

## Part V—Emergency Handling

### Chapter 3—Forced Landing, Abandoning and Ditching

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#### 1 Forced landing

The following drill is recommended if a forced landing becomes necessary:

- (a) Reduce weight as much as is practicable.
- (b) Have the nav/radar make the ejection seats safe. The pip-pin for the canopy jettison gun must *not* be removed.
- (c) If, in the opinion of the captain, there will be a danger of the navigators and the AEO being trapped in the aircraft after the landing, they should be ordered to abandon the aircraft. Ensure that the undercarriage is in the UP position.
- (d) Make a normal approach with the undercarriage up or down according to circumstances. The advantages of reducing impact load with the undercarriage down, however, should be carefully considered.
- (e) Jettison the canopy and close the HP cocks just before touch-down.
- (f) After touch-down the crew should escape through the top of the aircraft.

#### 2 Abandoning the aircraft

NOTE: The following paragraph deals more specifically with difficulties in crew movement to the exits, and with techniques of launching. It

should be read in conjunction with Part I, Chap 18, Para 20 which details the use of the safety equipment and in particular covers items which should be attended to while parachuting.

##### (a) General

(i) Flight trials show that, with the aircraft in a clean configuration, and with the bomb doors open or closed, fully equipped rear crew members can reach the entrance door under limiting airframe conditions of +2G accelerometer reading, and can successfully leave the aircraft at speeds up to 350 knots in straight and level flight. There are no indications that higher speeds would prejudice escape.

(ii) Rear crew members can leave the aircraft down to a minimum height of 250 feet at a maximum speed of 250 knots. Whenever possible, speed should be reduced to 200 knots and the aircraft should be in a shallow climb, prior to escape. At low altitudes speed should always be converted to height.

(iii) Ground tests with the undercarriage down and with Mod. 159 (entrance door jack guard plates) deleted, show that by using the technique, described in para. (e) rear crew members will clear the nose-wheel on escape at speeds up to 180 knots.

(iv) To minimise the possibility of injury by air blast or by loss of equipment, it is recommended that, if circumstances permit, speed is reduced as much as possible before attempting to

escape. Any stores beneath the bomb bay should be jettisoned and, if possible, the undercarriage should be in the retracted position.

(v) Escape is made easier if no personal survival pack PSP is worn. Unless likely to be required, it should be discarded before abandoning by disconnecting it before leaving the seat. Ensure that the lanyard to the life-jacket is disconnected and withdrawn from under the harness leg strap.

(vi) The bone dome, which should be worn at all times in flight, provides protection during exit and parachute descent on to land. If a landing is to be made into water, all headgear should be discarded prior to entering the water. The straps of the bone dome and type G helmet should be secured under the chin, the toggle-harness adjusted and the lock turned to emergency pressure. The short mic/tel lead should be tucked into the harness or life-jacket in order to prevent injury to the eyes during exit.

(vii) The time taken to unlock the door using the navigator's switch can be reduced if the manual door-opening lever is used as well. However, above 20,000 feet, unless escape in the minimum time is essential, the manual control should not be used in conjunction with the switch. Once the door is open, the door opening lever must be placed in the gated EMERGENCY position.

(viii) The co-pilot, if possible, should watch the rear crew members leave the aircraft and inform the Captain when the AEO has left. In addition, the AEO should touch the co-pilot's shoulder to indicate that he is leaving.

*(b) Action by Captain*

(i) If the time and circumstances permit, reduce speed and ensure that the undercarriage is retracted. External stores beneath the bomb bay should be jettisoned.

NOTE: Ejections may be initiated in straight and level flight, at any height from ground level upwards. However, runway ejections should only be made when the speed of the aircraft is above 90 knots or the circumstances of the emergency dictate that ejection is the only reasonable solution.

(ii) Operate the abandon aircraft switch rearwards to the EMERGENCY setting. (This action also depressurises the cabin).

Order the static lines to be used, if above 1,000 feet or, manual overrides, if below 1,000 feet and 200 knots. Confirm on intercomm. Crew acknowledges.

NOTE: To assist rear crew members in reaching the door, it is recommended that neither pilot should eject until all rear crew members have made their escape. Air blast experienced in the cabin, with the canopy jettisoned, makes movement difficult.

*(c) Preparatory action by rear crew members*

(i) On receipt of the order to "Abandon aircraft" by means of the illuminated sign and confirmation on intercomm by Captain, acknowledge and proceed as follows:—

- 1 Nav/plotter to select EMERGENCY DOOR OPEN. ▶◀
- 2 Unfasten seat-harness, and drop lap straps close to the sides of the seat.
- 3 Operate emergency oxygen and disconnect the main oxygen supply and throw supply pipe under the table.
- 4 Disconnect mic/tel lead and throw long lead under table. Tuck short lead in harness.
- 5 Rise from seat—taking care to clear PSP, if worn, from seat-pan.

(ii) Crew members should then vacate their seats in the following manner and order:—

*No. 1 Nav/radar (starboard man)*

Move between his seat and the centre seat, taking up a position forward of the escape hatch. Movement from the prone station under conditions of G may be difficult, but is possible by rolling onto the side and shuffling towards the door. Movement is easier if the PSP is discarded first.

*No. 2 Nav/plotter (centre man)*

Operate the cabin pressure release handle in the roof and move between his seat and the starboard seat, following No. 1 above.

Sit on the wooden platform on the starboard side of the well, feet in the well, forward of No. 1.

*No. 3 AEO (port man)*

Move between his seat and the centre seat. Sit on the wooden platform on the port side of the well, keeping his feet on the platform until No. 2 above is ready to leave.

(iii) It is advisable to remain facing aft when moving between the seats so as to minimise interference between the seats and personal survival packs. Care must be taken under conditions of G to avoid the total weight being taken on one leg, since the escapee may collapse and obstruct the exit for other crew members, in addition to jeopardising his own chances of escape. For this reason care is also required when stepping down to the level of the door. There are sufficient holds on the cabin sides; the pilot's ladder may also be used, provided that it is rigidly stowed to port.

(iv) Random selection of static lines should be adopted. It is essential for the static line to be passed over the left shoulder and not under the left arm after it has been attached to the snap hook. If time permits, each used static line should be pulled in by the following man and thrown out of the way, along the left-hand side of the centre seat.

(v) As soon as he has attached his static line No. 1 should:—

- 1 Steady himself at the edge of the exit, and place the door opening lever in the gated EMERGENCY position.
- 2 Jettison the entrance door ladder.

(vi) The rear crew members should then leave the aircraft in the order:—

- No. 1 Nav/radar (starboard man)
- No. 2 Nav/plotter (centre man)
- No. 3 AEO (port man)

The AEO should tap the co-pilot on the shoulder before leaving the aircraft to signify that all rear crew have left.

NOTE: When an additional crew member is carried, it is recommended that on receiving orders to abandon aircraft, he should operate his emergency oxygen, disconnect his main oxygen and attach his static line and leave after the Nav./radar (starboard man).

(d) *Escape for rear crew members—undercarriage raised*

- 1 Sit on the floor at the front end of the door aperture facing aft.
- 2 Grasping the grab handle at the bottom of the centre seat, swing forward onto the door and slide down it. The left hand must pass *underneath* the static line. At speeds above 200 knots it is advisable to adopt and hold a "balled up" attitude to minimise the possibility of injury due to limb flailing. Below 200 knots an extended attitude with the legs straight out and rigid probably gives an easier exit.

NOTE: When the PSP is worn, an upward pull with the arms is necessary to ensure that it is lifted clear of the door edge.

(e) *Escape for rear crew members—undercarriage lowered (Mod. 15) deleted*

If the undercarriage cannot be raised the following technique is recommended:—

- 1 Grasping the grab handle at the bottom of the centre seat, swing the legs on to the door facing aft. The left hand must pass *underneath* the static line. Slide down the door with the legs apart until the feet can be braced against the door operating jacks.

NOTE: When the PSP is worn, an upward pull with the arms is necessary to ensure that it is lifted clear of the door edge.

- 2 Releasing the grip on the grab handle, lean forward with bent knees and grasp the left-hand, i.e., starboard jack with both hands, as low as possible, thumbs uppermost, right hand above left.

3 Withdrawing both feet inwards from the jacks, keeping the knees bent and the body close to the starboard jack, swing down and round the starboard jack and over the starboard side at the bottom of the door. Release the hold on the jack as the body swings completely clear. Try to maintain a compact position with the arms close to the body after letting go.

NOTE 1: Keeping close to the starboard jack decreases the risk of the PSP fouling the port jack.

NOTE 2: The above drill recommends making an exit to starboard, as it was found in practice during trials to be more natural. Some crew, possibly left-handed crew, may find it more natural to make an exit to port, making a right-hand exit and swinging around the port jack. The drill will work equally well in either direction and some flight conditions may necessitate making a right-hand exit.

#### (f) *Escape for rear crew members at low altitudes*

Should it be necessary to abandon the aircraft at very low altitude (below 1,000 feet), reduction of the time interval between the moment at which the order to abandon aircraft is given and the moment at which the parachute deploys can be of overriding importance and the following points should be borne in mind.

- ◀ (i) The time taken to open the door is kept to a minimum by operating the navigator's switch immediately. *The first crew member to reach the door must place the door opening lever in the gated EMERGENCY position.* ▶
- (ii) Whilst it is most desirable to connect a static line, time should not be wasted if this proves troublesome.
- (iii) The static line arms a barostat, which then withdraws the parachute pack pins after a delay of two seconds. Therefore, whether a static line is connected or not, the parachute release handle should be pulled as soon as possible after clearing the door.

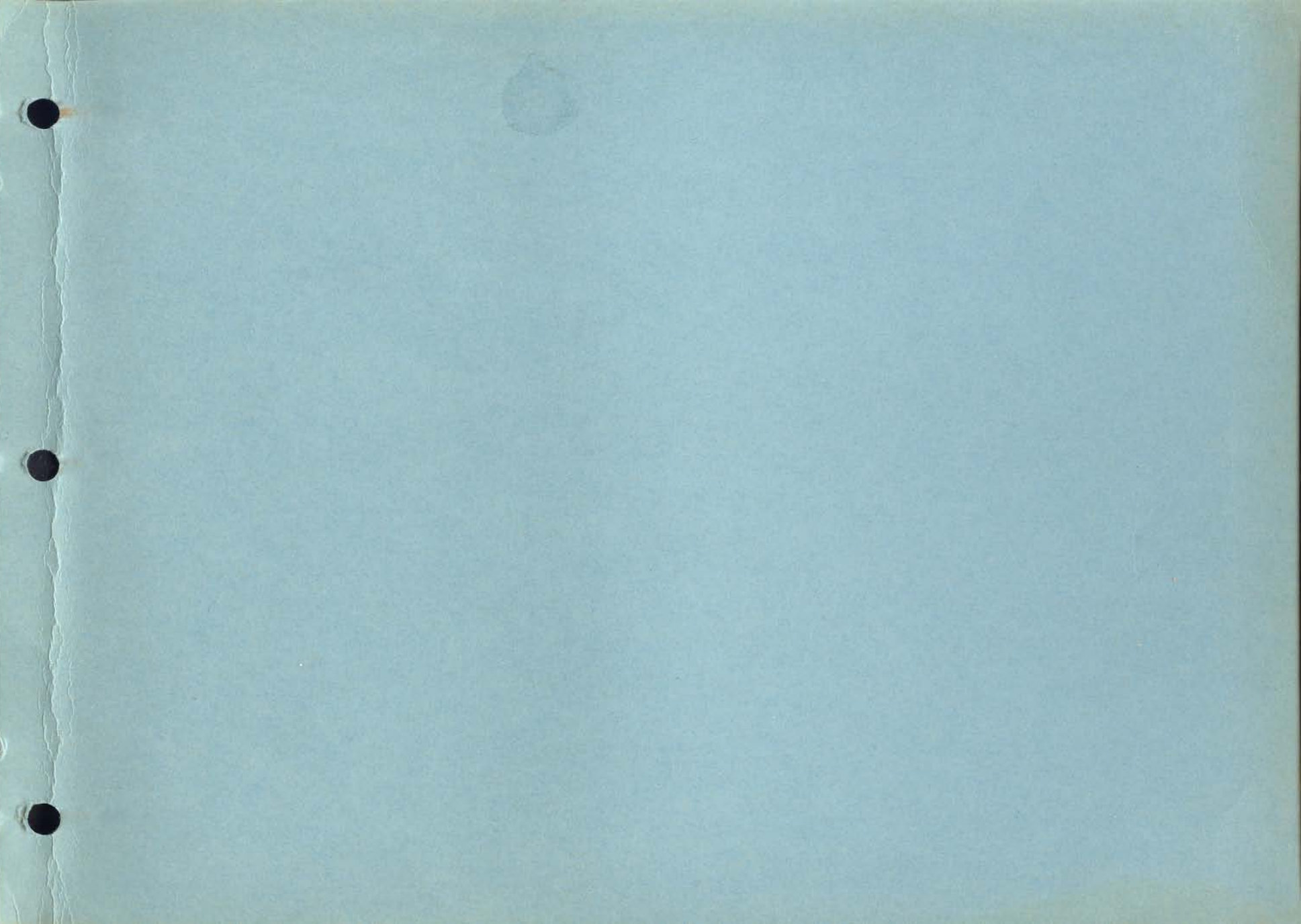
#### (g) *Escape for pilots*

- (i) The pilots should escape using their ejection seats.
- (ii) If the ejection seat automatic system fails after ejection proceed as follows:—
  - 1 When forward speed is sufficiently low discard the face screen and disconnect the main oxygen tube.
  - 2 Pull the over-ride D-ring to isolate the parachute auto-device before operating the seat harness quick release.
  - 3 Disengage the seat restraining straps.
  - 4 Lift the flap over the rip-cord D-ring and grasp the handle.
  - 5 Fall clear of the seat and pull the rip-cord handle.

### 3 Ditching

Model tests indicate that the ditching qualities of the aircraft are good, there being no tendency to nose under after impact. The following drill is recommended:—

- (a) Have the nav/radar make the ejection seats safe. The pip-pin for the canopy jettison gun must *not* be removed.
- (b) Ensure that the bomb-doors and the entrance door are closed.
- (c) Ensure that the crew are strapped in.
- (d) Jettison the canopy just prior to touch-down.
- (e) The touch-down should be made parallel to the swell and at the lowest practicable speed commensurate with the minimum rate of descent. If the swell is not steep and the wind across it is above 25 knots it may be better to alight into wind. Touching-down at high speed and low angle of attack should be avoided because of the likelihood of the aircraft bouncing off the water and the probable collapse of the bomb-aimer's blister with subsequent flooding of the cabin.
- (f) After touch-down, the co-pilot should operate the dinghy release handle and the crew escape through the top of the aircraft



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