

Chapter 1

VULCAN B Mk. 1 AND B Mk. 1A

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Introduction

1. The seating arrangements for the crew of these aircraft makes provision for the 1st and 2nd pilots to occupy side by side forward facing ejection seats and the remainder to occupy side by side rearward facing static seats.

2. The aircrew equipment assemblies for the two ejection seats are identical and so also are the assemblies for the static seats. One of each assembly will be dealt with in this chapter, the instructions being applicable to the others of the same type.

Note . . .

Ejection seats which do not embody the modifications specified (which make provision for mounting the emergency oxygen

set on the seat) will require the Type Q personal survival pack and the Mk. 4A emergency oxygen set instead of the items quoted in para. 3.

EJECTION SEATS

Composition of the assembly

3. The assembly for both pilots consists of the following items :

Ejection seat	Mk. 3K1 (incorporating Mod. 595) : 1st pilot
	Mk. 3K2 (incorporating Mod. 596) : 2nd pilot
Safety harness	Type ZF
Parachute assembly	Back Type Mk. 9 (incorporating Mod. para. 151)

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Personal survival pack	Type R or R, Mk. 1, c/w cushion 27C/2428
Emergency oxygen set	Mk. 7G
Flying clothing	To be included later

The Mk. 3K ejection seat

4. The Mk. 3K seat is ejected from the aircraft by a cartridge operated gun and slides in a guide rail attached to the airframe structure. The seat incorporates a Type ZF safety harness, head rest, leg restraint cords, parachute pack container, a seat pan which houses a personal survival pack and an emergency oxygen cylinder attached to the seat beam. Fully automatic facilities are provided to separate the occupant from the seat after ejection, and to open his parachute after separation.

5. The leg restraint cords ensure that the occupant's legs are drawn back to the seat pan and restrained there during ejection, thereby preventing injury to the legs due to being blown apart by the air blast.

6. The seat is adjusted for height by a lever at the port (1st pilot) or the starboard (2nd pilot) side of the seat; the knob in the end of the lever must be depressed before the seat can be moved. A safety harness 'go-forward' lever is also mounted on the port or starboard side of the seat, as appropriate; this is operated to allow the occupant to bend forward without disconnecting the safety harness. The seats are fitted with retractable arm rests.

7. Two firing handles are fitted to each seat. The main handle (which has an integral face screen), projects from the front of the drogue container; the alternative handle is located at the front of the seat pan and is for use when the occupant is unable to reach the main handle, e.g. when subjected to high G forces. As the seat is ejected, all connections to the aircraft are broken and the emergency oxygen is turned on automatically.

8. A manual override control (D-ring) is provided to isolate the parachute automatic withdrawal device, should the need arise to make (a) a manual bale-out from the aircraft or (b) a manual separation from the seat after ejection.

9. Information concerning the Mk. 3K ejection seat will be found in A.P.4288, Vol. 1. Information concerning the parachute assembly will be found in A.P.1182A, Vol. 1 and the personal survival pack is described in A.P.1182C, Vol. 1. Information concerning flying clothing will be found in A.P.1182E, Vol. 1 and in the appendix to this chapter.

Sequence of events during ejection

10. The canopy jettison device is coupled to BOTH ejection seats. When one of the firing handles on either seat is operated a time delay mechanism is set in motion and the canopy is jettisoned. After a delay of one second the ejection gun is fired; there will be a further delay of one second after operating either of the firing handles of the second seat before it is ejected, even though the canopy has already been jettisoned. The canopy can also be jettisoned manually, independently of seats, by operating the black and yellow striped handle below the cockpit rail.

11. The sequence of events after the ejection gun has fired is as follows :-

- (1) The leg restraint cords tighten until the rivets shear in the floor anchorages.
- (2) The time delay mechanism for the drogue gun is actuated, the gun being fired after ½ sec.
- (3) The time delay mechanism for the barostatic time-release unit is tripped. The delay is variable, depending upon aircraft height at the time of ejection.
- (4) The main oxygen hose and Mic/Tel lead are disconnected.
- (5) The emergency oxygen supply is turned on.
- (6) When the seat has been ejected the drogue gun is fired after a delay of ½ sec. and the drogue stabilizes the seat. If the ejection occurs at a high altitude the seat will eventually fall vertically with the occupant restrained by his safety harness from falling forward. At low altitudes there may not be time for the seat to attain the vertical position. During this phase the

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occupant will be breathing oxygen from the emergency cylinder attached to the rear of the seat.

- (7) After an appropriate delay the occupant is released from the seat and the parachute opens automatically. The delay is 1.25 sec. after ejection below 10 000 ft; at high altitude the 1.25 sec. delay does not start until the seat has descended to 10 000 ft.

Equipping the seat

Connections to the aircraft

12. With the seat installed in the aircraft the following items are connected to the airframe:—

- (1) Mic/Tel lead Push/Pull connection.
- (2) Static line from drogue gun.
- (3) Static line from barostatic time-release unit.
- (4) Static line from emergency oxygen cylinder operating head.
- (5) Main oxygen supply hose.
- (6) Leg restraint cords.
- (7) Face screen firing handle to canopy jettison unit operating cable.
- (8) Articulated sear linkage from time delay firing units.

Equipping the seat

13. Before equipping the seat, ensure that it has been made safe for servicing in accordance with current instructions.

14. When installing the equipment in the seat adopt the following procedure; refer to fig. 1, 2 and 3 as necessary:—

- (1) Fit the emergency oxygen cylinder into its clamping brackets on the seat beam, ensuring that the loop of the supply tube at the top of the cylinder faces outwards.

- (2) Pass the emergency oxygen supply tube through the guard and fit the end in the gate clamp mounted on the side of the seat pan.
- (3) Connect the nipple of the emergency oxygen cylinder operating cable to the anchor section of the static line and engage the end fitting of the cable housing in the anchor socket.
- (4) Connect the anchor hook to the static line cum-manual operating cable.
- (5) Place the personal survival pack in the seat pan, ensuring that the lowering line emerges over the port side of the seat pan.
- (6) Check that the bottom edge of the apron is clipped to the lower extension of the parachute container. Pull upwards on the apron to tension it.
- (7) Ensure that the seat cushion and back pad are strapped securely to the parachute harness with the leg loop passing through the slot in the cushion. Place the parachute pack in its container ensuring that the bottom edge is correctly located behind the corner plates.
- (8) Connect the parachute withdrawal line coupling.
- (9) Press the parachute pack fully home into the container and fit the restraining straps into the clips at each side.
- (10) Pass the upper oxygen tube assembly through the webbing tunnel on the parachute harness and couple the stirrup quick-release fitting to the end of the emergency oxygen tube in the gate clamp on the side of the seat.
- (11) Connect the side quick-release couplings of the personal survival pack to the parachute harness.
- (12) Fit the parachute harness sticker

straps into the spring clips on the sides of the seat pan.

15. After the seat has been equipped, restore it to the safe for parking condition in accordance with current instructions.

Strapping-in procedure

16. The strapping-in procedure is as follows: refer to figs. 4, 5 and 6 for detail as necessary; it is assumed that garters have been fitted:-

- (1) Ensure that the seat has been made safe for parking in accordance with current instructions.
- (2) Sit in the seat.
- (3) Connect the personal survival pack lowering line to the life jacket.
- (4) Fasten the parachute harness. Fasten the waist belt OVER the lowering line attachment strap on the life jacket. Pass the leg straps over the thighs and through the leg loop and insert the lugs in the quick-release fitting. Pass the shoulder straps UNDER the life jacket stole and insert the lugs in the quick-release fitting. Fit the safety pin clip in position behind the disc knob.

Note . . .

If the latest type of quick-release fitting is incorporated in the harness (inertia-proof fitting) the safety pin clip is not required and instructions to fit it behind the disc knob are to be ignored.

- (5) Fasten the lap straps of the safety harness but do not tighten.
- (6) Pass the right-hand leg restraint cord through the LEFT leg garter D-ring and under the left lap strap of the safety harness. Pass the end fitting of the left shoulder strap through the loop in the end of the leg restraint cord and insert the lug in the safety harness quick-release fitting.
- (7) Pass the left-hand leg restraint cord through the RIGHT leg garter D-ring

and under the right lap strap of the safety harness. Pass the end fitting of the right shoulder strap through the loop in the end of the leg restraint cord and insert the lug in the safety harness quick-release fitting.

- (8) Adjust the leg restraint cords to allow full simultaneous movement of the control column and rudder bar.
- (9) TIGHTEN THE SAFETY HARNESS LAP STRAPS. TIGHTEN THE SHOULDER STRAPS.
- (10) Put on the flying helmet, oxygen mask and protective helmet if this has not already been done. Connect the main and emergency oxygen supply hoses to the oxygen mask tube quick-release connector, ensuring that the emergency supply tube passes under the right shoulder strap of the safety harness. Attach the tube locating chain to the D-ring on the life jacket. Connect the Mic-tel lead.
- (11) Adjust the height of the seat; ideally the head should be in the centre of the headrest.
- (12) Stretch the arms upwards to check that the firing handle is within easy reach; DO NOT PULL THE HANDLE.
- (13) Fasten the chin straps of both helmets, 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 would result in loss of vital oxygen supply.

- (14) With the assistance of a ground crew member ensure that the safety pins are correctly positioned and stowed.

Emergencies

17. For drill and procedure to be taken in emergencies refer to Pilot's Notes, A.P.4505A-P.N.

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Leaving the seat after landing

18. (1) Remove the firing handle safety pins from their stowage and fit to face screen and seat pan firing handles.
- (2) Disconnect the main and emergency oxygen supply and the Mic/Tel lead.
- (3) Release the safety harness, pull out safety pin clip and release parachute harness.
- (4) Disconnect the survival pack lowering line and allow it to drape over the port side of the seat pan.
- (5) Remove the leg restraint cords.
- (6) Retract the arm rests. Vacate the seat.

STATIC SEATS**Composition of the assembly**

19. The assembly consists of the following items:—

A non-ejection seat, adjustable for position on guide rails	
Parachute assembly	Back Type Mk. 17 or 20
Personal survival pack	Type S
Emergency oxygen set	Mk. 3A
Flying clothing	To be included later

Equipping the seat

20. To equip each of the static seats proceed as follows (fig. 7):—

- (1) Place the personal survival pack in the seat pan, ensuring that the lowering line emerges over the port side of the seat pan.
- (2) Place the parachute assembly on the survival pack with the parachute pack against the back of the seat. The emergency oxygen cylinder is in the top of the parachute pack with the emergency oxygen tube emerging on the

right. The emergency oxygen release knob is on the right hand side leg strap of the parachute harness.

Note . . .

When a Mk. 2C parachute assembly is used, the location of the manual release is the same as that described in Chap. 2.

- (3) Connect the personal survival pack side quick-release couplings to the parachute harness.
- (4) Arrange the parachute harness neatly on the seat ready for the occupant.
- (5) When the back type Mk. 20 parachute assembly is installed, proceed as described in Chap. 2 and ensure that Mod. 614 is embodied; Mod. 614 makes provision for static lines and their stowage on the centre seat.

Strapping-in procedure

21. Strapping-in procedure for each rear crew member is the same and is as follows; refer to fig. 8 for detail:—

- (1) Push the seat away from the bench as far as it will go.
- (2) Sit in the seat.
- (3) Connect the personal survival pack lowering line to the life jacket so that the quick-release coupling comes below the parachute harness waist belt.
- (4) Fasten the parachute harness. Route the left-hand side of the waist belt OVER the lowering line attachment strap on the life jacket. Pass the leg straps over the thighs, through the leg loop and insert the lugs in the quick-release fitting. Pass the shoulder straps UNDER the life jacket stole and secure them to the quick-release fitting. Insert the safety pin clip in position behind the disc knob.

Note . . .

If the latest type of quick-release fitting is incorporated in the harness (inertia-proof fitting) the safety pin clip is not required and instructions to fit it behind the disc knob are to be ignored.

- (5) Check that the quick-release couplings of the personal survival pack are connected to the parachute harness and tighten the retaining strap. Tuck the surplus lengths of strap into the seat pan.
- (6) Fasten and tighten the lap and shoulder straps of the safety harness.
- (7) Put on the flying helmet, oxygen mask and protective helmet if this has not already been done. Connect the main oxygen supply hose (under the equipment bench) to the oxygen mask tube. Route the emergency oxygen supply tube behind the right shoulder, under the right arm and connect the tube to the mask tube assembly. Attach the tube locating chain to the D-ring of the life jacket. Connect the Mic/Tel lead. Adjust the seat position.

- (8) Fasten the chin straps of both helmets, fit the oxygen mask and perform pre-flight oxygen checks.

Emergencies

22. For drill and procedure to be taken in emergencies refer to Pilot's Notes A.P.4505A and C-P.N.

Leaving the seat after landing

23. On leaving the seat after flight proceed as follows :-

- (1) Disconnect the main and emergency oxygen supply tubes and the Mic/Tel lead.
- (2) Release the safety harness, pull out the safety pin clip and release the parachute harness.
- (3) Disconnect the personal survival pack lowering line and allow it to drape over the left hand side of the seat pan.
- (4) Vacate the seat.

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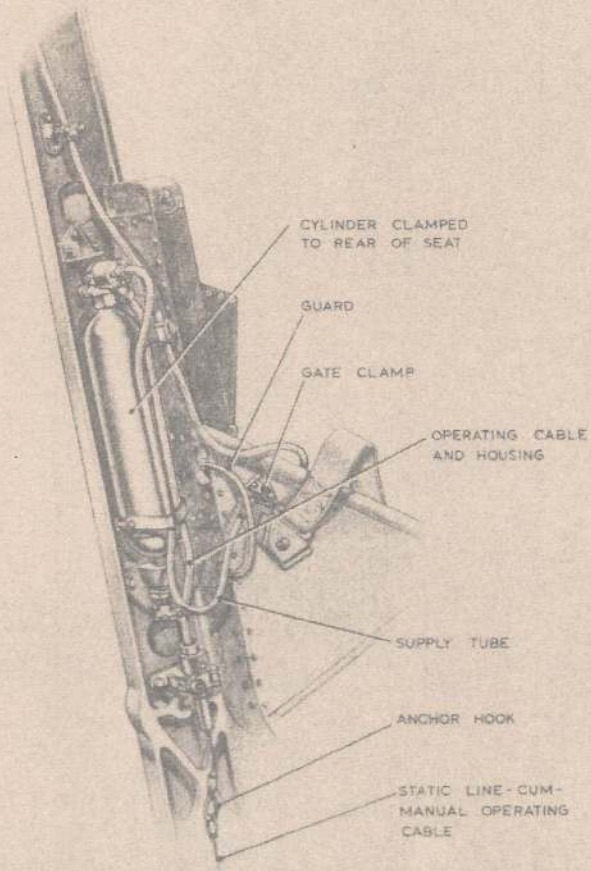


Fig. 1. Arrangement of emergency oxygen supply

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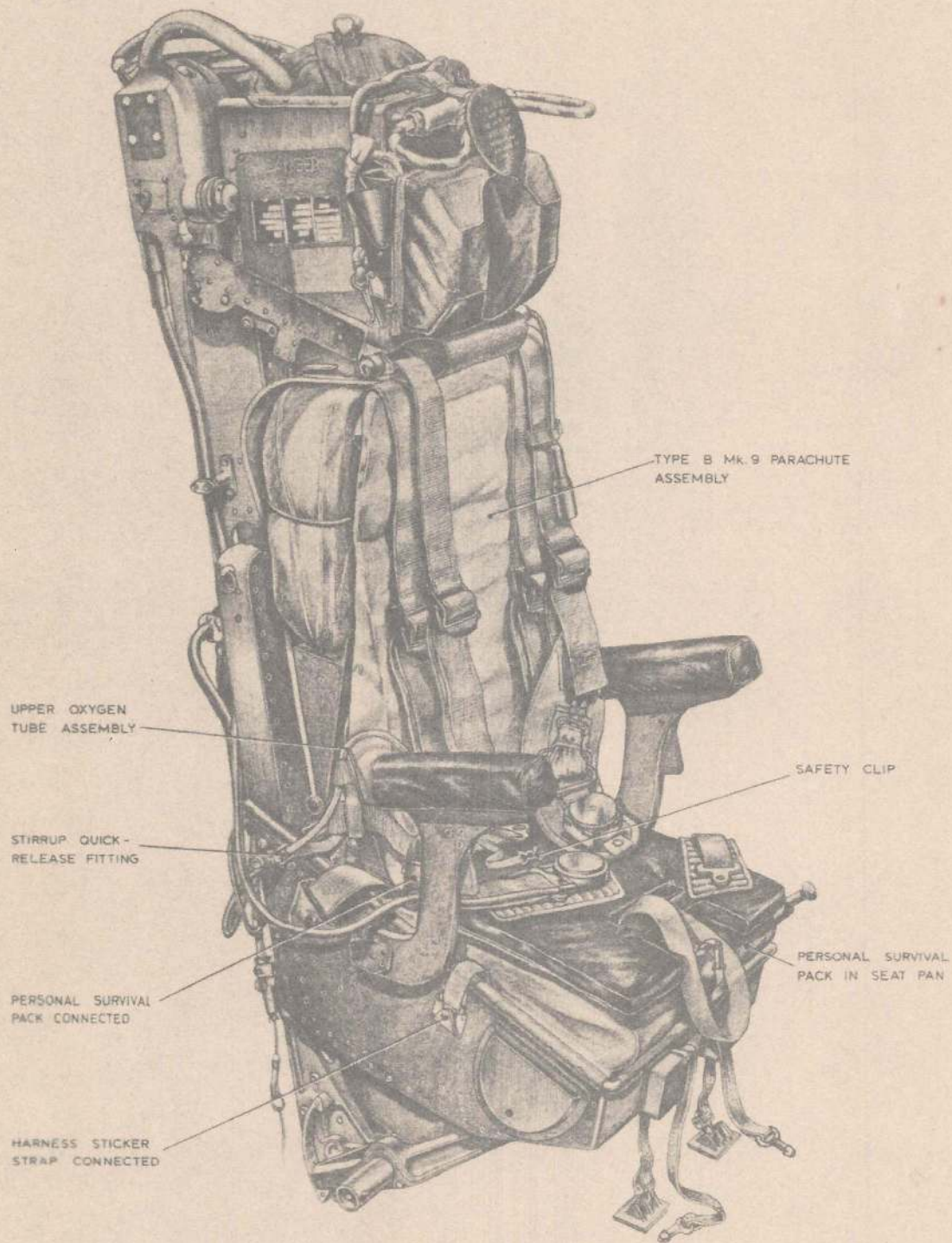


Fig. 2. The ejection seat equipped (1)

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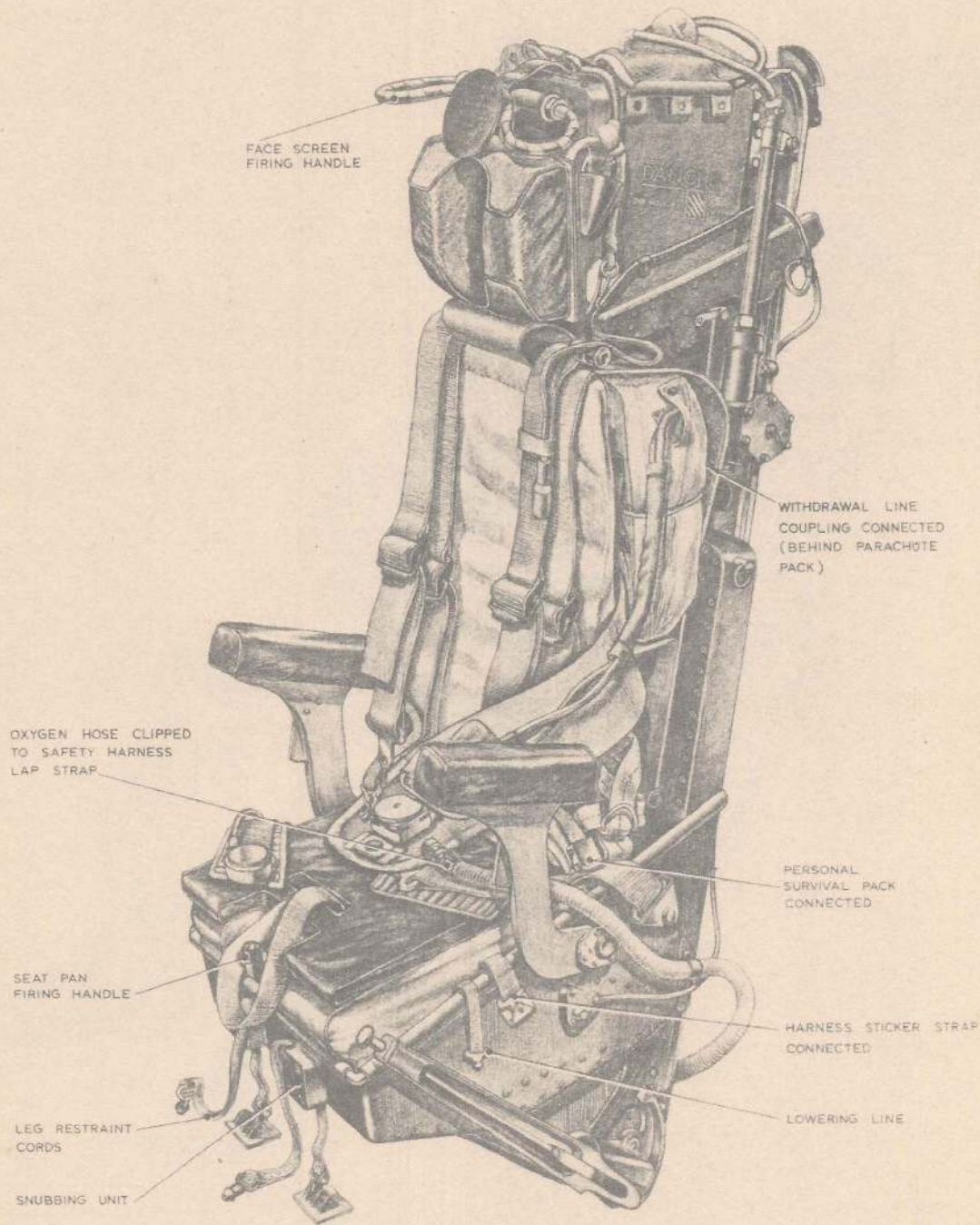


Fig. 3. The ejection seat equipped (2)

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Fig. 4. The ejection seat occupied (1)

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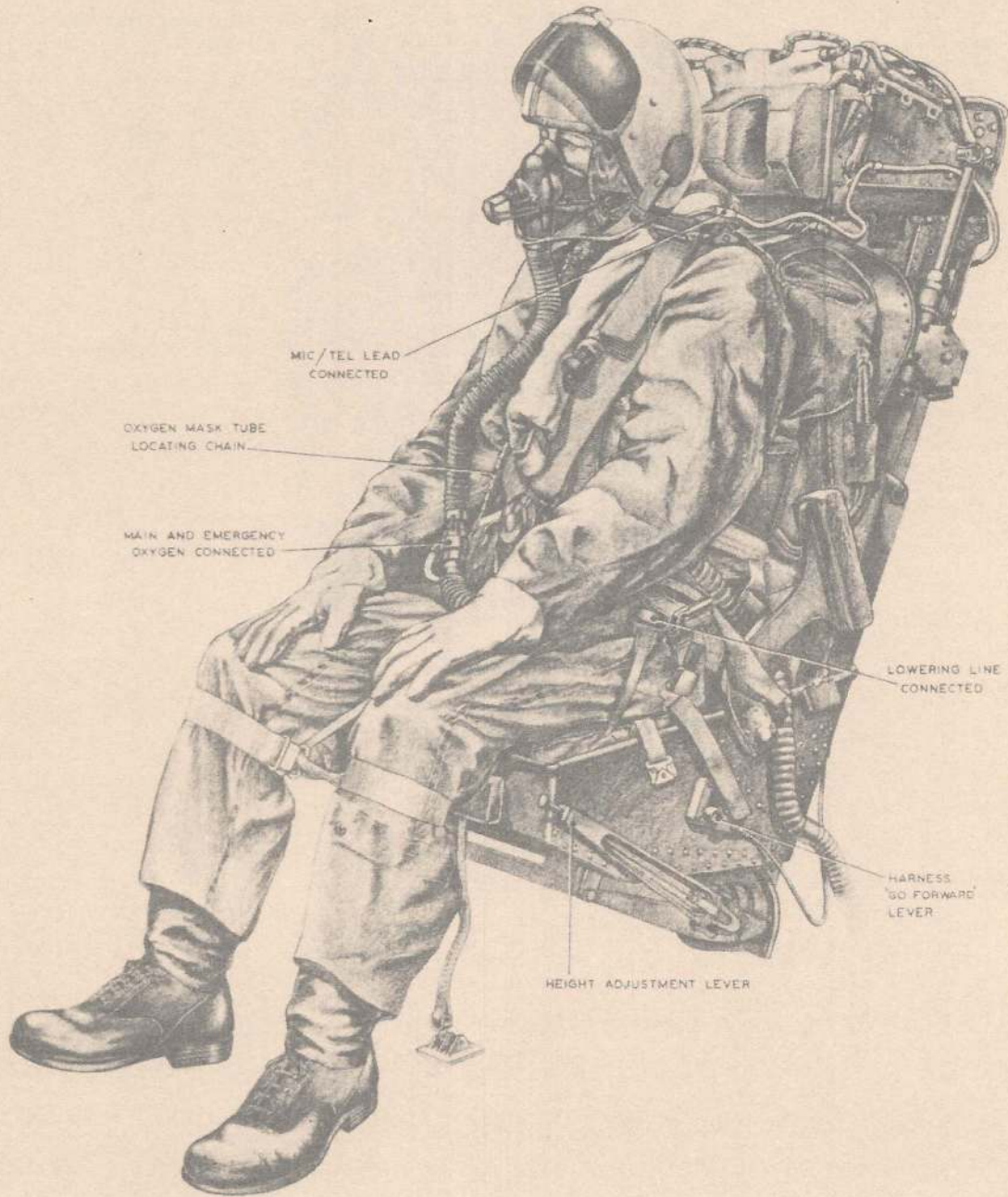


Fig. 5. The ejection seat occupied (2)

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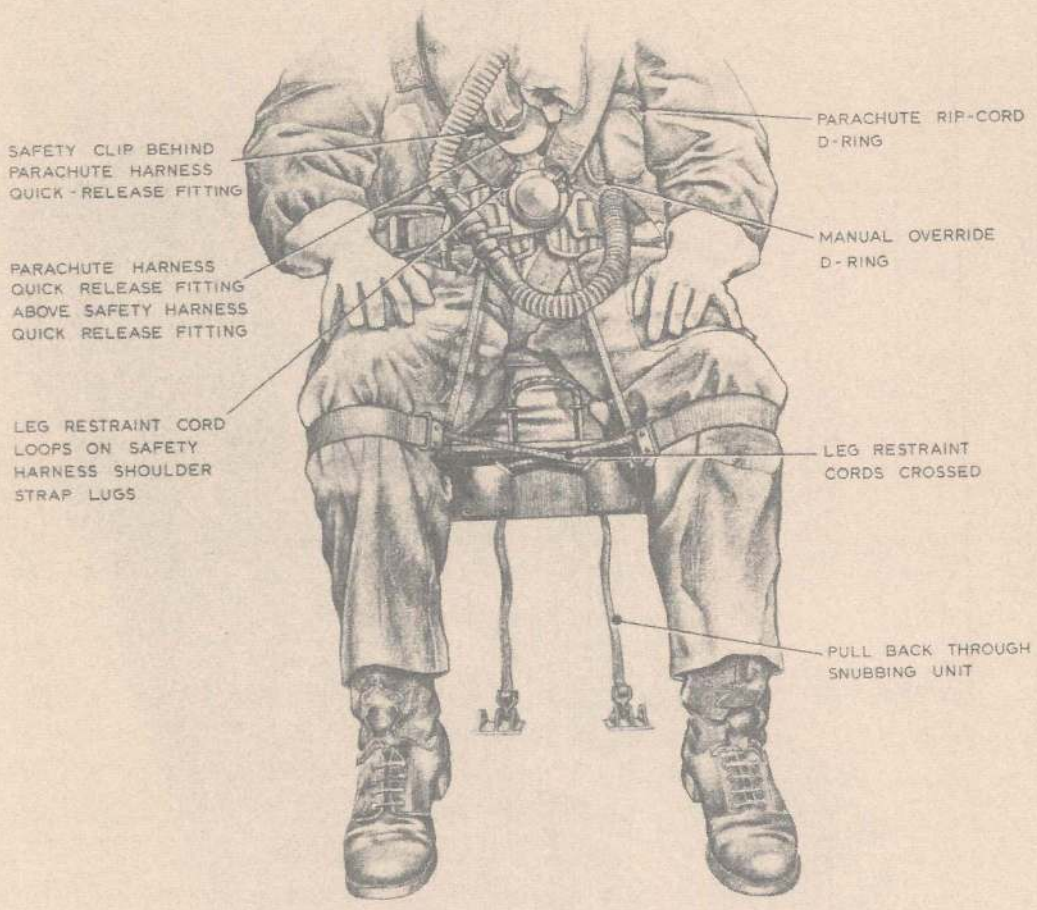


Fig. 6. Arrangement of leg restraint cords and harness

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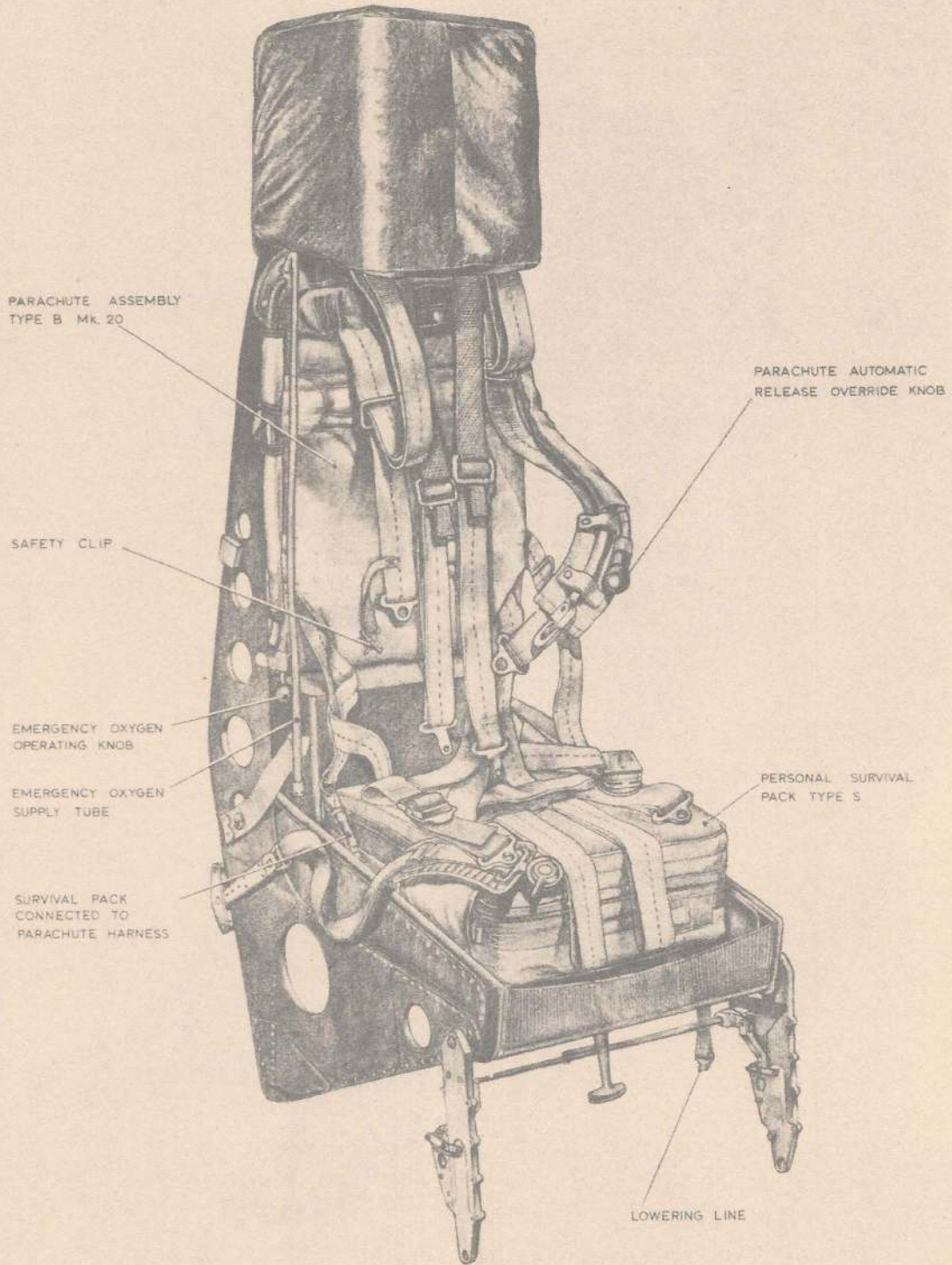


Fig. 7. The static seat equipped

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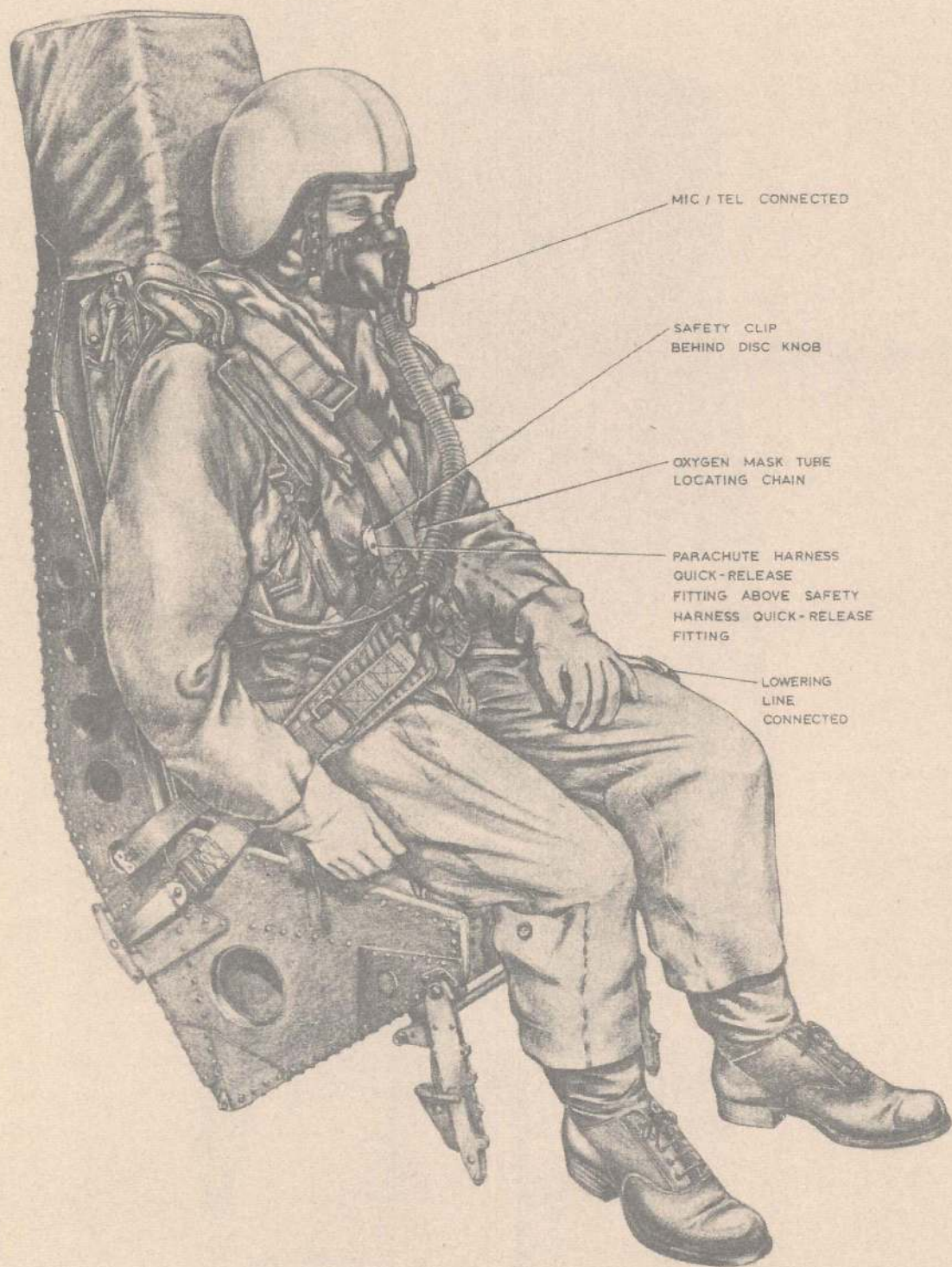


Fig. 8. The static seat occupied

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