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ATTACK HELICOPTER BATTALION

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No 1-112

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ATTACK HELICOPTER BATTALION

CONTENTS

*This publication supersedes FM 17-50, 4 May 1984.

PREFACE

Attack helicopter units are organized and equipped to fight as active members of the combined arms team. Success on tomorrow's battlefield depends on the execution of Air-Land Battle Doctrine by every member of the combined arms team. The swift strike capability and tremendous firepower of the attack helicopter battalions will, in no small measure, help to assure that success.

Based on the J-series table of organization and equipment, this publication describes how attack helicopter battalions will be organized and how they will fight on the air-land battlefield. It also discusses the roles of attack helicopter battalions and outlines employment techniques for all types of combat operations. The operational concepts are based on the Air-Land Battle Doctrine in FM 100-5.

This publication applies to commanders and staffs at all echelons who lead, employ, or fight with attack helicopter battalions.

The proponent of this publication is HQ TRADOC. Submit changes for improving this publication on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward it through the aviation unit commander to Commander, US Army Aviation Center and Fort Rucker, ATTN: ATZQ-TDD, Fort Rucker, AL 36362-5000.

The provisions of this publication are the subject of international agreements:

STANAG 2355	Procedures for the Employment of Helicopters in the Antiarmor Role
STANAG 3628	Helicopter Tactical Refueling

This publication has been reviewed for operations security considerations.

Unless otherwise stated, whenever the masculine gender is used, both men and women are included.

Chapter 1

INTRODUCTION

1-1. General

a. Attack helicopter battalions are assigned to corps attack helicopter regiments and divisional aviation brigades. They give the maneuver commander a highly mobile and lethal 24-hour antiarmor and antipersonnel destruction capability. When fully integrated with ground maneuver forces, ATKHBs can increase the commander's combat ratios.

b. Despite the increased range and lethality of Threat weapons, ATKHBs can fight and survive on the nonlinear battlefield. The battalions employ the same principles of battle used by armor and infantry forces. Those principles include the following:

(1) Seeing the battlefield.
(2) Using the terrain.
(3) Using overwatch techniques.
(4) Suppressing, neutralizing, or destroying enemy AD systems with smoke, with high-explosive ammunition, and with electronic countermeasures.

c. The ATKHBs are combat maneuver units and not CAS or fire support units. Therefore, they must be integrated into the commander's tactical maneuver plan along with other maneuver units. The ATKHBs can move rapidly to critical points at the decisive time, changing a battle's outcome. When employed with other combined arms elements, they can strike the Threat where and when it is most vulnerable.

1-2. Mission

a. The primary mission of ATKHBs is to destroy massed enemy forces with aerial firepower, mobility, and shock effect. With attack helicopters, units can gain, maintain, and exploit the initiative to defeat the Threat. The ATKHBs accomplish their mission during offensive, defensive, or special-purpose operations. The battalions may also be assigned tasks to—

(1) Conduct rear area operations.
(2) Coordinate and adjust indirect fires.
(3) Suppress or destroy enemy ADA assets.
(4) Reinforce, by fire, ground maneuver forces.
(5) Conduct JAAT operations with CAS and FA assets.
(6) Destroy enemy communication and logistical assets.
(7) Disrupt and destroy enemy second echelon and follow-on forces.
(8) Protect air assault forces during all phases of air assault operations.
(9) Destroy enemy helicopters that pose an immediate threat to mission accomplishment.

b. The ATKHBs can be committed early in battle. They can reinforce ground combat units and can attack, delay, or defend by engaging the Threat with direct and indirect fires. The battalions cannot conduct missions requiring the occupation of terrain without cross-attachment of ground maneuver forces. However, they can deny terrain to the enemy for a limited time by dominating that terrain with fire.

1-3. Organization

a. The heavy division ATKHB consists of an HSC and three ATKHCs. Figure 1-1 shows the organization of the heavy division ATKHB.

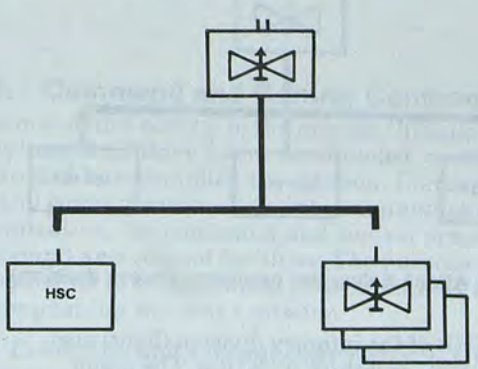


Figure 1-1. Attack helicopter battalion (heavy division)

(1) The HSC provides command, control, service, and logistical support to the battalion. The headquarters consists of the battalion commander and staff. The service company headquarters consists of a company supply section, a unit automotive maintenance section, and a consolidated mess section. The company includes an AVUM platoon, a battalion aviation section, a communications section, a Class III and V platoon, and a medical section. The AVUM platoon consists of a platoon headquarters, an aircraft maintenance section, and an aircraft component section. The service company provides organizational level maintenance for air and ground vehicles, Class III and V logistical support, communications support, and medical support. Figure 1-2 shows the organization of the HSC in the heavy division.

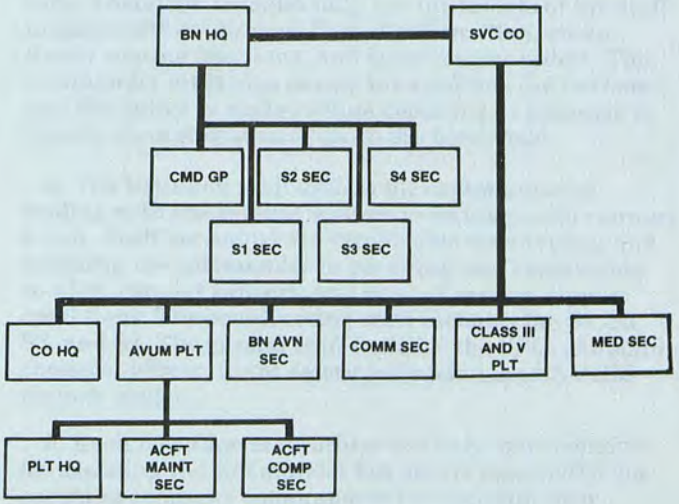


Figure 1-2. Headquarters and service company (heavy division)

(2) The three ATKHCs provide the ATKHB commander an antiarmor destruction capability. Each company is commanded by a captain who is responsible for ensuring that the unit can accomplish its mission. The company consists of a scout platoon with four scout helicopters. The attack platoon contains six or seven attack helicopters. Figure 1-3 shows the organization of the ATKHC in the heavy division.

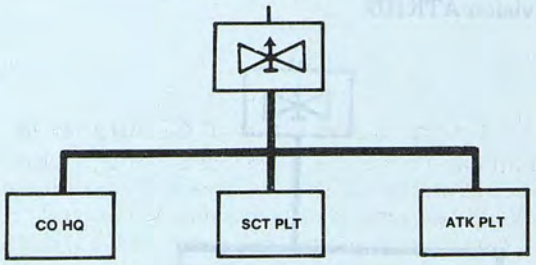


Figure 1-3. Attack helicopter company (heavy division)

b. The ATKHB of the infantry division (light) also consists of an HSC and three ATKHCs. The major difference between the heavy and light division battalions is that the latter does not have a Class I, III, or V capability at battalion level. Class I, III, and V support is provided by the AB, the division, or echelons above division. The three ATKHCs in a light division battalion are organized the same as those in a heavy division ATKHB.

c. The AMC provides AVIM for ATKHBs. The AMC is located at the DISCOM.

1-4. Air-Land Battle

a. Success on future battlefields will depend on how well the tenets of Air-Land Battle Doctrine are applied. Those tenets are initiative, depth, agility, and synchronization.

b. Attack helicopters are offensive weapon systems. They give commanders the means to deliver massed firepower rapidly and accurately, thus disorganizing Threat forces and keeping them off balance. The ATKHBs can conduct operations independently or in coordination with other members of the combined arms team.

c. The ATKHBs can attack Threat forces anywhere on the battlefield. Commanders must use the entire battlefield to strike the Threat and prevent it from concentrating firepower or maneuvering forces to a point of its choice. The speed with which attack helicopters can maneuver throughout the battle area allows ground commanders to destroy targets otherwise beyond their reach.

d. The mobility and flexibility of attack helicopters expand the reach of commanders at all levels to all parts of the battlefield. Terrain provides cover and concealment for attack helicopters just as it does for armor and infantry, but it does not limit the helicopter's mobility. Also, attack helicopter units need not occupy the terrain to deny the enemy access. As maneuver forces, ATKHBs can dominate terrain for a short time. They can also enable ground forces to outmaneuver and engage Threat forces from directions where they are most vulnerable.

e. To survive and succeed on the modern battlefield, ATKHBs must fight as integrated members of the combined arms team. The inherent weaknesses of the helicopter are counteracted by the strengths of armor and infantry forces and vice versa. That is the prime reason the combined arms team will be a potent force on the air-land battlefield.

Chapter 2

COMMAND, CONTROL, AND COMMUNICATIONS

2-1. General

Command and control is exercised in the ATKHBs in the same manner as it is in other maneuver battalions. Each ATKHB commander establishes a CP and unit trains to supervise and plan combat, combat support, and combat service support operations. The CP will usually include the coordinating staff, fire support coordination personnel, and necessary liaison personnel. The commander may operate from a ground-based CP, from his command and control aircraft, or from his ground vehicle.

2-2. Battalion Commander

The commander is the key to the overall success of the ATKHB. He decides how the battalion's combat assets will be used and directs the execution of those plans. The commander must position himself where he can best influence and accomplish these tasks, normally forward with his employed elements. The commander must also issue clear and concise guidance to avoid any confusion about how the battle is to be fought. Through personal contacts and communication links, the commander ensures the unity of effort required to accomplish the mission.

2-3. Commander's Estimate

The commander's estimate results in a decision on how to accomplish a given mission. After considering METT-T and other relevant factors, the commander reaches a decision. His estimate is based on personal knowledge of the situation, on ethical considerations, and on staff estimates. FM 101-5 contains details about the commander's estimate.

2-4. Commander's Concept

Once the battalion commander has studied his mission and chosen a course of action, he issues a commander's concept to his staff. This concept specifies and assigns tasks, organizes and sets priorities, and allocates support to subordinate units. A mission order is usually used to issue the commander's concept. The order should include the following:

a. Clearly state the task to be accomplished.

b. Allocate resources available to accomplish the task.

c. Point out limits or controlling factors for coordinating the outcome.

2-5. Commander's Intent

The commander's intent is his vision of the battle; that is, how the commander expects to fight his forces and what he expects to accomplish. Each ATKHB commander must know what his brigade and division commanders intend. The ATKHB commander states his intent in paragraph 3a (Concept of Operation) of the battalion OPORD.

2-6. Command and Control Components

Command and control is the process through which the activities of military forces are directed, coordinated, and controlled to accomplish the mission. Command and control components include the command and control organization, the command and control process, and command and control facilities. The purpose of these components is to implement the commander's desires for accomplishing the unit's mission.

a. Command and Control Organization. This is how the commander organizes his staff to accomplish the mission. The command and control organization defines the relationship and authority of each staff section and establishes the functional grouping of the sections.

b. Command and Control Process. The command and control process is how the commander and his staff accomplish the mission. It keeps them informed of ongoing activities, enables them to make pertinent decisions, and allows them to supervise the execution of the mission. These procedures and techniques used in this process include records, reporting systems, and briefings which support the decision-making process.

c. Command and Control Facilities. Facilities for the ATKHB commander are located in the battalion's CPs. They may be on the ground, in a vehicle, or on board the commander's aircraft. These facilities include the battalion's communications net.

2-7. Commander and Staff

The battalion commander cannot be in all places at one time. Therefore, he must fully use the talents of his staff to assess the continuous flow of information, make timely routing decisions, and issue concise orders. The commander must also ensure his staff has the latitude and flexibility to make routine decisions in response to rapidly changing situations on the battlefield.

a. The battalion staff assists the commander by dealing with the routine matters associated with running a unit. Staff personnel are responsible for advising and assisting the commander in planning and supervising combat, combat support, and combat service support operations. The coordinating staff includes the S1, S2, S3, and S4. The special staff includes the FSO, chaplain, chemical officer, flight safety technician, and AVUM platoon leader.

b. Each battalion staff officer not only is responsible for assisting the commander but also is responsible for assisting company commanders in executing their missions. FM 101-5 describes the duties and responsibilities of each staff officer.

2-8. Command Posts

The ATKHB commander must be able to communicate not only with his higher headquarters but also with his subordinate units and forces on the ground. He does this by using echeloned CPs. These include a battalion TOC, TAC CP, and a rear CP.

a. Tactical Operations Center. Battalion command and control is effected primarily from the TOC. The TOC consists of those staff personnel required to continue ongoing operations and to plan for future operations. Included in the TOC are S2 and S3 sections, communications section elements, the FSE, and TACP elements. The TOC monitors operations around the clock. The primary supervisor is the battalion XO. When not operating from the TAC CP, the command group is located in the TOC. Figure 2-1 shows typical locations of the battalion's CP structure. Distances shown in the illustration are for planning purposes only; actual distances will depend on the mission and the terrain.

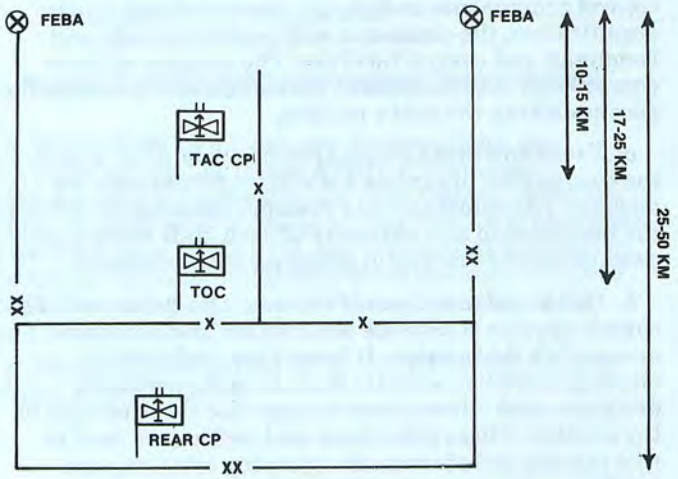


Figure 2-1. Battalion CP echelon

b. Tactical Command Post. The TAC CP, sometimes called the command group CP, consists of the commander's and S3's wheeled vehicles and the commander's aircraft. It is employed when a critical operational phase is taking place which requires forward area battle control. The TAC CP is manned by the battalion S3, some personnel from the battalion S2 and fire support sections, and the ALO. A TAC CP is ideal for fast-moving operations. It permits the commander to directly influence the battle while the rest of his staff, supervised by the battalion XO, operates from the TOC. The normal communciations mode is FM secure. The TAC CP—

(1) Controls unit movements.
(2) Coordinates fire support.
(3) Monitors combat operations.
(4) Relays CSS requirements to the rear CP.
(5) Provides updates on the enemy situation.
(6) Coordinates formation of JAAT operations.
(7) Issues mission changes in the form of OPORDs or FRAGOs. (Appendix A shows the format for an oral OPORD.)
(8) Monitors and controls movements of the battalion's FARPs.
(9) Maintains communications with higher headquarters and supported ground units.

c. Rear Command Post. The rear CP provides the CSS required to sustain the battalion. It may be located in the division support area or at a separate location in the division's rear area where major organizational maintenance is performed. The battalion S1 and S4 sections operate from this area and coordinate required support with the TOC. The battalion S4 has overall responsibility for the rear CP.

2-9. Communications

a. Successful employment of the ATKHB hinges on its ability to communicate with all members of the combined arms team. The primary means of requesting, directing, and employing attack helicopters is FM secure. However, UHF and VHF radios in all helicopters and the HF radio in the OH-58D helps reduce the load on FM radios. Other available means of communication include RATT, wire, messenger, sound, and visual communication.

NOTE: Wire and messenger will be the primary means of communication between the TOC and units in the battalion assembly area.

b. Figures 2-2 and 2-3 show examples of the ATKHB's external and internal communication nets. Figure 2-4 shows the internal communications net for an AH-1S-equipped ATKHC. Figure 2-5 shows the internal communications net for an AH-64-equipped ATKHC.

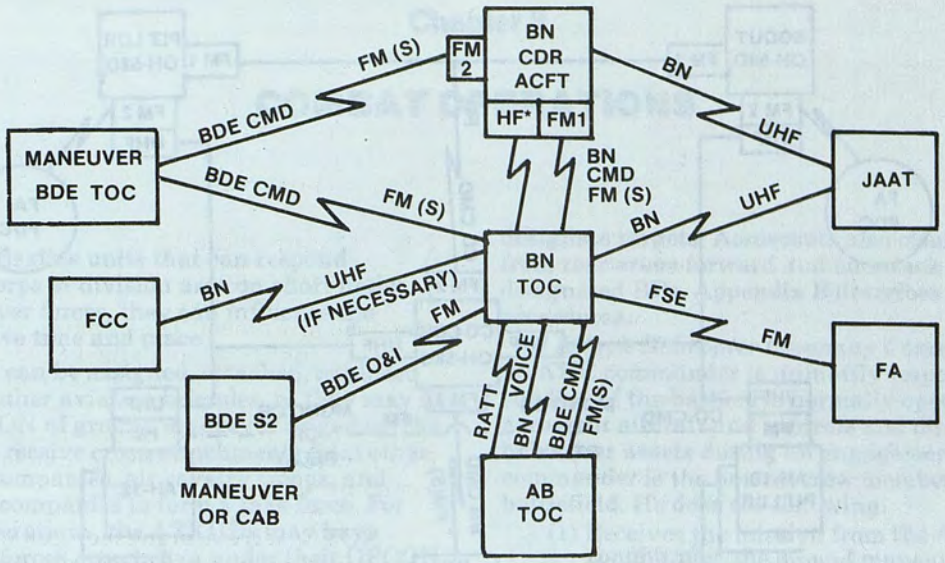
2-10. Continuous Operations

a. Arrival of the AH-64 will provide the ATKHB commander with an around-the-clock operational capability. However, this will present some difficult challenges concerning the battalion's command and control capabilities. Although there are enough personnel to man the TOC around the clock, the additional requirement to establish a TAC CP or rear CP will diminish that capability.

b. A single ATKHC cannot effectively operate on a continuous 24-hour-a-day basis. Therefore, if the ATKHB commander requires an around-the-clock capability, he must use his available assets.

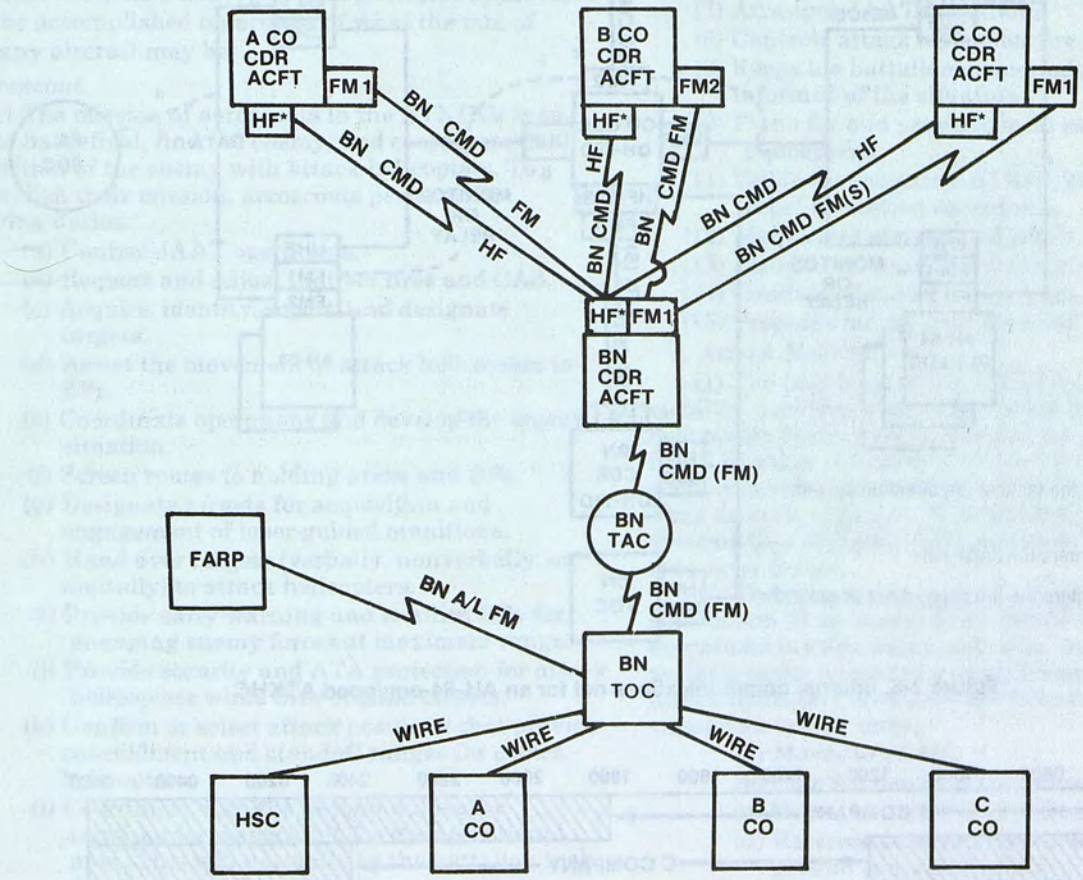
(1) One of the commander's options is to designate one ATKHC as the night-fighting unit. He will then have a dedicated, trained, and proficient force to conduct night operations. Company personnel, however, will require additional training in night aerial gunnery techniques and NVG operations. The other ATKHCs would assume responsibility for day operations. This does not relieve the remaining ATKHCs of the battalion from their night proficiency requirement.

(2) Another option is to train all three ATKHCs in night operations. This would increase the commander's flexibility in the employment of his units. Figure 2-6 is an example of how an ATKHB commander can disperse his units to meet a 24-hour-a-day operation. The illustration is based on a 12-hour aviator duty day with 5 hours' maximum flying time per aviator (4 hours when aviators use the NVGs).



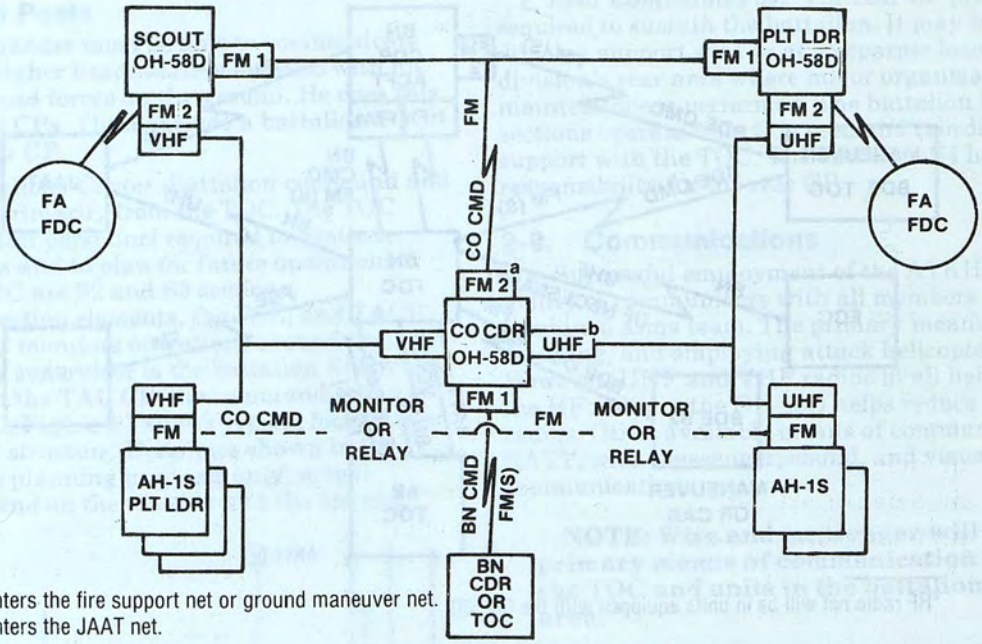
*HF radio net will be in units equipped with the OH-58D.

Figure 2-2. ATKHB's external communications net



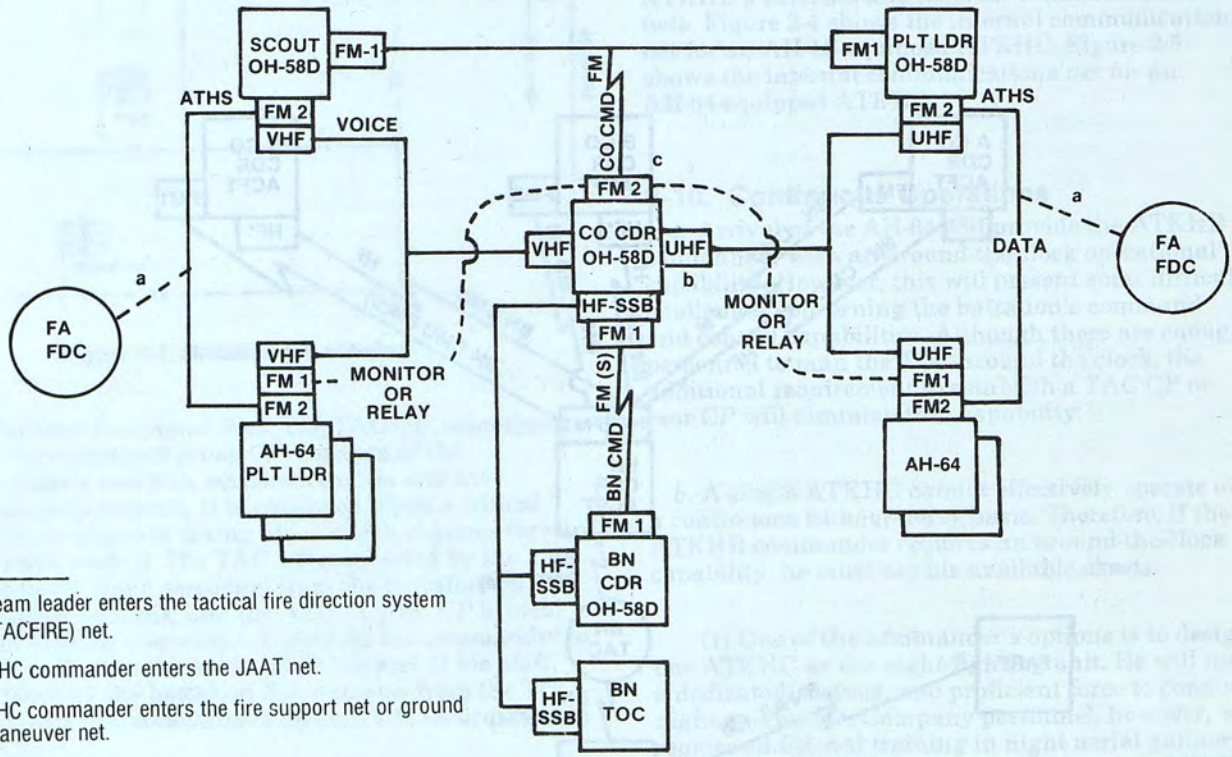
*HF radio net will be in units equipped with the OH-58D.

Figure 2-3. ATKHB's internal communications net



[a]AHC command enters the fire support net or ground maneuver net.
[b]AHC command enters the JAAT net.

Figure 2-4. Internal communications net for an AH-1S-equipped ATKHC



[a]Team leader enters the tactical fire direction system (TACFIRE) net.

[b]AHC commander enters the JAAT net.

[c]AHC commander enters the fire support net or ground maneuver net.

Figure 2-5. Internal communications net for an AH-64-equipped ATKHC

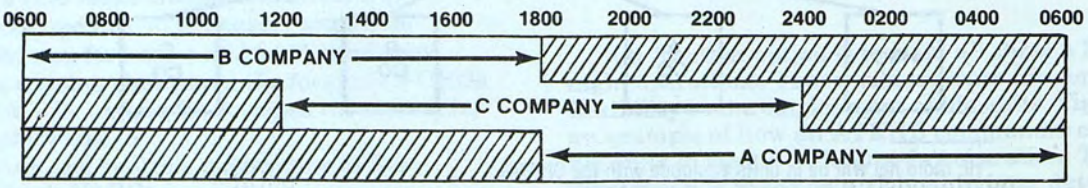


Figure 2-6. Battalion 24-hour-a-day cycle

Chapter 3

COMBAT OPERATIONS

3-1. General

The ATKHBs are flexible units that can respond anywhere in the corps or division area on short notice. As combat maneuver forces, they can influence the battle at the decisive time and place.

a. The ATKHBs can be assigned, attached, or placed under OPCON of other aviation brigades, or they may be placed under OPCON of ground maneuver brigades. The ATKHBs can also receive cross-attachments from other attack helicopter companies, air cavalry troops, and assault helicopter companies to form a task force. For specific combat operations, the ATKHBs may have ground maneuver forces attached or under their OPCON.

b. The success of the ATKHBs depends largely on the ground maneuver commander's understanding of how each ATKHB element contributes to the battle. Therefore, the commander must be aware of the missions of the aeroscouts and the attack helicopters.

3-2. Roles

During attack helicopter operations, the roles of the scout and the attack helicopters are different. These roles must be accomplished regardless of what the mix of company aircraft may be.

a. Aeroscout.

(1) The mission of aeroscouts in the ATKHCs is to see the battlefield, find the enemy, and coordinate the destruction of the enemy with attack helicopters. To accomplish their mission, aeroscouts perform the following duties:

(a) Control JAAT operations.
(b) Request and adjust indirect fires and CAS.
(c) Acquire, identify, report, and designate targets.
(d) Assist the movement of attack helicopters to BPs.
(e) Coordinate operations and develop the enemy situation.
(f) Screen routes to holding areas and BPs.
(g) Designate targets for acquisition and engagement of laser-guided munitions.
(h) Hand over targets (verbally, nonverbally, or digitally) to attack helicopters.
(i) Provide early warning and confirm BPs for engaging enemy forces at maximum range.
(j) Provide security and ATA protection for attack helicopters while they engage targets.
(k) Confirm or select attack positions that provide concealment and standoff ranges for attack helicopters.
(l) Coordinate with the ground maneuver commander responsible for the operational area. This will normally be the battalion task force commander or his S3.

(2) As enemy forces approach within the effective range of attack helicopters, aeroscouts adjust artillery, direct attack helicopters to the BP, and hand over or designate targets. Aeroscouts also clear flight routes from rear areas forward and on attack routes to designated BPs. Appendix B describes target handover procedures.

b. Attack Helicopter Company Commander. The ATKHC commander is primarily responsible for the conduct of the battle. He normally operates from an aeroscout aircraft and controls and directs attack helicopter assets during an engagement. The ATKHC commander is the busiest crew member on the battlefield. He does the following:

(1) Receives the mission from the ATKHB commander, the ground maneuver commander, or the S3.
(2) Provides detailed planning guidance to crews of scout and attack helicopters.
(3) Coordinates with the ground unit operating in the battle area.
(4) Selects primary and subsequent BPs for attack helicopters.
(5) Plans routes to HAs and BPs.
(6) Coordinates indirect fire support and CAS.
(7) Arranges JAAT operations.
(8) Controls attack helicopter fire in BPs.
(9) Keeps his battalion commander continually informed of the situation.
(10) Plans for and provides local security for attack helicopters.
(11) Briefs the incoming ATKHC commander during relief-on-station operations.
(12) Maneuvers aircraft to FARPs.
(13) Directs rearming and refueling operations.
(14) Conducts detailed debriefings.
(15) Prepares for the next mission.

c. Attack Helicopters.

(1) The backbone of the ATKHB is in the speed, mobility, and firepower of its attack helicopters. Attack helicopters destroy enemy tanks and armored vehicles found by other members of the combined arms team, such as cavalry, aeroscouts, or friendly ground forces. They destroy, suppress, or neutralize other enemy systems that threaten their operation or that of other maneuver forces.

(2) The primary purpose of attack helicopters is the destruction of an enemy force. While attack helicopter operations involve many activities, aircrews routinely perform tasks related to a specific sequence of events. An attack helicopter crew uses the following sequence to engage an enemy force:

(a) Moves to an HA.
(b) Coordinates with the aeroscout.
(c) Moves to the BP and selects a firing position.
(d) Receives target handover from the airborne or ground commander.
(e) Acquires and engages the target.
(f) Moves to and reengages an alternate firing position.
(g) Moves to a subsequent BP or FARP, or returns to the HA.

(3) The ATKHC commander is responsible for establishing the priority of engagement, for coordinating and directing fire distribution, and for controlling organic weapon systems. The ATKHC commander also coordinates supporting fires. Attack helicopters engage enemy forces using all available supporting fires. Figure 3-1 shows the employment of FA assets and attack helicopters.

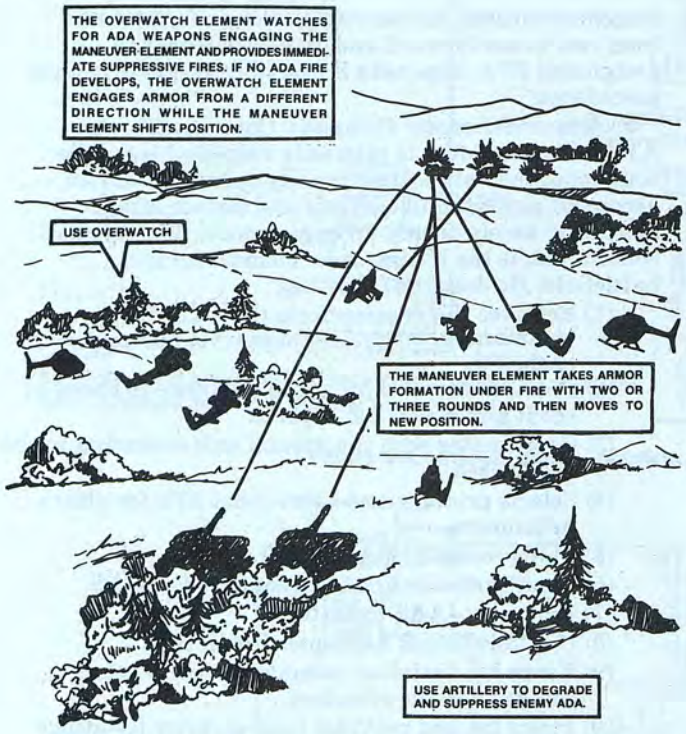


Figure 3-1. Employment of all available fires

(4) The ATKHBs maneuver to fight the enemy in much the same way as mechanized maneuver forces. The major difference is that helicopters are not hindered or impeded by terrain. The use of terrain as an ally of maneuvering forces applies equally to both ground vehicles and attack helicopters.

(a) Modern AD weapons enable enemy forces to detect, acquire, engage, and destroy helicopters under all conditions of weather and visibility. Therefore, aircrews must effectively use the terrain, day or night, for cover and concealment during aerial movement. To survive, attack helicopter units must avoid detection by using proper operational techniques. If detected, they must deceive and degrade the Threat by using aircraft survivability equipment. If this is not possible, the units must destroy the Threat with organic or supporting fires.

(b) To be successful, ATKHCs must use proper movement techniques. Table 3-1 shows the tactical techniques of movement used by attack helicopters.

Table 3-1. Tactical techniques of movement

Techniques of Movement	Likelihood of Contact	Type of Terrain Flight
Traveling	Not likely	Low level or contour
Traveling overwatch	Possible	Contour or NOE
Bounding overwatch	Expected	NOE

These techniques of movement are terrain and enemy-situation dependent.

3-3. Tactical Positions and Routes

To organize and control the movement of attack helicopters, the ATKHB commander establishes a series of tactical positions and routes. These positions and routes enable the ATKHB commander to control and fight his units with a minimum amount of voice communication. Figure 3-2 shows the locations of these various areas, routes, and positions on the battlefield.

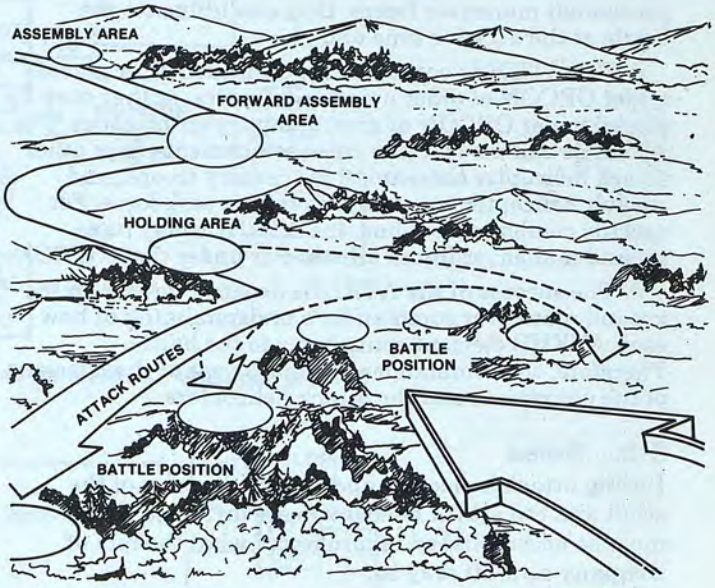


Figure 3-2. Tactical positions

a. Assembly Areas. Units or elements of the ATKHB use assembly areas to plan future actions, issue orders, accomplish routine maintenance, and resupply with Classes I, III, and V. Assembly areas should be located out of enemy artillery range and be large enough for dispersion of the unit. ATKHB assembly areas are normally located in the corps, division, or brigade rear area. Figure 3-3 shows a typical ATKHB assembly area. The following considerations are involved in selecting appropriate assembly areas:

(1) Ingress and egress routes.
(2) Availability of cover and concealment.
(3) Sufficient room for dispersion.
(4) Location of friendly units.
(5) Location of and accessibility to main supply routes.
(6) Security.

b. Forward Assembly Areas. Attack helicopters use forward assembly areas to shut down for extended periods while awaiting orders to go to battle. Forward assembly areas should be located at or near the ground or, for a more rapid response, at the air maneuver unit's TOC. They also should be located out of range of enemy medium artillery. A limited maintenance capability may be located in the forward assembly areas. Considerations for selecting forward assembly areas are the same as those for selecting assembly areas.

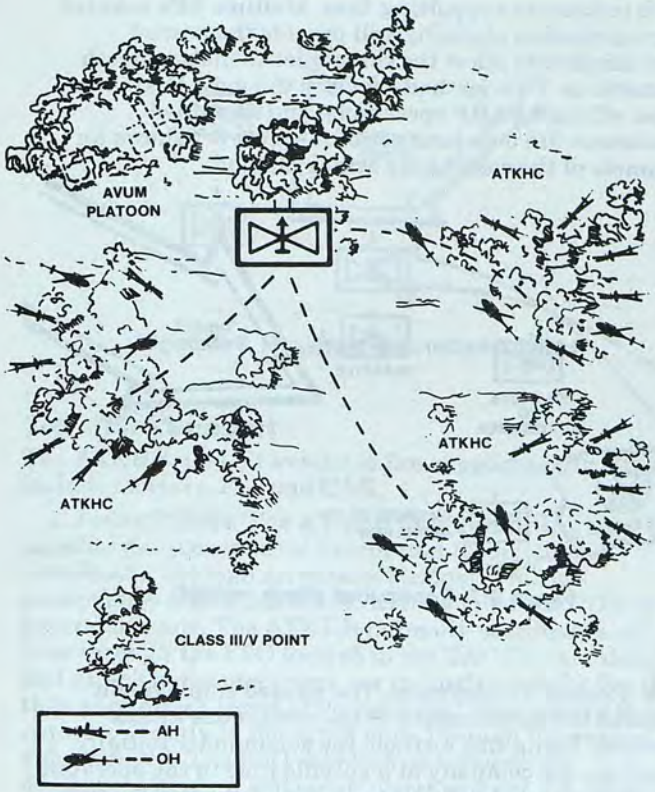


Figure 3-3. Typical ATKHB assembly area

c. Holding Areas. HAs, located between assembly areas and BPs, should provide good cover and concealment. Attack helicopters may occupy these areas for a short time while aeroscouts coordinate movement into the BPs. Aircraft may hover or land, but they will not shut down. If attack helicopter crews must wait longer than a few minutes, they should consider moving to alternate HAs or returning to the forward assembly area. Figure 3-4 shows how an ATKHC occupies an HA.

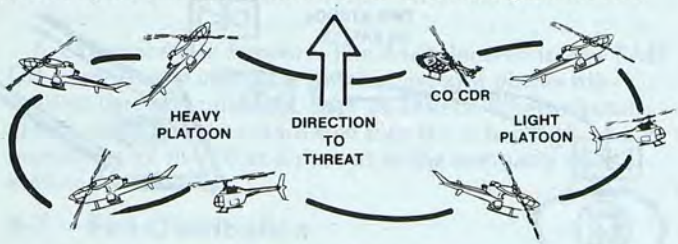


Figure 3-4. ATKHC holding area

The following considerations are essential for units in HAs:

(1) Crews maintain listening silence.
(2) One company should occupy one HA.
(3) Aircraft normally maintain power for immediate hover.
(4) Aircraft are dispersed but maintain section integrity.
(5) Aircraft must remain at NOE altitude at and near the HA.
(6) Aircraft should face outward, thus providing a degree of security.
(7) Copilot-gunners may dismount for face-to-face coordination with aeroscouts.
(8) The HA should be terrain-masked and free of sources of rotorwash signature.

d. Attack Routes. Attack helicopters move from HAs to BPs over attack routes. Properly selected attack routes allow attack helicopters to move undetected by the enemy, ensuring initial surprise in the attack. Aeroscouts select attack routes that take advantage of cover and concealment and have prominent terrain features to assist in navigation. When used properly, vegetation and various terrain features can reduce helicopter noise and decrease the possibility of detection.

e. Battle Positions. Attack helicopters engage targets from concealed BPs that are designated in the OPORD. The ATKHC commander uses information from the aeroscouts to confirm BPs and assign section BPs and sectors of fire. How an ATKHC is dispersed in a BP depends on the terrain. Aeroscouts maintain contact with the targets and call up attack helicopters as enemy forces come into range, reducing the exposure time of attack helicopters. BPs should be located within the last two-thirds of the maximum range of attack helicopter weapon systems. For example, an AH-1S employing TOWs would be ideally located 2,500 to 3,000 meters from center of mass of the target area. These ranges will increase for AH-64-equipped units. Aeroscouts must also designate and reconnoiter alternate BPs.

f. Firing Positions. The PICs select the actual firing positions. These positions should provide maximum standoff ranges with good fields of fire. Firing positions for the AH-64 must provide terrain clearance to allow firing of the HELLFIRE. Ingress and egress routes should be well concealed, and their backdrop should prevent visual acquisition by the enemy. Firing positions also must allow freedom of movement for the attack helicopter. To increase aircraft survivability, no more than two TOWs or four HELLFIREs should be launched from one firing position. Firing positions should also permit helicopters to hover without raising dust and debris. FM 17-35 explains the criteria used in selecting a firing position.

3-4. Task Organization

The primary maneuver elements of the aviation brigade are the ATKHBs. Each ATKHB commander organizes his units based on the factors of METT-T. He can task-organize his units into pure scout or pure attack units when required. To conduct combat operations, the ATKHB can also be task-organized with armor and infantry forces, as well as additional aviation assets.

a. Organization for Combat. The ATKHBs are internally organized into ATKHCs. The ATKHCs are organized into pure platoons—one scout and one attack—with a platoon leader for each platoon. Battle damage and maintenance requirements may preclude a full 4:6 or 4:7 company mix from being fielded. Because a 3:5 (three scouts to five attack aircraft) mix is common, it will be used to describe operations in this publication. The 3:5 company mix is further organized into two platoons. The heavy platoon consists of one scout and three attack aircraft under the direction of the attack platoon leader. The light platoon consists of one scout and two attack aircraft under the direction of the scout platoon leader. The ATKHC commander flies the third scout aircraft and has overall responsibility for the employment of his company. Figure 3-5 shows how a typical ATKHC is organized for combat.

Figure 3-5. Typical ATKHC organization for combat

b. Task Force. Under certain situations, the ATKHB can be task-organized with ground and air maneuver units. These situations could entail economy-of-force operations, air assault operations, and policing of ground units isolated because of conditions on the battlefield. Figure 3-6 shows a typical ATKHB task force in an economy-of-force role.

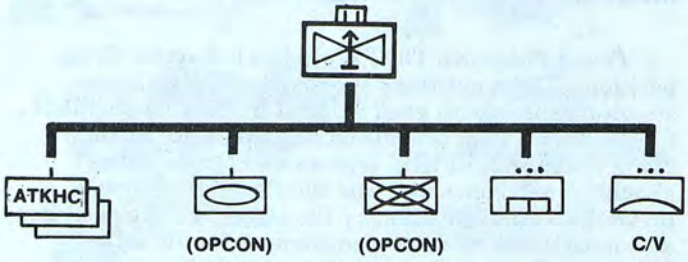


Figure 3-6. Typical ATKHB task force in an economy-of-force role

3-5. Employment Techniques

The smallest unit to be employed is the ATKHB. The lowest level that an ATKHB will be placed under OPCON is to a brigade. ATKHCs may, for short periods of time, fight independently from the battalion. A short period of time means one mission load of fuel or ammunition. The ATKHB commander uses his companies to destroy enemy forces. To do this, he uses one of three methods of employment: continuous attack, phased employment, or maximum destruction. Timing is critical in the employment of the ATKHB. Employed too early, the battalion may have to disengage too soon because of low fuel or ammunition. Employed too late, the battalion may not be able to destroy enemy forces at the critical time and place. The ATKHB should not be employed until a lucrative target has been identified; for example, a tank or a motorized rifle battalion or regiment.

a. Continuous Attack. To exert constant pressure on the enemy force, the ATKHB commander employs the ATKHCs using the continuous attack method. This method ensures that one company will be in the battle, one company will be en route to the battle, and one company will be rearming and refueling at the FARP. This is referred to as the one-third rule. Many times during a continuous attack, the ATKHC commander on-station may send only his attack helicopters to rearm and refuel. This allows the commander to continually monitor enemy activity and to keep the Threat under fire with indirect or supporting fires. Multiple BPs selected during mission planning will provide the needed coordination to allow the companies to make smooth transitions. This method provides the most flexibility, most efficient FARP operations, and sustained antiarmor fire over long periods. Figure 3-7 shows an example of the continuous attack method.

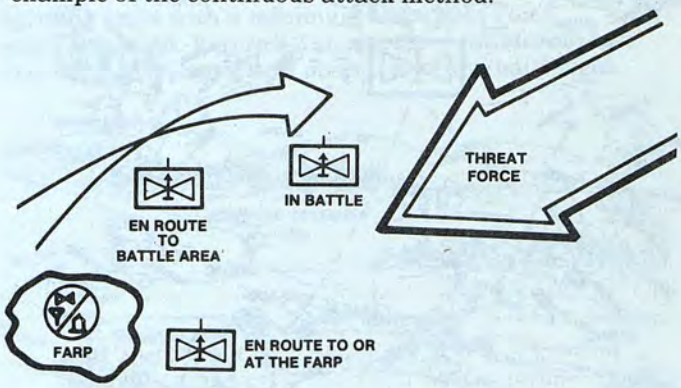


Figure 3-7. Continuous attack method

b. Phased Employment. The phased employment method is a modification of the continuous attack method. Using this method, the commander initially employs one company at a specific time in the operation. He then phases in the second company, while the first company fights at a different location. The third attack company is phased into the fight when either of the other companies is low on fuel or ammunition. If the phased employment method is used, aircraft turnaround in the FARP must be kept as short as possible. Figure 3-8 shows the phased employment method.

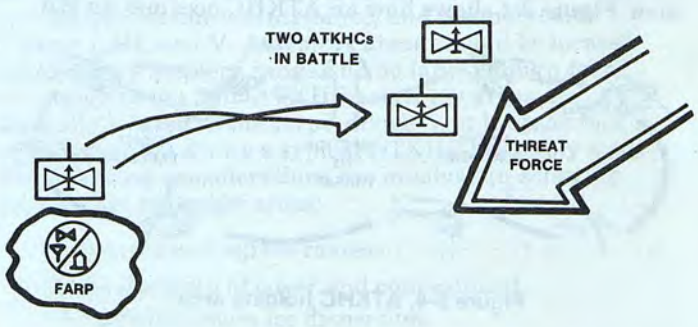


Figure 3-8. Phased employment method

c. Maximum Destruction. Operating with three ATKHCs forward provides massed firepower over a wide area, but severely limits the capability of one ATKHB to maintain continuous fires. However, it sometimes may be necessary to mass all available attack helicopters. In this situation, the ground commander must realize that attack assets will be out of the fight for about 45 to 60 minutes to replenish fuel and ammunition. The introduction of new rearm and refuel equipment will cut this time in half. Figure 3-9 shows the maximum destruction method.

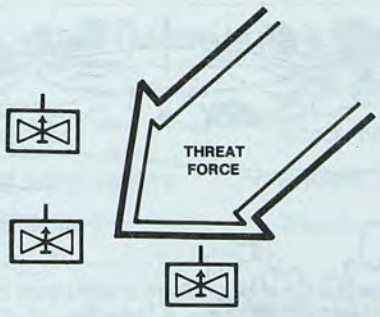


Figure 3-9. Maximum destruction method

3-6. Fire Support

The ATKHB uses all available fire support assets. These include mortars, FA, and CAS.

a. Indirect Fires. The ATKHB uses supporting fires as do other manuever units, except that it sometimes coordinates through an outside element. This is particularly true when the ATKHB is under OPCON of a ground brigade. The ATKHB normally coordinates all fires through the FSO located in the TAC CP. Aeroscout and attack helicopter crews are trained to call for fire if they encounter targets of opportunity. They submit their requests directly to the firing units through the ground quick-fire net. The FSO coordinates between the designated general support or direct support FA units and those units that routinely require fire support. The FSO handles all coordination and communication by voice FM radio or with the digital message device in units equipped with the TACFIRE. The FSO effects all preplanned fires, and the aeroscout or the ATKHC commander directs fires on targets of opportunity. In units equipped with OH-58D aircraft, the primary means of requesting indirect fire support will be through digital traffic using the ATHS. The battalion FSO will be located in the TAC CP or be airborne in the commander's aircraft.

b. Offensive Air Support. The ALO, located in the TAC CP, coordinates offensive air support and places his request through normal USAF channels. When aircraft arrive, their use is coordinated into the scheme of maneuver by the S3 and passed to the company on-station at that time.

3-7. Fire Distribution

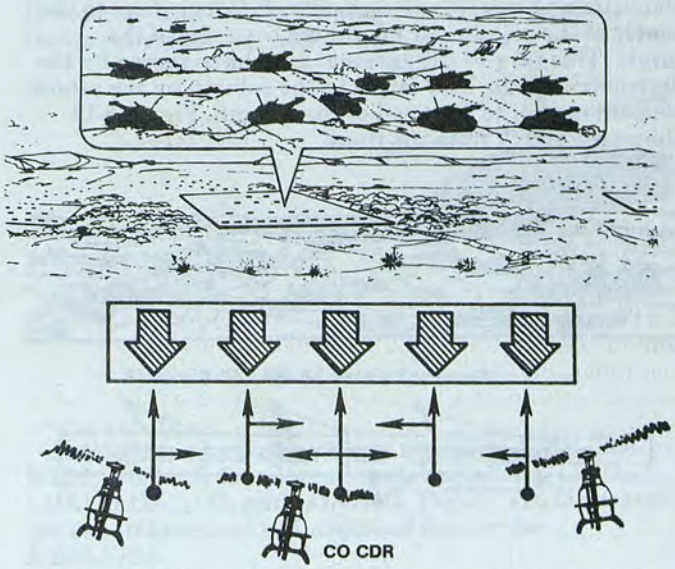
a. Guidelines. In combat, there is little time to plan for fire control and distribution. Often the attack helicopter mission is quickly assigned to a unit. Guidelines for fire distribution are established for efficient target engagement and distribution. Sample SOP guidelines are as follows:

(1) The left attack element fires at targets on the left of the EA. The extreme left aircraft fires at the extreme left target and shifts fire to the center.

(2) The right attack element fires at targets on the right of the EA. The extreme right aircraft fires at the extreme right target and shifts fire to the center.

b. Methods. Distribution of fire depends on the shape of the EA and the dispersion of the target. The three basic methods of fire distribution are attack in depth, attack from the flank, and frontal. Variations of all of these can occur in an EA, depending on the target array and terrain.

(1) *Attack in depth.* When targets present themselves in depth, one section should engage close targets, while the other section engages deep targets. Figures 3-10 and 3-11 show how to engage targets on line, in depth, and in column, in depth.



REMEMBER: THERE IS NO LINEAR OR SPECIFIED ATTACK FORMATION.

Figure 3-10. On line, in depth

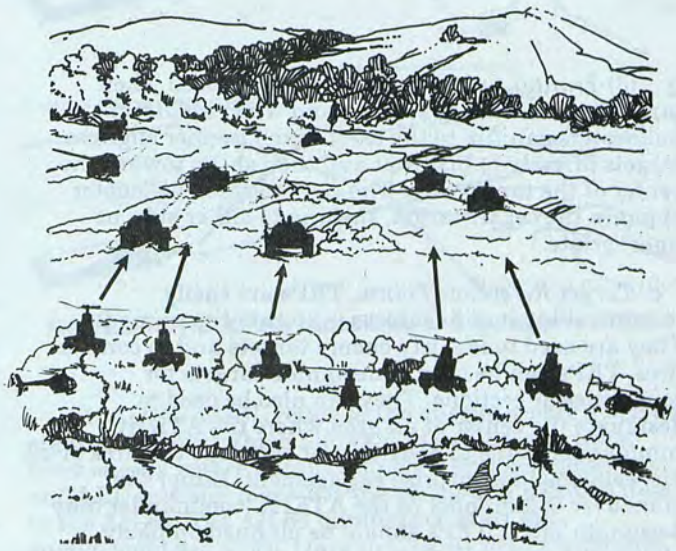


Figure 3-11. In column, in depth

(2) *Attack from the flank.* This method is the preferred method of engaging armored targets. It also requires great sensitivity of security of the force.

(a) *Attack from one flank.* When the ATKHC attacks a column of targets from one flank, left-side elements engage targets to their front and shift fire toward the column front. Right-side elements engage targets to their front and shift fire toward the column rear.

(b) Attacks from both flanks. The ATKHC can also engage a moving column from both flanks, as in an ambush. Elements on the right flank of the target column engage the last enemy elements or as far to the rear as possible with weapons employed. Elements on the left flank of the target engage the front of the column. During subsequent engagements, left-flank elements and right-flank elements shift their fires to the center of the column for maximum coverage of the target. This type of engagement may be triggered by the destruction of the lead target in the column by the attack element closest to the head of the column. Figure 3-12 shows an attack from the flank.

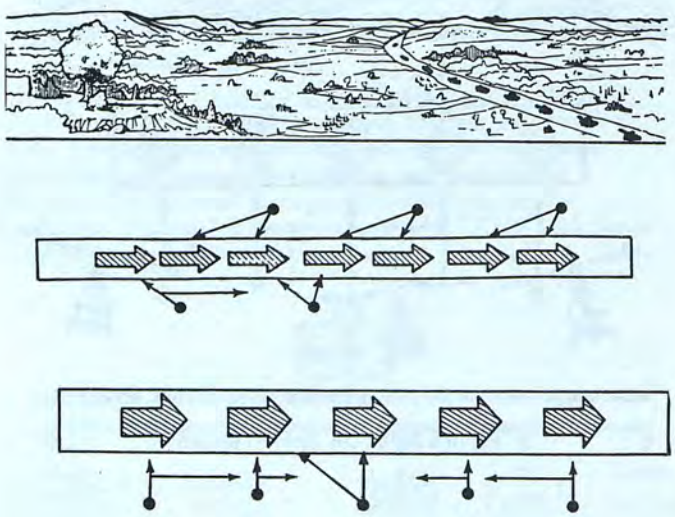


Figure 3-12. Attack from the flank method

(3) *Frontal fire.* This method can be used when targets are arranged laterally and when all attack helicopters can fire to the front. Each gunner engages targets directly to his front and then shifts toward the center of the target area. The center attack helicopter engages the center target, shifting to either side, as appropriate.

c. Target Reference Points. TRPs are easily recognizable ground features (natural or man-made). They are used to identify enemy targets and to control fires. TRPs can be used to designate targets for companies or sections. They can also be used to designate the center of an area where the ATKHC commander plans to distribute or converge the fires of all his weapons in a surprise engagement. Either the maneuver commander or the ATKHC commander may designate TRPs. TRPs should be planned on likely avenues of approach during defensive operations and on likely enemy locations during offensive operations. Weapons will be engaged from different directions. Therefore, compass points (north, south, east, or west) rather than direction (left or right) must be used when giving directions referenced on a TRP. Figure 3-13 shows TRPs.

d. Engagement Areas. Engagement areas are designated by the air or ground brigade commander, the ATKHB commander, or the ATKHC commander in an OPORD. An EA is where the commander intends to attack an enemy force with massed fires of all available

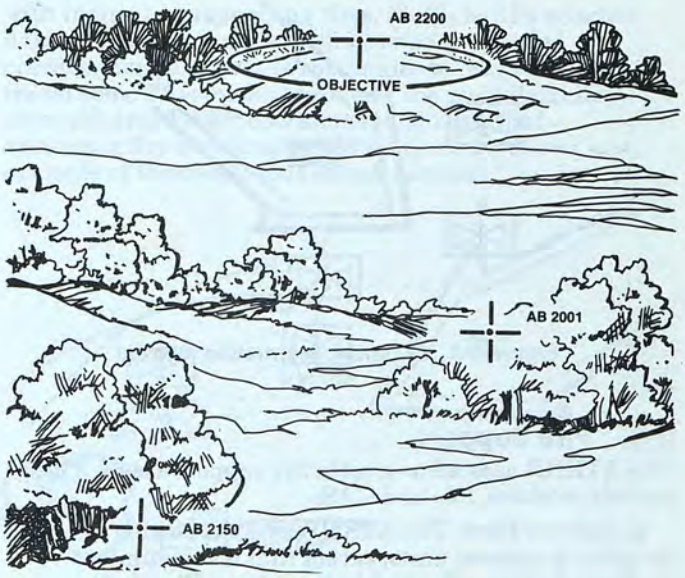


Figure 3-13. Target reference points

weapons which are integrated into the overall scheme of maneuver. A good EA has at least four characteristics:

(1) *Battle positions.* The EA should have several standoff BPs for attacking the enemy from several directions.

(2) *Obstacles to movement.* Obstacles are desirable in the EA to slow target movement and permit the effective use of direct and indirect fires.

(3) *Long-range fires.* To enhance aircraft survivability, an EA should allow aircrews to engage targets from 3,000 or more meters.

(4) *Continuous target visibility.* Long-range engagements require the target to be in view during missile flight or during terminal guidance of HELLFIRE shots. As a general rule, EAs should provide an unobstructed view of the target from firing positions or from designation positions.

e. Engagement Priorities. In combat, enemy forces will not often present themselves as willing targets waiting to be fired on and hit. They will be fast-moving and evasive, and will present only fleeting targets for attack helicopters. Battlefield obscuration and reduced visibility will further hamper the attack helicopter's ability to acquire and destroy these targets. To prepare aircrews for the confusion of battle, consider the following two methods of determining the priority of targets:

(1) *Target priority.* This method refers to the type of target that should receive first priority for destruction on the battlefield. Priority lists are designated in the OPORD or in the unit SOP. Target priorities for attack helicopters are listed in Table 3-2. The order may vary based on the mission and the situation.

(2) *Engagement priority.* Engagement priority concerns the actions of the individual aircrew during the firing engagement. Engagement priorities encompass immediate actions required for self-preservation and mission accomplishment. A general rule is for the aircrew to first engage the nearest target which can also acquire and engage it. Table 3-3 shows attack helicopter engagement priorities.

Table 3-2. Target priorities for attack helicopters	
Tanks	Command vehicles
Antitank vehicles	Attack helicopters*
Mechanized troop carriers	Artillery
Air defense artillery	Troops in the open

*Only when they pose a threat to mission accomplishment.

Table 3-3. Engagement priorities for attack helicopters
1. Immediate threat to self
2. Immediate threat to team members
3. Immediate threat to friendly ground force
4. Other targets in priority

3-8. AH-64 Employment

The employment of AH-64 attack battalions will present a new and unique fire distribution problem for aviation units. Distribution of AH-64 fires can, and in some instances will, be divided between airborne and ground designators.

a. Modes of Fire. The HELLFIRE system provides the AH-64 with its point target destructive capability. The AH-64 can fire the HELLFIRE in two modes: normal fire and ripple fire.

(1) *Normal fire.* The normal fire mode is the launching of single or multiple HELLFIREs on one laser code. As a guideline, when multiple missiles are fired, the AH-64 copilot-gunner will pause 10 seconds between the launching of the first and second missiles. This mode of fire can be used in both the autonomous and remote techniques of fire. Figure 3-14 shows the normal fire mode.

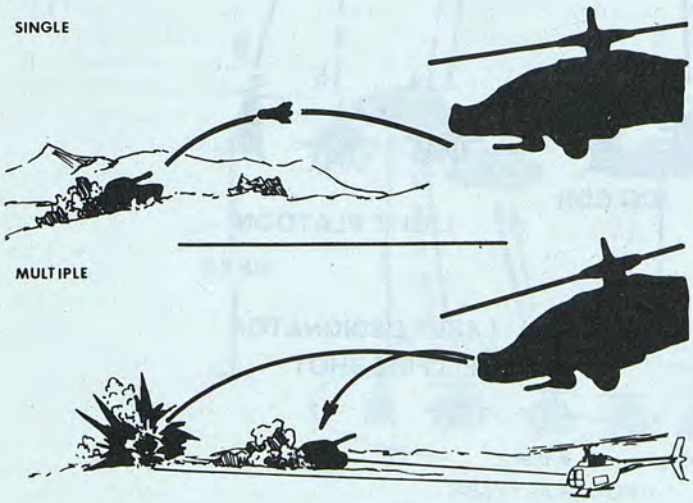


Figure 3-14. AH-64 normal fire mode

(2) *Ripple fire.* Ripple fire can be achieved when multiple designators are available. Each designator operates on a different laser code, and the missiles are coded to match each designator. Missiles are then fired virtually together, one after the other, within aircraft constraints. A combination of normal and ripple fire can be achieved by launching two missiles, waiting 10 seconds, and then launching two more. Figure 3-15 shows the ripple fire mode.

Figure 3-15. AH-64 ripple fire mode

b. Operational Capabilities of the HELLFIRE. The HELLFIRE has four operational capabilities: LOBL, LOAL, LOAL-LO, and LOAL-HI. Figure 3-16 illustrates the capabilities and techniques of fire for the HELLFIRE.

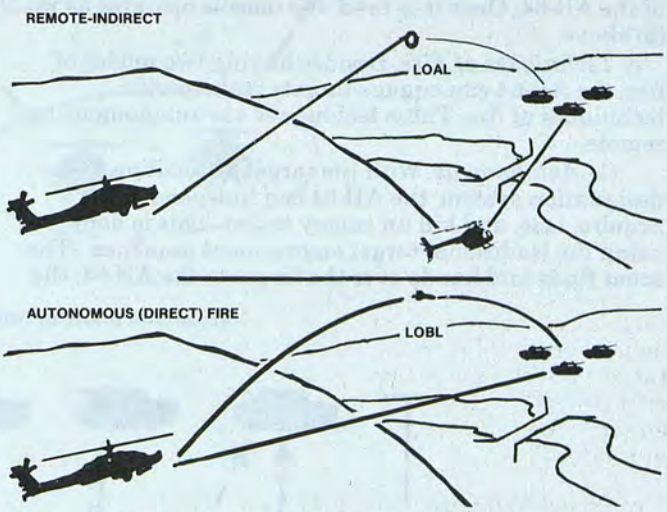


Figure 3-16. HELLFIRE capabilities and techniques of fire

(1) *LOBL.* LOBL refers to the missile seeker's line-of-sight capability, which allows it to lock on and track laser energy before missile launch. The scout helicopter or GLLD initially identifies the target and hands it over to the AH-64. The AH-64 unmasks to start the engagement sequence. Once the AH-64 fires the missile, it remasks and the remote designator continues target designation until missile impact. If a remote designator is not available, the AH-64 can independently designate the target while the missile is airborne.

(a) A major advantage of using LOBL when firing the HELLFIRE is that the correct laser code is confirmed before the missile is launched. In addition, when engaging in obscuration, the copilot-gunner can also confirm that the missile seeker is locked on the correct target. Because the missile impact angle will be greater, the possibility of a target kill is increased.

(b) The major disadvantage of using LOBL is that the missile requires laser energy on the target before launch. This extends the lasing time and makes delayed lasing impossible. Also, because of the missile's trajectory, a medium-to-high ceiling is needed to ensure a target hit.

(2) *LOAL.* LOAL is the missile seeker's capability to lock on a reflected laser energy source at some point after the missile leaves the aircraft. This capability requires close coordination between the AH-64 crew and the remote designator.

(a) The major advantage of LOAL is the capability for delayed lasing, which reduces lasing time. This increases the survivability of the OH-58D crew. Because HELLFIRE achieves a higher dive angle on the target, its probability of kill is increased.

(b) The major disadvantage of using LOAL is that the missile pitches up during periods of low ceiling. This can cause the missile to enter the clouds and break lock-on.

(3) *LOAL-LO.* Use LOAL-LO to clear a small obstacle or terrain feature in front of the AH-64. As the missile leaves the AH-64, it climbs to a specific altitude and begins scanning for laser energy. Once it locks on the laser energy, it will fly to the laser spot and destroy the target.

(4) *LOAL-HI.* Use LOAL-HI when the missile must climb to clear a large obstacle or terrain feature in front of the AH-64. Once it is fired, the missile operates as in (3) above.

c. Techniques of Fire. Besides having two modes of fire, the AH-64 can engage targets with specific techniques of fire. These techniques are autonomous and remote.

(1) *Autonomous.* With the target acquisition and designation system, the AH-64 can independently acquire, lase, and kill an enemy target. This is done using the traditional target engagement sequence. (The scout finds and hands over the target to the AH-64; the AH-64 unmasks, acquires, engages, and lases the target until missile impact.) The two capabilities of the autonomous technique of fire are remote and direct.

(2) *Remote.* This technique of fire combines the use of multiple (airborne and ground) designators. The scout or GLLD initiates the sequence by sending a target hand-over to the AH-64. The AH-64, located well outside the range of enemy ADA systems, fires a missile from a masked or unmasked position. The scout or GLLD then lases the target until missile impact. The remote technique of fire has two capabilities. They are remote-direct and remote-indirect.

(a) *Remote-direct.* This capability is used when the HELLFIRE has line-of-sight with the target, but the AH-64 is too far away to identify it. The remote designator directly lases the target so the HELLFIRE can destroy it using either LOBL or LOAL.

(b) *Remote-indirect.* This capability is used when the AH-64, from a masked position, receives the target hand-over from the remote designator. The AH-64 fires its missile using LOAL while remaining in the masked position. This enhances the attack asset's survivability.

d. Distribution of Fires. When the AH-64 uses the autonomous fire technique, fire distribution is almost the same as that discussed in paragraph 3-7. The AH-64 can be employed in various tactical situations using the autonomous technique or remote technique, or both, for fire distribution.

(1) Figure 3-17 shows how an AH-64-equipped ATKHC can use autonomous and remote fires to defeat an enemy force moving in column. In this example, one scout and one attack helicopter from each platoon (scout A with AH-64 #1 and scout B with AH-64 #5) work together using the remote fire technique. The heavy platoon engages targets to the rear of the column and shifts fire toward the center. The light platoon engages targets leading the column and also shifts fire toward the center. The remaining attack aircraft (#2, #3, and #4) engage targets using autonomous fire.

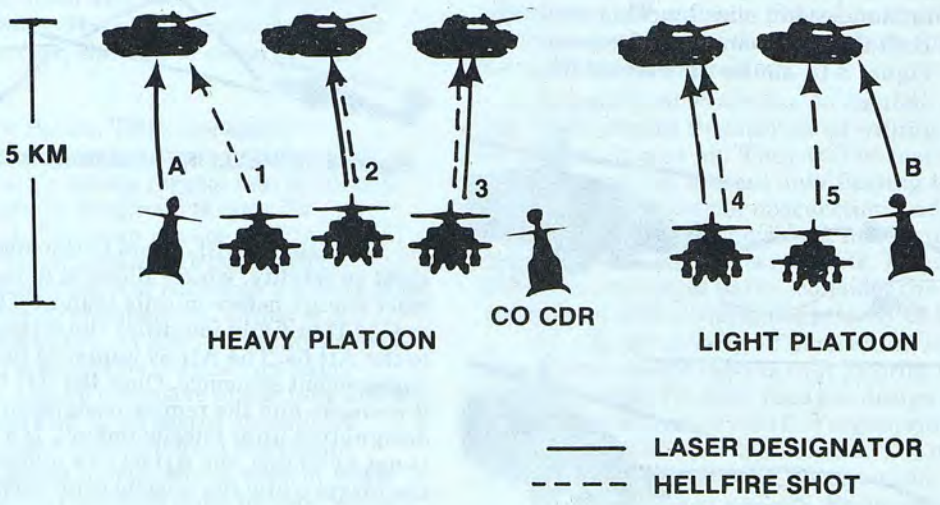


Figure 3-17. Fire distribution (first example)

(2) Figure 3-18 shows how an AH-64-equipped ATKHC uses the autonomous and remote fire techniques to engage targets while its aircraft are positioned in several locations. In this example, the heavy platoon is employed in a BP that offers autonomous fire engagement opportunities. The light platoon is positioned away from the other attack aircraft to provide a less vulnerable target. The heavy platoon engages targets with autonomous fire, and the light platoon engages scout-designated targets with remote fire.

(3) Figure 3-19 shows how to incorporate both airborne and ground designators with the AH-64 company. In this example, the AH-64 company is located in two BPs and is using a combination of autonomous and remote fire techniques. Scout A and AH-64 #1 use the remote technique, and AH-64 #2 and #4 use the autonomous technique. AH-64 #3 and GLLD C, as well as scout B and AH-64 #5, use the remote fire technique.

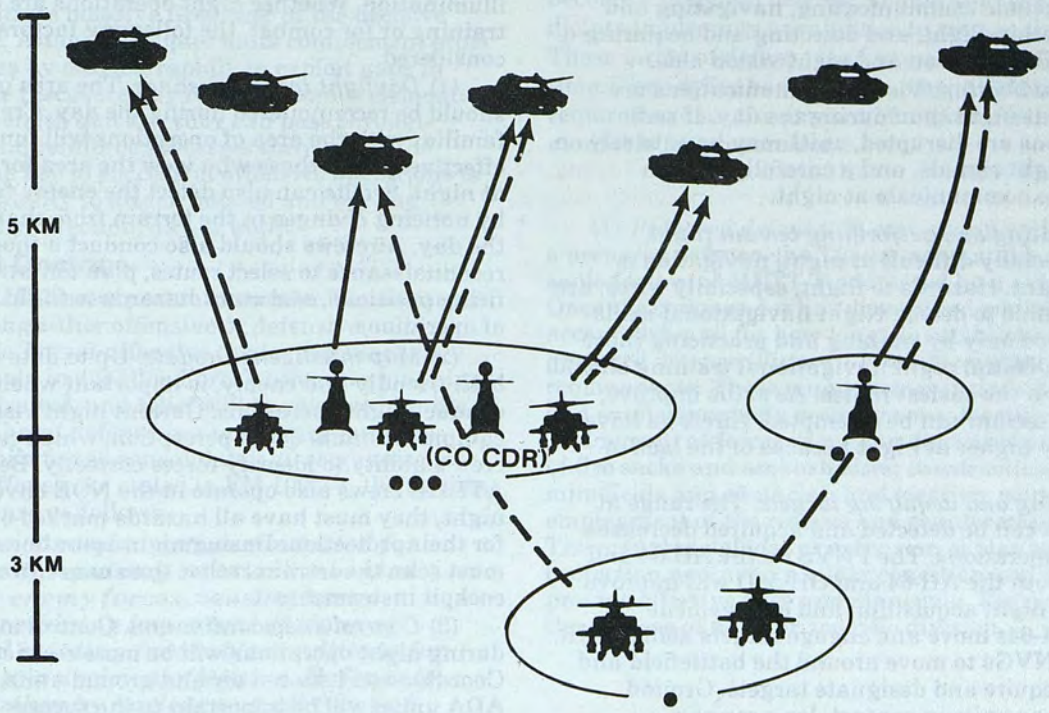


Figure 3-18. Fire distribution (second example)

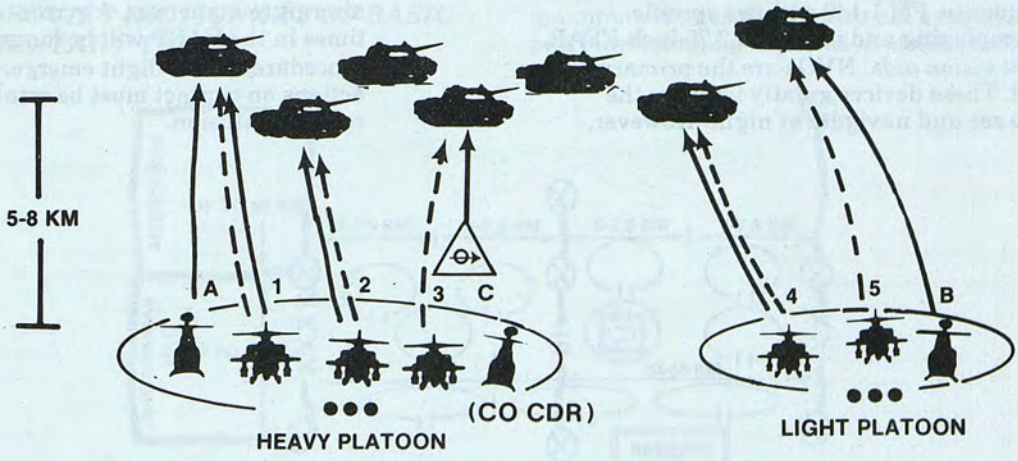


Figure 3-19. Fire distribution (third example)

3-9. Night Operations

Night operations enhance the ATKHB's survivability by lending it the element of surprise. ATKHB crews must conduct successful night operations. They must capitalize on the advantages associated with night operations and reduce or eliminate any disadvantages. Successful night operations will require using effective night-fighting techniques. Night operations will also involve detailed planning.

a. Night-Fighting Techniques. ATKHB aircrews must develop and maintain specialized skills to fight at night. These skills include communicating, navigating and performing terrain flight, and detecting and acquiring targets using illumination and night vision aids.

(1) *Communicating.* Visual communications are more difficult at night than during the day. If radio communications are disrupted, units may have to rely on battle drills, light signals, and a carefully written tactical SOP to communicate at night.

(2) *Navigating and performing terrain flight.* Although especially difficult at night, navigation is vitally important. Hazards to flight, especially wires, are almost impossible to detect. Night navigational skills can be improved only by training and practicing those skills at night. Initial night navigational training should be conducted on the easiest routes. As skills improve, more difficult terrain can be attempted. Aircrews have a tendency to fly higher at night because of the lack of visual cues.

(3) *Detecting and acquiring targets.* The range at which a target can be detected and acquired decreases during night operations. The PNVS on the AH-64 and the FLIR on both the AH-64 and OH-58D will improve the ATKHB's night acquisition and engagement capability. AH-64s move and engage targets using FLIR. OH-58Ds use NVGs to move around the battlefield and the FLIR to acquire and designate targets. Ground systems, such as units in contact, long-range reconnaissance patrols, and radars, can assist the ATKHB in detecting and acquiring enemy targets.

(a) *Illumination.* Engaging point targets at night may require using artificial illumination. This will be especially true when the ambient light is low or when battlefield obscurations limit the aircrew's visibility. Illumination from indirect fire (mortars or artillery) is preferred. When indirect fire is not available, the ATKHC commander may dedicate one of the platoons to provide a 2.75-inch FFAR for illumination during the engagement sequence. FM 1-140 outlines specific procedures for employing and using the 2.75-inch FFAR.

(b) *Night vision aids.* NVGs are the primary night vision aid. These devices greatly improve the crew's ability to see and navigate at night. However, successful use of NVGs requires some special preparation. Maps must be specially prepared. Weapon firing techniques are developed to prevent NVG failure, and aircrews are trained to recognize the potential hazards of NVG flight. Crew coordination is also vitally important during NVG flight. Appendix C is a sample SOP for NVG operations.

b. Night Operations Planning. Planning night operations will require time and effort during the day. Such planning must be detailed and should include the use of FA assets, with particular emphasis on illumination. Whether night operations are conducted for training or for combat, the following factors must be considered.

(1) *Daylight reconnaissance.* The area of operations should be reconnoitered during the day. Crews who are familiar with the area of operations will function more effectively than those who view the area for the first time at night. Scouts can also detect the enemy faster at night by noticing changes in the terrain from that seen during the day. Aircrews should also conduct a thorough map reconnaissance to select routes, plan tentative BPs and firing positions, and mark hazards to flight in the area of operations.

(2) *Map intelligence update.* Up-to-date intelligence, both friendly and enemy, is important when aircrews conduct night operations. Current night vision equipment limits depth perception, which can impair the crew's ability to identify forces correctly. Because ATKHB crews also operate in the NOE envelope at night, they must have all hazards marked on their maps for their protection. During night operations, aircrews must scan the terrain rather than concentrate on their cockpit instruments.

(3) *Control and coordination.* Control measures during night operations will be more restrictive. Coordination between air and ground units, particularly ADA units, will be important to the success of night operations. Some control and coordination considerations are as follows:

(a) Routes to and from the area of operations must be coordinated. Establishing minimum risk routes or air corridors will aid in control.

(b) Passage points are especially important when operations are conducted across the FLOT.

(c) Both verbal and nonverbal recognition signals are critical at night.

(d) FARP locations must provide space for aircraft to maneuver. Aircraft turnaround times in the FARP will be longer at night.

(e) Procedures for in-flight emergencies and actions on contact must be established to reduce confusion.

Chapter 4

OFFENSIVE OPERATIONS

4-1. General

Destroying the enemy's fighting force is the only sure way of winning any future conflict. The operational concepts of offensive operations are concentration, surprise, speed, flexibility, and audacity. The ATKHB gives the maneuver commander a viable force that can rapidly concentrate massive firepower at the decisive time and place. Attack helicopter units complement other attacking forces by moving rapidly to exploit gaps in enemy defenses discovered by reconnaissance elements. By shifting strength quickly, they can pass through penetrations and reinforce successes throughout the battle area. The key to successful offensive operations is the ATKHB's ability to attack massed and moving targets from any direction, day or night.

4-2. Threat Doctrine

a. The ATKHB can expect to encounter Threat forces while conducting either offensive or defensive operations. The Threat offensive tactics discussed in Chapter 5-2 apply to our Blue Force's offensive planning. Defense, withdrawal, and relief will be reviewed in this chapter. The Threat defense is a temporary measure undertaken while forces consolidate and reorganize to continue the offense. As stated in FM 100-2-1, the Soviets define the defense as follows:

> ***The type of combat action conducted for the purpose of repulsing an attack mounted by superior enemy forces, causing heavy casualties, retaining important regions of terrain, and creating favorable conditions for going over to a decisive offensive. Defense is based on strikes by nuclear and all types of weapons; on extensive maneuver with firepower, forces, and weapons; on counterattacks (or counterstrikes) with simultaneous stubborn retention of important regions which intercept the enemy direction of advance; and also on the extensive use of various obstacles. Defense makes it possible to gain time and to effect economy of forces and weapons in some sectors, thereby creating conditions for an offensive.***
>
> *—SOVIET DICTIONARY OF BASIC MILITARY TERMS*

b. The two major types of defensive operations are the prepared defense and the hasty defense. The hasty defense is more prevalent than the prepared defense. Therefore, the hasty defense is sometimes called the defense in the course of the offense. A hasty defense may become a prepared defense, should changing conditions dictate inadequate capabilities to resume the offensive. These forms of defense tend to merge as a function of time. They differ based on the amount of time that is required and on the amount of engineer support that is available for preparation.

(1) *Prepared defense.* In organizing and establishing a prepared defense, the Threat commander considers the same factors of METT-T addressed by a US commander. Once the commander has determined what he must accomplish and for how long, he establishes the prepared defense (Figure 4-1) while meeting several requirements. These requirements include deployment and employment of a security zone; location and deployment of forces in a main defensive area; location of fire sacks and ambush sites; construction of minefields and obstacles; and location, composition, and employment of the reserve and counterattacking forces. The prepared defense of a division is planned to provide protection against a nuclear condition and depth to provide effective fires and maneuver. Figure 4-2 shows the defense of a motorized rifle division.

(a) *Security zone.* The security zone is occupied by a force whose mission is to delay and deceive the enemy about the location and deployment of main defensive forces. The security zone force consists of elements from the division's second echelon forces. The divisional security zone may extend up to 15 kilometers forward of the main defensive area. One may be deployed forward of each of those first echelon regiments of the division. Army-level occupation of the security zone may extend to 30 kilometers forward of the FEBA. The security force will use the best terrain to engage the enemy force at maximum ranges. It will also use extensive obstacles and barriers along expected avenues across the front.

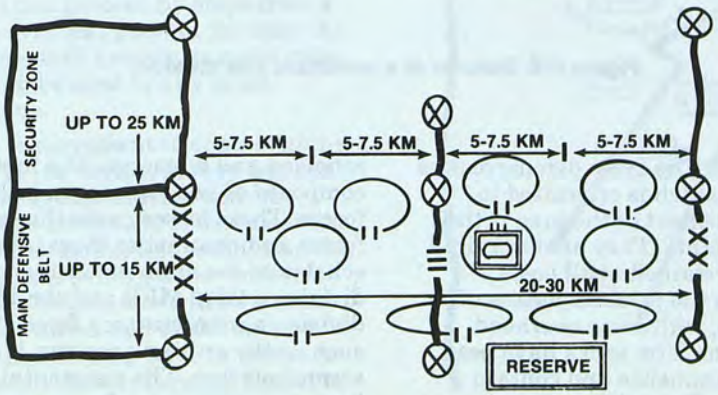
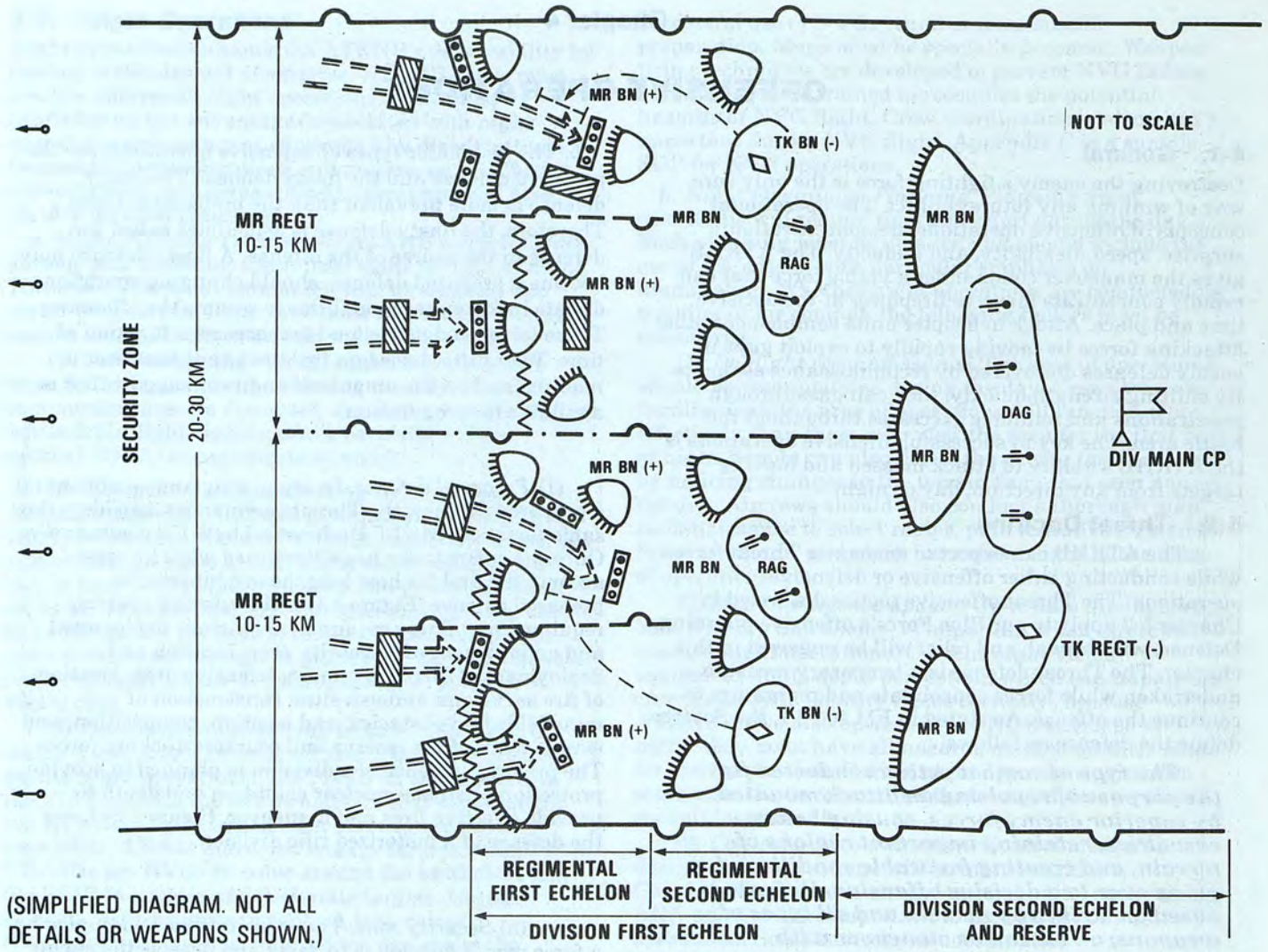


Figure 4-1. Threat defense in depth



NOTES

1. Main defensive area is organized into two echelons and a reserve:
   - First echelon inflicts enemy losses, forcing him to concentrate and canalize him into fire sacks.
   - Second echelon's mission is to destroy enemy or reinforce/replace first echelon.
2. In a motorized rifle division a tank regiment acts as the main counterattack force.
3. The security zone is comprised from elements of the division's second echelon.
4. Detailed and coordinated fire plan is developed for fire support.

LEGEND

- Preplanned artillery concentration
- Barrier
- Mixed minefield (antipersonnel and antitank)
- Probable enemy avenue of approach

Figure 4-2. Defense of a motorized rifle division

(b) *Main defensive area.* The main defensive area is a thorough defensive array which is organized in depth (Figure 4-3). The basic element of the area is the company and platoon strongpoints. They are organized on key terrain which must be retained at all costs. Vehicles are dug in and wire is the primary means of communication. Trench works, with some overhead cover, are dug between positions. Fire sacks have been established where obstacles channelize and contain attacking forces and where preplanned fires are concentrated. The area echelon is composed of two echelons and a reserve. The first echelon, normally composed of two regiments, inflicts losses on the enemy forces. These losses cause the enemy to concentrate its forces and channelize them into fire sacks. The second echelon of the main defensive area will consist of the division's third MRR and the TR who will act as the division's counterattack force. A regimental reserve, such as the antitank reserve, is located in the regimental second echelon. The regimental reserve will have a tank-heavy, company-size force, whose primary mission is to counterattack against enemy penetration. Many times

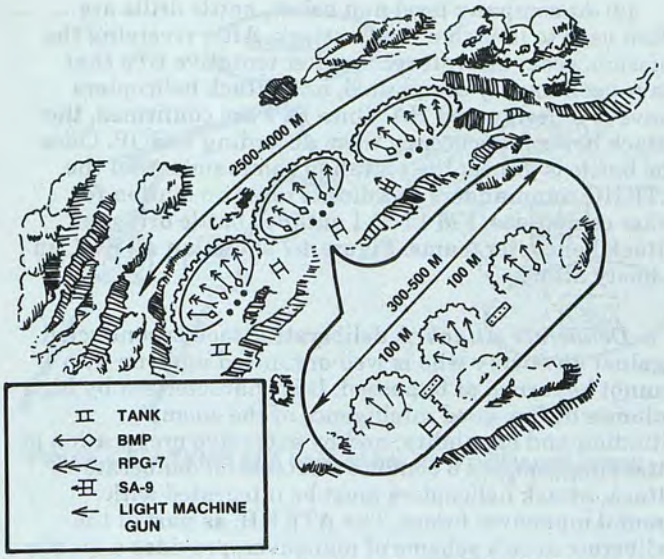


Figure 4-3. Defensive organization of a motorized rifle company

these antitank reserve forces are near the regimental command post. Counterattacks are normally conducted from the march along the enemy flank.

(2) *Hasty defense.* A hasty defense is more prevalent than the prepared defense. The hasty defense is force used in many diverse situations. This form of defense is different because the mission is more transitory, the enemy situation is clearer, and the attack is imminent. The terrain may be unfavorable to the defender. In addition, with a hasty defense, time is short before an offensive posture can be assumed.

(a) *Organization.* The Threat may be forced into a hasty defense while in contact. Sometimes this will eliminate the Threat's ability to deploy a security force. The Threat may leave some units in contact and prepare a reverse slope defense to cover their preparation.

(b) *Support.* Elements, such as engineers, may lay minefields across only critical avenues. The combat support elements' primary effort is to continue to support offensive action, especially for those units who will initiate the offensive action.

4-3. Types of Offensive Operations

The major types of offensive operations are movement to contact, hasty attack, deliberate attack, exploitation, and pursuit. Although these operations generally occur in order, one type of offensive operation can easily develop into another type, or it can develop into a defensive operation. The whole series can proceed by steps from a movement to contact to an eventual pursuit. Because the momentum of an attack may shift quickly as resistance varies, attack helicopters can be used in any or all phases of offensive operations.

a. Movement to Contact. A movement to contact gains or reestablishes contact with the enemy. It may be used when the force has temporarily lost contact with the enemy, or it may be to initiate an attack. A movement to contact develops the combat situation and maintains the commander's freedom of action. During a movement to contact, the ATKHB's attack helicopters will be critical to the success of the advance forces and to the success of the main body. As part of the covering force or advance guard, the ATKHB can destroy forward enemy elements and contain bypassed enemy units. The ATKHB's mobility and firepower will permit the main body commander to overwhelm the enemy and maintain the initiative. This means that the commander will not have to pause and marshall the necessary ground combat power to attack. A movement to contact often results in a meeting engagement; that is, units engage each other by chance rather than by design.

(1) *ATKHB in the advance guard.* Figure 4-4 shows how the ATKHB, as part of a division advance guard, is used for a movement to contact. In this situation, the AB has been assigned an advance guard mission in support of a division movement to contact. The cavalry squadron serves as the brigade's lead element, and the ATKHB occupies a forward assembly area ready to respond to targets of opportunity. Once the cavalry squadron identifies a lucrative target, the ATKHB attacks to destroy it.

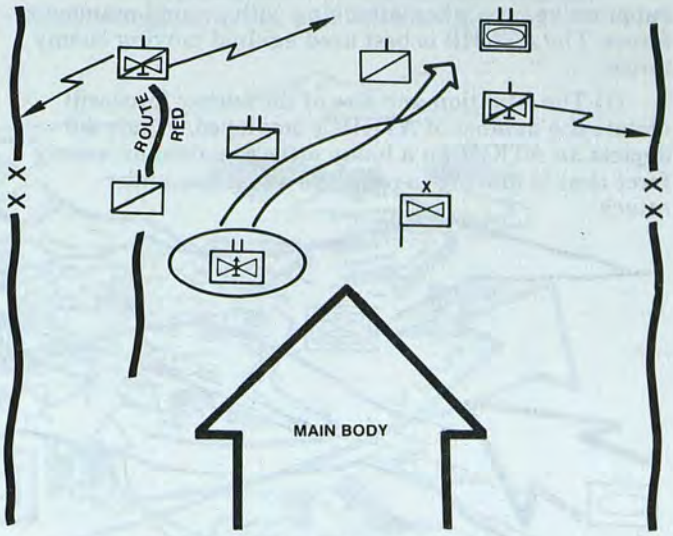


Figure 4-4. ATKHB in advance guard

(2) *ATKHB in the main body.* Figure 4-5 shows how the ATKHB, when under OPCON of a ground maneuver brigade, can exploit enemy weaknesses in a movement to contact. In this illustration, the brigade's lead battalion has made contact with a main defensive battalion and has found what it believes to be a gap between units. The ATKHB's mission is to exploit the penetration in the enemy's defenses and to secure the flanks for a follow-on tank task force.

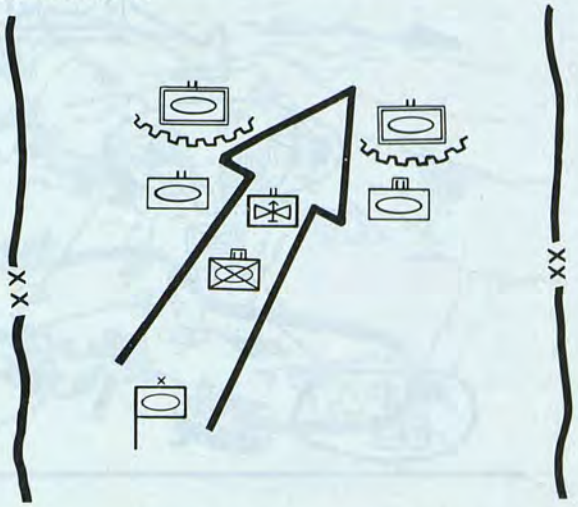


Figure 4-5. ATKHB in main body

b. Hasty Attack. The hasty attack is an offensive operation that evolves from a meeting engagement. It requires little planning and is characterized by violent, aggressive action. The hasty attack can also be a means of quickly seizing the initiative after a successful defense. The operational concepts of attack, which are concentration of effort, surprise, speed, flexibility, and audacity, apply in a hasty attack as in any other type of offensive operation. Attack helicopters have the speed and firepower necessary to shock and overwhelm the enemy and to seize the initiative from enemy forces. They allow the commander to mass firepower quickly to prevent the enemy from organizing increased resistance. Employed independently, the ATKHB is least effective when attacking strongly fortified defensive positions, because it lacks the staying power to seize and hold terrain. However, it can provide heavy and effective suppressive fires when attacking with ground maneuver forces. The ATKHB is best used against moving enemy forces.

(1) The situation and size of the enemy force will dictate the number of ATKHCs employed. Figure 4-6 depicts an ATKHB in a hasty attack against an enemy force that is moving to reinforce a position under attack.

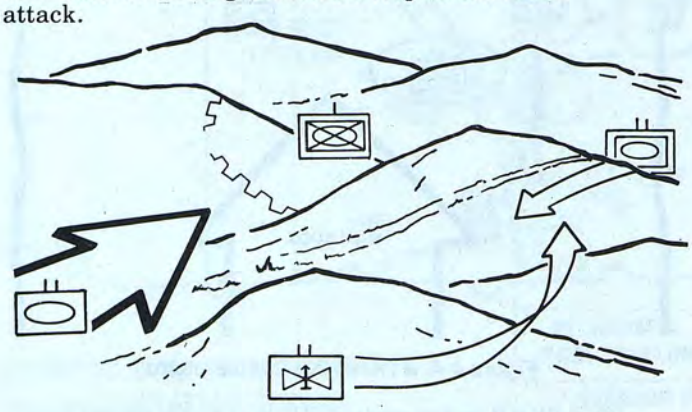


Figure 4-6. ATKHB in a hasty attack

(2) At company level and below, battle drills are often used to launch a hasty attack. After receiving the mission, scout aircraft reconnoiter tentative BPs that have been hastily designated, and attack helicopters move to a designated HA. Once BPs are confirmed, the attack helicopters occupy them according to SOP. Once the battle is joined, the battalion commander and the ATKHC commanders coordinate relief on station for other companies. FM 17-50-1 outlines battle drills for attack helicopter teams. Figure 4-7 shows an ATKHC in a hasty attack.

c. Deliberate Attack. A deliberate attack is conducted against an enemy who is well-organized and one who cannot be turned or bypassed. It is characterized by high volumes of fire, good intelligence of the enemy's situation and capability, and by extensive preparation of attacking troops. To conduct a successful deliberate attack, attack helicopters must be integrated with ground maneuver forces. The ATKHB, as part of the deliberate attack scheme of maneuver, provides a mobile and flexible combat capability. As part of the combined arms team, the ATKHB combines its long-range antiarmor fires and suppressive fires with those of the ground combat forces. In the deliberate attack, the ATKHB can independently conduct deep attacks to destroy enemy C^3 sites and to provide suppressive fires for assault forces. It can also attack withdrawing or moving enemy forces, attack along parallel axes into exposed flanks, and attack to exploit initial successes.

(1) Figure 4-8 shows an ATKHB providing suppressive fires for ground combat forces. In this illustration, the ATKHB becomes the fire element, and the battalion task forces become the maneuver element.

(2) Figures 4-9 and 4-10 show an ATKHB conducting a deliberate attack against a withdrawing enemy force. In these illustrations, the ground combat forces provide the base of fire, and the ATKHB becomes the maneuvering element.

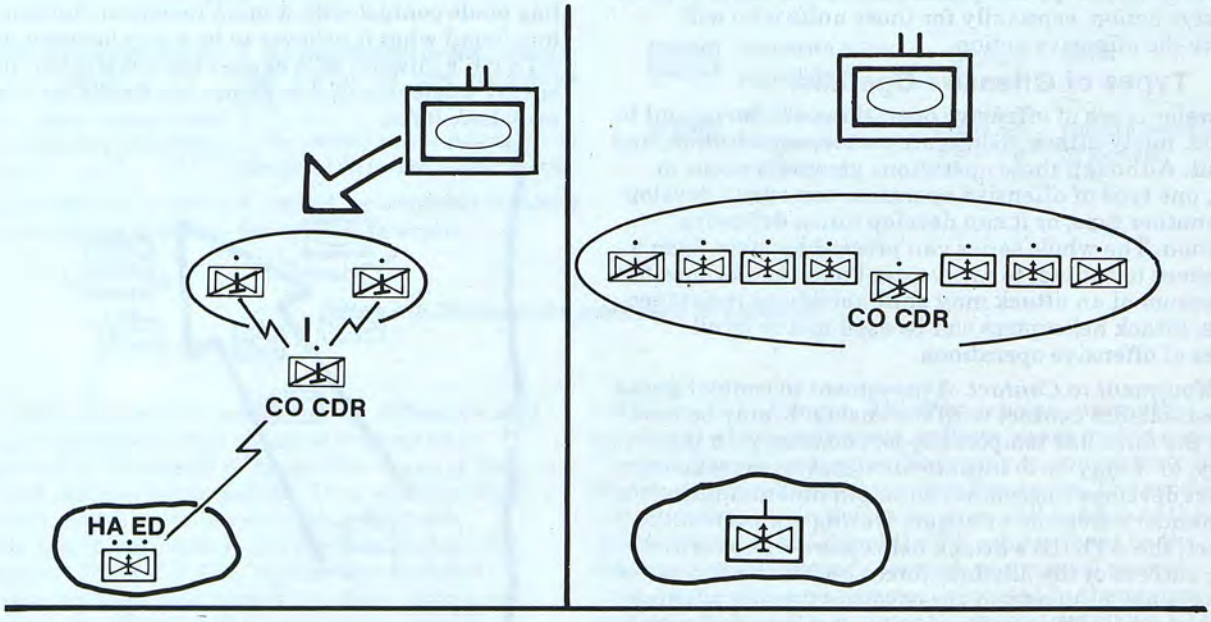


Figure 4-7. ATKHC in a hasty attack

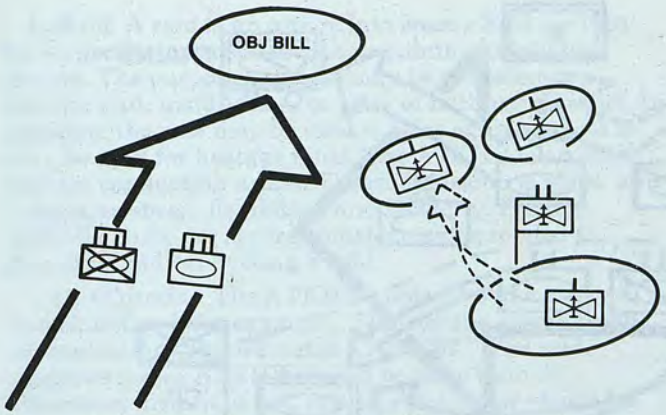


Figure 4-8. ATKHB as a base of fire for a deliberate attack

d. Exploitation. The purpose of exploitation is to prevent the enemy from reorganizing a defensive system or conducting an orderly withdrawal. The objective is to strike swiftly and deeply into the heart of the enemy's defense. This is done by rapidly advancing toward the enemy's rear area, bypassing small pockets of resistance, and destroying lightly defended or undefended installations and activities. In the exploitation, the ATKHB is employed as part of a larger force. By striking the enemy's flanks and rear area, the enemy's withdrawal and reorganization are disrupted. The ATKHB operates as in a movement to contact; that is, it follows the ground force and is ready to strike early in the fight. In addition, ATKHB attack helicopters can effectively interdict and harass retreating enemy armored forces. Figure 4-11 shows how the ATKHB can be used in an exploitation to attack enemy combat trains, command posts, and withdrawing forces.

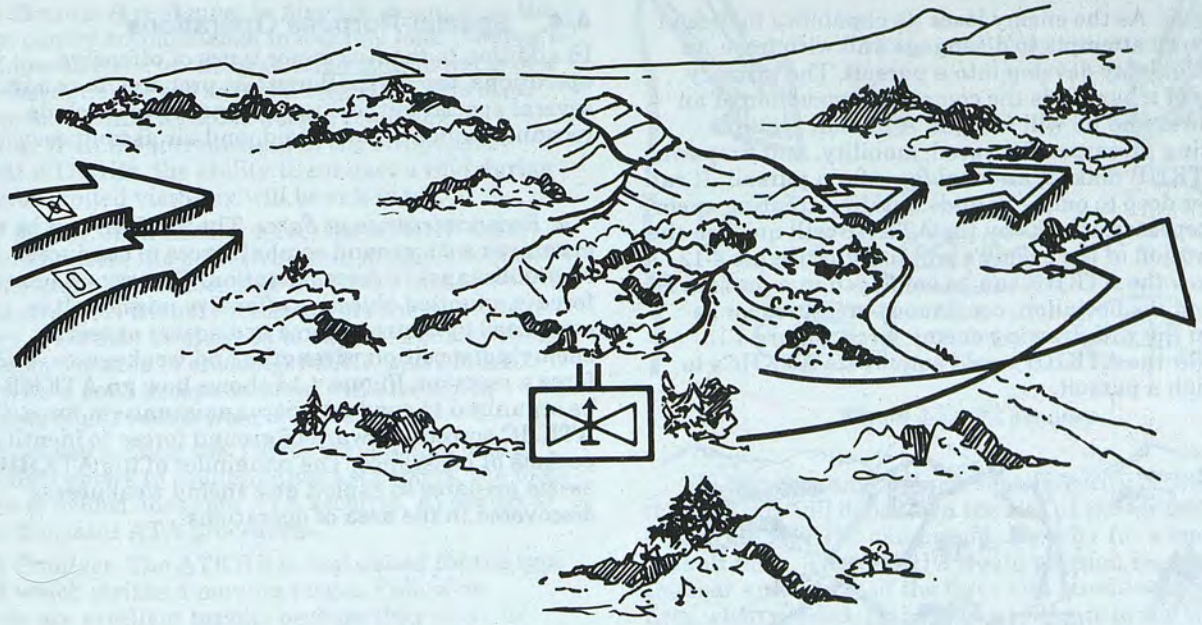


Figure 4-9 ATKHB attacking withdrawing forces

Figure 4-10. ATKHCs in a deliberate attack

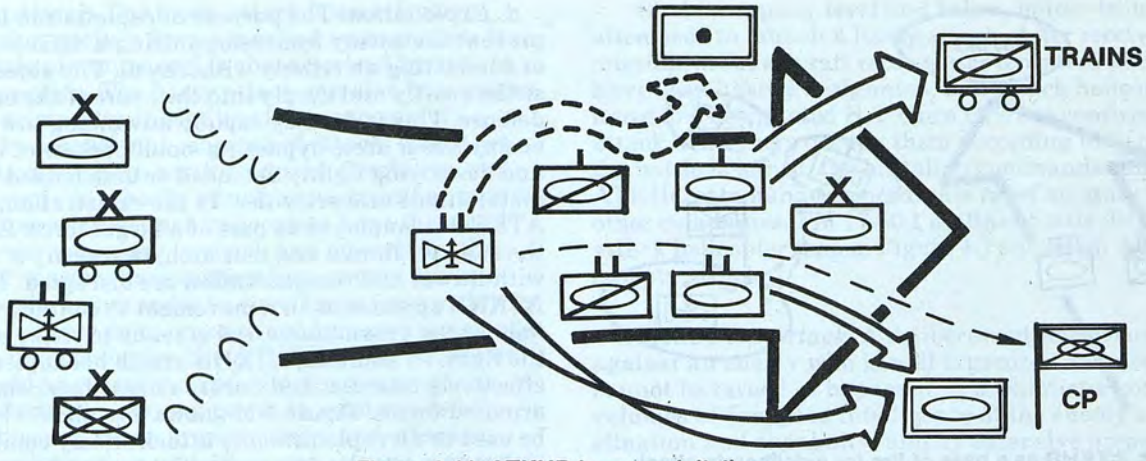


Figure 4-11. ATKHB in an exploitation

e. Pursuit. As the enemy loses its capability to defend or delay and attempts to disengage and withdraw, an exploitation may develop into a pursuit. The primary objective of a pursuit is the complete destruction of an enemy force and its will to fight. A pursuit requires unrelenting pressure. The speed, mobility, and firepower of the ATKHB make it an ideal force for a pursuit. It can maneuver deep to outflank and contain retreating enemy forces. Repeated attacks by the ATKHB will quicken the disintegration of the enemy's will to fight. Figure 4-12 shows how the ATKHB can be employed in a pursuit. By phasing in the battalion, continuous pressure can be placed on the withdrawing enemy force. Figure 4-13 shows how the ATKHB would employ its ATKHCs to accomplish a pursuit.

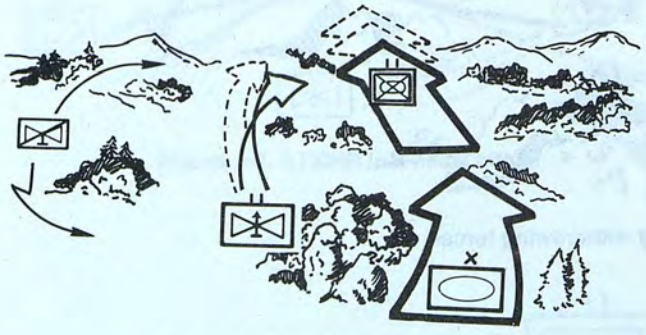


Figure 4-12. ATKHB in the pursuit

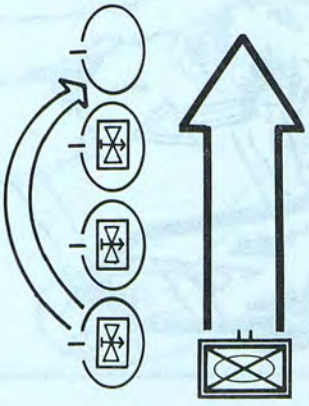


Figure 4-13. ATKHCs in the pursuit

4-4. Special-Purpose Operations

In addition to the five major types of offensive operations, the ATKHB must be prepared to conduct several special-purpose operations. These include reconnaissance in force, raid, and air assault security.

a. Reconnaissance in Force. The ATKHB can be task-organized with ground combat forces to conduct a reconnaissance-in-force operation. The reconnaissance in force is a limited objective offensive mission. It is conducted by a strong force to discover or test an enemy's disposition, strengths and weaknesses, and to force a reaction. Figure 4-14 shows how an ATKHB can be organized to conduct a reconnaissance in force. One ATKHC screens forward of ground forces to identify pockets of resistance. The remainder of the ATKHB assets prepares to exploit any enemy weaknesses discovered in the area of operations.

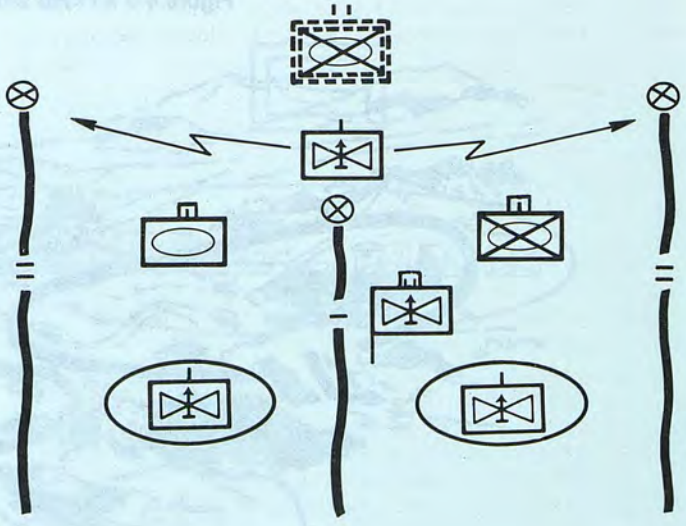


Figure 4-14. ATKHB in reconnaissance in force

b. Raid. A raid is an attack into enemy-held territory for a specific purpose other than gaining or holding terrain. The purpose of a raid may be to destroy a specific unit, installation, or class of military materiel. In addition, the raid may be used to seize equipment, or it may be used for hostage relief. The ATKHB is an ideal unit for conducting a raid. The raid mission is short, and it requires speed, flexibility, and audacity. For the ATKHB, there are several considerations related to planning and conducting a raid:

(1) *Objective.* The ATKHB's objective in a raid will be well defined; for example, "Destroy the enemy troop concentration at coordinates XŸ259767." The raid objective for an ATKHB should be more than 30 kilometers distant; if not, artillery is a better choice for attacking enemy targets. To meet all the intents of its higher commander, the ATKHB could conduct a raid on a closer objective.

(2) *Timing.* A raid must be short in duration so the mission can be accomplished in one fuel load. Timing is critical because one of the most important impacts of a raid is disruption of the enemy's timetable. The ideal time for conducting a raid is during the hours of darkness. With the introduction of the AH-64 and OH-58D ATKHBs, the ability to conduct a raid during periods of limited visibility will be enhanced.

(3) *Routes.* As a raiding force, the ATKHB must move to and from the objective using multiple routes. The time and place of crossing the FLOT must be coordinated with friendly forces before the raid. Field artillery must also be planned to suppress enemy ADA systems in the area of crossing. SEAD, and J-SEAD along with a good deception plan, will also aid in disguising flight routes from a Threat force.

(4) *Security.* Since the Threat emphasizes using attack helicopters to counter other helicopters, the force must be provided adequate ATA security. Appendix D briefly discusses ATA procedures.

(5) *Conduct.* The ATKHB is best suited for the type of raid which strikes a moving target. Follow-on echelons are excellent targets because they move in column on a main avenue. Long-range surveillance units or air cavalry assets can verify target locations. The need for timely intelligence from echelons above corps to the brigade is critical to the success of this type mission. Actions at the objective should be fast paced and provide massed fires to achieve maximum surprise and destruction in the shortest possible time. After completing the specified task, the ATKHB raiding force must rapidly move back to the friendly side of the FLOT. Figure 4-15 shows an example of an ATKHB raid.

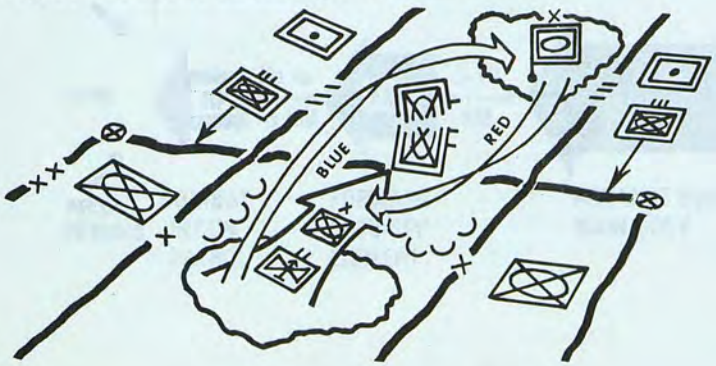


Figure 4-15. ATKHB raid

c. Air Assault Security. The ATKHB must be prepared to provide security for an air assault operation. Security must be provided during all phases of the operation, to include pickup of the assault force, movement to the LZ, and the landing itself. Moreover, the ATKHB should be prepared to provide suppressive fires for the assault force as it seizes its objective. In other words, the ATKHB must be responsive to the needs of the AATFC. The AATFC may be the aviation brigade commander or the ground maneuver brigade commander.

(1) *Security in the pickup zone.* The ATKHB must provide security while assault aircraft are in the PZ. The ATKHCs will be located in BPs where they can control movement in and around the PZ. These BPs should be near likely enemy avenues of approach into the PZ. Figure 4-16 shows PZ security.

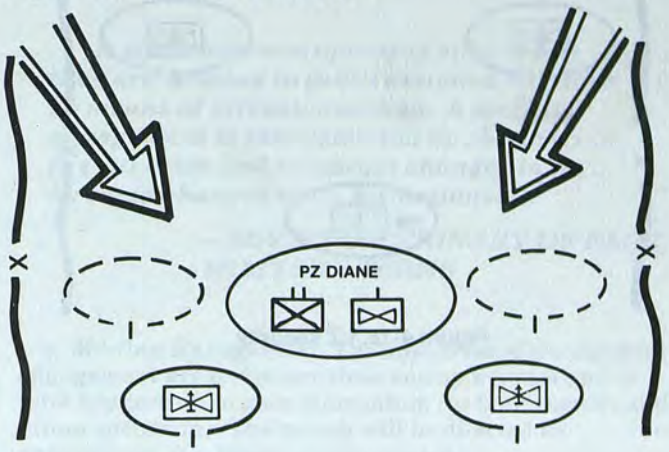


Figure 4-16. PZ security

(2) *Security en route.* En route security provided by the ATKHB will depend on the size of the air assault force. One ATKHC can provide security for a small assault force. The ATKHC would position its sections to the rear and flanks of the force and provide suppressive fires when needed. If the assault force is large, two ATKHCs can secure the move. In addition, air cavalry assets can provide security forward of the air assault forces. Figure 4-17 shows how the ATKHB provides en route security.

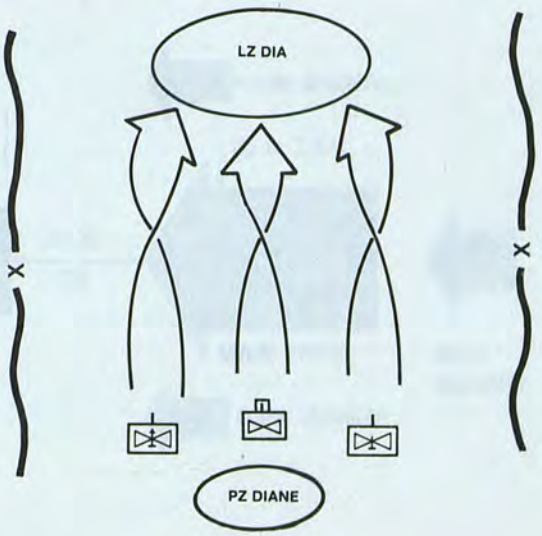


Figure 4-17. En route security

(3) *Security in the landing zone.* Methods for securing the LZ are similar to those used to secure the PZ. BPs must be planned short of the LZ as well as near the LZ on likely enemy avenues of approach. Figure 4-18 shows how this is accomplished.

(4) *Suppressive fires in the attack.* Once the assault is on the ground, the ATKHB must be prepared to provide suppressive fires as the ground force attacks its objective. BPs must be planned to accomplish this mission. Figure 4-19 shows the ATKHB providing suppressive fires at the objective.

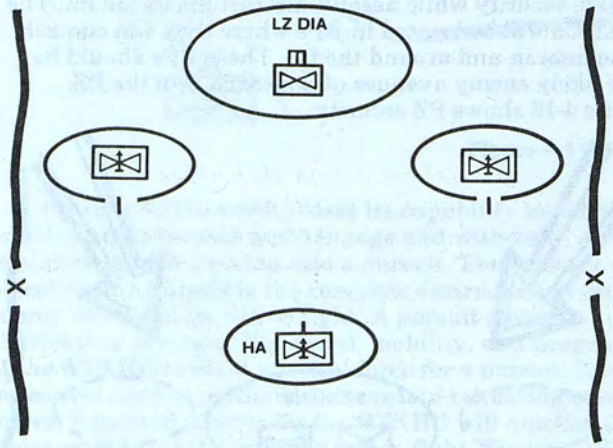


Figure 4-18. LZ security

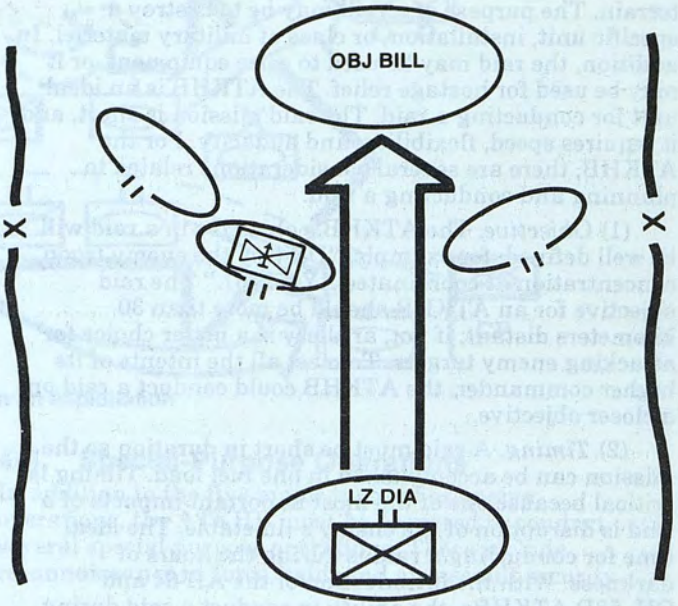


Figure 4-19. ATKHB providing suppressive fires at the objective

Chapter 5

DEFENSIVE OPERATIONS

5-1. General

A successful defense requires reactive and offensive elements working together to regain the initiative. The objective of a defensive operation is to cause the enemy attack to fail; to preserve the force, facilities and installations; to control key terrain; to gain time; or to concentrate forces elsewhere. Other objectives may be to degrade enemy forces to allow resumption of offensive operations and to retain captured terrain. Regardless of the mission of higher headquarters, the ATKHB's missions are offensive operations.

a. The ATKHBs will normally conduct defensive operations as part of a larger force. They will fight in the deep battle, covering force, main battle, and rear battle areas. When employed against lucrative targets, the ATKHBs are the combat multiplier that can turn the tide of battle at the decisive point on the battlefield.

b. Successful defensive operations will depend on strict adherence to the operational concepts of defense, which include—

(1) Seizing the tactical initiative locally, and then generally as the entire force shifts from defense to attack.

(2) Fighting the enemy throughout the depth of his formations to delay and disorganize him and to create opportunities for offensive actions.

(3) Maintaining agility and flexibility in using fire, maneuver, and electronic warfare to set the terms of battle.

(4) Synchronizing all available combat capabilities.

5-2. The Threat Offensive

The Soviets believe that the offensive is the only type of combat from which the combined arms efforts can attain a total victory. The offensive is the basic form of combat action. This type of action is high tempo combat and is aimed toward total destruction of the enemy force.

Offensive actions are keyed on enemy actions and dispositions. When their enemy is in a stationary defensive position, the Threat will conduct an attack against the defending enemy. When both forces are on the offense or know little about the situation of the other, their forces collide. The resulting action is a meeting engagement. When the Soviet's enemy withdraws, the Soviet force can be expected to pursue. The Soviet definition of a meeting engagement is as follows:

A clash between opposing sides when they are striving to fulfill assigned missions by means of offensive actions. A meeting engagement is characterized by obscurity of the situation and by abrupt changes in it . . . by rapid changes in . . . formations.

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a. Meeting Engagement. The objectives of the meeting engagement are to destroy their enemy's forces and to seize key terrain to gain momentum for both current and future operations. The march will be directed in anticipation of a meeting engagement.

(1) *The march.* The march is the formation of movement in a basic column; it offers flexibility, ease of command and control, and speed. The organization of the march to support is shown in Figure 5-1. Because the division has no organic advance guard, the march's advance guard will be a reinforced battalion from the first echelon regiment of the division. The advance guard displaces an FSE from its force, and the FSE dispatches a reinforced platoon known as a combat reconnaissance patrol (Figure 5-2).

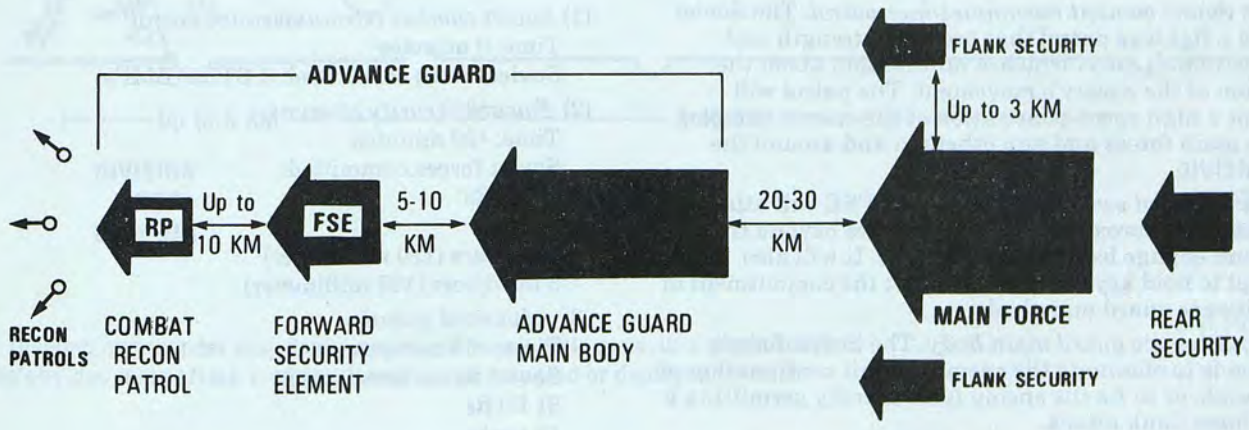


Figure 5-1. Elements of march formation

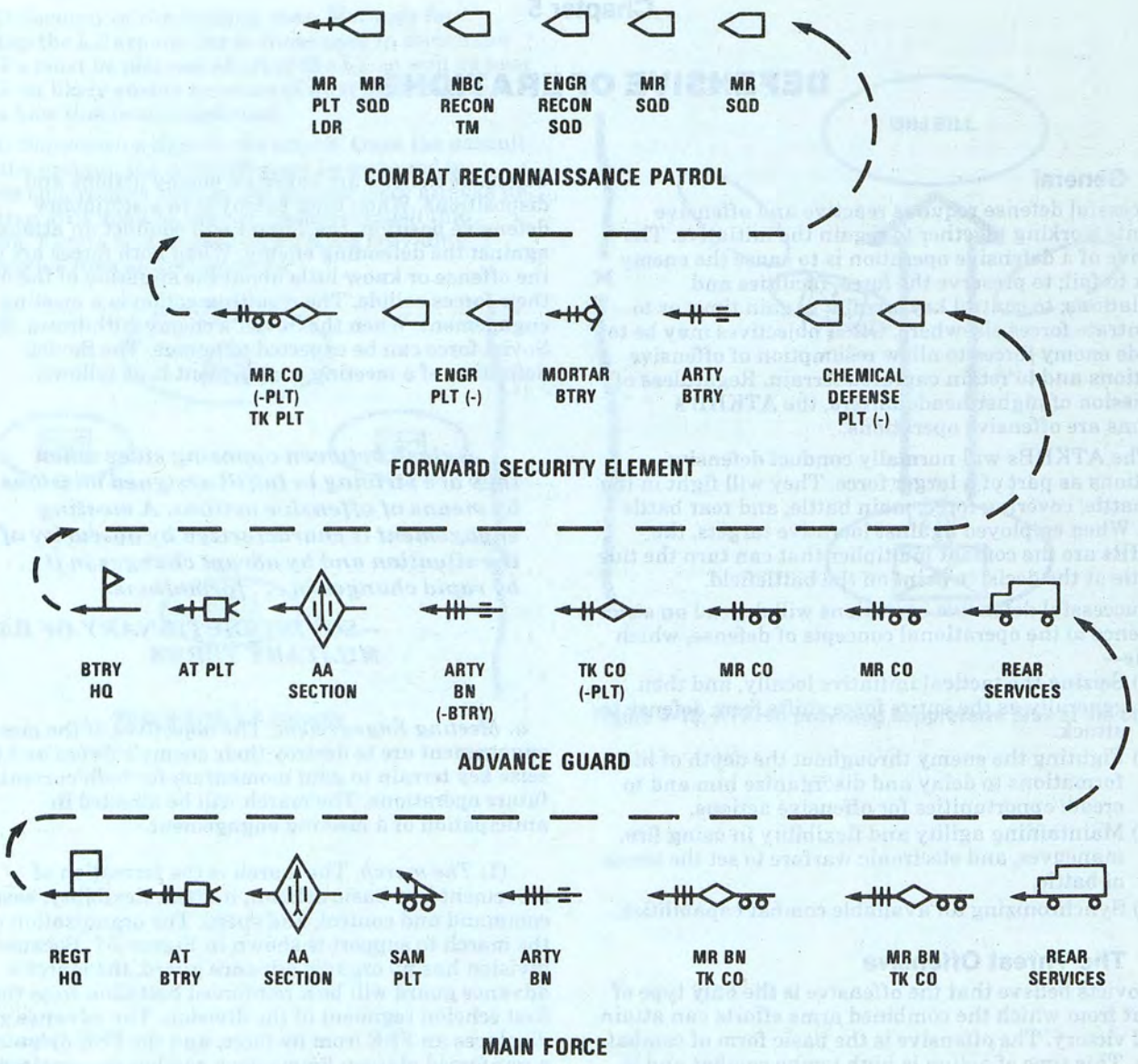


Figure 5-2. Typical march formation

(2) *Soviet combat reconnaissance patrol.* The Soviet CRP is a fighting patrol that provides strength and composition. It also furnishes information about the direction of the enemy's movement. The patrol will attempt a high speed penetration of the enemy to report on the main forces and any others in and around the FEBA.

(3) *Forward security element.* The FSE will attempt to penetrate approximately 10 kilometers beyond the CRP and engage lead enemy elements. It will also attempt to hold key terrain to support the commitment of the advance guard main body.

(4) *Advance guard main body.* The Soviet force's mission is to eliminate the enemy, permit continuation of the march, or to fix the enemy force thereby permitting a main force flank attack.

b. Initial Phase of the Meeting Engagement. This phase is that period of combat when contact is made with the CRP up until the main force is committed to an engagement. The buildup of firepower is as follows:

(1) *Soviet combat reconnaissance patrol.*
Time: 0 minutes
Soviet forces committed: 3 BTRs (BMPs)

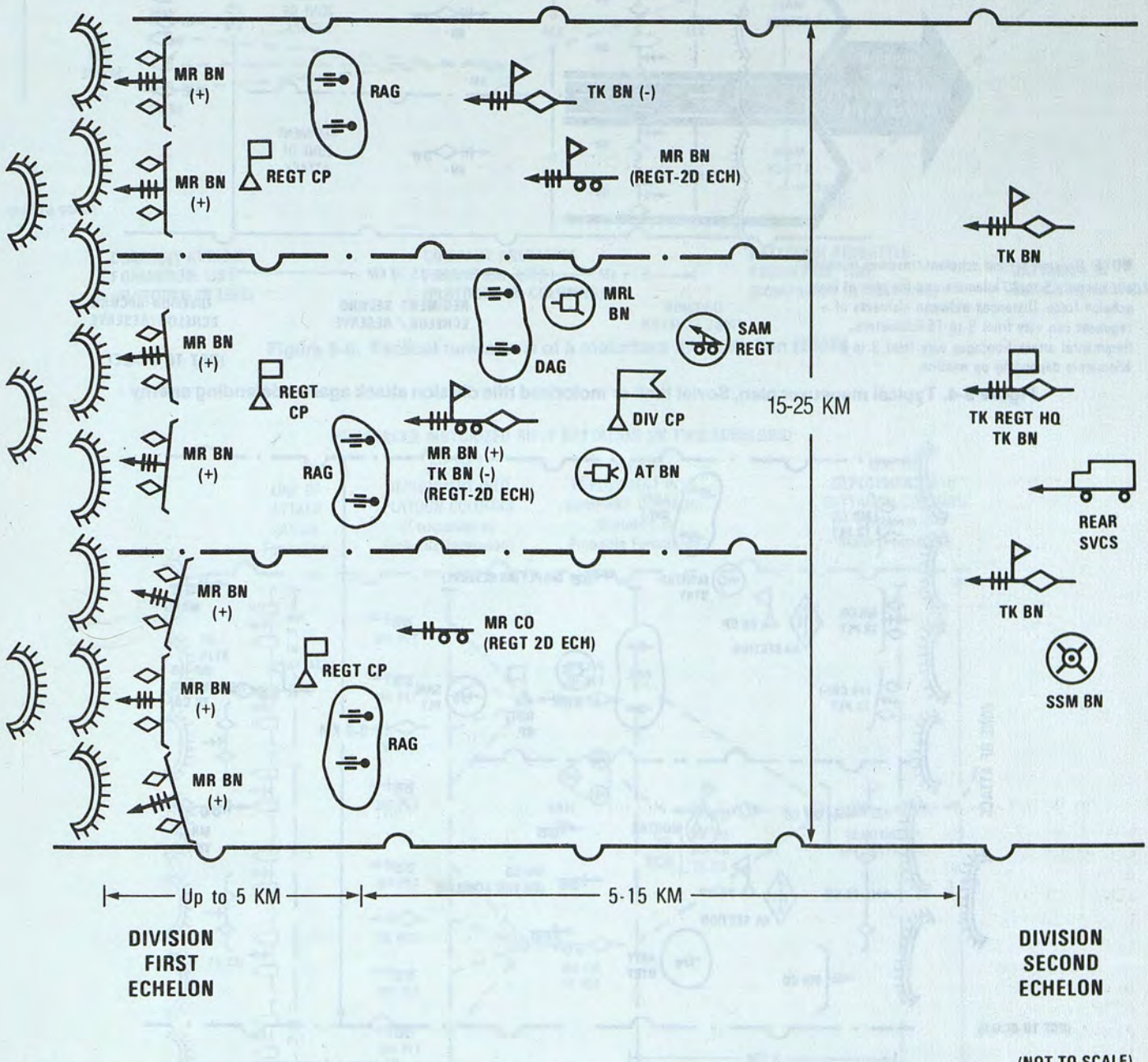
(2) *Foward security element.*
Time: +20 minutes
Soviet forces committed:
10 BTRs
4 tanks
6 mortars (120 millimeter)
6 howitzers (122 millimeter)

(3) *Advanced guard.*
Time: +60 minutes
Soviet forces committed:
31 BTRs
13 tanks
6 mortars (120 millimeter)
18 howitzers (122 millimeter)
2 antiaircraft guns (ZSU 23-4)
4 ATGMs (AT-4)

c. Attack Against a Defending Enemy. The attack against a defending enemy is employed when the enemy defensive position is known. The two methods of conducting this attack are an attack from the march and an attack from a position in direct contact.

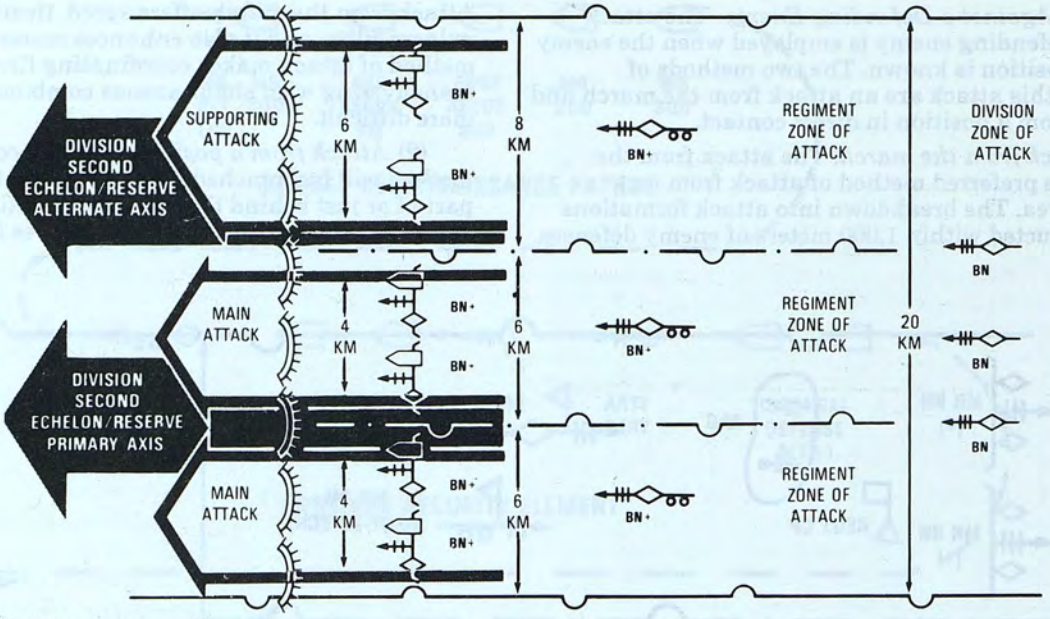
(1) *Attack from the march.* The attack from the march is the preferred method of attack from an assembly area. The breakdown into attack formations will be conducted within 1,000 meters of enemy defenses. Attack from the march offers speed, flexibility, less vulnerability, and it also enhances momentum. This method of attack makes coordinating fire and maneuvering with simultaneous combined arms efforts more difficult.

(2) *Attack from a position in direct contact.* This method will be launched from a position that may be part of or just behind the defensive position. Formations which can be used are shown in Figures 5-3 through 5-9.



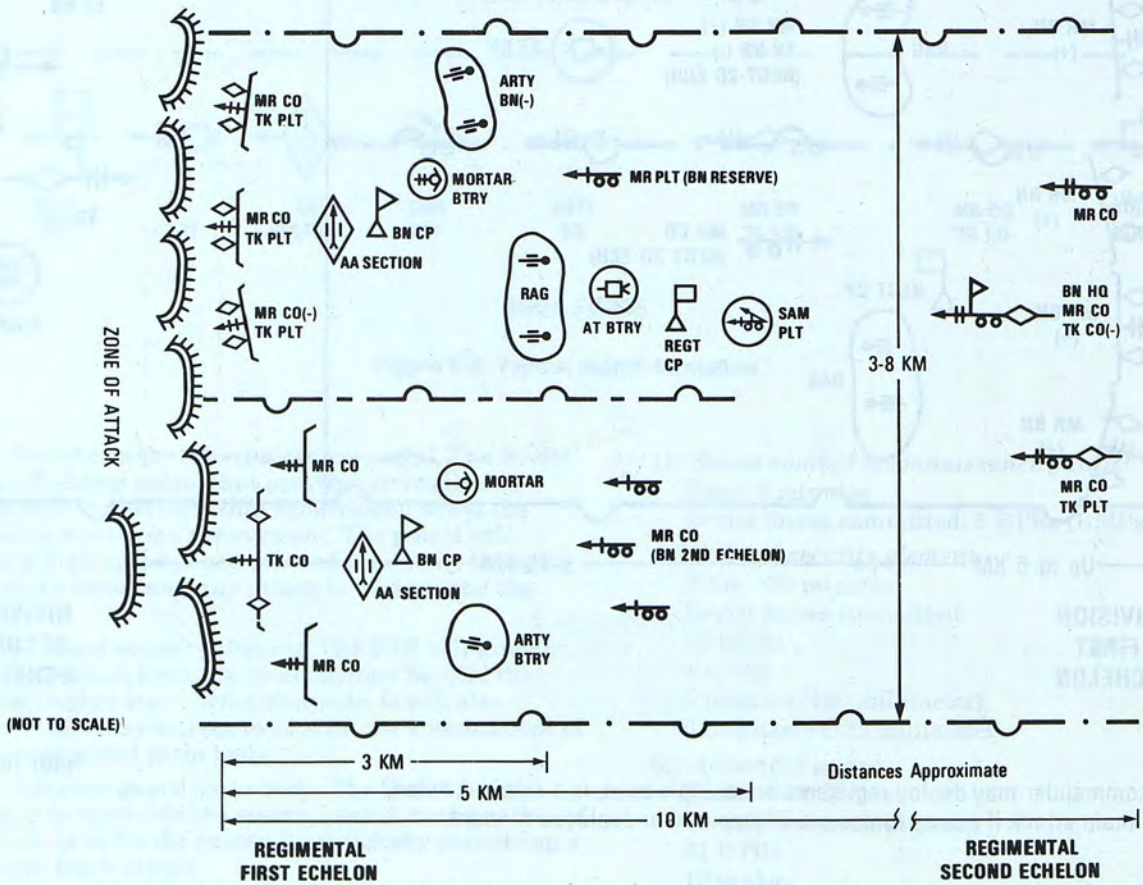
NOTE: Division commander may deploy regiments on multiple axes, in a single echelon, with no obvious main attack if enemy forces are ill-prepared or deployed forward.

Figure 5-3. Typical attack formation, Soviet motorized rifle division



NOTE: Division second echelons/reserves normally are spaced 15 to 30 kilometers to the rear of first echelon force. Distances between elements of a regiment can vary from 5 to 15 kilometers. Regimental attack frontages vary from 3 to 8 kilometers depending on mission.

Figure 5-4. Typical maneuver plan, Soviet tank or motorized rifle division attack against defending enemy



NOTES:

1. A tank regiment attacking in two echelons would be of similar configuration, with modifications based on differences in combat support elements.
2. The extreme limits of a regimental zone of attack are 3-8 kilometers. The most typical attack frontage of a regiment is 4-5 kilometers.

Figure 5-5. Typical attack formation, Soviet motorized rifle regiment

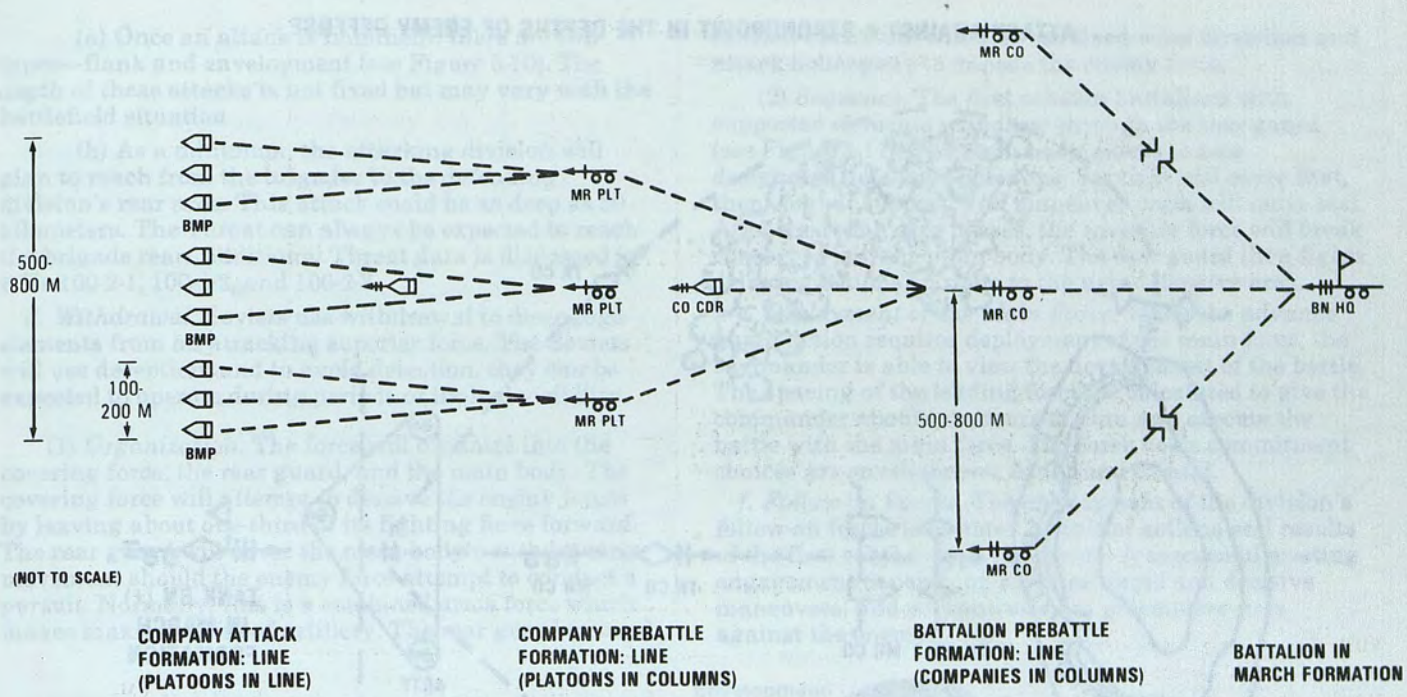


Figure 5-6. Tactical formations of a motorized rifle battalion (BMP)

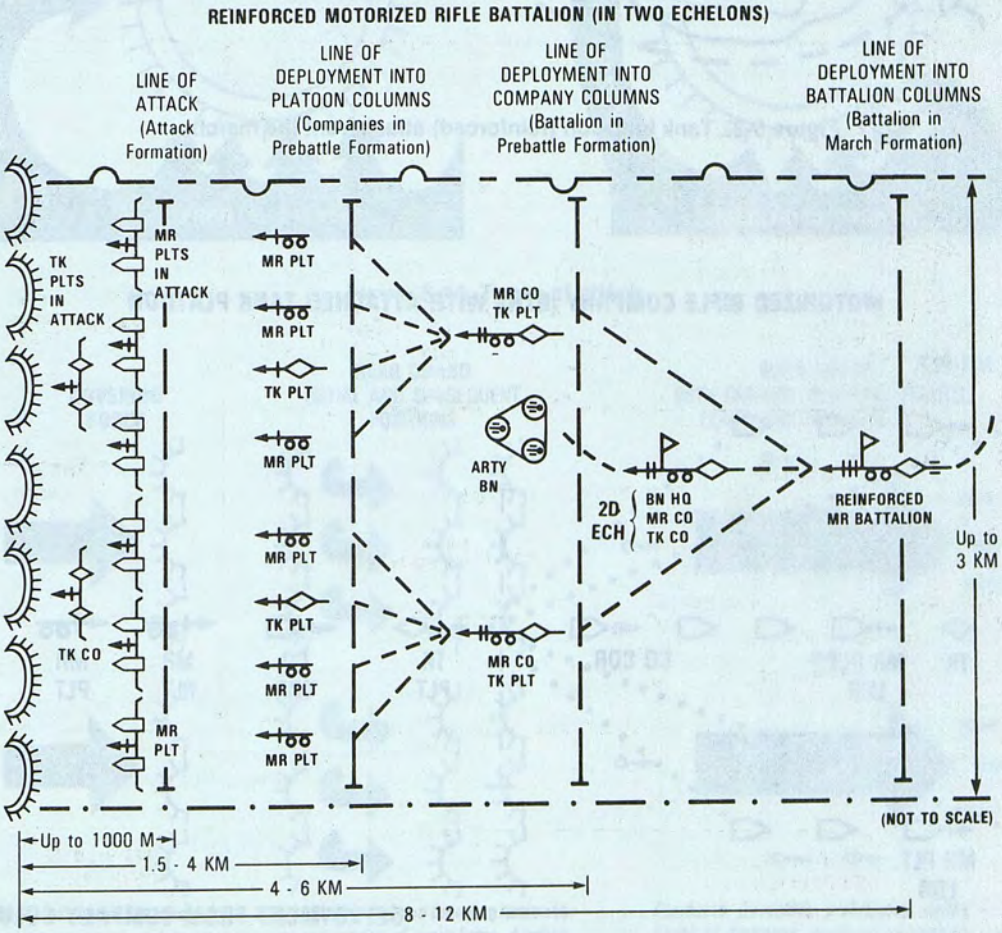


Figure 5-7. Deployment for an attack from the march

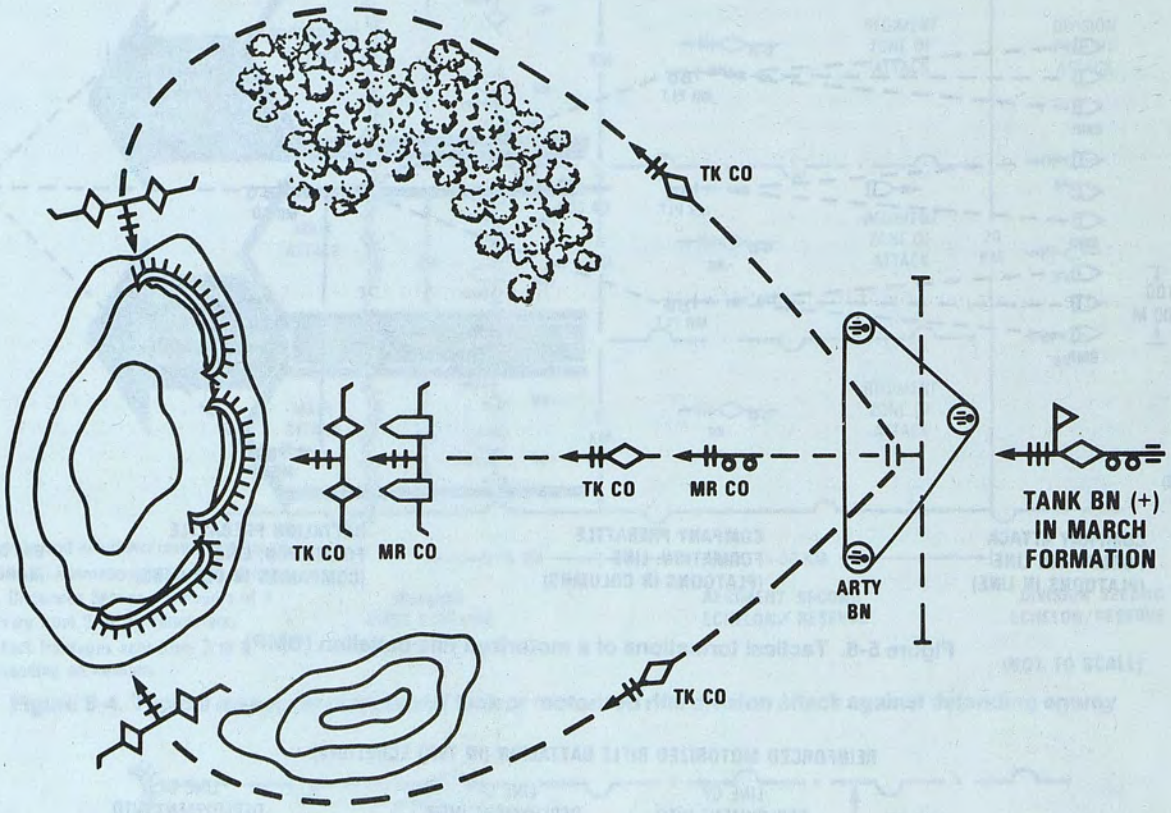


Figure 5-8. Tank battalion (reinforced) attack from the march

MOTORIZED RIFLE COMPANY (BTR), WITH ATTACHED TANK PLATOON

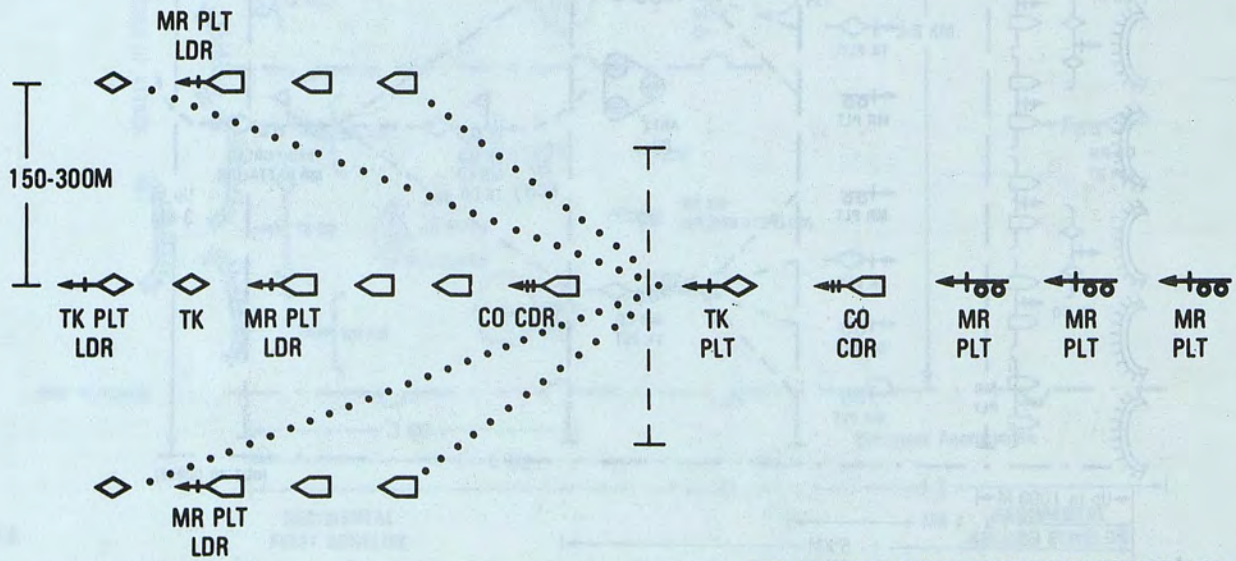


Figure 5-9. Prebattle formation

(a) Once an attack is imminent, there are two types—flank and envelopment (see Figure 5-10). The depth of these attacks is not fixed but may vary with the battlefield situation.

(b) As a minimum, the attacking division will plan to reach from the brigades to the defending division's rear area. This attack could be as deep as 80 kilometers. The Threat can always be expected to reach the brigade rear. Additional Threat data is discussed in FMs 100-2-1, 100-2-2, and 100-2-3.

d. Withdrawal. Soviets use withdrawal to disengage elements from an attacking superior force. The Soviets will use deception, and to avoid detection, they can be expected to operate during periods of limited visibility.

(1) *Organization.* The force will organize into the covering force, the rear guard, and the main body. The covering force will attempt to deceive the enemy forces by leaving about one-third of its fighting force forward. The rear guard will cover the main body's withdrawing movement should the enemy force attempt to conduct a pursuit. Normally, this is a combined arms force which makes maximum use of artillery. The rear guard (second echelon battalion) will also use fixed-wing airstrikes and attack helicopters to impede the enemy force.

(2) *Sequence.* The first echelon battalions with supported elements withdraw through the rear guard (see Figure 5-11). The main body moves to new designated defensive positions. Services will move first, then combat support, and maneuver units will move last. After the rear guard passes, the covering force will break contact to join the main body. The rear guard then fights delaying actions en route to the new defensive area.

e. Deployment of the Main Force. When the advance guard action requires deployment of the main force, the commander is able to view the development of the battle. The spacing of the leading forces is calculated to give the commander about two hours to plan and execute the battle with the main force. The three basic commitment choices are envelopment, flank, and frontal.

f. Follow-on Forces. The employment of the division's follow-on forces is dictated by initial actions and results of the first echelon lead regiments. A successful meeting engagement depends on surprise, rapid and decisive maneuvers, and concentration of preemptive fires against the enemy.

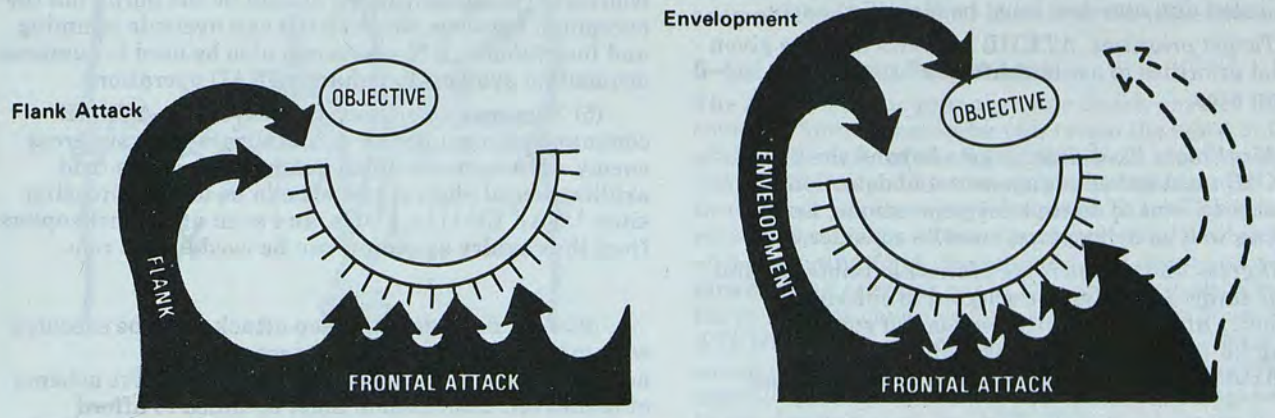


Figure 5-10. Types of attack

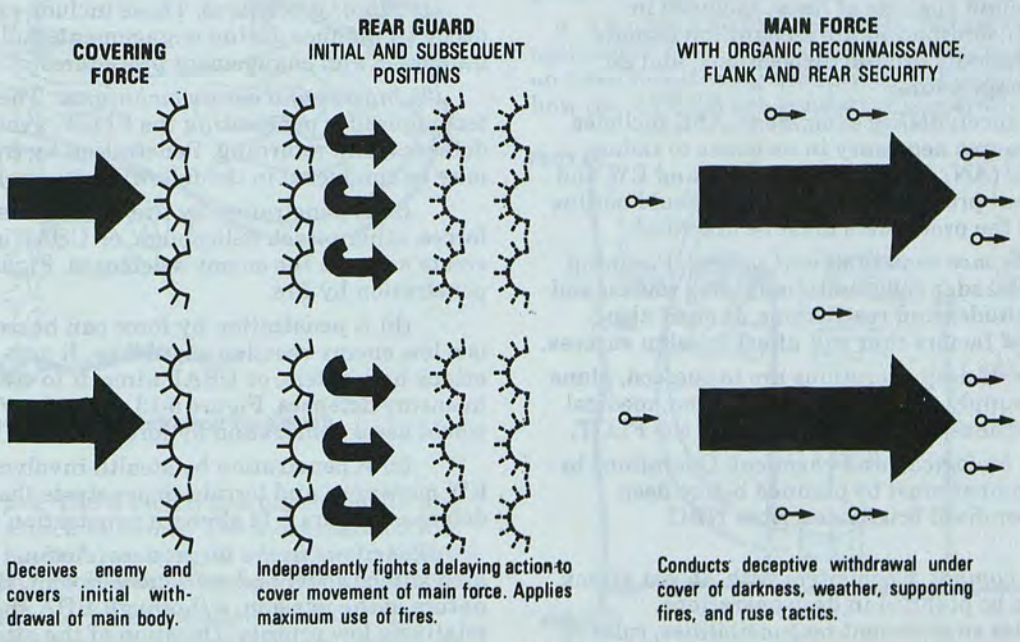


Figure 5-11. Basic concept of the withdrawal

5-3. Deep Operations Area

The deep operations component of Air-Land Battle Doctrine supports the commander's scheme of maneuver by disrupting enemy forces in depth. It prevents the enemy from massing, forcing that enemy to fight in many directions. When planning deep operations, high-value targets must be identified early. Commanders must select targets of the highest importance, whose loss will significantly reduce the enemy's fighting capability. The ATKHBs are ideally suited for deep operations because of their speed, mobility, flexibility, and firepower. At corps and division level, deep operations will always include attack helicopters. At division level, the ATKHBs may be the only means the commander has of influencing deep operations. The key to successful employment of the ATKHB in deep operations is to fight at night and during periods of low visibility.

a. Mission Plans. The ATKHB commander and staff receive, coordinate, and disseminate combat orders and plan for supporting deep operations based on combat intelligence information. Planning considerations include the following:

(1) *Target objectives.* High-value targets that can be easily located and attacked must be identified early.

(2) *Target priorities.* ATKHB aircrews must be given target list priorities to avoid confusion or hesitation in the target area.

(3) *Air threats.* To defeat targets beyond the FLOT, the ATKHB must either engage or avoid detection by enemy aircraft sent to disrupt deep operations. Enemy fighters, as well as helicopters, must be considered.

(4) *Ingress and egress route planning.* Routes in and out of the target area must be selected to enhance survivability and maintain the element of surprise. Planning for multiple routes must consider known enemy ADA locations, checkpoints, and navigational points.

(5) *Passage of lines.* Ingress and egress passage points and crossing times must be coordinated with all forces involved. Air passage of lines must be as strictly controlled as ground passage of lines. Included in passage-of-lines coordination are recognition signals, contact points, friendly ground dispositions, and air corridors to passage points.

(6) *Aircraft survivability equipment.* ASE includes maneuver procedures necessary in response to radar warning receiver (AN/APR-39) indications and EW and NBC environment procedures. Unit SOPs should outline all of these, and the procedures must be practiced.

(7) *Army airspace command and control.* Planning must include IFF radar codes, minimum risk routes, and coordinating altitudes and restrictions. It must also include any other factors that will affect mission success.

(8) *Logistics.* If deep operations are to succeed, plans must include resupply of fuel and ammunition, medical support, maintenance, and recovery beyond the FLOT.

(9) *Nuclear, biological, and chemical.* Operations in an NBC environment must be planned before deep operations. Appendix E briefly describes NBC operations.

(10) *Air-to-air combat.* Encounters with Threat attack helicopters must be planned in deep operations. Planning includes engagement responsibilities, rules of engagement, and evasive maneuvers.

b. Mission Support. Support of deep operations will require the efforts of all levels of the command. Support requirements include the following:

(1) *FARP operations.* If FARPs are to be used, commanders must consider setup times, locations, length of stay, mobility, capabilities, and survivability. If the operation is to be sustained beyond the FLOT, UH-60 and CH-47 aerial resupply must be considered.

(2) *Air cavalry.* Air cavalry assets can be used to conduct route reconnaissance and acquire or confirm target locations. They also can screen ATKHB flanks during movement or while in BPs and provide ATA protection for the force.

(3) *Fire support.* ATKHB commanders must employ all systems which are capable of providing fire support beyond the FLOT. Artillery can be used for SEAD, for masking the sounds of helicopter rotors, and as part of a deception plan.

(4) *Electronic warfare.* The ATKHBs must be prepared to execute the mission in an EW environment. Clear and concise mission orders will ensure success and allow attacking elements to take independent actions. Nonverbal communications should be the norm, not the exception; however, the ATKHB can override jamming and interference. EW assets can also be used to suppress acquisition systems to enhance SEAD operations.

(5) *Suppression of enemy air defenses.* ATKHB commanders must use all available assets to suppress enemy ADA systems. Field artillery as well as field artillery aerial observer assets can be used at crossing sites. USAF EF-111s, F-4Gs, and even attack helicopters from the cavalry squadron can be used in this role.

c. Mission Execution. A deep attack must be executed with maximum speed. Target destruction or neutralization is best ensured by an aggressive scheme of maneuver. The mission must be timed to afford maximum surprise and to have the greatest impact on enemy operations. Mission execution considerations include the following:

(1) *Flight procedures.* These include exposure times; decoy techniques during engagement; and target, handover, and engagement procedures.

(2) *Ingress and egress techniques.* These include techniques for penetrating the FLOT, avoiding enemy defenses, and returning. Penetration by friendly units may be conducted in the following manner:

(a) A penetration by fire uses artillery, ground forces, other attack helicopters, or USAF aircraft to create a gap in the enemy's defenses. Figure 5-12 shows a penetration by fire.

(b) A penetration by force can be used when there is a low enemy reaction capability. It uses cavalry, other attack helicopters, or USAF aircraft to create an opening in enemy defenses. Figure 5-13 shows how an ATKHB would use a penetration by force.

(c) A penetration by stealth involves deception, EW measures, and terrain to penetrate the enemy's defenses. Figure 5-14 shows a penetration by stealth.

(3) *Actions in the target area.* Actions in the target area will be short and extremely violent. Because of the nature of the mission, a thorough BDA should have relatively low priority. Duration of the attack should be specified in the OPORD or commander's intent.

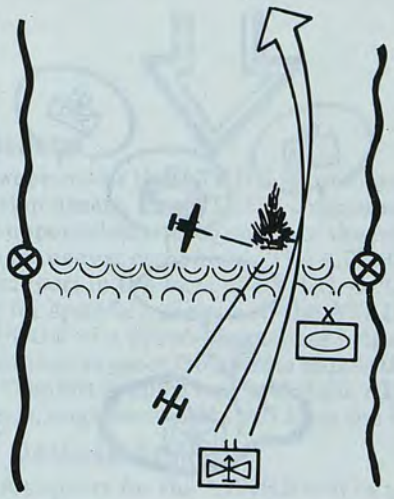


Figure 5-12. Penetration by fire

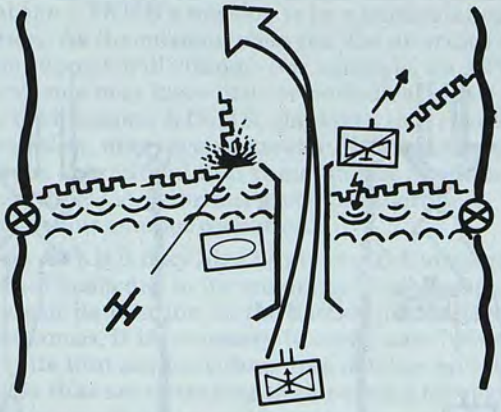


Figure 5-13. Penetration by force

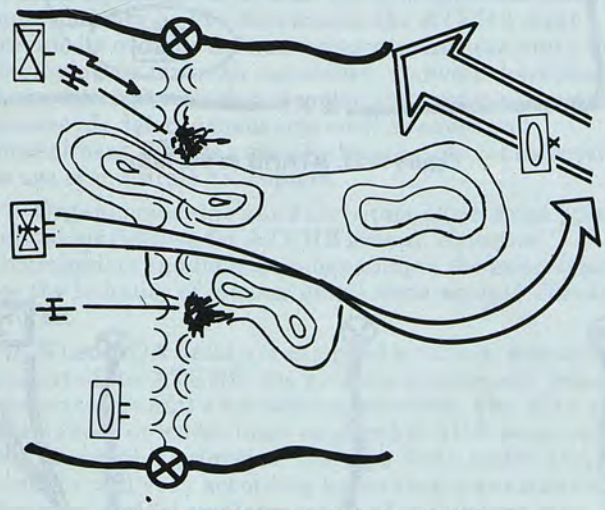


Figure 5-14. Penetration by stealth

d. Mission Types. The ATKHB can participate in any number of deep attack missions. The most common are an operation of limited duration, an operation to secure a deep objective, and an operation to continue the attack.

(1) An operation of short duration is a raid. The ATKHB penetrates enemy territory to delay, disrupt, or weaken a known target. Once the mission ends, the attack force withdraws. Figure 5-15 shows the ATKHB attacking a follow-on independent tank regiment.

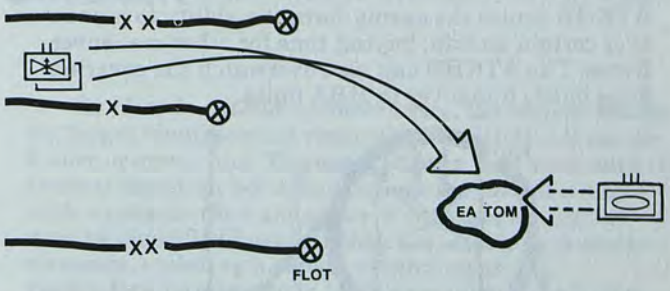


Figure 5-15. ATKHB attacking a follow-on tank regiment

(2) An operation to secure a deep objective is a deliberate attack. Its goal is to occupy a specific area in hostile territory, such as an airhead. This mission is a combined arms operation, and the ATKHB will be a part of that force.

(3) An operation to continue the attack is an exploitation. The ATKHB operates as part of a larger force and attacks withdrawing or counterattacking enemy forces before their arrival in the objective area.

5-4. Covering Force Area

The ATKHB is the primary force which ensures that the covering force commander can retain the spirit of the offense. Because of the ATKHB's speed and flexibility, it can rapidly respond to concentrate combat power throughout the covering force area. The ATKHB is employed in hasty attacks to accomplish the objectives of the covering force commander. It is employed well forward and operates out of forward assembly areas in the rear of the covering force area. At corps level, the ATKHB may be placed under OPCON of the armored cavalry regiment to increase the long-range antiarmor capability of the regiment's combat aviation squadron. In the division area, the ATKHB is the primary long-range killer. ATKHB-assigned missions include attacking follow-on forces, overwatching movement of ground forces, and acting as a blocking force.

a. Attacking Follow-on Forces. During covering force operations, the commander may desire to attack a follow-on force threatening his operation. Figure 5-16 shows how the ATKHB can conduct this operation.

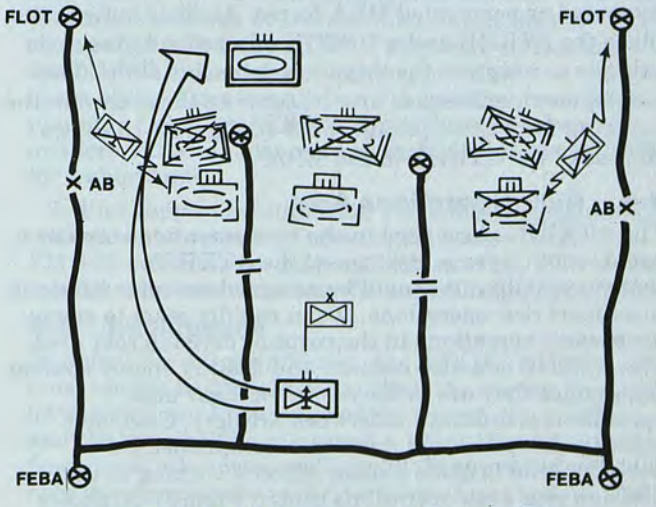


Figure 5-16. ATKHB attacking a follow-on force

b. Overwatching Ground Movement. Figure 5-17 shows how the ATKHB is employed to relieve a battalion task force so it can maneuver to a subsequent BP. The ATKHB denies the enemy force the ability to maneuver over certain terrain, buying time for other maneuver forces. The ATKHB can also overwatch the covering force battle handover to MBA units.

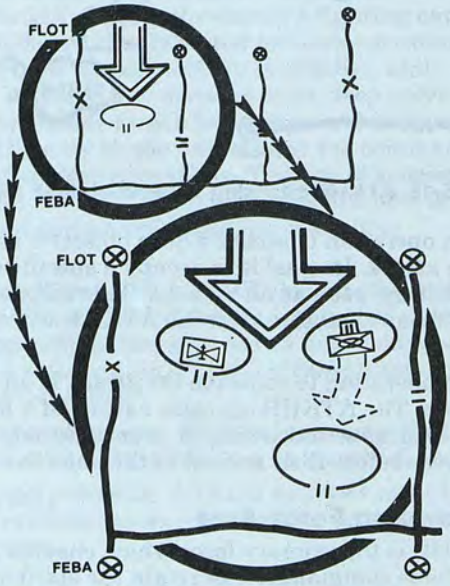


Figure 5-17. ATKHB overwatching ground movement

c. Acting as a Blocking Force. The ATKHB can also act as a blocking force. This allows the covering force commander to shore up a penetration site and maneuver ground forces to blunt the penetration. Figure 5-18 shows this mission.

5-5. Main Battle Area

In the MBA, the ATKHB can be employed to destroy enemy lead elements entering the main area of operations. It can also attack and destroy follow-on elements capable of influencing the enemy's main effort. The ATKHB should be employed in the MBA once the enemy's main effort has been identified. It may be held in reserve by the division and committed anywhere in the division area. It may also be committed as an independent force against enemy forces that have bypassed or penetrated MBA forces. Another option is to place the ATKHB under OPCON of a ground maneuver brigade to reinforce the brigade's defensive effort. The employment techniques are the same as those used in the covering force area (paragraph 5-4). Figure 5-19 shows the use of the ATKHB in the MBA.

5-6. Rear Operations Area

The ATKHB is best used in the rear operations area as a rapid reaction force. Because of the ATKHB's maneuverability, it should be assigned on-order missions to support rear operations. It can rapidly react to enemy air assault operations in the corps or division rear area. The ATKHB can also contain and destroy enemy combat forces once they are in the rear area. Rear area operations coordination between artillery, CAS, and attack helicopter units must be accomplished by battalion and brigade liaison officers working in the division rear area operations center. Figure 5-20 shows how the ATKHB can be employed in the rear area.

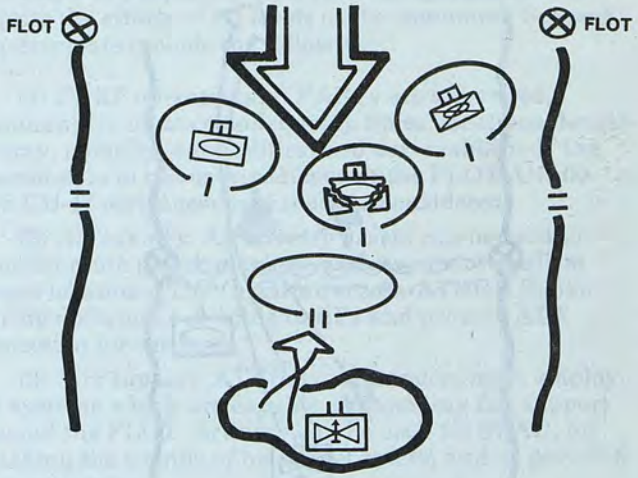


Figure 5-18. ATKHB as a blocking force

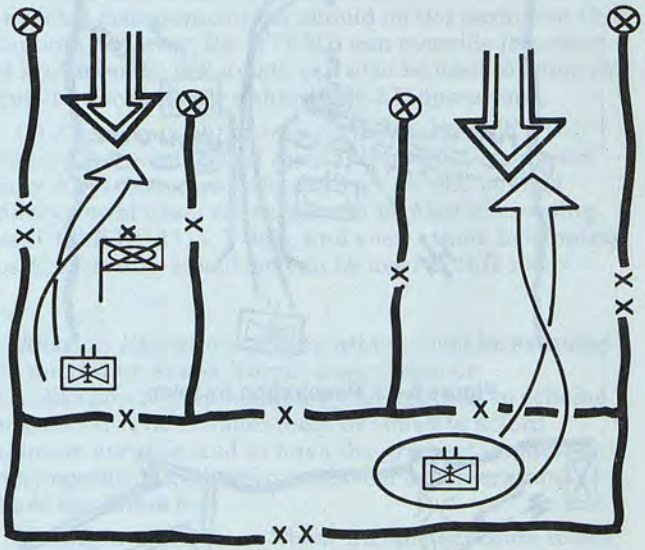


Figure 5-19. ATKHB in the MBA

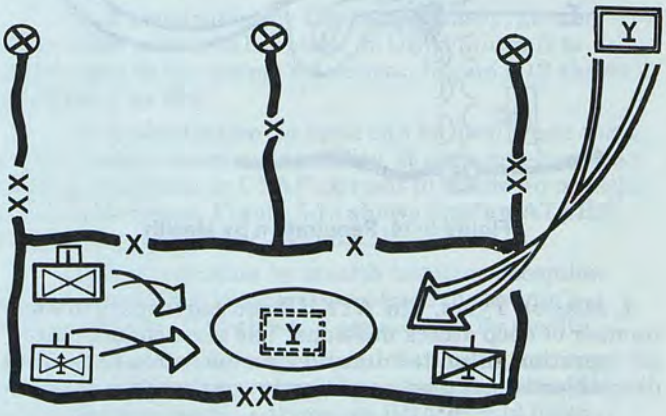


Figure 5-20. ATKHB in the rear area

Chapter 6

COMBAT SUPPORT

6-1. General

Combat support for the ATKHB is provided from corps and division assets. The ATKHB commander uses combat support elements to enhance the combat power of his three maneuver companies. The ATKHB may receive combat support in the form of DS, GS, OPCON, or attached for specific missions. If the ATKHB is placed under OPCON of a ground maneuver brigade, it may receive combat support from units supporting that brigade. Combat support assets include ADA, FA, intelligence, engineers, and CAS from the USAF.

6-2. Air Defense Artillery

a. ADA support for the ATKHB will be provided in much the same way as for other maneuver elements. The division commander sets the priority for ADA support from his organic SHORAD battalion based upon how critical the ATKHB's mission is in a particular combat operation. As the mission changes, the priorities for air defense support will change. For example, an ATKHB in a reserve role may have little or no dedicated ADA support. This same ATKHB, employed in a covering force mission, may receive greater SHORAD support. Therefore, it is critical that commanders continually reassess the ADA priorities given to subordinate forces in a particular combat operation.

b. The ATKHB may also be given ADA support on an incidental basis due to its proximity to other maneuver elements or its location on the battlefield. Under these circumstances, it is necessary to coordinate between the ADA units that are providing area defense and the ATKHBs that are operating in or passing through the area. This coordination will become necessary when the ATKHB is operating as an independent maneuver battalion. Because SHORAD systems cannot achieve the same mobility as aviation assets, the ATKHB must provide its own air defense using organic weaponry and employing its air-to-air capability. To avoid detection by enemy aircraft, attack helicopter units must also employ passive air defense measures such as cover and concealment. This is critical when the Threat increases its use of multirole helicopters.

c. Organic machine guns and other small arms provide limited air defense for ATKHB ground elements. Commanders should not underestimate the importance nor the lethality of massed small arms against Threat aircraft.

d. When ADA units are assigned a tactical mission in support of the ATKHB, the aviation commander must determine his unit's air defense priorities. The ADA unit commander or leader must employ his ADA weapons to best support his priorities. The type and number of ADA weapons will vary according to the task organization. However, typical employment of ADA weapons may include Stinger, Vulcan, and Chaparral. The Chaparral and Stinger systems are well suited for supporting critical assets within the ATKHB.

e. Air defense fires are controlled by using hostile criteria, weapons control status, and airspace restrictions. These three control measures are usually established by the area air defense commander and stated by the corps or division. Subordinate units may impose a more restrictive control status.

(1) *Hostile criteria.* In most cases, the responsibility for target identification rests with the SHORAD squad leader or crew chief. The exact criteria may vary with the tactical situation between areas on the battlefield and with available time and space. For example, aircraft may be classified hostile if they are attacking friendly elements, violating airspace control measures, responding improperly to IFF interrogation, or if they are identified visually.

(2) *Weapons control status.* When an aircraft is identified as being hostile, engagement by ADA weapons is controlled by the weapons control status in effect. Weapons control status categories are as follows:

(a) *Weapons hold.* Air defense weapons are not fired except in self-defense.

(b) *Weapons tight.* Air defense weapons are fired only at aircraft positively identified as enemy according to established criteria.

(c) *Weapons free.* Air defense weapons may be fired at any aircraft not positively identified as friendly.

f. ATKHB commanders and staff must exercise A^2C^2 to make safe aircraft operations easier among the other airspace users and to reduce the likelihood of friendly kills. To reduce interference with ADA operation and enhance aircraft survivability, integrate the airspace control measures received from the airspace control authority. Planning future operations using the control measures available to unit commanders and close coordination with the brigade and division A^2C^2 elements will also reduce interference with ADA operations and enhance aircraft survivability.

6-3. Field Artillery

The fire support most often used by attack helicopters is field artillery. This support is provided by FA battalions supporting the force as a whole. An ATKHB under OPCON of a brigade receives fire support from the FA battalion in direct support of the brigade.

a. An artillery unit is assigned missions which detail its fire support responsibilities and establish its relationship with a maneuver unit or another FA unit. The mission of one or more artillery units may be changed to reflect the ATKHB's priority of fires as established by the corps, division, or brigade commander. Occasionally, an FA battalion may be placed in DS of an ATKHB. Firing batteries from an artillery battalion also may be dedicated to the ATKHB for a short time.

b. Fire support coordination and control measures are critical to the success of attack helicopter operations. FM 6-20 describes the responsibilities of the FSO and the control measures necessary for controlling fire support.

6-4. Intelligence

To defeat the enemy and win, the ATKHB commander must see the battlefield better than the enemy. He must have a superior knowledge of the enemy, the weather, and the terrain. The commander gains that knowledge from good, all-source intelligence. That intelligence will help the commander make decisions, issue orders, and employ his forces successfully on the battlefield.

a. Sources of Intelligence. The ATKHB commander obtains information about the battlefield from many sources. These sources can be categorized as HUMINT and SIGINT.

(1) *HUMINT.* Considerable information is gathered during combat operations. Sources of human intelligence are available from higher headquarters, artillery FDCs, ground and air maneuver units, and long-range surveillance units. Intelligence information is gleaned from spot reports, intelligence reports, intelligence summaries, and other reports from various agencies.

(2) *SIGINT.* SIGINT and EW support are provided by corps and division units. These systems complement attack helicopter operations and must be considered along with other support systems during mission analysis and planning. They can exploit all electronic signals; for example, radars, radios, and homing beacons. In any weather, day and night, SIGINT can locate and identify enemy emitters and develop an electronic order of battle. Once emitters are identified by type, intelligence specialists can determine associated weapon systems. By integrating SIGINT and EW systems with other intelligence sources, analysts can determine the enemy's size, disposition, activities, capabilities, and possible weaknesses.

b. Intelligence Coordinator. The S2 in the ATKHB is the intelligence coordinator for the battalion. The S2 gathers, processes, and interprets information from subordinate units. He passes this information to higher headquarters where it is consolidated with intelligence information from other sources. The results are disseminated as INTSUMs. The INTSUMs provide an intelligence update for units in the division. The S2 also obtains weather information for the planning considerations of subordinate units. The S2 and the USAF ALO coordinate the joint suppression of enemy air defense systems.

c. Intelligence Collection Requirements. These requirements are distributed in terms of essential elements of information and other intelligence requirements. Based on the mission, command guidance, and available intelligence, the S2 develops an intelligence course of action. If the commander approves the course of action, orders and requests are issued to collect information for intelligence production.

6-5. Engineers

Engineer operations are time and labor intensive. They may not be realistic in ATKHB combat operations because helicopter HAs and FARPs are temporary and mobile. However, engineer support may be feasible in ATKHB assembly areas in corps or division rear areas. Attack helicopters can take advantage of countermobility operations by engineers in offensive and defensive situations. The ATKHB commander must coordinate obstacle plans with engineer units. FM 5-100 discusses the uses and capabilities of engineers.

6-6. Joint Air Attack Team

The effectiveness of the ATKHB is increased during JAAT operations. In JAAT operations, attack helicopters, USAF CAS aircraft, and field artillery launch synchronized simultaneous attacks against the same enemy target. These three different offensive weapon systems form a deadly partnership called the joint air attack team. TRADOC TT 17-50-3 describes JAAT operations in detail.

a. Key Personnel. Several key personnel are involved in coordinating and executing a JAAT operation. They are the maneuver commander, the ATKHC commander, the FAC, the CAS flight leader, and the FSO.

(1) *Maneuver commander.* The maneuver commander is responsible for the ground and airspace where the JAAT operation takes place. The USAF ALO coordinates with the maneuver commander, S3, or FSO to determine the type of target and friendly units in the area.

(2) *ATKHC commander.* One person must direct the overall JAAT effort. The ATKHC commander must know the ground and air tactical plans and maintain constant contact with enemy and friendly elements. The ATKHC commander coordinates the air attack with the ground commander, and the artillery is coordinated through the FSO. The overall responsibility for the JAAT operation rests with the ATKHC commander.

(3) *Forward air controller.* The FAC is a member of the battalion TACP which operates on the ground or in the air near the line of contact. CAS operations are controlled primarily by the FAC and CAS flight leader. The ATKHC commander may coordinate and relay information in the absence of the FAC. The FAC-A usually operates out of the enemy air defense envelope in a fixed-wing aircraft and coordinates the employment of incoming aircraft. Normally, the ATKHB will have a TACP or a FAC, or it can be supported by the TACP or a maneuver brigade in sector.

NOTE: The ATKHB may have a USAF TACP or a FAC assigned. Usually, the ATKHB will be supported by elements of the TACP of the ground force exercising OPCON of the battalion.

(4) *CAS flight leader.* The CAS flight leader directs the attack for his element. Flights will consist of two or four A-10s but may involve other CAS aircraft.

(5) *Fire support officer.* The FSO duties were described in paragraph 3-6 and are the same for a JAAT operation.

b. Conduct of Operations.

(1) After receiving the mission, aeroscouts move forward to reconnoiter the target area. They will identify battle positions, avenues of approach, choke points, and potential engagement areas if these have not been already designated. The scouts also will locate enemy air defense systems for subsequent suppression.

(2) Indirect fire support should be initiated by the scouts during reconnaissance and continued throughout the operation. Typical FA support for a JAAT operation may begin with initial engagement of the enemy at extended range to slow the enemy's movement. Field artillery continues the attack to suppress AD radars, other ADA systems, and follow-on targets not under immediate attack by helicopters and CAS aircraft.

(3) When the CAS flight leader arrives in the battle area, he will contact the FAC. He gives the FAC his call sign, mission number, ordnance available, and loiter time. The FAC or the ATKHC commander, if the FAC is not available, will pass target information to the CAS flight leader. This information includes the following:

(a) Target location (coordinates or geographic references).

(b) IP (recognizable terrain features or grid coordinates).

(c) Heading and distance from the IP to the target area.
(d) Target description.
(e) ADA or air threat.
(f) Position of friendly air and ground forces.
(g) Restrictions (artillery firing direction).
(h) Additional information (required CAS inbound calls).

(4) CAS aircraft usually enter the target area as a flight of two. The flight will leave the IP using low-altitude tactical navigation which maximizes terrain masking to avoid detection. The flight leader contacts the FAC or the ATKHC commander for an update on friendly and enemy activities. Attack helicopter and FA fires should be keyed to the CAS inbound call. This call is expressed in units of time; for example, 30 seconds. FA fires should be shifted to suppress ADA systems while attack helicopters engage targets.

(5) When the engagement ends, CAS aircraft and attack helicopters leave the area. If sustained combat requires continuous pressure in the target area, the departing ATKHC commander and CAS flight leader will update inbound flights and attack helicopter units. The JAAT operation continues until the mission is completed.

c. Employment Options. A JAAT operation can be preplanned, or it can occur spontaneously. The options available when employing the JAAT are sector attack, sequential attack, and combined attack. These basic employment options may be modified to meet a particular tactical situation. The JAAT also may employ decoy tactics with any of the three employment options.

(1) *Sector attack.* In a sector attack, the area of operations, to include the target and avenues of approach, is split by the FAC or the ATKHC commander. Each JAAT element is assigned a specific sector of responsibility. Each operates independently within its assigned sector while providing mutual support for the other element. The sector attack reduces the problems associated with aircraft coordination, ordnance fans, and clearance from weapons fragmentation. In a sector attack, the JAAT can operate even in an intense EW environment. Figure 6-1 shows a typical sector attack.

Figure 6-1. Sector attack

(2) *Sequential attack.* The second JAAT option is a sequential attack. This is the option of choice when the target area is small or when the terrain limits the axis of attack used by the team. Such limitations preclude all members of the team from engaging the target at the same time. Each element is assigned the target for a specific period; for example, 5 minutes. During that time, it operates independently to destroy the target. Sequencing continues until the target is neutralized or destroyed. The sequential attack works well when attack helicopters maneuver to new attack positions during an engagement sequence. Figure 6-2 shows a sequential attack.

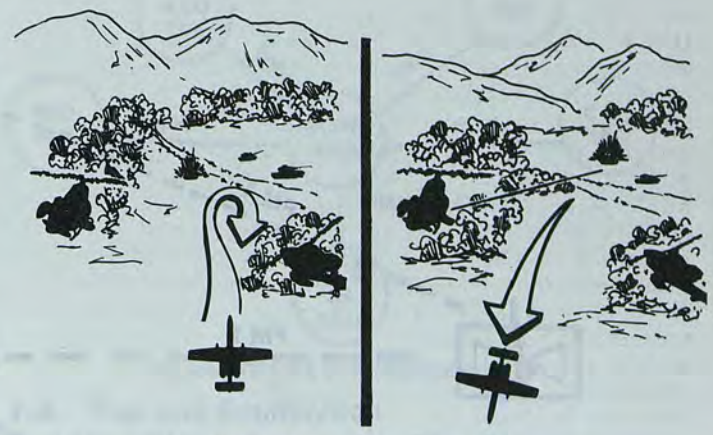


Figure 6-2. Sequential attack

(3) *Combined attack.* If the situation and terrain permit, all members of the JAAT can attack targets simultaneously and employ the same axis of attack. Timing is the key to a combined attack. The inbound call sequences the individual attacks. Ideally, the attack helicopters engage the target as the CAS flight crosses the IP inbound to the target area. As the CAS aircraft pop up to begin their attack run, the attack helicopters remask. The attack helicopters unmask to resume the attack as the CAS aircraft begin their escape maneuver to leave the target area. This coordinated attack sequence can continue until the tactical situation changes or the battle ends. Figure 6-3 shows the combined attack option.

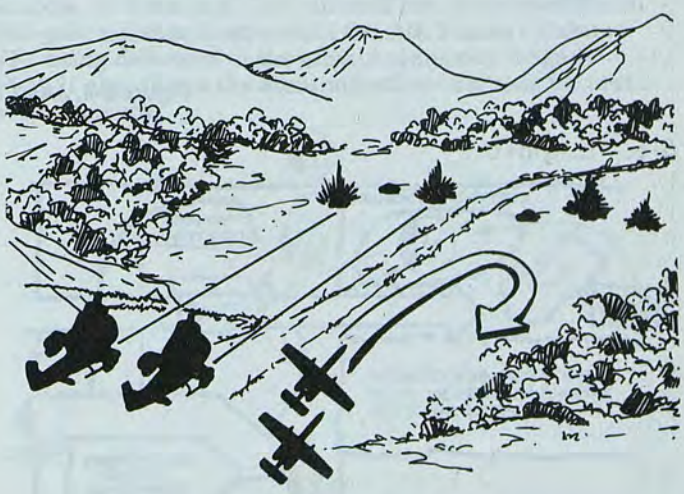


Figure 6-3. Combined attack

(4) *Decoy tactics.* Using decoy tactics, one element of the JAAT, either helicopters or CAS aircraft, decoys the primary air defense threat. The other element maneuvers to an attack position and engages the primary target or neutralizes the Threat.

d. Communications. The communications link between members of the JAAT is critical. Initial coordination between the FAC or the ATKHC commander and the CAS flight leader will be on UHF radio. Once the flight is in the target area and the ATKHC commander is in command, all communications between JAAT members will be on FM 2. This allows for secure communications between the helicopters and CAS aircraft. The ATKHC commander will maintain communications with the attack helicopters using UHF for the heavy section and VHF for the light section. Figure 6-4 shows a typical communications net for conducting a JAAT mission.

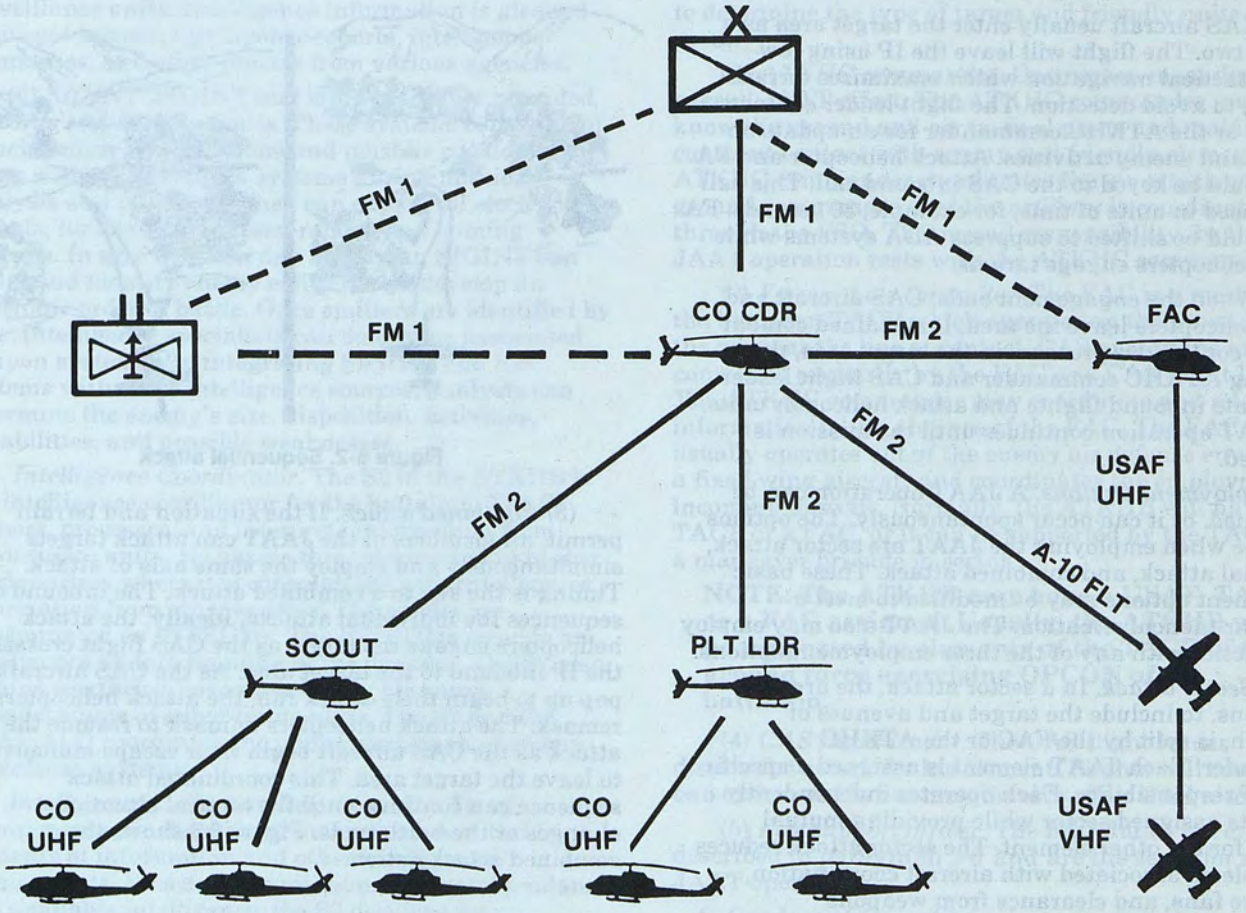


Figure 6-4. JAAT communications net

Chapter 7
COMBAT SERVICE SUPPORT

7-1. General

Successful ATKHB operations will depend on close staff coordination. The battalion staff must anticipate and coordinate CSS within the battalion with higher echelon CSS. The S1 and S4, under the direction of the battalion XO, coordinate ATKHB supply, maintenance, personnel, and health services activities to support combat operations. The ATKHB depends on CSS from its parent aviation brigade, the DISCOM, and the COSCOM. The principles and doctrine for CSS planning are described in general terms in FM 100-10. Corps and division CSS doctrine is contained in FM 63-3J and FM 63-2-series manuals.

7-2. Planning and Coordination

a. Planning. Combat operations planning and CSS planning must be conducted at the same time. The battalion commander relies on the S3 to employ his unit and the S4 to support it. Successful ATKHB combat operations require timely reports which reflect the CSS status of the battalion. Unlike other maneuver forces, the ATKHBs will be tactically employed anywhere within the division's area of interest and operation. The aviation brigade supporting the ATKHBs also shares the same area. However, it is employed without an FSB. Tactical and CSS planning must include support packages for aviation units throughout the division sector. The DISCOM unit or units supporting a ground maneuver brigade FSB and the division main support area must be prepared to support the ATKHB. To ensure the availability of CSS, the DISCOM, AB, and ATKHB commanders must maintain close coordination.

b. Coordination. Depending on the environment and the mission, attack helicopters will require fuel and ammunition resupply every 1½ to 2 hours. The battalion staff must forecast support requirements based on the expected duration of the mission. Requirements are processed through the brigade staff and then sent to the DISCOM. The DISCOM staff directs support to the ATKHB from the appropriate DISCOM unit. Successful ATKHB missions will depend on how well Classes III and V and aircraft maintenance, recovery, and evacuation are integrated into the tactical plan.

7-3. Organization and Command and Control

a. Organization. Combat service support for the ATKHB is usually organized in echelons. ATKHB combat trains are located where they can best support the operation. They consist of FARPs, maintenance support teams, medical specialists, and the TOC. The remainder of the battalion's CSS assets, which are field trains, will be with the battalion's rear CP in the division main support area.

b. Command and Control. The XO in the ATKHB is responsible for CSS command and control. He may operate from the battalion trains area or from the TOC. The S1 and S4 forecast CSS requirements and request the appropriate support from the brigade staff. The brigade staff processes the requests for support and coordinates the requests with appropriate divisional assets. The battalion will enter the aviation brigade's administrative and logistics FM and AM RATT nets. Figure 7-1 shows a typical CSS communications net.

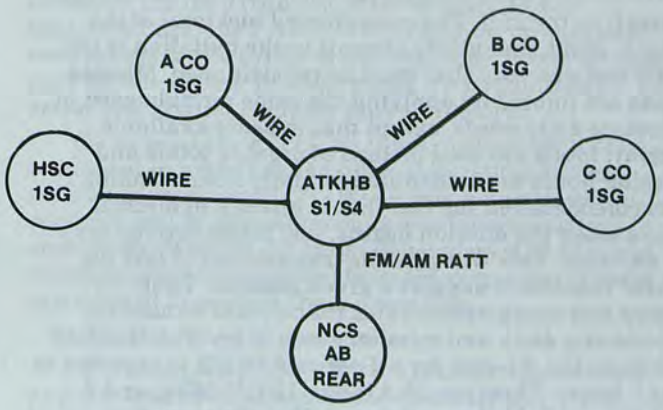


Figure 7-1. CSS communications net

7-4. Fuel and Ammunition

Fuel (Class IIIA) and ammunition (Class VA) are two of the three classes of critical supplies. The third class of critical supplies is repair parts (Class IXA), discussed in paragraph 7-7.

a. Fuel.

(1) *Requesting supplies.* Periodic status reports on bulk POL products are initiated by the attack battalion S4. They are processed through the aviation brigade S4 who consolidates user needs and coordinates delivery through the DMMC. When possible, corps tanker assets will throughput bulk JP4 to the attack battalion combat trains or to the closest support battalion fuel distribution point. If an emergency fuel shortage arises, attack unit tankers or aircraft can go to the division airfield where the MSB maintains up to 20,000 gallons of JP4. Corps cargo and utility aircraft may also be available to provide limited aerial resupply of JP4 from corps sources, or divisional CAC aircraft can cross-level fuel in 500-gallon drums from within the AB. Figure 7-2 shows JP4 being delivered to the ground maneuver brigade FSB. It also shows the administrative channels for unit status reports.

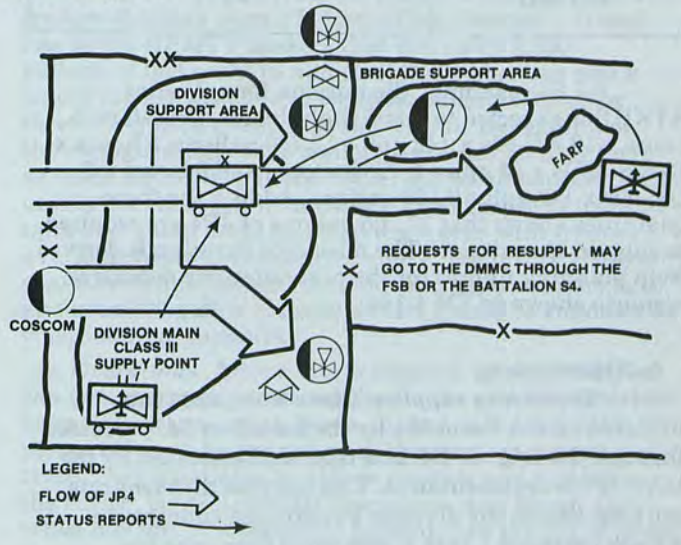


Figure 7-2. JP4 supply routes and unit status report channels

(2) *Calculating requirements.*

(a) Class IIIA requirements should be calculated based on both daily and mission needs. Daily needs are figured by multiplying the estimated daily hours each type aircraft will fly by the consumption rate of that particular aircraft, then by the total number of that type aircraft in the unit. The consolidated fuel total of the attack, scout, and utility aircraft in the battalion is the daily fuel quantity that must be requisitioned. Mission needs are figured by applying the same formula used to calculate daily needs, except that mission-available aircraft totals are used instead of organic totals and mission hours are substituted for daily hours. Taking into consideration the fuel that is already in aircraft tanks when the mission begins, fuel totals derived may be adjusted. This will give the true amount of fuel the FARP requires to support a given mission. Table 7-1 shows fuel consumption rates that should be used in calculating daily and mission needs of an ATKHB. For example, the mission for a J-series ATKHB is expected to last 5 hours. There are 15 AH-64s, 10 OH-58Ds, and 2 UH-60s available to participate. The minimum fuel required for the mission is figured as follows: 5 hours x 142 gph x 15 AH-64s = 10,650 gallons; 5 hours X 43 gph x 10 OH-58Ds = 2,150 gallons; and 5 hours x 2 UH-60s x 142 gph = 1,420 gallons. Combining these quantities shows that a minimum of 14,200 gallons of JP4 are required for the mission. If all aircraft are already topped off with fuel at the start of the mission, then 7,299 gallons of JP4 are already on board mission aircraft (15 AH-64s x 369 gallons; 10 OH-58Ds x 104 gallons; and 2 UH-60s x 362 gallons). Therefore, at least 6,921 gallons must be transported to the FARP to support the mission.

Table 7-1. Aircraft fuel consumption rates

Aircraft	Fuel Consumption (gph)
AH-64	142
AH-1	123
UH-60	142
UH-1	106
OH-58C	40
OH-58D	43

(b) For example, the mission for a J-series ATKHB is expected to last 5 flight hours. Therefore, 5 hours x 18 AH-64s x 142 gph = 12,780 gallons; 5 hours x 13 OH-58Ds x 43 gph = 2,795 gallons; and 5 hours x 3 UH-60s x 142 gph = 2,130 gallons. Adding the three quantities shows that 17,705 gallons of JP4 are required to support the mission. The mission's duration is derived from planning figures for the high-intensity defensive scenario shown in FM 1-104.

b. Ammunition.

(1) *Requesting supplies.* Class V requests are initiated on DA Form 581 by the battalion S4, processed through the brigade S4, and then authenticated by the DAO or his representative. This ensures that requests are kept within the division's controlled supply rate. Attack battalion Class V personnel then take the authenticated request to the corps ASP to draw the ammunition. In some circumstances and with proper coordination, attack helicopter ammunition may be delivered to a nearby ATP that is associated with a forward or main support battalion. In the event of an emergency shortage of ammunition, corps and S&P trailers can deliver ammunition to attack battalion combat trains, or corps aerial resupply can be arranged. Cross-leveling Class V supplies within the AB may also be necessary to relieve emergency shortages. Figure 7-3 charts the flow of ammunition to the ATP.

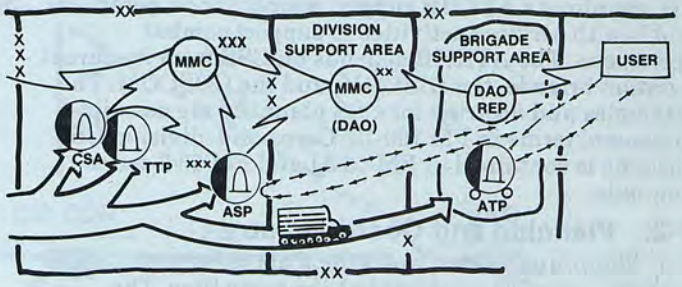


Figure 7-3. Flow of ammunition

(2) *Calculating requirements.* FM 1-104 discusses how to calculate ammunition requirements. To forecast the mission ammunition requirements for the ATKHB, rounds per each weapon system are multiplied by the total number of weapon systems available.

7-5. Transportation Requirements

Attack helicopter operations are time critical. A delay in the arrival of supplies could jeopardize the entire mission. To prevent a delay, the battalion staff must forecast the assets needed to support the mission.

a. Fuel. FARP fuel transportation requirements are calculated by subtracting the total fuel in mission aircraft fuel cells from the total fuel required to complete the mission. For example, it was determined in paragraph 7-4a(2) that the ATKHB will need 14,220 gallons of JP4 to accomplish a 5-hour mission with its available aircraft. By subtracting available aircraft fuel cell totals from this figure, the minimum fuel required at the FARP was 6,921 gallons. The total fuel already on board the aircraft was 7,299 gallons. By comparing these figures to the capacity of available fuel trucks, the total number of trucks required can be calculated. In this example, two HEMTT tankers with HEMAT-mounted 600-gallon pods (totaling 7,400 gallons), or three HEMTT tankers without HEMATs (totaling 7,500 gallons), or four 5-ton trucks with trailer-mounted pods and tank and pump units (totaling 7,200 gallons JP4) are required at the FARP to support the mission. Because it was determined that mission aircraft had a 7,299-gallon fuel cell capacity, a similar number of trucks is required at the assembly area FARP after the mission to top off the returning aircraft.

b. Ammunition.

(1) The first step in forecasting ammunition transportation requirements is to determine how much ammunition must be moved. The next step is to identify the number of vehicles required. Table 7-2 shows the cargo-carrying capabilities of 5-ton trucks and HEMTT cargo trucks, each with trailers.

Table 7-2. ATKHB transport capability (Class VA)		
Ammunition	5-Ton Truck With Trailer	HEMTT Cargo Truck With Trailer
HELLFIRE	45	96
TOW	48	96
2.75-inch FFAR (10-pound)	300	900
20-millimeter	12,000	36,000
30-millimeter	5,808	29,040

(2) As an example, the ATKHB is expected to fire 6,000 2.75-inch FFARs during a given mission. If the battalion is equipped with HEMTTs, five cargo trucks with trailers will be required to support the mission. If the ATKHB has 5-ton trucks, 20 trucks with trailers will be required to support the mission. However, 10 trucks making 2 trips each may be more feasible. The total transportation requirement will equal the sum of the vehicles required to carry each type of ammunition. Ammunition shortfalls must be identified early so the ATKHB can pre-position supplies or request cargo support to ensure a steady flow of ammunition during the mission.

7-6. Forward Arming and Refueling Points

The FARPs are the primary means of supplying the ATKHB when it is employed forward. They allow the ATKHB commander to position fuel and ammunition forward to support his unit. The battlefield is nonlinear and constantly changing. Each FARP must be austere, transitory in nature, and established to support specific mission objectives. Once committed, the FARP must be capable of meeting the Class III and V needs of mission aircraft. It also must be large enough to rearm and refuel three scout and five attack helicopters simultaneously. The sole function of the FARP is to provide the commander with the means to reduce turnaround times. The staying time of the ATKHB is increased in proportion to the decrease in turnaround time for Classes III and V. Reducing turnaround time enables the commander to apply continuous pressure on the enemy.

a. Planning. The volume of fuel and ammunition required to sustain an ATKHB during its mission requires extensive planning and coordination. FARP planning must provide for continuous rearming and refueling support and begin early in the planning sequence. During the mission analysis phase, the ATKHB staff must decide if FARP operations will be required to accomplish the mission. If the staff determines that FARP operations will be required, several key planning considerations are necessary.

(1) *Location.* The FARP must be located as close to the area of operations as possible. It is usually located 17 to 25 kilometers behind the FLOT or FEBA to protect it from enemy medium-range artillery.

(2) *Size.* Dispersion of aircraft within the FARP must be planned. Rearming and refueling points allow for aircraft dispersion to present a less lucrative target. Holding areas are planned near the FARP to allow space for spillover aircraft during peak operations.

(3) *Security.* FARP locations and routes should be masked from radar detection. Consideration must be given to local security. If possible, FARP personnel should coordinate with ground forces. Ground forces from units located in the ground maneuver brigade's BSA may also be dedicated to FARP security.

(4) *Resupply.* Most FARPs are established to support operations near the FLOT. They are resupplied by the ATKHB. Traffic volume and road conditions will directly influence the time required to move supplies and equipment into the FARP. If time is short or adequate road access to the FARP is not available, aerial resupply may be considered. In some cases, a combination of aerial and ground resupply may be required.

(5) *Beyond the FLOT.* At times, operations will be conducted in areas beyond normal logistical support, such as beyond the FLOT. When this happens, aerial resupply will be the only means available to sustain operations. Medium-lift cargo helicopters (CH-47s) and utility helicopters (UH-60s) from the corps and division can be used to support these operations.

b. Personnel and Equipment.

(1) Personnel. FARPs are designated, established, and manned by members of the Class III and V platoon in the battalion's HSC. They are augmented by members of the AVUM platoon also in the battalion's HSC. Figure 7-4 shows the personnel and equipment in these two sections.

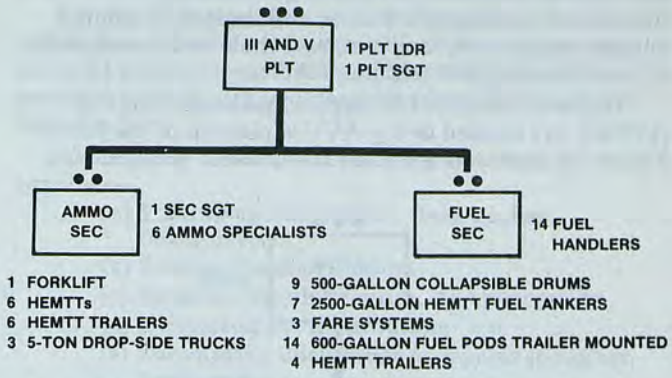


Figure 7-4. Personnel and equipment for Classes III and V

(2) *Equipment.* The ATKHB, in the heavy division aviation brigade, has a Class III and V platoon which is capable of transporting support requirements for the battalion. The platoon has six HEMTT cargo trucks with trailers that can store 176 tons of ammunition. It also has seven HEMTT tankers that can carry 2,500 gallons of fuel each. In addition, the tanker can pull a trailer loaded with one or two 600-gallon fuel pods or three 500-gallon collapsible fuel drums. Depending on the configuration of the trailer, the battalion may have as much as 28,000 gallons of fuel stored on wheels. If the unit is not equipped with HEMTT trucks, it will have 10 tank and pump units and 23 5-ton trucks with trailers available to move Classes III and V. Each ATKHB will also have three forward area refuel equipment packages and nine 500-gallon collapsible fuel drums to augment its wheel-storage capability.

c. Operations. After a site is selected, ground vehicles can transport preloaded supplies to the site. FARPs must be rapidly set up, taken down, loaded, and moved. FARP personnel must be trained until they are masters of their craft. They must also be able to relocate and establish the FARP, control aircraft operations, and rearm and refuel aircraft. Maintenance personnel in the FARP must be able to perform minor aircraft repairs. FM 1-104 describes FARP operations in detail.

d. Continuous Support. The Class III and V platoon of the ATKHB enables the commander to support multiple FARP operations. The ATKHB can operate several FARPs to support the ATKHCs. Each FARP may consist of a ¼-ton vehicle, a HEMTT cargo truck with trailer, and two HEMTT tankers with trailers. The ¼-ton vehicle is used to lead other vehicles to preplanned FARP locations. The FARPs will rotate in much the same way as the ATKHCs when they are employed using the continuous attack method (see paragraph 3-5a). This ensures that one or two FARPs will be in place, one will be moving, and one will be in reserve in the battalion assembly area. It facilitates orderly resupply of Classes III and V and still supports the battalion's mission.

7-7. Aircraft Maintenance and Recovery

Like fuel and ammunition, repair parts are critical to combat operations. Location of maintenance facilities should be far enough forward so that the step-up light sets can be set up to facilitate 24-hour maintenance operations. When equipment cannot be repaired on site, it is moved only as far as necessary to effect repair.

a. Aviation Unit Maintenance. AVUM units perform maintenance required to repair and return aircraft to a serviceable condition. AVUM is governed by maintenance allocation charts and limited by ground support equipment, facilities, and the number and skills of maintenance personnel available.

(1) *Personnel.* AVUM support personnel for the ATKHB are located in the AVUM platoon of the HSC. Figure 7-5 shows how the AVUM platoon is organized.

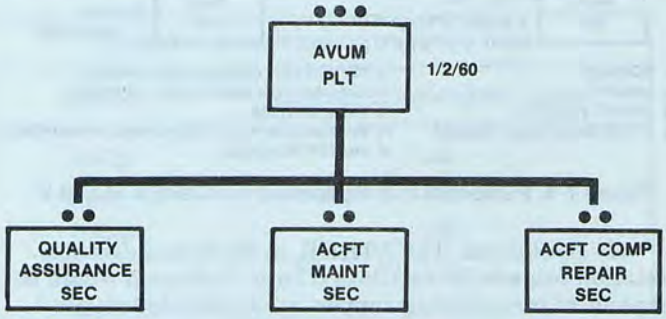


Figure 7-5. AVUM platoon organization

(2) *Responsibilities.* The AVUM platoon is responsible for preventive maintenance, repair, and parts replacement. It also identifies causes of malfunctions and evacuates unserviceable modules, components, and end items.

b. Aviation Intermediate Maintenance. AVIM units, located in the DISCOM, perform two major functions. They conduct the direct exchange program for battalion AVUM units by repairing selected items for return to stock and by picking up some of the overflow work. AVIM units, located in the COSCOM, can perform the same two functions for corps AVUM units. The COSCOM AVIM unit also provides backup support to the DISCOM AVIM unit.

c. Communications Maintenance. The communications section in the HSC provides unit-level communications maintenance. The AVUM platoon provides avionics maintenance for ATKHB aircraft.

d. Armament Maintenance. The ATKHB's aircraft component repair section performs unit-level armament maintenance. Its capabilities are limited to detection, fault isolation, and evacuation of major components and "black boxes." AVIM armament support is at the DISCOM or the COSCOM, depending on whether the ATKHB is a divisional or a corps unit.

e. Vehicle Maintenance. The HSC maintenance section provides unit-level vehicle maintenance for all of the ATKHB's vehicles. The DS maintenance company of the DISCOM or the COSCOM provides vehicle DS maintenance and repair parts support.

f. Recovery.

(1) *Aircraft.* Aircraft that cannot be flown are repaired in place if possible. Repair may be limited to that necessary to permit flight to more suitable repair facilities. The ATKHB has no unit-level capability to move downed aircraft. However, it can help rig and prepare its aircraft to be moved. Recovery support is provided by the AVIM company. The decision to recover downed aircraft depends on the tactical situation.

(2) *Ground vehicles.* The ATKHB recovers and moves its own ground vehicles. When it is unable to do so, it receives assistance from DS maintenance units.

7-8. Personnel Service Support

a. General. PSS functions at the battalion level are accomplished by the personnel assigned to the battalion PAC. PAC accomplishes as many support actions as possible to reduce the administrative burden on the ATKHCs. The way PAC performs these support actions will vary little from a unit that has an automated personnel support capability, such as the tactical Army combat service support computer system, from one that operates in a manual mode.

b. Combat Critical Versus Sustainment PSS. PSS functions fall into two general categories—combat critical and sustainment. Combat-critical PSS functions, such as strength accounting, replacement operations, casualty reporting, and health service support, must be accomplished despite the combat intensity level. On the other hand, sustainment PSS can be curtailed or suspended during intense combat. During combat or preparation for combat, priority must be given to the combat-critical PSS functions.

7-9. Specific Actions—Combat Critical

To maintain the battalion's strength, specific actions must be taken. These actions are as follows:

a. Strength Accounting. Strength accounting entails—

(1) Updating the unit battle roster, which is based on duty positions from the unit TOE.

(2) Preparing and forwarding of the personnel status roster, which is submitted daily and after significant changes in unit strength.

b Processing Replacements. Processing replacements includes—

(1) Assigning the replacement.

Note: Priority is given to critical leadership and WSRO assignments.

(2) Performing administrative and personnel actions, such as signing in personnel, preparing SIDPERS transactions, and updating the battle rosters.

(3) Briefing replacements on the tactical situation, unit SOPs, facility locations, and so forth.

c. Reporting Casualties. Reporting casualties involves—

(1) Reviewing casualty feeder reports and witness statements for completeness and accuracy.

(2) Checking the battalion aid station casualty treatment log to ensure all casualties have been reported.

(3) Forwarding the report.

d. Providing Health Service Support. Health service support involves—

(1) Preventing illness through field sanitation and personal hygiene.

(2) Obtaining medical support, which ranges from sick call conducted by medical specialists to processing casualties.

Note: Processing casualties includes administering first aid, evacuating casualties to the nearest aid station, and conducting the disposition of deceased personnel.

(a) Medical support is available through the ATKHB's medical section. The medical section establishes an aid station at the rear CP or the BSA, depending upon the ATKHB's commitment. Medical specialists should accompany FARP personnel when they move forward. One medical specialist is stationed at each of the FARP locations.

(b) Patients requiring extensive treatment are evacuated to the AB medical facility. Division or corps assets should be requested to provide medical evacuation support for personnel who cannot be evacuated with internal assets.

7-10. Specific Actions—Sustainment

To sustain the battalion and as the situation permits, the PAC must be able to perform the following actions:

a. Provide Personnel Service. At the battalion level, this generally consists of—

(1) *Promotions or reductions.* This task involves—

(a) Verifying information, such as time in service and time in grade.

(b) Forwarding lists of eligible soldiers who are beyond the commander's authority to promote.

(c) Ensuring that promotion and reduction orders are posted to the individual's personnel and finance records.

Note: The authority to promote enlisted personnel or reduce their grades is explained in AR 600-200.

(2) *Awards and decorations.* This task involves—

(a) Soliciting recommendations.

(b) Collecting and reviewing recommendations.

(c) Initiating the procedures for an award.

(d) Processing the recommendation.

(e) Presenting the award.

Note: See AR 672-5-1 for further details on awards and decorations.

(3) *SIDPERS transactions.* This task involves—

(a) Submitting data changes promptly and accurately.

(b) Resolving errors immediately.

(c) Performing continuous maintenance of files and source data.

Note: DA Pamphlet 600-8-1 gives detailed procedures for preparing and submitting SIDPERS input reports.

(4) *Evaluation reports.* This task involves—

(a) Establishing internal suspenses for OERs and EERs.

(b) Preparing OERs and EERs.

(c) Reviewing OERs and EERs for accuracy and completeness.

(d) Forwarding completed OERs and EERs.

(e) Distributing rated individual's copy of OER or EER.

b. Provide Adminstrative Services. This consists of—

(1) *Controlling classified documents.* Classified document control entails dispatching, routing, maintaining, and accounting for all classified documents. Classified document custodians and alternates must be appointed for each unit that operates a decentralized classified document storage facility (see AR 380-5).

(2) *Controlling reports and forms.* Reports and forms control entails requisitioning, stocking, controlling, and distributing appropriate forms and administratively reviewing reports (see AR 15-6 and AR 310-2).

(3) *Preparing correspondence.* Whenever possible, ADP equipment will be used in order to keep formal paper correspondence to a minimum (see AR 340-15).

(4) *Managing publications.* Publications management entails requesting, posting, and storing required publications. DA Pamphlet 310-1 should be scanned periodically to determine when changes have been made.

(5) *Making distribution.* Making distribution involves—

(a) Picking up distribution from higher headquarters.

(b) Sorting the distribution.

(c) Securing the distribution, as appropriate.

(d) Delivering the distribution.

(e) Forwarding documents or reports to higher headquarters.

c. Provide Financial Support. The degree of financial support given to the soldier varies with the situation. In mid- and high-intensity conflicts, regularly established paydays are suspended in the theater of operations. When and where a unit is paid is determined by the unit commander and coordinated with finance support personnel. The maximum amount a soldier can be paid is determined by the theater commander. Commanders at brigade or equivalent level (06 or above) may establish an amount of pay which is less than the maximum amount that personnel in their unit who are engaged in a tactical situation would normally receive.

d. Provide Mail Service. The corps direct support postal unit provides mail service for the ATKHB assigned to the corps attack helicopter regiment. Mail service for the ATKHB assigned to the divisional combat aviation brigade is provided by the corps direct support postal unit through the division and brigade. In the early stages of a conflict, postal services for soldiers will usually be restricted to personal mail and limited post card and stamp stock sales (see DOD Postal Manual 4525.6-M). Personal mail must conform to the weight limitations prescribed by the "Free Mailing Privilege." Normally, postal money orders will not be available in either contingency or prolonged operations.

e. Chaplain Activities. This task involves—

(1) Developing a unit ministry program with the battalion ministry team.

(2) Implementing the ministry program to include individual and group counseling, religious services, unit ministry team visits, memorial services, and other duties.

Note: FM 16-5 contains additional information on the unit ministry team concept.

f. Provide Legal Service Support. Legal service support consists of—

(1) Processing UCMJ actions.

(2) Drafting a summary of the violations.

(3) Assembling investigation reports and witness statements.

(4) Preparing formal Article 15 documents, DA Form 2627 (Record of Proceedings Under Article 15, UCMJ).

(5) Preparing formal charges, DD Form 458 (Charge Sheet).

(6) Processing Article 32 and 15-6 investigations.

g. Provide Morale and Welfare Support. Morale and welfare support involves—

(1) Determining the needs and interests of the soldier.

(2) Obtaining support from agencies such as the division band.

(3) Obtaining recreation-related supplies, such as paperback books, athletic kits, game kits, and so forth.

(4) Providing equal opportunity and drug and alcohol control.

Note: Equal opportunity and drug and alcohol control activities will be limited in the field and drastically reduced during combat operations.

h. Provide Public Affairs Support. Public affairs support involves—

(1) Disseminating information and published material received from higher headquarters.

(2) Implementing a hometown news release program which includes preparing, reviewing, and submitting news releases through the Public Affairs Office.

Appendix A
COMBAT ORDERS

The warning order, operation order, and debriefing formats shown in Tables A-1, A-2, and A-3, respectively, are oral examples. The formats are designed as checklists to be used by troop commanders. Many items will not apply to all units, nor are the checklists all-encompassing. Commanders must continue to develop and publish an SOP based on their unit's mission.

Table A-1 Oral warning order

1. Warning Order

2. Situation

a. Brief statement about enemy situation, friendly situation, or both.

b. Attachments and detachments.

3. Mission (Who, What, When, Where, and Why)

4. Coordinating Instructions

a. Specific mission or tasks for platoons, sections, and teams.

b. Number of aircraft and crews required.

c. Aircraft load, ammunition, fuel, and cargo or passengers.

d. Special-mission equipment.

e. MOPP.

f. Earliest time of movement (crank-up and load-up).

g. Changes to SOP.

5. Specific Instructions

a. Chain of command.

b. Weather (who gets).

c. Flight plan (who files and when).

d. Coordination, liaison, or special individual tasks.

6. Time and Place for Issuance of the OPORD

a. Time is now _____.

b. What are your questions?

Table A-2. Oral operation order

References: Maps and charts.

TIME: _____.

Task-Organization: Aircraft-aircrew mix, PICs or air mission commanders, chalk number, and light or heavy section.

1. Situation

a. Enemy forces. Strength, composition, disposition, location, previous actions, and probable courses of action.

b. Friendly forces.

(1) Higher (brigade commander's intent).

(2) Adjacent.

(3) Supported.

(4) Supporting.

(5) Other aviation elements in area of operations.

c. Attachments and detachments.

d. Weather.

(1) Current weather and light data.

(2) Forecast weather.

(3) Special environmental considerations or hazards.

(4) Published weather minimums for operation.

Table A-2. Oral operation order (continued)

2. Mission (Who, What, When, Where, and Why)

3. Execution

a. Concept of operation (overlay) (battalion commander's intent).

(1) Scheme of maneuver (ground and air).

(2) Fires and CAS.

(3) EW plan.

(4) Obstacle plan.

(5) Deception plan.

(6) Suppression of enemy air defenses.

b. Specific instructions to subordinate units.

c. Coordinating instructions.

(1) Essential elements of information.

(2) Actions on contact or rules of engagement.

(3) Times.

(a) Stand-to.

(b) Start.

(c) Communication.

(d) Lineup.

(e) Takeoff.

(f) On-station.

(g) Relief-on-station.

(4) Flight coordination.

(a) Air routes and corridors.

(b) Air control points, communication control points, rally points, and target index reference system.

(c) Holding areas, phase lines, and battle positions.

(d) Mode of flight, airspeed, and altitude.

(e) Movement technique or formation.

(f) Coordinating altitude and other airspace procedural control measures.

(g) Inadvertent IMC breakup procedures.

(h) Wire or bridge under flight.

(i) ATA procedures.

(j) Aircraft in-flight emergency procedures.

(k) Flight-following.

(l) Survival, evasion, resistance, and escape (pilot pickup points, signals, and times).

(m) ATA actions on contact procedures.

(5) Special-mission equipment.

(6) Aircraft load, ammunition, fuel, and cargo or passengers.

(7) MOPP.

(8) Time and place of debriefing.

(9) Inspections, rehearsals, or both.

Table A-3. Oral operation order (continued)

4. Service Support

a. Supply.

(1) Class I.

(2) Configuration of Class III and V resupply rates.

(3) Location of FARPs (primary and alternate).

(4) Class IX.

(5) Other classes of supply.

(6) Water point and trash point.

b. Services and transportation.

(1) Location of AVUM platoon.

(2) Contact teams.

(3) Downed aircraft recovery procedures.

(4) Road march and convoy procedures.

c. Medical and personnel services.

(1) Location of aid station.

(2) Air-ground medical evacuation procedures.

(3) Field sanitation.

(4) Decontamination site.

5. Command and Signal

a. Command.

(1) Chain of command.

(2) PIC designation.

(3) Locations of flight operations center and squadron CPs.

(4) Proposed location for assembly area.

b. Signal.

(1) CEOI in effect.

(2) Secure radio codes.

(3) IFF.

(4) Laser codes.

(5) Code words or passwords.

(6) Send-a-message system.

(7) MIJI and ECCM.

(8) Lost communication procedures.

(9) Tactical air and JAAT frequencies.

(10) Tactical beacons and navigational aids.

Time is now _____.

What are your questions?

Table A-3. Oral debriefing

1. Situation

a. Enemy situation encountered.

(1) Size and type.

(2) Location (grid).

(3) Weapons and vehicles.

(4) Enemy aircraft.

(5) Enemy actions on contact.

(6) NBC activity and indicators.

(7) EW and OPSEC activities.

(8) Supply and logistic capabilities noted.

(9) Strengths and weaknesses noted.

(10) BDA.

Table A-3. Oral debriefing (continued)

b. Terrain.

c. Friendly forces encountered.

(1) Size and type.

(2) Location (grid).

(3) USAF elements employed or encountered.

(4) Effectiveness of air strikes and CAS (BDA).

d. Weather and light data (significant changes from initial briefing).

2. Mission

a. Mission completed as briefed?

b. FRAGOs received.

3. Execution or Concept of Operation

a. Maneuver (general overview).

(1) Routes flown.

(2) Movement techniques used.

(3) Control measures used.

(4) Times of departure and return.

(5) Map corrections.

b. Fires.

(1) Artillery missions called (unit employed).

(2) Preplanned targets used.

(3) Artillery effectiveness (BDA).

(4) Friendly ADA positions noted.

(5) Friendly ADA status (free, hold, or tight).

(6) Significant problems noted.

c. Flight coordination.

(1) NBC posture for mission.

(2) Essential elements of information noted.

(3) Friendly aircraft downed.

(4) Crews recovered or probable pilot pickup points.

4. Service Support

a. FARPs used during the mission.

b. Status of FARPs in the area of operations, if known.

c. Class III consumed (gallons per FARP).

d. Class V consumed (by type of ammunition).

e. Mission status of aircraft.

f. Immediate maintenance requirements.

g. Status of recovery operations for downed aircraft.

h. Crew status (injuries and endurance).

i. Location of injured crew members.

5. Command and Signal

a. Chain of command (location).

b. Locations of flight operations center and tactical operations center.

c. Aircraft and crew assignments.

d. Instructions for crews (premission planning).

6. Conclusions and Recommendations

Appendix B

TACTICAL EMPLOYMENT

Section I

TARGET HANDOVER PROCEDURES

B-1. General

Effective employment of attack helicopter units demands that standardized target handover procedures be established and used by scout and attack aircraft. Essentially, these procedures will remain the same for ATKHBs equipped with the AH-1S or the AH-64. However, certain elements will be modified for AH-64 units.

B-2. AH-1S Procedures

a. Basic Target Handover. The basic target handover between scout and attack helicopters includes five elements. They are the alert and target description, target location, method of attack, execution, and post-attack action.

(1) *Alert and target description.* This alerts the attack helicopter that a target handover is about to occur. It identifies the sender and describes the target by type, number, and activity.

(2) *Target location.* The scout gives the direction of the target in degrees and range from the BP. The scout may reference from a known point (the TRP or the EA) or use grid coordinates.

(3) *Method of attack.* The scout describes the ATKHC commander's planned scheme of maneuver, fire distribution, and maneuver for the attack.

(4) *Execution.* The scout either gives the command to initiate the attack by having the attack helicopter engage the target when the scout says "Fire," or by having the attack helicopter fire when ready.

(5) *Post-attack action.* Once an engagement is complete, the attack helicopter will move to subsequent BPs, HAs, or as briefed by the ATKHC commander's order.

b. Target Handover Example.

(1) Alert and target description—"K13 (AH-1S), this is K06 (OH-58), three T-62s and four BMPs moving west."

(2) Target location—"120 degrees at 2,800 meters."

(3) Method of attack—"attack targets west of north-south road."

(4) Execution—"engage when ready."

(5) Post-attack action—"move to HA 4; on order, attack from BP 21."

B-3. AH-64 Procedures

The elements of information required for a target handover for engagement by an AH-64, when firing 2.75-inch FFARs and a 30-millimeter chain gun, are the same as those for the AH-1S. The major change occurs when information is required for a target engagement employing the HELLFIRE. Information essential for a HELLFIRE target handover is as follows:

a. Remote HELLFIRE Mission Request Procedures.

(1) *Voice remote HELLFIRE mission request.*

(a) At times, the OH-58D aircraft may be required to use a voice request when transmitting to HELLFIRE-equipped aircraft that do not have an ATHS.

(b) The procedures in Figures B-1 and B-2 are guides to ensure proper voice requests for HELLFIRE launches.

(OH-58D to AH-64)

Procedure	**Description**
Alert (Upon hearing the remote alert, the AH-64 crew knows that a remote laser designates for their HELLFIRE.)	Example: "B29, this is B62. Remote."
Target location plus firing angle. (The AH-64 crew needs the laser-to-target line to figure the separation angle between the designator and the AH-64. To do this, the AH-64 must enter the location of the target into the fire control computer, align the aircraft to the target, and compare its azimuth to that of the OH-58D LTL. This must not exceed the maximum allowable separation angle. If designator positions are known, LTL and these calculations are not needed.)	Three options follow: 1. Preplanned target and LTL stored in the AH-64 fire control computer. ("Target 1, 350°.") 2. State target grid and LTL. ("Grid XY123456, 350°.") 3. State engagement area and LTL. ("EA Fox, 350°.")
Firing method, if applicable:	Assume "indirect" unless "direct" is stated.
Firing mode, if applicable:	Assume "single" unless "rapid" or "ripple" is stated. Assume "LOAL" unless "LOBL" is stated.
Number of rounds, if applicable:	Assume "one round" unless stated otherwise.
Laser code, if applicable:	Code A-H (ripple 2 codes). Assume this is the OH-58D's code, and request "remote" HELLFIRE mission unless otherwise stated. (Paragraph B-7 discusses laser coding procedures.)
Time interval between missiles, if applicable:	Assume "10 seconds" unless stated otherwise.
Execution	Always "at my command" unless stated otherwise.

Figure B-1. Procedures for HELLFIRE launches

AH-64 WITHIN MISSILE LAUNCH CONSTRAINTS	AH-64 NOT WITHIN MISSILE LAUNCH CONSTRAINTS
(AH-64 to OH-58D)	*(AH-64 to OH-58D)*
1. "Ready." "Over." (Lets the OH-58D crew know that the AH-64 is in position and ready to fire.)	1. "Accept." "Over." (Lets the OH-58D crew know that the AH-64 crew is accepting the mission but is not in position to fire.) or "Ready." "Over." (Lets the OH-58D crew know that the AH-64 is in position and ready to fire.)
(OH-58D to AH-64)	
2. On receipt of a "Ready" call state "Fire." "Over."	
(AH-64 to OH-58D)	*(OH-58D to AH-64)*
3."Shot." "Over." (On receipt of this call, the OH-58D crew lases the target unless delayed or offset lasing is used.)	2. On receipt of a "Ready" call if the OH-58D crew has not computed missile time-of-flight for delayed or offest lasing, state "Fire, request laser on."
(OH-58D to AH-64)	*(AH-64 to OH-58D)*
4. "Shot." "Over." (The OH-58D lases the target until missile impact, until the "laser off" call, or for 20 seconds beyond expected missile time-on-target.)	3. "Laser on." (The OH-58D lases the target until missile impact, until the "laser off" call, or for 20 seconds beyond expected missile time-on-target.)

Note: If another target is located in the same area, an additional missile will be fired if the OH-58D transmits a "Repeat" call to the AH-64. This call gives the OH-58D one additional missile. If more than one additional missile is required, then the number of missiles is also transmitted ("Repeat, 3 missiles").

Figure B-2. Voice request procedures for HELLFIRE launches both within and not within missile launch constraints

(2) *Digital remote HELLFIRE mission.* The OH-58D production aircraft will have an ATHS incorporated in the avionics package. The ATHS provides several automatic functions that help relay HELLFIRE mission request information to the attack helicopter quickly (see Figure B-3). A typical digital remote HELLFIRE mission request is as follows:

(a) When the OH-58D forwards the fire request, the AH-64 is given the target grid, laser code, and number of rounds, firing mode (LOAL or LOBL), and requester identifier. If no change in target data is required, then the mission can be completed in both aircraft by pushing one key—the send key. All mission commands will sequence automatically to the next command to be sent.

(b) Once the AH-64 crew receives the fire request, it must decide if the mission can be accepted. If the mission can be accepted, the crew determines if the mission is within launch constraints. If so, an "Accept" message is sent. If the AH-64 crew is in constraints or has moved to get into constraints following an "Accept" message, it sends a "Ready" message. The "Ready" message lets the OH-58D crew know that the AH-64 crew is prepared to fire. The OH-58D crew sends a "Fire" message when it has identified a target that will be exposed for the time-of-flight of the HELLFIRE. The OH-58D crew lases the target when the "5-Shot" message is sent if delayed lasing is not being used. Lasing continues uninterrupted until missile impact, until the "laser-off" call, or for 20 seconds beyond the expected missile time-on-target.

(3) *ATHS system calculations.* The ATHS system calculates a number of variables that aid in ensuring a proper HELLFIRE launch. In its first request for fire, the OH-58D crew sends its position along with the location of the target. The ATHS in the AH-64 then calculates range to the target, missile time-of-flight, and separation angle between the OH-58D and the AH-64. When indirect HELLFIRE requests are transmitted by voice, this information must be interpreted by map. When the "Ready" message is transmitted back to the OH-58D crew, the time-of-flight, the separation angle, and missile time-of-flight are automatically shown on the multifunction display. When the "Shot" message is transmitted to the OH-58D, the ATHS systems in both the OH-58D and the AH-64 start a

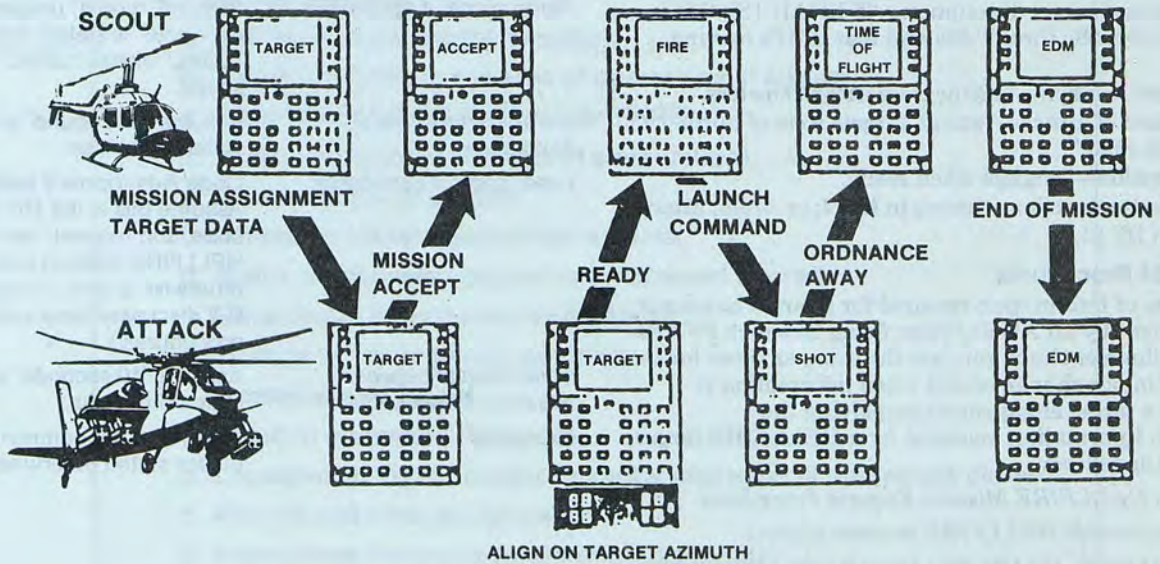


Figure B-3. ATHS HELLFIRE mission request

simultaneous countdown of missile time-of-flight to impact. This helps the crew determine the correct lasing time for offset or delayed lasing. (See paragraph B-4 for laser designation procedures.)

b. Target Handover Procedures for Autonomous AH-64 Target Engagement. Target handovers for autonomous AH-64 engagements can be transmitted either by voice or by digital means. Both procedures are basically the same as those used in OH-58C and AH-1S aircraft. The OH-58D differs from the OH-58C and AH-1S because the OH-58D can use its laser to either illuminate or to locate the target. Lasing to illuminate the target or to target-locate gives an 8-digit grid coordinate.

(1) By illuminating the target, the attack aircraft crews are able to use the LST in the AH-64 or the ALT in the AH-1S to lock-on the target quickly. Target illumination is the best method to use because if the target is illuminated, the attack aircraft crew does not require scanning time.

(2) If illuminating the target is not feasible, the next best method to get an 8-digit grid coordinate is to target-locate. Once the data is transmitted in the handover, the attack helicopter crew can enter this data in the fire control computer, prepoint its sighting system to the target grid, and then unmask the aircraft to detect the target.

(3) If unable to use either of these two methods, the OH-58D crew can employ the older methods of target location which are using engagement areas and direction and distance from a known location. The following procedural examples in Figure B-4 are a guide to ensure a proper target handover.

c. Target Handover Examples.

(1) "AH-64, this is OH-58D. Tank, tracker. Attack at will. Over. OH-58D, this is AH-64. Roger. Out."

(2) "AH-64, this is OH-58D. Two tanks, tracker offset left 20 meters; left tank first, at my command. Over. OH-58D, this is AH-64. Roger. Over. AH-64, this is OH-58D. Unmask and attack. Over. OH-58D, this is AH-64. Roger. Out."

(3) "AH-64, this is OH-58D. BMP in the tree line, grid AB12345678. Attack at will. Over. OH-58D, this is AH-64. Roger. Out."

(4) "AH-64, this is OH-58D. Column of tanks, 160 degrees, 4,000 meters. Engage left-to-right. Attack at will. Over. OH-58D, this is AH-64. Roger. Out."

(5) "AH-64, this is OH-58D. Tanks in the open; EA red. Priority to C^3 vehicles. From battle position 12. At my command. Over. OH-58D, this is AH-64. Roger. Over. AH-64, this is OH-58D. Unmask and attack. Over. OH-58D, this is AH-64. Roger. Out."

PROCEDURE	EXAMPLE
Alert plus target description:	"B29, this is B62. Three tanks on road."
Identify target location by:	1. Laser spot (state "offset," if needed); and by giving laser code A-H (if needed), stating "tracker."
	2. Stating grid. (Use most accurate means available—laser or Doppler).
	3. Stating engagement area (if preplanned).
	4. Stating direction of target plus the target's distance from a known location.
Method of attack, if applicable:	Type of fire, fire distribution, priority of engagement, firing of battle position, and so forth.
	"Engage left-to-right; priority to C^3 vehicles; from battle position 10."
Execution:	"At my command, attack at will."

Note: It is assumed that the OH-58D to AH-64 handover is for autonomous AH-64 target engagements.

Figure B-4. Procedures for target handover

Section II

OH-58D TACTICAL GUIDELINES AND PROCEDURES

B-4. Laser Designation Procedures

Laser designators are designed to provide target spotting for precision guided munitions. Several factors, such as environment, target types, target reflectivity, and designator beam characteristics, affect laser employment. The OH-58D crew must know the effects of these factors and take them into consideration when deploying the aircraft.

a. Environment. Line-of-sight must exist between the designator and the target and between the target and the laser seeker (Copperhead, HELLFIRE, or LST). The laser will not penetrate foliage or terrain. Visibility degradation lessens or blocks the amount of energy the target reflects and the amount of energy the laser seeker receives. Laser energy transmissions are affected by scattering; absorption; reflections caused by aerosols, smoke, haze, and clouds; and by blockage caused by explosive debris.

(1) Smoke can cause the most serious laser degradation on the battlefield. When engaging targets on the battlefield, ensure that the munition explosion does not hinder the engagement of subsequent targets. The OH-58D crew must select targets that do not block other targets. The standard procedure of engaging targets that are closest to the aircraft and working backward may have to be changed when employing these munitions. In addition to smoke that is created in the normal course of battle, smoke screens can be used which will render laser designators partially or totally ineffective. Smoke can block the laser energy from reaching the target, or it can obscure the seeker on the munitions to the point that reflected laser energy on the target cannot be seen.

(2) Clouds can affect the battlefield in much the same way as smoke. Clouds block the reflected laser energy on the target from the seeker on the munition that is being fired. Both the Copperhead and HELLFIRE have different minimum classified cloud ceiling height employment limitations at various ranges. Range is a factor in determining minimum ceiling height because the shorter the range, the lower the minimum ceiling restriction. Therefore, at certain cloud ceiling heights, the crews will be restricted to fire LOAL at reduced ranges. The HELLFIRE has a ceiling height restriction only when it is fired in the LOAL mode. This restriction is placed on the HELLFIRE because it climbs to achieve an optimum dive angle on the target at impact. Due to the nature of artillery fire, there is no method to change the ceiling height restriction. There are ways to keep the HELLFIRE out of the clouds. These include the following:

(a) Firing in the LOAL-DIRECT mode. This allows the missile to fly virtually straight to the target with only a slight climb.

(b) Delay lasing the target until laser energy is required. This mode of fire keeps the HELLFIRE on a preprogrammed altitude as it searches for the target. Before the munition locates the spot, and as the range between the target and the seeker decreases, the amount of climb decreases. Only when the munition sees the spot does the missile pitch up.

(3) Dust, water vapor, and other particles in the air may weaken the laser beam to the point that there is insufficient energy for an LST to lock-on or for guidance of the laser munition. In addition, laser energy reflected by these particles could present a false target to either the tracker or to the munition.

(4) As a rule of thumb, before designating through any obscuration, attempt to locate the target with day TV. If the target can be located with day TV, designation can be achieved. If not, attempt to acquire the target with the TIS. If the target can be acquired in the TIS, then determine the range to the target. If by crew estimation (based on experience) the range reading is correct, designation may be attempted. Do not attempt designation if these rules cannot be applied.

b. Target Types. Targets on the battlefield are classified into two groups—area targets and point targets.

(1) Area targets include infantry formations, assembly areas, motor pools, and other targets that are large in size or surface area. Normally, area targets are neutralized by numerous observed fires delivered throughout the target area. Area targets may be designated for CAS missions using the laser spot for target marking or for the engagement of point targets within that particular area target.

(2) Examples of point targets are tanks, BMPs, ZSU-23-4s, and bunkers. Point targets will comprise a large percentage of the battlefield. Some of these targets can move quickly, which increases their chance of survival. Laser designators were designed to spot these types of targets for destruction.

c. Target Reflectivity. Certain materials reflect laser energy better than others. For example, the reflection from a laser wavelength of olive drab metal is 2 to 30 percent, concrete is 10 to 15 percent, brick is 55 to 90 percent, and vegetation is 30 to 70 percent. Higher reflectance targets will increase the probability of a laser seeker picking up the laser spot. Certain paints that are being developed absorb a good percentage of the laser energy. However, because most munition's laser guidance systems must acquire only a fraction of the laser energy being transmitted by the designator, absorption may not pose a problem. Due to the reflectance restrictions, targets should be designated so the laser beam is reflected up and in the direction of the munitions seeker.

d. Designator Beam Characteristics. Range, size, shape, reflectance characteristics, location, and motion of a target help determine the laser operator's choices of employment techniques.

(1) Distance from the laser determines the size of the laser spot. With the OH-58D, the size of the spot will always be smaller than the size of the target. The designator operator should designate the top center of the target. He should select an aiming point on the target that will optimize spot tracking and weapon guidance. To do this, the designator operator considers the direction from which the ammunition will arrive, the shape of the target, the angular relationship, and the reflectance of the target surface. Do not aim the laser into an opening that will hold the reflected energy. This will prevent there being enough external reflection for weapons guidance. For example, do not lase tracks of a Threat vehicle. This may hide the spot from the seeker.

(2) Spot jitter is found in all laser designator systems. Spot jitter is caused by the inherent instability of the designator platform. In certain cases energy spillover occurs, which may cause the ordnance to guide on the spillover and impact behind the target. Targets should be tracked as smoothly as possible by tracking the target on the spot where the ordnance should impact.

(3) Most often, the best surface for designation is a flat surface that is perpendicular to the incoming ordnance. If a flat surface is not available, a curved or irregular surface facing the direction of the incoming ordnance will normally present a satisfactory aiming point.

B-5. Laser Designation Techniques

The introduction of lasers requires few tactical changes. However, the laser's unique characteristics demand increased emphasis on the OH-58D crew's laser designation techniques. The crew must properly use battlefield terrain, cover, and concealment to best observe enemy avenues of approach and to enhance the OH-58D's survivability.

a. Target Designation and Target-Locate Capability. Once the target has been located, lasing should be attempted at the highest magnification possible. Even if target location is needed, the OH-58D crew should not attempt to switch the laser to the rangefinding mode. The designator will still range and target-locate in the designation mode. Using the designation mode exclusively will preclude the problem of forgetting to place the laser back in the designator mode and then unsuccessfully trying to designate a target in the rangefinding mode. The target-locate capability will give eight-digit grid accuracy of the target. When trying to target-locate a Threat vehicle, ensure that the Threat vehicle's sensors do not pick up laser energy. Picking up laser energy will cause the Threat vehicle to take evasive action. Lasing close to the Threat vehicle or at a point through which the Threat vehicle will pass provides enough accuracy for target location.

b. Laser Designator, Target, Ordnance Angle (Separation Angle). When a target is lased, the greatest reflected energy is exerted on the laser designator-target line. For this reason, the separation angle of the ordnance-to-target line and the designator-to-target line is extremely important. Different separation angles are allowed for different munitions. To ensure that ordnance constraints are met, OH-58D crews must commit to memory these classified

separation angles for each type of munition. If munitions fall outside of the separation angle, the laser seeker on the ordnance may not sense the target.

c. Target Tracking. When activated by the operator, the laser designator on the OH-58D produces a narrow invisible beam of light. By using the image auto tracker, tracking the target can best be achieved with TIS or TV. Once the vehicle is identified, use point track to lock on the target. Once lock-on occurs, use offset track to move the hit point of the laser on the target. The designation point should be near the top center of the target and toward the direction of the incoming munition. Because of laser-guided munition's high angles of dive, a high designation point on the target will not result in a glancing shot off the target. The high designation spot will cause the shot to explode down through the target (see Figure B-5). The designator operator must be prepared to change quickly to the manual tracking mode if break-lock occurs. To prevent excessive false guidance, while in the manual mode, move the laser smoothly and slowly on the target.

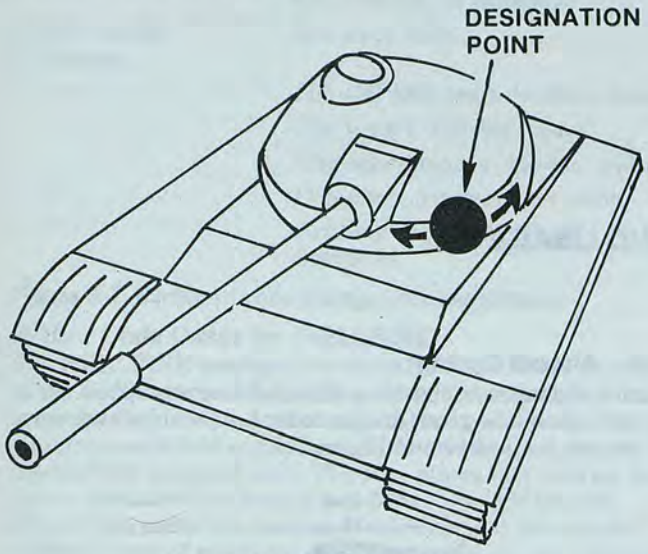


Figure B-5. Lasing the target

d. Terrain and Target Concealment. The OH-58D crew must select point targets that will be exposed for terminal guidance at the end of the munitions time-of-flight. If the laser designator operator suspects that, because of terrain or vegetation, the target may be partially masked from the incoming seeker, the laser should be aimed at a point on the target that will be within line-of-sight of the seeker; for example, a stationary tank that is partially masked by vegetation. If the target is well concealed, the laser should be aimed at some nearby object until the target becomes exposed again; for example, a tank that is moving behind a tree or building. If the target moves out of view of the laser designator operator and is not expected to reappear immediately, the attack may still be salvaged by moving the spot to another target in the vicinity. If the laser munition has already locked on, the spot should be moved slowly to the new location, with no interruption in laser output.

e. Laser Designation Timing. A laser-guided weapon's success depends on the laser operator's ability to lase the target for the required terminal guidance period of that particular munition. Copperhead rounds require a constant lasing period during terminal guidance for all ranges. The HELLFIRE's terminal guidance lasing period varies at different ranges. The OH-58D crew has the option of lasing during the entire flight of the missile, or the crew may elect to use a delayed lasing procedure. They may elect to delay lasing to increase survivability or to improve cloud ceiling height restrictions on the HELLFIRE. If delayed lasing is employed, communications are essential. The OH-58D crew must know the ordnance's time-of-flight, the time at which the ordnance is fired, the allowable delayed lasing time for that munition, and the exact range. Any delay or miscalculation may cause a missed target.

f. Offset Lasing.

(1) Offset lasing is the technique of aiming a laser designator at something near the intended target. The laser may be moved to the target for terminal guidance after laser spot acquisition by the seeker. Offset lasing has the following advantages:

(a) Security is improved by reducing on-target time and by reducing vulnerability to countermeasures.

(b) Designation of an object with greater reflectivity may help acquisition, especially during target handovers.

(2) For offset lasing, the OH-58D crew should lase at a location to either side of the base of the target. When an offset laser spot must be moved for terminal weapons guidance, the laser must be moved smoothly to the base of the target. The laser spot is moved up to the top center of the target in time for weapons impact.

(3) Lasing in line with the base of the target for offset engagements prevents the laser beam from lasing a spot at an extended distance. When the laser is moved to the target, lasing in line can prevent altering the spot to the extent that the missile may not be able to maneuver. Crews must use this lasing method for all target handovers to aircraft equipped with LST. This lasing method will eliminate the possibility of successful Threat countermeasures.

g. Multiple Target Lasing.

(1) The OH-58D crew, along with the AH-64 crew, may designate multiple targets for HELLFIRE in the rapid fire mode. During rapid fire, the AH-64 crew will launch the missiles the OH-58D crew requests at 10-second intervals. The OH-58D acquires the targets that can be engaged successfully. The OH-58D crew must ensure that all targets be exposed for terminal guidance for the missile's time-of-flight. For example, for three missiles, the third target must be exposed for the missile's time-of-flight plus an additional 22 seconds between the first and third missiles.

(2) Generally, only the number of targets that can be identified as falling within the narrow field-of-view of the sensor should be engaged. The OH-58D crew should ensure that the targets are close enough together so that the laser spot can be moved smoothly to the next target. If the targets are not close enough together, request more than 10 seconds between missiles in the HELLFIRE mission request. Because of the complexity of this task, no more than three targets should be lased. When energy is required on the first target, the OH-58D crew must designate that target and continue to lase without interruption until missile impact.

(3) After missile impact on the first target, traverse to the base of the second target, then up to the top center of the third target. Lasing base-to-base of the targets prevents the laser beam from continuing beyond the target. Extending the laser beam beyond the target could possibly alter the missile guidance to a longer range point. Engage the targets so smoke and debris will not hinder the laser spot on the next target.

h. Laser Designation Site Selection. The OH-58D crew selects its position based on METT-T. In addition to the normal observation position requirements, the designator position should provide line-of-sight, cover and concealment, and it should allow for necessary communications. Generally, higher terrain allows for better engagements because it provides a better view of the engagement area. The laser designation site should provide for mutual support and for coordination with all of the other friendly weapon systems on the battlefield.

i. Survivability. The laser designator operator's survivability can be enhanced by ensuring that laser designation times are kept to a minimum. This will reduce the time that is available for the Threat to detect, locate, and take action to suppress the designator. In conditions of probable energy counteraction of the laser designator, the crew may lase a spot in front of the target and "walk" the spot slowly to the target for the terminal portion of guidance (offset lasing). When the OH-58D's laser is employed on the battlefield, its maximum effective range provides standoff ranges for the aircraft. The crew must ensure that only the MMS is exposed during designation. When the OH-58D is employed incorrectly, it can become targeted by friendly munitions seekers. When laser designating, ensure that the OH-58D does not form a dust cloud while it is at a hover. Also ensure that the foliage around the aircraft does not block any of the laser energy. The reflected laser energy off the dust or foliage may be enough to provide guidance and lock-on to your position.

B-6. OH-58D Unmasking and MMS Search Procedures

OH-58Ds equipped with the MMS add a new dimension to the aeroscout's capability to complete its mission. The MMS allows the OH-58D to search for, locate, and engage a target without unmasking. The MMS mounted above the main rotor incorporates a day visual TV, a day/night TIS, and a laser designator–rangefinder. Sight displays can be seen on either one or both cockpit display units, where a narrow or wide field-of-view may be selected in either the TV or TIS mode.

Section III

CODING, STORAGE, AND USAGE

B-7. Laser Coding

a. Coding permits the laser tracker or the ordnance seeker to be sensitive to a selected laser frequency spot. Several spots on different laser frequency codes may be within the seeker's field-of-view, but the laser frequency coding prevents the seeker from homing in on random laser frequency spots.

b. Coding is by pulse repetition frequency. PRF is a three-digit code. Some lasing equipment, including the equipment on the OH-58D, have a four-digit code capability. This four-digit capability allows for further laser coding developments. The first code of the four-digit systems will always be set on the number one. Field artillery uses a three-digit coding system. When receiving a message-to-observer transmission from field artillery, always put the number one in front of the code that is transmitted (1XXX).

c. The advantages of coding include the following:

(1) Coding allows an AH-64 ATKHC to make simultaneous engagements on multiple targets by using separate codes.

(2) Coding complicates the Threat's use of countermeasures because all designators are not on the same frequency.

d. The following are the disadvantages of coding:

(1) Coding increases the equipment's complexity; therefore, it decreases the equipment's reliability.

(2) The laser designator operator must know the code of the ordnance before engagement.

(3) Codes are an additional burden on command and control. When necessary, the codes must be changed and the changes issued down through command. For attack helicopter units, prior coordination is essential to ensure that supported units do not have conflicting codes.

B-8. Aircraft Coding

During the mission planning stage, all laser-equipped aircraft should be given a laser code. A typical breakdown of laser codes is shown in Figure B-6.

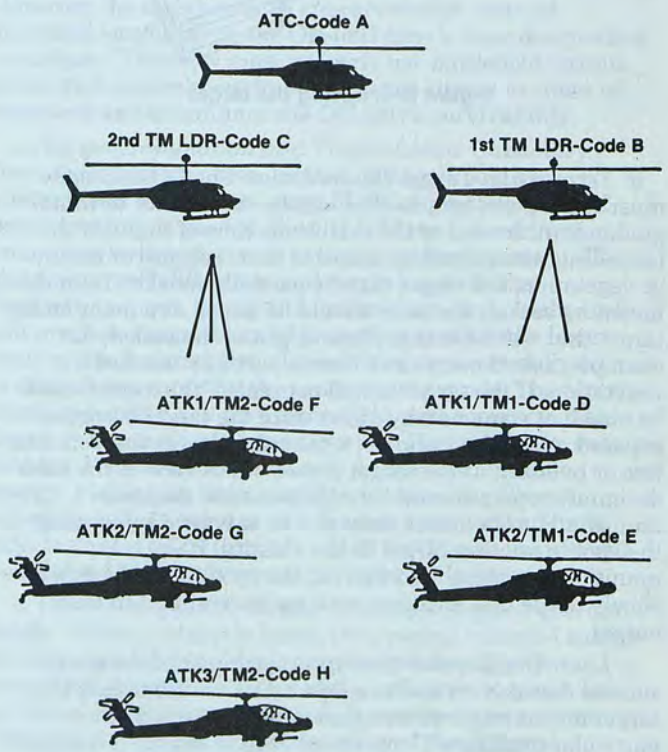


Figure B-6. Typical breakdown or laser codes

B-9. Code Storage

Both the AH-64 and the OH-58D can store eight laser codes in the fire control computer. The unit SOP should delineate which codes the aircraft should store. As a minimum, the SOP should consider the information in Figure B-7.

AIRCRAFT	CODES
OH-58D AHC Commander:	His own code.
	Artillery codes for Copperhead (if different).
	Code for close air support (laser-guided bombs).
	Attack helicopter codes of both teams.
OH-58D Team Leader:	His own code.
	His AH-64 attack team codes.
	The other team's AH-64s' codes for Copperhead (if different).
AH-64 Attack Helicopter:	His own code.
	His OH-58D team leader's code.
	His team's AH-64s' codes.
	The other team's AH-64s' codes.
	Company commander's code.
	Artillery codes for GLLD operators.

Figure B-7. Minimum code storage considerations

B-10. Code Usage for HELLFIRE

The HELLFIRE employed on the AH-64 can be set on any of the PRF codes available. The AH-64 crew can select codes for the missiles and change them as necessary. For autonomous AH-64 engagements, the AH-64 pilot should use his own assigned code. The pilot places this code on the upper channel of his fire control panel. The AH-64 pilot should also index the number of missiles that are encoded and at a state of readiness. (Different missions may require a different readiness state for each missile which is spooled up.) For remote missions, the AH-64 pilot should have his mission controller's code indexed into the lower channel of his fire control panel. For a remote engagement, the designator will use his assigned code. Then, the AH-64 pilot will select that designator's code on the lower channel and fire the mission. As a rule, the missile will always be encoded to the designator aircraft's assigned code. In addition, the designating aircraft (AH-64 or OH-58D) will always use its own code, which precludes the aircraft from continually having to change codes. This procedure also eliminates the possibility of having duplicate laser energy codes on the battlefield.

B-11. Copperhead Coding

The Copperhead round can sense any of the PRF codes on the OH-58D. These three-digit codes are set on the projectile before it is fired. The code set on the projectile must match the code set on the designator. Based on the designator's identification in the call-for-fire, the FDC selects the proper PRF code and transmits it to the Copperhead round for encoding. If operating in an area where prior code coordination has not been accomplished with the FDC, the designator aircraft's code (three-digit) should be included in the call-for-fire. The FDC will verify the code to be used in the MTO transmission. If the FDC sends the designator aircraft a different code in the MTO, then the designator aircraft will immediately change to the FDC code. The code sent by the FDC will always be three digits. The aircrew must place a one (1XXX) in front of the code before entering the code into the designator system.

B-12. Close Air Support Coding

Using laser designators in CAS is a fast and accurate means of marking friendly positions. It is also used to designate targets for LST and LGB. The use of lasers substantially improves first-pass target acquisition and ordnance delivery. Because the laser code of the LGB seeker is set on the ground before launch and cannot be changed by the pilot in the air, the FAC must pass the correct code to the designator aircraft. This coordination should be made before mission launch. If not, the designator aircraft's code must be changed to the one which the FAC provided in the pilot's on-station briefing. The codes used by the Air Force are four-digit PRF codings. LGBs require different lasing parameters. The CAS pilot inbound from the IP must announce to the designator aircraft "laser on" and then "laser off."

Section IV

COPPERHEAD PROCEDURES

B-13. Copperhead Description and Characteristics

a. The cannon-launched guided projectile (M712 Copperhead) is a high-explosive antitank 155-millimeter projectile. The nose of the projectile houses a semiactive laser seeker, and the body contains fins and wings, which deploy in flight and maneuver the round. The Copperhead round can be fired in either the ballistic or glide mode of flight.

(1) The primary mode of flight is the ballistic mode. The ballistic mode is used in the minimum to intermediate gun-target ranges. The projectile flies on a purely ballistic trajectory, similar to that of a conventional artillery round, until it reaches the descending branch of its trajectory. Then, the laser designator operator is cued to begin designating the target. The Copperhead projectile acquires the reflected laser energy and initiates internal guidance and control, which allows it to maneuver to and hit the designated target.

(2) For intermediate to maximum ranges, the Copperhead projectile flies in the glide mode. In the glide mode, the round flies on a ballistic trajectory to a point just beyond the maximum ordinate. The projectile, using its internal gyro as an inertial reference, maintains a constant angle of fall. The projectile maintains this angle of fall until it captures the laser energy, then it maneuvers to impact on the target.

b. On the downward leg of flight, the Copperhead round acquires the laser energy reflected from the target and begins maneuvering toward it. However, the ground surface area in which the round can successfully engage the target is limited. The Copperhead round's optimum limit of engagement is called a "footprint." Footprints are the shape of a rough oval. They form around the target location which is sent by the designator operator.

(1) Although a round can maneuver to the outside limits of the footprint, the greatest chance of hitting a target occurs when the round is at or near the target location sent to the FDC. The greater the target location error, the lower the probability that the round will hit the target. The outer boundary of the footprint represents a 50-percent probability of hit, whereas the location sent to the FDC has a hit probability higher than 50 percent. The size and shape of footprints are affected by the type of trajectory the round flies.

(2) The position of a footprint is determined by the ballistic aimpoint, which is the point on the ground where the Copperhead round would impact if it did not maneuver. The ballistic aimpoint is on the gun-target line, which is usually short of the target location sent in by the operator. The distance that the ballistic aimpoint is short of the target location varies and is called the offset correction. This offset distance is used to ensure that the maximum probability of hit occurs at the original target location sent in by the operator. The larger the target location error, the lower the probability of hitting the target (see Figure B-8).

c. To help the designator operator visualize the Copperhead footprint, a template was produced. However, use of the templates in the OH-58D cockpit is cumbersome and awkward at best. It is not recommended that they be used. The OH-58D crew should be aware of the relative size for a majority of the footprints. If the exact location of the target is given using the eight-digit target-locate capability, then the maneuver of the round will be minimal. The footprint can be used as a guide to the relative maneuver area of the round. Cloud ceiling height information contained on the footprint cards can be transferred to kneeboard information. During periods of low ceiling heights, refer to this information after the message to the observer has been received.

d. For Copperhead engagements, there is a maximum allowable separation angle limitation. The separation angle is the angle between the gun-target line and the designator-to-target line. The OH-58D crew must ensure it is within the separation angle by using one of two means. First, if the ATHS is used to transmit the call-for-fire, then the separation angle is automatically calculated and displayed on the MFD. Second, if the crew knows the location of the battery, it can use a map to determine the separation angle. If the designator is outside the separation angle, the crew must maneuver the aircraft laterally to stay within Copperhead constraints.

e. The success of a Copperhead mission depends on system responsiveness and the effectiveness of the communications link between the designator operator and the FDC. The shorter the time between target detection and round on the target, the more accurately the OH-58D crew can estimate target position relative to an intercept point. Responsive fire missions also increase the operator's ability to plan the mission so that the target will be visible during the guided portion of the round's flight. The operator must continuously designate the target during the last 13 seconds of the Copperhead trajectory. If the target is not designated continuously during this time, then the chances of hitting the target will be reduced. A few seconds' delay or a lost radio transmission may cause a miss.

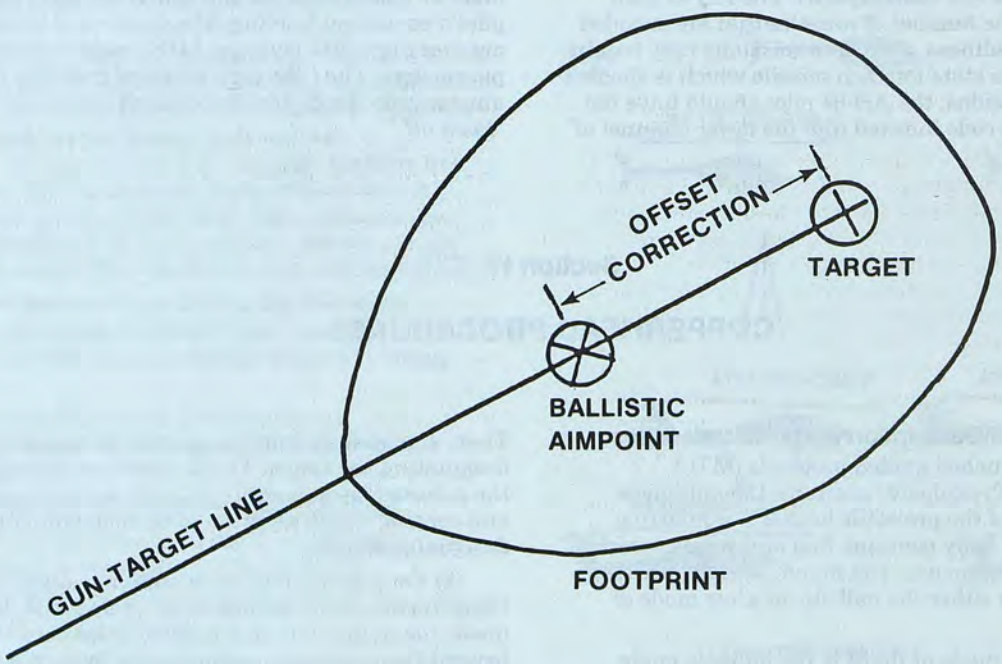


Figure B-8. Target location and probability of hit

B-14. Copperhead Fire Planning

a. Priority Targets. For priority targets, the data is precomputed and laid on the guns when another mission is not being fired. The Copperhead round should impact approximately 30 seconds plus time-of-flight after receipt of call-for-fire and when "At my command" has not been specified. No more than three planned priority Copperhead targets are assigned a six-gun battery. In an eight-gun battery, each firing platoon can be assigned a maximum of two targets.

b. On-Call Targets. On-call targets are processed the same as priority targets, except that the guns are not laid on firing data until after receipt of the mission. Normally, an on-call target can be processed in less than two minutes.

B-15. Targets of Opportunity

a. Requesting Copperhead fire against stationary targets of opportunity is a simple matter. The OH-58D crew simply determines the target's location and sends the call-for-fire. Requesting Copperhead against a moving target is more complex. The operator must predict where the target will be when the round arrives. This location is called an intercept point and is determined as follows:

(1) After acquiring the target, the operator follows it until he is sure of the direction in which it is moving. As the target moves from point A to point B, the operator needs to determine the speed of the target.

(a) First, the operator can estimate the speed as: SLOW—3 meters per second (7 mph); MEDIUM—5 meters per second (11 mph); and FAST—8 meters per second (18 mph).

(b) Second, the operator can use the laser to measure the distance the target moves during a certain time interval. As the target moves, the operator lases and target-locates to obtain grid locations. Using the two locations, he determines how far the target has moved. To obtain the grid location, the operator divides by the time interval between those locations. Using the two locations, he determines how far the target has moved. The operator then divides by the time interval between those locations to determine the target's speed in meters per second and to determine the direction in which the target is moving.

(2) Once the speed and direction are determined, the operator predicts an intercept point by adding the call-for-fire transmission time, firing battery mission processing time, and approximate time-of-flight. Then the operator multiplies the sum by the target speed. If, through experience, the OH-58D crew member knows how long it will take the firing unit to process the mission, he should use that time. If not, he should use 200 seconds as the time from the initiation of the call-for-fire to round impact. He converts this time to distance in meters and applies the distance in the direction of movement to determine an intercept point. He then lases that point to determine target location to eight-digit accuracy. The intercept point is used as the target location in the call-for-fire. An example using 200 seconds is as follows: SLOW—3 meters per second (600 meters); MEDIUM—5 meters per second (1,000 meters); and FAST—8 meters per second (1,600 meters).

B-16. Call-for-Fire

a. Format. When planning target locations are not available, the OH-58D crew engages the target as a target of opportunity. Calls for fire for Copperhead targets of opportunity follow the same format as the standard call-for-fire.

(1) See Figure B-9 for a sample call-for-fire format.

ELEMENT	EXAMPLE
Observer identification:	"Y5A57, this is Y5A71."
Warning order:	"Fire for effect. Over."
Location of target:	"Grid 12345678. Over."
Target description:	"1 tank."
Method of engagement:	"Copperhead, 1 round, at my command. Over."

Figure B-9. Call-for-fire format

(2) If prior coordination of codes has not been accomplished with the FDC, then the laser code of the operator should be added in the method of engagement element (Copperhead, 1 round, Code 123).

b. Message to Observer. After the FDC receives the call-for-fire and mission processing is started, an MTO is sent as soon as possible. This applies to all Copperhead targets except priority targets. MTOs are sent before firing.

(1) The MTO for a Copperhead mission includes elements as shown in Figure B-10.

ELEMENT	EXAMPLE
Unit firing:	A3Q27
Number of rounds:	3 rounds
Laser PRF code:	Code 241
Time-of-flight:	Time-of-flight 25

Figure B-10. The MTO elements for a Copperhead mission

(2) The OH-58D crew must ensure that the code sent back in the MTO is the one set on the designator. If not, then the code should be changed immediately to match the one sent in the MTO. (The number one [1XXX] should be placed in front of the code given in the MTO before the code is placed in the aircraft's computer.)

B-17. Copperhead Engagement Commands

a. Shot. As soon as the first Copperhead round is fired in a mission, the OH-58D receives "Shot" from the FDC. If he specified "At my command" or omitted the method of control in the call-for-fire (battery fires when ready), he receives "Shot" only once. The subsequent rounds will be fired without notification at intervals of at least 20 seconds. If the OH-58D crew specified "By round at my command," he receives "Shot" for each round fired.

b. Designate. The next and most critical engagement command is "Designate." When the OH-58D crew members receive the command "Designate" from the FDC, they will begin designating the target. This command is sent 20 seconds before impact. If the time-of-flight is 20 seconds or less, "Shot" and "Designate" are sent in the same transmission.

(1) The operator must designate the target during the last 13 seconds of time-of-flight. Once the operator receives "Shot," he should begin his own countdown using the time-of-flight received in the message to observer. If for some reason he has not received a "Designate" message, he should begin designation when 13 seconds are left in his countdown. (ATHS will automatically count down from the "shot" call.)

(2) If the battery is firing the Copperhead rounds automatically at 20-second intervals, the command "Designate" is sent only for the first round fired. The operator continues designating for the subsequent rounds while he moves the laser spot to the next target.

(3) If "Shot" is given for each round or if the firing interval is greater than 20 seconds, "Designate" is given for each round.

c. Designate Now. If an OH-58D crew fails to acknowledge the "Designate" command, the command "Designate now" is sent by the FDC until the OH-58D acknowledges or the time-of-flight of the round elapses. If the OH-58D operator fails to acknowledge the "Designate now" command, "Shot" and "Designate" are sent on the next round fired, regardless of the method of control.

d. Rounds Complete. After the engagement commands for the last rounds are transmitted and acknowledged, the FDC acknowledges "Rounds complete." If the OH-58D crew wants to terminate firing before the last round is fired, and if the FDC is controlling the firing of subsequent rounds, the FDC sends: "Check firing. Cancel check firing. End of mission."

e. Requests for Additional Rounds. If additional rounds are required to engage the target array, the OH-58D crew may request them after the last Copperhead is fired by sending: "_____ rounds. Repeat. Over."

Appendix C

NIGHT VISION GOGGLE OPERATIONS

C-1. General

This appendix is a sample SOP for NVG operations. Each battalion can use it as a guide and address each paragraph in a manner suitable for its own operations.

C-2. Individual Responsibilities

a. Battalion Commander. The battalion commander states the mission and sets the guidelines. He is responsible for implementing the battalion's NVG program.

b. Battalion S2. The S2 provides all tactical intelligence information, to include the enemy situation and the location of known or suspected enemy ADA systems. He also obtains data about current and forecast weather conditions.

c. Battalion S3. The S3 task-organizes and coordinates operations with the company commander. He also issues the battalion OPORD and coordinates with maneuver forces concerning the use of airspace in the area of operations.

d. Company Commander. The company commander designates those unit personnel who will participate in the company planning process. The ATKHC commander must be involved in all phases of the operation, to include route selection, actions in the HAs and BPs, and contingencies. The ATKHC commander should conduct the company mission briefing.

e. Instrument Flight Examiner. This officer plans and establishes IMC and emergency vertical helicopter recovery procedures for the battalion.

f. Standardization Instructor Pilot, Instructor Pilot, and Unit Trainer. These personnel, with the company commander, help plan the conduct of the NVG mission. They also ensure standardization with regard to planning and executing NVG missions.

g. Safety Officer. The safety officer continuously monitors all preparations. He also advises planners of critical safety and human factor issues relating to the mission.

h. Aircrews. All personnel from the battalion commander down participate in NVG operations. Everyone must know how to construct charts, plan routes, and compute time, distance, and heading data. All crew members also must participate in premission planning steps.

i. Support Personnel. All personnel involved in the support of the ATKHB's operation must be familiar with NVG operations. These include crew chiefs, maintenance personnel, fuel and ammunition handlers, and other personnel who may be associated with these types of operations.

C-3. Premission Planning

a. General Planning Considerations. Personal involvement in the planning process will enable personnel to become more familiar with the mission. NVG flight is difficult and anything less than full participation by all players may result in confusion and even mission failure. Each NVG mission or exercise should involve a mission scenario. All aspects of mission planning and execution must be included and practiced.

b. Terrain Identification Aids. Terrain identification aids include maps, aerial photographs, and terrain boards and sand tables. They also include miscellaneous supplies and ancillary materials.

(1) *Maps.* Premission planners should use every type of map available. By using different types of maps, planners can obtain more detailed information about the area of operations. Different phases of mission planning and execution will require different scales of maps. As a minimum, three different types of maps are necessary. They are as follows:

(a) *1:250,000 map.* This is an excellent map for mission planning and en route navigation. Planners may use either the JOG air or the JOG tactical map, which includes latitude, longitude, and universal transverse Mercator (grid) systems. (Paragraph C-6 gives pointers for preparing the JOG map for NVG use.)

(b) *1:500,000 map.* This map can be either a VFR sectional or a tactical pilotage chart with reference dates. Most information from this map is transferred to the 1:250,000 map for navigation. The information is then compared with the 1:50,000 map for clarification. Normally, the 1:500,000 map is not used for navigation.

(c) *1:50,000 map.* This Army tactical map is used for planning and transferring information to the 1:250,000 map. It is the primary navigational and operational map in the objective area (within 5 to 8 nm). It is also used for locating FARPs and attack helicopter positions around kill zones or engagement areas; for example, HAs and BPs.

(2) *Aerial photographs.* Aerial photographs of the objective area, engagement area, and key checkpoints are useful. Low-angle, oblique shots provide aircrews a good first look before they arrive in the area. Photographs can be used in planning BPs, TRPs, and attack positions.

(3) *Terrain boards and sand tables.* If possible, these aids should be constructed to scale. Their preparation is time-consuming, and their coverage probably will be limited to the objective area. They help pilots rehearse actions in the objective area before departure on the mission.

(4) *Miscellaneous supplies and ancillary materials.* These include protractors, bright- or dark-colored marking pens, plastic holders for 5- by 8-inch cards, and metal rings for binding plastic holders. Other materials include a standardized key for map symbology and a flight computer (E6B).

c. Route Selection. The route to and from the objective area must be tactically sound and conducive to successful navigation. Some general rules for selecting an NVG route are as follows:

(1) Avoid brightly lit areas, roads, and population centers. If this is not possible, reduce exposure in the area by maintaining cruise airspeed.

(2) Avoid navigational aids and airports because of the hazards associated with other aviation operations. This also avoids detection by radar which could be located on these facilities.

(3) Negotiate large north-south valleys on the lighted side with respect to the moon's position. This will avoid shadows cast by the moon and facilitate silhouetting of terrain features for navigation.

(4) Use narrow valleys or passes to cross north-south ridgelines when traveling east to west or west to east in mountainous terrain. This avoids flight in shadows and generally silhouettes the terrain. Shadows do not aid in concealing aircraft, but they do make identification of hazards and checkpoints difficult.

(5) Avoid a route that heads directly into a low rising or descending moon. Alter course as necessary to fly a zigzag course when left with no other choice.

(6) Avoid planning route segments that require heading changes of more than 60 degrees. This is particularly critical if formation flight is to be conducted.

(7) Select immediate reference points and checkpoints along each leg of the route for course confirmation and timing. The need for reference points increases as the ambient light decreases.

(8) Do not parallel roads, railroads, or rivers. When possible, cross these features at right angles to reduce exposure time.

(9) Compute the distance, heading, and time for each leg of the flight from barriers or prominent terrain features. This will aid in reestablishing the flight on course if a checkpoint is missed or if the flight becomes disoriented. Log this information on the navigational map or on the NVG time, distance, and heading card. (Paragraph C-7 outlines the preparation of the NVG time, distance, and heading card.)

(10) Plan times for crossing prominent intersecting features, such as rivers, railroads, and roads. This is a good double check on timing and navigation.

(11) Anticipate wires near roads, towers, and isolated buildings. Wires will also be located near populated areas, such as towns and villages.

(12) Plan alternate routes and bypasses in case the primary route is blocked because of weather or enemy compromise.

(13) Transcribe all route information to the navigational map and prepare an en route card for immediate reference. (Paragraph C-8 shows how to prepare an en route card.)

d. Aerial Checkpoint Selection. After a general route has been determined, ACPs are selected to control movement along the route. They are studied carefully using all available maps and photographs. Some general rules for selecting NVG checkpoints are as follows:

(1) Select ACPs which are natural or man-made features that can be easily seen from a distance. Do not select ACPs which are visible only when flying directly overhead.

(2) Ensure ACPs contrast with the surrounding terrain. Paved roads are poor ACPs to use in heavily vegetated terrain but are excellent ACPs in desert terrain. Small bodies of water provide little contrast in vegetated terrain but contrast well in a desert environment.

(3) Do not select ACPs near towns. Towns invariably grow and may alter the ACPs or make them difficult to detect.

(4) Never use bright lights for ACPs. They may not be on when they are needed.

(5) Use an adjacent prominent terrain feature along the route to aid in ACP confirmation.

(6) Ensure ACPs do not fall within the shadow cast by a terrain feature. When planning an ACP, consider the moon angle and percent of illumination.

(7) Ensure ACPs are between 5 and 20 nm apart. For routes exceeding 200 nm, ACPs may be up to 40 nm apart, provided the final two checkpoints meet the 5- to 20-nm criterion.

(8) Select prominent barriers near ACPs, particularly when turns are planned. A barrier will alert the pilot that he has overflown the ACP. If the pilot overflies the ACP, he should either restart his stopwatch or initiate the planned turn or do both. It is often better to discard a good checkpoint without a barrier than a fair checkpoint with an excellent barrier.

(9) Use an easily identifiable feature for the first and last checkpoints of the route, even if the route must be slightly altered. The checkpoints should be approximately 5 nm from the takeoff point or objective to ensure accurate timing and navigation. The last checkpoint should not involve a turn, and the final leg should not be longer than 5 to 8 nm from the objective.

(10) Note the mean sea level altitude at each checkpoint during the planning phase. This will aid in ACP confirmation when flying in mountainous terrain.

(11) Select intermediate reference points between checkpoints along the route to ensure course confirmation and route timing. More reference points are needed during low-light levels. All intermediate landing areas (for example, FARPs and HAs) should have an ACP associated with them.

C-4. Crew Briefing and Premission Checklist

Once the company commander has received the OPORD and the premission planning has been completed, he should conduct a thorough crew briefing. Crew members must then accomplish all aspects of mission planning to ensure success. Figure C-1 shows a sample crew briefing and premission checklist. Paragraph C-9 contains additional information that may be useful in planning any NVG mission.

1. SITUATION

a. *Enemy.*

_____ Size and type
_____ Known or suspected location
_____ Weapons and vehicles
_____ ADA
_____ Previous activities
_____ Likely courses of action (defend or attack)
_____ Avenues of approach
_____ NBC equipment, capabilities, and situation
_____ EW and OPSEC capabilities
_____ Supply and logistics strengths
_____ Morale and potential (strengths and weaknesses)

b. *Friendly.*

_____ Brigade and division missions (commander's intent)
_____ Unit missions (left, right, rear, and forward)
_____ USAF missions
_____ Attachments and detachments

c. *Weather and light data.*

_____ Sunrise, sunset, moonrise, moonset, and percent illumination
_____ Meteorological data
_____ Navigational hazards

2. MISSION (WHO, WHAT, WHEN, WHERE, AND WHY)

Figure C-1. Sample of crew briefing and premission checklist

3. EXECUTION

a. *Concept of operation*

_____ General overview from map
_____ Routes
_____ Movement techniques (air routes and primary and alternate air corridors)
_____ Control measures (boundaries, phase lines, and checkpoints)

b. *Fires.*

_____ FA missions and locations
_____ Priority of fires
_____ Restrictive and permissive control measures
_____ Preplanned fires
_____ ADA missions and locations
_____ Weapons status (free, hold, or tight)

c. *Flight coordination instructions.*

_____ Lineup time for aircraft
_____ Time for donning NVGs
_____ Departure time (run-up checks should be made before aviators don NVGs)
_____ Takeoff information (formation and separation time hacks)
_____ En route formation information (airspeeds, altitudes, headings, times, rotor disc separations, NOTAMs, and air traffic control)
_____ Time of final briefing and weather update
_____ FARP operations
_____ NBC instructions (MOPP status and decontamination sites)
_____ Specific reports (MIJI and crossing phase lines)
_____ Essential elements of friendly information
_____ Downed aircraft recovery procedures
_____ Quick reference points
_____ Alternate assembly area
_____ Rules of engagement
_____ Target priorities
_____ Holding areas (primary and alternate)
_____ Personal equipment, such as survival and safety
_____ Special aircraft configuration (ammunition and fuel load)
_____ Special-mission equipment, such as NVGs
_____ Occupation of HAs
_____ Individual crew duties (light and heavy sections)
_____ Time and place of debriefing

4. SERVICE AND SUPPORT (CLASSES I, III, AND V)

_____ Location of FARPs
_____ Maintenance and recovery
_____ Medical (frequency, call sign, and aid station)

5. COMMAND AND SIGNAL

_____ Chain of command (location)
_____ Location of TOC
_____ Aircraft and crew assignments
_____ Flight plan (file, weather, and NOTAMs)
_____ CEOI (call signs and frequencies for USAF and FA)
_____ IFF, mode 4
_____ Brevity codes and visual signals
_____ Inadvertent IMC breakup procedures
_____ ECCM

Figure C-1. Sample of crew briefing and premission checklist (continued)

C-5. Movement and Occupation Techniques

a. Occupation of Assembly Area. The ATKHC is designed to be bivouacked under a single large net with aircraft parked surrounding the company area. Specific occupation procedures are listed below.

(1) The scout or ground elements reconnoiter the area. Attack helicopters then enter the area in sections (light first and then heavy).

(2) Attack helicopters face outward and are dispersed 360 degrees around the company area. The scouts intermix among the attack aircraft, closer in toward the center.

(3) Aircraft are set to the start position after shutdown; that is, before-starting engine checks are completed through the throttle check.

(4) The ATKHC commander's OH-58 aircraft is parked closest to the tent area. Heavy and light lead aircraft are parked next to each other for identification and control.

(5) If an intermediate assembly area is designated closer to the battle area, aircraft are parked as in (4) above. Pilots remain near their aircraft.

b. Occupation of Holding Area.

(1) The scouts reconnoiter the HA. The ATKHC commander remains forward to coordinate the battle with ground units.

(2) The ATKHC moves into the HA by sections. Attack aircraft face inward to monitor actions and provide for mutual defense. The light section is on the right side of the HA, and the heavy section is on the left side. All aircraft remain running in the HA.

(3) The scouts orient to maintain contact with their sections and to observe the battlefield.

c. Movement into Battle Positions.

(1) The ATKHC commander and heavy platoon scout move forward from the HA and reconnoiter the BP or objective area. (Paragrah C-10 discusses in-flight techniques.) The ATKHC commander remains to observe while the other scout returns to pick up the sections. The sections move forward to the BP with the heavy platoon leading, followed by the light platoon. Normal deployment in the BP places the heavy platoon on the left and the light platoon on the right.

(2) Targets should be engaged according to SOP. Either of two methods of target engagement can be used. Scouts move farther forward to observe and adjust rocket firing, or the attack is conducted similar to a daylight engagement with aerial rocket illumination or artillery flares. (Paragraph C-11 discusses NVG firing techniques and limitations.)

(3) The scouts provide flank and rear security during engagements. Upon completion of the engagement, the heavy platoon scout takes the lead and moves the company back to the FARP or the HA. (Paragraph C-12 discusses NVG FARP operations.) The ATKHC commander remains on station and continues to observe and hand over the battle.

C-6. NVG Map Preparation

The JOG map is the primary reference for NVG navigation. Therefore, it must be prepared accurately. Some techniques and considerations for preparing the NVG map are as follows:

a. Use a bright, black liquid ink pen. (Permanent vis-a-vis is recommended.)

b. Place the route and ACPs on the map first.

c. Place a large "N" on each fold of the map in order to use or permit rapid orientation of the map.

d. Prepare the map with 8 to 10 nm on either side of the route in case the flight should depart the course line.

e. Mark lighted towers, beacons, and so on, out to a distance of at least 30 nm.

f. Do not overprepare the map. Outline only those features which are likely to be seen. Dirt roads, trails, and creeks in most areas are not likely to be seen and will only clutter the map. The opposite is true in desert terrain.

g. Transfer key features and hazards from the VFR sectional map to the tactical map.

h. Do not overly exaggerate any terrain feature.

i. Orient all notes and writing in the direction of flight for ease of reading that particular leg.

j. Use one map per mission. Never attempt to use the same map for a different mission in the same area.

k. Mark contour lines at 500-foot intervals. Marking contour lines in relatively flat terrain leads to confusion.

l. Use the NVG map symbols shown in Figure C-2.

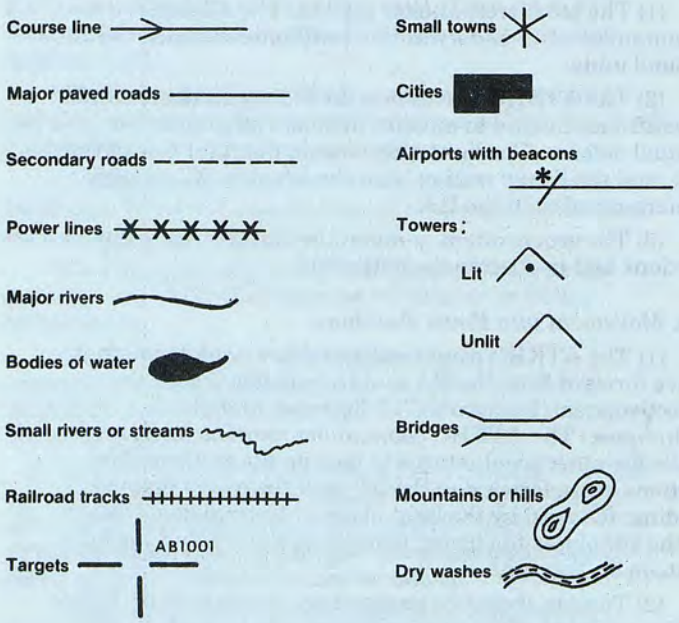


Figure C-2. NVG map symbols

C-7. NVG Time, Distance, and Heading Card Preparation

The NVG time, distance, and heading cards are constructed from 5- by 8-inch white or light-colored cards. All essential information for the navigation portion of the mission is included on the cards. An example of an NVG time, distance, and heading card is shown in Figure C-3. The cards are intentionally kept simple in format and construction to allow NVG compatibility. Some techniques and considerations for preparing NVG time, distance, and heading cards are as follows:

a. Use black ink to draw or write on the cards.

b. Make all letters and numbers at least ¼ inch in size.

c. Use degree and nm abbreviations to prevent confusion with the time column during low-light conditions.

d. Use the remarks column to record pertinent information (for example, running time and airspeed) and to describe the appropriate checkpoint.

e. Use no more than eight legs per card.

f. When determining the times, distances, and headings for the route, compute the same data for the barriers and intermediate reference points. Log this information on the navigational map to aid in reestablishing the flight on course if deviation must be made or a checkpoint is missed.

g. Place completed cards in plastic transparent envelopes of corresponding size and secure to the kneeboard or hang from the aircraft instrument panel with metal rings.

Note 1: Members of the planning cell should triple-check all times, distances, and headings before posting the card for briefings.

Note 2: Crews should study and memorize times, distances, and headings; ACPs; and terrain features of the route. A lost map should not be the reason to abort a mission.

ACP	HDG	TIME	DIST	RMKS
1	027° 026°	3:30 01:15	5 NM	1 MI 60K
2	080° 076°	12:22 01:27:27	17.1 NM	RDX
3	042° 040°	09:38 01:37	12.2 NM	RVR/ RDX
4	012° 011°	8:00 01:45	10.1 NM	400' MT .5 KM W
5	352° 352°	9:40 01:54:40	12.3 NM	50 RVR X
6	355° 355°	12:00 02:06:40	16.2 NM	1 MI 60K 50
HA	360° 001°	4:20 02:11	4 NM	60K 50 POL/ AMMO
OBJ	082° 090°	4:55 02:16	5 NM	60K TOT

Figure C-3. NVG time, distance, and heading card

C-8. NVG En Route Card Preparation

En route cards are constructed using the same basic criteria as the navigation cards. They should display all essential information for each particular leg of the route. An example of an NVG en route card is shown in Figure C-4. Some techniques and considerations for preparing NVG en route cards are as follows:

a. Construct a card for each leg of the flight and for each area of intended landing; for example, FARP or HA.

b. Construct each card to scale.

c. Make all letters and numbers at least ¼ inch in size.

d. Include the following information on each card:

(1) Checkpoint number.
(2) Heading.
(3) Time to checkpoint.
(4) Distance.
(5) Arrow pointing to direction of next checkpoint.
(6) Preceding checkpoint.
(7) Hazards.
(8) Prominent terrain features.
(9) Built-up areas.

Note 1: Completed en route cards should be placed in plastic transparent envelopes of corresponding size. They should then be secured to the kneeboard or hung from the aircraft instrument panel with a metal ring.

Note 2: Copies of the JOG map with the route posted serve as excellent en route cards once aspects along the route have been highlighted for NVG use. The same guidelines apply as discussed in paragraph C-6. This technique provides accurate en route cards. However, it does not provide the pilot with as good a map reconnaissance as the handdrawn version.

C-9. NVG Flight Crew Duty Checklist and Briefing

Each flight crew is responsible for performing a preflight inspection and a before-takeoff check. During its check, the crew ensures the cockpit is prepared for NVG flight. The PIC also conducts a copilot briefing.

a. Exterior Check. Both pilots conduct a walkaround inspection during daylight or white-light conditions. During their inspection, they ensure appropriate exterior lights are taped.

b. Interior Check.

(1) *OH-58 crew.* The OH-58 crew ensures that interior light shields are in place. It also ensures that the following lights are taped:

(a) KY control head.
(b) Position.
(c) Anticollision.

(2) *AH-1S crew.* The AH-1S crew ensures that the following lights are taped:

(a) KY control head.
(b) Rocket management subsystem.
(c) Overtorque.
(d) Master caution.
(e) Fire.
(f) Doppler memory.
(g) Position.
(h) Anticollision.

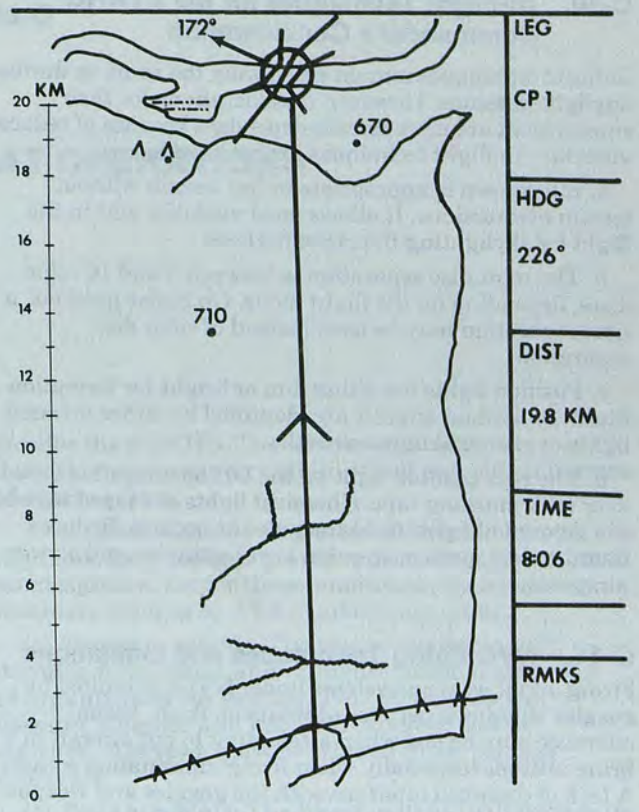


Figure C-4. NVG en route card

Note: Chemical lights, if used, must be in position and operational. All aircraft may have 2-inch sections of surgical tube attached to critical and other light switches.

c. Copilot Briefing. During the briefing, the crew makes a final equipment check and conducts an internal communications check. It also reviews the weapons plan.

d. Emergency Procedures. Both crew members have in-flight responsibilities. These are shown in Table C-1.

Note 1: Dedicated crews and crew coordination are critical in NVG operations.

Note 2: Dedicated teams and sections are also essential in the conduct of NVG operations.

Table C-1. In-flight responsibilities

Duty	Person Flying	Person Not Flying
Before-takeoff check		X
Before-landing check		X
Aircraft control	X	
Outside orientation	X	X
Radio calls	X	X
In-flight checks (airspeed, altitude, RPM, rate of descent, engine and transmission instruments, and so on)	X	X
Approach angle, rate of closure, and so on	X	X
Radio tuning		X
Navigation	X	X

C-10. In-Flight Techniques for the ATKHC Commander's Consideration

In-flight techniques remain essentially the same as during daylight missions. However, considerations for their employment are more terrain-dependent because of reduced visibility. In-flight techniques are outlined below.

a. Stackdown is appropriate in flat terrain without terrain obstructions. It allows good visibility within the flight by skylighting the aircraft ahead.

b. The rotor disc separation is between 3 and 10 rotor discs, depending on the flight mode. On cruise portions, a time separation may be used instead of rotor disc separation.

c. Position lights are either dim or bright for formation flight. Individual aircraft are identified by either infrared lights or chemical lights or both.

d. The rear position light on the OH-58 aircraft is taped over with masking tape. Chemical lights are taped to reduce the amount of light visible outside the cockpit. Reduced illumination levels may mean lower altitudes and slower airspeeds.

C-11. NVG Firing Techniques and Limitations

Firing aerial weapon systems under NVGs is limited by goggles shutdown because of weapons flash. Visual reference may be lost when attempting to put aircraft in a firing attitude (especially when firing illumination rockets). A lack of designed interface with the goggles and weapon aiming devices is a limitation with the NVGs. Another set of limitations is range estimation and target acquisition and tracking.

a. 20-Millimeter—Burst on Target. If the 20-millimeter is fired using the HSS, the helmet must be boresighted. The HSS cannot be used with the TSU at the present time, nor can it be used when flying with NVG. The HSS can, however, be used in the fixed fire mode.

b. 2.75-Inch FFAR—Burst on Target. The maximum number of 2.75-inch FFARs that can be fired is three pairs based on goggle shutdown time. Crew coordination is important during the firing sequence. The nonfiring pilot monitors the torque, heading, and altitude; the firing pilot gives the countdown to fire. Both pilots then look at the instrument panel to minimize goggle shutdown. Forward movement at ranges beyond 3,000 meters when firing will avoid rearward and downward drift.

c. TOW. The TOW can be fired at night provided there is moon illumination and provided 4.2-inch mortar or 2.75-inch FFAR illumination is available. A maximum of either six 4.2-inch or four 2.75-inch illumination rounds must be in effect to provide enough illumination to see the target through the TSU. Illumination must be in front of the target. If illumination is behind the target, shadows will make viewing difficult.

C-12. NVG FARP Operations

NVG FARP operations are inherently hazardous. All the ingredients for disaster are there, and one careless act can be catastrophic. Bulk fuels and ammunition, hovering aircraft, and personnel moving on the ground leave no margin for error. NVG FARP operations must be characterized by rigid rules. The guidelines below are designed to achieve the twin goals of efficiency and safety of operations.

a. Attack aircraft move into refuel positions before the scouts. The aircraft most critical on fuel refuels first.

b. Position lights are put up steady bright before aircraft refuel. Hot refueling points should be marked with chemical lights (beanbag lights tend to wash out the goggles).

c. The pilot who exits the aircraft to observe the refueling may degoggle at his discretion. After refueling, the attack aircraft move to rearm.

d. Ground guides should use taped red wands or chemical lights. They also should have NVGs available and be briefed on their capabilities and limitations.

Appendix D

AIR-TO-AIR COMBAT OPERATIONS

D-1. General

United States forces cannot assume that they will always have air superiority. They must be prepared to counter enemy aircraft in all areas of the battlefield, particularly beyond the FLOT. Threat antihelicopter doctrine has improved in concert with improvements in friendly helicopter combat effectiveness. One of the priorities of Threat helicopters will be to destroy US antiarmor systems, both in the air and on the ground. The Threat will use fighters, armed helicopters, and all other means to counter US systems. This appendix addresses planning considerations, keys to success, and principles of ATA combat. FM 1-107 describes helicopter ATA combat in detail.

D-2. Planning Considerations

a. Planners should assume that ATA combat will occur during all types of operations and plan accordingly. ATKHBs must be prepared to conduct ATA combat in deep, close-in, and rear operations areas. Since the ATKHB does not have dedicated ATA assets, it must plan to use its internal assets for ATA combat.

b. In planning ATA combat operations, the ATKHB commander uses the same factors as for any other type of mission. These factors are METT-T.

(1) *Mission.* All or part of an ATKHC may receive the primary mission to conduct ATA combat. In a mid- to high-intensity conflict where the enemy has a significant attack helicopter force, ATA combat may be an implied mission. Whatever the mission, the ATKHB must plan for ATA combat to protect the force. ATKHBs conduct defensive ATA combat in the deep operations area and offensive ATA combat in the close-in and rear operations areas.

(2) *Enemy.* Planning must accurately assess the size, training level, quality of equipment, and ATA weapons of the enemy force. These factors will influence the planning considerations for the conduct of ATA combat. The ATKHBs will have three options upon contact with an enemy ATA force. These options are—

(a) Avoid the enemy aviation force and request assistance from other members of the combined arms team.

(b) Engage the enemy aviation force and delay to gain time and space so the primary mission can be accomplished.

(c) Destroy the enemy aviation force and continue the primary mission.

(3) *Terrain and weather.*

(a) Planners must analyze the vegetation and relief that will provide terrain masking and maneuver space for the ATKHB. The terrain will influence acquisition ranges, intervisibility, and security of ingress and egress routes.

(b) Low visibility degrades all aviation operations. Low ceilings provide concealment from most Threat fighters. Under these conditions, many chance encounters leading to ATA combat may occur.

(4) *Troops available.* The troops available will determine force ratios and influence mission planning and organization for combat. This factor also will determine whether and how ATA combat will be conducted. Aircrews must be trained in air combat maneuvers.

(5) *Time available.* The time available will determine the degree of detail for planning and coordinating ATA combat. Time usually is shorter than most planners would like, and it should be used wisely.

c. In addition to METT-T, ATKHB commanders must consider other factors. These include intelligence, fuel and ammunition, aircraft availability, and C^3 assets.

D-3. Keys to Success

a. Continuous planning, constant surveillance, and well-rehearsed battle drills are keys to success in ATA combat. To succeed in an ATA environment, the ATKHB commander must—

(1) Plan for ATA combat regardless of the assigned mission.

(2) Always provide an armed escort for unarmed aircraft in the deep operations area.

(3) Use fire and movement when engaging or delaying against an enemy aviation force.

(4) Use terrain and weather effectively.

b. The ATKHBs must never lose their ability to maneuver and should always avoid becoming decisively engaged. They should engage at maximum standoff ranges.

D-4. Principles

The principles of ATA combat have been developed from many years of experience. Helicopter ATA doctrine borrows extensively from the principles of ATA combat used by fighters. Some of the principles which apply to both fighters and helicopters are—

a. Avoid detection.

b. See the Threat first.

c. Recognize the Threat.

d. Decide to engage—fire first.

e. Be unpredictable.

Appendix E

NUCLEAR, BIOLOGICAL, AND CHEMICAL OPERATIONS

E-1. General

Threat forces possess nuclear and chemical weapons and stress the use of obscurants. They also can produce biological weapons. Threat doctrine stresses winning through relentless offense and indicates a willingness to use chemical and nuclear weapons. The power of these weapons can quickly and drastically alter combat power ratios and permit the using force to seize the initiative. Threat forces will use smoke and natural obscurants to degrade observation and visual targeting and to neutralize friendly technical superiority in these areas.

a. The nonlinear, integrated, extended battlefield is an extensive zone in which forces can employ NBC weapons singly or in combination with conventional weapons. The ATKHB commander must understand NBC operations to preserve his force. He must be familiar with nuclear or chemical retaliatory policy, as well as know how to use obscurants to enhance survivability. The air-land battle requires training and planning for NBC and obscurants in all phases of the unit's mission.

b. The mass casualties and destruction caused by NBC weapons will increase reliance on aviation assets. Aviation may be one of the only means left to provide command and control, bypass obstacles, and attack enemy forces in contaminated areas. Therefore, ATKHB personnel must be able to conduct radiological and chemical surveys, to see beyond obscurants, and to perform all missions in a contaminated environment.

c. The fluidity and depth of air-land operations increase the probability of encountering NBC contamination. The ATKHB commander cannot assume that nonpersistent agents will be used solely in the front lines. Therefore, all personnel in the ATKHB must be trained to operate in an NBC environment. Moreover, the Threat can fight in its own persistent agents and trains consistently in this area. The NBC environment will impact on every aspect of personnel and unit mission accomplishment. Through training and planning, the units of the ATKHB can minimize the effects of contamination and defeat the Threat. FM 3-100 describes NBC operations in detail.

E-2. Defensive Measures

ATKHB commanders must ensure their units can survive an NBC attack and accomplish their missions. Physiological and psychological stresses on the integrated battlefield degrade aircrew performance. When the stress of flying in full MOPP gear is added, crew rest becomes a major problem. Proper training and supervision can decrease the degree of unit degradation. Sufficient crew rest will restore combat effectiveness. Medical personnel must monitor exposure to low, nonlethal concentrations of agents since these can significantly reduce a pilot's performance. Commanders and their staffs must be aware of the status of supported, supporting, and adjacent units, especially if the units have been contaminated. Active and passive OPSEC measures also reduce unit vulnerability to NBC weapons. ATKHB commanders must carefully plan for the dispersion of their units when concentrating combat power at the critical time and place. Contamination avoidance, NBC protection, and decontamination measures are described in FMs 3-3, 3-4, and 3-5, respectively. FM 1-102 describes specific NBC defensive measures for Army aviation.

a. Nuclear Considerations. The electromagnetic pulse produced by a nuclear weapon explosion may degrade communications-electronics equipment to a great degree. The resultant degradation of command and control will affect the ATKHB and require the use of scout aircraft to maintain C^3. Aircraft are more vulnerable to nuclear weapon's effects than other vehicles because of their relative structural weakness, aerodynamics, and when airborne, their vulnerable position. Their speed allows them to travel great distances in a short time, thus allowing them to reach a negligible risk area rapidly. For this reason, advance notice of the use of nuclear weapons is critical to the survival of aircraft, particularly those that are airborne.

b. Biological Considerations. Biological agents on the battlefield in the form of diseases and natural food and water contamination have caused extensive casualties in previous conflicts. The Threat has the potential to employ biological weapons in friendly rear areas to kill or incapacitate personnel and contaminate foodstuffs. The following preventive measures will greatly reduce vulnerability to the biological threat: personal hygiene, area cleanliness, proper latrine facilities, insect control, and immunization. Toxins are employed similarly to persistent chemical agents; full encapsulation will protect from toxins. Decontamination procedures are the same as for chemical agents. There are no biological agent detectors at this time.

c. Chemical Considerations.

(1) Chemical contaminants force personnel to don their entire MOPP gear, thus creating physiological and psychological stresses and reducing efficiency. Aviators may unknowingly fly into a chemical hazard area. Exposure to even a low, nonlethal dose of a chemical agent could be fatal to aviators. No advance warning chemical detectors for aircraft exist today. Rapid donning of the protective mask and clothing while flying is not practical; therefore, aviators must train wearing their MOPP gear for extended periods of time. Once chemical agents have been employed or their employment is imminent, aircrews must be notified and their MOPP clothing worn to prevent exposure. As a field expedient method of detecting chemical agents, M-8 paper or M-9 tape may be taped to wind screens, forward edges of stubby wings, and so forth.

(2) Ground personnel will be able to lower their chemical protective posture when chemical agent detectors are properly employed. Spot decontamination measures will reduce the transfer of hazards to aircraft, from supported personnel to aircraft, and from contaminated aircraft to personnel. Aircraft can be hastily decontaminated by using hot soapy water.

E-3. Offensive Measures

Aircraft mobility enhances survivability in an NBC environment. However, unwarned aircraft can move rapidly from an area of negligible risk to one of vulnerability. Therefore, all ATKHB units must be given advance warning of any intended use of friendly nuclear weapons throughout the entire area of operations. Time is critical; units must be able to pass nuclear warning information to aviators in flight if their area or movement corridors will be affected. OPSEC must be emphasized so the Threat is not forewarned.

E-4. Responsibilities

ATKHB commanders are responsibile for ensuring their units can perform their missions on the integrated battlefield. All staff personnel must be fully aware of the impact on each staff area. Chemical specialists are found at brigade and battalion staff levels. Additional duty, cross-trained personnel comprise the team which advises the commander and staff and provides 24-hour planning and coordination.

a. The ATKHCs do not have authorized chemical NCOs. However, an NCO from each company does attend a divisional school to become familiar with NBC operations. This individual and the battalion NBC NCO are responsible for training company personnel.

b. The ATKHCs are responsible for operating company decontamination stations for personnel and equipment. The ATKHB is responsible for any extended or mass decontamination operations.

c. Chemical staff personnel in the ATKHB advise the commander concerning the location and availability of divisional and corps level decontamination assets. Aviation brigade chemical personnel also are available to perform various NBC functions.

d. Rigorous individual and unit training will prepare the soldier for the physiological and psychological impacts of an NBC environment. The potentially devastating impact of NBC operations can also be minimized by planning. Planning for the integrated battlefield is a continuous process performed by everyone in the chain of command, to include the individual soldier.

REFERENCES

Required Publications

Required publications are sources that users must read in order to understand or to comply with this publication.

Army Regulations (ARs)

15-6	Procedures for Investigating Officers and Boards of Officers
310-2	Identification and Distribution of DA Publications and Issue of Agency and Command Administrative Publications
340-15	Preparing Correspondence
380-5	Department of the Army Information Security Program
600-200	Enlisted Personnel Management System
672-5-1	Military Awards

DA Pamphlets (DA Pams)

310-1	Consolidated Index of Army Publications and Blank Forms
600-8-1	SIDPERS Unit Level Procedures

Field Manuals (FMs)

1-102	Army Aviation Employment in an NBC Environment
1-104	Forward Arming and Refueling Points
1-107	Air-to-Air Combat
1-140	Helicopter Gunnery
3-3	NBC Contamination Avoidance
3-4	NBC Protection
3-5	NBC Decontamination
3-100	NBC Operations
5-100	Engineer Combat Operations
6-20	Fire Support in Combined Arms Operations
16-5	The Chaplain and Chaplian Assistant in Combat Operations
17-35	Aeroscout Procedures
17-50-1	Attack Helicopter Team Handbook
63-2	Combat Service Support Operations—Division
63-3J	Combat Service Support Operations—Corps
100-2-1	Soviet Army Operations and Tactics
100-2-2	Soviet Army Specialized Warfare and Rear Area Support
100-2-3	Soviet Army Troops Organization and Equipment
100-5	Operations
100-10	Combat Service Support
101-5	Staff Organization and Operations

TRADOC Training Text (TT)

17-50-3 Joint Air Attack Team (JAAT) Operations

Available from:
Commander
US Army Aviation Center
ATTN: ATZQ-OSS-TS
Ft Rucker, AL 36262-5000

Miscellaneous Publications

DOD Postal Manual 4525.6-M

Available from:
Director
US Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120

DA Form

2627 Record of Proceedings Under Article 15, UCMJ

DD Form

458 Charge Sheet

Related Publications

Related publications are sources of additional information. They are not required in order to understand this publication.

Field Manuals (FMs)

1-100	Combat Aviation Operations
6-20-2J	Division Artillery, Field Artillery Brigade, and Corps Artillery Headquarters
12-3-1	Separate Company/Battalion Level Personnel and Administrative Doctrine
12-3-2	Division / Separate Brigade Level Personnel and Administrative Doctrine
12-15	Wartime Casualty Reporting
12-16	Replacement Operations
17-50	Attack Helicopter Operations
17-95	Cavalry
71-2	The Tank and Mechanized Infantry Battalion Task Force
101-5-1	Operations Terms and Symbols

Training Circulars (TCs)

1-201	Tactical Flight Procedures
12-6	Wartime Strength Accounting
12-16	PAC Drill Book

Standardization Agreements (STANAGs)

2355	Procedures for the Employment of Helicopters in the Antiarmor Role
3628	Helicopter Tactical Refueling

Projected Publications

Projected publications are sources of additional information that are scheduled for printing but which are not yet available.

Field Manuals (FMs)

1-111	Aviation Brigade
1-113	Assault Helicopter Battalion and Command Aviation Battalion
1-114	Regimental Aviation Squadron
1-116	Air Cavalry Troop
1-130	Joint Air Attack Team

GLOSSARY

A^2C^2	Army airspace command and control
AA	antiaircraft
AATFC	aircraft assault task force command
AB	aviation brigade
acft	aircraft
ACP	aerial checkpoint
AD	air defense
ADA	air defense artillery
ADP	automatic data processing
AGL	above ground level
AH	attack helicopter
ALO	air liaison officer
ALT	airborne laser tracker
AM	amplitude modulation
AMC	aviation maintenance company
ammo	ammunition
ASE	aircraft survivability equipment
ASP	ammunition supply point
AT	antitank
ATA	air-to-air
ATC	air traffic control
ATGM	antitank guided missile
ATHS	airborne target handover system
atk	attack
ATKHB	attack helicopter battalion
ATKHC	attack helicopter company
ATP	ammunition transfer point
ATTN	attention
AUTO	automatic
AVIM	aviation intermediate maintenance
avn	aviation
AVUM	aviation unit maintenance

BDA	battle damage assessment
bde	brigade
BMP	boyevaya mashina pekhoty (Russian, literally: combat vehicle, infantry)
bn	battalion
BP	battle position
BSA	brigade support area
btry	battery

C^3	command, control, and communications
CAS	close air support
cdr	commander
CEOI	communications-electronics operation instructions
CH	cargo helicopter
cmd	command
co	company
comm	communications
comp	component
COSCOM	corps support command
CP	command post
CRP	combat reconnaissance patrol
CSA	corps storage area
CSS	combat service support
C/V	Chaparral/Vulcan

DA	Department of the Army
DAG	division artillery group
DAO	division ammunition officer
def	defense
DISCOM	division support command
dist	distance
DMMC	division materiel management center
DOD	Department of Defense
DS	direct support

EA	engagement area
ECCM	electronic counter-countermeasures
EER	enlisted evaluation report
engr	engineer
EW	electronic warfare

FA	field artillery
FAC	forward air controller
FAC-A	forward air controller-airborne
FARE	forward area refueling equipment
FARP	forward arming and refueling point
FCC	flight coordination center
FDC	fire direction center

FEBA	forward edge of the battle area
FFAR	folding fin aerial rocket
FLIR	forward-looking infrared
FLOT	forward line of own troops
flt	flight
FM	frequency modulated
FRAGO	fragmentary order
FSB	forward support battalion
FSC	fire support coordination
FSE	fire support element
FSO	fire support officer
GLLD	ground laser locator designator
gp	group
gph	gallons per hour
GS	general support
HA	holding area
hdg	heading
HELLFIRE	helicopter launched fire and forget
HEMAT	heavy expanded mobility auxiliary trailer
HEMTT	heavy expanded mobility tactical truck
HF	high frequency
HI	high
HQ	headquarters
HSC	headquarters and service company
HSS	helmet sight subsystem
HUMINT	human intelligence
IFF	identification, friend or foe (radar)
IMC	instrument meteorological conditions
INTSUM	intelligence summary
IP	initial point
JAAT	joint air attack team
JOG	joint operations graphic
J-SEAD	joint suppression of enemy air defenses
KIAS	knots indicated airspeed
km	kilometers
ldr	leader
LGB	laser-guided bombs
LO	low
LOAL	lock-on after launch
LOBL	lock-on before launch
LST	laser spot tracker
LTL	laser-to-target line
LZ	landing zone
m	meter
maint	maintenance
MBA	main battle area
med	medical
METT-T	mission, enemy, terrain and weather, troops available, and time
MFD	malfunction display
MIJI	meaconing, intrusion, jamming, and interference
mm	millimeter
MMC	materiel management center
MMS	mast mounted sight
MOPP	mission-oriented protective posture
mph	miles per hour
MR	motorized rifle
MRD	motorized rifle division
MRL	multiple rocket launcher
MRR	motorized rifle regiment
MSB	main support battalion
MTO	message to observer
NBC	nuclear, biological, and chemical
NCO	noncommissioned officer
NCS	net control station
nm	nautical mile
no	number
NOE	nap-of-the-earth
NOTAM	notice to airmen
NVG	night vision goggle
OER	officer evaluation report
O&I	operations and intelligence
obj	objective
OH	observation helicopter
OPCON	operational control
OPORD	operation order
OPSEC	operations security

PAC	personnel and administration center
PIC	pilot in command
plt	platoon
PNVS	pilot night vision system
POL	petroleum, oils, and lubricants
PRF	pulse repetition frequency
PSS	personnel service support
PZ	pickup zone
RAG	regimental artillery group
RATT	radio teletypewriter
recon	reconnaissance
rmks	remarks
rpm	revolutions per minute
S1	Adjutant (US Army)
S2	Intelligence Officer (US Army)
S3	Operations and Training Officer (US Army)
S4	Supply Officer (US Army)
SAM	surface-to-air missile
S&P	supply and petroleum
sct	scout
SEAD	suppression of enemy air defenses
sec	section
SGT	sergeant
SHORAD	short-range air defense
SIDPERS	standard installation/division personnel system
SIGINT	signal intelligence
SOP	standing operating procedure
SSB	single sideband
SSM	surface-to-surface missile
STANAG	standardization agreement
svc	service
tac	tactical
TAC CP	tactical air control command post
TACFIRE	tactical fire direction system
TACP	tactical air control party
TC	training circular
TIS	thermal imaging system
tm	team
TOC	tactical operations center
TOE	table of organization and equipment
TOW	tube-launched, optically tracked wire-guided
TR	tank regiment
TRADOC	United States Army Training and Doctrine Command
TRP	target reference point
TSU	telescopic sight unit
TT	training text
TTP	transportation transfer point
TV	television
UCMJ	Uniform Code of Military Justice
UH	utility helicopter
UHF	ultra high frequency
US	United States
USAF	United States Air Force
veh	vehicle
VFR	visual flight rules
VHF	very high frequency
WSRO	weapon system replacement operations
XO	executive officer
ZSU	zeintnaya samokhodnaya ustanovka (Russian, literally: antiaircraft self-propelled gun mount)

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