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## CRITICAL COMBAT PERFORMANCES KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER

Airmobile Operations

by
Frank L. Brown, Chester I. Christie, Jr.,
and Albert R. Amos, Jr.

December 1969

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HumRRO Division No. 4

HUMAN RESOURCES RESEARCH ORGANIZATION
operating under contract with
THE DEPARTMENT OF THE ARMY

## FOREWORD

In response to a request from the United States Army Infantry School (USAIS), HumRRO Division No. 4 initiated a Technical Advisory Service research project to identify and record the critical combat performances, knowledges, and skills required of the Infantry Rifle Squad Leader (IRSL) and the Infantry Fire Team Leader (IFTL).

The requirements imposed upon the IRSL and IFTL are essentially the same, except that the former is responsible for the control of the men and fires of both fire teams in a rifle squad, rather than only one. The senior IFTL within each squad must be prepared to assume effective leadership of the squad immediately if the IRSL becomes a casualty, completes a prescribed combat tour, or is absent for any reason. Since it is common practice to provide the same training for candidates for both positions of leadership and to employ the outstanding candidates in the higher position, each paper in this series will set forth the critical requirements imposed upon the IRSL and, therein, those imposed upon the IFTL as well.

Under Work Unit LEAD, Work Sub-Unit I, the critical combat performances, knowledges, and skills of the Infantry Rifle Platoon Leader were published in a series of 41 papers covering a like number of subject areas. Each paper was published with prior review and concurrence by the USAIS Instructional Departments concerned. These papers are being used as the primary source of data in completing a parallel series of papers for the Infantry Rifle Squad Leader and the Infantry Fire Team Leader. This document details the requirements pertaining to airmobile operations.

This Technical Advisory Service research is being performed at HumRRO Division No. 4, Fort Benning, Georgia. The present Director is Dr. T. O. Jacobs.

Military support for this study is being provided by the U.S. Army Infantry Human Research Unit, Fort Benning, Georgia. LTC Chester I. Christie, Jr. is the present Unit Chief.

HumRRO research is conducted under Army Contract DAHC 19-70-C-0012.

Meredith P. Crawford
President
Human Resources Research Organization

# AIRMOBILE OPERATIONS

## General Considerations

### Introduction

The Infantry Rifle Squad Leader of today must be capable of planning and executing airmobile operations in a variety of battlefield environments, acting as the leader of an independent tactical unit or of an integral part of a platoon. As a member of an Infantry unit, he can anticipate the availability of airmobile resources from aviation units supporting his platoon, company, or battalion. During the conduct of airmobile operations, the IRSL may have immediately available to him an array of direct and indirect fires, troopships, armed helicopters, close tactical air support, and airmobile logistical support that far exceeds the support available to a company commander two decades ago. Further, the tempo of airmobile operations exceeds that of any means of mobility heretofore employed in combat by Infantry units. This calls for increased training, study, and practice to permit the rapid recall and effective application of technical information and complex procedures under battlefield stress.

To lead a squad with confidence, the IRSL must master the performances, knowledges, and skills vital to planning, coordinating, and executing an airmobile operation as an integral part of his parent platoon under the direct guidance of the platoon leader. When separated by time and space from his platoon leader, he must lead his squad effectively and make maximum use of airmobile resources. During special operations, such as an airmobile raid, the IRSL may lead a reinforced squad near twice normal squad strength and be required to plan, coordinate, and control the employment of airmobile resources in conjunction with members of the battalion or brigade staff and the aviation unit liaison officer.

The IRSL is as vulnerable to enemy fire as any other soldier and his duties often will require exposure to hostile fire exceeding that demanded of his men. Thus he must train his fire team leaders to function in his stead in the event he suddenly becomes an ineffective casualty. He must anticipate that his fire teams will be assigned semi-independent missions requiring reconnaissance, the establishment of small-unit ambushes, and the manning of security positions at a distance from the parent unit. In such situations, fire team leaders will be required to use airmobile resources to obtain vital fire support, life-saving aeromedical evacuation, and, not infrequently, extraction or reinforcement to offset local enemy superiority. The IRSL must train his subordinate leaders accordingly to ensure their effective use of airmobile resources to accomplish their missions successfully with minimum casualties.

Infantry rifle squad leader

### Scope

describes

This paper presents the performances, knowledges, and skills required of the IRSL to plan, coordinate, and execute airmobile operations when his squad is operating as an integral part of his platoon and when operating as a separate,

reinforced unit directly under company or higher control. Much of the material presented is applicable to the squad leader only when he is operating as the leader of a semi-independent unit or in the event that he is forced by circumstances to assume the role of principal coordinator of an airmobile operation. The IRPL will, through instruction and demonstration, provide his subordinate leaders with the knowledge and skill necessary to assume leadership of the platoon in the event that he becomes a casualty or otherwise unable to lead the platoon during the conduct of an operation. It is desirable for the squad leader to know the phases of an airmobile operation, the coordination that is required, the capabilities and limitations of aircraft, and other considerations for planning an operation. This understanding of how the system functions logically will assist the IRSL in the performance of his assigned tasks. Coverage includes the characteristics, capabilities, and limitations of commonly employed aircraft; the reverse planning procedure; the establishment of SOP and the conduct of staging (assembly areas), loading, air movement, and air landing; the selection, security, defense, clearing, marking, and operation of LZ's/PZ's for aeromedical evacuation, resupply, extraction, and reinforcement, including the content and format of requests for support; and the control and planning of aerial fire support, including aerial illumination, for offensive, defensive, retrograde, and patrolling operations. Throughout the paper heavy emphasis has been placed upon the knowledges and skills that will increase safety for airmobile personnel during combat operations. Because airmobile operations are still in the formative stage, effort has been made to show the reasoning underlying the performances, knowledges, and skills recorded herein.

The availability of airmobile resources is likely to affect virtually every facet of combat operations. Therefore, the content of this paper is directly related to the content of all other papers comprising the IRSL series, with particular emphasis upon Offensive Operations, Defensive Operations, Retrograde Operations, Patrolling, and Use of Indirect Supporting Fires.

Materiel

TOE materiel pertinent to the IRSL's specific organization.

Special equipment provided by higher headquarters.

Rotary-wing aircraft equipped for troop movement, aeromedical evacuation, resupply, fire support, reconnaissance and surveillance, and battlefield illumination.

Fixed-wing aircraft equipped to provide reconnaissance, surveillance, fire control, close tactical air support, logistical support, and battlefield illumination.

Troop ladders, cargo nets, pallets, and slings.

Battlefield Cues

Orders and instructions from commanders requiring employment of airmobile resources.

Environmental conditions, including weather, terrain, and enemy action, likely to affect the employment of supporting aircraft.

The occurrence of casualties or need for resupply, extraction, or reinforcement when helicopter support is available.

Discovery of potentially useful landing zones during tactical movement.

Enemy targets suitable for engagement with aerial fire support or a combination of aerial fire support and indirect fires.

## Performances, Knowledges, and Skills

1. TO SUCCESSFULLY PLAN AND EXECUTE AIRMOBILE OPERATIONS AS THE LEADER OF A SEMI-INDEPENDENT UNIT THE IRSL MUST ANTICIPATE SPECIFIC MISSIONS; KNOW AND EXPLOIT THE CAPABILITIES OF AVAILABLE HELICOPTERS AND FIXED-WING AIRCRAFT; KNOW AND OPERATE WITHIN REALISTICALLY APPLICABLE AIRCRAFT LIMITATIONS; UNHESITATINGLY SEEK ESSENTIAL ADVICE FROM HIS PLATOON LEADER, THE AVIATION UNIT LIAISON OFFICER, AND AIRCRAFT COMMANDERS CONCERNING AIRCRAFT CAPABILITIES AND LIMITATIONS PERTINENT TO SPECIFIC MISSIONS AND SITUATIONS; AND CONTINUALLY TRAIN AND INDOCTRINATE HIS MEN TOWARD INCREASINGLY EFFECTIVE EMPLOYMENT OF AIRMOBILE TACTICS AND TECHNIQUES.

He must : know that an airmobile operation is one in which combat forces and their equipment move about the battlefield in air vehicles under the control of a ground force commander to engage in ground combat and that: 1

a. It is characterized by surprise, flexibility, maneuver, timing, accuracy, and speed over extended distances and terrain obstacles.

b. The ultimate goal in airmobile operations is to land organized assault forces <u>on the objective</u> without taking prohibitive losses;if the objective is so heavily defended or the terrain is so unsuitable that landing on the objective is impractical, seek to land <u>within assaulting distance of the objective</u>.

: know and ensure that his men learn the <u>standard terms</u> and abbreviations commonly employed in planning and executing airmobile operations to ensure rapid, meaningful communication. 2

: know that the purposes of offensive, defensive, retrograde, and patrolling operations are not altered by the addition of airmobile resources and that fundamental tactics and doctrine remain the same for airmobile forces as for ground forces; however, the tempo of airmobile combat operations is vastly increased, requiring mastery of additional techniques and procedures not otherwise required, e.g., land navigation from aerial platform, rapid estimates and decisions. 3



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: know that an airmobile capability frees the commander from reliance on surface routes and greatly increases the rapidity with which troops and supplies can be moved over undeveloped areas. 4

: anticipate that small units often will be extracted from one area and inserted into battle in another area with little warning and with fragmentary orders as the commander employs air mobility to concentrate overwhelming strength and firepower against an enemy force. 5

: recognize that the absence of surface routes and lack of surface transportation during dismounted portions of an airmobile operation require an extremely high degree of stamina and tolerance to stress in the airmobile soldier. 6

He will : anticipate that the missions of airmobile forces include: reconnaissance and security missions designed to block or screen avenues of enemy approach during an operation; raids; antiairborne, antiairmobile, and counterguerrilla operations; exploitation of the effects of nuclear, chemical, and biological weapons and conventional bomber strikes; seizure and retention of key terrain; feints and demonstrations; economy-of-force missions; counterattack of enemy penetrations; ship-to-shore operations; amphibious operations; shore-to-shore operations (e.g., river crossings); riverine operations; envelopment and over-obstacle operations; composition of a highly mobile reserve; and long-range patrols. (The performances, knowledges, and skills required to execute typical missions without airmobile resources are covered in the papers on Offensive Operations, Defensive Operations, Retrograde Operations, and Patrolling and are not repeated herein except as pertains to the specific employment of airmobile resources.) 7

: know that airmobile operations are uniquely effective in the entrapment of guerrillas in primitive areas where the lack of roads prohibits rapid maneuver by surface vehicles and dismounted troops. 8

He must : know the capabilities of rotary-wing aircraft in common use and plan to exploit them during the planning and execution of airmobile operations; plan to: 9

a. Use confined, unimproved landing areas to gain surprise and cover and concealment for men and aircraft through the capability of the helicopter to land or take off at relatively steep angles.

b. Land troops and cargo from helicopters at a hover within five feet or less of the surface in areas where the surface prohibits touchdown.

c. Land and extract troops with selected, man-portable cargo from hovering helicopters at altitudes under 100 feet by means of rappelling or use of the trooper ladder in areas that prohibit landing or low hovering.

d. Extract casualties for treatment and prisoners for interrogation by means of a winch and harness from areas where obstacles prohibit landing.

e. Have cargo delivered and retrieved in external sling loads to save time and where obstacles prohibit the use of surface transportation or fixed-wing aircraft.

f. Land on or near the objective with minimum requirements for the timely reorganization of assault troops.

g. Use helicopters as weapons platforms and aerial observation posts to deliver aerial fire from low levels to gain surprise and shock effect and call for and adjust indirect fires as required.

h. Participate in low-level flight, false landings, and variations in direction of approach to deceive the enemy as to the actual location and direction of employment of airmobile troops and weapons.

He will : know these limitations of the rotary-wing aircraft in common use: 10

a. Helicopters are vulnerable to enemy fire, though this fire can be largely suppressed by a combination of friendly indirect fire, tactical air support, and the employment of armed helicopters.

b. Helicopters consume fuel at a high rate requiring careful balance of fuel load, range, and allowable cargo load (ACL).

c. Weight and balance affect helicopter flight control, thus requiring close conformity to the aircraft commander's instructions on loads, distribution of loads, securing of cargo, and movement of personnel during flight.

d. Helicopters may be grounded by marginal weather such as hail, sleet, heavy rains, and gusty winds of 30 knots or more.

e. Anticipate that the ACL will decrease with increases in temperature, humidity, and altitude, requiring a flexible loading SOP to meet unforeseen changes in ACL. Where the LZ or PZ is small and restricted by obstacles an almost vertical ascent and descent are required, the ACL may be further reduced.

f. Recognize that helicopters place more severe demands on pilots than do fixed-wing aircraft, requiring that passengers cooperate with and avoid distracting helicopter crews.

g. Know that wind velocities dictate the direction of approach and landing of helicopters; within the limits imposed by the mission, select LZ's and PZ's (pick-up zones) that will permit landing into the wind.

He must : know that the aviator designated as aircraft commander is in charge of the aircraft and, if no aircraft commander is designated, the aviator given the mission is in charge and is directly responsible to the aviation commander for the safe loading and operation of the aircraft and for the safe and timely delivery of passengers and cargo in accordance with the demands of the mission, i.e., aircraft capabilities and limitations, weather contingencies, suitability of flight routes and landing zones. 11

: upon being designated leader of an airmobile raid force or similar detachment required to execute an airmobile operation, coordinate with the platoon leader, the aviation unit liaison officer, and appropriate staff personnel and rely upon them to provide technical advice pertinent to: 12

a. Availability, capabilities, and limitations of aircraft to support the mission, including troop lift, armed helicopter support, reconnaissance and surveillance, aeromedical evacuation, recovery aircraft, illumination, airborne radio relay, and a weather helicopter.

b. Reconnaissance of tentative flight routes and the objective, by map, photos, and aerial reconnaissance.

c. Selection of LZ's, PZ's, ACP's (Aircraft Check Points), RP's (Release Points), and alternates.

d. Aviation communications procedures.

e. Formations for loading and offloading.

f. The current ACL.

g. Internal and sling loads.

h. Effects of weather, both current and forecast.

i. Capabilities and limitations of aircraft required for specific missions throughout the operation.

: know that many Army aviators are experienced ground tactical officers; that the aviation unit liaison officer usually will be a highly qualified aviator as well as an experienced ground officer; and that the level of aviation support usually will far exceed the minimum demanded by the mission. 13

2. GIVEN A SPECIFIC MISSION AND EITHER A COMPLETE ORDER OR FRAGMENTARY ORDER REQUIRING PARTICIPATION IN AN AIRMOBILE OPERATION, THE IRSL WILL PLAN, COORDINATE, AND SUPERVISE THE ACTION REQUIRED OF HIS SQUAD AND ATTACHED PERSONNEL IN PREPARATION FOR THE OPERATION; ISSUE THE SQUAD OPERATIONS ORDER IN COMPLETE OR FRAGMENTARY FORM; BRIEF AND REHEARSE HIS MEN ON ALL PHASES OF THE MISSION; AND COORDINATE AND SUPERVISE THE MOVEMENT OF HIS MEN, WEAPONS, EQUIPMENT, AND SUPPLIES TO THEIR DESIGNATED LOCATION WITHIN THE STAGING AREA. HE MAY LEAD A SQUAD AND NORMAL ATTACHMENTS WHILE OPERATING AS AN INTEGRAL PART OF HIS PLATOON OR COMMAND A REINFORCED SQUAD (E.G., A RAID PATROL) OPERATING DIRECTLY UNDER COMPANY OR BATTALION CONTROL.

He will : anticipate that platoon- and squad-level airmobile operations frequently will stem from recently gained intelligence and must be mounted quickly on the basis of fragmentary or mission-type verbal orders and SOP. 14

: upon joining an airmobile unit, learn the unique aspects of its airmobile SOP because a detailed knowledge of pertinent SOP by all squad members and attached personnel is vital to the effective and efficient execution of airmobile operations. 15

He must : on receipt of orders for an airmobile operation, apply reverse planning to facilitate understanding of the necessary orders, instructions, and coordination to accomplish the assigned mission, i.e., develop the ground tactical plan, the landing plan, the air movement plan, and the loading plan, in the order named on the basis of information and instructions provided by the commander. 16

: during all planning, preparation, and coordination, view the entire airmobile operation as an entity with complete recognition of the relationships existing among the plans (phases) that encompass the over-all operation. 17

: consider the effects of current and predicted weather and visibility upon air movement planning, e.g., an operation mounted in marginal but clearing weather may gain surprise and exploit the surprise gained as the weather clears; an operation mounted in the face of deteriorating weather may face a cessation of flying because of impossible weather conditions at a time when aviation support is vital; and know that weather must be much better for night operations than for daylight, with a forecast that good weather will continue during darkness. 18

He will : as part of normal security measures, anticipate the possible loss of aircraft over enemy areas during aerial reconnaissance and en route to the LZ; forewarn all personnel against taking marked maps, operations orders, complete SOI, or any other classified material aboard any aircraft; and review SOP for establishment of security for downed aircraft, frequencies and call signs of supporting aviation units, and establishment of LZ's for extraction. (Additional details pertinent to the maintenance of security are set forth in the paper on Counterintelligence.) 19

He must : when his squad and attachments are to participate in an airmobile operation as an integral part of the platoon, anticipate that development of the ground tactical plan, the landing plan, the air movement plan, the loading plan, and the staging plan for his squad will be based upon the platoon operations order. 20

: upon notification of an impending operation, submit a squad strength figure to the platoon leader (or to the officer in charge if a special operation) to aid in formulating the platoon loading table and in determining aircraft requirements. 21

: anticipate that the platoon operations order in its entirety may be issued as a verbal order, supplemented with an issue of maps. Aerial photographs and a loading table may be available for review when time permits. 22

: during the planning of a semi-independent airmobile operation, coordinate directly with the appropriate member of the controlling commander or staff officer, i.e., S2 or S3: ground tactical plan, fire support and fire coordination; Company Supply Personnel: supplies and special equipment, slings and loading of sling-loaded items; Aviation Unit Liaison Officer: aircraft allocation, allowable cargo load, flight routes, and technical advice pertinent to the employment of helicopters. (Detailed coverage of troop-loading procedures and the content and format of squad and platoon operations are presented in Mission, Organization, and General Operation of the Rifle Squad and Platoon. Additional detailed information pertinent to the staging plan, loading plan, air movement plan, and landing plan are presented in additional performances contained in this paper.) 23

: develop the basis for a tentative ground tactical plan for accomplishing his mission with due attention to the effect of the platoon landing plan and his own loading plan upon the employment of his own troops and fires. 24

: as soon as practical after completing the platoon's ground tactical plan, complete and disseminate the squad loading plan to ensure the cross loading of key equipment and personnel so that the loading and landing plans are coordinated to directly support the ground tactical plan, if more than one helicopter is to be used. Plan for the touchdown or off-loading. If machineguns are attached to the squad, ensure that extra ammunition is aboard with the machineguns. Ensure that fire team integrity is maintained where possible if the ACL or loading plan requires the use of two ships. This will assist in providing a balanced fighting force for each aircraft, i.e., proper distribution of automatic weapons, grenade launchers, etc. 25

: recognize that the company air movement plan is usually prepared by the Battalion S3 or S3 Air in coordination with the company commander, the aviation unit liaison officer, and the staffs of other supporting and supported units; include appropriate elements of the platoon air movement plan in his squad operations order. 26

: arrange for the movement of his men, weapons, and supplies to the staging area; and plan to utilize an organization en route that conforms to the squad loading plan if practicable, i.e., use the movement to the staging area as a rehearsal of the squad loading plan. 27

He will : know that dismounted mobility will be the primary means of small-unit maneuver after landing in the objective area, and avoid overloading troops, i.e., limit the combat loads of the assault elements to the weapons, ammunition, and equipment vital to accomplishing the immediate assault mission. 28

: recognize the vulnerability of helicopters and dismounted troops without prepared positions to attack by enemy armored vehicles and prescribe the number of antitank weapons (e.g., M72) to be carried when an armor threat exists. 29

: ensure the availability of colored smoke, panels, and lights for designating targets and marking LZ's for resupply, aeromedical evacuation, and extraction. 30

He must : when operating as a semi-independent force, arrange for: 31

a. On call air delivery of critical items such as ammunition, water and rations, marked for identification and packaged to facilitate recovery.

b. Additional prepackaged kits of heavy weapons and gear needed in organization of a defensive position, such as Claymores, trip-flares, pioneer tools, night-vision devices and sleeping gear.

c. On call extraction of unexpended or surplus equipment.

He will : recognize that aerial reconnaissance may indicate to the enemy a forthcoming operation in a given area; therefore, make a thorough map reconnaissance of the area to become familiar with routes to the area, the LZ and the objective; when available, use aerial photographs to further define specific areas of interest; concentrate on the selection and description of identifiable terrain features that will be meaningful to the members of the squad in executing the ground tactical plan. 32

He must : when conducting a reconnaissance prior to a semi-independent mission: 33

a. Seek to conduct an aerial reconnaissance of the flight route, LZ/objective, and surrounding terrain to determine: the nature and locations of any obstacles to entry, leading, and take-off by aircraft; locations and usefulness of alternate LZ's, within the limits imposed by the mission, the situation, and command restrictions.

b. Seek to determine the existing pattern of friendly air activity over the area of operations, and adhere to it during reconnaissance to avoid alerting the enemy.

c. Prior to departure on aerial reconnaissance record specific information to be obtained, and brief the pilot as to the requirements of the mission, relying upon him as an additional observer; such preparation will reduce exposure time over the operational area.

d. Recognize that excessive reconnaissance of a proposed landing zone may pinpoint it for the enemy and allow him to prepare an ambush; a good technique is to make one high pass over the area, then make one low pass over the area from a different direction, and clear the area.

e. When conducting aerial reconnaissance for a night operation (illuminated or non-illuminated), recognize that hazards to flight become doubly dangerous during limited visibility; seek to conduct an initial reconnaissance during daylight and a second reconnaissance of the same area during darkness.

f. During the conduct of a reconnaissance or actual operation follow the flight of the aircraft on a map and require that subordinate aircraft troop commanders do the same; in the event that the aircraft is forced to execute an emergency landing it is essential that the ground forces know their location as precisely as possible.

3. THE IRSL WILL DEVELOP AND ENFORCE SQUAD SOP PERTINENT TO STAGING FOR AN AIRMOBILE OPERATION AND, ON ORDER, HE WILL PLAN AND SUPERVISE SUCH MOVEMENT BY HIS UNIT TO ENSURE TIMELY EXECUTION OF THE LOADING PLAN.

He will : know that a staging area for an airmobile operation is a specified geographical location selected to provide the necessary ground and air space needed for the concentration, integration, and final preparation of aircraft, air crews, troops, weapons, equipment, and supplies (including helicopter refueling and rearming facilities, if necessary). 34

He must : when responsible for a semi-independent operation, prepare a loading plan with the aid and guidance of the appropriate commander, staff member, and the aviation unit liaison officers. 35

: recognize that massed troops, grounded aircraft, weapons, equipment, and supplies in a staging area invite destruction by the enemy. 36

: know that the supported unit (i.e., his squad when in a semi-independent role) is responsible for the security of the pick-up zone, and seek to obtain space and facilities for staging small AMF (Air Mobile Force) operations within the protected base area or within a friendly operational perimeter. 37

: coordinate with the LCGO (Loading Control Group Officer) to ensure that sling loads (if applicable) are spotted and ready for loading, anticipate last-minute changes in loading plans, and seek to minimize the effect of changes upon his unit's implementation of the ground tactical plan. 38

He will : submit and require each aircraft troop commander to submit to the platoon sergeant a simple loading manifest identifying the men, equipment, and aircraft chalk number of his aircraft load to a designated individual prior to take-off. 39

: recognize that loading manifests cannot be prepared during extraction under fire and require each fire team leader acting as aircraft troop commander on loading for withdrawal to identify and account for all his men and equipment. 40

: require all personnel to establish and maintain dark adaptation on a continuous basis during the hours of darkness when an Airmobile Ready Reaction Force mission is pending. 41

: particularly during night operations, require all personnel to know the exact locations of items for which they are responsible and to load and off-load these assigned items. 42

: ensure dissemination and proper use of the challenge and password to aid recognition after landing and forewarn all personnel against hasty delivery of fire during darkness after landing. 43

He must : know the following dangerous characteristics of rotor downwash: 44

a. It is most severe when helicopters are hovering in ground effect.

b. It changes to horizontal winds at the level of standing men, that may reach velocities of 75 knots within a radius of 1 to 1.75 rotor diameters of the helicopter.

: locate assembly positions for loading points after due consideration of the rotor downwash. 45

: know that winds generated by hovering helicopters will drive airborne particles with sufficient force to penetrate the cornea of the eye, and that airborne dust and sand will vastly increase the aircraft maintenance required for safe flight. 46

: consider the use of goggles, if available, during exposure to rotor wash and seek to avoid use of dusty, sandy landing zones within the limits imposed by the mission. 47

: know that wind chill and risk of frostbite are markedly increased by winds, and require that protective clothing and gloves be worn during exposure to rotor wash and during flight in open aircraft in cold weather. 48

: know that airborne dust and dirt may clog weapons mechanisms particularly during exposure to rotor downwash, so consider the use of issue covers or a single fold of light plastic to protect weapons while loading from a dusty PZ, and prohibit the use of excessive oil on weapons; if protective covers are used, ensure that they are removed well in advance of entry into a "hot" LZ and secured with personal equipment to eliminate any chance of their becoming entangled in the rotor blades if they are ripped off or discarded under fire. 49

: know that ponchos, poncho liners, parachute canopies, cargo nets, loose brush, tentage, and similar items will become airborne in rotor downwash to fly into main and tail rotors and cause aircraft crashes; require thorough police of all landing and hovering areas to clear all objects which may possibly be thrown into the rotors by downwash. 50

: require that helmets be worn with chinstraps fastened during flight, that all equipment which is not hand-held be fastened securely to the body, and keep men clear of danger areas where helicopters are hovering to make free drops of supplies or to release sling loads. 51

: require all personnel to move under main rotors with caution, to avoid tail rotors by habitually moving around the front of aircraft, to carry no item (e.g., radio antenna) projecting above the top of the head, and to carry no loose items that may be blown into rotors, since helicopter main and tail rotors are nearly invisible when running (invisible during darkness), and often are close to the ground in uneven terrain or because of tilt during landing or take-off. 52

: when scheduled to move in the Chinook (CH 47), instruct his men to load and exit through the rear door at an angle of 90 degrees to the door to avoid the low rotors in front and to avoid the 500-degree heat from the aircraft engines. 53

: when using the light observation helicopter, OH6A, ensure that personnel approaching the aircraft, when the rotor blade is turning, crouch so that the silhouette is no more than five feet tall; the rotor blade is only 7 feet from the ground on level terrain, and if the helicopter has landed on sloping terrain or on irregular ground the probability of contact with the rotor blades is increased. 54

: when boarding the OH6A, ensure that the head is placed into the aircraft first. If the individual elevates himself with the step and then lowers himself into the seat, he is likely to make contact with the main rotor blade. 55

: when loading or unloading, secure equipment such as fixed bayonets or swinging bipods to avoid damage to the aircraft; bayonets should not be fixed while loading or unloading unless tactically necessary. 56

: check the unit SOP and coordinate with the aviation unit liaison officer concerning the required briefing of the troop load by the aircraft commander and, during training, seek to familiarize all personnel with aircraft in common use and the content of the aircraft commander's required briefing to ensure safety and to limit briefing to a minimum in the staging area; cover the following subjects in SOP training: location and operation of emergency exits and fire extinguishers; location of first aid and survival kits; location and operation of portable emergency radio; use of safety belts; smoking rules; oral and visual signals; weapons handling safety and storage of crew-served weapons; when to unload and what priority; and procedure if downed in hostile area. 57

: forewarn his men to avoid jettisoning equipment or any other item from an aircraft except on order of the aircraft commander. 58

: caution his men to unhook web equipment (belt) when off-loading over inundated areas (e.g., flooded rice paddies or tidal flats) so equipment can be slipped off if the wearer is plunged into water over his head. 59

: seek to limit all internal loads to a weight and bulk that can be off-loaded and carried by one soldier as part of his combat load to limit exposure time during landing, off-loading, and movement to the objective. 60

: adhere to the requirements of supporting aviation units with regard to sling loading procedures and necessary equipment. 61

: load trailers and their prime movers on the same aircraft and have drivers ride with the vehicles they are to operate. 62

: require drivers to back vehicles into aircraft to permit driving forward to unload at the tactical LZ, but have drivers load by moving forward during extraction to minimize exposure time; this is applicable for both fixed and rotary wing aircraft. 63

4. THE IRSL WILL DEVELOP AND ENFORCE SQUAD SOP PERTINENT TO HELICOPTER LOADING FOR AIRMOBILE OPERATIONS AND PLAN AND SUPERVISE THE LOADING OF HIS SQUAD AND ANY ATTACHED PERSONNEL WITH THEIR WEAPONS, EQUIPMENT, AND SUPPLIES TO ENSURE TIMELY AIR MOVEMENT TO THE OBJECTIVE AREA OR TO FACILITATE EXTRACTION FROM A COMBAT AREA.

He will : know that the primary purpose of the air loading plan is to place adequately organized, armed, equipped, supplied, and briefed airmobile troops and their leaders aboard helicopters at the prescribed pick-up zone for timely movement to and initial deployment (through landing) in the prescribed objective area to accomplish their assigned missions in accordance with the AMF commander's ground tactical plan. 64

: know that the allowable cargo load (ACL) is the number of troops, or amount of cargo, or a combination by weight, cubic displacement, and distance that can be flown by one aircraft in one sortie. 65

: know that the ACL commonly stated in planning airmobile operations usually specifies the number of combat-equipped soldiers (averaging 240 pounds each) or an equal weight of equipment that can be transported between two designated points. 66

: know and adhere to specific guidelines to establish and maintain an SOP organization for loading his squad and normal attachments on helicopters for an airmobile operation: 67

a. Know the type of aircraft in common use and the usual ACL for the area of operations and plan SOP loads to make maximum use of each aircraft within the limits of the specified ACL.

b. Utilize the fire team leaders within the squad as aircraft troop commanders to command the airmobile troops within each helicopter load.

c. Maintain tactical integrity to the maximum possible degree within each helicopter load.

d. As a general rule on an airmobile assault, plan to load with the first members of his squad to touch down to keep abreast of the situation and to regain complete control of his squad as quickly as possible after they land.

e. As a general rule on an airmobile extraction, seek to be the last man to load to maintain maximum control of organic and supporting fires to cover the withdrawal of his men and to ensure that no vital equipment and none of his men are abandoned.

f. When medium helicopters (e.g., CH 47) are provided, the entire squad can be accommodated by a single aircraft.

He must : know the elements of information required to prepare a loading table or to convey meaningful loading instructions to his squad and attached personnel when verbal orders replace a written loading table: 68

a. Date, place (including the specific assembly area and loading site locations designated for use by his platoon), loading time, and station time pertinent to his unit's mission.

b. Designation of the aviation unit providing the lift for his unit.

c. Type and number of helicopters allotted, the ACL, and the chalk numbers of the aircraft allotted to his squad and attachments.

d. Loading formation and heading of the aircraft allotted to his squad as related to the location of chalk numbers within the formation. (This reduces confusion particularly during night operations, e.g., "Six aircraft, in trail, headed west, with chalk numbers 7 through 12 from front to rear; first squad will mount number 7 and number 8 with team A on 7 and team B with attached machinegun on 8.")

e. Relationship of the chalk numbers (aircraft positions) in the loading formation to their relative positions in the landing formation to provide optimum tactical deployment upon landing at the LZ/objective.

f. Radio frequency and call signs to be employed by troop commanders to maintain communication during loading, in flight, landing, and during completion of the mission (i.e., platoon command net as governed by SOI and SSI).

: conduct a map (or ground) reconnaissance of the pickup zone and select a landing site and landing points or become familiar with the ones assigned, to fit the loading formation to be employed, and fix and coordinate the locations and the heading with the officer in charge of the operation and the aviator in command. 69

: arrange for and coordinate pathfinder support to mark and control the pickup zone on the basis of advice from the aviation unit liaison officer, when on an independent mission. (A marker panel [or light] for the lead aircraft, to be placed by the aviation unit liaison officer immediately prior to the arrival of the lift, may be all that is required, if a requirement exists at all during unlimited visibility. Selection and marking of LZ/PZ for emergency use for extraction, casualty evacuation, resupply, etc., are covered in a later performance in this paper.) 70

: select and mark assembly areas for troop occupation immediately prior to loading. 71

: arrange for and brief guides as necessary to aid loading, e.g., movement from within the staging area to specified assembly positions for timely loading of equipment and troops, and ensure that personnel who are "bumped" are directed to report to the assembly area designated for the collection of these personnel. 72

He will : when responsible for conducting an airmobile operation as a semi-independent unit requiring withdrawal by helicopter: 73

a. Prepare and coordinate an additional loading plan, preferably as nearly identical to the loading plan used to mount the operation as possible; provide spaces for prisoners and captured equipment as applicable; anticipate casualties and provide spaces for evacuating seriously wounded personnel in the event medical evacuation isn't possible; coordinate the fire support required to cover the airmobile withdrawal.

b. Consider maintaining the helicopter lift scheduled to extract his force on station in the vicinity of the objective pending landing on call to limit the exposure of his lift helicopters to possible enemy fire in the LZ/objective area during extraction.

c. If the squad is the last to be extracted, plan for the use of Claymores and automatic weapons fire to suppress enemy attempts to engage them as the last unit; ensure that Claymores are out of backblast range of the PZ and that they are observed and covered by fire to prevent their being turned around.

d. Arrange for automatic weapons to deliver fire into the perimeter of the PZ just prior to liftoff; this fire can be continued if necessary by the door gunner after the last man is loaded.

5. THE IRSL WILL DEVELOP AND ENFORCE PLATOON SOP PERTINENT TO MOVEMENT BY HELICOPTER, CONTROL THE IN-FLIGHT BEHAVIOR OF HIS MEN THROUGH HIS AIRCRAFT TROOP COMMANDERS, AND, ON ORDER, HE WILL MONITOR THE PREPARATION AND COORDINATION OF THE AIR MOVEMENT PLAN TO SUPPORT A SEMI-INDEPENDENT AIRMOBILE OPERATION BY HIS SQUAD AND ATTACHED PERSONNEL.

He will : know that the primary purpose of the air movement plan is to provide the best possible aerial movement route from the PZ to the LZ and to coordinate, control and protect the airmobile troop column en route to ensure timely landing on the prescribed LZ at H-hour in support of the AMF commander's landing plan and ground tactical plan. 74

: know that a useful flight route permits a favorable approach (heading) to the LZ in the formation selected to implement the ground tactical plan; reduces fuel consumption to permit each aircraft to carry maximum ACL; avoids known enemy locations within the limits of the mission; provides maximum cover and concealment from enemy observation and fire; avoids friendly artillery, naval gunfire, and air strikes; provides easily identified checkpoints to aid navigation; and avoids areas of unfavorable weather. 75

He must : when designated to command a semi-independent airmobile force under the direct control of higher headquarters, anticipate that the air movement plan will be prepared by the battalion S3 or S3 Air in conjunction with the supporting aviation unit liaison officer and coordinated by staff members of the higher headquarters. 76

: know that the air movement plan will include the flight route diagram, including the PZ, SP, intermediate ACP, RP, and LZ; and that the air loading table is annexed to the air movement plan. 77

: know and apply basic fundamentals during the preparation and coordination of the air movement plan, e.g.: 78

a. To gain surprise and to limit exposure time for troops and aircraft, particularly for small, semi-independent operations, seek to move the personnel and equipment required to accomplish the mission in a single lift.

b. Know that low-level flight is conducted at a low altitude to avoid or minimize detection or observation by enemy ground observers and radar and that a low-level flight route is preselected and conforms generally to a straight line and a constant altitude above the terrain thus facilitating navigation as compared to nap-of-the-earth flight.

c. Know that nap-of-the-earth flight is as close to the earth's surface as obstacles will permit, i.e., it follows the contours of the earth to take maximum advantage of cover and concealment from detection, observation, and enemy fire.

d. Against an enemy equipped with high-performance aircraft and sophisticated antiaircraft weapons, anticipate low-level or nap-of-the-earth flight to avoid enemy fire.

e. Know the capabilities and limitations of pathfinder troops and utilize their advice and services in any operation where they are available.

f. Arrange to receive reports from armed helicopter aviators preceding his lift to the LZ when charged with execution of a semi-independent mission.

He will : recognize that direct supervision of his men during flight will be limited to the men aboard his helicopter; seek continually to develop effective in-flight SOP through observation and after-action critiques; e.g., aircraft troop commanders will: 79

a. Frequently check cargo lashings, prohibit unnecessary movement of troops, and emphasize that shifting of loads in aircraft increases the effort of the aviator to maintain safe flight; when safety permits, frequently check seat belts.

b. Require that any item passed from man to man within a helicopter be held securely.

c. Monitor, when possible, the aircraft interphone-radio net in flight to facilitate communication with the aircraft commander.

d. Maintain orientation (aircraft compass) and knowledge of location en route through use of strip map and time checks or through contact with aircraft commander; arrange for 4-minute alert warning prior to off-loading; and conduct maximum terrain reconnaissance on final approach and landing to ensure orientation on LZ.

e. On making landfall after over-water flights, order and supervise the removal and secure storage of life preservers.

f. If engine failure, abrupt and continuing descent, or signal from the aviator indicates an emergency landing, forewarn troops to assume emergency landing positions; check chin straps and seat belts; but leave emergency exits in place as possible protection from fire, to prevent loose exit covers from becoming missiles, and to keep the exit covers out of main and tail rotors.

g. Require all able-bodied men to clear downed aircraft rapidly, to avoid danger of fire or explosion; deploy security; evacuate injured personnel from aircraft and render first aid; retrieve unit and emergency radios, weapons, fire extinguishers, survival and first aid kits, etc., from aircraft; and aid organization under senior man present.

h. Remain with and secure downed aircraft, when possible, and establish visual and/or radio contact with any aircraft in the area; mark and clear landing point for extraction and recovery; destroy aircraft only on order of AMF commander or higher authority.

i. Recognize that balanced off-loading is necessary to flight safety during a hover and require troops to off-load equally and simultaneously from both sides to limit shifting the aircraft's center of gravity.

j. Forewarn troops that door gunners may continue to deliver suppressive fires during approach and landing, ceasing fire only long enough to permit off-loading.

k. Forewarn troops that helicopters generate heavy charges of static electricity and to avoid simultaneous contact with the ground and hovering helicopters.

l. When terrain prohibits landing, coordinate with the aircraft commander to hover as close to the ground surface as possible to prevent injuries likely to occur when men must jump from hovering helicopters.

m. Require use of compass directions in degrees for orientation on off-loading troops because lead and trail helicopters often will land at an angle to the direction of approach to the LZ so door gunners can effectively suppress hostile fire.

6. THE IRSL WILL ENFORCE PLATOON SOP PERTINENT TO THE ASSAULT LANDING PHASE OF AIRMOBILE OPERATIONS AND PLAN AND SUPERVISE THE LANDING OF HIS SQUAD AND ATTACHED PERSONNEL WITH THEIR WEAPONS, EQUIPMENT, AND SUPPLIES TO IMPLEMENT THE GROUND TACTICAL PLAN AS PART OF HIS PARENT UNIT OR AS COMMANDER OF A SEMI-INDEPENDENT SMALL-UNIT FORCE.

He will : know that the primary purpose of the landing plan is to ensure the timely massing of decisive numbers of adequately organized, armed, equipped, supplied, and briefed airmobile soldiers and their leaders on the prescribed LZ/objective with minimum exposure time in predetermined, deployed formations tailored to the demands of the AMF commander's ground tactical plan. 80

: know that the landing plan, as a minimum will specify the location and designation of the primary and alternate LZ's, fix H-hour, designate the landing formation(s) to ensure the desired ground tactical deployment of the initial and (if applicable) successive lifts, and specify the sequence of arrival of successive lifts when multiple lifts must be employed. 81

He must : know and apply these basic fundamentals during the preparation, coordination, and implementation of the landing plan in his role as IRSL or as the commander during semi-independent operations: 82

a. Know that the final decision on the usefulness of an LZ is based on the advice of the supporting aviation unit commander (or the aviation unit liaison officer for small, semi-independent operations).

b. Adopt the proper actions considering that the proximity of the LZ to the objective may bear directly upon the phases of the attack that must occur after landing:

(1) The LZ/objective may coincide to demand immediate assault upon landing.

(2) The LZ may be within assaulting distance of the objective so the boundary of the LZ in the direction of the objective becomes the Final CL.

(3) The LZ may serve as an attack position with the boundary of the LZ in the direction of the objective becoming the LD.

(4) When the LZ is at a greater distance from the objective, the area adjacent to the LZ may serve as an assembly area.

c. When surface conditions prohibit landing directly on or immediately adjacent to the objective, habitually study the routes to the objective with emphasis upon the conservation of energy of dismounted troops during movement to the objective.

d. Particularly during semi-independent missions, brief and rehearse to strike from either primary or alternate LZ's and unhesitatingly divert to the alternate LZ when it will permit the mission to be accomplished with fewer casualties and less battle damage to aircraft. (Note that this decision demands precisely timed armed reconnaissance.)

e. When forced to operate in lowlands, pay careful attention to ground elevation, drainage lines, tide tables, the effects of recent weather, and the probable effects of predicted weather during the selection of LZ's, since tidal mudflats, marshland, flooded rice paddies, and deeply drifted snow will not support the weight of a helicopter, will usually lack cover and concealment, and limit dismounted movement.

f. When selecting LZ's for semi-independent operations, view all large expanses of cleared area as possible fields of fire for the enemy; given a choice for landings, use the minimally adequate LZ that provides cover and concealment during final approach and landing.

g. Prior to any operation, drill his squad members in off-loading to minimize helicopter down time on the LZ, to avoid accidents and injuries, and to enhance control during the critical period of landing and initial assembly of each aircraft load; establish SOP.

h. Know that the responsibility for security passes to the ground commander upon landing and the adequate defense of an LZ can be maintained by adhering to the doctrine prescribed for the perimeter defense.

i. Orient himself as quickly as possible upon landing on the basis of aerial reconnaissance during the final approach, since enemy fire or unforeseen obstacles may cause variations in planned landing formations.

j. Use radio, arm-and-hand, and voice signals to vector his men from landing points toward assigned security positions, assembly areas, or the objective, as applicable.

k. Recognize that direct control and supervision of his squad and attached personnel cannot occur until the unit assembles after landing.

7. THE IRSL WILL CONTROL AND SUPERVISE THE SELECTION, DEFENSE, CLEARING, AND MARKING OF LANDING ZONES FOR RESUPPLY, AEROMEDICAL EVACUATION, REINFORCEMENT, AND EXTRACTION BY HELICOPTER UNDER ALL CONDITIONS OF WEATHER AND VISIBILITY. HE WILL PROVIDE INFORMATION TO AVIATORS WITHIN THE LIMITS OF AVAILABLE MEANS OF COMMUNICATION AS DEMANDED BY THE SITUATION.

He will : since an LZ within the perimeter of a defensive position enhances the tactical mobility of any unit that can be lifted by helicopters and permits rapid reinforcement, resupply, and evacuation, seek a useful LZ as an integral part of each defensive position. 83

: recognize that the selection of a useful LZ on the basis of a map reconnaissance alone often may be insufficient and that higher headquarters maintain detailed, current information on the location and usefulness of LZ's. 84

**He must** : in areas where LZ's are scarce, habitually report the map coordinates, the approximate size in meters, and the magnetic attitude in degrees (long axis of the LZ) of any potentially useful LZ discovered, e.g., POTENTIAL LZ, GRID 64819257, 150 BY 300, MAGNETIC ATTITUDE 200 DEGREES. (Known magnetic attitude may provide a basis for selecting a specific LZ from among several potentially useful ones when wind velocity and direction bear on landing capabilities.) 85

**He will** : assume that any useful LZ may be mined, boobytrapped, and under enemy surveillance; approach, reconnoiter, establish a perimeter defense, and clear accordingly. 86

**He must** : plan and coordinate the delivery of fires to limit enemy resistance during final approach, ground operations, and take-off, and prior to the delivery of these fires, inform the pilots. 87

: anticipate that resupply and aeromedical evacuation helicopters inbound to a hot LZ will have an armed helicopter escort to help suppress enemy fire. 88

: anticipate that helicopters landing or hovering will attract enemy reconnaissance and draw enemy fire; therefore, plan to resupply just prior to departure from a temporary LZ, and avoid tarrying at LZ's after the departure of helicopters. 89

: on a single-ship mission, anticipate that the aviator may turn the aircraft to the proposed direction of take-off or away from a known source of enemy fire; prior to touching down, forewa . all personnel against premature approach to and possible contact with the tail rotor. 90

**He will** : know, and ensure that his fire team leaders and key personnel know, the minimum useful dimensions and characteristics of an adequate LZ for use by each class of helicopter in common use to include: 91

a. Diameter of the landing point to be cleared to ground level to permit touchdown.

b. Diameter of cleared space around the landing point to be cleared to within one meter of the ground to provide maneuver space during touchdown and lift-off.

c. Length of approach and take-off paths as related to obstacle height.

: know that aircraft can best land and take-off directly 92
into the wind, select and clear LZ's with the long axis coinciding with the direction of the prevailing wind, and designate approaches for landing into the wind, particularly during limited visibility.

: when a vertical landing is unavoidable, forewarn the 93
supporting aviation units; when in doubt as to the usefulness of the LZ for landings and take-offs with the required ACL, request a hoist.

: seek terrain with a slope not exceeding 15 per cent 94
because either an up-slope or down-slope landing is likely to demolish rotors through ground contact.

: seek to provide a landing point cleared to ground 95
level to permit aviators to take maximum advantage of ground effect (a cushion of dense air confined between the helicopter rotor system and a smooth, firm surface that increases lift), particularly during limited visibility and with small LZ's.

: when terrain slope demands a cross-slope landing or 96
low hover, require all personnel to move from the lower elevation upward toward the helicopter to avoid possible contact with rotors on the up-slope side. (Applies to all loading, but is particularly pertinent to litter-bearers likely to focus attention upon the casualty during movement to place litters aboard evacuation helicopters.)

: leave as much grass-covered sod as possible on LZ's 97
when clearing them; and recommend the use of "peneprime" or a similar oil base dust palliative on bare LZ's that must be kept in use in semi-static positions.

: in areas where heavy rains may make water depth and 98
current speed highly unpredictable, seek to avoid the use of sand bars and stream beds for LZ's except for immediate and temporary use.

He must : know that tanks may be used to push down and drag away 99
trees when clearing emergency LZ's and that tracked vehicles may be used to crush underbrush and tall grass and to pack areas of deep snow.

: control the direction of fall of standing timber to 100
reduce LZ clearing time by designating the locations of saw and ax kerfs and points for placement of explosive charges to facilitate clearing and to avoid blocking cleared space.

: seek to clear a landing surface for touchdown (instead of hovering) to increase flight safety, to reduce aviator stress and engine wear, and to ease the loading of seriously wounded litter patients, since skid-type landing gear provides only some 15 inches of fuselage clearance. 101

: make maximum effort to remove or clearly mark and report obstacles to safe flight, with increased emphasis on the problem during limited visibility. 102

: recognize that any aircraft commander may refuse to land upon an LZ not deemed suitable for its intended purpose; ask for and welcome suggestions from incoming and departing aviators for the improvement of any emergency LZ that must be continued in use. 103

: seek to limit use of power hoist evacuation to daylight hours if the tactical situation and the condition of casualties will permit when the location or clearing of an LZ is not feasible or not compatible with the mission; meet demands through the use of free-fall delivery and power hoist evacuation with slings, Stokes litters, and cargo nets. 104

He will : know the display configurations, the colors, and the meanings of smoke-, panel-, and light-marking signals as prescribed in the SOI or as verbally coordinated for a specific mission; ensure the availability and serviceability of all items required for marking LZ's, PZ's, DZ's (Drop Zones), and hoist evacuation points and for emergency signals (e.g., CEASE FIRE, DO NOT LAND); and supervise the display of signals. 105

He must : follow specific guidelines when using panels and smoke markers for helicopters during daylight to aid in maintaining security and to limit the exposure of friendly air and ground personnel to enemy fire, e.g.: 106

a. Display only the visual signals that are vital to the location and identification of the LZ.

b. Do <u>not</u> transmit smoke or panel colors in the clear and thus invite enemy attempts to display similar signals to ambush or confuse approaching friendly aviators; when smoke or panels are displayed, have lead aviator confirm colors to reinforce LZ identification.

c. Use smoke colors that contrast sharply with the background against which the colored smoke must be detected by aviators, e.g., yellow smoke against green foilage, green or violet smoke against snow or dried vegetation; reserve red smoke for emergency signals.

d. When using colored smoke grenades on sites covered with dry vegetation, dig a hole or place grenade in a tin can to avoid igniting grass and brush fires; when using smoke grenades in flooded or snow-covered areas, support the grenades with stones or tree branches to avoid quenching.

e. Use colored smoke (allow 3 to 5 minutes for penetration of jungle canopy) or hand held flares to mark locations in dense jungle; anticipate, however, that smoke above the canopy will drift and thus indicate only approximate locations; "talk" the aviator directly over the desired drop point to ensure accurate delivery of supplies or the forest penetrator and evacuation harness.

f. Know that mirrors can be used to signal visible aircraft during clear sunny weather in emergency situations, and that white cloth or lightweight nylon panels may be substituted for issue panels in an emergency.

He will : adhere to the following specific guidelines when marking LZ's with issue and field expedient devices during darkness so that pilots may maintain their night vision: 107

a. Know that strobe lights are easily seen from the air, but may look like muzzle flash to the aviator; if available, they may be effectively used to signal aircraft; the use of colored filters and <u>coordination with the aviator</u> can ensure the proper identification of the light source; steady and flashing light may also be provided by "bean-bag" type runway lights, for which colored filters are normally available; strobe lights and bean-bag runway lights are not TO&E equipment but, if available, should be considered for use.

b. Face <u>subdued</u> lights <u>toward</u> approaching aircraft during night marking; avoid use of harsh, glaring lights because they will cause loss of night vision by aviators, particularly during final approach, hovering, landing, and take-off.

c. If beamed lights must be used in an emergency, keep the beams parallel to or on the landing surface and <u>avoid beaming any unshielded light toward the cockpit</u>.

d. Know that flare pots (cans filled with sand and saturated with fuel) may be used to mark an LZ in an emergency; anticipate that rotor wash may extinguish open flame markers and detail personnel to keep them ignited.

e. Know that hand-held pyrotechnics may be projected directly above the LZ to aid incoming aircraft crews to gain a direction in degrees toward an LZ; forewarn aircraft commander to watch horizon for flare prior to firing, then have him identify the signal by color and type.

: anticipate that in lieu of ground signals the helicopter element leader may use his FM homing device to locate the ground unit; therefore, will request a "long count," i.e., depression of the supported unit's radio microphone and counting from 1 to 10 into the microphone. (Avoid a lengthy depression of the push-to-talk switch; give the aviator a chance to break in every few seconds; if he needs an additional signal for direction he will call for it.) 108

He must : on a single-ship mission (e.g., medevac or resupply) at night, anticipate that the aircraft will arrive blacked-out to limit ease of tracking by enemy gunners; watch and listen for the aircraft to aid detection, vectoring, and landing with minimum exposure time. 109

He will : use and supervise the use of arm-and-hand and light signals to guide aircraft. 110

: be able to control helicopters by using the following signals under all conditions of visibility: approach, wave-off or go around, hover, move forward, move rearward, move right, move left, move upward, move downward, hook-up completed, take off, land, and cut engines. 111

: seek to coordinate the movement to and clearing of LZ's with the arrival of aircraft on a timely basis with minimum hazard and exposure time for air crews and supported units alike. 112

He must : use aerial fire support and indirect fire support to cover extractions and thus avoid losses likely to occur when using dismounted security at a distance from the PZ perimeter. 113

He will : to coordinate extraction, provide all pertinent information concerning the PZ and situation. 114

He must : provide essentially the same basic information as for extraction to facilitate reinforcement, except to determine the strength of reinforcing unit as a basis for planning deployment upon arrival at the LZ. 115

He will : during extraction under fire, plan and direct the evacuation of casualties, i.e., require litter patients incapable of fire delivery to be loaded first, ambulatory casualties unable to deliver fire next, and ambulatory casualties capable of delivering fire last to maintain maximum available fire for the defense of the PZ during extraction. 116

: during preparation for extraction during darkness in monotonous terrain, consider marking the entire perimeter to facilitate maximum delivery of close suppressive fires by armed helicopters with minimum danger to friendly troops; avoid marking friendly perimeters where air superiority is doubtful or where marking will give the enemy an obvious advantage. 117

: seek to gain at least temporary fire superiority through the use of all available supporting and organic fires to permit relatively safe landing of helicopters. 118

: if the command radio net is loaded with tactical traffic, seek to use another radio on an alternate frequency to provide landing instructions without interferences to the tactical traffic. 119

: require men with automatic weapons and grenade launchers to load last to maintain the maximum volume of fire to cover all loading and take-offs of initial lifts. 120

: if they are attached for a semi-independent operation, designate radio operators and attached forward observers to load on the last aircraft so as to maintain the most effective control of supporting fires. 121

: report to higher headquarters when the last helicopter clears the LZ so that air strikes, artillery, or naval gunfire can be directed upon the massed enemy after friendly personnel clear the PZ. 122

He must : when being <u>reinforced</u> seek to establish communication with and brief the incoming commander by radio en route to the LZ; meet the commander of the reinforcing unit on the LZ to facilitate coordination; and provide all available vital information and necessary fire support to the reinforcing unit. 123

8. THE IRSL WILL ENSURE USE OF PROPER PROCEDURES AND EQUIPMENT USED IN SPECIAL OPERATIONS RELATED TO AIRMOBILITY INCLUDING THE USE OF HELICOPTERS, AND WILL TRAIN HIS MEN TO ACCOMPLISH RESUPPLY, AND MEDICAL EVACUATION, AND TO USE TROOP LADDERS AND RAPPELING AS A MEANS OF INSERTION OR EXTRACTION WHEN SUITABLE LZ'S ARE NOT AVAILABLE.

He will : know the categories of priorities for evacuation; and, with the aid of the platoon medical corpsman, determine and assign priorities for evacuation to specific casualties in accordance with their need for medical treatment, i.e.: 124

a. Urgent: Emergency cases requiring immediate evacuation to save life or limb or to prevent serious complications if medical treatment were delayed, e.g., gunshot wound of the abdomen or sucking chest wound.

b. Priority: Patients requiring prompt medical care not available locally; to be evacuated within 24 hours, but usually picked up during daylight hours of day request is sent. (If patient can be made comfortable for few hours more without injury to health and without sericusly interfering with the mission, list as priority.)

c. Routine: Patients requiring evacuation within 72 hours for treatment in stabilized medical treatment facilities.

d. Tactical Urgent: Patients requiring professional medical treatment not locally available and retention with unit will interfere with unit mission to a significant degree. (Usually treated same as Urgent.)

: if in doubt as to which one of any two priorities to assign, assign the priority that will expedite evacuation and permit the small unit to continue the assigned mission unhampered by wounded or ill men. 125

He must : usually request evacuation through his own unit command net, but know the aeromedical evacuation call signs and frequencies for the area of operations and initiate direct communication in emergencies in accordance with unit SOP. 126

: provide the following minimum information when requesting aeromedical evacuation: 127

a. Call sign, radio frequency, and alternate radio frequency of the unit to be contacted at the pick-up site.

b. Number of litter patients and number of ambulatory patients.

c. Type of injuries and special equipment required.

d. Priority of evacuation, i.e., urgent, priority, routine, tactical urgent.

e. Nationality and status of casualty, e.g., U.S. military, ARVN, Australian military, Vietnamese civilian, Viet Cong, etc. (Flight origin and final destination may be based upon nationality and status of casualty.)

f. Six-figure coordinates of pick-up site and desired ETA of aircraft at pick-up site.

g. Tactical security of pick-up site, including requirement for armed helicopter escort.

h. Weather and terrain at pick-up site.

i. Markings (smoke, panels, lights, etc.) to be displayed or available for display on call at the pick-up site.

j. Number of landing points available for simultaneous landing of helicopters or requirements for harness and power-hoist equipment when no landing points are available at pick-up site.

He will : know that use of the power hoist to evacuate casualties from wooded areas is hazardous for the helicopter crew and the casualty, particularly during darkness or other limited visibility; that aviators prefer to land at a small LZ rather than to use the hoist; and, if the hoist must be used, defer evacuation until daylight if the mission and the condition of the casualty will permit. 128

: evacuate weapons and equipment not needed by the platoon with the casualties to whom assigned or with KIA's on the first available back-haul. 129

: permit ambulatory casualties capable of delivering fire to retain their individual weapons and ammunition during evacuation for self-defense in the event the helicopter is forced down by enemy fire. 130

: require his men to limit the length of poles used in field-expedient litters to aid rapid loading of helicopters. 131

He must : anticipate the need for resupply; prepackage critical items in one-man loads for delivery on call when possible; when requesting resupply provide all information pertinent to the location and status of the LZ to be used. 132

He will : expedite helicopter resupply by organizing a team to move back-haul to each helicopter immediately upon firm touchdown (or signal from a low hover) to off-load, load back-haul cargo, remain with the load until take-off, and remove the load from the LZ. 133

: make maximum use of resupply helicopters for back-haul cargo including casualties, KIA's, excess arms and equipment, prisoners, captured documents, and captured materiel; use rubber bags, mail bags, hammocks, and rope lashings to package back-haul cargo in one-man loads to facilitate rapid loading and to aid loading by power hoist when demanded by the terrain and mission. 134

: when no LZ is available, anticipate resupply by free drop, parachute, or power hoist; require men to take cover to avoid injury from falling resupply packages. 135

: within the limits imposed by the mission and the situation, seek to recover <u>all</u> items delivered to avoid loss to the enemy. 136

He must : know that use of the trooper ladder will permit the deployment of airmobile troops in areas not suitable for landing or low hovering and recognize that the time required to move dismounted, combat-loaded men to a cleared area or to clear an area for helicopter landing during extraction often can be saved with significant tactical advantage. 137

: know that the availability of trooper ladders often is limited; that ladders are not normally carried and must be installed on order for specific operations. 138

He will : know that the installation, maintenance, deployment, and recovery of the trooper ladder is an aviation unit responsibility, but recognize that safety during use of the ladder is a <u>joint</u> responsibility and establish SOP to be enforced by each <u>aircraft troop commander</u> to promote safe and confident use of the equipment, e.g., each <u>aircraft troop commander</u> will: 139

a. Conduct a joint inspection of the installed trooper ladder with the aircraft commander to ensure adequate installation and to detect and correct inadequate installation, frayed cables or tie-down straps, cracked tubing, missing safety pins from snap fasteners, or any sharp edges or extending wires likely to cause injury or snagging of equipment.

b. Require men to secure weapons and equipment to their bodies to prevent loss, to permit both hands to be used on the ladder, and to prevent snagging equipment on ladder rungs.

c. Consider the use of goggles, if available, to protect the eyes from injury by flying grit and trash thrown up by rotor downwash.

d. Brief his load of troops prior to planned use of the trooper ladder for landing and extraction.

e. Instruct the men to keep their weight on their feet, to use their legs to lift or lower their weight, to place each foot deliberately prior to shifting weight, and to use their hands and arms to maintain balance and to hold the ladder close to the body.

f. Designate the order to exit to put fire team leaders, followed by their own men, on the ground in organized groups and instruct the men to unstrap and move from seat to exit individually on signal from the crew chief to limit the number of men on the ladder to 5 or 6 men at any given time.

g. Brief his men on emergency procedures; i.e., if the helicopter starts settling, stay calm, remain on the ladder, watch the ground, step off the ladder at ground level, and move rapidly from under the helicopter to clear the rotor arc; if the aircraft comes under fire, place no additional personnel on the ladder, signal troops on the ladder to expedite descent or ascent to clear the ladder, and abort the mission on the basis of prior orders and the recommendations of the aircraft commander.

h. Ensure that the free end of the ladder is <u>on the ground</u> and that the helicopter is in a steady hover prior to use of the ladder.

i. During landings, require two of the first men down (in addition to local security) to anchor and steady the ladder for descending troops; during extractions, designate two men to anchor and steady the ladder and ascend last.

j. During extractions, forewarn men not to grasp the ladder until it touches the ground to avoid shock from static electricity.

He must : seek to qualify all squad members and normal attachments to ascend or descend a troop ladder for 100 feet with a fighting load without halting to rest or to adjust equipment. 140

: train replacements as soon after they join the unit as is practicable to qualify them to use the trooper ladder safely and with confidence. 141

: provide periodic (e.g., monthly) practice in use of the trooper ladder to maintain confidence and proficiency among his men; utilize field expedients when equipment or aircraft are not available. 142

He will : know that rappelling is a specialized technique useful only for landing in areas lacking adequate space for the landing or low hovering of helicopters; that rappelling lacks both the versatility and the simplicity common to use of the trooper ladder; and that rappelling usually is limited to special missions, such as long-range patrols. 143

: know that well-trained and disciplined airmobile soldiers can master the critical knowledges and skills required for rappelling in approximately eight hours (TC 21-4). 144

9. THE IRSL WILL ENSURE CONTINUAL SYSTEMATIC OBSERVATION FOR HOSTILE TARGETS SUITABLE FOR ENGAGEMENT BY ARMED HELICOPTERS AND FIXED-WING AIRCRAFT.

He must : know that the primary mission of armed helicopters is to destroy or suppress the enemy by delivering concentrated aerial firepower that will neutralize selected enemy targets and materially assist the ground commander in accomplishing the mission. 145

: recognize and continually emphasize to his men the absolute necessity to navigate accurately and maintain effective communication as essential to accurate and rapid vectoring of armed aircraft to the target area where friendly units and the target must be accurately located and identified on the ground to ensure safe and effective delivery of fire. 146

He will : know, and ensure that fire team leaders know, the command channels used to obtain armed helicopter fire support and close tactical air support, the frequencies and call signs of the supporting armed helicopter element leaders and those of the forward air controller (FAC), and the authentication procedures and brevity codes required to ensure secure communication. 147

: know that armed helicopter communication usually is most effective when operating on the supported unit's command frequency, particularly during special operations, so the armed helicopter element leaders can monitor all unit transmissions, keep abreast of the tactical situation, and be ready for any contingency. 148

: ensure that all personnel know the signals for lifting friendly aerial fire support by inspections and spot checks that the necessary signal devices (radio, panels, pyrotechnics) are available. 149

: forewarn his men to anticipate that armed helicopters may shower friendly troops with empty cartridge cases, metal belt links, and M79 cases when firing passes must be made over friendly troops; require helmets to be worn; and ensure that cartridge cases, etc., are <u>not</u> mistaken for bullets, thus causing unwarranted display of cease fire signals. 150

: know that armed helicopters (or FAC aircraft) orbiting or hovering around an unengaged friendly unit will indicate the probable location of that ground unit to the enemy. 151

He must : <u>know the techniques of engagement commonly employed by aviators</u> providing aerial fire support, and anticipate that aviators will: 152

a. Conduct attacks at maximum airspeeds consistent with accuracy to suppress or destroy the enemy with minimum delay and to reduce helicopter exposure time to enemy fire.

b. Begin firing at the armament subsystem's maximum range to hasten effective engagement, provide maximum time for fire adjustment (by the aviator and crew) during each run, and to reduce enemy opportunity to return fire.

c. Keep targets under continuous fire throughout the attack to facilitate maneuver by friendly air or ground elements and to limit enemy ability to fire or move in defense against aerial fires.

d. Continue all effective fires from each helicopter during disengagement to maximize the effect of destructive or suppressive fires.

e. Use a minimum of two armed helicopters (light fire team) in any attack to permit use of fire and maneuver, provide mutual support within the element, and to ensure the availability of sufficient ordnance to accomplish the team mission with uninterrupted fire.

f. Use three armed helicopters (heavy fire team), when possible, to provide continuous fire on the target and maximum flexibility in tactical engagement.

g. After subsequent firing passes as to direction and altitude to ensure most effective coverage of the target despite enemy use of cover and concealment and to limit the ability of the enemy to return fire.

h. Avoid overflight of the target or known or suspected enemy positions to reduce helicopter vulnerability to enemy fire.

i. Orient attack patterns (formation, direction of flight, altitude, and attitude of aircraft) to obtain maximum effect of beaten zones and dispersion patterns as demanded by terrain, targets, and mission.

j. Make maximum use of available cover and concealment, the effect of sun glare on enemy observation and fire delivery, and suppressive fire delivered by ground troops in coordination with firing runs.

He will : know that armed helicopters deliver either <u>suppressive</u> or <u>destructive</u> fires; that <u>suppressive</u> missions prevent enemy delivery of effective fire and restrict enemy movement for the duration of the mission; that <u>destructive</u> missions aim to inflict high casualties upon enemy personnel and equipment; anticipate that <u>suppressive</u> fire will be delivered unless otherwise requested. 153

He must : know the types of ordnance available from armed helicopter support and the characteristics, capabilities, and limitations of such ordnance. A complete and detailed description of the target will enable fire support coordinators to request the most suitable type of ordnance for the target. 154

He will : know that the USAF airborne forward air controller (FAC) is an experienced tactical fighter pilot with extensive knowledge of tactical air ordnance capabilities and fighter delivery techniques; that each FAC is specifically trained to coordinate and control close air support by USAF fixed-wing aircraft according to plan in support of the ground commander; and that the FAC communicates directly with supporting USAF tactical aircraft and with the supported unit. 155

: know that the FAC may operate on the ground during special operations, but is most effective when airborne in a fixed-wing aircraft or helicopter that provides an aerial view of the battlefield and reliable communications. 156

: establish direct communication with the FAC and initiate calls for fire by using essentially the same techniques and procedures employed when calling for and adjusting fire delivered by armed helicopters except to rely upon the FAC to interpret and relay instruction to the supporting USAF aircraft. 157

: in the absence of prearranged plans, rely upon the FAC to select the ordnance for delivery by fixed-wing aircraft on the basis of an adequate description of the target as contained in the call for fire. 158

: know the general characteristics of ordnance available within the system and considerations that might influence ground operations, e.g., entering an area after the delivery of cluster bomb units (CBU) could produce casualties to friendly personnel; unexploded bomblets could be detonated by friendly troops. 159

: know that the FAC can be requested to: 160

a. Contribute to the safety of supported troops by recommending the application of specific aerial ordnance to an enemy target in relation to the location of ground troops to the target.

b. Provide information as to the usefulness of movement and maneuver routes for ground troops on the basis of his detailed knowledge of his assigned area of operations.

c. Call for and adjust naval gunfire, artillery fire, and armed helicopter fire (in addition to fixed-wing air strikes) upon targets designated by units on the ground.

d. Maintain surveillance over an area or along a route to increase security, to detect targets of opportunity, and to report the location of known or suspected enemy positions.

e. Mark targets with rockets or smoke grenades to increase the accuracy of fire from the ground unit's organic weapons.

f. Call for and vector medevac, resupply, and rescue aircraft to a specific point in support of ground units.

g. Provide radio relay service between a small unit and parent unit in emergencies when combinations of distance and terrain masks interrupt ground communication.

h. Vector small units around obstacles or to the nearest useful PZ/LZ to facilitate extraction, medical evacuation, or resupply.

i. Call for, coordinate, and control fixed-wing flare ships to provide emergency illumination of the battlefield in support of ground units.

j. Confirm or designate the location of friendly ground troops to aid navigation during tactical movement.

k. Locate and report the ground location of a friendly unit whose location is otherwise uncertain.

: coordinate requests for aid from the FAC through the company command net except when an emergency situation (as defined by unit SOP) warrants direct contact on the FAC's frequency. 161

: recognize that FAC aircraft are unarmed except for rockets used to mark targets and have no recourse but to take aerial evasive action against enemy fire; forewarn the FAC of any air or ground threat noted at any time. 162

: know that a vertical radio antenna radiates signals 360 degrees around the long axis of the antenna; to increase signal strength during air-ground communication, orient the long whip antenna more nearly parallel to the ground with the tip of the antenna pointing in the direction opposite from the estimated direction of the approach of the aircraft, but ensure that the antenna is not grounded by contact with vegetation. 163

10. THE IRSL WILL FORMULATE AND TRANSMIT CALLS FOR FIRE BY USING PERTINENT ELEMENTS OF THE TARGET-GRID METHOD OF FIRE CONTROL WHEN EMPLOYING AERIAL FIRE SUPPORT; HE WILL INSTRUCT AND SUPERVISE HIS SUBORDINATE LEADERS AND SELECTED POTENTIAL LEADERS IN INITIATING CALLS FOR AERIAL FIRE SUPPORT.

He will : initiate a call for aerial fire support using the prescribed sequence to call for indirect supporting fires except specifying degrees instead of mils in citing directions to permit reading the directions in degrees directly from the compass on the aviator's instrument panel, i.e.: 164

(1) Observer identification and exact location.

(2) Location of target.

(3) Description of target.

He must : select a clearly visible point near the center of the target area as the adjusting point when requesting suppressive or destructive fire on an area target; when calling for destructive fire on a point target, use the target as the adjusting point. 165

: establish the observer-target (OT) line as the magnetic direction, measured to the nearest five degrees, from the observer's position to the adjusting point. 166

: avoid marking friendly troop positions when timely and accurate aerial fire support can be obtained without display of smoke or panels. 167

: when necessary, mark the observer's position with panels or colored smoke as prescribed by the SOI and mark the outer periphery of friendly troop locations in the direction of the target. The system must permit the aviator to discriminate between the location of the observer and the locations marked to indicate friendly troop limits, e.g., three panels may be displayed to mark troop limits in the direction of the target with the observer located at the center panel or two panels 10 meters apart may be used to mark the observer's position while single panels are used to indicate the limits of friendly troop positions. 168

He will : initiate a call for aerial fire support by transmitting the call sign of the supporting unit followed by his own call sign as (1) Observer identification and exact location. 169

He must : transmit (2) Location of target by announcing prearranged data, use of grid coordinates, reference to a known point (shift), polar coordinates, marking rounds, or organic weapons fire. 170

: announce the target designation followed by the OT direction, e.g., TARGET ALPHA ECHO FIVE; MAGNETIC DIRECTION 320 DEGREES to use prearranged data to strike a preplanned target. 171

: announce the grid coordinates from the map to the nearest 10 meters when possible (or to the nearest 100 meters as a minimum requirement), then announce the OT direction, e.g., GRID 49163961; MAGNETIC DIRECTION 20 DEGREES. 172

: locate a target by reference to a known point by transmitting the designation of the known point, the magnetic direction from the observer to the target (OT line), the lateral shift, and the range shift in the order cited, e.g., FROM ROAD JUNCTION 426; MAGNETIC DIRECTION 20 DEGREES; RIGHT 150; ADD 200. 173

: in using polar coordinates, inform the supporting aviator of the observer location (e.g., marked with panels or smoke), then transmit the magnetic direction from the observer's position to the target (OT line) and the distance (OT range) to the nearest 50 meters from the observer's position to the target, e.g., MAGNETIC DIRECTION 200 DEGREES; DISTANCE 750. 174

: use marking rounds to establish an exact ground location by calling for a rocket to be fired or smoke grenade dropped at a map coordinate estimated to be well away from friendly troops but in a visible area, e.g., MARK GRID 43216984. 175

: use organic weapons fire to locate a target, ensuring that the fire will converge upon or burst on the adjusting point and alert the aviator to observe for the type of fire delivered, e.g., employing the M79 or LAW and transmit: WATCH MY HE BURST; MAGNETIC DIRECTION 15 DEGREES. Alternatively use converging tracer fired from two sources simultaneously and transmit: WATCH MY TRACER; MAGNETIC DIRECTION 15 DEGREES. 176

He will : to transmit (3) Description of target, briefly describe the installation, personnel, or activity observed; state the approximate number of personnel or materiel; announce the dimensions in meters to the nearest 50 meters; announce the magnetic azimuth of the long axis (ATTITUDE) of linear or rectangular targets to the nearest five degrees; and the RADIUS of circular target areas in meters, e.g., 50 INFANTRY DIGGING IN ALONG RIDGE; 50 by 300; MAGNETIC ATTITUDE 315 DEGREES. 177

: omit (3) Description of target when requesting marking rounds to determine exact ground location. 178

: recognize that an adequate description of the target is vital to the flight leader (or FAC) to establish priorities for the delivery of fire, to determine the amount and type of ordnance most useful for attacking the target, and to aid in determining the direction and technique of attack. 179

He must : recognize when adjusting aerial fires that 2.75 rockets and 40mm grenades provide bursts that are easier to spot than machinegun fire. 180

He will : when calling for and adjusting aerial fires anticipate a read-back by the aviator (or FAC) of the data transmitted after the first two elements and after the second four elements, or after each element if communication is poor or if jamming occurs. 181

: monitor each read-back and ensure that the aviator has received the data correctly. 182

: anticipate the elimination of call signs to save time after identities have been established and when no confusion will result. 183

: read back all transmissions originating with the aviator that are pertinent to the fire mission he is conducting. 184

He must : to correct an error, announce CORRECTION, followed by the element in its correct form. 185

a. Upon noting an omission, error in transmission, or error in aviator read-back pertinent to location of the target, transmit correction immediately, followed by the complete location of the target.

b. If any element other than a target location is omitted or incorrectly stated, transmit the corrected element to the aviator as a separate transmission.

He will : transmit CHECK FIRING to halt firing immediately upon discovery that friendly personnel are in danger or for any other reason; transmit CANCEL CHECK FIRING to continue a fire mission. 186

: transmit END OF MISSION to end firing on a specific target or to terminate the delivery of suppressive fire. 187

He must : respond correctly to standard phrases such as those transmitted to the observer by the aviator during the conduct of fire: 188

a. Anticipate announcement of ammunition type by the aviator when no ammunition type was requested by the observer or when ammunition to be fired is different from that requested by the observer and observe for bursts indicated by the announced ammunition type.

b. Interpret FIRING FOR EFFECT as an announcement to the observer that fire for effect is commencing and as a cue for the observer to focus on the target area and prepare to report results of fire or make corrections.

c. Respond cooperatively to information and advice from armed helicopter element leaders and FAC's during the conduct of fire, and query aviators to obtain specific information since aviators often have a better view of ground targets than the ground observer.

He will : when able to see bursts on or near the target, though the aircraft is not visible, determine and report the necessary corrections to the aviator; the burst location for range with respect to the adjusting point along the OT line, and for directing the lateral deviation of the burst from the OT line employ these techniques for spottings, always keeping in mind the next rounds are to hit the target. 189

a. Spot bursts that appear beyond the adjusting point as OVER (so many meters).

b. Spot bursts that appear between the observer and the adjusting point as SHORT (so many meters).

c. During a DESTRUCTION mission on a <u>point</u> target, spot a burst that hits the target as TARGET.

d. In destructive or suppressive fire on an <u>area</u> target, spot a burst at the proper range as RANGE CORRECT.

e. Spot an observed burst as DOUBTFUL when it cannot be sensed for range as OVER, SHORT, TARGET, or RANGE CORRECT and make a correction to permit a positive spotting on the next delivery of fire.

f. Spot a burst as LOST upon the receipt of SHOT, OVER, from the aviator when the burst can neither be seen nor heard.

11. THE IRSL WILL, AFTER SPOTTING THE INITIAL BURST OF AERIAL FIRE, FORMULATE AND TRANSMIT SUBSEQUENT CORRECTIONS TO COMPLETE THE FIRE MISSION; HE WILL INSTRUCT AND SUPERVISE HIS SUBORDINATE LEADERS AND SELECTED POTENTIAL LEADERS IN SUCH ADJUSTMENTS OF FIRE.

He must : provide only minimum essential corrections and take maximum advantage of the aviator's experience and clarity of the target to speed the adequate and effective delivery of fire on the designated target; announce FIRE FOR EFFECT to speed fire delivery and reduce exposure time. 190

He will : formulate and transmit subsequent corrections to control an aerial fire mission, using the prescribed sequence given below for subsequent corrections of indirect fires except to omit any element not pertinent to the specific mission specifying degrees in citing magnetic directions, i.e.: 191

(1) Magnetic direction (when it deviates more than 10 degrees from previous magnetic heading).

(2) Type of ordnance (change as required by results observed to achieve desired effect).

(3) Deviation (correct right or left to nearest 10 meters from the OT line).

(4) Range (correct ADD or DROP to nearest 25 meters for point target and to nearest 50 meters on other targets).

(5) Control.

He must : know that in planning missions prior to an operation specific types of ammunition (e.g., bombs, rockets) may be fuzed based upon knowledge of likely targets and upon advice from the aviation unit liaison officer and the USAF liaison officer or FAC. 192

He will : exercise Control during adjustment and during fire for effect: 193

a. Recognize that the aviation leader's aerial view of the target area may permit positive identification of the target without need for adjustment; prearrange for the element leader to report, i.e., transmit TARGET IDENTIFIED; CAN FIRE FOR EFFECT; OVER. Return such transmissions with: AT YOUR COMMAND; FIRE FOR EFFECT; OVER. To regain control, transmit: CANCEL AT YOUR COMMAND, OVER.

b. Anticipate the need for intra-element communication between aviators on the fire control frequency during adjustment; pause between fire commands to permit vital break-in operation by aviators; and avoid any break-in that interrupts an aerial leader's instructions to his team leaders or that interferes with the exchange of essential information among aviators.

c. Seek habitually to obtain accurate and adequate fire for effect with minimum loss of time since prolonged adjustment permits the enemy to take cover or move, wastes limited aircraft fuel and ordnance loads, and increases exposure time of friendly aircraft to enemy fire.

He must : observe the result of suppressive and destructive fire on area targets and take appropriate measures toward completion of the mission to include: 194

a. If fire was effective and sufficient, announce END OF MISSION and report effect observed.

b. If fire was accurate, but insufficient, request REPEAT and anticipate repetition of fire based on same firing data as initial fire for effect.

c. If any element of the adjustment was sufficiently in error so that the effect sought was not obtained, transmit the necessary correction(s) and request repetition of fire for effect, e.g., RIGHT 50; ADD 50; REPEAT.

d. Make successive shifts to ensure adequate coverage of the target, e.g., LEFT 100; REPEAT, when the fire power delivered was inadequate to cover the specified target area effectively.

e. Record information prior to and during the conduct of fire to facilitate rapid and accurate fire control guidance to aerial fire support units, e.g., determine and record target locations and designations in advance for points of probable activity, particularly when defending an LZ or similar objective; record initial data and subsequent corrections during adjustment to facilitate rapid and accurate changes in deviation, range, and during illumination missions, burning times, and height of burst.

: adhere to these specific guidelines when using WP rockets: 195

a. Avoid the use of WP rockets close to friendly troops when wind direction and speed will cause the smoke to interfere with friendly troop control or observation and in situations where smoke may aid the enemy.

b. Limit the use of WP rockets to engagement of enemy automatic weapons, antitank weapons, observation posts, enemy located in flammable structures or dry vegetation, marking rounds, and similar fire missions that do not entail establishment and maintenance of a smoke screen.

c. Place the center of impact on the target with minimum adjustment to avoid having smoke shroud the target and limit visibility of the aviator and the ground observer and thus to produce maximum casualties with WP rockets.

d. Know that flooded areas (such as rice paddies and swamps) and deep snow seriously reduce the effectiveness of WP rockets.

12. THE IRSL COMMANDING A SEMI-INDEPENDENT FORCE WILL PLAN, EMPLOY, AND SUPERVISE USE OF AERIAL ILLUMINATION AS REQUIRED BY HIS MISSION AND THE SITUATION AND WILL EMPLOY AERIAL ILLUMINATION PROVIDED BY HIGHER HEADQUARTERS IN ACCORDANCE WITH UNIT SOP AND SPECIFIC INSTRUCTIONS WHEN OPERATING AS A PART OF A LARGER UNIT.

He will : know that control over the use of aerial illumination usually is exercised by the battalion or higher commander in coordination with adjacent units through higher headquarters to ensure against illumination that might adversely affect the operations of adjacent friendly units. 196

: know that high levels of artificial illumination will cause almost immediate loss of night vision among all troops exposed to it; that once illumination is commenced during darkness, it must be continuous pending completion of the mission and the establishment of adequate security to protect against surprise due to loss of night vision. 197

: exercise economy in the planning and use of illumination, but maintain an adequate illumination capability in reserve at the lowest practicable level for use pending receipt of support from higher levels, e.g., avoid requesting short-term aerial illumination by flare ship if supporting artillery or mortars can fulfill the mission without reducing the effectiveness of indirect fires; maintain an SOP level of trip flares, hand-held ground signals (white star parachute M127), and illumination grenades for immediate local use in emergency situations. 198

He must : coordinate his use of battlefield illumination with the use of infrared and image-intensification devices realizing that none of these methods of artificial illuminants are effective in smoke, fog, or heavy precipitation. 199

He will : when leading a detached force responsible for executing a special operation, plan, coordinate, and control the employment of aerial illumination required to effectively accomplish the mission. 200

: utilize direct illumination from aircraft flares as usually preferable to that provided by mortar and artillery illumination shells because aircraft flares provide higher intensities of illumination, have a slower rate of fall and a longer burning time, and range is limited only to the range of aircraft. 201

: know that aerial illumination can be used to: 202

a. Illuminate LZ, objective, and PZ areas to permit the employment of daylight tactics and techniques during darkness.

b. Facilitate detailed visual reconnaissance of and adjustment of fire upon enemy-occupied areas by surveillance from vantage points occupied under cover of darkness.

c. Create a diversion.

d. Increase the effectiveness of armed helicopter fire and close air support.

e. Aid in the occupation, organization, reconnaissance, siting of direct fire weapons, installation of Claymores and warning and illuminating devices, clearing of fields of fire, and the digging of fighting positions upon seizure of critical terrain after a night airmobile assault.

f. Facilitate search and rescue operations by providing light to locate individuals and groups separated from the parent unit; locate, treat, and evacuate casualties; and to locate and salvage downed helicopters, crews, and troop loads.

: plan and coordinate the delivery of aerial illumination with the aid of the S3, FAC, aviation unit liaison officer, and the USAF liaison officer. 203

: provide visual signals as a ground reference point (e.g., a minimum of two colored lights set 10 meters apart) for the flare ship commander, the FAC, and supporting armed helicopter aviators to establish a clearly visible point of origin for the OT line to facilitate target designation and the adjustment of aerial supporting fires and illumination. 204

: when the mission requires key terrain to be held by maintaining a perimeter defense, mark the perimeter with flares or field expedient devices, and place the visual ground reference point within the lighted perimeter to facilitate control of aerial illumination and fire support; when friendly locations cannot be marked, use cardinal directions to adjust flares, e.g.: "Correction from last flare, 200 meters North." 205

: utilize an available airborne FAC or an airborne armed helicopter aviator when they can provide better control of aerial illumination during the delivery of aerial fire support than can a ground observer. 206

He must : call for aerial illumination using the standard call for fire as modified for use with armed helicopters, i.e., specify directions in degrees and omit elements not pertinent to the specific mission. 207

He will : know or determine the types and characteristics of locally available USAF light sets and plan and coordinate their use in support of special operations with the aid of the USAF liaison officer. 208

: know the types and characteristics of helicopter-mounted illumination systems available within supporting aviation units. 209

: make maximum use of the FAC and attached artillery and mortar forward observers, if available, to call for and adjust aerial illumination as well as illumination delivered from indirect fire weapons organic to the company or battalion. (i.e., 81mm mortars and 4.2 inch mortars) 210

13. THE IRSL WILL REQUEST AND EMPLOY AERIAL FIRE SUPPORT FOR HIS SQUAD AND ATTACHED PERSONNEL IN ALL TYPES OF COMBAT SO AS TO EXPLOIT CAPABILITIES OF THE AERIAL FIRE SUPPORT PLANNED AND PROVIDED BY HIGHER HEADQUARTERS.

He must : recognize that the supporting fires from all sources, including indirect fire sources, are planned to complement each other within the capabilities and limitations of the weapons system and that fire support from armed helicopters and tactical fixed-wing aircraft is closely coordinated and controlled as an integral part of the over-all fire plan for each operation or the continuing phases of an operation. 211

He will : know that aerial supporting fires in offensive airmobile operations usually will include provision of air cover for the staging and loading areas during the loading of troops and supplies; armed aerial reconnaissance along and on the flanks of the flight route during movement of airmobile forces; tactical escort of the aerial troop column throughout the flight to suppress hostile fires en route; reconnaissance by fire and the delivery of preparatory fires on the LZ/objective immediately prior to landing; suppressive fires on the periphery of the LZ during landing and extractions; fires planned for delivery on critical terrain and avenues of approach to the LZ/objective; and fires beyond the objective and on any open flank of the objective to assist in reorganization and consolidation of the objective. 212

: recognize that successive tactical air or armed helicopter strikes from different directions on dug-in enemy, with delays of three to five minutes between strikes, may permit the enemy to expose himself, man his defenses, and thus increase his vulnerability; avoid set patterns of attack or patterns of spacing between strikes that are likely to be anticipated by the enemy to increase the vulnerability of friendly aircraft. 213

: use armed helicopters as a base of fire (or to supplement the organic base of fire) to support the maneuver of small units by carefully coordinating the timing and direction of helicopter firing runs with troop movement; e.g., a rifle squad may maneuver right to strike a marked enemy flank while aerial fire is delivered on successive runs perpendicular to the route of friendly ground maneuver and coinciding with the long axis of the enemy position. 214

: require one rifleman in each fire team to wear a section of easily visible signal panel, if available, either on his back or display it near his position, to aid aviators to identify the maneuver elements as friendly troops. 215

: establish or verify existing signals for lifting and shifting both organic fires and aerial fire support with emphasis on use by the maneuver element if necessary prior to commencing a maneuver with aerial fire support. 216

: coordinate application of effective fires from organic weapons with the delivery and shifting or lifting of aerial fire support to suppress enemy resistance pending closure by the maneuvering ground elements anticipating that enemy use of tunnels, overhead cover, and small foxholes may leave significant resistance on enemy positions hit by armed helicopters; recognize that organic squad and platoon fires can suppress enemy fires likely to be directed at helicopters during firing runs. 217

: take maximum advantage of aerial fire support <u>during and immediately following delivery</u> by aggressive, coordinated use of fire and movement/maneuver and suppress the natural tendency for ground action to halt while troops "watch the show" during the delivery of aerial fire. 218

: shift aerial fire support to cover reverse slopes and possible approaches to the flanks as opposed to lifting (ceasing) fires during an assault on a specific objective within the limits of available fuel and ordnance loads. 219

: display identification according to SOP and <u>promptly report rapid advances or changes in direction</u> to permit planning and maintenance of close support capability and to avoid mistakenly delivered aerial fire; anticipate and respond to queries, orders, and instructions from higher commanders (battalion, brigade) using C&C helicopters over the battle area. 220

: use aerial fire support to pursue a withdrawing enemy and, when feasible, request aerial fire support for pursuit (in lieu of using indirect fire) to gain the advantage of direct observation and control of fires by armed helicopter crews. 221

: use armed helicopter teams to provide surveillance and fire support against enemy counterattack during friendly reorganization and consolidation of the objective and request support accordingly. 222

He must : use aerial fire support in the <u>defensive</u> phase of an airmobile operation to conduct armed surveillance and strike targets of opportunity beyond the visual range of combat outposts; support combat outposts, i.e., force early deployment of the enemy in front of the combat outposts and thus delay and deceive the enemy as to the exact location of the main defensive position; provide close defensive fires to destroy the enemy prior to assault; and supplement the final protective fires where friendly perimeters are clearly marked to permit firing runs perpendicular to the enemy direction of assault. 223

: use armed helicopters, when perimeters are clearly marked with lights (night) or panels, to deliver heavy machinegun fire on enemy assault troops with greater safety for friendly troops than is achieved with the indirect fires of fragmentation weapons. 224

: when the sound (detonation of propelling charge) of enemy mortars or artillery can be localized, obtain intersecting azimuths to the enemy sounds from two known points, plot the azimuths on the map, and call for armed helicopters to strike the gun positions indicated by the intersecting azimuths. (A single azimuth may be used, if necessary, but this thrusts the burden of location of the target on the aviator.) 225

: use the sound and flash method to locate enemy direct and indirect fire weapons and report the location (grid coordinates) for strikes by armed helicopters. 226

: use helicopters armed with machineguns and antitank missiles against enemy infantry-tank forces to force the enemy to react against a 360-degree front because he cannot predict the directions of attack by armed helicopters. 227

: keep suspected target areas in mind for aircraft reaching fuel limits so that available ordnance can be used profitably prior to departure of aircraft from the battle area to refuel. 228

: habitually obtain clearance to fire organic or attached mortars providing fire support for the squad when friendly aircraft are in the area; and forewarn all personnel to maintain vigilance against the delivery of any type of fire likely to inflict damage upon friendly aircraft since any missile launched or fired into friendly airspace is a hazard to flight, and proximity-fuzed HE shells are particularly dangerous to friendly aircraft. (Applied to all operations, but is particularly pertinent to defense.) 229

He will : know that aerial fire support planning in <u>retrograde operations</u> is similar to that employed during the defense: 230

a. With increased use of armed helicopters against enemy on approach routes and targets of opportunity as the enemy seeks to develop resistance.

b. To supplement and replace the fires of the detachment left in contact, particularly when the enemy seeks to use "hugging tactics."

: use HE and WP aerial rocket fire to cause casualties, deny observation, and cover patrols and the withdrawal of other small units to prevent decisive engagement with superior enemy forces. 231

: use armed helicopters to suppress enemy fires on the periphery of the PZ during extractions and particularly for suppressing enemy fire during the loading and take-off of the final lift from the PZ when they must assume total responsibility. 232

: habitually file a quantitative description (SP, azimuths, distances, and checkpoints) or overlay of patrol or other movement routes with the commander who is to monitor the operation to facilitate dispatch of aerial fire support, i.e., armed helicopters can fly directly to the patrol's last checkpoint, then proceed on a heading that coincides with the direction of movement of the patrol from the checkpoint. (The patrol leader can transmit his location as, "From checkpoint 3, add 600 meters," without necessity to use map coordinates or encode the message.) 233

: use aerial fire support to escort convoys and mounted patrols (i.e., orbit along the route), conduct reconnaissance by observation and fire against ambush, and to direct fires from other sources against any enemy within striking proximity of the patrol. 234

: use aerial fire support as a diversion to cover noise and exposure likely to occur when friendly patrols are breaching obstacles, maneuvering in noisy undergrowth, or crossing streams or other open areas. 235

: anticipate enemy "hugging" tactics by maximum application of organic fires upon contact and an immediate initiation of a call for aerial fire support to prevent the enemy from closing to within a distance that would prohibit the use of supporting fires. 236

: use aerial machinegun fire to probe inundated areas when enemy seek to escape by submerging themselves in water, followed by coordinated organic weapons fire from the surface to increase destruction or force surrender. (Fire plunging downward from an aerial weapons platform often is more effective against ground targets than small arms fire delivered from ground surface, particularly when the enemy is submerged in water or protected in foxholes or ground folds.) 237

: avoid the possible effects of forest and brush fires resulting from the use of napalm, rockets, etc., when danger to friendly troops exists by specifying the type of aerial ordnance to be employed. 238

: avoid the use of aerial fire support that may cause unnecessary loss of life or property damage without contributing significantly to the mission, particularly during internal defense and development situations, considering the probable effect of aerial fire support upon the indigenous population. 239

: use armed helicopters, close air support, indirect fires, and organic weapons to gain fire superiority and cover troop movement and extraction when the unit is under heavy fire because troop lift helicopters will be lost to the same sources of fire being received by the small unit on the ground. 240

: use armed helicopters for reconnaissance and surveillance during support of surface patrols; request information accordingly from air crews providing support. 241

He must : during all use of aerial fire support, recognize that knowledge of results enhances performance and habitually provide aircraft crews with details of the effects of their fires when possible; if supporting fires are inaccurate, unresponsive, or inadequate, make corrections and request repetition of fire, and report inadequate responses to his commander. 242