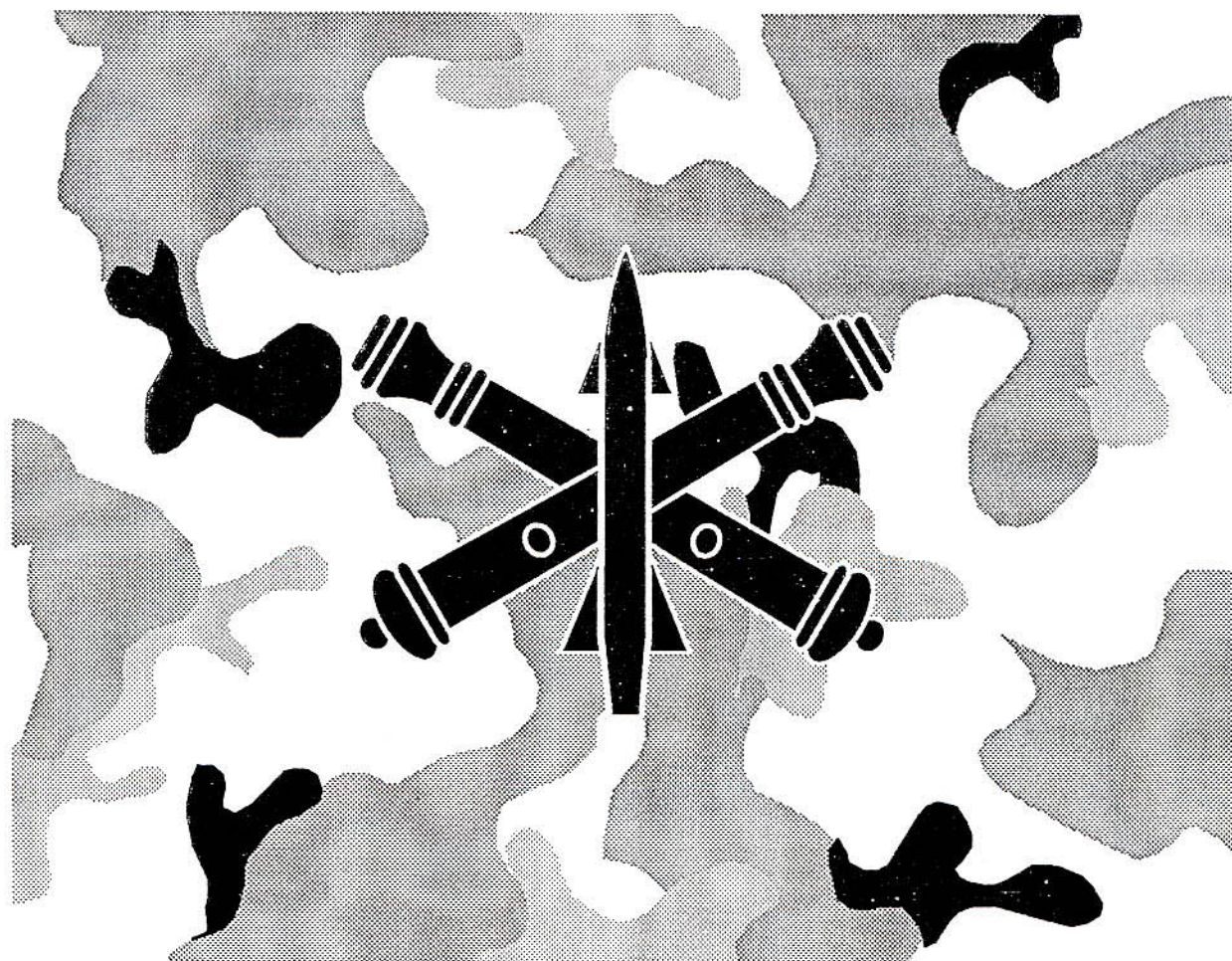


FIELD MANUAL
No.44-43

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 3 October 1995

BRADLEY STINGER FIGHTING VEHICLE PLATOON AND SQUAD OPERATIONS



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CONTENTS

	Page
Chapter	
1 The BSFV Platoon	1-1
2 Command, Control, and Communications	2-1
3 Force Projection Operations	3-1
4 Offense	4-1
5 Defense	5-1
6 Other Operations	6-1
7 Logistics	7-1
Appendix	
A Air Defense Orders and Annexes	A-1
B Combined Arms for Air Defense	B-1
C Reconnaissance, Selection, and Occupation of Position	C-1
D BSFV Platoon/Squad Checklists	D-1
E Early Warning	E-1
F Combat Operations in Varied Environments	F-1
G Limited Visibility Operations	G-1
H Nuclear, Biological, and Chemical Operations	H-1
I Air Intelligence Preparation of the Battlefield (IPB)	I-1
J Safety and Risk Assessment	J-1
K Maps and Control Measures	K-1
L Target Engagement	L-1
Glossary	Glossary-1
References	References-1
Index	Index-1

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PREFACE

The mission of air defense artillery is to protect the force and selected geopolitical assets from aerial attack, missile attack, and surveillance.

FM 44-43 describes how the Bradley Stinger Fighting Vehicle (BSFV) platoon and squad operate. The manual details tactics, techniques, and procedures used by the BSFV platoon to exploit its capabilities, provide protection for the supported force, and survive on the battlefield. Most importantly, this manual describes the integration of the BSFV platoon with its supported unit, normally a heavy combined arms task force, in conducting combined arms operations on tomorrow's battlefield. The manual is required reading for commanders, platoon leaders, platoon sergeants, and squad leaders who will direct and supervise the employment of BSFV platoons and squads. Other recommended essential reading includes—

FM 44-100	US Army Air Defense Operations (TBP)
FM 44-64	FAAD Battalion and Battery Operations (TBP)
FM 71-123	Tactics and Techniques for Combined Arms Heavy Forces: Armored Brigade, Battalion/Task Force, and Company/Team
FM 71-1	The Tank and Mechanized Infantry Company Team
FM 71-2	The Tank and Mechanized Infantry Battalion Task Force
FM 71-3	The Armored and Mechanized Infantry Brigade

This publication is unclassified; therefore, threat information contained in the publication is general in nature. Where detailed and current information is required, consult authoritative sources. Classified information pertaining to BSFV capabilities, limitations, and AD planning is found in (S) FM 44-100A (U) (TBP).

This publication implements the following international standardization agreements (STANAGs):

STANAG	TITLE	EDITION
2014	Operation Orders, Warning Orders and Administrative/Logistics Orders	7
2019	Military Symbols for Land Based Systems (APP-6)	3
2868	Land Force Tactical Doctrine (ATP-35 (A))	4
3880	Counter Air Operations (ATP-42(B))	2

The proponent of this publication is USAADASCH. Users of this manual are encouraged to submit recommended changes or comments to improve this publication. Key comments to the specific page and line of the text in which the change is recommended. Provide rationale for each comment to ensure understanding and complete evaluation.

Prepare comments on DA Form 2028 and forward them to—

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Unless this publication states otherwise, masculine nouns or pronouns do not refer exclusively to men.

THE BSFV PLATOON

The Bradley Stinger Fighting Vehicle platoon plays an integral role as part of the combined arms team on the modern day battlefield. This chapter discusses BSFV platoon organization, personnel roles and responsibilities, and system capabilities.

The mission of air defense artillery is to protect the force and selected geopolitical assets from aerial and missile attack and surveillance. The FAAD mission is to provide low-altitude air defense protection to the force and its critical assets. FAAD contributes to force protection operations by countering threat reconnaissance, intelligence, surveillance and target acquisition (RISTA) and lethal aerial platforms. FAAD weapon systems ensure the force has the freedom to maneuver during combat operations.

BSFV PLATOON IN ARMY OPERATIONS

FM 100-5 describes how the Army organizes and applies combat power. It describes synchronization of the combat functions to achieve victory. Within its framework, there are five tenets which describe the characteristics of successful operations.

While these tenets apply to the training and leadership doctrine of all combat, combat support, and combat service support organizations, an understanding of them by the BSFV platoon will aid in success on the battlefield.

INITIATIVE

Initiative sets or changes the terms of battle by action. It implies an offensive spirit in the conduct of all operations. Initiative requires that leaders anticipate events on the battlefield. This allows them and their units to act and react faster than the enemy. Applied to individual soldiers and leaders, initiative requires a willingness and ability to act independently within the framework of the commander's intent. The BSFV platoon must be able to anticipate enemy actions and organize its assets to defeat or destroy the enemy air threat.

AGILITY

Agility is the ability of friendly forces to react faster than the enemy. It is a prerequisite for seizing and holding the initiative. It is as much a mental as a physical quality. For the BSFV platoon, agility is the ability to adjust platoon capabilities to meet varying air threats. The decision support matrix and the execution matrix are examples of tools that may be used by the BSFV platoon to achieve agility. This is accomplished

by the swift concentration of air defense fires against enemy aerial platforms.

DEPTH

Depth is the extension of operations in time, space, resources, and purpose. It is the ability to gain information and influence operations throughout the battlefield. The BSFV platoon achieves depth by integrating fires with other air defense systems, for example, a reinforced Stinger section.

SYNCHRONIZATION

Synchronization is arranging activities in time and space to mass at the decisive point. It requires a clear understanding of the supported unit commander's intent. The BSFV platoon achieves synchronization by massing fires at the critical point on the battlefield. An example of synchronization by the BSFV platoon is the proper positioning of sections on the battlefield to mass fires at a specific air target area of interest to destroy or defeat any enemy air threat.

CONTENTS

	Page
BSFV Platoon in Army Operations	1-1
BSFV Platoon Organization	1-2
BSFV Platoon Personnel Roles and Responsibilities	1-2
BSFV Characteristics and Capabilities	1-3

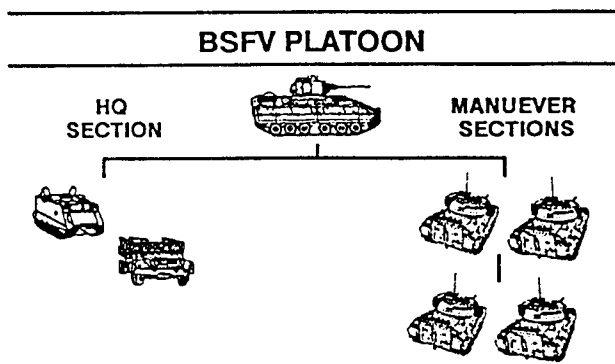
VERSATILITY

Versatility is the ability to meet diverse mission requirements. The BSFV platoon must be flexible to meet diverse mission requirements. An example of

versatility in a BSFV platoon is the ability to move laterally on the battlefield transitioning from a defensive to an offensive posture in a reinforcing role.

BSFV PLATOON ORGANIZATION

The BSFV platoon is organized into a headquarters section and two maneuver sections. See the BSFV Platoon illustration. The headquarters section consists of the platoon leader's Bradley Fighting Vehicle (BFV) and the platoon sergeant's armored personnel carrier (APC) and 5-ton ammo truck. The maneuver sections each contain two BSFV squads. This configuration gives the platoon the capability to fight as an entire platoon or to task-organize and fight as sections. Air defense commanders may modify platoon organizations to fit specific mission requirements.



BSFV PLATOON PERSONNEL ROLES AND RESPONSIBILITIES

Roles and responsibilities of personnel assigned to the BSFV platoon are varied. This section outlines the general roles and responsibilities of platoon personnel.

PLATOON LEADER

The BSFV platoon leader has several responsibilities. He commands the BSFV platoon and his BFV track. In this capacity, he is responsible for tactical employment, track commander tasks, and logistics. He is also the special staff officer for air defense for the supported unit commander.

PLATOON SERGEANT

The platoon sergeant (PSG) is second-in-command of the platoon and takes charge of the platoon in the absence of the platoon leader. He is responsible to the platoon leader for maintenance and supply, and may assist in employment of the platoon and in dissemination of early warning. He may also act as an liaison officer (LNO) for the platoon. Depending on platoon task organization, he may direct the tactical employment of one section.

SQUAD LEADER

The squad leader is the BSFV commander and has overall responsibility for the squad. He identifies and designates targets, routes of movement, and vehicle

positions. He determines weapon to be fired, fire command, and decides when to dismount the Stinger team. He also maintains communications and carries out the platoon leader's or platoon sergeant's directives. The squad leader has primary responsibility for the maintenance of the BSFV and the training of his squad.

GUNNER

The gunner, as second-in-command of the squad, assists the squad leader in the detection and identification of targets. He is the primary operator of the BSFV turret weapon systems. He is responsible for operator maintenance of the turret and its weapons.

DRIVER (ASSISTANT GUNNER)

The driver operates the vehicle under the squad leader's control. He aids in target identification and engagement. The driver is primarily responsible for operator maintenance on vehicle automotive and communications systems. When required, the driver will perform duties of an assistant gunner by aiding the gunner in the preparation and loading of ammunition.

STINGER TEAM

The two-man Stinger team consists of a team chief and a gunner. The team chief is responsible for Stinger employment, target identification and engagement, and Stinger maintenance.

The gunner is responsible for assisting the team chief in the operation and maintenance of the Stinger. He must be prepared to assume all the duties and responsibilities of the team chief. The Stinger team

may assist the Bradley crew in uploading 25-mm ammunition.

BSFV CHARACTERISTICS AND CAPABILITIES

The BSFV tremendously enhances air defense protection in the forward area of the battlefield. This section addresses the weapon system features which are responsible for the increased firepower, mobility, and survivability of air defense artillery fire units. Target engagement and weapon characteristics and capabilities are addressed in Appendix L of this manual.

FIREPOWER

Although the primary weapon system on the BSFV is the Stinger missile, other firepower systems provide target engagement alternatives. The weapons are characterized as dismounted and mounted systems.

Dismounted Weapons

The Stinger is the primary air defense weapon in the BSFV. The Stinger team maintains a basic load of two weapon-rounds and four missile-rounds. See Stinger Technical Data and BSFV Stinger Storage illustrations.

STINGER TECHNICAL DATA

Maximum effective range	4,000 meters
Weight	34.9 pounds
Length	58 inches
Backblast clearance	
Personnel	50 meters
Equipment	5 meters

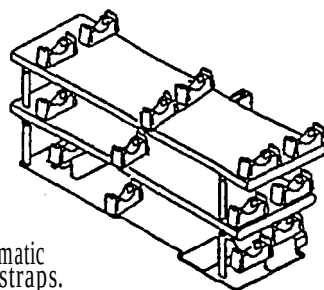
Mounted Weapons

The BSFV has three mounted weapon systems that support the surface-to-surface and surface-to-air mission. The following paragraphs explain each system's capabilities.

25-mm automatic gun. The BSFV has a 25-mm fully automatic gun. The dual-feed weapon system allows the crew to select two types of ammunition: Armor-piercing discarding sabot-tracer (APDS-T) and high-explosive incendiary tracer (HEI-T). See the BSFV 25-mm chain gun basic load illustration.

BSFV STINGER STORAGE

SIX STINGER MISSILES
(2 weapon-rounds and
4 missile-rounds)



Hinged racks with automatic
up-lock, quick-release straps.

BSFV 25-MM CHAIN GUN BASIC LOAD

	TOTAL		
SYSTEM	QUANTITY	APDS-T	HEI-T**
M2A2	900	70 ready*	230 ready*
M3A0	450	140 stowed	460 stowed
		30 stowed	120 stowed

* Ready canister capacity, regardless of vehicle model.

** The APDS-T has a higher probability of hit than HEI-T. However, HEI-T has a higher probability of kill at ranges beyond 1,700 meters. Even though APDS-T is more accurate, HEI-T will reduce the likelihood of fratricide if target is missed.

Tube-launched, optically tracked, wire-guided (TOW missile system.) The TOW is a command-guided surface attack weapon that can destroy stationary and slow-moving aerial targets as well as armored vehicles. It may also be used against fortified bunkers, gun emplacements, and other protected positions.

M240C 7.62-mm coaxial machine gun (coax). The coaxial machine gun is a belt-fed, gas-operated, fully automatic weapon which can be used against unmanned aerodynamic vehicles (UAVs), fixed- and

rotary-wing aircraft, dismounted infantry, crew-served weapons, and unarmored vehicles.

MOBILITY

The BSFV has acceleration and speed far superior to the APC. Its mobility, survivability, and maneuverability is commensurate with that of the supported force. Its cross-country speed is 48 kilometers per hour, and its cruising range is 480 kilometers. Fuel capacity is 175 gallons. The BSFV is powered by a 600-horsepower (M2A2) turbocharged diesel engine. Power train efficiency is derived from a hydromechanical transmission. The suspension system has 14 inches of vertical wheel travel and high-performance shock absorbers. The following illustration contains additional details.

BSFV CHARACTERISTICS

Combat weight	23.5 tons
Height	116 inches
Width	128 inches
Ground clearance	18 inches
Acceleration (0 to 20 MPH)	7.7 seconds
Road speed	40 MPH (66 KPH)
Cross-county speed	30 MPH (48 KPH)
Cruising speed	480 kilometers
Vertical obstacle	36 inches
Trench	100 inches
Fording depth	3.5 feet

ADDITIONAL CAPABILITIES AND CHARACTERISTICS

The BSFV has additional capabilities and characteristics common to the Bradley family of vehicles. Some of the more important capabilities and characteristics are discussed in the following paragraphs.

Armor Protection

Through the use of special armor plate materials, surface slope, and a unique laminate armor system, the BSFV has maximum armor protection for its weight. The BSFV can withstand projectiles up to and including 14.5-mm on all sides on the M3A0 and 30-mm on the M2A2. The BSFV cannot withstand fire from anti-armor weapons, but skillful application of the vehicle's mobility and suppressive firepower can decrease its vulnerability.

Smoke Capability

The BSFV has two onboard smoke systems. The first, a smokescreen generator, creates a dense smoke cloud by introducing diesel fuel into the engine exhaust system. It is not effective if the vehicle is fueled with JP3 or JP8. The BSFV also has two smoke-grenade launchers (eight tubes) mounted on the front of the turret, four per side. They are fired simultaneously and produce a dense cloud of smoke. The launchers must be reloaded from the outside of the vehicle.

Under certain circumstances, smoke obscurants may be effective as a defense against attacking rotary- and fixed-wing aircraft. They can be used for obscuring the vehicle from air or ground-launched optical-guided missiles. The use of onboard smoke may give away the user's vehicle position as well as obstruct aerial target acquisition.

Water-Crossing Capability

The BSFV can ford up to 3.5 feet of water. With its water barrier erected, the BSFV can swim water obstacles with currents up to 6.4 kilometers or 4 miles per hour. Maximum speed is 7.25 miles per hour while swimming. Erection of the swim barrier takes about 25 minutes for the M2A2. The BSFV requires an exit bank slope not greater than 17 percent and can fire both its 25-mm automatic gun and 7.62-mm systems while swimming, though care must be taken not to hit the trim vane or water barrier. The 25-mm automatic gun may be fired in any direction while swimming however, traversing the turret may upset the balance of the vehicle.

Operations During Limited Visibility

The BSFV is capable of operating in limited visibility. Operation of the weapons and the vehicle are aided by special sights and viewers.

Integrated sight unit. The ISU is the primary sighting system for mounted weapon systems on the BSFV. Using the integrated sight unit in the thermal mode, the BSFV commander and gunner can detect and engage targets during limited visibility, day or night. The day sight has normal optics. The night sight uses thermal imagery which enables the gunner to "see" through most limited-visibility conditions, including darkness, smoke, light foliage, camouflage, light fog, snow, and mist. Thermal sights normally remain on during combat operations.

Driver's night sight. The driver uses the driver's night viewer during periods of darkness. This viewer is an image intensification device that allows the driver to see to his front. The driver can also use the viewer to assist the BSFV commander and gunner in sensing

rounds fired to the front from the turret weapons. The viewer is prone to “white out” (fade out) if bright light shines directly at the vehicle. When installed, the viewer obscures the speedometer or odometer. It may be battery powered or run directly off the vehicle.

Night vision goggles. The BSFV commander can assist in the control of the vehicle’s night movement while wearing the AN/PVS-7 night vision goggles.

Communications

The BSFV’s communications system provides for control of mounted and dismounted operations. All five Bradleys in the platoon, objectively, will have digital and FM communications capability. Digital communications is the primary means for communications, with FM as the alternate. The BSFV platoon must also be proficient in the use of visual communications. However, the effectiveness of visual communications may be reduced by battlefield obscurant and limited visibility.

COMMAND, CONTROL, AND COMMUNICATIONS

This chapter discusses command and control techniques and communications requirements for the successful integration of the BSFV platoon with its supported force.

Command is the authority vested in an individual of the armed forces for the direction, coordination, and control of military forces. Control is the authority, which may be less than full command, exercised by a commander over part of the activities of subordinate or other organizations. The platoon leader commands the BSFV platoon, aided by the platoon sergeant. Effective platoon command and control is mainly dependent on leadership, training, standing operating procedures (SOPs), drills, and the effective use of control procedures and communications techniques.

COMMAND

For forces to properly task-organize to accomplish varying missions, command and support relationships have been established to define relationships between supporting and supported forces on the battlefield. This section describes the relationships between supported and supporting units.

COMMAND RELATIONSHIPS

Command relationships define the specifics of command and control and support between supported and supporting forces. Command responsibility and authority vary depending on the type of command relationships between units and elements. The four types of command relationships that will be used by the BSFV platoon are organic, assigned, attached, and operational control (OPCON).

Organic

A unit is organic when it forms an essential part of a larger unit and is listed in the larger unit's TOE. For example, a BSFV platoon is organic to a BSFV battery.

Assigned

Assigned units are those units placed in an organization on a permanent basis. Assigned units are controlled and administered by the organization to which they are assigned. For example, an air defense artillery battalion is assigned to a division.

Attached

Attachment places a unit in an organization on a temporary basis. Attached units are subject to

limitations specified in the attachment order. The attachment order should state clearly the administrative and support responsibility of the gaining unit to the attached unit and any limitations. The commander of the formation, unit, or organization receiving the attachment will exercise the same degree of command and control as he does over units organic to his command. When a unit is attached, the supported force normally provides administrative and logistical support to the attached unit. However, the responsibility for transfer and promotion of personnel will normally be retained by the parent formation, unit, or organization. For example, a BSFV platoon from one battery in the air defense battalion may become attached to another battery in the same battalion.

Operational Control

OPCON is a relationship in which a unit is provided to the commander of another unit to accomplish specific missions or tasks which are usually limited by function, time, or location. OPCON is normally assigned when the parent unit cannot exercise effective command and control. Units placed in an OPCON relationship do not normally receive

CONTENTS

	Page
Command	2-1
Control	2-9
Communications	2-16

administrative or logistical support, unless specified in the operation order directing their OPCON status. An example of OPCON is a BSFV platoon placed OPCON to a mechanized task force for an offensive mission.

SUPPORT RELATIONSHIPS

Support relationships define specific arrangements and responsibilities between supporting and supported units. The four support relationships are direct support, general support, reinforcing, and general support-reinforcing.

Direct Support (DS)

In direct support, the supporting unit provides dedicated support to a specific unit. A DS ADA unit provides dedicated air defense for a specific element of the force which has no organic air defense. The supporting ADA unit coordinates its movement and positioning with the supported unit. A BSFV platoon, for example, may provide direct support to a mechanized task force. The platoon will provide dedicated support to the task force and the platoon leader will position the platoon in conjunction with the task force commander's concept of the operation.

General Support (GS)

An ADA unit in general support provides support for the force as a whole. It is not committed to any specific element of the supported force. It does not support a specific unit within the larger unit's area of operations. An ADA unit in general support remains under the control of its higher ADA commander and is positioned by its ADA commander. GS is commonly used to protect corps or division level assets and is not normally a support relationship used by BSFV platoons.

Reinforcing (R)

A reinforcing ADA unit augments the support of another ADA unit or strengthens the air defense of the force. A reinforcing ADA unit is positioned to protect one or more of the reinforced unit's priorities as specified by the supported ADA unit commander. For example, a BSFV platoon could reinforce the ADA battery which is in direct support of a maneuver brigade conducting the division main attack. This support relationship is not normally used by BSFV platoons.

General Support-Reinforcing (GS-R)

An ADA unit with a general support-reinforcing mission provides support for the force as a whole and augments the support provided by another ADA unit. ADA units with a GS-R mission still have a

responsibility to provide support to units or assets within a specific area, but must coordinate with the supported ADA unit to reinforce the coverage of assets in the area of operations. BSFV platoons are not normally assigned a GS-R mission.

SUPPORT RELATIONSHIP SELECTING

The ADA Support Relationships illustration, on page 2-3, shows responsibilities associated with each ADA relationship. To determine the most appropriate support relationship for accomplishing the ADA mission, the following questions need to be answered:

- Who establishes ADA priorities?
- Who positions ADA fire units?
- Who coordinates terrain on which ADA will position fire units?
- With whom should liaison be established?
- With whom should communications be established?

STAFF COORDINATION

It is imperative that the platoon leader maintain coordination with the supported unit's staff throughout the planning process. Examples of information coordinated with the supported task force are listed below and in the Supported Force/ADA Platoon Leader Responsibilities illustration on page 2-4.

S1 Section

The platoon leader will give the S1 a battle roster of authorized and on-hand personnel by military occupational specialty (MOS) and grade. He must also coordinate to integrate platoon casualty evacuation into the task force (TF) plan. Routine personnel reports required by the supported unit, such as personnel status reports, must be submitted as specified in the supported unit's tactical SOP (TACSOP).

S2 Section

The platoon leader assists the task force S2 in the development of the air intelligence preparation of the battlefield (IPB). The platoon leader must pay particular attention to enemy air avenues that can influence the supported force's area of operations. Enemy air avenues and corresponding air named areas of interest (NAIs) must be depicted on the task force intelligence overlay. Time permitting, the battery commander should provide this information to the platoon leader.

S3 Section

The platoon leader recommends ADA priorities to the supported commander and helps the S3

ADA SUPPORT RELATIONSHIPS

QUESTION	DIRECT SUPPORT	GENERAL SUPPORT	REINFORCING	GENERAL SUPPORT- REINFORCING
Who establishes ADA priorities?	The supported commander.	The ADA commander assigning relationship, based on the supported commander's priorities.	The supported commander through the reinforced ADA commander.	(1) The ADA commander assigning relationship, based on the supported commander's priorities. (2) The supported commander through the reinforced ADA commander.
Who positions ADA fire units?	ADA fire unit commanders with approval of the ground commander.	ADA fire unit commanders in coordination with local ground commander.	ADA fire unit with approval of the reinforced ADA commander and local ground	The ADA fire unit commanders in coordination with the local ground commander and reinforced ADA commander.
Who coordinates terrain on which ADA units will position fire units?	The DS ADA commander (approved by the supported commander).	The commander assigning the support relationship.	The reinforced ADA commander with the supported commander.	The commander assigning the mission with the supported commander and reinforced ADA commander.
With whom should liaison be established?	Supported unit.	As required.	As required, but including the reinforced ADA commander.	As required, but including the reinforced ADA commander.
With whom should communications be established?	Supported unit.	As required.	As required, but including the reinforced ADA commander.	As required, but including the reinforced ADA commander.

Notes:

1. The term "positions" specifies the selection of the exact placement of individual fire units within the operating area.
 2. A unit supporting another unit is responsible for establishing communications with the supported unit.
-

integrate air defense into the task force scheme of maneuver. During the planning process, the platoon leader or designated LNO (PSG or section sergeant) will assist in development of any graphics dealing with his platoon's scheme of maneuver. The platoon leader will receive a copy of the supported force's final operational graphics with the operation order

(OPORD). These graphics must be disseminated to the platoon sergeant and squad leaders.

S4 Section

While the platoon sergeant executes logistics for the platoon, the platoon leader must conduct initial coordination with the supported force. The PSG will

SUPPORTED FORCE/ADA PLATOON LEADER RESPONSIBILITIES

STAFF AGENCY	SUPPORTED FORCE DETERMINES...	ADA PLATOON LEADER ASSISTS AND COORDINATES WITH...
S2	Ground Operations Enemy Regiments Main Objective Enemy Follow-On Forces Enemy Artillery Locations Avenues of Approach	Input to Air IPB Input on Enemy Air Capabilities, Operations, and Objectives
S3	Intent Scheme of Maneuver Terrain Management Army Aviation Plan TOC/TAC LOC/Operations Mission Changes Dissemination of EW TF/TM Graphics Combined Arms AD Operations ADA Priorities Approval Passive Air Defense	ID Priorities Over Time A ² C ² Plan Coord With Other ADA Redundant EW Plan ADA Execution Matrix Command/Support Relationship ADA Force Allocation ADA Movement Plan Synch of ADA With Supported Force Scheme of Maneuver Advice to Commander on Passive AD
FSO	Fire Support Plan/FASCAM	Attack on Enemy FAAS/FACS FA Call for Fire/TRPs Input to Fire Support Plan
S1	Casualty Evacuation Plan	Provide Battle Roster Integrate Into Evacuation Plan
S4	Combat/Field Train LOC MSRs/Movement Priorities LOGPAC/Plan Availability of Resources	ADA Logistical Plan Recovery ADA Peculiar Items
ENGR	Obstacle Plan Routes Survivability Priorities	Survivability Mobility Obstacle Plan
NBCO	MOPP Level Decontamination Sites Contaminated Areas Downwind Messages	
CESO	Frequencies/Call Signs Radio Maintenance Plan Sensor Connection	

conduct additional coordination with the supported force S4 or support platoon leader, as well as the ADA battery first sergeant. The platoon sergeant may contact the supported force on its administrative/logistics (ADMIN/LOG) radio net to conduct routine functions and submit reports required by the supported force SOPs. More information on logistics is contained in Chapter 7.

Engineer

Once the supported unit obstacle plan and engineer priorities for support have been specified, the BSFV platoon leader will coordinate with the supported force engineer. If the BSFV platoon is scheduled to receive engineer support for the mission, direct coordination with the supported force engineer is required to coordinate specific vehicle location requirements.

Fire Support Officer

The platoon leader's coordination with the fire support officer (FSO) may include the following type and location of targets and target reference points (TRPs), Army Airspace Command and Control (A²C²) information, and current fire support information. Full integration with the fire support scheme of maneuver is imperative for mission accomplishment.

COMBAT ORDERS

Combat orders are the tools with which leaders and staffs transmit battle plans to subordinate units. The Army has developed standard combat order formats; however, units often modify or augment basic combat order formats to meet their specific needs.

Combat arms platoon leaders may issue orders either verbally or in writing, depending on time available. Optimally, combat orders should reference unit SOPs to enhance brevity and clarity.

BSFV platoons will use a combination of combat order formats. In addition to the orders format used by the parent air defense artillery battery, the platoon leader must use the supported unit's orders format. This section will list the most frequently used combat orders and describe the basic information included in each.

Warning Order

Warning orders notify subordinate units of future missions. Normally, warning orders include an anticipated upcoming mission statement, any changes to task organization, any movement instructions to position units for the upcoming mission, a general description of the area of operations, an intelligence update, and

time and location for issue of the operation order. The warning order should be brief. It may be disseminated via radio or messenger. A sample warning order is in Appendix A.

Operation Order

An OPORD is a complete order issued to units prior to a specific mission or a series of missions. It follows the format topics listed below

- Situation.
- Mission.
- Execution.
- Service Support.
- Command and Signal.

OPORD formats are frequently modified by units to meet their specific needs while adhering to the standard five-paragraph format. OPORD will contain annexes for each paragraph to more completely describe the actions and events.

BSFV platoon leaders will write the air defense annex to the supported unit's OPORD. Depending on the parent air defense artillery battery and supported unit SOPs, the air defense annex may be written fully or in matrix format. An example of an air defense annex is in Appendix A.

Fragmentary Order

A fragmentary order (FRAGO) is an abbreviated form of an OPORD. A FRAGO is used to update existing OPORDs. Examples of information contained in FRAGOs are changes in enemy situation, friendly task organization, mission, graphic control measures, commander's intent, and scheme of maneuver. During extended operations, units will publish an initial OPORD and update it with FRAGOs for each follow-on mission. Like warning orders, FRAGOs are usually brief oral or written messages. An example of a FRAGO is in Appendix A.

PLATOON TROOP-LEADING PROCEDURES

Upon receipt of an order, combat arms platoon leaders must begin their own planning process. Troop-leading procedures are designed to focus the leader's effort, given the time available, on preparations for the ensuing mission.

BSFV platoon leaders must understand the steps of troop-leading procedures and practice them to implement them efficiently for each mission. This section addresses standard troop-leading procedures and how each step applies to the BSFV platoon leader.

Step One—Receive the Mission

Upon mission receipt, the platoon leader must conduct an initial mission analysis as well as begin to prepare the platoon for its next mission. The ADA mission, as well as the task force mission, must be considered. For timely mission analysis of both air defense and task force requirements, the platoon leader will enhance the efficiency of the planning process by considering the following:

- What is the restated mission (task and purpose)?
- Who is the enemy (unit, size, and type)?
- Where is the area of operations (is movement required; when must it start)?
- Who is attached? What are the detachments and when are they gained or lost?
- What is the available time (time for further planning, when to issue the warning order, FRAGO or OPORD)?

Step Two—Issue a Warning Order

The platoon leader issues a warning order to the platoon upon receipt of a warning order from higher headquarters. The warning order is refined upon receipt of the OPORD or FRAGO. The platoon leader informs the platoon of upcoming mission information, initial preparations that must be made, when and where a detailed OPORD will be issued, and any other information that he can give the platoon to aid in its preparations.

Step Three – Make a Tentative Plan

The platoon leader begins planning by reviewing the information gleaned during mission analysis. Backward planning, based on the analysis of available time, must be conducted. The initial timeline must be disseminated to the platoon as soon as possible and be updated as necessary (see the Backward Planning Checklist in Appendix D). The result of backward planning will result in a timeline that may include the following events:

- Mission execution time (line of departure or defend no later than time).
- OPORD issue time.
- Movement time between positions.
- Emplacement time.

Depending on the command and support relationship, the BSFV platoon leader may or may not receive an AD plan from his battery commander. If he does, this plan may be given by the battery commander via

various means (radio, facsimile (FAX), and so forth) due to battery dispersion and time available. This plan may be general, depending on information available. The AD plan will normally include the air defense artillery task organization, current situation, battery mission, supported unit commander's intent, and scheme of maneuver for the supported unit.

Based on the command and support relationship, the BSFV platoon leader will conduct parallel planning with the supported unit's staff. This occurs during the staff planning process. The BSFV platoon leader, as the senior air defender of the supported force, is the commander of the BSFV platoon, supported force commander's air defense advisor, as well as the staff air defense officer. Integration with the supported force staff during the planning process and an understanding of the planning process used by the supported force are imperative for proper mission planning. The BSFV platoon leader must align his air defense plan and his plan for positioning of his fire units with the phases specified in the supported force's scheme of maneuver.

During the planning process, the platoon leader must ensure that any additions or changes to mission-specific information are immediately disseminated to the platoon (that is, linkup time and location with subordinate units, current task force/company team locations, changes to task organization, and so forth).

The AD plan will continue to be adjusted based on the maneuver plan. Each task force will receive the brigade order containing the completed ADA annex. The BSFV platoon leader must review the ADA annex in the brigade operation order. This written annex contains the AD plan that will provide the BSFV platoon leader information on the following:

- Ground and air IPB.
- The sensor plan.
- Enemy aviation command and control (C³) facilities targeted by the division.
- Locations where the platoons may be employed.
- The A²C² plan.
- The logistics plan.

The platoon leader should have sufficient information from the battery AD plan to synchronize his air defense plan with the supported task force scheme of maneuver. He must also consider the following information: mission, commander's intent, and RISTA threat.

Leaders must follow a logical process when analyzing the mission requirements. The commander's estimate of the situation includes an analysis of mission, enemy, terrain, troops, and time available (METT-T). The platoon must be aware of the factors of METT-T and how they apply at platoon level. METT-T must be applied during mission analysis for both air defense requirements and the ground scheme of maneuver. Following are examples of questions that may be considered during mission analysis:

- What is the mission? What are the specified and implied tasks? What is the commander's intent? If the BSFV platoon is direct support to a task force, the BSFV platoon leader must conduct mission analysis for both the AD mission and the supported task force mission.

- Where is the enemy, and what is its strength? What is the enemy air threat? What weapons does it have that can affect the supported force? What can it do in response to the platoon's actions? What are its weaknesses and how can the platoon exploit them? The BSFV platoon leader must consider the ground threat as well as the enemy air threat.

- What is the impact of terrain and weather on both air and ground operations? Observation and fields of fire, cover and concealment, obstacles, key terrain, and avenues of approach (OCOKA) should also be considered.

- What are the conditions of personnel and vehicles? What is the status of ammunition, fuel, and supplies? Who is best able to do a specific task? What is the crew endurance (rest) plan? What other assets are available to support the mission? What are the other ADA platoons in the supported force doing? Who and where are the adjacent ADA units?

- How much time is available for planning and mission preparation prior to mission execution? How long will it take to position assets and prepare positions if necessary? When can the platoon rehearse? The platoon leader should adhere to the 1/3- 2/3 planning rule and take no more than 1/3 of the time allocated to prepare his order and disseminate the order to his platoon, allowing 2/3 of the time available for squad planning and preparation. It is imperative that BSFV platoon leaders do not spend so much time producing the platoon operations order and ADA annex that task force directed preparation tasks are overlooked. Responsibilities for some preparation tasks may be delegated to the platoon sergeant or squad leaders (pre-combat inspections,

leader's recons, and linkup operations).

Once the timeline is complete, the platoon leader will begin to plan his concept for air defense coverage based on higher headquarters plans. At the same time, he will begin to plan his platoon's ground scheme of maneuver based on the supported force's ground scheme of maneuver. To begin planning, the platoon leader must have an understanding of enemy air and ground avenues of approach, the supported force mission and scheme of maneuver, and the supported force commander's intent.

When developing the plan for air defense coverage of any supported force, the platoon leader must consider the six air defense artillery employment guidelines. These guidelines aid air defenders at all levels when planning for air defense coverage.

Early engagement. Fire units must be positioned so they are capable of engaging enemy air platforms before they can release their ordnance on, or gain intelligence about, friendly forces. With the mobility provided by the BSFV, fire units should be located well forward and integrated into the supported task force scheme of maneuver. In the less likely mission of defending a static asset, fire units should be positioned forward of the supported force along likely enemy air avenues of approach.

Weighted coverage. Once the supported force commander designates his main effort, BSFV fire units should be positioned along the most likely air avenues of approach to support the commander's main effort. This massing of firepower increases the BSFV platoon's probability of killing enemy air targets. It is extremely important that a detailed, in-depth air IPB be developed prior to deciding where to establish weight coverage of air defense assets. Air defense will focus its effort on the most likely avenues of approach along the supported force commander's designated main effort.

Depth. Depth is achieved by positioning fire units so threat air platforms encounter a continuous volume of fire as they approach the protected force and or asset. The BSFV platoon leader achieves depth by positioning his assets so that they can provide continuous fires along enemy air avenues, destroying the enemy as it advances toward the protected force and or asset. Depth is maximized through the integration of all air defense weapons used in the defense. Additional air defense assets on the battlefield such as Stinger teams, Avenger fire units, HIMAD assets, and combined arms

air defense efforts from ground forces contribute to the creation of depth on the battlefield.

Balanced fires. Balanced fires are created by positioning air defense weapons to distribute fires equally in all directions. Except for the mission of defense of a static asset, where no clear avenues of approach are identified, this guideline will seldom be employed. As an example, on a flat, open battlefield, characteristic of a desert environment, no specific air corridors exist. In this scenario, planning for balanced fires may be viable.

Mutual support. Mutual support is achieved by positioning weapons to complement fires from adjacent fire units, thus preventing the enemy from attacking one position without being subjected to fire from one or more adjacent positions. Mutual support will enhance volume of fire as well as cover dead space of adjacent units. The planning range for mutual support for Stinger systems is approximately 2,000 meters.

Overlapping fires. Fire units should be positioned so engagement envelopes overlap. In many instances because of terrain limitations, the size of the area to be covered, or a scarcity of available Stinger systems, the air defense planner should attempt to enhance the AD protection of the force and or asset by ensuring engagement envelopes overlap. The planning range for overlapping fires for Stinger systems is approximately 4,000 meters.

In developing the plan, the BSFV platoon leader will incorporate a mix of guidelines in his coverage plan, according to the mission, availability, limitations, and survivability of ADA assets; the tactical situation; and the threat. Integrating all guidelines into the plan will seldom be possible or desirable. The most important guidelines for the BSFV platoon leader to consider normally include early engagement, weighted coverage, and depth.

Planning guidelines for developing the platoon's ground scheme of maneuver will incorporate those topics considered in developing the air defense coverage plan. The platoon leader will consider METT-T and OCOKA in development of his plan.

The platoon leader will determine the best positions for both himself and the platoon sergeant based on the following:

- Platoon task organization.
- Location of the supported force command post.
- Platoon dispersion.
- Routes between locations.
- Survivability of locations.

- Communications with air defense network.

Initial positions for individual BSFVs will be determined by considering—

- Maximum observation and fields of fire on high ground over probable air avenues of approach.
- Depth.
- Communications with platoon leader, platoon sergeant, adjacent squads, crews, and sensors.
- Routes to and from positions.
- Protection against ground attack.

Platoon leaders must coordinate fire unit positions with the supported force. Sensors may be attached to the platoon. If so, platoon leaders must also coordinate sensor positions. Sensor positions should be selected based on their ability to effectively provide early warning (EW) to the unit. The platoon leader informs the battery commander of the tentative plan, then updates as necessary.

Step Four—Initiate Necessary Movement

Movement should begin as soon as possible following receipt of the warning order. Often, movement will occur simultaneously with the initiation of the planning process. Normally, the platoon leader reports to the supported TF tactical operations center (TOC) and begins the planning process with the TF staff. The platoon sergeant conducts resupply operations for the platoon and the initial coordination for linkup with the supported force. The platoon should be positioned to ease support of the upcoming mission.

Step Five—Conduct Reconnaissance

If possible, a ground reconnaissance of the area in which the supported force will fight must be made. This is often possible for defensive operations but harder to accomplish for offensive operations. Reconnaissance of the ground on which the platoon will fight will confirm or deny the tentative plan. For the BSFV platoon leader in support of a maneuver task force, reconnaissance efforts will normally be completed in conjunction with the task force reconnaissance. At least, a map reconnaissance of the area in which the supported force will fight must be made.

Step Six—Complete the Plan

Based on the reconnaissance, the plan will be adjusted and detail normally will be added. The air defense annex to the supported force OPORD will be

completed, and the platoon OPORD will be finalized.

Step Seven—Issue the Operation Order

Orders may be issued verbally or in writing. When issuing orders, leaders must ensure that each soldier knows how the mission is to be accomplished and how he fits into the plan. Squad leaders should provide the platoon leader with a backbrief to ensure squad leaders fully understand the mission and their required tasks. Include orientation on terrain if possible. Sand tables and terrain models are effective tools to use if time is available for their construction.

Step Eight—Rehearse, Execute, and Supervise

Rehearsals should be conducted prior to each mission. They can be conducted on the ground, over the radio, or on sand tables or terrain boards. Time permitting, all personnel in the platoon should attend the rehearsals; often, only the platoon leader, platoon sergeant, and squad leaders will attend platoon rehearsals. The platoon's execution matrix is the script for the rehearsals. The platoon must leave the rehears-

al with a clear understanding of its mission and where it fits into the supported force scheme of maneuver.

The BSFV platoon leader is an important attendee at the supported force rehearsals. He will explain the air defense plan to support the scheme of maneuver for each phase of the operation and describe its integration into the supported force scheme of maneuver. Final coordination with the supported force staff may occur at the rehearsal. ADA integration in the planning, preparation, and execution phases of the mission is critical. Usually integration will occur concurrently at respective levels within the supported force. See the ADA Planning Process illustration.

Supervision and execution will fall into place if a solid plan has been developed. The platoon leader must ensure vehicles are in correct positions, radio nets are monitored, and the platoon is ready to execute according to its matrix. Experience will enable the platoon leader to make decisions during execution, based on changing enemy actions and modifications to the supported force scheme of maneuver.

CONTROL

Combat units at all levels are controlled on the battlefield through two major control methods: positive and procedural. This section will discuss the various types of positive and procedural control measures the BSFV platoon uses to accomplish its mission.

POSITIVE CONTROL MEASURES

Positive control measures are normally developed through use of existing equipment and systems. Air defense positive control measures include the identification, friend or foe (IFF) system and early warning systems and sensors.

Early Warning and Sensors

Early warning sensors are an air defense unit's primary resource for locating aerial targets. Early warning sensors are employed to observe aerial NAs and decision points (DPs). The sensors report aerial target information on the early warning (EW) net.

Early warning gives the initiative to the air defender. Accurate and timely early warning allows the BSFV to attack the aerial threat and also assist the maneuver commander in protecting his forces. There are numerous methods used to pass early warning information. Early warning dissemination requires careful coordination to ensure that the information gets to those who

need it at the proper place and time and in the proper terminology. Maneuver units must disseminate applicable early warning to subordinate maneuver elements.

Directed Early Warning

Directed early warning must be quick, simple, and redundant in nature. It is imperative that all units, including the supported force, receive early warning. It is especially important that units with no air defense assets receive all early warning. It states whether the aerial targets are friendly or unknown, provides a cardinal direction, and if known, identifies the most likely affected asset(s) within the supported force. For example, if an early warning source reports four enemy Hinds inbound from the east, and 1st Brigade is attacking along the eastern axis, the BSFV platoon leader should transmit a local air defense warning (LADW) message over both the maneuver force command net and the platoon net: "Dynamite! Dynamite! Hinds from the east against Axis Blue!" Dynamite is the LADW that alerts the maneuver force of an attack; the response, according to the local SOP should be immediate.

PROCEDURAL CONTROL MEASURES

Procedural control measures are control measures developed through established rules and

ADA PLANNING PROCESS

BRIGADE	ADA BATTERY	TASK FORCE	ADA PLATOON
New Mission			
WARNO	WARNO	WARNO	WARNO
Staff Estimates	Gather Information Recommend COA Allocate ADA	Move Prepare for Future Operations	Linkup With TF
Decide on COA	Issue DST/DSM to Platoons	Begin Planning Process Leader Recon -Intent -TASKO	Conduct Planning With Supported Force -Aerial IPB -Supported Force Mission -Supported Force Scheme of Maneuver -Supported Force Commander's Intent -AD Concept -A ² C ² Information -Concept for Logistics support -Recommend AD Priorities -Complete AD Annex
Rehearse	Rehearse With Brigade	Staff Estimates	
		TF COA Decision	
		OPORD Brief	
		TF Rehearsal	
		Battery Rehearsal	Conduct Platoon Rehearsal Execute DSM
	Refine DST Execute DSM		Execute TF Execution Matrix

standing operating procedures. Procedural control relies upon techniques such as segmenting airspace by volume and time and using weapon control statuses. Procedural techniques are usually more restrictive than positive techniques but are less vulnerable to degradation from electronic or physical attack.

Air Defense Warnings

Air defense warnings (ADWs) are established by the corps or area air defense commander. Authority to declare ADWs may be delegated to corps commanders. In no case can the platoon ADW be of a lower level than the overall ADW issued by higher authority however, the platoon's ADW can be higher. When received, ADWs apply to the entire force or a specific area and must be disseminated to every soldier within the force. At the brigade level and below, air defense warnings are disseminated over redundant nets along with LADWs. See the following illustration.

ADWs

ADW Red	Attack or surveillance by hostile aerial targets or missiles is <i>imminent or in progress</i> . This means that hostile aerial targets or missiles are within a respective area of operations or in the immediate vicinity of a respective area of operations with high probability of entry.
ADW Yellow	Attack or surveillance by hostile aerial targets or missiles is <i>probable</i> . This means that hostile aerial targets or missiles are en route toward a respective area of operations, or unknown aerial targets or missiles suspected to be hostile are en route towards or are within a respective area of operations.
ADW White	Attack or surveillance by hostile aerial targets or missiles is <i>improbable</i> .

Local Air Defense Warning

Local air defense warning is designed to alert a particular unit, several units, or an area of the battlefield. LADW parallels ADWs and reflects the local aerial threat. It should be incorporated into SOPs which explain what response is desired by the supported force. For example, when Dynamite

precedes ADW red, the affected force may stop to increase passive air defense and engage with a combined arms response. The response desired by the affected force is METT-T dependent. See the Local Air Defense Warnings illustration.

LADWs

LADW Dynamite	Aerial platforms are inbound or are attacking now.
LADW Lookout	Aerial platforms are in the area of interest but are not inbound, or are inbound but there is time to react.
LADW Snowman	No aerial platforms pose a threat at this time.

Fire Control Orders

Fire control orders are commands used to control engagements on an individual basis, regardless of the prevailing weapon control status (WCS). For the BSFV platoon, fire control orders are normally issued by the immediate ADA commander (squad leader). The squad leader initiates orders for fire control purposes and for ensuring safety. Fire control orders are—

- Cease Fire: Gunner does not fire--continues to track.
- Hold Fire: Gunner ceases all tactical action, to include tracking (resume search of assigned sector).
- Engage: Gunner fires.
- Cease Engagement: Gunner changes an on-going engagement from one target to another of higher priority. This order accompanies direction to engage new target.

Rules of Engagement

Rules of engagement (ROE) are used to control fires to protect friendly forces and to maintain the needed level of defense. The ROE tell the BSFV squad what, when, and where they may shoot. There are three primary ROE which are applicable to the BSFV.

Right of self defense. Right of self-defense is never denied. The ADA fire unit always has the right to defend itself or its protected asset.

Hostile criteria. ADA squad leaders have both identification and engagement authority. The exact criteria enabling the fire unit to declare a target hostile may vary with the tactical situation. Hostile criteria may include —

- Attacking friendly elements.
- Violating airspace control measures.
- Being visually identified as hostile.
- Responding improperly or not at all to IFF interrogation.

BSFV crews must visually identify aerial targets prior to engagement. The BSFV squad leader has engagement authority. The target must satisfy one or more of the theater hostile criteria.

Weapon control status. Weapon control status (WCS) describes the degree of control for air defense fires. WCS applies 10 weapon systems, volumes of airspace, and types of aerial threats. The degree or extent of control varies depending on the tactical situation. The corps commander usually has WCS authority for rotary-wing aerial threats. ADA forces must have the ability to receive and disseminate WCS. WCSs are—

- WEAPONS FREE-Fire at any aerial threat not positively identified as friendly. This is the least restrictive status.
- WEAPONS TIGHT-Fire only at aerial threats positively identified as hostile.
- WEAPONS HOLD-Do not fire except in self-defense. The term self-defense includes defense of the fire unit, supported unit, and protected asset. This is the most restrictive status.

Autonomous operations. Autonomous operations are implemented when communications with the battery or higher controlling headquarters are lost for any reason. The platoon or squad leader must take immediate action to reestablish communications. Specific actions will be listed in the battery SOP. If communications are lost, the WCS will remain the same. If a time limit is placed on the weapon control status, the fire unit will maintain that status until this time limit expires and then revert to WEAPONS TIGHT. If the fire unit is in a WEAPONS HOLD status and a time limit was not established, it will maintain that status for 30 minutes and then revert to WEAPONS TIGHT. If the fire unit is using

WEAPONS FREE and a time limit was established, the same rule applies as in WEAPONS HOLD. If no time limit was established for a fire unit using WEAPONS FREE, it will immediately revert to WEAPONS TIGHT. See the following illustration.

WEAPON CONTROL STATUS DURING AUTONOMOUS- OPERATIONS		
If WCS is...	and communications are lost and WCS has a time limit...	and communications are lost and WCS has no time limit...
WEAPONS FREE	remain at WEAPONS FREE for duration of time limit, then revert to WEAPONS TIGHT	immediately revert to WEAPONS TIGHT
WEAPONS TIGHT	remain at WEAPONS TIGHT	remain at WEAPONS TIGHT
WEAPONS HOLD	remain at WEAPONS HOLD for duration of time limit, then revert to WEAPONS TIGHT	remain at WEAPONS HOLD for 30 minutes, then reveal to WEAPONS TIGHT

AIR AND GROUND DIRECT FIRE
CONTROL MEASURES

The differences in Stinger and gun turret weapon systems and the engagement techniques used require separate control measures for each weapon system. For aerial targets, ADA fire units are assigned sectors of fire and primary target lines. These are designated by the platoon leader after a review of fire unit positions to ensure that all aerial targets threatening the protected assets can be engaged. These measures assist in the distribution of air defense fires against multiple targets threatening from different directions. Each fire unit concentrates its fires on the most threatening aerial target within its assigned sector or closest to its primary target line (PTL). The following Stinger control measures provide efficient fires and reduce the probability of simultaneous engagements from two or more systems.

Stinger Control Measures

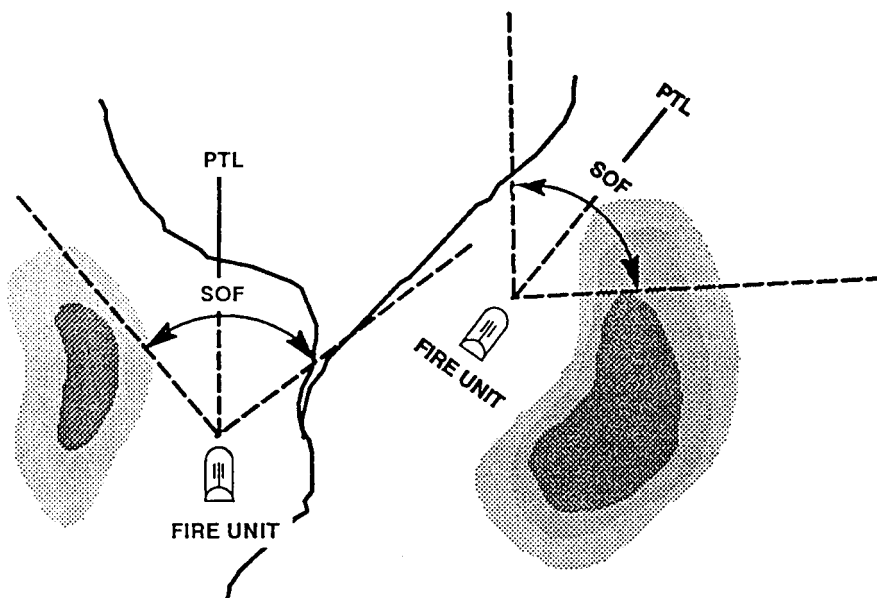
The following Stinger control measures provide efficient fires and reduce the probability of simultaneous engagements from two or more systems.

Primary target line. A PTL is an azimuth along which the gunner will focus his attention.

Sectors of fire (SOF). Sectors of fire are specified by left and right limits. A sector of fire aids target detection and identification of aerial targets. The fire unit

will focus its attention (both searching and firing) within the designated sector. See the Sector of Fire and PTL illustration.

SECTOR OF FIRE AND PTL



Selection Criteria. The assignment of a sector of fire and PTL does not restrict the Stinger team to look only in that sector. Given two targets of equal capability within the sector of fire, the target closest in range to the PTL will be engaged first. Platoon leaders will ensure assignment of PTLs and sector of fire for each system during the planning of the operation. See the Single and Multiple Targets Selection Criteria illustration on page 2-15.

Gun Turret Weapon Systems Control Measures

The 25-mm automatic gun, coaxial machine gun, and TOW control measures dictate the placement of their fires. By using the following control measures, the BSFV crew can correctly and safely engage targets.

Primary target line. PTL is an azimuth along which the gunner will focus his attention.

Sectors of fire. Sectors of fire are specified by left and right limits. A sector of fire aids target detection and identification of aerial targets. The fire unit will focus its attention within the designated sector. The BSFV should not fire outside of its sector of fire and must coordinate fires with the supported force.

ADDITIONAL CONTROL MEASURES

In addition to weapons control measures, the BSFV platoon leader must consider the control procedures associated with communications and airspace. The descriptions in the following paragraphs explain how volumes of airspace can be used.

Radio Transmissions

Radio transmissions should be brief to reduce the EW signature. Using a secure means or operational and numerical codes will also reduce the chance of enemy detection. Use low power transmissions and terrain to mask signals from enemy direction-finding equipment. Messengers or wire should be used for lengthy messages. BSFV platoons must practice the use of SOIs, SOPs, and operational terms.

Supplemental Fire Control Measures

Supplemental fire control measures (SFCMs) are procedures which delineate or modify hostile criteria, delegate identification authority, or serve strictly as aids in fire distribution or airspace control. The BSFV platoon leader must understand these procedures to

take advantage of any vertical and horizontal integration with HIMAD, aviation, or air force units. The most commonly used measures in the maneuver force area are weapon engagement zones, high-density airspace control zones (HIDACZ), and temporary airspace restrictions.

Weapon engagement zone. Weapon engagement zone (WEZ) identifies a volume of defined airspace within which a specific type of AD weapon is preferred for use in an engagement. Use of WEZ does not preclude engagement of high-priority targets by more than one type of weapon system if centralized control of each weapon system involved is available.

High-density airspace control zone. The corps commander may establish a HIDACZ with approval of the airspace control authority (ACA). A HIDACZ allows the corps commander to control the use of a particular volume of airspace. A HIDACZ also allows the controlling authority to declare WCS. An example would be if the division commander wanted to execute a joint air attack team (JAAT) mission.

Temporary airspace restrictions. Temporary airspace restrictions can be imposed on segments of airspace of defined dimensions in response to specific situations and requirements. These can include combat air patrol (CAP) operations, air refueling areas, HIDACZ, concentrated interdiction areas, and those areas which have been declared

ADA WEAPONS FREE. The promulgation of such restrictions will include—

- Identification of the airspace user being restricted.
- Period, area, altitude, and height of restriction.
- Procedures for cancellation or modification of the restriction in the event of communications loss.

Airspace Control Measures

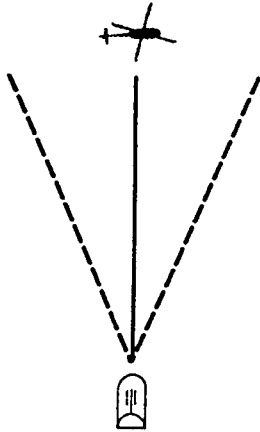
Airspace control measures afford the commander a variety of procedural methods of controlling airspace and restricting airspace users. Airspace control measures are the rules and mechanisms promulgated by joint and allied doctrine and defined by the theater airspace control plan. They are defined in general terms according to the normal usage associated with the control measure. The precise dimensions of various control measures (for example, low-level transit routes) and those techniques used in their arrangement and application are specified and defined by the theater airspace control plan and ACA directives. The following illustration explains airspace control measures available to provide procedural control for airspace users.

AIRSPACE CONTROL

MEASURE		USAGE
Corridors and routes:	Air route	NATO/ASCC
	Low-level transit route (LLTR)	NATO/ASCC
	Minimum risk route (MRR)	US
	Standard use Army aviation flight route (SAAFR)	US
	Special corridor	NATO
	Transit corridor	NATO
Zones:	Base defense zone (BDZ)	NATO
	High-density airspace control zone (HIDACZ)	US/NATO/ASCC
	Restricted operations zone (ROZ)	US/NATO/ASCC
	Weapons free zone (WFZ)	NATO
Flight levels:	Coordinating altitude level	US/NATO
	Traverse level	US/NATO
Other airspace subdivisions or control measures:	Airspace coordination area	US/NATO
	Amphibious objective area	US/NATO
	Terminal control area (zone)	US/NATO
	Weapons engagement zone	US/NATO
	Control point	US/NATO
	Way-point	US/NATO
	Time slot	NATO/ASCC

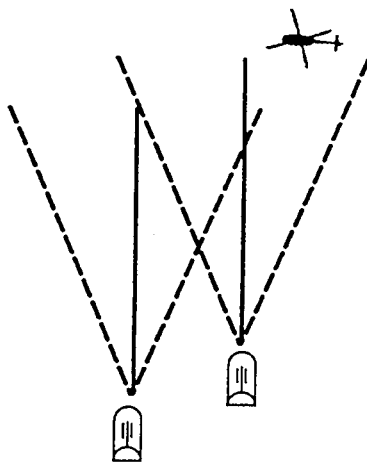
SINGLE AND MULTIPLE TARGETS SELECTION CRITERIA

WHEN DO YOU ENGAGE?



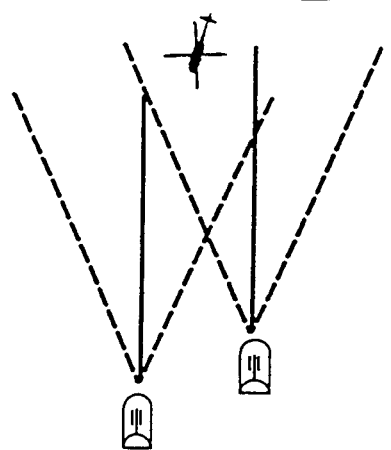
Always engage as soon as possible.

CROSSING RW EAST TO WEST. WHICH FU ENGAGES?



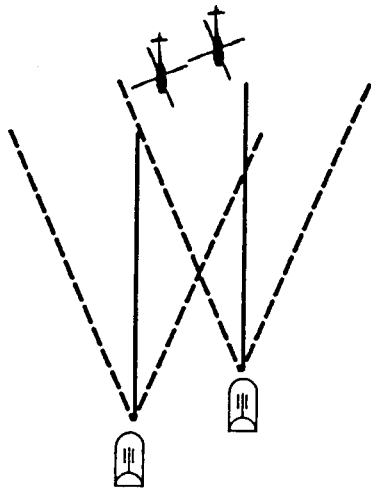
FU on the right engages.

INCOMING RW. WHICH FU ENGAGES?



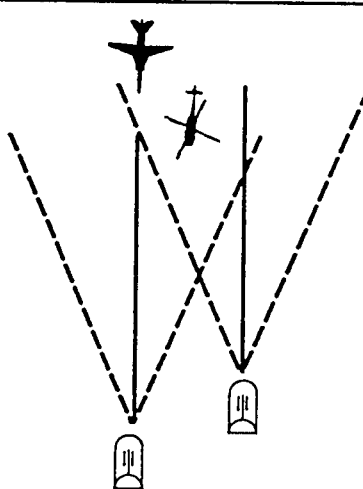
FU first to acquire engages. FUs must communicate. If in doubt and ready, shoot.

MULTIPLE RW. WHICH FU ENGAGES WHICH RW?



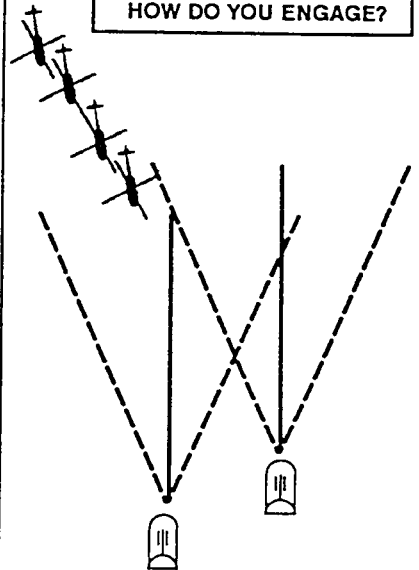
Left FU engages left RW. Right FU engages right RW. If RW in trail, left FU shoots lead RW, and right FU shoots trail RW.

MULTIPLE FIXED- AND ROTARY-WING AC. WHICH FU ENGAGES WHICH AC?



FW has priority over RW. Left FU engages left AC. FUs must communicate.

MULTIPLE RW IN ONLY ONE FU SECTOR. HOW DO YOU ENGAGE?



FU only engages as many RW as possible. Good communications with FU within range but along flight path.

Legend:



= BSFV fire unit (FU)

COMMUNICATIONS

One of the BSFV platoon leader’s most essential systems is his radio system. It is with this system that he is able to command and control his platoon, stay in touch with his battery, monitor the early warning network, and maintain communications with the supported force. Maintenance of radio nets within the platoon, with the supported unit, and with the parent air defense battery is a challenge for the BSFV platoon leader. He must maintain—

- Control of the air battle.
- Command, administrative, and logistical communications with higher headquarters.
- Contact with supported units.

This section will outline standard communications networks that are used by the BSFV platoon. Unit SOPs will develop networks that modify those described here; however, the BSFV platoon leader must be flexible enough to operate within differing communications networks used by various supported units.

COMMUNICATIONS REQUIREMENTS

The minimum communications requirements the platoon leader must maintain include the following nets:

- Battery command net.
- Platoon command net.
- Supported force command net.
- EW net.

See the following illustration.

SAMPLE PLATOON RADIO COMMUNICATIONS NETWORK

	BATTERY COMMAND	SUPPORTED UNIT	PLATOON	EW
Platoon Leader	x	x	x	x
Platoon Sergeant	x	x	x	
Squad Leader		x	x	x
Stinger Team		x	x	x

Note: METT-T and local SOP will determine which platoon elements will monitor respective communications nets.

Most units are not equipped with sufficient communications equipment to monitor the required nets. One technique to facilitate this is to make a platoon radio net matrix. See the illustration below.

PLATOON RADIO NET MATRIX

	BTRY	PLATOON	SUPPORTED UNIT	SUPPORTED UNIT EW ADMIN/LOG
Platoon Leader	X	X	X	
Platoon Sergeant		X		X
Squad 1		X		X
Squad 2		X		X
Squad 3		X	X	
Squad 4	X	X		

Since he realizes your radio situation, the battery commander will normally eavesdrop on his subordinate platoon nets, thereby freeing the platoon to monitor the other nets above. In this case, the ADA unit should develop all SOPs to determine when platoons should transmit on the battery command net. Examples are situation updates and aircraft engagement reports. In all situations, the BSFV platoon leader must comply with communications requirements established in the battery and supported force SOPs.

Depending on the availability of radios and the tactical situation, the BSFV platoon may be required to operate on the following radio nets:

- Supported force intelligence net.
- Sensor early warning net.
- Supported force ADMIN/LOG net.

Regardless of the tactical situation, the BSFV platoon leader establishes those nets that are required by the supported force or ADA unit being reinforced and complies with SOPS imposed by those forces.

DISMOUNTED STINGER TEAM COMMUNICATIONS

The BSFV Stinger team’s ability to effectively react to rapidly changing conditions on a fluid battlefield is dependent on efficient and reliable

communications. Digital, radio, wire, and visual signals provide the necessary means to effectively communicate with a dismounted team in offensive and defensive operations. If available, digital communications are the primary means of early warning communications for the Stinger team. As a backup to digital communications, the team requires man-portable FM communications.

Offensive Operations Communications Considerations

Dismounting the Stinger team in support of an offensive mission will be influenced by the factors of METT-T and air threat. During an offensive mission, the employment of the Stinger team will be quick and usually a short distance away from the BSFV. Once dismounted, communications are challenging.

Ideally, the Stinger team will receive digital alerting and cueing information. Command and control of the Stinger team by the BSFV squad leader will be accomplished using voice communications. If the communications equipment available to the platoon does not support digital and voice communications, techniques and procedures must be developed to facilitate effective communications.

Communications techniques and procedures that may reduce communications shortfalls are as follows:

- Use the orientation of the 25-mm automatic gun to cue the Stinger team on the direction of the aerial platform.
- Use the orientation of the hull to indicate the direction of the aerial platform's approach. This technique allows the 25-mm automatic gun to orient on secondary threats while the Stinger focuses on the primary air threat.
- Hand and arm signals can be employed by the BSFV squad leader to cue the Stinger team. It is recommended that BSFV platoons use standard Army visual signals, although BSFV platoons may have to develop specific visual signals which are not addressed in Army publications. GTA 17-2-19 should be used as a guide when developing visual signals.
- Use color-coded flags as a visual signal to communicate fire control orders. For example, a red flag displayed by the squad leader may indicate an aerial platform has been identified as hostile and engagement is authorized.

Techniques and procedures which are developed to reduce communications equipment shortfalls will only be effective if they are understood by the entire BSFV platoon. The techniques and procedures which are developed must be trained and rehearsed on a recurring basis.

Defensive Operations Communications Considerations

In defensive operations, dismounted Stinger team operations are equally as complex. Depending on the air IPB and factors of METT-T, the Stinger team may be located one kilometer away from the BSFV. This situation will require BSFV squads to be relentlessly innovative in reducing these challenges. Defensive operations communications requirements are the same as for offensive operations. The primary difference between offensive and defensive operations is the dismounted Stinger team is employed in a stationary position. The stationary defensive posture of the team may allow the squad leader to—

- Remote the simplified handheld terminal unit (SHTU) from the BSFV to the Stinger team's position. This will provide digital alerting and cueing information.
- Use wire communications more extensively.
- Share communications equipment with task force elements in the vicinity.

The communications means employed should not hamper the BSFV squad's ability to mount the Stinger team and reposition in a timely manner. For example, recovering wire used for communications is time-intensive and may not support hasty displacement to another position.

COMMUNICATIONS EQUIPMENT

BSFV platoon communications equipment varies depending on the organizational structure. Equipment authorizations indicate the BSFV platoon is authorized the single-channel ground and airborne radio system (SINCARS) radio equipment.

MEANS OF COMMUNICATIONS

The BSFV platoon leader can choose from a number of different communications means: radio, wire, messenger, visual, and in the future, digital. Different means should be used when possible so that the platoon does not depend only on one means. Depending on the situation, one means of communications is often

more effective than another. The following criteria must be considered when deciding which means to use:

- Reliability.
- Installation time.
- Transmission time.

The platoon leader selects the most effective and secure, yet least restrictive, communications means.

Wire Communications

The platoon hot loop is for use in static asset defenses, night defensive positions, or on defensive perimeters. Each ADA squad has a sound-powered telephone, and WD-1 wire.

Radio Communications

The radio is the platoon's most flexible means of communications. It can quickly transmit information

over long distances with great accuracy. However, without secure equipment, the radio is vulnerable to enemy interception. All vehicles of the platoon should monitor the platoon net.

COMMUNICATIONS SECURITY

Communications security preventive techniques are employed to safeguard communications. These include all measures taken to avoid enemy detection and to deny the enemy any useful information about friendly forces. The most effective preventive technique is to keep all communications as short as possible, especially radio transmissions and transmission times.

Communications security techniques reduce the effectiveness of enemy spot and barrage jamming efforts. Specific procedures are covered in FM 24-33.

FORCE-PROJECTION OPERATIONS

This chapter discusses the role of the BSFV platoon as part of the collection of forward area air defense weapon systems in force-projection operations. Air defense in force-projection operations will be a joint task. The Air Force, Navy, and Marine Corps air elements will primarily counter threat fixed-wing assets while the Army and Marine Corps ground air defense units will counter the UAV, cruise missile, tactical ballistic missile, and rotary-wing threat. It discusses techniques and special planning considerations needed to support the maneuver force during force-projection operations. The focus is on how to counter and defeat enemy aerial platforms from early entry through postconflict activities. It includes discussion on echelons above platoon level so that BSFV platoon leaders can understand their role in the overall operation.

OVERVIEW

In general, FAAD doctrine for force-projection operations may be applied to both contingency and mature theaters of operations in which a force must operate without US base support, and in which the threat is capable of attacking any point in the area of operations (AO). The stages of force projection

include mobilization (if necessary), predeployment activities, deployment, entry operations (which include expansion and buildup operations), postconflict or postcrisis operations, redeployment, and demobilization. This chapter will primarily concentrate on the stages of early entry through postconflict operations.

FAAD'S ROLE IN FORCE -PROJECTION OPERATIONS

The overall focus for forward area air defense is to protect the force from low-altitude aerial threats during force-projection operations. FAAD systems accomplish this by denying enemy intelligence gathering efforts through counter-RISTA, reducing the enemy's aerial combat power, allowing the force freedom of maneuver, and protecting the forces' critical assets.

Each FAAD system plays a specific role. The BSFV provides freedom of maneuver to heavy forces, thereby providing the ground force commander with the opportunity to seize the initiative and achieve rapid, decisive victory. Stinger teams are essential for light and special forces and they enhance force protection for heavy forces. Also, the BSFV will assist in the counter-RISTA effort. They provide the flexibility and versatility needed on a fluid battlefield

by augmenting the coverage of other FAAD systems. FAAD C³I allows for more effective air defense synchronization by providing detection and tracking data, early warning, and situational awareness as well as reducing the potential for fratricide.

CONTENTS

	Page
Overview	3-1
FAAD's Role in Force-Projection Operations . . .	3-1
Low-Altitude Aerial Threat	3-2
Command and Control	3-2
Warfighting Overview	3-3

LOW-ALTITUDE AERIAL THREAT

The primary aerial threats that must be countered by FAAD systems are unmanned aerodynamic vehicles (UAVs), cruise missiles (CMs), and rotary-wing (RW) and fixed-wing (FW) aircraft. Key characteristics of these priority threats are summarized below.

UNMANNED AERODYNAMIC VEHICLES

UAVs include both drones and remotely piloted vehicles. They are inexpensive, easily procured or manufactured, and versatile. There are over 100 UAV programs being pursued by at least 30 countries. Their small radar cross sections make them very difficult to detect and track. Payloads may consist of radar seekers, high-explosive warheads, forward-looking infrared (FLIR) cameras, laser designators, TV thermal imaging devices, chaff, decoy, and electronic attack capabilities. Ranges vary from 25 to 800 kilometers, and the upper limit of flight endurance reaches 72 hours. They perform a wide variety of missions including RISTA, suppression of enemy air defense, ground attack, decoy, communications relay, and chemical detection. The RISTA mission, which uses UAVs to locate maneuver forces and key assets with the ability to pass real-time information back to threat long-range attack systems, is the greatest near-term concern for forward area air defenders and the force commander.

CRUISE MISSILE

Cruise missiles are considered the most stressing threat because of the difficulty in detecting them at launch, in flight, and in destroying them at extended ranges. Their ranges vary from 10 to 400 kilometers.

They can be packaged with a variety of payload options. They may be ground, air, or sea launched. CMs with their increasing accuracies and warhead diversity make a potent threat.

ROTARY-WING AIRCRAFT

Rotary-wing versatility and survivability make them ideal for logistics resupply, air assault, command and control, and heavily armed weapons platforms for attack roles. RW aircraft currently exist in every potential theater US forces may enter.

Many countries around the world possess dedicated attack helicopters. Armed with standoff antitank guided missiles, helicopters can inflict heavy casualties on the force and destroy critical assets. The proliferation of helicopters is also of concern. Utility helicopters, combined with standoff munitions and state-of-the-art target acquisition technology, can produce less expensive, robust helicopter capabilities for any country.

FIXED-WING AIRCRAFT

Although other threats have taken the place of fixed-wing aircraft as the principal air threat to ground forces, the following types of fixed-wing aircraft may be employed by the enemy against friendly forces: bombers, fighter-bombers, fighters, and close air support aircraft. Any of the fixed-wing family may carry tactical air-to-surface missiles (TASM), while only the larger ones will carry cruise missiles. Improvements to fixed-wing aircraft will include increased survivability and improved fire control accuracy.

COMMAND AND CONTROL

Air defense operations will be planned and controlled by an area air defense commander (AADC) designated by the joint task force or theater commander. The AADC establishes theaterwide rules of engagement (ROE). All forces will receive air defense warnings and weapon control status from the joint force air component commander (JFACC).

Platoon leaders must be aware of the unique and complex traits of the coordination effort required in projection operations. The constrained and structured environment adds pressure to all leaders. It is not likely that all forces employed in the JTF have trained and

worked together. This demands that each person be oriented and motivated to accomplish the mission because without this, the possibility of fratricide increases. The platoon leader must also balance the physical security of forces between the mission and restrictive rules of engagement. This may be hard to do because the political concerns used to develop the ROE may conflict with the physical security needs of the force. Additionally, the ROE are sometimes established late, requiring flexibility on the part of air defenders at all levels.

WARFIGHTING OVERVIEW

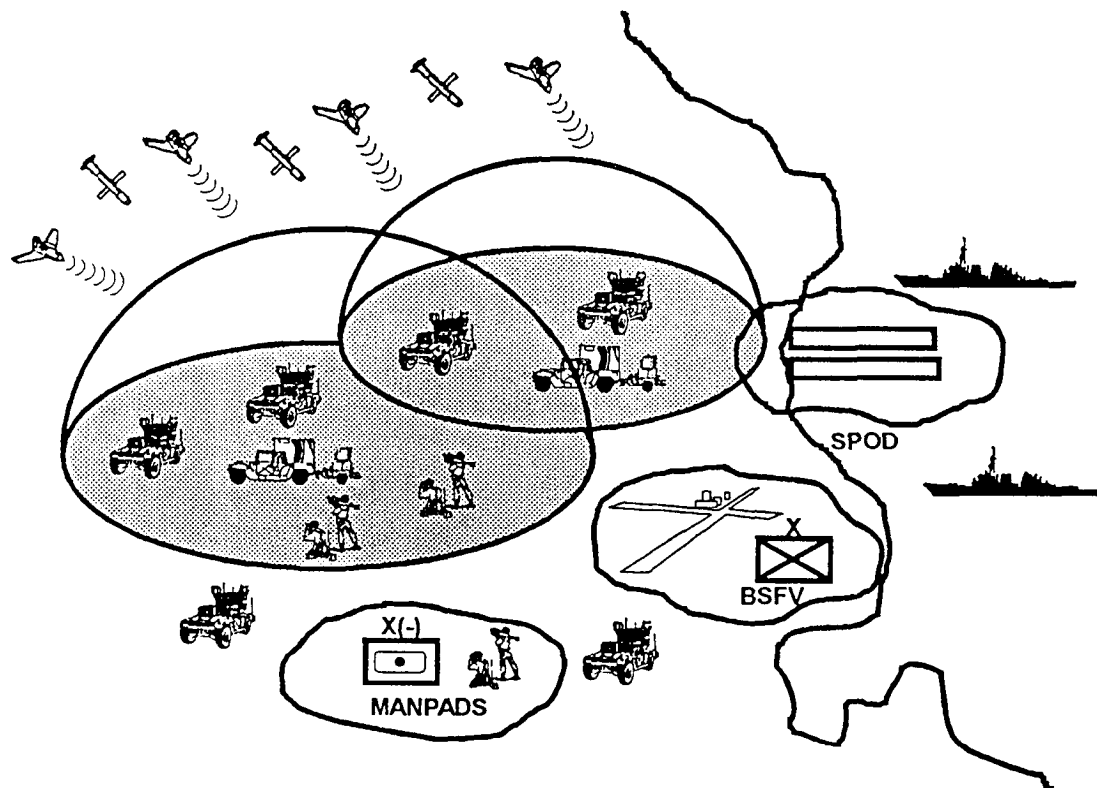
A joint force entry operation may begin by forces deploying from CONUS and other locations via air and sealift for ports of debarkation contained within or near the area(s) of operation. Upon debarkation, the forces are marshaled into staging areas to prepare for future operations or further movements. Whenever possible, US forces will seek unopposed entry. Deploying forces are most vulnerable and the success of the operation is at greatest risk during initial entry operations, especially forced entry operations. Aerial ports and seaports of debarkation (APODs/SPODs), as well as staging areas, will be lucrative targets for threat aerial platforms. Throughout this stage, enemy UAVs conducting RISTA missions can reveal details about arriving forces and provide targeting information to long-range attack systems.

Early deployment of FAAD assets is crucial to the success of entry operations. The FAAD mission during this stage focuses on denying enemy RISTA efforts.

FAAD weapon systems and FAAD C³I should be deployed with the earliest airlifts to ensure composite defense against the threat spectrum. The BSFV will provide force protection and assist in the counter RISTA effort while FAAD C³I furnishes requisite early warning of threat aerial platforms. In addition to integrating with other Army air defense artillery systems, FAAD elements integrate their weapon and sensor coverages with deployed joint and combined arms defenses.

Protection of forces and equipment in this stage requires FAAD systems to be positioned with coverage at least contiguous and perhaps overlapping, depending on the factors of air intelligence preparation of the battlefield (IPB), METT-T and asset criticality. Positioning based on an in-depth IPB will provide for defense against threat aerial platforms. See the following illustration.

FAAD IN EARLY ENTRY OPERATIONS



Expansion and buildup operations set the conditions for victory. Buildup in combat power and supporting forces and equipment occurs during this phase of entry operations. Expansion of the force and rapid buildup may include—

- Establishing forward operating and logistics bases.
- Expanding the lodgment.
- Closing the remainder of the force in country.
- Linking up with other forces.
- Preparing for future operations.

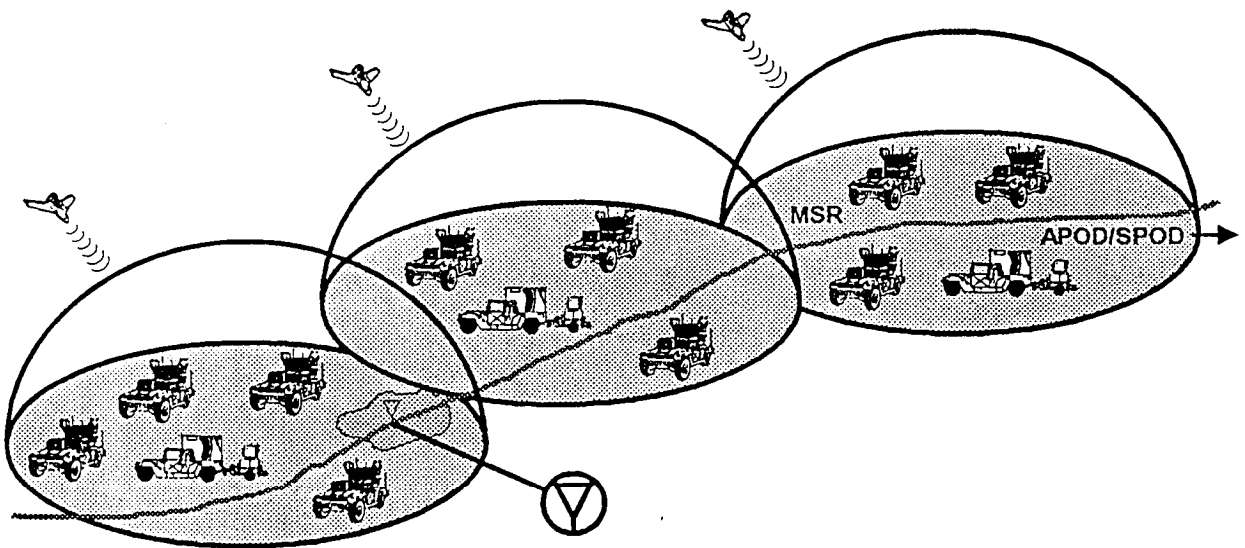
During this phase, units road march or maneuver to tactical assembly areas. These movements can be quite extensive, up to several hundred kilometers. Within the assembly areas, units are equipped and prepared to initiate decisive operations.

The BSFV platoon leader must be integrated in all phases of the operation to provide effective air defense protection against threat aerial platforms. At a minimum, when planning air defense protection, the BSFV platoon leader must consider the commander's intent and priorities, aerial IPB, supported force scheme of maneuver, and availability of assets. BSFV positioning during deployment to the tactical assembly

area (TAA) is critical. Ultimately, the factors of METT-T will determine positions of BSFV squads. Nevertheless, BSFVs should be positioned forward and on the flanks of maneuver formations. The BSFV platoon must synchronize its movement so it does not mask fires of combined arms elements but optimizes observation and fields of fire on suspected air avenues of approach.

The threat will focus on locating unit movements, determining unit sizes and strengths, and postulating the ultimate destinations. The primary low-altitude threat platform during this stage is the RISTA UAV. Information obtained by UAVs will be relayed back to the enemy who will use any attack means necessary to inflict maximum casualties, inhibit momentum, and destroy forces. These attack means may include lethal UAVs, CMs, and rotary- and fixed-wing aircraft. Unless FAAD systems counter threat RISTA efforts by denying detection and targeting, the enemy may disrupt the supported force commander's plan by inflicting significant casualties or preempting his actions. Denial of threat observation of force composition and routes of movement will require that the BSFV platoon and sensors be integrated in the supported force scheme of maneuver. See the following illustration.

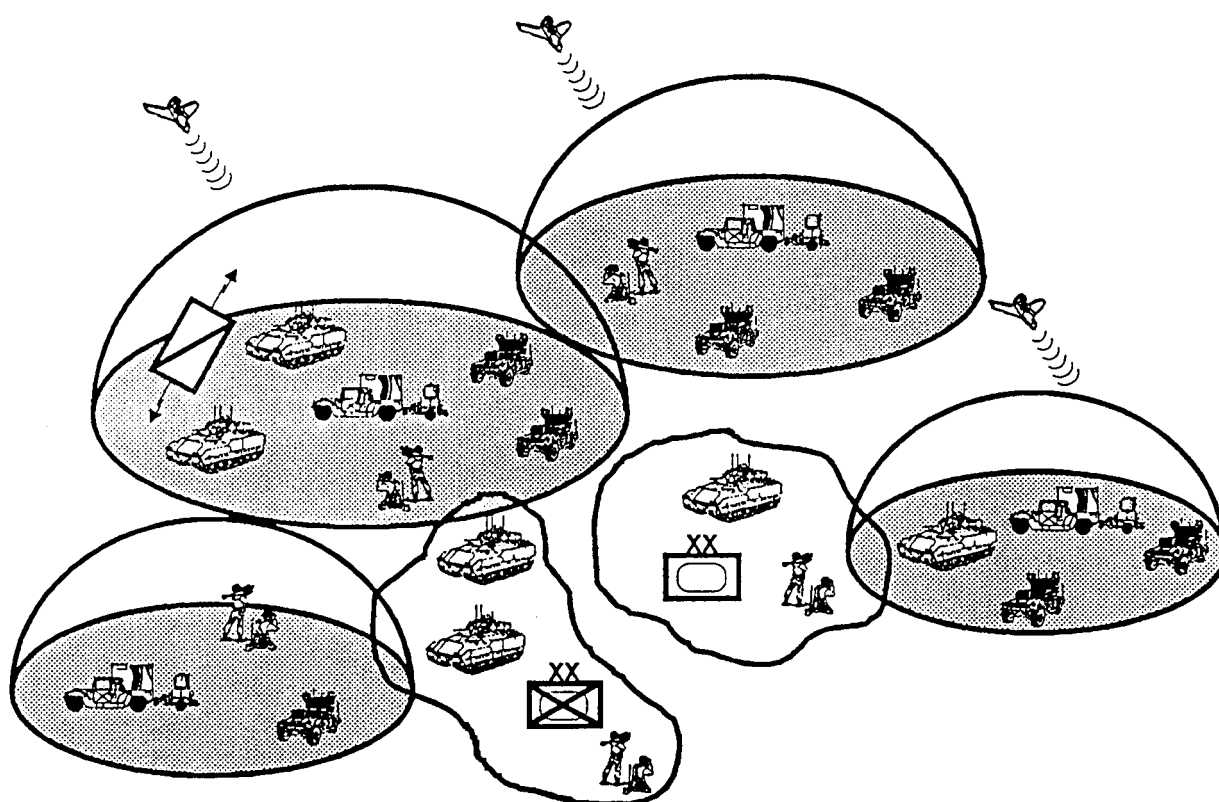
FAAD EMPLOYMENT DURING THE EXPANSION PHASE (ROAD MARCH)



Just prior to decisive operations, units will be positioned TAAs, completing their final preparations before launching the attack. BSFVs are positioned with their supported maneuver elements, prepared to execute decisive operations. Stinger teams augment air defense coverage. By countering the enemy's RISTA

efforts throughout these initial stages, forward area air defense ensures that the supported force commander retains the element of surprise and the ability to mass forces at the place and time he chooses. See the FAAD Protection of TAAs (Expansion and Buildup Phase) illustration.

FAAD PROTECTION OF TAAs (EXPANSION AND BUILDUP PHASE)



During decisive operations, maneuver forces deploy out of TAAs and into attack formations that ease movement and mass sufficient combat power to ensure decisive victory. Distances from TAAs to close combat areas can be extremely long with intermediate objectives designated along the routes. Numerous refuel and rearm points may be established along the way. During the deployment, Avenger and FAAD CI screen along the flanks of the maneuver force and continue to deny threat RISTA efforts while protecting the movement. BSFV platoons deploy with their maneuver elements. Stingers augment air defense coverage of the maneuver force. See the FAAD in Decisive Operations (Deployment From TAAs).

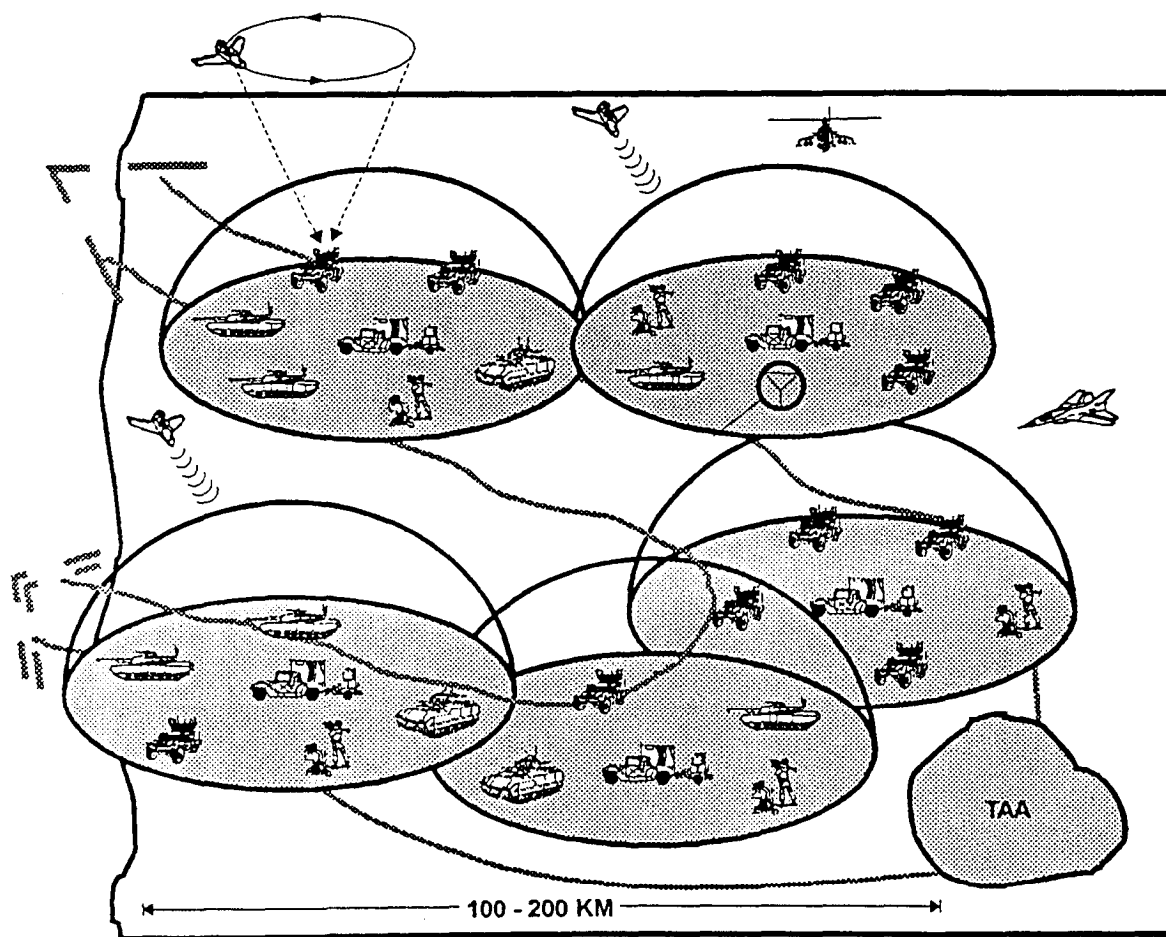
The threat will attempt to counter the attack with a myriad of aerial weapons. RISTA UAVs will seek to determine friendly unit locations, movements, and

objectives. Aerial and artillery strikes will be generated from the gathered intelligence against targets such as—

- The maneuver force.
- Forward arming and refueling points (FARPs).
- Aviation forward operating bases (FOBS).
- Command and control nodes.
- Reserve troop concentrations.
- Logistical support areas.
- Terrain features which could constrict unit movements (massed forces).

Lethal UAVs will be employed against maneuver forces as they advance toward and close with enemy

FAAD IN DECISIVE OPERATIONS (DEPLOYMENT FROM TAAs)

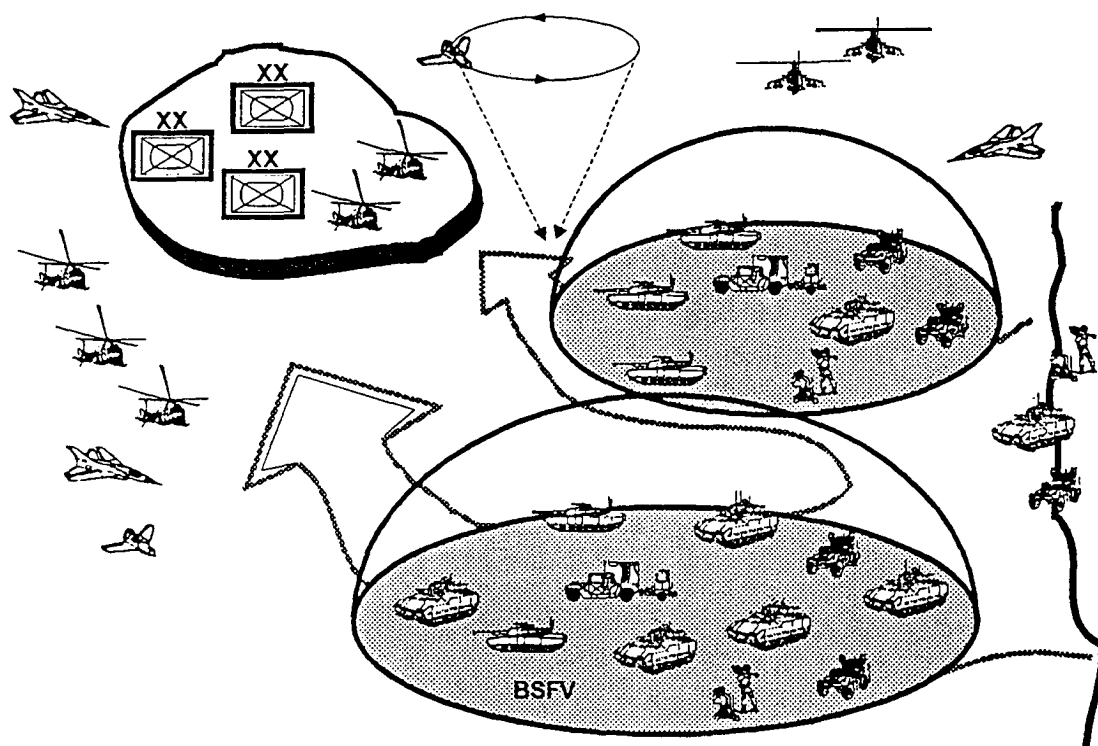


forces. The lethal UAV's primary mission is to disrupt the tempo of the offensive by disabling and destroying armored vehicles and FAAD C³I elements. Cruise missiles will be targeted against logistical concentrations and command and control nodes. Rotary-wing aircraft will be used to attack the forward elements and the flanks of the advancing maneuver forces in order to slow their tempo, cause confusion, and inflict maximum casualties. They will also conduct cross-forward line of own troops (FLOT), close air support (CAS), and air insertion operations. These attack helicopters constitute the most widespread and capable air threats to ground forces in the close battle.

During this stage of force projection operations, the primary focus of FAAD shifts from counter-RISTA

to force protection. The BSFV mission is paramount during the decisive operations stage. BSFV platoons will be in support of maneuver units. They will be primarily used to counter CAS threats such as rotary-wing aircraft and lethal UAVs. They should be integrated in the formation of the lead maneuver elements, positioned behind the lead vehicles of the lead company teams, and weighted toward the most likely air avenues of approach. Stingers augment air defense coverage of maneuver forces and provide flexible force protection to air defense commanders. Avengers will be deployed with the maneuver force to defend against rotary-wing aircraft and lethal UAVs and to counter enemy RISTA efforts. See the FAAD in Decisive Operations illustration.

FAAD IN DECISIVE OPERATIONS



At the close of the decisive battle, friendly forces may be required to prepare for follow-on operations. They must rearm, refuel, and reconstitute personnel and equipment. Friendly forces are extremely vulnerable while conducting these types of activities. They become lucrative targets for enemy long-range strike systems which are able to detect and target them based on information received from enemy RISTA UAVs. FAAD weapons, mainly Avengers, shield the force from the enemy reconnaissance and attack and ensure success of future operations.

While the most significant aerial attack capabilities may have been eliminated, friendly forces must be prepared to counter isolated air and missile attacks

from any remaining threat forces. Avenger platoons will be primarily concerned with countering potential enemy RISTA efforts, thereby providing force security and preventing surprise attacks. These actions allow for unimpeded reconstitution and unharassed redeployment of forces.

During postconflict operations, friendly forces are marshalled into staging areas for follow-on operations or redeployment. Forces will either be redeployed to another theater of operation or back to CONUS.

CHAPTER 4

OFFENSE

This chapter describes how the BSFV platoon operates during offensive operations. The offense is the decisive form of combat. Army operational doctrine seeks to seize the initiative quickly and achieve decisive victory with minimum casualties.

PURPOSE OF THE OFFENSE

The main purpose of the offense is to defeat, destroy, or neutralize an enemy force. Additionally, offensive operations are undertaken to—

- Secure decisive terrain.
- Deprive the enemy of resources.
- Gain information.
- Disrupt an enemy attack.
- Deceive and divert the enemy.
- Hold the enemy in position.
- Set up conditions for future successful operations.

CHARACTERISTICS OF OFFENSIVE OPERATIONS

The main feature of an offensive battle is the outflanking or bypassing of the defender—that is, taking the initiative. The aim of the commander in an offensive battle is to expedite the decision. Surprise, concentration, tempo, and audacity characterize offensive operation and are components of initiative. Initiative, combined with maneuver, makes decisive offensive operations possible.

SURPRISE

Commanders achieve surprise by striking the enemy at the time or place or in a manner for which it is not physically or mentally ready. Being unpredictable and using deception, cunning, and guile also help to gain surprise. Surprise is achieved by the direction, timing, boldness, and force of the attack.

CONCENTRATION

While surprise may contribute to offensive success, concentration is the ability to mass effects

without massing large formations and is, therefore, essential for achieving and exploiting success. By concentrating forces rapidly along converging axes, the attacker overwhelms enemy forces at the point of attack by massing the effects of combat power.

TEMPO

Tempo is the rate of speed of military action; controlling or altering the rate of speed is essential for maintaining the initiative. Commanders seek a tempo that maintains relentless pressure on the enemy to prevent him from recovering from the shock and effects of the attack. An attack tempo that puts sufficient pressure on the defender is essential to success; it promotes surprise, keeps the enemy offbalance, contributes to the security of the attacking force, and denies the defender freedom of action.

CONTENTS

	Page		Page
Purpose of the Offense	4-1	Meeting Engagement	4-12
Characteristics of Offensive Operations	4-1	Hasty Attack	4-13
Sequence of the Attack	4-2	Deliberate Attack	4-15
Movement Techniques and Formations	4-2	Exploitation	4-16
Threat	4-10	Pursuit	4-16
Air Defense Artillery in the Offense	4-10	Forms of Maneuver	4-17
Movement to Contact	4-10		

AUDACITY

Audacity is a key component of any successful offensive action. A simple plan, boldly executed, requires audacious leaders to negate the disadvantages of numerical inferiority. Commanders should

understand when and where they are taking risks but must not become tentative in the execution of their plan. A difficult situation handled boldly often leads to dramatic success. The offensive is inherently a bold action and must be pursued with audacity.

SEQUENCE OF THE ATTACK

Offensive operations are normally broken down into the following phases. Each phase may have subordinate parts within it to further delineate specific portions, as shown in the following illustration.

PHASES OF THE OFFENSE



1. Preparation for Operations
2. Movement to Contact
3. Attack
4. Exploitation
5. Pursuit
6. Consolidation, Reorganization, and Preparation

Different forms of the attack occur throughout the depth of the battlefield. This happens simultaneously and in closely aligned phases that shift back and forth. They may take new forms and offer increasing options for development. Therefore, phases of the offense are not fixed.

PREPARATION FOR OPERATIONS

During this phase, units prepare for offensive operations and conduct specific tasks in support of the mission. The BSFV platoon must be integrated in all phases of the mission, especially the preparation phase. Planning, reconnaissance, assembly area operations, and movement to the line of departure occur during this phase. The BSFV platoon must synchronize task force preparation tasks with air defense peculiar operations. Simultaneously, task force directed events such as reconnaissance, selection, and occupation of position (RSOP) and task force rehearsals must be accomplished in conjunction with operations that may be peculiar to the ADA element such as—

- Providing air defense protection for the total Army analysis (TAA).
- Linkup operations.
- Conducting an ADA rehearsal.
- Cross-leveling ammunition.
- Air battle handover.

MOVEMENT TO CONTACT

During this phase, maneuver forces in the main battle area maneuver to positions of advantage. It may be characterized by flanking movements, limited attacks, and penetrations of enemy security zone forces.

ATTACK

The unit attacks the enemy's main defensive positions, assaulting by fire and maneuver or fixing and bypassing to attack the enemy somewhere else. There are two forms of attack, hasty and deliberate.

EXPLOITATION

The unit exploits its success by extending its destruction of the defending force by maintaining offensive pressure. This phase follows a successful attack.

PURSUIT

The attacker pursues the retreating enemy to complete destruction of the opposing force. Pursuit follows successful exploitation.

CONSOLIDATION, REORGANIZATION, AND PREPARATION FOR FUTURE OPERATIONS

The unit secures the objective, consolidates, conducts resupply, reorganizes if required, and prepares for future operations. Planning begins with this step and works backwards.

MOVEMENT TECHNIQUES AND FORMATIONS

The selection of movement techniques and attack formations for the task force is dependent on

METT-T. Either the task force commander or the company team commander may specify movement

techniques for the unit.

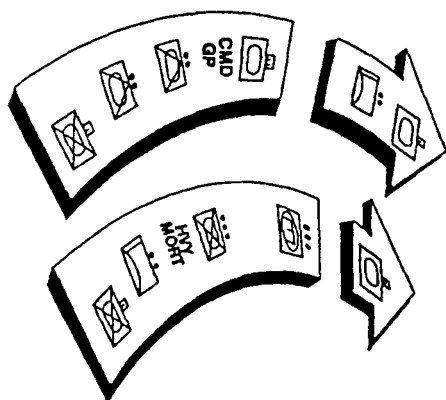
MOVEMENT TECHNIQUES

The three movement techniques are traveling, traveling overwatch, and bounding overwatch. The supported force may not move as a unit using one movement technique. Rather, the supported force commander designates the movement technique to be used by the subordinate units. Movement techniques may be modified upon enemy contact. A portion of the unit may take actions on contact against enemy positions while the rest of the unit continues to move.

Traveling

Traveling is used when speed is necessary and contact with the enemy is not likely. The unit moves with an interval between elements based on visibility, terrain, and range of weapons. When a BSFV platoon supports a task force using the traveling technique, a BSFV section is normally positioned behind the lead company team and another may be located to the front of the trail company team. See the following illustration.

TASK FORCE USING TRAVELING FORMATION

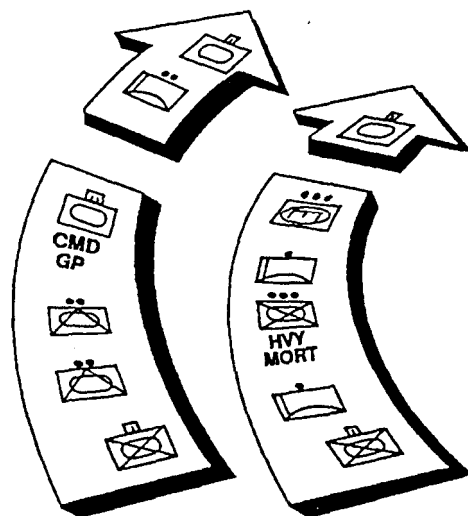


Traveling Overwatch

When enemy contact is possible but not expected, **units** use the traveling overwatch technique. The units move in columns, but the interval between elements is increased. Positioning of ADA elements in the traveling overwatch is similar to the traveling technique. Traveling overwatch is characterized by continuous movement of the lead element. The trailing element moves at variable speeds and may even

pause to overwatch the movement of the lead element. Depending on the duration of halts, the speed of travel, and the air threat, the BSFV Stinger teams may dismount in the traveling overwatch. See the Task Force Using Traveling Overwatch Formation illustration.

TASK FORCE USING TRAVELING OVERWATCH FORMATION



Bounding Overwatch

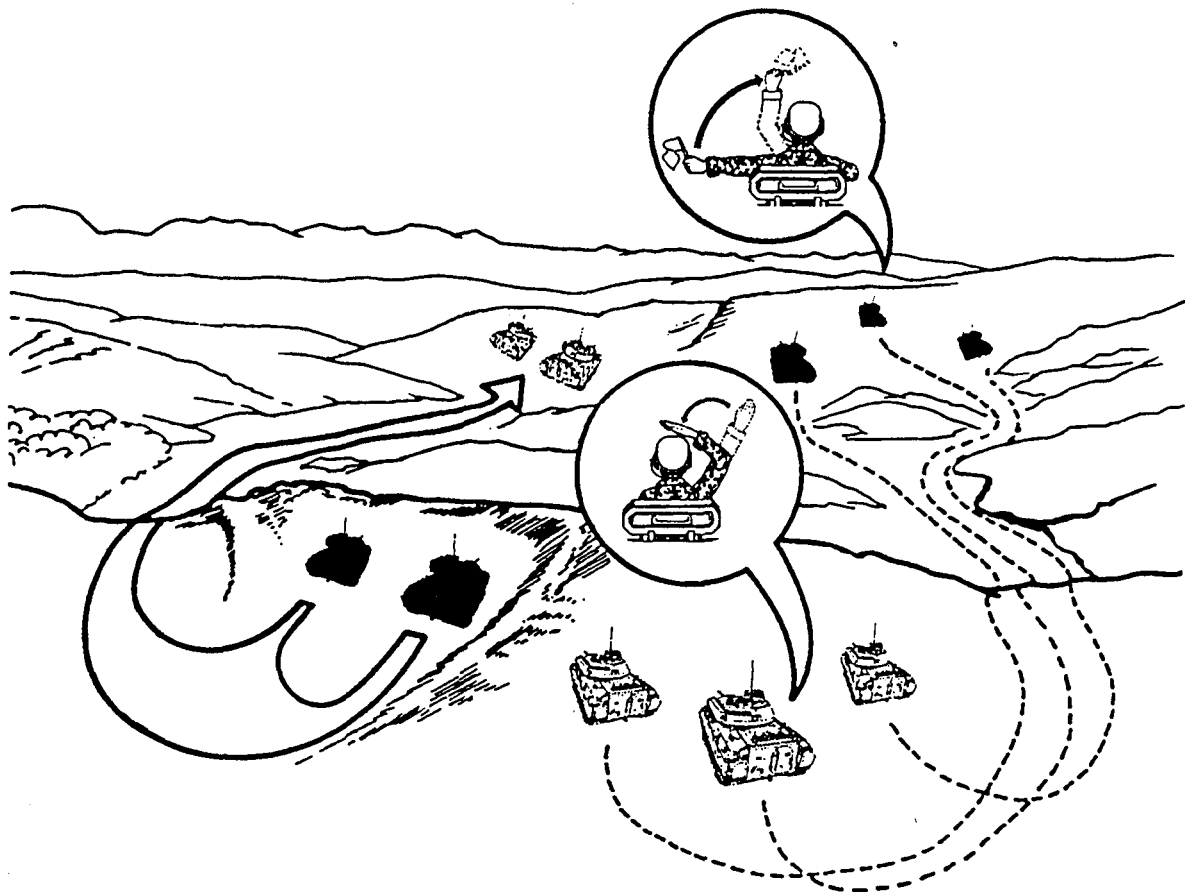
When enemy contact is expected, the unit uses bounding overwatch. Elements move by bounds, one covering or overwatching the movement of another. The advancing element moves forward on a covered route whenever possible and the overmatching unit is positioned to support the moving element by suppressive fire or maneuver. The length of bounds is normally within the direct fire range of the weapon systems overmatching the bound. Based on METT-T BSFVs may be placed behind the lead elements to provide overwatch of enemy air avenues of approach. See the following illustration.

Additional BSFV Platoon Considerations

In planning movement techniques, the BSFV platoon leader should consider the following

- Use of movement techniques in conjunction with those used by supported unit.

COMPANY TEAM USING BOUNDING OVERWATCH FORMATION



- Task organization either as a platoon or in sections, depending on METT-T and prescribed movement techniques by supported unit.
- Air defense coverage forward of the lead elements.
- Balanced fires.

FORMATIONS

The task force may move in any one of seven formations: column, wedge, vee, echelon, line, box, or diamond. The task force may use more than one formation at a time especially when the terrain changes during the movement. For example, the task force commander may elect to use initially a column formation to clear a defile, changing to a wedge formation once elements are clear of the defile. Again, the choice of formations is METT-T dependent.

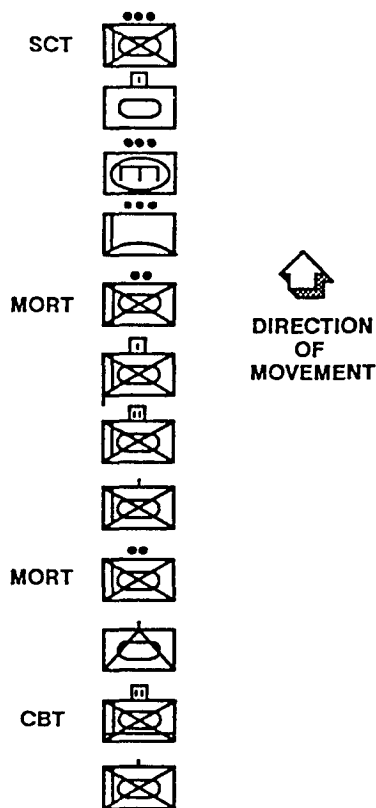
Column Formation

Column formation is used when enemy contact is not expected, a lengthy move is expected, and or terrain is restrictive. Normally, the task force lead element uses traveling overwatch while follow-on units move in traveling. The BSFV platoon may travel as a platoon behind the lead unit in the column or may task-organize into sections and travel with supported company teams. A column formation—

- Eases speed of movement, is easy to control, and is useful in defiles or dense woods.
- Provides for quick transition to other formations.
- Requires flank security.
- Provides majority of firepower to the flanks.

See the Task Force In Column Formation illustration.

TASK FORCE IN COLUMN FORMATION



Wedge Formation

The wedge formation best positions the task force to attack an enemy appearing to the front and flanks. The wedge is used when enemy contact is possible or expected. When enemy contact is not expected, it may be used to rapidly cross open terrain. BSFVs are normally placed behind the lead elements of the main body when moving in the wedge formation. The wedge formation—

- Facilitates control and transition to the assault.
- Provides for maximum firepower forward and adequate firepower to the flanks.
- Is difficult to control in forested areas or during limited visibility operations.
- Requires sufficient space to disperse companies laterally and in depth.

See the Task Force in Wedge formation illustration on the next page.

Vee Formation

In the vee formation, the task force moves with two company teams abreast and two trailing. It is normally used when enemy contact is expected and the location and disposition of the enemy is known. This arrangement allows the trail company teams to move to support either lead company team. In the vee formation, the BSFV platoon is normally task-organized and moves with supported company teams. The vee formation—

- Is hard to reorient; control is difficult in heavily wooded areas.
- Provides for good firepower forward and to the flanks.
- Allows flexibility allows the task force commander to move units to support the lead company teams.

See the Task Force in Vee Formation illustration on the next page.

Echelon Formation

The echelon formation echelons the task force with company teams in a slant in direction of the enemy (right or left). It is commonly used when the task force provides security for a larger moving force. In the echelon formation, the BSFV platoon moves as a platoon behind the lead company team or may be task-organized in sections and move with supported company teams. The echelon formation—

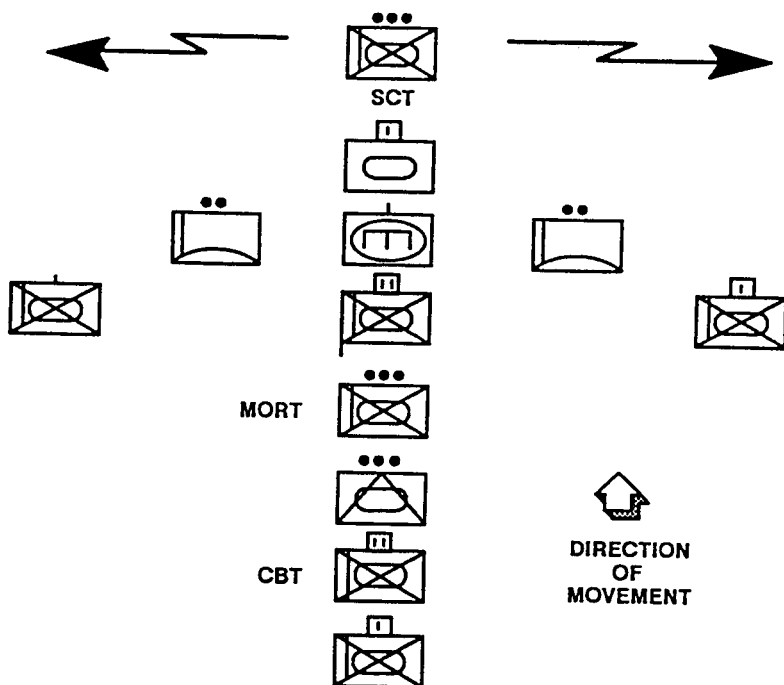
- Provides for firepower in the direction of the echelon.
- Eases control in open areas; more difficult in heavily wooded areas.
- Is difficult to control.

See the Task Force in Echelon (Right) Formation illustration on next page 4-7.

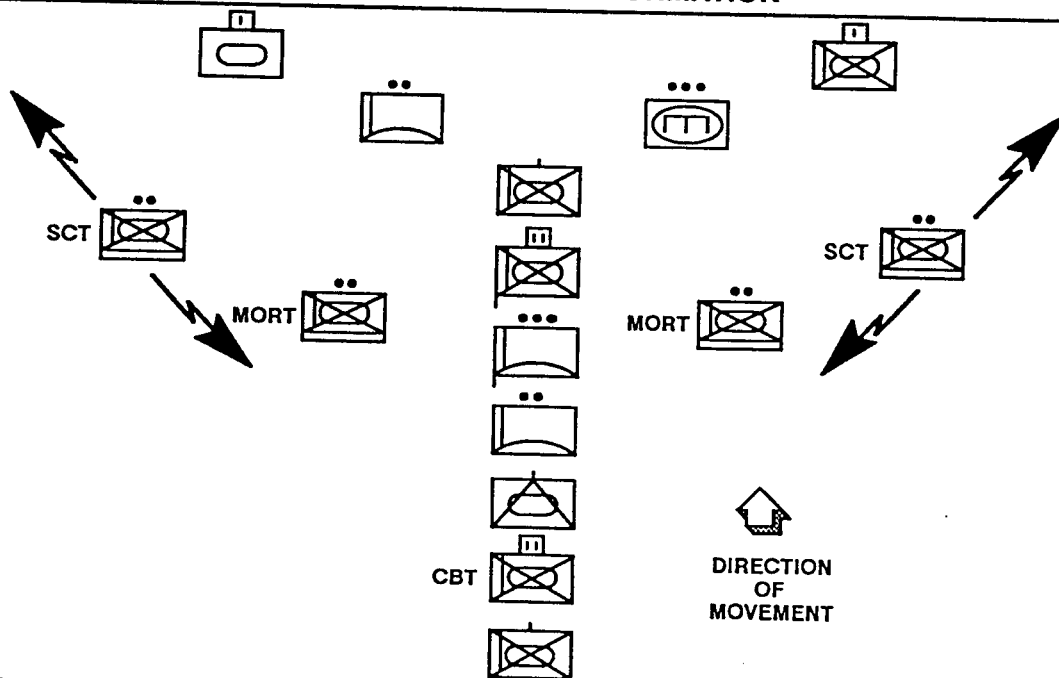
Line Formation

In the line formation, the task force moves with company teams abreast. It is often used in reconnaissance operations or when continuous movement with maximum firepower to the front is required. Since it does not disperse company teams in depth, the line provides less maneuver flexibility than other formations. The BSFV platoon may move as a platoon behind the company team moving along the most dangerous air avenue of approach, or it may

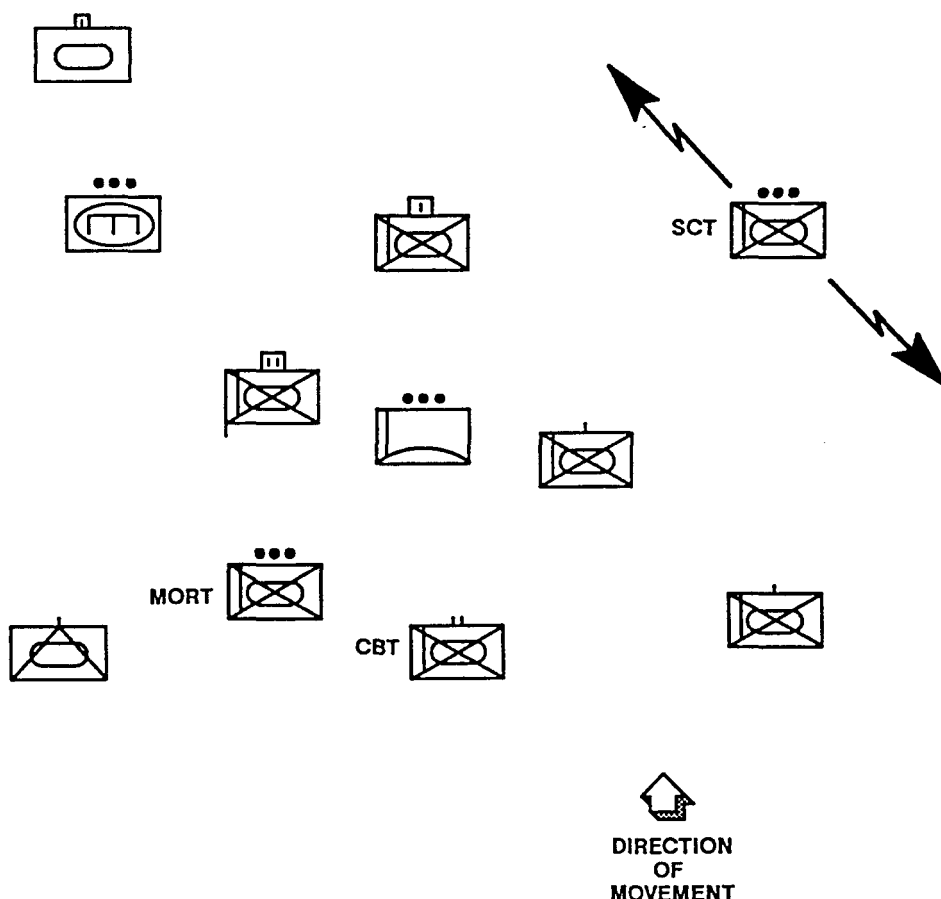
TASK FORCE IN WEDGE FORMATION



TASK FORCE IN VEE FORMATION



TASK FORCE IN ECHELON (RIGHT) FORMATION



be task-organized into sections and travel with supported company teams. The line formation—

- Permits maximum firepower to the front.
- Uses the use of speed and shock in closing with the enemy.
- Is difficult to control.

See the Task Force in Line Formation illustration on the next page.

BOX FORMATION

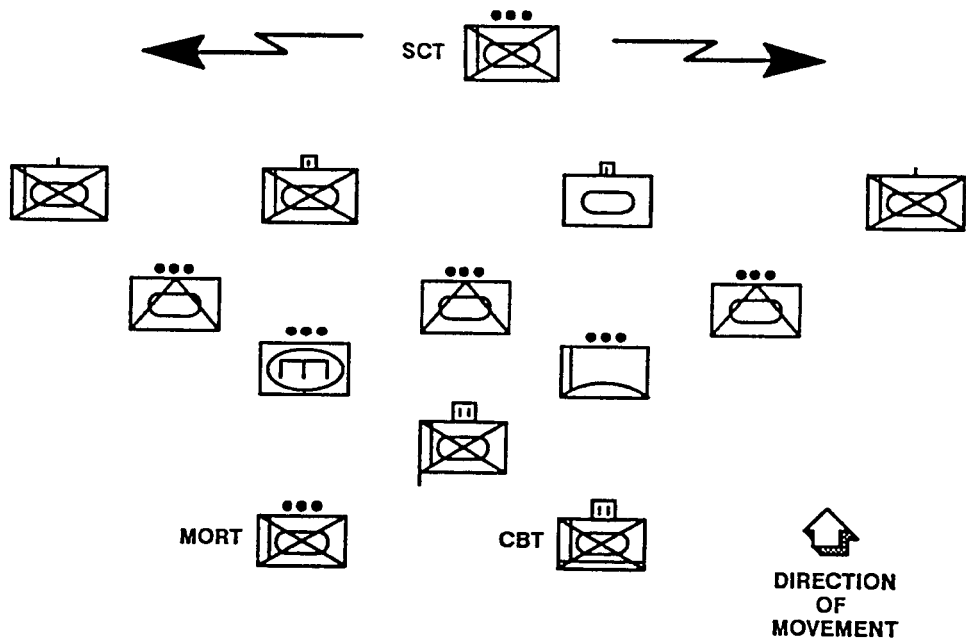
In the box formation, the task force moves with two company teams forward and two company teams trailing. It is the most flexible of all formations

because it can easily be changed to most other formations. The BSFV platoon may move as a platoon positioned astride the main enemy air avenue of approach, or it may be task-organized into sections with sections moving with supported company teams. The box formation—

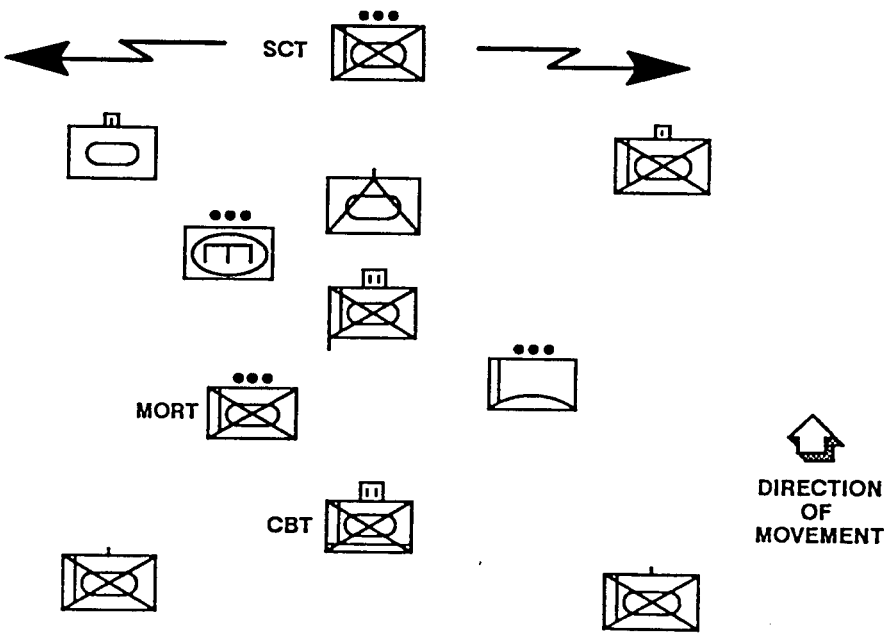
- Provides firepower to the front and flanks.
- Eases speed of movement due to ease of control.
- Protects elements moving in the center of the box.

See the Task Force in Box Formation illustration on the next page.

TASK FORCE IN LINE FORMATION



TASK FORCE IN BOX FORMATION



Diamond Formation

The diamond formation is a variation of the box formation. In the diamond formation, one company team leads; one company team is positioned on each flank; and the remaining company team is at the rear. In this formation, the BSFV platoon may be placed behind the lead company team or task-organized and travels with supported company teams. The diamond

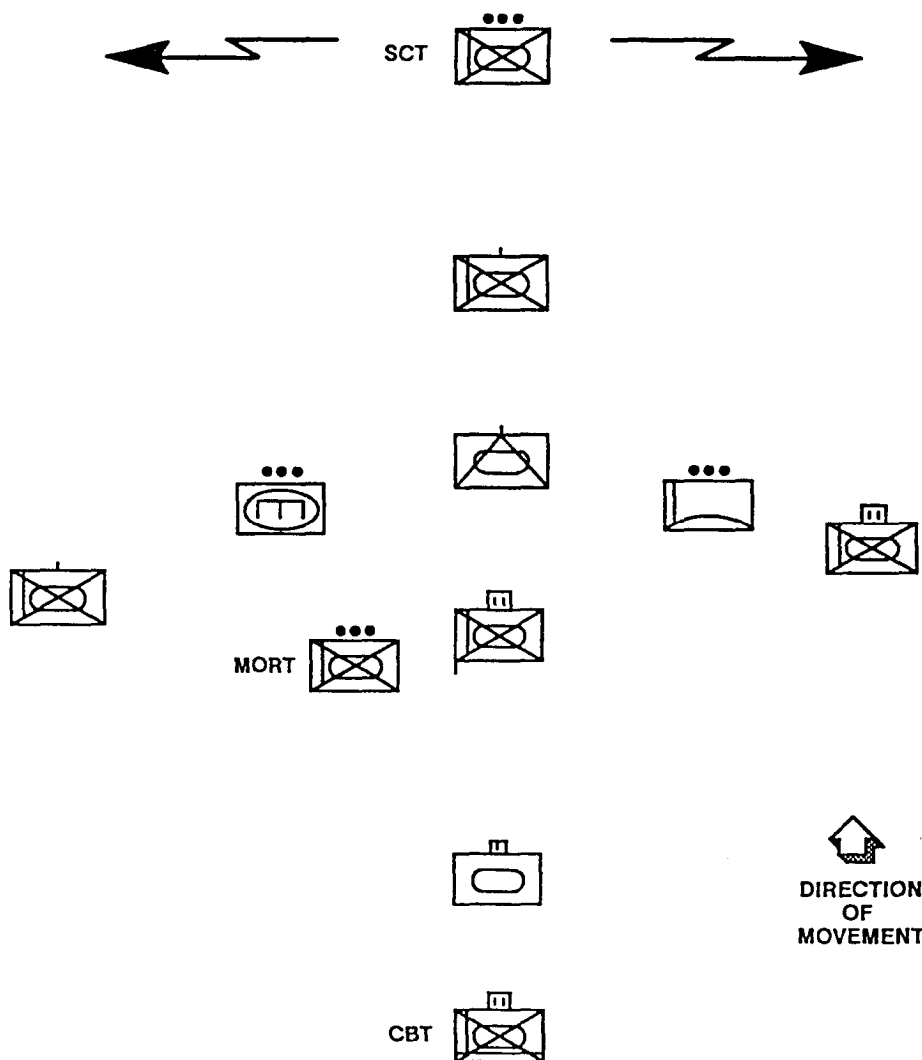
formation—

- Leads with less combat power forward than the box formation.

- Transitions easily to other formations.

See the Task Force in Diamond Formation illustration.

TASK FORCE IN DIAMOND FORMATION



SUMMARY

Using a combination of movement techniques and formations, the supported unit commander

adjusts his overall scheme of movement based on the factors of METT-T.

THREAT

During friendly offensive operations, threat forces will attempt to use their fire support assets to regain the initiative. Threat air activity will most likely be categorized by RISTA operations in support of artillery and maneuver. UAVs are best suited for these types of operations, especially if threat forces have developed effective command, control, communications, and intelligence (C³I). Secondary weapon systems the enemy will use include helicopters, either as dedicated attack assets or as armed utility helicopters. Helicopter assets can be used in two roles: attack or reconnaissance. Helicopters in the reconnaissance role will operate in the same manner as UAVs to support artillery targeting and maneuver. In the attack, the air defender can expect spoiling attacks usually consisting of two helicopters taking full advantage of

cover and concealment with the mission of disrupting friendly operations.

In some cases, helicopters will be used in conjunction with threat armored forces to deter friendly penetrations. However, it is unlikely the friendly commander will see large numbers of helicopters in this role. The enemy will use ground forces to first neutralize friendly air defense assets. Helicopters will be used primarily against armored forces.

Threat fixed-wing assets will be limited and their use will be hampered by friendly fixed-wing aircraft. Use of enemy fixed-wing aerial platforms cannot be entirely ruled out. If used by the enemy, the ground commander can expect to see no more than one or two aircraft in a spoiling attack, normally not coordinated with enemy ground operations.

AIR DEFENSE ARTILLERY IN THE OFFENSE

The BSFV platoon adds an important new capability to the combined arms team during offensive operations. Its speed and armor protection increase mobility and survivability on the battlefield. Its onboard weapon systems allow the BSFV to protect itself while providing continuous ADA protection at the critical time and place.

In the offense, BSFVs normally accompany the main body or the task force reserve. Ultimately, BSFV positioning will be determined by the factors of METT-T. The BSFV platoon may be task-organized to provide direct support to the task force or task-organized into sections to support individual company teams. Priorities for protection may include maneuver elements, fire support, engineer elements, command and control nodes, and logistics assets. Unit SOPs and mission-specific IPB developed during the planning process will

ultimately direct priorities for air defense for each mission. The BSFV platoon will develop a plan to support the supported unit's scheme of maneuver and commander's intent for each mission. The BSFV platoon leader will develop an execution matrix which will position his assets to protect the supported force against air threats.

A task force may conduct various types of offensive operations. Each requires the platoon leader to plan using the six ADA employment guidelines outlined in Chapter 2. The forms of tactical offensive operations are—

- Movement to contact.
- Attack.
- Exploitation.
- Pursuit.

MOVEMENT TO CONTACT

A task force conducts a movement to contact to develop the situation and to establish or regain contact with the enemy. A movement to contact often results in a meeting engagement. The movement to contact

ends when contact is made or the objective is occupied without enemy contact.

The movement to contact is characterized by decentralized control, rapid movement, and

commitment of forces from the march. A movement to contact can be conducted against either stationary or moving forces. Each side attempts to seize the initiative and overwhelm the opposing force via fire and maneuver. Various subcomponents and variants of the movement to contact are—

- **Approach march.** An approach march is a variant of the movement to contact and is used when commanders are more certain of the enemy's location and strength.
- **Search and attack.** Search and attack operations are conducted by smaller, lighter forces and reconnaissance forces to destroy enemy forces, protect the force, secure areas, or collect information.
- **Reconnaissance in force.** A reconnaissance in force is a limited-objective operation by a considerable force to obtain information about the enemy.

MANEUVER ELEMENT

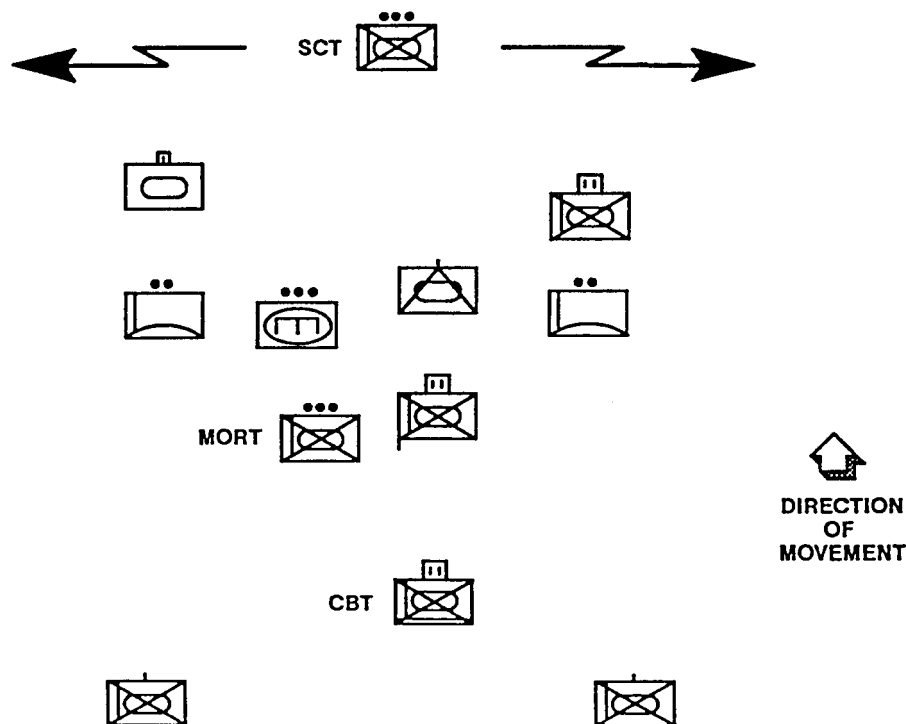
The forward security force, usually a combination of ground and air scouts in a moving screen forward of

the main body, confirms the IPB by developing the situation and attempts to make contact with the enemy with the least amount of force. It may fix small concentrations of enemy forces. It ensures the main body can deploy uninterrupted.

The flank and rear guards protect the main body from attack. In a task force, these may be platoon-sized forces. These forces are strong enough to either defeat or fix small enemy forces or delay a stronger enemy attack to allow the main body to deploy. The flank guards travel on routes parallel to the main body. These elements move by continuous march or alternate bounds to occupy key terrain on the flanks of the main body. The rear guard follows the main body and likewise protects it from attack.

The main body will normally move along an axis or axes of advance, and the task force commander may plan intermediate objectives along these axes to orient his forces. Usually, the task force commander will designate a main effort, giving priority to one axis in his zone to more clearly focus his combat power. See the following illustration.

TASK FORCE CONDUCTING MOVEMENT TO CONTACT USING BOX FORMATION



AIR DEFENSE ARTILLERY UNITS

Enemy air can be expected if the friendly attack is achieving success. BSFV platoon leaders will normally design their coverage in conjunction with the task force commander's scheme of maneuver. This may mean that the platoon leader will structure his platoon's support to support the task force commander's designated main effort. The platoon leader can do this by allocating more of his assets to the main effort.

A movement to contact usually results in lateral maneuver once the enemy is located, and the task force attempts to either fix or bypass. BSFV platoon leaders must remain flexible, and planning for a movement to contact must include analysis of enemy air avenues throughout the entire zone of action. BSFV platoons must be able to posture themselves quickly to counter any enemy air threat.

In a movement to contact, the pace of movement prevents frequent dismounting of Stinger teams; therefore, the 25-mm chain gun is the initial weapon

used by the BSFV platoon to engage enemy air targets. Consequently, BSFVs will normally maneuver no further than 2,000 meters apart to ensure more than one BSFV can engage enemy air targets at the same time.

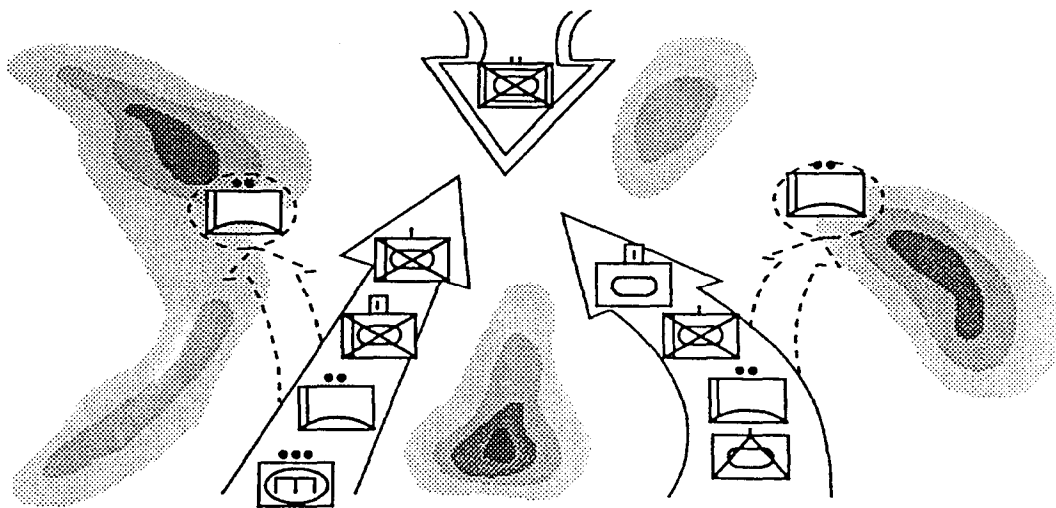
Stinger teams should dismount when possible. While tedious, this technique results in the most effective air defense coverage. If the task force uses bounding overwatch, teams can dismount when sections are part of the overwatch element. Sections must make opportunities for themselves during movement to dismount as much as possible. The decision to dismount the Stinger team is normally a squad leader's decision, based on METT-T. BSFV platoons should incorporate into their SOPS dismount criteria during movements to contact. Vehicle dispersion, weapon range, and movement techniques should be considered when developing dismount SOPs for offensive operations.

MEETING ENGAGEMENT

The meeting engagement is normally the result of a movement to contact. A meeting engagement is the initial contact that occurs when a force that is not completely deployed for battle encounters an enemy force on which little information is known. Depending on his mission, the maneuver commander may defend, bypass, or attack. Success in a meeting engagement

depends on effective execution once contact has been made. A force involved in a meeting engagement maintains momentum by focusing all available combat power against the enemy. The force which seizes the initiative, moves rapidly, and attacks violently will usually be the victor in a meeting engagement. See the Task Force in a Meeting Engagement illustration.

TASK FORCE IN A MEETING ENGAGEMENT



MANEUVER ELEMENT

The primary consideration in a meeting engagement is the ability to quickly mass all available combat power to defeat or destroy the enemy in contact. Rapid grasp of enemy locations and strengths, quick repositioning of units, and effective integration of indirect fire assets are critical for success. Ultimately, the maneuver commander must conduct fire and maneuver with all available elements to gain the decisive edge.

AIR DEFENSE ARTILLERY UNITS

Planning for a meeting engagement is conducted during the movement to contact planning phase. Through the IPB process, the S2 determines possible enemy courses of action throughout the zone of action. The BSFV platoon leader must understand all

templated enemy air avenues in zone. The platoon leader will develop a plan that allows for agility and flexibility to effectively counter each enemy course of action throughout the supported unit's zone of action. He will normally do this by planning throughout the entire zone a series of aerial named areas of interest to observe, on-order positions to occupy with his BSFVs, and aerial target areas of interest on which to mass air defense fires. Once contact is made and a meeting engagement ensues, the BSFV platoon leader will execute planned positions, observe planned NAIs, and upon enemy contact, activate planned TAIs according to his decision support and execution matrices. Success will depend upon the platoon's ability to quickly execute its plan once initial enemy contact is made in the meeting engagement.

HASTY ATTACK

A hasty attack is normally the result of a meeting engagement. A hasty attack differs from a deliberate attack in the amount of time allowed for planning and preparation, and information available on enemy dispositions. Normally, planning time for a hasty attack is limited and knowledge of enemy dispositions is sketchy. A hasty attack results from a meeting engagement or when bypass has not been authorized. Optimally, a hasty attack is conducted when the enemy is in a vulnerable position or when he is marginally prepared to conduct operations. The friendly force must move quickly to gain the advantage. Speed and violence can overcome lack of preparation. SOPs, battle drills, and understanding of the commander's intent are critical for effective execution of hasty attacks. There are two categories of hasty attacks.

HASTY ATTACK AGAINST A MOVING FORCE

A hasty attack against a moving force occurs when two opposing moving forces converge. Normally, enemy forces are conducting a movement to contact as well, and have relatively equal information regarding the disposition of friendly forces. The side that wins must gain a rapid understanding of the opponent's disposition, maneuver first to position forces to his advantage, and mass all available combat power first. See the illustration on the next page.

HASTY ATTACK AGAINST A STATIONARY FORCE

A hasty attack against a stationary force is normally initiated as a result of a movement to contact.

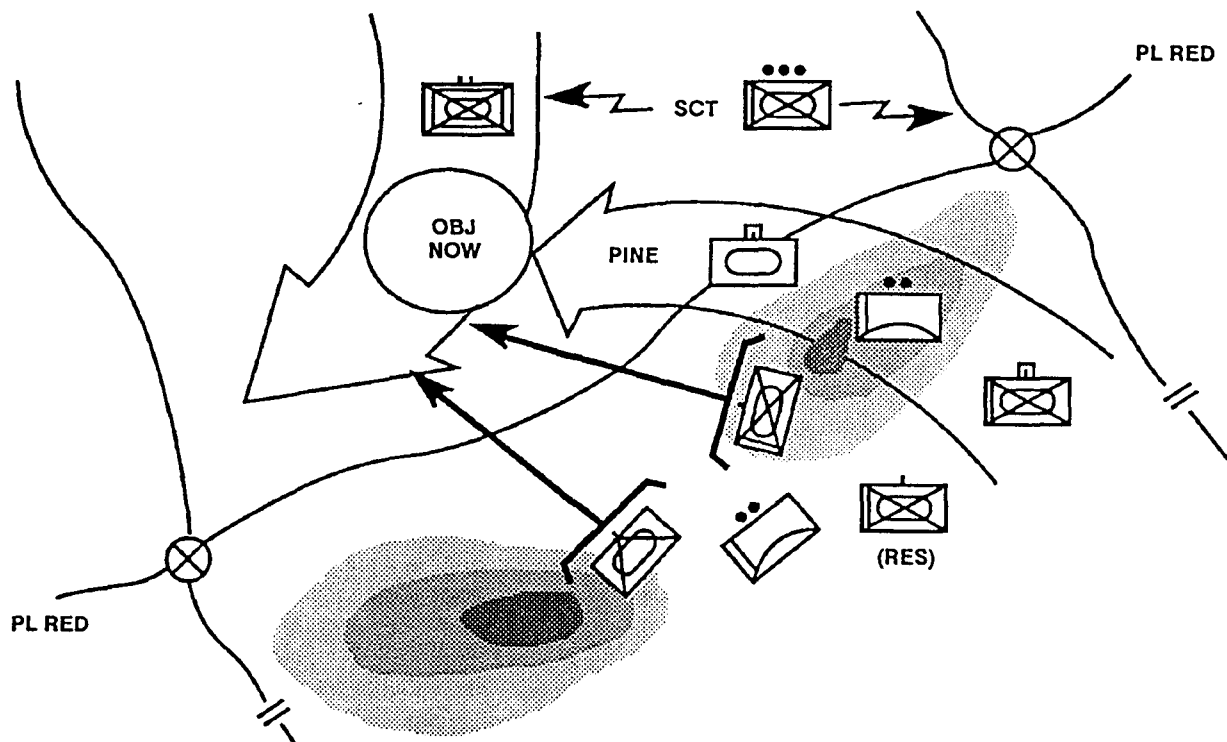
Some information of enemy positions and strength may be known. Friendly lead security elements begin the hasty attack by reconnoitering enemy positions, and by confirming or denying the initial enemy template. Lead scouts will attempt to find a weakness in the enemy position, normally at the enemy's flank. The task force will deploy, arraying itself to concentrate its combat power on a designated point of penetration. The task force commander will maneuver trail elements in the task force to take advantage of success during the attack. Since the task force has an offensive mission, it may have subordinate tasks of either fixing and bypassing, defeating, or destroying the enemy.

The hasty attack is completed when the enemy has been either fixed and bypassed, defeated, or destroyed (depending on the unit's mission); and the task force has consolidated on the objective, postured to defend or to continue the mission to the next objective. See the Hasty Attack Against a Stationary Force illustration on page 4-15.

AIR DEFENSE ARTILLERY UNITS

As in the meeting engagement, the success of air defense artillery in a hasty attack will depend on thorough prior planning. Prior to the mission, on-order BSFV positions, aerial NAIs and TAIs along suspected enemy air avenues of approach, and decision and execution matrices must be developed throughout the entire zone of action to ensure success. The BSFV platoon leader will plan his scheme of maneuver based on the task force designated main effort, outlined in the commander's intent. Unit SOPs and battle drills,

MEETING ENGAGEMENT BETWEEN MOVING FORCES WITH ENSUING HASTY ATTACK



combined with rapid, aggressive execution, will aid in mission accomplishment.

During the movement to contact, BSFVs will maneuver based on the supported unit's scheme of maneuver and the BSFV platoon's execution matrix. Stinger teams will dismount whenever possible. Once the hasty attack begins, the platoon leader will position his assets, based on the supported task force designated main effort, to defend against enemy air avenues of approach developed during the planning process.

Depending on METT-T and the IPB, the task force conducting the main effort may require two BSFV platoons. In this case, the BSFV battery commander should allocate his forces in the following manner whenever possible:

- One platoon in the direct support role and the

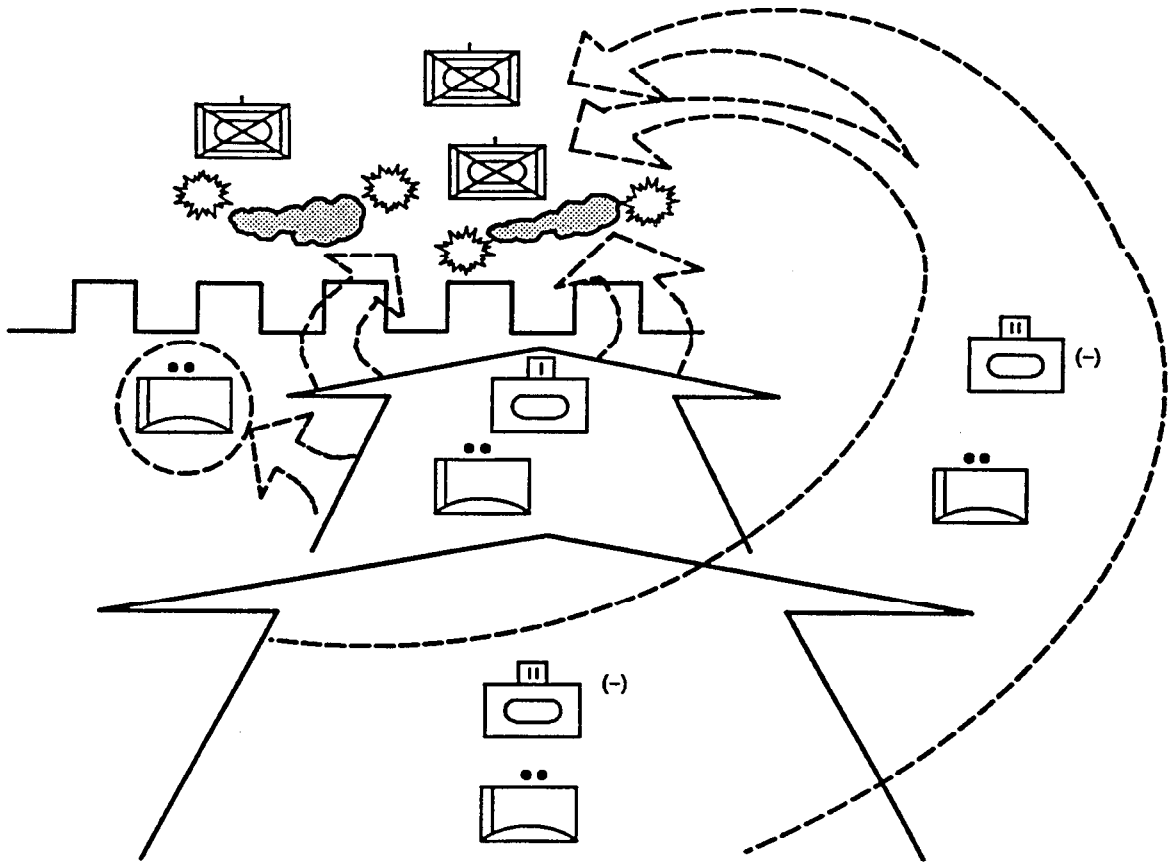
other in the reinforcing role. The reinforcing BSFV platoon will allow the commander flexibility to shift coverage and platoon fires.

- The platoon leaders deploy systems in an overwatch position—no more than 1,000 meters behind the assaulting forces.

- BSFV fire units must be kept under the central control of one platoon leader to maximize coordination and synchronization. In certain cases, when two BSFV platoons are required, the BSFV battery commander may serve as the task force air defense coordinator. The battery commander maneuvers with his platoons to enhance command and control and to shift fires as necessary.

- Aerial surveillance positions or routes.

HASTY ATTACK AGAINST A STATIONARY FORCE



DELIBERATE ATTACK

Deliberate attacks are fully synchronized operations that employ the effects of every available asset against the enemy defense and differ from hasty attacks in planning time and knowledge of the enemy. All deliberate attacks are characterized by greater planning time and more detailed information on enemy dispositions. Deliberate attacks are often conducted from a defensive posture. Because deliberate attacks require a greater degree of synchronization of battlefield operating systems, they require additional planning time. It must be noted that during the planning and preparation of a deliberate attack, the enemy can improve defenses, disengage, or launch a spoiling attack against friendly positions.

MANEUVER ELEMENT

Graphic control measures for a deliberate attack are similar to those for a hasty attack; however, they

may be more detailed based on an increased knowledge of enemy dispositions. Axes of advance to intermediate objectives are designated to coordinate unit movement. A primary axis is designated to specify the task force main effort. A final objective is specified, usually located on what is believed to be the enemy's main defensive belt. Movement techniques will be specified based on suspected enemy locations. Task force formations will, terrain permitting, place more combat power forward due to a greater knowledge of enemy locations. Reconnaissance is focused on confirming existing enemy templates, rather than gaining initial contact with the enemy. The final assault on the objective will be characterized by a higher degree of synchronization of combat multipliers; the previous planning process will have resulted in a greater

degree of specificity for maneuver and support elements.

AIR DEFENSE ARTILLERY UNITS

For a deliberate attack, air defense coverage must be extensive and well coordinated. This requires a complete IPB process that must include—

- Air and ground avenues of approach.
- Air and ground capabilities.
- Aerial NAIs and TAIs designated along air avenues of approach.

- Fixed- and rotary-wing attack profiles.
- Probable enemy aviation fire sacks.
- Aerial surveillance positions and routes.

From the IPB, the BSFV platoon leader will develop and use his own graphic control measures and those directed by the supported unit to control movement of the platoon. During a deliberate attack, BSFVs are normally positioned to support the main effort. The BSFV platoon leader must, however, retain the flexibility to shift and redirect platoon fires in support of the entire zone of action.

EXPLOITATION

Exploitation takes advantage of successes on the battlefield. Exploitation prevents the enemy from reconstituting, setting up an organized defense, or conducting a controlled withdrawal. It may follow either a hasty or deliberate attack. The task force can exploit its own success, attacking as the exploiting force for a larger unit, or follow and support another exploiting force.

The task force's mission can include—

- Securing objectives deep in the enemy rear.
- Severing lines of communications.
- Destroying enemy units.
- Denying escape routes to an encircled force.
- Ensuring the exploiting force has mobility and balanced firepower.

MANEUVER ELEMENT

An order to exploit will probably come as a warning order and immediately follow the initial offensive mission. Decentralized execution is characteristic of the exploitation. However, the commander must not allow over-extension of his combat forces.

AIR DEFENSE ARTILLERY UNITS

ADA resources supporting an exploiting task force must be as mobile as the maneuver forces. Less mobile fire units are used to keep open the task force lines of communications and protect key logistics facilities and command and control centers.

The BSFV platoon may move with the task force main body (exploitation force), or it may be task-organized to provide support for both the exploitation force and the logistics elements. Effective command and control is required to support constantly moving units.

PURSUIT

The purpose of pursuit is to complete the destruction of the enemy force while it is in the process of withdrawal. The enemy force itself is the main objective.

MANEUVER ELEMENT

The pursuit usually consists of direct pressure and enveloping forces. The direct pressure force prevents the enemy from disengaging and inflicts maximum casualties. This force must not allow the enemy to break contact.

The enveloping force penetrates to the rear of the enemy and prevents his escape. It destroys the enemy with support from the direct pressure force. If the

enveloping forces cannot get to the rear of the enemy force, it may attack the flank of the retreating main body. The task force can conduct a pursuit to support the brigade or have one of its company teams conduct a pursuit to support task force operations.

AIR DEFENSE ARTILLERY UNITS

As with the exploitation, air defense systems deployed with the enveloping forces must be as mobile as the supported force. Since penetration occurs deep in the enemy rear, the same caution as in a movement to contact must be practiced.

BSFVs maneuver with the enveloping forces. They normally travel to the flanks but not outside the

maneuvering forces. The battery may employ platoons with the enveloping forces. Stinger sections may be

used to protect critical command and control nodes, logistics facilities, and supply lines.

FORMS OF MANEUVER

Offensive actions use different forms of maneuver to achieve success. These forms of maneuver are—

- Envelopment.
- Turning movement.
- Infiltration.
- Frontal attack.
- Penetration.

Frequently, offensive actions will use more than one form of maneuver. Forms of maneuver orient on the enemy, not terrain. BSFV platoon leaders must understand these forms of maneuver to optimize their platoon's capabilities in the combined arms team.

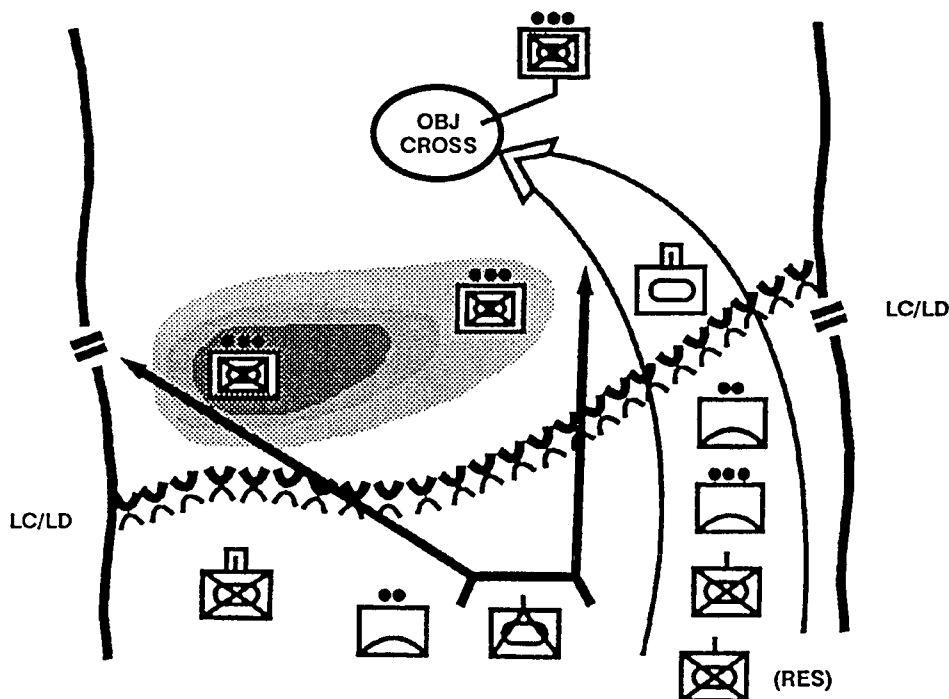
Using forms of maneuver to influence the enemy is an art, not a science. Forms of maneuver used during each mission are normally specified in the task force commander's intent and scheme of maneuver. The higher commander seldom directs the form of maneuver to be used by the battalion task force.

ENVELOPMENT

In an envelopment, the attacker uses fire and maneuver to place greater combat power against the defender. The attacker strikes the enemy's flank or rear, finding or creating an assailable flank. The envelopment causes the enemy to fight in a direction in which he is not prepared to fight. The BSFV platoon has the responsibility to provide air protection for the enveloping maneuver element, as well as the stationary maneuver element occupying attack by fire positions. METT-T commander's intent, and scheme of maneuver will ultimately determine how the BSFV platoon accomplishes the mission.

An encirclement is a continuation of an envelopment. A force in direct contact with the enemy fixes the enemy in position while an encircling force maneuvers to surround the enemy, cutting the enemy's escape routes. See Task Force Conducting Envelopment of a Stationary Enemy Force illustration.

TASK FORCE CONDUCTING ENVELOPMENT OF A STATIONARY ENEMY FORCE

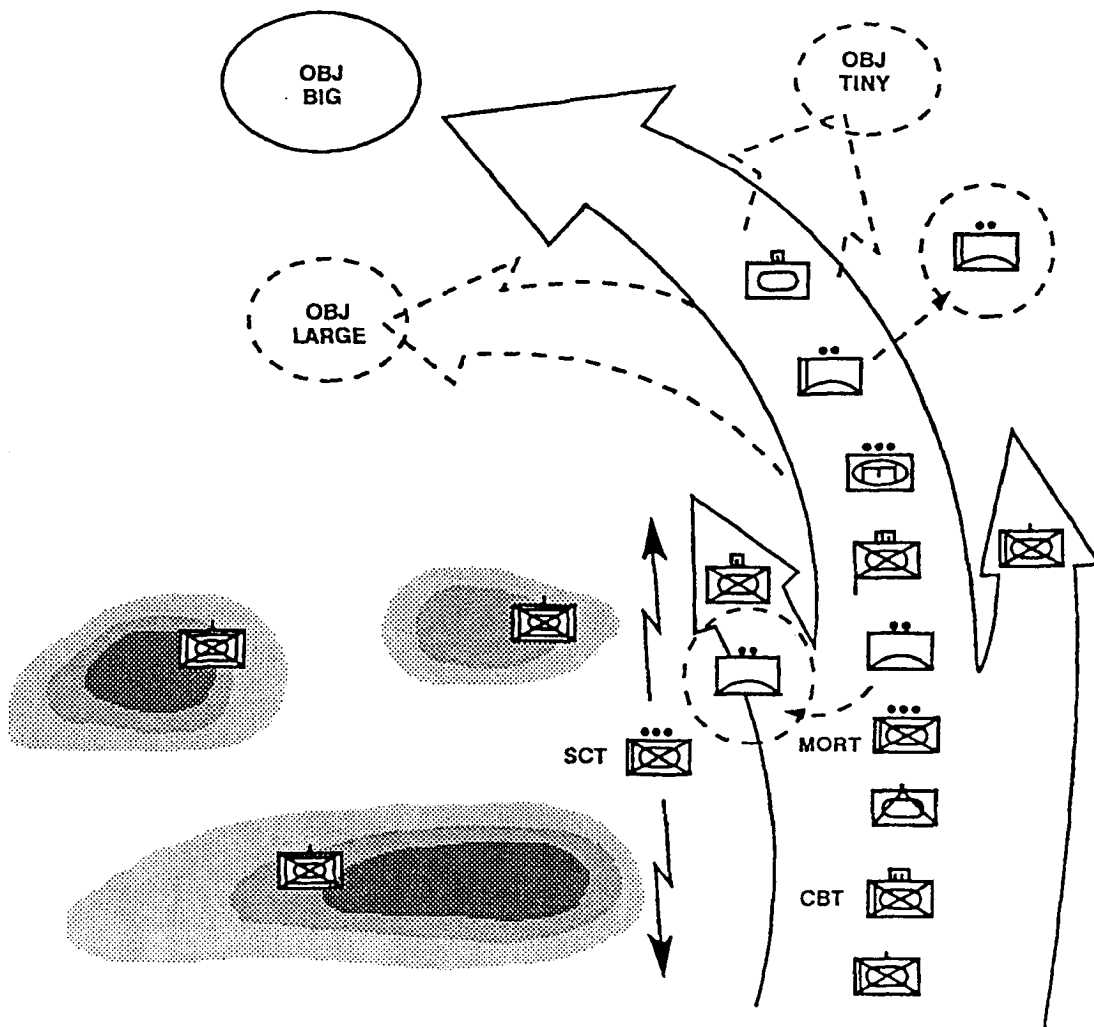


TURNING MOVEMENT

The turning movement is a variant of the envelopment in which the attacker seeks to pass around the enemy, avoiding his main forces, to secure a terrain oriented objective deep in the rear and sever enemy lines of communications (LOC). Optimally, enemy forces will abandon prepared positions and attack in an undesirable direction. A task force normally conducts a turning movement as part of a

larger unit's operation. The BSFV platoon employment considerations are basically the same for the turning movement as they are for the envelopment. Special emphasis should be placed on ADA integration during preparation phase of the operation to ensure the BSFV platoon does not mask the fires of the supported force during the turning movement. See the following illustration.

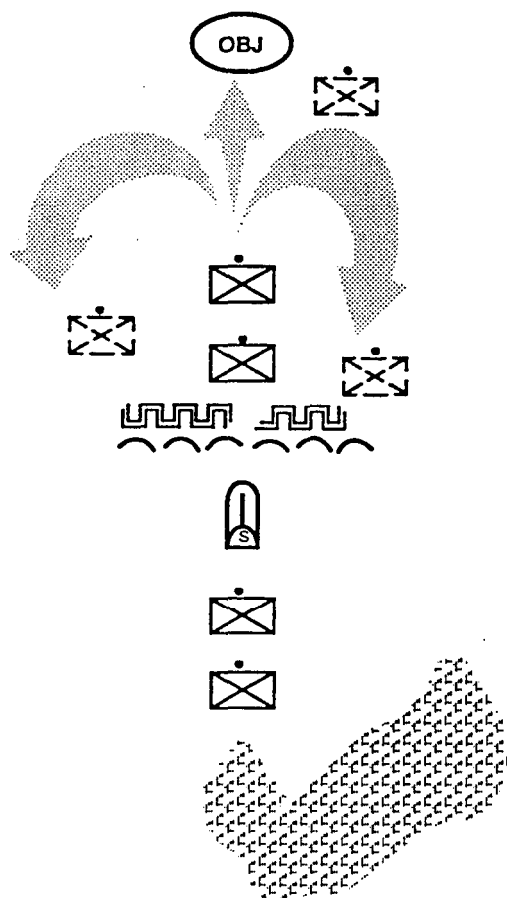
TASK FORCE CONDUCTING A TURNING MOVEMENT



INFILTRATION

Infiltration is a form of maneuver in which combat elements move by stealth to objectives to the rear of the enemy's position without fighting through prepared defenses. All or part of the task force may move by infiltration. Infiltrations are slow and are often conducted during reduced visibility. Successful infiltration requires effective reconnaissance to discover and secure undefended routes. Such routes are normally found in rough terrain or in areas difficult to cover with observation and fire. The infiltrating elements avoid detection, but if detected, they avoid decisive engagement. If the infiltration is mounted, the Stinger teams will probably remain mounted but may dismount depending on movement and METT-T. If the infiltration is dismounted, Stinger teams may be part of the dismounted force. See the Infiltration Maneuver illustration.

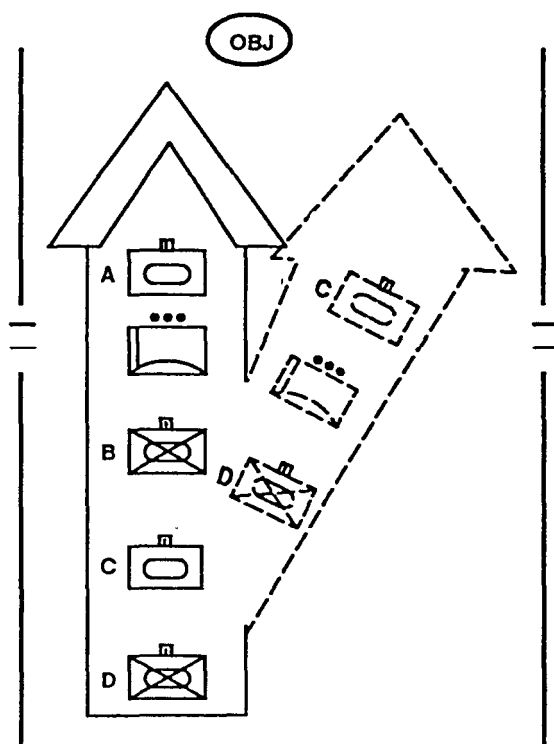
INFILTRATION MANEUVER



FRONTAL ATTACK

The frontal attack is the least preferred form of maneuver. In the frontal attack, the task force uses the most direct routes to strike the enemy along a wide front. This attack is normally employed when the mission is to fix the enemy in position or deceive him. Although the frontal attack strikes the enemy's front within the zone of the attacking force, it does not require that the attacker do so on a line or that all subordinate unit attacks be frontal. Frontal attacks, unless in overwhelming strength, are seldom decisive. Often, frontal attacks are the best form of maneuver for a hasty attack or meeting engagement against enemy light defenses or security zone forces where simplicity and speed are important in maintaining battle tempo. The BSFV platoon must provide air defense protection forward of the lead element of the frontal attack. If follow-on elements of the supported force are not conducting a frontal attack, the BSFV platoon must develop a plan to provide air defense protection on a supporting axis of advance. See the Frontal Attack Maneuver illustration.

FRONTAL ATTACK MANEUVER



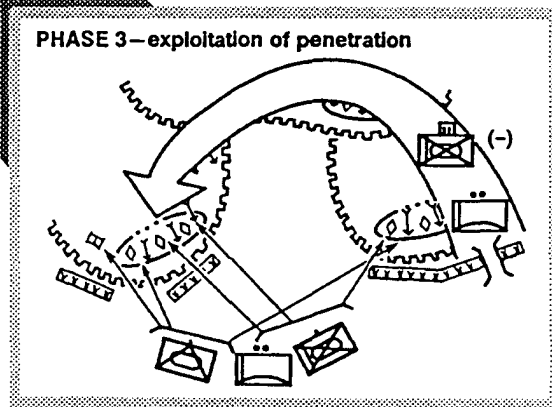
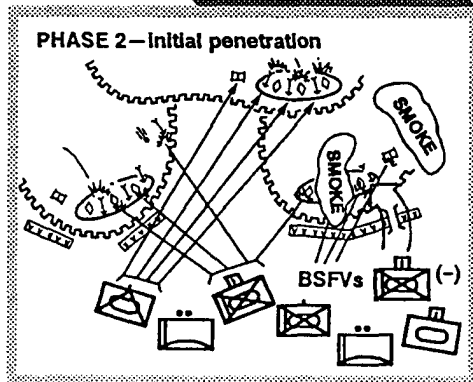
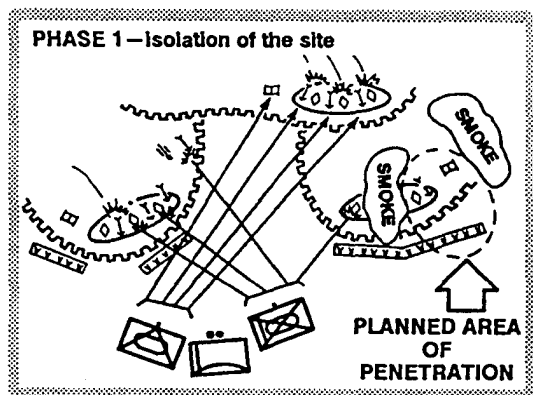
PENETRATION

In a penetration, the task force concentrates its force at a specified point of penetration to overwhelm the enemy and gain the advantage. A penetration is used when enemy flanks are not assailable. All available combat assets are massed at a single point to make a breach; the shoulder of the penetration is held open and any enemy counterattacks attempting to thwart the penetration are repelled. A successful penetration depends on surprise and the attacker's ability to suppress enemy weapons, to concentrate forces at the point of attack, and to quickly pass sufficient forces through the gap to destroy the

enemy's defense. In support of a penetration, the BSFV platoon must consider the vulnerability of the supported element holding open the shoulder of the penetration and the lead element which exploits the penetration. A penetration is planned in the following three phases as shown in the Task Force Conducting a Penetration illustration:

- Isolation of the site selected for penetration.
- Initial penetration of the enemy position.
- Exploitation of the penetration.

TASK FORCE CONDUCTING A PENETRATION



DEFENSE

This chapter discusses the role of the BSFV platoon in defensive operations. The immediate purpose of defensive operations is to defeat an enemy attack. Army forces conduct defensive operations as part of major operations and campaigns, in combination with offensive operations.

PURPOSE OF THE DEFENSE

Military forces conduct defensive operations to gain sufficient strength to attack. Though the outcome of decisive combat derives from offensive operations, it is often necessary, even advisable, to defend. When commanders choose to defend, they can apply defensive strategies that achieve the following results:

- Enemy destroyed.
- Enemy forces weakened as a prelude to the

offense.

Failure of an enemy attack.

- Time gained for further defensive operations.
- Opportunities created to concentrate forces elsewhere.
- Control of key or decisive terrain.
- Terrain retained.

CHARACTERISTICS OF DEFENSIVE OPERATIONS

History has shown that normally the defender has the advantage over the attacker. This is due to the defender's time to prepare and knowledge of the terrain. The attacker has the initiative to choose the time and place of battle. He tries to shatter the defense quickly and prevent its reconstitution by continuing the attack at a fast pace. The defender must slow the attack to provide time to isolate, fight, and destroy the attacker. However, the defender's concept must be tempered with the understanding that, ultimately, offensive operations must be conducted to ensure defeat of the enemy. Defensive operations are characterized by prepared positions, security, disruption, mass and concentration, and flexibility.

PREPARATION

Using the advantages of time and knowledge of terrain, the defender enhances his disposition by preparing positions from which to fight. Like offensive operations, every defense has a focal point or main effort. Preparations include but are not limited to—

- Positioning forces in depth.
- Improving terrain.
- War-gaming defensive plans.
- Organizing logistics support.

- Strengthening air and missile defenses in critical areas.

- Rehearsing.

The efficient use of time during preparation by the defender normally leads to success during execution of the defense.

CONTENTS

	Page
Purpose of the Defense	5-1
Characteristics of Defensive Operations	5-1
Sequence of the Defense	5-2
Battlefield Framework Considerations in the Defense	5-3
Forms of Defensive Operations	5-4
Threat	5-4
Air Defense Planning Considerations in the Defense	5-5
Defense in Sector	5-5
Defense of a Strong Point	5-6
Counterattack	5-9
Perimeter Defense	5-10

SECURITY

Commanders must provide security for their forces during both defensive preparations and execution of the defense. During preparation, a task force provides security by establishing a screen line to protect the force, conducting counterreconnaissance operations in sector, and repositioning elements during preparations to deceive the enemy as to the true positions in the main defensive area. During execution, security is provided at the task force level by the screen line and local counterrecon operations to provide early warning, disrupt the enemy attack early, and protect the main defensive positions.

DISRUPTION

An attacker's strength comes from momentum, mass, and synchronization. The defender attempts to disrupt the attacker's tempo by preventing him from massing his combat power. The defender never allows the attacker to get set. The defender interrupts the attacker's command and control, fire support, and logistics system. Disruption can be caused by—

- Defeating or misleading enemy reconnaissance forces.
- Isolating enemy units.
- Breaking up enemy formations, causing them to attack piecemeal.

MASS AND CONCENTRATION

He who defends all defends nothing. Like the offense, the defense has a main effort, designated by the task force commander in his intent. The defender seeks to mass the effects of overwhelming combat power to defeat the attacker. To concentrate forces at

decisive points, the defender accepts risk in some areas. Obstacles, security forces, and fires can assist in reducing these risks. He retains and, when necessary, reconstitutes a reserve. He maneuvers to gain local superiority at the point of decision. The defender may have to surrender some ground to gain the time necessary to concentrate his forces.

Defending commanders normally mass effects and concentrate forces repeatedly during battle. They do so swiftly since periods that allow them to develop superior combat power will be brief. Concentration of the force increases the threat of large losses from weapons of mass destruction. Defending commanders use deception and concealment to hide their vulnerability from the enemy. Furthermore, defending commanders protect the force from weapons of mass destruction through integrated air and missile defenses.

FLEXIBILITY

The defender must plan his defense in depth and build in the agility to counter the attacker's initiative. He designs contingency plans that allow for rapid action and exploitation of enemy weaknesses. He must anticipate the enemy's decision-making and maneuver forces to apply combat power before the enemy can react against it. The flexibility to outmaneuver the enemy during the defense stems from detailed planning and a thorough IPB. Flexibility allows the defender to shift his point of main effort quickly, without losing the advantage. The defender adds flexibility to his defense by planning alternate and supplementary positions throughout the depth of the battlefield. The defender must be prepared to assume the offensive through planning and preparation for a counterattack.

SEQUENCE OF THE DEFENSE

As in the offense, defensive operations are normally phased. Defensive operations routinely adhere to the following phases.

PREPARATION FOR OPERATIONS

During this phase, units prepare for defensive operations. This is the most important phase of defensive operations. Reconnaissance and counterreconnaissance operations, defensive position

preparations, refinement of the plan, and rehearsals occur during this phase.

DEFENSE

During this phase, the task force conducts the main defense. Obstacles are closed and armed; units occupy initial defensive positions; engagement areas are structured; and the task force fights its main defensive battle. Local counterattacks and repositioning of forces to complete enemy destruction are accomplished during this phase.

CONSOLIDATION, REORGANIZATION, AND PREPARATION FOR THE ATTACK

The unit consolidates forces, conducts resupply, reorganizes (if required), and prepares for future

operations. Often, security forces for the next battle are positioned forward during this phase to facilitate transition to follow-on missions.

BATTLEFIELD FRAMEWORK CONSIDERATIONS IN THE DEFENSE

The TF normally defends as part of a brigade plan. The defensive battlefield framework consists of the deep, close, and rear battles. Even though the battlefield framework components are the same for offensive operations, the objectives are different.

DEEP OPERATIONS

The defender designs deep operations to achieve depth and synchronization in the defense and to secure advantages for future operations. Deep operations disrupt the enemy's movement in depth, destroy high-payoff targets vital to the attacker, and interrupt or deny vital enemy operating systems such as command, logistics, or air defense at critical times. As deep operations succeed, they upset the attacker's tempo and synchronization. The defender selectively suppresses or neutralizes some of the enemy's operating systems to exploit the exposed vulnerabilities. Individual targets in depth are only useful as they relate to the destruction of a critical enemy operating system. A defender denies freedom of maneuver to the attacker with deep operations; he also seeks to set the terms for the transition to the offense.

Deep operations provide protection for the force as they disrupt, delay, or destroy the enemy's ability to bring combat power to bear on friendly forces. As with deep operations in the offense, activities in depth, such as counterfire, focus to protect close combat operations directly. To synchronize the activities that encompass both deep and close objectives, commanders integrate and prioritize reconnaissance, intelligence, and target acquisition efforts to focus fires and maneuver at the critical place and time on the battlefield.

Normally, the task force has limited involvement in deep operations. True deep operations in the defense are fought at brigade levels and higher. The primary task force responsibility is to monitor the progress of deep operations and adjust the close battle plan as necessary to gain maximum advantage over the enemy.

CLOSE OPERATIONS

Close operations are the activities of the main and supporting efforts in the defensive area to slow, canalize, and defeat the enemy's major units. The

task force plays the primary role in close operations. The defending commander may do this in several ways. Often, he fights a series of engagements to halt or defeat enemy forces. This requires him to designate a main effort, synchronize effects to support it, then shift the main effort to concentrate forces and mass effects against another threat if necessary. Maneuver units defend, delay, attack, and screen as part of the defensive battle.

Security operations warn of the enemy's approach and attempt to harass and to slow him. A covering force meets the enemy's leading forces, strips away enemy reconnaissance and security elements, reports the attacker's strength and locations, and gives the commander time and space in which to react to the enemy. The security force at the task force level is normally the task force scout platoon. It may be reinforced with additional infantry fighting vehicles and tanks to strip away enemy reconnaissance elements at the forward edge of the task force main battle area.

Reserves conduct operations throughout the defense and may require continual regeneration. They give the commander the means to seize the initiative and preserve his flexibility; they seek to strike a decisive blow against the attacker but prepare to conduct other missions as well. They provide a hedge against uncertainty. Reserves operate best when employed to reinforce and expedite victory rather than prevent defeat. In defensive operations, a task force reserve is usually no smaller than a platoon and no larger than a company team.

REAR OPERATIONS

Rear operations protect the force and sustain combat operations. Successful rear operations allow the commander freedom of action by preventing disruption of command and control, fire support, logistical support, and movement of reserves. Destroying or neutralizing enemy deep battle forces achieves this goal.

Rear operations must retain the initiative and deny freedom of action to the enemy, even if combat forces are not available. A combination of passive and

active defensive measures can best accomplish this. Commanders assess threat capabilities, decide where risk will be accepted, and then assign the units necessary to protect and sustain the force. Unity of command facilitates this process.

Regardless of the proximity or separation of elements, defense of the rear is integrated with the deep

and close fights. Simultaneous operations defeat the attacking enemy throughout the battlefield and allow an early transition to the offense. In task force rear operations, the headquarters and headquarters company commander or the task force S4 may be designated to control rear operations.

FORMS OF DEFENSIVE OPERATIONS

The two primary forms of defensive operations are mobile and area. Mobile defenses orient on the destruction of the attacking force by permitting the enemy to advance into a position that exposes him to counterattack by a mobile reserve. Area defenses orient on retention of terrain by absorbing the enemy in an interlocking series of positions and destroying him largely by fires.

MOBILE DEFENSE

Mobile defense orients on the destruction of the enemy force by employing a combination of fire and maneuver, offense, defense, and delay to defeat his attack. The minimum force possible is committed to pure defense; maximum combat power is placed in a striking force that catches the enemy as it is attempting to overcome that part of the force dedicated to the defense. Commanders conducting a mobile defense take advantage of terrain in depth, obstacles, and mines, while employing firepower and maneuver to wrest the initiative from the attacker. A mobile defense requires a mobility greater than that of the attacker. The defenders cause the natural aggressiveness of the attacker to focus on the wrong objective, setting him up for attack from an unexpected direction and driving that attack home with overwhelming force and violence.

Terrain is traded for maximum effect to divert the attention of the enemy from the defender's main force, overextend the attacker's resources, exposing his flanks, and leading him into a posture and terrain that diminishes his ability to defend against the counterattack of the larger, mobile reserve. The mobile defense

sets up large-scale counterattacks that offer the defender the opportunity to gain and retain the initiative, going over to the offense, and moving into exploitation and pursuit.

AREA DEFENSE

Commanders conduct an area defense to deny the enemy access to designated terrain or facilities for a specified time. In an area defense, the bulk of defending forces deploy to retain ground, using a combination of defensive positions and small, mobile reserves. Commanders organize the defense around a static framework provided by defensive positions, seeking to destroy enemy forces with interlocking fires. Commanders also employ local counterattacks against enemy units penetrating between defensive positions. A security area or covering force is also part of an area defense.

Commanders position their forces in platoon, company, or battalion battle positions on suitable terrain, with a specific orientation and direction or sector of fire. On occasion, commanders may also direct the construction of a strong point to deny key terrain to the enemy and force his movement in a different direction. The construction of a strong point requires considerable time and combat engineer support. In some cases, because of terrain restrictions, requirements to hold specific terrain, or when enemy forces are weak and disorganized, area defenses without much depth may be necessary, requiring the main effort to be well forward.

THREAT

During defensive operations, friendly forces are the most vulnerable to the full spectrum of threat aerial platforms. The enemy will attempt to use aerial platforms to monitor friendly forces for targeting.

The number one challenge to the BSFV platoon will be to deny the enemy's use of RISTA air assets. We can expect the enemy to use UAVs, rotary-wing and

possibly fixed-wing aircraft to determine locations of friendly artillery, command and control, ADA assets, logistical sites, and troop concentration areas. Once these sites are located, we can expect threat forces to disrupt or destroy these sites with the use of artillery or rocket fire, air attacks and air insertions.

Artillery and rocket attacks will be the enemy's preferred weapons against US forces and air defense assets. These systems are usually numerous, inexpensive, survivable, and highly effective. UAVs can be extremely effective for threat use during this phase. The UAV's low detection signature and standoff capability make them ideal for providing targeting data. Rotary- and fried-wing attacks are less likely during this phase due to the low survivability of these systems. In most cases these systems are limited to daylight operations.

These attacks will be supported with preattack and postattack reconnaissances.

Threat air insertion operations will be conducted with either fried- or rotary-wing assets and probably during the hours of limited visibility. The threat will likely conduct daytime reconnaissance of landing sites and target areas within 24 hours prior to attack. These operations will fly at low levels attempting to infiltrate into friendly rear areas.

AIR DEFENSE PLANNING CONSIDERATIONS IN THE DEFENSE

In the defense, the task force commander will prioritize his requirements for air defense coverage, based on his mission analysis, IPB, and METT-T. Priority for air defense in the defense may be to the battle positions in the main engagement area, command and control elements, or logistics assets. While most supported unit SOPs outline generic air defense coverage priorities for defensive operations, each mission will have its own specific requirements.

The BSFV platoon leader must perform a mission analysis, ensuring he understands the commander's intent and the task force concept of the operation. The BSFV platoon leader must clearly understand where the task force's effort will be weighted. Based on these considerations, the platoon leader will develop a coverage plan to support the defensive concept of operations. The entire BSFV platoon may be deployed to cover the defensive main effort, or the platoon may be task-organized into sections, with one section covering one asset on the battlefield (for example, the reserve) while the other section provides coverage for another asset on the battlefield (for example, the main engagement area). In either configuration, the platoon leader must ensure he conducts his planning in conjunction with the six air defense artillery employment guidelines and can mass his air defense

fires at the critical point on the battlefield when necessary.

Actual positioning of vehicles should be based on the air IPB, the commander's priorities for the air defense, and the location of the supported unit's assets. Vehicles should not be further than 2,000 meters apart, or as METT-T dictates, for the Stinger weapon system. In the defense, BSFVs may be prioritized for engineer effort and dug in to maximize survivability. The TOW, 25-mm automatic gun, and 7.62-mm coaxial machine gun should be used against ground targets in self-defense.

If BSFVs are tasked to provide coverage for the task force reserve, they should be positioned along identified enemy air avenues of approach that influence the task force reserve's initial positions as well as routes to its defensive or attack by fire positions.

The platoon leader's decision support template will result in an air defense artillery plan that synchronizes his operations with the supported commander's concept of the operation. Planning and troop-leading procedures must occur as early as possible to allow maximum preparation time. Once the basic plan is established, reconnaissance and rehearsals are key to an effective defense.

DEFENSE IN SECTOR

A defense in sector defines the unit's boundaries, terrain responsibilities, and where it will operate. A defense in sector is the most common defensive mission given to a task force. The task force commander is expected to defeat enemy forces within his sector forward of a no penetration line and maintain flank security. A defense in sector is one of the least restrictive missions.

MANEUVER ELEMENT

Normally, a task force commander is given the latitude to develop his defense as long as he complies with boundary restrictions directed by higher headquarters. He must develop a plan to defeat the enemy forward of a designated point. Preparation of a defense begins with a thorough IPB. The IPB must clearly describe all

enemy ground and air avenues of approach into the task force sector.

Once the IPB is completed, the task force commander designates the point on the ground within his sector where he wants to kill the enemy. This location becomes the cornerstone upon which a defensive engagement area is built. An engagement area is an area in which the commander intends to trap and destroy the enemy force with the massed fires of all available weapons. Within the engagement area, the task force will use the following techniques to destroy the enemy:

- Target reference points to coordinate both direct and indirect fires.
- Obstacles to turn the enemy into the engagement area and to impede its movement once in the engagement area.
- Battle positions to specify unit locations from which units defend, alternate positions for units to occupy when not in their assigned battle positions, positions for the initial placement of the reserve.
- Routes between positions.

Depending on the size of the sector the task force is required to defend, there may be more than one engagement area designated by the task force commander. However, one engagement area must be designated as the task force main effort, and priority of effort must be given to building this engagement area. The following is a general sequence of events that a task force may use to construct an engagement area:

- Identify the spot on the ground to kill the enemy.
- Construct obstacles to turn the enemy into the engagement area and to block the enemy in the engagement area.
- Position direct fire assets in battle positions to engage at the designated killing spot. Must have the ability to mass fires at the specified point. Adjust battle positions as necessary to ensure effective fires into the engagement area.
- Develop indirect fire support plan to kill the enemy at a specified point on the battlefield. Position indirect fire support assets to range engagement area.

An engagement area is built from the inside out. It is imperative that assets are planned and

positioned to support the building of the engagement area.

The task force commander will designate those areas within his sector where he intends to take risk. Through a combination of deception, obstacles, and unit positioning, he will structure his defense to “turn” the enemy into his main engagement area.

Strong points and perimeter defenses can be used in a defense in sector. If used, the commander will designate their locations and those assets dedicated to building the strong point or perimeter defense.

ADA COVERAGE OF A DEFENSE IN SECTOR

In a defense in sector, priority is based on the supported commander's intent and METT-T. Commanders designate priorities for air defense coverage. Maneuver forces, command and control elements, and logistics nodes are normally among priorities identified for air defense coverage.

BSFVs are normally allocated to the force anticipating the enemy main effort. If the tactical situation dictates, the platoon may split into sections to cover various enemy air avenues of approach in sector. Stinger sections from the battery may be allocated to augment the BSFV platoon defending against the main attack.

BSFVs may provide overwatch for reserve forces. BSFV crews protecting reserve forces must be aware when friendly reserves are committed, they will most likely receive the brunt of the enemy air attack. The illustration on the bottom of page 5-7, portrays an example of BSFV platoon support of an engagement area.

A task force which is part of a brigade level defense in sector may be assigned the defense of an engagement area. This type of defensive mission is more restrictive than a defense in sector. The task force may be given a series of battle positions in support of a specific engagement area within a brigade sector.

The BSFV platoon leader uses the air IPB to identify the location of expected air avenues of approach. He plans his defense to mass fires on these avenues.

BSFVs provide overwatch of maneuver units defending battle positions. The platoon leader must plan primary, alternate and supplemental positions. If dismounted Stinger teams support the defense, they must be dug in. BSFVs will use their 25-mm chain guns to support the Stinger teams and for

self-defense. See the Air Defense Artillery Coverage of a Battle Position illustration on the top

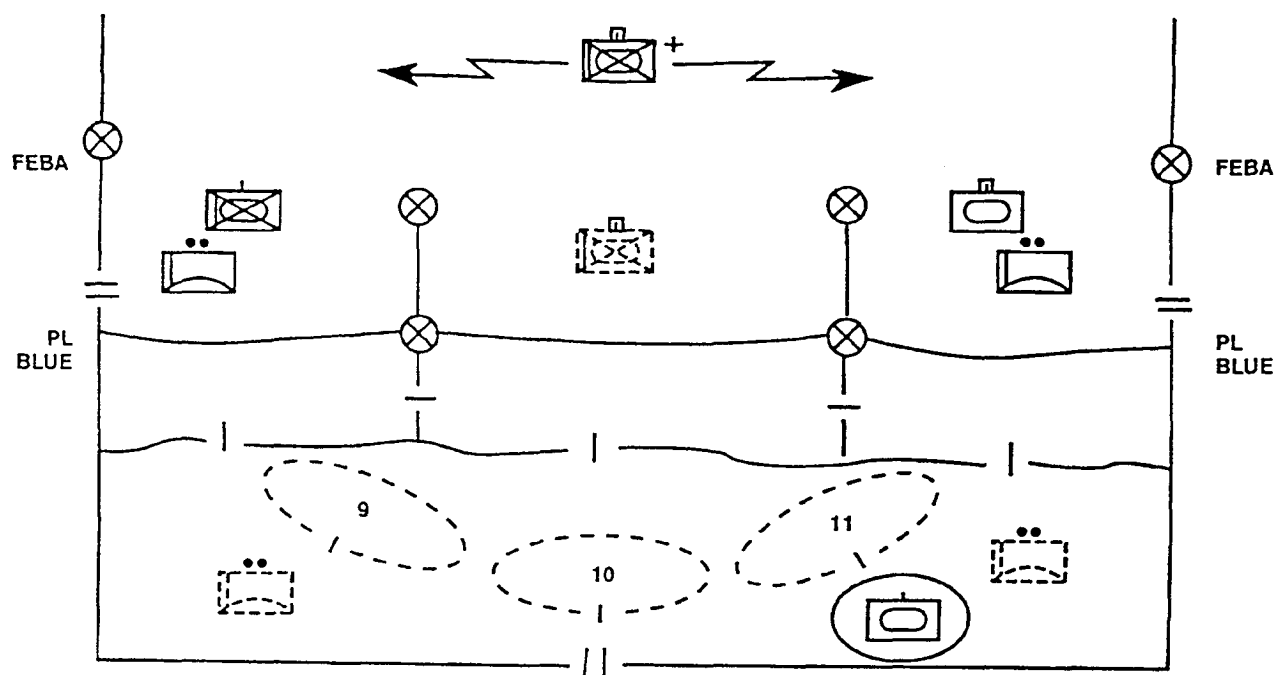
of page 5-8.

DEFENSE OF A STRONG POINT

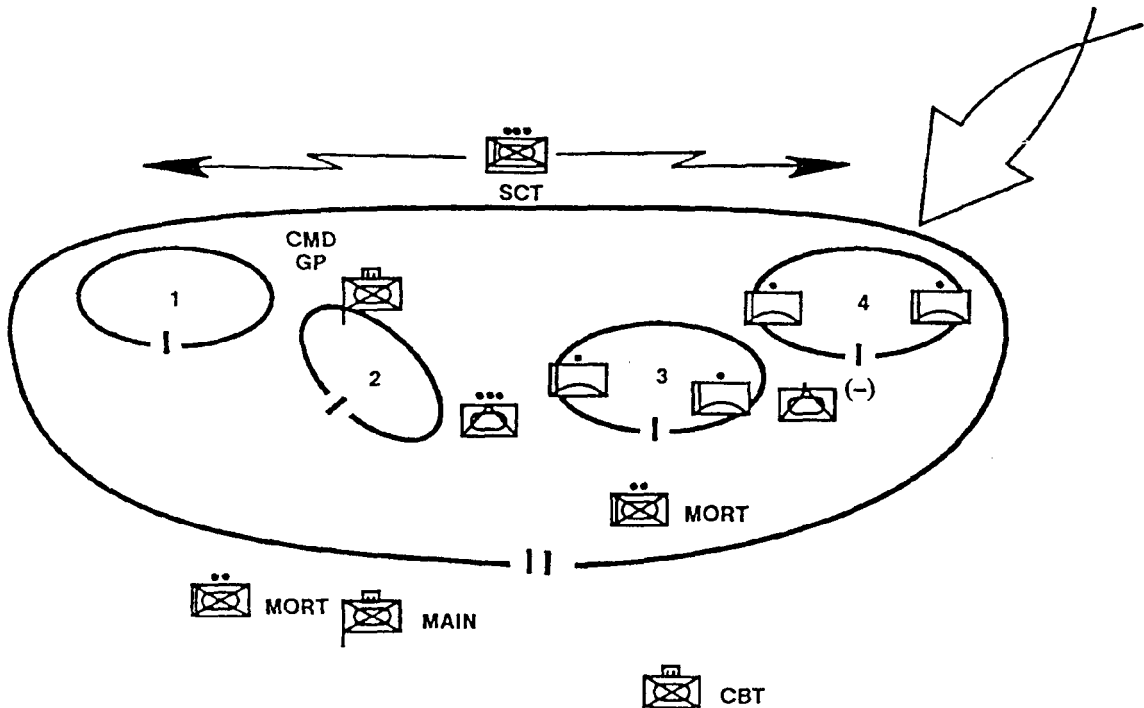
The mission to create and defend a strong point implies retention of terrain with the purpose of stopping or directing enemy formations. Strong points can be used in conjunction with battle positions to maximize effectiveness. The construction of strong points

involves a considerable engineer effort and an extensive amount of time, equipment, and materials. Once constructed, all positions must allow massed fires from two or more units.

AIR DEFENSE ARTILLERY COVERAGE OF A DEFENSE IN SECTOR



AIR DEFENSE ARTILLERY COVERAGE OF A BATTLE POSITION



A battalion task force establishes a strong point with all units within the strong point perimeter. Positions are mutually supporting and allow massed fires from at least two units on any target area. Avenues that cannot be covered by fire are kept under observation.

In a strong point defense, ADA systems must be positioned within the strong point and oriented on the most likely air avenues of approach. METT-T and

OCOKA must be used to maximize effectiveness of all air defense weapon systems. Plans must still be flexible enough to adjust and synchronize against any air threat. See the Strong Point Defense illustration, on page 5-9. Stinger teams are dismounted and dug in. BSFVs are in turret-down positions and initially oriented for the use of the 25-mm chain gun. All positions will have primary target lines.

COUNTERATTACK

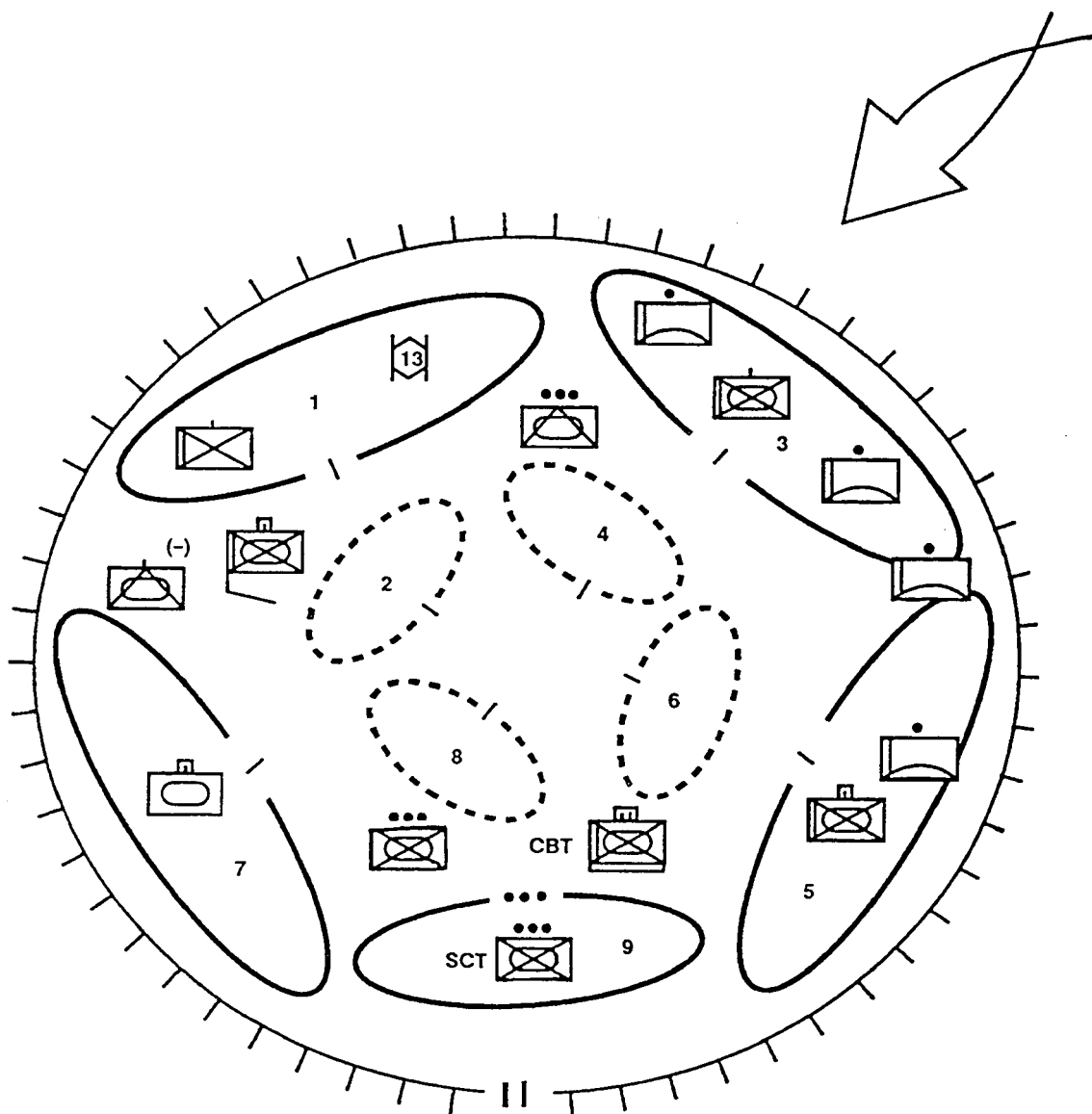
Counterattacks are conducted to block a penetration, to attack through forces to seize terrain, or to attack enemy forces from the flank or rear. Counterattacks are conducted by fire and maneuver. A Counterattack must develop quickly to surprise the enemy before he has time to consolidate and react.

A task force conducts a counterattack against an attacking force. The enemy attack is initially blunted in sector, causing a loss of momentum. The brigade commander's guidance is to counterattack the enemy's

flank. The task force commander repositions his forces to support the counterattack.

Normally in a counterattack, some ADA systems will travel with the counterattack forces to protect them from enemy aerial platforms. BSFVs may travel with the counterattacking force or operate from overwatch positions. BSFV fires are oriented on the flanks to defend the maneuver forces moving to conduct the counterattack. When counterattack forces move to accomplish their mission, BSFVs must be prepared to

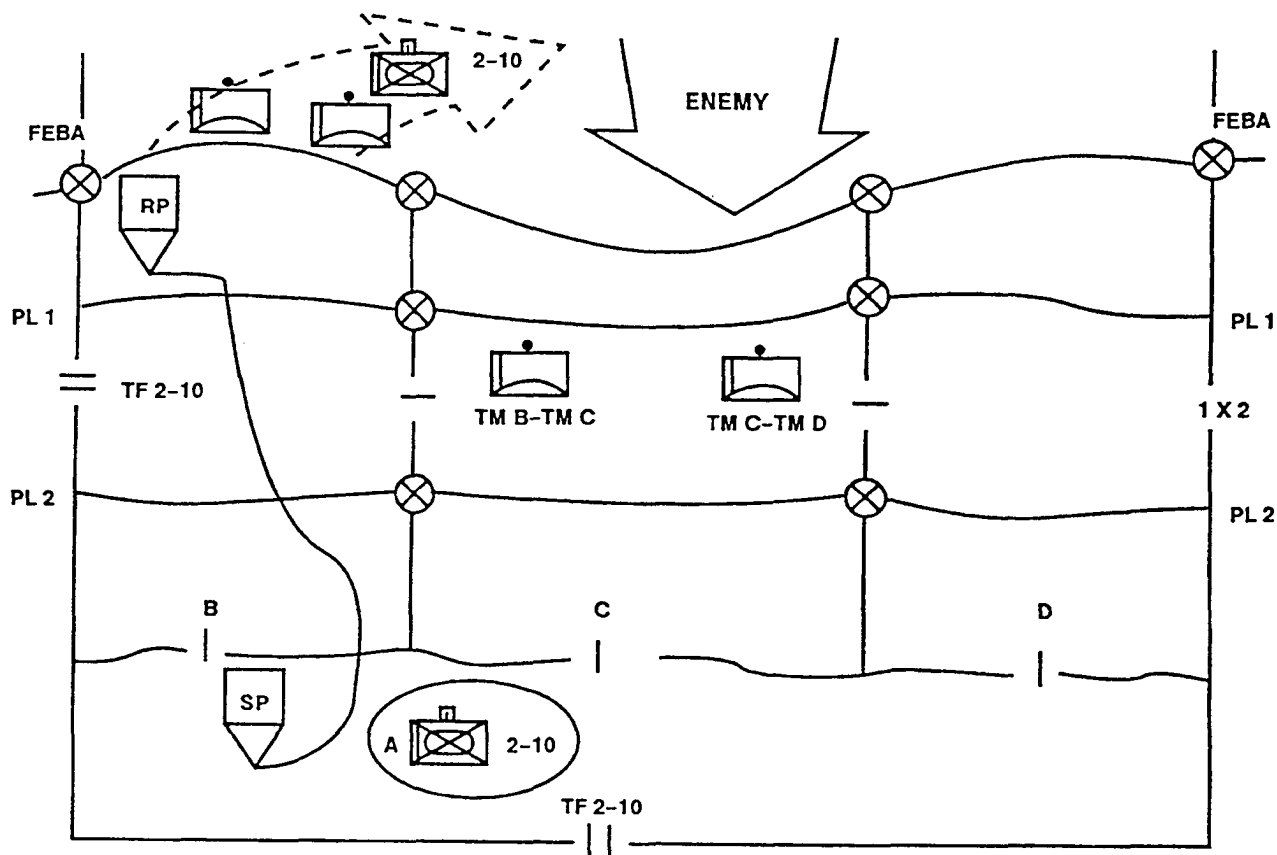
STRONG POINT DEFENSE



maneuver with them on a moment's notice. See the Task Force Counterattack illustration. If attacked by air, the BSFVs will return fire with all available means.

If possible, Stinger teams should be dismounted to overwatch the counterattack.

TASK FORCE COUNTERATTACK



PERIMETER DEFENSE

A perimeter defense protects the force from all directions. A task force organizes a perimeter defense to provide self-protection. A perimeter is established to hold critical terrain in areas where the defense is not tied in with adjacent units. A perimeter defense may also be used to defend from a strong point. A perimeter is normally formed when a unit has been passed and isolated by the enemy and must defend in place.

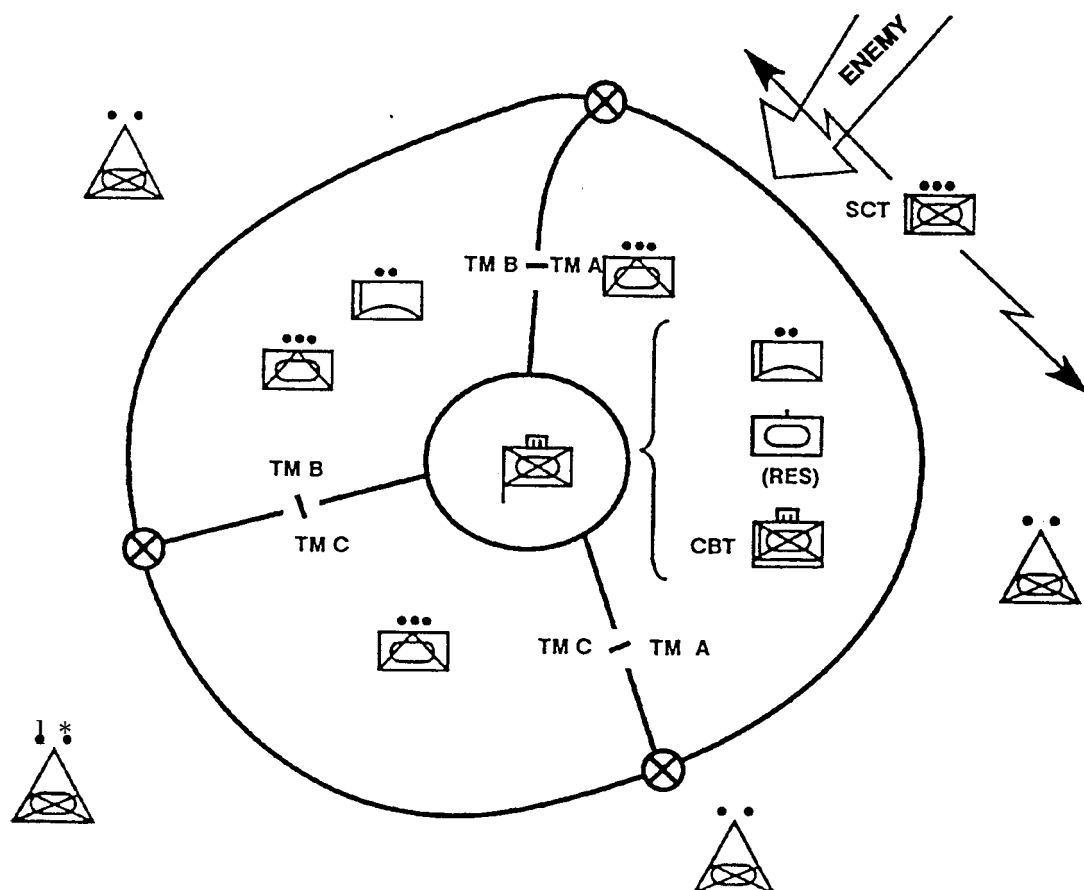
A battalion task force organizes a defensive perimeter to hold a critical piece of terrain for future operations. The TF may defend with three teams in sector and one in reserve. It defends with scouts in the primary direction of the enemy attack and listening posts or observation posts in all directions.

The platoon leader uses the air IPB to determine the most likely air avenue of approach. BSFV units

cover the most likely air avenue of approach but are not positioned outside the perimeter. The commander and platoon leaders must conduct detailed planning to ensure systems are integrated and positioned to quickly

mass against the air threat. Stinger teams will be dismounted and dug in. BSFVs will cover assigned PTLs. See the Typical Perimeter Defense Configuration illustration.

TYPICAL PERIMETER DEFENSE CONFIGURATION



OTHER OPERATIONS

This chapter addresses other types of operations and the peculiarities associated with the tactical employment of air defense artillery units in support of these operations. A task force conducts operations that complement offensive and defensive operations. They may be a part of a larger operation, or in some cases, be performed alone. These operations may require augmentation by specialized equipment and personnel with special skills from brigade or above. In support of other combat operations, the basic principles and guidelines for the employment of air defense artillery weapon systems do not change.

RETROGRADE OPERATIONS

Retrograde operations are conducted to economize forces, maintain the freedom to maneuver, or to avoid decisive combat. Brigades use retrograde operations to gain time, deceive the enemy, disengage, shorten lines of communications, or eliminate exposed flanks. The three types of retrograde operations are delay, withdrawal, and retirement.

DELAY

The intent of delay operations is to trade space for time, inflict maximum damage on the enemy, and avoid decisive engagement. Delays consist of a variety of subordinate unit missions ranging from attacking and conducting ambushes to defending and conducting feints. The delay creates time to support other battlefield events, such as allowing reserves to reposition. A TF will conduct a delay as part of—

- The covering force operation for defending or withdrawing forces.
- The advance guard or covering force operation when meeting superior forces.
- An economy-of-force operation to fix or contain an enemy attack on a low priority avenue of approach.
- A deception operation to support a counterattack.

The delay is conducted using successive alternate positions. Air defense artillery units accompany and provide coverage to maneuver units in the delaying forces. The air defense artillery platoon leader must establish disengagement criteria which allows air

defense artillery weapon systems to reposition and overwatch the movement of the delaying force. Depending on the distances between the occupied and subsequent positions, the BSFV platoon may be split into sections to provide air defense protection of the delaying force in the occupied position and their movement to the subsequent position. See the Tactical Delay illustration on page 6-2. Stinger teams will be dismounted if a section or the platoon is repositioned along the delay route to cover critical choke points or areas of expected air attack.

WITHDRAWAL

A withdrawal is conducted to remove a unit from combat, adjust defensive positions, or relocate the force. A withdrawal may be executed at anytime, by any size force, or during any type of operation. Preferably, a withdrawal is made while a unit is not under heavy enemy pressure.

Task forces normally conduct withdrawals using a covering force and a main body. If the TF is conducting a withdrawal as part of a brigade or division force, the

CONTENTS

	Page
Retrograde Operations	6-1
Encircled Forces	6-4
Linkup Operations	6-5
Defile Operations	6-6
Relief in Place	6-8
Passage of Lines	6-10

larger unit may provide a covering force to help the TF break contact.

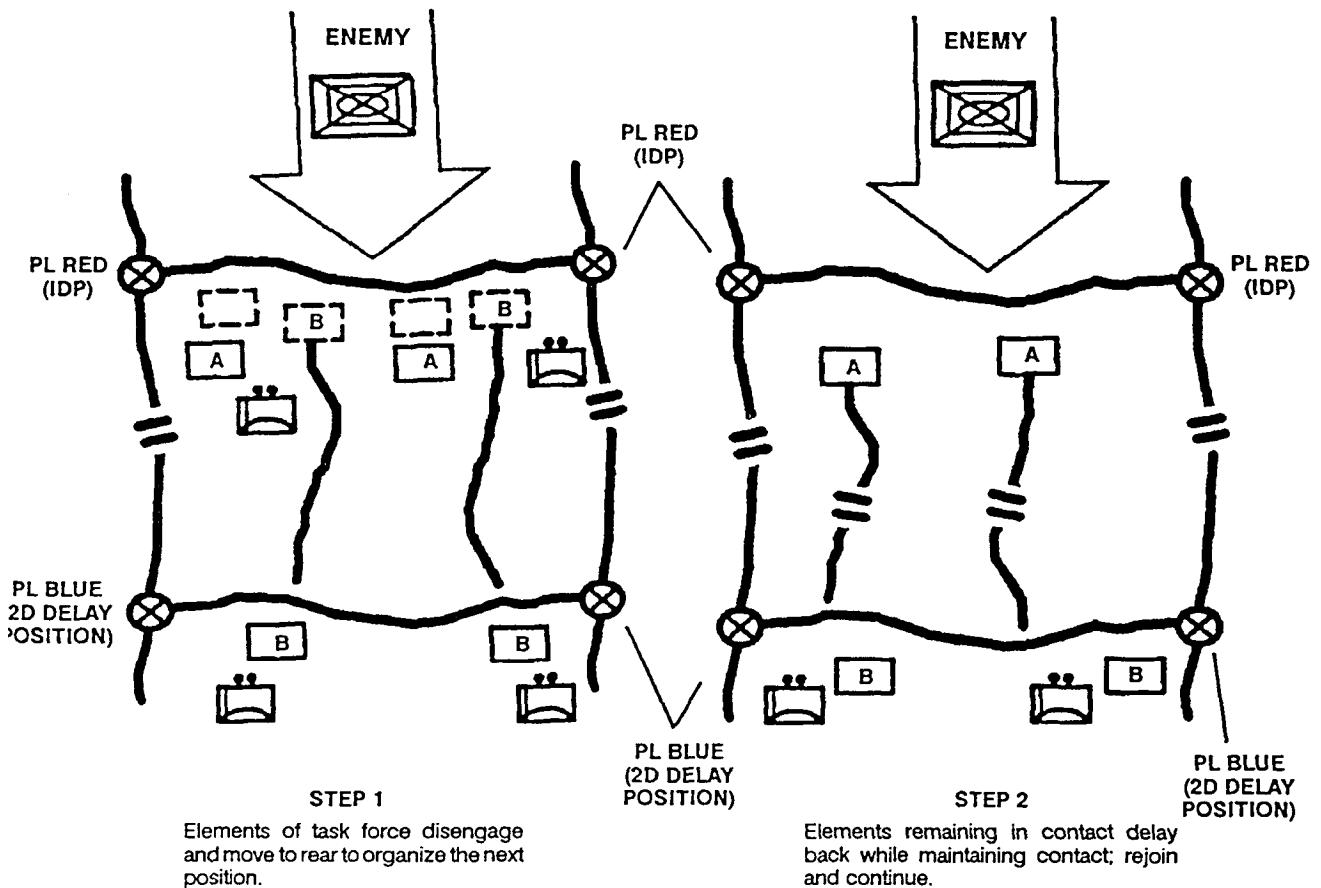
Air defense artillery weapon systems supporting forward maneuver units in a withdrawal must be positioned to provide air defense protection as they are breaking contact. Air defense artillery weapon systems may be positioned along withdrawal routes or deployed with the withdrawing force (see the illustration on page 6-3). Stinger teams will remain mounted unless dismounting is necessary. Stingers will dismount at choke points and passage points. The air defense artillery platoon leader must coordinate with adjacent air defense artillery units to determine who has coverage responsibility.

RETIREMENT

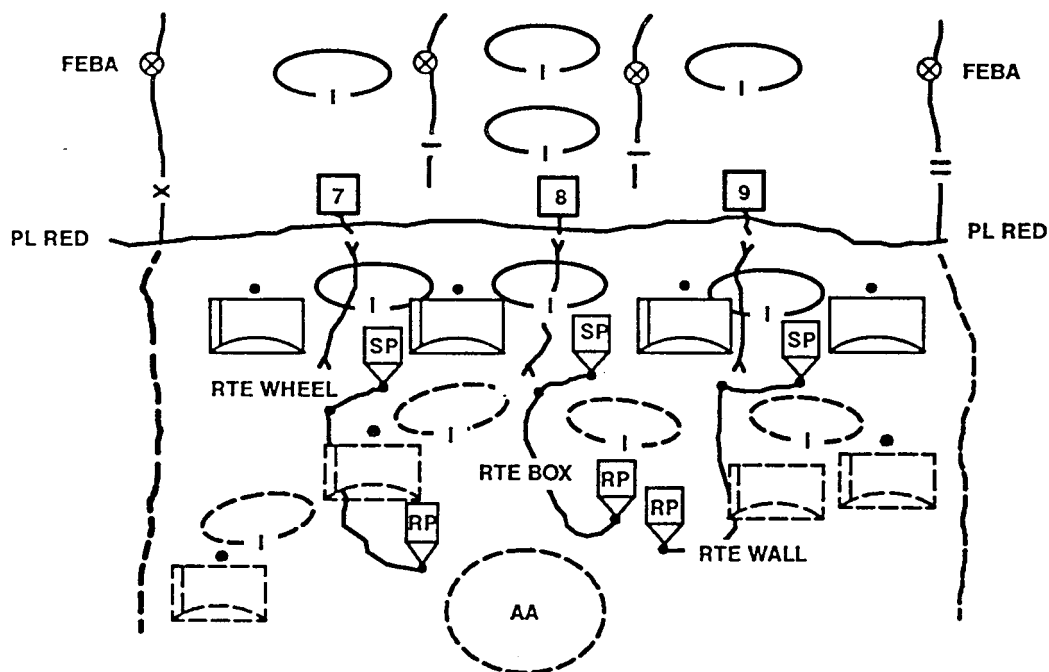
A retirement is an orderly move to the rear by an element not in contact with the enemy. The TF conducts a tactical or administrative move to the rear along multiple routes. Security is essential: advance, flank, and rear guards are employed. Retiring units may travel in a tactical column or in convoy formations, increasing their vulnerability to enemy air attack.

Since retrograde units travel in tactical road marches or administrative convoys, air defense assets may be pre-positioned at choke points, along likely air avenues of approach, or integrated into convoys. See the Air Defense Artillery Supporting a Retrograde Operation illustration on page 6-3.

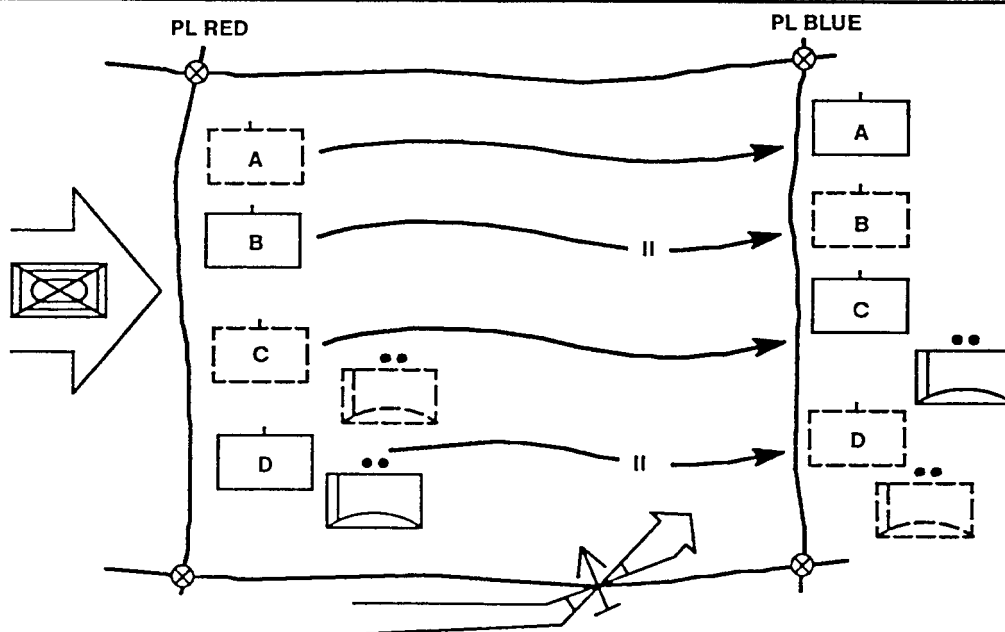
TACTICAL DELAY



AIR DEFENSE ARTILLERY DURING A TF WITHDRAWAL



AIR DEFENSE ARTILLERY SUPPORTING A RETROGRADE OPERATION



CONSIDERATIONS

All retrograde operations are difficult and inherently risky. To succeed, they must be well-organized and executed. A retrograde operation requires these specific elements.

Leadership and Morale

Soldiers must not perceive a move to the rear as a defeat. Leaders must maintain morale. Withdrawals must be conducted in a tightly controlled manner. Leaders must keep soldiers informed. Leaders must be present and set the example to maintain the soldiers' confidence.

Reconnaissance, Intelligence, Surveillance, and Target Acquisition (RISTA)

As combat power is echeloned to the rear, the RISTA threat increases. Air defense artillery assets must maintain vigilance to defeat the enemy air threat. During retrograde operations, air assaults and air insertions are likely.

Mobility

Mobility for air defense artillery forces must be maintained. Retrograde operations are fluid in nature, and air defense assets must maintain the agility to adjust coverage throughout the operation.

Deception

Deception enhances the security of moving units and surprise by denying friendly unit dispositions to the enemy. The proper use of deception causes indecision and delay in enemy actions. Deception is aided by taking maximum advantage of darkness and other limited visibility conditions. Infiltration techniques are used to cover the relocation of units and material. Visual, electronic, acoustical, and thermal decoys can greatly enhance deception.

Conserve Combat Power

It is imperative for the commander to conserve the combat power of his unit during the retrograde operation. Future operations may depend on the use of this combat power.

ENCIRCLED FORCES

Due to battlefield mobility and the nonlinear nature of the battlefield, there will be situations where forces become encircled or bypassed. Regardless of the operation, units may be cut off from other friendly forces either by design or due to rapidly changing situations. Whether defending strong points, retaining key terrain, conducting attacks, holding the shoulder of friendly or enemy penetrations, units face the possibility of encirclement. Encirclement occurs when a ground force has all of its ground routes of evacuation and reinforcement cut by the enemy.

Forces face encirclement most often when enemy forces bypass defending units or when advancing units are cut off by an enemy counterattack. The most important consideration of encircled forces is the continuation of their mission. The encircled force commander must attempt to establish communications with his higher commander. In the absence of communications, he must, however, act on his initiative within the intent of the higher commander to maintain the integrity of his fighting force. Encircled forces have several options. They can—

- Defend until relieved.
- Conduct a breakout toward friendly forces.

- Attack and conduct small unit harassment operations (guerrilla warfare operations) to attrit enemy units from the main attack.

- Attack rear-echelon enemy forces and installations to disrupt their operations.

MANEUVER COMMANDER RESPONSIBILITIES

The senior maneuver commander within the encirclement assumes control of all forces. He informs his superior of the situation and simultaneously begins to accomplish the following tasks:

- Reestablish a chain of command.
- Establish a viable defense.
- Establish a reserve.
- Organize fire support.
- Reorganize logistics.
- Establish security.
- Reestablish communications if interrupted.
- Continue the defense.
- Maintain morale.

DEFENDING ENCIRCLED

Encircled forces may elect to stay in position and defend encircled. Important considerations in the decision to stay and fight are—

- Mission and commander's intent.
- Exfiltrate from the encircled positions toward friendly forces.
- Good defensive terrain.
- Available reinforcement or relief.
- Availability of the necessary combat support to sustain the operation.
- The enemy's mobility.
- Motivation and discipline of troops.

BREAKOUT FROM ENCIRCLEMENT

Breakout operations are planned, organized, and executed before the enemy has time to react. Commanders considering the breakout option face the critical demand of time. Encircled forces have to act before the enemy decides on a course of action and begins to contain or destroy the encircled forces.

The attack to breakout of an encirclement differs from other attacks only in that a simultaneous defense in other areas of the perimeter is maintained. To achieve a breakout, the commander accomplishes the following tasks:

- Deceive the enemy as to time and place of the breakout attack.

- Identify and exploit gaps or weaknesses in the encircling force.
- Exploit darkness and limited visibility.
- Organize the forces for the breakout.
- Concentrate combat power at the breakout point.
- Coordinate with supporting attacks.

EXFILTRATION

If success of a breakout attack appears questionable and a relief operation is not planned, the least preferred option to preserve a portion of the force is through organized exfiltration. It can distract the enemy from his main effort and produce intelligence for the main force.

The encircled forces are organized into small groups under small unit leaders and exfiltrated during periods of limited visibility through gaps in the encircling forces. Equipment which cannot be taken is left behind and destroyed.

AIR DEFENSE CONSIDERATIONS

Air defense units that are caught with encircled forces will continue their air defense mission. They should orient their fires to the likely air avenue of approach. If a break-out force is planned, the air defense units should mass their fires to cover the force during the break-out. Air defense artillery leaders must rigidly enforce fire control measures to conserve ammunition.

LINKUP OPERATIONS

Linkup operations are conducted to join two friendly forces. Both forces may be moving toward one another, or one may be stationary or encircled. Linkup operations may be conducted in a variety of circumstances. They are most often conducted to—

- Complete the encirclement of an enemy force.
- Assist the breakout of an encircled friendly force.
- Join an attacking force with a force inserted in the enemy rear (for example, an airborne, air assault, or infiltration force).

For a TF linkup operation, the TF TOC establishes the command relationship between forces and the responsibilities of each. It also establishes control

measures such as linkup points, boundaries between converging forces, fire support coordination line, restrictive fire lines, coordinated fire lines, and other measures to control maneuver and fires. Control measures may be adjusted during the operation to provide for freedom of action as well as positive control.

When one of the units involved is stationary, linkup points are usually located where the moving force's routes arrive at the location of the stationary force's security elements. Alternate linkup points are also designated since enemy action may interfere with linkup at primary points. Stationary forces assist the linkup by opening lanes in minefields, breaching or removing selected obstacles, furnishing guides, and designating assembly areas.

Linkup between two moving units is a difficult

operation. Primary and alternate linkup points for two moving forces are established on boundaries where the two forces are expected to converge. As joining units move closer to one another, the need for positive control to avoid firing on one another must be coordinated by commanders to ensure that the enemy does not escape between the two forces. Leading elements of each force must be on a common radio net.

During linkup operations, air defense considerations must focus on air defense protection of friendly forces. There must be lateral communication between the air defense officers from both forces to assure an integrated and synchronized air defense effort. The battery TOC may assist in communications or synchronization during linkup operations. The air defense plan should incorporate the air defense priorities of both

supported force commanders, the total number of air defense weapon systems available, and the factors of METT-T. Platoon and fire unit responsibilities must be planned, coordinated, and rehearsed. The supported force and parent unit must be informed of the disposition of air defense elements throughout the operation. Failure to synchronize the air defense plan may result in fire units with the same priorities and leave the task force vulnerable to air attack on unprotected air avenues of approach.

During linkup operations, particularly with airborne or air assault units, the rules of engagement become extremely important. The brigade A²C² element must ensure timely dissemination of information and coordination so that air defense artillery units do not engage friendly aircraft that may be supporting the airborne or air assault units.

DEFILE OPERATIONS

A defile operation is a critical and vulnerable mission, because of terrain considerations, maneuver forces must mass into relatively small areas. The benefits of dispersion are lost and vulnerability to air attack increases. Air defense artillery units must provide protection to the force conducting the operation.

PASSAGE POINTS AND CHOKE POINTS

Defile drills through choke points or passage points are a routine, yet a critical phase of offensive operations. They pose particular challenges to the BSFV platoon. Because of terrain or mission constraints, maneuver units canalize forces into relatively narrow areas, usually moving in column formation. The benefits of dispersion are lost and vulnerability to enemy indirect and direct aerial fires increases. Often, minimum cover and concealment exists at choke points. Targeting choke points is a common procedure. Choke points can be natural or man-made and can vary from bridges and mountain passes to passages through minefields or between obstacles. Passage lanes are choke points because they canalize the force while it moves through a stationary force.

Two techniques exist for providing air defense coverage at choke points. They are pre-positioned coverage and hasty coverage from the march. The BSFV platoon may use either of these techniques. Whenever possible, the Stinger teams should be dismounted and oriented to PTLs and STLs. The BSFV supplements the Stinger with a PTL and sector of fire.

RIVER CROSSING

River crossings are conducted to maintain the momentum of an operation. The approach to the water obstacle is made on a broad front whenever possible. Hasty crossings using captured bridges or fords are the products of rapid offensive action.

Detailed planning ensures that fire support and crossing means are available with two tactical concepts in mind. First, assault forces lead, making the initial assault of the obstacle and continuing the advance from the far side. Second, follow-on forces provide overwatch, direct and indirect fire support, crossing site security, and support assistance to the assault.

The BSFV platoon must be prepared to support river crossings by either hasty or deliberate operations. In either case, considerations are similar to providing air defense of a breaching operation. Massed friendly forces in a small area provide the enemy a target rich environment. Factors of METT-T and the IPB must be continuously monitored to determine whether the crossing will be opposed or unopposed. Planning and continuous coordination are critical to successfully providing air defense for the force.

The BSFV platoon leader must consider the following as he prepares his units to defend and negotiate obstacles:

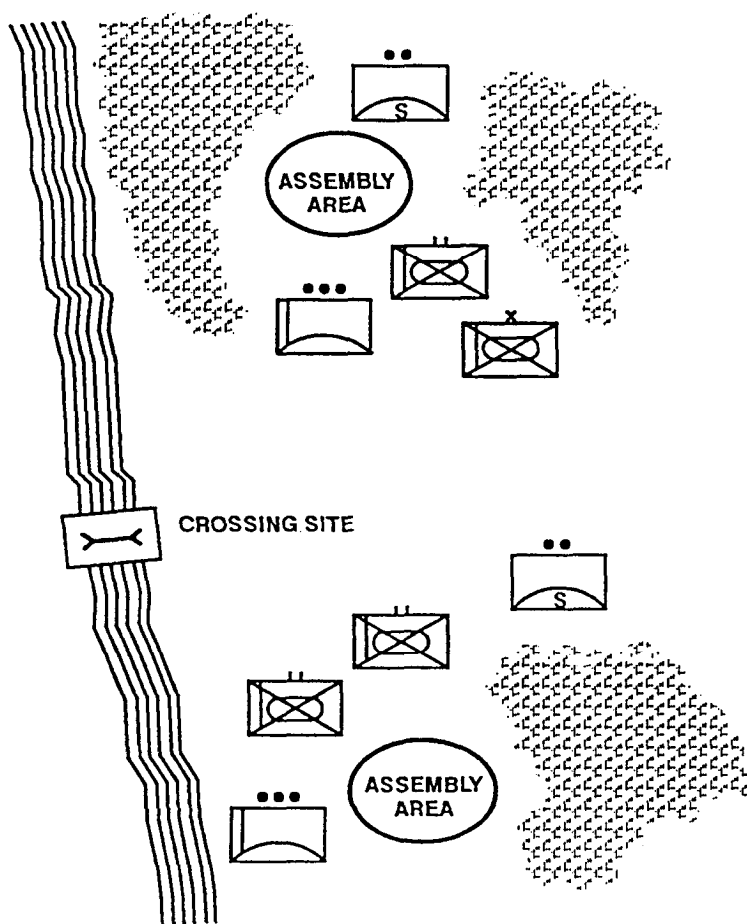
- Identify enemy air avenues of approach.
- Know where local security is positioned.
- Conduct a thorough reconnaissance.

- Decide on the most suitable method for crossing obstacles.
- Support the operation from the near and far side.
- Include vehicles, personnel, equipment, and entrance and exit points in planning considerations.
- Plan for continued operations once the crossing has been completed.
- Consider the effects obscurants will have on weapon system's visual acquisition and identification of targets.

- Ensure crossing assets are protected.
- Identify key terrain on the far side that enemy aerial platforms may use for hide and standoff engagement positions.

The BSFV platoon leader must ensure that he knows what is happening during all phases of the operation. He must be flexible and aggressive in his planning to ensure air defense protection is provided during the entire crossing operation. See illustration of Air Defense Artillery in Support of a River Crossing.

AIR DEFENSE ARTILLERY IN SUPPORT OF A RIVER CROSSING



BREACHING OPERATIONS

Obstacles must be rapidly overcome to retain the initiative and to maintain momentum. When confronted with an obstacle, the task force will bypass, breach, or force through the obstacle. Bypass is accomplished through reconnaissance, while forcing through is chosen when there are no other alternatives. A force through will result in high losses of equipment and personnel. Regardless of the method selected, obstacles must not be the focus of attention and should be breached or bypassed as quickly as possible en route to accomplishing the mission.

The supported force air defense plan should be designed to protect the force initially in its maneuver configuration; however, once the commander gives the order to conduct an in-ride breach, the air defense protection must shift to protect the breach site. In this regard, air defense planning considerations are the same as for a river crossing. This does not imply that air defense assets necessarily move to the breach site, although some assets may. Air defense assets should remain with their respective maneuver elements establishing near side air defense protection. Positions

should be established which take advantage of dominating terrain that cover enemy air avenues of approach into the area. Furthermore, air defense assets must establish positions on the near side of the breach that ensure the effective range of the weapons system extends to the far side of the breach. This will ensure air defense protection for breach and assault force elements on the far side of the breach until far side security is established and near side air defense elements reposition to the far side of the breach. BSFVs will usually accompany support force elements through the obstacle network to the far side of the breach.

The BSFV platoon leader must coordinate with all air defense elements in the vicinity of the breach to ensure BSFV platoon fires are integrated with the battery's air defense plan. Air defense positions and fire control measures must be planned throughout the depth of the breach. This will prevent one BSFV squad from duplicating the effort of another BSFV squad. See illustration of FAAD Breaching Operations, on page 6-9.

RELIEF IN PLACE

Relief in place is an operation in which a unit is replaced in combat by another unit. Responsibilities for the combat mission and the assigned sector or zone of action are assumed by the incoming unit. A relief in place can occur during offensive or defensive operations.

The primary purpose for a relief in place is to maintain the combat effectiveness of committed elements. A relief in place may be conducted to—

- Give a unit a break from combat when it has taken heavy losses.
- Relieve the stress of prolonged operations in adverse weather or terrain.
- Replace a unit that requires medical treatment or decontamination as a result of combat losses or exposure to chemical or nuclear munitions.
- Conform to a larger tactical plan.

In the relief in place of a unit, the BSFV platoon attached to the relieving force will coordinate with the replaced force air defense artillery element. This coordination will cover, but is not limited to, air IPB, rules of engagement, current air activity, present fire unit positions, A²C² information, the operations plan,

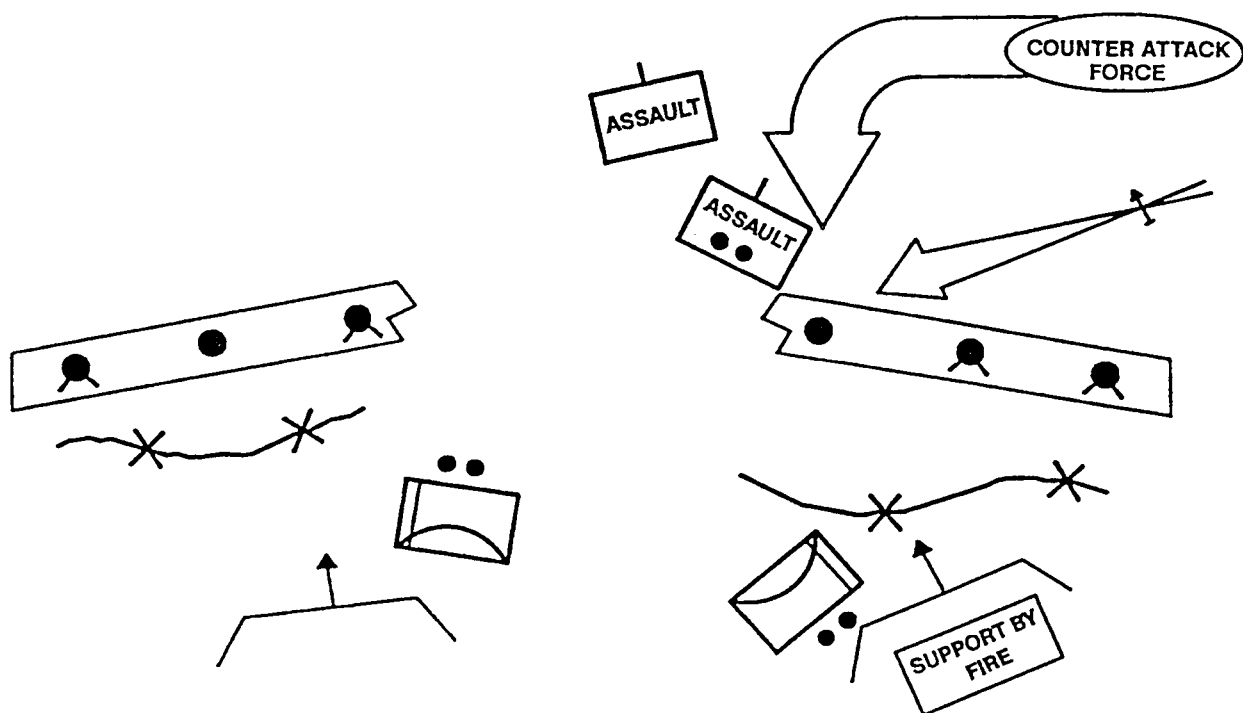
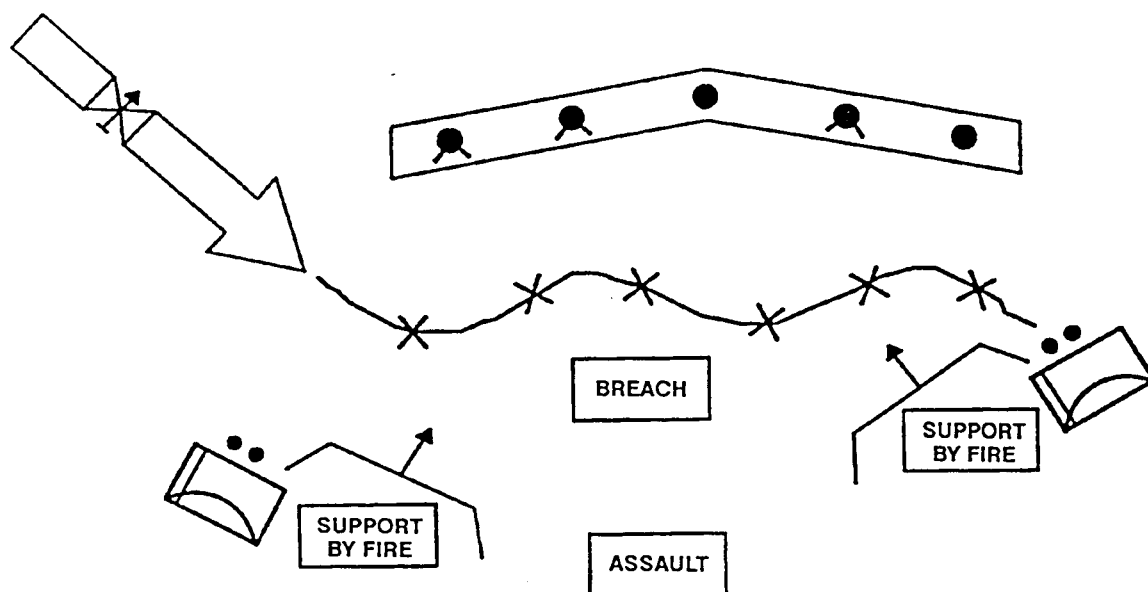
logistics, and communications. Air defense protection must be planned for all forces during all phases of the relief in place.

As the relieving BSFV squads arrive, they will move out to designated positions selected by the platoon leader. The squads emplace and are integrated into the present unit's air defense coverage.

This overlap of air defense protection will aid in ensuring good coverage. Once the replaced unit's systems have departed, the platoon leader will assume complete control of the mission. The platoon leader must do the following before assuming control:

- Relieve air defense artillery systems in place; do not degrade air defense.
- Coordinate with the departing unit about the enemy situation, specifically the departing unit's assessment of air avenues of approach.
- Recommend air defense priorities to the supported commander.
- Determine the air threat and enemy capabilities.
- Evaluate air avenues of approach.

FAAD BREACHING OPERATIONS



- Confirm the present WCS and ADW.
- Confirm hostile criteria and ROEs.
- Confirm the locations of friendly AD units.
- Position fire units according to the supported

commander's AD priorities.

- Establish communications with early warning sensors in the area.
- Obtain and disseminate airspace control measures.

PASSAGE OF LINES

A passage of lines is conducted to allow a moving unit to pass through a stationary unit. It can be conducted as part of offensive, defensive, or retrograde operations. A passage of lines may be designated as a forward passage or rearward passage. A passage of lines is rarely a primary mission; it is usually performed incidental to a mission.

In planning a passage of lines, air defense is absolutely essential. Whether passing forward or to the rear, the moving unit will be forced to move slower and often in some type of column formation during the passage. Congestion in assembly areas after the passage and the linear nature of the movement presents a lucrative target to hostile air assets. As a result, air defense must be coordinated with the stationary unit. In

most cases, the stationary supported force will be able to protect the passing force, allowing the passing force supporting air defense assets to move with them. However, if the passing force requires static air defense coverage, the terrain will have to be coordinated with the supported stationary force.

The stationary force BSFV platoon may be reinforced or augmented with additional ADA elements to provide air defense protection for the passage of lines. It is imperative that the moving force ADA platoon leader coordinate with the stationary force ADA platoon leader for the position of all air defense elements supporting the passage of lines. Furthermore, he must develop and coordinate an air defense plan in the event the moving force becomes static.

CHAPTER 7

LOGISTICS

This chapter discusses LOGPAC support for the BSFV platoon. The BSFV platoon receives logistics from the supported unit or the battery headquarters. The platoon leader and platoon sergeant should ensure detailed and timely coordination is conducted to logistically support the tactical situation. Logistics, or lack of it, may determine the success or failure of combat operations. The BSFV platoon should be armed, fueled, and repaired as far forward as the tactical situation permits. Forward support is accomplished through logistics packages (LOGPACs).

LOGISTICS FUNCTIONAL OVERVIEW

Logistics operations in combat and combat support battalions are normally organized into support trains. Support elements from the companies and the battalion headquarters displace from the combat elements into either field trains or combat trains. The support and supplies available vary greatly between the combat trains and the field trains.

Battalion combat trains carry the minimum amounts of supplies and equipment needed to sustain the force for short periods of time. Combat trains are positioned where they can quickly provide essential support to fighting forces, usually between the

company team area and the brigade support area (BSA). Combat trains can provide battlefield recovery, maintenance, medical services, and some Class III and V support.

Field trains consist of the remainder of the battalion combat service support (CSS) element. Field trains for all task forces and battalions operating at the brigade area are located in the forward part of the BSA. The BSA will also consist of the brigade trains, forward area support teams, and other combat support and combat units.

LOGPAC OPERATIONS BY THE SUPPORTED FORCE

LOGPACs are organized and put together at the field trains. They usually include Class I, III, V, medical, and BSFV peculiar items. The platoon leader and platoon sergeant are responsible for planning and executing an effective CSS system for the platoon. CSS functions such as supply, maintenance, field services, personnel services, and health services must also be considered during the planning phase.

The BSFV platoon leader conducts logistics planning. The BSFV platoon logistics plan is implemented by the platoon sergeant. The platoon sergeant consolidates information provided by the squad leaders and requests support from the TF or battery. Routine and recurring CSS operations should be addressed in unit SOPs.

SUPPORTED FORCE

LOGPAC operations at the supported force level are formed by companies and moved forward under the control of the support platoon leader who normally

organizes a convoy for movement of all LOGPACs under his control. In emergencies, he dispatches unit LOGPACs individually. The convoy may contain additional vehicles, such as a maintenance vehicle with Class IX to move to the unit maintenance collection point (UMCP), or additional ammunition and fuel for

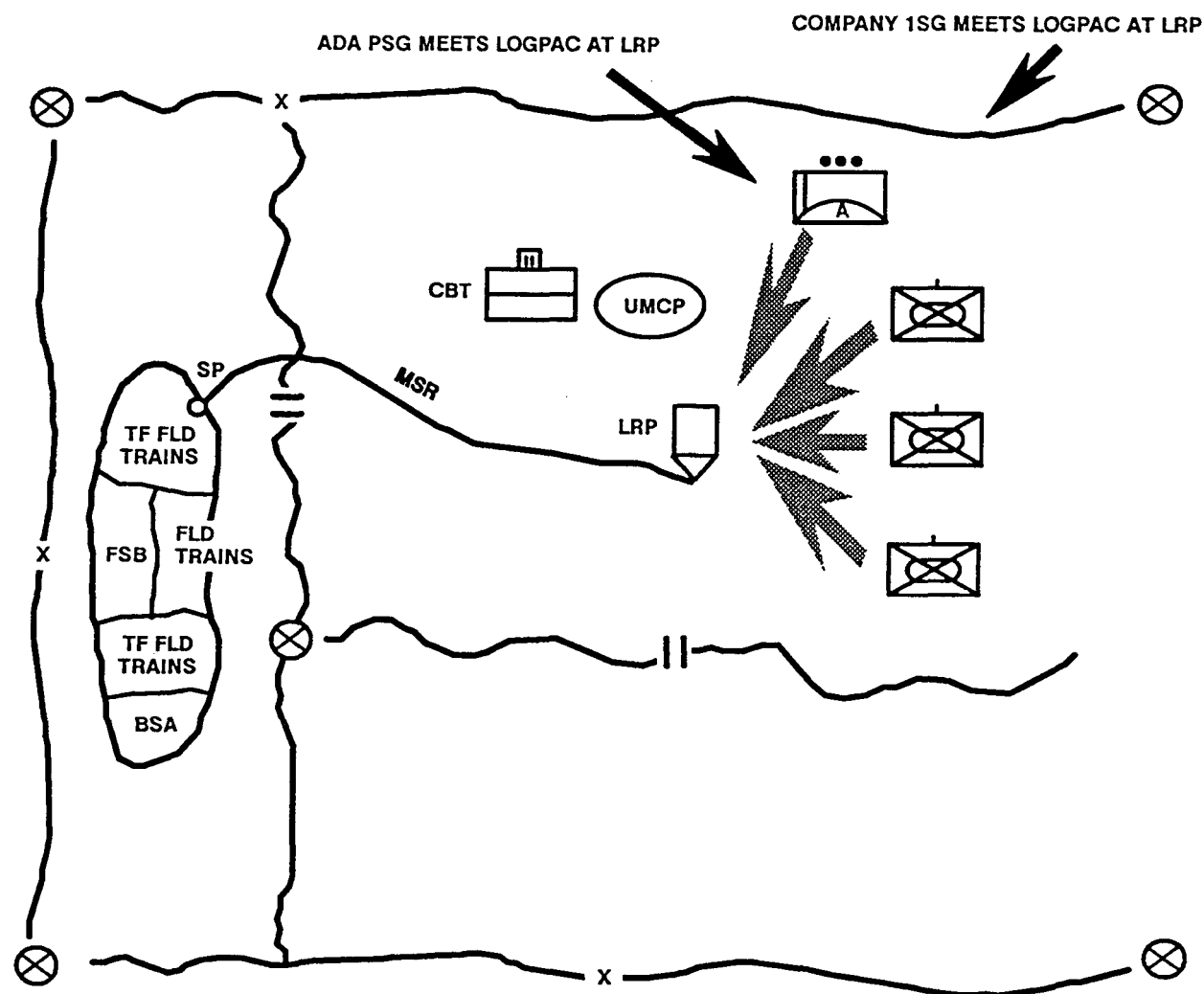
CONTENTS

	Page
Logistics Functional Overview	7-1
LOGPAC Operations by the Supported Force . .	7-1
LOGPAC Operations by Battery Headquarters . .	7-3
Platoon Resupply Techniques	7-4
Cross-Leveling	7-5
Pre-Positioning Supplies	7-6
Personnel Services	7-7
Replacement Operations	7-7
Health Services Support	7-8

the combat trains. The LOGPACs move along the (main) supply route (MSR) to a logistics release point (LRP), where the company first sergeant or a unit guide takes control of the company LOGPAC. After the company has been resupplied, the company first sergeant informs his supply sergeant of requirements

for the next LOGPAC. The supply sergeant collects outgoing mail and equipment for movement to the rear. The LOGPAC then returns to the LRP where it joins the rest of the supported force's LOGPACs for return to the field trains. See the following illustration.

LOGPAC OPERATIONS BY SUPPORTED UNIT



BSFV PLATOON

Any time the BSFV platoon has a support relationship of direct support, the basic principles of LOGPAC operations by the supported unit will apply. If the platoon is reinforcing another ADA platoon, it should follow the procedure established for the ADA platoon that is being reinforced. The BSFV platoon must be integrated in the planning and preparation of the supported force's LOGPAC operations.

The platoon should coordinate with the supported force on a constant basis to ensure that the BSFV platoon's LOGPAC consists of the items required and is formed at the field trains and moved forward to the LRP. The BSFV platoon sergeant must ensure that supplies, equipment, and personnel replacements which are peculiar to the ADA mission are coordinated with the support platoon leader or supported unit S4 or S1. When the LOGPAC reaches the LRP, the BSFV

platoon sergeant or a designated representative will take control of the platoon's LOGPAC.

Maintenance and evacuation of damaged vehicles will be coordinated with the supported force. The location of UMCPs should be available and briefed to platoon personnel. When the supported force has not responded to a request for support in sufficient time, the platoon leader should notify the supported force commander and his battery commander.

Evacuation of wounded personnel has to be coordinated with the supported force. This is time-sensitive and generally beyond the capability of the BSFV platoon. This requires the BSFV platoon to be knowledgeable of the supported force's SOP on evacuation procedures. The platoon must be informed of locations for casualty collection points. When the tactical situation allows, organic platoon vehicles may be used to evacuate the wounded.

LOGPAC OPERATIONS BY BATTERY HEADQUARTERS

LOGPAC operations by the battery headquarters follow the same procedures as supported force LOGPAC operations with the exception of having different key players. The major difference is that the platoon will normally be operating in terrain which is "owned" by a larger fighting force. The support relationship will likely be general support or general support-reinforcing. In this situation, support may be provided by the battery.

The battery support vehicles are maintained at the battery trains where they are loaded with the necessary supplies. The battery first sergeant with the help of the battery supply sergeant forms the LOGPACs for each BSFV platoon based upon prior coordination. The first sergeant moves the LOGPACs forward along the established MSR to a designated LRP. When MSRs and LRPs are located within the area of operations of another unit, the platoon leader or platoon sergeant may be required to coordinate for the use of MSRs or LRPs with the unit occupying the area. When the LOGPACs arrive at the LRP the BSFV platoon sergeant or a designated representative will take control of the platoon's LOGPAC. Once the platoon has been resupplied, the vehicle returns to the LRP and the platoon sergeant gives his requests to the battery first sergeant for the next LOGPAC.

LRP locations are determined either by the first sergeant or a designated representative (such as the battery XO). LRPs are established based on the tactical situation. It is often useful or necessary to coordinate

for the use of MSRs or LRPs which have already been established. The LRP should be close to where the platoons are employed and easy to locate. The MSR, LRP UMCP and trains locations should be included on the operations overlay. The LOGPAC convoy arrival time at the LRP and length of time it remains are normally established by the SOP.

The first sergeant or responsible battery representative remains at the LRP as long as the LOGPAC vehicles are in the platoon areas. He should ensure that the LOGPAC release and return takes place efficiently. To assist in the coordination for the next LOGPAC, the following must be considered:

- Changes in logistical requirements reflecting any last-minute changes in task organizations.
- Reports on personnel, logistics, and maintenance from the platoon sergeants.
- First-hand updates on the tactical situation and logistical status.
- Delivery, receipt, and distribution of mail.

The battery maintenance personnel monitor and ensure the BSFV platoons are being supported in LOGPAC operations. Contact teams will be integrated into the LOGPAC convoys when required by the platoons. The contact teams will be moved from LRPs by the platoon sergeants. If it is necessary to evacuate a vehicle, the recovery asset will move the vehicle to the battery UMCP.

Evacuation of wounded personnel has to be coordinated and planned in detail. Evacuation of wounded personnel should be by the most expeditious means

PLATOON RESUPPLY TECHNIQUES

Routine resupply takes place at least daily. Periods of limited visibility are best for resupply. If possible, resupply of Class III takes place at every opportunity. The LOGPAC commonly used technique is a simple and efficient way to conduct routine resupply operations. LOGPACs should contain all anticipated supplies required to sustain the platoon for a specific time, usually 24 hours or until the next scheduled LOGPAC operation.

The platoon leader determines the resupply technique to be used based on METT-T. The technique selected for ground resupply will generally be the service-station method, tailgate method, or a variation thereof. The platoon leader informs the platoon sergeant of the resupply technique to be used. The platoon sergeant briefs each squad on the resupply method and establishes the resupply point. The platoon sergeant notifies the platoon when the resupply point is prepared.

SERVICE-STATION METHOD

When the service-station method is the desired resupply technique, a resupply point centrally located to the platoon is established. If the platoon is split into sections, METT-T may dictate that each section is resupplied separately. The following procedures outline the service-station method:

- Vehicles enter the resupply point following a one-way traffic flow.
- Only those vehicles requiring immediate organizational or higher maintenance stop in maintenance holding areas before conducting resupply.
- If not already evacuated, WIA, KIA, and EPW are removed from squad vehicles once they stop at the refuel or rearm point.
- Vehicles will rearm and refuel, rotating to each point.
- Crews rotate individually to feed, pickup mail, pick up supplies, and refill or exchange water cans.
- Once all vehicles have completed resupply, they move to the holding area where the platoon leader or platoon sergeant will conduct a PCI.

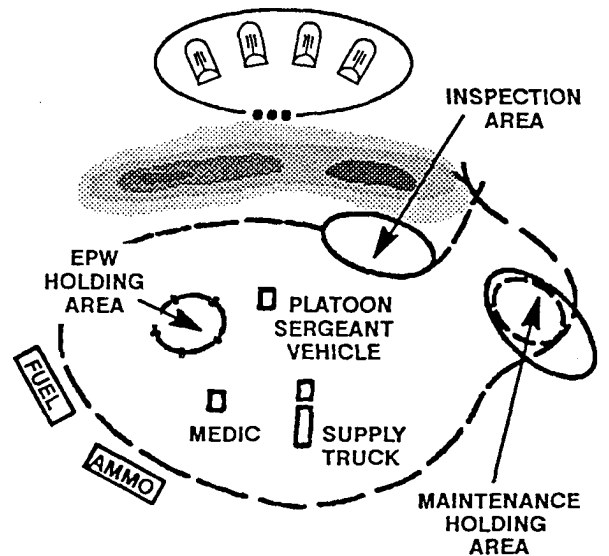
possible. The means to evacuate personnel will be based on unit SOP and the current tactical situation.

- Based on the enemy situation, vehicles will disperse from their positions one vehicle at a time. They will be resupplied and returned one at a time until the platoon has been resupplied.

Note: Medical evacuation vehicles are positioned an equal distance between the refuel and rearm points. This decreases the number of stops that a vehicle has to make.

The following graphic illustrates the above procedures.

SERVICE-STATION ISSUE METHOD



TAILGATE METHOD

When the tailgate method is used, BSFV squads remain in place or back out of their position a short distance so the resupply vehicle is not exposed. POL and ammunition trucks go to each vehicle position in turn. The following procedures outline the tailgate method:

- Crew members rotate individually through feeding areas and pick up supplies, water, and mail.

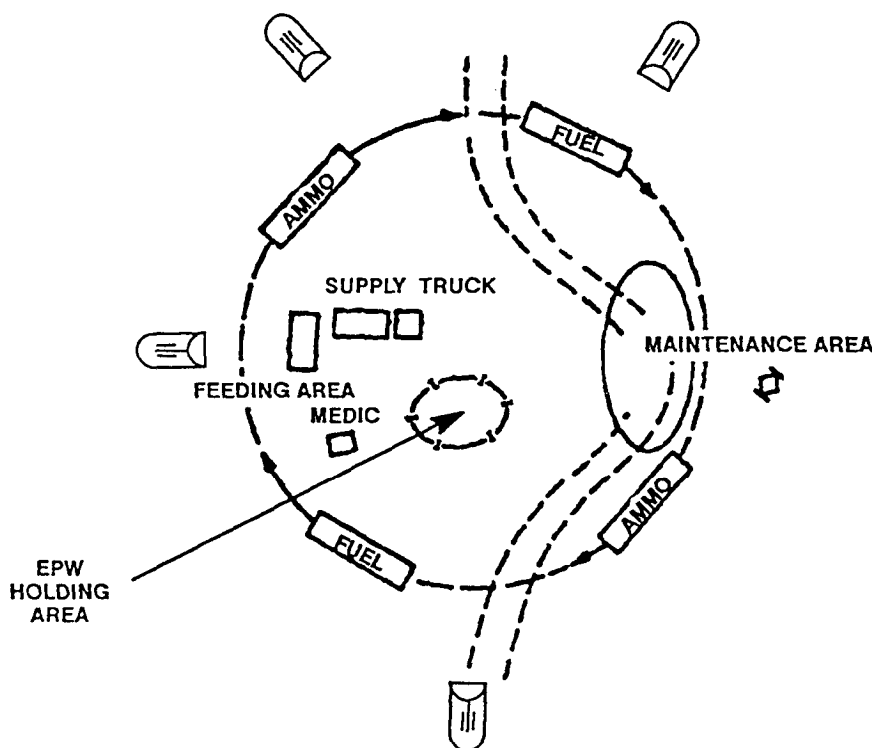
- KIA and personal effects are brought to the holding area by platoon personnel.
- Armored ambulances pick up critically wounded; other injured are carried or walk to the ambulances for first aid.
- EPW are centralized and guarded.
- Vehicles requiring maintenance are brought

to the maintenance area.

- Inspections are completed by the platoon leader or platoon sergeant at each vehicle.

Note: The tailgate issue method is normally used only in an assembly area (AA). If it is employed in forward positions, resupply must be masked by terrain. This procedure takes much longer than the service-station method.

TAILGATE ISSUE METHOD



EMERGENCY RESUPPLY

Occasionally, usually as a result of combat, the battery may have such urgent need for resupply that it cannot wait for routine LOGPAC. Emergency resupply may involve Classes III, V and VIII. Because it often occurs while in contact with the enemy, special techniques must be considered. When the platoons are

under fire, limited supplies can be brought forward to the closest concealed position where the tailgate method may be used. Individual fighting vehicles drop back to resupply at the direction of the platoon leader, then return to fight. For resupply during a lull in combat, the service-station method may be appropriate.

CROSS-LEVELING

Cross-leveling is not a technique of resupply but a way to make supplies last longer. It is the distribution of supplies evenly throughout the platoon. It is done

automatically by squad leaders and platoon sergeants in the assembly areas and after every action. Cross-leveling usually takes place between squad and team

members but is also used between squads and platoons. It is done for repair parts and all classes of supply. In some cases, supplies may be shifted in the platoon to increase combat potential. For example, if a squad is preparing for movement but is short on ammunition

and water, they may acquire or draw these items from the other squads remaining in position. These squads would, in turn, be resupplied by the designated resupply system. Cross-leveling between platoons must be approved by the battery commander.

PRE-POSITIONED SUPPLIES

Pre-positioning supplies is required in most defensive operations. Normally, only Class V supply items are pre-positioned. The location and amount of pre-positioned ammunition must be carefully planned, and each vehicle commander must be informed. All leaders down to squad leader verify the locations of the sites during their reconnaissance and rehearsals. Propositioning considerations include the following:

- Pre-positioned ammunition is on pallets, preferably in covered, protected positions.
- Pre-positioning frees cargo vehicles to bring more ammunition forward.
- The possibility of capture or destruction of pre-positioned ammunition is a risk for the battery. The battery cannot guard pre-positioned sites with the manpower available.
- Pre-positioned ammunition must be far enough away from vehicles and individual fighting positions that its destruction will not cause friendly vehicle or personnel casualties.
- Pre-positioning fuel is difficult. It requires

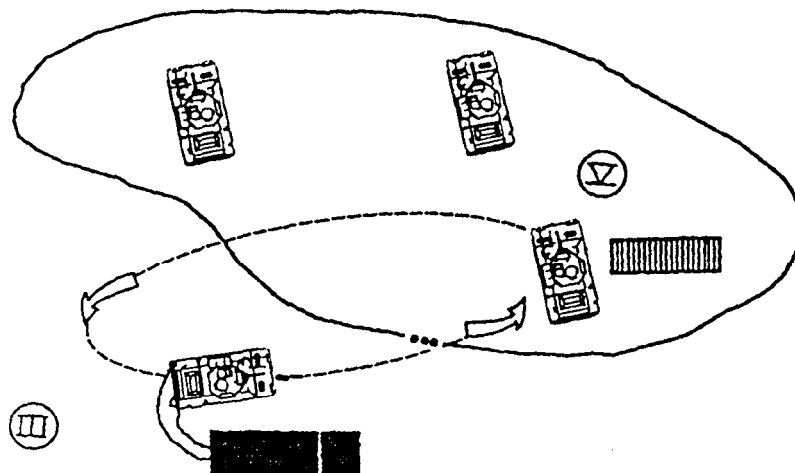
covered sites separated from ammunition as well as additional equipment, including fuel transfer pumps and drums, blivets, and 5-gallon cans in quantity.

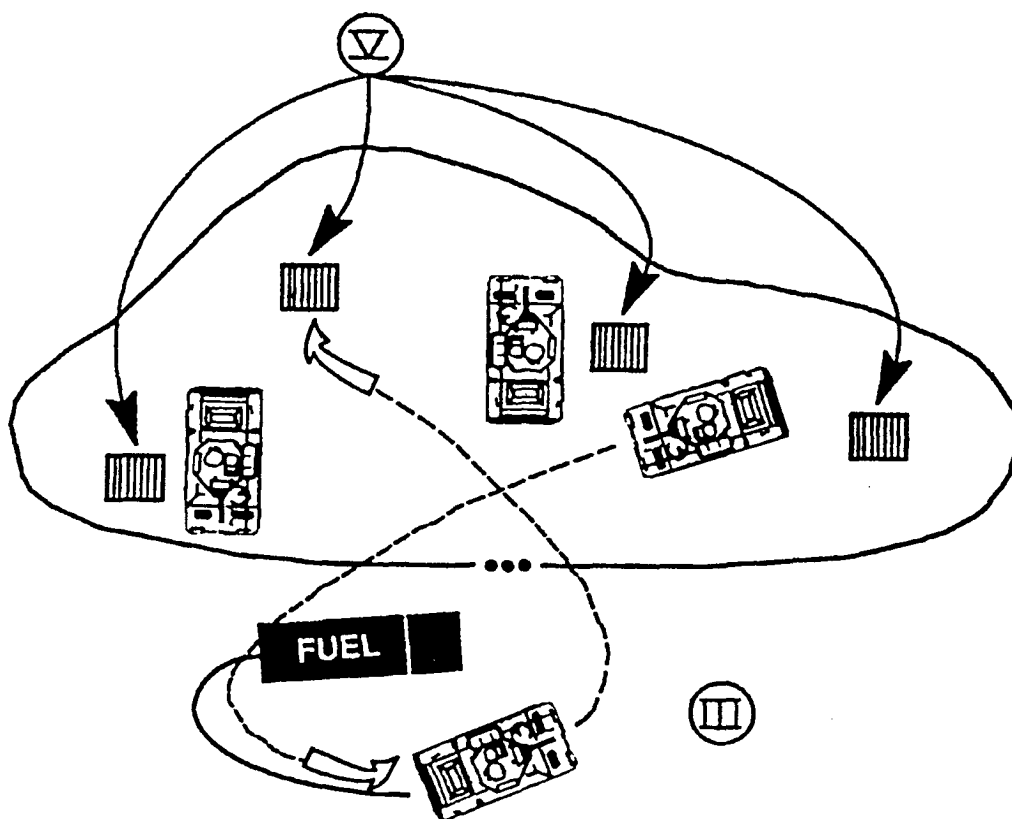
The following describes the two main methods of propositioning supplies:

Method 1. Class V supply is located in one place inside the assembly area or battle position (see the following illustration). Each vehicle pulls into the central area to upload ammunition and rations. Pre-positioned fuel tankers are set up at the rear of the position, and refueling is done using the service-station method.

Method 2. Class V supply is pre-positioned at each vehicle position, and Class III fuel tankers are pre-positioned in one location for the entire platoon (see the illustration on the next page). In this method, Class V supplies are placed on the ground in the vicinity of each vehicle position and begin to rearm. The fourth vehicle stops at the Class III fuel tanker located to the rear of the position and refuels. When the refueling vehicle is full, it moves into its fighting position and begins to rearm while another vehicle moves to the refuel point.

PRE-POSITIONED SUPPLIES, METHOD 1





unit, interview him, and introduce him to his squad leader and team chief. The squad leader introduces him to the squad, briefs him on his duty position, and assigns him an experienced “buddy” to “look out” for him. This in-briefing should cover recent squad and

platoon activities, current activities, and future activities. Furthermore, this in-briefing should reinforce the fact that he is part of a good unit with a proud heritage

(esprit de corps). The soldier should be told about important SOPs and special information concerning the area of operations.

HEALTH SERVICES SUPPORT

At platoon level, health services support consists of three things: prevention, treatment, and evacuation of casualties. Emphasis is placed on prevention since soldiers may become combat ineffective due to non-battle injuries or disease as often as due to combat. These casualties may be eliminated by understanding and applying the principles of field hygiene and prevention of weather-related injuries. Leaders have the responsibility to monitor the overall condition of their soldiers (see FM 21-10).

The leader must be prepared to treat and evacuate casualties. The treatment of serious casualties consists primarily of stabilizing the soldier until he can be evacuated to the nearest medical aid station.

Casualties are treated and may be evacuated directly from the platoon by vehicle or helicopter. If evacuated by vehicle, they are taken to the supported unit

casualty collection point designated in the OPORD. If evacuated by helicopter, they are taken to the rear to receive medical assistance.

Unit SOPs and operation orders address casualty evacuation in detail. They cover the duties and responsibilities of key personnel, rank methods of evacuation, and establish procedures for retrieving and safeguarding the weapons, ammunition, and equipment of casualties.

In war, leaders must be prepared to treat and evacuate casualties. The combat lifesaver program enhances the platoon's ability to provide immediate medical attention to casualties until evacuated to the nearest casualty collection point. The unit must identify and train selected squad members as combat lifesavers. The goal is to have one combat lifesaver in each BSFV squad.

AIR DEFENSE ORDERS AND ANNEXES

This appendix explains those orders and annexes that are associated with the BSFV platoon leader's troop-leading procedures. To execute a plan, the platoon leader must be able to organize his thoughts and convey them in a concise and informative manner to his subordinates. To do this, the platoon leader must have a thorough understanding of the different types of orders and annexes he will receive and issue.

WARNING ORDER

A warning order provides subordinate units advance notice of a contemplated action or order to follow. The purpose is to initiate the troop-leading procedures of subordinate units.

The amount of detail included in a warning order is dependent on the time available, the means of communication available, and the information necessary for subordinate leaders. As more information becomes available, additional warning orders should be issued. Warning orders are normally oral orders but may be brief written messages.

The essential information required in a warning order is as follows:

- "Warning Order" stated so that addressees will recognize that orders follow.

- Addressees to whom the warning order pertains.
- Situation or a brief description of the enemy and friendly situation.
- Time and nature of the operation. Mission or probable mission and time.
- Earliest time to move.
- Time and place for OPORD issuance.
- Special instructions including any details of early coordination, rehearsals, special equipment requirements, attachments, et cetera.
- Acknowledgement that the warning order has been received and understood. See the following illustration for an example of a warning order.

OPERATION ORDER

To carry out the plan, the platoon leader must be able to convey his thoughts in a concise and informative manner. The Army's OPORD format standardizes the content and organization of information essential to clarity and execution of the order.

Leaders at all levels must practice preparing and presenting OPORDs. The time used will be time well-spent. Normally, at platoon level, the order will be oral or an annotated graphic overlay.

The five-paragraph OPORD tailored for an ADA platoon should contain the following information:

- Situation.
- Mission.

- Execution.
- Service Support.
- Command and Signal.

CONTENTS

	Page
Warning Order	A-1
Operation Order	A-1
Fragmentary Order	A-5
Air Defense Annex	A-5

See the following Air Defense Operations Order
Format illustration.

SAMPLE WARNING ORDER

1st platoon moves night of 5-6 Aug to assembly area Pinto (VIC iYR1016); prepare to advance early 7 Aug to provide AD for river crossing over Warta River. Road movement plan and OPORD to be issued at 051300Z August at grid YQ985105.

AIR DEFENSE OPERATION ORDER FORMAT

1. SITUATION

Information of the overall situation essential to a platoon leader's understanding of the current situation.

a. Enemy Forces (weather, terrain, identification, location, activity, and strength.

(1) Ground forces.

(2) Air forces.

o Identification, type of aircraft, and markings.

o Location of known and suspected airfields and estimated loiter and turnaround times.

o Strength of enemy air forces, including number of aircraft sorties available per day by type aircraft.

Note: Air IPB should be briefed at this time to subordinates.

b. Friendly Forces (mission of next higher headquarters; locations and planned actions of units on left, right, front, and rear; fire support available; and the mission of any adjacent or supplementary air defense, if applicable.

(1) ADA forces.

(2) Supported forces.

c. Attachments and Detachments (units attached to or detached from your unit by higher headquarters and effective time).

AIR DEFENSE OPERATION ORDER FORMAT (continued)

d. Weather and Terrain.

(1) Beginning morning nautical twilight (BMNT).

(2) End (of) evening nautical twilight (EENT)

(3) Moonrise and moonset times.

(4) Percent illumination.

(5) Weather forecast for next 24 hours or period of OPORD, including the low, and chance of precipitation.

(6) Terrain information concerning vegetation, type of terrain features, trafficability of roads, cross-country movement, and local water features.

2. MISSION

The mission includes who, what, why, and where. Include the command and support relationship and priority.

3. EXECUTION

This paragraph contains the platoon leader's visualization of the execution of an operation from start to completion.

a. Platoon leader's intent for the operation.

b. Concept of operation for support of maneuver forces, stationary asset, convoy et cetera. This should include the overall plan and missions of the platoon.

(1) Scheme of maneuver relevant to the supported force.

(2) Fire support target reference points, target list, family of scatterable mines (FASCAM) locations.

(3) Coordinates of priority asset, if applicable.

c. Subunit missions (using the platform execution matrix, assign mission to each organic and attached squad, section, or team to include the priority of protection for each unit).

d. Coordinating Instructions.

(1) Time of leader's reconnaissance, departure, and return.

(2) Weapon control status and air defense warnings.

AIR DEFENSE OPERATION ORDER FORMAT (continued)

(3) Rallying points and actions at rally points.

(4) Actions at supported unit's objective or upon enemy contact to include disengagement criteria.

(5) Any information concerning two or more fire units not covered by SOP.

(6) Rehearsals, backbriefs, and inspections.

(7) Formations to be used by the platoon or supported unit.

(8) Crew endurance plan.

(9) Rules of engagement.

(10) Hostile criteria.

(11) Mission-oriented protection posture.

4. SERVICE SUPPORT

This paragraph contains CSS instructions for support of the operation.

a. Rations, POL, and water.

b. Ammunition control, ASP location, and resupply plan.

c. Maintenance: motors, ADA systems, and communications (contact teams)

d. Uniform and equipment.

e. Method of handling sick, wounded, and EPWs (supported unit coordination).

5. COMMAND AND SIGNAL

This paragraph contains instructions relative to command and to the operation of common communications equipment.

a. Command.

(1) Chain of command and locations.

(2) Locations of headquarters command posts (CPs) and alternate CPs (battalion, battery, platoon, and supported unit headquarters).

AIR DEFENSE OPERATION ORDER FORMAT (continued)

b. Signal.

- (1) Supported unit frequency.
- (2) Convoy frequency (if applicable).
- (3) Challenge, password, signals, and code words.
- (4) Early warning frequency; IFF codebook number.
- (5) Listening silence instructions.
- (6) Artillery or FIST element frequency.
- (7) Alternate frequencies.
- (8) Antijamming procedures (if not addressed in SOP).

- Notes:
1. Prior to the briefing, orient personnel with maps (if time permits, construct a sandtable). Provide personnel with strip maps and graphic overlays posted on maps.
 2. Conduct a backbrief at the end of the OPORD to ensure personnel understand the order.
 3. Establish rehearsal location and date-time group.
-

FRAGMENTARY ORDER

A FRAGO is an order which presents material extracted from a more detailed order or which changes a previous order. Like warning orders, these are usually brief oral or written messages. A mission order is one form of FRAGO which provides experienced leaders

with the essentials of an order: their mission or a change to a previously issued mission. FRAGOs may be oral, written, or graphic. In all instances, they are brief. See the Sample Fragmentary Order illustration on page A-6.

AIR DEFENSE ANNEX

An annex is an integral part of an order which deals with one aspect of an operation. Its purpose is to keep the basic text of an order short. Annexes allow the distribution of certain information to key players in the task force. Annexes include—

- Details that amplify the basic order (operations overlay, intelligence instructions, early warning concept).

- Combat support instructions (ADA, fire support, and engineer).
- CSS instructions (service support overlay, traffic circulation, and control instructions).
- Any other information or directions required to amplify the order.

Many times the platoon leader supporting a specific unit will be required to write the AD Annex to the supported unit's OPORD. Annexes can be attached to the order or distributed separately. Unless there is good reason to the contrary, each copy of an order is issued complete with all annexes. See the Sample AD

Annex illustration.

An AD annex may also be formatted in an execution matrix style that is common to many units. See the illustration on page A-8 for an example.

SAMPLE FRAGMENTARY ORDER

Reference: OPORD 7

Map series V661, sheet 7061, edition 1, scale 1:50,000.

Task Organization: 2d platoon GS to brigade effective 141400Z Jan.

1. SITUATION Tank battalion delaying advance of TF 1-6.
2. MISSION No change.
3. EXECUTION
 - 1st squad LOC TS456835, PTL 6400 mils.
 - 2d squad LOC TS481814, PTL 1600 mils
 - 3d squad LOC TS454783, PTL 3100 mils
 - 4th squad LOC TS424816, PTL 4088 mils.
4. SERVICE SUPPORT No change.
5. COMMAND AND SIGNAL Platoon CP currently at TS454814.

Acknowledge.

SAMPLE AD ANNEX

(CLASSIFICATION)

Copy no. of copies
 Issuing headquarters
 Place of issue
 Date-time group
 Message reference no.

ANNEX (AIR DEFENSE) TO OPERATION ORDER NO.

REFERENCES: maps, charts, and other relevant documents
 Time zone used throughout the order.

1. SITUATION

Items of information affecting air defense support not included in paragraph 1 of the operation order or which need to be expanded.

SAMPLE AD ANNEX (continued)

a. Enemy Forces.

(1) Reference to intelligence annex, if applicable.

(2) Enemy air capabilities.

b. Friendly Forces.

(1) Outline higher headquarters plan.

(2) Outline higher and adjacent unit AD plans.

(3) Note additional AD resources supporting the unit.

c. Attachments and Detachments. Air defense resources attached and detached to include effective times.

2. MISSION

A clear concise statement of the air defense mission.

3. EXECUTION

a. Commander's Intent.

b. Concept of Operation. A brief statement of the air defense operation to be carried out, to include air defense priorities.

c. Tasks to subordinate ADA units.

d. Coordinating Instructions.

(1) Instructions applicable to two or more subordinate units.

(2) Reference to supporting appendixes not referenced elsewhere in the annex.

(3) WCS and ROE.

4. SERVICE SUPPORT

5. COMMAND AND SIGNAL

Acknowledgement instructions.

Last name of commander
RankAuthentication
Appendixes
Distribution

(CLASSIFICATION)

SAMPLE EXECUTION MATRIX STYLE AD ANNEX

ANNEX
OPORD
UNIT

DATE_____

TASKO: (Includes the TF breakdown by company / team and all the combat and combat support units)

MISSION: (Who, what, when, where, why, command and support relationship)

COMMANDER'S INTENT

AD

UNIT	Ist SQD	2d SQD	3d SQD	4th SQD	STINGER
------	---------	--------	--------	---------	---------

ACTION

PHASE 1

PHASE 2

PHASE 3

PHASE 4

PHASE 5

COORDINATING INSTRUCTIONS: ADW/WCS_____
MOPP_____

NOTES :

SERVICE SUPPORT: AMMO RESUPPLY POINTS_____
CASUALTY EVAC POINTS_____

COMMAND AND SIGNAL: CHAIN OF COMMAND
FREQUENCIES

ADA PLT_____
TF CMD_____
BATTERY CMD_____
ADMIN/LOG_____
DEW_____
FA FREQ_____

COMBINED ARMS FOR AIR DEFENSE

This appendix explains platoon and squad level passive and active air defense measures. When a unit does not have air defense protection by ADA weapon systems, the unit must use active and passive means organic to the unit for air defense protection. In a conflict, threat aerial platforms may operate over the entire battlefield with the potential to attack any friendly unit or force. Army units operate under the protection of ADA units. However, for close protection and self-defense, these forces also depend on their own passive and active air defense measures. Every member of the combined arms team must be capable of firing at attacking air threat platforms. Individual and crew-served weapons provide a significant defense against aerial threats.

PASSIVE AIR DEFENSE

Passive air defense includes all measures used to prevent attack by threat aerial platforms except engagement by fire. The effectiveness of enemy air is greatly reduced when units take full advantage of terrain for cover and concealment. The strict enforcement of communications security reduces the enemy's ability to pinpoint friendly units. This is particularly important for C³I nodes. If the situation allows, units should-

- Travel by covered and concealed routes when moving.
- Turn vehicles (if vehicles are moving when there is an enemy air attack) 90 degrees away from the direction of attack (the attack is normally parallel to the movement of the convoy) and seek cover and concealment. This quickly gets vehicles out of the line of fire.
- Wipe out track marks after moving into position.

- Occupy positions which offer natural cover and concealment when stopped. Camouflage vehicles that are exposed to enemy observation.
- Dig in and camouflage dismounted positions. Use engineer assets if available.
- Disperse vehicles as much as possible. This makes detection and engagement difficult.
- Cover windshields, headlights, and canopies of vehicles to retard glare, making detection difficult.
- Require air guards on each vehicle and at each position and rotate them.
- Establish an air attack warning system. Include both visual and audible signals. Ensure warning system is included in supported unit OPORD (usually coordinating instructions).
- Include in the SOP the passive air defense measures tailored to the unit. The SOP must be practiced during unit training.

ACTIVE AIR DEFENSE

Active air defense is direct action taken to destroy or reduce the effectiveness of enemy air attack. Techniques of engaging aircraft for non-ADA systems are summarized below.

ENGAGEMENT PRINCIPLES

While the decision to fire is made at the lowest level and is based on the leader's judgment of the

situation, the techniques used in delivering fire are

CONTENTS

	Page
Passive Air Defense	B-1
Active Air Defense	B-1

standard. Volume fire is the key to effective small arms fire against hostile aerial platforms. Every weapon must be used to engage the target. The goal is to mass a high volume of sustained small arms fire in the target's flight path with the intention of destroying the aerial platform when it flies into the fire. Each fire unit and individual must select an aiming point in front of the target and fire at that point. This method uses the football field technique for estimating lead distance.

For engagement techniques using vehicle-mounted

weapons, see Appendix L.

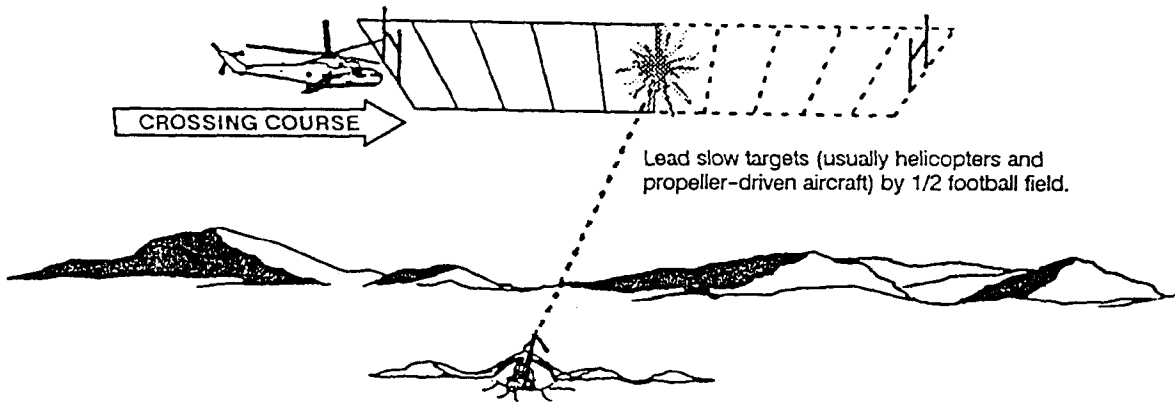
SMALL ARMS (M16, M60, M249, AND M2)

Fighting back is active air defense but should not be undertaken as a one-on-one activity (one soldier, acting independently, against one aircraft). Rather, it is a coordinated group response undertaken either spontaneously or under command using proper engagement techniques.

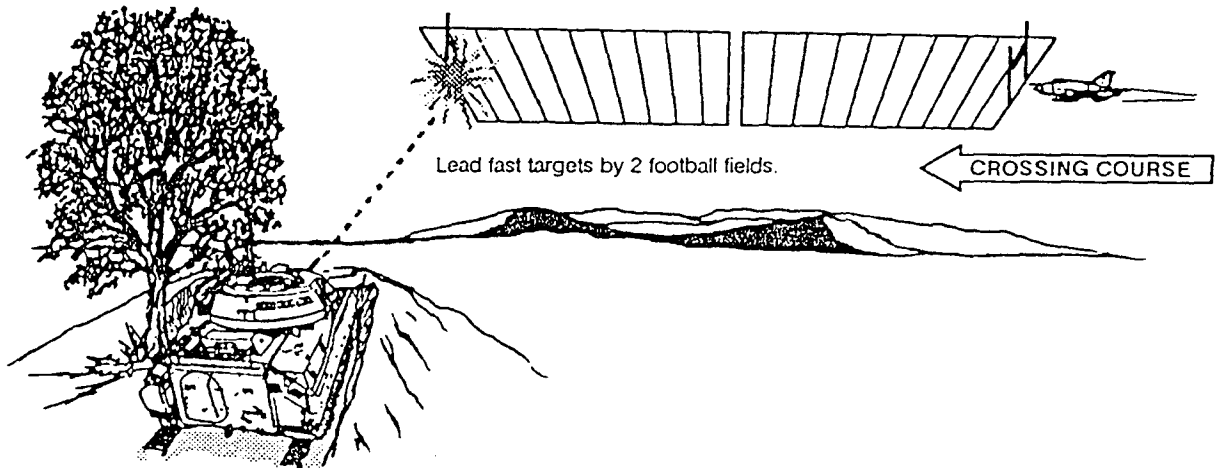
Aiming points for slow- and fast-moving aerial targets using the football field technique for estimating lead distance are shown in the following three illustrations.

CROSSING TARGETS

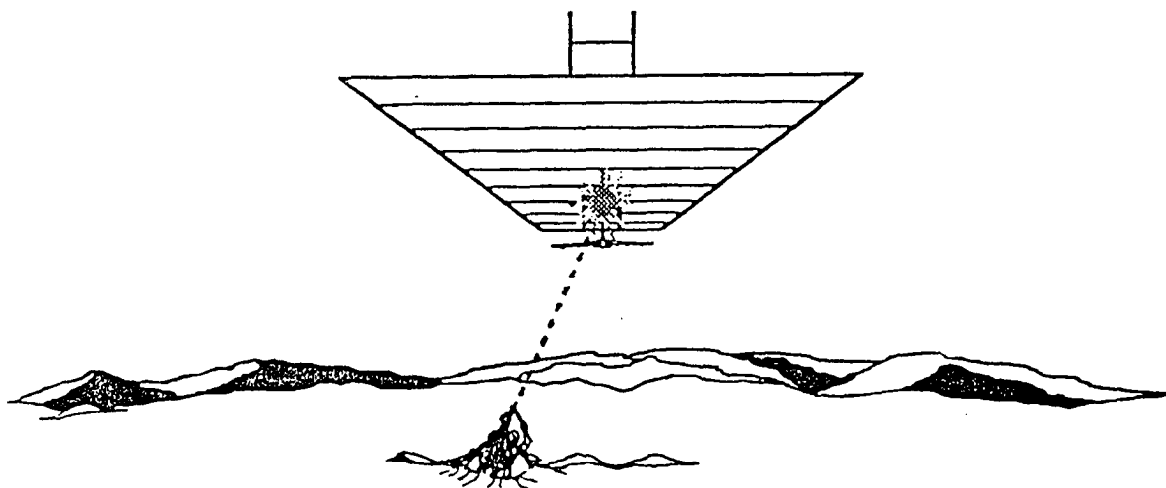
SLOW TARGET LEAD ANGLE



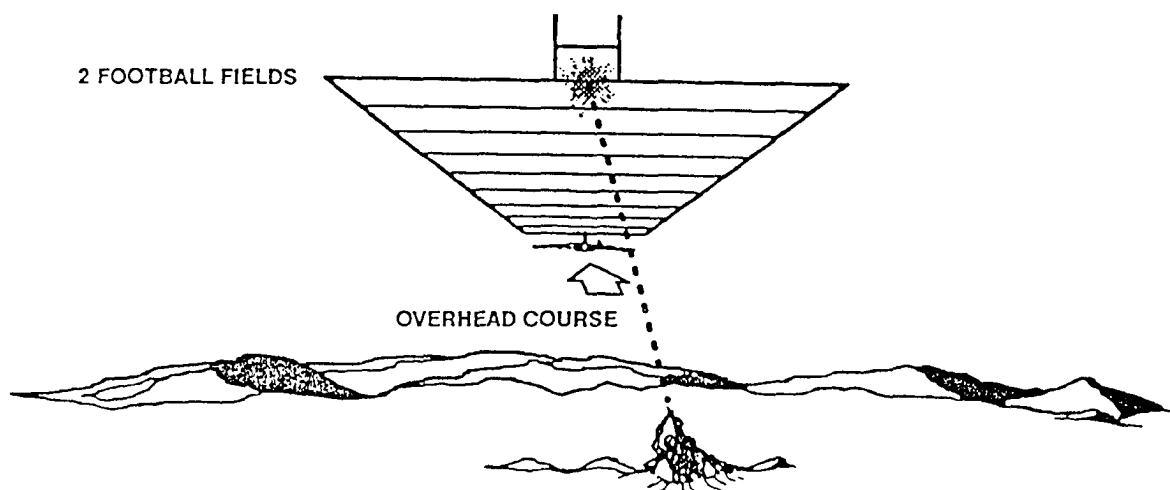
FAST TARGET LEAD ANGLE



FORWARD APPROACHING TARGET (DIRECT ATTACK)



OVERHEAD TARGET



A coordinated high volume of fire will get results. Fire should be delivered on command and not at the option of the individual. This will ensure controlled, high-volume engagement. See the Aiming Points for Massed Small Arms Fire illustration below.

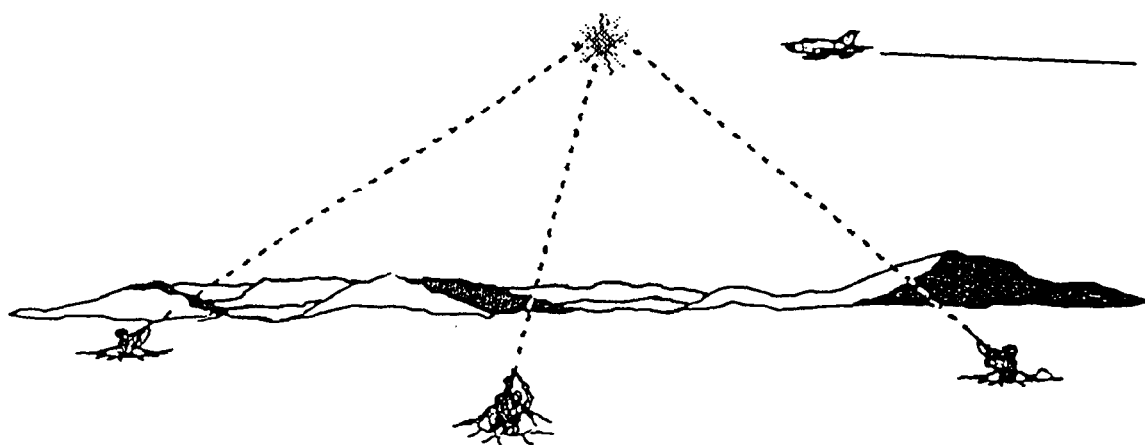
Firing Positions for Small Arms

A supine position is the proper firing position for the engagement of aerial platforms. This means the soldier is lying on his back, aiming his weapon into the

air. Soldiers should seek some kind of cover and concealment no matter how small. If in an individual fighting position, fire from a supported standing position. If not in an individual fighting position, look for a tree, a large rock, or something to help support the weapon and provide protection.

The M249 gunner will also fire from a protected position if possible. He can hold the weapon up or use a support for his arms and the weapon. In an emergency, another soldier can act as a hasty firing support.

AIMING POINTS FOR MASSED SMALL ARMS FIRE



RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

This appendix presents RSOP requirements and their applications. The procedures for RSOP have been developed to facilitate the rapid, orderly, and safe movement of ADA systems on the battlefield.

The BSFV platoons displace frequently, whether deployed in forward or rear areas. They move to support the maneuver force plan in response to mission changes. They also move to enhance survivability. The RSOP must be part of a unit's SOP, clearly understood, and practiced repeatedly by all members of the platoon.

METHODS OF RECONNAISSANCE

Reconnaissance is the thorough examination of terrain, to determine its suitability for accomplishment of the mission. The three methods of reconnoitering are: map, aerial, and ground.

MAP RECONNAISSANCE

A study and analysis of a tactical map will provide an appreciation of the terrain and show the best route to the selected location. A map reconnaissance—

- Precedes all other methods. A map should always be available for the area of operation.
- Allows quick examination of large areas. This is faster than other reconnaissance methods.
- Cannot determine current conditions in the area. The map may be dated and provide an inaccurate representation of the area.
- Ensures the most security. A map reconnaissance can be conducted in a secured area.

AERIAL RECONNAISSANCE

If an aircraft is available, the commander or the RSOP officer can see the terrain. An aerial reconnaissance—

- Provides the fastest way to see the terrain.
- Is limited by aircraft availability, weather, and light conditions.
- Is still an imperfect reconnaissance. Fields of fire, ground conditions, and local threat cannot be determined.

- Is still an imperfect reconnaissance. Fields of fire, ground conditions, and local threat cannot be determined unless the aircraft lands..
- Is less secure than a map reconnaissance. Aircraft activity in an area exposes soldiers to threat activity and also reveals an interest in a particular area.

GROUND RECONNAISSANCE

A ground reconnaissance is an on-site examination of the terrain. A ground reconnaissance—

- Is the most accurate and desirable type of reconnaissance. The route can be evaluated for trafficability, obstacles, choke points, and key terrain. Firing positions, fields of fire, and air avenues of approach can be analyzed for planning finalization.
- Is time-consuming. Covering the distances over potential routes and checking alternate positions takes time. The ground reconnaissance is the slowest method of reconnaissance.
- Is dangerous. The small reconnaissance party could be subjected to threat observation en route or at the objective area.

CONTENTS

	Page
Methods of Reconnaissance	C-1
Reconnaissance, Selection, and Occupation of Position Sequence	C-2

If ground or aerial reconnaissance cannot be performed, engineer terrain teams may be able to provide necessary information. Plans can be made for the reconnaissance to include routes, release points (RPs), assembly points, and assembly times for the reconnaissance party. If time is limited and the unit must move before the reconnaissance party returns, road guard

positions are selected, and soldiers necessary for these tasks are included in the RSOP party.

Actual inspection of the chosen routes and positions on the ground is desirable to confirm selections made from the map or to make necessary adjustments in plans.

RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION SEQUENCE

Since BSFV units will likely be employed as a platoon and in support of a task force, the RSOP party will normally be led by the platoon leader. The sequence of actions for conducting the RSOP are discussed in the following paragraphs.

RECEIVE THE ORDER

The commander meets with his key personnel, passes on the basic order, and briefs his key personnel on the new mission. The commander's briefing includes information on the purpose of the operation, routes, road clearance times, start and RP locations, and AD operational times. Each platoon leader reviews his briefing notes, completes precombat checklists, and initiates the reverse planning sequence.

ISSUE MOVEMENT WARNING ORDER

The platoon leader returns to the assembly area, issues a movement warning order, and briefs his key personnel on the new mission.

The movement warning order can be—

- Written or verbal.
- Delivered in person.
- Passed over tactical communications nets.

The warning order must include, as a minimum, the new mission, the location of the planned area of operation, the time of release for march order, crossing the start point (SP), crossing the release point, and assuming operational status at the planned area of operation.

MAKE A MAP RECONNAISSANCE

This is the fastest way to conduct a reconnaissance and will always precede any other type of reconnaissance. The positions of BSFVs and dismounted Stinger teams are plotted on a map and represent the best locations for providing air defense protection. The platoon leader must consider the air defense employment guidelines, weather, and the factors of METT-T. Alternate positions should be identified at this time. After the weapon positions have been plotted on a map,

positions for checkpoints, and primary and alternate routes are selected and plotted. The platoon leader identifies a reconnaissance route by conducting a map reconnaissance to the proposed area. Positions selected by map reconnaissance must be confirmed by additional reconnaissance if the tactical situation allows.

PLAN THE GROUND RECONNAISSANCE

Reconnaissance is performed to select the best fire unit positions, march routes, SPs and RPs, sensor positions, and communications sites. The ADA platoon leader should coordinate with the local maneuver commander and the supported unit battalion S3 to determine what areas maneuver units plan to occupy. Mutual agreement must be established to make the best use of the available terrain. The platoon leader selects personnel and equipment to conduct the reconnaissance with him and assigns tasks to the reconnaissance party personnel. The unit SOP will establish the normal composition and responsibilities of the party. The reconnaissance party for the platoon should consist of at least the platoon leader and one representative from each squad. The RSOP party also includes a security force.

BRIEF NEXT-IN-COMMAND-ISSUE ORDERS

After the platoon leader finalizes and coordinates the plan, he briefs his personnel covering all elements of a five-paragraph operation order (situation, mission, execution, service support, and command and signal) and indicates when the RSOP party will depart the present position. He identifies at least the SP and the RP. His briefing and issuing of orders should include instructions on continued operations in the absence of key leaders.

CONDUCT THE RECONNAISSANCE AND SELECT POSITIONS

As soon as RSOP preparations are complete, the platoon leader departs with the reconnaissance party.

He ensures that the selected primary route meets equipment requirements (height, weight, width) is passable, and avoids possible ambush locations. He positions road guides as required. He may keep the platoon main party posted on his progress by referencing predetermined check points. As the RSOP party approaches the new location, the platoon leader checks the area. The platoon leader must ascertain if the tentative map-selected locations will allow immediate occupation for accomplishment of the mission. Ground reconnaissance verifies whether the terrain provides good natural concealment and has access roads for primary and alternate routes into the position. The terrain should provide good observation, fields of fire, and sectors of search and have firm ground that will support the weight of the equipment.

NBC and mine detection teams check the immediate area to ensure it is free of contamination and mines. A total security plan is then placed in effect. This includes positioning automatic weapons overlooking the main avenue of approach and alternate routes into the position and establishing other security positions around the area to preclude gaps in the perimeter. A PTL and a sector of fire are assigned to each squad, and communications are established with all the positions. Proposed positions plotted during the map reconnaissance should be used if possible. Squad representatives reconnoiter the positions assigned to their weapons, select tentative sites for the weapons and observation posts (OPs), and confirm them with the platoon leader. The platoon leader reconnoiters the platoon area and selects the site for the platoon command post. He visits each proposed weapon site and supervises or assists the squad representative. After approving the positions, the platoon leader informs the battery commander and the supported unit of the weapon and platoon CP locations.

Positions selected must be the best available for fields of fire, communications, accessibility, and survivability. The following specific characteristics must be considered in selecting sites for the platoon headquarters.

- CP is centrally located with respect to fire unit positions.
- Cover and concealment are available.
- Alternate entrance and exit routes are available.
- Position is defendable against ground attack.
- Communications can be established with higher, lower, and supported units.

The following are characteristics which must be considered in selecting sites for BFSV squads:

- Primary and secondary fields of fire and observation must be clear.
- Communications with platoon CP, other squads in the platoon, and with EW sources are available.
- Positions must be within 100 meters of plotted positions in original defense design. If not, defense may need to be redesigned.
- Positions make maximum use of available cover and concealment to facilitate survivability.

The firing signature of the Stinger and tube-launched, optically tracked, wire-guided (TOW) weapon systems disclose the weapons' positions during each engagement therefore, frequent shifting of position is required. Units will select primary, alternate, and supplementary positions during the ground reconnaissance. Routes into and out of these positions must be selected and prepared as necessary. The following positions are normally selected by ground reconnaissance:

- Primary position. A position from which the fire unit intends to accomplish its tactical mission.
- Alternate position. A position to which the fire unit moves when the primary position becomes untenable or unsuitable for carrying out the assigned mission. The alternate position must be far enough away to prevent its being rendered untenable by the same action that affected the primary position. The alternate position must meet all the requirements of the primary position.
- Supplementary position. A place to fight which provides the best means to accomplish a task that cannot be accomplished from the primary or alternate positions.

Avoid placing positions near terrain features easily recognized from the air. Positions are more vulnerable to enemy fires (once spotted near an identifiable object).

PREPARE TO OCCUPY THE POSITIONS

After the platoon leader has selected the positions, he ensures the ground guides know exactly where he wants all the vehicles and equipment emplaced. Preparation should include marking the location of each major piece of equipment (as required). Everyone at the new position is given the new challenge and password; any known enemy activity

in the area; and the approximate arrival time, location, and order of vehicles for the main party.

MOVE THE UNIT TO THE NEW POSITIONS

The platoon leader informs the platoon sergeant of the results of his reconnaissance and relays appropriate instructions for the movement of the main body. The platoon sergeant organizes the vehicles as ordered by the platoon leader. Platoon vehicles use movement techniques dictated by the factors of METT-T and unit SOP.

OCCUPY, ORGANIZE, AND IMPROVE THE POSITIONS

The occupation of position should be coordinated with the supported unit to avoid mutual interference. When the platoon arrives at the position, all vehicles move off the road into the position without halting and without closing the interval between vehicles. The unit SOP should state the requirements and the priorities for occupying positions.

When all squads have reported that they are in position and capable of providing coverage of their assigned sector, the platoon leader will report the platoon "ready for action."

Squad leaders begin improving positions as dictated by SOP or additional orders. A typical improvement sequence may include—

- Natural camouflage. Supplement existing camouflage nets where possible with indigenous

materials (branches, leaves, snow). These materials should be from the vicinity of the squad so they will blend naturally into the surroundings.

- Individual fighting positions. Hasty positions are prepared for the Stinger team. These will be replaced by deliberate fighting positions.

- Cover. The BSFV and personnel dig the vehicle in turret-down for protection from blast, fragmentation, and small arms. Engineer support may be required in some situations and should be requested through the supported unit.

- Alternate and supplementary positions. Work on alternate and supplementary positions is initiated as early as possible to ensure that they are available should the primary position become untenable.

Upon occupying the position, the platoon must provide continuous local security. Obstacles such as a hasty protective minefield provide security which blocks, disrupts, or canalizes enemy attacks. All obstacles must be coordinated with the supported unit S3 and the engineer officer. Other measures taken should also be integrated with the ground defense plan of the supported unit. Range cards should be prepared. At a minimum, range cards should indicate ranges to critical points on all likely avenues of approach, dead spaces, and likely targets.

APPENDIX D

BSFV PLATOON AND SQUAD CHECKLISTS

The checklists in this appendix are recommended for use by the BSFV platoon leader and squad leaders. They are not all inclusive; however, they are useful in most combat situations. If required, make additions to these checklists. If your battery SOP calls for different or more detailed procedures, follow the local SOP.

PLATOON PRECOMBAT INSPECTION CHECKLIST

The platoon precombat inspection checklist is outlined here. Use the lined columns to indicate status of the individual item being checked.

a. Individual soldier readiness.

- 1. TA-50 inventory. _____
- 2. Assigned weapon clean and zeroed. _____
- 3. Assigned NBC mask with accessories. _____
- 4. Load-bearing equipment (LBE). _____
 - (a) First aid pouch with dressing. _____
 - (b) Canteen(s) with water. _____
 - (c) Ammo pouch with magazines. _____
 - (d) Decontamination kit. _____

b. Equipment readiness (continued).

- (f) Necessary maps on hand. _____
- (g) Rations distributed. _____
- (h) Vehicles loaded by load plan. _____
- (i) Compasses on-hand. _____
- (j) All necessary manuals on-hand. _____
- (k) Flashlights. _____

b. Equipment readiness.

- 1. Publications for vehicles. _____
- 2. Logbook, dispatch, and drivers' licenses. _____
- 3. Ensure before-operation PMCS and
prefire checks have been completed per
TMs and FMs. _____
- 4. General. _____
 - (a) Orders and rehearsals conducted. _____
 - (b) Required package products
on-hand. _____
 - (c) BII present and serviceable. _____
 - (d) Fuel can(s) filled. _____
 - (e) Water can(s) filled. _____

- 5. Communications equipment. _____
 - (a) All necessary (supported force, AD,
et cetera) TACSOPs and SOIs on-hand. _____
 - (b) Radios and intercom operational. _____
 - (c) AH connectors and receptacles
clean. _____
 - (d) Grounding straps secure. _____
 - (e) Antennas and matching units
complete and serviceable. _____
 - (f) Field phones present and
serviceable. _____
 - (g) Applicable batteries on-hand. _____
 - (h) Radios complete and operational. _____
 - (i) COMSEC equipment operational
and programmed. _____

CONTENTS

	Page		Page
Platoon Precombat Inspection Checklist	D-1	Platoon Coordination Checklist	D-4
Platoon Leader's Planning Checklist	D-2	Platoon Command Post Checklist	D-5
Squad Leader's Briefing Checklist	D-3	Platoon Operation Checklist.	D-6
Night Defensive Position checklist	D-3	Priorities of Work Checklist.	D-8

PLATOON PRECOMBAT INSPECTION CHECKLIST (continued)

(j) GPSs operational.	_____	(b) All machine guns have spare barrels and cartridge extractor.	_____
(k) CVCs present and operational.	_____	(c) Weapon cleaning equipment on-hand.	_____
6. Fire control system.		8. Safety.	
(a) Firing circuits operational.	_____	(a) Road crossing equipment (warning triangles, safety vests, and flashing lights) on-hand.	_____
(b) Optics clean, operational, and present.	_____	(b) Safety briefing.	_____
(1) Sights.	_____	(c) Vehicle safety check performed.	_____
(2) Night vision device.	_____	(d) First-aid kits and or bags filled.	_____
(3) Binoculars.	_____		
7. Weapons.			
(a) All weapons clear.	_____		

PLATOON LEADER'S PLANNING CHECKLIST

The platoon leader's planning checklist is outlined here. Use the lined columns to indicate status of the individual item being checked.

a. Analyze the threat.

1. Aerial IPB. _____
2. Ground IPB. _____
3. Templates air indicators. NAIs and TAIs. _____
4. Receive DST from battery. _____

b. Analyze the mission.

1. Convoy. _____
2. Fixed asset. _____
3. Maneuver force. _____
 - (a) Passage of lines. _____
 - (b) Movement to contact. _____
 - (c) Meeting engagement. _____
 - (d) Hasty attack. _____
 - (e) Deliberate attack / checkpoints. _____
 - (f) River crossing / breach. _____
 - (g) Defend in sector. _____
 - (h) Defend BP / strong point. _____

b. Analyze the mission (continued).

- (i) Delay. _____
- (j) Withdrawal. _____
4. NDP (see NDP checklist). _____
5. Backward planning.
 - (a) Equipment emplacement time. _____
 - (b) Movement time from RP to position. _____
 - (c) Convoy time. _____
 - (d) SP time. _____
 - (e) Brief time to squad leaders. _____
 - (9 Ammunition, POL, and ration resupply plan. _____
 - (g) Maintenance completion time. _____
 - (h) Time necessary to set hasty defense. _____
 - (i) Movement time to rally point. _____
 - (j) March order time. _____
 - (k) Rehearsal time. _____

PLATOON LEADER'S PLANNING CHECKLIST (continued)

- | | | | |
|-------------------------------------|-------|-------------------------|-------|
| b. Analyze the mission (continued). | | (m) Time to pass WARNO. | _____ |
| (l) Reconnaissance time. | _____ | (n) Receipt of order. | _____ |
| (1) Primary route. | _____ | | |
| (2) Alternate route. | _____ | | |

SQUAD LEADER'S BRIEFING CHECKLIST

The checklist contains minimum information the squad leader must receive from the platoon leader to accomplish his mission. Each item should be checked.

- | | | | |
|---|-------|--|-------|
| (a) Mission. | _____ | (i) WCS. | _____ |
| (b) Threat. | _____ | (j) Hostile criteria. | _____ |
| (c) Fire unit location and alternate. | _____ | (k) Platoon rally point. | _____ |
| (d) PTL. | _____ | (l) RP. | _____ |
| (e) Sector of fire. | _____ | (m) Friendly units in AO. | _____ |
| (f) A ² C ² control measures in effect in the AD. | _____ | (n) Platoon rehearsal location and time. | _____ |
| (g) Route and alternate route. | _____ | (o) ROE. | _____ |
| (h) ADW. | _____ | (p) MOPP | _____ |

NIGHT DEFENSIVE POSITION CHECKLIST

Defense of perimeters and rally points during the night are difficult. The following checklist will assist the BSFV platoon and or squad during night operations.

Does the area have the following features?

- | | | | |
|--|-------|---|-------|
| (a) Sufficient area for dispersion. | _____ | (i) Area secured prior to occupation; listening post and observation post established at main entrance. | _____ |
| (b) Alternate exit and entrance routes. | _____ | (j) NBC detection, monitoring, and survey teams check the area prior to arrival. | _____ |
| (c) Easily defended against ground snack. | _____ | (k) Ensure all units occupy the NDP. | _____ |
| (d) Easily recognizable and known to all squads. | _____ | (l) Establish vehicle dismount point with ground guides. | _____ |
| (e) Good communications with higher, lower, and supported units. | _____ | (m) Place NBC alarms. | _____ |
| (f) Good observation. | _____ | (n) Occupation time after end of evening nautical twilight (EENT). | _____ |
| (g) Reconnaissance prior to occupation. | _____ | (o) Unit moves out and emplaces before beginning of morning nautical twilight. | _____ |
| (h) Coordination with adjacent units prior to occupation. | _____ | (p) Fill gaps in the perimeter with individual fighting positions. | _____ |

NIGHT DEFENSIVE POSITION CHECKLIST (continued)

Does the area have the following features (continued)?

- (q) Ensure each fire unit coordinates with the fire units to left and right. _____
- (r) Ensure each position has a range card. _____
- (s) Ensure LPs and OPs have the following:
 - (1) Cover and concealment. _____
 - (2) Communications to perimeter. _____
 - (3) Range card. _____
 - (4) Sufficient distance from perimeter to provide early warning. _____
- (t) Camouflage positions and vehicles. _____
- (u) Establish a reactionary force. _____
- (v) Plan and conduct the following:

- (1) Ammunition resupply. _____
- (2) POL resupply. _____
- (3) Water resupply. _____
- (4) Ration resupply and feeding. _____
- (5) Maintenance support. _____
- (6) Evacuation plan. _____
- (w) Submit necessary reports. _____
- (x) Enforce noise, light, and litter discipline. _____
- (y) Brief everyone on –
 - (1) Tactical situation. _____
 - (2) Mission. _____
 - (3) Challenge and password. _____

PLATOON COORDINATION CHECKLIST

The platoon leader's coordination checklist for coordination at TF and or brigade TOC. Each item should be checked.

a. Visit all staff sections and exchange information. Pay particular attention to the TF staff planning/orders process. Pass the information gathered to ADA HQ.

- 1. S3.
 - (a) Commander's intent. _____
 - (b) Frontline trace (operations overlay). _____
 - (c) Friendly air or ground situation. _____
 - (d) Mission. _____
 - (e) Task force rehearsal location and time. _____
- 2. S2.
 - (a) Current enemy situation. _____
 - (b) IPB (air and ground) requirements. _____
- 3. Combat trains command post (CTCP) (S1/S4).
 - (a) Personnel reporting/replacement procedures. _____

- (b) Maintenance/vehicle recovery. _____
- (c) Rations/water. _____
- (d) Casualty evacuation. _____
- 4. NBC officer.
 - (a) NBC situation. _____
 - (b) Location of decontamination points. _____
 - (c) Location of NBC recon surveillance vehicles. _____
- 5. Communications and electronics officer.
 - (a) Current SOI requirements and changes. _____
 - (b) Radio replacement procedures. _____
- 6. Engineer officer.
 - (a) Known obstacles. _____
 - (b) Known minefield. _____

PLATOON COORDINATION CHECKLIST (continued)

- | | |
|----------------------------------|---|
| 6. Engineer officer (continued). | c. Keep TF informed on all AD engagements and squad dispositions. |
| (c) Coordinate digging assets. | |
| 7. Fire support plan. | d. Keep TF Informed of AD warnings, hostile criteria, and WCS. |
| b. Attend all briefings. | |

PLATOON COMMAND POST CHECKLIST

The platoon command post checklist is outlined here. Each item should be checked.

- | | |
|--|---|
| a. Ensure good communications with— | 7. Maintenance of control points. |
| 1. Battery. | 8. Logistics resupply points. |
| 2. Squads. | 9. Rally points. |
| 3. Sensors. | 10. Location of higher headquarters. |
| 4. Supported unit. | 11. Location of adjacent air defense elements. |
| b. Observe COMSEC/ECCM procedures. | 12. Class IV by squad/team. |
| 1. Enter net according to SOI procedures. | i. Know current SOI and authentication passwords. |
| 2. Establish platoon net. | j. Know and display on map the current locations or all squads. |
| 3. Enforce net discipline. | k. Ensure second-in-command is briefed on plans and operations so he can take over in your absence. |
| c. Ensure all required reports are identified and submitted in a timely manner. | l. Take corrective action on down equipment. |
| d. Establish maintenance recovery procedures for platoon. | m. Make coordination with adjacent units. |
| e. Ensure AD information is disseminated during OPOD briefs. | n. Ensure squads with nonoperational equipment still observe cover and concealment. Camouflage disabled vehicles. |
| f. Ensure logistical resupply of the platoon occurs. | o. Ensure squads with problems continue to provide AD coverage to the greatest extent possible. A disabled fire unit may still be able to shoot. |
| g. Ensure all TOC supplies are on-hand. | p. Ensure platoon performs before-, during-, and after-operation maintenance on all equipment. |
| h. Track the tactical situation in the TOC. At a minimum, track the following: | q. Ensure adequate security measures are taken for classified documents and other sensitive items. |
| 1. Frontline trace. | r. Ensure platoon members are clean shaven and perform personal hygiene daily. |
| 2. Friendly air/ground situation. | |
| 3. Enemy air, ground, NBC, and EW situations. | |
| 4. Location of decontamination points and clean/dirty routes. | |
| 5. SOI requirements and changes. | |
| 6. Bridging, route, and obstacle information. | |

PLATOON OPERATION CHECKLIST

The platoon operation checklist is outlined here. Each item should be checked.

a. Planning phase.

- 1. 1/3, 2/3 rule. _____
- 2. Perform backwards planning. _____
- 3. Properly consider factors of METT-T in TF planning. _____
- 4. Present recommendations to commander regarding allocation of assets. _____
- 5. Actively participate with battalion staff during planning process. _____
- 6. Plan platoon rehearsal (location, time, and duration). _____
- 7. Ensure TF AD plan is doctrinally sound. _____
- 8. Template planned weapons coverage. _____
- 9. Properly analyze enemy air avenues of approach. _____
- 10. Ensure AD plan compensates for system capabilities. _____
- 11. Ensure AD plan compensates for maintenance/ combat losses. _____
- 12. Ensure AD plan supports commander's scheme of maneuver/intent. _____
- 13. Accomplish contingency planning. _____
- 14. Address AD rearm/ refuel/ maintenance. _____
- 15. Address AD of TF rearm/ refuel/ movement. _____
- 16. Discuss night/limited visibility operations. _____
- 17. Discuss BSFV ground support role. _____
- 18. Address AD plan in assembly areas/ nonmission periods. _____
- 19. Address receipt/ dissemination of WCS/ADW. _____
- 20. Address early warning/ sensor management. _____
- 21. Establish disengagement criteria. _____
- 22. Address employment of air guards and engaging with organic weapons. _____

- 23. Perform adequate reconnaissance to facilitate NDP. _____
- 24. Provide AD for orders group during planning. _____
- 25. Plan coverage for choke points and passage points. _____
- 26. Consider prestock of ammunition. _____
- 27. Coordinate weapon emplacement positions with local commander who owns the ground. Make provisions for alternate and secondary positions. _____
- 28. Plan medical evacuation of casualties through supported unit or ADA battery. _____
- 29. Plan PTLs. _____
- 30. Establish priority of work for squads. _____

b. Preparation phase.

- 1. Brief all personnel on the OPORD at once. _____
- 2. Extractor address pertinent elements of TF OPORD in platoon OPORD. _____
- 3. Allocate 1/3 of available time to planning; allocate 2/3 of available time for execution. _____
- 4. Move personnel into position or perform face-to-face coordination for weapon emplacement with supported force. _____
- 5. Verify that AD personnel and TF elements use proper camouflage. _____
- 6. Verify that AD personnel are prepared to defend at first light. _____
- 7. Verify that precombat checks and PMCS are accomplished. BSFVs are boresighted; and IFFs are programmed. _____
- 8. Verify that range stakes/ range cards are properly prepared. _____
- 9. Verify that Class III/ V uploads are accomplished in a timely manner. _____
- 10. Check AD coverage of TF road march and preparation. _____

PLATOON OPERATION CHECKLIST (continued)

b. Preparation phase (continued).

11. Verify complete dissemination and understanding of TF/platoon plan with backbriefs. _____

12. Verify that initial/ongoing liaison is conducted by AD squads and supported elements. _____

13. Check preparation of primary, alternate, and supplementary positions. _____

14. Verify request and receipt of engineer support _____

15. Template actual weapons coverage. _____

16. Conduct rehearsals at all echelons. _____

17. Conduct backbrief. _____

18. Verify Stinger team fighting positions are dug to standard. _____

19. Verify that BSFVs are dug in to turret down. _____

20. Verify that prestocked ammunition is dug in. _____

21. Verify that adjacent unit coordination has been accomplished. _____

22. Verify dissemination of engineer obstacle overlay. (Are clear lanes and the location of minefield known?) _____

23. Conduct coordination for medical evacuation on the ground with supported unit. _____

c. Execution phase.

1. Immediately pass any enemy information to the platoon. _____

2. Platoon kept informed on disposition of friendly troops and scouts disposition. _____

3. Adequate communications maintained to facilitate C². _____

4. Changes in WCS/ADW from TF net passed to the platoon. _____

5. "Flash" attack warnings made to the platoon and to maneuver elements. _____

6. AD engagement reports, situation reports (SITREPs), and spot reports (SPOTREPs) sent in a timely fashion. _____

7. Adjustments made to compensate for maintenance and combat losses. _____

8. Hostile aircraft properly engaged by AD weapons. _____

9. Hostile aircraft properly engaged by organic non-ADA weapons. _____

10. TF reacting appropriately to enemy air attack: massing small arms fire. _____

11. Platoon reacting properly to artillery. _____

12. Platoon properly responding to NBC conditions. _____

13. Combat reload accomplished. _____

14. Movement techniques consistent with TF movement. _____

15. Choke points properly defended. _____

16. BSFV ground fires controlled and properly executed. _____

17. Sound gunnery techniques employed. _____

18. Chain of command functioning. _____

19. Individual squads maximizing use of time. _____

d. Reorganization.

1. Platoon organization reestablished. _____

2. FRAGO issued for follow-on mission. _____

3. Ammunition status reviewed cross-leveling accomplished. _____

4. Class III supplies obtained. _____

5. Casualties treated and evacuated. _____

6. Search scan position improvement continued during reorganization. _____

7. Parent battery notified to provide maintenance support or to pass engagement reports. _____

8. Battery or supported unit updated on status of personnel, Class I, III, IV, and V supplies, and combat capability. _____

9. Crews performing PMCS. _____

PLATOON OPERATION CHECKLIST (continued)

e. Consolidation.

1. Platoon reestablishes local security.

2. Platoon reestablishes AD sector of fire.

3. If necessary, the platoon repositions to overwatch the designated objective.

4. Platoon leader prepare and issues FRAGO for specific tasks or to continue mission.

PRIORITIES OF WORK CHECKLIST

The priorities of work checklist are outlined here. Each item should be checked.

a. Occupation of position (squad checklist).

1. Recon your tentative position. Select a position that optimizes squad field of fire. Emergency emplace.

2. Establish security. Advise chain-of-command of location. Run wire to LP/OP.

3. Employ NBC detection equipment.

4. Prepare positions (request engineer support).

- (a) Prepare range cards (in duplicate).

- (b) Dig fighting positions (overhead cover).

- (c) Natural and net camouflage (cover track marks).

- (d) Establish obstacles.

5. Brief AD OPORD to squad members.

6. Perform PMCS of all equipment.

7. Rears, resupply/redistribute Classes I, II, and V, and water report to CF.

8. Field sanitation.

9. Establish work, maintenance, chow, and rest plan. (Improve alternate/supplementary position and recon routes.)

2. Account for all sensitive items.

3. Report/evacuate casualties.

4. Fill leadership positions.

5. Zero weapon/check batteries.

6. Conduct maintenance on all equipment.

7. Resupply/redistribute Classes I, III, and V and water. Cross-level Class V.

8. Complete two DA Forms 2404; turn in within two hours of occupation.

9. Establish work plan.

10. Recover WD-1.

11. Police area and move trash to rear.

12. Reload vehicles per load plans.

13. Cross-level personnel, if required.

14. Maintain security.

15. Check communications send situation/status reports.

16. Prepare to move.

17. Prepare sleep plan.

b. After battle/premovement (squad checklist).

1. Gather forces. Account for all personnel.

EARLY WARNING

This appendix describes the purpose of early warning and how it provides reliable alerting and cueing information to air defense units and early warning alerting to other combat, combat support, and combat service units. Alerting allows units time to apply active and passive air defense measures. The accurate and timely dissemination of this information enhances the effectiveness of air defense weapon systems and the accomplishment of the air defense mission. Alerting information tells the unit an aerial platform is approaching its position. Cueing information tells the unit the direction of the aerial platform, its location, and its tentative identification. This enables the unit to focus attention in that direction to detect the aerial platform at a greater range.

The BSFV platoon leader must coordinate activities for any sensors in the supported force area of operations. In the event command and control for sensors cannot be provided by the parent ADA organization, the BSFV platoon leader may have to provide command and control.

DIGITAL EARLY WARNING

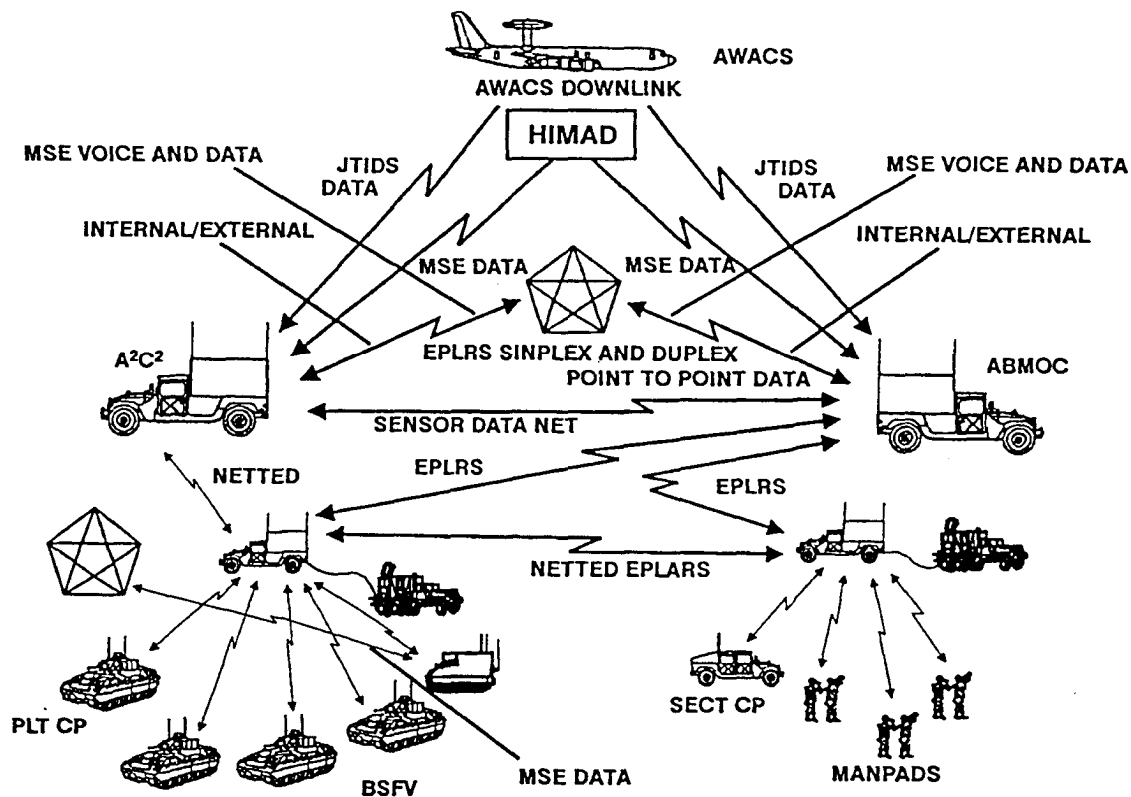
Digital early warning track data will be the primary means of early warning communications to the BSFV platoon. Voice early warning will be the alternate method. The air battle management operations center (ABMOC) and Army airspace command and control (A²C²) element receive track data simultaneously from the airborne warning and control system (AWACS). The JTIDS track data, along with weapon control status, and air defense warnings (ADWs) are transmitted to the tactically employed sensors by using the enhanced position location reporting system (EPLRS), or single channel ground and airborne radio system (SINCGARS). The sensors correlate that information with their own local track data (lightweight and special division interim sensor (LSDIS) with a 20-kilometer detection range and ground-based sensor (GBS) with a 40-kilometer detection range) and send it to the BSFV platoon. Early warning dissemination using

SINCGARS requires line of sight (LOS) between the sending and receiving nodes. Early warning dissemination using EPLRS does not require LOS alignment. EPLRS also provides the capability to net sensors with the ABMOC and A²C² element. This network facilitates sharing track data and graphics digitally at all echelons. See the AWACS and Local Data illustration on page E-2.

CONTENTS

	Page
Digital Early Warning	E-1
Voice Early Warning	E-2
Directed Early Warning	E-2
Local Air Defense Warning	E-3
Ground-Based Sensor	E-3
Simplified Handheld Thermal Unit	E-4

AWACS AND LOCAL DATA



VOICE EARLY WARNING

Voice early warning is the method of disseminating directed early warning. It is the alternative to digital

early warning. See the Voice Early Warning Network Illustration on page.

DIRECTED EARLY WARNING

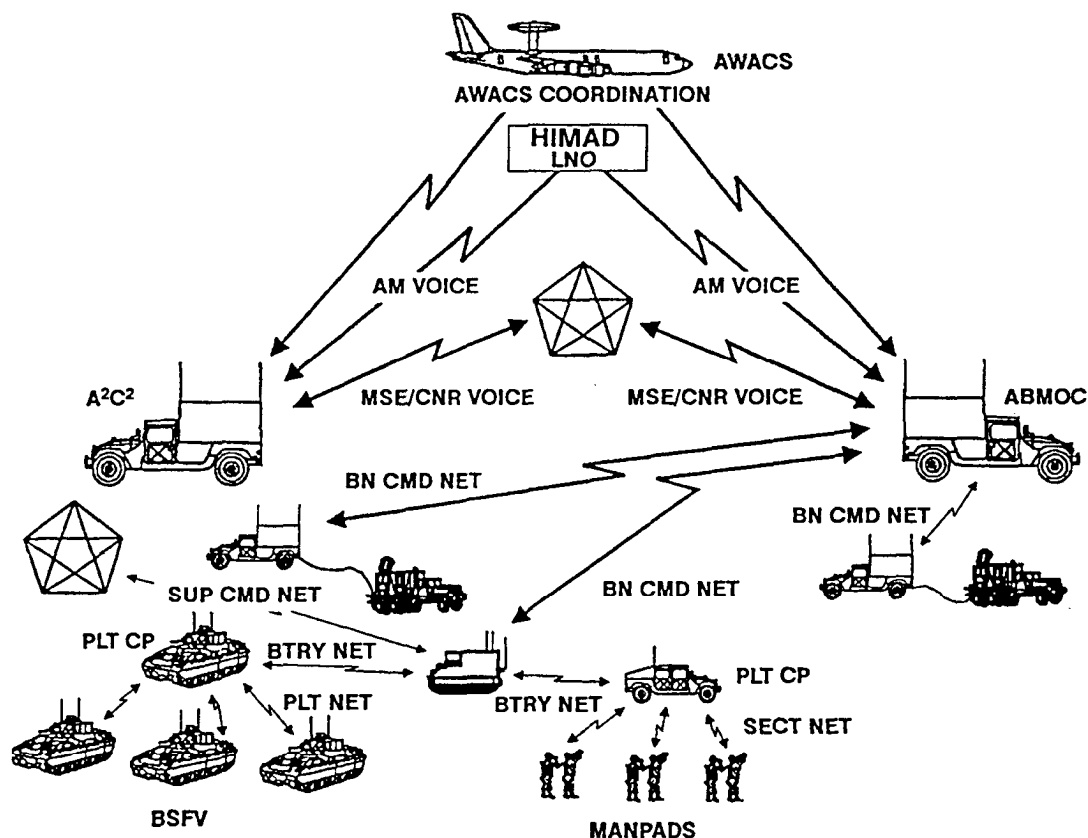
Directed early warning is designed to alert a specific unit or area of the battlefield of an immediate aerial threat. It is passed over the supported unit command net or a net designated by the supported unit commander. Directed early warning defines the local air defense warning and states whether the aerial platform is unknown or friendly, location of the aerial platform, provides a cardinal direction of approach for the aerial platform, and if known, the element most likely affected within the force.

Directed early warning is quick, simple, redundant in nature and given in clear text. The unit's SOP will

specify the exact procedures to be used. The following elements of directed early warning will be determined by unit SOP:

- Preface.
- Identification.
- Local air defense warning.
- Direction.
- Size.
- Affected asset.

VOICE EARLY WARNING NETWORK



LOCAL AIR DEFENSE WARNING

LADWs are described in Chapter 2. The following is an example of an LADW. LADW is designated as DYNAMITE, LOOKOUT and SNOWMAN. They parallel air defense warnings RED, YELLOW, and

WHITE, but the level of warning is determined by the tactical air defense artillery commander. They are used to alert a unit of an impending air attack.

GROUND-BASED SENSOR (GBS)

GBS with C³I node provides ADA fire units with a sensor radar device meeting all-weather surveillance and detection requirements. GBS is the FM sensor for all heavy maneuver ADA units. GBS is an EW sensor that provides FAAD units with cueing, alerting, and other EW information.

GBS with C³I node capabilities are as follows:

- GBS detects one square meter targets to an instrumented range of 40 kilometers and altitudes of 0 to 4,000 kilometers.
- All-weather.
- FAAD C³I is IFF-compatible.

- Provides visual display of target location in azimuth and range.
- Uses military power sources (10-kilowatt generator) to include organic vehicle power sources.
- Two-man emplacement or march order of GBS.
- Two-man emplacement or march order of C³I node.
- GBS is operable by one man.
- Capable of sharing division picture with other

sensors (and ABMOC / A²C²), using EPLRS.

- GBS provides cueing (specific and timely range, azimuth, and elevation) data on aircraft within a designated range of a weapon system. This cueing quality data permits orienting the weapon systems to a potential target.

The platoon will have six sensors (GBS) with six C³I nodes for deployment. The GBS section consists of two teams. One team consists of a team chief, a sensor operator, and a driver. The other team consists of a team chief/operator and a radio operator/driver.

SIMPLIFIED HANDHELD TERMINAL UNIT

The simplified handheld terminal unit (SHTU) is a state-of-the-art military light-weight battery operated, handheld communications terminal designed for “man on the move” operation and providing digital communications over advanced communications systems. The SHTU has a modular and open architecture,

allowing for internal and external expansion. Separate numeric keypad and cursor controls provide user friendly operation under adverse conditions. An LCD display provides both bitmappable graphics and text capability.

COMBAT OPERATIONS IN VARIED ENVIRONMENTS

This appendix discusses the four environments most commonly encountered in combat operations. They are mountain, jungle, desert, and cold weather environments. Rarely will platoons operate in jungle and mountainous environments. Generally, MANPADS will provide air defense protection in these rugged environments.

Combat operations cannot be stopped because of rain, snow, ice, extreme heat, lack of water, or rough terrain. These environments present special problems to military operations.

MOUNTAIN OPERATIONS

Mountains of military significance are generally characterized by rugged, compartmented terrain with steep slopes and few natural or man-made lines of communications. The weather is usually seasonal, varying from extreme cold to warm temperatures. Rapid, drastic changes in weather are not unusual in mountainous terrain. The wind can also pose a problem. In cold weather, the wind chill factor significantly increases the chances of frostbite. Winds are accelerated when forced over ridges and peaks or when converged through passes and canyons.

There are several problems associated with a mountainous environment. Personnel acclimation is required above 2,500 feet. Acclimation is complete only when personnel realize their limitations and the limitations imposed on their equipment. The effects of high altitude on unacclimated personnel are—

- Increased errors in performing simple mental operations.
- Decreased ability for sustained concentration.
- Deterioration of memory.
- Decreased vigilance.
- Increased irritability and self-evaluation impairment.

There are several health hazards that exist in mountainous climates. These hazards include—

- Snowblindness: more direct sunlight reaches the earth at higher altitudes than at sea level and reflection is increased.
- Frostbite: wind chill factor is increased by strong winds.

- Sunburn: a serious case of sunburn can disable a person for days.

- Dehydration: excessive sweating without replenishing water can happen in mountain terrain.

Military operations have a unique challenge in mountainous terrain. Some of the physical characteristics of this environment that affect operations are—

- Rugged peaks, steep ridges, deep ravines, and valleys.
- Limited routes of communications.
- Highly changeable and unpredictable weather.
- Availability of natural cover and concealment.

Mountainous terrain offers distinct advantages to attacking enemy air threats. Air platforms can avoid radar and visual detection by flying low through valleys and mountain passes. They attack or surveil their target with little or no warning. Maneuver forces, combat support, and combat service support units that are road-bound provide lucrative targets. Narrow mountain roads often prevent passing and force one-way traffic. A disabled vehicle may stop a whole column

CONTENTS

	Page
Mountain Operations	F-1
Jungle Operations	F-2
Desert Operations	F-3
Cold Weather Operations	F-4

and make it vulnerable to ground fire, indirect fire, or air attacks.

Operations in this terrain favor the use of small, lightly-equipped maneuver forces. The Stinger team may be the only air defense unit that can accompany these forces and provide close-in air defense protection for these units. Stinger teams will generally operate—

- Dismounted, accompanying the maneuver forces.
- Pre-positioned, using helicopters for positioning of the teams to provide protection along the maneuver force's route of march.
- Mixed, dismounted and mounted. Mounted teams trail units by 1,000 meters. This is especially useful in poor weather when helicopter support is not available).

The Stinger teams may encounter many problems when operating in mountainous terrain. Some

problems that may be encountered are—

- Reduced early warning because the terrain will cause masking of radars and difficulty in establishing line of sight.
- Reduced ability to visually identify aircraft.
- Degraded distance and quality of FM radio transmission.
- Limitations of dedicated airlift for ammunition and supplies.
- Limitations of dismounted Stinger operations.
- Limitations to the missile system for firing down into valleys.
- Receiving adequate preventive medical care.
- IR increases, however, background clutter noise will also increase.

JUNGLE OPERATIONS

Jungle areas usually are comprised of trees interconnected by a network of thick vines. High temperatures, high humidity, and a heavy annual rainfall create lush vegetation which can seriously impede movement.

There are unique hazards in the jungle. Some of these hazards are—

- Movement by vehicle or foot is difficult.
- Minor terrain features can present major obstacles to movement in combination with the dense vegetation.
- The great fear of the jungle environment in the minds of personnel.

The health hazards associated with the jungle operations include the following:

- Heat exhaustion and dehydration: high humidity and heat can cause problems without proper water intake.
- Sanitation problems caused by the jungle climate that aids in the flourishing of bacteria.
- Fungus can rapidly cause infections in personnel.
- Jungle diseases carried by insects.
- Wildlife and poisonous or harmful plants.

Military operations in the jungle environment impact on equipment by requiring an additional maintenance effort to prevent—

- Rust.
- Corrosion.
- Fungus growth that will cause failure or non-operation of equipment.
- Problems caused by humidity.

Repair parts, ammunition, and other items should be kept in sealed containers until they are needed to minimize damage from rust and corrosion. Electronic equipment should be kept on so the heat generated can eliminate moisture that causes corrosion.

Dense jungle offers good concealment for maneuver forces. Defensive action is considerably aided by natural features. Small units are the essential element in all jungle operations. Enemy air attacks will be directed primarily against combat service support units, supply lines, and exposed field artillery units. However, air attack of maneuver forces can be expected when they cross open areas such as rice paddies or rivers.

The ADA unit supporting a maneuver force in a jungle environment will operate by positioning within and moving with the maneuver force. To defend a

stationary asset, it will clear trees and underbrush to have adequate firing positions.

The ADA unit will encounter the following problems in a jungle environment:

- Increased missile problems due to humidity.
- Reduced detection and identification ranges.
- Requirement for teams to be positioned closer together.

- Requirement for more teams to provide balanced fires and mutual support for a particular asset.
 - Reduced range of FM radios.
 - Extensive use of wire communications or special wavelength antennas.
- Improper individual sanitation causing health risks.

DESERT OPERATIONS

The desert is an arid, barren, and largely treeless environment that can be classified as three different types: mountain, rocky plateau, and sandy or dune desert. The only common denominator is the lack of water. A mountain desert is characterized by high, steep mountains with rains in the high areas that cause severe flash floods.

A rocky plateau desert is characterized by relatively slight relief interspersed with large flat areas. Rock is usually at or near the surface and steeply eroded valleys are common. Flash floods often occur in the valleys.

Sandy or dune deserts are extensive, relatively flat areas covered with sand or gravel. Sand dunes can reach over 1,000 feet high and 15 to 25 kilometers long. Flash floods can occur and cause problems along with high wind and dust storms.

Acclimation of personnel will be needed to allow for strengthened heat resistance and physical exertion. While the jungle and desert environments are very different, many of the health hazards are the same. The desert hazards include—

- Dehydration: a resting person may lose as much as a pint of water per hour.
- Heat injuries: sweat evaporates so fast the cooling of the body is degraded. Personnel should remain fully clothed to retain sweat and aid the cooling process.
- Cold injuries: rapid heat loss from the ground once the sun goes down can cause temperature fluctuations exceeding 70 degrees Fahrenheit.
- Numerous diseases.
- Loss of mental alertness.

Military operations have unique challenges in a desert environment. Some characteristics of a desert operation are:

- Wide dispersion of forces.

- Fast-moving operations and high-speed tactics.
- Navigation problems.
- Covered and concealed positions are difficult to find.
- Flash flooding can bog down movement.
- Sand or dust storms will reduce visibility.

Forces will be required to disperse to prevent detection and engagement at long ranges. Covered and concealed positions are difficult to find and vehicle tracks leading into fire positions must be erased or covered to prevent detection from the air.

The ADA unit supporting a maneuver force in a desert environment can expect—

- The low, flat terrain to aid in detection of enemy air at greater ranges.
- Lack of landmarks will cause problems to enemy air in finding and fixing their targets.
- Fire units will have a greatly improved chance of destroying the air threat before it attacks the target.
- Fire units will have to move rapidly to survive.
- Line of sight can usually be obtained for communications.

While the ADA units will normally be aided in target detection and engagement in the desert, problems will also impact on its operations. Some of these problems are—

- Sand or dust storms may degrade threat detection.
- Dispersion of forces may cause gaps in defenses where overlapping fires by the fire units are not possible.
- Concealment is difficult and fire units will need to move often.

- Missile backblast will create a dust or sand cloud revealing the fire unit's position.
 - Reduced FM radio range caused by extreme heat and poor grounding of antennas because the surface soil lacks moisture.
 - Radio dead spaces due to the presence of RF absorbable minerals on or near the surface.
- In the desert environment, dust and sand can be as deadly to equipment as enemy fire. Equipment is vulnerable to the extreme heat and cold temperatures of the desert. Problems can occur in the following
- Vehicle cooling and electrical systems.
 - Moving metal parts eroded by sand.

- Rubber parts will dry rot and crack; tires puncture easily.
- Batteries have a shorter life span.
- Seals break down.
- Deterioration of clothing and equipment.
- Extreme vibrations of equipment on rocky plateaus cause equipment failure and demand preventive maintenance checks and services be performed much more than required by operator maintenance manuals.
- Fuel filters and air filters require more frequent maintenance.

COLD WEATHER OPERATIONS

The area of cold weather operations is generally defined as the areas lying north and south of the temperate zone. It is characterized by deep snow, permafrost, seasonally frozen ground, frozen lakes and rivers, glaciers and extreme cold. Vegetation varies from thick evergreen trees to moss and lichens. During summer in permafrost areas, vegetation may mat together over a pool of water that can support soldiers but will not support any type of vehicle. These areas can be extremely dangerous.

There are several problems associated with a cold weather environment. They are—

- Freezing: both wet and dry cold require special clothing.
- Frostbite: skin can become painfully frozen in seconds.
- Hypothermia: the body cannot reheat itself and needs an external heating source to regulate its functions.
- Exhaustion common in cold climates especially at high elevations.
- Snowblindness: reflection of sunlight is increased and more direct sunlight reaches the earth.
- Dehydration: heavy clothing will cause increased sweating.

Several factors must be taken into account when planning military operations in a cold weather area. These factors are as follows:

- Mobility: conditions tend to restrict movement on the ground.

- Momentum: is difficult to achieve and is easily lost.
- Requirement for heat will place a premium on fuel.
- Camouflage is difficult due to ice fog created by personnel and equipment and tracks left in the snow.
- Navigation is difficult due to lack of aids, blending of features, and blowing snow.
- Night operations are the rule because of limited mobility during daylight.

Conditions which tend to restrict movement on the ground have little or no effect on enemy air operations. Roads, hills, and rivers found in all regions provide good navigational aids for enemy aircraft. Road-bound maneuver and support units are easily detected and attacked from the air.

Heavy snow in the winter and poor ground conditions in other seasons may require units to move on foot. The ADA units operating in this environment may encounter the following problems:

- Units will be limited in the amount of ammunition.
- Resupply may have to be made by air.
- Equipment batteries have decreased power levels and drain quickly.
- Special equipment for cold weather is necessary.

- Wearing of bulky, heavy clothing and gloves increase the time necessary to perform the engagement sequence.

- Extreme and prolonged cold weather causes sluggish operations, malfunctions, and broken parts.

To reduce the effects of cold weather, the ADA leader must ensure that proper training in cold environments is conducted and that additional time is provided to perform preventive maintenance.

LIMITED VISIBILITY OPERATIONS

This appendix presents the means and methods by which BSFV platoons cope with limited visibility. Platoons that have trained long and hard and have mastered the tactical and technical job skills required will fight effectively; however, they must understand limited visibility operations are extremely difficult.

CONDITIONS

Limited visibility conditions are difficult to deal with. Smoke and suppressive fire which can severely limit local visibility are used by all armies. Dust and smoke caused by fire and movement of troops in combat often obscure parts of the battlefield. Dust and smoke are especially critical to the effective employment of long-range direct fire weapons. Rain, falling snow, fog, and natural obscurants also limit visibility. Most current night vision devices and battlefield illumination means have limited effectiveness under these

conditions.

The leader's primary task is to coordinate and control the fire and movement of his unit so that he can mass combat power. This is a demanding task when visibility is good, and it becomes even more demanding when visibility is limited. Even in limited visibility, the unit must detect targets, distinguish between friendly and enemy units, effectively engage targets, and navigate.

PLATOON AND SQUAD LIMITED VISIBILITY EQUIPMENT

Modern technology has produced devices that soldiers and leaders can use to reduce the effects of limited visibility. Several of these devices are organic to the platoon. The following paragraphs describe the types and number of these devices issued to the platoon and explain how they are employed.

SURVEILLANCE, TARGET ACQUISITION, AND NIGHT OBSERVATION EQUIPMENT

Advanced surveillance, target acquisition, and night observation (STANO) equipment is either active or passive. Active STANO equipment projects some form of energy. This energy, likely radio frequency or infrared, can be detected by the enemy. Passive STANO equipment either detects existing energy emissions or uses available light as a detection means. Use of passive equipment is usually not detectable by the enemy. Active STANO equipment is generally limited to infrared illumination devices. Objects illuminated by these active devices are viewed using passive STANO equipment. There are two categories of passive STANO equipment: image-intensification devices and thermal-imagery devices.

Image-Intensification Devices

Image-intensification devices, or starlight scopes, do not project detectable energy. They amplify the existing or ambient light at night and project an image on a viewing scope. Ambient light may be moonlight, starlight, or the glow from cities and towns. Light from flares, searchlights, and laser illumination improves the viewing capability but should not be viewed directly with these devices. Image-intensification devices are adversely affected by fog, smoke, heavy rain, and falling snow. Image-intensification devices and binoculars aid where darkness is the only limiting factor.

CONTENTS

	Page
Conditions	G-1
Platoon and Squad Limited Visibility Equipment	G-1
Battlefield illumination	G-3
Control During Limited Visibility	G-4
Limited Visibility Employment Considerations . . .	G-4

Thermal-Imagery Devices

Thermal-imagery devices penetrate fog, smoke, camouflage, and light vegetation. The principle of this type of device is that all objects radiate energy in the form of heat. This radiated energy travels outward. Because of differences in the amount of heat being radiated, the viewer detects the shape and position of the object being viewed. Thermal-imagery devices can be used in daylight or darkness. These devices are able to see through light vegetation, camouflage, darkness, smoke, fog, rain, falling snow, or a combination of these factors.

STANO DEVICES

STANO devices greatly improve a unit's ability to carry out its mission under all conditions of visibility. Image intensification and thermal-imagery devices aid in detecting enemy active STANO devices such as infrared equipment.

The platoon may be issued the following STANO equipment: binoculars, AN/PVS-7 night vision goggles, AN/VVS-2 night vision driver's viewer, and integrated sight unit.

Binoculars

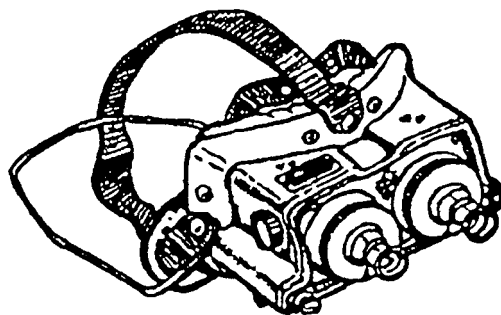
The platoon headquarters is issued two sets of 7X 50-mm binoculars. Each squad is also issued a pair of 7X 50-mm binoculars. They are used to acquire long-range targets. At night, binoculars can be used to extend the range of the naked eye by taking advantage of existing light. Binoculars are limited by smoke, dust, heavy rain, falling snow, or fog.

AN/PVS-7 Night Vision Goggles

The AN/PVS-7 night vision goggle (NVG) is a lightweight, battery-powered (3 VDC) device. It is a passive or active night vision device with a 40-degree field of view. The NVG is worn on the head. The battery life is 20 to 75 hours depending on the type of battery used. The NVG weighs 1.5 pounds and has a range of 9.8 inches to infinity in the passive mode. Using the NVG while moving, the track commander has almost the same night vision capability as the driver. The AN/PVS-7 helps the BSFV commander control the movement of the vehicle as it travels at night on roads or cross country. The NVG has a built-in active infrared light source, which can be used to provide added illumination for close-up viewing within 3 meters. In the active mode, the night vision goggles can be used to read maps, overlays, or orders. When the active mode is used, the infrared source must be shielded from enemy detection. Inside a building or vehicle or under a poncho, there is not a

direct line of sight from the infrared light source to the enemy. The NVG can be used for vehicle maintenance during darkness and can be worn by a ground guide to direct the BSFV. It can also be used by the driver as a backup system to the AN/VVS-2. See the following Night Vision Goggles illustration.

NIGHT VISION GOGGLES



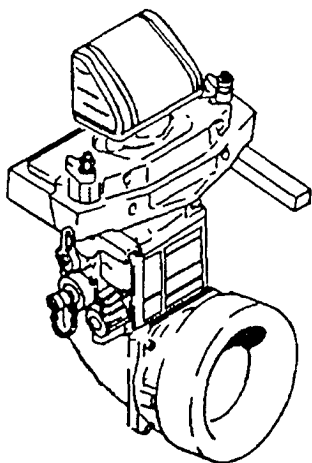
AN/VVS-2 Night Vision Driver's Viewer

The AN/VVS-2 is an image-intensification device. It allows the vehicle driver to see well enough to move the BSFV during darkness. It is mounted in the center periscope position of the driver's station. The center periscope is stowed in the AN/VVS-2's stowage space in the driver's compartment when the night vision viewer is used. Without placing his face against the eyepiece, the driver is able to use both eyes to view through one large diameter eyepiece of the AN/VVS-2. Night road marches can be conducted at speeds up to 50 KPH. At night, the driver is also able to sense rounds for the gunner with the AN/VVS-2 if the target is within his field of view. The AN/VVS-2 can be rotated 30 degrees to the right or left. It has a range in excess of 150 meters. This gives the driver a possible field of view 115 meters wide at a range of 150 meters. Rounds fired from the 25-mm automatic gun and the 7.62-mm coaxial machine gun can be observed out to greater ranges. The AN/VVS-2 is powered by the vehicle electrical system or 2.7-volt battery. See the following Driver's Night Viewer illustration on page G-3.

Integrated Sight Unit

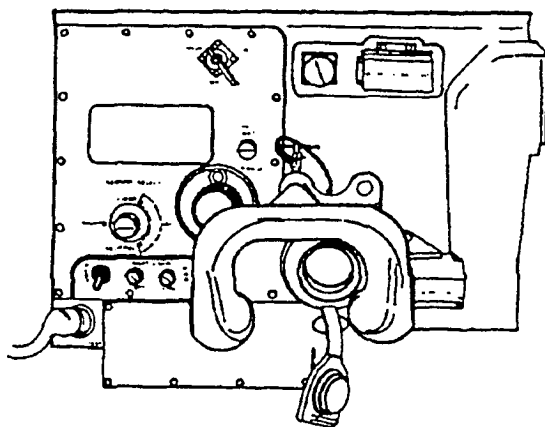
The integrated sight unit (ISU) is a single-sight unit used for all turret weapons. It has a day sight mode and a night sight mode. The day sight uses normal optics that have 4X or 12X magnification. The 4X lens has a wide field of view. It is used for acquiring targets.

DRIVER'S NIGHT VIEWER



Once a target is acquired, the sight is switched to the 12X magnification for target engagement. The smaller field of view presented by the 12X sight helps furnish greater accuracy when engaging targets. The ISU displays the same image to both the gunner and the BSFV commander. Thus both can acquire and engage targets. Rain and falling snow decrease the ISU's effective day sight range. See the following integrated sight unit illustration.

INTEGRATED SIGHT UNIT



When the ISU is used during silent operations, the turret must be traversed and weapons elevated by hand to conserve power.

Note. The thermal-imagery sight requires a 10-minute cool down period after turning it on before targets can be detected. Each unit SOP should have an SOP describing when the thermal sights are to be turned on before dark or during smoke conditions.

BATTLEFIELD ILLUMINATION

Artificial battlefield lighting is an easy way to penetrate darkness. Effective battlefield lighting must illuminate or silhouette the enemy without illuminating friendly forces. There is always a chance that artificial lighting may have an adverse effect on friendly troops. The characteristics of available artificial illumination systems, and how they are influenced by darkness, weather, and terrain are addressed in the following paragraphs.

Artificial light is not necessarily visible light. There are two types of artificial light: invisible and visible.

INVISIBLE LIGHT

Invisible light is most often light emitted by an infrared source. It is impossible to see with the un-

aided eye. It offers greater security than visible light because a night observation device is needed to detect it. But it is easily detected by active and passive devices.

VISIBLE LIGHT

Visible light is light from flares and searchlights. It requires no special equipment other than the light source itself. It is the simplest type of illumination. Visible light sources are used frequently to continue operations into the night. The disadvantage of using visible light is that it compromises friendly positions and activities.

The platoon uses the following sources of artificial visible light: trip flares, indirect fire illumination, and tank searchlights.

Trip Flares

Trip flares are mainly defensive and are excellent early warning devices. They can be set to ignite by rigging them with either a trip wire or a trigger release. Their size and limited burning time make them unsuitable for continuous illumination.

Indirect Fire Illumination

Indirect fire illumination from artillery and mortar fire is the most commonly used form of battlefield illumination. Wind direction must be considered when requesting illumination of this type. Drifting flares may illuminate friendly units. Strong winds may move the burning flare off target. Normally, illumination will not provide enough light to allow use of the ISU day sight. The illumination will not affect the use of the night sight, but if it comes into the night sight's field of view, it will appear as a streak on the screen.

Illumination from artillery or mortar flares is dimmed by fog, dust, smoke, and falling snow. Under these conditions of limited visibility, low illumination rounds may be used as a navigation aid.

Searchlights

Searchlights are on many types of tanks and in target acquisition batteries of corps artillery. Tank searchlights furnish two types of illumination: white light and infrared light. Depending on the terrain, enemy situation, and cloud cover, searchlights may provide direct illumination or reflected illumination off low clouds. They can mark targets, objectives, or boundaries. They can also be used to increase deception by illuminating an area or point outside the intended area of action. The system employing the searchlight is easily detected and extremely vulnerable. It should be used when no other system is available.

CONTROL DURING LIMITED VISIBILITY

Leaders must be ready to use various techniques to control units during limited visibility. These include measures to identify friendly forces, control movement and fire, and navigate.

CONTROL

During movement, visual contact can be maintained by reducing the intervals between dismounted soldiers or vehicles. Night vision devices allow units to retain dispersion while maintaining visual contact. When vehicles are moving in any area that has friendly dismounted personnel, such as an assembly area or urban terrain, dismounted guides must be used. Leaders should move forward where they can control the direction and speed of movement.

FIRES

Besides the night sight and other night observation devices, there are several techniques and aids that

can be used to control the fires of the BSFV and the crew member. When the unit is in a stationary position, range cards should be used. Range cards help orient weapons on likely targets and reference points. The platoon should use wire in the defense to establish more reliable and secure communications between the squads, OPs, and platoon headquarters. Tracers can be used to denote targets and to direct fire on targets. Pyrotechnic signals, such as hand-fired flares, can be used to call for the lifting and shifting of fire.

NAVIGATION

Whenever possible, guides should be used while moving over unfamiliar terrain. Compasses, visible landmarks, and night vision devices can be used as navigational aids. Artillery spotting rounds may help determine location and direction.

LIMITED VISIBILITY EMPLOYMENT CONSIDERATIONS

Reduced visibility during the hours of darkness may limit the intensity and effectiveness of the air threat. However, air threat activities will increase during periods of limited visibility as new technological advancements in night observation and target acquisition are achieved. Aerial platforms can be detected and acquired using radar, FLIR, sound, moonlight, reflected light, and engine exhaust flames. But ranging and posi-

tive identification become difficult. Temporary night blindness which may be caused by the firing of weapons can further handicap BSFV squads conducting engagements at night. FM 44-16 and FM 44-18-1 discuss Stinger in night operations.

Since air battle activities may be reduced during hours of limited visibility, the BSFV platoon may be integrated in supported force night operations. The

BSFV integrated sight unit and weapons, especially the 25-mm automatic gun, provide the capability for the BSFV platoon to execute a secondary mission in a ground role. Before the decision is made to employ the BSFV in a ground role, leaders must consider BSFV crew, weapons, and ammunition availability for future air defense operations. Also, periods of limited visibility can be used to accomplish the following:

- Move weapons to new, alternate, or supplemental positions.
- Improve positions.
- Resupply weapons and crews.
- Perform required maintenance.
- Crew endurance (rest).

NUCLEAR, BIOLOGICAL, AND CHEMICAL OPERATIONS

This appendix addresses nuclear, biological, and chemical defense; mission-oriented protection postures; and detection, monitoring, and unmasking procedures. NBC weapons produce casualties and disrupt operations. Platoons must be prepared to operate in an NBC environment during any operation.

NUCLEAR, BIOLOGICAL, AND CHEMICAL DEFENSE FUNDAMENTALS

To defend against NBC weapons, soldiers must apply the three fundamentals of NBC defense: avoidance, protection, and decontamination. FM 3-100 contains a general discussion of NBC defense measures. FMs 3-3, 3-4, and 3-5 also contain detailed information.

CONTAMINATION AVOIDANCE

The first fundamental of defense against NBC weapons is contamination avoidance. If soldiers can avoid contamination, they decrease the need for protection.

Take Passive Measures

Use concealment so the enemy cannot find you, or disperse so you make a poor target. You can also harden your position by improving its cover. Other passive measures include operations and communications security.

Detect and Identify Hazards

Monitor for contamination. Reconnoiter and survey specific areas to determine contamination status. Listen to higher and supported unit nets for reports of contamination or enemy NBC use. Enemy intentions may be discerned by identifying the type of agent. Also identification gives the platoon an idea of what type of decontamination support is required. If the agent is nonpersistent, weather will reduce it to nonthreatening levels in minutes or hours. There is no need to request decontamination units for nonpersistent agents. Decontamination will consist of an operator spraydown using a decontaminating solution applied with an M11 or M13 portable decontamination apparatus. Periodic monitoring with chemical detection paper (M8 and M9) and the M256 chemical detection kit will identify any agent present in threatening concentrations. In a nonpersistent agent attack, the unit may only have to remain in MOPP 4 for 30 minutes or less.

Use the NBC Warning and Reporting System

When a hazard is detected, pass the alarm locally. Mark the contaminated area with NATO standard US markers and report to higher headquarters using standard NBC reports.

Limit Contamination

Cover mission-essential equipment using readily available material. Restrict personnel movement in the contaminated area.

Move From the Contaminated Area

The unit must move if the tactical situation allows. This reduces the overall contamination hazard; however, carefully avoid spreading contamination during movement.

PROTECTION

The second fundamental of defense against NBC weapons is protection. It is required when contamination cannot be avoided. See FM 3-4 for a detailed discussion of personnel and selected equipment protection. There are four broad groups of activity that can be emphasized as protective measures. They are hardening positions, personnel using MOPP, reacting to attack, and using collective protection.

CONTENTS

	Page
Nuclear, Biological, and Chemical Defense Fundamentals	H-1
Nuclear Defense	H-2
Chemical Defense	H-4
Biological Defense	H-4
Mission-Oriented Protection Posture	H-5
Decontamination	H-6

DECONTAMINATION

The third fundamental of defense against NBC weapons is decontamination. Decontamination reduces the contamination hazard by removing or neutralizing hazardous levels of NBC contamination on

personnel and materiel. The extensive time and logistical support needed to perform deliberate decontamination operations mandates avoiding contamination, if possible.

NUCLEAR DEFENSE

Nuclear weapons are tremendously powerful, but defensive measures can be taken to reduce their effectiveness. The more information known about nuclear weapons, the more effective the defense and the greater the chances of survival.

DEFENSIVE ACTIONS BEFORE A NUCLEAR ATTACK

Cover is the best protection against a nuclear attack. Fighting positions, armored vehicles, heavy structures (concrete, stone, and brick) culverts, and other underground areas provide excellent protection. Light-skin and wheeled vehicles offer very little protection. Weapons, individual equipment, clothing, supplies, ammunition, explosives, petroleum products, and other flammables should be safeguarded. These items should be secured in one of the protected areas listed above. Nuclear defense levels for possible, likely, and imminent conditions are described in the Nuclear Defense Levels illustration, on page H-3.

When operating in a radiologically contaminated area, vehicles should be buttoned up, sandbagged, and the cargo covered. If the mission permits, personnel should be closely monitored to ensure compliance with operational exposure guides. The radiation exposure status should be updated.

DEFENSIVE ACTIONS DURING A NUCLEAR ATTACK

Immediately secure cover using a prone position and protect exposed skin until blast waves have passed and debris has stopped falling. Stay calm, check for injuries, check weapons and equipment for damage, and prepare to continue the mission.

DEFENSIVE ACTIONS AFTER A NUCLEAR ATTACK

Once the attack has ended, forward an NBC-1 nuclear report; consolidate and reorganize the AD position. Improve protection against possible fallout by seeking overhead cover for vehicles and begin continuous monitoring. If the radiation dose rate reaches a hazardous level, request permission to move.

NUCLEAR FIRST AID

Various injuries may result from nuclear attack. Soldiers must be prepared to administer first aid as described in the following paragraphs.

Blast Injuries

Damage can range from minor cuts and broken bones to severe lacerations and critical damage to vital organs. First aid treatment will be the same as that used for conventional combat casualties suffering similar injuries.

Thermal Radiation Injuries

The intense heat generated by a nuclear detonation burns skin, clothes, and equipment. Injuries can be caused by direct exposure, reflected exposures (from clouds and ground), and from secondary sources such as burning debris. These burns are categorized as first, second, and third degree. First-degree burns should heal without special treatment and there will be no scar formation. Casualties of a second-degree burn, which resembles a severe sunburn with blistering, are treated as burn casualties to prevent infection. These casualties may require evacuation. In third-degree burns the full thickness of the skin is destroyed. The casualty should be treated and evacuated.

Eye Injuries

Thermal radiation's effect on the eyes fall into two categories: temporary blindness (dazzle) and permanent blindness. Individuals suffering permanent damage should be evacuated as soon as possible. Individuals who are temporarily blinded will recover with time but will require assistance until their sight returns.

Radiation

Individuals may react differently to radiation exposure; but generally, individuals can be expected to react similarly to certain dose ranges as shown in the Radiation Dose Levels illustration, on page H-3.

Symptoms of radiation exposure include vomiting, diarrhea, dry heavy nausea, depression, and mental disorientation. At lower dose levels incapacitation and lethargy occur due to a loss of physical mobility or

NUCLEAR DEFENSE LEVELS

NUCLEAR DEFENSE LEVELS	PERSONNEL	RADIOS	EQUIPMENT
A POSSIBLE	OFFENSE Inform personnel and continue mission.	OFFENSE Turn off all nonessential radios. Disconnect antenna and matching unit cables.	OFFENSE Secure all loose equipment Close and latch all hatches.
	DEFENSE Prepare fighting positions with minimum of 18 inches overhead cover. Remain in fighting positions or armored vehicles.	DEFENSE Same as offense. Use wire messenger communications.	DEFENSE Same as offense.
B LIKELY	OFFENSE Inform personnel. Restrict movement away from vehicle or position.	OFFENSE Use one radio per squad. Remove antennas from all unused	OFFENSE Secure all loose equipment Close and latch all hatches. Turn off all electrical equipment.
	DEFENSE Prepare fighting positions with minimum of 18 inches of overhead cover. Remain in fighting positions or armored vehicles.	DEFENSE Same as offense. Use one per squad. Use one radio per squad.	DEFENSE Same as offense.
C IMMINENT	OFFENSE Inform personnel. Remain in fighting positions or armored vehicles.	OFFENSE Use visual signals to control. Use one radio per squad.	OFFENSE Secure all loose equipment Close and latch all hatches. Turn off all electrical equipment.
	DEFENSE Inform personnel. Remain in fighting positions or or armored vehicles.	DEFENSE Turn off all nonessential radios. Use wire communications.	DEFENSE Same as offense.

RADIATION DOSE LEVELS

DOSE IN CENTIGRAYS (cGy)	TIME OF ONSET OF SYMPTOMS AND PERCENT OF PERSONNEL AFFECTED	FATALITIES
0 to 70	Within 24 hours, 5 percent.	None
150	Within 6 hours, 5 percent.	None
250	Within 2 hours, 100 percent,	More than 50 percent in approximately 15 days.
2,000 to 3,000	Within 15 minutes, 100 percent.	More than 50 percent in approximately 7 days.
5,000	Within 5 minutes, 100 percent.	All in 1 to 2 days.
18,000	Immediately, 100 percent.	All within 24 hours.

mental disorientation. At high-dose levels, shock and unconsciousness are the early symptoms.

Mechanical injuries such as broken bones, internal injuries and burns are more serious when the casualty has received minor doses of radiation. Every effort should be made to identify casualties who have been exposed to radiation.

RADIOLOGICAL CONTAMINATION

Platoons exposed to radiation must measure the total dose using the IM-93 dosimeter and send

dosimetry (exposure) reports to the commander. Commanders must identify units that exceed the operational exposure guidance.

Team members contaminated by radioactive dust or debris perform partial decontamination by brushing, wiping, and shaking debris from their bodies and gear. Contaminated vehicles are partially decontaminated by brushing or washing. This procedure limits the spread of contamination and reduces radiation hazard. Early decontamination is necessary to diminish the cumulative effects of radiation.

CHEMICAL DEFENSE

Chemical agents are used to kill, injure, or incapacitate personnel. The effects produced by these agents are dose-dependent. Through the use of various delivery systems, enemy forces can initiate and sustain large-scale chemical warfare operations.

DEFENSIVE ACTION BEFORE A CHEMICAL ATTACK

Make sure all personnel have their protective mask available and that it fits and functions properly. All personnel should be wearing protective clothing according to the designated MOPP level. The M-8 automatic alarm should be put into operation for chemical monitoring and detection.

DEFENSIVE ACTION DURING A CHEMICAL ATTACK

Mask and give the alarm. Get into MOPP 4 as soon as possible. Use chemical agent detector paper and M256 chemical detector kits to determine type of agent and forward an NBC-1 report; continue the mission.

DEFENSIVE ACTION AFTER A CHEMICAL ATTACK

Certain defensive actions must be taken following a chemical attack. Perform individual decontamination as required, treat casualties, then complete basic individual decontamination.

BIOLOGICAL DEFENSE

Biological agents consist of microorganisms and toxins. Microorganisms are germs that cause diseases. Toxins are poisons produced by plants, animals, or microorganisms. Biological agents, including toxins, can cause death and disease. It is not necessary for biological agents to kill to be effective. Their purpose may only be to reduce the ability of our forces to fight.

DETECTION

Biological attacks are difficult to detect. Sunlight reduces the effects of biological agents. Based on this, the most likely time for a conventional biological attack is in the evening and early morning hours. Some toxins are not sensitive to environmental factors and could be employed in any type of environment.

BIOLOGICAL DEFENSIVE ACTIONS

The best defense is to observe preventive measures such as keeping immunizations up to date, maintaining personal hygiene, eating and resting regularly, and providing rodent and insect control. Keep cuts or scratches covered and germ-free by using soap, water, and first aid. Insects carry biological agents, prevent insect bites by keeping clothes buttoned, covering skin, and using insect repellent.

After an attack, you must assume everything has been contaminated. Only eat rations that have remained sealed. Wash the outside of food and water containers before opening. Use only water from quartermaster water supply points. In emergencies, boil all water for at least 15 minutes or use water purification tablets. Do not use water exposed to toxins or spore-forming microorganisms.

MISSION-ORIENTED PROTECTION POSTURE

Protective actions against biological and chemical agents depend on the threat, mission, situation, and weather. As with nuclear protective actions, chemical and biological protective actions fall into three categories: action before the attack, during the attack, and after the attack.

MOPP LEVELS

MOPP levels are established by the commander depending on the risk of NBC attack. Commanders use MOPP analysis to determine appropriate MOPP levels based on the tactical situation.

Standardized MOPP levels allow commanders to easily increase or decrease levels of protection. Commanders can raise or lower the amount of protection through five levels of MOPP-- MOPP 0 through MOPP 4. Commanders may not implement a MOPP level lower than that set by higher headquarters.

The BSFV platoon must understand and apply MOPP levels, when required, for protection and survival. See the Standardized MOPP Levels

illustration. See STP 21-1-SMCT for further guidance on wearing MOPP gear.

PROCEDURES BEFORE ATTACK

The Individual and Unit Actions illustration on page H-6 describes individual and unit actions that must be completed at different MOPP levels prior to an attack. Specific postures are subject to modification by commanders to permit mission accomplishment.

SUPERVISION OF MOPP

Leaders must check their soldiers for proper fit and seal of the protective mask and proper fit of protective clothing. Soldiers must assume stressed positions (bending, twisting, and stretching) to check fit. Compliance with the MOPP level should be checked regularly.

Stress and fatigue can be reduced by rotating heavy work requirements. Allow frequent rest periods, make maximum use of mechanical aids, and provide adequate water supply.

STANDARDIZED MOPP LEVELS

					
	MOPP 0	MOPP 1	MOPP 2	MOPP 3	MOPP 4
Overgarments	readily available	worn *	worn *	worn *	worn
Overboots	readily available	carried	worn	worn	worn
Gloves	readily available	carried	worn	carried	worn
Mask/Hood			carried	worn *	worn
Mask	carried	carried			

*In hot weather the jacket or hood can be left open for ventilation.

INDIVIDUAL AND UNIT ACTIONS

MOPP LEVEL	INDIVIDUAL ACTION	UNIT ACTIONS (all actions mission permitting)
0	• Mask/hood carried. • Overgarments, overboots, and gloves available.	• Equipment available.
1	• Wear overgarments. • Carry mask/hood, gloves, and overboots. • Place M8 or detector paper on overgarments. • Remain under cover whenever possible. • Sleep or rest only in pup tents, shelters, and vehicles.	• Initiate monitoring with M8 alarms. • Place M8 detector paper on exposed surface of vehicle and equipment. • Cover all grounded equipment, ammunition, and POL products. • Close all hatches, windows, and access plates. • Cover all food and water supplies. • Construct shelter over open hatches when stationary. Construct overhead cover for foxholes.
2	• Wear overgarments and overboots. • Carry mask/hood and gloves.	• Continue actions described under MOPP 1.
3	• Wear overgarments, overboots, and mask/hood. • Carry mask/hood and gloves.	• Continue actions described under MOPP 1.
4	• Wear overgarments, gloves, overboots, and mask.	• Continue actions described under MOPP 1.

DECONTAMINATION

Decontamination is essential in preventing casualties and combat degradation in a contaminated environment. In the past, when a unit was contaminated, it was withdrawn from battle and went through an 18-hour decontamination to remove all traces of contamination. Tactically and logistically, this approach may not be feasible.

METHODS OF DECONTAMINATION

There are three methods of decontamination. When the battle situation dictates that the unit cannot withdraw to decontaminate, the following methods can be used.

Individual Decontamination

Individual decontamination begins within one minute of contamination and is conducted using individual or unit vehicle supplies and equipment (M11 or M13 decontamination apparatus, M258A1 decontamination kit). STP 21-1-SMCT provides further information.

Hasty Decontamination

Hasty decontamination operations are the function of teams or squads using equipment found within battalion-size units. Hasty decontamination reduces the spread of contamination on people or equipment and may allow relief from MOPP 4. Hasty

decontamination consists of MOPP gear exchange and vehicle washdown. Both should be done within six hours of contamination.

Deliberate Decontamination

Deliberate decontamination operations require detailed planning. More manpower and resources are needed than in hasty decontamination. Detailed troop decontamination may also require external support for decontaminants and shower facilities.

TECHNIQUES OF DECONTAMINATION

Seven decontamination techniques are used to support the three types of decontamination. These seven techniques are fully explained in FM 3-5. They

- Skin decontamination.
- Personal equipment wipedown.
- Operator spraydown.
- MOPP gear exchange.
- Vehicle washdown.
- Detailed troop decontamination.
- Equipment decontamination.

AIR INTELLIGENCE PREPARATION OF THE BATTLEFIELD

This appendix describes the air intelligence preparation of the battlefield (IPB) process as it applies to AD operations. The breakup of the former Soviet Union has caused the Army to shift its focus from the Soviet threat to regional threats. With the current lack of a single, well-defined threat to plan against, the IPB process will provide continuous input toward defining that threat. Developing templates will be more challenging and more critical in support of the IPB process.

PROCESS

FM 34-130 is the manual that explains the IPB process. IPB is the key for preparing for the next battle. The IPB process assists the commander and the intelligence staff in predicting where and when the enemy will surveil and attack and what assets will be used. The modern battlefield is viewed in three dimensions: width, depth, and airspace. Airspace, or the aerial dimension, is the most dynamic and fast-paced of the three dimensions. The intelligence staff must consider all the aspects of air operations and must be aware of the capabilities of all air threats to include UAVs, ballistic missiles, cruise missiles, TSMs, and rotary- and fixed-wing aircraft. The G2 and S2 have overall staff responsibility for IPB. The air defense artillery and aviation officers must provide input to the G2 and S2 when integrating air aspects into the IPB process.

The IPB process has four steps:

- Define the battlefield environment.
- Describe the battlefield's effects.
- Evaluate the threat.
- Determine threat courses of action.

Because IPB of the aerial dimension is conducted from a different perspective than that of ground IPB, the terrain and weather have correspondingly different effects on air and air defense operations. Enemy forces must be evaluated in relation to the effects that weather, terrain, and friendly operations will have on them. The most significant threats that must be evaluated for IPB are UAVs, ballistic missiles, cruise missiles, TSMs, and rotary- and fixed-wing aircraft. IPB of the aerial dimension is an integral part of the IPB process at all levels as threat air operations may be tied directly to ground operations.

DEFINE THE BATTLEFIELD ENVIRONMENT

The battlefield includes aerial dimensions to an area of operations, battle space, and an area of interest. Because of the aerial dimension, each of these parts of the battlefield framework may be different from that of ground force operations.

AREA OF OPERATIONS

The air area of operations is the area where the commander is assigned responsibility and authority for military operations. It usually is, but does not necessarily need to be, identical to the ground area of operations in width and depth. It extends vertically up to the maximum altitude of friendly ADA systems.

BATTLE SPACE

Battle space is a physical volume that expands or contracts in relation to the ability to acquire and engage the enemy. It vanes in width, depth, and height

CONTENTS

	Page
Process	I-1
Define the Battlefield Environment	I-1
Describe the Battlefield's Effects	I-2
Evaluate the Threat	I-4
Determine Threat Courses of Action	I-6

as the commander positions and moves assets over time. Battle space is not assigned by a higher commander and can extend beyond the commander's area of operations.

AREA OF INTEREST

The area of interest is the geographic area and the airspace above it from which information and intelligence are required to facilitate planning or successful conduct of the commander's operation. Because the commander and staff need time to process information and to plan and synchronize operations, the commander's area of interest is generally larger

than the area of operations or battle space. It is also larger due to the great distances that air and missile systems can rapidly cover. The air area of interest will extend vertically to cover the maximum service ceilings or trajectories of aircraft, UAVs, and missile systems. Horizontally, it will extend to cover the maximum range of aircraft, UAVs, and missiles plus threat airfields, forward arming and refueling points, navigation aids, and missile sites. The area of interest extends to the limits from which intelligence and information must be gathered about enemy forces which could affect friendly forces.

DESCRIBE THE BATTLEFIELD'S EFFECTS

The effects of terrain and weather on the enemy and friendly forces must be analyzed. They are different than the effects on ground operations.

TERRAIN ANALYSIS

Terrain analysis in support of air defense is significantly different from terrain analysis for ground operations. The nature of airspace does not eliminate the need for terrain analysis because enemy air and friendly ADA will still attempt to use terrain to their own best advantage. IPB focuses on the impact of geographic factors on the ability of threat air to approach, acquire, and engage a target. Analysis of the terrain for IPB follows the same principles as ground analysis and uses the military aspects of terrain (OCOKA).

Observation and Fields of Fire

These aspects relate to the influence of terrain on reconnaissance and target acquisition. In the IPB context, observation relates to optical and electronic line of sight. Many battlefield systems require line of sight to effectively operate or acquire and engage targets. These systems include radios, radars, jammers, direct-fire weapons, and airborne and ground sensors as well as friendly ADA systems. Fields of fire relate to the terrain effects on weapon systems. Airspace must be analyzed with regard to routes which provide the best protection for air threats entering the target area, and those which provide the best fields of fire once they reach the target area.

Cover and Concealment (Masking)

Cover and concealment have slightly different applications with respect to air systems. The following tactics and techniques fall into the context of cover and concealment:

- Contour flying is flying a constant altitude above the surface of less than 22.8 meters (75 feet). This allows for maximum use of terrain masking.
- Pop-up tactics are the use of a low-altitude approach to the target area. Target acquisition and engagement is made by popping-up in altitude at a predetermined position or time to minimize exposure.
- Masking is using terrain to protect an air system from visual and electronic observation or detection. Electronic warfare supplements natural masking.
- Cover is using terrain to provide protection from direct-fire weapon systems.
- Ground clutter can be characterized as a reduction of electromagnetic signal-to-noise ratio due to the signature of a background. It is different for each type of terrain or feature.

Threat aircraft, cruise missiles, and possibly even UAVs will use contour flying, masking, and ground clutter to avoid detection and provide cover from direct fires. Aircraft will also use the terrain by loitering on reverse slopes, using pop-up tactics and ground clutter and vegetation as a backdrop to enhance concealment.

Obstacles

Obstacles are broken down into three primary types:

- Those which prevent the effective employment of ADA systems.
- Those which restrict contour flight.
- Those which force air threats to use a particular surveillance, attack profile, route, or to gain excessive altitude.

Of particular interest are obstacles and terrain which restrict lateral movement within an avenue of approach. This will canalize movement or restrict evasive action. Additionally, terrain may stop the employment of certain air threat systems if the terrain exceeds the system's maximum operating ceiling.

Key Terrain

Key terrain is any locality or area in which the seizure, retention, or control of it will afford a marked advantage to either combatant. In the aerial dimension, these consist of terrain features which canalize or constrain air threat systems and terrain with an elevation higher than the maximum ceiling of air threat systems. Additionally, areas that can be used for airfields, missile and UAV launch sites, landing and drop zones, or forward arming and refueling points also need to be considered as key terrain, since these areas could be used to support friendly or threat air operations. Terrain can be used as an aid to navigation. Man-made features are also used as cues to navigate to targets.

Air Avenues of Approach

Air avenues of approach are evaluated using the same criteria as for ground. A good air avenue of approach will permit maneuver while providing terrain masking from surface-to-air weapon systems. Some common air avenues of approach are valleys, direct lines from the enemy point of origin, and river beds. Factors which should be used to determine air avenues of approach, both ingress and egress, are the following:

- Type of air threat, attack profile, and ordnance.
- Air threat point of origin and ground control radar positions.
- Probable threat objective.
- Potential to support maneuver forces.
- Freedom to maneuver within the air avenue.
- Protection afforded to the air system and pilot.
- Air threat and pilot capabilities.

Type of air threat. UAVs are small and elusive. They usually fly low, and altitude can vary. Once in the target area, they may fly an orbit attempting to slay out of engagement range of ADA. Most surface-launched cruise missiles are terrain-following, and they use terrain-masking. Due to their range, they may take indirect approach routes. Ballistic missiles are not terrain-dependent. They fly a straight ground track from launch point to objective, and their flight is not

restricted by terrain. TASMs usually fly direct routes from launch platform to the target. Rotary-wing aircraft primarily conduct contour flights. They follow ridge lines and military crests. Fixed-wing aircraft usually follow major terrain or man-made features. Depending on range, they may fly a straight line to the target. Ordnance or payload may affect range and altitude of the air system and thus influence the selection of avenues of approach.

Point of origin. When determining air avenues, the staff looks at the commander's entire area of interest. Analysis begins at the threat airfield or UAV or missile launch site and works toward the probable enemy objective. This allows a look at the big picture. The staff considers the range of the air systems and location of navigation aids and ground control sites.

Probable threat objective. Each avenue of approach must end at a target or within reconnaissance, intelligence, surveillance, or target acquisition range of a target. Reverse IPB is used to pick threat objectives.

Potential to support maneuver forces. Air assets which are used to achieve ground objectives will seek to use air avenues of approach coincident with ground avenues of approach. Air assets attacking deep are not limited to these ground avenues. Missiles and RISTA UAVs are not limited by ground corridors.

Freedom to maneuver. Does the avenue—

- Canalize the air system?
 - Have access to adjacent avenues?
 - Provide the ability to acquire a target and use available munitions?
 - Assist in navigation?
- Protection for the air system and pilot.** Does the avenue provide—

- Terrain masking (cover and concealment)?
- Full use of air system speed?
- Protection against radar detection?
- Protection from air defense weapon systems and tactical air support?

Air threat and pilot capabilities. Can the air system or pilot—

- Perform contour flying?
- Fly at night?
- Fly in all weather conditions?
- Range the targets?

WEATHER ANALYSIS

Air operations are especially susceptible to the effects of weather. Weather analysis for air and air defense operations considers the same factors as ground operations. These factors are as follows:

- Visibility has a significant impact on offensive air operations and RISTA. Visibility has the same effects on visually-directed ADA systems and sensors.
- High winds will hinder maneuver, close air support, and target engagement, especially in tight air avenues of approach. Missiles and UAVs will be adversely affected in performance and accuracy.

EVALUATE THE THREAT

Threat evaluation for air operations consists of a detailed study of enemy air capabilities, organization, and doctrine. The following steps should be used when evaluating the threat:

- Collect and analyze doctrinal threat data.
- Analyze threat air capabilities.
- Conduct target evaluation.

COLLECT AND ANALYZE DOCTRINAL THREAT DATA

Typical questions include the commander's critical information requirements and priority intelligence requirements. Questions which should be answered during this step are listed below:

- What are the major strategic, operational, and tactical objectives of the enemy's air operations?
- Which objectives may be targeted for destruction or suppression?
- Where do friendly air defense assets fit into the enemy's objectives? Do they need to be destroyed or suppressed for the enemy plan to work? Answers to these two questions may result in modification to air avenues of approach.
- What is the enemy's air order of battle? How are the assets organized? Knowledge of threat organization and who has operational control will indicate the importance of the area of operations. For example, if the enemy's bombers are at theater level and are in the area of operations, then that area is probably receiving the theater's main attack. What is the size of his ballistic missile brigade, battalion, and battery? Does it fire as a unit? Does the threat have mobile, fixed, or both types of launchers?

- Precipitation affects aircraft, missile, and UAV performance and reduces the effectiveness of sensors. Precipitation reduces ADA sensor range.

- Cloud cover and ceilings may restrict operations by setting low operational ceilings and restricting visibility and target engagement. Low ceilings, overcast, and clouds may restrict visually-directed ADA weapons' detection and acquisition ranges.

- Extreme temperature and humidity have a severe effect on aircraft and UAVs by decreasing combat range, altitude (particularly rotary-wing aircraft), and ordnance loads.

- Who has tactical control of aircraft at the point of attack?

- How will UAVs be used, for example, battle damage assessment, attack, or RISTA? What are the associated profiles?

- How does the enemy doctrinally attack? Will the enemy use airborne, air assault, or special operations forces in conjunction with an air or ground attack? What size are these forces and to what depth are they used? Will the enemy synchronize the air attack? Does the enemy have the capability to coordinate an air attack (possibly with varied air threat platforms that can overmatch friendly air defense capability)?

- What are air system combat ingress and egress speeds?

- Where are missile and UAV launch points? What are the likely targets? What are the range, endurance, and profile of these systems?

- What are the doctrinal distances for forward arming and refueling points? If the enemy's maximum range falls short of the area of operations, where is the enemy likely to stop and refuel, or be aerially refueled?

- What is the enemy's capability to coordinate air-to-ground attacks?

- How and where will the enemy attack ground targets for interdiction?

- What is the enemy's capability to coordinate air and artillery operations? Are ground forward air controllers used?

- What are the enemy's capabilities for suppression of friendly air defense?

- At what altitude will the enemy approach the target, deliver munitions, and exit the target area?
- What is the release authority of certain types of ordnance? This is particularly important when dealing with NBC threats.
- How does the enemy employ reconnaissance assets?
- How has the enemy historically fought?

ANALYZE THREAT AIR CAPABILITIES

ADA units evaluate a broad range of order of battle data and threat capabilities. They also evaluate the answers to the following questions:

Aircraft

What are the capabilities of the air systems in terms of—

- Performance (speed, altitude, airfield restrictions, troop, and weapon load capacity).
- Endurance and range. Ingress and egress altitudes and speeds.
- Levels of combat readiness and sortie generation rate.
- Ability to conduct pop-up maneuvers? What is the standoff range?
- Target acquisition capability, night and adverse weather capability, and identification ranges.
- The standoff ranges for cruise and tactical air-to-surface missiles.
- Ordnance load (maximum weight, type, load mixture, and level of sophistication).
- Combat personnel load.
- Navigational capability (type of radar; can it fly at night or in adverse conditions?).
- Combat radius (with or without external tanks, ordnance, and location of staging bases).
- Loiter time (how long will it have on station over the target area?).
- What is the countermeasures environment? For example, will standoff jammers, ground-based jammers, reconnaissance or chaff-laying UAVs, or aircraft degrade friendly air defense systems?
- What type, quantity, and quality of training has the pilot received? How much does he conform to doctrine?

- Can pilots fly at night or perform contour flying? During peacetime, did the pilot conduct the type of mission expected to be conducted during war?

- What are the types and capabilities of threat ordnance? Each type of ordnance should be evaluated for—

- Range: assume engagement at maximum range and two-thirds maximum range. What is the accuracy?
- Release altitude how high or low must the aircraft fly?
- Reload and refire time. What is the number of missiles available?
- Warhead type: for example, mass casualty, conventional, and submunitions. What is the release altitude?
- Guidance modes: how does the pilot acquire and engage?

Unmanned Aerodynamic Vehicles

What are the capabilities of threat UAVs in terms of—

- Performance (speed, altitude, and launch restrictions)?
- Endurance and range?
- Contour flying or terrain-limiting factors?
- Target acquisition and standoff range?
- Sensor package and payload (maximum weight, type, and load mixture)?
- Loiter time (how long can the UAV stay on station)?
- Visibility affecting acquisition?
- Modes of recovery and turnaround time?
- Their systems having a real-time data-link capability?
- Guidance modes (ground controlled and pre-programmed)?
- Crew proficiency?

Tactical Ballistic Missiles

What are the capabilities of threat TBM systems in terms of—

- Performance (flight time, speed, trajectory, launch restrictions)?
- Maximum and minimum ranges?

- Circular error of probability?
- Crew proficiency?
- Reload and refire time? Number of TBMs available per transporter erector launcher?
- Warhead type and size?
- Guidance modes?
- Location of presurveyed launch sites?

Cruise Missiles

What are the capabilities of threat cruise missiles in terms of—

- Performance (flight time, speed, altitude, and launch restrictions)?
- Maximum and minimum ranges?

- Circular error of probability?
- Targeting capabilities and type?
- Contour flying capability?
- Vulnerability to countermeasures?
- Guidance modes?
- Warhead type and size?

CONDUCT TARGET VALUE EVALUATION

This should determine what targets are to be labeled as high-value targets. High-value targets are assets the enemy or friendly commander has deemed as important for the successful accomplishment of his mission. High-value targets are determined by operational necessity and weapon system capability.

DETERMINE THREAT COURSES OF ACTION

Determining air threat courses of action, as with ground, relates the enemy's offensive air, air defense, and airborne and air assault doctrines with the effects of weather and terrain to determine how the enemy will employ assets. This is accomplished through the development of the situation, event, and decision support templates. The process of developing these templates is covered in FM 34-130.

SITUATION TEMPLATE

The situation template integrates air attack and surveillance profiles with terrain. It focuses on specific air avenues of approach and mobility corridors to determine which avenues are the most capable of supporting specific attack techniques, and profiles. It also determines the most direct routes to landing and drop zones to protect and ensure the survivability of air threat systems.

EVENT TEMPLATE

The event template depicts named areas of interest (NAIs) where the commander expects to see certain activities of tactical significance and is used to confirm or deny an enemy course of action. These NAIs are based on the terrain constraints on air approach routes to potential targets and analysis of the enemy's attack and RISTA profiles. Examples of NAIs include landing and drop zones forward arming and refueling points; forward staging areas; aerial choke points; and TBM, cruise missile, and UAV launch points.

DECISION SUPPORT TEMPLATE

The decision support template is based on the event template and should depict—

- Air avenues of approach.
- Airborne and air assault objectives.
- Landing and drop zones and largest size enemy element which could be employed at the zone.
- Ranges of enemy systems.
- Ranges of friendly air defense systems.
- Target areas of interest (TAIs).
- Decision points (DPs).

Air TMs and DPs are determined in the same manner as for ground operations. However, due to the high speeds of air systems, decision points must be placed significantly farther in advance of the TAIs.

In conclusion, IPB in support of air defense operations is a quantified, step-by-step process that examines enemy air and ground activity and identifies gaps in available intelligence holdings. This process will allow the commander and staff to direct collection assets and request collection from other sources to enable them to visualize the battlefield and identify and understand the enemy's intentions. Preparation and continuous updates of aerial portions of IPB are fundamental to the execution of the air defense and land force missions on the modern battlefield.

SAFETY AND RISK ASSESSMENT

This appendix provides guidelines concerning BSFV safety issues prior to or during combat operations. Leaders at all levels must ensure that safety is an ongoing process during war. This includes doing a risk assessment for all operations. Although not all-encompassing, this appendix provides some basic rules of safety. Leaders should add to the subjects in this appendix as they deem necessary.

RISK ASSESSMENT

Tough, realistic training conducted to standard is the cornerstone of Army warfighting skills. An intense training environment stresses both soldiers and equipment creating a high potential for accidents. The potential for accidents increases as training realism increases. Thus, realistic training poses a risk to personnel and equipment. Commanders must find ways to protect their soldiers and equipment from accidents during realistic training to prepare for war. An accidental loss in war is no different in its effects than a combat loss the asset is gone. Commanders must compensate for the advantages of the enemy by protecting their combat resources from accidental loss. How well they do this could be the decisive factor in winning or losing. Commanders and staffs can use the following information as a guide for managing risks as it applies to their organization and mission during peace and war.

CONCEPT

Risk assessment is a tool leaders can use to make smart risk decisions in tactical operations. It allows leaders to execute more realistic training scenarios not otherwise possible because of the high probability of accidents. Risk assessment is a common sense way of training with the least possible risk. It is a method of getting the job done by identifying the areas that present the highest risk and taking action to eliminate,

reduce, or control the risk. Risk assessment must be a fully integrated part of mission planning and execution.

RESPONSIBILITIES

Risk assessment is not complex, technical, or difficult. It is a comparatively simple decision-making process: away of thinking through a mission to balance mission demands against risks. Once understood, risk assessment is a way to put more realism into training without paying a price in deaths, injuries, damaged equipment, or all three. Risk assessment is not limited to training scenarios. It is performed during actual combat as well as in peacetime. Leaders must learn to assess risks during actual training events and apply the same techniques during combat actions. During

CONTENTS

	Page
Risk Assessment	J-1
BSFV Safety Precautions	J-4
Firing	J-8
Other Hazards	J-8
Vehicle Movements and Convoys	J-9
Developing a Safety Briefing Checklist	J-10

combat, risks may be taken, but only after they are evaluated and weighed as they are during training.

Commanders

As in all other areas, commanders are responsible for the effective management of risk. To meet this responsibility, commanders—

- Seek optimum, not just adequate performance.
- Select from risk reduction options provided by the staff.
- Accept or reject residual risk, based on the benefit to be derived from an informed position knowing what they are accepting or rejecting.
- Train and motivate leaders at all levels to effectively use risk assessment concepts.

Staff

Staff members also have responsibilities in risk assessment. The staff—

- Assists the commander in assessing risks and in developing risk reduction options.
- Integrates risk controls into plans and orders.
- Eliminates unnecessary safety restrictions that diminish training effectiveness.

Troop Leaders

The responsibilities of troop leaders play an important part in how risk assessment is viewed by subordinates. Their commitment to managing risks will improve the fighting capability of their unit. Troop leaders—

- Develop a total commitment to mission accomplishment and the welfare of subordinates.
- Consistently apply effective risk assessment concepts and the methods to operations they lead.
- Report risk issues beyond their control or authority to their superiors for resolution.

PROCESS

The risk assessment process improves the efficiency, effectiveness, and safety in all operations. The payoff of the process is increased readiness as a result of safer, smarter, and more beneficial operations. The process involves four steps for risk assessment.

Identify Risks

Identify major events of the operational sequence and list them chronologically then, if necessary, dis-

play them in a flow chart. This process will aid in the detection of specific risks associated with all specified and implied tasks. Safety can be built into an operation by first seeing the operation in its entirety. Operations invariably can be broken down into a series of phases, each with special characteristics and considerations. As soon as the commander states the mission and concept, it is usually possible to define the key events. Operations also have a time factor (beginning-to-ending series of events) in which the timing of events is often as significant as the events themselves. The operations analysis is a useful tool in quickly defining the flow and time sequencing of events in an operation. The objective is to reflect the total operation from the preparatory actions until the operation is completed or the next phase of operation is under way. The operations analysis is a simple but highly effective tool. It ensures that risk is evaluated in every aspect of the operation. Operations safety techniques are effective to a point, but they do not detect risk with the reliability required to achieve the degree of safety needed in today's Army.

Assess Risks

Determine the magnitude of risks by estimating loss probability and cost. Assess each event, determine whether it is routine, and make an initial risk assessment. Ensure that standards for routine events are adequate enough to provide an acceptable level of risk.

Risk matrix. Consider the value of a risk matrix or decision guide for all or part of the operation. Risk matrices provide a quick and ready method of breaking down an operation into its major operational aspects and eliminating or controlling the risks associated with it. Like other risk assessment tools, risk matrices can be used alone or with other risk analysis techniques to provide a quick overview of the risk situation. Risk matrices are simple enough to be routinely used by tactical leaders in operational planning. These matrices are nearly always more effective than intuitive methods in identifying the extent of risk. The Risk Assessment Work Sheet/Matrix (Operational) illustrates a typical matrix that can be used to estimate the level of risk associated with an operation. When using risk matrices, the risk assessor should—

- Review each situation; ensure that all significant areas of concern are evaluated, even if they are not included in the matrices.
- Use the matrices to analyze the risk to target areas of concern for risk-reducing action.
- Review the individual areas of concern before recommending an option. (If an area of concern is off

the scale in a particular situation, a higher decision level may be required than the risk gauge suggests.)

- Keep in mind that the risk assessment work sheet arbitrarily weighs factors; modify these factors to fit particular missions and units.

METT-T. Consider using the mission, enemy, terrain, troops, and time available (METT-T) format as another means to assess risks. Leaders can subjectively determine the likelihood and extent of accidental loss based on this type of analysis. When using the METT-T format, the risk assessor should—

- Determine mission complexity and difficulty.
- Assess the enemy situation and identify specific hazards.
- Consider all aspects of the terrain as well as weather and visibility.
- Determine the supervision required and evaluate the experience, training, morale, and endurance of troops; also, determine the availability of equipment.

Risk Decisions

Make risk acceptance decisions by balancing risk benefits against risk assessments. Eliminate unnecessary risks. Reduce the magnitude of mission-essential risks by applying controls. Controls range from hazard awareness to detailed operational procedures. Focus on high-hazard events and events not covered by a good set of standards. Complete a preliminary hazard analysis of these events. The preliminary hazard analysis is the initial examination of the hazards of an operation and their implications. It is normally based on the mission analysis and database review and takes place before the details of an operation have been completely defined. The objectives of the preliminary hazard analysis is to define, at the earliest possible point in the operational life cycle, the hazards that can be expected. Doing this early means that these hazards can be addressed when they are still preliminary when the operation is being planned.

Implement controls. Based on the preliminary risk analysis and products of analytical aids, develop a roster of options for command decision. Once risks are identified and measured as accurately as possible, the leader must act to eliminate or control them. These controls must not unnecessarily interfere with training objectives. The best options often come from reviewing the doctrinal publications relevant to the operation to glean information about the proper procedures for hazard control. Merely reviewing the analysis and assessment will often suggest options. Some options

will be more effective than others. AR 385-10 provides a convenient list of actions that commanders can use as an aid in ranking options. In order of priority commanders should—

- Eliminate the hazard totally if possible. Engineer out the hazard or design equipment to eliminate the hazard or incorporate fail-safe devices.

Example. A soldier in SWA was killed when his poncho was caught in a power takeoff (PTO) shaft on a desalinization plant. Why was a metal plate or wooden box not placed over the shaft to prevent this?

- Guard or control the hazard. Use automatic monitoring or alarming devices. Provide containment or barriers.

Example. In the example above, a barrier could have been placed between the soldier and the hazard. In combat operations, control lines that limit subordinate unit operations are an example of controls. At the unit level, limiting vehicle traffic within a perimeter is a control measure that keeps traffic away from sleeping areas.

- Change operational procedures to limit exposure. Modify operational procedures to minimize exposure (numbers and duration) consistent with mission needs.

Example. In Desert Shield and Desert Storm, 5 soldiers were killed and 28 injured because of improper misfire procedures. Having soldiers clear their weapons and remove the magazine when not on guard duty may be an effective reduction measure if the enemy situation allows.

- Train and educate personnel in hazard recognition and avoidance.
- Provide protective clothing or equipment that will minimize injury and damage potential.
- Use color coding and signs to alert personnel to hazards. Motivate personnel to use hazard avoidance actions.

Safety restrictions. Leaders can detect and eliminate unnecessary safety restrictions that impede the realism or effectiveness of training. With proper controls, these restrictions can be eliminated or scaled back. Check for residual effects before implementing risk reduction options. Visualize what will happen once the option has been implemented. Sometimes, reducing one risk will only introduce others.

Supervise

Determine the effectiveness of standards in controlling risk. The commander must enforce controls

and standards. This is key to loss control. The commander may have approved a number of risk reduction procedures, but approval does not mean that the procedures are carried out. Leaders must monitor the situation to ensure that action is actually taken. The prudent leaders then follow up to see that personnel understand and accept the guidance. Leaders should also monitor the effect of risk reduction procedures to verify that they really are good ideas. This is especially true for new and untested procedures.

Monitor activities. Leaders must always monitor the operational activities of subordinate elements. Only by seeing the character of operations can leaders fully appreciate risk implications. When monitoring operational activities, leaders should—

- Avoid administrative intrusions and not get in the way.
- Go where the risks are and spend time at the heart of the action.
- Analyze and think through issues, not just watch.
- Work with key personnel to improve operational procedures after the action and not hesitate to address imminent danger issues on the spot.
- Fix systemic problems that are hindering field effectiveness.

Cost of the risk. Leaders must be able to balance the cost of the risk involved with the value of the outcome desired in an operation. They must consider and manage risks in making decisions. The following three general rules apply when leaders select a tactical procedure:

- No unnecessary risk should ever be accepted. The leader who has the authority to accept or reject a risk is responsible for protecting his soldiers from unnecessary risks. If a risk can be eliminated or reduced and the mission still be accomplished, the risk is unnecessary and must not be accepted.

- Risk decisions must be made at the appropriate level. The leader who will answer for an accident is the person who should make the decision to accept or reject the risk. In some cases, this will be a senior officer. In other cases, it will be the front-line leader. Small-unit commanders and first-line leaders will make risk decisions in combat. Therefore, they should learn to make risk decisions in training. Commanders should publish risk criteria information and ensure subordinates understand the parameters within which they may operate.

- The benefits of taking a risk must outweigh the possible cost of the risk. Leaders must understand the risk involved and have a clear picture of the benefits to be gained from taking the calculated risk.

RISK ASSESSMENT TOOLS

Three tools are provided to assist in risk assessment: the risk assessment work sheet, the risk matrix, and the actual risk assessment. These three tools can be modified as desired and placed into safety annexes of SOPs. When done, it becomes the unit's standard and modification should not be allowed.

Risk Assessment Work Sheet

The risk assessment work sheet is a tool to help in the quantification of the risks. Events can be added and modified based on local unit missions and the commander's intent. See the Risk Assessment Work Sheet/Matrix (Operational) illustration on the next two pages.

The Risk Assessment

The risk assessment should be used as a part of the near-term training plan or operation order (OPORD). It helps to get first-line supervisors thinking and planning for safety just prior to the mission or task. Oftentimes, the information on it can be used as a safety briefing just prior to the mission or task. With an OPORD or the near-term training plan in hand, first-line supervisors have readily available what they must do and how they should do it safely. See the Risk Assessment/Analysis illustration on page J-7.

BSFV SAFETY PRECAUTIONS

Personnel operating and maintaining the BSFV must be constantly aware of the hazards associated with the equipment. All personnel must observe safe practices and procedures.

The BSFV operations manual should be consulted for complete information on equipment hazards. Detailed first aid information and instructions are found in FM 21-11.

RISK ASSESSMENT WORK SHEET/MATRIX (OPERATIONAL)

Task: _____ Location: _____

PLANNING	Preparation		
	Guidance	In-Depth	Adequate
Vague		M	H
Implied		L	M
Specific		L	L

SUPERVISION	Mission		
	Command & Control	Nontactical	Day Tactical
OPCON		M	H
Attached		L	M
Organic		L	L

PERSONNEL SELECTION	Experience		
	Task	Highly Qualified	MOS Qualified
Complex		M	H
Routine		L	M
Simple		L	L

ENDURANCE	Basic Needs		
	Environment	Optimum	Adequate
Tactical		M	H
Training		L	M
Garrison		L	L

RISK ASSESSMENT WORK SHEET/MATRIX (OPERATIONAL) (Continued)

WEATHER	Effects on Mission			
	Conditions	Negligible	Moderate	Critical
Severe		M	H	EH
Unfavorable		L	M	H
Favorable		L	L	M

TERRAIN	Conditions of the Area of Operations		
	Length of Operation	Improved	Tactical
> 72 Hours	M	H	EH
< 72 But > 24 Hours	L	M	H
< 24 Hours	L	L	M

MISSION-ESSENTIAL EQUIPMENT	Equipment Readiness			
	Availability	Optimum	Adequate	Minimal
Shortage Critical		M	H	EH
Shortage Noncritical		L	M	H
No Shortage		L	L	M

LEVEL OF RESPONSIBILITY FOR RISK ACCEPTANCE:

- EH - Extremely High Risk
- H - High Risk
- M - Moderate Risk
- L - Low Risk

Note: The "elements" listed above are not all-inclusive. Add or eliminate, as needed.

ELEMENT	REASONING	RISK VALUE
PLANNING		
SUPERVISION		
SOLDIER SELECTION		
SOLDIER ENDURANCE		
WEATHER		
COMPLEXITY		
EQUIPMENT		
	TOTAL RISK VALUE =	

Date:

The following general safety precautions must be followed to prevent personal injury or equipment damage.

- Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. A technician, aided by maintenance personnel, must warn all personnel about dangerous areas.
- With power on, personnel must stand clear of the turret during movements.
- Work only in well-ventilated areas when the BSFV is running. Carbon monoxide may be present and is deadly when inhaled.
- Do not walk on tools or components removed

from the system. Damage to equipment or injury to personnel can result.

- Do not smoke or have any open flame near or around opened containers of fuel or solvents.
- Do not kink, twist, strike, walk on, or otherwise abuse cables and hoses.
- Do not expose the ISU to direct sunlight for prolonged periods of time. This may cause a heating effect on the interior that would prevent FU availability. Looking at the sun through the ISU add cause blindness.
- Whenever exposed to smoke or gases, put on the protective mask, close heater ventilator intakes, and wear protective clothing. This will help ensure survivability.

FIRING

Stinger, automatic gun, machine gun, and TOW missile firings pose special hazards. These hazards include various malfunctions as discussed below.

STINGER

The Stinger missile or the associated firing circuitry may malfunction, and the missile will not leave the tube. Should a missile malfunction occur, the team leader must ensure the proper action is taken. The team follows the procedure shown in ARTEP 44-117-21-Drill.

Additional safety measures to be observed areas follows:

- Fire only from a standing position.
- Wear ear protectors, helmet, and flak jacket when firing. Personnel within 125 meters should also wear ear protectors.
- Use the plastic eyeshield on the weapon sight.
- Always fire at an angle less than 65 degrees.
- Always superelevate.
- Never discard a used BCU into dry brush or grass or near flammable materials.

AUTOMATIC GUN AND MACHINE GUN

When the 25-mm automatic gun or 7.62-mm machine gun fails, the gunner announces, "Misfire" over intercom to the crew. The gunner then follows the procedures as outlined in TM 9-2350-252-10-2. Noise from the 25-mm automatic gun can damage hearing. The 25-mm automatic gun barrel can hit personnel or open hatches. Brass ejected from firing weapons can injure personnel.

TOW

Soldiers on top of a vehicle in the path of a moving TOW missile launcher could be killed or injured. Check top of vehicle. Make sure no soldiers or equipment are in the path of a moving TOW missile launcher. Accidental firing of the TOW missile could injure or kill soldiers. Make sure ARM-SAFE-RESET switch is set to SAFE. The TOW missile backblast could kill or injure soldiers. All BSFV personnel must be inside of vehicle when the TOW missile is fired. Close all hatches and the ramp. Everyone outside the vehicle should be at least 246 feet (75 meters) from the TOW missile blast area. If the TOW missile misfires, wait 30 minutes after last firing attempt before unloading the missile.

OTHER HAZARDS

Safety hazards also exist in the equipment and environment of the unit operation. The hazards described below range from gas poisoning to electrical shock.

CARBON MONOXIDE POISONING

Carbon monoxide poisoning can kill. Carbon monoxide is a colorless, odorless, deadly poisonous gas which, when breathed, deprives the body of oxygen and

causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, drowsiness, and possible coma. Permanent brain damage or death can result.

Carbon monoxide occurs in exhaust fumes of fuel-burning heaters and internal combustion engines. It becomes dangerously concentrated under conditions of inadequate ventilation. You must follow these safety precautions to ensure safety of personnel whenever the personnel heater or engine of any vehicle is operated for maintenance or tactical use. The best defense against carbon monoxide poisoning is adequate ventilation.

TOXIC MATERIALS

Toxic materials are located in the vicinity of the missile IR dome. If the dome shatters, mercury thallium liquid may be released. This material is toxic to unprotected skin. Avoid all contact with released material unless protective equipment is being worn (such as a respirator, protective gloves, and chemical goggles).

SOLVENTS

Solvents used in maintenance are volatile and flammable. They produce toxic vapors that are harmful when inhaled. Use only in well-ventilated areas and keep away from flame or sparks. For proper use of lubricants on the BSFV, see the operator's manual.

ACIDS

Electrolyte solution in vehicle and FU batteries contain sulfuric acid. Be extremely careful when handling or working with batteries. Battery acid can

cause severe burns and equipment and clothing damage.

AMMUNITION

Explosives are contained in BSFV machine gun ammunition and TOW missile rounds. All applicable safety regulations must be strictly enforced. Explosive components containing electrical wiring must be protected at all times to eliminate stray voltages. Missile-handling operations should not be performed during electrical storms.

MISSILE EXHAUST

Missile exhaust contains amounts of hydrogen chloride gas which may cause eye and throat irritation if inhaled by personnel. To prevent any irritation or exposure to potentially harmful concentrations of hydrogen chloride from the exhaust plume, the gunner must ensure all hatches are closed and securely latched. For first aid, refer to FM 21-11.

NOISE HAZARD

A dangerous noise level exist in the vicinity of the BSFV system when weapons are fired. Permanent ear damage may result to personnel during weapons firing if they are at close distances. The gunner must wear the communications-type headset provided for adequate protection while in the turret.

DECONTAMINATION USING DS2

The chemical solution used in the DS2 unit is highly combustible. Severe chemical burns may occur when improperly used. DS2 can severely injure eyes, skin, or may cause illness if inhaled. DS2 can also cause damage to NBC MOPP equipment. For proper use of DS2, see FM 3-5.

VEHICLE MOVEMENTS AND CONVOYS

Proper planning and management of vehicle movements and convoy procedures will affect the number of vehicles on the battlefield, and more importantly, their timeliness in getting there. All leaders should ensure that the following conditions have been met during movement operations:

- Are basic issue items on every vehicle in the convoy?
- Are operators performing before-, during-, and after-operation PMCS?
- Are all radio antennas tied down properly to a length of not more than 7 feet?

- Have operators been trained to drive in adverse weather and difficult terrain?
- Are convoy drivers provided with adequate rest?
- Are ground guides used in the appropriate circumstances, such as backing, in bivouac areas, and limited visibility areas?
- Are personnel prohibited from sleeping in vehicles while the engine is running? Are they prohibited from sleeping near or under vehicles?

- Are vehicle dismount points clearly marked and ground guide procedures strictly enforced at all bivouac areas?

- Are fire drills practiced on all vehicles?

DEVELOPING A SAFETY BRIEFING CHECKLIST

The purpose of a safety checklist is to provide leaders with a ready safety reference that encompasses most tasks common to a unit. The checklist should be used in conjunction with DA Pamphlet 385-1. Users are encouraged to add additional checklist items that cover their particular mission needs.

When developing a safety checklist, ADA leaders should ensure that the following questions are covered:

- Is the safety annex of the unit SOP current? Does it cover all field training operations?
- Are adequate provisions for safe practices,

procedures, and physical standards incorporated into unit predeployment exercises?

- Is there an established procedure for informing the next higher commander of all accidents, injuries, and incidents? Are recommendations for corrective actions made?

The following safety briefing checklist should serve as a guide for ensuring that, as a minimum, the following are performed before engaging in training or hostile operations.

SAFETY BRIEFING CHECKLIST

- | | |
|--|-------|
| 1. MANPADS safety. | _____ |
| 2. Individual weapon safety. | _____ |
| 3. Ammunition and or explosive safety. | _____ |
| 4. Pyrotechnic safety. | _____ |
| 5. Serviceable fire extinguishers. | _____ |
| 6. Carbon monoxide poisoning. | _____ |
| 7. Vehicle safety (personnel restraints, warning devices, speed, road conditions, road crossings, vehicular river crossings, fuel, spares, and OVM/BII). | _____ |
| 8. Convoy procedures (speed, distance, visibility, routes). | _____ |
| 9. Equipment timeworn safety. | _____ |
| 10. Ground guide safety (dismounted, mounted, and knowledge of equipment. | _____ |
| 11. River-crossing safety. | _____ |
| 12. Complete first aid kits. | _____ |
| 13. Hearing protection. | _____ |

SAFETY BRIEFING CHECKLIST (continued)

- | | |
|--|-------|
| 14. Eye protection (laser, sun, and foreign objects). | _____ |
| 15. Headgear and or flak vest. | _____ |
| 16. Heat and or cold injuries. | _____ |
| 17. Environmental safety (pollution control, weather, terrain, poisonous snakes, spiders, and plants). | _____ |
| 18. Sleeping safety (in and around vehicles). | _____ |
| 19. Air assault and airlift safety (in and around aircraft). | _____ |
| 20. Tactical antennas. | _____ |
| 21. MEDEVAC frequencies. | _____ |
-

MAPS AND CONTROL MEASURES

This appendix presents some military symbols and control measures which are of operational interest to the ADA platoon. BSFV platoon personnel must know how to use a map. Each squad leader should have a plastic map case and marker to post operational symbols. Because the loss of key personnel may result in the platoon sergeant or squad leader assuming control of the platoon, the platoon sergeant and each squad leader must know his location at all times and have the platoon's operational graphics properly posted on his map.

Performing land navigation while mounted at high speeds is now easier with the global positioning system (GPS) locator. However, all key leaders must still be able to use terrain association. Making a thorough map study and identifying major terrain features, contour changes, and man-made structures that exist along a route is essential. As the platoon advances, the platoon leader and squad leaders must observe existing features and elevation change. They use these and structures on the ground to orient or locate themselves and other elements of the platoon. For a complete list see of military symbols and control measures, see FM 101-5-1.

COLOR REPRESENTATION

Ideally, different colors are used for enemy and friendly symbols. Different colors may not always be available; therefore, other procedures are needed for one-color symbols as well as for multicolor representation.

ONE COLOR REPRESENTATION

Friendly symbols are outlined by a single line, and enemy symbols are outlined by double lines. For enemy equipment, ground environment, and activities symbols, use the abbreviation EN.

MULTICOLOR REPRESENTATION

The colors on a military map indicate varied meanings. These meanings are given below:

- Blue or black indicates friendly units, posts and installations, equipment, activities, and ground environment symbols not covered by other colors.
- Red indicates enemy units, posts and

installations, equipment and activities, and friendly fire support ground environment symbols not covered by other colors.

- Yellow indicates friendly and enemy chemical or radiological areas and enemy biological areas.
- Green indicates friendly and enemy man-made obstacles.
- Other colors used must be explained in a legend.

CONTENTS

	Page
Color Representation	K-1
Control Measures	K-2
ADA Symbols and Graphics	K-6

When overlays are transmitted by facsimile, only black on white is possible. To differentiate between enemy and friendly contaminated areas or obstacles, use

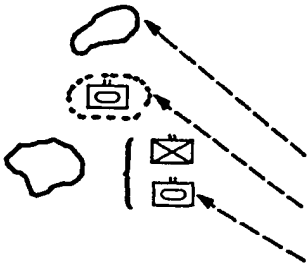
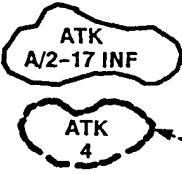
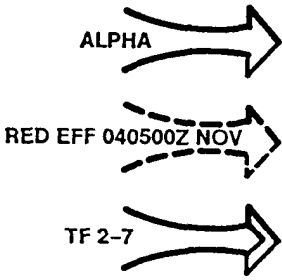
the abbreviation EN in the line that defines the enemy area.

CONTROL MEASURES

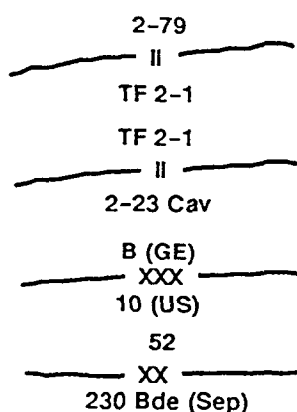
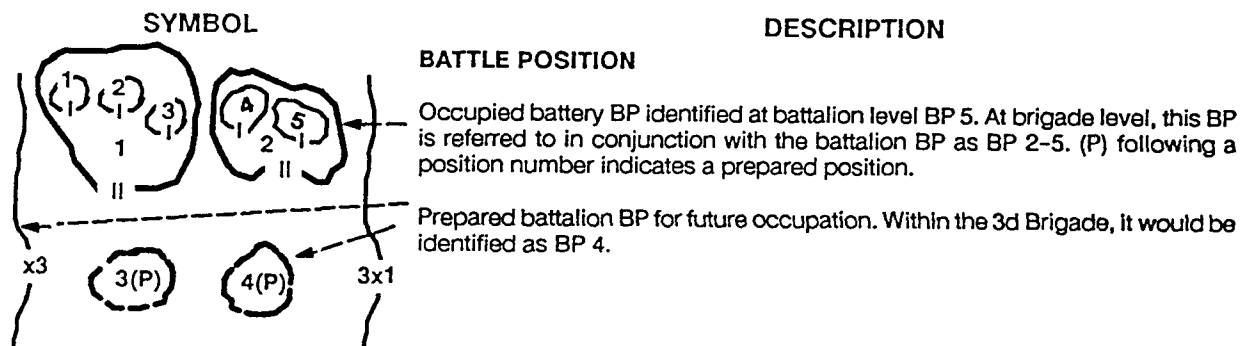
Most of the control measures commonly used by the battery or supported commander are also used at the platoon level. See the Control Measure Graphics

illustration to help facilitate the use of this manual.

CONTROL MEASURE GRAPHICS

SYMBOL	DESCRIPTION
	ASSAULT OBJECTIVE General assault objective symbol. Objectives and immediate objectives are enclosed and contain the abbreviation OBJ, with a letter, code name, or unit designation.
	ASSAULT POSITION A position between the line of departure and the objective in an attack. It is usually the last covered and concealed position from which the assault force will launch its attack against this objective. It is identified by a name, number, or code.
	ASSEMBLY AREA An area in which a force prepares or regroups for further action. May be designated by numbers, letters, code names, or unit designations. Occupied assembly area. Planned assembly area for a battalion. Unit symbols displaced to indicate an assembly area for a group of units.
	ATTACK POSITION May be designated with a number, letter, code name, or unit designation. Actual attack position, A Co, 2d Bn, 17th Inf. Proposed attack position.
	AXIS OF ADVANCE Actual. Proposed with date and time effective. Axis of advance for unit designated to conduct main attack.

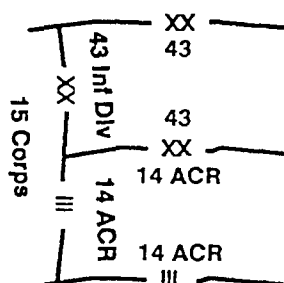
CONTROL MEASURE GRAPHICS (continued)



BOUNDARY

Lateral boundaries.

Lateral boundaries are lines with a symbol placed on the boundary to show size and designation of the highest echelons that have the boundary in common. If the units are of unequal size, the symbols of the highest echelon are shown and the designation of the lowest units are given completely.



REAR BOUNDARIES

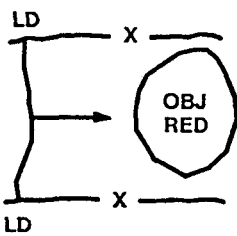
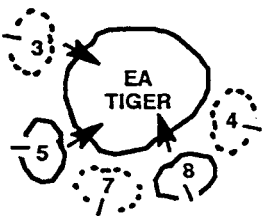
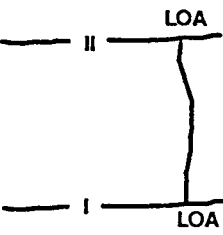
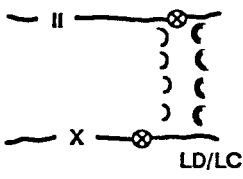
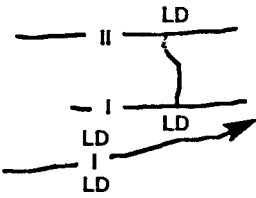
When used, a rear boundary shows the size symbol for the smaller or subordinate unit rather than that of the target unit of which it is a part.



CHECKPOINT

A predetermined point on the ground used as a means of coordinating friendly movement.

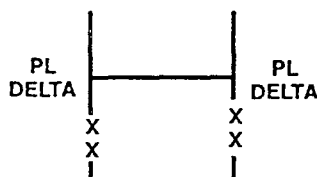
CONTROL MEASURE GRAPHICS (continued)

SYMBOL	DESCRIPTION
	CONTACT POINT A designated easily identifiable point on the terrain where two or more units are required to physically meet.
	COORDINATION POINT A specific point where fires and maneuvers between adjacent units are coordinated. It is usually found where a phase line crosses a unit boundary or where the boundary lines extend beyond the FEBA.
	DIRECTION OF ATTACK Direction of attack is shown graphically as an arrow extending from the line of departure. The arrow is not normally labeled.
	ENGAGEMENT AREA An area in which the commander intends to trap and destroy the enemy with massed fires. It is routinely identified by a target reference point in the center of the trap area.
	LIMIT OF ADVANCE General LOA symbol. The symbol depicted by drawing a line along an easily identifiable terrain feature.
	LINE OF CONTACT General LC symbol. Enemy symbols depicted with double lines when portrayed in color.
	LINE OF DEPARTURE General LD symbol. The symbol is a solid line generally perpendicular to the direction of attack with the letters LD at either end.

CONTROL MEASURE GRAPHICS (continued)

SYMBOL**DESCRIPTION****PASSAGE POINT**

A place where units will pass through one another in an advance or withdrawal.

**PHASE LINE**

Phase lines are labeled PL and assigned letters, numbers, or code name designations.

PLs are drawn across a unit's sector from boundary to boundary.

**POINT OF DEPARTURE**

In night attacks, the PD is a specific point on the LD where a unit will cross.

**RELEASE POINT**

A clearly defined control point on a route at which specific elements of a column revert to control of their respective commanders. (Also see start point.)

**START POINT**

A clearly defined initial control point on a route at which elements of a column of ground vehicles come under the control of the commander having the responsibility for the movement.

**TARGET**

A known or suspected enemy position on which artillery fires are planned. A target is identified with an alphanumeric designation.

ADA SYMBOLS AND GRAPHICS

Symbols and graphics represent units of varying sizes and operations, equipment, activities, or other items of military interest. In order to properly plan and

interpret operational graphics, the BSFV platoon leader must know the ADA symbols and graphics. See the following illustration.

EXAMPLES OF ADA SYMBOLS AND GRAPHICS
USED BY THE BSFV PLATOON LEADER

SIZE	SYMBOL
Squad/Crew	
Section or unit larger than a squad but smaller than a platoon	
Platoon or detachment	
Battery	
Battalion	
Group or regiment	
Brigade	
Battalion task force	
Company team	

**EXAMPLES OF ADA SYMBOLS AND GRAPHICS
USED BY THE BSFV PLATOON LEADER (continued)**



BSFV



LIGHT AUTOMATIC WEAPON



GUN

Add horizontal bars (one for medium or two for heavy) to denote size.



MEDIUM MACHINE GUN



HEAVY GUN

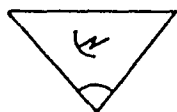
If the weapon is primarily for air defense, a  is placed at the base of the shaft.



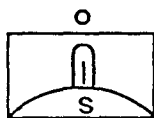
AIR DEFENSE MISSILE



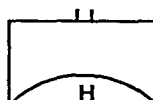
AIR DEFENSE GUN



AIR DEFENSE RADAR



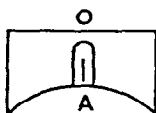
STINGER CREW



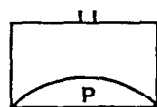
HAWK BATTALION



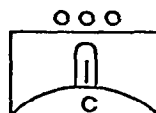
AIR DEFENSE AMMUNITION



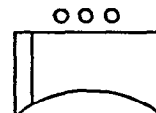
AVENGER CREW



PATRIOT BATTALION



CHAPARRAL PLATOON



BSFV PLATOON

TARGET ENGAGEMENT

This appendix addresses essential elements of target engagement. BSFV platoons must be prepared to move and rapidly engage multiple aerial targets. Depending on the tactical situation and area of operations, threat aerial targets will be operating in the same airspace as friendly aerial platforms. The BSFV'S effectiveness depends on the ability to detect, acquire, identify, and rapidly engage threat aerial targets. Speed and accuracy of an engagement depend on proficiency in target engagement techniques.

BSFV WEAPON SYSTEMS

The BSFV is a lethal weapons platform that enhances the firepower and survivability of air defense assets on the battlefield. This section outlines the capabilities of BSFV mounted and dismounted weapons systems. Both are designated to be used primarily in an air defense role. For a more detailed description of BSFV capabilities, refer to specific weapons and vehicle manuals.

DISMOUNTED WEAPONS

The Stinger is the primary air defense weapon in the BSFV. It is used during engagements against fixed- and rotary-wing targets. In the current model of the BSFV, the Stinger team must be able to dismount to employ the weapon. Future versions of the BSFV will have fire-on-the-move capability. The standard vehicle mounted launcher (SVML), a mounted Stinger firing apparatus, will replace the current TOW missile system. In its current configuration, the BSFV carries a basic load of two ready-rounds and four weapon-rounds.

MOUNTED WEAPON SYSTEMS

The primary role of mounted weapon systems on the BSFV is for engagement of aerial targets. BSFV mounted weapon systems may be used on ground targets primarily for self-defense.

The 25-MM Automatic Gun

The 25-mm chain gun complements Stinger capabilities of the BSFV. The Stinger and 25-mm combination provides a gun and missile mix for the BSFV. When the Stinger team is dismounted, the 25-mm automatic gun provides coverage for the Stinger team's dead zone. The 25-mm automatic gun is used for immediate reaction engagements. The dual feed chain

gun system allows the crew to fire both high-explosive incendiary tracer (HEI-T) and armor-piercing discarding sabot-tracer (APDS-T) ammunition.

Aerial. The 25-mm automatic gun has an effective range of 2,000 meters against aerial targets. HEI-T is recommended for aerial engagements. The 3,000 meter self-destruct capability of HEI-T reduces the likelihood of fratricide.

Ground. The 25-mm automatic gun has a maximum effective range of 3,000 meters against ground targets using HEI-T and a 1,700 meter maximum effective range using APDS-T. APDS-T should be used when engaging armored vehicles. Ground targets are classified as point or area targets. When engaging point targets, a three- to five-round killing burst should be used. Area targets should be engaged using a sufficient round burst in a Z pattern. For more information about ground target engagement with the 25-mm automatic gun refer to FM 23-1.

Tube-Launched, Optically Tracked, Wire-Guided Missile

The tube-launched, optically tracked, wire-guided (TOW) missile is very limited in an air defense role but can be a useful alternative to the Stinger for stationary and slow-moving targets. The time required from launch to engagement is a factor that must be

CONTENTS

	Page
BSFV Weapon Systems	L-1
Weapon Selection Criteria	L-3
Engagement Techniques	L-4

considered when employing the TOW as an alternative to the Stinger. The TOW may be used as a self-defense weapon against ground targets. Its maximum effective range against ground targets and stationary and slow-moving aerial targets is 3,750 meters.

M240C 7.62-MM Coaxial Machine Gun

The coaxial machine gun can be used against fixed-wing, rotary-wing, UAV aerial platforms and airborne troops; however, it is ineffective against the heavy armor of some helicopters. The coaxial machine gun may be used against ground targets, usually in self-defense. Against ground targets, a 15- to 30-round burst is used. In both air and ground engagements, the coaxial machine gun's effective range is 900 meters (the tracer burnout point). The BSFV can carry 2,200 rounds of 7.62-mm ammunition and 800 rounds ready to fire and 1,400 rounds stowed.

SIGHTING SYSTEMS

The 25-mm automatic gun and the 7.62-mm coaxial machine gun use two sighting systems to engage aerial targets. The integrated sight unit may be used with either the 25-mm automatic gun or the 7.62-mm coaxial machine gun when engaging aerial targets. The ring sight may be used with the 25-mm automatic gun (using HEI-T) and the 7.62-mm coaxial machine gun against

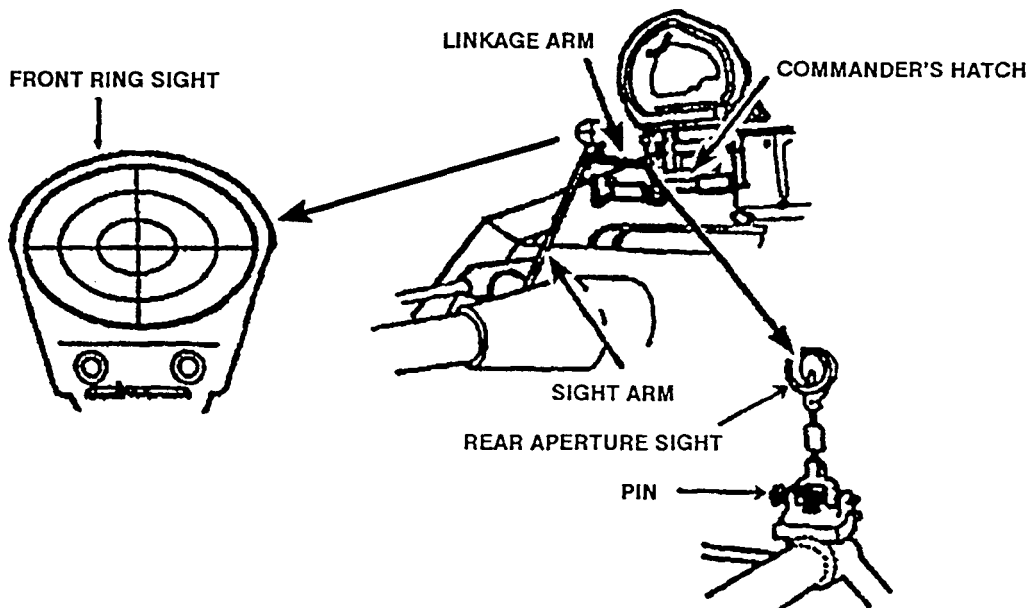
slow-moving threats. It is mounted on the BSFV commander's hatch and may be used for aerial engagements. The front ring sight is marked with sighting cross hairs and three speed rings. The rings are spaced for a target lead of 50, 100, or 150 miles per hour. The rear aperture sight has an aperture ring and a pointer post. See the Ring Sight illustration.

To use the ring sight—

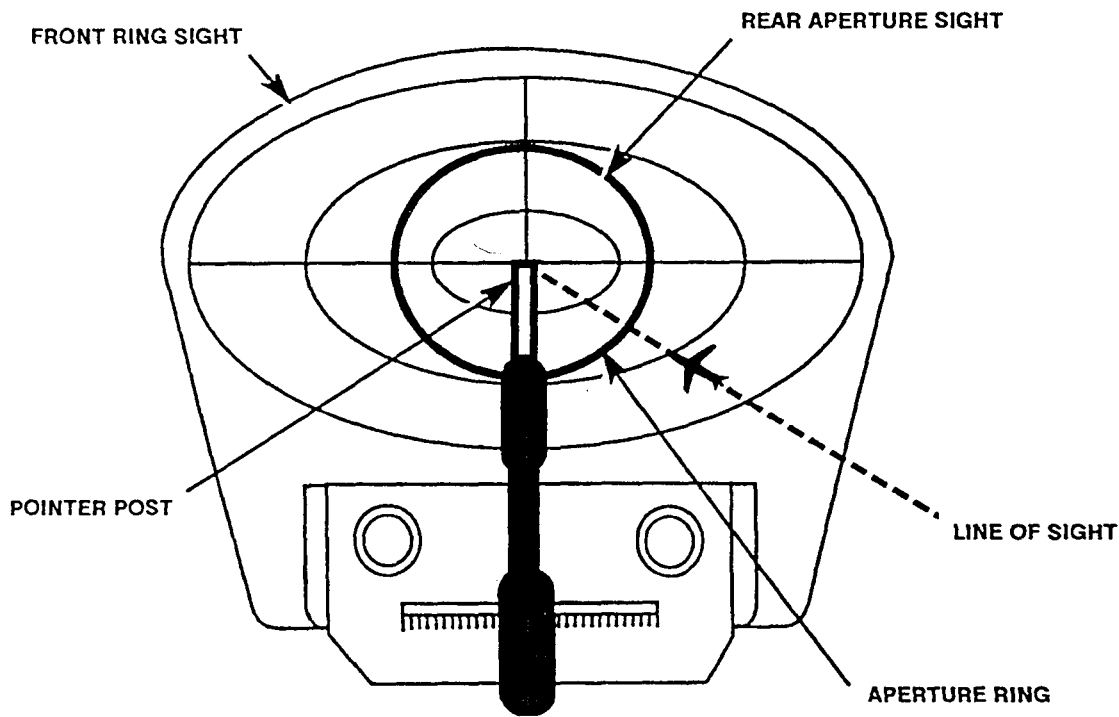
Estimate the target speed. The speed of threat aerial platforms using hovering, contour, or transiting flight profiles can be estimated with these general rules: hovering—0 MPH; contour flying—50 MPH; transiting—100 MPH.

- Raise the front ring and rear aperture.
- Align the front sight cross hairs ahead of and in line with the line of flight.
- Look through the rear aperture sight. Lead the target one ring for each 50 miles per hour the target is moving for a maximum engageable airspeed of 150 MPH.
- Align the pointer post with the target on the same flight path using the distance from the center which the target speed requires. The Cross Hair Alignment illustration, on page L-3, shows a target with an estimated speed of 100 MPH.

RING SIGHT



CROSS HAIR ALIGNMENT



WEAPON SELECTION CRITERIA

Weapon selection criteria against enemy targets is an important part of the BSFV commander's role. It begins with target detection. Conditions which may affect target detection include—

- Early warning systems emplaced and operational.
- Visibility of assigned aerial avenues of approach.
- Incoming direct and indirect fire.
- Mission-oriented protection posture (MOPP) level.

Target detection begins with the BSFV squad leader who directs the squad's search and scan operations within sector. During offensive and defensive operations, the driver, gunner, and squad leader search for targets. When dismounted, the Stinger team searches and scans assigned enemy air avenues of approach.

BSFV hatch positions will normally be specified in local SOPs, based on possible enemy situations. Open hatches are preferred unless the BSFV is under direct or indirect fire, sniper fire, or nuclear, biological, and chemical attack. If hatches are closed, the crew will search and or scan with the BSFV integrated sight unit and squad leader periscopes. In all cases, the BSFV squad leader must ensure the following operational considerations are used:

- Use all detection /identification means.
- The Stinger as the primary air defense weapon system.
- The 25-mm automatic gun to complement the Stinger.
- Use the TOW missile system only if other air defense systems fail or for self-defense.

The following illustrations show BSFV weapon systems and their effects against common threat targets, and prioritize weapon selection for the BSFV.

BSFV WEAPONS, AMMUNITION, AND EFFECTIVENESS

WEAPON/ AMMO	FIXED-WING SLOW FAST		HELICOPTER ARMORED/UNARMORED	UAV	RANGE*
Coaxial MG	Yes	No	Yes	Yes***	900 m
HEI-T**	Yes	Yes	Yes	Yes***	2,000 m
APDS-T	Yes	Yes	Yes	Yes***	1,700 m
TOW	No	No	Yes	No	3,750 m
Stinger	Yes	Yes	Yes	Yes	4,000 m

Notes: * Maximum effective range for aerial targets. In a ground role, the 25-mm automatic gun has a maximum range of 3,000 meters with HEI-T and 1,700 meters with APDS-T.
 ** Recommended as primary ammunition against aerial targets because of self-destruct capability at 3,000 meters which reduces likelihood of fratricide.
 *** Probability of kill is minimal; volume of fire increases effectiveness.

BSFV PRIORITIES OF WEAPON SELECTION

WEAPON	ROTARY WING		FIXED-WING	STINGER DEAD ZONE
	<2,000 m	>2,000 m		
Stinger	1	1	1	NA
25-mm automatic gun*	2	NA	2(< 2KM)	1
Coaxial MG**	3	NA	3	2
TOW	4	2	NA	NA

Notes: * The APDS-T has a higher probability of hit than HEI-T. However, HEI-T has a higher probability of kill at ranges beyond 1,700 meters. Even though APDS-T is more accurate, HEI-T will reduce the likelihood of fratricide if target is missed.
 ** Maximum effective range 900 meters.

ENGAGEMENT TECHNIQUES

The BSFV coaxial machine gun and 25-mm automatic gun can be used to engage aerial targets. Due to the difficulty associated with engaging aerial targets, a high volume of fire should be established in front of the target using the techniques previously discussed.

When the BSFV squad leader is alerted and cued about an air threat in the squad's sector of search, the Stinger team will be dismounted. Upon dismounting from the BSFV, target handoff must occur between the BSFV squad leader and the dismounted Stinger team. The BSFV squad leader will inform the team chief of the target's location if the Stinger team is not capable of being alerted and cued by digital or voice means. The squad leader may accomplish this using various communications methods, including visual signals. It is

imperative that the Stinger team acquire the correct target. Well-trained and rehearsed target handoff procedures ensure that target handoff is expedient and effective. After orienting the Stinger team to the air avenue of approach of the aerial platform, the BSFV gunner will continue to track the target through the execution of the engagement sequence. If multiple targets are present, the BSFV gunner will immediately slew to acquire the target posing the greatest threat after the Stinger team effectively communicates the correct target has been acquired. In the event a target acquired by the Stinger team is approaching or in the Stinger dead zone, the BSFV gunner immediately resumes engagement responsibility.

ENGAGING HIGH-PERFORMANCE AIRCRAFT

A general rule of thumb is to avoid engaging high-performance aircraft with the coaxial machine gun because of—

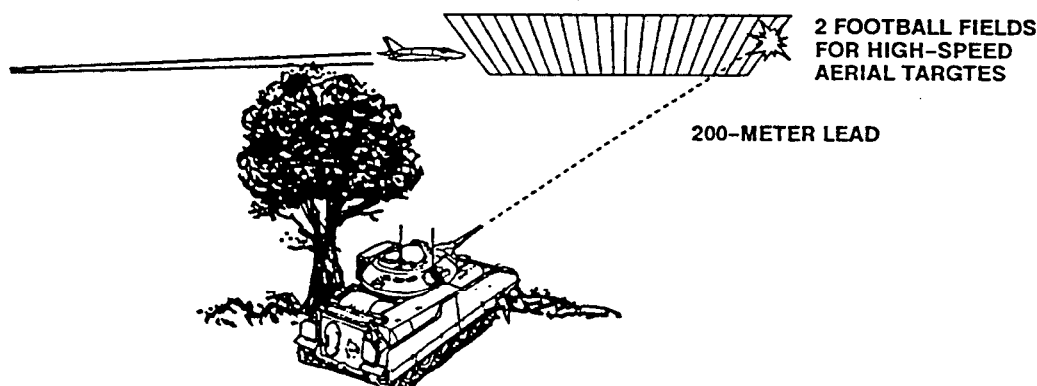
- Their high speed.
- The limited amount of machine-gun ammunition available to the vehicle commander and loader.
- The brief exposure time of the aircraft within effective machine-gun range.

The crew should engage if the aircraft is a direct

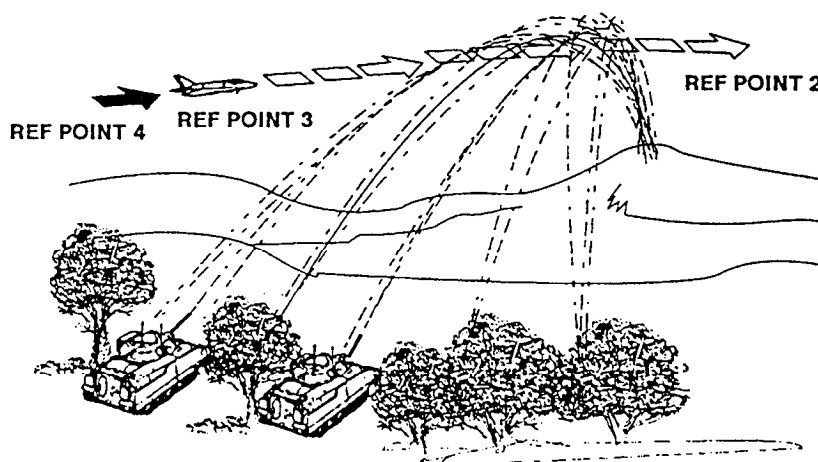
threat to the crew or unit (actually making an attack run). The mission statement usually provides guidance which includes criteria for the engagement of high-performance aircraft.

If the target has to be engaged, the best technique is to fire the coaxial machine gun in a continuous burst of 50 to 100 rounds. If the target is flying a crossing or overhead profile, the BSFV commander or gunner uses a 200-meter lead or about two football field lengths (See the Football Field Technique [Crossing] illustration).

FOOTBALL FIELD TECHNIQUE (CROSSING)



REFERENCE POINT TECHNIQUE (CROSSING)



Fire is directed in front of the aircraft, allowing the aerial platform to fly through the automatic gun's cone of fire (See the Reference Point Technique illustration, on the previous page, for an alternate method of engagement).

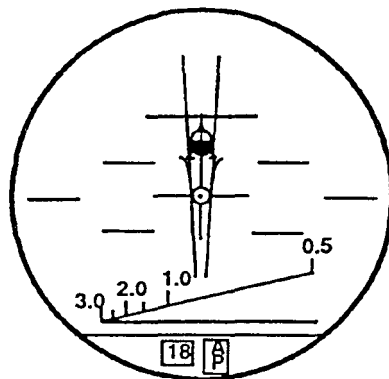
ENGAGING HELICOPTERS

The rule of thumb for engaging high-performance aircraft also applies to helicopters. However, when helicopters are exposed on the ground, and are slow moving or hovering, they become targets of opportunity that should be engaged if within effective automatic-gun range. Heavily armored threat attack helicopters faced head-on should be engaged with a TOW missile.

The BSFV commander or gunner should use the following techniques when engaging helicopters with the 25-mm automatic gun using the integrated sight unit. If the helicopter is flying a crossing or overhead profile, the commander or gunner uses a lead of 50 meters or half the length of a football field. If the helicopter is flying directly toward the BSFV, fire should be directed slightly above the nose of the helicopter. If the helicopter is hovering, the commander or gunner aims just above the fuselage and fires an HEI-T burst of 20 to 25 rounds on high rate of fire.

BSFVs with ISU produced after February 1987 have an air defense reticle added to the high-magnification gun reticle. The reticle is used for engaging attack helicopters. To use the air defense reticle, set the range control knob to 1,800 meters. Select AP (armored vehicles) or HE (all other vehicles) and then set rate on HIGH. Align the sight reticle so the fuselage sides appear to touch the appropriate reticle lines (See the illustration of Aligning the Helicopter With the ADR). Fire a 3- to 5-round sensing burst until on target and then engage with a 20- to 25-round burst. As the helicopter approaches, move the reticle down to keep the fuselage between the reticle lines.

ALIGNING A HELICOPTER WITH THE ADR



ENGAGING HELIBORNE INFANTRY AND PARATROOPERS

Infantry rappelling from a hovering helicopter should be destroyed by engaging the helicopter first, using a high volume of fire. Airborne troops are difficult to engage because of their rapid descent (approximately 10 feet per second). When engaging airborne troops, use the ISU as the primary sight. Use the coaxial machine gun at ranges under 900 meters and the 25-mm automatic gun with HEI-T at ranges beyond 900 meters and fire two body lengths below their feet.

ENGAGING UNMANNED AERODYNAMIC VEHICLES

When engaging UAVs, the same principles apply that are used for the engagement of other hostile aerial platforms. For massing fires, the BSFV and FAAD are necessary to destroy these small platforms.

GLOSSARY

A

A ² C ²	Army airspace command and control
AA	assembly area
AADC	area air defense commander
ABMOC	air battle management operations center
ac	aircraft
ACA	airspace control authority
AD	air defense
ADA	air defense artillery
ADCOORD	air defense coordinator
ADMIN/LOG	administrative/logistics
ADW	air defense warning
AI	air interdiction
ALOS	administrative and logistics operation
AO	area of operation
AOR	area of responsibility
APC	armored personnel carrier
APDS-T	armor piercing discarding sabot-tracer
APOD	aerial port of debarkation
ASCC	Army Service Component Commander
ATP	allied tactical publication
AWACS	Airborne Warning and Control System

B

bde	brigade
BDZ	base defense zone
BFV	Bradley Fighting Vehicle
BII	basic issue items
BMNT	beginning morning nautical twilight
bn	battalion
BSA	brigade support area
BSFV	Bradley Stinger Fighting Vehicle
btry	battery

C

C ²	command and control
C ² I	command, control, and intelligence
C ³	command, control, and communications
C ³ I	command, control, communications, and intelligence
CAP	combat air patrol
CAS	close air support
cbt	combat
cdr	commander
CESO	communications—electronics staff officer
cmd	command
CNR	command net radio
CO	company
COA	course of action
coax	coaxial

COMSEC	communications security
CONUS	continental United States
coord	coordinate
CP	command post
CSS	combat service support
CTCP	combat trains command post
CVC	combat vehicle crewman

D

DA	Department of the Army
DD	Department of Defense (form)
decon	decontamination
DEW	directed-energy weapon
DP	decision point
DS	direct support
DS2	decontaminating solution #2
DSM	decision support matrix
DST	decision support template
DZ	drop zone

E

EAC	echelons above corps
ECCM	electronic counter-countermeasures
EENT	end of evening nautical twilight
EMCON	emissions control
en	enemy
engr	engineer
EPLRS	enhanced position location reporting system
EPW	enemy prisoner of war
EW	early warning
evac	evacuation

F

FA	field artillery
FAAD	forward area air defense
FACS	Field Army Communication System
FARP	forward arming and refueling point
FASCAM	family of scatterable mines
FAX	facsimile
FEBA	forward edge of the battle area
1SG	first sergeant
FIST	fault isolation by semiautomated techniques
fld	field
FLIR	forward looking infrared
FLOT	forward line of own troops
FM	field manual
	frequency modulated
FOB	forward operating base
FRAGO	fragmentary order
freq	frequency
FSB	forward support battalion

FSO fire support office
FU fire unit
FW fixed wing

G

G2 Assistant Chief of Staff, Intelligence
G3 Assistant Chief of Staff, Operations and Plans
GBS ground-based sensor
gen generator
gP group
GPS gunner primary sight
GS general support
GS-R general support-reinforcing
GTA graphic training aid

H

HEIT high-explosive incendiary tracer
HIDACZ high-density airspace control zone
HIMAD high- to medium-altitude air defense
HIMEZ high-altitude missile engagement zone
HMMWV high-mobility, multipurpose wheeled vehicle
HQ headquarters
hvy heavy

I

IDP initial delay position
IFF identification, friend or foe
in inch
int intercommunications
IPB intelligence preparation of the battlefield
IR infrared
ISU integrated sight unit

J

JAAT joint air attack team
JFACC joint force air component commander
JTF joint task force
JTIDS Joint Tactical Information Distribution System

K

KIA killed in action
KPH kilometers per hour

L

LADW local air defense warning
LBE load bearing equipment
lbs pounds
LC/LD line of contact/line of departure
ldr leader

LLTR low-level transit route
LNO liaison officer
LOC lines of communications (logistics routes)
LOGPAC logistics package
LOS line of sight
LP listening post
LRP logistics release point
LSDIS lightweight and special divisions interim sensor
LZ landing zone

M

maint maintenance
METT-T mission, enemy, terrain, troops, and time available
MG machine gun
mm millimeter
MOPP mission-oriented protection posture
mort mortar
MOS military occupational speciality
MPH miles per hour
MRR minimum risk route
MSE mobile subscriber equipment
MSR main supply route

N

NAI named area of interest
NATO North Atlantic Treaty Organization
NBC nuclear, biological, and chemical
NBCO nuclear, biological, and chemical officer
NDP night defensive position
no number
nvG night vision goggles

O

obj objective
OCOKA observation and fields of fire, cover and concealment, obstacles, key terrain, and avenues of approach
OP observation post
OPCON operational control
OPORD operation order
ops operations

P

PERSTAT personnel status report
PL phase line
plt platoon
PMCS preventive maintenance checks and services
POL petroleum, oil, and lubricants
prep preparation/prepare
PSG platoon sergeant
PTL primary target line

PTO power take off
PZ pick-up zone

R

R reinforcing
RCS radar cross section
res reserve
RISTA reconnaissance, intelligence, surveillance,
and target acquisition
ROE rules of engagement
ROZ restricted operational zone
RP release point
RPV remotely piloted vehicle
RSOP reconnaissance, selection, and occupation
of position
rte route
RW rotary wing

S

S1 Adjutant (US Army)
S2 Intelligent Officer (US Army)
S3 Operations and Training Officer (US Army)
S4 Supply Officer (US Army)
SAAFR standard Army air flight route
set scout
sect section
SEN small extension node
SFCM supplemental tire control measures
SHTU simplified handheld terminal unit
SINCGARS single-channel ground and airborne radio system
SITREP situation report
SPOTREP spot report
sptd supported
SOF sector of fire
SOI signal operation instructions
SOP standing operating procedure
SP start point
SPOD seaport of debarkation
STANAG standardization agreement
STANO surveillance, target, acquisition, and night
observation

STL secondary target line
sup support
SVML standard vehicle mounted launcher (missile pod)
sync synchronize

T

TAA tactical assembly area
tac tactical
TACSOP tactical SOP
TAI target area of interest
TASKO task organization
TASM tactical air-to-surface missile
TBM tactical ballistic missile
TC track commander
TF task force
tm team
TM technical manual
terrain magement
tactical operations center
table(s) of organization and equipment
tube-launched, optically tracked, wire-
guided (missile)
target reference point
tactical standing operating procedures
television

U

UAV unmanned aerial vehicle
us United States
UMCP unit maintenance collection point

W

WARNO warning order
WCS weapon control status
WFZ weapons free zone
WIA wounded in action

X

XO executive officer

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INDEX

A

active air defense 2-4, 2-11, B-1, E-1
 ADA support relationships 2-1, 2-2, 2-3
 aerial ports and seaports of debarkation 3-3
 aerial reconnaissance C-1, C-2
 agility 1-1, 4-13, 5-2, 6-4
 air avenues of approach 4-5, 5-10, 6-5, C-3, I-3, L-4
 air defense warning (ADW) 2-11, 6-10, D-3, E-1
 airspace control measures 2-12, 2-15, 6-10
 alternate linkup points 6-6
 approach march 4-11
 area defense 5-4
 area of interest 1-1, 2-11, 4-13, 4-16, I-2
 area of operations 2-2, 2-11, 3-1, 7-3, I-1, L-1
 armored personnel carrier 1-2, 1-4
 assembly areas 3-4, 3-5, 6-10, 7-5, D-6
 assess risks 5-1, J-2
 assigned relationship 2-1
 assistant gunner 1-2
 audacity 4-1
 autonomous operations 2-12

B

balanced fires 2-8, F-3
 battalion combat trains 7-1, D-4
 battery support vehicles 7-3
 battlefield illumination G-1, G-3, G-4
 battle space I-1
 biological defensive actions H-4
 blast injuries H-2
 box formation 4-6, 4-9
 Bradley Stinger Fighting Vehicle (BSFV)
 characteristics and capabilities 1-1, 1-3
 platoon organization section 1-1, 1-2
 weapon systems L-1, L-3
 breaching operations 6-8, 6-9
 brigade support area (BSA) 7-1

C

choke points 6-1, 6-2, 6-6, 6-7, C-1, D-6
 close operations 5-3, 5-4
 cold weather operations F-4
 color representation
 one color K-1
 multicolor K-1
 column formation 4-4, 4-5, 6-6, 6-10
 combat environments
 mountain F-1
 jungle F-2
 desert F-3
 cold weather F-4
 combat orders
 warning order (WARNO) 2-5
 operation order (OPORD) 2-5
 fragmentary order (FRAGO) 2-5
 command, defined 2-1
 command relationships
 organic 2-1
 assigned 2-1
 attached 2-1
 concentration 1-1, 3-6, 3-7, 4-1, 4-11, 5-1, 5-2, F-1, H-1, J-9

contamination avoidance H-1
 control
 positive 2-9
 procedural 2-9
 cover and concealment B-1, C-3, D-4, I-3
 cross-leveling 4-2, 7-1, 7-5, 7-6
 cruise missile 3-1, 3-2, 3-7, I-1, I-6

D

deception 4-1, 5-2, 5-6, 6-1, 6-4, G-4
 decontamination, methods of
 individual H-6
 hasty H-6
 deliberate 6-8, D-1, H-6, J-9
 techniques H-6
 deep operations 5-4
 defense in sector 5-5, 5-6
 defile operations 6-1, 6-6
 delay operations 6-1
 deliberate attack D-2, 4-13, 4-14, 4-15, 4-16
 depth 2-7, 2-8, 4-2, 4-5, 5-2, 6-8, I-1,
 desert operations F-1, F-3
 diamond formation 4-9
 direct support (DS) 2-2, 2-7, 4-10, 4-14, 7-3
 directed early warning (DEW) 2-9, E-2
 dismounted Stinger team communications 2-16
 dismounted weapons I-3, L-1
 disruption 5-1, 5-2, 5-3
 driver (assistant gunner) 1-2

E

early engagement 2-7, 2-8
 early warning
 digital E-1, E-2
 voice E-2
 directed 2-9, E-2
 early warning and sensors 2-9
 echelon formation 4-5
 encircled forces 6-4, 6-5
 engagement techniques 2-12, B-2, L-4
 helicopters L-6
 high-performance aircraft L-5
 envelopment 4-17, 4-18
 exfiltration 6-5
 exploitation 3-4, 3-6, 3-7, 4-2, 4-16, 5-2, 6-9
 eye injuries H-2

F

FAAD 1-1, 3-1, 3-3
 field trains 2-4, 7-1
 fire control order (FCO) 2-11, 2-17
 fixed-wing (FW) aircraft 3-2, I-3
 flexibility 5-2
 force-projection operations 3-1, 3-7
 fragmentary order (FRAGO) 2-5, A-5
 frontal attack 4-17, 4-19

G

general support (GS) 2-2
 general support-reinforcing (GS-R) 2-2
 global positioning system (GPS) K-1

CR ground-based sensor (GBS) E-1, E-3
ground reconnaissance C-1, C-2, C-3
gunner 1-2

H

hasty attack. 4-13, 4-14, 4-15
health services 7-8
helicopters 3-2, 3-7, 4-10, 7-8
hostile criteria 2-12, 6-10, A-4, B-3

I

identify risks J-2
image-intensification devices G-1
indirect fire illumination G-3, G-4
infiltration 4-17, 4-18, 4-19
initiative 1-1, 4-1, 6-8
integrated sight unit 1-4, G-2, G-3, G-5
integrating replacements 7-7
invisible light G-3
IPB process I-1

J

jungle operations F-2

L

limited visibility employment 1-4, G-4
line formation 4-5, 4-8
linkup operations 2-7, 4-2, 6-5, 6-6
local air defense warning (LADW) 2-9, 2-11, 2-12, E-3
logistics operations 7-1
low-altitude aerial threat 3-2

M

M240C 7.62-mm coaxial machine gun 1-3, 2-14, 5-5, L-2, L-4, L-5
maintenance collection point 7-3
maneuver
 commander responsibilities 6-5
 element 5-6
 sections 1-2
 forms of
 envelopment 4-17
 turning 4-18
 infiltration 4-19
 frontal 4-19
 penetration 4-19
map reconnaissance C-1
masking I-3
mass and concentration 5-1
mobile defense 5-5
mobility 1-4, 6-5
mountain operations F-1
mounted weapons 1-3, L-1
movement techniques 4-2, 4-10, 4-15, C-4
mutual support 2-8, F-3

N

NBC warning and reporting system H-1
NBC defense
 contamination avoidance H-1
 protection H-1
 decontamination H-2

night vision driver's viewer G-2
night vision goggles G-2
nuclear defense H-2
 before attack H-4
 during attack H-4
 after attack H-4
nuclear first aid
 blast injuries H-2
 thermal radiation injuries H-2
 eye injuries H-2
 radiation H-2

O

observation and fields of fire I-2
offensive operations 2-17, 4-1, 4-10, 5-1, 6-6
operation order (OPORD) 2-5, 2-9, A-1
organic relationship 2-1
overlapping fires 2-8, F-3

P

paratroopers L-6
passage of lines 6-10, D-2
passage points 6-2, 6-6, D-6
passive air defense 2-4, 2-11, B-1, E-1
penetration 4-17, 4-20
personnel services
 strength accounting 7-7
 casualty reporting 7-7
 replacement procedures 7-7
 maintenance 7-7
 personnel actions and awards 7-7
platoon leader responsibilities 1-2, 2-2, 3-2, 4-13, 5-11, 6-2, 7-1
platoon sergeant 1-2, 2-5, 7-1, 7-5, K-1
point of origin I-3
positioning of vehicles 5-5
positive control measures 2-9
pre-positioning supplies 7-6
primary target line (PTL) 2-12
procedural control measures 2-9
protection of forces 3-3
pursuit 4-2, 4-16, 5-4

R

radiation H-2
radiological contamination H-4
radio communications 2-16, 2-18
radio transmissions 2-13
rear operations 5-3
reconnaissance, selection, and occupation of position (RSOP) 4-2, C-1
 reconnaissance in force 4-11
reinforcing support 2-2
relief in place 6-8
remotely piloted vehicle (RPV) 3-2
replacement operations 7-7
resupply method 7-4
 point 7-4
 techniques 7-4
retirement 6-2
retrograde operations
 delay 6-1
 withdrawal 6-1
 retirement 6-2
risk assessment J-1

risk matrix J-2, J-5
 river crossings 6-6
 rotary-wing (RW) aircraft 3-2, 3-7, I-3
 rules of engagement (ROE) 2-11, 3-2, 3-5, 6-8, A-4

S

sector of fire (SOF) 2-13
 sequence of the attack 4-2
 service-station method 7-4
 simplified handheld terminal unit (SHTU) E-4
 sighting systems I-4, L-2
 small arms
 M16 B-2
 M60 B-2
 M249 B-2
 M2 B-2
 staff coordination
 S1 2-2
 S2 2-2
 S3 2-2
 S4 2-2
 engineer 2-2
 fire support 2-3
 standard vehicle mounted launcher (SVML) L-1
 Stinger
 control measures 2-12
 team 1-2, 3-5, 4-3, D-7
 support relationships 2-2
 direct support 2-2
 general support 2-2
 general support-reinforcing 2-2
 reinforcing 2-2
 surprise 4-1
 synchronization 1-1

T

tactical air-to-surface missile (TASM) 3-2, I-1, I-5
 tactical assembly areas (TAA) 3-4, 3-5
 tailgate method 7-4
 target engagement I-3, G-3, L-4
 tempo 4-1
 temporary airspace restrictions 2-15
 terrain analysis I-2
 thermal-imagery devices G-2
 thermal radiation injuries H-2
 toxic materials J-9
 troop-leading procedures 2-5
 tube-launched, optically tracked, wire-guided (TOW) missile system 1-3, 5-5, C-3, J-8, L-1, L-2, L-3, L-4, L-5
 25-mm automatic gun 2-13, 2-17, 5-5, G-2, G-5, J-8, L-1, L-2, L-3, L-4, L-5

U

unmanned aerodynamic vehicle (UAV) 1-2, 5-5, I-4, I-6

V

vee formation 4-5
 versatility 1-2
 visible light G-3

W

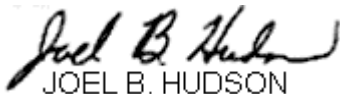
warfighting overview 3-3
 warning order (WARNO) 2-5, 2-10, 4-16, A-2
 weapon control status (WCS) 4-7, 2-11, 2-15, D-3
 weapon engagement zone (WEZ) 2-15
 weapon selection criteria L-3
 weather analysis I-4
 wedge formation 4-4
 weighted coverage 2-7
 wire communications 2-18
 withdrawal 6-1
 wounded, evacuation of 7-3

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