

PATHFINDER OPERATIONS

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PREFACE

This manual provides a reference for the training and employment of pathfinder and terminal guidance personnel. The tactics, techniques, and procedures describing the conduct of various missions are guides that may be modified for pathfinder/terminal guidance personnel as required by various air assault operations.

A glossary of acronyms and terminology that are peculiar to air assault and pathfinder operations, and to Army-Air Force air traffic control are included. Users are urged to read and refer to this glossary as an aid to understanding the text.

This publication implements the following international agreements:

STANAG 2863

Navigational and Communication Capabilities for Helicopters in
Multinational Land Operations, 26 SEP 88

STANAG 3117

Aircraft Marshaling Signals, 17 OCT 85

STANAG 3281

Personnel Locator Beacons, 3 APR 78

STANAG 3570

Drop Zones and Extraction Zones— Criteria and Markings,
26 MAR 86

STANAG 3619

Helipad Marking, 10 JUL 80

QSTAG 585

Marshaling Helicopters in Multinational Land Operations, 23 April 81.

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

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CHAPTER 1 INTRODUCTION

Army pathfinders primarily provide navigational assistance and advisory services to military aircraft in areas designated by supported unit commanders. Their secondary missions include providing advice and limited assistance to units planning air assault/airdrop operations.

1-1. EMPLOYMENT

The pathfinder provided navigational assistance and air traffic advisories for Army aircraft encompass any phase of an air assault or a ground operation that requires sustained support by Army aircraft. For some missions, employment may be on a short-term basis as pathfinders are redeployed upon completion of a major troop lift or airdrop.

a. Primary Employment. Ideally, a pathfinder team is assigned to each combat aviation battalion. This enhances the relationship between aviators and pathfinders; an understanding between the two is important to the successful completion of a mission. However, with the reduction of pathfinder units and the assignment of pathfinder coded positions within ground units, it is still important to maintain this relationship.

(1) Personnel who are not pathfinder qualified are trained by the pathfinder and formed into a pathfinder team at company level. The team will provide navigational assistance, air traffic advisories, and information on an around-the-clock basis for any type air movement or resupply operation conducted by or for the ground unit and supported by an aviation unit.

(2) Pathfinders are trained and equipped to select, mark, improve, and control landing sites. Engineers in direct support of lifted ground units may assist pathfinders in improving LZs. In most situations, pathfinders perform two or more of the functions at the same time, with priority given to establishment of GTA radio communications. Pathfinders should be combat lifesaver qualified to provide additional internal medical support.

b. Secondary Employment. When not performing duties for supported units, pathfinders (with equipment) stay near and in communication with the supported ground unit command post. When pathfinders are awaiting further missions, the command post of the parent or supported unit may task them to assist in aviation unit base airfield control, in minor demolition work, or in staff sections by performing map and aerial photographic work. However, training and maintenance of equipment take priority over the performance of secondary missions.

c. Capabilities. Appropriately equipped and trained pathfinders can fulfill the following responsibilities.

(1) Reconnoiter areas selected by supported unit commanders and select LZs and DZs.

(2) Infiltrate areas of operation by foot, vehicles, or watercraft, and airland, rappel or parachute from aircraft.

(3) Prepare LZs and DZs to include establishing and operating visual and electronic navigational aids and removing minor obstacles.

(4) Employ GTA radio communications to provide pilots with guidance and air traffic advisories within an area of operations.

(5) Advise pilots concerning friendly mortar and artillery fires through direct coordination with fire support units.

(6) Provide technical assistance for the assembly of supplies, equipment, and troops before aircraft loading for deployment to LZs and DZs.

(7) Advise and provide limited physical assistance in preparing and positioning supplies, equipment, and troops for air movement.

(8) Conduct limited NBC monitoring and surveying of designated areas.

(9) Provide limited weather observations, to include wind velocity and direction, cloud cover, visibility, and approximate cloud ceiling.

(10) Operate, by agreement with the USAF, DZs and airfields for USAF aircraft in the absence of CCT.

(11) Survey DZs for use by USAF and Army aircraft. (In this situation, it maybe necessary to provide pathfinders with radios [UHF or VHF] that are compatible with USAF radio equipment. Aviators and pathfinders must coordinate to ensure they understand ground markings and radio procedures to be used.)

d. Limitations. Pathfinders are restricted in their employment to aircraft guidance and related primary tasks. Pathfinders must be augmented when they—

- Provide security.
- Remove major obstacles.

- Recover and assemble equipment and supplies.
- Operate additional radio nets and telephones.
- Transport items of equipment.
- Conduct detailed NBC monitoring and surveying.

1-2. EQUIPMENT

A wide variety of equipment is used by the pathfinder. Although the aviation unit SOP may specify the type of equipment, the mission will dictate what will be taken on the operation.

a. Navigation Aids. Navigation aids are used to help aviators locate and identify an exact area.

(1) Electronic navigation aids include homing beacons, transponders, radios, and other electronic devices that assist in aircraft navigation. These aids have a greater signaling range than visual navigation aids.

(2) Visual navigation aids are used to designate specific areas or points on LZs and DZs. They are also used as GTA signals. Daylight visual aids include panels, smoke, signal mirrors, and colored gloves for signalmen. Night visual aids include light beacons, lanterns, baton flashlights, strobe lights, and pyrotechnics. Field-expedient visual aids may also be used effectively day or night. Visual aids are vulnerable to detection because the enemy can also see them.

(3) Infrared navigation aids are used as NVG compatible items to assist in night navigation.

b. Communications Equipment. Pathfinders use FM radios with secure capability and limited wire equipment. These radios allow pathfinders to communicate with aircraft, other pathfinder elements, and supported units. They have incorporated homing capabilities to provide navigation assistance to aircraft.

c. Assembly Aids. Assembly aids are used to designate troop and supply assembly areas. As with navigation aids, assembly aids may be either electronic or visual. Field expedients may also be employed. All assembly aids can attract the threat force's attention; therefore, care must be exercised to avoid compromise.

(1) Electronic assembly aids include radios and homing devices employing a radio signal. All electronic signals can be intercepted by direction-finding equipment and attract enemy attention.

(2) Visual assembly aids are usually simple to employ. They include panels, smoke, and armbands for day operations; and lanterns, flashlights, light beacons, strobe lights, chemical lights, and pyrotechnics for night operations. They afford positive identification of assembly areas; however, they can also be seen by the enemy. Close coordination of their

use is required to prevent misunderstandings. (See TM 9-1370-206-10, FM 21-60, and STANAGs 3117 and 3281.)

(3) Infrared light sources can be used as assembly aids; but, they dictate the use of night vision devices.

d. **Miscellaneous Equipment.** Pathfinder equipment also includes vehicles, binoculars, night (starlight) scopes, nonelectric demolition kits, wind-measuring equipment, parachutes, NBC detection equipment, NVDs, and thermal sights.

1-3. COMMUNICATIONS SECURITY

Pathfinders and terminal guidance personnel must be aware of hostile data collection and exploitation activities, which seek to disrupt, deceive, harass, or otherwise interfere with the command and control of pathfinder operations.

a. Enemy Interception. All signal equipment that radiates electromagnetic energy (such as radios, radars, and electro-optical devices) is vulnerable to enemy interception, analysis, direction finding, and exploitation. Such exploitation may be aimed at gaining intelligence for enemy fire and maneuver elements and for collecting data for electronic countermeasures.

(1) Enemy exploitation of pathfinder emissions may not include an immediate enemy response. The enemy collection and analysis of data gained by interception maybe used to plan operations for a later, more advantageous time. Enemy jamming or deception may not be used either; the enemy may pretend that he has not detected pathfinder electronic signals.

(2) The enemy's capability to exploit signal intelligence in support of his ground operations is limited to some degree by time-distance factors. He may use a reaction force or a direction-finding fix. If he uses a DF, he may use electronic countermeasures (jamming and deception) against electronic aids used in pathfinder operations.

b. Pathfinder Awareness. Pathfinders must anticipate enemy DF capabilities. Automated DF systems determine line bearings for each signal detected. Line bearings are continuously processed and compared, and fixes are plotted for signals. Depending on the size of the DF base and the number of DF systems available, the enemy may be able to accurately determine a position with little difficulty.

(1) Enemy actions to gain signal intelligence may indicate their intended reaction to the opposing force. Some factors to consider in combating enemy DF systems are:

(a) The high priority given to aviation-related missions.

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- (b) The amount of time their transmitter is in use (on the air).
 - (c) The number of their transmitters.
 - (d) The distance of friendly forces from enemy DF systems, fire and maneuver elements, and collection and jamming resources.
 - (e) Friendly actions to mask pathfinder operations.
- (2) The vulnerability of signal devices to enemy exploitation is significantly reduced through strict signal security practices to include electronic warfare. (For more information on communications and EW, see FM 24-18, FM 34-40, FM 90-2, and FM 100-26.)

1-4. TRAINING

Personnel become pathfinder-qualified by completing the Pathfinder Course at the US Army Infantry School, Fort Benning, GA. Every pathfinder training program emphasizes development of individual proficiency in air traffic control procedures and an understanding of supported aviation unit SOP. The training program also stresses mission accomplishment in an electronic warfare environment.

a. **Commander's Responsibilities.** Major unit commanders employing pathfinders are responsible for sustaining their training and proficiency. Pathfinder training is most beneficial when it is integrated with the training of supported aviation and ground units.

b. **Pathfinder's Responsibilities.** The assigned, qualified, and trained pathfinder must ensure that the nonqualified personnel assigned to his unit team are adequately trained before they attempt a mission.

THIS CHAPTER IMPLEMENTS STANAGs 2863, 3117, AND
3570.

CHAPTER 2 OPERATIONS

Pathfinders conduct many different missions, many of which are additional requirements of the ground units' operation.

Section I. PLANNING

Pathfinder missions must be planned in detail to ensure success of the ground units' mission. The amount of detail is dictated by the amount of time allotted to plan.

2-1. WARNING ORDER

Upon notification of a pending operation, the senior pathfinder gives a mission alert as early as possible and follows it with a warning order. The warning order includes sufficient information to permit initial preparations for the operation. It should include:

- A roll call.
- A brief statement of the enemy and friendly situations.
- The mission.
- The chain of command and task organization.
- The individual uniform and equipment (if not in the SOP).
- The required equipment.
- The time schedule to complete work priorities; includes place, time, and personnel required.
- Specific instructions and personnel attached.
- Time coordination.

2-2. INITIAL PREPARATION

Inspection of personnel and equipment begins upon receipt of the alert or the warning order. Personnel or equipment augmentation, if required, is also accomplished at this time.

- a. Equipment is normally prepared in the following priority:
 - Radios.
 - Navigation aids, both electronic and visual.
 - Weapons and essential individual equipment.
 - Assembly aids.
 - Miscellaneous items.

b. The pathfinder element leader or his representative and the air mission commander initiate their liaison with the supported aviation and or ground unit(s).

c. As more information is received, personnel and equipment are reorganized to better accomplish the mission. Time permitting, rehearsals are conducted using available briefing aids and terrain that most nearly resembles the operational area.

d. Security is mandatory for the success of an operation; therefore, personnel are given only the minimum essential information needed to complete each phase of an operation. Individuals who have received detailed information are isolated (for security). Operational situations dictate security requirements.

2-3. COORDINATION

Ground and aviation commanders coordinate and plan the details of operations that require pathfinder assistance. The pathfinders may be required to recommend the exact location of DZS or LZs, the time schedule, the landing formations, and the techniques to be employed. These recommendations are likely for any type of operation (combat assault, reinforcement, artillery displacement, resupply, or evacuation). The DZ or LZ is selected by the supported unit commander after considering the factors of METT-T, and the advice of the pathfinder and aviation commanders or their representatives.

a. While preparing for an operation, aviation liaison officers and ground unit commanders coordinate factors used to formulate an air movement table with the pathfinders. Their responsibilities include:

- (1) Operational location (coordinates). (ALO & GUC)
- (2) Location of the communications checkpoint and alternate communication checkpoint (coordinates). (ALO)
- (3) Location of release point (coordinates and whether manned or unmanned). (ALO)
- (4) Time the site is to be operational. (ALO & GUC)
- (5) Aircraft information (formation, time interval, number of flights, drop speed, and drop altitude). (ALO)
- (6) Pathfinder transportation and time available for briefing. (ALO)
- (7) Pathfinder transportation station time. (ALO)
- (8) Routes into the objective area. (ALO & GUC)
- (9) Call signs (aircraft, pathfinders, supported units, other friendly units). (ALO & GUC)
- (10) Primary and alternate frequencies (aircraft, pathfinders, supported units, other friendly units, homing beacon). (ALO & GUC)
- (11) Fire support (artillery, tactical air support). (ALO & GUC)

- (12) Weather forecast (ceiling, visibility, temperatures [high, low]). (ALO)
- (13) Logistical support (locations of medical aid station, prisoner collection point, fuel, ammunition, rations). (ALO & GUC)
- (14) Alternate plan (evacuation plan, escape and evasion). (ALO & GUC)
- (15) Friendly unit locations. (ALO & GUC)
- (16) Authority to implement mission change. (ALO & GUC)
- (17) Support personnel required. (GUC)
- (18) No-land or no-drop signals. (ALO)
- (19) Markings for obstacles. (Done only on request of flight commander.)
- (20) Marking objective site for identification from the air. (ALO)
- (21) Time allowed for approval. (ALO & GUC)

b. The pathfinder needs this information because he participates in all planning coordination and uses the information to prepare final plan for the pathfinder phase of the operation. He must know the air movement phase of an operation to ensure that he can safely and efficiently control all aircraft in and around the DZs or LZs. Aviation and ground commanders keep pathfinders informed of all changes in plans and landing sites or any emergencies. The pathfinder ensures that all pathfinder activities are coordinated with all agencies or units involved and that information is disseminated to all pathfinders involved in the operation.

c. When the pathfinder gets to the objective site, he may decide that it is not suitable, as regards the coordinated landing formation, heading, drop altitude, or the ground site itself. He then coordinates with the ground and or aviation commander(s) if any of the original requirements are to be amended. Depending upon the situation (METT-T), the commander(s) determines what, if any, changes may be made to accomplish the mission. The pathfinder can also coordinate for authority to change requirements if contact with the GUC or aviation commander is not possible or practical.

d. Based upon coordinated plans for an operation, the pathfinder requests augmentation in personnel and equipment. He considers the following:

- Mission.
- Use of personnel and equipment for security.
- Requirement to assist in the assembly of personnel, supplies, and equipment of supported units.
- Need for assistance in removing obstacles.
- NBC survey or monitoring requirements.

- Assistance required for transporting and operating navigational aids under pathfinder direction.

e. Augmentation is kept to a minimum, in keeping with the transportation to be used in delivering the pathfinder team. When reinforced, the pathfinder team remains under the command of the pathfinder leader who is responsible for the functions of the team.

2-4. LINKUP WITH SUPPORTED UNIT

Pathfinders join the supported unit in sufficient time to allow final coordination between pathfinder, aviation, and lifted ground unit representatives. However, if pathfinders enter an LZ or DZ ahead of the assault echelon, and have been designated to accompany and provide continuous support to a ground unit, then the linkup with the supported unit normally occurs after the initial phase of the air movement.

2-5. FINAL PREPARATIONS

The pathfinder leader issues his operation order. If he issued it prior to linkup with the supported unit, he should issue any changes as a fragmentary order. If the unit SOP does not describe each member's duties, the order must do so. Team members are given an opportunity to study maps, aerial photos, and terrain models of the area. The order must contain detailed information on the location and the operation of proposed air delivery facilities, flight routes, flight formations, time schedules, RPs, and CCPs.

a. A final, detailed check is made of the equipment to be used in the operation. A decision is made on the exact manner in which the equipment is to be transported into the objective area. All items of equipment are prepared for rapid displacement.

b. A final weather and operation briefing is held for the pathfinders just before departure. Final coordination between the pathfinders and supported units is accomplished at this time.

Section II. ORGANIZATION FOR COMBAT

Pathfinders are organized to meet specific requirements of the mission. In most operations, three to six men make up the average size pathfinder *element* at an LZ or DZ or when in continuous support of an infantry battalion. A pathfinder *section* is seldom employed as a unit at a single location. The pathfinder leader plans for widely separated and disconnected operations by his elements.

2-6. INSERTION

Pathfinders can be inserted into an area by a variety of air, sea, or land transportation.

2-4