Chapter 22

SHIPBOARD OPERATIONS

22-1. General. Each shipboard situation is unique and the final decision on the course of action must rest with the aircraft commander. The chapter establishes standard procedures and guidelines to be used during shipboard operations.

22-2. Shipboard Hoist Procedures. If the ship does not have a suitable landing area or if rough seas will prevent a safe landing, a hoist recovery will be necessary.

a. After arriving on scene, make observation passes as necessary to:

(1) Identify the ship.

(2) Check the ship's superstructure for poles, antennas, cables, smoke stacks, and any other hazards to a hover.

(3) Confirm the location for survivor recovery or select a better one.

b. Complications and problems associated with rescue hoist pickups usually are the result of poor planning and the use of untrained personnel aboard the vessel. These problems may be minimized by prebriefing the crew of the vessel by radio, loud hailer, message streamers, or if required, by lowering a crewmember with a radio onto the vessel. The use of the rescue hoist to lower a message is not recommended. Inadvertent entanglement of the hoist cable with the vessel can result in an extremely hazardous situation. Therefore, this method of communication will not be used except when all other means are exhausted, and only then when a life or death situations exists or is suspected. Brief these items:

(1) Course of vessel. Normally the ship should steer to put the wind 30 off the port (left) bow. However, this may have to be varied depending on available hover references.

(2) Speed of vessel. The vessel should maintain minimum forward speed (idle or steerageway speed) in calm areas. Slightly higher speeds are required in higher seas.

(3) Pickup location (bow/amidship/stern).

(4) Type rescue device.

(5) Signals to indicate the survivor is securely attached to the rescue device, etc.

c. Complete power available checks and compute power required for an out-of-ground effect hover.

d. Make an approach to a hover astern of the ship and establish a hover at the same speed as the ship. Avoid hovering directly downwind of the funnel where hot, choking stack gas and smoke may be encountered or downwind from any large superstructure where turbulence and downwash may be present. Watching the ship's wake may induce vertigo.

(1) Check power to hover.

(2) Observe sea state versus ship pitch and roll pattern. When the ship is light and seas heavy, the pitch and roll cycle will vary from stable to violent. By observing this pattern, a stable period may be chosen for crewmember placement and recovery from the ship. The pitch-and-roll pattern also varies with the type of ship and loading. A tanker may be stable where a partially loaded freighter, under the same sea conditions, will pitch and roll violently. If the ship is underway, the roll factor may be cancelled out; but if it is dead in the water, you will encounter violent pitch, roll and yaw with very little or no measured pattern. In any case, select the most stable part of the ship for a recovery; in most cases, superstructure permitting, it will be amidship. Close observation and coordination between the pilot and hoist operator are required during this type of operation.

e. Hover taxi to the pickup location over the ship. Use a tag line to facilite the recovery.

(1) It may be necessary to deploy a PJ with a radio to make a medical evaluation and assist shipboard personnel with the recovery. The PJ determines what type of recovery equipment is required and supervises loading of the patient. After the PJ is on the vessel and clear of the hoist, recover the rescue device and move to the observation position to await further instructions. If the Stokes litter is used, disconnect it from the hoist for patient loading. Recover the hoist and deploy it again when ready for hookup. Do not allow the hoist cable to be secured to the ship or taken below decks. After the patient is recovered, if conditions allow recover the crewmember.

(2) Whenever observing or signaling the vessel, or while waiting for the survivor to be prepared for hoist operations, move to an observation position. Hover to the left and rear of the vessel where you can adequately observe activity on the vessel and where rotor wash will not affect recovery operations.

(3) The helicopter crewmember will signal the helicopter back in for the pickup and will specify the type of rescue device. The crewmember should keep the shipboard personnel away from the rescue device as it approaches the deck. Ground the rescue device prior to handling.

f. The RCC/OCC accomplishes all coordination for medical assistance. Case history, vital signs, and medication administered should be passed to the hospital.

g. Night Operations. Night pickups may be complicated by inadequate lighting of mast, booms, or rigging. Use parachute flares for illumination whenever possible, except when NVG's are being used.

(1) An escort aircraft, especially on long range missions, is very desirable. If weather and numerous ships are in the recovery area, excessive time can be consumed locating and identifying the vessel.

(2) To aid in location and identification, request the ship to shine a search light beam vertically or display flares when the aircraft arrive in the area.

(3) Reduced depth perception at night make approach to a ship difficult. Fly a rectangular pattern using the ship as a reference. The flight engineer monitors engine and transmission instruments. During descent, the copilot calls out altitude in 100-foot increments when above 300 feet AWL and 50-foot increments below 300 feet AWL. As the ship is approached, enter a hover astern above the deck.

22-3. Shipboard Landing Procedures. If the ship has a suitable landing platform (size and weight bearing capacity) and the sea state (ship's pitch-and-

roll) is not violent, a landing is the most expeditious method of recovery. Use the following procedures to accomplish shipboard landings on missions:

a. Communications. Established radio contact with the ship's primary flight controller and confirm the following:

(1) Direction of landing

(2) Wind direction and velocity

(3) Ship Heading. Normally, the ship will steer to place the wind 30 off the port (left) bow.

(4) Current altimeter

(5) Other aircraft in the area

b. Traffic Patterns. For shipboard landings to port, a left-hand pattern is flown. For landing to starboard, a right-hand pattern is flown.

(1) The traffic pattern is flown at 300 feet.

(2) Complete power available checks and compute power required for an out of ground effect hover.

(3) Set brakes (H-3/H-53/H-60A)

(4) Avoid crossing the bow of the ship. However, if crossing is unavoidable, continue upwind a sufficient distance (500 yards) to remain well clear of the ship.

c. Approach. Final approach should be shallow to avoid exaggerated power changes or excessive flares near the deck. Avoid hovering directly downwind of the funnel where hot, choking stack gas and smoke may be encountered or downwind from any large superstructure where turbulence and downwash may be present. Pilots should not attempt to watch the ship's wake as it may induce vertigo.

(1) Establish visual contact with the landing signal person (LSE). The LSE wears a yellow shirt in contrast to other flight deck personnel. The LSE provides visual landing signals. If the LSE is not in sight prior to crossing the deck, a wave-off (go-around) is mandatory. (*EXCEPTION:* During operations where LSE is not being utilized, with concurrence of the Air Boss/Captain.)

(2) Wave-off and hold signals must be obeyed. Other signals should be followed as closely as possible unless safety of flight is jeopardized.

(3) Final movement onto the deck normally is accomplished by moving forward at air-taxi speed from the edge of the deck and about 10 to 15 feet above the deck. A significant change in hover attitude (nose low) occurs when hovering over a moving deck.

d. Deck Operations. Precise hovering and extreme caution is required at all times when operating on or over the landing platform.

(1) Figure 22-1 depicts a typical shipboard landing platform.

(a) The longitudinal axis of the helicopter will be aligned with the landing line-up line. The line is usually aligned approximately 45° to the bow. An approximate 15° crosswind will be encountered with the wind 30° off the ship's bow.

(b) The larger circle is 24 feet in diameter.

(c) The center circle is four feet in diameter and is the designated landing position for the front wheels or forward skid supports.

(d) The VERTREP (vertical replenishment) line-up line is used during sling operations. The center of the main rotor must remain over or aft of this line.

(2) Post scanners, if available, to both sides of the helicopter.

(3) The FE/AG/PJ talks the pilot down to the deck after being given the land signal by the LSE. The FE/AG/PJ insures both main gear are over the deck. Touchdowns must be smooth and positive to reduce the possibility of ground reasonance. Under adverse conditions it may be necessary to turn off the AFCS amplifiers (H-53) or disengage the AFCS (H-3/60A) immediately after landing on a ship to avoid tip path movement induced by the AFCS attempting to compensate for ship pitch and roll.

(4) If rotors are to be shutdown, ground crews come under the rotor blades to chock and chain the aircraft immediately after landing. Shutdown is accomplished upon signals from the LSE. Consider rotor disengagement wind limitations prior to shutdown. If a droop stop fails to come in, reengage rotors. If the rotors must be shutdown with a droop stop out, insure the landing platform is cleared. The ship is constantly under way, hence any wind gusts will be increased by the ships speed. An overstress of helicopter components may result. Adequate rotor blade tie-down equipment is mandatory.

(5) Exercise caution while on the landing platform. Slippery footing, ship's motion and lack of good hand holds are potential hazards. Continue to wear LPUs while working on the deck.

(6) Coordinate APP/APU start, engine start and rotor engagement via radio with primary flight control. Do not initiate starting/engagement sequences without approval from the LSE. Locked rotor starts will be performed by H-53s. The FE/AG/PJ will remove the pins as required by the checklist. Excessive intercom interference may occur if an intercom cord is allowed to rest on the deck. During rotor engagement, it is mandatory that the tie-down chains be loose (two to three inches of slack). Confirm visual signals with the LSE as follows:

ITEM CREW RESPONSE	LSE SIGNAL	
APP Start	three fingers	same
No. 1 Engine Start	one finger	same
No. 2 Engine Start	two fingers	same
Rotor Engagement	circular motion with finger	same
Four Tiedown Chains displayed to crew	points to chains	thumbs up
Four chocks displayed to crew	points to chocks	thumbs up

(7) Takeoff. Remove chocks and chains prior to takeoff. Accomplish takeoff after clearance from primary flight control and a visual signal from the LSE.

(a) If the ship is rolling and pitching engage the AFCS amplifiers (H-53) or engage the AFCS (H-3/H-60A) just prior to takeoff.

(b) Takeoff to a hover and check power before continuing the takeoff to clear the ship's deck. Slight rearward and sideward flight may be required to clear deck obstacles.

(c) The prefered takeoff is made on a 45 heading from the ship's heading

(d) Raise landing gear (H-3/H-53) immediately after clearing the ship.

(e) At high gross weights, be aware that there is a considerable increase in power required when the helicopter moves off the ship's surface. This phenomenon occurs even when the over deck wind velocity places the helicopter in translational lift.

e. Recurring Shipboard Operations. These missions will require extensive coordination with the ship's crew, and a thorough knowledge of detailed procedures for shipboard operations. NWP 42(B) SHIPBOARD HELICOPTER OPERATING PROCEDURES and a diagram of the ship's landing platform and obstacles will be made available to crew when performing recurring shipboard operations.

f. Carrier Operations. CV NATOPS MANUAL covers these procedures and should be used for extensive operations from carriers.

22-4. H-3 Surface-To-Air Refueling. A technique has been developed and employed by the US Navy whereby a refueling hose is hoisted from the deck of a ship by the helicopter rescue hoist. The refueling hose nozzle is then connected to the single point refueling adapter by a crewmember stationed in the door of the helicopter, and the aircraft is refueled while hovering alongside the ship. Certain naval vessels equipped with this system can refuel H-3 helicopters in an emergency.

a. If surface-to-air refueling is required, prior coordination with the vessel is necessary to assure it is equipped to refuel helicopters, has a Parker nozzle available, and the deck crew is trained and briefed on the proper procedures.

b. The ship is equipped with 150 feet of one and one-half inch refueling hose. A grounding wire is married to the hose. Capacities of the fuel service tank vary from 350 to 750 gallons depending upon the class of ship. Fuel normally is pumped from the service tank to the helicopter at a rate of 400 pounds a minute at a hovering altitude as high as 80 feet.

c. Helicopter Procedures:

(1) Prior to initiating an approach, the ship turns so that the wind is 30 degrees off the port (left) bow. This allows the helicopter to approach into the wind and still keep the deck of the ship in view. Complete the hi-drink checklist.

(2) The ship crew has the fueling rig prepared and the saddle pickup point positioned in the center of the landing circle.

(3) Hover at approximately 25 feet and lower the hoist cable to the deck of the ship. The hook on the end of the cable is engaged with the loop attached to the refueling hose saddle. Because of the danger of static electricity, shipboard crewmembers should not touch the hoist cable until it has contacted the ship.

(4) Hoist the refueling hose into position so the helicopter crewmember stationed in the main cabin door can connect the grounding cable and hose nozzle to the refueling adapter. This is best accomplished by having the flight engineer in a prone position at the cabin entrance door to handle the hose and nozzle. The pararescueman should operate the hoist. The hose remains attached to the hoist cable during the refueling operation. The crewmember making the connection lowers the helmet visor to protect from fuel spray in the event the nozzle does not completely seat in the adapter. After the connections are made, move the helicopter outboard and forward to a position abeam the port side of the flight deck of the vessel, signal to commence refueling. The refueling hose is fed out and recovered as necessary by the deck hands on the ship.

(5) When fuel transfer is completed, the flight engineer signals the ship to stop refueling; moves back over the deck of the ship, and disconnects the nozzle and ground wire from the refueling port; and lowers the hose and nozzle to the ship so it can disconnected from the hoist cable.

(6) Use visual aircraft-to-ship hand signals in addition to radio communications. A circular motion with the index finger extended vertically means transfer fuel. A "throat cutting" motion made by drawing the hand across the throat means stop fuel transfer. These signals are given from the main cabin door.

d. Ship Procedures:

(1) During fuel pumping operations with the helicopter hovering clear of the ship, the fuel hose is tended by two deck handlers to prevent excess slack developing in the hose. It is essential that no excess strain be placed on the hose. Should this occur, the possibility exists of the hose breaking and whipping into the helicopter rotor. When the helicopter hovers directly over the ship, no fuel hose handlers are required as no hose strain exists.

(2) A quick disconnect is provided between the refueling nozzle and the hose out-board of the saddle and shackle assembly. The quick disconnect is used in emergency situations when it is necessary to separate the refueling hose from the helicopter quickly. The quick disconnect is activated by pulling a lanyard that is attached to the refueling hose and within easy reach of the flight engineer. When the disconnect is made using this system, the refueling nozzle remains attached to the helicopter, and the saddle and shackle assembly remain attached to the hoist cable. The refueling hose outboard of the saddle and shackle assembly falls to the surface.

Chapter 23

37 ARRS PROCEDURES

23-1. General. This chapter contains procedures unique to the missile site unit security program and is applicable only to the 37 ARRS and subordinate units.

23-2. Terms Explained:

a. Transportation Control Center (TCC). Agency which manages missile site security support transportation requirements.

b. Launch Complex. The area in which TITAN launch operations are conducted.

c. Launch Control Center (LCC). A manned facility from which monitoring, controlling, and launching are conducted (TITAN/Minuteman units).

d. Launch Control Facility (LCF). A manned facility composed of a launch control building, a hardened launch control equipment building, a launch control center, and support buildings (Minuteman units).

e. Launch Facility (LF). A remote, unmanned missile site which consists of a launcher, launch support building, security system, and service area (Minuteman units).

f. EWO Commitments. For the purpose of this regulation, any missile site activity related directly to operations, maintenance, to include munitions, communications, civil engineering maintenance, supply and security functions or related significant logistics support (i.e., cable and flood surveys).

g. Airborne Fire Team (AFT). A security team carried on convoy surveilance helicopter.

h. Choke Point. A section of road bounded by some obstacles that will prevent any turning or detouring of the weapons van or weapons transporting vehicle and thus halt the progress of the convoy.

23-3. Utilization. Helicopters are provided primarily for support of SAC missile activities. The key to effective helicopter employment lies in close coordination among all agencies concerned with management of helicopter resources and supervision of unit employment programs. Use the air transportation priority system (IAW ARRS Regulation 55-6) to determine mission accomplishment sequence for multiple mission requirements.

23-4. Radio Frequencies. SAC has authorized the use of 266.2, 271.9, 308.8, and 314.3 MHZ for missile air support operations. All frequencies used in 23 AF and SAC support operations must be approved by the base frequency manager.

23-5. Operational Requirements:

a. Establish procedures for LCC/LCF/LF and other site support missions to provide pilots a visual signal indicating that passengers and cargo are clear of the aircraft prior to departure.

b. Establish common routes between the strategic missile support base (SMSB) and all missile sites. The unit commander must approve these routes prior to use. Use direct routes where topographical considerations permit. If direct routes are not feasible, establish specific routes and turning points. If possible, avoid tactical low-level routes/altitudes. Adhere to established routes when practical for air traffic control (ATC) and safety. Report deviations as soon as possible to the flight following agency.

c. Detachments will maintain diagrams of each helipad showing prominent landmarks, site elevation, obstructions to flight, location of wind indicator, prohibited landing area, approach/departure zones, and restricted areas. Place checklist size diagrams in each mission navigation kit. Units must review sites annually for currency. Document this review.

d. Maintain the following information for ready reference in the unit operations section:

(1) Aircraft availability.

(2) Helipad status. Include all prohibited sites, construction in progress, and obstacles not on the site diagrams due to recent changes.

(3) Mileage and time charts from parent base to missile LCC/LCF and from any one LCC/LCF to any other LCC/LCF.

e. Establish procedures to insure the radio equipped unit operations section is manned during periods of missile site security mission activity. The operations section will monitor mission activity, relay diversion requests and provide emergency assistance to unit aircraft. The unit commander, operations officer, or other designated rated officer that is at least aircraft commander qualified will monitor the activities of the operations section.

23-6. Operational Procedures:

a. Conduct missile support flights within the missile/base complex under day visual meteorological conditions. The squadron commander or his or her designated representative has waiver authority. (*EXCEPTION:* See paragraph 3-2a(5)(b).)

(1) Weather minimums are 700 feet ceiling and one mile visibility for other than priority one missions.

(2) Support flights may be flown to areas outside the missile/base complex under instrument or visual flight rules.

(3) Detachment 8 is authorized to conduct support flights within the missile/base complex using IFR for launch and termination at the support base provided the operational portion of the mission can be conducted under VMC.

b. Do not fly below 500 feet AGL except for approaches/departures, takeoffs/landings, cable route inspections, missile site security checks (100 feet AGL minimum), and missile security or launch safety support.

c. The following procedures apply to Minuteman cable route survey missions:

(1) Minimum altitude is 100 feet AGL or IAW the flight manual height/velocity chart, whichever is higher. Hover taxiing to accomplish the survey is not authorized.

(2) Use an observer to determine the security/condition of the cable. In addition, a safety observer will occupy the copilot's seat to help in navigation and to alert the pilot to hazards and

obstacles. The safety observer will be a pilot, helicopter mechanic, medical technician, flight surgeon, or other unit assigned/attached noncrewmember to help in navigation and to alert the pilot to hazards and obstacles. Brief safety observers on their duties prior to the mission.

(3) Landing on the cable right-of-way is authorized. The pilot should select the safest landing area on the cable right-of-way within walking distance of the area requiring inspection. The landing area must be free of obstructions which would cause aircraft or property damage.

d. Landing Clearance:

(1) Inside LCF/LF fences. Obtain clearance from the missile combat crew (MCC) prior to landing by direct radio contact with the MCC or by landline through the operations section. If unable to establish radio contact, land at the LCF/LF as scheduled. All personnel must remain aboard until identified by a security guard at the LCF or manned LF (AFR 207-16).

(2) LCF helipads located outside the security fences and launch facilities. Attempt to obtain landing clearance. If communications fail, land as scheduled. For LCC helipads, attempt to obtain landing clearance if you cannot determine winds and/or topside site status (via the surface warning control beacon). Determine site status (Titan II only) prior to landing.

(3) Landing on access roads is authorized only when mission dictates or landing on the site is not feasible (e.g., when landing area is blocked by vehicles or other obstacles) complete all remote area procedures prior to landing.

(4) Do not land at LFs with transport erectors or RV/G&C and PT vans within the fenced area without missile wing/LG approval. (*EXCEPTION:* Landing areas outside the fenced area.)

e. Immediately report any unusual digging, building, or activity noted around missile sites or along cable right-of-ways to the base SAC command post.

f. Monitor the unit operation section/LCF/LCC frequency while en route on support missions except when frequency change is required for ATC. Insure that the unit is notified of all arrival, departure, and estimated en route times. Arrival times need not be reported if a departure report is made within 10 minutes after arrival ETA. Make position reports to the unit operations section at least every 45 minutes. Arrival and departure reports are considered as position reports. Avoid frequent position reports to prevent communications saturation; however, more frequent position reporting may be required during unusual conditions or marginal weather. Report ETA changes of more than 10 minutes to the unit operations section as soon as practicable.

g. Missile Site Evaluation. Prior to commencing final approach at a missile site, the aircraft commander will review the site diagram and evaluate site elevation, power required, power available, obstructions to flight, wind, and approach and departure routes. A power available check may be completed at the pilot's discretion and will be completed any time maximum engine power is anticipated. If required, the pilot may descend to a minimum of 300 feet AGL into the wind/500 feet AGL downwind for the evaluation.

23-7. Mission Kits. Provide a mission navigation kit containing the following minimum information for each mission:

a. Charts of the entire missile complex layout. (Charts of the local area depicting all normal support/operational sites for Det 8.)

b. Common routes, magnetic courses, and distances from the parent base to missile LCF/LCC and from any one LCC/LCF to any other LCC/LCF.

c. No wind times for common routes.

d. Terrain and equipment permitting, VOR/TACAN radials to LCFs/LCCs.

e. Diagrams of each helipad/support site.

f. Aircraft flight manual (dash 1).

g. AF Form 15 and 15A, Invoice Envelope.

h. FLIP IFR supplement (one each).

i. FLIP VFR supplement (one each).

j. FLIP en route low altitude charts. (One set for area of operation.)

k. FLIP low altitude instrument approach procedures. (One set for area of operation.)

l. Local area navigation maps and charts, sectional aeronautical charts. (One set for area of operation.)

NOTE: Each unit is required to maintain a minimum of one mission kit containing those items listed in chapter 6 for flights outside the local area.

23-8. Mission Briefings. The pilot will be briefed on the following items:

a. Current weather and forecast changes.

b. Itinerary.

c. Load (passengers and cargo).

d. LCC/LF/LCF support site landing status.

23-9. Convoy Procedures. Conduct convoy escort as specified in SACR 207-18 and this chapter.

a. General:

(1) Helicopters are assigned to support the SAC Nuclear Security Mission due to the vulnerability of off base weapons convoys. Accompany off base weapons movements with a surveillance helicopter when weather and safety restrictions do not prohibit flight.

(2) The deterrent value of having helicopters overhead is important but its presence should not be so obvious that it is an easy target or a distraction to the citizenry. It may be assumed that anyone attempting to hijack a convoy will be well informed on convoy/helicopter operations and will more than likely be armed with weaponry capable of combating armed escort personnel as well as the surveillance helicopter. Denial of a good target is the key to success.

(3) Denial of a target can be accomplished by a combination of distance and airspeed. Static or stereotyped procedures are the easiest to ambush. It is therefore necessary that variety and ingenuity be used when maintaining surveillance. Surveillance remains paramount. Survival of the helicopter is essential to the successful deterrence of an attempted hijacking.

(4) The SAC wing commander is the command authority for the convoy and exercises operational control over the helicopter resources. The wing commander's directions normally will be received through wing security or the wing command post, depending on location. The convoy commander is the on-scene commander for the ground forces associated with the convoy; however, authority or responsibility as aircraft commander will not be relinquished.

b. Procedures:

(1) Prior to departure, insure the aircrew is briefed on applicable items from the "Convoy Commander Predeparture Briefing" contained in SACR 207-18. Brief the AFT on surveillance and choke point landing procedures. In addition, removal of finger rings will be recommended to the AFT.

(2) Inflight Requirement:

(a) Prior to convoy departure, establish and maintain radio contact with the convoy.

(b) Maintain communications with the support base through the command post, security control, TCC or the helicopter operations section.

(c) During normal convoy surveillance, fly the helicopter at unspecified altitudes and airspeeds. Factors such as terrain, weather, and fuel will dictate the parameters maintained.

(d) Unless diverting for weather, remain within five minutes of the convoy at all times.

(e) Under normal conditions, maintain at least 500 feet AGL and remain at least 1,500 feet from the weapons vehicle for protection from small arms.

(f) If an increased threat situation occurs, immediately maneuver to a safe distance and altitude to avoid hostile fire. Maintain knowledge of the exact position of the convoy at all times. Relay this information to the command post or helicopter operations section.

(g) Provide the AFT team chief with the approximate direction and distance to the convoy in the event a choke point landing is required.

(h) Once the aircraft is landed at a choke point, shut down the engine, remove the key and abandon the aircraft.

(i) The tactical approach as described in para 19-7e(3), may be flown to land at a choke point.

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 equipment
      (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 25-1. 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 25-2. 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. INSURE 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. DEVEVOP 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 INSURE 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. NDIVIDUAL AIRCREW BRIEFINGS, FORMATION BRIEFING, AND COMBAT SAR 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 lead also briefs the helicopter crew on use of denial ordance (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 26-1).

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 firepower. 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 visibility 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 right formation off the number two helicopter (figure 26-3). This three ship tactical box 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 ordance 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.

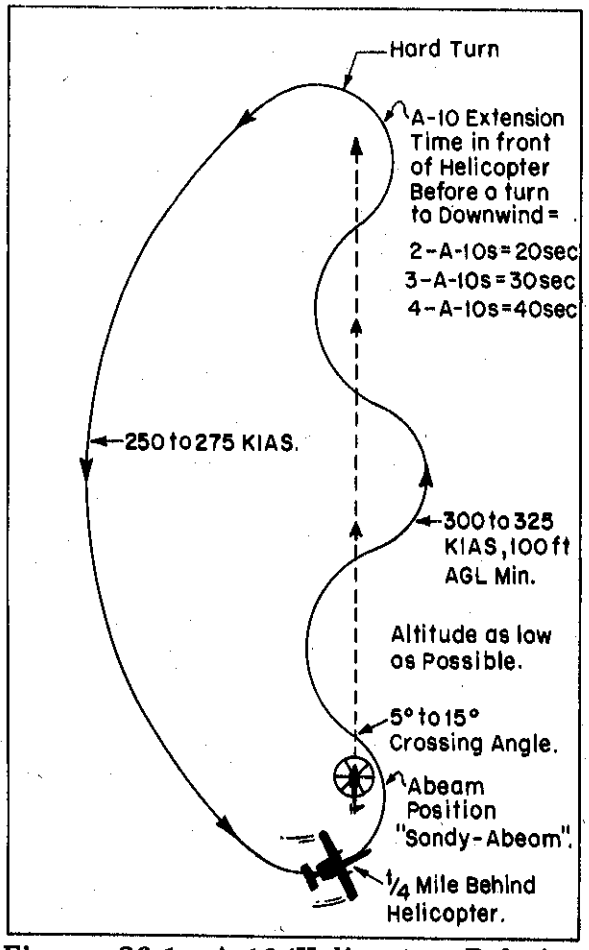


Figure 26-1. A-10/Helicopter Relationship During Daisy Chain Escort.

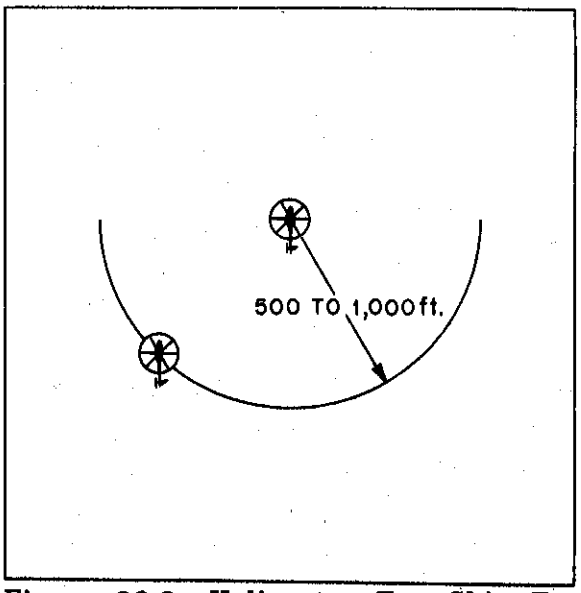


Figure 26-2. Helicopter Two-Ship Tactical Formation.

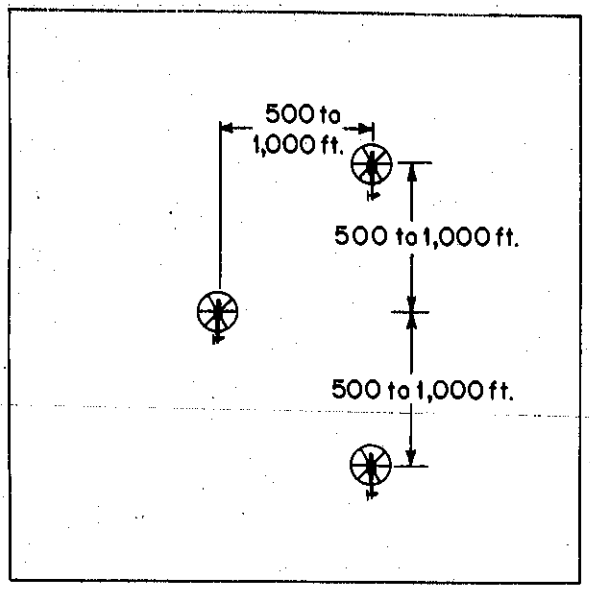


Figure 26-3. Helicopter Three-Ship Box Formation.

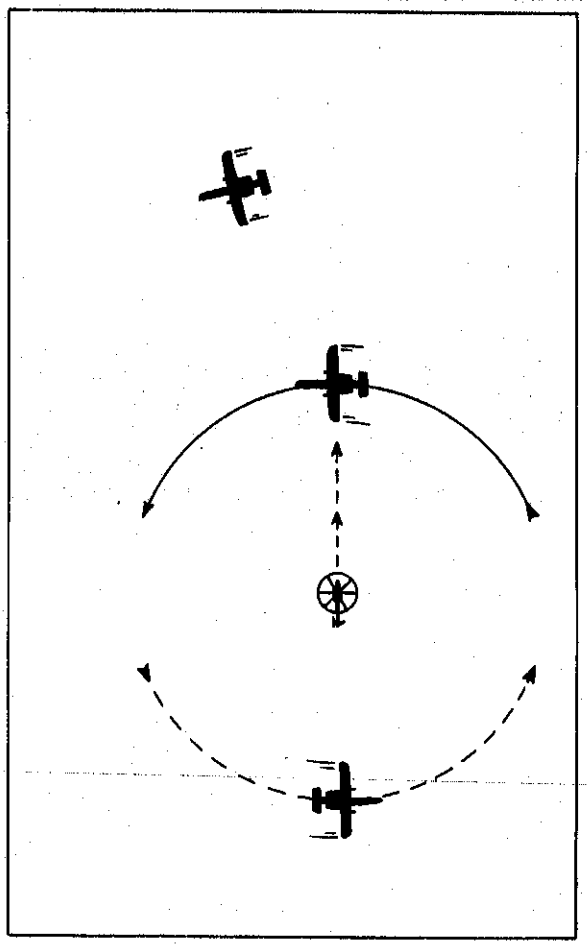


Figure 26-4. Hover Cover (Wheel).

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 ground fire. Good checkpoints permit the flight leader to place the flight at the release 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 the 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 be 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.

c. The vulnerability of helicopters on infiltration/exfiltration missions is not extreme. The aircraft use small LZs, do not have to touch down all the time, and spend a minimum amount of time near the ground. Terrain features which afford concealment to the enemy also mask ground fire except in the clearings themselves. Time of exposure to enemy fire in the LZ is measured in seconds unless the team has to rappel into the LZ or use rope ladders. Hazards to successful completion of a mission of this type usually come from the terrain itself.

27-7. Alternate Insertion/Extraction Methods:

a. Rappelling:

(1) Rappelling from a helicopter is accomplished by personnel descending to the ground on ropes with the helicopter at a hover. Rappelling can be accomplished from almost any height above the ground. The "Swiss Seat Rappel" is normally used, but it requires precision training. Untrained troops cannot use this method of exit. It is possible to rappel members of a team from both sides of the UH-1N, but troops must be staggered in their exit to prevent collisions during their descent.

(2) The pilot should be careful not to over control the aircraft. The pilot will have to make corrections for the changes in weight shifts during the rappelling to keep the aircraft position as stable as possible. Since the aircraft is hovering out of ground effect, available power, especially at high density altitude, could be critical. The shifting, jerking movements of the descending troops will require delicate handling of the aircraft. This method of infiltration can be accomplished safely when LZs are secured or free from observation of the enemy. It is also a satisfactory method of entry where jungle cover masks the enemy. However, the long exposure time is hazardous and it should be employed with care.

b. Rope ladders:

(1) Rope ladders can be used for loading/unloading trained personnel when a landing is not possible. UH-1N: Rope ladders can normally be deployed out each cargo door when the helicopter has excess power available. H-3: One rope ladder is deployed out the right side cargo door. H-53: One or two rope ladders may be deployed out the aft ramp and one rope ladder may be deployed out the right side personnel door.

(2) When hovering with a limited power reserve, caution must be exercised to limit the number of persons on the rope ladder. Excessive weight can cause loss of control. UH-1 ONLY: No more than three persons can be on one ladder because cyclic control may be lost.

(3) The pilot must be exceptionally careful in control movements to avoid making the climber's task more difficult. In the event of enemy fire, it is possible to fly out with personnel on the ladders.

NOTE: The rope ladder is unstable due to twisting and turning which could dislodge the persons on the ladder.

c. Stabo Rig:

(1) The stabo rig is comprised of one nylon rope 100-150 feet in length, with a pick-up harness.

(2) Normally 30 minutes is the maximum length of time personnel should be carried on the rig. Physical condition of the personnel must be considered when determining exposure time.

(3) When an immediate exfiltration is necessary and a hoist is not available or is considered too slow, the stabo rig is readily employable. The pilot brings the helicopter to a hover over the team and orders the ropes dropped. When the personnel are attached and give a signal that they are ready for pickup, the FE/AG will give the pilot clearance to climb vertically and guide the pilot with voice commands (left, right, back or forward) until the personnel are clear of the trees. At this time, the pilot will slowly accelerate to 40 KIAS (do not exceed 60 KIAS), proceed to a secure area for landing, and transfer the personnel from the rig into the helicopter. Extreme care must be taken in the approach to a high hover with a very slow rate of descent in placing personnel on ground.

(4) Since all hovering is out of ground effect, density altitude is critical. (OGE + 5% is required.)

27-8. Authentication:

a. Surface-to-Air. The Reception Committee Leader (RCL) will display a flashing green light (or other designated signal) oriented in the opposite direction of the established approach track until the aircraft is on its final approach at which time the RCL will display a continuous, steady signal pointed at the underside of the fuselage. During daylight periods, a distinctive panel or smoke will be used for authentication purposes.

b. Air-to-Surface. Arrival at the LZ within two (2) minutes of the established TOT, on or near the designated approach track, will serve to authenticate mission aircraft. (**NOTE:** This procedure should not be construed so as to preclude adjustment of the LZ marking for existing winds. When surface winds are a factor (infils: 10 kts or more, exfils: 5 kts or more) the LZ marking will be positioned to insure the landing is make into the wind, regardless of the approach track established in the mission request and confirmation. The mission aircraft will make the initial approach to the LZ along the designated track and, if necessary, subsequently adjust to the final approach track indicated by the LZ marking.)

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. The 4th Psychological Group, Ft Bragg NC has, through extensive testing, developed a leaflet dissemination guide. Although large numbers of leaflets are required, the results obtained are excellent.

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 4½ pounds.

(1) Large DOLLS us a 10′ 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 punches in a length of slow burning fuse or utilizes cutter power actuator. M-21 (25 second delay) or M-22 (10 second delay). FSN 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 increased 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 yards 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 insures 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:

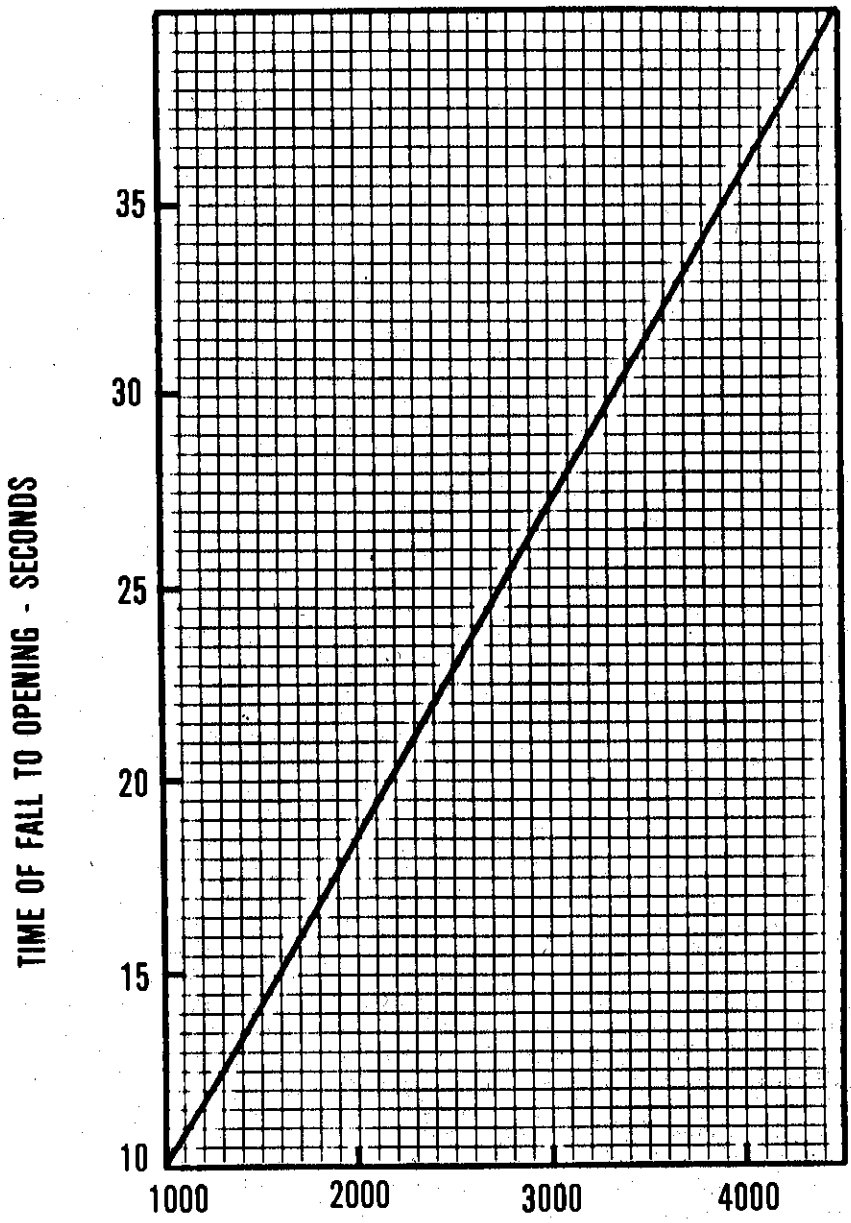
a. Before cutting a time delay fuse, its exact burning rate must be established. This rate should be ascertained for each new role of fuse. Discard the first two inches of fuse from the roll as it may be dirty or deteriorated from exposure to moisture. Cut several 10-inch pieces of fuses and check their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

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

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

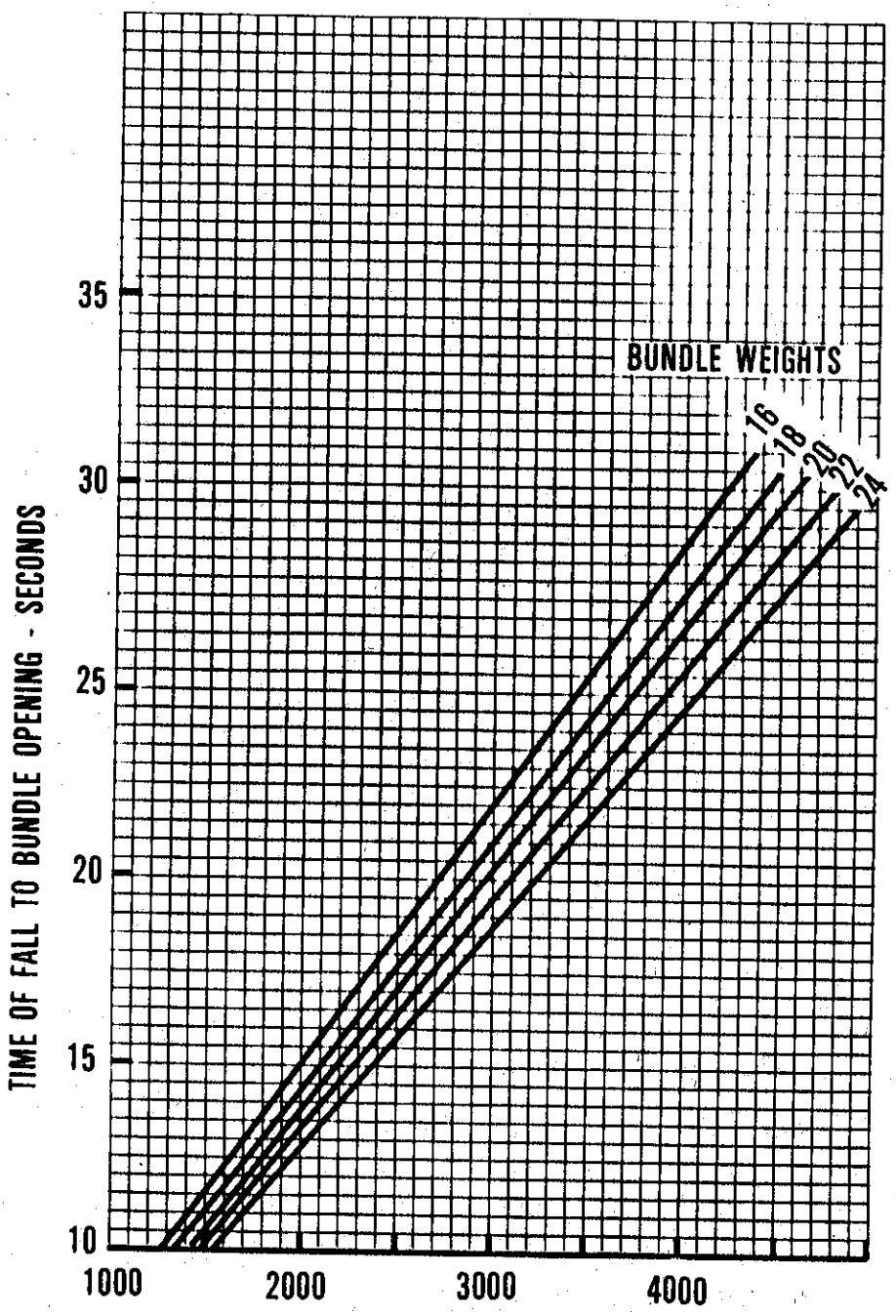
2.7 Sec Inch

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.



NOTE: BUNDLE OPENING
ALTITUOE 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.

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 actuation, M-21 (25 second delay) or M-22 (10 second delay), FSN 1375-060-0885) may be substituted for hand cut fuses.

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. 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 feet AGL. The angle of bank should be varied to keep the aircraft in ½ to 1 mile radius while the speaker operator varies the speaker depression angle to keep the speaker pointed at the target. 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 ½to 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 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 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 sense 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 is 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 anti-aircraft 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 enfilade fire on the entire team.

(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 reconnaissance 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 clósely 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 be 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 3,000 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. Transmiting 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 insure 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 be 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 insure 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 be 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 the 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 orbit 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.

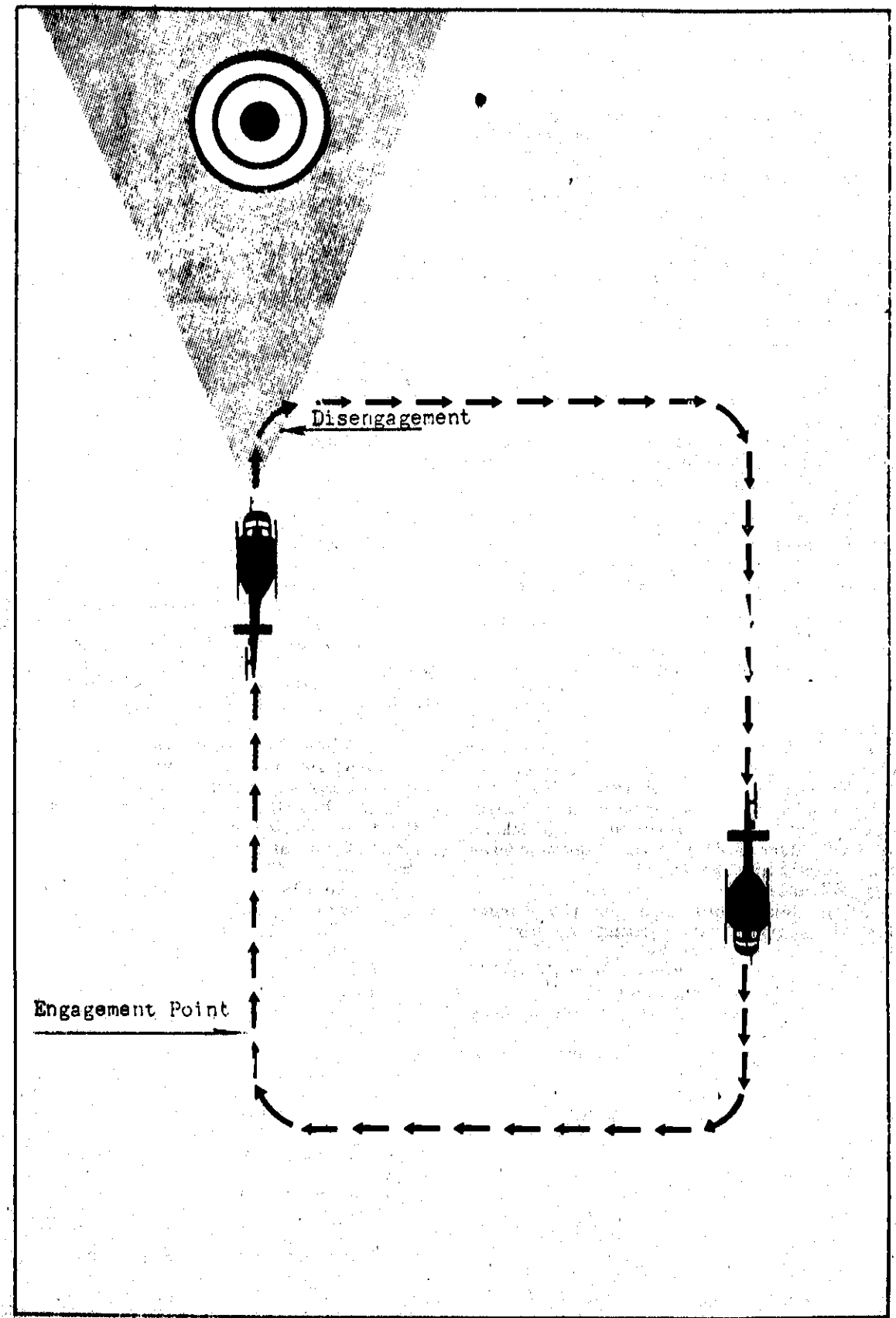


Figure 29-1. Racetrack Pattern.

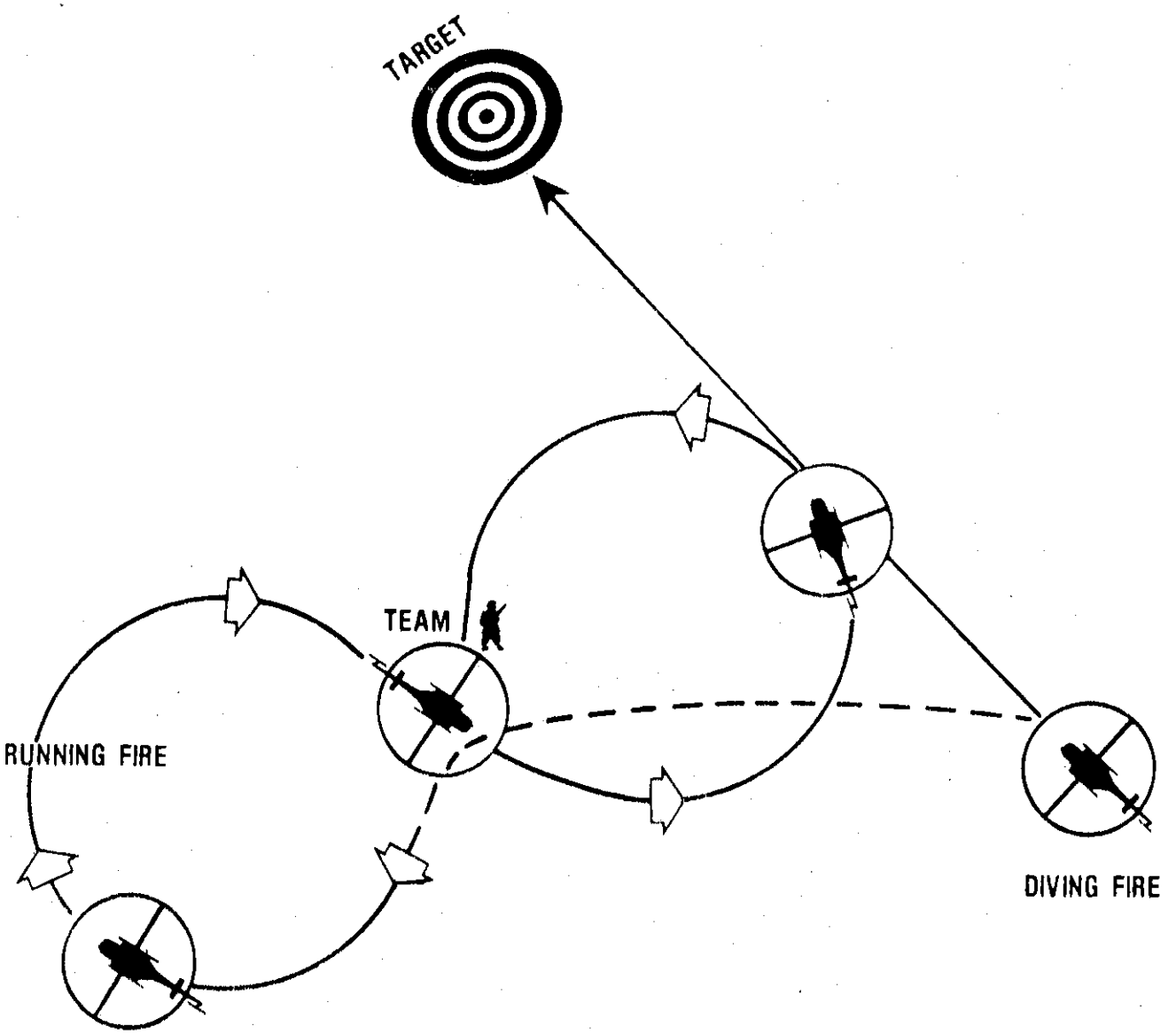


Figure 29-2. Figure "8" Pattern Entered From Diving Fire.

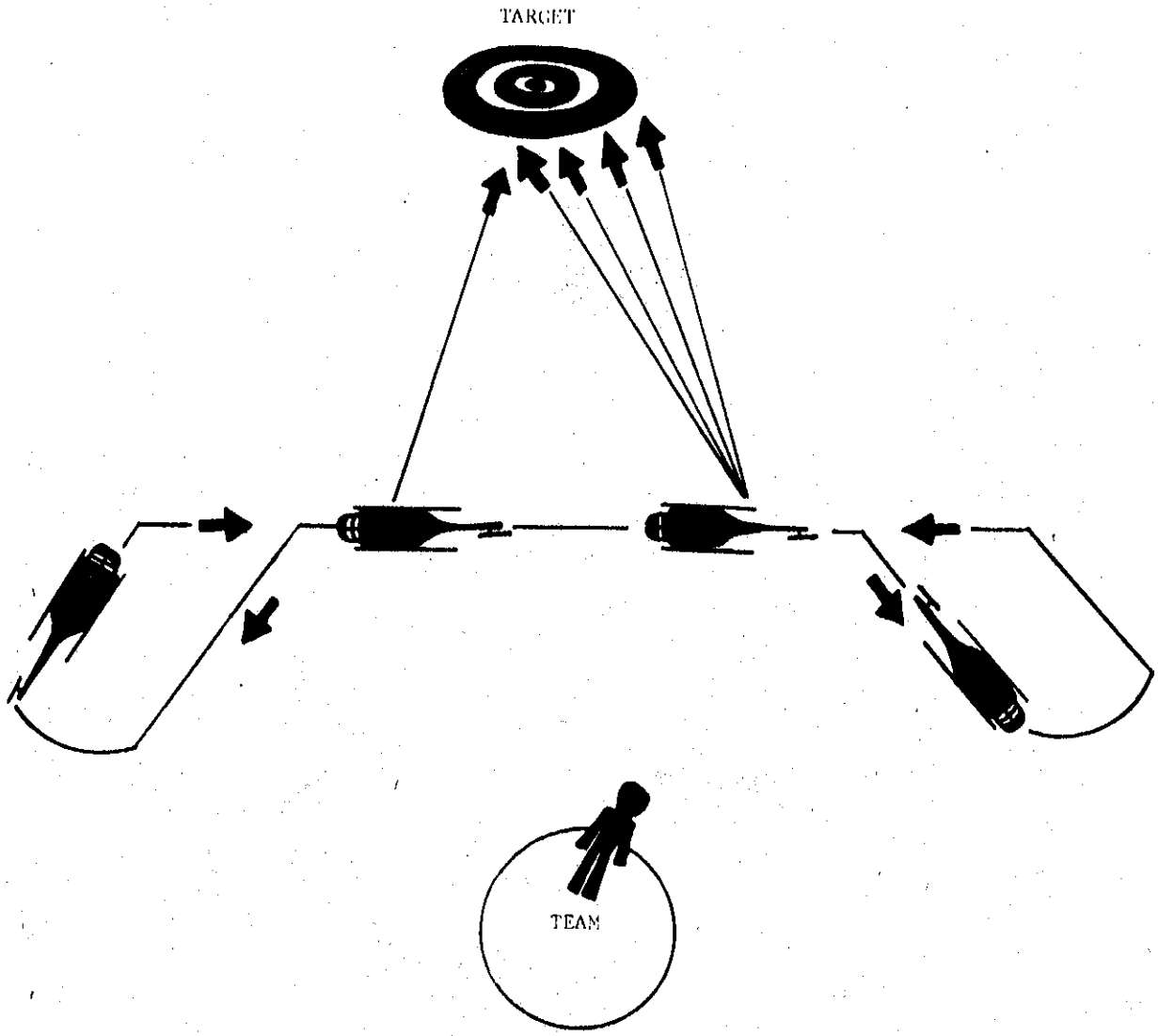


Figure 29-3. Dogbone Pattern.

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 insure 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.

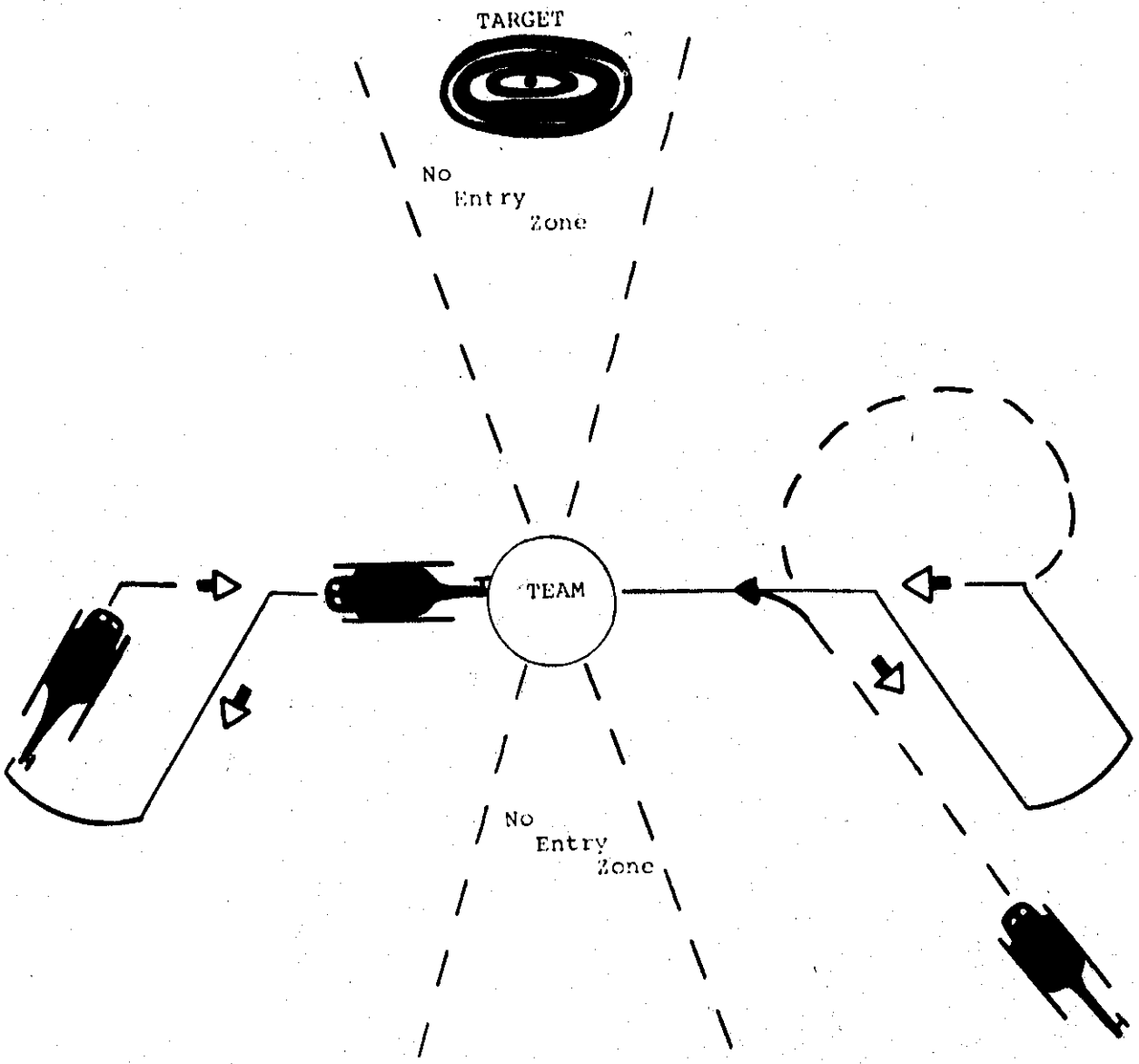


Figure 29-4. Dogbone Pattern Entered From Diving Free.

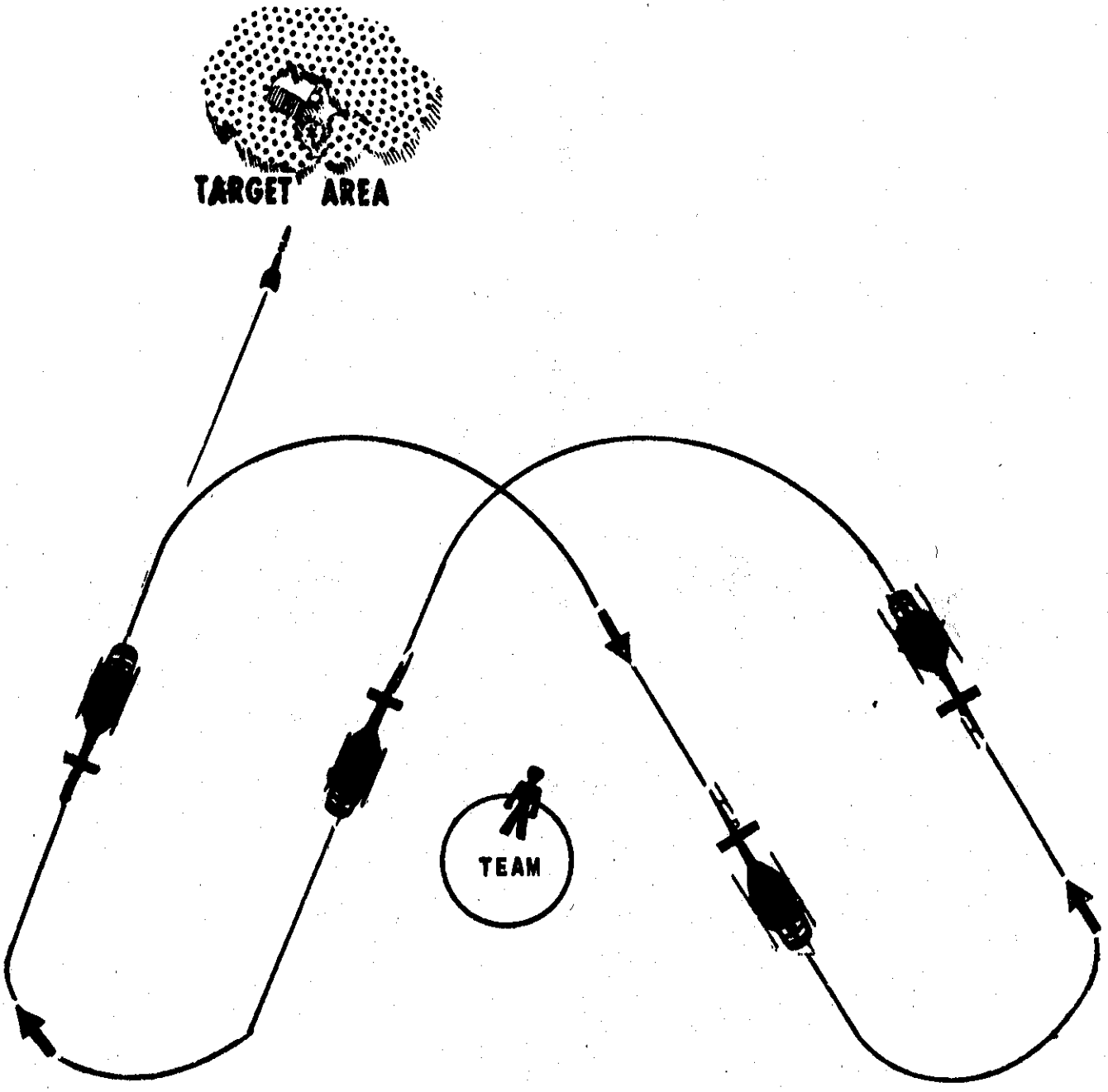


Figure 29-5. Random/Modified Using Integrated Fixed Fwd and Side Fire.

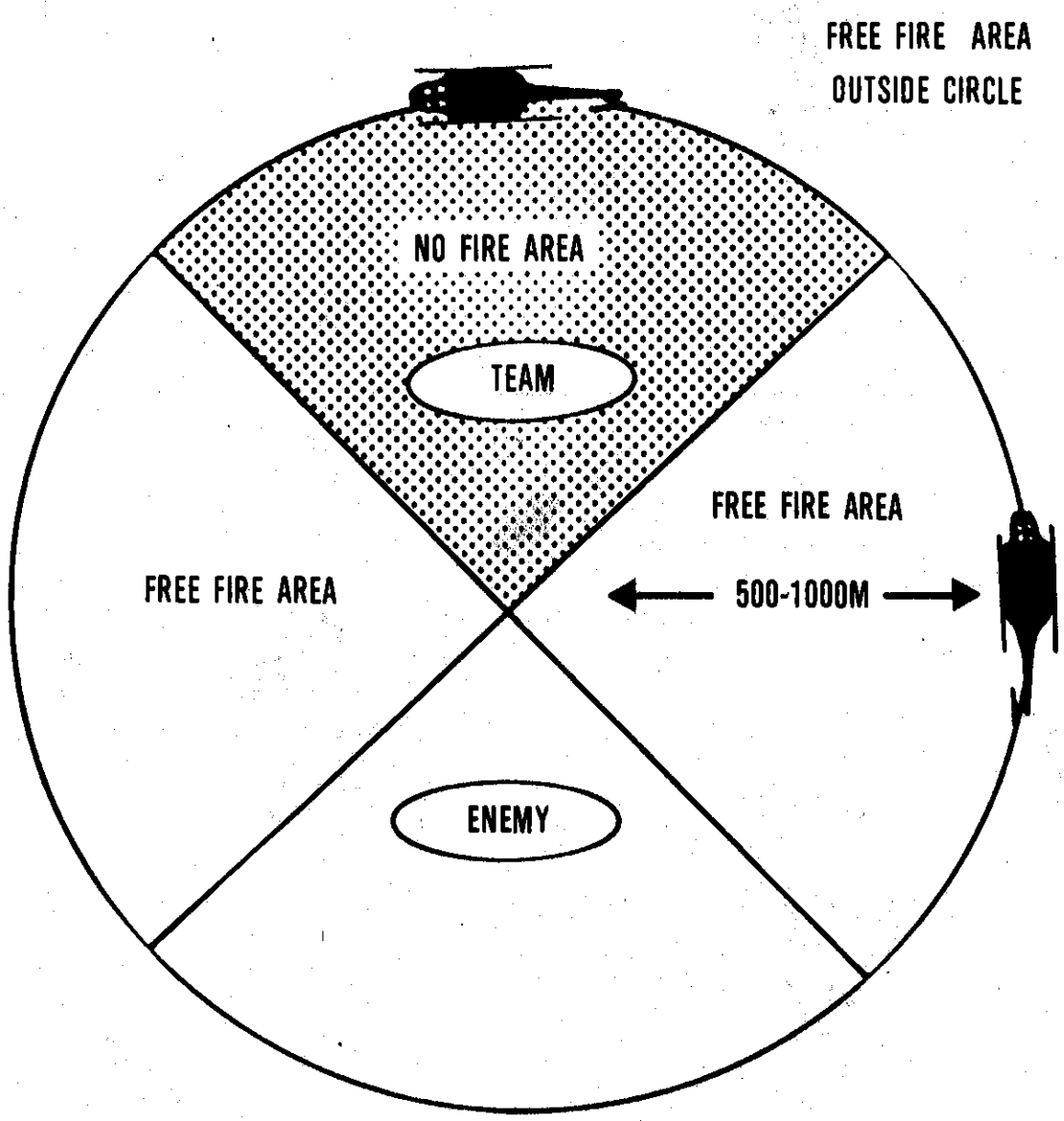


Figure 29-6. Spooky Pattern.

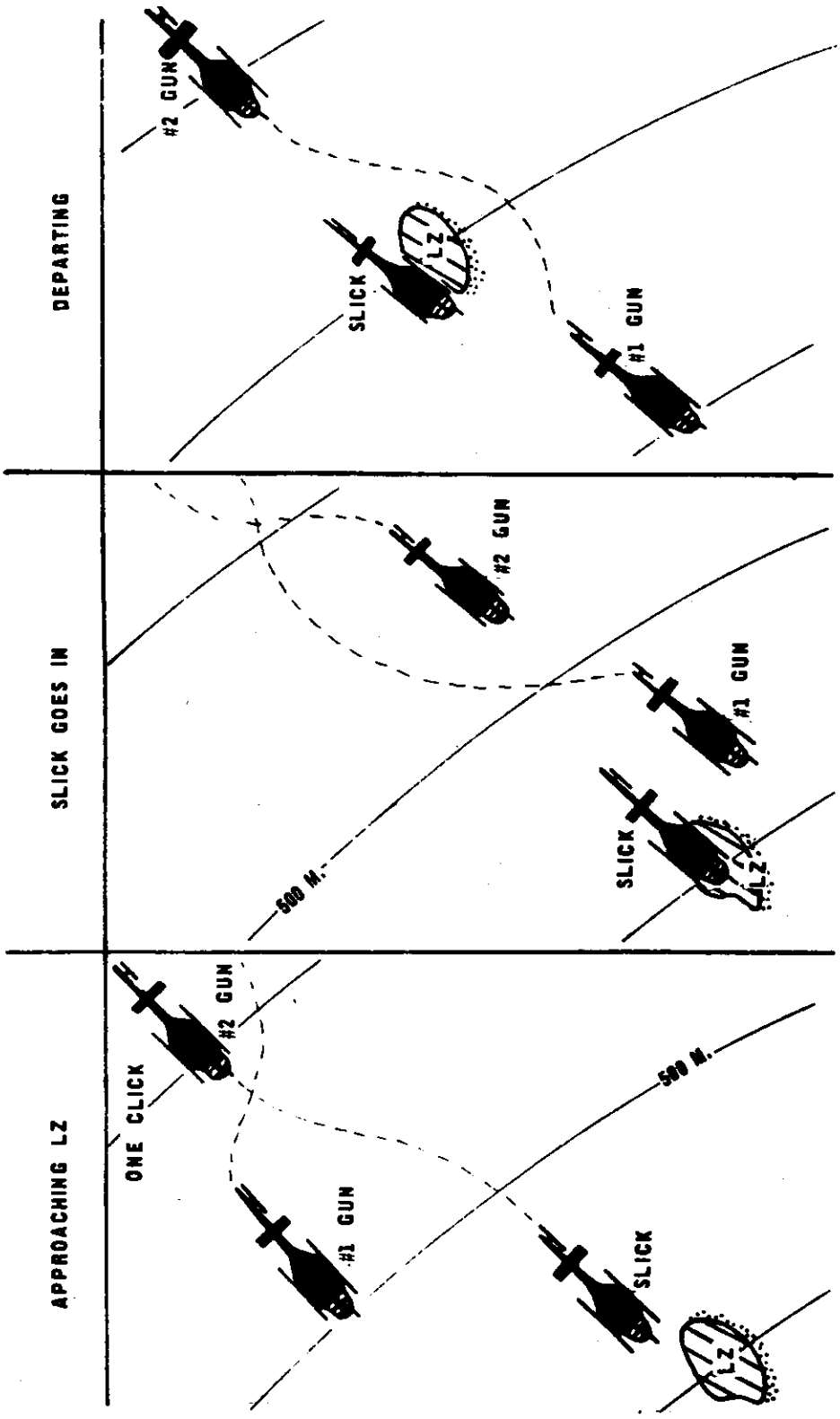


Figure 29-7. Infil Coverage Pattern.

Chapter 30

NIGHT VISION GOGGLE (NVG) OPERATIONS

30-1. General. Certain 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; closing on another aircraft or descending toward the ground is not immediately noticeable).

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

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. Bright lights (direct or reflections) from internal or external sources seriously degrade the NVG wearer's vision.

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

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

j. With adequate available outside illumination, NVG vision enhancement is inversely proportional to altitude—the lower you fly the better you see. Caution, do not fly below the minimum altitudes specified in para 30-2 below.

k. Avoid flying toward moonrise or moonset as vision may be severely restricted by the intensity of the moonlight.

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). 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. For upgrade training, illumination levels should be of medium to high intensity for the first night NVG training flight. When available illumination will not permit safe NVG operations at minimum altitudes, the following restrictions apply:

a. Navigation:

(1) In nonmountainous areas minimum altitude is 300 feet above the highest obstacle within ½NM of the flight path.

(2) In mountainous areas minimum altitude is 500 feet above the highest obstacle within two NM of the flight path.

EXCEPTION: Formation flight on the wing of an HH-53H utilizing PAVE LOW systems is authorized.

b. Less than 20% Illumination for Approaches:

(1) Nonmountainous approaches 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.

(3) Fully operational HH-53H aircraft have no illumination restrictions. Other helicopters may fly on the wing of an HH-53H utilizing PAVE LOW systems in zero illumination conditions.

NOTE: Mountainous areas are defined as areas where a 500 foot gradient occurs within ½NM of the flight path.

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

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

30-5. Safe Escape Altitudes. Compute safe escape altitudes for each route segment using the following criteria:

a. VMC. The heading and altitude must provide a minimum of 500 feet above obstacles within three NM of the course centerline when maintaining VMC.

b. IMC. The heading and altitude must provide a minimum of 1000 feet above all obstacles within five NM of course centerline (2,000 feet clearance in designated mountainous areas) when IMC is encountered.

30-6. Wind Information. When accurate wind information is not available, base wind determination on forecast winds, doppler if available, 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. 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 NUG's 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 tanker low or tanker high procedures. Tanker high 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/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 Chapter 31 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.

c. Pilots must wear PVS5 NVGs with the modified face plate or a more improved system.

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