Chapter 10

CANBERRA B(I) Mk. 8

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. The Canberra B(I) Mk.8 carries a crew of two; a pilot who occupies an ejection seat in the cockpit and a navigator who may occupy any one of the following positions:–

(1) A seat attached to the bulkhead on the starboard side of the aircraft. This seat is occupied during take-off, landing and in an emergency if possible.

(2) A folding seat at the instrument bench. This is the normal flight station.

(3) The prone position on cushions, in the nose of the aircraft, during sighting operations.

Note . . .

Instructions for changing position in flight will be found in Pilot's Notes A.P.4326H–P.N.

2. This chapter is primarily concerned with the installation of the A.E.A. in the seats, strapping-in procedure and the drill to be used when leaving the aircraft 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 the other publications, references to which are contained in the appropriate paragraphs.

COMPOSITION OF THE ASSEMBLIES

Pilot's A.E.A.

3. The aircrew equipment assembly for the pilot 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

Navigator's A.E.A.

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

Static (non-ejection) seats	Two: one fixed, one folding
Safety harness	Type ZA in fixed seat Type Z (lap straps only) in folding seat
Parachute assembly	Type C Mk.1 or C Mk.4
Parachute harness	Incorporated in flying suit Mk.3
Personal survival pack	Type S. Two (one in each seat)
Emergency oxygen set	Mk.3B in leg pocket of Mk.3 flying suit
Flying clothing	To be included later

Ejection seat

5. The Mk.1CN 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 at 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 leaning forward again until the lever is operated.

Firing handle

8. The firing handle, which projects from the front of the drogue container, 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 around 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 couplings simultaneously.

Automatic safety harness release

11. An automatic harness release is mounted on the left-hand side of the seat and is 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 a 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 release does

not interfere with the normal manual opening and closing 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 anchorage.

(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 A.V.S. (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 pulled, turning on the emergency oxygen supply.

(5) As the ejection seat leaves the aircraft another static line pulls taut and fires 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 (see (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 actuates 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 deploy. 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.

Static seats

13. In flight, the navigator normally occupies the seat at the instrument bench. This is a bucket type folding seat mounted on a structure which is hinged and locked to catch plates in the floor. When not required the seat can be unlocked from the catch plates and, owing to the hinging of the seat structure, can be stowed and locked beneath the bench. A spade-handle grip, protruding from the rear of the structure, controls the locking action of the mechanism; to release from the operative position the handle is pulled upwards. The seat locks automatically in either position when the catches engage.

14. The seat pan swivels about its axis and can be locked in any one of four different positions by the swivel release knob. These positions are facing (a) forward, (b) aft, (c) inboard towards the bench and (d) outboard towards the access door. The seat has a hinged back rest and is equipped with a Type Z safety harness.

15. The fixed static seat is provided for occupation during take-off and landing and in certain emergencies as required. An additional mic-tel lead is provided at this position but the main oxygen and air ventilated suit supplies are not connected until the navigator moves over into the folding seat.

Emergency oxygen

16. The emergency oxygen cylinder for the pilot is installed in the seat type parachute pack, but the operating cable conduit is clamped by the 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 if required.

17. The emergency oxygen set Mk.3B for the navigator 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 emergency oxygen supply tube is led through a tunnel in the suit and is secured in the oxygen mask tube connector.

Parachute assemblies

18. The seat Type Mk.11 (or Mk.14 when available) parachute assembly for the pilot 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).

19. The automatic release mechanism is set in operation by the withdrawal of a pin at the end of the 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 disconnect-key which is turned to break 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.

20. The Type C Mk.1 or C Mk.4 parachute pack for the navigator is stowed in a container on the starboard of the cabin just above and forward of the access door and is held in place with an elastic strap. The parachute harness is incorporated in the Mk.3 flying suit, the suspension straps having a pair of snap hooks arranged to lie outside the suit on the chest and clip on to two square metal fittings on the back of the parachute pack when required; 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.

21. Detailed information about both types of parachute assemblies is contained in A.P.1182A, Vol. 1.

Personal survival packs

22. The pilot's Type M personal survival pack 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.

23. A Type S personal survival pack is provided in both the fixed seat and in the folding seat for the navigator. It is attached to the quick-release couplings on the flying suit during strapping in to either seat. It also has a lanyard which is connected to another quick-release coupling on the flying suit, to prevent the pack being lost when the parachute is discarded after a descent.

24. Information about both types of survival packs will be found in A.P.1182C, Vol. 1.

EQUIPPING THE EJECTION SEAT

Connections to the aircraft

25. 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 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

26. The following procedure is to be used when equipping the seat; refer to figs. 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 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.

EQUIPPING THE STATIC SEATS

27. To equip the fixed seat, place a Type S personal survival pack in the seat pan and arrange the safety harness ready for occupation. The lanyard must be on the left-hand side.

28. To equip the folding seat proceed as follows:–

(1) Grasp the spade-handle grip and pull out and down. The seat will unfold, withdraw from its stowed position under the bench and lock automatically in the new position.

(2) Raise the seat back rest. Place a Type S survival pack in the seat with the lanyard on the left-hand side.

(3) Lower the back rest. Fold and stow

the seat under the bench.

(4) Place a Type C Mk.1 or C Mk.4, parachute pack in the container, flat side of the pack facing inboard and rip cord D-handle on the right-hand side of the container.

(5) Secure the pack by hooking the flexible straps on the cleat in front of the container.

STRAPPING-IN PROCEDURE

Pilot

29. The strapping in procedure for the pilot is as follows: refer to fig. 3, 4 and 5 for detail 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, if this has not already been done (the garters may be stitched into the flying suit, or fitted before entry to 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 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 the tension on the buckles.

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

(11) Connect the air supply hose to the air ventilated suit (if worn).

(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. Pass the cord emerging from the snubbing unit behind the left leg 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 right shoulder strap in the quick-release fitting. Pass the cord emerging from the snubbing unit behind the right leg 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 left shoulder strap in the quick-release fitting.

(14) If there is insufficient cord, press and hold the plunger under the snubbing unit and pull more 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 quick-release 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 and tucked between the seat thigh guard and the side of the personal survival pack (loose loops of cable or hose constitute a hazard of ejection).

(17) Connect the Mic/Tel lead.

(18) Ensure that the cap on the static line disconnect and barostat override control is in place. If the cap has been removed, try to replace 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.

Navigator

30. Before and during take-off the navigator is to occupy the fixed seat but, before doing so, he must be wearing a flying helmet, oxygen mask and protective helmet. The procedure is as follows:–

Before take-off:–

(1) Pull out and lock the folding seat.

(2) Sit in the seat.

(3) Check that the safety pin has been removed from the emergency oxygen cylinder in the leg pocket.

(4) Connect the main and emergency oxygen supply to the mask tube assembly. The main oxygen supply hose is at the right (forward) end of the bench.

(5) Conduct pre-flight oxygen check.

(6) After the oxygen check, disconnect the main oxygen hose only. Swivel the seat to face aft and lock it in this position.

(7) Leave the folding seat and occupy the fixed seat.

(8) Fasten the fixed seat safety harness.

(9) Connect the Mic/Tel lead provided at this station.

After take-off:–

(10) Disconnect the Mic/Tel lead.

(11) Disconnect the fixed seat safety harness.

(12) Leave the fixed seat and occupy the the folding seat.

(13) Connect the survival pack side quick-release couplings to the corresponding fittings on the Mk.3 flying suit.

(14) Connect the survival pack lanyard to

the coupling on the flying suit (left-hand side).

(15) Fasten the folding seat harness.

(16) Turn the seat to face the bench and lock it in position.

(17) Connect the main oxygen supply.

(18) Connect the air ventilated suit supply as required. The coupling for this is on the left (aft) end under the bench.

(19) Connect the Mic/Tel lead (under the bench).

EMERGENCIES

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

LEAVING THE SEAT AFTER LANDING

Pilot

32. 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; pull out 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.

Navigator

33. Before landing the navigator proceeds to occupy the fixed seat (refer to Pilot's Notes) as follows:–

(1) Rotate the folding seat to face aft and lock it in position.

(2) Disconnect the survival pack and lanyard.

(3) Disconnect the main oxygen and air ventilated suit supplies and the Mic/Tel lead.

(4) Undo the safety harness.

(5) Occupy the fixed seat.

(6) Connect the survival pack side quick-release couplings and lanyard.

(7) Fasten the fixed seat safety harness.

(8) Connect the Mic/Tel lead provided at this station.

34. After landing, proceed as follows:–

(1) Undo the fixed seat safety harness.

(2) Disconnect the survival pack and lanyard.

(3) Disconnect the Mic/Tel lead.

(4) Leave the fixed seat.

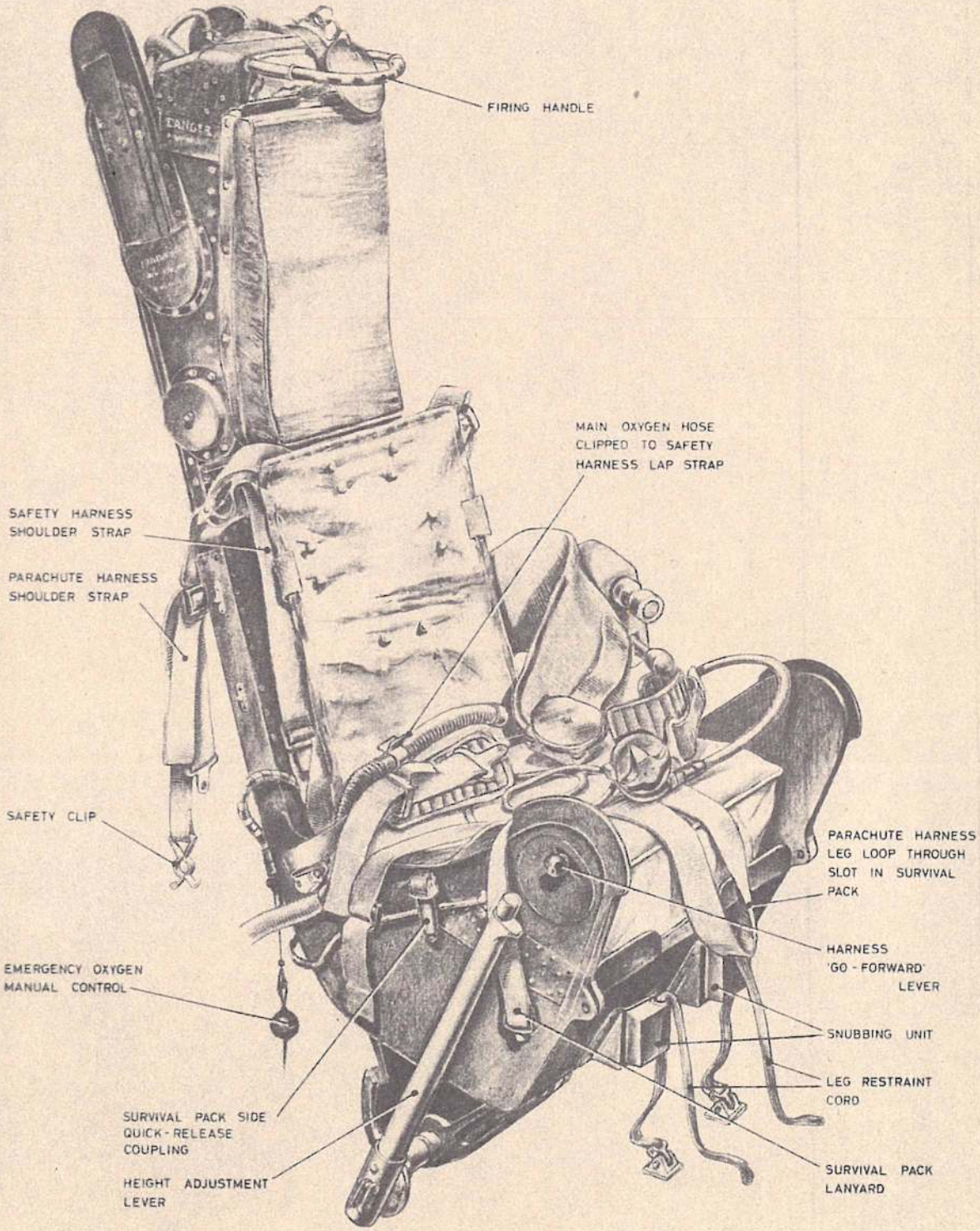

Fig. 1. The Mk.1CN ejection seat equipped (1)

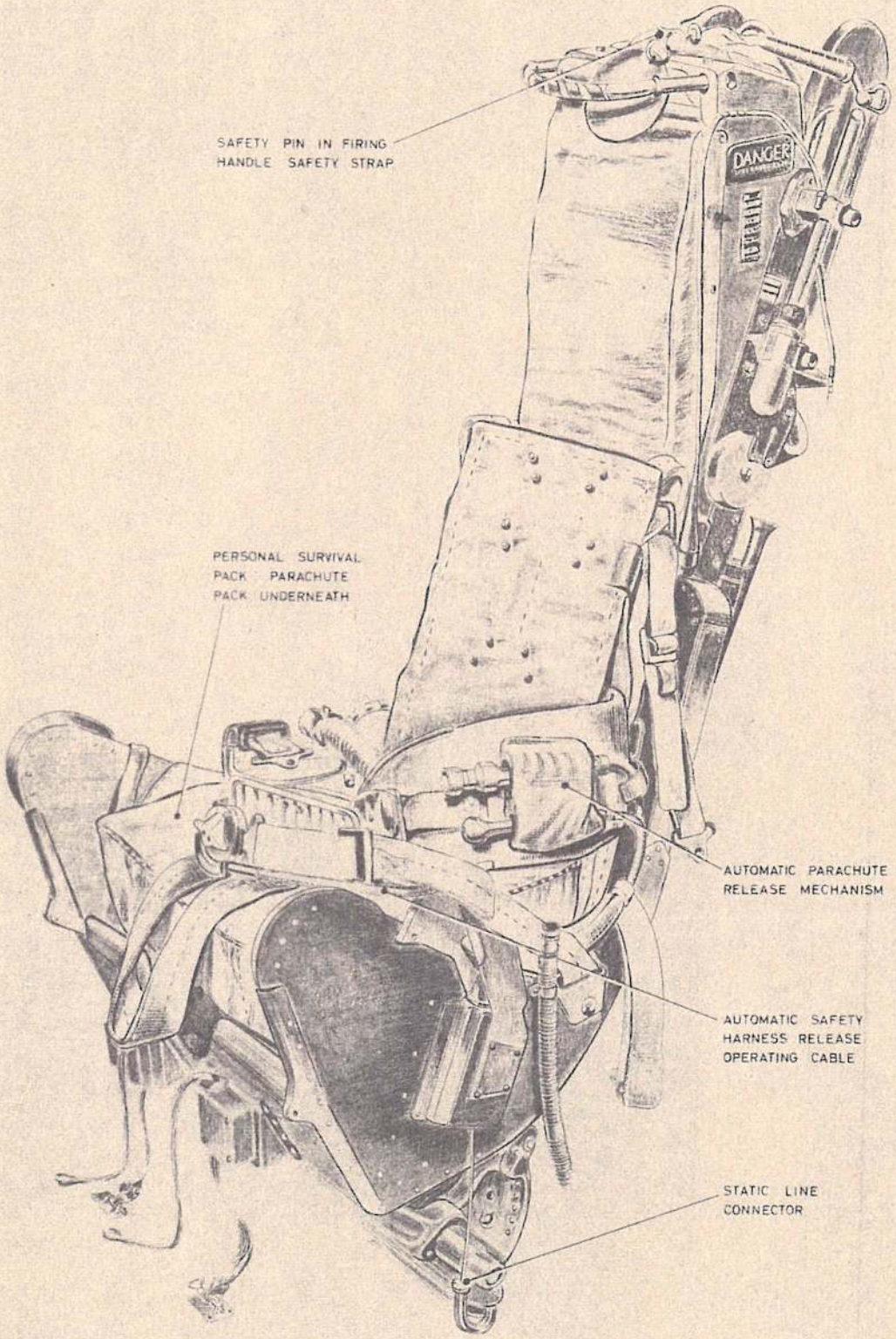

Fig. 2. The Mk.1CN ejection seat equipped (2)

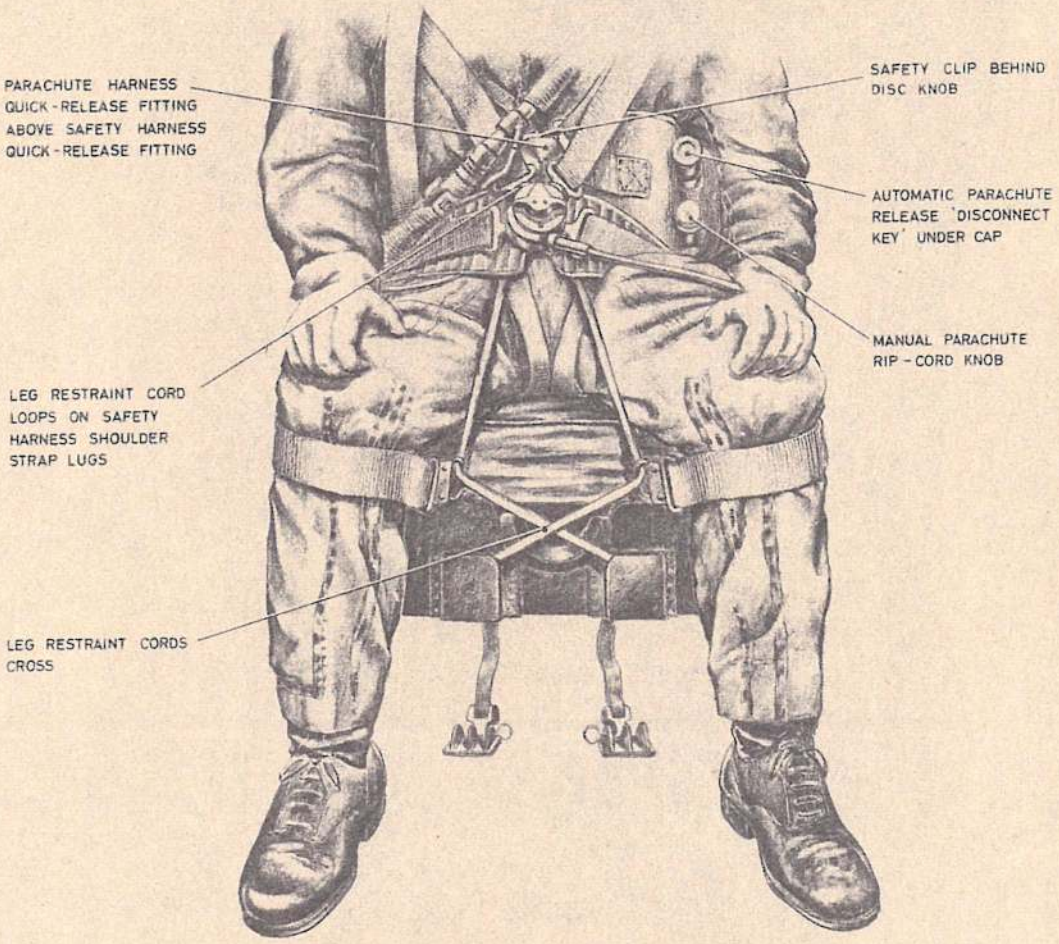

Fig. 3. Assembly of leg restraint cords and harness

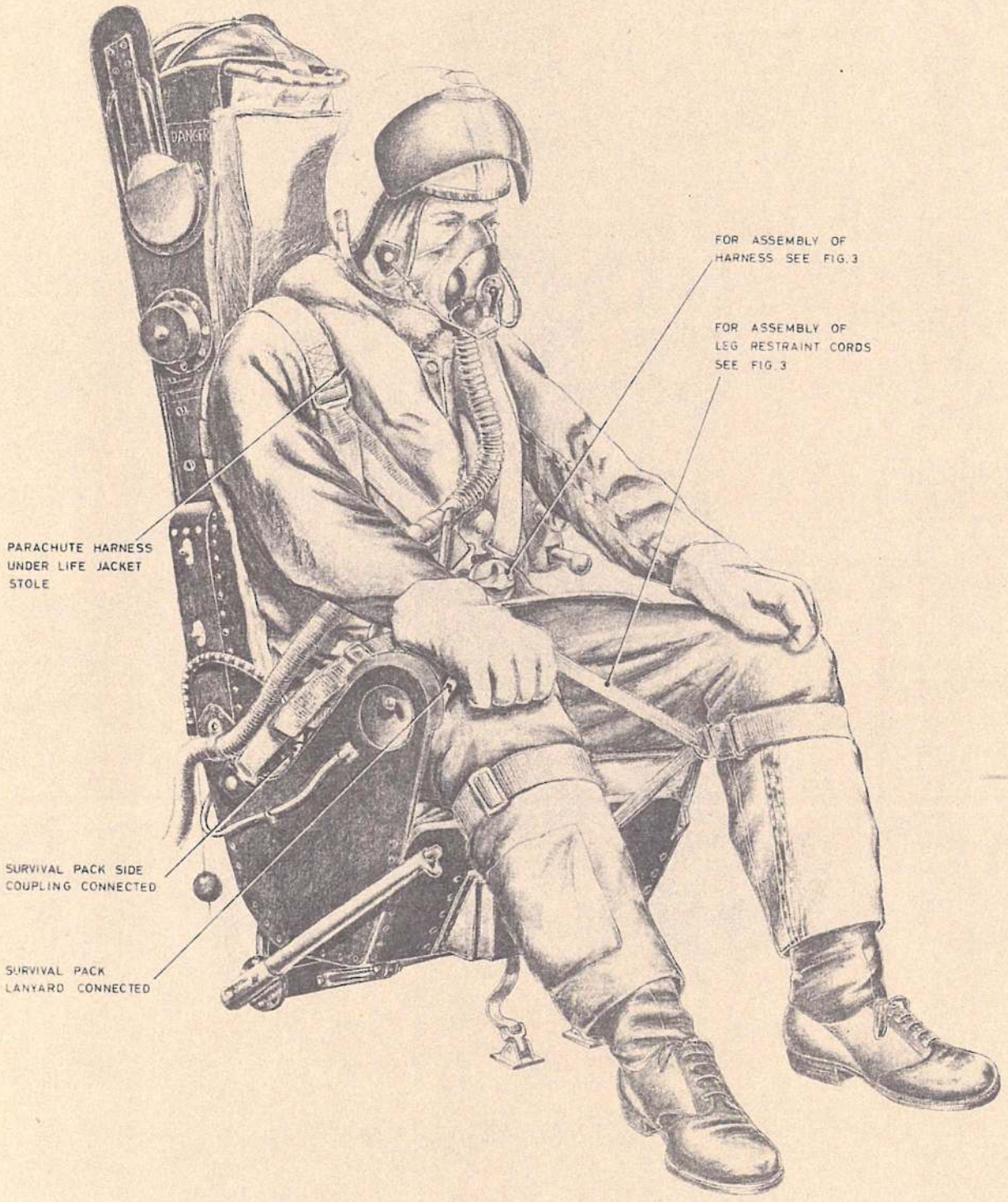

Fig. 4. The Mk.1CN ejection seat occupied (1)

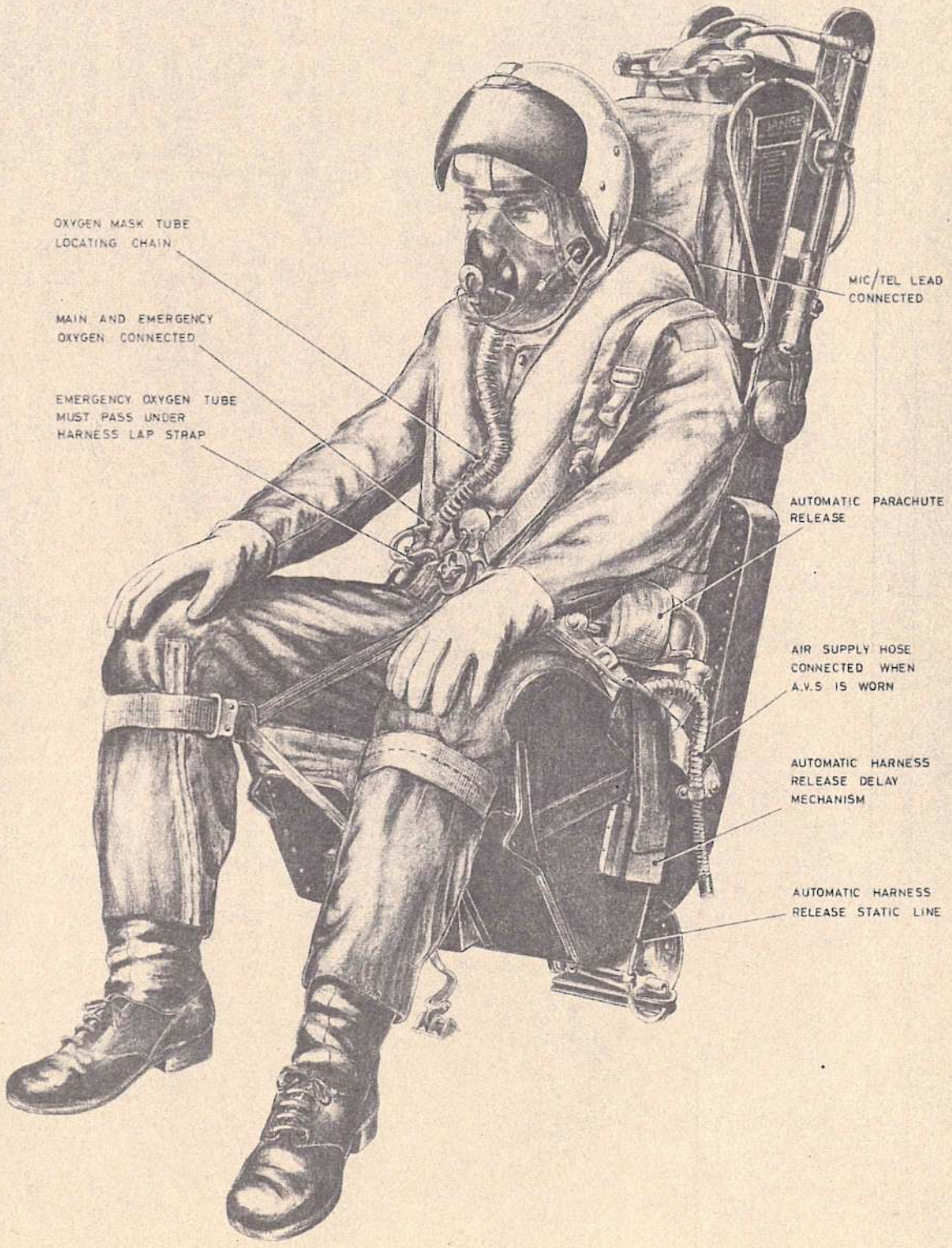

Fig. 5. The Mk.1CN ejection seat occupied (2)

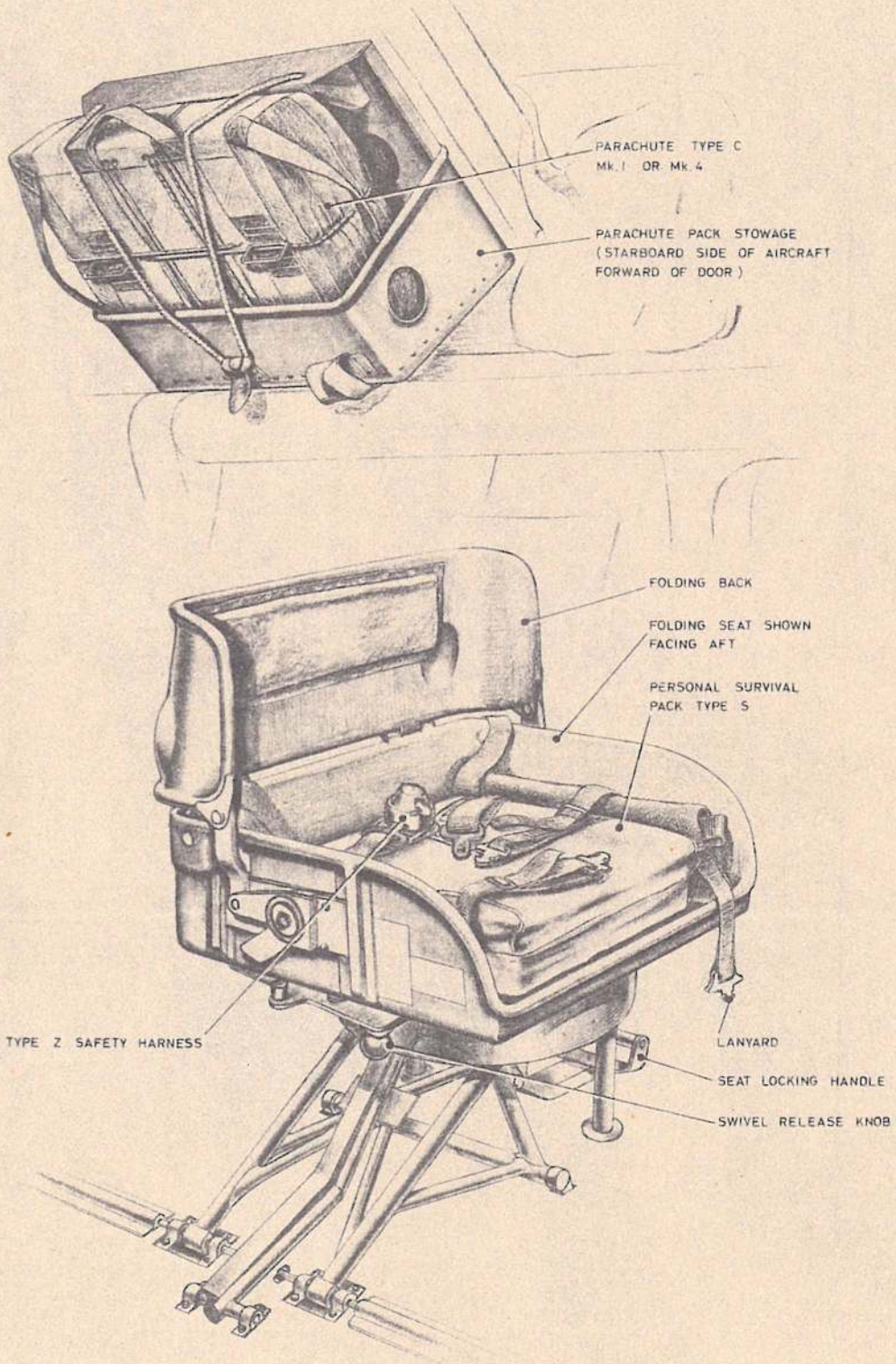

Fig. 6. The folding seat equipped

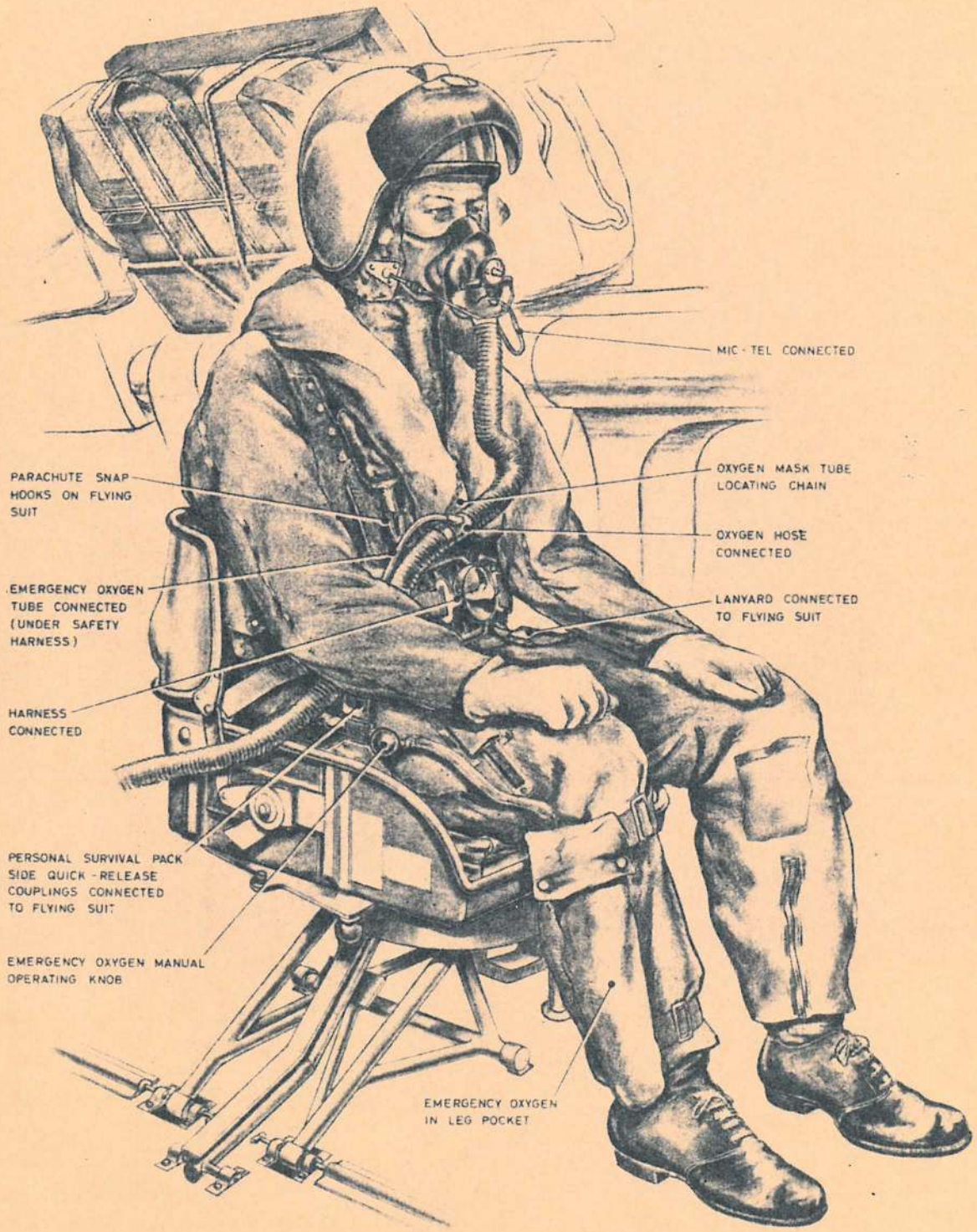

Fig. 7. The folding seat occupied