

Chapter 1

◀ JET PROVOST T Mk. 3 AND Mk. 4 ▶

LIST OF CONTENTS

	Para.		Para.
Composition of the assembly	1	Strapping-in procedure	18
◀ The ejection seat ▶	4	Emergencies	19
Connections to the aircraft	14	Leaving the aircraft after landing ...	20
Equipping the seat	15		

LIST OF ILLUSTRATIONS

	Fig.		Fig.
The seat equipped (1)	1	Arrangement of oxygen supply on seat ...	5
The seat equipped (2)	2	Installing the parachute assembly ...	6
Arrangement of drogue withdrawal and link lines	3	The seat occupied (1)	7
Arrangement of leg restraint cords ...	4	The seat occupied (2)	8

APPENDIX

	App.
Flying clothing	1

COMPOSITION OF THE ASSEMBLY

◀ 1. This chapter deals with aircrew equipment assemblies incorporating ejection seats embodying Modification E.S.2179 which introduces an upward pull negative-G restraining strap. Ejection seats embodying Modification 2730 which introduces a downward pull negative-G restraining strap are dealt with in Chap. 3. ▶

2. Two aircrew equipment assemblies are installed in this aircraft, the sole difference being that the port and starboard ejection seats are handed. Reference will therefore be made to one assembly only throughout this chapter except where the handing causes variations in the information.

3. ◀ The assembly consists of the following items:—

- | | |
|---------------|-------------------------|
| Ejection seat | <i>T Mk. 3 aircraft</i> |
| | Type 4P/1 (Port) |
| | Type 4P/2 (Starboard) |

- | | |
|------------------------|--|
| | <i>T Mk. 4 aircraft</i> |
| | Type 4PA/1 (Port) |
| | Type 4PA/2 (Starboard) |
| Parachute assembly | Back Type Mk. 30 |
| Personal survival pack | Type R Mk. 2 c/w Mk. 2 fibreglass insert |
| Emergency oxygen set | Mk. 7E |
| Flying clothing | See App. 1. ▶ |

◀ The ejection seat ▶

4. The seat slides in two guide rails attached to the ejection gun cylinder; the rails are fitted with brackets which enable the gun and rails to be bolted to the airframe structure. The seat is ejected by a cartridge-operated gun.

5. A combined safety and parachute harness is used in conjunction with the seat, the harness being attached at three points. The personal survival pack is housed in the seat pan and an auxiliary cushion is provided for additional comfort. A negative 'G' restraining strap is

secured at the rear by being looped over the bottom harness anchorages; it then passes over the personal survival pack and, extending upwards through a bracket situated behind the seat pan firing handle, is looped over the harness lap straps (fig. 4). Tightening the negative 'G' restraining strap prevents forward movement of the pack, cushion and occupant.

6. An emergency supply of oxygen is provided by a cylinder clamped to the rear of the seat. The end-fitting of the supply tube is clamped to the starboard side of the seat pan and an upper oxygen tube assembly conveys the oxygen to the user's mask. A stirrup quick-release is fitted to the upper oxygen tube assembly to disconnect it from the seat as the occupant is separated after ejection. The emergency oxygen supply is turned on automatically during ejection, or manually by pulling the knob at the right-hand side of the seat pan.

7. Leg restraint cords, fitted through snubbing units on the underside of the seat pan, ensure that the occupant's legs are drawn back to the seat and restrained there during ejection, thereby preventing injury due to flailing. To ensure that there is sufficient leg clearance during ejection, the control column is automatically disconnected and forced forward as the seat begins to ascend the guide rails.

8. Seat height adjustment is achieved by a lever on the outboard side of the seat pan; the plunger on the end of the lever must be depressed before the seat can be raised or lowered.

9. The harness 'go-forward' lever is fitted at the forward end of the outboard side of the seat pan, the lever being pushed forward to disengage the harness snubbing unit and allow the occupant to lean forward without disconnecting the harness. A small lever, just forward of the harness 'go-forward' lever, releases the leg restraint cords; this lever must be pulled back to free the cords.

10. Two firing handles are fitted to each seat. The face screen handle projects from the front of the drogue container and has an integral face screen which protects the face from the air blast during ejection. The seat pan handle is partially recessed into the top front edge of the seat pan and is intended for use when the occupant is unable to reach the face screen handle, e.g. when subjected to high 'G' forces.

11. As the seat is ejected, all connections to the aircraft are broken automatically and the emergency oxygen supply is turned on.

12. Fully automatic facilities are provided to withdraw the parachute and separate the occupant from the seat after ejection. Two manual override controls are, however, provided, one on the combined harness disconnects the parachute automatic withdrawal device from the seat and the other, a lever on the left-hand side of the seat pan, disconnects the combined harness attachment points from the seat. Both override controls must be operated if the occupant is forced to (a) make a manual bale-out or (b) make a manual separation from the seat after ejection.

13. ◀ A full description of each ejection seat will be found in A.P.4288D, Vol. 1; detailed information concerning the Mk. 30 parachute assembly and the Type R Mk. 2 personal survival pack will be found in A.P.1182A, Vol. 1 (2nd. Edn.), and A.P.1182C, Vol. 1, Book 2, respectively. ▶

Connections to the aircraft

14. When the seat is installed in the aircraft and is properly equipped, the following items are connected to the airframe:—

- (1) *Left-hand side of seat:—*
 - (a) Mic/Tel lead.
 - (b) Static rod from drogue gun.
- (2) *Right-hand side of seat:—*
 - (a) Main oxygen supply hose.
 - (b) Static rod from barostatic time-release unit.
- (3) *Front of seat:—*
 - (a) Leg restraint cords.
- (4) *Top of seat:—*
 - (a) Canopy jettison unit operating cable.

EQUIPPING THE SEAT

15. Before equipping the seat make sure that it is 'safe for servicing' in accordance with current instructions.

16. The following procedure is to be adopted when installing the equipment in the seat, reference being made to fig. 1 to 6:—

- (1) Fit the emergency oxygen cylinder into its clamping brackets on the rear of the

seat. Secure the supply tube end-fitting in the clamp on the right-hand side of the seat pan and fit the tube into the clip on the rear of the seat pan.

- (2) Ensure that the emergency oxygen supply manual control is pushed fully down; connect the cylinder operating cable to the actuating arm on the rear of the seat pan.
 - (3) Ensure that the manual separation lever is in the operated (upward) position. Place the parachute pack on its support bracket on the seat structure and ensure that the harness straps are not twisted.
 - (4) Operate the harness 'go-forward' lever and pull out the centre strap. Pass the strap through the D-shackle on the harness shoulder straps, taking care that the fitting is in its natural position and that the straps are not twisted. Pass the O-rings of the pack restraint straps over the lug of the centre strap, lift the parachute pack forward and fit the lug into the attachment point on the seat. Place the manual separation lever in the locked (down) position and ensure that the lug is secure by attempting to pull the harness away from the anchorage.
 - (5) Replace the parachute pack on its support bracket.
 - (6) Position the headrest cushion on the parachute pack, ensuring that it fits correctly under the drogue container.
 - (7) Pass the left-hand pack restraint strap over the parachute withdrawal line, through the buckle on the short strap at the left-hand side of the drogue container and then forward through the buckle on the left-hand side of the headrest cushion.
- Note . . .**
When passing the strap through the buckle on the short strap at the side of the drogue container, ensure that the strap passes through the buckle from the outside inwards.
- (8) Pass the right-hand pack restraint strap through the buckle on the short strap at the right-hand side of the drogue container (refer to the note following sub-para. (7)) then forward through the buckle on the right-hand side of the headrest cushion.
 - (9) Tighten the left-hand pack restraint strap and then the right-hand strap so that the pack and headrest cushion are held firmly in position.
 - (10) Connect the two halves of the link line coupling, ensuring that the line passes under the left-hand pack restraint strap and UNDER THE DROGUE WITHDRAWAL LINE.
 - (11) Lift the harness clear of the seat pan and insert the personal survival pack into the pan, first lowering the rear of the pack and then sliding it to the rear.
 - (12) Fit the negative 'G' restraining strap as follows :-
 - (a) Pass the white 'Y' strap through the anchor bracket inside the front of the seat pan from top to bottom, leaving the blue 'Y' strap uppermost with the adjustment buckle above the anchor fitting and the free end of the strap facing forward.
 - (b) Route the white 'Y' strap over the top of the personal survival pack to the rear bottom harness locks of the seat. Engage the loop ends of the strap over their respective bottom lock harness lugs and insert the lugs into the locks. Ensure that the straps lie flat across the pack and that the harness is not twisted. Pull on the harness straps to ensure that they are secure in the seat locks.
 - (13) Place the comfort cushion on top of the personal survival pack and secure it to the harness straps.
 - (14) Fit the harness sticker straps into the clips on the inside of the seat pan.
 - (15) Connect the side quick-release couplings of the personal survival pack to the parachute harness. Ensure that the harness straps are positioned inside the quick-release couplings.

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- (16) Drape the personal survival pack lowering line over the front, right-hand side of the seat pan, just clear of the alternative firing handle.
- (17) Fit the stirrup quick-release fitting of the upper oxygen tube assembly to its bayonet fitting in the clamp block at the right-hand side of the seat pan. Pull lightly on the upper oxygen tube assembly to check security of attachment.
- (18) Remove and retain the safety pin from the emergency oxygen cylinder operating head.

17. ◀ Leave the safety pins in position in the ejection gun firing unit sear, canopy jettison firing unit sear and time delay unit trip lever pawl; report the position of the pins to the N.C.O. i/c Aircraft Servicing. ▶

STRAPPING-IN PROCEDURE

18. The following procedure is to be adopted when strapping into the seat; refer to fig. 3, 4, 5, 6, 7 and 8 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.
- (3) Adjust the seat height to bring the head to the centre of the headrest cushion.
- (4) Connect the personal survival pack lowering line to the life jacket ensuring that the line passes under the left leg, behind the negative 'G' restraining strap and over the right thigh.
- (5) Pass the left-hand leg restraint cord through the right leg garter D-ring and then insert the end-plug into the left-hand socket on the front of the seat pan.
- (6) Pass the right-hand leg restraint cord through the left leg garter D-ring and then insert the end-plug into the right-hand socket on the front of the seat pan.
- (7) Pull sharply on each leg restraint cord in turn to check security in the sockets.
- (8) Adjust the leg restraint cords in their snubbing units to achieve sufficient freedom of leg movement.

- (9) Position the harness waist belt against the body. Draw up the blue 'Y' section of the negative-'G' restraining strap and pass the appropriate looped end over each lap strap; ensure that the adjustment buckle and free end of the strap face forward and that the 'Y' section lies flat against the inside of the thighs. Insert the lugs of the lap straps to the quick-release fitting.

◀ Note . . .

When an inertia-proof quick-release fitting is incorporated in the harness, turn the disc knob anti-clockwise as far as it will go (until the yellow line passes the dots on the body), hold the knob in this position and insert the first lug. Repeat this operation as each of the remaining lugs are inserted. ▶

- (10) Pass the left-hand leg loop of the harness through the D-ring on the left lap strap (from the inside outwards). Bring down the left shoulder strap of the harness, pass the lug through the leg loop (from the outside inwards) and insert the lug into the quick-release fitting.
- (11) Pass the right-hand leg loop of the harness through the D-ring on the right lap strap (from the inside outwards). Bring down the right shoulder strap of the harness, pass the lug through the leg loop (from the outside inwards) and insert the lug into the quick-release fitting.
- (12) Fit the safety clip behind the disc knob of the quick-release fitting.

Note . . .

This operation is not applicable when the harness is equipped with an inertia proof quick-release fitting as the safety clip will have been removed.

- (13) Adjust the negative 'G' restraining strap as tight as possible, ensuring that all slack in the white 'Y' section is pulled forward from the rear anchorages.

Note . . .

To ensure that the free end of the negative 'G' restraining strap causes

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seat. Secure the supply tube end-fitting in the clamp on the right-hand side of the seat pan and fit the tube into the clip on the rear of the seat pan.

- (2) Ensure that the emergency oxygen supply manual control is pushed fully down; connect the cylinder operating cable to the actuating arm on the rear of the seat pan.
- (3) Ensure that the manual separation lever is in the operated (upward) position. Place the parachute pack on its support bracket on the seat structure and ensure that the harness straps are not twisted.
- (4) Operate the harness 'go-forward' lever and pull out the centre strap. Pass the strap through the D-shackle on the harness shoulder straps, taking care that the fitting is in its natural position and that the straps are not twisted. Pass the O-rings of the pack restraint straps over the lug of the centre strap, lift the parachute pack forward and fit the lug into the attachment point on the seat. Place the manual separation lever in the locked (down) position and ensure that the lug is secure by attempting to pull the harness away from the anchorage.
- (5) Replace the parachute pack on its support bracket.
- (6) Position the headrest cushion on the parachute pack, ensuring that it fits correctly under the drogue container.
- (7) Pass the left-hand pack restraint strap over the parachute withdrawal line, through the buckle on the short strap at the left-hand side of the drogue container and then forward through the buckle on the left-hand side of the headrest cushion.

Note . . .

When passing the strap through the buckle on the short strap at the side of the drogue container, ensure that the strap passes through the buckle from the outside inwards.

- (8) Pass the right-hand pack restraint strap through the buckle on the short strap at the right-hand side of the drogue container (refer to the note following sub-para. (7)) then forward through the buckle on the right-hand side of the headrest cushion.
- (9) Tighten the left-hand pack restraint strap and then the right-hand strap so that the pack and headrest cushion are held firmly in position.
- (10) Connect the two halves of the link line coupling, ensuring that the line passes under the left-hand pack restraint strap and UNDER THE DROGUE WITHDRAWAL LINE.
- (11) Lift the harness clear of the seat pan and insert the personal survival pack into the pan, first lowering the rear of the pack and then sliding it to the rear.
- (12) Fit the negative 'G' restraining strap as follows:—
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 - (b) Route the white 'Y' strap over the top of the personal survival pack to the rear bottom harness locks of the seat. Engage the loop ends of the strap over their respective bottom lock harness lugs and insert the lugs into the locks. Ensure that the straps lie flat across the pack and that the harness is not twisted. Pull on the harness straps to ensure that they are secure in the seat locks.
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- (18) Remove and retain the safety pin from the emergency oxygen cylinder operating head.

17. ◀ Leave the safety pins in position in the ejection gun firing unit sear, canopy jettison firing unit sear and time delay unit trip lever pawl; report the position of the pins to the N.C.O. i/c Aircraft Servicing. ▶

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- (2) Sit in the seat.
- (3) Adjust the seat height to bring the head to the centre of the headrest cushion.
- (4) Connect the personal survival pack lowering line to the life jacket ensuring that the line passes under the left leg, behind the negative 'G' restraining strap and over the right thigh.
- (5) Pass the left-hand leg restraint cord through the right leg garter D-ring and then insert the end-plug into the left-hand socket on the front of the seat pan.
- (6) Pass the right-hand leg restraint cord through the left leg garter D-ring and then insert the end-plug into the right-hand socket on the front of the seat pan.
- (7) Pull sharply on each leg restraint cord in turn to check security in the sockets.
- (8) Adjust the leg restraint cords in their snubbing units to achieve sufficient freedom of leg movement.

- (9) Position the harness waist belt against the body. Draw up the blue 'Y' section of the negative-'G' restraining strap and pass the appropriate looped end over each lap strap; ensure that the adjustment buckle and free end of the strap face forward and that the 'Y' section lies flat against the inside of the thighs. Insert the lugs of the lap straps to the quick-release fitting.

◀ Note . . .

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Note . . .

This operation is not applicable when the harness is equipped with an inertia proof quick-release fitting as the safety clip will have been removed.

- (13) Adjust the negative 'G' restraining strap as tight as possible, ensuring that all slack in the white 'Y' section is pulled forward from the rear anchorages.

Note . . .

To ensure that the free end of the negative 'G' restraining strap causes

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no obstruction of the seat pan firing handle, it is permissible to secure it to the standing portion by means of scarlet locking thread or an elastic band.

- (14) Tighten the harness lap straps.
- (15) Ensure that the harness shoulder straps pass under the folds of the life jacket stole. Tighten the blue and khaki shoulder straps in that order.
- (16) Put on the flying and protective helmets and fasten the chin straps.
- (17) Connect the main oxygen supply hose to the oxygen mask tube assembly.
- (18) Connect the upper oxygen tube assembly to the oxygen mask tube assembly and clip the oxygen mask tube locating chain to the D-ring on the life jacket.
- (19) Connect the Mic/Tel lead.
- (20) Remove the safety pin from the seat pan firing handle and hand it to the ground crew member who, having removed the safety pins from the face screen firing handle and canopy jettison unit sear, stows all the pins in the appropriate stowages in the cockpit.

EMERGENCIES

19. Instructions for dealing with emergencies are contained in A.P.4560D - P.N.

LEAVING THE AIRCRAFT AFTER LANDING

20. After landing proceed as follows :-

Ground crew member

- (1) Remove the safety pins from their stowage on the starboard wall of the cockpit and hand the appropriate pin to the seat occupant who fits it through the seat pan firing handle. Fit the other pins through the face screen firing handle and canopy jettison sear.

Note . . .

If a ground crew member is not available the seat occupant MUST fit all pins before leaving the cockpit.

Seat occupant

- (2) Fit the face screen firing handle safety pin.
- (3) Disconnect the main and emergency oxygen supply from the oxygen mask tube assembly.
- (4) Remove the safety pin clip from the harness quick-release fitting (see Note following para. 17 (12)) and release the harness; return the quick-release fitting to the locked position.
- (5) Operate the leg restraint cord manual release lever and free the cords.
- (6) Disconnect the personal survival pack lowering line from the life jacket.
- (7) Vacate the seat.

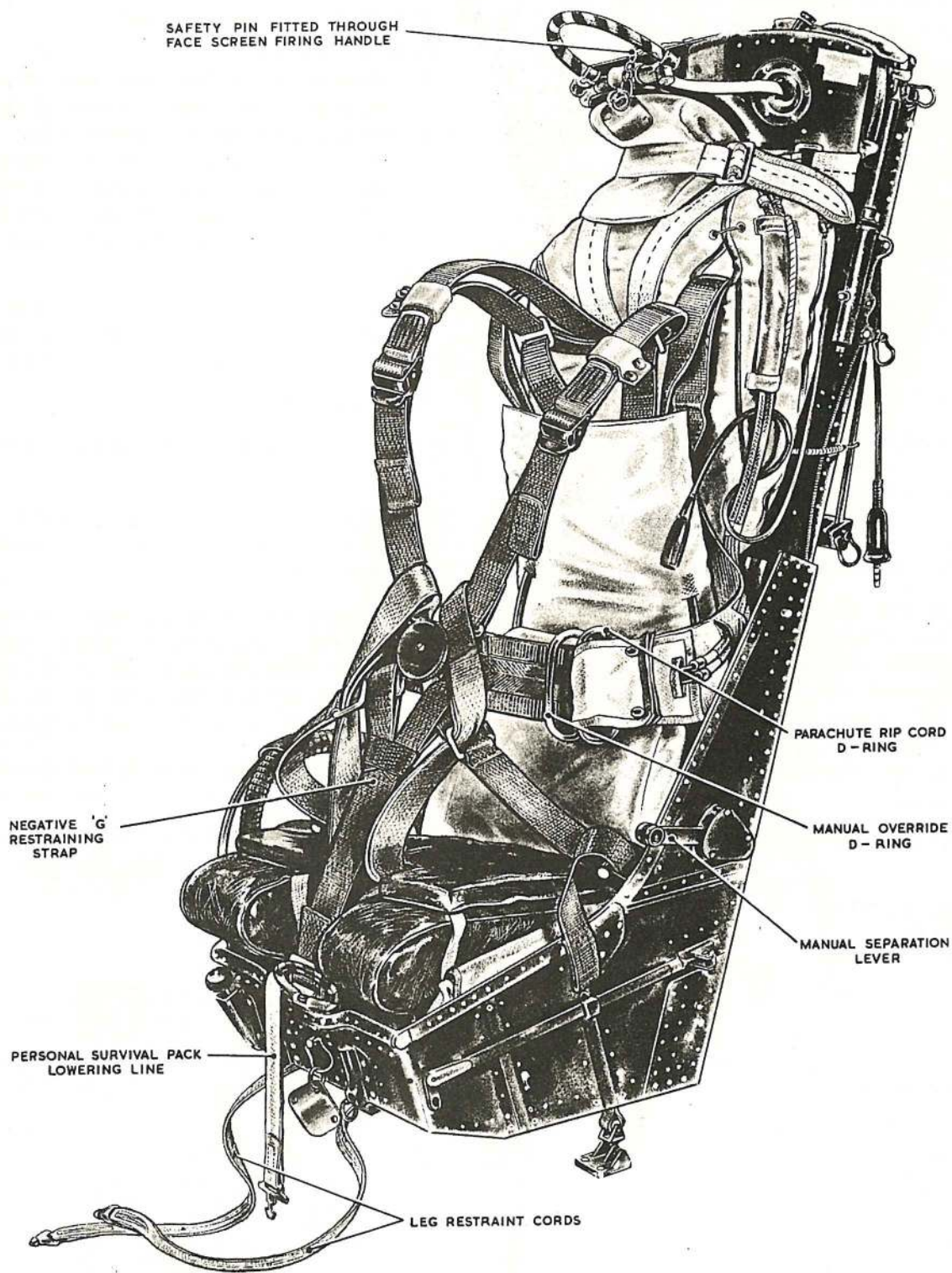


Fig. 1. The seat equipped (1)

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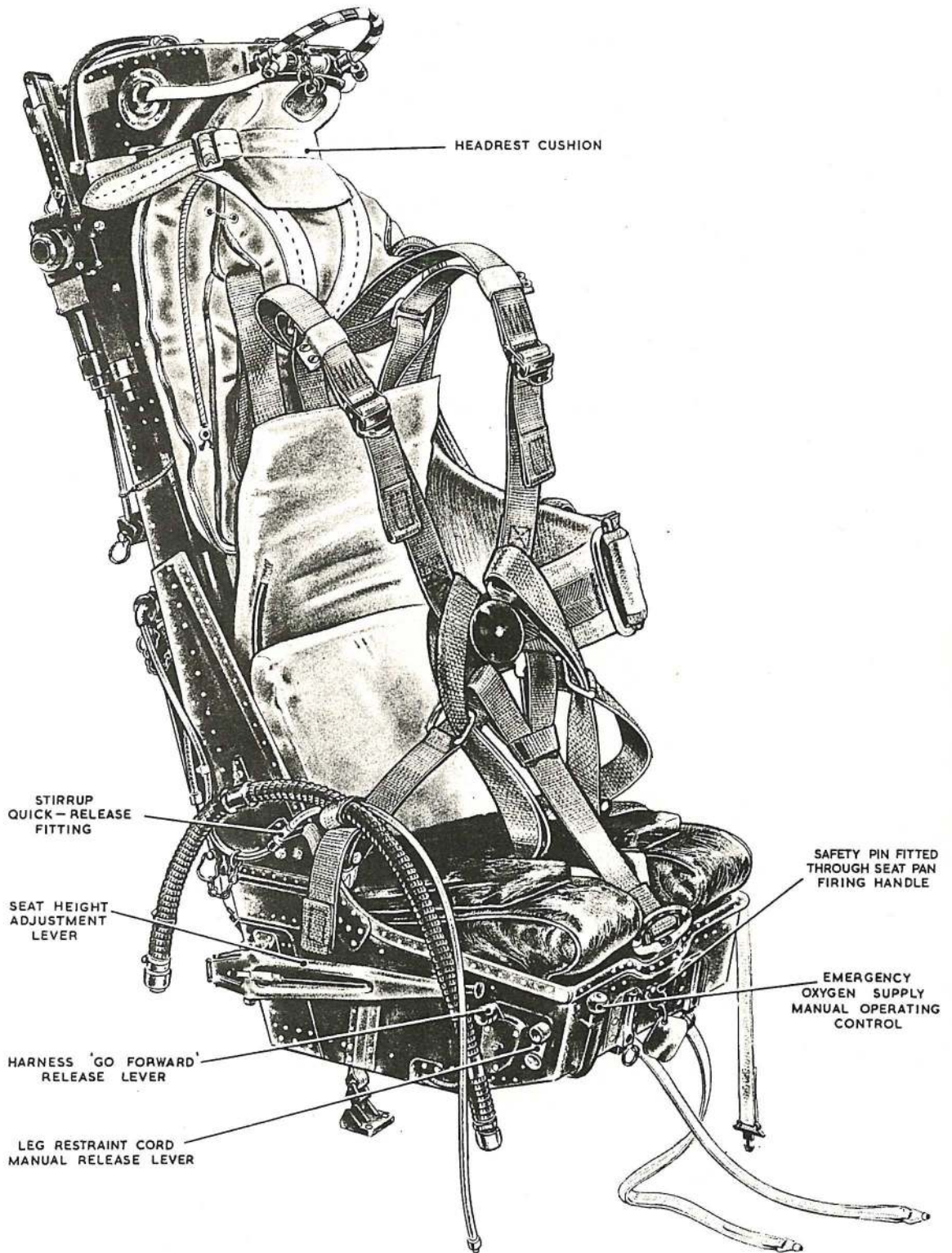


Fig. 2. The seat equipped (2)

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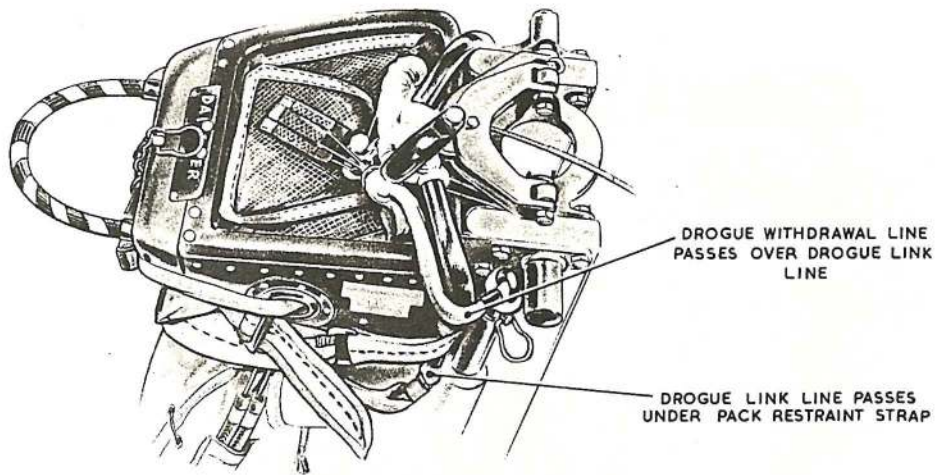


Fig. 3. Arrangement of drogue withdrawal and link lines

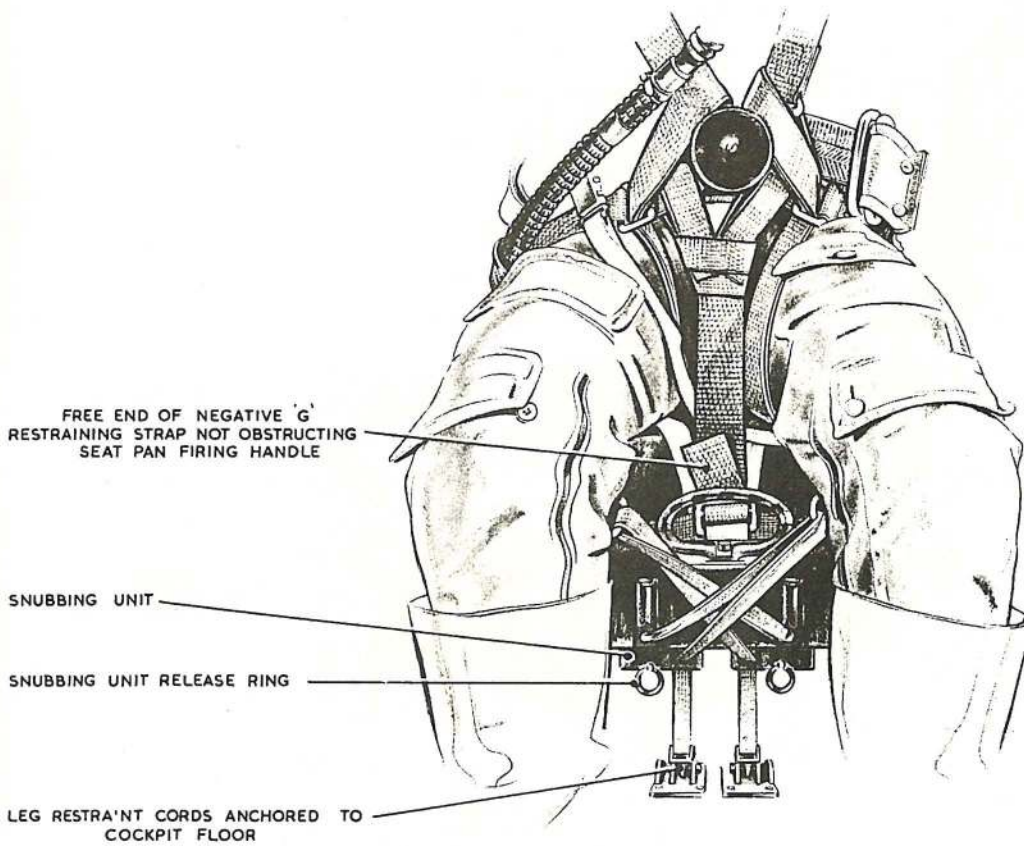


Fig. 4. Arrangement of leg restraint cords

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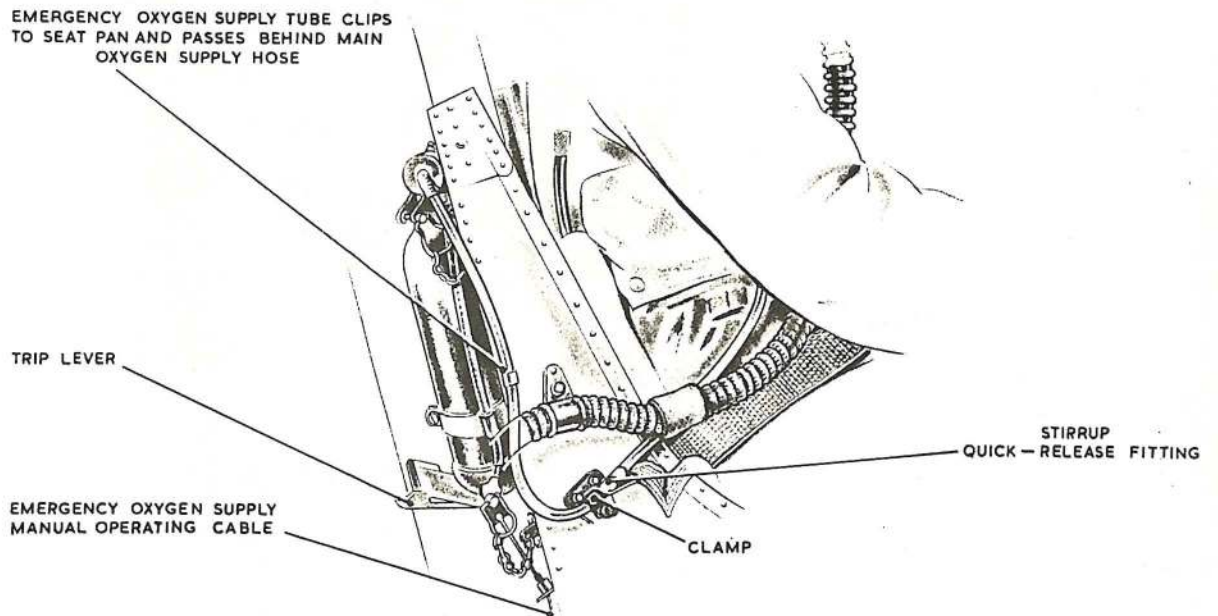


Fig. 5. Arrangement of oxygen supply on seat

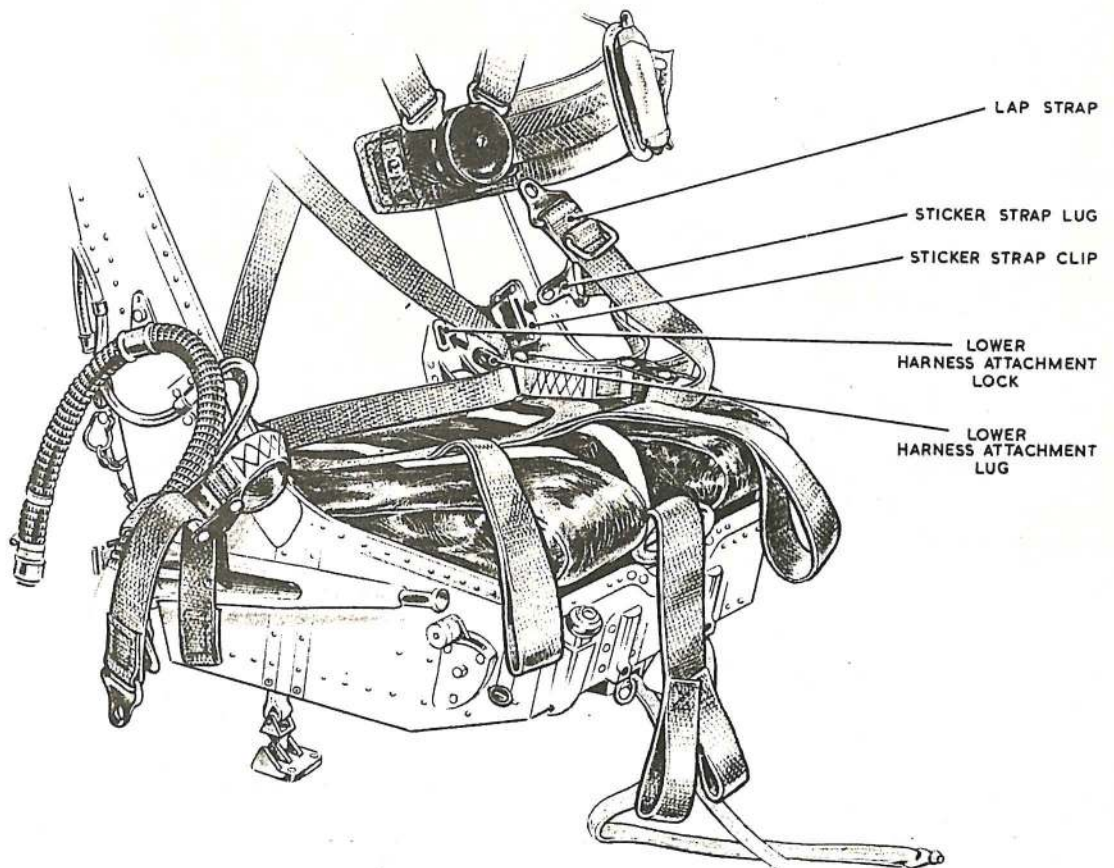


Fig. 6. Installing the parachute assembly

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Fig. 7. The seat occupied (1)

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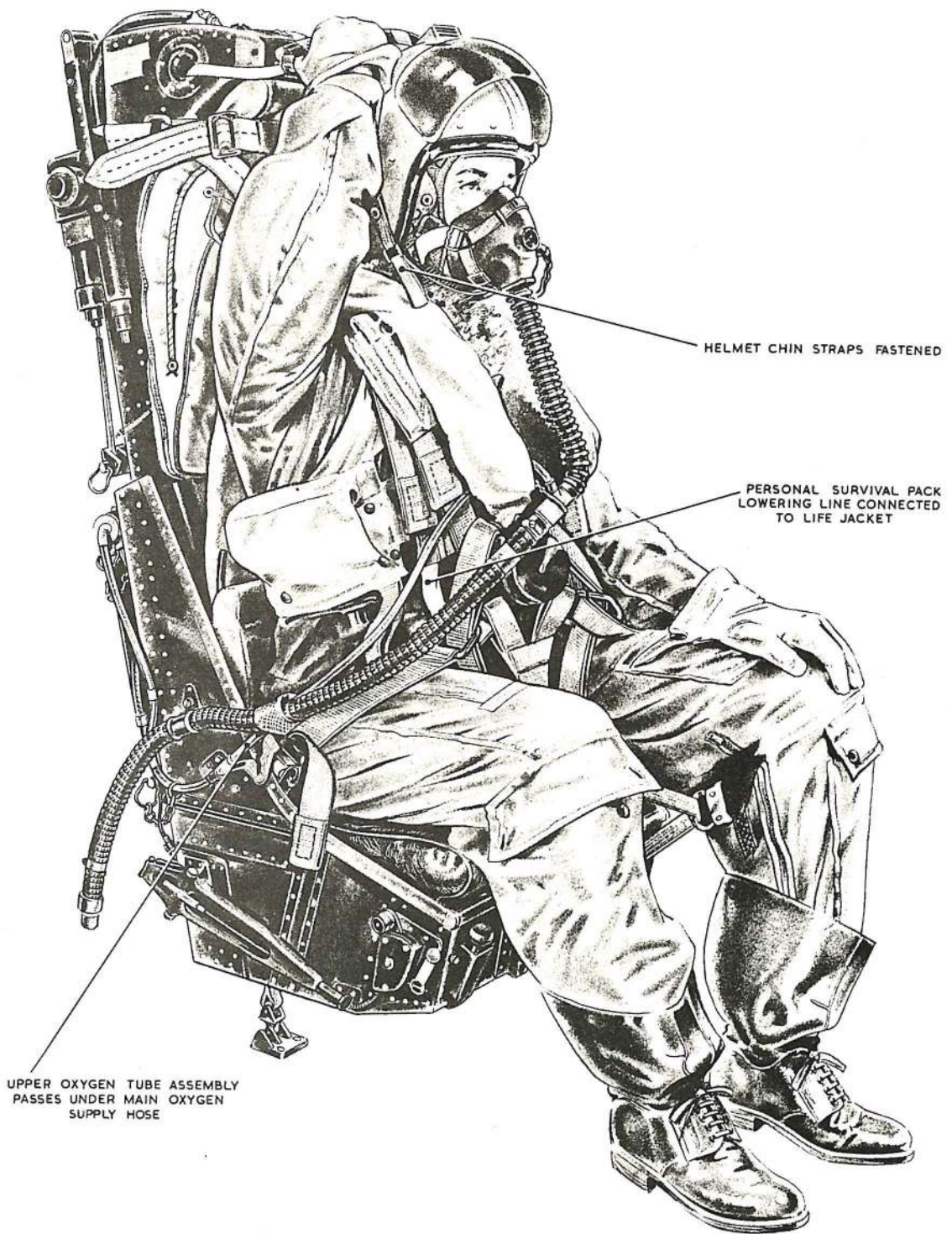


Fig. 8. The seat occupied (2)

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**TELEBRIEF
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