

CHAPTER 5

SIGNALS TO AIRCRAFT

5-1. General

With the introduction of the airplane and helicopter to the combined arms team, a new requirement for communication was added to the battlefield. Ground troops and air forces need to communicate. There will be times when radios cannot be used and visual signals must be used. Therefore, systems of standard visual signals have been developed to allow ground-to-air communication. These systems include arm-and-hand signals used by ground forces to direct helicopters in direct support; devices that can be used to communicate with aircraft; and ground-to-air emergency signals and codes.

5-2 Arm-and-Hand Ground Signals

Helicopters and fixed-wing aircraft are often used to support ground forces by moving supplies and/or personnel. Often, pathfinder personnel will not be available to direct aircraft in support of these efforts. Therefore, the responsibility to guide aircraft will fall upon the ground forces. To be prepared for this effort, the soldier must know these general signals (Figures 5-1 through 5-22).



When directing a taxiing helicopter, the signalman's position is slightly to the right, in full view of the pilot, and at a safe distance of no less than 40 meters (or, no closer than 20 meters during slingload operations). These positions are used in day and night operations. The signalman never stands in front of an armed helicopter.

Figure 5-1. HELICOPTERS (rotary wing).



When directing taxiing airplanes, the signalman's position is forward of the left wing tip and in full view of the pilot.

Figure 5-2. AIRPLANES (fixed wing).

Either arm, level with the shoulder, palm down. Draw the extended hand across the neck in a throat-cutting motion. If a specific engine (rotor) of a multi-engine (rotor) aircraft is to be shut down, execute the signal and point with the other hand to the appropriate engine (rotor).



Figure 5-3. CUT ENGINE(S), or STOP ROTOR(S).

The hand is raised, thumb down.



Figure 5-4. NEGATIVE SIGNAL.



Bend the left arm and fist horizontally across chest (knuckles down); point the open, right hand up to the center of the left fist.

Figure 5-5. LOAD HAS NOT BEEN RELEASED.



Move the fist up and down, making contact with the other fist, which is stationary and on top of the helmet.

Figure 5-6. HOOKUP COMPLETE.



Extend the left arm horizontally with the fist toward the load while the right arm makes a horizontal, slicing motion under the left arm, palm down.

Figure 5-7. RELEASE.

Hold the left arm down. Extend the right arm across the body to indicate the direction to the next signalman.



Figure 5-8. PROCEED RIGHT TO NEXT SIGNALMAN.

Hold the right arm down. Extend the left arm across the body to indicate the direction to the next signalman.



Figure 5-9. PROCEED LEFT TO NEXT SIGNALMAN.

Make an overhead circular motion with the right hand, ending it in a throwing motion in the direction of lift-off (takeoff).

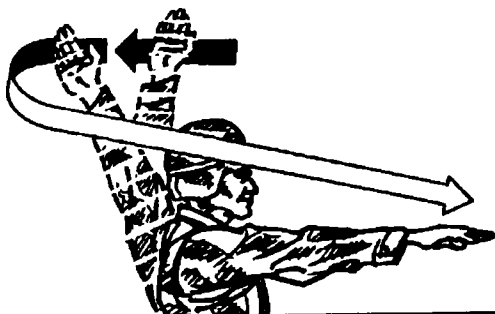


Figure 5-10. DEPART.



Cross the arms repeatedly overhead.

Figure 5-11. GO AROUND, DO NOT LAND.



Extend the crossed arms downward in front of the body.

Figure 5-12. LAND.



Cross the arms above the head, palms forward.

Figure 5-13. STOP.

Move the hand upward and backward, from a horizontal position, to indicate direction of tail movement. Point the other hand toward the center of the spot turn. The signalman must remain in full view of the pilot.



Figure 5-14. SPOT TURN.

Extend the left arm horizontally to the side in the direction of movement; swing the right arm over the head in the same direction (repeat movement).



Figure 5-15. MOVE RIGHT.

Extend the right arm horizontally to the side in the direction of movement; swing the left arm over the head in the same direction (repeat movement).

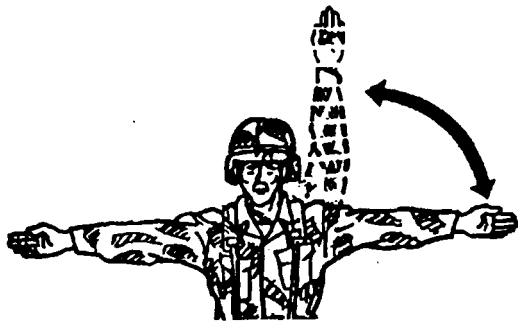
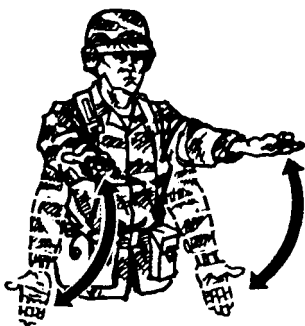


Figure 5-16. MOVE LEFT.



Extend the arms slightly away from the side, palms to the rear, and repeatedly move them upward and backward (from shoulder height). This signal is used to indicate short distances.

Figure 5-17. MOVE AHEAD.



Place the arms by the sides, palms to the front. Sweep the arms forward and upward repeatedly, level with the shoulders.

Figure 5-18. MOVE REARWARD.



Extend the arms horizontally to the sides, beckon downward, palms down.

Figures 5-19. MOVE DOWNWARD.

Extend the arms horizontally to the sides, beckon upward, palms up.



Figure 5-20. MOVE UPWARD.

The signalman assumes guidance by extending the arms above the head in a verticle position, palms facing forward.



Figure 5-21. ASSUME GUIDANCE.



Extend the arms horizontally to the sides, palms down. (When guiding a landing helicopter, this signal should not be given until the helicopter is at a normal hover height above the ground and just short of the desired landing point, depending on its forward speed).

Figure 5-22. HOVER.

5-3. Ground-to-Air Panel System

- a. The panel system is a method ground troops use to communicate, to a limited degree, with aircraft by displaying panels on the ground. There are two types of panels: marking and identifying colored panels, and black and white panels for transmitting messages.
 - (1) The marking and identifying panels are made in fluorescent colors. The panels are used to mark positions and identify friendly units. These panels can be ordered through the supply system using the nomenclature Panel Marker, Aerial, Liaison (Figure 5-23).
 - (2) Black and white panel sets are arranged on light or dark terrain backgrounds. They are used to transmit brief messages or to identify a unit. This is done by using the combined panel system and the panel recognition code in the unit's communications-electronics operating instructions.
- b. Panels (if constructed locally) should be large enough to permit easy reading from the air. There should be as much color contrast as possible between the symbols and the background. Panels should be at least six feet long and two feet wide.
- c. Select a relatively flat, clear area of ground about 40 by 130 feet. This area is large enough to display messages and special signs. For message drop and pickup, the area should be clear of obstacles which could prevent aircraft from flying into the wind at reduced airspeed and low altitude.
- d. When using the panel system, one of the panels is used as a base panel. Place the base panels first and keep them in place as long as panel signaling is in progress. The distance between panels is one panel length throughout, when space is available. Change from one panel figure to another as soon as possible by shifting, adding, or removing panels (other than the base panels). The index panel is the first removed and the last laid out when the display is changed. Remove all panels from view that are not used for a particular display.

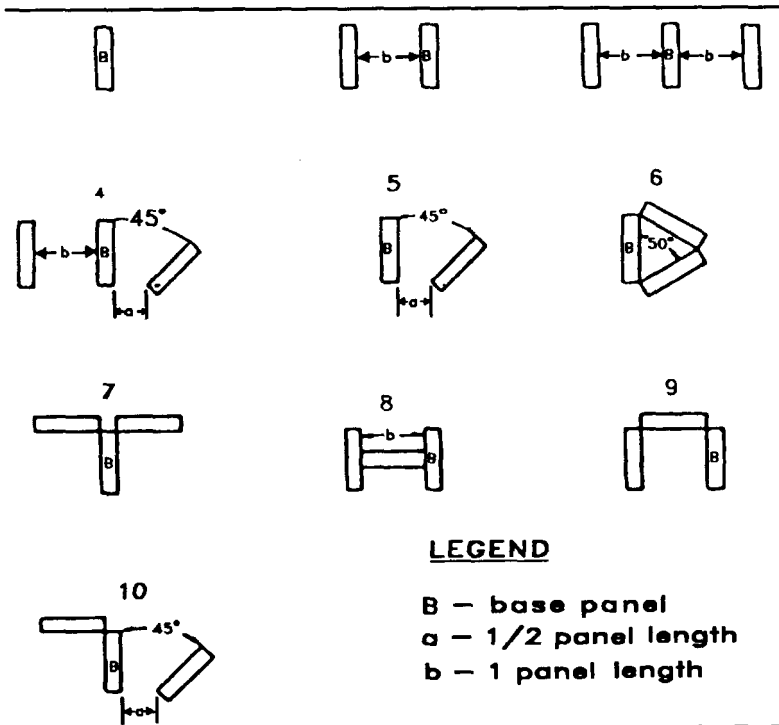


Figure 5-23. PANEL CODE FIGURES.

- e. The unit's communications-electronics operating instructions assign specific vocabulary, receipting, acknowledging, and identification procedures. Code meanings are normally based on this manual, with local amplification, while the numbers associated with the meanings are determined by the unit's communications-electronics operating instructions. They are changed periodically to prevent compromise.
- f. An aircraft pilot indicates that ground signals have been understood by rocking the wings laterally, by flashing a green signal lamp, or by any prearranged signal (A, Figure 5-24). The pilot indicates that ground signals are not understood by making a 360-degree turn to the right, by flashing a red signal lamp, or by any prearranged signal (B, Figure 5-24). Each panel display is acknowledged. A pilot requests a unit to display an identification code by a prearranged signal. In no case does a unit display an identification code until the aircraft has been identified as friendly.

Rocking from side to side—
**SIGNAL RECEIVED AND
UNDERSTOOD**

(A)



Right turn 360 degrees—
**SIGNAL RECEIVED AND
NOT UNDERSTOOD**

(B)

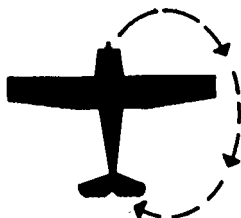


Figure 5-24. AIRCRAFT ACKNOWLEDGEMENT.

- g. Ground units can identify themselves as friendly elements to a pilot by using a panel marker or its equivalent. This panel marker is displayed on combat vehicles to identify the vehicle as friendly to the pilot. It is also displayed on the ground for other purposes; for example, to identify friendly front lines and dismounted troops. The color and pattern of the display are prescribed in unit standing operating procedures.

5-4. Special Panel Signals

- a. **Wind-T.** The T is used to indicate wind direction. It represents an aircraft flying into the wind. The wind-T is two panels wide and two panels long (Figure 5-25).

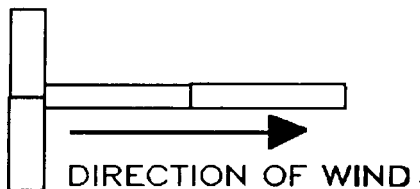
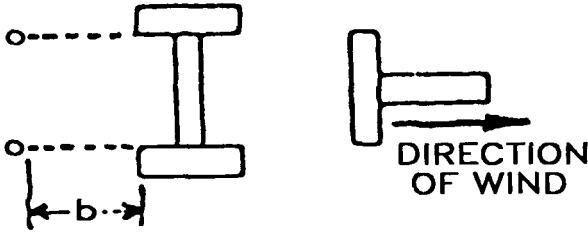


Figure 5-25. WIND DIRECTION, wind-T.

- b. **Message Pickup.** This message is displayed by the figure 8 (H) with the wind-T centered below it. The crossbar of the H (8) is not placed in position until the message is ready to be picked up. The pickup poles are placed so that each pole is one panel-length away from the corner of the nearest panel (Figure 5-26).



LEGEND:

b — 1 panel length

o — Pickup poles

Figure 5-26. PICK UP MESSAGE HERE (wind in direction indicated)

- c. **Message Drop.** When a dropped message is not found, this symbol is displayed in the drop area (Figure 5-27).

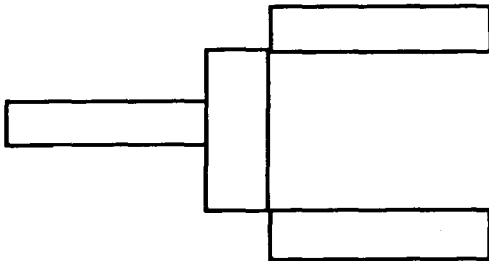
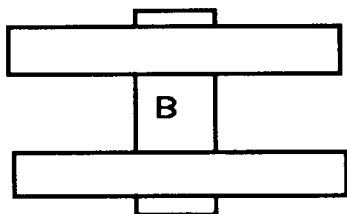


Figure 5-27. DROPPED MESSAGE NOT RECEIVED.

- d. **Enemy Aircraft.** Two panels, placed at right angles to a third and on the axis of any base panel, always means enemy aircraft near—even though other parts of the panel display remain in place (Figure 5-28).
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LEGEND:
B — base panel

Figure 5-28. ENEMY AIRCRAFT IN YOUR VICINITY.

- e. **Direction Indicator.** An arrow made with not less than four panels means “in this direction.” This sign is used alone or with the pattern preceding it to complete its meaning (Figure 5-29).
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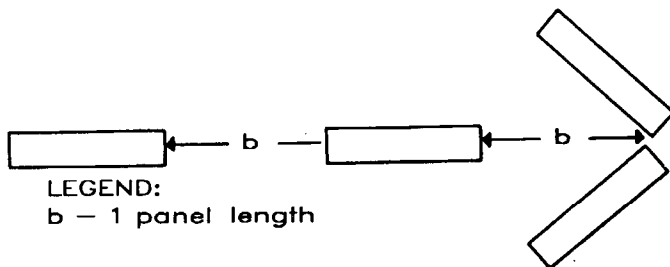


Figure 5-29. DIRECTION INDICATOR.

5-5. Ground-to-Air Emergency Signals and Codes

- a. Two Methods. Aviators have developed two methods of transmitting emergency messages once a pilot's attention has been obtained.
- b. Emergency Signals. The body can be used to transmit messages. The individual stands in an open area to make the signals. He ensures that the background (as seen from the air) is not confusing, goes through the motions slowly, and repeats each signal until it has been understood (Figure 5-30).

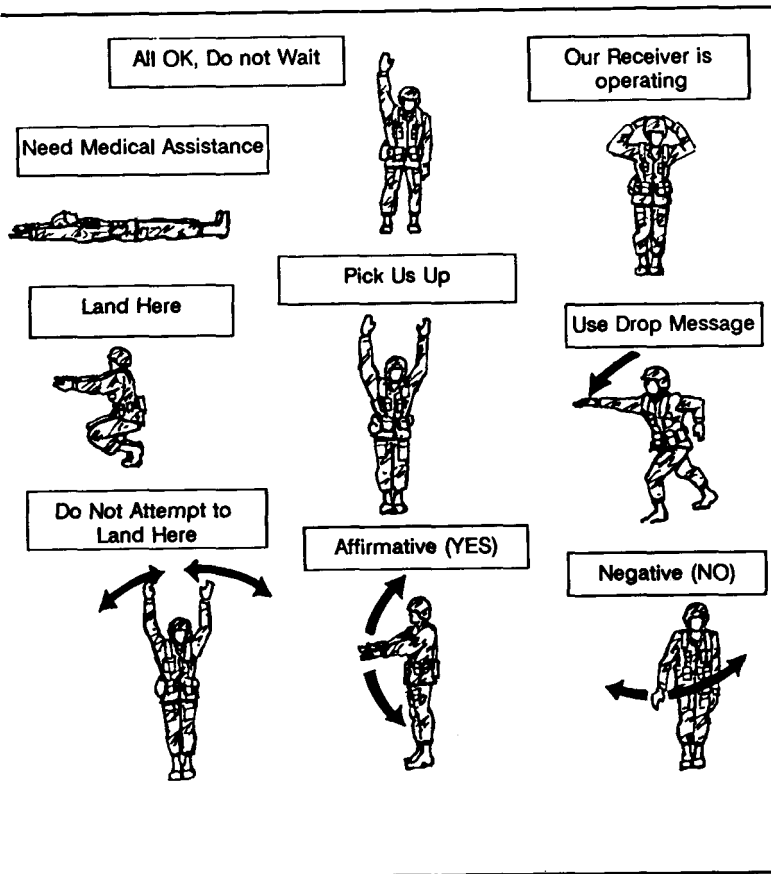
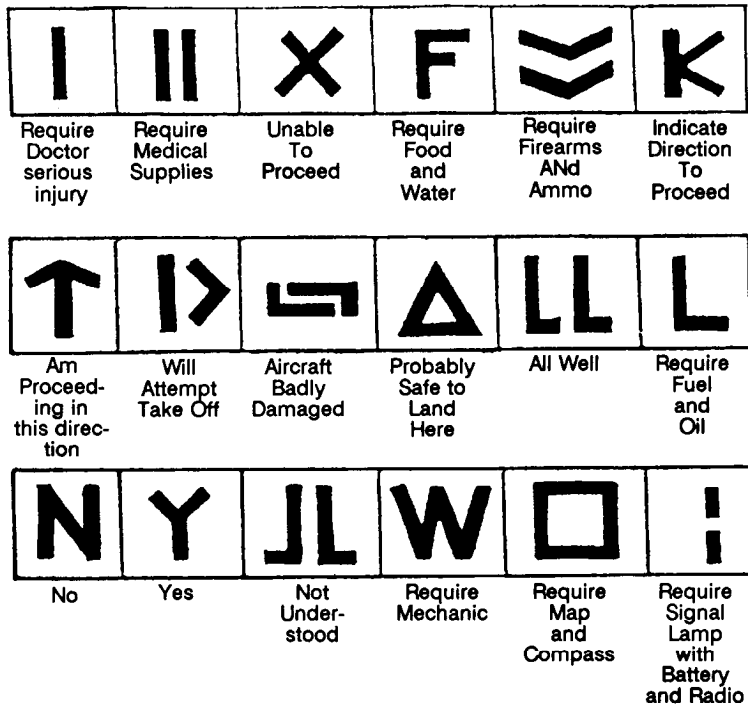


Figure 5-30. EMERGENCY SIGNALS

c. Emergency Codes. The symbols for these codes may be constructed from any available material that contrasts with the background; for example, strips of parachute canopy, undershirts torn into wide strips, rocks, sticks, and foliage stripped from trees. Once laid out, these signals (codes) are semipermanent (Figure 5-31).



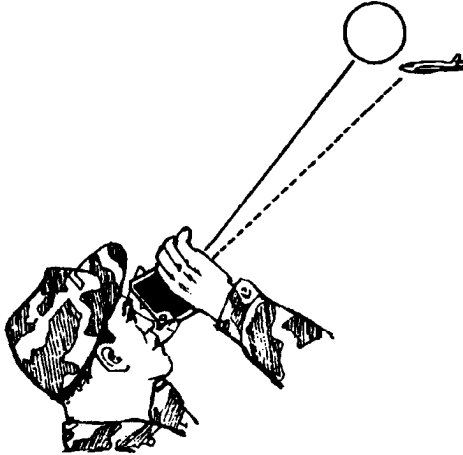
If in doubt, use international symbol —

SOS

Figure 5-31. EMERGENCY CODES.

5-6. Signaling With Mirrors and Strobes

- a. **Mirrors.** These are used to get the attention of an aircraft pilot during the day. Their use requires good visibility and little or no cloud cover in order to reflect the sun. Mirrors can also be used to transmit messages, if signals have been arranged. The MK 3 signal mirror is designed for use as a signal device. Instructions for its use are printed on the back of the mirror (Figure 5-32).



HOW TO USE THE MK-3 SIGNAL MIRROR

- 1 Reflect sunlight from mirror onto a nearby surface (raft, hand, etc.).
2. Slowly bring mirror up to eye-level and look through sighting hole. You will see a bright spot of light. This is the aim indicator.
3. Hold mirror near eye and slowly turn and manipulate it so that the bright spot of light is on the target.
4. In friendly areas where only rescue by friendly forces is anticipated, free use of mirror is recommended. Even though no aircraft or ships are in sight, continue to sweep the horizon. Mirror flashes may be seen for many miles, even in hazy weather. In hostile areas, the signal mirror must be used as an aimed signal only.

Figure 5-32. HOW TO USE A SIGNAL MIRROR.

- b. **Strobes.** These can be used at night to identify positions. If prior coordination has been conducted with supporting aviation units, strobes may also be used to signal pilots. In order to reduce detection when used, strobe lights should be placed in holes so they can only be viewed from above. Strobes with infrared covers can be used if there has been prior coordination with the aircrew. Strobes are ordered using the nomenclature Distress Markers.