

EO 00-50-19

**ROYAL CANADIAN AIR FORCE**



**MARSHALLING, TOWING & GROUND  
HANDLING OF RCAF AIRCRAFT**

**REVISION  
NOTICE**

**LATEST REVISED PAGES SUPERSEDE  
THE SAME PAGES OF PREVIOUS DATE**  
Insert revised pages into basic publication.  
Destroy superseded pages.

**ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF**

**18 JAN 63**

Revised 14 Sep 64

**LIST OF RCAF REVISIONS**

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# MARSHALLING, TOWING & GROUND HANDLING OF RCAF AIRCRAFT

## GENERAL

1 On all occasions when aircraft are being taxied or towed the following instructions are to be observed:

(a) Only the assigned pilot is authorized to be in the cockpit of nuclear weapons loaded aircraft during taxi or towing operations. Personnel qualified to taxi fixed wing aircraft, see EO 00-50-16.

(b) The signalman, or marshaller, will place himself in a position where he can see both wing tips and be fully visual to the pilot at all times. Hand signals will be used with the addition of wands or flashlights (marshalling lights) during the hours of darkness. (Marshalling and Ground Handling Signals are contained in Appendix "A" and "B" to this order). The signalman will ensure that he has two serviceable marshalling lights before the commencement of operations. In the event that one of the marshalling lights becomes unserviceable the other light is to be extinguished and further marshalling shall cease until two serviceable marshalling lights have been obtained. The pilot of the taxiing aircraft is, where practical, to bring the aircraft to a stop and no further taxiing is to be attempted until two serviceable marshalling lights are in use.

### NOTE

The use of visual aids (daylight) to aircraft marshalling will be at the discretion of Commands/Units, and may take the form of bats, sleeves, jackets, gauntlets, or any combination of these items. The use of these aids is not compulsory. However, when used, the colour of the aid will be similar to cloth fluorescent 9TR/95 or paint fluorescent fire orange 33A/524 in order that RCAF wide standardization will be obtained.

(c) Towing of aircraft is to be accomplished by the use of approved vehicles driven by qualified drivers in possession of the appropriate certificate in accordance with CAP 23.

(d) The senior NCO or junior NCO detailed to move aircraft shall station the airmen as follows:

(1) One man at each wing tip whose duty is to raise an adequate warning by shouting or otherwise if any obstruction is approaching close to the aircraft or vice versa.

(2) One man in the cockpit of the aircraft to apply brakes as necessary or/when instructed by the NCO i/c to do so. He will ensure that the undercarriage selector lever is in the "DOWN" position, hydraulic pressure is adequate for braking purposes, and the locking device on the tail/nose wheel is released.

(3) One qualified driver on the towing vehicle to operate the vehicle to successfully transport the aircraft from point "A" to "B". He is to take his instructions from the NCO in charge. During actual towing operations, passengers are not to be carried on the tractor.

(4) One man at the tail section to prevent any possibilities of damage to the aircraft when moving backwards and to assist in the steering where necessary.

### NOTE

Where unit strength is such that the above mentioned cannot be carried out, the positioning of men will be left to the discretion of the NCO i/c who will ensure maximum coverage against possible damage.

2 The NCO in charge will walk in a position where he can see either wing tip and the personnel detailed. He will direct the driver of the vehicle, by the means of RCAF (NATO) Marshalling Signals as specified in pages 1 to 16 of Appendix "A". He is to ensure that the following is carried out.

(a) Aircraft shall be towed at a walking pace (approximately four miles per hour) or slower if necessary. The vehicle must be started smoothly and must proceed steadily. Avoid impact loading caused by jerking motion as this imposes double the amount of normal strain on the aircraft; in addition tow bar shears pins may be over-stressed or sheared. Under no circumstances are personnel to jump on or from an aircraft while the aircraft is in motion.

(b) Where it is necessary to change direction of movement of an aircraft more than the prescribed maximum radius as laid down in the applicable aircraft -2 EO the turn is to be made manually with the necessary precautions being taken as in (c).

(c) To prevent any undue strain being imposed on the aircraft, the tail wheel or nose wheel is not to be turned crosswise with the main wheel acting as a pivot, but the aircraft is to be moved forward or back with the proper minimum radius turning of the inside wheel being approximately five feet.

(d) Wherever possible, aircraft are to be towed forward rather than backward; however, where instructions are in the specific aircraft -2 EO for backward towing procedure, then that instruction shall take precedence.

(e) The appropriate towing bar for the specific aircraft is to be used on runways, tarmac or concrete aprons and hangar floors.

(f) Where the ground is uneven a towing bridle fixed to the towing lugs is to be utilized. On aircraft not equipped with towing lugs, and where conditions warrant towing, the towing bridle is to be constructed of rope of sufficient strength for towing. The length of the towing bridle is to be approximately three and one half times the track of the aircraft.

(g) Knot Strength - The approximate strength of knots with the full strength of (dry) rope (-100) is as follows:

|                              |    |
|------------------------------|----|
| Eye splice over iron thimble | 90 |
| Short splice in rope         | 80 |
| Timber hitch                 | 65 |
| Round turn and half hitch    | 65 |
| Bowline                      | 60 |
| Slip knot (center loop)      | 60 |
| Clove hitch                  | 60 |
| Square or reef knot          | 50 |
| Sheet bend (weavers knot)    | 50 |
| Bight of a rope              | 45 |
| Figure eight knot            | 45 |

**WARNING**

Prior to towing any aircraft fitted with jettisonable tanks or other external

stores, ALL switches and circuit breakers controlling the applicable circuits must be in the "OFF" position, or pulled out, in order to prevent accidental operation of the jettison system.

### OUTSIDE PARKING OF AIRCRAFT

3 This EO details the minimum requirements for the parking of aircraft and is of a general nature. Instruction regarding specific aircraft types will be detailed in the relevant aircraft -2 EOs and where conflict occurs the -2 EOs are to take precedence.

4 The aircraft must be secured against movement while unattended. The parking brake cannot be depended upon, as the brakes may become inoperative as the result of leakage, fluid contraction resulting from changes in temperature, or from inadvertent release. Aircraft are to be parked and secured as follows:

NORMAL WIND (not exceeding 15 miles per hour).

(a) Distance between adjacent aircraft not less than 20% of the wingspan. (May be reduced on CTechSO's authority if the parking area is restricted).

(b) Parking brake ON.

(c) Nosewheel or tailwheel in normal fore-and-aft position.

(d) Tailwheel locked (if provided).

(e) Chocks in front of each mainwheel and behind the nosewheel or tailwheel. (Alternately mainwheels double-chocked).

(f) Controls locked (if provided).

STRONG WINDS (Up to 40 MPH)

In addition to above.

(g) All wheels double-chocked.

(h) Aircraft headed into wind.

(j) All doors, windows, hatches, etc. closed.

**DANGEROUS WINDS**

(CTSO to determine the velocity of winds which would be considered dangerous for particular aircraft types)

Aircraft to be hangared if possible.

If not possible, in addition to above.

(k) Units are to adopt appropriate safety measures based on a knowledge of local weather phenomena, aircraft characteristics and unit operational requirements. Precautions are to reflect relevant -2 EOs and EO 00-80-4/42.

**NOTE**

Providing surface conditions are acceptable to the Unit Technical Officer, nose wheels may be chocked fore and aft in lieu of main wheels for immediate departures only.

**TOWING PROCEDURE FOR SEAPLANES****GENERAL**

5 The term "seaplane" applies to all aircraft adapted to land and take-off from water and includes all types including rotating wing types.

**TOWING CREW**

6 The minimum towing crew, their positions and duties are as follows:-

(a) COXSWAIN, qualified to tow aircraft and positioned in the towing boat.

(b) BOAT CREW, normally consisting of one man at the controls of the towing boat. He shall operate the boat under the direction of the coxswain, handle the towing line, and carry out any other duties detailed by the coxswain.

(c) PILOT, qualified on the aircraft types and positioned aboard the aircraft.

(d) DROGUE OPERATOR, to be stationed at each Drogue Station as specified in the applicable -2 EO. He shall operate drogue and mooring lines as instructed by the coxswain.

(e) FLIGHT ENGINEER, (or crewman, or AE Tech) aboard the aircraft, to assist the pilot if it becomes necessary to start the engines. He shall relay commands from the coxswain to the drogue operator and shall lower the anchor if so instructed.

(f) DOCK PARTY (if the aircraft is to be secured to a dock or wharf) to ensure that the aircraft is properly secured.

**RESPONSIBILITIES**

7 The responsibilities are:-

(a) Coxswain - The coxswain is responsible for the safety of the aircraft whenever towing, mooring, docking or anchoring is in

progress and the services of a towing boat are required. He shall ensure that all towing equipment, including towing lines, mooring lines, fenders, drogues, etc., are serviceable and adequate for the purpose. In the event of an emergency arising, where he cannot control the aircraft, he shall inform the pilot. At the conclusion of towing, he shall ensure that the aircraft is properly secured.

(b) Pilot - The pilot shall carry out a normal preflight inspection of the aircraft prior to any towing operation, ensuring that the engine is ready for immediate use if required. In the event of an emergency, he will take such action so as to minimize the risk of damage to the aircraft and injury to its occupants; he will submit a written report of the occurrence to the unit commander, detailing the cause of the emergency and outlining the reasons for the action taken.

#### OPERATION

8 The following operations must be observed:-

(a) All types of seaplanes are normally to be towed bow (nose) first under all conditions. The towing line or bridle is to be attached to the pendant or towing point(s) provided. All hatches, doors, portholes, compartment covers, etc., are to be kept closed at all times.

(b) The undercarriage of amphibious aircraft may be lowered to act as drogues when towing conditions warrant.

(c) No one is to be allowed on any external part of the aircraft during towing operations, unless as necessary to pass or receive mooring lines, lower or raise anchor, or other duties of a similar nature. Those areas designated as "walkways" out-lines in the -2 EO are to be used.

(d) Suitable and adequate fenders are to

be placed between the hull or float and the dock or wharf to prevent damage.

(e) Beaching operations are to be carried out as specified in the applicable -2 EO.

(f) Docking, mooring or anchoring may be carried out by the pilot as detailed in the -1 EO.

(g) When towing by non RCAF personnel is necessary (e.g., on detached operations) the captain of the aircraft will ensure that towing is done in a safe and reasonable manner.

#### SPECIAL CONCESSION FOR SINGLE ENGINE SEAPLANES UNDER 10,000 LBS.

9 At the discretion of the unit commander the requirement for a pilot, drogue operators, and flight engineers may be waived during routine towing operations, over short distances under ideal conditions. If no pilot is aboard, the engine will not be started under any circumstances. The aircraft may be towed by lashing the boat to a float; adequate fenders must be used to prevent damage.

#### SECURITY MEASURES

10 The following security measures must be observed:-

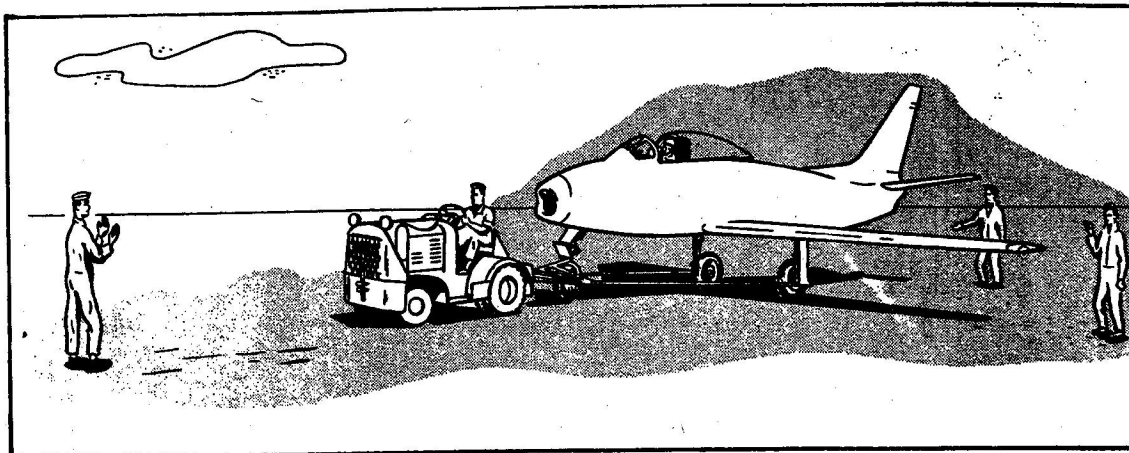
(a) Control locks are to be installed at all times when the aircraft is unattended.

(b) Covers for engine, propeller, cockpit and wings should be installed as dictated by weather conditions.

(c) A daily inspection is to be carried out to ensure that the aircraft is safely moored or anchored. At night, a white light shall be displayed which is visible for at least two miles.

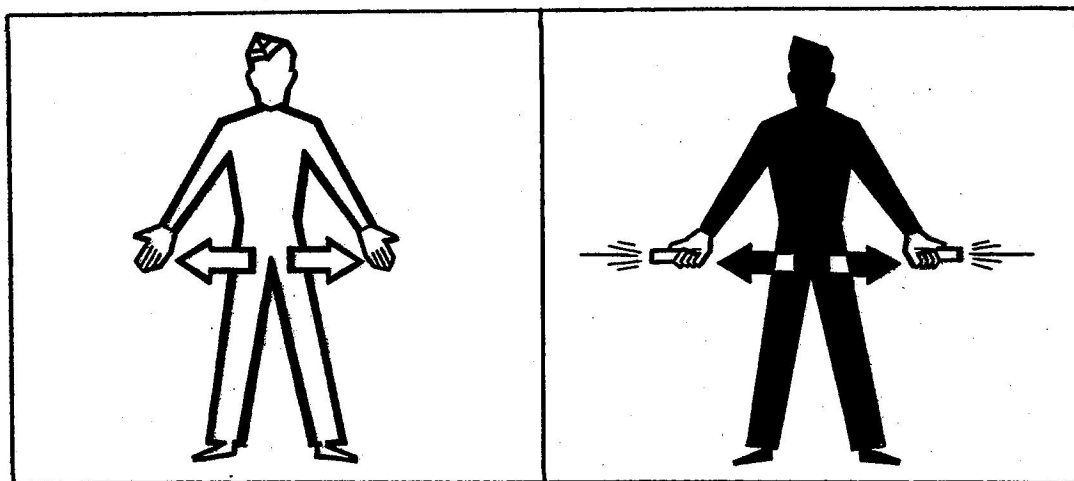


## APPENDIX "A" RCAF AIRCRAFT OPERATING SIGNALS



To direct the towing of an aircraft the NCO i/c is to assume the position as herein indicated keeping the eyes of the driver visible, at all times, for direction signals.

Figure 1 Towing Aircraft

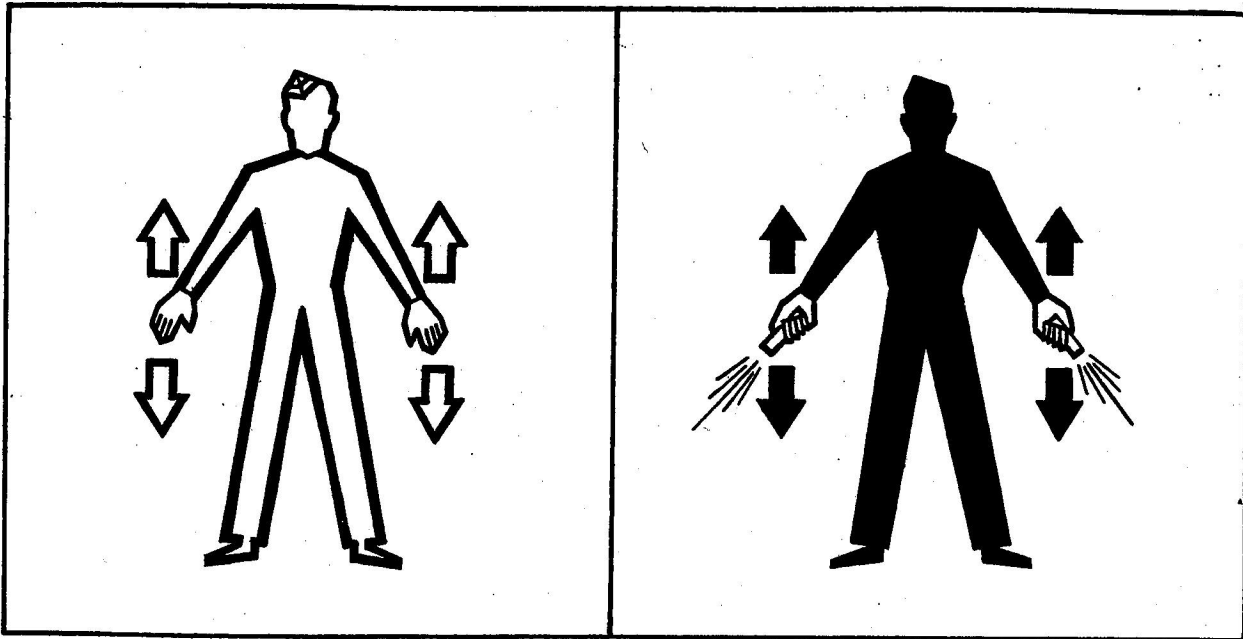


Arms down, palms facing outwards, swing arm outwards.

Figure 2 Chocks Away

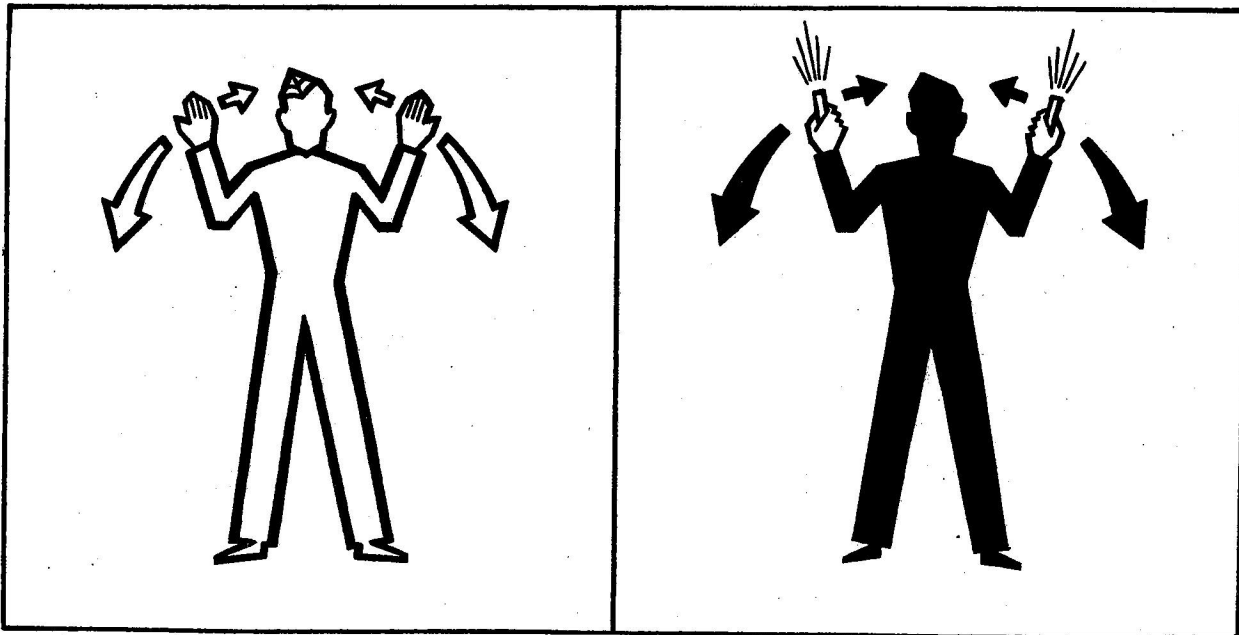
### NOTE

RCAF Poster #225 size 30" x 40" titled "Marshalling, Towing and Ground Handling Signals for RCAF Aircraft" which is a reproduction of Figures 1 to 30 inclusive, is available on demand.



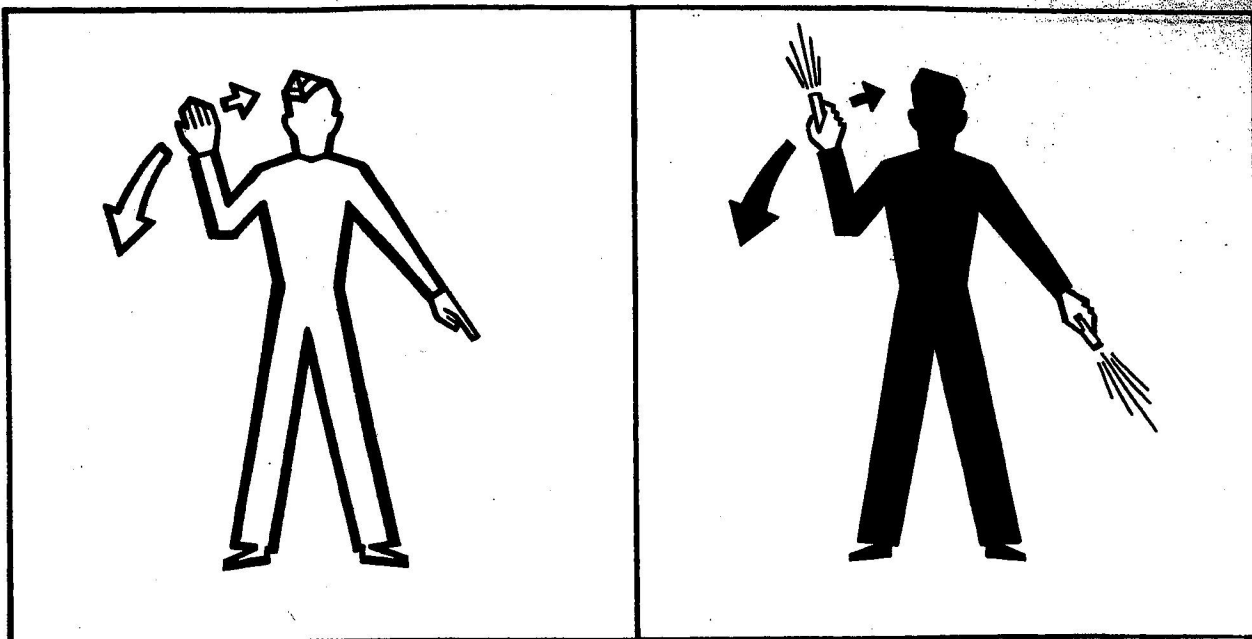
Arms down with palms towards ground, then moved up and down several times.

Figure 3 Slow Down



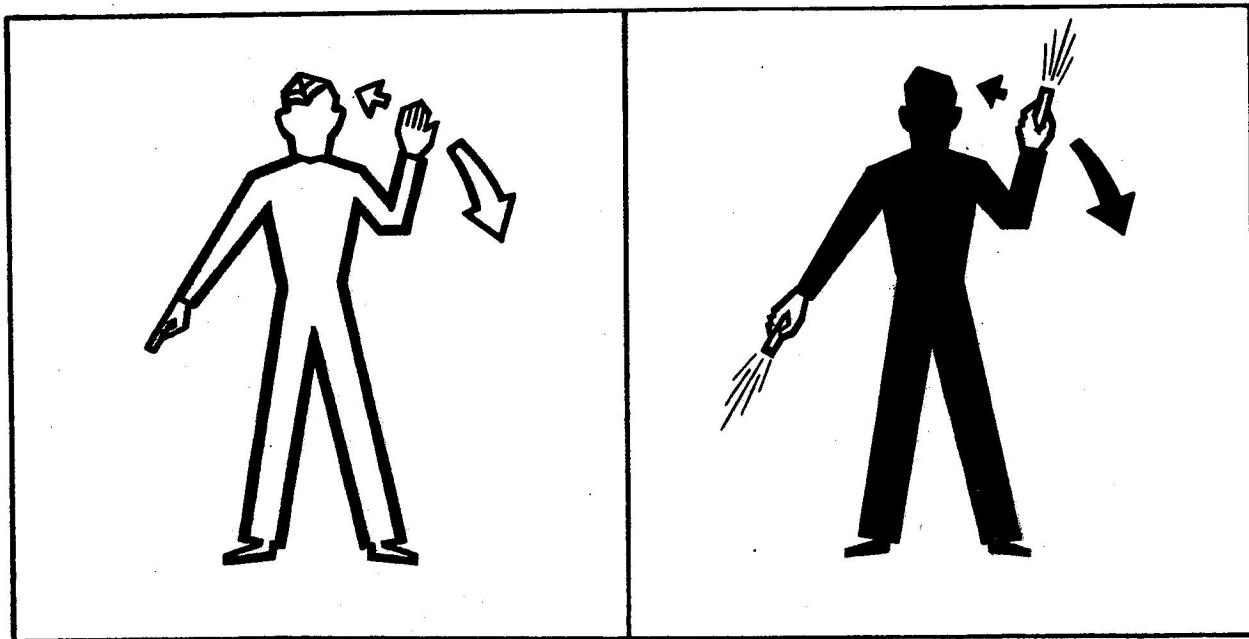
Arms repeatedly moved upward - backward, beckoning onward.

Figure 4 Straight Ahead



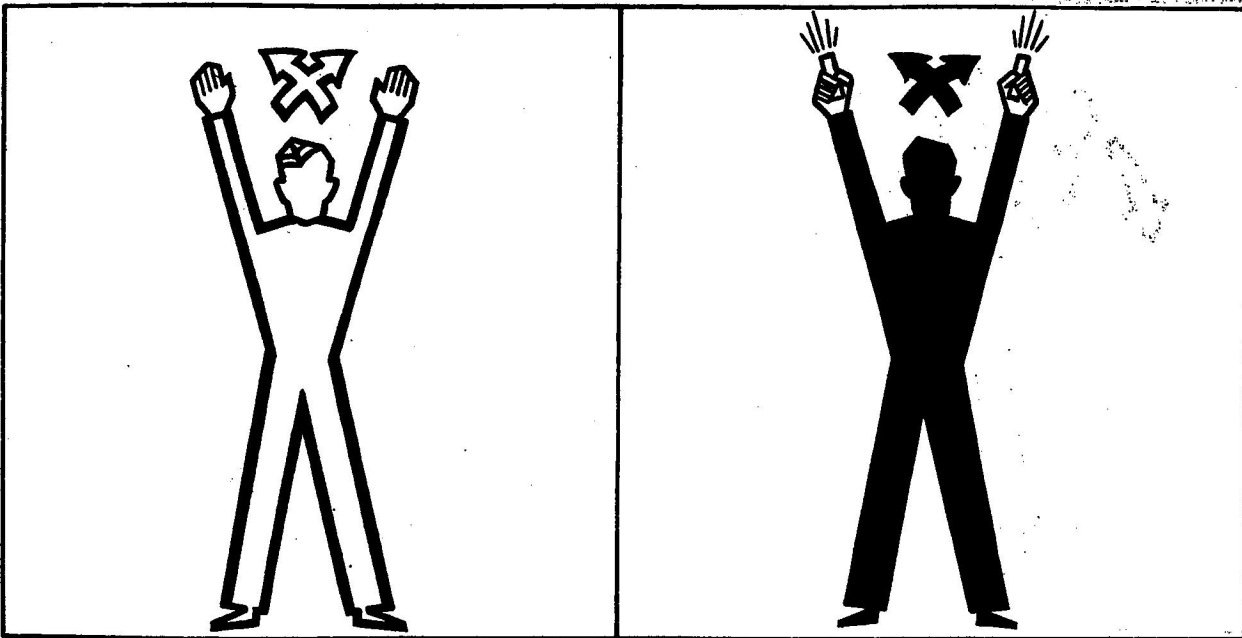
Left arm down, right arm repeatedly moved upward - backward. Speed of arm movement indicating rate of turn.

Figure 5 Turn to Starboard



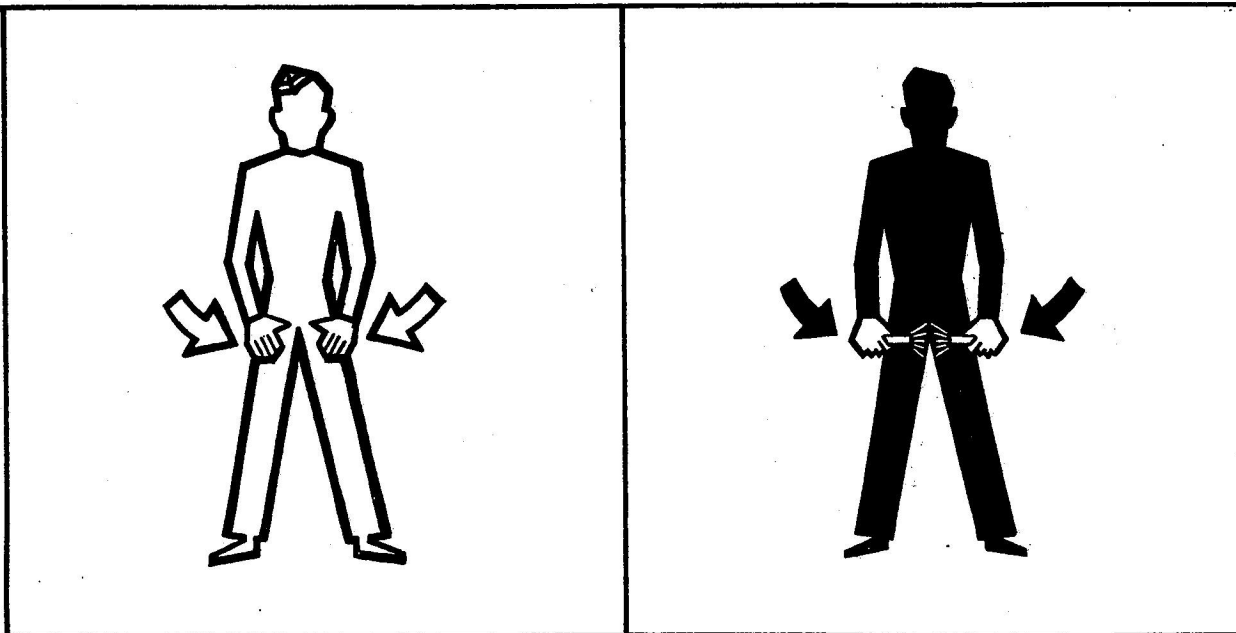
Right arm down, left arm repeatedly moved upward - backward. Speed of arm movement indicating rate of turn.

Figure 6 Turn to Port



Arms repeatedly crossed above head. - Rapidity of arm movement to be related to the urgency of the stop., the faster the movement the quicker the stop.

Figure 7 Stop



Arms down, palms facing inwards, swing arms from extended position inwards.

Figure 8 Insert Chocks

DAY

NIGHT

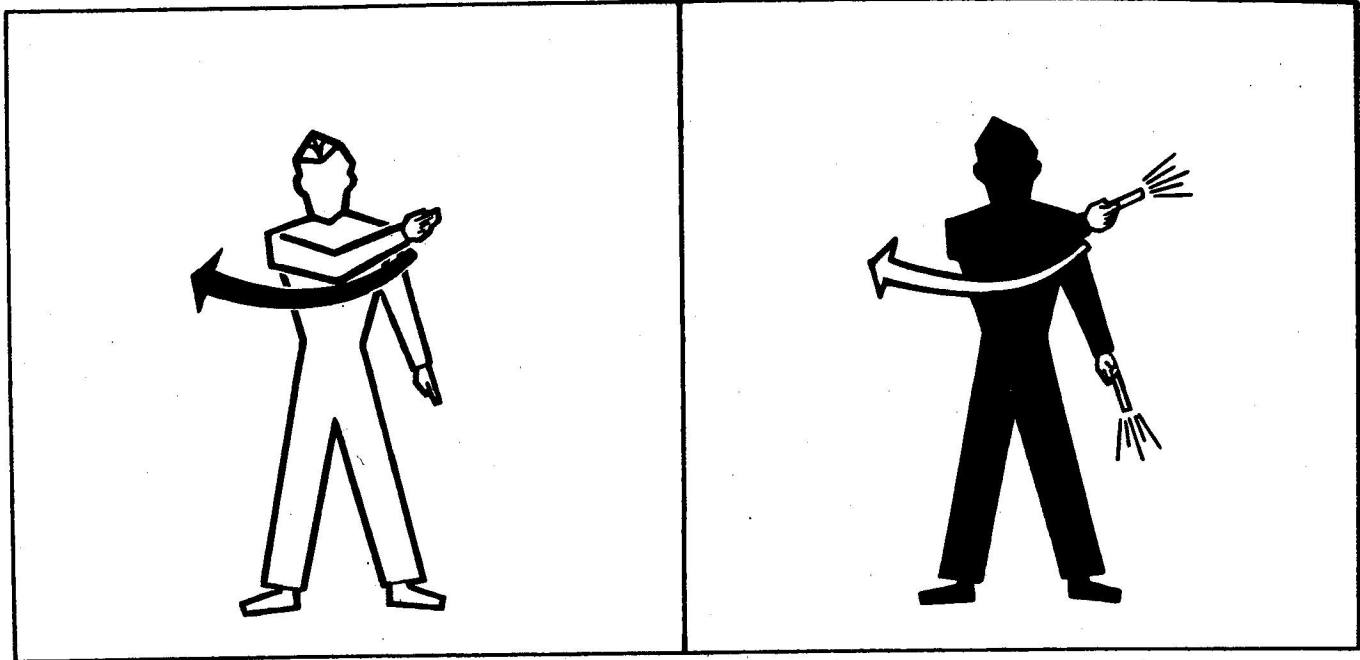


Figure 9 Proceed Under Guidance To Next Marshaller  
 Right or left arm down, other arm moved across body  
 and extended to indicate direction of next marshaller .

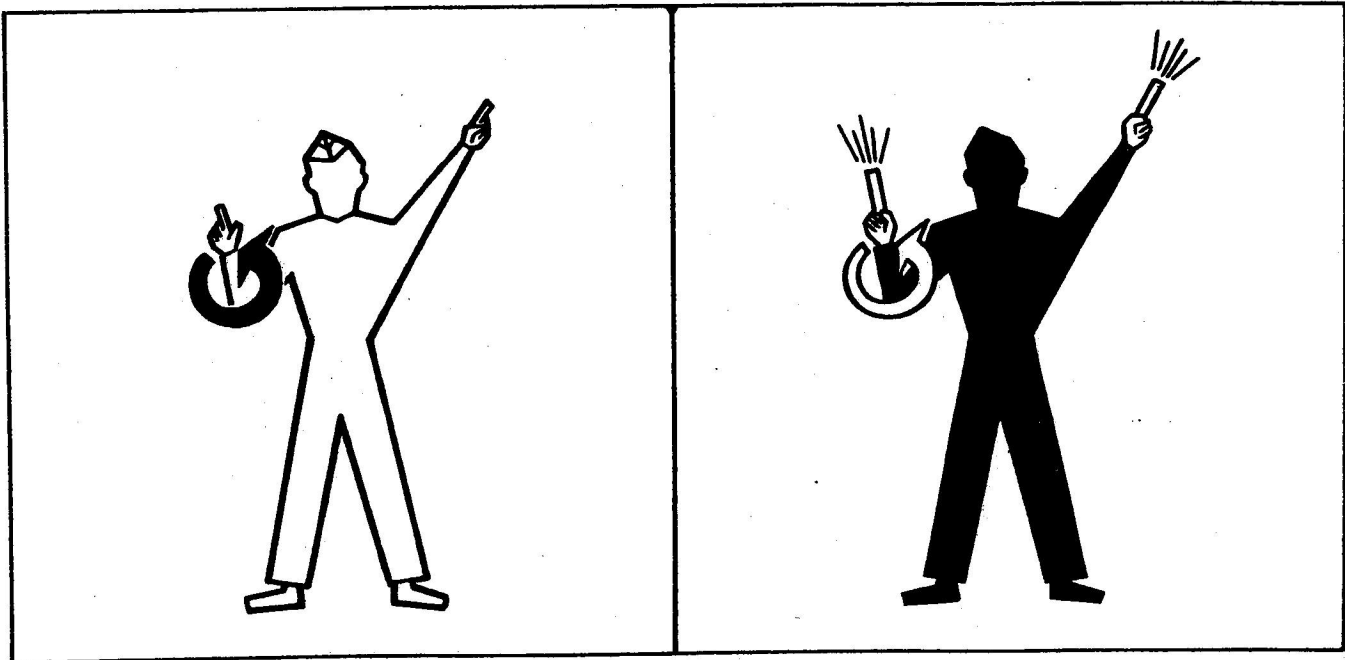


Figure 10 Start Engines  
 Circular motion of right hand at head  
 level, with left arm pointing to engine .

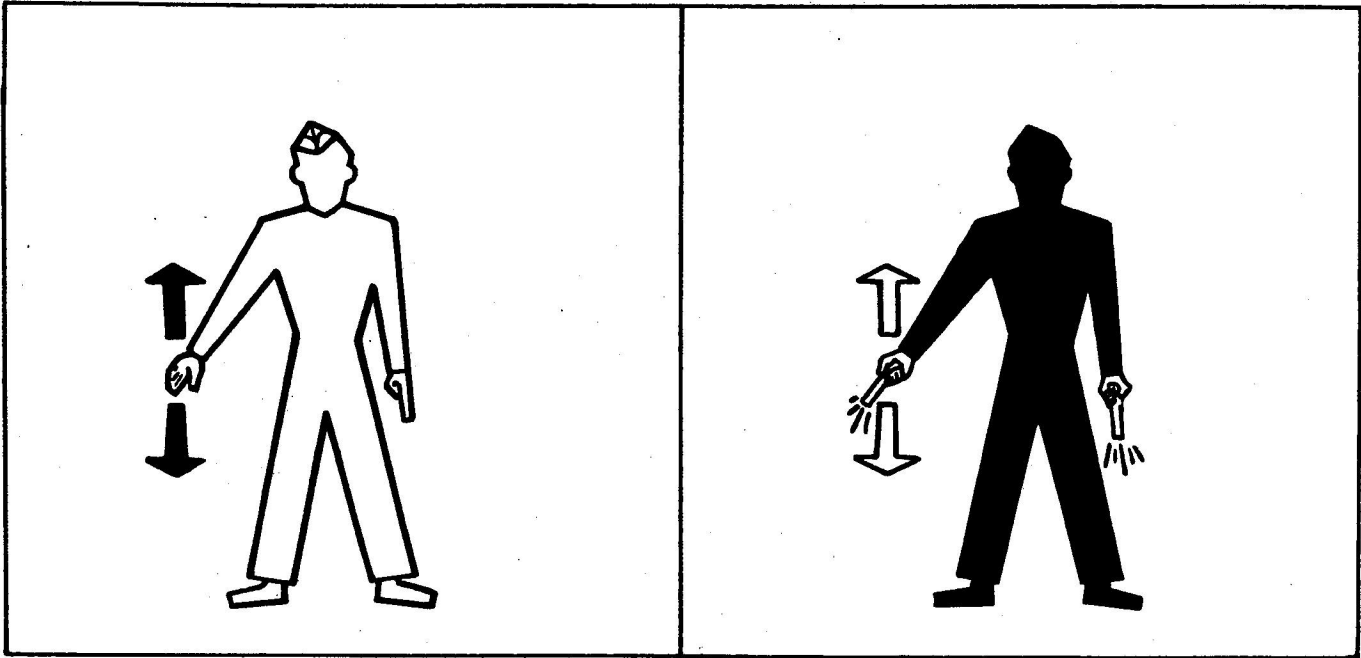


Figure 11 (Issue 2) Slow Down Engines On Indicated Side

Arms down with palms toward the ground, then either right or left arm moved up and down indicating that the left or right side engine(s) respectively should be slowed down.

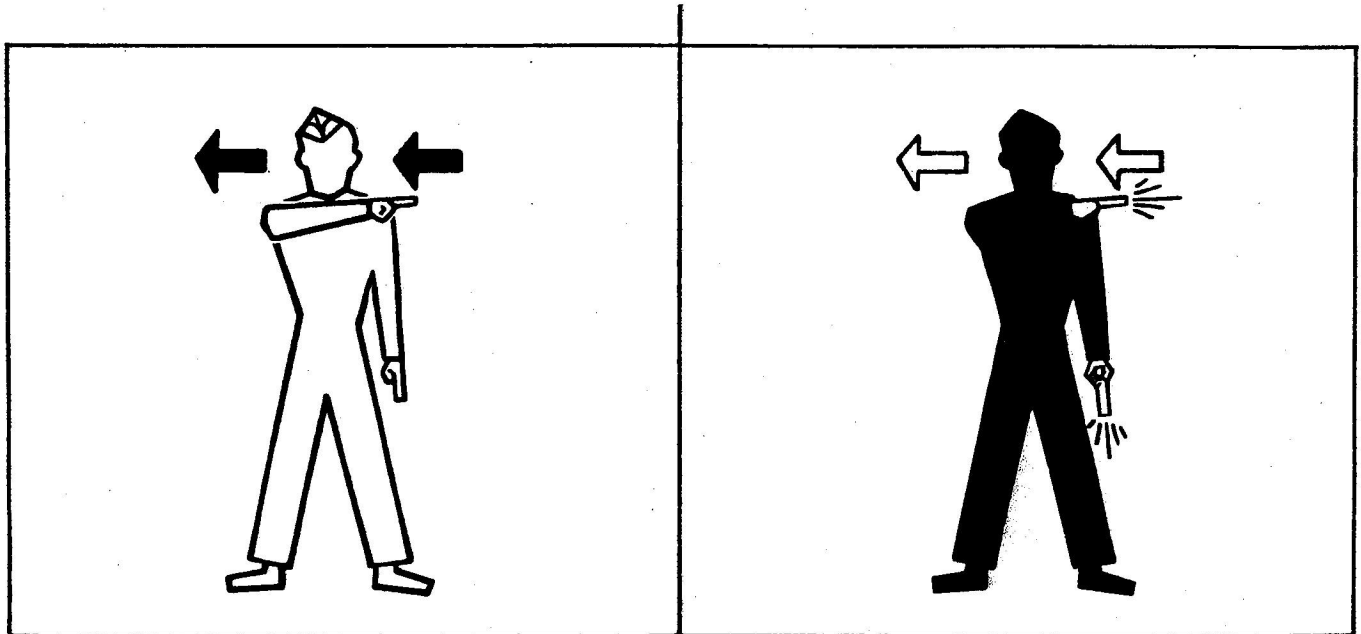


Figure 12 (Issue 1) Cut Engines

Either arm and hand level with chest, hand across throat, palm downwards.

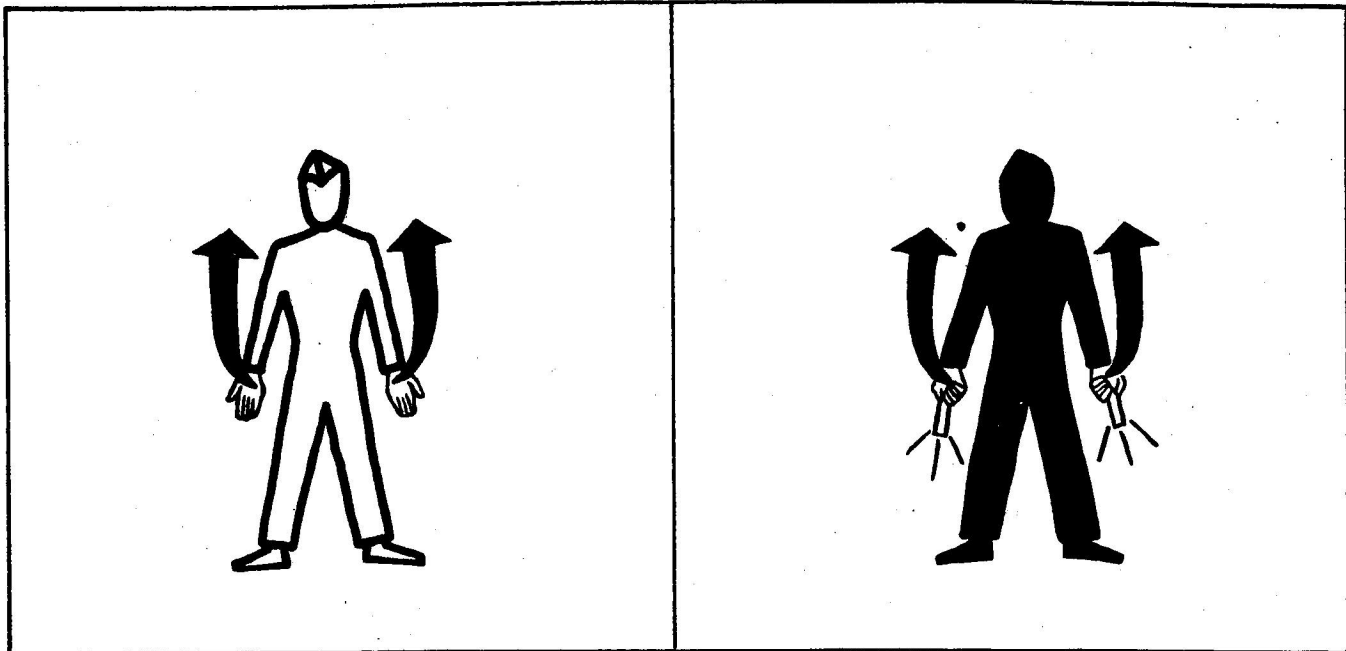


Figure 13 (Issue 1) Move Back  
 Arms by sides, palms facing forward, swept forward and upward repeatedly to shoulder height.

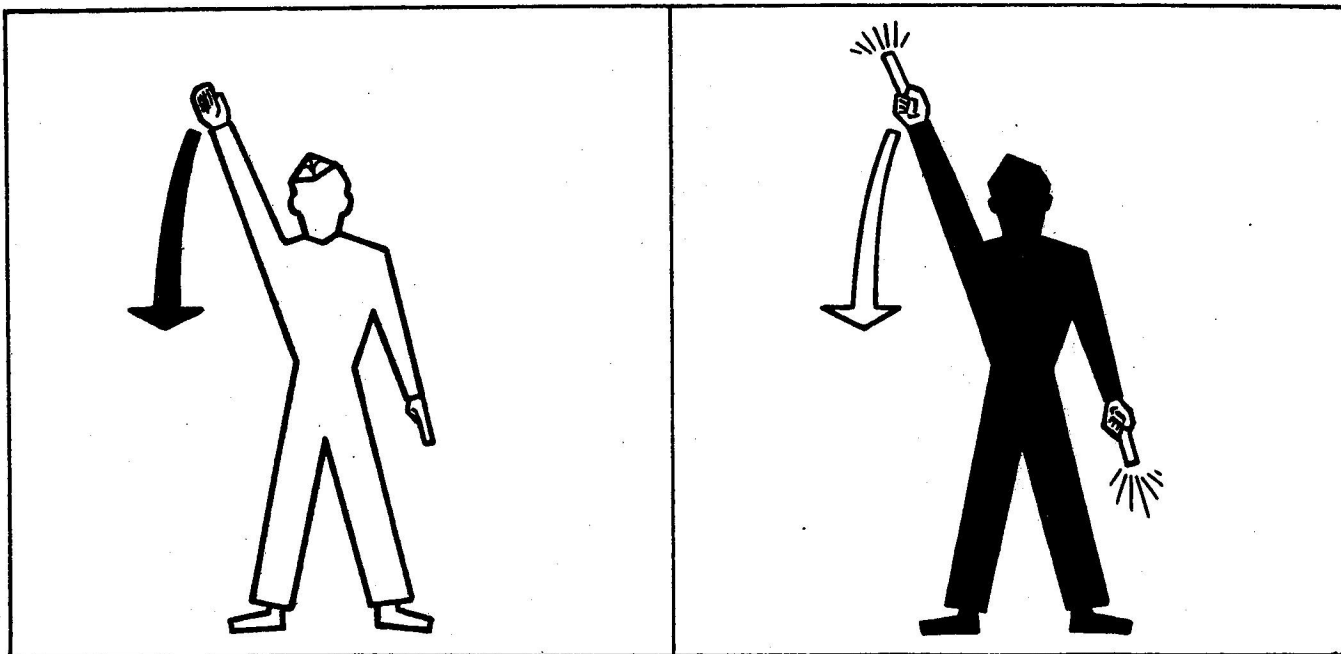


Figure 14 Turns While Backing-Tail To Starboard  
 Point left arm down, and right arm brought from overhead vertical position to horizontal forward position, repeating.

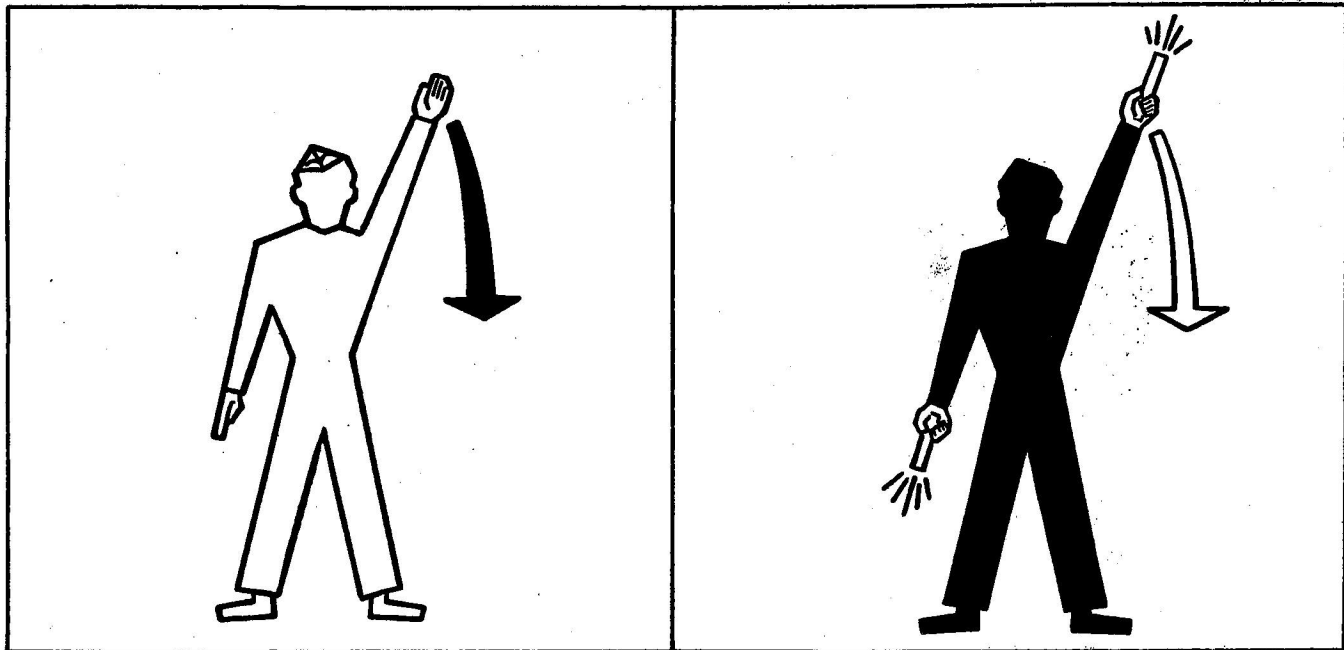


Figure 15 Turns While Backing - Tail To Port

Point right arm down, and left arm brought from overhead vertical position to horizontal forward position, repeating.

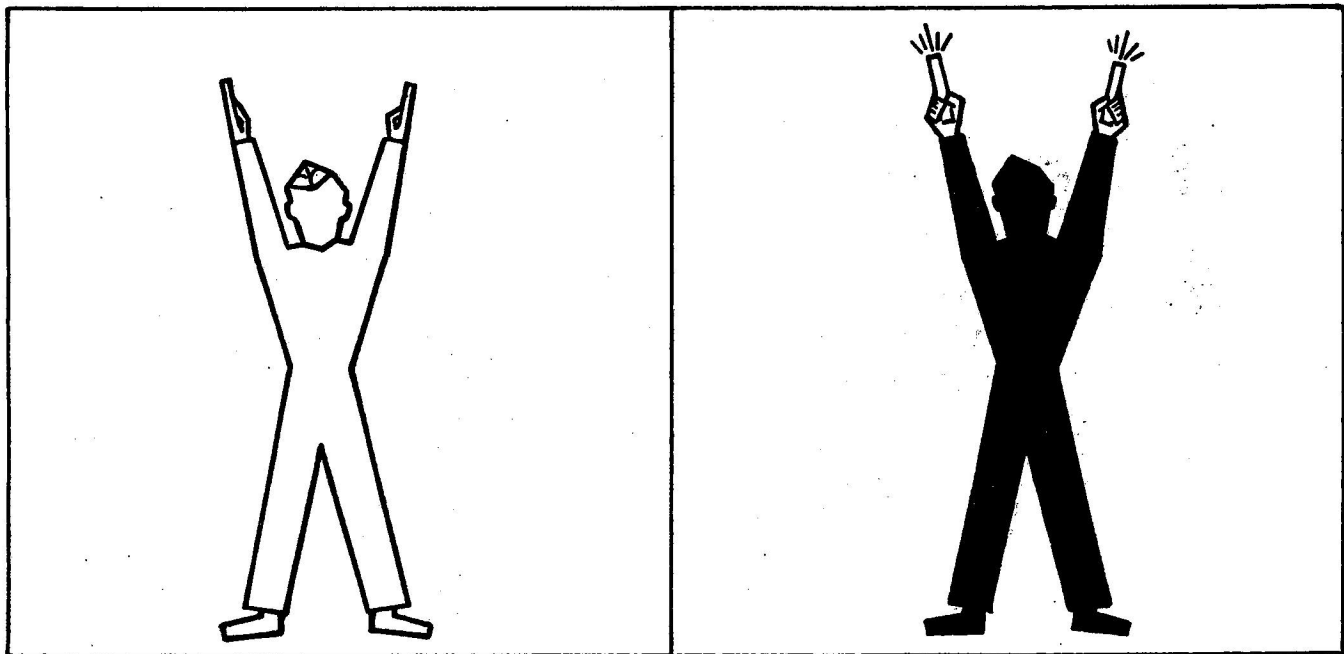


Figure 16 This Dispersal  
Arms above head  
in vertical position.



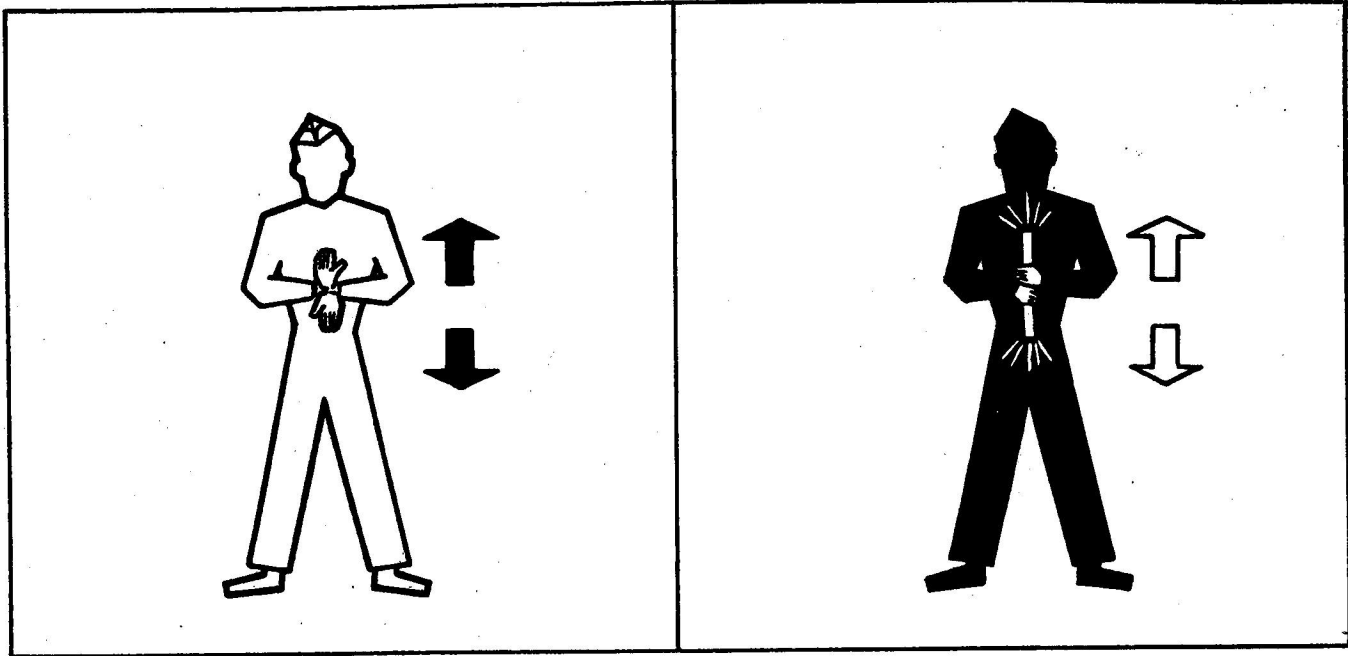


Figure 17 Lower Wing Flaps

Hands in front, palms together horizontally, then opened from the wrist alligator mouth fashion.

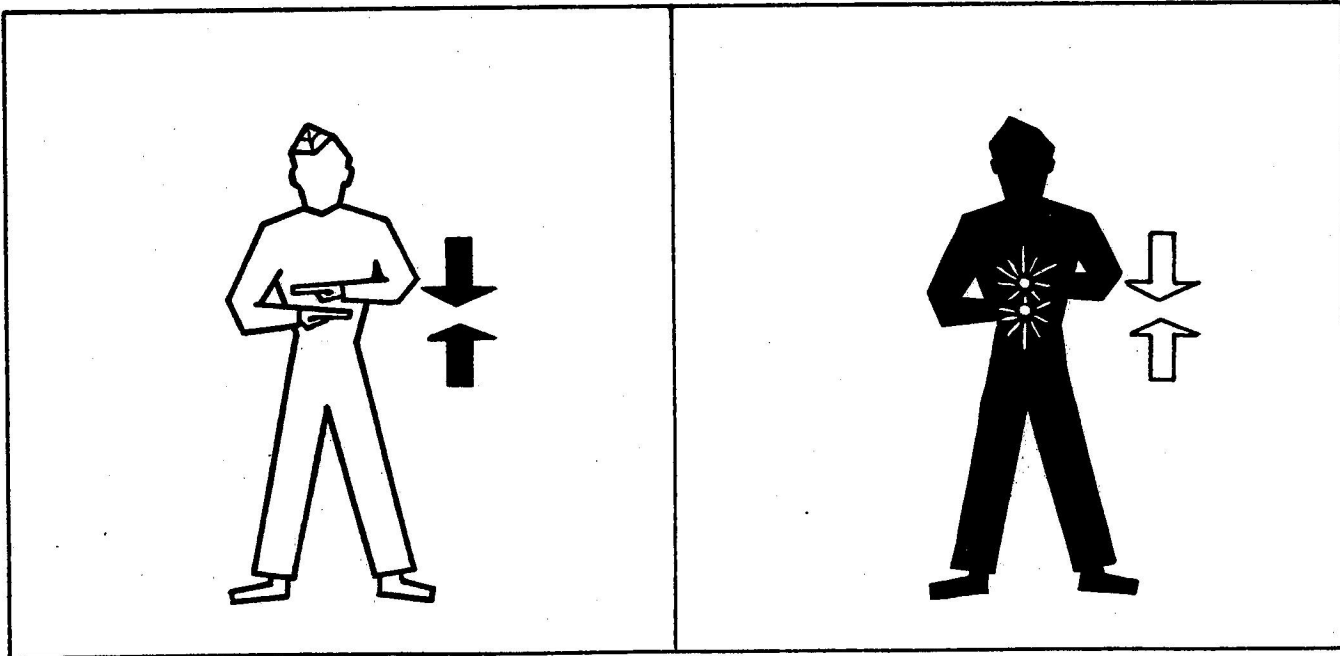


Figure 18 Raise Wing Flaps

Hands in front, horizontally, with the palms open from the wrists, then suddenly closed.

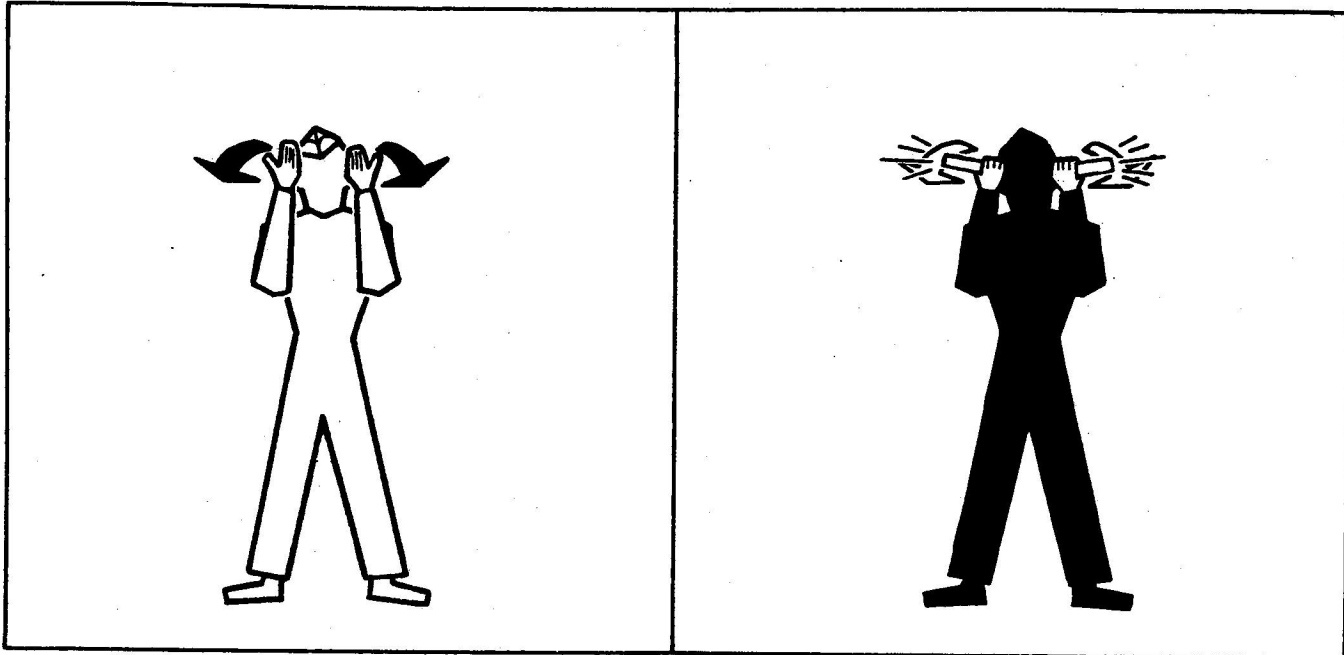


Figure 19 Open Cowl Flaps

Hands flat against sides of head, then opened by bringing thumbs outward and forward.

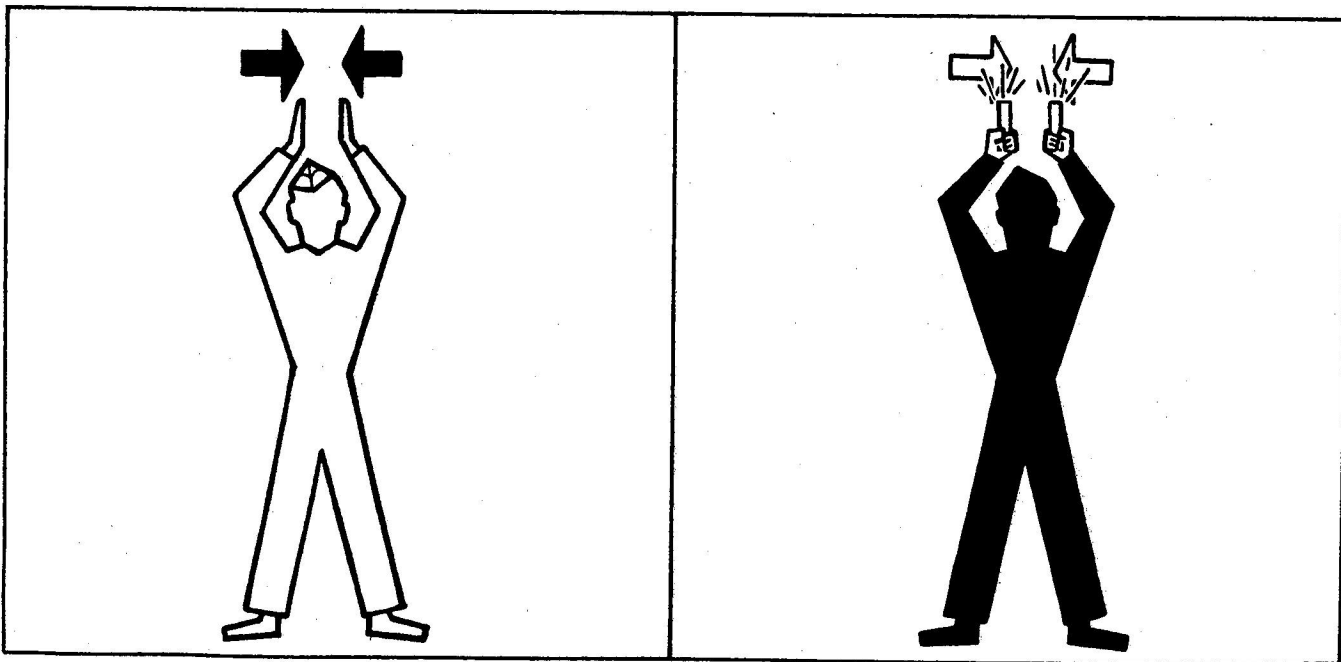


Figure 20 Lock Tail Wheel

Hands together overhead, palms open from the wrists in a vertical V then suddenly closed.

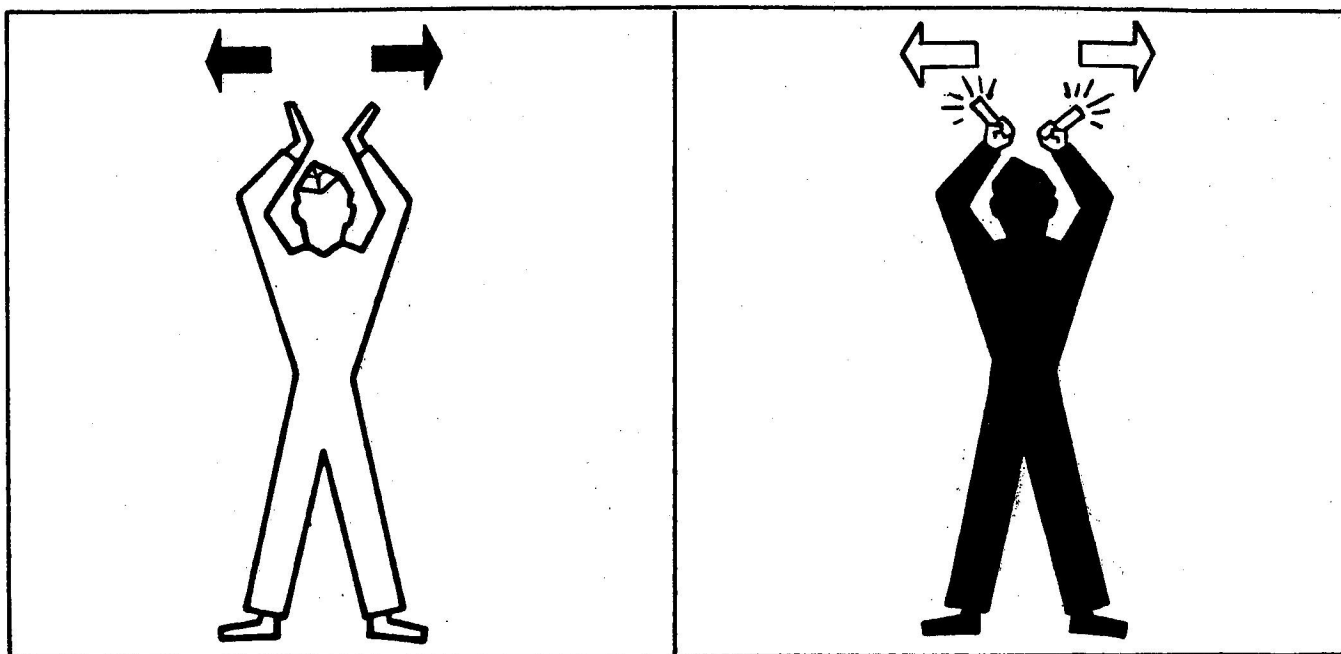


Figure 21 Unlock Tail Wheel

Hands overhead, palms together, then opened from the wrists to form a vertical V.

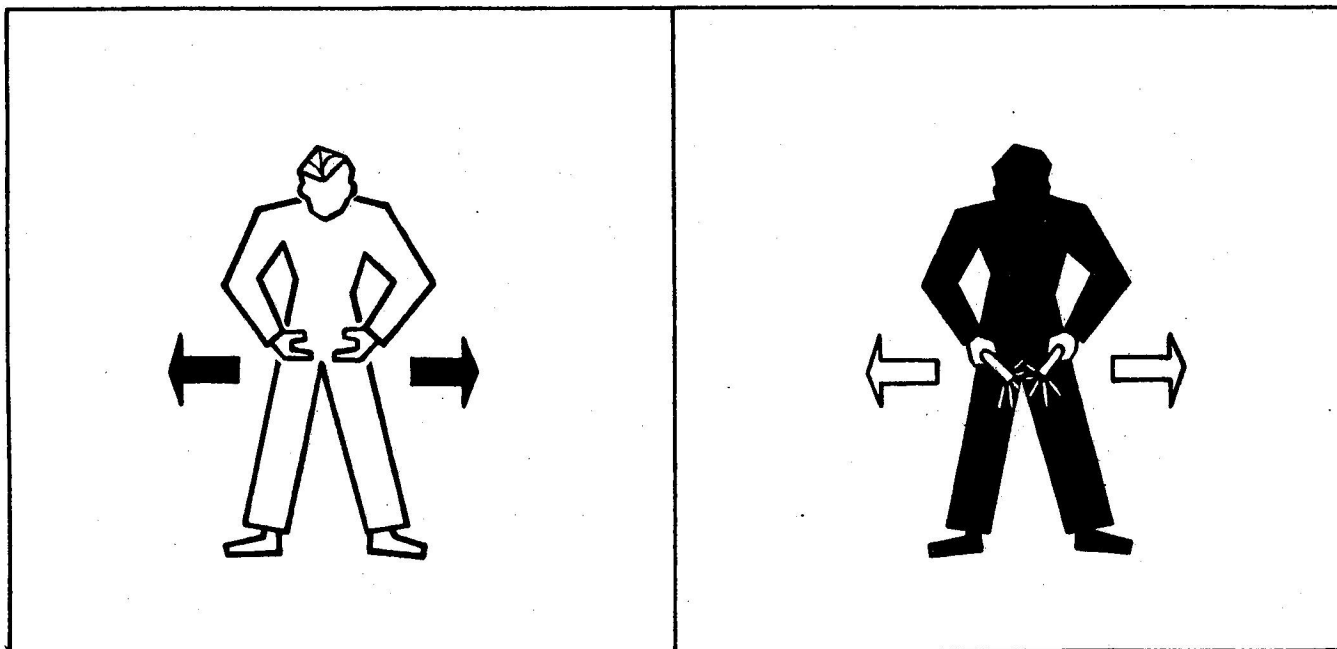


Figure 22 Open Bomb Bay

Lean over with arms wrapped as if around a barrel. Open arms in a manner similar to bomb bay opening.

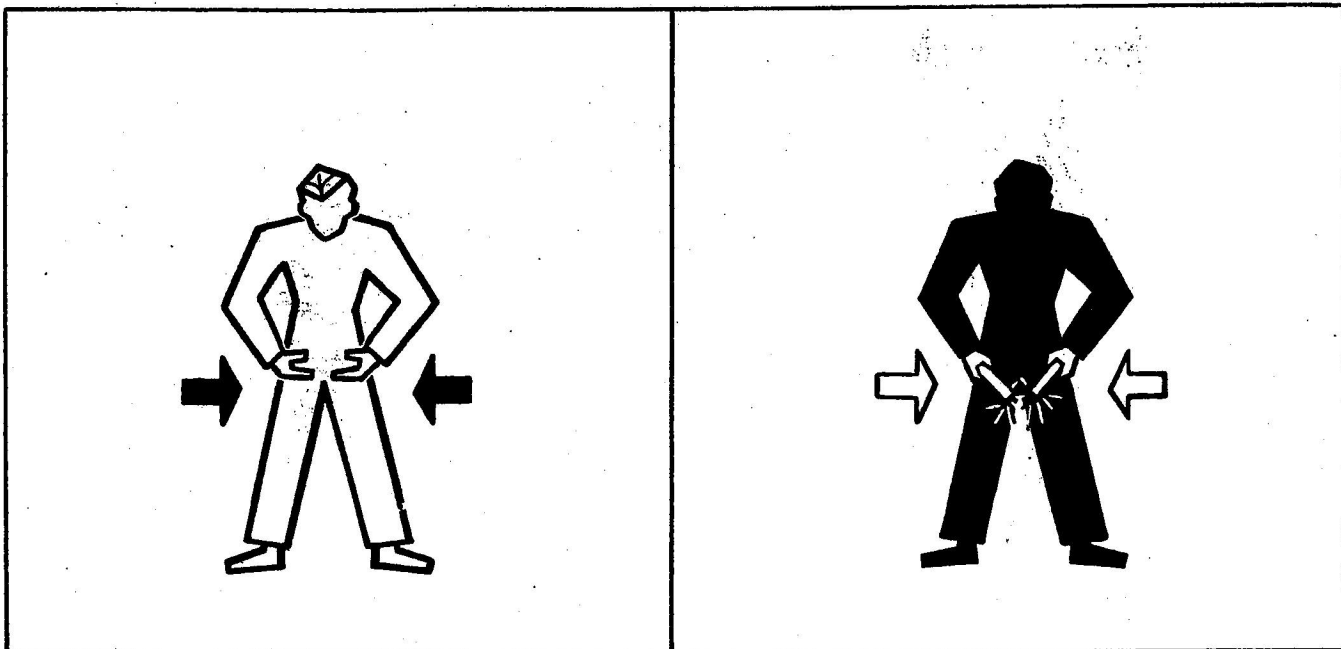


Figure 23 Close Bomb Bay

Bend at waist with arms open and wrap arms in a circle as around a barrel.

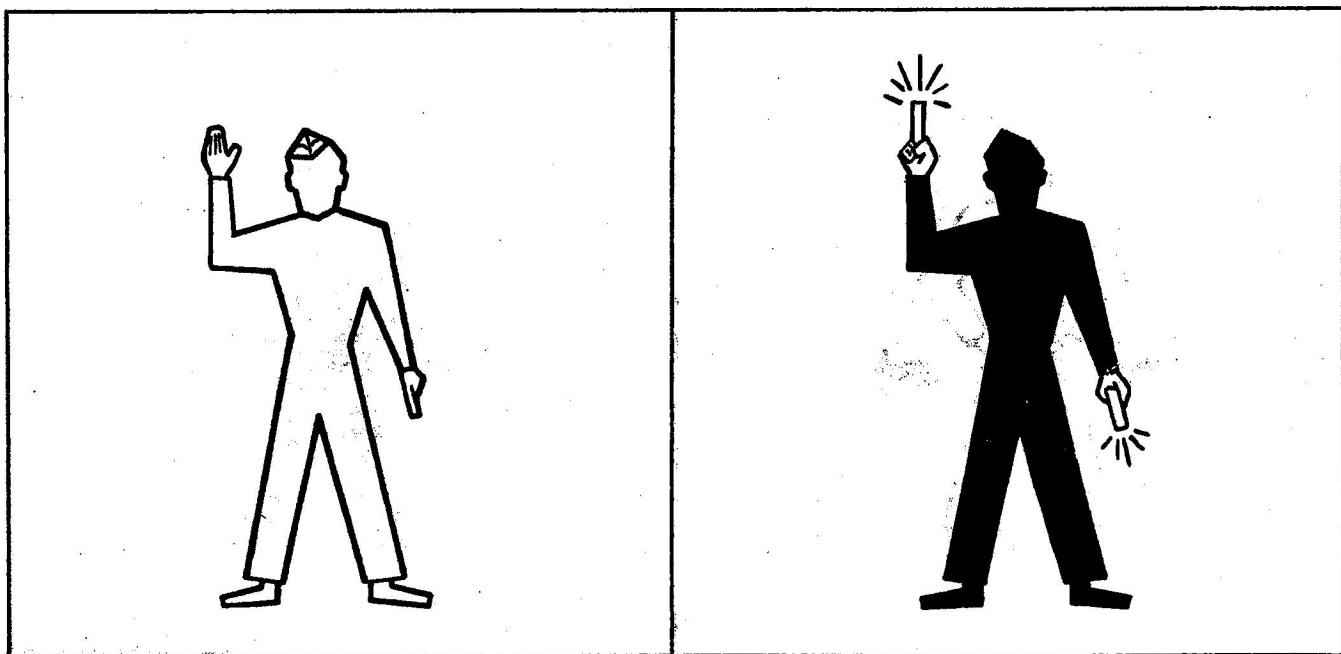


Figure 24 All Clear (Marshalling Finished)

Right arm raised at elbow with palm facing forward.

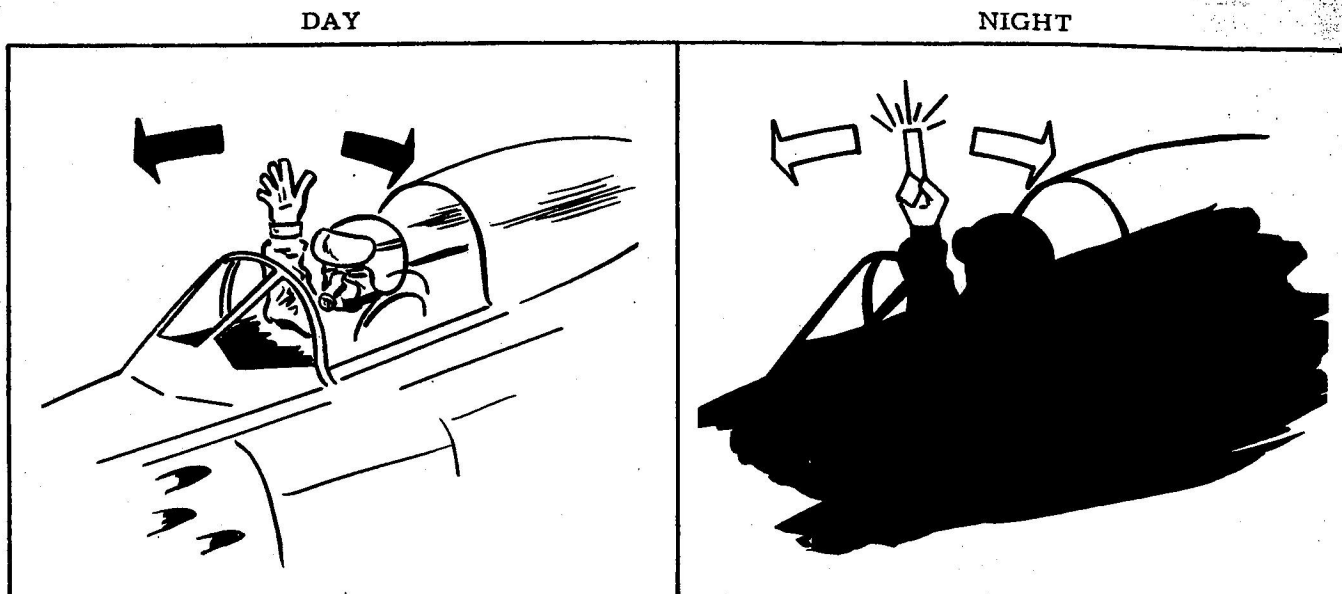


Figure 25 Remove Chocks

The pilot waves hand, or flashlight by night, from side to side above head.

Used by: Canada, Greece, Italy, Norway, U.K.



Figure 26

**CONNECT A.P.U.**

The pilot will swing one arm outside cockpit, the fist clenched with extended thumb pointing towards aircraft.

**DISCONNECT A.P.U.**

The pilot will swing one arm outside cockpit, the fist clenched with extended thumb pointing away from aircraft.

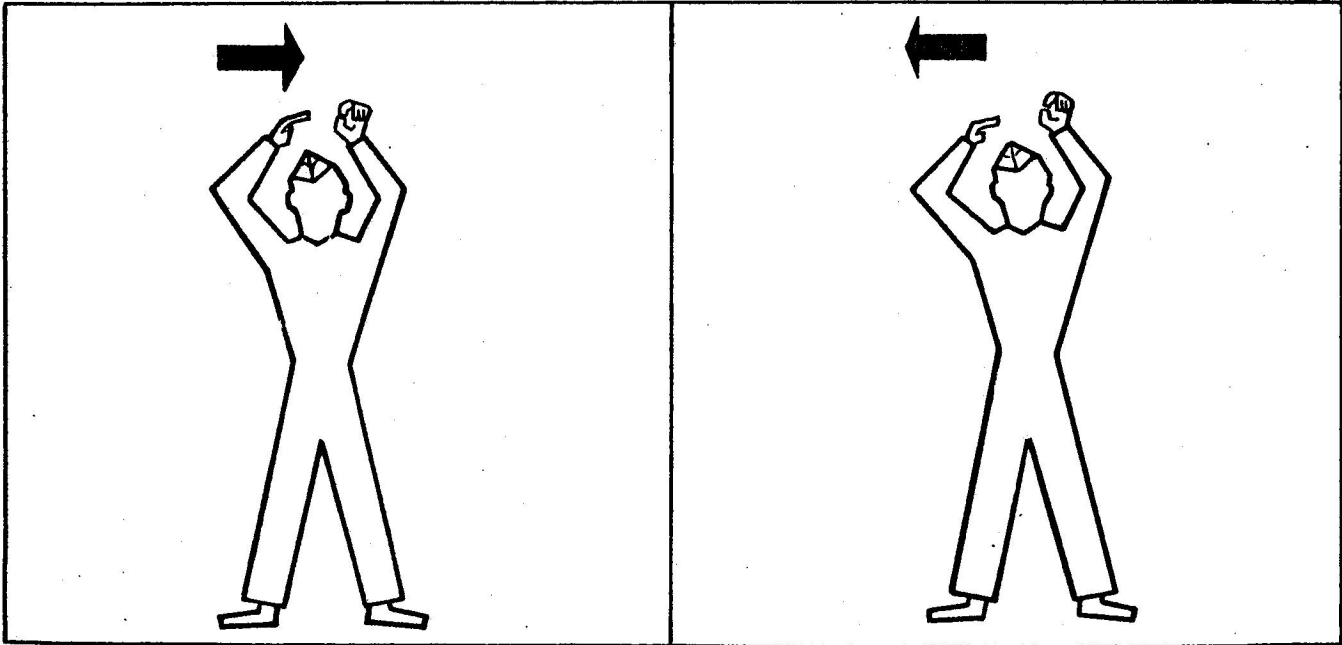


Figure 27

**A.P.U. CONNECTED**

With his hands above the head, the ground crewman will partially clench left fist and insert the extended index and first finger of the right hand into the circle made by the fingers of the left hand.

**A.P.U. DISCONNECTED**

With his hands above the head, the ground crewman holding the index and the first finger of the right hand with the partially clenched left fist, will withdraw the right hand from the left hand.

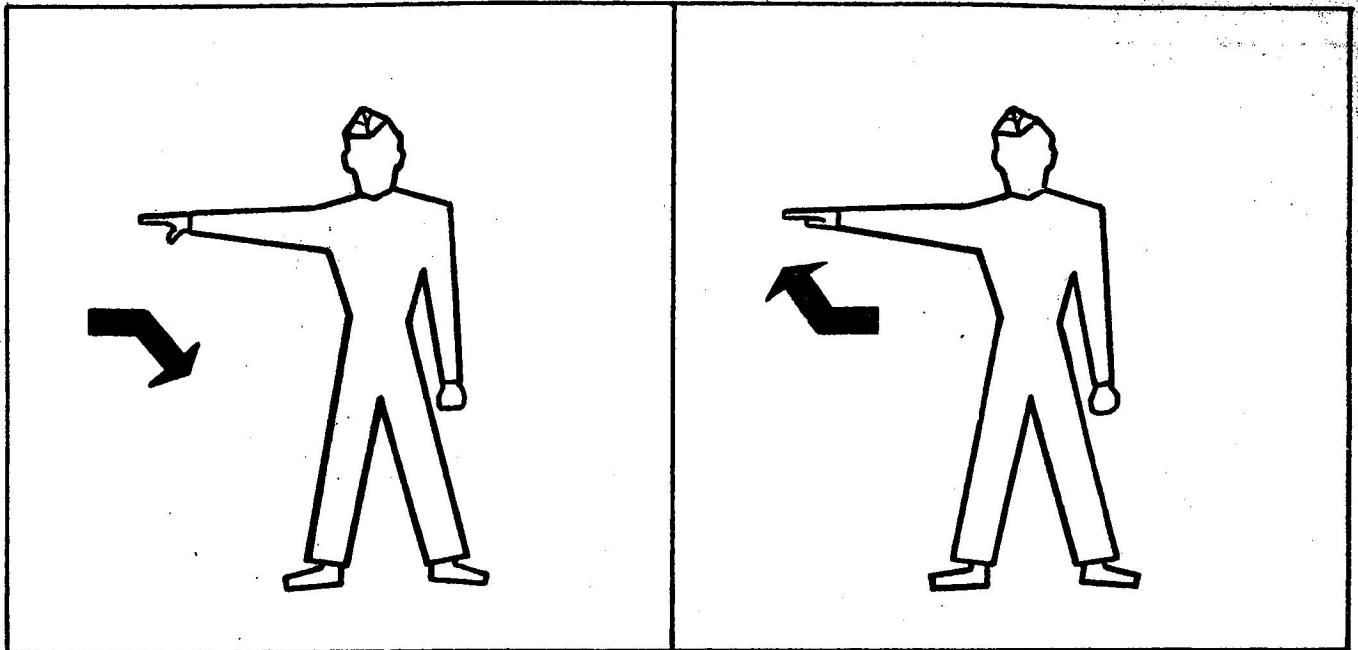


Figure 28

**OPEN DIVE FLAPS**

The arm will be extended with the hand palm down and the thumb point down.

**CLOSE DIVE FLAPS**

The arm will be extended, hand palm down with the thumb parallel to fingers.

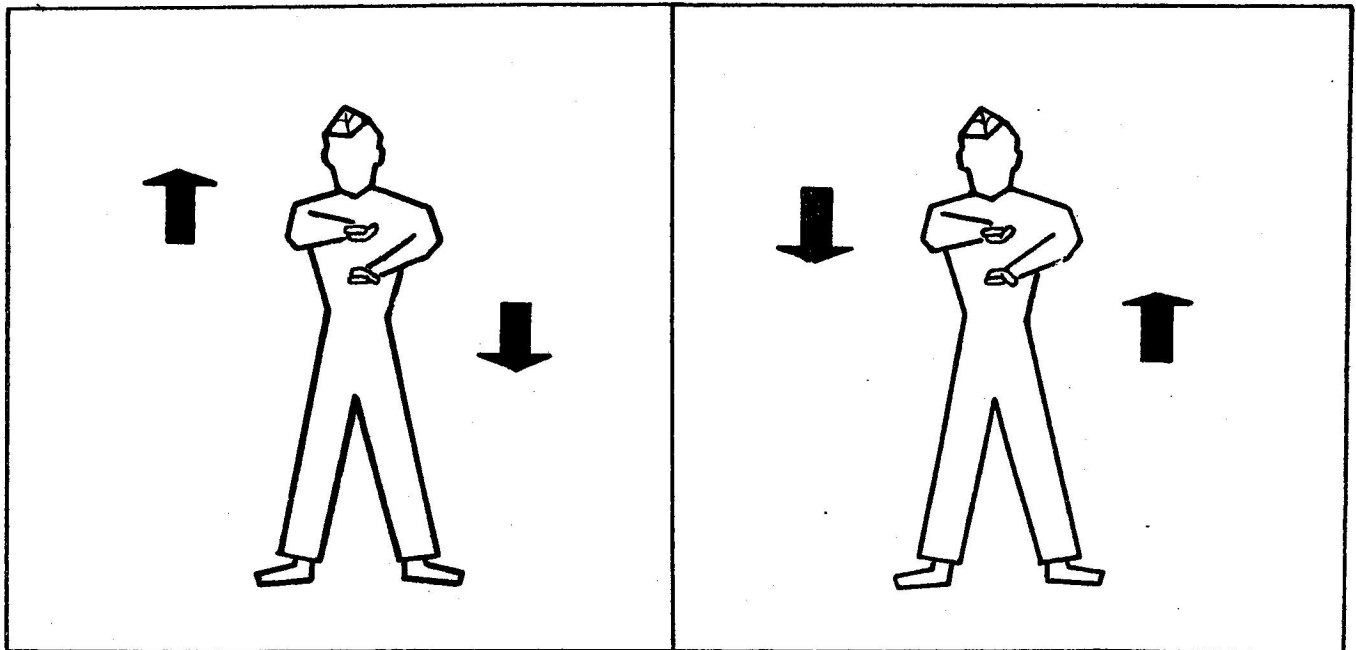


Figure 29

**OPEN ROCKET PODS**

Both arms extended, the right hand palm down, the left hand palm up and about six inches directly below right hand.

**CLOSE ROCKET PODS**

Both arms extended, hands brought together, the right hand palm down, the left hand palm up.

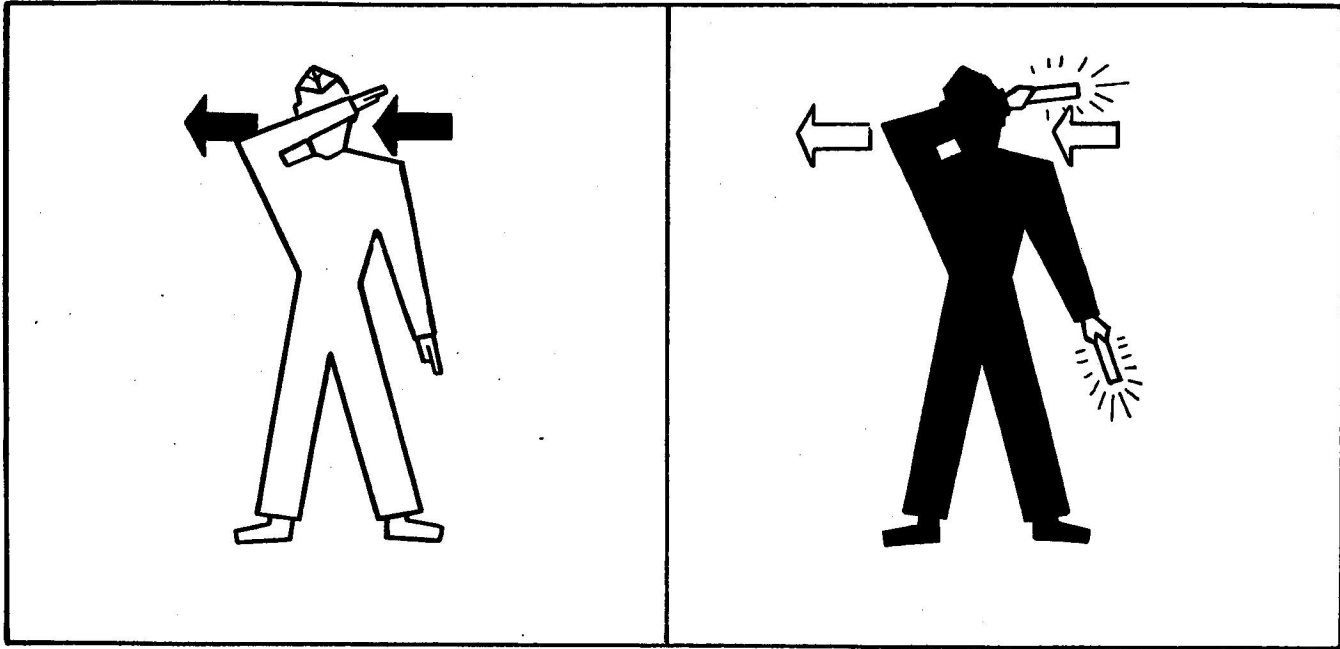


Figure 30

WET FUEL

Right hand drawn across forehead left arm extended and hand pointing to excessive fuel spill.

(To alert pilot of the accumulation of fuel due to over-priming, wet start or other causes).



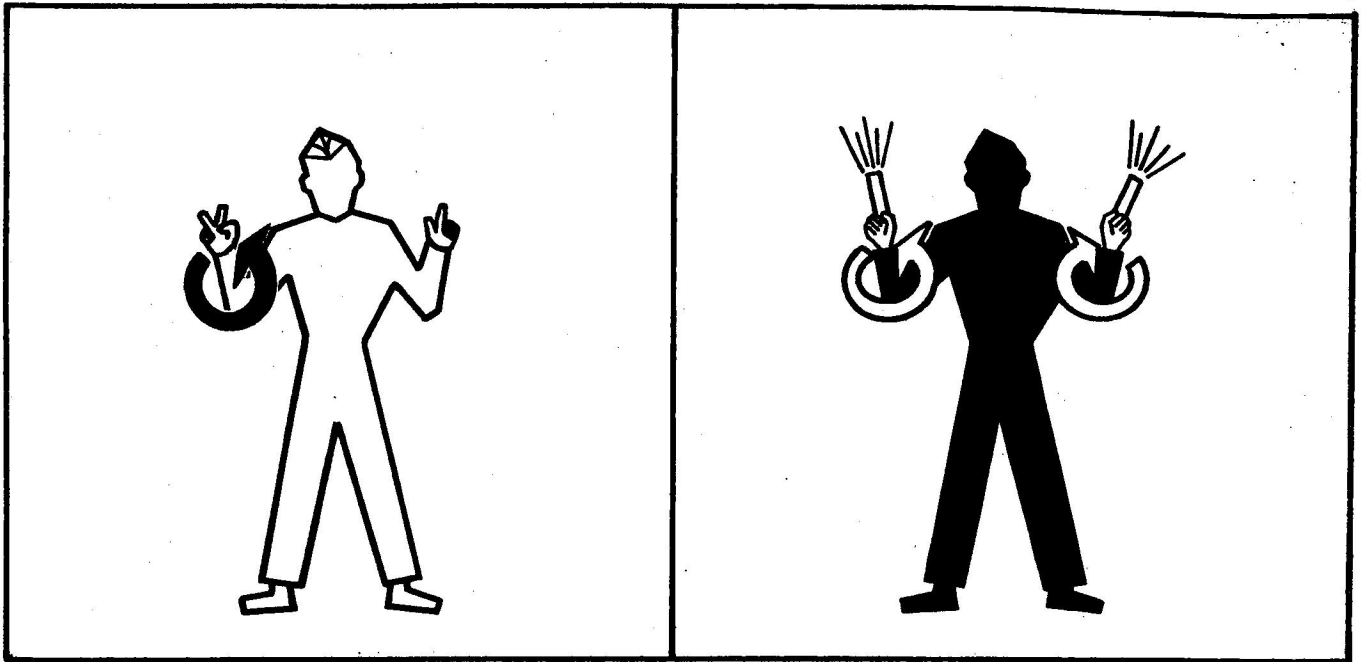


Figure 31 Start Both Engines

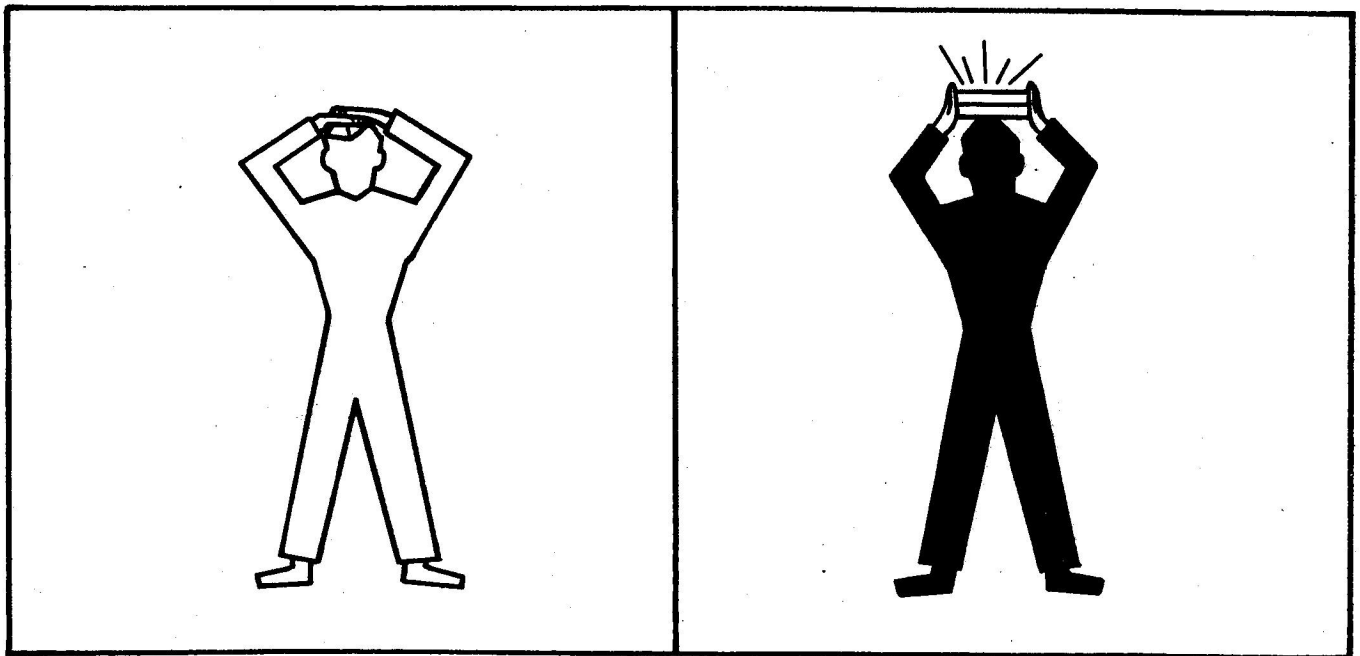


Figure 32 Stray Voltage and Arming

Day - Palms Flat on Top of Head

Night - Wands Held Parallel on Top of Head

NOTE

Pilot acknowledges by returning signal

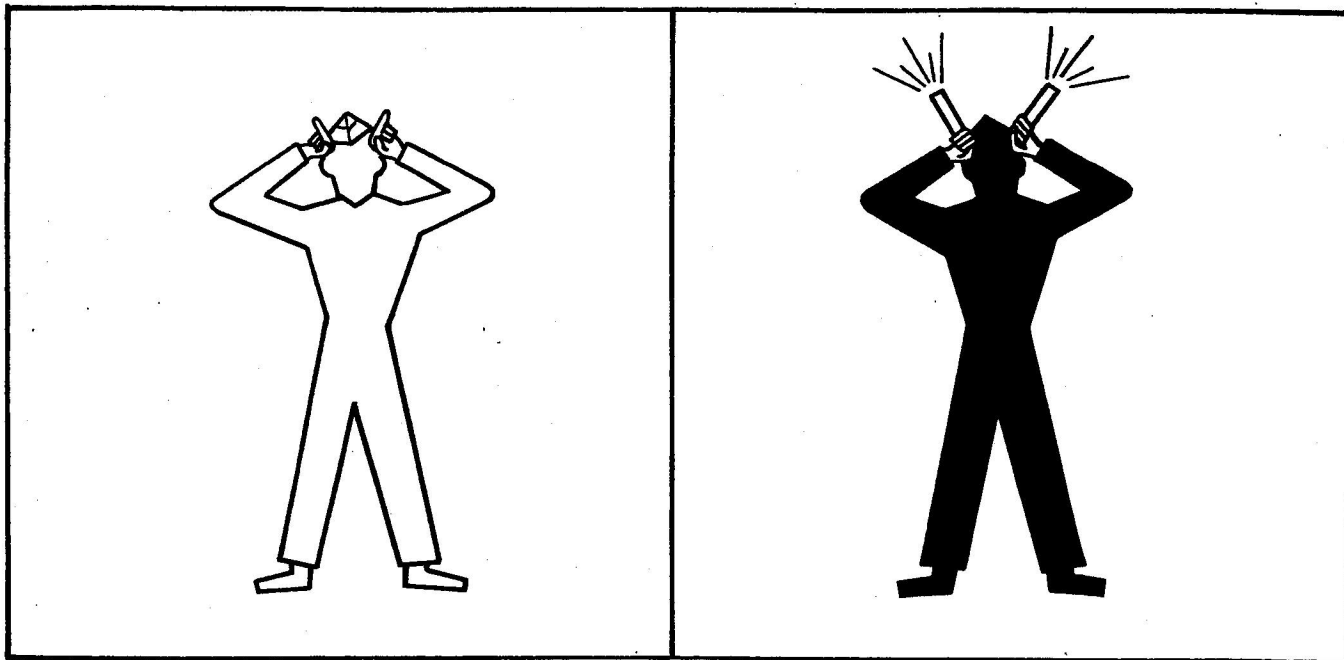


Figure 33 Arming Completed

Day - Hands on head index fingers pointing outwards as horns  
 Night - Wands used in same position

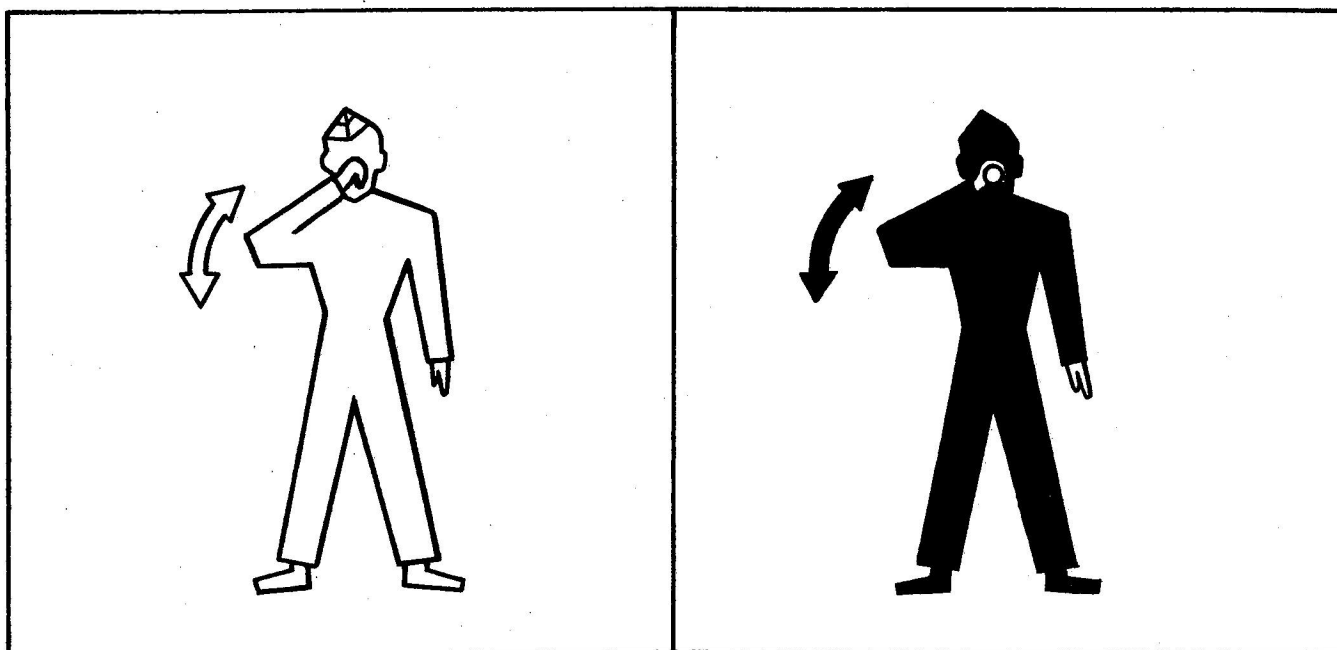


Figure 34 Check Pitot Head

Day - Clenched fist to nose  
 Night - Wand pointed from nose  
 Pilot acknowledges by returning signal

# APPENDIX "B"

## HELICOPTER OPERATING SIGNALS

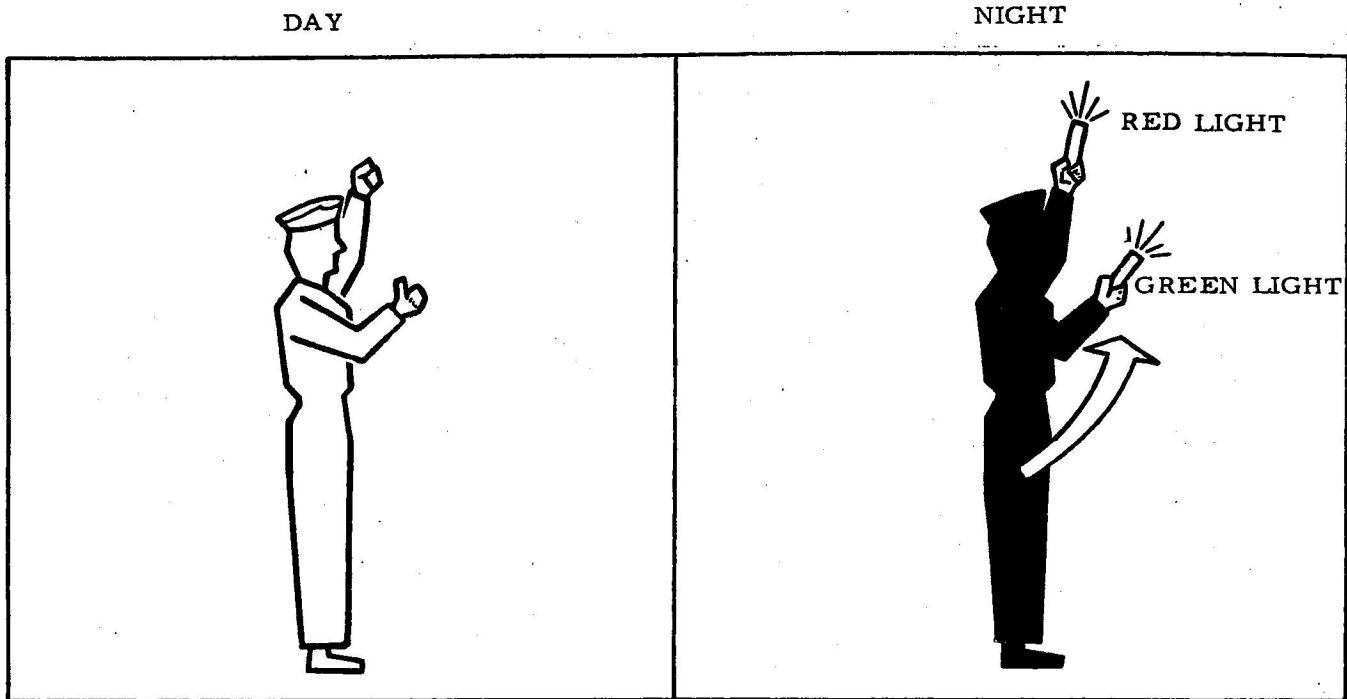


Figure 1 (Issue 1) Start Engine(s)

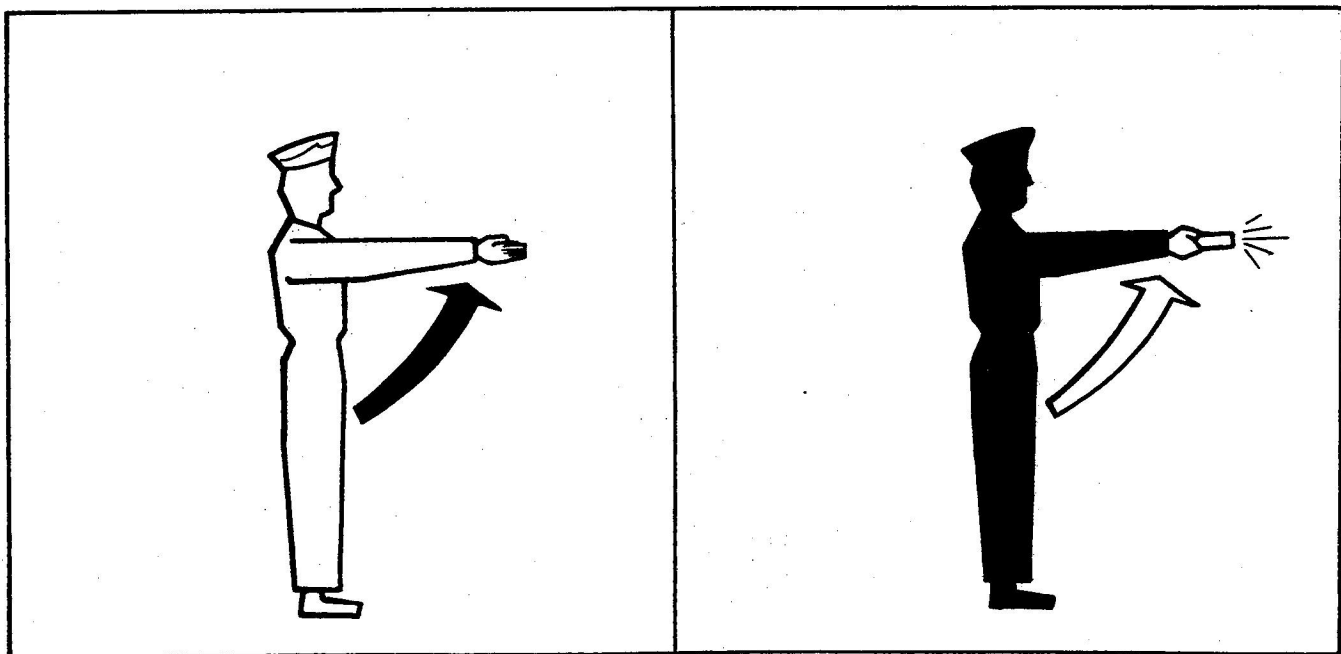


Figure 2 (Issue 1) Landing Direction

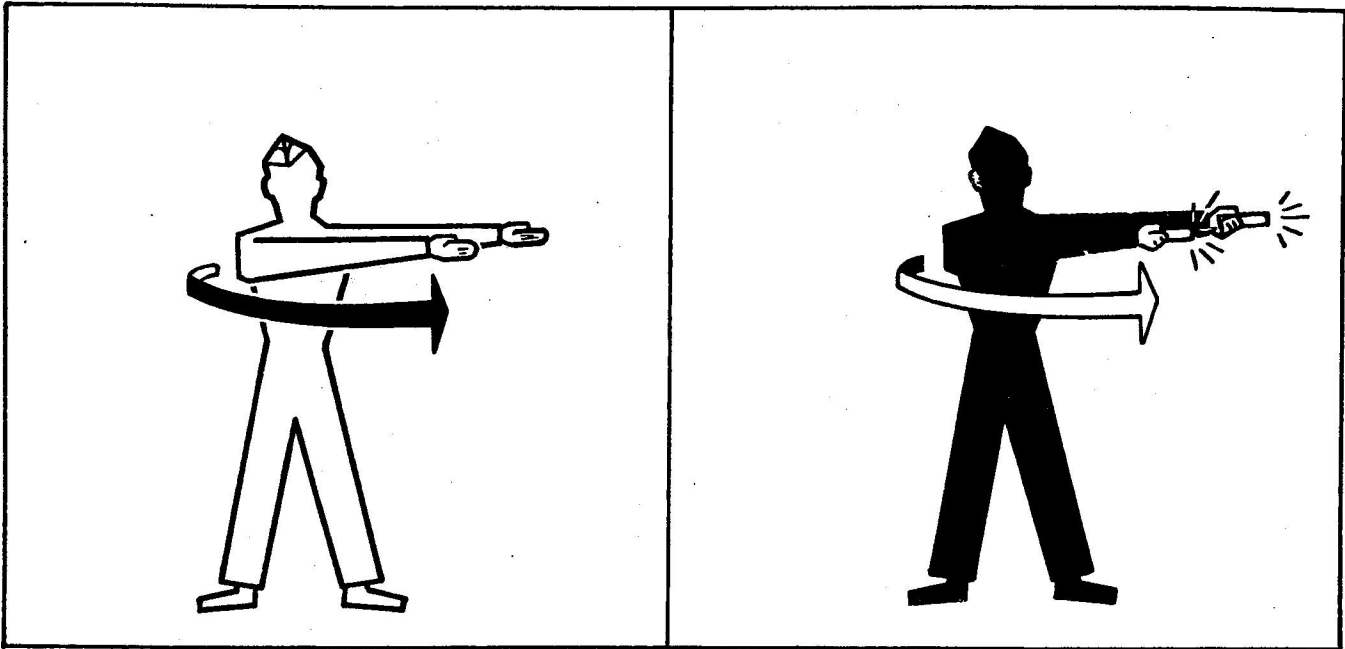


Figure 3 (Issue 1) Move Right

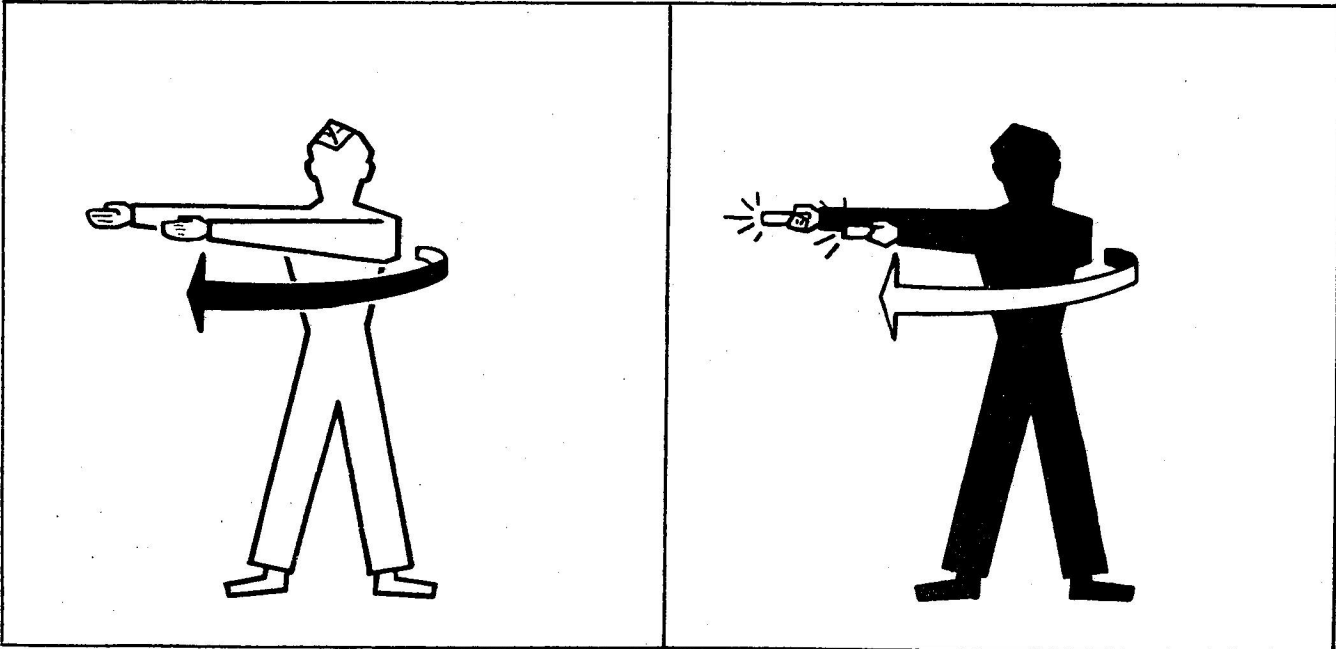


Figure 4 (Issue 1) Move Left

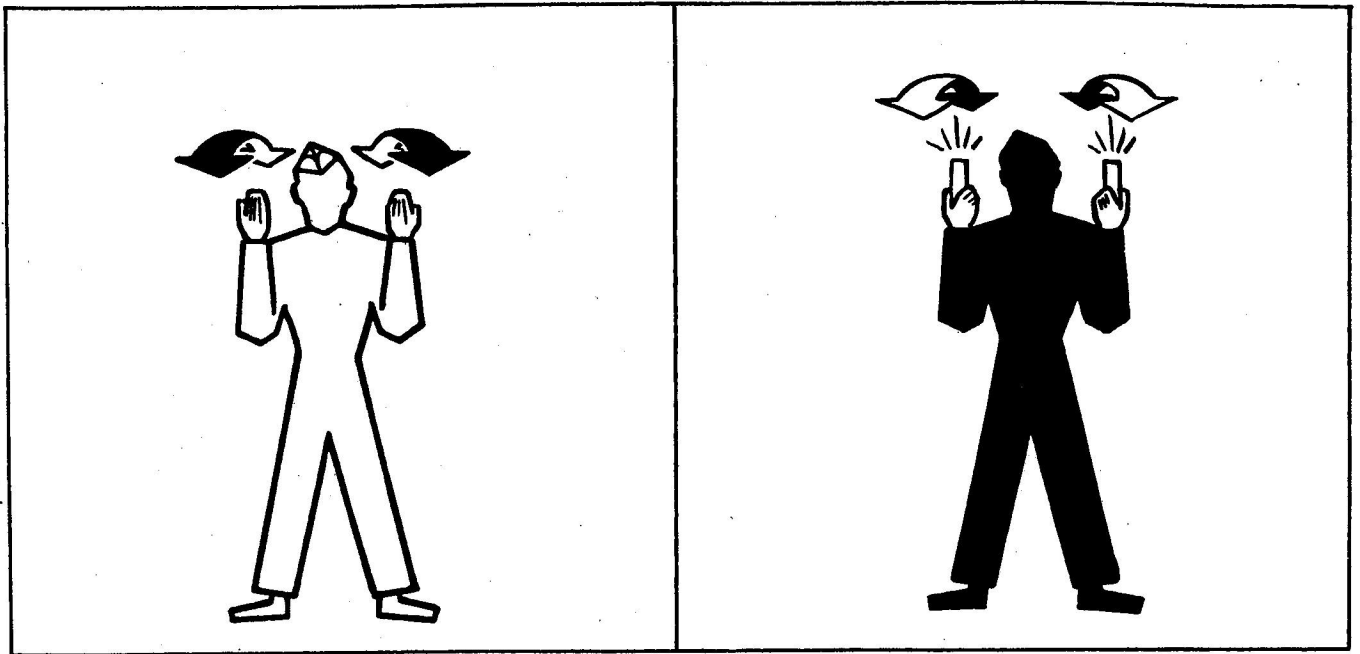


Figure 5 (Issue 1) Move Forward

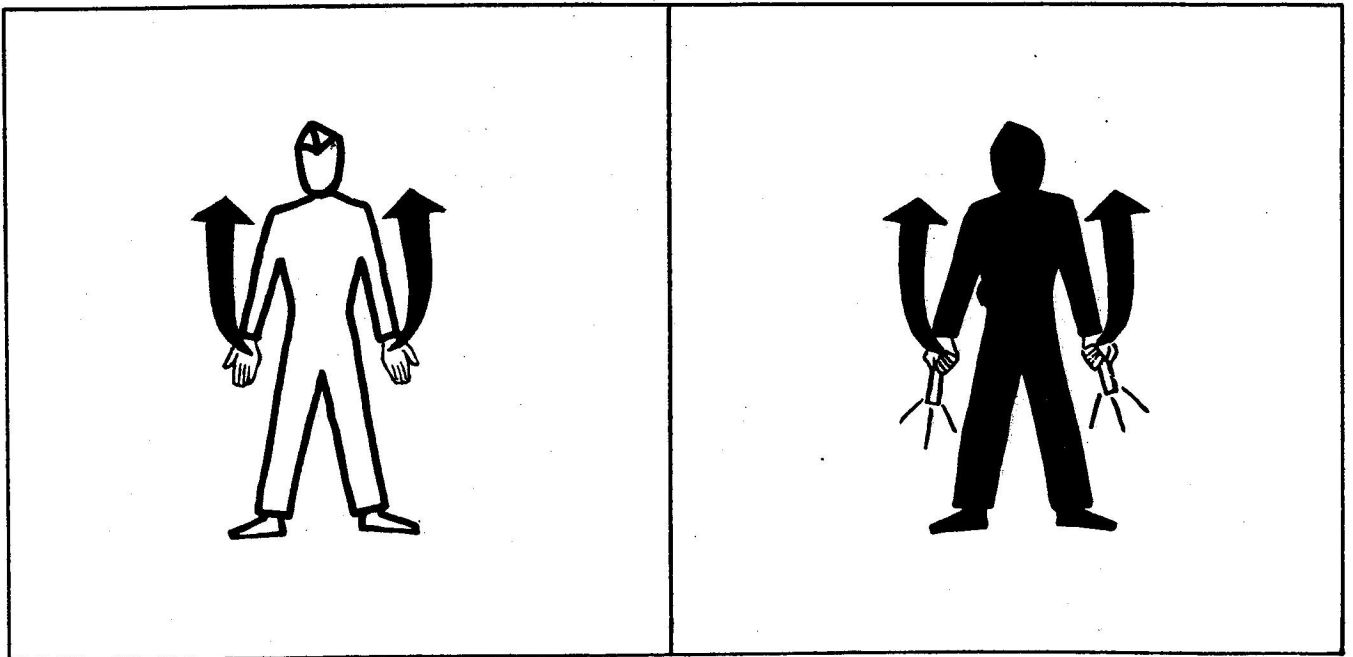


Figure 6 Move Back

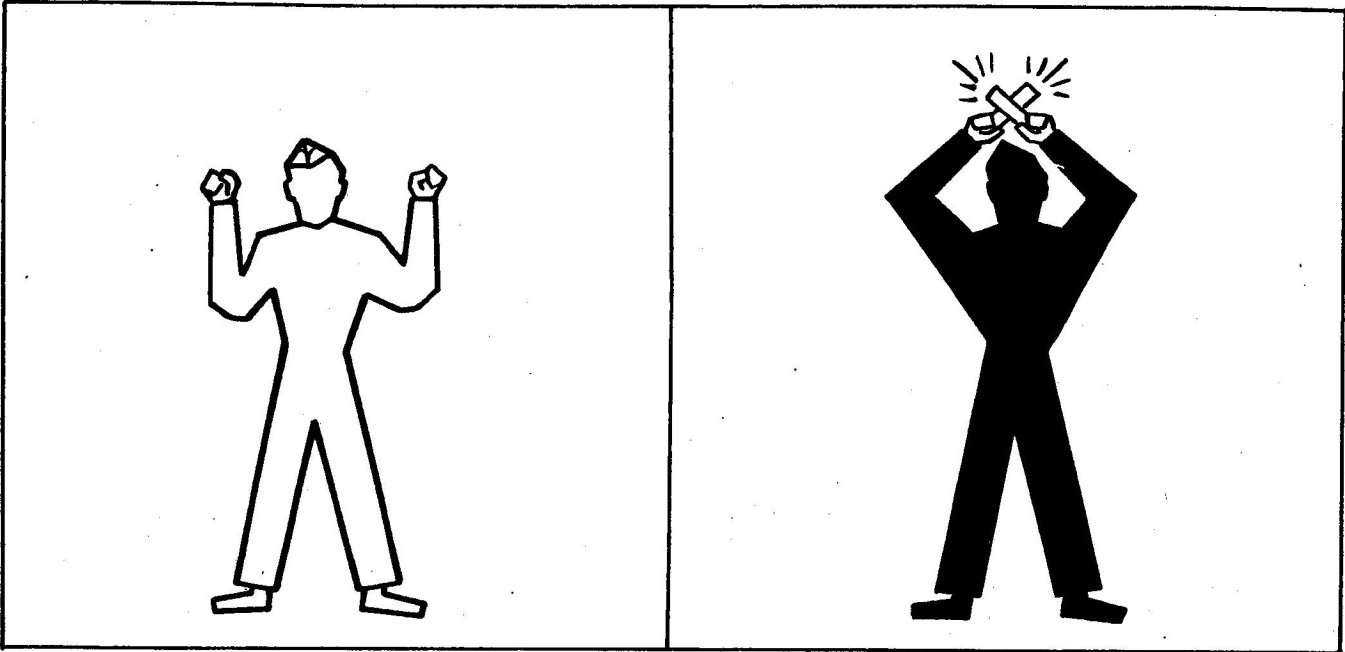


Figure 7 (Issue 1) Emergency Stop

Same as stop signal for fixed wing aircraft except fists clenched.

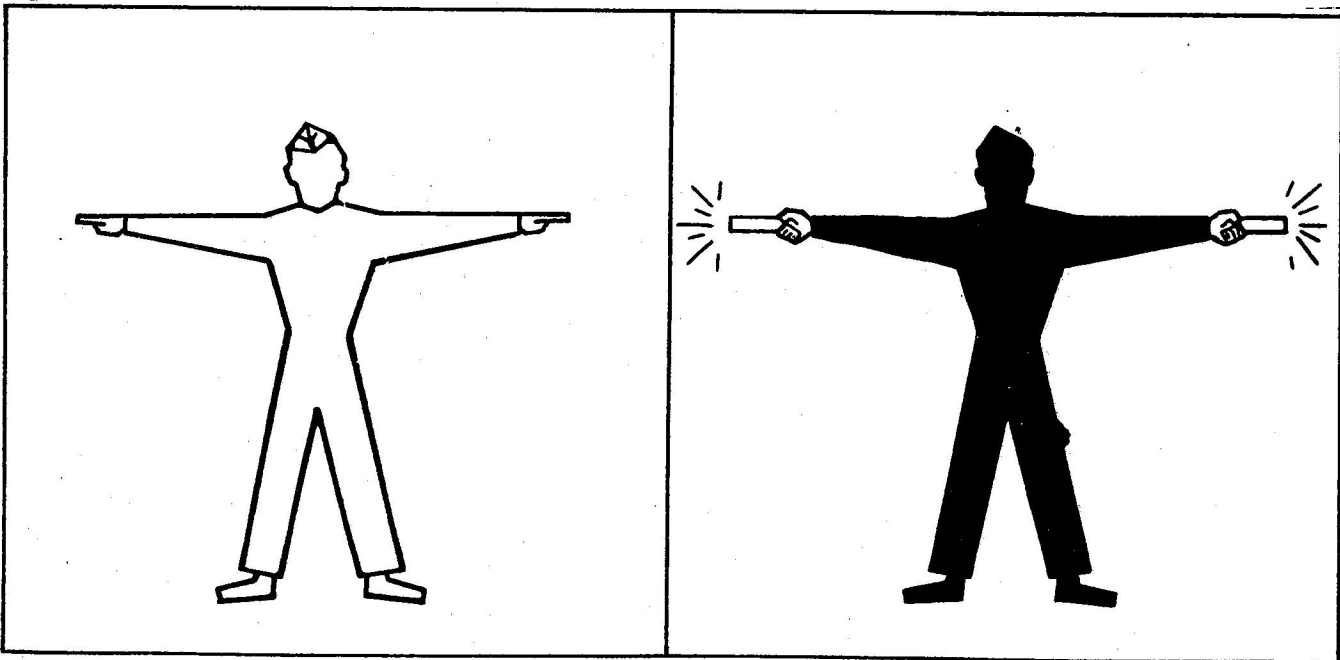


Figure 8 Hover

Arms extended horizontally sideways.

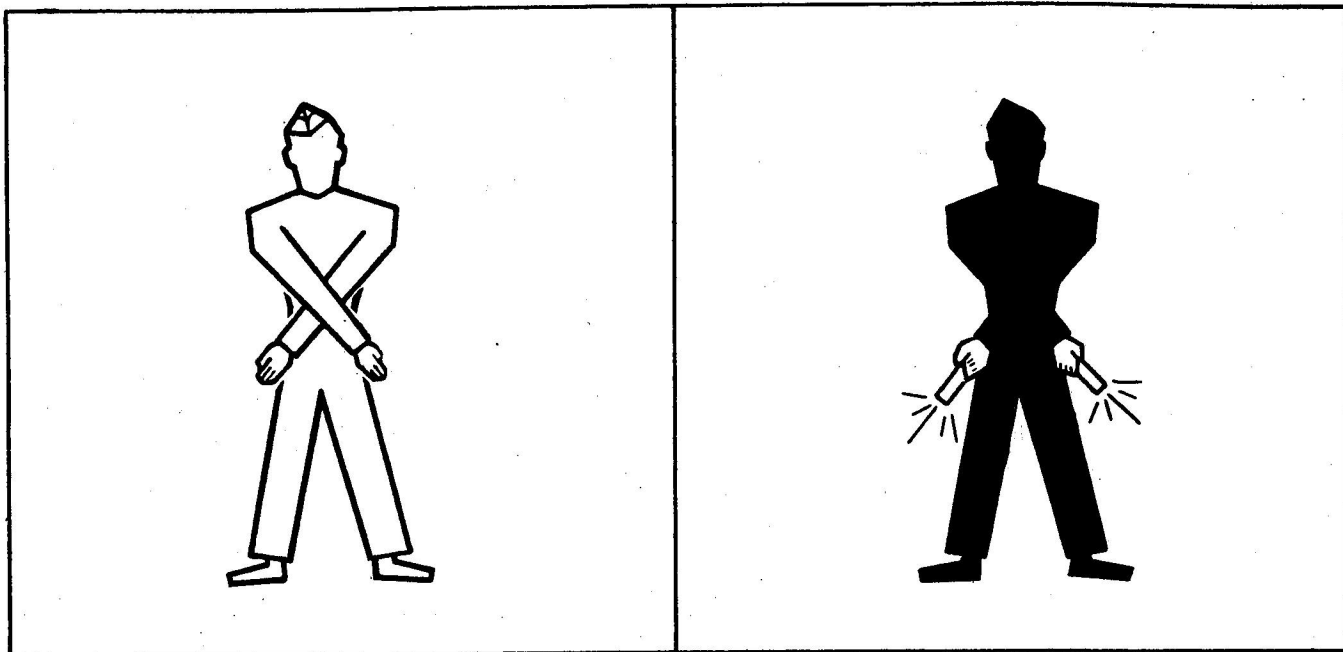


Figure 9 Land

Arms crossed and extended downwards in front of the body.

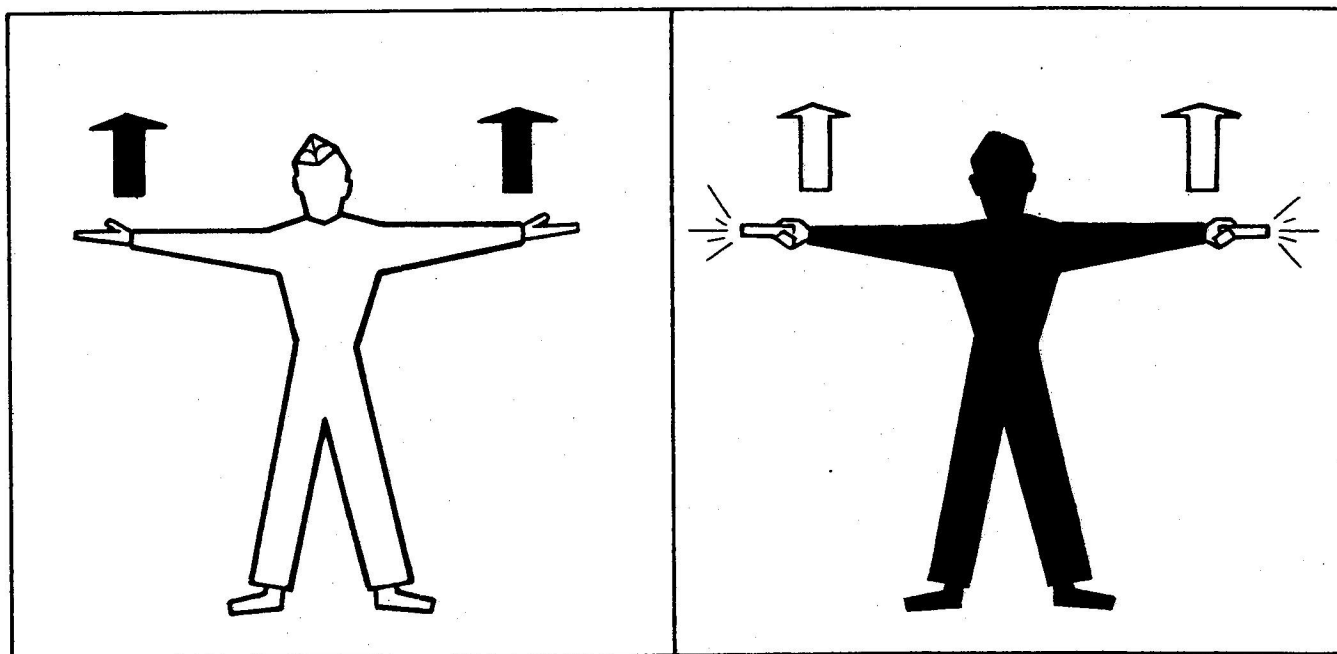


Figure 10 Move Upwards

Arms extended horizontally to the side beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.

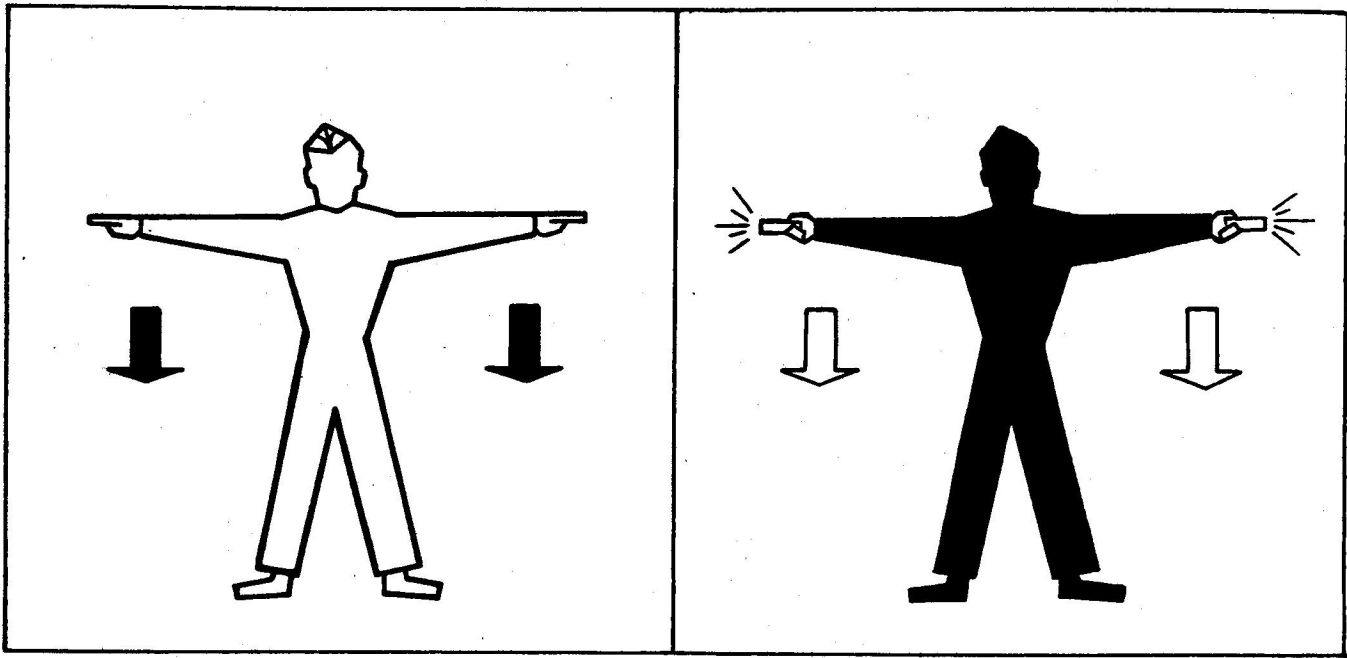


Figure 11 Move Downwards

Arms extended horizontally to the side beckoning downwards, with palms turned down. Speed of movement indicates rate of descent.



# SIGNALS FOR HELICOPTER SLINGING OPERATIONS

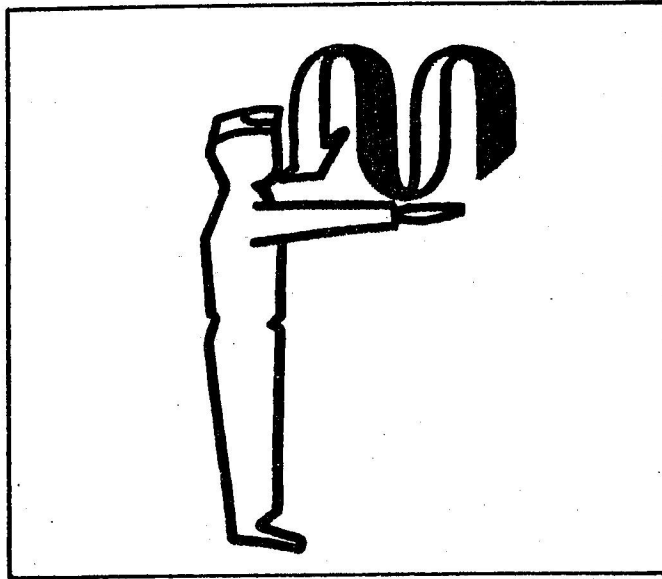


Figure 12 Up

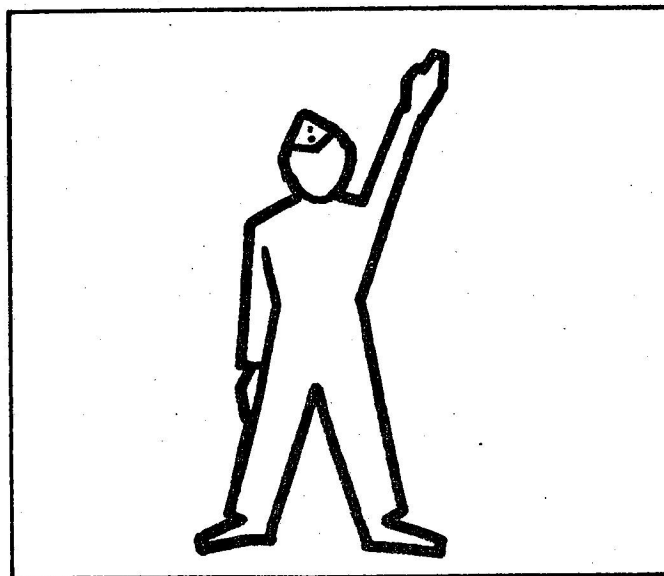


Figure 13 Hooked Up

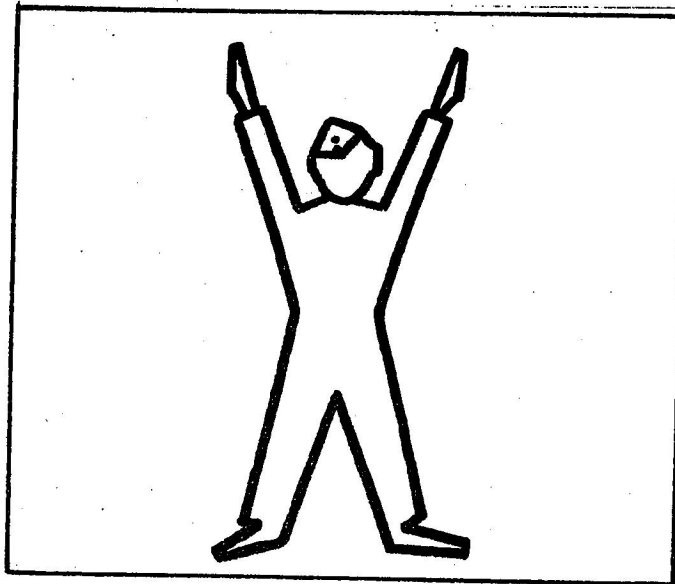


Figure 14 Unload/Hover Here (Palms Facing Inward)

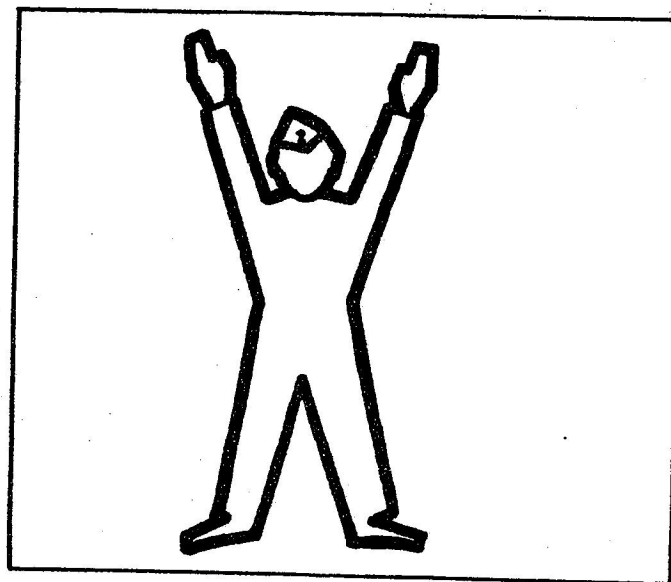


Figure 15 All Clear Up (Palms Facing Forward)

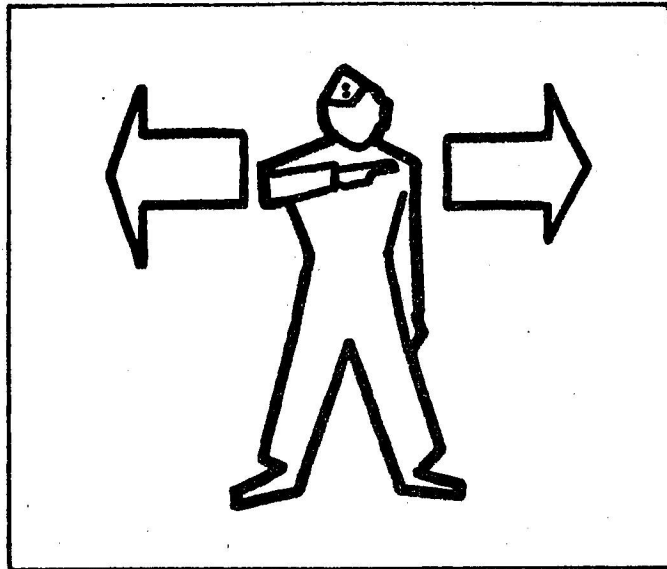


Figure 16 Cut Load

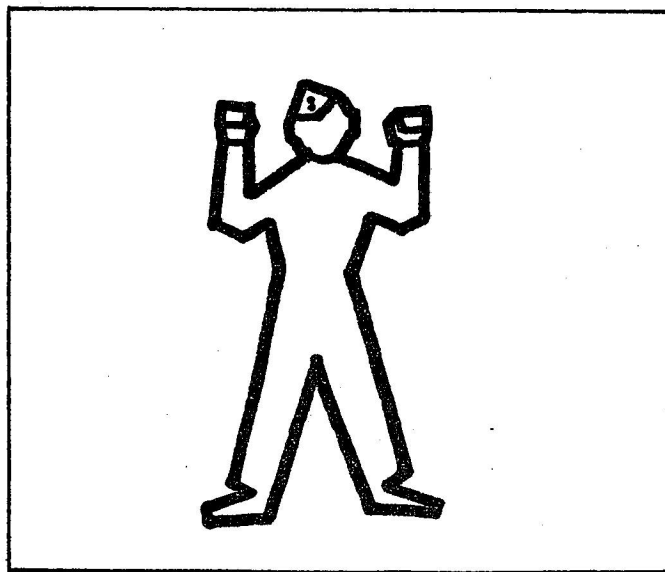


Figure 17 Steady

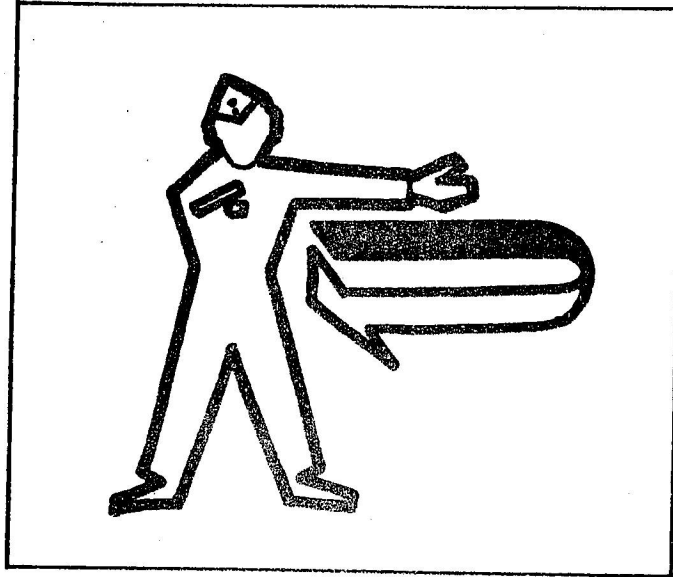


Figure 18 Move Left/Right

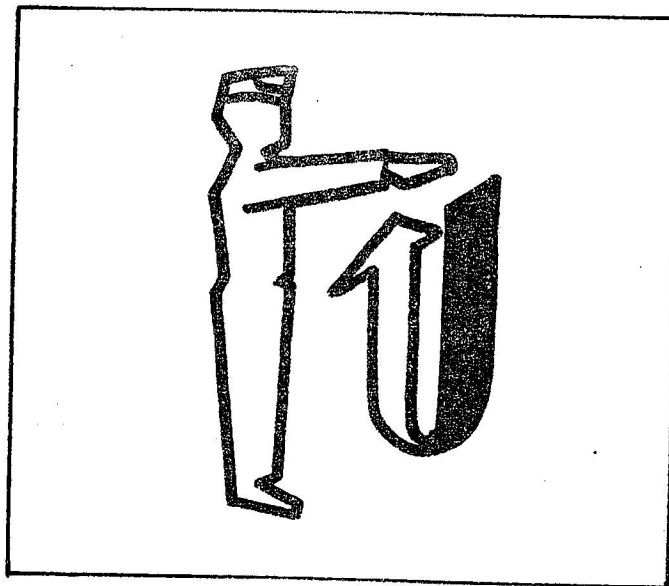


Figure 19 Down

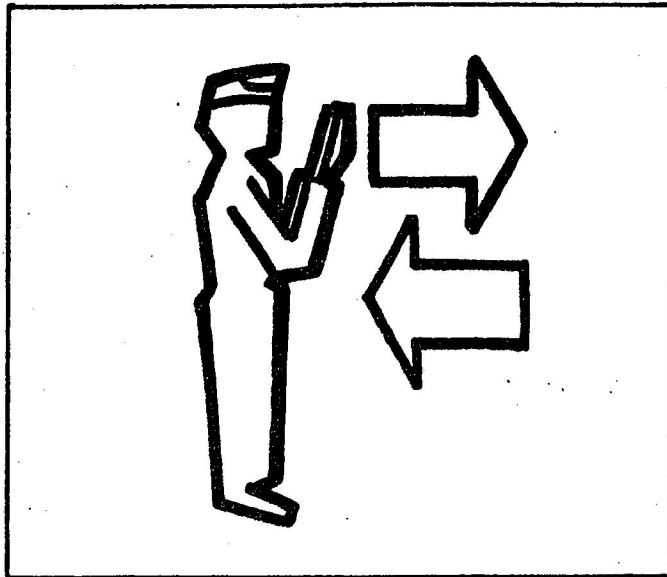


Figure 20 Come Ahead/Move Back

