Chapter 25

COMBAT MISSION PLANNING

25-1. **Employment Concept.** Prior to detailed combat mission planning, the mission planner must develop the employment concept. Development should include the following considerations:

a. Air tasking order (if applicable)
   (1) ATO number and task Organization
   (2) Mission
      (a) Primary
      (b) Alternative
   (3) TOT
   (4) Mission aircraft
   (5) Ordnance
   (6) Target coordinates
   (7) IFF squawk

b. Intelligence
   (1) Security classification
   (2) General situation
   (3) Enemy defenses
   (4) En route
   (5) Target
   (6) Evasion and escape (SAFE, EPA)

c. Weather (local, en route, objective, egress, destination, sea state, temperature, moon illumination)

d. Communications (sequence and frequencies)

e. Execution
   (1) Prelaunch
      (a) Crew rest and show time
      (b) Planning time and briefing time
      (c) DO or CC briefback time
      (d) Special equlpment
      (e) Fuel
   (2) Launch
      (a) Engine start time
      (b) Takeoff time
      (c) Sequence
      (d) Join-up, formation, and rendezvous
      (e) Go or no-go procedures
      (f) En route NAVAIDs

f. Ingress and egress
   (1) Primary route
   (2) Alternate route
   (3) Way points
   (4) Airspeed and altitude
   (5) Rendezvous
   (6) ARCP and ARCT
   (7) Known enemy location
   (8) ROE
   (9) Abort plan

g. Terminal area
   (1) Primary LZ
   (2) Alternate LZ
   (3) Suppressive fire plan
   (4) Holding area
   (5) Command, control, and communications
   (6) Identification and authentication
   (7) Insertion procedures
   (8) ROE
   (9) PJ team or CCT plan (as required)

h. Emergency Procedures
   (1) Aborts
   (2) Lost com
   (3) EPA
   (4) Inflight emergency or downed aircraft
   (5) IMC
   (6) Divert bases

i. Special instructions (cover story, mission alternates, etc.)

j. Support procedures
   (1) Refueling
   (2) Fire support (TOT, air, ground, type)
   (3) Intelligence
      (a) E&E aids
      (b) CRF
      (c) Survivor or evader data
      (d) SAFE data
      (e) SERE guides
      (f) Briefing time

k. Command and control
   (1) Mission commander
   (2) Airborne mission commander (AMC)
   (3) On-scene commander (OSC)
   (4) Formation lead
   (5) Ground commander
   (6) Recall procedures
   (7) Signals
   (8) Code words

25-2. **Mission Commander Prelaunch Guide.** The mission commander prelaunch guide is at tab 25-A. The depicted sequence of events is intended to serve as a guide to assure that all required prelaunch actions are accomplished. For additional guidance, refer to 23 AF Operation Plans 9545 and 9519.

25-3. **Mission Commander Briefing Guide.** Plan a brief interval between aircrew show time and briefing start time for crews to review contents of mission handouts and complete other administrative details. The mission commander briefing guide is at tab 25-B. For additional guidance, see 23 AF Operation Plans 9545 and 9519.

25-4. **Combat Rescue Folders (CRF).** Normally, CRFs are prepared by intelligence mission planners along with the aircrew; however, the situation may dictate that the aircrew develop navigation route maps instead of the CRF for in-flight use. The CRF serves as the primary source for premission study of the route profile, enemy defenses, and target areas.

25-5. **Aircrew Mission Flimsy.** The flimsy provides the aircrew with the necessary information to execute the employment portion of the mission. Aircrew mission flimsies reduce the length of the mission briefings by eliminating the necessity for detailed discussion. The aircrew mission flimsy is optional at the discretion of the mission commander. The mission flimsy format and contents are as directed by the mission planners or commander, but should contain the following information:

a. Airborne order (aircraft and call signs).

b. General instructions.

c. Sequence of events.

d. Mission procedures (communication, low level route, coordinates, rendezvous, recovery).

MISSION COMMANDER'S PRELAUNCH GUIDE

1. BREAKOUT ATO (IF APPLICABLE)
   a. TASKED FORCES
   b. TOTs

2. ESTABLISH OBJECTIVE
   a. FORMULATE INITIAL GAME PLAN
   b. CHECK WEATHER FORECAST

3. CONSULT WITH AIRCRAFT COMMANDERS (INCLUDING OFF STATION PARTICIPANTS) AND PJ TEAM LEADER
   a. PROVIDE INITIAL GAME PLAN
   b. DISCUSS DECONFLICTION CONCEPTS
   c. DISCUSS SUPPORT FORCE EMPLOYMENT

4. ESTABLISH FIRM TOTS
   a. ALTERNATE TOTs FOR LATE TAKEOFFS

5. BRIEF ALL PARTICIPANTS ON UNIQUE CONSIDERATIONS SUCH AS LIVE ORDNANCE AND RANGE RESTRICTIONS.

6. ENSURE TANKER COORDINATION IS ACCOMPLISHED.

7. CROSS CHECK ALL ROUTE TIME AND SPACE RELATIONSHIPS FOR CONFLICTS.

8. ESTABLISH FIRM TAKEOFF TIMES AND PROPER CREW REST FOR CREWS.

9. DEVELVOP A DETAILED TAXI, ARMING, AND LOADING PLAN.

10. SIT BACK AND "WHAT IF" YOUR PLAN
   a. ABORTS
   b. WEATHER IMPACTS
   c. TAKEOFF DELAYS
   d. RANGE RESTRICTIONS
   e. TANKER, RECEIVER, OR ESCORT NO SHOW
   f. MEANS OF PASSING MISSION ESSENTIAL ADVISORIES

11. CONDUCT A MASS BRIEFING TO ENSURE EVERYONE KNOWS EXACTLY WHAT EVERYONE ELSE IS DOING (MISSION COMMANDER'S BRIEFING).

12. SCHEDULE A DEBRIEF TO THOROUGHLY ASSESS PROBLEMS AND SUCCESSES.

MISSION COMMANDER/MISSION BRIEFING GUIDE

1. BRIEFER AND VISITORS

2. TIME HACK

3. ROLL CALL

4. MISSION
   a. CLASSIFICATION
   b. PRIMARY AND ALTERNATE
   c. OBJECTIVE
   d. GENERAL ROUTING
   e. ONLOAD REQUIREMENTS
   f. COMBAT RESCUE FOLDER, MISSION FLIMSY, AND MAPS

5. TASKED ORGANIZATION (S)

6. AIRCRAFT ASSIGNMENTS
   a. TAIL NUMBERS
   b. CALL SIGNS
   c. FUEL LOADS
   d. LOAD DESCRIPTION
   e. OTHER AIRCRAFT AND RESCORT

7. COMMAND
   a. AMC AND OSC
   b. FORMATION LEAD
   c. GROUND COMMANDER (IF APPLICABLE)
   d. RECALL PROCEDURES

8. COMMUNICATIONS
   a. CONTROL AGENCIES
   b. FREQUENCIES AND SEQUENCE
   c. AUTHENTICATION
   d. NAVAIDS
   e. CODE WORDS
   f. COMMUNICATION-OUT SIGNALS
   g. IFF SQUAWKS

9. INTELLIGENCE
   a. ENEMY SITUATION
   b. ENEMY CAPABILITY (AOB)
   c. SERE (SAFE AREAS, EPAs, SANITIZATION, AUTHENTICATION)
   d. MISSION ESSENTIAL ELEMENTS OF INFORMATION
   e. COMSEC AND OPSEC PROCEDURES
   f. DEBRIEFING TIME AND PLACE

10. WEATHER
   a. TAKEOFF, EN ROUTE, TERMINAL
   b. PA, TEMP, WIND, AND QNH
   c. ALTERNATE AND RECOVERY BASES
   d. SUNRISE AND SUNSET
   e. MOONRISE, MOONSET, AND PERCENT ILLUMINATION
   f. SEA STATE

11. MUNITIONS
   a. FLARES AND CHAFF
   b. VERY PISTOLS
   c. AIRCRAFT WEAPONS
   d. PERSONAL WEAPONS

12. EXECUTION
   a. PRELAUNCH
      (1) START TIME
      (2) COM CHECK TIME (FREQUENCY AND SEQUENCE)
      (3) TAXI TIME
      (4) SPECIAL EQUIPMENT REQUIRED
      (5) FUEL REQUIRED
   b. LAUNCH
      (1) TAKEOFF HEADING
      (2) FORMATION
      (3) GO OR NO-GO PROCEDURES
   c. EN ROUTE
      (1) PRIMARY ROUTE AND WAY POINTS
      (2) ALTERNATE ROUTE AND WAY POINTS
      (3) FORMATION
      (4) AIRSPEED AND ALTITUDE
      (5) FREQUENCY CHANGE PROCEDURES
      (6) FLIGHT LEAD CHANGE PROCEDURES
      (7) ARCP AND RENDEZVOUS LOCATION
         (a) TIME
         (b) COORD
         (c) ALTITUDE
      (8) KNOWN ENEMY LOCATIONS
      (9) HAZARDS AND NOTAMS
   d. TERMINAL AREA
      (1) PRIMARY LZ
      (2) ALTERNATE LZ
      (3) SUPPRESSIVE FIRE
      (4) HOLDING AREA
      (5) LANDING HEADING AND FORMATION
      (6) ROE
      (7) LOAD, PAX, AND CARGO
      (8) HAZARDS AND NOTAMS
   e. EGRESS
      (1) PRIMARY ROUTE AND WAY POINTS
      (2) ALTERNATE ROUTE AND WAY POINTS
      (3) EMERGENCY LZ
      (4) DESTINATION
      (5) FUEL

13. PJ OR CCT BRIEFING

14. EMERGENCY PROCEDURES-ABORTS
   a. SYSTEMS
   b. WEATHER
   c. LOST COM
   d. ESCAPE AND EVASION
   e. INFLIGHT EMERGENCY OR DOWNED AIRCRAFT
   f. IMC
   g. SAR

15. REFUELING PROCEDURES
   a. AIR (ARCT)
   b. GROUND

16. DEBRIEFING
   a. MAINTENANCE
   b. OPERATIONS
   c. INTELLIGENCE
   d. MASS DEBRIEF

17. SPECIAL ITEMS
    a. TRANSPORTATION
    b. MESSING
    c. LIFE SUPPORT
    d. MISSION UPDATE BRIEF

18. FLIGHT SAFETY

*19. INDIVIDUAL AIRCREW BRIEFINGS, FORMATION BRIEFING, AND COMBAT PREMISSION BRIEFING (Items covered in the mission commander briefing do not need to be covered again during subsequent briefings.)

Chapter 26

SPECIALIZED SAR TACTICS FOR TACTICAL AIR FORCES (TAF) AIRCRAFT (RESCORT)

26-1. Introduction. A SAR effort is a demanding situation and there is no "standard" SAR operation. RESCORT tactics and techniques were developed during the SEA conflict for A-1 and A-7 aircraft. Because of its proven operational suitability and capability to perform the close air support (CAS) mission, the A-10 has the SAR role previously performed by the A-7 and A-1 aircraft. The recommended procedures in this chapter are the product of TAC and MAC formal test and evaluation of the A-10 search and rescue (SAR) tactics.

26-2. Operational Control. The operational control elements specifically applicable to the SARTF consist of the joint rescue coordination center (JRCC), airborne mission commander (AMC), on-scene commander (OSC), and the recovery aircraft. The JRCC, by authority of the theater commander, is the primary coordinating and controlling agency for the SAR activity within its specified area. The JRCC coordinates with the tactical air control center (TACC) to obtain the necessary assets to initially support a SAR. The AMC coordinates SAR efforts between the SARTF elements and the JRCC, and monitors the status of SARTF elements. The on-scene commander (FAC or Sandy lead) directly controls the objective area.

26-3. On-Scene Command. Success of the combat SAR mission depends on the OSC's ability to control the recovery. Initially, the OSC could be one of the survivors, a forward air controller (FAC), or King. The AMC appoints an extraction point for the forward air controller—OSC (normally Sandy lead) as soon as practical. The AMC supports the OSC by:

a. Managing available SAR assets and requesting additional assets.

b. Monitoring weather.

c. Providing radio relay, navigational aid, and intelligence.

d. Controlling and maintaining communication discipline.

26-4. Communications. Strict radio discipline is essential. Monitor radios (SARTF) and assigned frequencies as much as possible—monitor, but do not clutter, frequencies. One cardinal communication procedure is that the helicopters and Sandys be given uninterrupted use of SAR primary (UHF). FM radios are for Sandy-to-Sandy coordination, but monitored by all. VHF is Sandy two's primary radio for communicating with King. Normally, a VHF frequency is used by all SARTF participants to check in and out with King. Communication encoding procedures are used because the A-10 does not have secure voice at this time. Crews must be prepared for operations with limited or no radio communications. Visual signals may have to be used. In either case, a thorough, face-to-face preflight briefing should be conducted between helicopter and A-10 crews.

26-5. Ordnance. Sandy one is typically configured with white phosphorous (WP), high explosive incendiary (HEI) rockets and a 30 mm gun. Cluster bomb unit (CBU) munitions may also be carried. Sandy two is typically configured with a variety of antipersonnel and smoke, CBU, rockets, and 30 mm gun. Sandy two acts as a bookkeeper for lead, keeping track of ordnance requests and receiving most of the incoming calls from King or AWACS. Sandy three and four are responsible for the safety of the helicopter en route to the pick-up area and at the holding point. They are typically configured with a variety of soft ordnance. If a CS agent is to be used, Sandy lead will advise the helicopter crew. Sandy lead advises the helicopter when expending ordnance during the pickup to avoid the helicopter crew mistaking it for ground fire. Sandy isad also briefs the helicopter crew on use of denial ordnance (time delay antipersonnel bomblets) or smoke screen patterns.

26-6. SAR Phases:

a. Search Phase. Sandy leads first objective is to locate the survivor, usually by radio communication and automatic direction finding (ADF) steering.

(1) The easiest way to find a survivor with an operable radio is by UHF-ADF steering. Flares, mirrors, and combat casualty blanket are effective in identifying the survivor's exact location, especially without communications. Sandy locates and authenticates the survivor and passes encoded coordinates to King.

(2) Next, Sandy lead selects the safest helicopter ingress route. Sandy identifies a holding point and IP. The holding point is chosen away from threats to permit necessary briefings. The IP is the starting point for the ingress and is chosen to be easily identifiable.

(3) The Sandys ensure that threats are avoided or suppressed prior to the rendezvous with the helicopter(s). After rendezvous, Sandy conducts a prepickup briefing (see Tab 26-A).

b. Escort Phase. The Sandys provide protection as they guide the SAR helicopter to the survivor's exact location. The basic A-10 fighting unit is a two-ship formation. "A three-ship daisy chain escort is optimum. The two-ship formation does not provide adequate frontal cover for the helicopter and has limited fire-power. A four-ship daisy chain may be used but the four-ship pattern does create a possible A-10 midair collision potential. Regardless of the number of A-10 aircraft, the daisy chain is the preferred escort pattern.

(1) The daisy chain (figure 26-1) pattern maximizes the A-10 ordnance delivery capability in relation to the helicopter's vulnerability zones. Normally, Sandy calls abeam the helicopter for reference and spacing. A minimum visibillty of three miles and a ceiling of 1,500' AGL or higher is desired.

(2) The A-10 daisy chain can effectively escort a fluid helicopter formation of up to three helicopters or a four-ship helicopter formation composed of two-ship elements each with its own dedicated A-10 aircraft. The recommended formation for the helicopters to fly is a tactical formation left (figure 26-2) with 500 to 1,000 foot spacing between helicopters. The number two helicopter can vary its position to be unpredictable but should favor the left side because the A-10 daisy chain pattern normally is flown in a counterclockwise rotating pattern. If a third helicopter is added to the formation, fly a tactical staggered trail

formation, (figure 26-3). This three ship tactical formation is optimum for three helicopters. This formation allows the A-10s to remain close. The tighter the helicopter formation, the less the Sandys get strung out and the better the protection. The four-ship daisy chain is the optimum pattern when escorting a three-ship helicopter formation. During Sandy rendezvous with helicopter formation elements, it is important that each element maintain a tight formation. In addition, a complete formation briefing is paramount, especially for lost wingman procedures and actions to take if attacked by enemy aircraft.

(3) On run-in, the Sandys form a daisy chain around the pickup helicopter. Sandy one may hold high or join the daisy chain. With three Sandys in the daisy chain, Sandy four will remain with the second helicopter at the holding point. As the helicopter is making the run-in, Sandy one is overseeing the whole operation. Sandy gives the helicopter heading changes and distance to the survivor and provides navigational directions to enable the pickup helicopter to maximize terrain masking tactics. An alternate method of directing the helicopter in a communication out environment is by the use of visual signals. The Sandy flies in front of the helicopter, executes a wing rock (and then rolls out) in the desired direction of turn. To indicate the survivor's position, Sandy executes a wing rock and pulls straight up directly over the survivor. The following items should be accomplished prior to the run-in:

(a) Review of the Sandy prepickup briefing either prior to flight on en route in a safe area.

(b) Check all intercom wafer switches to avoid unexpected transmissions outside the aircraft.

(c) Brief the FE and PJ to call out "Sandy abeam" so the pilot can anticipate signals from Sandy.

(d) Brief evasive maneuvers.

(4) Another method of operations is a non-escorted ingress by helicopter(s) for a TOT rendezvous with the RESCORT. The A-10s navigate for the helicopter(s) after rendezvous at the IP. The key to a successful TOT communication out mission is thorough premission planning. Other important items to consider are:

(a) Brief actions for early arrival at IP (i.e., hold out from IP or land).

(b) The SAR helicopters should maintain a tight formation in their orbit so that Sandy can determine the lead helicopter.

(c) Prebrief a time, distance, and general heading from the IP to the survivor's position as backup data for first pass recovery of the survivors.

c. Hover Cover and Survivor Pickup. Sandy gives distance and time calls to aid the helicopter to slow down, i.e., "Two miles," "One mile," "Slow down now." Listen for the decreasing mileage calls and slow down when instructed. Do not wait until the survivor is sighted. Usually, Sandy will call the survivor to pop smoke when the helicopter is about one-half mile out. This usually gives the smoke enough time to build, allowing visual acquisition by the time the helicopter is within one hundred meters. During a TOT communications-out mission clandestine survivor authentication procedures, mirror flash, survivor body signals, or colored panels may be used instead of smoke.

(1) Combat experience has shown that the helicopter is most vulnerable while in the hover. Sandy's job is to protect the helicopter from any threat. The best hover cover pattern is the classic wheel (figure 26-4) with three A-10s. If the helicopter takes fire, the pilot calls out the direction relative to the nose of the aircraft. The wheel permits the Sandys to roll in on enemy fire within 10-15 seconds and deliver ordnance on either side of the helicopter.

(2) When the helicopter is 15-30 seconds from egress give the Sandys a call, but this may not be possible because of the tactical situation. After the helicopter departs the hover, Sandys reestablish the daisy chain to egress the area. Transition from "wheel" to "daisy chain" is difficult for the Sandys. Use of the prebriefed egress heading aids the sandys during egress. Sandy lead will attempt to keep the helicopter low and clear of known threats on egress. Once clear of the area, check for battle damage, fuel status, survivor's condition, and revise recovery plans based on the most critical factor. Use "King" for DR headings and refueling points.

26-7. A-7D RESCORT Procedures. From the helicopter stand point, the A-7D pattern is similar to the A-10 RESCORT procedures except the A-10 pattern is much tighter and slower. For hover cover, the A-7D flies a cloverleaf vs the wheel flown by the A-10. The A-10 is the preferred TAC aircraft for the RESCORT mission.

26-8. E-3A SAR Mission Employment. The E-3A has a look down radar with excellent range and IFF/SIF interrogating capability. Available radios include HF, UHF (in either clear or secure voice modes), VHF, and FM). The E-3A radio displays provide excellent wide area coverage, friendly or enemy air order of battle, radar and IFF sensor returns, and track symbology. The mission crew is made up of surveillance (ECM) operators, weapons directors (WD), and a mission crew commander. The E-3A can provide radar, communications, and command and control assistance in support of SAR operations. The E-3A may be first on scene and is well equipped to serve as SAR coordinator. When "King" arrives, the E-3A reverts to a radar and communications platform, working with the AMC and other SARTF forces.

26-9. EC-130 Airborne Battlefield Command and Control Center (ABCCC). The ABCCC is not dedicated to performing the AMC role; however, the crews are trained in SAR procedures and could act as AMC if an HC-130 is not available and also when King AMC has to perform tanker operations with SAR helicopters. The EC-130 capsule has eight UHF, four VHF, four FM, and four HF radios, none of which can be operated from the flight deck. All of the UHF and VHF radios can be used in a secure mode.

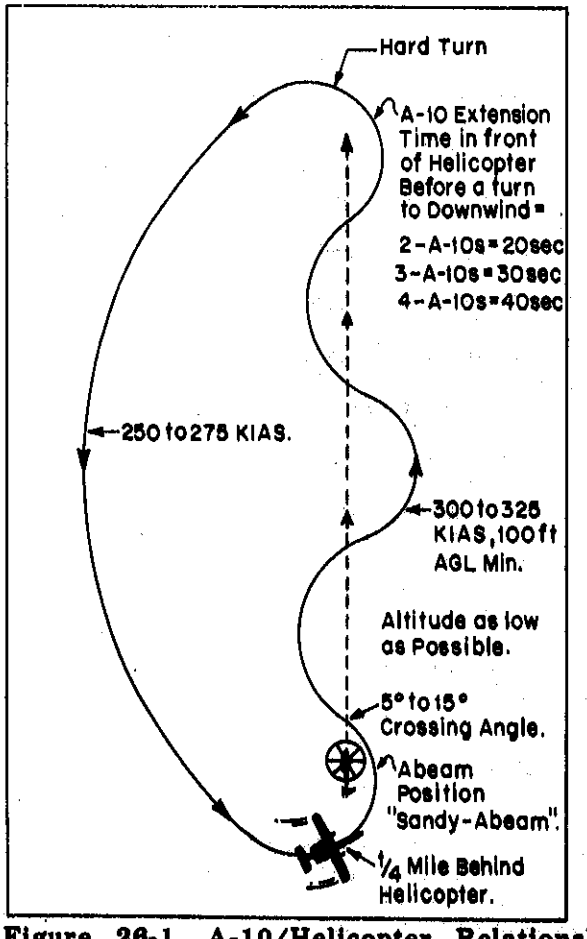


Figure 26-1. A-10/Helicopter Relationship During Daisy Chain Escort.

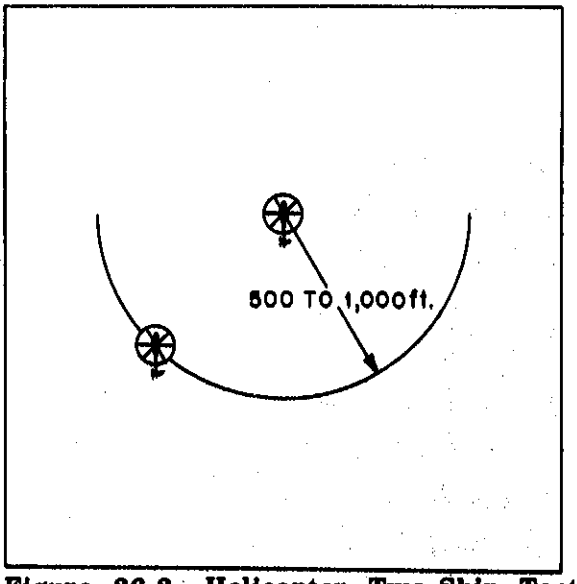


Figure 26-2. Helicopter Two-Ship Tactica Formation.

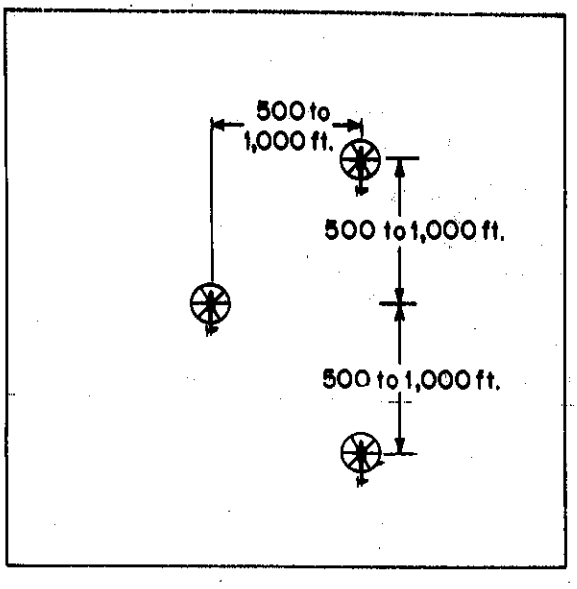


Figure 26-3. Helicopter Three-Ship Formation.

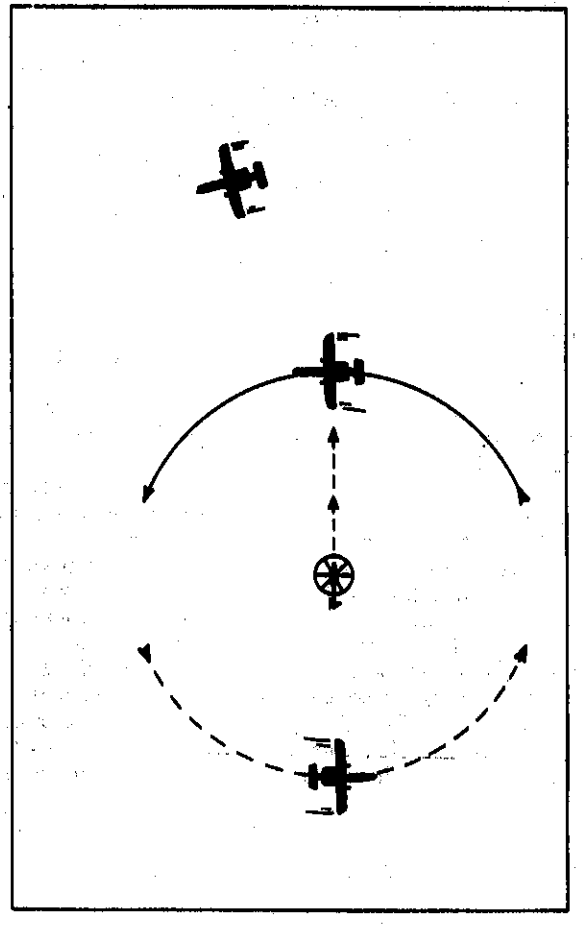


Figure 26-4. Hover Cover (Wheel).

SANDY PICKUP BRIEFING

1. Survivor's Location.
2. Number of survivors.
3. Confirm authentication complete.
4. Description of Survivor's Area.
   a. Pressure Altitude.
   b. Terrain.
   c. Winds.
   d. Height of Trees.
5. Survivor's Condition and Assistance Needed.
6. CS Agents Used.
7. Final Holding Point or IP.
8. Ingress Heading and Distance.
9. Egress Heading.
10. Emergency Egress Heading.
11. Emergency Setdown Area.
12. Defenses Encountered and Expected.
13. Ordnance to be used by Sandys.
14. Radio Procedures.
15. Instructions for Backup Helicopter.
16. Coordination of Smoke and Ordnance.
17. Questions.

SARTF PLANNING AND BRIEFING GUIDE

1. Time Hack.

2. Intelligence and Threat Briefing-Authentication and Encoding.

3. Line-up:
   a. Call Signs.
   b. Air Alert Times.

4. Radio Procedures:
   a. Communications.
   b. Fuel Checks.

5. En Route Procedures:
   a. Frequencies and Codes.
   b. Rendezvous.
   d. Checkpoints.

6. Escort:
   a. Frequencies and Codes.
   b. Escort Patterns and Procedures.
   c. Navigation Responsibilities.
   d. Lookout Responsibilities.
   e. Ordnance Delivery Procedures.

7. Execution:
   a. Frequency and Codes.
   b. Hover Cover Procedures.
   c. Sandy Rendezvous Procedures.
   d. Ingress Formations and Procedures.
   e. Radio Procedures.

8. Pickup:
   a. Radio Procedures.
   b. ID of Survivor's Location.
   c. Hover Cover Procedures.
   d. Lookout Responsibilities.
   e. Pickup Timing—30 Second Call.
   f. Egress Procedures.

Chapter 27

INFILTRATION AND EXFILTRATION

27-1. **General.** The techniques and procedures outlined in this chapter may be modified to fit many mission requirements, depending on the environment and nature of the operation. No one system is the final answer. Units should vary the tactics as new ideas and techniques are developed. See applicable 3-1(S).

27-2. **Composition of Flight:**

a. The number and types of helicopters utilized to carry out an infiltration will vary according to the mission requirements and the size and number of teams to be transported. Each helicopter in the flight will be assigned specialized tasks, such as team transport, command recovery, and armed escort. The ratio of armed and recovery helicopters to team transport helicopters will be determined by the mission commander.

b. When the mission ground and air environment permit escort by armed helicopter, a typical flight may consist of the following:

(1) Slicks as required.
(2) One recovery helicopter.
(3) Two armed helicopters.

c. If available resources permit, a second flight of two armed helicopters should be placed on alert at a forward location to augment the escort helicopters in the event of hostile action in the landing zone.

27-3. **Reconnaissance.** A general reconnaissance of the area of operations should be conducted prior to the mission. This reconnaissance should be conducted by members of the infiltration team and helicopter flight leader. Although area coverage photography may be used for this purpose, premission overflight of the area at high altitude is recommended, threats permitting. The flight route is flown to permit the team members sufficient time to plot landing zones, but in such a way that it appears as an overflight. Such reconnaissance permits the teams and the pilot to select a primary and secondary area for infiltration but will not always determine hidden obstacles on the ground. If obstacles are suspected and a ground survey is impractical, the aircraft and personnel should be prepared for other exit methods, such as jumping from a low hover, rappelling, or rope ladders. The flight leader should formulate a general plan during the overflight, to include type of approach, approach route, departure route, how the team will exit the helicopter and general hazards in the area. For most Unconventional Warfare (UW) situations, this information is obtained from photo reconnaissance, map study, intelligence, and surveys by UW teams.

27-4. **Selection of Infiltration Landings Zones.** In general, any area that permits entry of the helicopter to a spot low enough to the ground to drop off troops will suffice as a landing zone. Areas in heavy forest with few clearings will require extensive search since the enemy may watch clearings which can support helicopter operations. Photographs may highlight features not readily apparent during visual reconnaissance and are useful for detailed planning. In high threat areas, low altitude, high speed photography may be used to detail helicopter low level routes to selected landing zones. River banks are normally watched by the enemy as are well traveled routes. Large clearings in heavily forested areas are also frequently observed by the enemy. Use of such areas for LZs must be done with caution. A small area close to the tree line allows the team a chance to reach cover before enemy pursuit can start. LZs are usually selected by the aircrew and the team leader, but may also be selected by ground teams or reception committees. Refer to figures 19-7, 8, 9 for size and lighting criteria for LZs.

27-5. **Infiltration.** Infiltration may be conducted any time sufficient light is available to allow visual references. Night infiltrations pose certain risk factors which must be balanced against mission requirements. Consideration should be given to conducting infiltrations during "first light" or "last light." While both exploit the element of surprise, a "last light" infiltration could result in an emergency night exfiltration if enemy contact is made after the team has left the aircraft. The primary goal of an infiltration mission is to insert a team safely on the ground, undetected. Imagination is the only limitation to the variety of tactics that may be used. Night infiltration may be desirable if crews are equipped and trained in the use of night vision devices.

a. Aircraft fly to the area in a tactical formation at altitudes that provide the best avoidance of enemy threat. Good checkpoints permit the flight leader to place the flight at the designated point at the proper time and give the flexibility of releasing early or late depending on light conditions. Checkpoints also serve to keep the flight oriented, and may be used as rendezvous or orbit points upon completion of the infiltration. The infiltrating aircraft will proceed to the primary LZ and drop the team. The final part of the approach may be vertical or flat depending on the LZ and must be accomplished with care. The team should not have to leap an excessive distance to the ground. The crew must assist the pilot and provide a warning of any obstacles since most of the pilot's attention is directed to keeping the aircraft steady. The FE/AG will inform the pilot when all team members are out. The pilot should then leave the LZ as rapidly as possible, executing a tactical departure. If the aircraft is disabled and light conditions or terrain do not permit evacuation, downed aircrew members become part of the infiltration team and remain with the UW team until evacuation is accomplished.

b. The command controlled approach is designed to permit accurate navigation to a landing zone while providing maximum protection from enemy observation and ground fire through tha use of external guidance. Navigation is assumed by the command control ship, which is holding away from the LZ at altitude. Turn instructions are given by terminology such as, "Turn right/left," "Stop turn." During the final phase of the approach, the controller gives a 2 kilometer, 1 kilometer, and 500 meter warning, followed by continuous instructions regarding the location of the landing zone until the pilot reports the landing zone in sight. Airspeed should he reduced to arrive at 60 knots at 500 meters and to hover at the LZ.

c. False insertions to several LZs in the same area are effective in confusing the enemy and disrupting enemy movements. The false insertion should meet all the requirements of an actual insertion.

d. Infiltration Techniques. The basic tactics described below can be varied or modified for each mission. However, certain flying techniques remain constant. The following tactics generally apply:

(1) Flight altitude in the insertion area should be that which provides the best avoidance of the enemy antiaircraft threat.

(2) Descents with turns should be made as rapidly as possible without going into autorotation.

(3) Terrain features should be used to conceal the helicopter as much as possible.

(4) Final approaches should be short, fast, and masked, if possible. This does not mean a big flare over the LZ, but rather a moderate, gradual flare and reduction of airspeed into the LZ.

(5) Final descent into the LZ must be slow and cautious in order to avoid trees, stumps, and settling with power.

27-6. **Exfiltration.** Exfiltration is accomplished on schedule except in the event of an emergency. It can be accomplished at any time during daylight hours if weather permits. A night extraction may be desirable under certain conditions of moon illumination and cloud cover or if night vision devices are available.

a. When the pickup aircraft sights the team's location, the mission commander directs the armed helicopters to position themselves to protect the extraction aircraft during pickup. If enemy fire is present, there may be delays while the armed escort attempts to suppress it. If complete neutralization cannot be made, the armed escort will keep a steady fire on the enemy element while the pickup aircraft proceeds to extract the team.

b. Departure from the LZ will depend on terrain, aircraft performance, enemy opposition, and the size of the element. A low level departure followed by a maximum performance climb offers the advantages of disguising the exact point of exfiltration and reducing the vulnerability to ground fire. Terrain and weather masking, position of the sun, and wind direction must be considered in determining the best type of departure.

Chapter 28

PSYCHOLOGICAL OPERATIONS

SECTION A—LEAFLET DROP

28-1. General. The mission of the Special Operations Unit includes the capability to conduct psychological warfare activities to support joint operations with friendly foreign nations. One operation involves dissemination of propaganda type information to enemy or neutral populations by leaflet drop. To be effective, a leaflet mission must concentrate printed material within the populated area without excessive waste. See 2AD 3-1(S).

28-2. Planning:

a. The agency requesting a leaflet mission will furnish the Special Operations Unit with material to be dispersed and give the location and confines of the objective area.

b. The requesting agency and the Special Operations Unit will jointly determine the best altitude for the drop considering the packaging of the leaflets, method of dispersal, and desired ground saturation.

c. The aircrew executing the drop and the psychological operations officer will plan the release point and heading for the drop based on winds in the target area. Missions are normally performed at as low an altitude as possible to minimize drift, and the aircrew will use judgment to compensate for wind.

28-3. Dispersal Techniques. There are several methods by which leaflets may be dispersed from the aircraft. Two methods most suitable are Delayed Opening Leaflet System (DOLLS) and dropping by hand.

a. DOLLS. DOLLS were developed to deliver leaflets to hostile targets while flying at altitudes above the effective range of small arms fire. There are two standard size DOLLS. Large DOLLS weigh 20 pounds and the small DOLLS 4-1/2 pounds.

(1) Large DOLLS us a 10 foot cubical cardboard box for a leaflet container. The box is bound with the casing of 550 pound test nylon parachute line. The cord is threaded through a hole punched in a length of alow burning fuse or utilizes cutter power actuator. M-21 (25 second delay) or M-22 (10 second delay). NSN 1375-060-0885.

(2) Small DOLLS do not require a container. The leaflets are neatly stacked and tied with 100 pound test nylon line. As with large DOLLS the line is threaded through a fuse which delays and severs the binding cord. A plastic cone should be secured to the small DOLLS to stabilize bundle trajectory, which increases drop accuracy.

b. Hand dispersion of leaflets can be effective if hostile action is not a factor. Fly at 400 feet AGL and offset by the distance obtained from the table below.

Speed of Wind (MPH)	Yards Offset
5	215
10	430
15	530
20	610
25	680
30	740

28-4. Tactics. The agency requesting the drop should deliver the prepared leaflet bundles to the aircrew. Airspeed will be as required.

a. As the aircraft nears the target area, the pilot must closely examine the terrain for indications of surface wind. If no indications are apparent, forecast winds will be used. On the first run only one leaflet bundle is dropped. The aiming point is approximately 500 feet upwind of the target and the aircraft is maneuvered to track across the wind. The first bundle is released 500' above planned delivery altitude. This technique ensures bundle opening.

b. When the leaflet pattern lands short of the target, the pilot may either climb a few hundred feet and allow the leaflets to drift further downwind or adjust aircraft track closer to the target. When bundles open too high, the leaflets will blow over the target, requiring either a descent or adjustment in track farther away from the target. When necessary corrections have been made, a full delivery pass is completed by dispensing as many units as required.

28-5. Fuse Preparation. The leaflet bundles including the fuse should be fully prepared when they are delivered to the aircrew. However, the following information is provided:

a. Before cutting a time delay fuse, its exact burning rate must be established. This rate should be ascertained for each new role of fuse. Discard the first two inches of fuse from the roll as it may be dirty or deteriorated from exposure to moisture. Cut several 10-inch pieces of fuse and check their burning time with a stop watch. The burning rate is equal to seconds per inch burn.

b. To compute fuse length, first ascertain delay time (see drop charts), then divide by the delay fuse burning rate. Example (from large DOLLS drop chart):

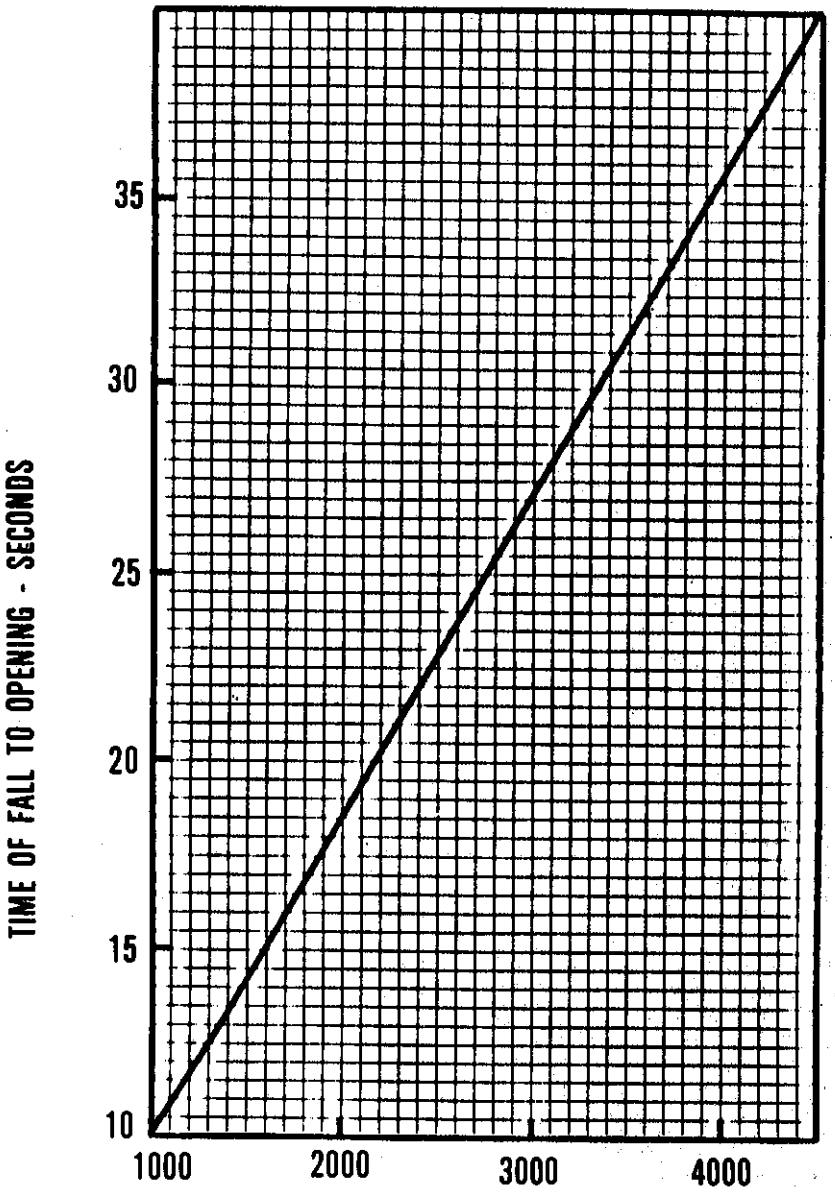
Drop Altitude = 2,000' AGL with 16-lb bundle
Time Delay = 15 seconds
Calibrated
Burning Rate = 3.7 seconds inch
Fuse Length = 15 Sec. = 4.05 inches

2.7 Sec Inch

When hand cutting fuses, always add 1 inch to the calculated length to arrive at total length. This inch represents a section of fuse located on the opposite side of the binding cord hole from the time delay power train.

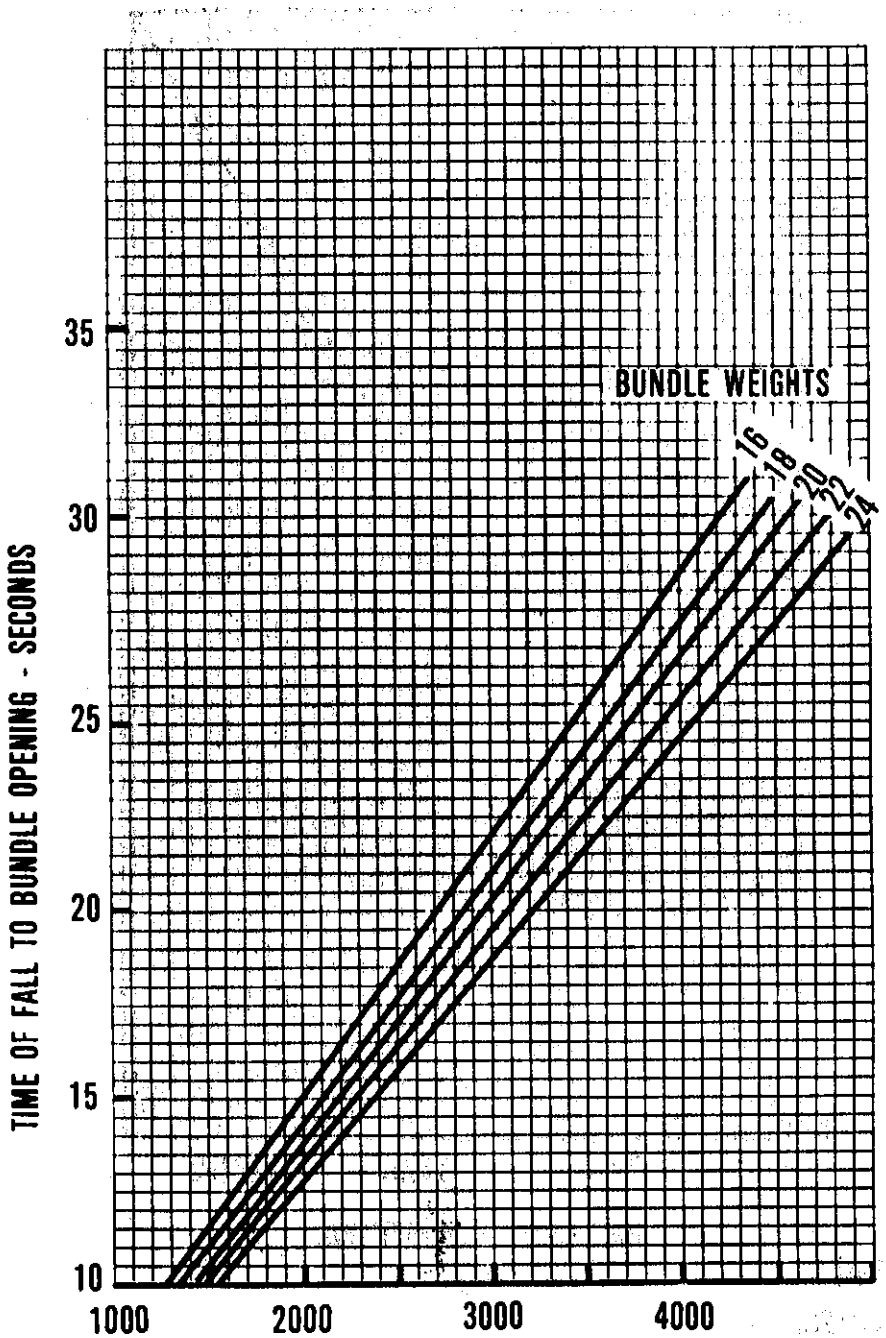
c. Sever fuses with a sharp knife making a clean cut. Do not use wire cutters for this operation as fuse crimping may occur resulting in ignition failure. At a point one inch from the fuse end, pierce a hold with an ice pick or awl. The hole splits the power train. It is the heat produced by the burning train which melts the DOLLS nylon binding cord.

d. The cutter power actuator, M-21 (25 second delay) or M-22 (10 second delay), NSN 1375-060-0885) may be substituted for hand cut fuses.



NOTE: BUNDLE OPENING ALTITUDE 200 FEET

Figure 28-1. Small Drop Chart 5" X 8" Leaflets.



NOTE: BUNDLE OPENING
ALTITUDE 400 FEET

Figure 28-2. Large Drop Chart 10″ X 10″ Leaflets.

SECTION B—LOUDSPEAKER

28-6. General. Loudspeaker broadcast missions are conducted for the purpose of aiding friendly forces in disseminating propaganda-type information to adjacent enemy or neutral populations. Loudspeakers can also be an effective instrument in civic-action work or in disaster areas. Tape broadcasts are usually made by personnel who are proficient in the local language. It is highly desirable to have a local citizen speaking, especially if dealing with certain ethnic groups. This not only adds credibility but allows a natural, understandable use of the language. If a local citizen is not available, the tape recorder may be used for this purpose. While the recorder has found much success, it is not as valuable as the "live" broadcast, because the "live" speaker can vary his speaking to suit the situation, thus enhancing the overall effect.

28-7. Procedures.

a. H-3/H-53. The aircraft should be established in a right-hand orbit around the target area at an airspeed of 70-90 KIAS and approximately 800-1,000 AGL. The angle of bank should be varied to keep the aircraft in 1/2 to 1 mile radius while the speaker operator varies the speaker depression angle to keep the speaker pointed at the target.

b. UH-1N procedure. The aircraft should be established in a circular left-hand orbit around the target area at an airspeed of 60-110 KIAS. The slower airspeeds provide a clearer message at lower altitudes. Rotor speed should be maintained at 100% Nr at all times. The angle of bank should be varied to keep the aircraft in ¼ to 1 mile radius while the speaker operator varies the speaker depression angle to keep the speaker pointed at the target.

28-8. Position Selection. An operating location with a line of sight observation of the target objective is desirable. As sound carries well across water, advantage can be taken of a river or a lake to improve sound transmission. It is preferable to locate upwind of the target to use the carrying power of wind. If a circling course is planned, the horn should be continually aimed at the target by varying the aircraft angle of bank or adjusting the angle of the loudspeaker. From a hover, the sound beam should be directed outside the area of sound caused by the rotor system. If broadcasting over hostile areas, maintain sufficient altitude to avoid ground fire. Small targets can be reached from high altitude by maintaining a steeper bank in the orbit.

28-9. Techniques of the Voice Transmission. The system possesses the capability of high quality voice transmission over long distance for long periods of time. However, effective utilization of these features depends, to a great extent, upon proper operating procedures.

a. To successfully project the voice over long distances, it is necessary to develop a microphone technique different from the normal conversational manner. Talk clearly and distinctly, separating each word with noticeable pauses, keeping the voice volume high and the lips touching the mouthpiece. A normal (medium pitched) voice is more intelligible and carries farther than a bass voice.

b. Acosutic feedback can be prevented by shielding the microphone from direct sound waves from the speaker. This can be accomplished if the speaker operator will place his body between the microphone and the speaker.

28-10. Operation with Recorder. When a recorder, or other sound source is to be operated with the amplifier, connection is made to the recorder (REC) input connector (PL). The "Gain" control is rotated counter-clockwise from the OFF position to increase the recorder input signal. If the recorder sound is voice, the correct input level is adjusted in the same manner as for microphone operation. IF the recorder sound is music, operate at a reduced "Gain" control setting. The correct setting will cause the "Monitor" meter to swing occasionally to full power reading. Failure to reduce the gain setting may cause excessive power to be dissipated in the speaker units and result in failure of the speaker voice coils due to overheating.

Chapter 29

ORDNANCE DELIVERY

29-1. General:

a. Armed helicopters used in support of ground troops or employed in the transport escort role are extremely effective due to their flexibility and ability to deliver ordnance very close to friendly positions. The fundamentals described here, in conjunction with the Dash 1, appropriate 3-1, and AFM 3-5, are basic information for gunship employment. Each situation will require some degree of modification to patterns and tactics described. The tactics described here are for a two-ship pattern. When resources are available, additional aircraft can be incorporated in the patterns.

b. Due to the maneuverability of the helicopter and the wide variety of target situations, the helicopter crew must have a complete knowledge of their capabilities and limitations with the various helicopter weapon systems.

29-2. Basic Principles. Armed helicopter doctrine demands the timely and accurate delivery of fire to meet the requirements of supported forces. All members of the gunship team must be continuously indoctrinated with a senee of urgency; however, they must prevent inadvertent firing into friendly positions. The following must be considered:

a. Control. Control is the ability of the commander to position or maneuver elements to accomplish the mission. Control le enhanced by the communications capabilities of armed helicopters. Establishing standard operating procedures and thoroughly training crews allow the use of brief commands.

b. Flexibility. Flexibility allows the armed helicopter commander to adapt to the situation and to accept a variety of missions. Flexibility is primarily a result of communications and mobility.

c. Fire and Maneuver. Fire and maneuver allows one element to close with the enemy under the supporting fire of another element. One of the most efficient uses of armed helicopters is employing them as a base of fire while ground elements close with the objective. To provide a continuous base of fire and maneuver, armed helicopters are employed as a team.

d. Surprise. Surprise implies striking the enemy in a manner that they are unable to counter effectively. Even when the enemy knows they will be attacked, the armed helicopter may achieve surprise by the time, place, direction, size, or composition of forces, or by the tactics employed.

e. Timing. Precise timing allows maximum support of all attacking elements and reduces the effect of enemy countermeasures.

29-3. Established Rules for Armed Helicopter Employment. Factors affecting the employment of armed helicopters are METT (Mission, Enemy, Terrain and Weather, and Troops and Equipment) and the established (cardinal) rules. These established rules are combat proven guides which enhance mission success and increase survivability in the combat environment.

a. Avoid Target Overflight. Armed helicopters do not have the speed to survive in the vicinity of hostile antiaircraft fire. Two steps in avoiding target overflight are:

(1) Engage target at maximum effective range.

(2) Disengage target before reaching enemy's effective range.

b. Avoid Flight in the ZAP Zone:

(1) The ZAP zone is the airspace where most aircraft hits occur. The limits of the zone are governed by the enemy ground-to-air firepower capability.

(2) The ZAP zone is also that airspace which provides the best air-to-ground observation. For this reason, it is not always possible to meet the requirements for reconnaissance and remain out of the zone.

c. Avoid Flying the Trail Position:

(1) When both the gunship lead and the wingman fly the same ground track, the following unacceptable conditions result:

(a) Observation as a team is reduced.

(b) Enemy gunners can place raking fire across the entire formation.

(c) The hostile force is alerted by the first helicopter, and will either take cover or place fire on the second.

(2) To properly employ fire power the lead aircraft should establish the axis of advance over the most favorable terrain for the entire element.

d. Make a High Reconnaissance First. Circumstances that can prevent a high reconnaissance include weather, the tactical situation, or situations when mission security would be jeopardized.

e. Always Assume the Area is Hostile. The assumption that an area is safe just because no hostile fire has been received, especially in guerrilla conflicts, can be fatal. A reconnsissance by fire with negative results is not a guarantee that the area is safe.

f. Locate the Friendly Forces. Armed helicopter crews should not return hostile fire until the friendly positions are known. Constant visual and radio contact should be maintained with friendly forces.

g. Avoid Flying Parallel to Terrain Features. Continually flying parallel to terrain features establishes a pattern. Flight over linear terrain features should be conducted at maximum speed and at varying angles more nearly perpendicular.

h. Conserve Ammunition. Ammunition should be conserved for contingencies such as rescuing downed crew members. One method of conserving ammunition is to regularly reserve a certain percentage of the ammunition load for contingencies.

i. Know the Situation. It is imperative that armed helicopter crews know the ground tactical situation if they are to provide the accurate, timely fire support required.

j. Team Briefing. Each member of the team must know the situation, the mission, and the plan of execution. Debrief the team on completion of the mission. Debriefing will often bring out valuable intelligence information.

k. Take your time. A common mistake, especially with inexperienced crews, is the tendency to rush. The crew should concentrate on sound tactics and accurate fire delivery.

29-4. Target Acquisition (Airborne):

a. Reconnaissance. Targets may result from aerial reconnaissance performed by the armed helicopter or by a FAC:

(1) Known Target. The known target is located by aerial or ground surveillance. The armed helicopter pinpoints the target specifically before attacking it.

(2) Target of Opportunity. "Pop-up" or surprise targets located by the armed helicopter element reconnaissance are targets of opportunity.

b. Night Acquisition. At night or during periods of low visibility, target acquisition becomes more difficult and crew responsibilities take on added importance. Proper crew training and knowledge of techniques available can be an advantage for the armed helicopter element. Aids to night target acquisition include:

(1) Artificial illumination. Night target illumination may be accomplished by aircraft flares, artillery illuminating rounds, and ground or aircraft mounted searchlights.

(a) Armed helicopters can drop flares for illumination. The flares constitute an inflight hazard because of their possible ignition by hostile fire.

(b) Due to the danger of flying into the flare, attack helicopters normally operate outside or above the lighted areas. The use of flares must be closely coordinated with the ground commander to prevent interference with the ground tactical plan.

(2) The use of night vision goggles (NVGs) by qualified aircrews may increase the ability to identify targets at greater ranges; however, accurate range estimation is difficult. All detection ranges are largely a function of the existing light conditions. Moving targets with contrasting backgrounds or targets with a reflected or generated light source can be identified at greater ranges. Target acquisition capabilities are:

(a) Under low to medium ambient light conditions (quarter moon), personnel can be detected at ranges up to 400 meters (1,310 feet). Vehicular targets and other large stationary objects may he acquired at ranges up to 2,000 meters (6,560 feet). Acquisition in excess of 3,000 meters (9,840 feet) is possible when vehicles are moving. Recognition of prominent terrain features is possible at ranges up to 3,000 meters (9,840 feet).

(b) In medium to high ambient light (quarter moon to full moon), all detection ranges are significantly increased. Major terrain features have been identified at distances exceeding 16 kilometers (9.9 miles) and buildings at ranges exceeding 8,000 meters (9,840 feet). Aircrews may fire numerous rockets or tracers without losing the ability to see with goggles. The NVGs amplify and regulate ambient light at a constant level. A sudden illumination or sudden increase in light, such as when firing rockets, will cause the goggles to darken momentarily until the wearer turns away from the light or the source is extinguished. The darkening effect results from the goggles adjusting to the bright light source. Areas surrounding the bright light or flash will appear to darken. The effect depends on the duration and intensity of the light. Recovery from the darkening effect is almost instantaneous.

29-5. Target Acquisition (Ground). Ground elements acquire most targets for armed helicopters. Transmitting target information from the ground to the armed helicopter element causes special problems. A simplified fire request system must be used by the ground observer to minimize the difficulties of calling for armed helicopter support:

a. Target Location. Friendly Elements Position. The ground observer and the armed helicopter commander must be sure that the armed helicopter element knows the location of the friendly elements. Several methods may be used to ensure that no mistake is made:

(1) Use colored smoke or colored panels which can be seen from the air to mark the friendly positions.

(2) Use normally encoded coordinates, reference points, and point of origin giving friendly positions.

b. Target Identification. The ground observer can use colored smoke, or any other signal which can be identified from the air, to reference the target. If it is impossible to mark the target, the ground observer may elect to use smoke or panels to mark a position. The ground observer will estimate the direction and distance to the target.

c. Target location and description should be as concise as possible but not so concise as to preclude absolute understanding of the target and its location by all members of the team.

d. Attack Formation. To position each ship in the team at the proper location during the attack, the pattern to be used in the attack will he given by the gunship lead.

e. Attack Procedures. When the gunship lead specifies the attack direction, the wingman is allowed time to move into position to provide protective fire. When determining the attack heading, gunship lead will take into account those principles of target attack previously discussed.

f. Direction of Break. Lead calls the direction of break so that the wingman can position to take advantage of the break.

g. Acknowledgement. All elements of the armed helicopter force must understand the situation completely prior to attack. All commands must be acknowledged by each element.

h. Actions of Gunship Elements. When under direction of the ground observer, the gunship element must ensure that:

(1) Friendly positions are identified.

(2) If a mark is used, the direction from the mark to the target is clearly identified and understood by both the ground observer and the armed helicopter team.

(3) The type fire that the ground observer wants on the target is known.

(4) The armed helicopter element is cleared to fire before attacking.

29-6. Attack Patterns. Normally specific patterns cannot be preplanned. The mission commander will adjust each attack to take advantage of the terrain and weather, exploit enemy weaknesses, and employ combat elements to gain the maximum advantage:

a. Entry from rocket passes to gunnery patterns will be dictated by terrain, weather, and friendly/enemy positions. Turns should always be made away from the enemy position. If the friendly position is difficult to distinguish, a rapid descent should be made directly to the friendly position using jinking maneuvers during the descent.

b. The Break. The break is employed to enable attack helicopters the safest possible departure from the target area. It consists of a 150 to 180 degree turn after weapons release.

c. Racetrack Pattern. The racetrack pattern (Figure 29-1) is the basic attack pattern from which the others are derived. This pattern may be used on any direct fire support mission or may be modified as the situation dictates. Integrated weapons may be used to suppress hostile fire long enough for the helicopter to break contact. Direct hits are not necessarily a requirement in suppressing hostile fire. Often the sound of the weapons being fired is sufficient to momentarily silence hostile fire. This is particularly true

for the 2.75-inch folding fin aircraft rocket (FFAR) which has a significant psychological effect that is derived from the noise of firing alone:

(1) Advantages:

(a) Any number of helicopters may be used in the pattern.

(b) The helicopters are mutually supporting by fire and observation.

(c) Continuous fire may be placed on the target.

(d) Engagement range, disengagement range, and timing are flexible.

(2) Disadvantages:

(a) Target is covered from only one direction at a time.

(b) Enemy is able to place enfilade fire on the entire attack formation from one position.

(c) Direction of break is fixed.

d. Figure "8" Pattern. This pattern is effective for both LZ security and attack. The helicopters are positioned so that each is in position to attack as the other helicopter disengages the target. Timing is important and care must be taken to vary the track over the ground. Turns are away from the target area. Entry into the Figure "8" may be from any position (Figure 29-2) using a combination of mixed ordnance (2.75 rockets, 40 mm gun or fixed forward fire). Offset the run in so as not to inadvertently hit the team:

(1) Advantages:

(a) Continuous fire on the target preventing the enemy from setting up fire in anticipation of subsequent attacks.

(b) Provides continuous "over the head" observation and coverage of the team.

(c) Permits delivery of large volume of fire in a short period of time.

(d) Mutual coverage is maintained during the break.

(2) Disadvantages:

(a) Spacing and timing are critical.

(b) Target is covered from only one direction.

(c) Pattern accepts only two ships.

e. Dogbone Pattern (figure 29-3). An effective pattern designed to place protective fire between the team on the move and a pursuing hostile force.

(1) Advantages:

(a) Attacking helicopters are mutually supporting and control is easily maintained during the attack.

(b) The pattern may be modified to adapt to terrain and number of firing passes required.

(c) Length of time for firing pass is quite long.

(d) Maneuvering places gunships in position to cover teams without firing into friendly positions.

(2) As in the figure "8" pattern, entry may he from any position (figure 29-4) using combination of mixed ordnance.

NOTE: The loops of the basic Dogbone should always be made away from the target position.

f. Random/Modified (Figure 29-5). This pattern gives the gunships tha capability of delivering rocket fire as well as side fire, and may be entered from either the figure "8" or Dogbone.

g. Spooky Pattern (figure 29-6). This pattern is basically the same as a circling pattern but flown at an altitude above the range of enemy ground fire. It can be used effectively to provide a ring of fire around a friendly position that may be completely surrounded. Firing can be done on a tangent to the friendly position which will prevent ricochets or direct fire from hitting the friendlies. This pattern is useful in providing an escape route for a team or neutralizing a maneuvering area for a low altitude pattern.

29-7. Gunship Escort (figure 29-7). No matter what circumstances are encountered during the escort role, the duties of the armed helicopters remain the same. Before the slick descends into the area, the gunships should make a thorough reconnaissance of the flight route to clear, radio instructions to the slick, and get in position to escort the slicks into the area:

a. During the approach portion of an escort, the gunships must be in a position to provide fire support, as necessary.

b. When the friendly troops are engaged in a fire fight with the enemy, another procedure must be used. In this situation enemy units can often be accurately located. Once the enemy has been located, a route should be selected which offers the best protection in terms of concealment and avoidance of enemy ground fire.

c. An attack of the enemy position will allow the slick aircraft to make its approach with comparative safety. The attack must be timed to place heavy continuous fire on the enemy positions during the final portion of the slick's approach. Fire support must also be delivered while the slick is on the ground. If the slick is able to land in a well covered or concealed position, it may be possible for the gunship to orhit until the slick is ready to depart the area.

d. Departure:

(1) If the armed helicopters have made a thorough reconnaissance of the route and landing area, there should be little difficulty in escorting the slick from the area. Try to avoid establishing a definite departure pattern. Choose a departure route that offers concealment and avoids all known enemy area.

(2) The slick should notify the gunships of its intentions prior to takeoff. This will allow the gunship time to maneuver into proper position to give maximum protection during the departure.

29-8. Evading Enemy Fire. See Tactics Manual for helicopter operations.

29-9. Aircrew Responsibilities. One thing that must be emphasized is that flight integrity and air discipline are not flexible. The most experienced, able, and intelligence aircrews can negate much of their effectiveness by a simple violation of air discipline. Supervisors must provide the training and guidance necessary to ensure a professional well-disciplined and effective strike force. The techniques outlined in this regulation will provide the basic guidelines for the combat employment of the UH-1. However, no regulation can ever substitute for any lack of skill, determination, or intelligence:

Gunner (Flight Engineer/Aerial Gunner):

(1) To be effective, the gunner must be well briefed on the mission. The gunner must know the enemy situation, the friendly situation, the formation to be flown and the specific mission of the helicopter. The pilot's briefing to the gunner should include applicable rules of engagement and any local operating procedures.

(2) The pilot must give the gunner an opportunity to test fire his weapon prior to any potential engagement.

This can be accomplished over open fields or bodies of water, carefully avoiding inhabited areas. When in formation, prior to test fire, the pilot will request clearance from the flight leader. (For training purposes, weapons will only be fired over an approved range.)

(3) Under normal circumstances, the gunner will not leave his assigned position within the aircraft until cleared to do so.

(4) The door gunners should keep the brass policed from the cabin area. Not only does the brass cause precarious footing, but it can work its way beneath the floor panels and jam the controls. On training missions, the brass is policed prior to departing the range.

(5) When engaging targets or flying cover for slick aircraft, the gunner should immediately notify the pilot of gun malfunctions. He should assist the pilot in maintaining relative position during gun patterns by giving clear concise information pertaining to the location of the LZ and other aircraft in the pattern.

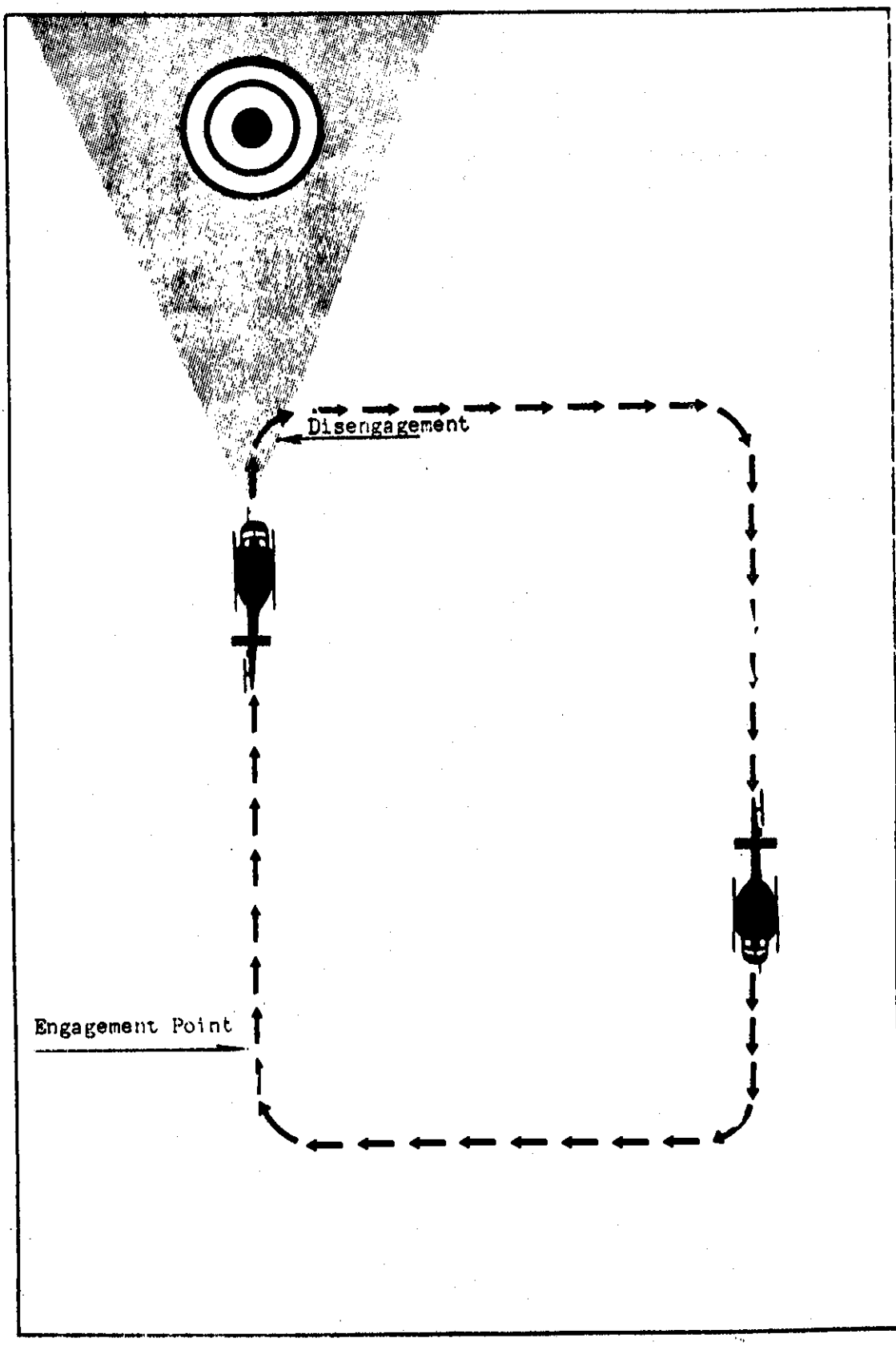


Figure 29-1. Racetrack Pattern.

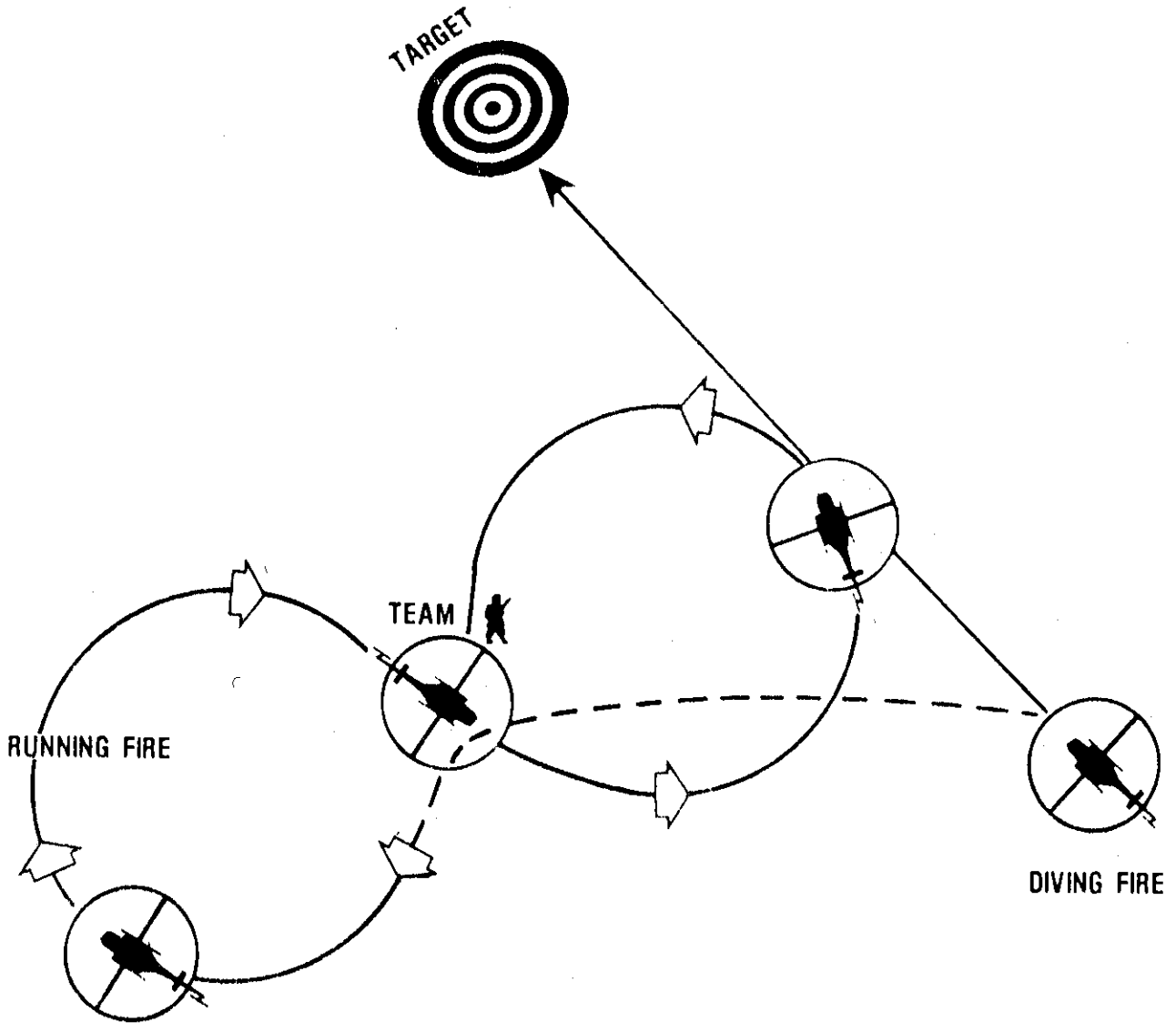


Figure 29-2. Figure "8" Pattern Entered From Diving Fire.

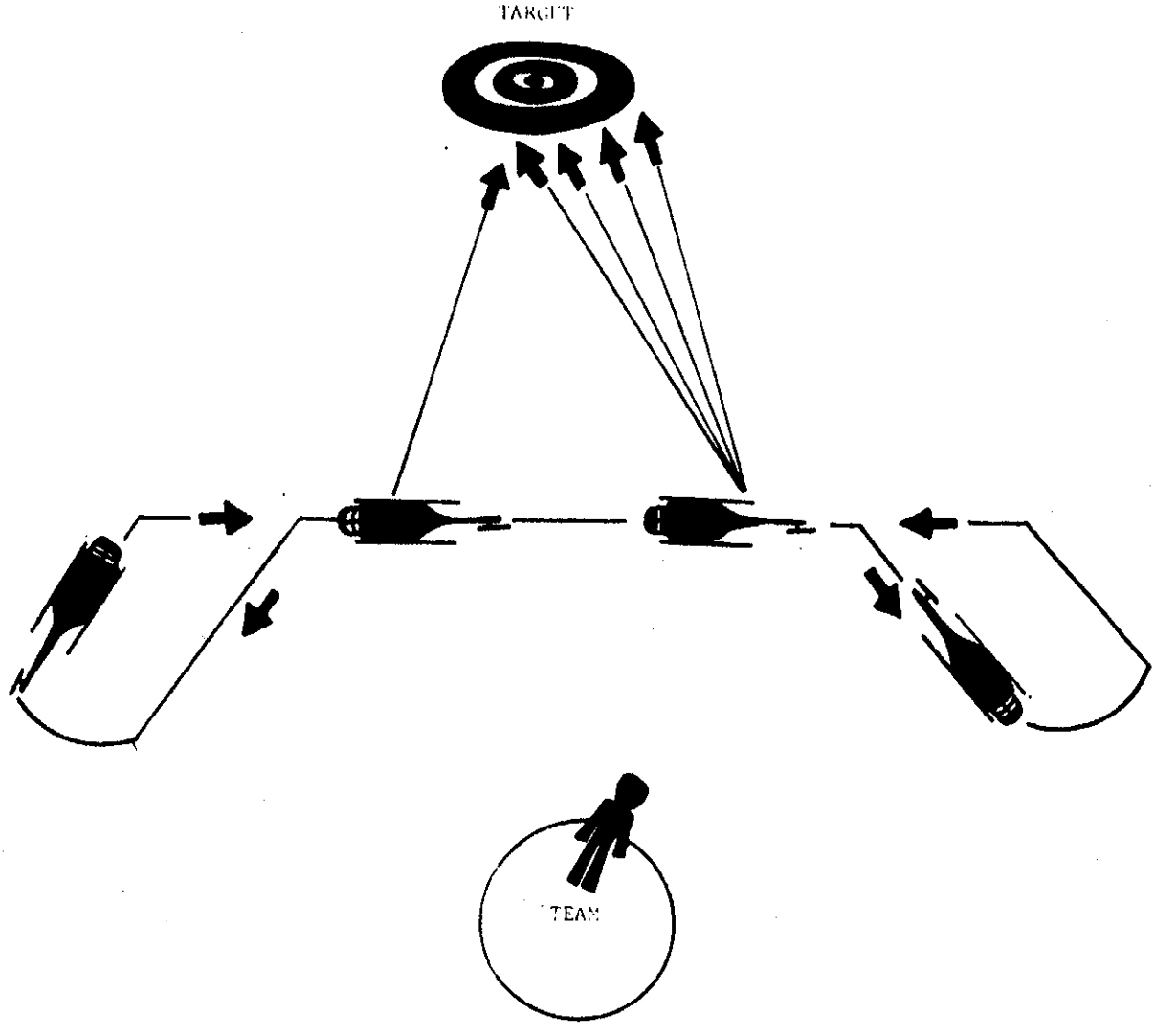


Figure 29-3. Dogbone Pattern.

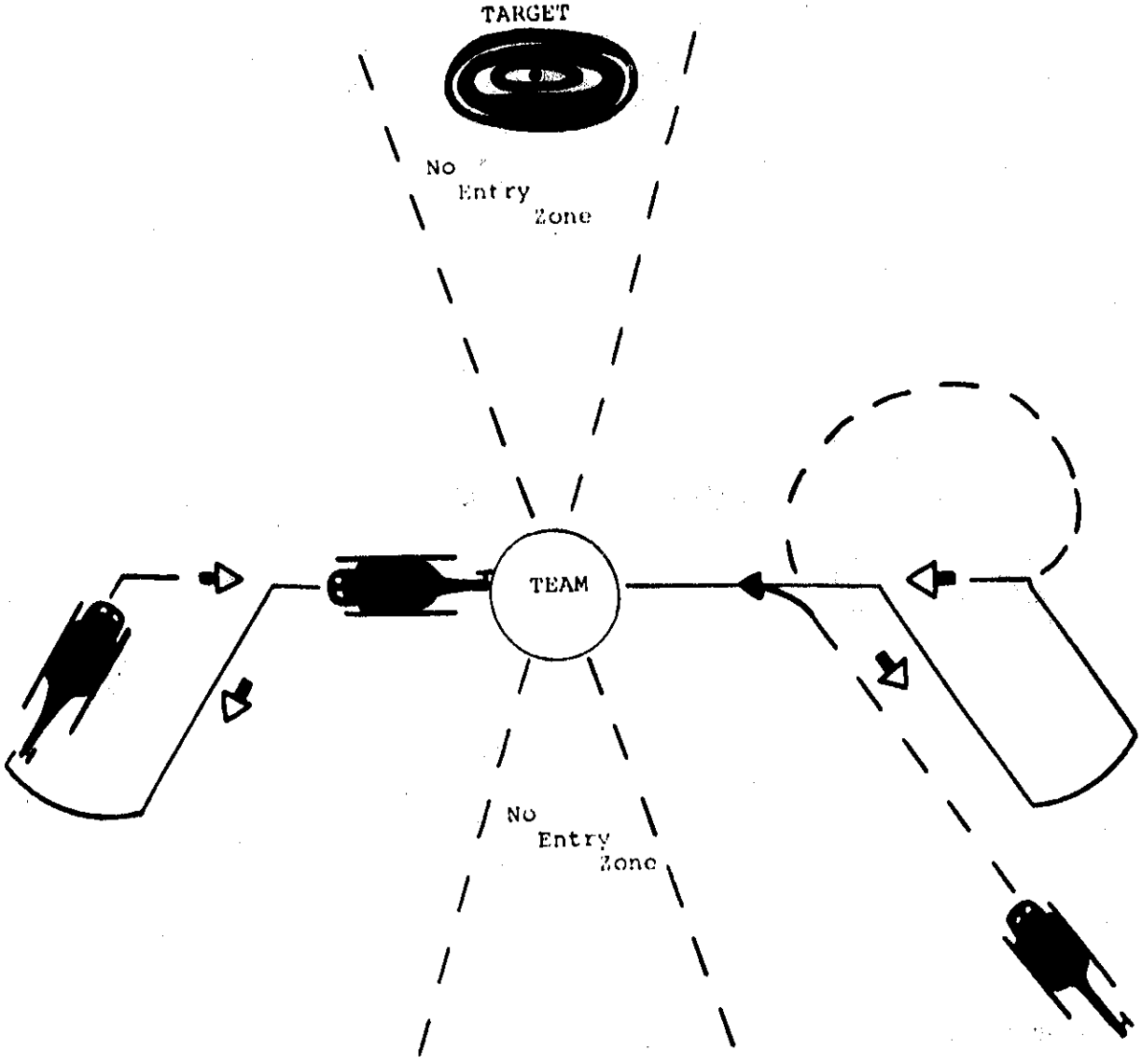


Figure 29-4. Dogbone Pattern Entered From Diving Free.

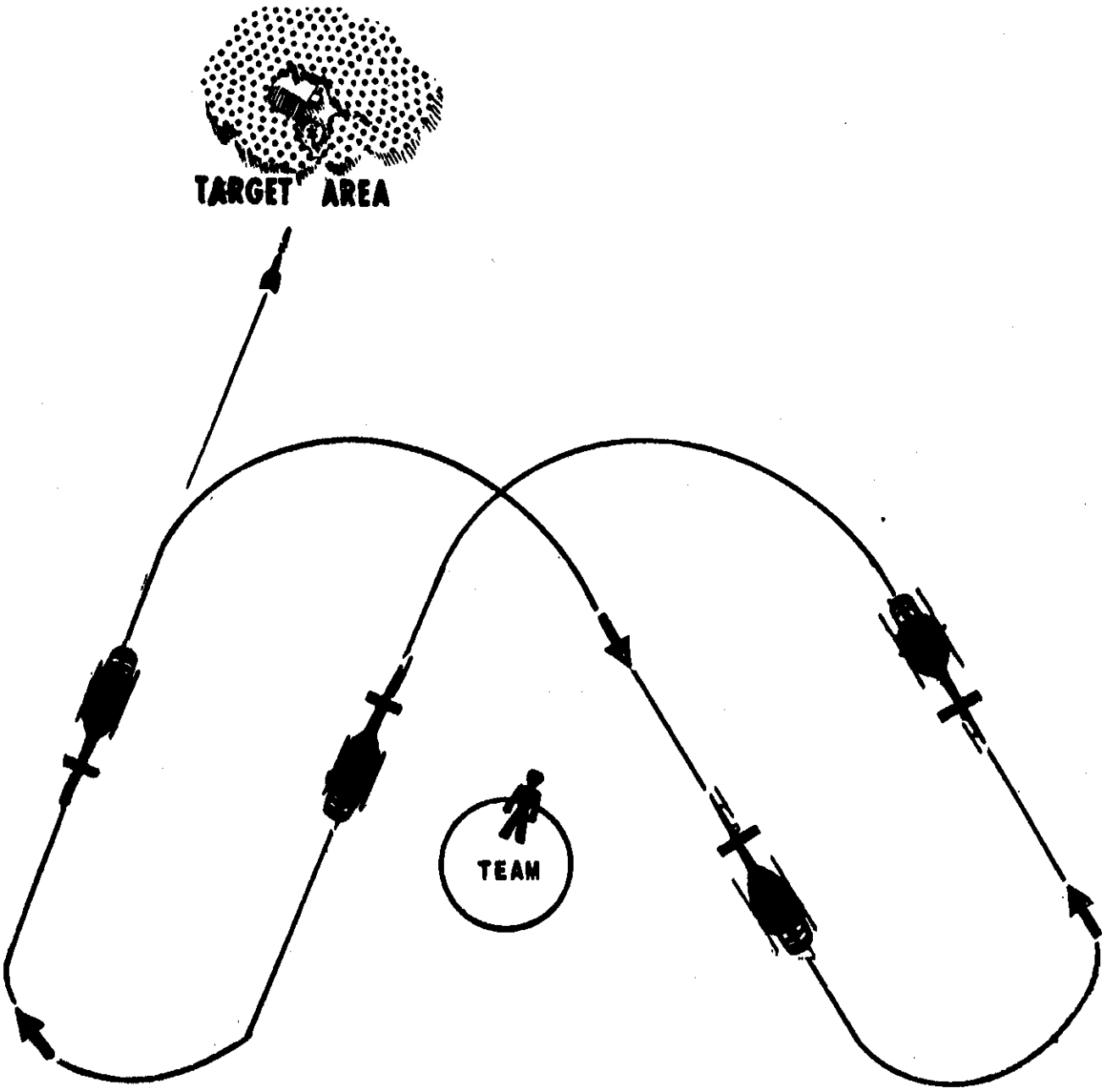


Figure 29-5. Random/Modified Using Integrated Fixed Fwd and Side Fire.

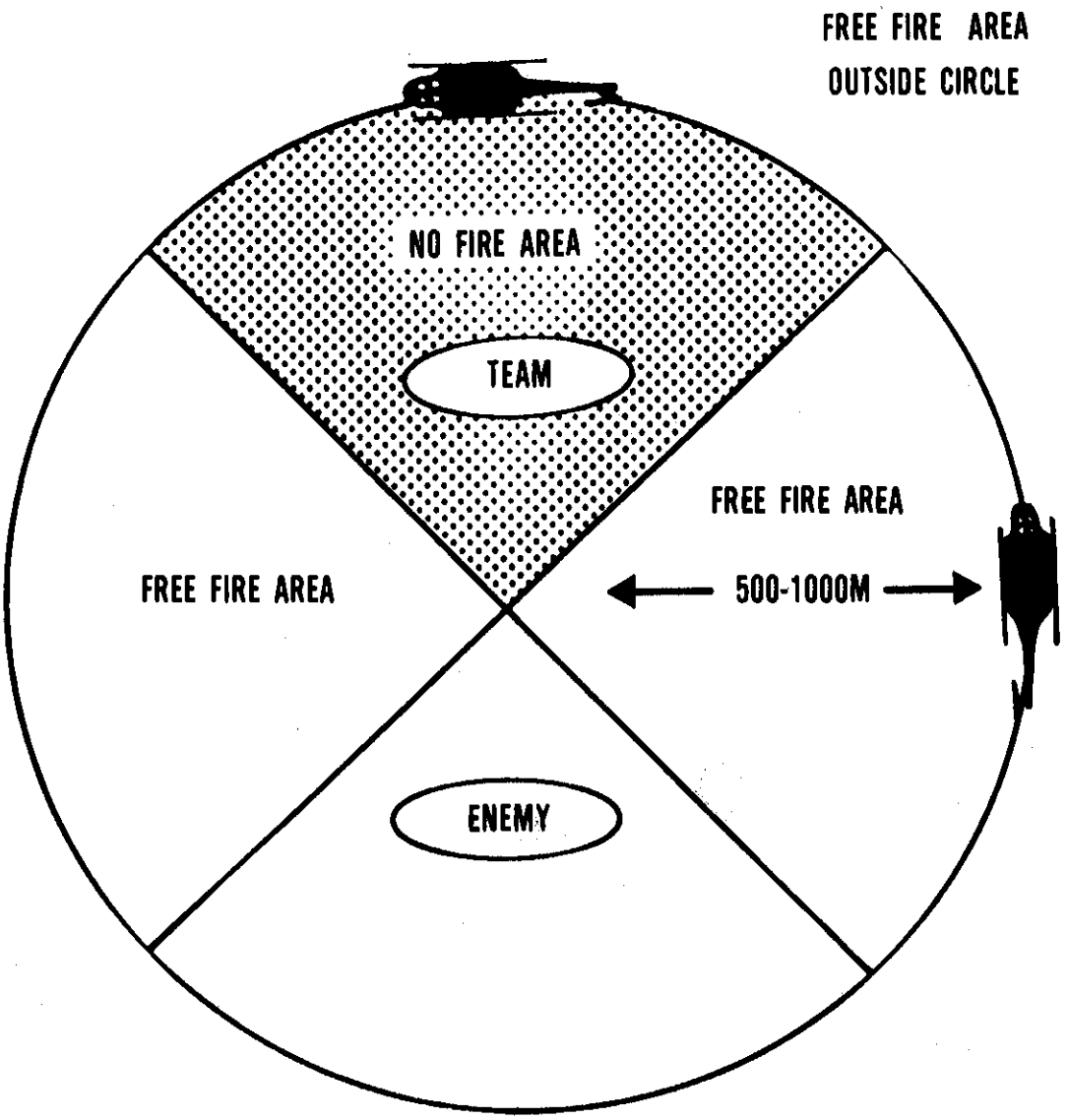


Figure 29-6. Spooky Pattern.

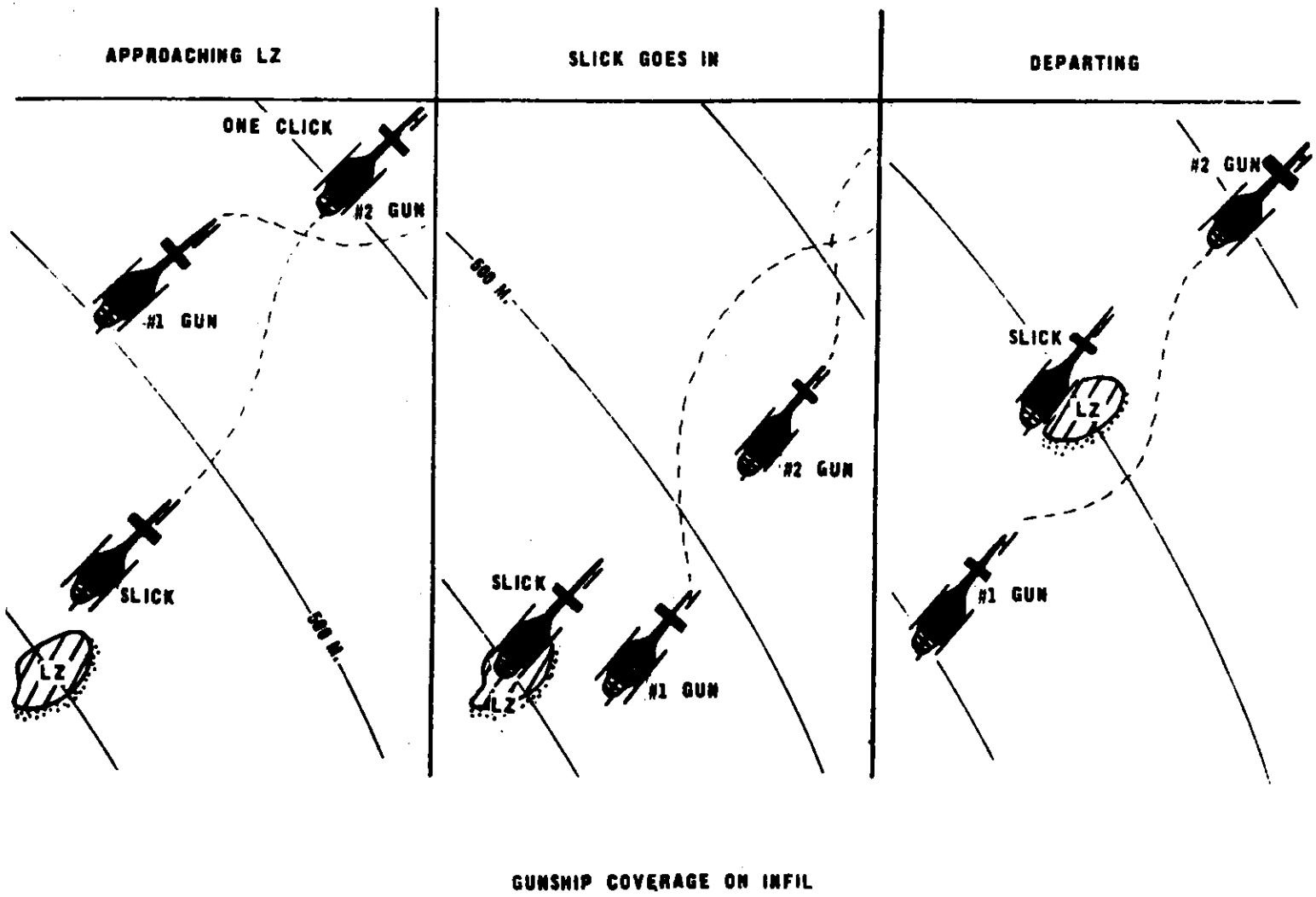


Figure 29-7. Infil Coverage Pattern.

Chapter 30

NIGHT VISION GOGGLE (NVG) OPERATIONS

30-1. General. Tactical and peacetime missions may require the use of NVGs on all or part of the mission. NVGs amplify light from stars, ground lights, and the moon to enhance the vision of the wearer. The following limitations and cautions must be observed when operating on NVGs.

a. Depth perception is adversely affected by NVGs (i.e., weather may appear much further away than it actually is; closure on another aircraft or descents toward the ground are not immediately noticeable).

b. Reduced visual acuity does not allow the aircrew member to perceive singular objects or terrain features as rapidly.

WARNING: Electric power lines, unlighted towers, poles, antennas, dead trees, and all types of wires are extremely difficult to see while conducting NVG operations.

c. Reduced peripheral vision degrades the ability to perceive motion, particularly in a hover.

d. Terrain/other obstacles in the "shadow" of more distant/higher terrain, man made obstacles or clouds, may not be seen when wearing NVGs.

e. Different colored lights cannot be distinguished (i.e., all lights appear to be the same color).

f. Brigbt lights (direct or reflections) from internal or external sources seriouely degrade the NVG wearer's vision.

g. Haze, smoke, and low outside illumination, due to overcast conditions or lack of ground ligbts, diminish the effectivenees of NVGs.

h. Turning on NVGs in daylight or looking directly at bright sources of illumination will damage the light seneitive material in the goggles.

i. Wearing NVGs for an extended period can cause extreme fatigue. Eye fatigue can be lessened by periodically removing the NVGs to rest the eyes. NVG users must guard against mission degradation due to prolonged usage. Commandere and operations officers must weigh crew experience, qualification, weather conditions, and other environmental factors when required to perform long NVG sorties which are not normally part of the unit's mission or which require an aircrew to fly a maximum crew duty day.

j. With adequate available outside illumination, NVG vision enhancement le inversely proportional to altitude and airspeed—the lower and slower you fly the better you see. In marginal or poor illumination conditions, the low/slow altitude and airspeed combinations required to adequately see are prohibitive to conducting eafe NVG operations at normal cruise airspeeds. Therefore, do not fly below the minimum altitudes specified in paragraph 30-2.

k. Avoid flying toward moonrise/moonset or sunrise/sunset as vision may be severely restricted by the intensity of the light.

30-2. Illumination Requirements. Altitudes listed in this section are minimums and should be adjusted upward for limited available illumination and reduced aircrew proficiency. During overcast sky conditions, sufficient reflected light may be available, depending on surrounding area lighting, to safely conduct NVG operations. Operations may be conducted down to 50 feet obstacle clearance with sufficient available illumination (illumination equivalent to 20% moon disk for operations using PVS-5s and 5% moon disk for operations using PVS-6 goggles). If only one pilot is equipped with PVS-6 goggles, or a mix of goggles exists in a formation, illumination restrictions will be the same as when operating with PVS-5 goggles. The decision on whether there is sufficient available illumination to safely conduct NVG operations down to minimum altitudes rests entirely with the aircraft commander, instructor pilot, or flight lead. When available illumination will not permit safe NVG operatione at minimum altitudes, the following restrictions apply:

a. En Route Altitude. See paragraph 5-17d.

b. Approaches:

(1) Nonmountainous approachee may be accomplished using additional light source once you have established your position and are within approximately two NM of the LZ. LZ lighting should be used. Use of aircraft white lights to make the first landing to set up LZ lighting is authorized.

(2) Mountainous approaches (i.e., LZ located along ridge lines or valleys, etc.) are not authorized.

NOTE: Mountainoue areas are defined as areas where a 500 foot gradient occurs within½ NM of the flight path.

c. Fully operational MH-53 aircraft bave no illumination restrictions. Other helicopters may fly on the wing of an MH-53 utilizing PAVE LOW systems in zero illumination conditione.

30-3 Weather Criteria. See paragraph 6-22.

30-4. Power Requirements. (Ref para 9-9a.)

30-5. Safe Escape Altitudes. See paragraph 5-17.

30-6. Wind Information. When accurate wind information is not available, base wind determination on forecast winds, on-board systems, and indications obtained during the site evaluation. If power reserve and escape routes are questionable, multiple passes should be made to determine wind effects before committing to an approach, hover/landing.

30-7. Minimum-Light/Communications-Out Air Refueling.

a. Minimum-light air refueling is basically the same as normal night air refueling. The main difference is which lights, if any, the helicopter uses. The pilot must make a real-time decision on light use based on moon illumination. If adequate illumination exists and if the tanker's pod and hose illumination lights are properly positioned, then the pilot may not require the use of any lights to effect the refueling phase. When lower levels of illumination are present, the pilot may desire to use the following lights:

(1) H-53. The drogue or probe light can be used. Because of the low level of light produced by the drogue light, the pilot may have difficulty when attempting to locate and properly position the light beam. Also, use of the

drogue light increases the potential for detection from the ground. The probe light has proven very effective for minimum-light conditions and it is difficult to detect from below. The pilot cannot normally discern that the light is operating until the helicopter is approaching the precontact position and is within approximately 20 feet of the drogue. Once the light is effective, the intensity may be adjusted to a level satisfactory to the pilot.

(2) H-3 and MH-53. The controllable spotlight, when used at low intensity, is very effective for minimum-light conditions and is difficult to detect from below. Adjust the light so it shines near the tip of the probe. When the helicopter is approaching the precontact position, the light will become effective and the intensity may be adjusted to a level satisfactory to the pilot.

b. The contact, refueling, and disconnect phases are identical to any other air refueling. Most pilots who have accomplished minimum-light air refueling find it much easier than the classic night AR. It is essential, however, that the tanker maintains a steady heading until the contact is made because spatial disorientation may occur if heading is varied in periods of low illumination.

NOTE: The pilot accomplishing the air refueling will not use NVGs for the contact and refueling phase.

c. One of the key elements to a successful minimum-light/communications-out AR is the briefing. During the briefing, it is essential that the altimeter setting, the rendezvous and join-up altitudes, the ARCT, and aircraft lighting be thoroughly briefed and understood.

d. The tanker and receiver must plan their flights and control their timing carefully. Under no circumstances should the tanker arrive at the ARCP early. Likewise, the helicopter must not be late. Absolute crew discipline must be maintained to effect timing and, if either aircraft is off schedule, radio silence may have to be broken to advise all concerned parties. In addition, the helicopter should be at the ARIP on time, at the assigned altitude, and have all checklists completed.

e. Rendezvous and join-up are essentially the same as normal night or day air refueling. The helicopter pilot should maneuver into the observation position slowly because of decreased depth perception. Rendezvous and join-up may be accomplished using either helicopter low or helicopter high procedures. Helicopter low has proven the better procedure for H-53s because the tanker can see the helicopter blade tip lights. When the helicopter acquires the tanker, the pilot climbs 300 feet/descends 200 feet and establishes a normal observation position. The observation position can be identified by flying on a line which places the tanker pod and hose illumination light on a line with the amber light by the paratroop door.

f. NVGs may or may not be required for the pilots to visually acquire the tanker. The use of NVGs may not be necessary after establishing air refueling altitude at the ARIP. However, proximity of high terrain along the AR track should be a consideration. If illumination and terrain are a consideration, it is recommended that the copilot be on goggles during the rendezvous and join-up. He usually removes the goggles when the helicopter is established in the observation position and remains off NVGs until disconnect. After disconnecting, the copilot can go back on goggles to assist the pilot in determining other aircraft positions and terrain clearance.

g. The requirement to AR with minimum light and in a communications-out environment is realistic. The actual AR is no more difficult than day AR if you thoroughly plan your mission, fly it on schedule, and think ahead. The key is good crew coordination, situation awareness, and aircrew/formation discipline.

h. Use the Planned Comm Out Refueling light signals in Annex A of this regulation for light signals between receiver and tanker.

30-8. Over Water Operations:

a. Cruise over water is permissible down to 100 feet AWL.

b. The minimum altitude for over water cruise for aircraft without radar altimeters or for aircraft with inoperative radar altimeters is 200 feet AWL.

30-9. Live Hoist. Live hoist is authorized during all NVG operations.

30-10. Minimum Equipment:

a. NVG compatible cockpit lighting.

b. One external IR landing light. Exception: (noncontingency) Helicopters with one operable, fully controllable searchlight with a variable intensity capability may operate without an IR filter installed. These operations will be conducted IAW MACR 55-54, para 5-16 and 30-2 illumination requirements. Helicopters without the variable intensity capability may operate without an IR filter installed only when the moon disk and effective illumination is 20 percent or greater.

c. Pilots must wear PVS5 NVGs with the AFLC approved modified face plate or a more improved system (e.g., two and a-half or third generation NVGs).

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SUMMARY OF CHANGES

This revision clarified crew complement for NVG operations and MEGP status (Chap 3); deleted redundant training criteria already contained in flight manuals (Chap 9); clarified exercise participation (Chap 9, Tab B); added new staggered trail formation, expanded tactical formation procedures, clarified lost visual procedures, and provided several new tactical turning maneuvers (Chap 14); expanded convoy procedures for missile security operations (Chap 23); added a new chapter on alternate insertion/extraction procedures to include alternate loading as well as rope ladder, rappelling and fast rope procedures (Chap 24); added minimum illumination requirement for PVS-6 NVG's (Chap 30); and updated the entire text. Aircrews are advised to review the entire regulation.

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