolation of the battlefield and destruction of, or interference with, his reinforcement actions reduce the enemy's responsiveness, enhance the security of the friendly forces, and assist in gaining and retaining the initiative.

g. Advance by Fire and Maneuver. Airmobile forces are better suited, in the role of the maneuvering force, to close with and destroy the enemy with fire and shock effect. They can be employed as the base-of-fire force to minimize the enemy's capability to interfere with the movement of the

maneuver force and, within their capabilities, to neutralize or destroy the enemy.

h. Maintain the Momentum of the Attack. Once the airmobile assault is launched, every effort is made to maintain momentum until the objective is secured. Flexibility and speed in the employment of combat power are paramount. The AMTF commander attempts to seize the objective in the shortest possible time. He has the means at his disposal to retain pressure on the enemy, deny him respite from battle, prevent him from executing an orderly withdrawal, and deny him the opportunity to recoup losses or regain the initiative.

i. Concentrate Superior Combat Power at the Decisive Time and Place. Successful offensive action requires the massing of superior combat power at the decisive place and time and the rapid application of this power to destroy the enemy. Airmobility allows the commander to move his maneuver elements rapidly to obtain the desired mass at the desired time and place.

j. Exploit Success. Because combat power is relative, commanders on their initiative seek to capitalize on any advantage or tactical success that occurs during the attack. The AMTF possesses the capability to rapidly apply reserve combat power. The most decisive results are obtained by committing the AMTF to exploit deep in the enemy's rear.

k. Provide for the Security and Integrity of the Force. Airmobile forces can provide security by early detection of the threat; by taking sufficient time to maneuver in reaction to the threat; and by avoidance, neutralization, or destruction of the threat. Tactical integrity involves maintaining the command as an effective fighting force. The AMTF commander insures that his forces are not so divided that they can be defeated piecemeal and that essential support is available to each element of the force.

2-4. Types of Offensive Operations

In offensive operations, three tasks must be performed: Locating and holding the enemy in position; maneuvering against him to gain a tactical advantage; and, at the decisive time and place, delivering an overwhelming attack which destroys him. In order to accomplish these tasks, five offensive operations have evolved: The movement to contact, reconnaissance in force, coordinated attack, exploitation, and pursuit.

2-5. Movement to Contact

a. General. During a movement to contact, where the AMTF is attempting to gain initial

contact or regain contact with the enemy, airmobile forces may be employed with the covering force, between the covering force and advance guard, with the advance guard, or on the flanks of the protected force. An airmobile force is particularly suited for employment on the flanks of the protected force. Reconnaissance for suitable landing zones is continuous. Air cavalry units are particularly suited for reconnaissance of selected areas or seizure of key terrain. Airmobile security elements between the advance guard and covering force normally are under the control of the main force commander. He controls them by assigning phase lines, checkpoints, and objectives.

b. Meeting Engagement. In a meeting engagement, the force seizing the initiative has the advantage. The AMTF must have control over the supporting aviation unit in order to use his forces quickly and efficiently. The airmobile force commander takes those actions that will facilitate the retention of the initiative in order to adopt the best course of action to accomplish his mission. The envelopment of an assailable flank generally will disclose the enemy's disposition more rapidly than will frontal attacks, and will give more opportunity for tactical surprise and decisive results. Airmobile security forces can be used to initiate limited attacks on the enemy. The AMTF commander can use them to contain the enemy while he accumulates his forces for a coordinated attack, or the security force can contain the enemy while the AMTF bypasses. Designating landing zones, gaining fire superiority, and evaluating intelligence are necessary prerequisites to the initiation of a coordinated attack. In a meeting engagement, the commander attempts to cause the enemy to deploy, withdraw, or attack prematurely, through the skillful use of his airmobile reserves. He can also place small forces astride withdrawal routes to block any escape.

2-6. Reconnaissance in Force

An AMTF offers a rapid means of conducting a reconnaissance in force. The AMTF can attack the enemy on the flanks or in rear areas. Airmobile forces can discover and test the enemy's dispositions and strengths and rapidly develop other intelligence. Air cavalry elements operating separately, in conjunction with, or as part of the airmobile force can conduct reconnaissance to discover the enemy's disposition and enable an AMTF commander to develop the situation.

2-7. Coordinated Attack

During offensive operations, after contact has been gained with the enemy and the situation has

been developed, an AMTF may launch coordinated attacks against subsequent objectives. Such attacks may render delaying positions ineffective, exploit weaknesses in organized positions, block reinforcement or withdrawal, disrupt support operations, and reduce the enemy's defensive capability. These attacks may be independent operations, or they may be a part of a larger operation.

a. Attack Against Delaying Positions. Airmobile reconnaissance and security forces can quickly determine the depth of enemy delaying positions and pinpoint prepared or improved obstacles. Through the use of deceptive movement and reconnaissance in force on enemy delaying positions and key installations, an AMTF may deceive the enemy and cause him to react. Airmobile forces can bypass initial delaying positions to strike succeeding ones, rapidly reorganize for attack against other positions, and force or block the enemy withdrawal.

b. Attack Against Organized Positions. Through the use of well-coordinated fire support combined with mobility and timely, accurate intelligence, an AMTF can attack an organized position from any direction. This capability permits maximum deception and surprise. Troops can be landed in the rear or on the flanks of organized enemy positions or close to the objective area—provided fire support has neutralized enemy automatic and anti-aircraft weapons fires. Ideally, airmobile forces used should be large enough to seize assigned objectives without need for subsequent lifts into an objective area. Multiple routes should be used and an altitude should be selected which will reduce exposure to ground fires. Every effort should be made to avoid flying over an organized enemy position. Alternate flight routes, landing zones, and objective areas should be planned for and used as the situation demands. When practical, plans should provide for the use of screening smoke to cover the activities of an airmobile force. Once an objective area has been seized, the airhead may be expanded rapidly through the use of succeeding airlifts. Areas may be cleared of obstacles to accommodate helicopters and other troop-carrying aircraft. Airmobile reserve forces are held in readiness to rapidly reinforce, or to exploit a penetration, or to pursue the enemy force. Once an objective has been seized and the enemy has been neutralized or destroyed, the AMTF may be withdrawn and used to seize additional objectives. Plans should also provide for withdrawal of an AMTF to support the overall

scheme of maneuver. Withdrawals should not be attempted while units are under heavy enemy fire.

2-8. Exploitation

Airmobile forces are particularly well suited for an exploitation when the purpose is to destroy the enemy's ability to reconstitute and conduct an organized defense or to withdraw in good order. The AMTF seizes objectives deep in the enemy's rear and masses its force to cut the enemy's lines of communication and destroy his reserves. The AMTF attacks on a broad front, relies on decentralized control and small-unit actions, and makes maximum use of air cavalry and reconnaissance units to locate the withdrawing enemy.

2-9. Pursuit

An AMTF conducting a pursuit can maintain or rapidly regain contact with the enemy by using airmobility. Whether using the direct pressure force or the enveloping force, the AMTF can move rapidly and mass to the rear of the demoralized, disintegrating enemy force to cut routes of withdrawal. Attacks made in conjunction with ground forces are coordinated to cut off fleeing enemy forces. Speed and accuracy of movement and landing are more important than secrecy. The application of aerial reconnaissance and surveillance will provide timely information on the location of the enemy and contribute to the surprise with which such attacks are accomplished.

Section III. DEFENSIVE OPERATIONS

2-10. General

a. The availability of aviation resources will significantly assist the ground commander in the conduct of defensive operations. However, fundamentals of the defense must still be applied.

b. An airmobile force is capable of executing both mobile and area defense.

2-11. Fundamentals of Defensive Operations

The following fundamentals apply specifically to combat in which units employ all means available to prevent, resist, repel, or disrupt an enemy attack and, in particular, destroy enemy forces.

a. *Use Terrain Properly.* In a defensive environment, the initiative usually rests with the enemy. Through the proper analysis of terrain and weather, the supported commander can greatly improve his defensive position, particularly if he is deployed on wide frontages. Regardless of the degree or means of mobility available to the commander, terrain considerations must be paramount in planning the defense.

b. *Provide for Security.* The flexibility provided by aviation resources allows the defender to attain a high degree of security. The air cavalry troop and attack helicopters are ideally suited to providing timely warning and information of enemy movements, while attack helicopters are capable of bringing firepower to bear on the enemy to deny him information of the defensive plan. Further deception in the defensive plan can be accomplished by using aviation resources to position security elements in areas not readily accessible by other means of mobility.

c. *Insure Mutual Support.* Mutual support is provided the defender by the airlift of units not in contact and/or reinforcement of units under

attack. When possible, the reinforcing unit should be committed in such a manner as to cause the enemy to fight in more than one direction. Fire support is made more responsive through the use of the attack helicopter and by movement of supporting artillery by air. Gaps can be effectively covered by airmobile forces when supported by various combinations of reconnaissance/surveillance aircraft and sensors.

d. *Organize for All-Round Defense.* The superior mobility provided by supporting aviation allows great flexibility in organizing an all-round defense. The ability to reposition forces rapidly to block an enemy threat is a distinct capability that can only be provided by airmobility. An airmobile reserve can be employed on a variety of missions. The reserve may be positioned well to the rear, poised for commitment at the most decisive time and place. The perimeter defense is associated with an airmobile operation and the security of an airhead or landing zone; it is a method of defending against an enemy attack from any direction. The bulk of the defending force is employed on the perimeter. In view of the limited depth to the position, the reserve should be mobile and positioned in the vicinity of the most critical sector of the perimeter, prepared to counterattack. For additional information on perimeter defense, see FM 7-20.

e. *Organize Defense in Depth.* Through the use of supporting aviation, the defender can organize the depth of his defenses in a series of blocking positions. The threat of defeat in detail is greatly lessened by the ability of airmobile elements to rapidly adjust their defensive posture to meet developing situations.

f. *Achieve Responsiveness.* The defensive fundamental of achieving responsiveness parallels the

offensive fundamental of enhancing flexibility. Responsiveness is obtained through the use of aircraft to rapidly reposition forces to counter the enemy's thrusts.

g. Make Maximum Use of Offensive Action. A basic purpose for assuming a defensive posture is to develop more favorable conditions for offensive actions. The defender must be constantly alert for the indications that point to favorable conditions for assuming the offense. Once these indications are detected, the defender must have the required mobility to regain the initiative and assume offensive combat. This mobility differential is made available through the employment of mechanized, armored, and airmobile forces. Aggressive patrols, raids, spoiling attacks, and counterattacks may be used to maintain the spirit of the offense.

h. Attain Dispersion. Through the use of airmobile assets, the defender can attain dispersion and still maintain mutual support. In organizing the defense, the commander must deploy his forces to present the least vulnerable target to the enemy. Dispersion of airmobile forces must be consistent with the capability to provide sufficient mass to accomplish the mission. Mobility permits the reserve to be dispersed to minimize vulnerability to hostile fires without degrading its primary mission.

i. Use Time Available. Supporting aviation will permit maximum use of available time by—

- (1) Providing improved mobility and communications for command reconnaissance and command and control.

- (2) Rapid deployment of troops and equipment.

j. Integrate and Coordinate Defensive Measures. The overall defensive plan involves careful coordination and integration of aviation support into the following:

- (1) *Fire plans.* Fires are planned to insure the coordination and integration of field artillery, close air support, naval gunfire, and attack helicopters. Plans are made to reposition artillery by air to meet changing requirements caused by enemy actions or repositioning of troops. Close coordination must be accomplished between all fire support means to insure efficiency and economy of fire support. Flight routes in and out of the defensive area are carefully planned to minimize restrictions on fire plans and maximize troop safety.

- (2) *Barrier and denial operations.* Aviation resources can be used to air deliver certain mines and sensors. The weight and dimensions of barrier materials usually preclude their movement by

aviation resources except for the movement of materials and personnel to construct obstacles and accomplish minefield seeding.

- (3) *Defense against armor.* Attack helicopters have the capability to seek out and defeat enemy armor using a variety of missile systems. Additionally, visual and electronic surveillance aircraft can provide early warning against an armor threat in sufficient time to allow the defender to mass his antitank defenses.

- (4) *Counterattack.* An airmobile reserve force gives the commander the capability to rapidly react and destroy enemy penetrations. Airmobile reserves may be dispersed in positions farther from the line of contact than reserves that depend on surface transport. Airmobile reserves of adjacent units may be massed to meet a penetration in a particular unit's area before the enemy can exploit a penetration. Coordination of all fire support means with the ground and airmobile units participating in a counterattack is essential. Counterattack plans should be rehearsed. Flight routes for counterattacking airmobile forces should be selected to avoid detection and interfere least with friendly supporting fires.

- (5) *Deception plans.* Aviation resources, used in conjunction with electronic deception, dummy airfields and other deceptive techniques, contribute to a comprehensive deception plan which will enhance the defensive posture.

- (6) *Defense against air attack.* Organic, attached, and supporting air defense means, when combined with aggressive use of nonair-defense weapons against attacking hostile aircraft, provide an effective counter to the air threat. Employment details are contained in FM 44-1 and FM 44-3.

2-12. Types of Defensive Operations

The two basic forms of defense are the area defense and the mobile defense. The airmobile battalion or brigade conducts the area defense and may participate as an element of the division mobile defense.

- a.* The area defense may be conducted at all command levels and is oriented toward the retention of terrain.

- b.* The mobile defense is conducted by division and higher levels of command and is oriented toward the destruction of enemy forces that have been permitted to enter preplanned areas. The forward defense forces conduct an area defense, then a delay, in order to slow, canalize, and contain the attacker. This creates the conditions necessary to allow the reserve force to counterat-

tack and destroy the enemy in the contained penetration.

c. To conduct a successful mobile defense, the friendly force must destroy a significant number of enemy track vehicles (tanks, personnel carriers) before the enemy reaches the battle area. On the general outpost (GOP), the commander should make maximum use of his airmobile capability. Airborne armor-killer teams comprised of observation and attack helicopters should be employed. The majority of the attack helicopters should be armed with a 20/30mm turret cannon and a tube-launched, optically-tracked, wire-command-linked (TOW) missile system. AMTF of battalion or smaller strength should be employed as armor-killer forces to impede, blunt, and/or channel into preselected killing zones enemy armor formations. In addition, a combined-arms force supported by cargo and attack helicopters should be formed as a reserve to disengage armor-killer task forces which become isolated. Units located on the forward edge of the battle area (FEBA) should position maximum strength forward and should position antiarmor weapons to support these units. It is probable that battalion- and company-size units will not retain a reserve and that a highly mobile, heavily armored brigade reserve, supported by TOW-equipped attack helicopters, will be

employed to block and destroy enemy penetrations of the FEBA.

2-13. Defense Against Airborne, Airmobile, Guerrilla, and Infiltration Attack

a. An AMTF may be employed effectively to counter enemy airborne, airmobile, or guerrilla forces. As a minimum, airmobile striking forces and airmobile reserves employed against enemy airborne, airmobile, guerrilla forces, and forces which have tactically infiltrated should be provided heavy fire support and air defense coverage. Ideally, the airmobile striking force should be employed in situations in which it could link up with armored forces. Initially, the AMTF conducts patrols and established observation posts to locate the enemy and set up roadblocks to delay, canalize, or block his movement. As part of the mobile reserve, AMTF are committed when the enemy main effort is determined.

b. Attack helicopters employed with AMTF are particularly effective against airborne, airmobile, guerrilla, and infiltrator forces. The lack of armor, air defense weapons, and heavy fire support of these enemy forces can be exploited by the use of attack helicopters against them. Medium and heavy helicopters may be used to position and displace supporting field artillery.

Section IV. RETROGRADE OPERATIONS

2-14. General

a. An AMTF may conduct retrograde operations unilaterally, participate as a covering force for other ground forces, screen or protect the flanks of another withdrawing force, and conduct limited counterattacks and spoiling attacks to disorganize an advancing enemy force.

b. AMTF are suited to all forms of retrograde operations. Withdrawal under pressure, however, has a high degree of risk. Generally, reinforcement into an area of contact is a far better solution. If LZ are available, it may be more advantageous to reposition forces against the enemy to force him to fight in several directions. When withdrawal is necessary, the force should attempt to break contact before withdrawal by air is attempted. In any case, carefully planned, coordinated, and controlled air and artillery fire support is required.

c. During a retrograde movement, an AMTF may employ forces in a stay-behind role, as they can quickly be withdrawn after the completion of the mission. The mission may include adjustment of fires, providing information on enemy move-

ment, or harassing the enemy advance. Such missions require detailed planning, carefully delineated procedures, and a high degree of control.

2-15. Types of Retrograde Operations

a. *Withdrawal.* A withdrawal is an operation in which a deployed force disengages from an enemy force. A withdrawal by air is a complex operation which requires detailed centralized planning and decentralized execution. In some circumstances, it may require the use of high-angle artillery fire on enemy positions to allow armed aircraft and lift aircraft to conduct their respective missions simultaneously while flying under artillery fire; however, the technique of shifting fires normally is employed. Intermediate secured assembly areas may be established to reduce turnaround time of helicopters. Troops in intermediate assembly areas can be picked up and lifted to base areas at a later time. If shuttling is required, one complete lift of troops should be left in the landing zone to be withdrawn on the last turnaround. This will provide the maximum security for the last elements. All elements of the unit which are not part

of the security force should be prepared by tactically assembling in aircraft loads prior to arrival of aircraft. When only the security force remains on the ground, the last flight should land as close as practicable to the security elements to expedite loading and departure. The size of this force may be limited by the number of lift aircraft available. This procedure may not be applicable when the enemy force has air superiority and a nuclear capability. Withdrawals through friendly forces (passage of lines) are conducted by overflying the newly established positions. Coordination must be accomplished with the overflown force, and provisions must be made for use of smoke, air-to-ground fires, and deceptive measures. Consideration should be given to leaving fire support elements in position long enough to cover the withdrawal, unless it can be covered by fire from the next position to the rear. Additional fire support can be gained by the use of attack helicopters. Positive control and coordination of aircraft and ground fire support means is absolutely essential during withdrawal operations.

(1) *Withdrawal not under enemy pressure.*

This type operation is based on secrecy and deception and usually is conducted under periods of reduced visibility. If enough resources are available, or the enemy cannot rapidly react to the situation, consideration may be given to lifting an entire unit simultaneously from the forward edge of the battle area. The main body of the ground unit may be withdrawn from secured assembly areas located well to the rear of the battalion forward defensive area, and then the security elements of the detachments left in contact are withdrawn on order in one lift.

(2) *Withdrawal under enemy pressure.* In this type of withdrawal, the forward frontline units withdraw to the rear of a local covering force to assigned assembly areas located at, or in proximity to, pickup zones. These pickup zones and alternate pickup zones should be located laterally and in depth to the rear of the covering force. The main body may then be withdrawn by air. Upon completion of the delay mission, the covering force is withdrawn from its present position if the tactical situation permits. Plans should be made to reinforce units in contact or to counterattack to disengage a decisively engaged unit.

b. Delaying Action. A delaying action is an operation in which a force under enemy pressure trades space for time while inflicting maximum punishment on the enemy without becoming decisively engaged in combat. An airmobile force can best perform a delaying action by repositioning forces on the flanks or to the rear of an advancing enemy rather than by occupying successive delay-

ing positions in front of him. When employed together with other forces, an AMTF should be used to exploit its mobility for security and covering force missions or participate as a mobile reserve. Since the withdrawal of airmobile forces does not require use of a road net, the forces can be employed in flanking positions adjacent to the enemy route of advance, thus forcing the enemy to pause and deploy before continuing his advance. Such a maneuver may be integrated with an action on a delaying position, or with a covering force action between positions. Obstacles may be placed in front of delay positions without interfering with the withdrawal of AMTF from delaying positions to the front. Consideration should be given to employment of the helicopter in placing scatterable mines in front of delay positions. Airmobile forces are suited for harassing actions between delaying positions. Reconnaissance and surveillance elements can also provide information on the location of advancing enemy units.

c. Retirement. A retirement is an operation in which a force not in contact with the enemy conducts an orderly withdrawal according to its own plan and without pressure by enemy forces. An AMTF can rapidly execute a retirement. The retiring force may use a combination of ground and airmobile means to move to the rear. Security forces are used as rear and flank security. Attack aircraft are employed to harass and delay the enemy within their capabilities and missions.

2-16. Withdrawal by Air

A withdrawal by air may be conducted to terminate an operation or to facilitate redeployment of forces.

a. Planning. The planning process for a withdrawal by air is similar to that for an airmobile operation. The entire process, from the ground tactical plan through the loading plan, must be considered. The major difference is that the ground tactical plan is actually the plan for the defense of the pickup zone. If the withdrawal is being conducted to recommit the force immediately into combat, then a separate ground tactical plan is prepared for the offensive phase of the operation. The plan should be as detailed as time permits. The following will be included as a minimum:

- (1) Designation of pickup zones.
- (2) Fire support plans.
- (3) Schedule for movement of units to pickup zones.
- (4) Schedule and priorities for loading.
- (5) Designation of, and instructions for, the loads control group.

b. Pickup Zones. Pickup zones are designated by the highest headquarters involved in the withdrawal. They are located as close to unit battle positions as the terrain and enemy situation will permit. To achieve maximum speed in the landing, loading, and takeoff, and to provide passive protection against mass destruction weapons, multiple pickup zones are desirable consistent with available security forces. Factors to be considered in selecting the location and number of pickup zones include—

- (1) Landing requirements for the type of aircraft to be used.
- (2) Number of aircraft and rate of landing.
- (3) Availability of facilities for improvement of landing sites.
- (4) Availability of aircraft control facilities.
- (5) Availability of dispersed pickup zones.
- (6) Distance from POL locations and turnaround time.
- (7) Availability of fire support means.

c. Pickup Zone Control. A pickup zone control officer may be designated by the senior ground commander for each pickup for battalion-size and larger moves. To expedite loading, this officer will guide units from their assembly areas to the pickup zones. The actions of all pickup zone control personnel are coordinated by this officer. Constant liaison is maintained with the aviation liaison officer, when present, to keep a balance between the arrival of troops and aircraft. When separate company pickup zones are used, pickup zone control may be provided by the company.

d. Air Movement Control. Air movement control by pathfinders is desired to insure precise timing and minimum delay in the withdrawal. The size of the pathfinder team depends upon the number of aircraft involved, landing facilities, and visibility.

e. Security Elements.

(1) Security elements are positioned to provide cover for the main body as it assembles, moves to the pickup zone, and is withdrawn. These elements may be composed of small detachments from each subordinate unit, or they may be one of the subordinate units. The latter is more desirable since unit integrity facilitates control and assures a more effective reaction in case of an attack during the withdrawal. It also facilitates control for a unit withdrawing and executing an airmobile operation into another area. The security element assumes the task of securing the defensive position, to include the pickup zones, at a time designated by the commander of the unit conducting the withdrawal.

(2) A security element reserve may be designated and may remain airborne over the pickup zone or on standby in another area.

f. Security.

(1) Supporting fires should be carefully planned. Security is also a major concern when the withdrawal is delayed or interrupted.

(2) In a battalion-size operation, when the entire unit cannot be withdrawn without delay, at least one company-size unit should remain on the pickup zone during the delay.

(3) The last security element to be withdrawn can achieve a measure of security by firing claymores and automatic weapons and employing artillery fire and tactical air support just prior to loading. The loading and takeoff should be quickly executed, with attack helicopters providing fire on the periphery of the pickup zone. For the last lift, the helicopters land as close as possible to their individual loads. To speed the withdrawal of the security element, smoke or panels should be used to identify each loading site.

(4) Smoke may be used to screen the entire withdrawal. Care must be taken to insure that the pickup zone and flight routes are not obscured.

g. Conduct of the Withdrawal.

(1) The sequence of the withdrawal varies with the destination of the unit and may vary with the location of the pickup zone with respect to the location of the unit being withdrawn. Administrative personnel and heavy equipment should be withdrawn before the tactical units. The commander may withdraw them to an intermediate secure area, subsequently moving them to the new operational area after it is secured.

(2) The commander of the unit conducting the withdrawal selects the pickup zone. The selection is based upon the size, condition, and location of potential sites that are or can be secured, and upon the recommendation of the aviation unit commander.

(3) Excessive congestion and confusion on the pickup zone should be avoided. The pickup zone should, when possible, be aligned so that the helicopters can land heading into the wind. Colored smoke should be used to identify the location where the lead helicopter should land.

(4) Control measures for the withdrawal by air must be closely coordinated with the aviation unit commander.

(5) Routes to the pickup zone, assembly areas, and loading sites for each aircraft should be designated. For a battalion withdrawal, movement on the pickup zone usually is coordinated by the S3 Air and the pathfinders, who remain on the

pickup zone throughout the withdrawal. The commander, S3, or the executive officer may use aircraft to assist in the control of movement to the pickup zone and to the destination.

(6) When unit integrity is disrupted by loading sequence, temporary attachment of separated elements to another control headquarters may facilitate control during the withdrawal.

(7) The lift capability in the last lift should be sufficient to insure troop space in case other lift aircraft are downed or overloaded.

h. Downed Aircraft. See chapter 4.

i. Techniques of Employment. Techniques of employing aviation resources vary with the form of retrograde operation and the purpose of the operation. The following general techniques apply to all retrograde operations:

(1) Accomplish early liaison with the supporting aviation commander.

(2) Make maximum use of all available lift space, even at the expense of unit integrity.

(3) Execute the operation in the minimum number of sorties.

(4) Use the shortest practicable flight route to remove the force to a more secure area. Once the force is in a secure area, use cargo helicopters for a retirement.

(5) Vary each flight route into and out of the pickup zone whenever possible.

j. Fire Support.

(1) The effective and timely use of all available fires requires detailed fire support coordination of all indirect fire support means to insure safe flight paths for the lift helicopters, attack helicopters, and close air support aircraft. This is accomplished by the use of limiting boundaries, a time sequence, or by placing fire support units on call.

(2) The normal volume of artillery fired before the withdrawal may deceive the enemy with respect to the withdrawal. Targets are planned on likely enemy assembly areas, avenues

of approach, and defensive targets in the vicinity of the pickup zone, and should be planned along the flight route. Fire support should increase proportionately as the number of elements diminish on the ground. Control of fires can best be accomplished from the air. However, an artillery forward observer or reconnaissance sergeant with a radio on the artillery net should remain with the last element to be withdrawn.

(3) Armed helicopters (attack helicopters) cover the pickup zone and escort the lift helicopters (app C).

(4) Close air support is used against pre-planned targets and targets of opportunity before, during, and after the withdrawal. When the enemy situation dictates, tactical aircraft should be on station for the withdrawal. The forward air controller or air liaison officer remains over the pickup zone until the last element has been withdrawn.

k. Communication.

(1) Reliable communication is one of the keys to a smooth and successful withdrawal by air. Additional radios may be needed by the last element. In addition to the usual stations operating in the command net, it is sometimes necessary to establish alternate or additional stations during a withdrawal by air (e.g., an additional net control or operations station may be necessary when the unit is moving directly into another tactical operation after the withdrawal).

(2) Colored smoke may be used to mark pickup and landing zones and to orient aircraft before landing. Panels or other items that contrast with the pickup zone may also be used for marking when smoke is not available or is not practical.

(3) Care must be taken to avoid compromising the withdrawal operation through careless use of communication media. The use of additional radio stations significantly increases the need for strict adherence to signal security procedures and electronic counter-countermeasures (ECCM).

Section V. OTHER OPERATIONS

2-17. Infiltration

Infiltration is a technique of movement used with offensive operations. For detailed discussion of an infiltration, see FM 7-20.

2-18. Linkup

a. General. When withdrawal of an airmobile force from the objective area is not planned or is

infeasible, a linkup operation by a surface force is accomplished. Close coordination and detailed planning between the two forces are essential. Initial coordination may be limited to an exchange of information. As the linkup force approaches the objective area, fires are coordinated by standard fire control measures and procedures. As the situation develops, objectives and axes or boundaries of the advancing friendly forces are changed to

facilitate the linkup. When necessary, elements of the airmobile force take offensive action to break roadblocks and to otherwise disrupt enemy forces delaying the linkup force. Armed aircraft may assist in these actions.

b. Planning for Linkup. Plans for the meeting of the airmobile force and advancing friendly ground forces are coordinated in advance. This coordination should include—

- (1) Command relationship.
- (2) Command and staff liaison before and during the operation.
- (3) Systems of mutual recognition (panels, armbands, pyrotechnics, vehicle markings).
- (4) Coordination of communications plans (radio nets established, exchange of call signs and frequencies, verification of compatible secure voice key lists, and issue or loan of compatible radio equipment).
- (5) Coordination of schemes of maneuver (designation of primary and alternate linkup points, and delineation of objectives and boundaries or axes of advance).
- (6) Fire control measures, with emphasis on the fire coordination line and no-fire line.
- (7) Plans for air-to-ground fire support.
- (8) Guides from the AMTF, when feasible.
- (9) Supply and maintenance upon linkup.

c. Linkup with Friendly Guerrilla Forces. When offensive operations push toward an unconventional warfare operations area or when such an area expands toward the friendly FEBA, airmobile operations may be mounted to link up with these forces. Such operations may be used to consolidate positions taken by the guerrilla force by resupply, reinforcement, and evacuation of patients. For additional information on guerrilla warfare operations, see FM 31-20 and FM 31-21.

2-19. Raids

a. General. An airmobile raid is conducted for the same purpose as a ground force raid—to accomplish a specific mission with no intent of holding the area. It can be conducted to harass, deceive, or disrupt the enemy and preclude his concentration of forces in another area. It can also be conducted to obtain information of enemy installations, units, or activities, and to capture personnel or materiel. Through raids, airmobile forces are capable of achieving extensive harassment and destruction in the enemy rear. A raid is characterized by rapid movement to gain surprise, and rapid withdrawal to avoid decisive engagement.

b. Missions and Objectives. An airmobile raid force may be assigned an area of operations

instead of a specific objective, and the area objectives may be located well to the rear in enemy territory or relatively close to the forward edge of the battle area. The force may operate in conjunction with friendly guerrilla forces. Some raid objectives are—

- (1) Command posts.
- (2) Communications centers.
- (3) Airfields and their installations.
- (4) Key enemy personnel.
- (5) Supply installations.
- (6) Conventional, nuclear, and chemical weapons delivery means and storage areas.
- (7) Prisoner-of-war compounds.
- (8) Other targets of intelligence interest.

c. Planning and Preparation. The steps in planning and preparing for a raid closely parallel those required for the airmobile assault. The following aspects of planning and preparation must be emphasized:

- (1) Detailed intelligence is essential.
- (2) Concept and execution are characterized by boldness.
- (3) Deception and counterintelligence plans are made. (Consideration should be given to the use of jamming and electronic deception to enhance the overall deception and counterintelligence plans.)
- (4) Technically trained and specially skilled personnel may be needed to assist in accomplishing the mission.
- (5) Special weapons or equipment may also be required.
- (6) Movement should be planned to insure delivery of the raid force with minimum risk of detection.
- (7) Coordination with other services or agencies must be thorough.
- (8) To enhance security, the raid should, if possible, be carried out under some condition of reduced visibility, with Army pathfinders providing positive terminal guidance into, within, and from the objective area. This does not preclude a daylight raid; however, in all circumstances, positive aircraft control is essential.
- (9) The raid should be rehearsed.
- (10) Fire support should be provided and coordinated.
- (11) Elements of the raiding force assemble independently and carry out their assigned tasks. Decentralized assembly points and decentralized control of the elements of the task force up to H-hour for the raid are required.
- (12) Provisions should be made for the transport of prisoners and captured materiel.

(13) When possible, withdrawals are made by air. Alternate withdrawal plans must be included within the overall plan.

(14) Normally, the raiding force carries all supplies and equipment necessary to accomplish the mission. Resupply, when required, may be made by airdrop directly to the raiding force or through friendly paramilitary forces.

(15) Coordination of a raid with those headquarters that operate long-range patrols (LRP) must be accomplished to insure that the raiding party and LRP operation do not conflict in time or space and that one element's operations will not compromise the existence of the other element within the same general geographical area.

(16) When indicated by the air threat, the raid should utilize organic/attached air defense artillery. The raid should be coordinated with the air defense officer.

d. For additional information on planning raids in conjunction with friendly guerrilla forces, see FM 31-20.

2-20. Relief of Frontline Units

a. In a relief operation, Army aircraft can transport incoming units to positions and withdraw outgoing units on the return trip. The outgoing units should mark landing sites. When demonstrations and feints are employed to mask a relief, aviation support priorities should be established for incoming and outgoing units. The ground force headquarters directing the relief should retain control of the aircraft to avoid a change of control between the incoming and outgoing units.

b. In conducting a relief with airmobile forces, coordination and effective communications are of prime importance. Deceptive measures should be planned to assist in accomplishing the mission.

2-21. Night/Limited Visibility Operations

a. *General.* A commander may desire to take advantage of night or limited visibility conditions to gain maximum surprise or deception, maintain the momentum of daylight operations, reinforce or withdraw committed units, or deploy maneuver or fire support elements. The use of pathfinders or air traffic control (ATC) units is desirable and, in most cases, necessary for controlled movement of aircraft during night and limited visibility operations. The zone of action can be illuminated to facilitate control; however, caution should be exercised to preclude blinding of aviators during critical maneuvers.

b. *Operations Requisites.* Normally, aircraft can operate when—

(1) The ceiling permits safe flying above the highest terrain to be traversed.

(2) There is enough visibility for the aviator to see obstacles in time to avoid them when flying at reduced speeds.

(3) There is enough visibility for the aviator to recognize prominent landmarks.

(4) Radio control is available.

c. Advantages of Night Operations.

(1) The aircraft are partly concealed from enemy visual observation.

(2) Maximum surprise and enemy confusion can be achieved.

(3) Continuous pressure can be exerted on the enemy.

(4) Acquisition by nonradar-controlled weapons is more difficult at night.

d. *Disadvantages of Night Operations.* The need for elaborate control measures and caution on the part of the aviators and troops impedes operations. Locating landing areas and zones is also more difficult. However, with proper equipment, constant training, and thorough indoctrination in techniques of night operations, these disadvantages may be overcome. The following factors must be considered.

(1) More time is required to perform tasks at night.

(2) Pathfinder support is required to provide the guidance and control necessary for safe and efficient night operations.

(3) Landing areas used at night should be larger than those normally used in daylight.

(4) Navigation is more difficult.

(5) Areas heavy with dust create a safety hazard and should be avoided in night operations.

(6) Artificial illumination facilities should be available and immediately responsive to the commander. Illumination must be coordinated between aviator and ground unit commanders. If used indiscriminately, it may destroy night vision or reveal friendly positions. Illumination may be used:

(a) For lighting the approaches to areas occupied by friendly troops for reconnaissance.

(b) On enemy targets for attack helicopters and other fire support means.

(c) For illumination of the landing zone.

(d) For deception or diversion.

(e) As a navigational aid.

(7) Formation flight is more difficult.

2-22. Operations under Nuclear Warfare Conditions

a. General. Airmobile forces can mass rapidly after being dispersed for protection from the effects of nuclear weapons. A nuclear target can be investigated by air soon after the explosion to determine the nuclear effects and conduct radiological survey. (See FM 3-12 for details on radiological survey and monitoring.)

b. Exploitation of Nuclear Strikes. Airmobile forces can bypass obstacles created by a nuclear strike, whether their objective is within or beyond the target area.

c. Defense Against Enemy Use. In the event of enemy nuclear attack, AMTF can move into the target area after the explosion to forestall enemy exploitation of its effects. They can also promptly remove casualties from the target area to the initial medical treatment facility.

d. Special Considerations. Plans for timing airmobile operations with nuclear explosions must take into account the effect of the intense light on aviators' eyes, the distance from ground zero for safety from primary effects, and the length of time residual radiation will be at dangerous levels. The danger of fallout in the case of a surface burst is considered when selecting approach routes and landing zones. Landing zones can be made unusable by debris resulting from a nuclear explosion. Where a landing zone is contaminated, dust stirred up by propellers or rotors will be hazardous. Alternate plans are prepared in the event residual radiation dose rates are unacceptable in primary routes and landing zones.

2-23. Operations in a Toxic Environment

a. Planning for airmobile operations in a toxic environment must include consideration of the following:

(1) Reconnaissance of areas known or believed to be contaminated.

(2) Selection of routes and positions with regard to contaminated areas to avoid stirring up or spreading agents with rotor or propeller wash.

(3) Protection of supplies and equipment.

(4) Special considerations for operating in toxic environments.

b. For details, see FM 3-10 and FM 21-40.

2-24. Jungle Operations

Airmobile operations in jungle areas do not differ drastically from operations in any other area. However, due to dense foliage, the availability of landing and pickup zones takes on major impor-

tance. Schemes of maneuver may have to be adjusted to coincide with the available landing zones. Troops can be moved and resupplied over terrain which would preclude ground operations. Surveillance of the terrain or enemy by airmobile security and reconnaissance forces is limited by the foliage and frequent precipitation in jungle areas (FM 31-35).

2-25. Mountain Operations

A mountain environment often precludes the use of all vehicles except the helicopter. Reduced performance of aircraft at increased altitudes must be considered during planning. An AMTF has a distinct mobility advantage in mountainous areas. Line-of-sight communication problems are overcome by aerial radio relay. Troops and equipment can be moved over terrain that is impassable by ground vehicles. Availability of landing zones must receive constant and special attention. If adequate landing zones are not available, troops can rappel or climb down a ladder from a hovering helicopter. Medical evacuation is greatly facilitated by the helicopter in mountainous terrain. Weather, often erratic in the mountains, takes on great importance as a planning factor (FM 31-72).

2-26. River-Crossing Operations

Airmobile forces materially reduce the consideration given the river as an obstacle. Such forces may overfly the river or support bridge construction. Reconnaissance units can deploy by air to verify and collect essential intelligence on crossing sites and enemy dispositions. Objectives can be quickly secured on the far shore, thereby eliminating enemy interference with development and use of crossing sites. Components for engineer crossing means can be airlifted forward, and thus eliminate traffic problems on the crossing site approaches (FM 31-60).

2-27. Cold Weather Operations

Aspects of airmobile operations in cold weather regions are covered in FM 31-71.

2-28. Combat in Fortified and Built-Up Areas

An AMTF can bypass a fortified or built-up area. In the conduct of either offensive or defensive operations in a fortified or built-up area, the limited ground observation, limited landing zones, and high density of obstacles will impede the AMTF. Special considerations include verification of the soundness of roof structures prior to landing, use of rappelling and troop ladder techniques,

suppression of enemy fires (particularly snipers) by fire, smoke, and riot-control agents, and the safeguarding of noncombatants. For details on combat in fortified and built-up areas, see FM 31-50.

2-29. Desert Operations

a. Operations of an AMTF in a desert environment are characterized by a greater choice of landing zones and a lack of restrictions on observation and fields of fire; however, landing zones are extremely difficult to operate from due to dusty conditions. Security, surprise, and economy of force assume great importance in planning operations. Consideration must also be given to increased maintenance requirements caused by the blowing sand.

b. Deceptive measures are employed to the maximum. Several landing zones are prepared. False insertions, contour flying, and multiple, simultaneous landings can be conducted to deceive the enemy as to where the primary threat exists.

c. Air cavalry, with a reaction force, can provide security over a large area and at great distances to provide the AMTF early warning of enemy movements.

d. In the desert, an airmobile force can take maximum advantage of the ability to resupply over long distances and extended frontages.

e. See FM 31-25 for details on desert operations.

2-30. Support of Unconventional Warfare Operations

a. Airmobile operations can play a decisive role in the conduct or support of unconventional warfare operations. Such airmobile operations are highly specialized and differ from those in support of conventional operations in the following manner:

(1) Small formations and/or single aircraft missions are the rule.

(2) Mission aircraft are required to navigate precisely with a minimum of terminal guidance assistance.

(3) These operations are normally conducted during the hours of darkness.

(4) Although desirable, air superiority is not essential to mission accomplishment.

(5) These operations may be conducted in areas or against targets located relatively deep in enemy-controlled territory.

(6) The timing of such operations is generally more critical than that of conventional airmobile operations.

b. More detailed information on Army aviation and airmobile support of unconventional warfare operations may be found in FM 1-105, FM 31-20, FM 31-21, and FM 31-21A.

CHAPTER 3

PLANNING AIRMOBILE OPERATIONS

Section I. PLANNING CONSIDERATIONS

3-1. General

a. Airmobile operations are characterized by speed of execution, timing, and rapid reaction to the developing situation. Plans should be as detailed as time permits. Time usually will not be available to produce elaborate and detailed plans for the movement of a company-sized or smaller force. Planning and preparation time is materially reduced by training and maintaining forces in a state of operational and logistical readiness and by the development and rehearsal of SOP.

b. Strict security during planning, and rapidity and coordination of movement during the operation reduce the vulnerability of the AMTF.

c. To achieve maximum planning effectiveness, the supporting aviation mission commander should participate throughout the planning phase as consultant on all matters that pertain to aviation employment.

3-2. Mission

When a mission is received, it must be carefully analyzed by the AMTF commander and his staff to determine stated and implied tasks which are to be accomplished. If it is determined that additional Army aviation assets will be required to accomplish the mission, a request for Army aviation support of the operation is forwarded to the headquarters controlling the available resources.

3-3. Resources Available

Before detailed planning can be initiated, the AMTF commander and his staff must know what resources are available to accomplish the mission. In addition, the command relationship of combat, combat support, and combat service support units must be considered.

3-4. Liaison

a. Timely liaison between the ground and aviation units will expedite planning. The aviation liaison element must be constantly aware of the

tactical situation; the status, current capabilities, and limitations of the parent unit; and the plans, operational status, capabilities, and limitations of the supported unit. Proper liaison will provide near simultaneous development of the supported and supporting unit plans.

b. To accomplish the liaison task, each aviation group commander should provide an Army Aviation Element (AAE) on a permanent basis to the tactical headquarters that has operational control of the aviation group. The AAE participates in planning from the earliest phases until the plan is completed, keeps its own unit informed as the plan develops, and assists the supported commander and staff in the use of aviation resources during the conduct of the operation. The AAE must be equally responsive to parent and supported unit requirements. In addition, each aviation group should provide a liaison team, with necessary communications, to all supported divisions on a continuous basis. Liaison below these levels is provided on a mission basis by the aviation unit supporting a particular operation. The establishment of an AAE or liaison team with a supported unit does not preclude the requirement for aviation mission commanders to accomplish personal coordination with the supported AMTF commander and his staff. When an aviation battalion or company is attached to, in direct support of, or under operational control of a supported unit for more than one day, it should establish liaison with the supported unit command post to enhance mission planning and expedite response to immediate requirements.

3-5. Reconnaissance

Upon receipt of a mission, a ground commander should acquire all available intelligence concerning the potential enemy. Whenever possible, the AMTF commander, the air mission commander, and the artillery fire support coordinator should jointly reconnoiter the proposed area of operations. This insures that key individuals observe the same terrain and understand exactly what is

being planned. Reconnaissance using minimum aircraft will reduce traffic which might attract enemy attention. In addition, reconnaissance of the area of operation should be continuous during conduct of an airmobile operation. Employment of air cavalry units, long-range reconnaissance patrols, and visual/electronic detection devices will provide data which must be analyzed to develop useful intelligence.

3-6. Airspace Coordination

a. *General.* Field and air defense artillery fires and aircraft movement must be coordinated to reduce mission interference. Airspace coordination occurs at three levels within the division: Command and staff, tactical operations center, and operator level.

b. *Command and Staff.* The division commander, operations officer, air defense officer, fire support coordinator, Army aviation officer, and Air Force tactical air control party commander all have responsibilities in airspace coordination and form a division airspace control element. The commander determines missions and priorities for airspace coordination plans and SOP, and coordinates with corps and other services.

c. *Division Tactical Operations Center (DTOC).* Within the DTOC an airspace control element is charged with the primary responsibility for division airspace coordination, clearances, and air movement information. Mission approval is not implied. Lower command-level airspace control elements are formed whenever necessary and feasible to support decentralized operations. The members of the airspace control element coordinate airspace, fire support, and tactical air support requirements.

d. *Operators.* Emergencies and unprogramed operations may preclude timely coordination by members of the airspace control element. Therefore, airspace users must be able to coordinate directly with each other and must inform the airspace control element of this coordination when the mission is completed. Control facilities should be collocated and must be interconnected by radio.

e. *Air Traffic in the Zone of Action.* In order to keep air traffic in the zone of action to a minimum, only those aircraft directly involved in the airmobile operation should be permitted into the zone. Observers and commanders who are not involved in the conduct of the operation should remain well clear until approval for entry into the zone has been received from the AMTF commander.

f. *Flight Procedures in the Zone of Action.* To minimize possible mid-air collisions, altitude separation must be established for all aircraft en route to, as well as in, the zone of action.

3-7. Communications

Communication requirements must be considered at the beginning of the planning phase. Plans and orders should include a selection of communication equipment and personnel to accompany the assault and rear echelons. Particular attention is given to the transportability of equipment and the dispersal of key personnel when preparing for loading and air movement. Because of the importance of communications in airmobile operations, enemy electronic warfare (EW) techniques could and, in all probability will, be employed in an attempt to disrupt such operations. Due to the extensive use of, and reliance on, radio transmissions during all phases of an airmobile operation, communications planners must give special attention to provisions for effective ECCM in order to cope with the potential threat or actual use of hostile electronic warfare measures.

a. *Communication for Control of an Airmobile Task Force.* Control of movement is necessary to provide precise timing and execution of the operation. Separate radio frequencies within the air/ground frequency spectrum are required for each supporting and supported element of the airmobile task force. Plans are prepared to insure positive communication between command and control personnel and the following:

- (1) Loading area.
- (2) Objective area.
- (3) Army aviation unit.
- (4) Aircraft in flight.
- (5) Fire support coordinator and air liaison officer.
- (6) Airborne command post.

b. *Communication in the Objective Area.*

(1) For effective control of ground operations, positive communication must be established prior to commencement of the airmobile operation and maintained continuously thereafter. This is particularly important as the airmobile elements arrive in the combat area. Initially, the airborne command post and the pathfinders can provide an effective means of communication. When a helicopter is not equipped with command and control communications, an aircraft equipped to accommodate ground radio equipment should be requested. Enough communication personnel and equipment are moved into the objective area early in the assault to insure timely installation of vital communication for the command post. In case of

destruction or malfunction of communication systems, alternate plans must be implemented. Organic or direct support aircraft may be used to relay messages or as aerial messengers. Early reliable and continuous communication with fire support elements is vital to the success of the operation.

(2) In each operation, provision should be made to equip specified direct support aircraft with radio sets for retransmission of both AM and FM voice radio messages from the objective area to the airborne command post or loading area. Such radio retransmission may be automatic if appropriate equipment is available, or it may be manual and necessitate retransmission by the radio operator on the aircraft. Designation of specific aircraft for required radio retransmissions will insure a higher degree of positive command and control of the airmobile operation.

(3) The following communication is necessary for effective command control:

(a) Immediate establishment of lift frequencies, and command and fire control nets.

(b) Communication with supporting artillery, tactical air, naval forces, and attack helicopter elements.

(c) Communication with Army aviation units concerned with reconnaissance, build-up, air supply, aeromedical evacuation, aircraft rescue support, and aerial fire support.

(d) Communication with airfields and bases in friendly territory.

(e) Communication with other forces (including linkup forces) with common or coordinated missions.

(f) Communication with higher headquarters.

(g) Communication with pathfinder or other ground control elements in pickup zones and landing zones.

3-8. Weather Considerations

a. For discussion of cold weather, see FM 31-71.

b. Adverse weather may cause modification or delay of airmobile operations; however, the AMTF can normally conduct operations except in the most severe weather conditions.

(1) During the planning phase, adverse weather may cause modification or selection of alternate—

(a) Altitudes.

(b) Pickup zones.

(c) Formation in the pickup zones.

(d) Routes to the objective.

(e) En route formations.

(f) Fire support plans and escort plans.

(g) Landing zones or objectives.

(2) Although periods of low visibility make navigation more difficult, they also provide concealment from enemy observation and fire, thereby increasing the possibility of achieving surprise.

(3) Fire support will be considerably reduced during adverse weather. U.S. Air Force tactical air, artillery observers, and attack helicopter support will be less effective. In the event weather conditions deteriorate, the assault element should be prepared to conduct operations without aerial resupply or reinforcements.

(4) Commanders and staffs should plan for an airmobile operation to begin at H-hour and then specify the proposed time of H-hour and the length of delay increments. This allows for delays due to adverse weather and assures completion of the operation. For example: A commander designates H-hour as 0730Z and a delay increment of 15 minutes. At 0720Z he is informed of adverse weather conditions near the landing zone. He delays two increments and, in effect, has delayed H-hour until 0800Z (30 minutes) without compromising the starting time of the airmobile operation.

3-9. Landing Zone Considerations

a. *Pickup Zone Considerations.* Pickup zone considerations should include distance from AO, adequacy of size and facilities to handle the number of aircraft involved, aircraft line up, loading sequence, air traffic control, landing and takeoff direction, security, obstacles, surface conditions, and restriction to visibility.

b. *Landing Zone Considerations.* Landing zones should be selected to support the ground tactical plan. Specific considerations include proximity to objective area, size, obstacles, surface conditions, restrictions to visibility, landing and takeoff direction, aircraft formation, rules of engagement, and suitability for subsequent lifts and cargo helicopters. Alternate landing zones should always be selected in the event that a landing in the primary landing zone is not practical. Alternate landing zones should be adequately spaced to preclude the same enemy unit from covering both landing zones. For detailed discussion of landing zones, see appendix B.

3-10. Fire Support

The fire support means available to the AMTF commander may be artillery, naval gunfire, organic mortars, attack helicopters, and U.S. Air Force tactical aircraft. During any specific operation, the AMTF commander may be supported by

any or all of these means. Airmobile assaults normally are made with preparatory fires utilizing artillery, U.S. Air Force tactical aircraft, attack helicopters, or any combination thereof.

a. The fire support plan must include all means of fire support available. During the conduct of an airmobile operation, the command group in the command and control aircraft must control all the fire support elements which are capable of influencing the operation. Fires of the attack helicopters organic to the helicopter unit are normally on call under control of the aviation mission commander. All fires along the flight route may be used to facilitate the safe movement of the lift formations past areas of known or suspected enemy positions. These planned fires should be intense and of short duration due to the speed with which the lift formation may pass a specific location. Preparatory fires on and around a landing zone should also be intense with no time gaps in the fire from the various sources. Long or stereotyped preparations tend to compromise the intent of the AMTF and allow the enemy time to ambush the landing zone or withdraw before the airmobile assault can be executed. Positive control measures must be established to provide for lifting all fires or shifting them, and to prevent time gaps in the fire. Fire support should continue and be uninterrupted during the initial landing phase of the operation or until the tactical situation precludes it. Fire support must also be included in the planning for feints or diversionary assaults. Large Air Force bombs designed to create an overpressure should be considered for employment during the preparation of a landing zone when mines and booby traps are suspected. When using napalm or white phosphorus in a landing zone preparation, the effect of fire, smoke, and ashes should be considered. If prospective landing zones are developed and burned in advance of an airmobile operation, the use of napalm and white phosphorus munitions may not be required during the preparation just prior to the arrival of the aircraft. (Note. If the prior burning method is used, the landing zones/pickup zones should be burned on a random schedule to preclude establishment of a recognizable pattern.)

b. The U.S. Air Force is responsible for providing air superiority, restricting enemy movement into or out of the area, and providing close air support to neutralize hostile ground targets.

c. Attack helicopters may be used for direct fire support of ground forces and must be carefully planned and controlled and the following requirements met:

(1) Aircrews must be thoroughly familiar with the tactical situation.

(2) Friendly positions must be positively identified by the aircrews.

(3) Aircrews must have positive radio communications with the supported ground unit.

(4) To insure safe operations during all phases of an airmobile operation, all supporting fires, to include demolitions, must be thoroughly coordinated with the aviation mission commander so that aircraft crews are aware of these hazards to flight (app C).

3-11. Smoke Employment

Smoke may be employed along the flight route or in the pickup zone/landing zone areas to mask movement of the helicopters from enemy observation and fire. Extreme care must be taken to insure that its use does not obscure the vision of pilots or cause undesirable fires in the area. The aviation mission commander must insure complete coordination between the attack helicopters and the lift formation.

3-12. Enemy Weapons Considerations

The effects of antiaircraft weapons, as well as the effects of smallarms fire, can be minimized by thorough planning in the selection of flight routes, altitudes, and formations. All available intelligence concerning suspected or confirmed locations of enemy antiaircraft weapons should be considered when planning an airmobile operation. Whenever possible, these locations should be avoided by the AMTF. Planning must include provisions for employing all available fire support.

3-13. Logistical Support

The AMTF commander must consider the large quantities of fuel and ammunition required to support airmobile operations. Plans should be made to prestock these items whenever possible. Particular attention must be given to backup means of replenishing fuel and ammunition stocks in the event of disrupted surface travel (chap 4).

3-14. Security

a. Special attention must be given to the vulnerability of aircraft on the ground. Security measures must be designed to safeguard the aviation assets against espionage, sabotage, damage, and theft. Security in depth must be an inherent part of those measures developed and applied to reduce this vulnerability. Aviation companies require close coordination with ground elements to maximize security measures and defense of the combat base. Special consideration should be given to defense against infiltration.

b. Security of aviation units in field locations in support of an airmobile operation is the responsibility of the AMTF commander. Aviation units have a very limited means of securing themselves against ground attacks. When necessary, aircrews may be incorporated in the defensive perimeter. Aircraft operating in forward areas are especially vulnerable to indirect fire weapons. When aircraft are to remain on the ground for extended periods, it is desirable to relocate them in secure areas where protective revetments are available.

c. One of the best means of acquiring security for an AMTF is through displacement. Frequent displacement denies the enemy the reaction time he normally requires to plan and launch an attack.

d. During the planning and conduct of an airmobile operation, consideration should be given to the following means of acquiring security:

(1) Deny the enemy knowledge of a pending airmobile operation.

(2) Deny the enemy knowledge of mission, time, and objective of the assault echelon.

(3) Control key terrain by use of fire support means to avoid commitment of maneuver forces.

(4) Maintain visual/electronic surveillance of the AO with emphasis on known enemy forces not posing an immediate threat. Surveillance can be accomplished by several means, such as—

(a) Air cavalry units.

(b) Airborne/ground mounted electronic equipment.

(c) Long-range reconnaissance patrols.

Section II. GROUND TACTICAL PLAN

3-16. General

a. The ground tactical plan for an airmobile operation, while bearing a close resemblance to the plan for a conventional infantry assault, differs in certain aspects. These areas of difference will be emphasized in this section. (See FM 7-10, FM 7-20, and FM 7-30.)

b. The ground tactical plan is prepared to capitalize on speed and flexibility to gain maximum surprise. The ultimate goal is to place the assault echelon, with supporting units, on or near the objective so organized for combat as to be capable of immediate assault, seizure of the assigned objective, and subsequent operations.

c. The infantry assault phase of an airmobile operation begins with the landing of the assault echelons and continues through the seizure of the objective and the occupation of security positions.

3-17. Types of Airmobile Assaults

The AMTF commander must consider two general types of airmobile assaults when preparing the

3-15. Reverse Planning Sequence

An airmobile operation is planned in reverse order of execution. The *reverse planning* sequence consists of the—

a. *Ground tactical plan*, which deploys the assault force and supporting units on or near the objective so organized for combat as to be capable of immediate assault, seizure of objective, and subsequent operations.

b. *Landing plan*, which introduces the combat power of the airmobile task force onto the objective area at the time and place and in the proper sequence to support the ground tactical plan.

c. *Air movement plan*, which provides the guidance for the coordinated movement of the combat power of the airmobile task force into the zone of action in the sequence required to support the landing plan.

d. *Loading plan*, which supports the air movement plan and selects the PZ and provides guidance for PZ establishment and control; establishes the commander's priority of loading for each unit; plans for the movement of troops, supplies, and equipment to the PZ in aircraft load sequence; and is used as a basis for troop briefing.

e. *Staging plan*, which provides control area(s) and guidance when major repositioning of units, supplies, and equipment is required prior to the conduct of a large-scale airmobile operation.

ground tactical plan. These types of assaults differ primarily in the proximity of the LZ to the assault objective.

a. The first and preferred type is the landing of the assault echelons immediately on, or adjacent to, the objective. This type of assault has the following advantages:

(1) Surprise is exploited by attacking and seizing initial objectives and vital installations before defending forces can react.

(2) Assault echelons avoid the exhaustion resulting from forced marches, carrying heavy combat loads, and manhandling equipment over long distances.

b. The second type of assault involves landing at a distance from the objective in a secure LZ, and requires assembly, reorganization, and movement to an attack position prior to the assault on the objective. This type of assault is used if the terrain and/or enemy situation do not permit landing on, or immediately adjacent to, the objective. Here LZ are selected with emphasis on their

suitability for landing, assembling, and reorganizing units without enemy interference. This type assault has these advantages:

(1) Landing in a secure LZ reduces losses to aircraft and personnel.

(2) Coordinated action is facilitated by establishing control of small units before engaging the enemy in ground combat.

(3) Less time is required to train and rehearse troops for this type of assault since it most nearly resembles standard ground combat.

c. A variety of factors influence the selection of the type of assault. These include the mission, the terrain, the strength and disposition of enemy forces, the capability of either side to employ nuclear weapons, and the state of training of participating units.

3-18. Development of the Ground Tactical Plan

The ground tactical plan is developed based on the fundamentals of offensive, defensive, or retrograde operations. The unique characteristics of airmobile operations require that special consideration be accorded the following areas of planning:

a. Organization for Combat.

(1) *General.* The mission, enemy situation, terrain, troops, and numbers and types of aircraft available are considered in determining the AMTF organization for combat. Emphasis is placed on organizing the assault, followup, and rear echelons so as to place the required combat force into the objective area to accomplish the mission.

(2) *Organization of the reserve.* During airmobile operations, unit reserves are part of the unit assault echelon and are usually smaller than nonairmobile unit reserves due to their mobility and rapid deployment capabilities. However, when the AMTF is moving into an AO where intelligence of enemy size, location, and capabilities is limited, a stronger reserve than normal may be required. Airmobile reserve units may be located outside the airhead to provide the commander greater flexibility in committing the reserve should the airhead come under heavy attack.

(3) Combat support units.

(a) The mobility of supporting artillery must equal that of the assault echelon in order to remain within supporting range. To achieve this mobility, artillery may be attached to an AMTF when operating at distances that preclude effective, centralized artillery control.

(b) Supporting engineer units should be retained under centralized control whenever possible; however, during an airmobile operation, an

engineer company may be attached to a brigade-size AMTF. Engineer platoons may be attached to maneuver battalions when centralized engineer control is difficult or impractical.

b. *Control Measures.* Control measures used during airmobile operations closely parallel those used for ground operations. Only those measures absolutely necessary to control the operation should be utilized.

(1) *Objective.* During airmobile operations, objectives are normally deep. However, close-in objectives may be assigned when the situation dictates. When adequate aerial field artillery support is not available, the depth of objectives may be limited by the range of supporting artillery. When more than one objective is assigned to an AMTF, they should be mutually supporting. The assignment of intermediate objectives will slow down an AMTF and should be used only when required to accomplish the mission.

(2) *Line of departure.* A line of departure normally is not used during an airmobile assault. However, because of enemy resistance or lack of suitable LZ, an AMTF may be required to land at a distance from its objective. In this event, the AMTF would first assemble and then conduct a standard ground attack utilizing control measures, including a line of departure, as applicable.

(3) *Time of attack.* The time of attack (H-hour) denotes the time the lead assault echelon helicopter touches down in the LZ. Stereotyping the time of attack should be avoided in order to attain surprise and prevent enemy detection of pending airmobile operations. An habitual relationship of time of attack to extensive artillery preparation must also be avoided.

(4) *Axis of advance and direction of attack.* When the AMTF is landed on or close to the objective, an axis of advance and a direction of attack are seldom used. However, when the AMTF or its elements cannot land on or near the objective, an axis of advance/direction of attack may be essential to effective control.

(5) *Assembly area.* The assembly area, when used, is influenced by the type of helicopters employed, the security of the LZ, and the distance between the LZ and the objective. If the landing is on the objective, no assembly area is used.

(6) *Attack positions.* The AMTF normally does not use an attack position; however, if an assembly area is used, it can also function as an attack position.

(7) *Phase lines.* When AMTF units are required to move by foot or by ground vehicle, phase lines may be used to control and coordinate the operation.

c. Fire Support Planning. The fire support and ground tactical plans must be closely coordinated and integrated to provide maximum effectiveness. They are developed concurrently and are revised as the operation progresses.

(1) LZ preparations normally are fired in support of airmobile assaults. The AMTF commander, during planning for LZ preparation fire support, should consider the following:

(a) Availability of fire support means and ammunition.

(b) The effects of fires in creating obstacles to landing maneuver.

(c) Troop/aircraft safety requirements in relation to targets.

(d) Whether the probable effect of the preparation will justify the loss of tactical surprise and afford sufficient time for the enemy to change his tactical disposition.

(e) Use of more than one type weapon to obtain different angles of attack.

(f) Burning of the LZ (but not in a manner that alerts the enemy to friendly intention).

(g) Use of artillery on the LZ itself to detonate mines or boobytraps.

(h) Firing false preparations to deceive the enemy.

(i) Whether the artillery fires should be checked or shifted at the end of the preparation.

(j) A thorough briefing of attack helicopter pilots and crews to include proposed artillery gun target lines, targets, desired directions of helicopter attacks, percent of ordnance they are to retain after preparation is fired (if applicable), and time sequence of the preparation.

(2) The fire support plan should include on-call fires which can be placed on targets as they arise.

(3) Fire support to cover reorganization and consolidation after objectives have been seized is included in the fire support plan. Data for such fires are as complete as possible to permit effective fire support for repelling enemy counterattacks. The AMTF commander and the artillery liaison officer, through map and aerial reconnaissance, determine the target area that must be covered. This includes the area on and around the LZ, avenues of approach and withdrawal, and key terrain. Once the target area has been determined, they must then consider the firepower sources, ammunition, and fuze actions available. The artillery liaison officer then forwards the fire plan to his DS battalion. His request should include, but not be restricted to, the following:

(a) Which batteries he wants to fire.

(b) Target coordinates.

(c) Start time of preparation.

(d) Length of preparation.

(e) Time for last rounds on target.

(f) Location of last round of each battery.

(g) Type ammunition for each battery to fire, to include fuze action.

(h) Orbit area for aerial field artillery, attack helicopters, command and control aircraft, and forward air controllers.

(i) Time aerial field artillery is to be on airborne alert and type ordnance to be carried.

(j) Provisions for unexpended aerial field artillery and attack helicopter rounds.

(4) It is desirable to have more than one battery available to fire the preparation.

(5) The conduct starts with the artillery liaison officer alerting the batteries in sufficient time to allow the batteries to relay (if necessary) and break out required ammunition and load. Adjustment of the batteries on target can be done in one of two ways: The artillery liaison officer can adjust the artillery batteries in on the LZ just prior to the preparation or, if local topographical maps are accurate, consideration can be given simply to firing a check round from each battery in the vicinity of the LZ to confirm its location and not adjusting the batteries until after the preparation has begun, thus denying the enemy warning of the proposed landing.

(6) Sequencing of the preparation should be done by referring to a single stopwatch. The countdown sequence is extremely important. Any late rounds would be extremely hazardous to the approaching helicopters. The preparation should be long enough to cover the LZ target area and provide maximum destruction of enemy forces and emplacements. Excessively long preparations should be avoided as they provide the enemy reaction time and consume a large quantity of ammunition.

(7) The planning and execution of the preparation should be thoroughly rehearsed.

3-19. Initial Combat

a. Initial combat after landing requires the coordinated and aggressive action of small units to seize objectives rapidly before the advantage of surprise is lost. Units assigned reconnaissance and security missions are positioned in the air movement serial to land early and move out rapidly or to land near the combat outposts to establish roadblocks, locate enemy forces, disrupt enemy communication facilities, and provide the AMTF commander with early warning, security, and information.

b. After initial objectives have been secured, units establish a coordinated defense. Defensive positions are organized, communications are supplemented, reserves are reconstituted, and other measures are taken to prepare the force to repel counterattacks, to minimize the effects of attack by nuclear weapons, or to resume the offensive.

3-20. Defense Against Air Attack

a. An AMTF is vulnerable to air attack.

b. Active air defense initially will depend upon organic weapons such as the Redeye, crew-served automatic weapons, and individual weapons used in an air defense role.

c. Passive air defense measures to include camouflage, dispersion, and movement lessen the effects of enemy air attack.

3-21. Landing Plan

The landing plan is a phase of airmobile operations planning. Information developed in the landing plan will be included in paragraphs 3 and 4 of the operations order and/or the air movement annex to the operations order. The landing plan consists of the AMTF commander's guidance concerning the desired time, place, and sequence of arrival of units.

a. Based on recommendations from the air mission commander, the AMTF commander designates the priority for landing and primary and alternate LZ for each subordinate unit. Alternate LZ should always be utilized if primary LZ are unusable due to terrain or enemy activity. The ground tactical and landing plans are closely interrelated during the selection/designation of LZ. This interrelationship insures the best possible troop disposition. The important thing to

remember in preparing the landing plan is that it must support the ground tactical plan and cannot be finalized until the ground tactical plan is completed.

b. The rapidity with which tactical units can be landed varies greatly. The assault echelon should be transported in one lift, if possible. Shuttling of the assault echelon should be avoided whenever possible. The initial lift of the assault echelon must have the necessary combat power to seize and secure the LZ. To preclude major losses of combat power and helicopters due to an ambush, rifle platoons may be landed at 15- to 30-second intervals until the LZ is secured. This method also allows the use of smaller LZ, thus permitting a greater concentration of preparation fires. Pathfinders should be landed with the first flight of the initial lift of the assault echelon to provide LZ control for subsequent lifts. Forward observers and air control teams accompany the supported ground commander. Supporting weapons are landed directly in planned firing positions as soon as the LZ is secure. First priority must be given to ground forces to secure the LZ.

c. During the planning stage, the AMTF commander must determine the maximum loss he will accept during the assault landing before changing to an alternate LZ. This is coordinated with the aviation commander, and authority for aborting the landing or diverting to an alternate LZ must be delegated.

d. Casualties should be evacuated from a designated location to prevent interruption of the operation.

e. Upon landing, the troops should rapidly disembark the helicopters and organize into the formation required by the ground tactical plan. Internal loads should not be included in the initial lift.

Section III. AIR MOVEMENT PLAN

3-22. General

The air movement plan, included as part of the operations order, supports the ground tactical plan and is based on landing plan guidance. The AMTF commander is responsible for the preparation of the air movement plan. Technical assistance is provided by the supporting aviation commander. The air movement plan consists of the flight route diagram and the air movement table. In addition, information concerning flight formations, altitudes, and speeds and procedures for air traffic control are developed.

3-23. Flight Route Diagram

The flight route diagram includes the primary and alternate flight routes, flight corridors, and control points used to control the air movement of the AMTF. This information can be placed on the operations overlay or on a strip map. The reaction time required may be so short that the flight route diagram will exist only on the maps of the AMTF and air mission commanders and other key individuals (e.g., subordinate unit commanders, fire support coordinators, air liaison officers, etc.).

a. *Flight Route.* Primary and alternate flight

routes selected should be as short as practicable, should be designed to avoid known or suspected enemy air defense, and should utilize terrain features for protective cover as well as navigational and control points. When possible, each lift of a multilift assault should use different flight routes.

(1) *Control points.* Air control points (ACP) are easily identifiable points on the terrain or locations marked with electronic navigational aids to provide necessary control during air movement. An ACP close to the LZ/PZ should be designated as the point over which the commander for each serial initiates communications with the appropriate LZ/PZ control and acquires landing instructions. The initial and final ACP are referred to, respectively, as the start point (SP) and release point (RP).

(2) *Terminal guidance.* The time from the RP to the actual touchdown in the LZ/PZ is known as the terminal guidance phase. The distance from the RP to the LZ/PZ (usually 5 to 8 kilometers) must be sufficient to allow the airmobile column to divide into serials and flights, descend, slow down, and land in the prescribed formation in their respective zone. The heading from the RP to the LZ should not differ more than 45° from the final flight heading and should be as close to the direction of landing as possible. The RP is normally used to time the lifting or shifting of artillery fires and the commitment of attack helicopters.

b. *Air Corridor.* When a possibility exists that aircraft within the airmobile column may be endangered by friendly fire support or air defense means, an air corridor should be established to reserve for the airmobile column both altitude and surface space along the flight route. All fires into this space must be approved by the AMTF commander or his designated representative prior to actual delivery. The width of the corridor may vary and may be determined by the—

- (1) Number of flight routes.
- (2) Flight formation and altitude.
- (3) Terrain.
- (4) Artillery positions near the flight route.
- (5) Distance between navigational aids.

3-24. Air Movement Table

The air movement table is prepared jointly by the ground and aviation commanders and may be included as an annex to the operations order. It is the most complete timetable published concerning the overall operation. The table is a very exacting time schedule, prepared to assure that aviation and ground units link up efficiently and that the landing of each flight is accomplished in the desired LZ at the desired time. Even in company-

size or smaller operations, preparation of the air movement table requires maximum coordination between the supported and supporting units.

a. For battalion or larger airmobile operations, a detailed air movement table may be required to insure the degree of control necessary. Regardless of how small the airmobile operation may be, an air movement table will minimize confusion and may be covered informally by instructions to both the supported and supporting units.

b. If the air movement table is inadequate or inaccurate, the success of the operation may be jeopardized. Therefore, the air movement table should be as detailed as time permits.

3-25. Flight Formation, Altitude, and Speed

a. *Formation.* The flight formation for any given mission is influenced by technical as well as tactical considerations. The flights are organized and arranged within the column by the air mission commander to support the landing and ground tactical plans. The formation used within the flight should allow for maximum use of the weapons mounted on the helicopters en route and during approach, landing, and takeoff from the LZ.

b. *Altitude.* Nap-of-the-earth flights reduce the enemy's capability to detect the airmobile column, and enable aircraft to take maximum advantage of terrain irregularities, thus gaining some protection from small-arms fire, enemy acquisition radar, and ground-to-air missiles. However, the primary consideration may be to avoid enemy small-arms fire by flying at a higher altitude. En route flight between 50 and 800 feet above the ground should be consistently avoided as this places the aircraft within effective range of most infantry weapons.

c. *Speed.* The use of external loads and various other factors can significantly reduce the cruise speed. The indicated air speed of the aircraft is the speed utilized to control the air movement. The AMTF commander must consider wind effect when establishing en route times. When two or more different types of aircraft fly in a single serial, the cruising speed of the slowest type must be the controlling speed.

3-26. Air Traffic Control

An air traffic control unit (when available) is used in PZ and, on occasion, in LZ whenever high-density traffic or instrument weather is anticipated. An airborne command post may be used to control the airmobile column. Pathfinders and control measures discussed in paragraph

3-18b will enhance control of the airmobile column.

3-27. Conduct From Pickup Zone to Landing Zone

a. Takeoff. Takeoff may be by individual aircraft or simultaneous liftoff. Under some conditions it is advisable to break the serial into flight increments for takeoff. Simultaneous liftoff from the PZ is desirable for the following reasons:

(1) Control is more positive.

(2) Escort and fire support can be more effective because the AMTF presents itself as a target to ground fire for a shorter period of time.

b. En Route Control.

(1) The serial leader reports passing each ACP to the AMTF commander unless otherwise instructed.

(2) The air mission commander insures that the fire support coordinator and the air liaison officer are always aware of the column's location.

(3) The air mission commander will give the order to switch to previously designated alternate flight routes when necessary. If the LZ is to be changed, the AMTF commander will make this decision and inform the entire airmobile force.

c. Fire Support En Route.

(1) Attack helicopters escort the airmobile column and provide security for downed aircraft, aerial reconnaissance, and other activities as required.

(2) Artillery fires should be planned on known and suspected enemy anti-aircraft locations and on prominent terrain features along the flight route.

(3) Air Force aircraft may be placed on airborne alert near the flight route.

Section IV. LOADING PLAN

3-28. Composition of the Loading Plan

a. The loading plan is prepared to select, establish, and control the PZ; plan for movement of troops and equipment to the PZ; establish the priority of loading for each unit; and provide a basis for troop briefings.

b. For battalion-size or larger operations, a written plan may be required to control movement of troops, supplies, and equipment to the PZ, designation of unit loading sites, and the timing and priority of loading.

c. The requirement for written loading instructions can be minimized by advance planning and by detailed unit SOP covering the organization and operation of PZ.

d. The loading plan, regardless of the simplicity desired, must receive command attention during preparation. The ultimate success of the operation is directly related to a properly developed loading plan and subsequent control of unit loading.

3-29. Selection of Pickup Zones

a. The selection of PZ is the first major step in the loading plan. Like the rest of the airmobile operation, the preparation of the loading plan and the selection of the PZ are the responsibility of the AMTF commander. The air mission commander should be consulted for PZ recommendations.

b. Tactical factors and aviation criteria must be considered when selecting PZ.

(1) The location of the troops is an important tactical consideration. When there are sev-

eral acceptable PZ, the one closest to the troops should be used to decrease the staging requirement.

(2) The supported and supporting forces are integrated at the PZ. Therefore, a coordination point on the PZ should be designated to facilitate the linkup of the aviation and ground unit commanders. Assembled troops, supplies, and equipment should be concealed as much as possible.

3-30. Pickup Zone Organization and Control

The AMTF commander is responsible for organizing and controlling the PZ. The aviation liaison officer, augmented by an airfield control element and/or pathfinders, should be present to control the helicopters and assist the supported unit in any way possible. The organization and control of the ground force personnel, supplies, and equipment rest solely with the AMTF commander. For efficient control, the AMTF commander should vest this authority in one individual.

a. At company level, the executive officer is frequently assigned the mission of planning, organizing, and supervising the PZ. He is assisted by enlisted personnel who are trained in loading and ground control of helicopters. These personnel should also be part of the rear echelon.

b. At battalion level, a PZ control group is organized, under the control of an officer, to control loading. This officer is frequently the unit S4, and his enlisted assistants should be trained terminal guidance personnel.

(1) The control group has the function of assuring that personnel, supplies, and equipment are ready and loaded on time.

(2) The organization and marking of the PZ is the responsibility of the control group for both day and night/limited visibility operations.

(3) The movement of units to the loading area is controlled in order to prevent congestion and confusion. The simultaneous arrival in the PZ of troops, by aircraft loads, and the aircraft required to move them is desired to insure maximum security, rapid loading, and immediate take-off of the aircraft.

(4) The officer should be provided two primary FM frequencies, one to control the supported units for call up and loading and one to control aviation assets. Alternate FM frequencies should be provided.

(5) A PZ straggler control point should be established and supervised by the control group to insure that personnel not moved according to the original plan are expeditiously rescheduled.

3-31. Air Loading Table

The air loading table is prepared to account for and assign every individual and piece of equipment to be moved into the objective to a specific chalk-numbered helicopter. The air loading table is the responsibility of the AMTF commander. The following factors should be considered when preparing an air loading table:

a. Use a simple format to prepare the air loading table if it is to be written.

b. The weight, type load, or space method is utilized to develop aircraft loads.

c. The aviation unit commander will determine the allowable cargo load (ACL) for each type aircraft and insure that all loads remain within this ACL.

3-32. Briefing

Troops must be briefed in detail on the actions expected of them upon arrival at the PZ. This

briefing may include the organization of the PZ, method of marking loading points, location of straggler point, and location of internal and external loading points.

3-33. Disposition of the Air Loading Plan

If in written form, the loading plan and related appendixes become an annex to the operation order. Frequently, this plan, with the exception of the air loading table, is not written. Completed air loading tables are turned over to the loading control officer after the troop briefing.

3-34. Aircraft Loading Formations

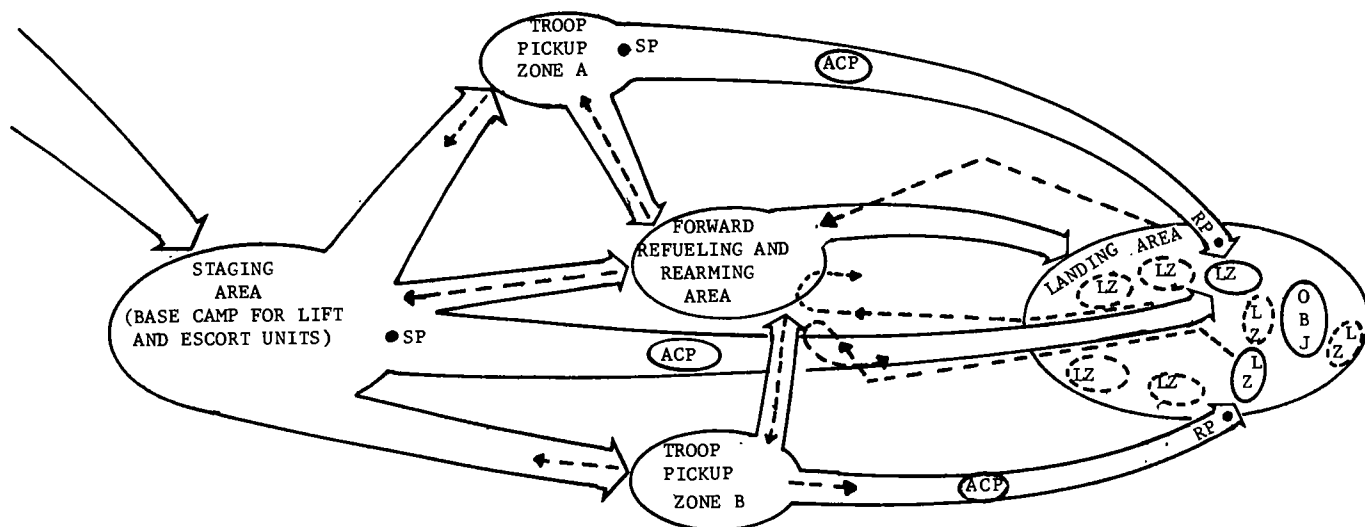
The formation selected for aircraft in the PZ is determined by the size and shape of the zone and the size of the aircraft.

3-35. Manifests

A loading manifest of each aircraft should be kept at the PZ. This record should be simple and capable of quick preparation in order to avoid a large administrative requirement. For example, it can be a sheet from a squad leader's notebook listing the men and equipment loaded into his aircraft and containing the tail number or chalk number. All such lists are left with a unit representative in the rear echelon. Manifesting is not always possible when units are withdrawn under fire or when emergency loading is required.

3-36. Refueling and Rearming

The air mission commander is responsible for coordinating refueling time, place, and facilities with the AMTF commander. Refueling normally is not required prior to the first lift from the PZ. However, there may be occasions when a forward refueling/rearming area must be established at or near the PZ in order to support continuous operations (fig 3-1). Forward refueling and rearming area security is provided by the supported unit. See chapter 4 for additional information on combat service support.



LEGEND:

- PRIMARY ROUTES
- TURNAROUND ROUTES
- TURNAROUND ROUTES FOR ARMED HELICOPTERS
- PRIMARY LANDING ZONES
- ALTERNATE LANDING ZONES

Figure 3-1. Multiple lifts using forward refueling and rearming area.

Section V. STAGING PLAN

3-37. General

A staging plan is prepared when a major repositioning of forces is necessary for the conduct of large-scale airmobile operations. If this plan is developed, it will be included as a part of the operation order.

3-38. Planning Considerations

The plan will be developed based on the type movement being executed. The force may relocate by air, surface, or a combination of means. Consideration will be given to logistical and tactical requirements within the staging area. If the move is conducted by Air Force aircraft, the plan will be developed as outlined in FM 57-1 and FM 100-27.

3-39. Final Coordination

a. As a minimum, prior to the conduct of operations, the AMTF commander and air mission commander must thoroughly coordinate the following:

- (1) Number of aircraft required.
- (2) Number of sorties and lifts.
- (3) Location of PZ and LZ.
- (4) Rules of engagement for the LZ.
- (5) Fire support.
- (6) Sequence of events.
- (7) Communications.
- (8) Command and control.
- (9) Aircraft cargo load (ACL).
- (10) Resupply requirements.

b. Commanders must insure that everyone is thoroughly briefed on all pertinent matters to include rules of engagement.

CHAPTER 4

COMBAT SERVICE SUPPORT

Section I. BASE OPERATIONS

4-1. Introduction

a. Logistical support of airmobile forces is governed by the fundamentals of logistics. The concept of the organizational base remains in effect but will be modified to meet the requirements of the units being supported. Logistical resources in many cases must be relocated from a secure area to a combat base or base area. Therefore, combat service support at division, brigade, battalion, and company level will be tailored to meet the specific requirements of the operations.

b. The logistics officer is responsible for planning and coordinating all types of supply with the maneuver element and the support elements. An airmobile force can be resupplied over land, by air, and over water. Prestock points, when established, may be used as a source of supply. Supplies should, whenever possible, be moved by a method such as nets, palletized loads, and external sling loads, which will reduce loading and unloading time. As a guide, supplies should always be moved as far forward as possible by combat service support units (throughput distribution). Aviation units operating from base/staging areas receive supplies from logistical supporting units. When ground movement is possible, supply point distribution is employed. The logistics officer constantly monitors logistical operations.

4-2. Organizational Modifications in the Airmobile Environment

The environment (enemy situation, terrain), type of operations, and methods of employment of combat forces may dictate the use of base areas at division, brigade, and to some extent at battalion level. The same logistical activities are conducted in the base areas as are conducted in the trains areas and division support areas in conventional operations.

a. Division and Separate Brigades.

(1) Base areas of division or separate brigade-size units will contain all combat service support units not directly committed in the for-

ward logistical bases. Combat and combat support units not engaged in operations within the area of operations may also be located here, along with the rear echelons of committed units.

(2) To be completely functional for supply and service support of airmobile operations, the base should—

(a) Be close to an airfield capable of handling cargo aircraft.

(b) Provide facilities and services which cannot be furnished in the brigade base. Large quantities of supplies are stocked here, such as the unit's reserve of supplies.

(c) Be located to support tactical missions.

b. Division Support Command.

(1) The division support command normally will establish air movement and airfield control teams to plan and control air movement of supplies and services by Army and USAF aircraft. The transportation officer may be assigned to organize and control these teams.

(2) Maximum use is made of backhaul for the recovery and evacuation of materiel when the use of ground transportation is unsuitable. This includes items to be repaired and salvage items.

c. Brigade.

(1) Each brigade establishes a base from which combat support and combat service support units provide support to all brigade and attached units. This base may be within the division base or may be a separate brigade base.

(2) In addition to the logistical elements from the support command, supporting aviation and aircraft maintenance teams may be located in the brigade base.

(3) The logistical coordinating element of the brigade base normally consists of the assistant S4, food services warrant officer, brigade supply sergeant, and supply clerk. Requirements for aviation support are submitted to the brigade S3 Air. Each committed airmobile force of battalion size will require a minimum of one, preferably two, utility helicopters daily for logistical support. The

S4 recommends movement of the brigade base when it can no longer support the operation.

d. Battalion and Company.

(1) Battalion logistical elements normally operate as a unit trains at the brigade base. The supply, medical, and maintenance elements necessary for immediate combat service support may be located with the battalion command post or as far forward as security and mobility requirements will permit. Elements not needed for the support of forward operations remain at the base to facilitate security.

(2) Although most of the battalion logistical units normally are located in the brigade base, certain elements/individuals may be with the combat elements of the battalion. If the battalion is operating in a relatively secure area with a

road network, the logistical units may be organized into a combat and field trains as in normal ground operations.

(3) With the use of aircraft, the need for a battalion base separated from the brigade base is rare. If a battalion base is employed beyond the brigade base, it should be located near a landing zone that will accept resupply helicopters at night. The organic logistical resources employed in this base should be the minimum essential to provide support.

(4) In the company, the primary logistical activities are maintenance of individual equipment, request and breakdown of supplies, and evacuation of casualties. During an airmobile operation, company supply personnel will be collocated with the battalion trains.

Section II. AEROMEDICAL EVACUATION

4-3. General

This section is oriented toward the use of medical air ambulance units which have the primary mission of aeromedical evacuation of selected patients. It should be recognized, however, that all Army aircraft that have the capability of being employed to evacuate patients can be used to supplement or reinforce these units.

4-4. Concept of Aeromedical Evacuation Support

Aeromedical evacuation expedites the evacuation of wounded personnel to a medical facility. This will often require that wounded personnel be evacuated from insecure areas. General requirements are—

a. Aeromedical Evacuation Aircraft. At least one aeromedical evacuation aircraft should be requested per battalion-size airmobile operation. This aircraft will be used primarily in direct support of airmobile operations; however, it may also be used on a general (area) support basis for evacuation of wounded not operating with the airmobile force. To best accomplish its mission, the medical helicopter should accompany the airmobile column and remain on airborne alert during the assault.

b. Battalion Aid Station. For battalion or larger operations, this element can be established utilizing medical personnel and equipment organic to the airmobile force. It provides medical support when no other medical treatment facility is sufficiently close to the operational area. A clearing station is normally set up in the brigade forward logistical base.

c. Sequence of Evacuation. Once attended by a company aidman or at the battalion aid station, patients are evacuated by aeromedical evacuation

aircraft to a medical facility determined by the battalion surgeon. When aeromedical evacuation aircraft are not available, transportation may be provided by organic/supporting lift helicopters under the operational control of the responsible surgeon. Battalion aid stations may be overflown to move patients to specialized treatment centers more rapidly.

d. Supporting Aviation Unit. The medical treatment facility supporting the AMTF may also be utilized by the supporting aviation unit. The aviation unit flight surgeon coordinates this prior to the operation.

e. Accountability. The accountability of personnel and their equipment is the responsibility of the parent unit.

4-5. Assignment and Basis of Allocation

a. Medical air ambulance companies (TOE 8-137G) normally are assigned to a field army, independent corps, or task force as required. They are allocated on the basis of one per corps in the field army and one per independent corps or task force as required. The company is authorized 25 UH-1 type helicopters.

b. Helicopter ambulance detachments (Team RA-TOE 8-500G) may be assigned to a field army, independent corps, task force, or a TAS-COM and are allocated as required. Each detachment is authorized 6 UH-1 type helicopters.

c. The mission of these units is to—

(1) Provide army aeromedical evacuation of selected patients.

(2) Provide emergency movement of medical personnel and accompanying equipment and supplies to meet a critical requirement.

(3) Insure uninterrupted delivery of whole blood, biologicals, and medical supplies when there is a critical requirement.

4-6. Procedure for Requesting Aeromedical Evacuation

a. When possible, requests should be controlled by the AMTF surgeon, who determines if local conditions will affect the air ambulances in the pickup area. If the mission is approved, it is assigned to the supporting air ambulance unit.

b. Aeromedical evacuation requests will be processed through the fastest and most reliable means available. A sole user channel is desirable for the expedient transmission of aeromedical evacuation requests. Within their area of responsibility, surgeons may monitor requests and recommend priorities. Adjustments in the commitment of evacuation capabilities between supported divisions are made by the air ambulance unit commander upon instructions from the commander of the medical brigade and in coordination with the corps surgeon, who establishes priorities for support among subordinate units of his corps. The requesting airmobile force surgeon is notified of the estimated time of arrival of the air ambulances. If medical aviation is not available, the request for support is forwarded to the airspace control element of the division tactical operations center which determines the availability of other aircraft to accomplish the mission.

4-7. Aeromedical Evacuation Requirements

a. All Army aeromedical evacuation requests should include the following in the sequence indicated, but need not be limited to only those elements shown:

(1) *Location*. If grid coordinates are used, they should contain six digits and be preceded by the 100,000-meter grid designator.

(2) *Radio frequency and call sign*. The radio frequency and call sign should be that of the radio at the patients' location and not a relay frequency.

Note. The location, call sign, and radio frequency should always be transmitted first. This information enables the helicopter ambulance to begin the mission, and should the other information not be immediately available, precludes unnecessary delay in helicopter reaction time. It also helps in cases of communication breakdown.

(3) *Patient category of precedence (priority)*:

URGENT: Patients who require immediate evacuation to save life or limb. Psychiatric patients are not considered in this category.

PRIORITY: If a patient category is not urgent, but requires evacuation within a certain time frame (such as patients who are tactical burdens), the time frame required should be specified in the request.

ROUTINE: All other patients requiring helicopter evacuation. The patients will be picked up immediately if air ambulances are available, or as soon as possible.

(4) *Number of patients by type*; i.e., litter or ambulatory.

(5) *Security of pickup site*. Significant information on enemy location and/or weaponry, if available, should be noted here. This may be defined in practical terms as being sufficiently secure for members of the unit requesting patient pickup to stand up in the landing area, guide the approach of the air ambulance, and load patients.

(6) *Type of wound, injury, or illness*.

(7) *Method of marking pickup site*.

(8) *Special equipment* (e.g., hoist) or emergency medical supplies required.

(9) *Weather at pickup site*.

(10) *Patient nationality*.

b. The unit requesting air ambulance service is responsible for selecting, securing, and properly marking the pickup site and for loading the aircraft. Supervision of the aircraft loading is the aviator's responsibility.

c. It is not the mission of the air ambulances to evacuate the dead, although they may do so under the following conditions:

(1) When the requesting party has exhausted all other resources.

(2) When the mission does not interfere with air ambulance service to the living.

(3) When it does not present undue danger to the air ambulance and crew.

Section III. AVIATION LOGISTICAL REQUIREMENTS AND DOWNED AIRCRAFT

4-8. Responsibilities

The logistical problems peculiar to Army aviation employment must be understood so the commander can properly use his supporting aviation assets.

a. Upon receipt of a unit mission, the aviation unit supply officer is responsible for accomplish-

ing immediate coordination with the unit that is directed to provide aviation logistical support and with the supported ground unit S4. Aviation requirements for all classes of supplies should be coordinated and requisitioned throughout the planning and execution of the airmobile operation.

b. The supported commander requires that the aviation commander keep him informed of aviation logistical requirements that affect the ground tactical plan. He should always include the aviation commander or his representative as a member of the reconnaissance party when selecting possible sites where helicopter refueling, rearming, or aviation logistical support will be located. The forward logistical bases for the airmobile operation are normally the desired locations for aircraft refueling and rearming. Forward tactical command posts often require a limited helicopter refueling and rearming capability. The supported commander is responsible for the physical security of forward aviation staging bases. The aviation unit is not organically capable of providing its own security. If forced to do so, its ability to perform its mission will be adversely affected.

4-9. Class IIIA Supplies—Aviation Petroleum-Oil-Lubricants (POL)

a. When operating in support of divisional units, aviation units coordinate POL support with the division's logistics representative. When in support of other than divisional units, coordination is accomplished through the supported unit's logistics representative to the area support facility. Whenever possible, throughput distribution from the POL distribution point to selected forward refueling areas is utilized. It is the responsibility of aviation commanders and their supply officers to periodically forecast class III supply requirements. In planning POL support for airmobile operations, consideration must be given to displacing refueling areas well forward to provide responsive support for airmobile forces.

b. A key factor in the success of an airmobile operation is the efficient and expeditious refueling of helicopters. This reduces ground and turnaround time during the critical air movement phase.

c. Upon receipt of the operation order or briefing on a proposed airmobile operation, the AMTF commander must immediately begin plans for the location of refueling assets. The following factors must be considered:

(1) *Proximity to area of operation.* Increased flying time may be available to the supported commander if refueling areas are near the area of operation.

(2) *Security.* Every effort should be made to locate in a common-user area to reduce security requirements.

(3) *Proximity to logistics support area.* The location of the supported unit's forward logistical

base is an extremely important factor. While delivery of POL is the responsibility of the unit providing logistical support, the distance between the helicopter staging base and the forward logistical base should be as short as possible (they should be collocated if possible); however, there must be some separation or barrier between POL sites and class V supplies.

(4) *Soil condition.* Sand and dust can cause damage to helicopters. Mud can immobilize refueling equipment.

(5) *Size of area.* Generally, an area 200 meters square and free of obstacles is required to safely contain four UH-1 type helicopters for both day and night refueling operations. A separate area should be provided for refueling and rearming attack helicopters.

(6) *Air traffic control and artillery coordination.* Pathfinders should be used to control the air traffic and provide artillery advisory information in the refueling area when an airfield control team is not available.

(7) *Total fuel requirements.*

(8) *Availability of special filters and separators for aviation fuel.*

(9) *Personnel and equipment to operate forward refueling points.*

d. When the supporting aviation units are organic or attached, it is the responsibility of the supported unit to insure that these units will have adequate fuel to support the operation. When several lifts of the supporting aviation units are required, staging areas with adequate POL reserves, pumps, and handlers must be located as near as feasible to the operational area.

4-10. Class V Supplies—Ammunition

a. Class V supplies normally will be positioned near the POL sites. This procedure provides ammunition near the operating area and improves overall efficiency by allowing a helicopter to refuel and rearm in the same area.

b. At the staging area, aircraft normally will park by unit. The armed helicopters will be furnished a separate parking area. This enables them to park facing away from other aircraft and activities and reduces the chance of an accident due to inadvertent firing of any of the weapons systems. The rockets should be preassembled and located near the parking area.

4-11. Aircraft Maintenance

a. *General.* The conduct of sustained airmobile operations depends on a constant availability of mission-ready aircraft. To achieve this, command

influence is vital in scheduling and planning maintenance operations. Aircraft maintenance is the responsibility of the aviation command; however, the supported commander must understand the necessity for a planned aircraft maintenance program and develop his tactical and logistical plans to operate within such a program. A scheduled program of maintenance is the key to safe operations and a steady availability rate. This program cannot succeed without the full understanding and support of commanders at all echelons.

b. Planning. The goal of aircraft maintenance planning is to provide commanders with a prescribed percentage of mission-ready aircraft. Support facilities are geared to maintain a certain number of helicopters at any one time. The AMTF commander will receive the maximum support possible for a sustained period when he supports the maintenance plan. Total availability will be a function of the flow rate of aircraft through the maintenance facilities. Maintenance efforts can be planned to provide peak availability for short duration-high intensity operations; however, post-operation decrease in lift requirements should be planned to allow the maintenance support facilities time to regain the established level of mission-ready aircraft.

c. Aircraft Utilization. Effective utilization of the aircraft made available to the commander is a responsibility of that commander. Plans which utilize more aircraft than past experiences and current estimates project as being mission ready are unrealistic. Operations which utilize more aircraft than can be maintained operationally ready on a prolonged basis jeopardize future operations. The number of aircraft which may be employed is not the only guideline which must be followed. The average number of flying hours consumed per aircraft relates directly to future aircraft availability. Department of the Army establishes the number of flying hours that current maintenance assets and programmed levels of supply will support. Maintenance officers at all levels must, in conjunction with operations personnel, keep their commanders regularly informed of the status of the unit flying hour program. Commanders must insure that the flying hour program is not exceeded unless emergency conditions exist.

d. Day-to-Day Planning.

(1) Maintenance planning provides the aircraft maintenance officer with guidelines which he uses to program his maintenance requirements.

(2) Scheduled maintenance services must be programmed to provide a steady level of high aircraft availability rather than peaks of high availability which attempt to match periods of intense operations. Aircraft should be scheduled for main-

tenance just as they are scheduled for operational missions.

(3) Consideration must also be given to the maintenance time that is lost whenever an aviation unit's operating base is displaced during tactical operations. *At least* one day's maintenance is lost when a unit's organic maintenance elements are required to move, and two or more days are lost when the direct support maintenance unit moves.

e. Planning for Airmobile Operations. The maintenance officer should be present during the initial planning for any operation. He must advise the commander on projected aircraft availability for the operation and then orient aircraft maintenance activities to the location, duration, and special requirements of the operation.

4-12. Downed Aircraft

a. General. The United States Air Force theater component commander has overall responsibility for aircraft search and rescue (SAR) operations. The Army commander of the tactical area of operations is responsible for security of the downed aircraft, evacuation of personnel and sensitive equipment, and aircraft recovery within his capabilities. To facilitate rapid and coordinated rescue operations, the nearest Air Force SAR element should be tied to the AAE by direct communications. Search and rescue, and aircraft recovery SOP should be developed jointly to include actions to be taken for aircraft from all of the services. The following policy is stated as it applies to an airmobile task force. However, the same principles apply to all aircraft losses.

b. Policy.

(1) The mission of the airmobile task force has priority over rescue and recovery of aircraft forced down during the operation. However, rescue operations must always be initiated as quickly as possible, to include evacuation of personnel and sensitive items of equipment in the following priority:

- (a) Personnel.
- (b) Classified material.
- (c) Weapons and ammunition.
- (d) Radios.
- (e) Medical kit.
- (f) Other valuable equipment which can be removed quickly.

(2) A maintenance helicopter equipped with sling and rigging accessories should be immediately available to an airmobile force on all combat assaults. Whenever possible, a recovery aircraft should remain on alert status throughout the

operation in order to recover the downed aircraft.

c. *Security of Downed Aircraft.* If in an insecure area, every effort must be made to provide air cover for surveillance of the site and the protection of personnel on the ground until a security force arrives or recovery operations are completed.

(1) *Aircraft carrying troops.* Troops aboard an aircraft forced down will establish a defensive perimeter and secure the aircraft as prescribed by the senior individual aboard. The air mission commander will coordinate with the AMTF commander to obtain additional security forces, as required, and will request maintenance and recovery aircraft as prescribed by unit operations plans.

(2) *Empty aircraft.* The air mission commander normally will designate an aircraft or attack helicopter to remain on airborne alert near the downed aircraft and coordinate through the AMTF commander as to the source and number of security personnel required.

(3) A downed aircraft security force should be designated and remain available throughout the operation. The last tactical unit to be landed can provide this force. Flight commanders should have a standard plan for pickup and landing of such a security force.

d. *Evacuation of Downed Aircraft.*

(1) The recovery aircraft will not be called in until the downed aircraft is ready for pickup. If the damage to the aircraft is beyond the maintenance capability of the owning unit, it will be evacuated directly to the direct support maintenance company location.

(2) Field recovery and maintenance evacuation of aircraft are the responsibility of the direct support maintenance company having aircraft maintenance responsibility for the unit or area in which the downed aircraft was operating. Personnel, aircraft, and special equipment will be provided for all airlift recovery operations. However, a combat aviation battalion or combat support aviation battalion may be called upon to provide the recovery aircraft if necessary. The unit which has downed aircraft is responsible for performing limited repair on those which can be flown out to

a secure area after minor maintenance or component change.

(3) Units requesting aircraft recovery will submit the following information to the recovering unit:

- (a) Parent unit.
- (b) Name of requester.
- (c) Type and serial number of aircraft.
- (d) Location of aircraft.
- (e) Extent of damage.
- (f) Air-to-air frequency and call sign.
- (g) Type security in the area.
- (h) Where downed aircraft are to be taken.
- (i) Tactical situation.

(4) If geographical conditions make recovery impractical for the direct support maintenance unit supporting the area, the authority to perform recoveries may be delegated to organizations possessing a recovery capability.

(5) Each company-sized aviation unit will maintain a trained rigging crew and the necessary equipment for rigging the type aircraft assigned. The rigging crew will be available on a standby basis to rig aircraft for recovery.

e. *Destruction of Downed Aircraft.* Destruction is authorized only when it is determined that capture of SOI, weapons, ordnance, or radios is imminent and that capture of these items will seriously affect friendly operations or materially assist the enemy. Authority to destroy downed aircraft normally will be delegated to the aviation battalion commander. Authority may be delegated no lower than the aviation company commander when operating independently from the battalion in remote areas and reliable communications with the battalion cannot be maintained. A reasonable possibility of recovery of a downed aircraft at a later date should preclude destruction. All reasonable efforts will be made to accomplish recovery, but unnecessary risks such as attempted recovery during the hours of darkness will be avoided. When a downed aircraft is not immediately recovered and is not destroyed, the recovery team will include an explosive ordnance disposal (EOD) team to determine whether the aircraft has been boobytrapped and to disarm any boobytraps discovered.

CHAPTER 5

ARMY AVIATION SUPPORT

5-1. General

a. Army aviation support of airmobile operations includes movement of combat, combat support, and combat service support units; aerial fire support en route to and in the objective area; resupply operations; and information obtained from observation and the use of sensory devices. FM 1-15, FM 1-100, FM 1-105, FM 6-102, FM 32-20, FM 55-46, FM 61-100, and FM 100-26 contain details on Army aviation employment.

b. The provisions of this chapter apply to all airmobile operations. For operations requiring only a few aircraft, the magnitude of planning and execution will be reduced; however, the considerations outlined herein apply equally to all operations.

5-2. Responsibilities of the Aviation Mission Commander

a. The aviation mission commander accomplishes the following:

(1) Assists the ATF commander and his staff in the planning and coordination of the airmobile operation in all aspects pertinent to aviation.

(2) Determines the aviation resources available to support the operation.

(3) Plans for employment of organic aerial surveillance and reconnaissance capabilities as required.

(4) Determines the allowable cargo load (ACL) for the specific mission.

(5) Plans for and coordinates the use of air movement control facilities. This control may be provided by command and control aircraft, flight leaders, pathfinders, tactical operations center personnel, liaison officer(s), air traffic control units, flight operations centers, or any combination thereof. Trained personnel from the supported unit may assist in this control function.

(6) Organizes aircraft flights to support the loading and landing plan as approved by the AMTF commander. Aviation unit integrity should be maintained if possible.

(7) Conducts a detailed briefing for the participating personnel. This briefing includes all aspects of the operation, particularly the time schedule from aircraft station time in the aircraft ready area to the completion of the operation.

(8) Insures provisions for refueling, rearming, and aircraft maintenance. Airmobile operations emphasize maximum initial airlift into the objective area. Resupply airlifts must be planned. Aircraft maintenance support must be planned to provide limited on-site maintenance to insure maximum continuous aircraft availability.

(9) Coordinates timely, safe, and orderly movement of aircraft into pickup zones.

(10) Plans for continuous aviation support of the AMTF in the objective area. This normally consists of a limited number of airlift aircraft, attack helicopters, and observation and surveillance aircraft.

(11) Coordinates the employment of the attack helicopters.

(12) Arranges for current aviation weather forecasts. Flight weather information normally is available from the Air Force weather detachment at field army, corps, and division, or from the command S2/G2 or staff aviation officer. In addition, a weather reconnaissance may be planned to check the existing weather conditions just prior to the operation.

b. When an aviation mission commander is notified that he will support an airmobile operation, the aviation mission commander and the aviation unit liaison officer contact the airmobile task force commander. Liaison with supported units will enable aviation units to gain early knowledge of pending operations. Even sketchy information received in time can be used to begin planning and may allow reconnaissance and coordination earlier in the planning phases. Adequate SOP and reaction plans reduce the time required to respond to immediate missions or changing situations. The aviation mission commander controls all aviation elements on a specific mission or operation. He is also responsible for advising the AMTF commander when the mission requires more than a normal risk. If the risk is prohibitively high and

the AMTF commander wishes to continue the mission, the aviation mission commander will continue the mission and inform his next higher aviation commander of the risk involved.

5-3. Aviation Unit Plans

a. As soon as preliminary alert information is available, or when the implementing directive which specifies the airlift or support requirement is received, the aviation mission commander can analyze the mission to—

- (1) Establish appropriate liaison.
- (2) Determine the special equipment required by his unit.
- (3) Obtain the weather forecast and determine the navigation aids required.

(4) Determine what maintenance support is needed.

(5) Inform the AMTF commander of the lift capability of the aircraft and the flight time from the pickup zone(s) to the landing zone(s).

(6) Determine the responsibilities and requirements of the command relationship specified, if not prescribed, in SOP.

(7) Determine the required number of lifts.

b. As soon as possible in the planning sequence, the aviation mission commander prepares and disseminates to supporting aviation units instructions they need to accomplish the mission.

c. Further planning is done by the aviation mission commander after he learns the AMTF commander's tentative tactical plan. SOP checklists may be used in planning; they provide immediate responses when time is critical.

d. Refer to chapter 4 for combat service support planning.

5-4. Aircraft for Training

If practicable, personnel and aircraft to be used in the operation should be made available to elements of the AMTF requiring familiarization training.

5-5. Movement to Pickup Zones

a. The aviation mission commander assists in the selection of loading sites to insure that they meet requirements. It is the aviation mission commander's responsibility to insure that partici-

pating personnel of his unit are briefed on the location of, routes to, and arrival time at the loading sites.

b. Factors in the successful movement of aircraft to the loading sites include—

- (1) Flight routes.
- (2) Approaches to the loading site or pickup zone.
- (3) Coordination of attack helicopters, tactical air support, artillery fires, and other fire support means.
- (4) Careful movement planning to insure timely arrival at the loading site or pickup zone.
- (5) In-flight and landing formations.
- (6) Provision of terminal guidance.
- (7) Use of prearranged signals, which are difficult for the enemy to compromise, to identify pickup zone(s). Artillery or mortar smoke fired near the pickup zone may also be used as a reference point.
- (8) Use of other aircraft.

c. Care must be exercised in the choice of the method of movement into the pickup zone. Large gatherings of troops and aircraft in a loading zone which normally has little air activity will usually alert the enemy. It may be more advantageous to infiltrate into the pickup zone.

5-6. Loading

a. The aviation mission commander or the aviation unit liaison officer advises and assists the AMTF commander in preparing loading plans based on the lift capability of the aircraft. The liaison officer insures that planned loads do not exceed the capacity of the aircraft.

b. Ideal loading conditions do not always exist. Many situations, such as when time is critical in exploiting a tactical advantage, will require loading without plans and may necessitate the making up of loads on site, based upon the number and types of aircraft that are actually committed to the specific operation. Maximum advantage is taken of space and lift available, giving due consideration to tactical integrity. Available aircraft not designed for troop lift should be used to haul additional logistical items during all phases of the operation; to evacuate prisoners and administrative returnees, and to assist in evacuating patients if medical air ambulances are not available.

CHAPTER 6

TRAINING

Section I. RESPONSIBILITIES

6-1. General

The training of aviation and ground combat units for airmobile operations is the responsibility of commanders at all echelons. The objective is to familiarize units with all aspects of airmobile operations and enable them to conduct airmobile operations with maximum speed, flexibility, and timeliness.

6-2. Major Unit Commanders

Major unit commanders are responsible for aviation unit training and combined training with ground combat forces. They insure that the following requirements are fulfilled:

- a. Training of staffs at all levels in planning for and conducting airmobile operations.
- b. Training of combat service support units and nondivisional aviation units in appropriate subjects in the conduct of support for airmobile operations.
- c. Training of nondivisional combat and combat support units in the conduct of airmobile operations.
- d. Support of airmobile training by aviation combat service support, and combat and combat support units.

6-3. Ground Force Commanders

Commanders of all forces participating in airmobile operations should insure that troop training includes the following: Working knowledge of Army aircraft, troop flight safety procedures, preparation and loading of equipment for internal and external transport; familiarization with aerial weapons systems employment and how to control this fire support; terminal guidance techniques; techniques of assembly and reorganization; rappelling and trooper ladder operations; air movement; and conduct of airmobile operations.

6-4. Army Aviation Unit Commanders

Army aviation unit commanders are responsible for individual proficiency within their organizations and for training their units in the following procedures: Teamwork with the supporting arms and services; the employment of aerial weapons systems; low-level and nap-of-the-earth navigation; formation flying at night and under other conditions of reduced visibility; camouflage and security of aircraft; unit control of aircraft; air traffic control; rappelling and trooper ladder operations; sling load operations; pathfinder techniques; and confined area operations with maximum internal and external loads.

Section II. CONDUCT OF TRAINING

6-5. General

a. Airmobile training is integrated into appropriate current unit training programs. The purpose of training is to develop the capability to conduct airmobile operations at each level from squad through brigade. Combined unit training is integrated into tactical training of successively larger units. In preparation for an airmobile operation, ground and aviation units should train together. Joint training of ground and aviation elements and improvements in procedures will result in a high level of readiness.

b. Airmobile training begins by training per-

sonnel of small units in the techniques and procedures peculiar to airmobile operations. Proficiency in these techniques and procedures provides a foundation for the combined training of small ground combat units and their support. Aircraft organic to division and brigade are used in support of squad, platoon, and company training.

6-6. Ground Force Training

Ground combat forces that are to participate in airmobile operations must be proficient in ground tactical operations and must obtain maximum combat efficiency. Whenever the situation permits,

airmobile operations should be preceded by intensive training employing battle drill and formations tailored to fit the contemplated operations.

6-7. Individual and Unit Training

The following subjects should be included in appropriate phases of individual and unit training:

a. Ground Combat Units.

- (1) Subjects required for attainment of maximum proficiency in ground combat skills.
- (2) Methods and techniques of assembly and reorganization.
- (3) Psychological preparedness.
- (4) Methods and procedures for control and guidance of aircraft.
- (5) Aircraft and flight safety.
- (6) Aerial weapons systems and control of attack helicopter strikes.
- (7) Close air support.
- (8) Subjects required for attainment of proficiency in rigging for external loading of organizational equipment.

b. Aviation Units.

- (1) Working knowledge of operational planning.
- (2) Low-level navigation and nap-of-the-earth flying.
- (3) Formation flying (day, night, and reduced visibility conditions).
- (4) Camouflage and security of aircraft.
- (5) Employment of aerial weapons systems.
- (6) Unit control of aircraft.
- (7) Air traffic control and pathfinder techniques.
- (8) Confined-area operations and maximum loads.
- (9) Aerial surveillance capabilities and limitations.
- (10) External loads.

c. Subjects Common to Aviation and Ground

Combat Units.

- (1) Conduct of liaison and coordination.
- (2) Selection, organization, and operation of loading areas and landing areas.
- (3) Working knowledge of pathfinder techniques.
- (4) Techniques of loading, lashing, and unloading internal and external loads.
- (5) Air resupply techniques.
- (6) Forward area rearming and refueling techniques.
- (7) Air and ground communications.
- (8) Air movement control and coordination with appropriate air defense agencies.
- (9) Special measures for antitank defense.
- (10) Stating requirements for fire support to include aerial fire support.
- (11) Training in defense against nuclear, biological, and chemical weapons.
- (12) Training in employment of special agents.
- (13) Call for and adjustment of field artillery.
- (14) Formations and actions at pickup zones under adverse combat conditions.
- (15) Withdrawal by use of ladder and personnel recovery devices.
- (16) Passive air defense and use of nonair-defense weapons against aircraft.
- (17) Training in signal security and electronic counter-countermeasures.

6-8. Staff Training

Staffs of ground and aviation elements must be trained in planning and conducting airmobile operations with emphasis on the following:

- a. Command and staff relationships.*
- b. Reverse planning sequence.*
- c. Fire support.*
- d. Aerial supply and evacuation procedures.*
- e. Aerial reconnaissance and surveillance support planning.*

Section III. REHEARSALS

6-9. General

Rehearsals should include troops and equipment to be moved on the airmobile operation. Rehearsals should be staged under conditions paralleling those expected in the operation. In units where airmobile operations are routine, SOP may preclude the requirement for airmobile operations rehearsals.

6-10. Specific Instruction

Security considerations and lack of adequate time and areas may limit the rehearsals or necessitate

acceptance of some artificial conditions. Ideally, each rehearsal includes the following:

- a. Occupying loading areas.*
- b. Moving to and loading aircraft at loading sites.*
- c. Unloading aircraft.*
- d. Assembly and control procedures after landing.*
- e. Executing the tactical plan.*
- f. Communication procedures.*
- g. Supply and evacuation procedures.*
- h. Actions to be taken during withdrawal under fire.*

APPENDIX A

REFERENCES

AR 95-100	Clarification of roles and Missions of the Departments of the Army and the Air Force Regarding Use of Aircraft
AR 310-25	Dictionary of United States Army Terms
AR 310-50	Authorized Abbreviations and Brevity Codes
AR 710-12	Army Aircraft Inventory, Status and Flying Time
FM 1-15	Aviation Battalion, Group, and Brigade
FM 1-40	Attack Helicopter Gunnery
FM 1-60	Army Air Traffic Operations
FM 1-80	Aerial Observer Techniques and Procedures
FM 1-100	Army Aviation Utilization
FM 1-105	Army Aviation Techniques and Procedures
FM 3-2	Tactical Employment of Riot Control Agent CS
FM 3-10	Employment of Chemical and Biological Agents
FM 3-12	Operational Aspects of Radiological Defense
FM 3-50	Chemical Smoke Generator Units and Smoke Operations
FM 5-1	Engineer Troop Organizations and Operations
FM 5-136	Engineer Battalions, Airborne and Airmobile Divisions
FM 6-20-1	Field Artillery Tactics
FM 6-20-2	Field Artillery Techniques
FM 6-102	Field Artillery Battalion, Aerial Field Artillery
FM 7-10	The Rifle Company, Platoons, and Squads
FM 7-20	The Infantry Battalions
FM 7-30	The Infantry Brigades
FM 8-10	Medical Support, Theater of Operations
FM 8-15	Medical Support in Divisions, Separate Brigades, and the Armored Cavalry Regiment
FM 11-50	Signal Battalion, Armored, Infantry, and Infantry (Mechanized) Divisions
FM 17-36	Divisional Armored and Air Cavalry Units
FM 17-37	Air Cavalry Squadron
FM 17-95	The Armored Cavalry Regiment
FM 20-32	Landmine Warfare
FM 20-33	Combat Flame Operations
FM 21-26	Map Reading
FM 21-30	Military Symbols
FM 21-40	Chemical, Biological, Radiological, and Nuclear Defense
FM 21-60	Visual Signals
FM 21-75	Combat Training of the Individual Soldier and Patrolling
FM 23-3	Techniques of Antitank Warfare
FM 24-1	Tactical Communications Doctrine
FM 24-16	Signal Orders, Records, and Reports
FM 24-18	Field Radio Techniques
FM 24-19	Communications-Electronics Reference Data
FM 24-21	Field Radio Relay Techniques

FM 29-22	Maintenance Battalion and Company Operations (Non-divisional)
FM 29-30	Maintenance Battalion and Company Operations in Divisions and Separate Brigades
FM 30-5	Combat Intelligence
FM 30-20	Aerial Surveillance-Reconnaissance, Field Army
FM 31-20	Special Forces Operational Techniques
FM 31-21	Special Forces Operations—U.S. Army Doctrine
(S) FM 31-21A	Special Forces Operations—U.S. Army Doctrine (U)
FM 31-23	Stability Operations, U.S. Army Doctrine
FM 31-25	Desert Operations
FM 31-35	Jungle Operations
FM 31-36 (Test)	Night Operations
FM 31-50	Combat in Fortified and Built-Up Areas
FM 31-60	River-Crossing Operations
FM 31-71	Northern Operations
FM 31-72	Mountain Operations
(C) FM 32-5	Signal Security (SIGSEC) (U)
(S) FM 32-10	USASA in Support of Tactical Operations (U)
(C) FM 32-20	Electronic Warfare (Ground Based) (U)
FM 41-10	Civil Affairs Operations
FM 44-1	U.S. Army Air Defense Artillery Employment
FM 44-3	Air Defense Artillery Employment, Chaparral/Vulcan
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FM 57-1	U.S. Army/U.S. Air Force Doctrine for Airborne Operations
FM 57-38	Pathfinder Operations
FM 61-100	The Division
FM 100-5	Operations of Army Forces in the Field
FM 100-26	The Air-Ground Operations System
FM 100-27	U.S. Army/U.S. Air Force Doctrine for Tactical Airlift Operations
FM 101-5	Staff Officers' Field Manual: Staff Organization and Procedure
TC 3-16	Employment of Riot Control Agents, Flame, Smoke, Antiplant Agents, and Personnel Detectors in Counter guerrilla Operations
TC 23-15	Engagement of Aerial Targets with Small Arms
TM 1-225	Navigation for Army Aviation
TM 1-300	Meteorology for Army Aviation
TM 5-330	Planning and Design of Roads, Airbases, and Heliports
TM 38-250	Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 55-450-8	Air Transport of Supplies and Equipment: External-Transport Procedures
TM 55-450-15	Air Movement of Troops and Equipment (Administrative)
ACP 125	Voice-Radiotelephone Procedures
ACP 136	Communication Instructions, Panel Signaling
ACP 168	Communication Instructions, Pyrotechnic Signals
JCS Pub 1	Dictionary of U.S. Military Terms for Joint Usage

APPENDIX B

SELECTION, IMPROVEMENT, AND OPERATION OF LANDING ZONES

B-1. General

a. In selecting a landing/drop zone, a major consideration is its proximity to the objective to be seized. A landing/drop zone should be as close to the objective area as possible without bringing the assault force under enemy ground attack or fire from supporting weapons. Alternate zones should be considered in the planning.

b. Consideration is given to enemy troop dispositions and his capability to react to an airmobile assault. Consideration is also given to terrain in, and adjacent to, the primary and alternate landing zones.

c. Available approaches to the landing zone, the obstacles on the landing zone, and the meteorological forecast for the time of the operation must be considered. A combination of terrain and low ceiling or changing visibility conditions may preclude the selection of some landing zones, or temporarily deny their use.

d. Selected landing zones should be within the range of supporting artillery. Supporting fires must have the capability of rendering the enemy ineffective against an AMTF until a foothold can be gained.

e. The security of the operation should not be compromised by the presence of reconnaissance aircraft overflying proposed landing zones.

B-2. Selection of Landing Zones

a. In selecting helicopter landing sites from maps, aerial photographs, and actual ground or aerial reconnaissance, the following factors are considered:

(1) *Size of landing point.* As a guide, a helicopter requires a relatively level, circular area 20-75 meters in diameter for landing, depending upon the type of helicopter. Generally speaking, a helicopter will require more usable landing area at night than during the day.

(2) *Number of helicopter used.* An important factor is the number of helicopters required to land simultaneously to accomplish the mission. It may be necessary to provide an additional land-

ing site nearby or to land aircraft in successive flights at the same site.

(3) *Landing formation.* Planned landing formations may require modification to allow helicopters to land in restricted areas. It is desirable, whenever possible, to land aircraft in the same formation in which they are flying.

(4) *Surface conditions.* Surface conditions must be firm enough to prevent helicopters from bogging down, creating excessive dust, or blowing snow. Rotor wash on dusty, sandy, or snow-covered surfaces may cause loss of visual contact with the ground and should be avoided, especially at night. Loose debris that may cause damage to the rotor blades or turbine engines must be removed from the landing zone.

(5) *Ground slopes.* Normally, if the ground slope is greater than 15 percent, helicopters cannot land safely. When the ground slope is under 7 percent helicopters should land upslope. In areas where the ground slope is from 7 to 15 percent, aircraft must land and park side-slope. It is sometimes possible, however, for helicopters to hover over ground slopes greater than 15 percent to load or unload personnel or supplies.

(6) *Approach/departure directions.* The direction of landing should be generally into the wind, especially at night. However, if there is only one satisfactory approach direction due to obstacles or tactical situation, or to make maximum use of available landing area, most aircraft can land with a crosswind (10 knots or less) or tailwind (5 knots or less). (The same considerations apply to departure from a landing area.)

(7) *Prevailing winds.* Of the two factors—approach/departure route ((6) above) and prevailing wind—the best approach/departure route is the more important factor unless the crosswind velocity exceeds 10 knots. The ability to land crosswind or downwind will vary, depending upon the type aircraft. Smaller aircraft can accept less crosswind or tailwind than larger, more powerful aircraft.

(8) *Density altitude.* The density altitude is determined by altitude, temperature, and humid-

ity. For planning purposes, as density altitude increases, the size of the landing site must be increased proportionately. Generally speaking, high or hot conditions at a given landing site will decrease the lift capabilities of helicopters using that site.

(9) *Loads.* Most helicopters cannot ascend or descend vertically when fully loaded; therefore, a larger landing area and better approach/departure routes are required for fully loaded helicopters.

(10) *Obstacles.* Landing sites should be free of tall trees, telephone or powerlines, or similar obstructions on the approach or departure ends of the landing site that may interfere with helicopter landings or takeoffs. Obstacles within the landing site (e.g., rocks, stumps, holes) that cannot be eliminated must be clearly marked. For planning purposes, an obstacles ratio of 10 to 1 will be used (e.g., a 10-meter tree needs 100 meters of horizontal clearance from landing points if aircraft must approach or depart directly over the tree).

b. Detailed information of the effects of air density, slope, and surface conditions on landing site requirements is contained in appropriate technical manuals. The helicopter unit commander determines minimum landing requirements. These requirements must be available to the pathfinder and ground unit in the form of SOP or oral instructions in the early planning stages of the mission.

c. Alternate sites may be needed because of enemy action, unfavorable terrain conditions, or changes in the tactical or logistical situation. The ground commander or his representative decides when alternate sites will be used, at the recommendation of the aviation unit commander and the pathfinder on the site.

d. Operations in landing zones include the following considerations:

(1) Serial or flight leaders establish communications with the control center or the airborne command post at the communications checkpoint and receive information on the weather, enemy, and terrain. When the information indicates that an alternate plan must be used, the airborne command post normally advises the serial or flight leader of the heading and distance to alternate sites or strips. All flights pass over the release point before taking up the heading to their landing sites or strips.

(2) Aircraft land, unload, and takeoff under control of the control center which normally, although not necessarily, consists of pathfinders. The following standard procedures may be used:

(a) *Helicopter landing zone.*

1. Flights may be vectored to the landing zones by the airborne command post or by armed helicopters which precede the troop aircraft.

2. Pathfinders or helicopters may mark the landing zone with smoke or other means.

3. A landing point for the flight leader may be marked for the flight leader and the rest of the flight lands adjacent to him.

4. Normally, only minimum markings are used during daylight operations. The landing point for the lead helicopter of each major formation may be marked by smoke or other easily identifiable means.

5. During pinnacle or single-point landings, the pathfinders may guide each helicopter individually, guiding it to its landing point by use of arm-and-hand signals.

(b) *Airplane landing strip.*

1. Parking party personnel use arm-and-hand signals to control aircraft parking.

2. When pathfinders or other air traffic control elements are used, aircraft receive landing, taxi, and takeoff instructions from the control center by radio or standard light signals. (See FM 21-60 and FM 57-38 for light signals.)

B-3. Night Landing Zones, Landing Strips

a. *General.* During the conduct of illuminated or nonilluminated night operations, the touchdown point of each aircraft in the formation should be marked by a visible light source.

b. *Selection.* The considerations applicable to the selection of day landing zones and landing strips are equally applicable for night operations. Increased emphasis is placed on avoiding obstacles and selecting glidepaths free of obstacles. Landing sites must be easily identifiable and must provide added maneuver room for helicopter formations in flight during landing and takeoff.

c. *Preparation.* At night, emphasis must be placed on preparation of landing strips and sites to insure an obstacle-free and dust-free surface. Obstacles that cannot be removed must be clearly marked.

d. *Operation.* The operation of night-landing zones, landing strips, or drop zones is essentially the same as for day operations, but more control is exercised over the aircraft formations. Normally, radio control is mandatory to control aircraft. Flight leaders establish communication with the control center at a designated communication checkpoint or time. Command and control and reconnaissance helicopters may be used to vector helicopters to the landing zones.

B-4. Special Landing Zones

a. In difficult terrain, landing zones may be unusually hard to prepare. Much work will have to be done to remove obstacles and level the ground. Additional personnel and equipment may be required for this purpose.

b. In swampy areas, it may be necessary to build mats of small trees or other material upon which helicopters may land and unload.

c. In mountainous terrain, landing sites may be prepared on ridges or pinnacles by cutting into a hill or ridge and building up a level area. This leveled area must allow enough room for the helicopters to land and provide a clearance between the rotor blades and the uphill slope.

d. Every effort must be made to reduce the amount of dust created by landings and takeoffs. Dust interferes with an aviator's vision and creates special aircraft maintenance problems. oil may be sprayed on the ground to minimize dust.

e. In arctic areas, powdered snow creates the same general problems created by dust in the desert. When time and the situation permit, the powdered snow should be scraped away until a firm surface is reached, or the snow should be firmly packed.

f. Loaded helicopters may not be able to land or take off vertically but require a short ground roll or running takeoff. In jungle operations, considerable time and effort may be required to provide adequate landing and takeoff space. If landing sites cannot be cleared, and the density altitude permits, personnel can unload from hovering helicopters by climbing down ladders, by rappelling or by jumping if the helicopters can touch down on skid or wheel or hover low enough to preclude injury to personnel exiting from the aircraft. Troop ladders and rappelling ropes may also be used to land troops. On occasion, pathfinders or engineers may use demolitions or powersaws to open sufficient space in the jungle canopy. Landing sites may also be cleared by large bombs delivered by the Air Force or Army heavy lift helicopters.

B-5. Landing Zone Preparation (Prestrike)

The purpose of preparing a landing zone is to disorganize and confuse a strong enemy force to prevent its immediate reaction to the airmobile force during movement, landing, and assault phases of an operation. The airmobile force commander may choose one or more of the following methods of preparation:

a. Close Air Support.

(1) The versatility of available aircraft

armament systems allows for flexibility in any plan of operation. The weapons system and method of delivery will depend on several factors, to include disposition of troops, type of landing zone, location of landing zone, time of combat assault and desired effect. The tactical air power must be immediately responsive to the airmobile force.

(2) Use of bombs is another means of delivering maximum devastation against an enemy force fortified in or near a proposed landing zone. Coordination for the use of this support is completed at the joint staff level.

b. *Artillery Preparation.* Artillery fires must be planned on known or suggested enemy positions on or near the actual landing zone to deceive the enemy as to the intended attack and maximize the effects of surprise.

c. *Naval Gunfire.* The availability of this type of fire support is often limited by location and restriction of movement. However, this fire can be used very effectively to prepare several likely landing zones, thus causing the enemy to become confused as to which landing zone will be used by the assault elements. Adjustment of naval gunfire by naval gunfire spotters will greatly increase the accuracy of this fire. A positive means of radio contact with the vessels providing the gunfire gives a direct response to the airmobile force commander.

d. *Attack Helicopters.* Attack helicopters give the commander a capability for immediate responsive aerial fire support. Attack helicopters firing close-in, last-minute preparatory fires will neutralize enemy forces present within the landing zone in a minimum amount of time.

e. *Employment of Riot Control Agents and Smoke.* The use of nonpersistent chemical riot control agents in landing zone preparation is most effective against a well-entrenched enemy. Screening smoke may also be used to great advantage in restricting enemy observation and reducing the effectiveness of enemy fire. Employment of riot control agents and smoke must be coordinated with all elements to avoid adverse effects to friendly elements.

f. *Special Munitions.* Special munitions are effective when used against well-entrenched enemy forces located on the perimeter or in the vicinity of the landing zone.

g. *Troop-landing Smokescreens.* Smokescreens properly placed can be used to conceal the landing zones. Care must be taken to insure that the smoke does not interfere with the landing operations.

APPENDIX C

EMPLOYMENT OF ATTACK HELICOPTERS SUPPORTING AIRMOBILE UNITS

C-1. General

a. Mission. Attack helicopters supporting air-mobile units perform three basic missions—direct aerial fire support, escort and reconnaissance, and security. These missions occasionally may be performed concurrently. The primary mission will be dictated by the mission of the supported unit or by tactical necessity (i.e., attack helicopters supporting a maneuvering ground force by fire normally will be assigned a primary mission of direct aerial fire support).

b. Organization. The basic element is the light fire team (two attack helicopters employed for mutual support). The light fire team may be augmented (reinforced) by an additional attack helicopter (heavy fire team). Larger tactical units are made up of multiple fire teams. A single attack helicopter is not used in the attack role. However, single attack helicopters may be used to provide fire support to aircraft conducting a reconnaissance mission. When assigned this mission, the attack helicopter will maintain visual contact with the reconnaissance aircraft and fly at an altitude and in a position which will allow a single, responsive delivery of aerial firepower. The attack helicopter should deliver a high volume of firepower at this time and should not engage the enemy more than once.

c. Concept. Attack helicopter fire augments, but does not replace, the other types of fire support. Attack helicopters normally provide neutralization fire; however, when the available armament, the target type, and the target area allow, the attack helicopter can provide effective destruction/neutralization firepower upon emplacements, equipment, and personnel.

C-2. Factors Affecting Employment

a. Mission. enemy, terrain and weather, and troops and equipment should be considered. (For a detailed discussion, see FM 1-40.)

b. Number of fire teams available to support the operational concept.

c. Availability of fuel/ammunition in or near the area of operation.

C-3. Coordination and Control of Aerial Fires

When a ground commander assumes responsibility or control of an area, he coordinates and controls all fires delivered into the area, including aerial fires delivered by aviation resources. Aerial fires delivered into an area that are not controlled by or assigned to a US or allied unit are controlled by the aviation element delivering the fires. The manner in which a commander controls aerial fires in his area may vary; however, the commander, S3, G3, the artillery representative and the representative of the aviation unit providing the aerial fire support are principally involved in planning, controlling, and coordinating direct aerial fire support.

C-4. Requesting Procedures

Two procedures for requesting attack helicopter support are utilized. These are the *preplanned* and the *immediate*.

a. Preplanned Request. The preplanned request is used when the tactical requirement can be anticipated sufficiently in advance to permit detailed mission coordination and planning. Certain elements which must be included in all preplanned requests are as follows:

(1) *Type of support desired.* This portion of the request should include anticipated mission(s) to be accomplished by the attack helicopters.

(2) *Place and time to report for briefing.*

(3) *Special instructions.* Special instructions pertinent to the operation to be conducted will be covered in the briefing. Special instructions within the request should pertain to any desired actions *prior* to the briefing.

(4) *Signal.* The signal plan to include identification procedures, frequencies, and call signs is required prior to reporting to the briefing. Proper distribution of signal information required to support the mission will be distributed at the brief-

ing. This information will include arrangements for key lists for secure voice FM.

b. Immediate Request. When the situation does not allow time for a preplanned request and briefing, an immediate request is submitted through the most responsive channels, usually over the command radio net.

(1) An immediate request should include, as a minimum—

(a) *Observer identification.*

(b) *Observer situation.*

(c) *Target description/location.*

(2) An example of an immediate request would be: DOUGHBOY 6, THIS IS DOUGHBOY 21; MY UNIT PINNED DOWN BY ENEMY FIRE FROM TWO AUTOMATIC WEAPONS IN THE VICINITY OF COORDINATES XS681242. OVER.

C-5. Attack Helicopter Crew Briefing

a. Ideally, the briefing of the attack helicopter crews would be included in the briefing and issuance of orders to subordinate commanders or leaders. The attack helicopter crews should be fully aware of each aspect of the operation.

b. A preplanned mission briefing should include—

(1) *Enemy information.* Known or suspected location and type of enemy antiaircraft weapons.

(2) *Friendly information.* To include controlling authority and rules of engagement binding on friendly ADA.

(3) *Mission.* The supported unit's mission with all of its specified and implied tasks.

(4) *Concept of the operation.*

(a) *Execution (scheme of maneuver).*

(b) *Supporting elements or units.*

(c) *Restrictions.* Attack helicopters will be governed by the same restrictions and fire support coordination and control measures as those for the ground forces.

(5) *Location of refueling and rearming points.*

(6) *Signal.* Attack helicopters are most effective when operating on the supported unit's internal command frequency. By monitoring this frequency, the attack helicopter team commander can stay abreast of the tactical situation and remain prepared for any contingency. When fires are coordinated by the FSCoord, attack helicopters may be most effective while operating on the direct support field artillery battalion's fire net. Inter-helicopter communications normally will be on VHR or UHF radio and will not interfere with ground command FM communications. Care should be exercised in using the inter-helicopter

VHF/UHF transmissions to avoid identifying the ground unit or its location.

c. An immediate mission briefing should include—

(1) *Observer's identification (call sign).*

(2) *Target location.*

(3) *Target description.*

Under normal operating conditions, the fire team will have previously received a preplanned mission briefing and only observer identification, target location, and target description will be required by the fire team leader prior to or shortly after takeoff.

Note. All following data are applicable to both preplanned and immediate missions.

C-6. Radio Contact

While enroute to the target area, the fire team leader will contact the supported unit's observer on the unit's secure FM command frequency. An example of radio contact would be: DOUGHBOY 21, THIS IS DEVIL 36; LIGHT FIRE TEAM; OVER. At this time, the observer must further brief the fire team. This briefing should include—

a. Situation.

(1) Target location (grid coordinates).

(2) Target description.

(3) Proximity of friendly unit to target (DANGER CLOSE must be announced when friendly unit is 600 meters or less from the target).

(4) Direction of friendly unit from target (cardinal direction).

b. Other friendly fire support considerations.

(1) Artillery/mortars (artillery/mortar unit call sign).

(2) Tactical air (attack direction/altitude).

c. Presence and/or location of known or suspected enemy antiaircraft weapons.

C-7. Control Procedures

a. Attack helicopters are controlled through the use of a CALL FOR FIRE and adjustment of fire techniques. When the requestor (observer) is contacted by the fire team leader, he must issue a CALL FOR FIRE. The CALL FOR FIRE must include the *target location*, the *target description*, and the *method of adjustment*. It may include the *observer's exact location*.

(1) *Target location.* Target location (fig. C-1) can be given to an attack helicopter fire team by—

(a) Reference to the observer's location, a prominent terrain feature (readily identifiable from the air), or a known point, checkpoints, etc..

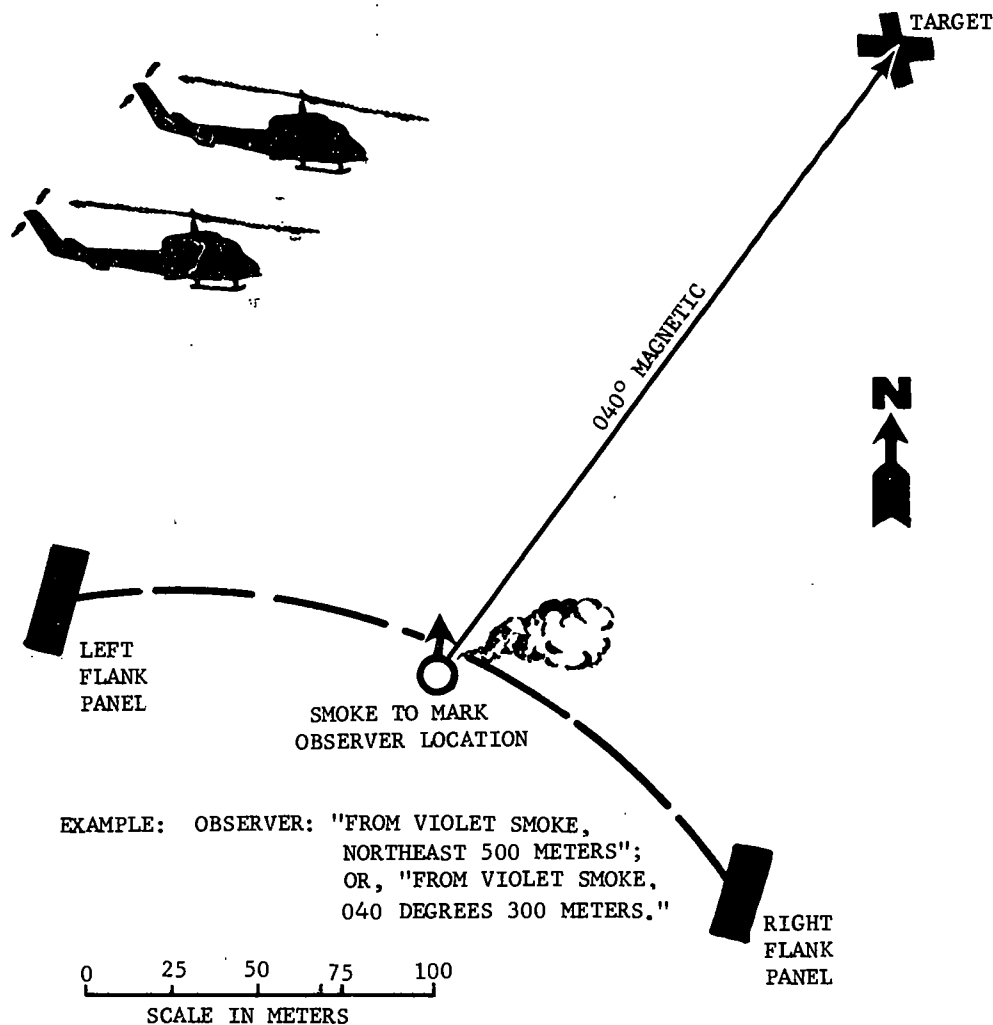


Figure C-1. Target location.

1. Direction to target from observer's marker (magnetic heading in degrees or one of the eight cardinal points of the compass such as north, south, southwest, northeast, etc.).

2. Distance to target from observer's position in meters.

(b) Friendly fire:

1. M79 (day-smoke, night-HE).

2. Tracers.

(2) *Target description.* It is necessary for the armed helicopter team to have a target description since the type of target will determine the method of attack and the weapon(s) to be used.

(3) *Method of adjustment.* Round impact or observer target.

b. The aircraft commanders will take many factors into consideration when making their strike. Among these are—

(1) Sun.

(2) Wind.

(3) Enemy situation (disposition).

(4) Friendly situation (disposition).

(5) Longitudinal dispersion of weapons.

(6) The type of target as given in target description.

(7) Weather. Low clouds or rain.

c. An example of a CALL FOR FIRE would be:

Observer: DOUGHBOY 21, SMOKE, OVER.

Fire Team: DEVIL 36, SMOKE, WAIT . . .
VIOLET SMOKE, OVER

Observer: FROM VIOLET SMOKE, NORTH-
EAST 300 METERS, TWO AUTO-
MATIC WEAPONS NEAR TREE
LINE, OVER

Fire Team: TARGET IDENTIFIED, OVER.

Observer: PANELS MARK MY FLANKS,
ADJUST FIRE FROM ROUND
IMPACT, OVER.

Fire Team: ROGER, FRIENDLY POSITIONS IDENTIFIED, ATTACK HEADING 090 DEGREES, OBSERVE ROUND IMPACT, OVER. (Fires one pair.)

For information on control of aerial field artillery, see FM 6-102.

C-8. Adjustment of Fire

The individual responsible for firing the ordnance can visually locate the observer, the target, the impact of the ordnance, and the effect of the ordnance on the target. This simplifies the adjustment requirements. However, the observer must be prepared to adjust direct aerial fire support. When adjusting direct aerial fire support, certain principles must be considered. (See fig. C-2 and C-3.)

a. *Establish a Reference Point.* The point of impact of the initial round is the recommended reference point.

b. *Adjust for Target Strike.* Do not attempt to "bracket" the target. This is a waste of limited ammunition.

c. *Transmit Corrections in Meters (directions and distances).* Do not transmit sensings such as long, short, to the left, etc.

Note 1. Once the method of adjustment has been established, it should not be changed unless the tactical situation dictates, at which time the fire team must be informed.

Note 2. When the adjustment is 50 meters or less, transmit the adjustment and *fire for effect*. When utilizing the round method, the observer estimates the direction (cardinal headings) and the distance (in meters) from the round impact to the target. (See fig. C-2.)

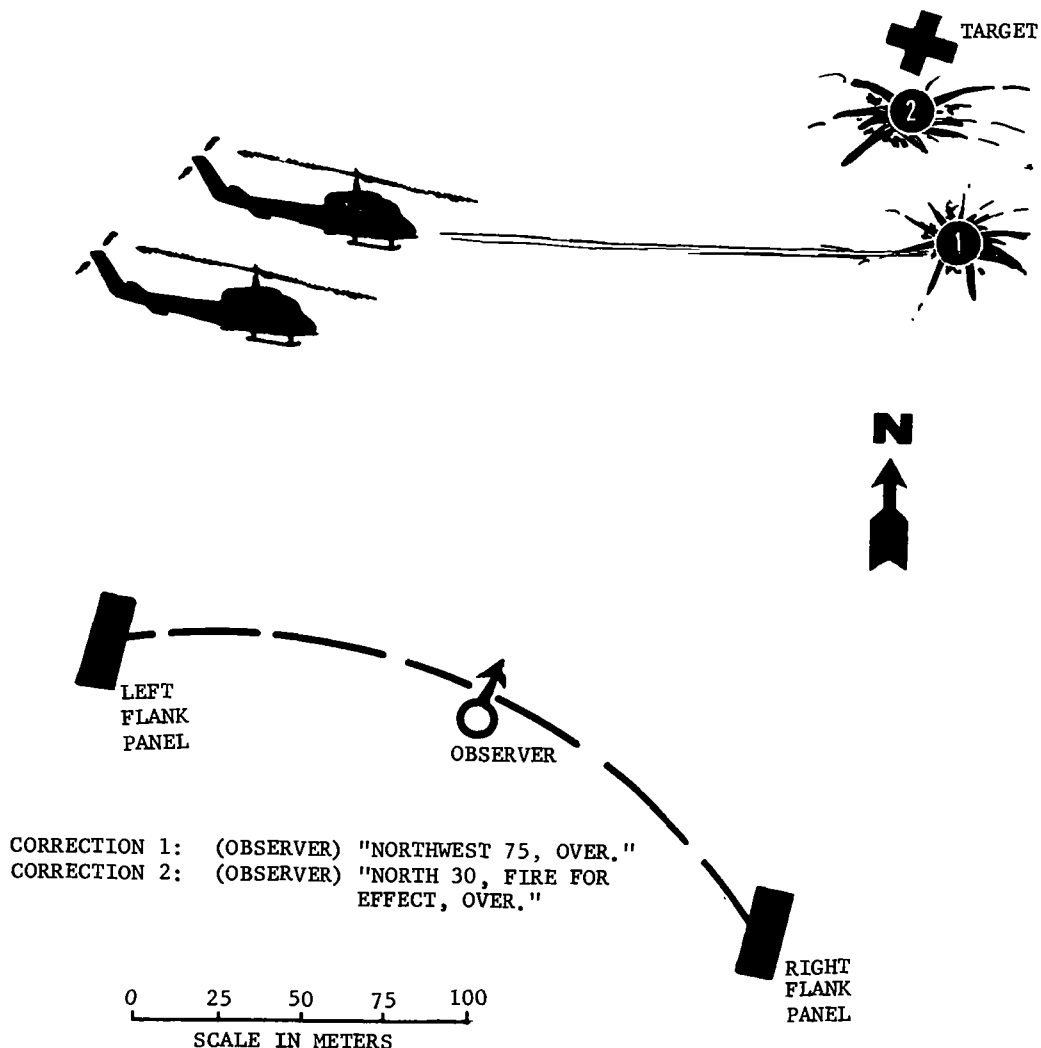


Figure C-2. Adjustment of attack helicopter fire (round-impact method).

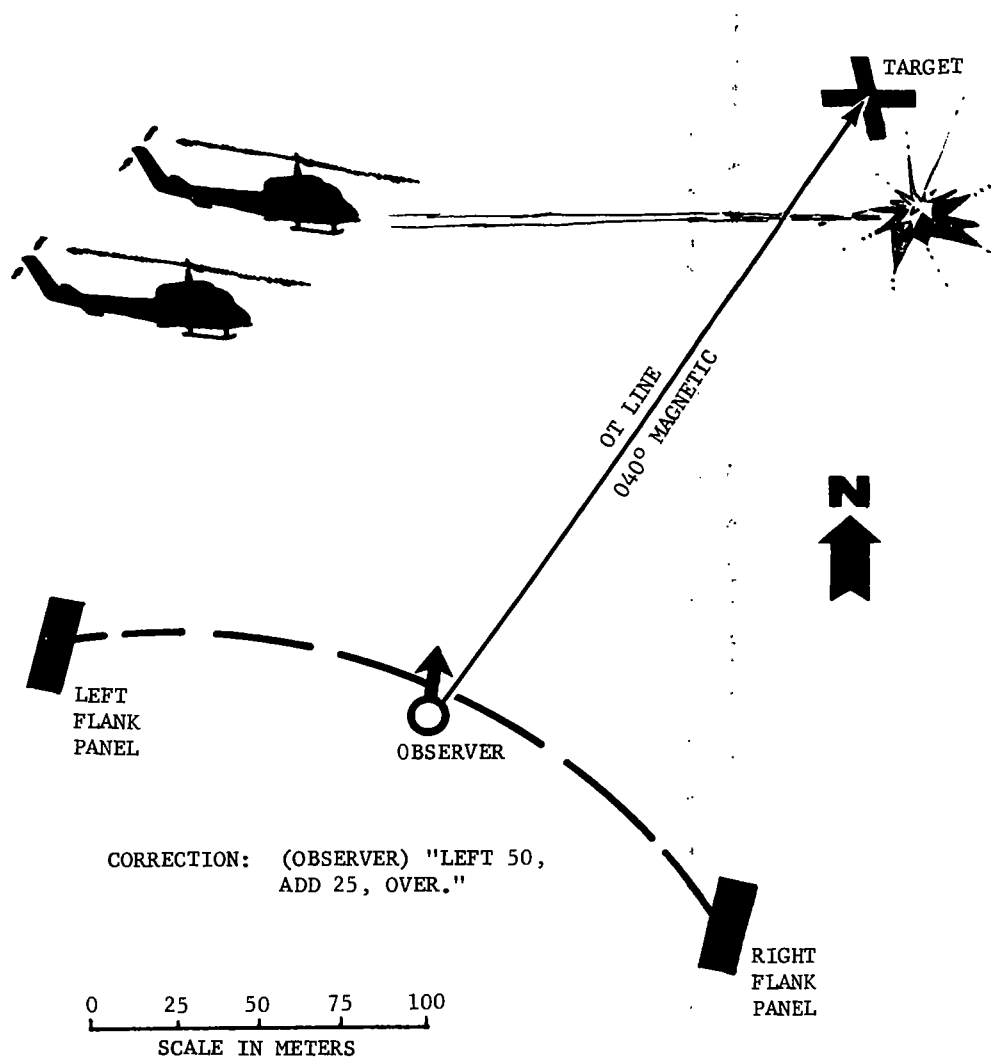


Figure C-3. Adjustment of attack helicopter fire (OT-line method).

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