Chapter 9

CANBERRA B(I) MK. 6

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. The Canberra B(I) Mk. 6 carries a crew of three, a pilot who occupies an ejection seat in the front cockpit and a navigator and bomb aimer who occupy side-by-side ejection seats in the rear cockpit. The ejection seats and the aircrew equipment assemblies with which they are associated are identical, but since the bomb aimer may be required to vacate his seat during flight and occupy the sighting position in the nose of the aircraft, his A.E.A. includes additional items for use when not occupying the ejection seat.

2. This chapter is primarily concerned with the installation of the A.E.A. in the seat, strapping-in procedure and the drill to be used when leaving the seat after landing. A brief description of the various components of the A.E.A. and their functions is included; full details will be found in other publications, references to which are contained in the appropriate paragraphs.

COMPOSITION OF THE ASSEMBLY

3. The aircrew equipment assembly for the pilot and navigator consists of the following items:–

Ejection seat	Mk. 1CN
Safety harness	Type ZG
Parachute assembly	Seat Type Mk.11 or Mk.14
Personal survival pack	Type M
Emergency oxygen set (in parachute pack)	Mk.4
Flying clothing	To be included later

4. The aircrew equipment assembly for the bomb aimer consists of the following items:–

Ejection seat	Mk.1CN
Safety harness	Type ZG
Parachute assembly (in ejection seat)	Seat Type Mk.11 or Mk.14
Parachute assembly (stowed in aircraft)	Type C, Mk.1 or Mk.4
Emergency oxygen set (in seat type parachute pack)	Mk.4
Emergency oxygen set (in leg pocket of Mk.3 flying suit)	Mk.3B
Flying clothing	To be included later

Ejection seat

5. The Mk.1CN ejection seat, details of which will be found in A.P.4288, Vol. 1, is ejected from the aircraft by a cartridge operated gun at a speed of 80 ft/sec. During ejection the seat slides on a guide rail attached to the aircraft structure.

6. The seat pan is adjustable for height by a handle on the right-hand side of the seat; the plunger in the end of the handle must be depressed before the height can be adjusted.

7. Mounted on the thigh guard on the same side of the seat pan is the harness "go-forward" lever which, when operated, permits the occupant to lean forward in the seat. When assuming the normal upright sitting position, the "go-forward" mechanism is locked by its ratchet and prevents the occupant moving forward again until the lever is operated.

Firing handle

8. The firing handle projects from the front of the drogue container and has an integral face screen. Pulling this handle right down over the face fires the ejection gun and operates the seat immediately.

Leg restraint system

9. Leg restraint cords are provided to ensure that the legs are drawn back and held close to the seat pan during and after ejection. The cords pass through snubbing units in front of the seat pan and are then attached to the aircraft floor by shear rivets. The snubbing units allow the cords to pass freely down through the units, but prevent the cords passing upwards except when released by pressing the spring button underneath each unit.

10. The leg restraint cords are threaded through rings attached to garters worn by the occupant just below the knees and are then looped over the shoulder strap lugs of the safety harness at the quick-release fitting. The garters are provided with small quick-release couplings and the rings (which are usually threaded on the leg restraint cords beforehand) have lugs which lock into the quick-release couplings and attach the rings to the garters. The rings are released by squeezing the triggers on each side of the coupling simultaneously.

Automatic safety harness release

11. An automatic harness release is mounted on the left-hand side of the seat, connected by a guarded cable and conduit to the safety harness quick-release fitting. The release contains a spring-controlled time-delay mechanism which is set in operation by the withdrawal, on ejection, of a pin connected by static line to the seat guide rail. After an appropriate delay the spring mechanism is tripped, opening the harness quick-release fitting and freeing the occupant from the seat. The automatic harness release does not interfere with manaul operation of the quick-release fitting.

Sequence of events during ejection

12. The following is the normal sequence of events after the firing handle has been pulled. There is no delay between pulling the handle and firing the ejection gun. As the seat ascends the guide rail, the following sequence occurs:–

(1) The leg restraint cords tighten until the rivets shear in the floor anchorages.

(2) The static line on the automatic harness release withdraws the pin which sets the time-delay mechanism in motion. The time delay is two seconds.

(3) The main oxygen supply hose is disconnected from the aircraft connection.

The supply hose to the air-ventilated suit (if used) is disconnected. The Mic/Tel lead is disconnected at the push-pull connection.

(4) The static line to the emergency oxygen cylinder is withdrawn turning on the emergency oxygen supply.

(5) As the ejection seat leaves the aircraft another static line operates the drogue gun. This deploys the drogue which first checks the forward speed of the seat and then stabilizes it in a slightly forward attitude.

(6) Two seconds after withdrawal of the automatic harness release pin (subpara. (2)), the safety harness quick-release fitting opens automatically and the occupant leaves the seat. The main and emergency oxygen supplies are disconnected at the oxygen mask tube; the helmet Mic/Tel lead is disconnected from the seat lead.

(7). Separation from the seat causes the static line attached to the seat to withdraw the pin in the automatic parachute release and actuate the barometric time-release unit.

(8) If ejection has taken place below 13,000 ft. the parachute rip cord will be withdrawn after a delay of 3½ to 4½ sec. and the parachute will deploy. If above 13,000 ft. the rip cord withdrawal mechanism is held by the barostat until the descent reaches this altitude when, after a further delay of 3½ to 4½ sec., the parachute will open. The parachute rip cord can be withdrawn manually (overriding the barostat) at any time after separation from the seat, by pulling the lower striped emergency operating knob on the parachute harness waist belt.

Emergency oxygen

13. The cylinder of the Mk.4 emergency oxygen set is installed in the seat type parachute pack, but the operating cable conduit is clamped by an anchor socket to the rear of the seat. The cable (which runs through the conduit) is connected to another static line by an anchor hook so that the emergency oxygen is turned on automatically on ejection. A ball handle is incorporated in the static line assembly to turn on the emergency oxygen supply manually as required.

14. The emergency oxygen set Mk.3B (used by the bomb aimer when occupying the prone sighting position in the nose of the aircraft) is stowed in the leg pocket of the Mk.3 flying suit. The operating cable runs in a conduit attached to the right thigh and terminates in a manual operating knob. The supply tube is led through a tunnel in the suit and is then connected to the oxygen mask tube connector.

Parachute assembly

15. The Seat Type Mk.11 assembly, described in A.P.1182A, Vol. 1, incorporates a combined automatic and manual release attached to the harness waistbelt. The manual release consists of a rip cord terminating in a knob situated at the lower part of the casing, which is pulled to release the canopy and initiate deployment; this knob is only used when the automatic release cannot be employed (manual bale-out) or if the automatic release fails after leaving the aircraft (manual separation).

16. The automatic release mechanism is set in operation by the withdrawal of a pin at the end of a static line cable as the occupant separates from the seat after ejection. This cable is in two sections which are coupled together at a position approximately midway between the release and the point of anchorage on the seat pan. Incorporated in the mechanism is a key which is turned to disconnect the cable coupling and immobilise the mechanism; this key is situated under a cap on the casing above the manual operating knob. When the key is turned the static line is uncoupled and at the same time the barometric time-release unit is locked, so that subsequently the parachute can only be operated manually.

17. An additional parachute pack Type C Mk.1 or C Mk.4 is stowed in a container on the star-

board side of the cabin just above and forward of the access door and is held in place with an elastic strap; this pack is provided for use of the bomb aimer if required when not occupying the ejection seat and the parachute harness is incorporated in the Mk.3 flying suit. The suspension straps of the harness have a pair of snap hooks arranged to lie outside the suit on the chest and to clip on to two square metal fittings on the back of the parachute pack; these fittings are connected to the parachute lift webs inside the pack. When clipped on to the hooks the parachute pack lies in position on the chest with the rip cord D-handle within reach of the right hand.

Personal survival pack

18. The personal survival pack, Type M, described in A.P.1182C, Vol. 1 is placed on top of the seat type parachute pack and in normal flight serves as a cushion; it is attached to the life jacket by quick-release couplings during strapping in. A lanyard, which is connected to another quick-release coupling on the life jacket, is provided to prevent the pack being lost when discarding the parachute harness after a descent. The personal survival pack has a slotted hole in the centre which provides a passage for the leg loop of the parachute harness.

EQUIPPING THE SEAT

Connections to the aircraft

19. When the ejection seat is installed in the aircraft and is properly equipped the following items are connected:–

(1) *Left-hand side of the seat:–*

(a) Mic/Tel lead push-pull connection.

(b) Static line from the drogue gun.

(c) Static line from the automatic safety harness release.

(d) Static line from the automatic parachute release. This is not connected to the aircraft but to the left-hand side of the seat pan.

(2) *Right-hand side of the seat:–*

(a) Main oxygen supply hose. This is clipped to the right-hand lap strap of the safety harness.

(b) Static line and manual control knob to anchor hook of emergency oxygen assembly.

(c) A.V.S. air supply hose. (This may be fitted on either the right or the left-hand side).

(3) *Underneath the seat:–*

(a) Leg restraint cords.

Equipping the seat

20. The following procedure is to be used when equipping the seat; refer to fig. 1 and 2 for detail as necessary:–

(1) Ensure that the seat is safe for servicing in accordance with current instructions.

(2) Undo the safety harness and clear the straps from the seat pan. Ensure that the quick-release fitting is in the locked position.

(3) Place the parachute in the seat pan; spread out the harness straps to leave the seat clear. Connect the parachute static line (on the seat) to the barometric release operating cable at the disconnect unit. Alternatively, if the disconnect unit is already coupled, connect the static line to the seat by means of the eyebolt spliced on the end.

(4) Place the personal survival pack on top of the parachute pack with the connecting lanyard on the right. Pull the leg loop of the parachute harness through the aperture in the centre of the survival pack.

(5) Connect the emergency oxygen cable housing fitting in the gate clamp at the rear of the seat. The cable must lie OUTSIDE the parachute harness and INSIDE the safety harness. Connect the anchor hook to the static line-cum-manual operating cable.

(6) Remove the safety pin from the emergency oxygen cylinder.

(7) Check that the knurled cap on the automatic harness release static line is screwed into the curved tube at the left hand rear of the seat.

(8) Open the parachute harness straps ready for occupation of the seat; ensure that the quick-release fitting is in the locked position.

(9) Restore the seat to the safe for parking condition.

STRAPPING-IN PROCEDURE

21. The procedure is as follows; refer to fig. 3, 4 and 5 for details as necessary:–

(1) Ensure that the seat has been made safe for parking in accordance with current instructions.

(2) Sit in the seat. Fit the leg restraint garters just below each knee, if this has not already been done (the garters may be stitched into the flying suit which is fitted before entering the aircraft).

(3) Connect the personal survival pack lanyard to the quick-release coupling on the right of the life jacket so that the lanyard lies across the right thigh.

(4) Connect the side quick-release couplings of the personal survival pack to the two corresponding fittings on the life jacket.

(5) Connect the parachute harness shoulder straps to the quick-release fitting. The shoulder straps are to lie under the life jacket stole.

(6) Pass the parachute harness leg straps through the leg loop and couple them to the quick-release fitting.

(7) Adjust the quick-release fitting so that it lies centrally with the waistbelt close to the body.

(8) Tighten the shoulder straps first so that the parachute harness quick-release fitting will lie above and clear of the safety harness quick-release fitting when this harness is assembled.

(9) Tighten the parachute harness leg straps. When tightening harness straps pull on the running end with one hand and push the standing end towards the buckle with the other hand to relieve tension on the buckle.

(10) Insert the safety clip behind the disc knob of the parachute harness quick-release fitting.

(11) If the air-ventilated suit is worn, connect the air supply hose.

(12) Fasten the lap straps of the safety harness but do not tighten.

(13) Thread the leg restraint cords through the quick-release coupling rings on the garters as follows:–

(a) The cord emerging from the snubbing unit behind the left leg is fed through the garter ring on the right leg and UNDER the safety harness lap strap. Insert the lug of the right shoulder strap of the safety harness through the loop at the end of the cord and secure the strap in the quick-release fitting.

(b) The cord emerging from the snubbing unit behind the right leg is fed through the garter ring on the left leg and UNDER the safety harness lap strap. Insert the lug of the left shoulder strap of the safety harness through the loop at the end of the cord and secure the strap in the quick-release fitting.

(14) If there is insufficient length of cord, press and hold the plunger under the snubbing unit and pull the cord through;

if there is too much, pull back any excess through the unit in the opposite direction (it is unnecessary to press the plunger in this instance).

(15) Tighten the safety harness lap straps first, then tighten the shoulder straps.

Note . . .

Ensure that the harness quick-release fitting is as low as possible to expose the parachute harness fitting. The emergency oxygen release cable and emergency oxygen supply tube must be under the safety harness and over the parachute harness.

(16) Connect the main and emergency oxygen supply to the oxygen mask tube and the locating chain to the life jacket. Any excess of emergency oxygen tube is to be coiled up and tucked between the seat thigh guard and the side of the personal survival pack (loose loops of cable or hose constitute a hazard on ejection). The bomb aimer's additional emergency oxygen tube from the leg pocket is attached to the clip provided – see fig. 6.

(17) Connect the Mic/Tel lead.

(18) Check that the cap on the static line disconnect and override control is in place. If the cap has been removed, try to refit it; if it cannot be refitted, the parachute assembly will not operate automatically and is to be exchanged for a serviceable item.

(19) Adjust the height of the seat. Ideally, the head is to be located in the centre of the headrest cushion.

(20) Reach upwards and check that the firing handle is within easy reach; DO NOT PULL.

(21) Ensure that the chin straps of both helmets are fastened, fit the oxygen mask and perform pre-flight oxygen checks.

Note . . .

If the chin straps are not fastened the helmets may be wrenched off during ejection. At high altitude this may result in loss of vital oxygen supply.

(22) Remove the safety pin from the firing handle safety lock and place it in its stowage

EMERGENCIES

22. For drill and procedure to be taken in emergencies refer to Pilot's Notes A.P.4326L–P.N.

LEAVING THE SEAT AFTER LANDING

23. Proceed as follows:–

(1) Remove the firing handle safety pin from its stowage and fit through the safety strap (assistance should be obtained, wherever possible, from a member of the ground crew).

(2) Disconnect the main and emergency oxygen supply and the Mic/Tel lead.

(3) Disconnect the air-ventilated suit, if worn.

(4) Release the safety harness; remove the safety clip and release the parachute harness.

(5) Disconnect the personal survival pack from the life jacket and allow the lanyard to drape over the right-hand side of the seat pan.

(6) Remove the leg restraint cords.

(7) Leave the seat.

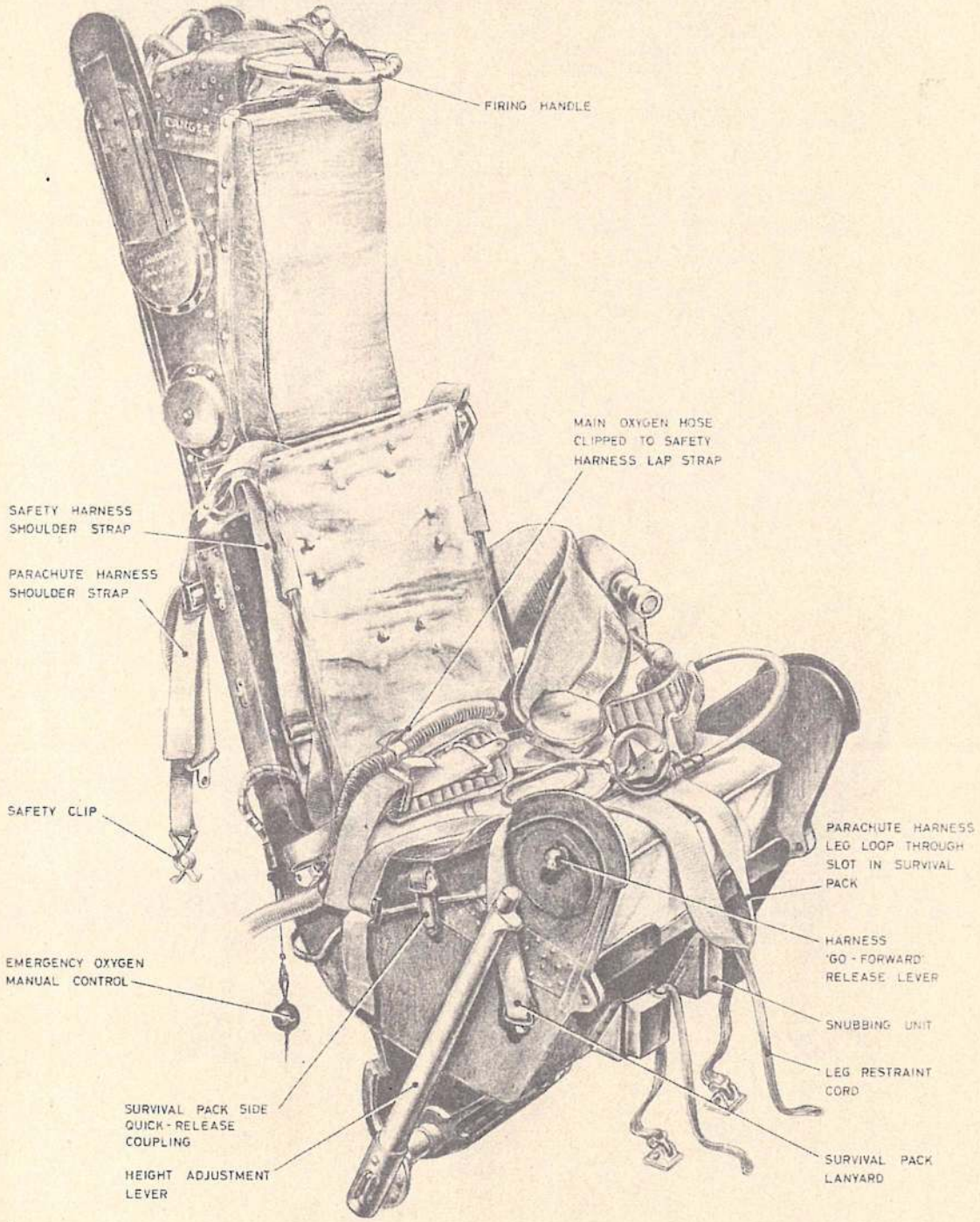

Fig. 1. The seat equipped (1)

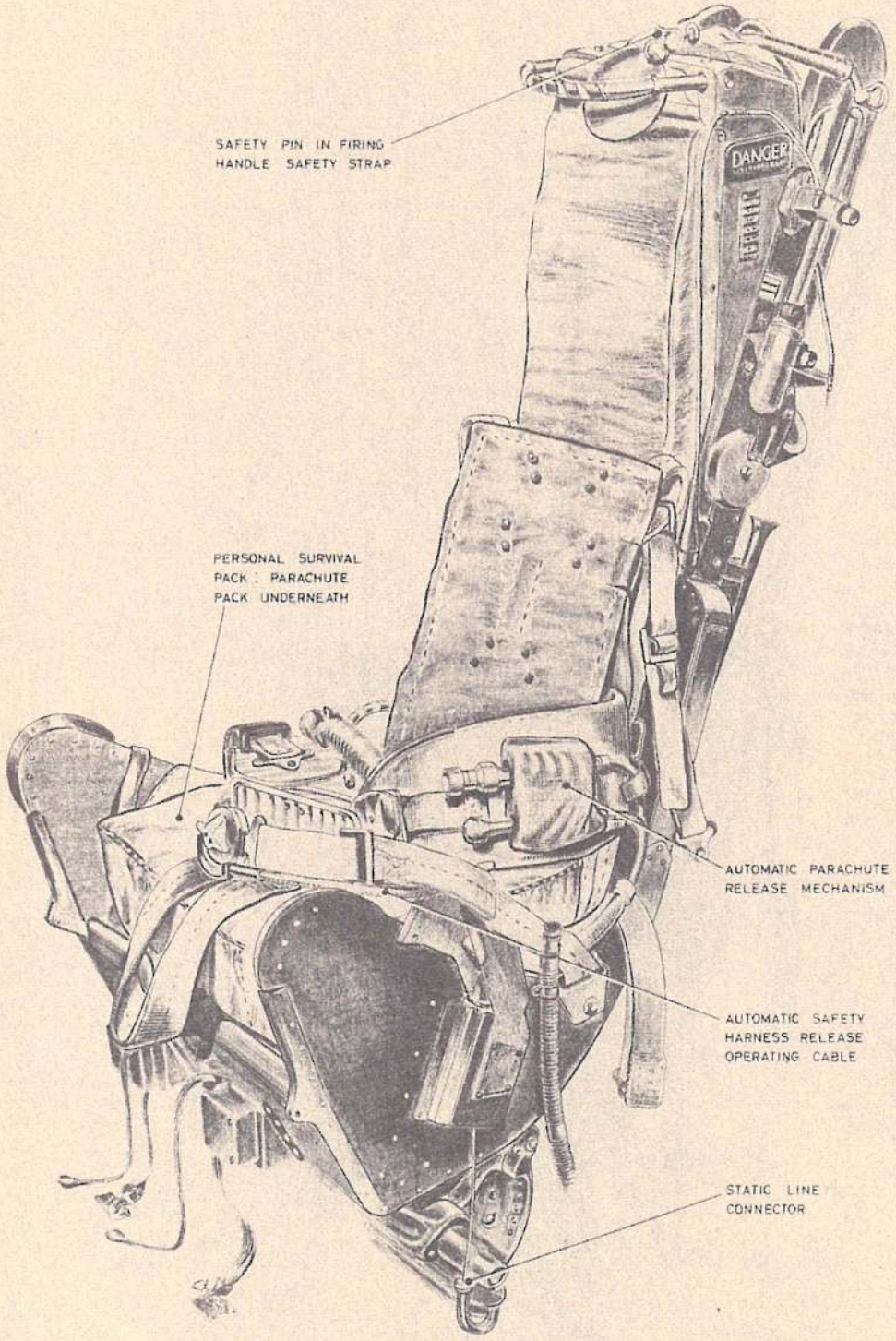

Fig. 2. The seat equipped (2)

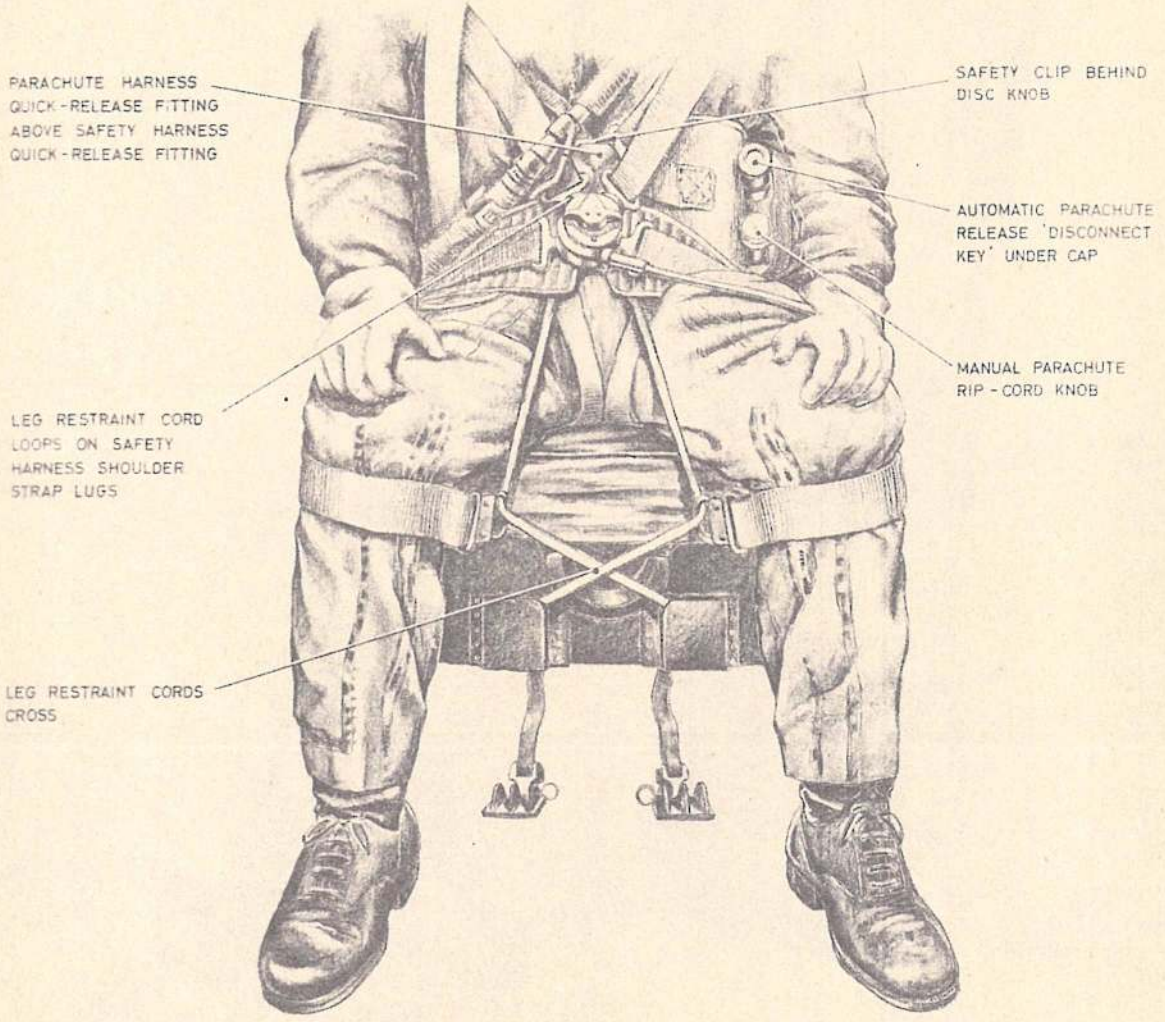

Fig. 3. Arrangement of harness and leg restraint cords

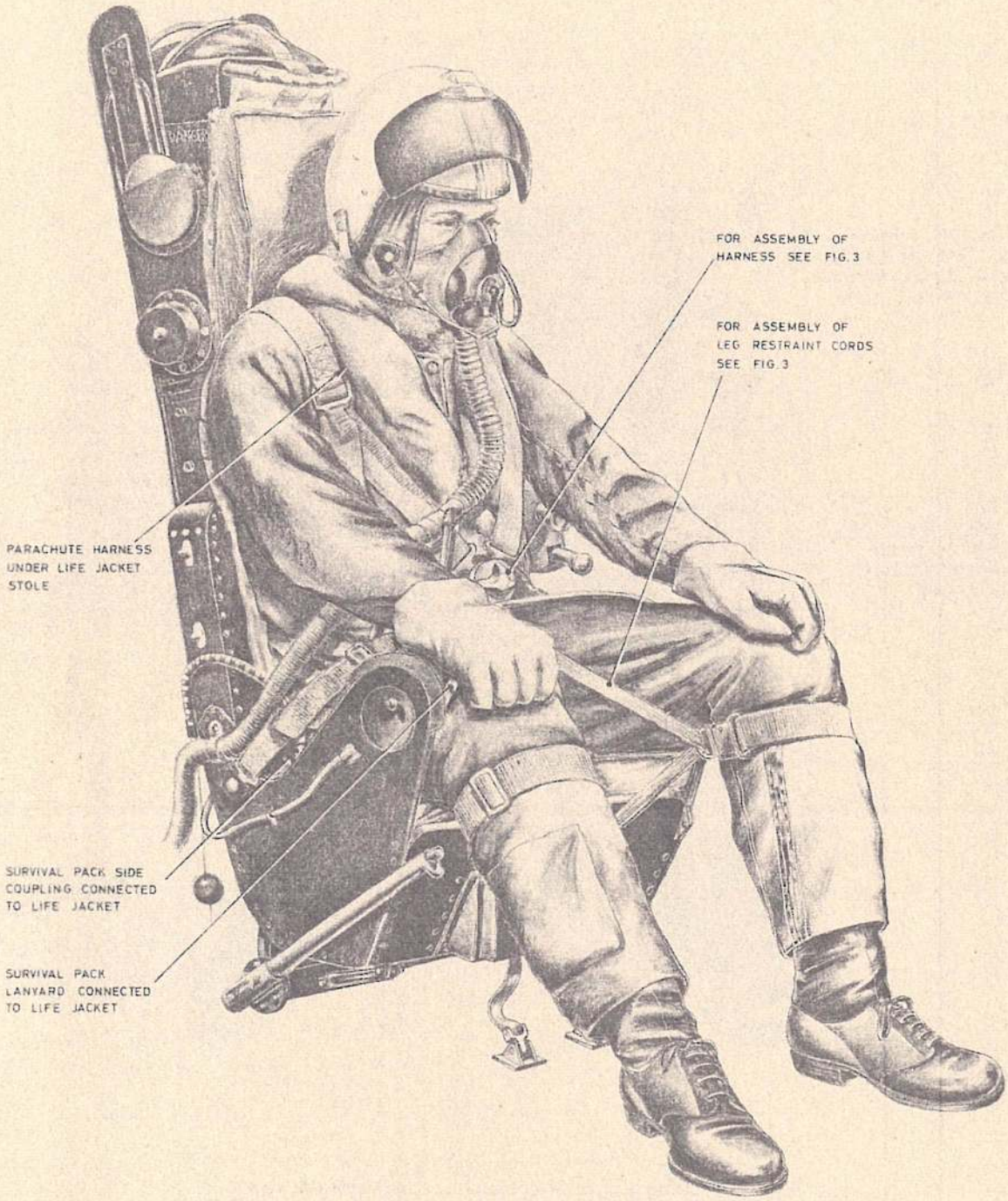

Fig. 4. The seat occupied (1)

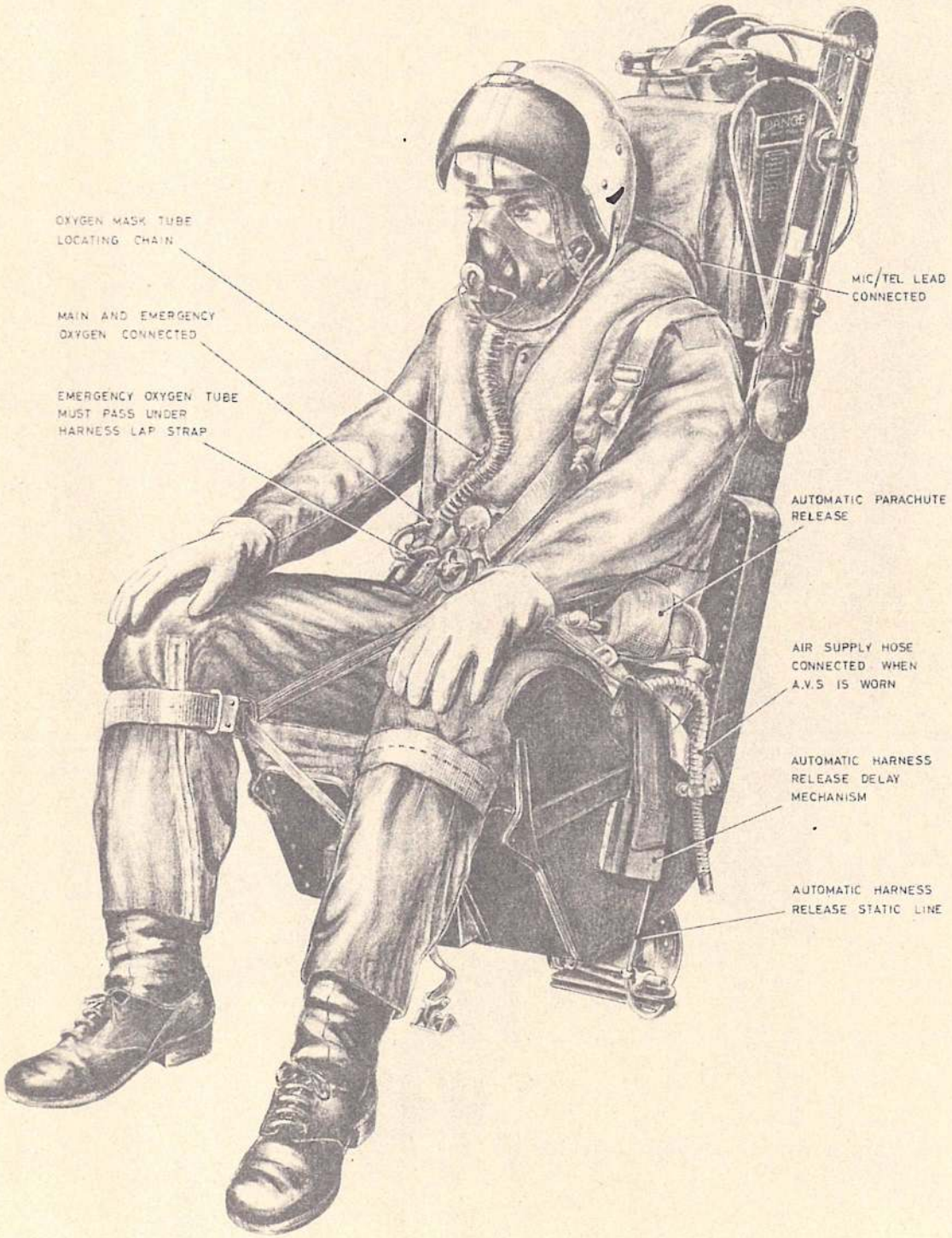

Fig. 5. The seat occupied (2)

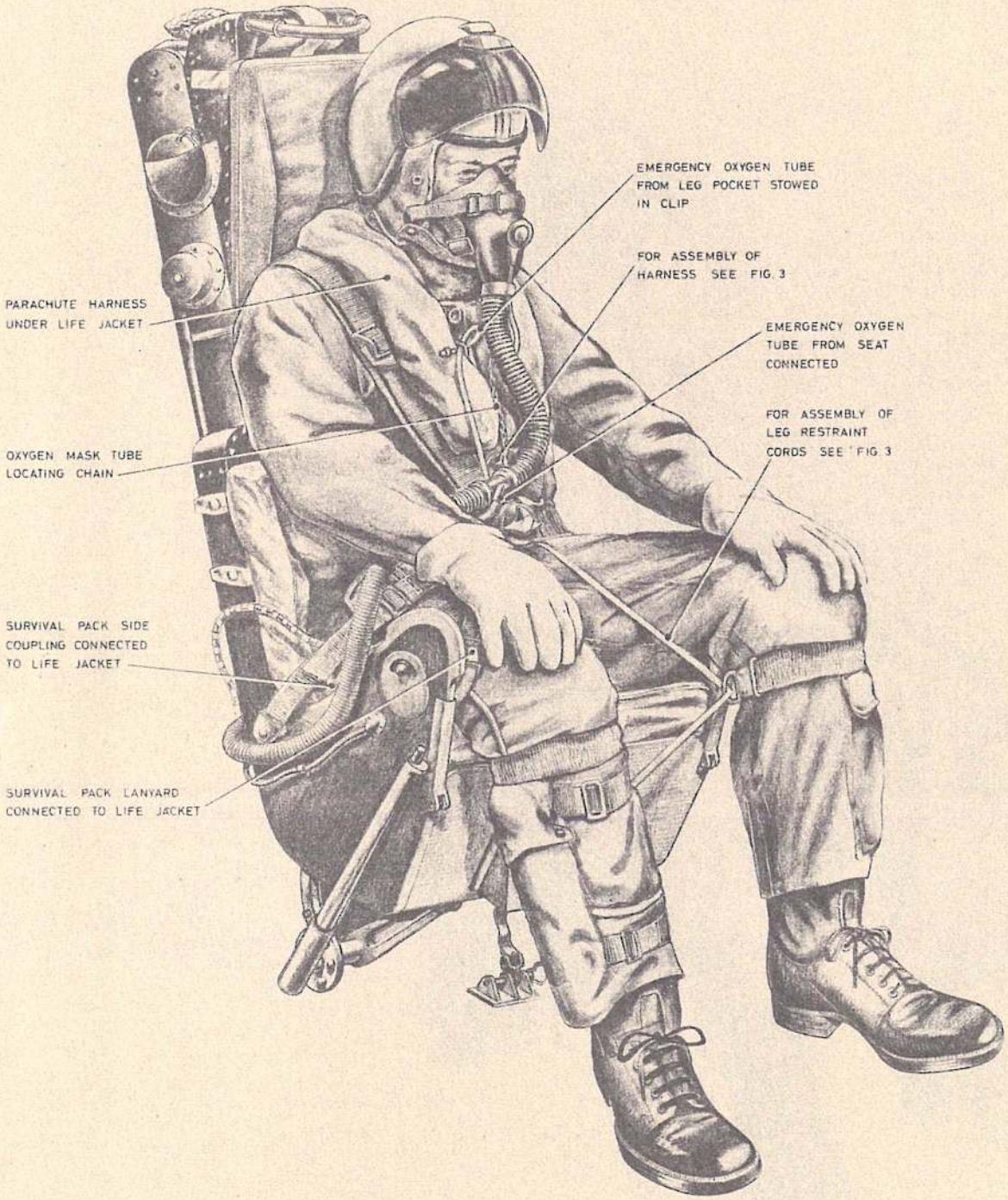

Fig. 6. The seat occupied (Bomb Aimer)

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AIRCREW EQUIPMENT ASSEMBLIES

ADVANCE INFORMATION LEAFLET NO. 1/65

Insert this leaflet in A.P.1182, Vol.1, Book 1, Sect.9, Chap.9, to face fig.6.

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1. The attitude of the seat pan cushion in relation to the seat shown in fig.6 is incorrect; the correct attitude is shown in A.P.4288B, Vol.1, Sect.1, Chap.1, fig.1, and this arrangement is to be adopted at the earliest opportunity.

2. Pending the issue of a suitably amended chapter, the following details will assist in ensuring that the cushion is correctly fitted:-

(1) At the top of the cushion, the fastening straps are located $4\frac{1}{2}$ in. below the top edge; the top is also the thinner end of the cushion.

(2) Having located the top, stencil the word "TOP" in 1 in. high letters centrally just below the top edge of the front panel, using an approved non-corrosive black ink.

Notes

(1) The information contained in this leaflet will be incorporated by normal amendment list action in due course.

(2) If, after receipt of the leaflet, an amendment list with a prior date and conflicting information is received, the information in the leaflet is to take precedence.

(ENGINEER)