Chapter 1

SWIFT F.R.5

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LIST OF ILLUSTRATIONS

COMPOSITION OF THE ASSEMBLY

1. The aircrew equipment assembly for the Swift F.R.5 consists of the following items:—

Ejection seat	Mk. 2G.
Safety harness	Type ZF
Parachute assembly	Back type, Mk. 13
Personal survival pack	Type J.
Dinghy	S.S. Mk. 2 or 3.
Emergency oxygen set	Mk. 4A.
Flying clothing	See Sec. 1, Chap. 1.

The Mk. 2G ejection seat

2. The Mk. 2G seat is ejected from the aircraft by cartridge operated gun and slides in a guide rail attached to the aircraft structure. It incorporates the Type ZF safety harness, headrest cushion, footrests, parachute pack container, and a seat pan which houses the personal survival pack and the emergency oxygen set.

3. The seat pan is equipped with thigh-guards which, in conjunction with the footrests, are designed to prevent injury to the pilot due to the legs being blown apart by the air blast during ejection.

4. The seat is adjusted for height by a lever at the right of the seat pan; the plunger in the end of the lever must be depressed before the seat can be moved. The safety harness 'go-forward' release control is fitted on the outside of the starboard thigh guard, the knob being raised to disengage the harness lock.

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

6. Fully automatic facilities are provided to separate the pilot from the seat after ejection and to open the parachute after separation. A manual override control is fitted ◀ to the parachute harness waistbelt ▶ to disconnect the parachute automatic withdrawal device from the seat should the need arise to make (a) a manual bale-out from the aircraft or (b) a manual separation from the seat after ejection.

7. A full description of the Mk. 2G ejection seat will be found in A.P.4288, Vol. 1.

Connections to the aircraft

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

(1) *Left-hand side of seat:*

(a) Mic/Tel lead.

(b) Static rod from drogue gun.

(c) Anti-G suit air supply hose.

(2) *Right-hand side of seat:*

(a) Static line from barostatic time release unit.

(b) Static line from emergency oxygen cylinder operating head.

(c) Main oxygen supply hose.

EQUIPPING THE SEAT

9. The following procedure is to be adopted when equipping the seat; reference should be made to fig. 1. 2 and 3 for detail as necessary:

(1) Ensure that the safety pin is in position in the hole in the ejection gun sear.

(2) Place the safety harness shoulder straps over the top of the parachute pack container and ensure that the lap straps are clear of the seat pan.

(3) Ensure that the bottom edge of the apron is securely clipped to the lower extension of the parachute pack container.

(4) Tension the apron against its clips and insert the parachute pack into its container ensuring that the bottom edge of the pack is correctly located behind the corner plates of the container. Before pushing the pack fully home, connect the two halves of the parachute withdrawal line coupling. ◀ When installing the parachute assembly in the seat, ensure that the protruding stiff section of the drogue link line is folded towards the starboard side of the parachute container. ▶

(5) Push the parachute pack fully home into its container and fit the pack restraining straps into the clips on the sides of the container.

(6) Arrange the parachute harness to follow the inner contours of the seat pan. Check that the operating head of the emergency oxygen cylinder is to the right of the seat pan, that the operating cable and the supply tube both pass through the tunnel on the right of the parachute harness and that they are not kinked. The operating cable must emerge over the rear of the right-hand side of the seat pan and pass OUTSIDE the safety harness 'go-forward' release cable.

(7) Fit the parachute harness seat sticker straps into the clips on the sides of the seat pan.

(8) Connect the knurled and screwed union on the emergency oxygen cylinder operating cable to the corresponding union on the anchor section of the static line. Engage the end fitting of the operating cable housing with the anchor socket and connect the anchor hook to the static line-cum-manual operating cable.

(9) Remove and retain the safety pin from the operating head of the emergency oxygen cylinder and ensure that the "tell-tale" wire is unbroken.

(10) Place the survival pack on the parachute harness in the seat pan ensuring that the harness back pad is pulled upwards as much as possible. The flap carrying the lanyard must point to the front of the seat, the lanyard being draped over the right-hand front edge of the seat pan.

(11) Check that the anti-G suit air supply hose is fitted through the loop on the left lap strap of the safety harness.

(12) Remove the safety pin from the ejection gun sear and fit it through the firing handle safety strap.

STRAPPING-IN PROCEDURE

10. When strapping-in, the following procedure should be used; reference should be made to fig. 3. 4 and 5 for detail as necessary:

(1) Remove the safety pin from the firing handle safety strap and place it in the stowage on the left-hand side of the parachute pack container.

(2) Sit in the seat.

(3) Connect the survival pack lanyard to the life jacket ensuring that it passes OUTSIDE in the right thigh.

(4) Connect the survival pack side quick-release couplings to the life jacket.

(5) Connect the anti-G suit air supply hose ensuring that it passes OUTSIDE the lower left-hand strap of the parachute harness.

(6) Fasten and tighten the parachute harness ensuring that the right leg strap passes OVER the survival pack lanyard and that the shoulder straps pass UNDER the folds of the life jacket stole.

(7) Fasten and tighten the safety harness lap straps; then connect and tighten the shoulder straps.

(8) Put on the flying and protective helmets and fasten the chin straps.

Note . . .

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

(9) Connect the Mic/Tel lead to the socket on the left shoulder strap of the safety harness.

(10) Connect the main oxygen supply hose to the oxygen mask tube and adjust the hose to allow full movement of the head; the hose is clipped to the right lap strap of the safety harness.

(11) Pass the emergency oxygen supply tube under the right shoulder strap of the safety harness and connect it to the oxygen mask tube.

(12) Connect the oxygen mask tube locating chain to the D-ring on the life jacket.

(13) Adjust the height of the seat so that the head is correctly located in the centre of the headrest cushion.

(14) Check that the firing handle can be reached with both hands together; DO NOT DISPLACE THE HANDLE FROM ITS STOWAGE.

NORMAL EXIT FROM THE SEAT

11. The following procedure should be used when leaving the seat:—

(1) Disconnect the main and emergency oxygen supply pipes from the oxygen mask tube.

(2) Release the safety harness.

(3) Release the parachute harness.

(4) Disconnect the mic-tel lead at the left shoulder.

(5) Disconnect the anti-g suit air supply pipe and fit the blanking plug to the seat portion of the pipe.

(6) Disconnect the survival pack lanyard and side attachments from the life jacket.

(7) Stand up, extract the seat firing handle safety pin from its stowage and fit it through the firing handle safety strap.

(8) Climb out.

FORCED LANDING

12. When carrying out a forced landing, the aircraft should be handled in accordance with Pilot's Notes. Then proceed as follows:—

Note . . .

If time permits, actions (1), (2), (3) *and* (4) *below should be taken while still airborne; it is imperative that action* (5) *is carried out before touchdown.*

(1) When below 10,000 ft., disconnect the main and emergency oxygen supply pipe from the oxygen mask tube.

(2) Disconnect the survival pack lanyard and side attachments from the life jacket.

(3) Release the parachute harness.

(4) Disconnect the anti-g suit air supply pipe.

(5) TIGHTEN THE SAFETY HARNESS and lock it in the rear position.

(6) When the aircraft stops, release the safety harness and vacate the aircraft as quickly as possible.

(7) If, after a reasonable time, there are no signs of fire, return to the aircraft and INSERT THE EJECTION SEAT SAFETY PIN IN THE HOLE IN THE EJECTION GUN SEAR.

ABANDONING THE AIRCRAFT

13. When it becomes necessary to abandon the aircraft, the normal method is by ejection followed by automatic separation from the seat and automatic withdrawal of the parachute. However, the possibility of the seat failing to eject must be borne in mind although this will almost certainly be due to the use of an incorrect technique rather than failure of the seat itself. Similarly the possibility of failure of the mechanisms for automatic separation and parachute withdrawal must be considered. The following paragraphs give the procedure to be adopted in each case.

Note . . .

In each case, the aircraft is to be handled in accordance with Pilot's Notes.

Exit by ejection

14. To eject from the aircraft, proceed as follows:—

(1) Set the parachute pack container fully back.

(2) Withdraw the feet from the rudder pedals, place them on the footrests of the seat, and, at the same time, grasp the seat firing handle with both hands together, palms facing aft and elbows tucked in as much as possible.

(3) Pull the firing handle and the attached face-screen down firmly over the face keeping the head pressed well back into the headrest. IT IS MOST IMPORTANT THAT THE HANDS ARE KEPT CLOSE TO THE CHEST DURING THE LAST PART OF THIS MOVEMENT; if the handle is merely pulled out horizontally, the seat may not operate.

Sequence of events on ejection

15. As the seat ascends the guide rail, the following occurs:—

(1) The time delay mechanism for the drogue gun is actuated, the gun being fired after ½ sec.

(2) The time delay mechanism for the barostatic time release unit is actuated. If ejection takes place above 10,000 ft., the barostat prevents automatic separation from taking place until 3 sec. after that height is reached; if below 10,000 ft., separation should occur 3 sec. after ejection followed immediately by parachute withdrawal. ◀When Mod. No. Ejection Seat 610 has been incorporated, the time-delay mechanism is set at 1·25 sec. instead of 3 sec.▶

(3) The emergency oxygen cylinder is turned on, whether required or not.

(4) The main oxygen supply pipe is disconnected.

(5) The anti-g suit air supply pipe is disconnected.

(6) The mic-tel lead is disconnected at the rear of the seat.

16. If, following separation, the parachute fails to open automatically, lift the flap over the parachute rip-cord D-ring, grasp the D-ring in the right hand and, having checked any somersaulting, pull the D-ring across the body. For control of the parachute during descent and landing, refer to Sect. 1, Chap. 3.

Manual bale-out

17. If the seat fails to eject, a manual bale-out must be made as follows:—

(1) Pull the over-ride D-ring on the parachute harness.

(2) Disconnect the anti-g suit air supply pipe.

(3) Disconnect the seat sticker straps for the parachute harness from the clips on the sides of the seat pan.

(4) Operate the manual control for the emergency oxygen cylinder.

Note . . .

If time is vital, this action may be ignored as the cylinder should be turned on automatically as the occupant leaves the seat.

(5) Disconnect the main oxygen supply pipe from the oxygen mask tube.

(6) After the aircraft has been rolled into the inverted position, release the safety harness and fall clear.

(7) Lift the flap over the parachute rip-cord D-ring, grasp the D-ring in the right hand and, having checked any somersaulting, pull the D-ring across the body.

18. For control of the parachute during descent and landing, refer to Sect. 1, Chap. 3.

Manual separation from the seat after ejection

19. If ejection takes place above 10,000 ft., automatic separation will not occur until 3 sec. after that height has been reached; if below 10,000 ft., automatic separation should occur 3 sec. after ejection. ◀When Mod. No. Ejection Seat 610 has been incorporated, the time-delay mechanism is set at 1·25 sec. instead of 3 sec.▶ The approximate time to descend to 10,000 ft. is given in Sect. 1, Chap. 3 to which reference should be made.

20. If it is suspected that the automatic separation mechanism is not functioning, a manual separation from the seat must be made using the following procedure:—

(1) Discard the face-screen and disconnect the main oxygen supply tube from the oxygen mask tube.

(2) Pull the manual over-ride D-ring on the parachute harness.

(3) Disengage the seat sticker straps for the parachute harness from the clips on the sides of the seat pan.

Note . . .

If saving of time is essential, items (1) *and* (3) *above may be ignored as they should separate as the pilot leaves the seat.*

(4) Release the safety harness and fall clear of the seat.

(5) Lift the flap over the parachute rip-cord D-ring, grasp the D-ring in the right hand and, having checked any somersaulting, pull the D-ring across the body. For control of the parachute during descent and landing, refer to Sect. 1, Chap. 3.

Note . . .

It is vital to concentrate all the faculties on operating the manual over-ride D-ring, releasing the safety harness and pulling the rip-cord; the seat will probably be spinning and the occupant therefore confused.

DITCHING

21. During ditching, the aircraft should be handled in accordance with Pilot's Notes. The procedure is as follows:—

(1) *Before touch down:—*

(a) Check that 100 per cent. oxygen is selected and deflect the regulator emergency toggle switch sideways.

(b) Disconnect the emergency oxygen supply pipe from the oxygen mask tube.

(c) Release the parachute harness.

(d) Disconnect the anti-g suit air supply pipe.

(e) Check the survival pack lanyard and side attachments to the life jacket for security.

(f) Disconnect the oxygen mask tube locating chain from the life jacket.

(g) TIGHTEN THE SAFETY HARNESS and lock it in the rear position.

(2) *After touch-down:—*

(a) When the aircraft stops, release the safety harness, disconnect the main oxygen supply pipe from the oxygen mask tube, and vacate the aircraft as quickly as possible, inflating the life jacket when clear of the cockpit coaming.

(b) To inflate and board the dinghy refer to Sect. 1, Chap. 4.

22. If the aircraft dives under before stopping, an underwater escape is perfectly feasible and safe if the following points are observed:—

(1) The temptation to fill the lungs to the maximum before disconnecting the oxygen tube MUST be resisted.

(2) It is essential to breathe out on the ascent; whistling is a good method of doing this.

(3) Every endeavour must be made to regulate the ascent so as not to overtake one's bubbles. This will ensure that the rate of ascent is not too high.

(4) The life jacket must be inflated.

WARNING...

Unless these precautions are observed, injury to the lungs may result. Failure to breathe out steadily during the ascent results in the air expanding in the lungs and bursting them; there may be no symptoms of the impending injury. When the lungs are only partially filled with air, the expansion during a correctly regulated ascent ensures that sufficient air is available for escape from a considerable depth and, furthermore, there is no desire to breathe in.

23. An underwater ejection may be carried out as a last resort but, as yet, little is known of the behaviour of the seat underwater.

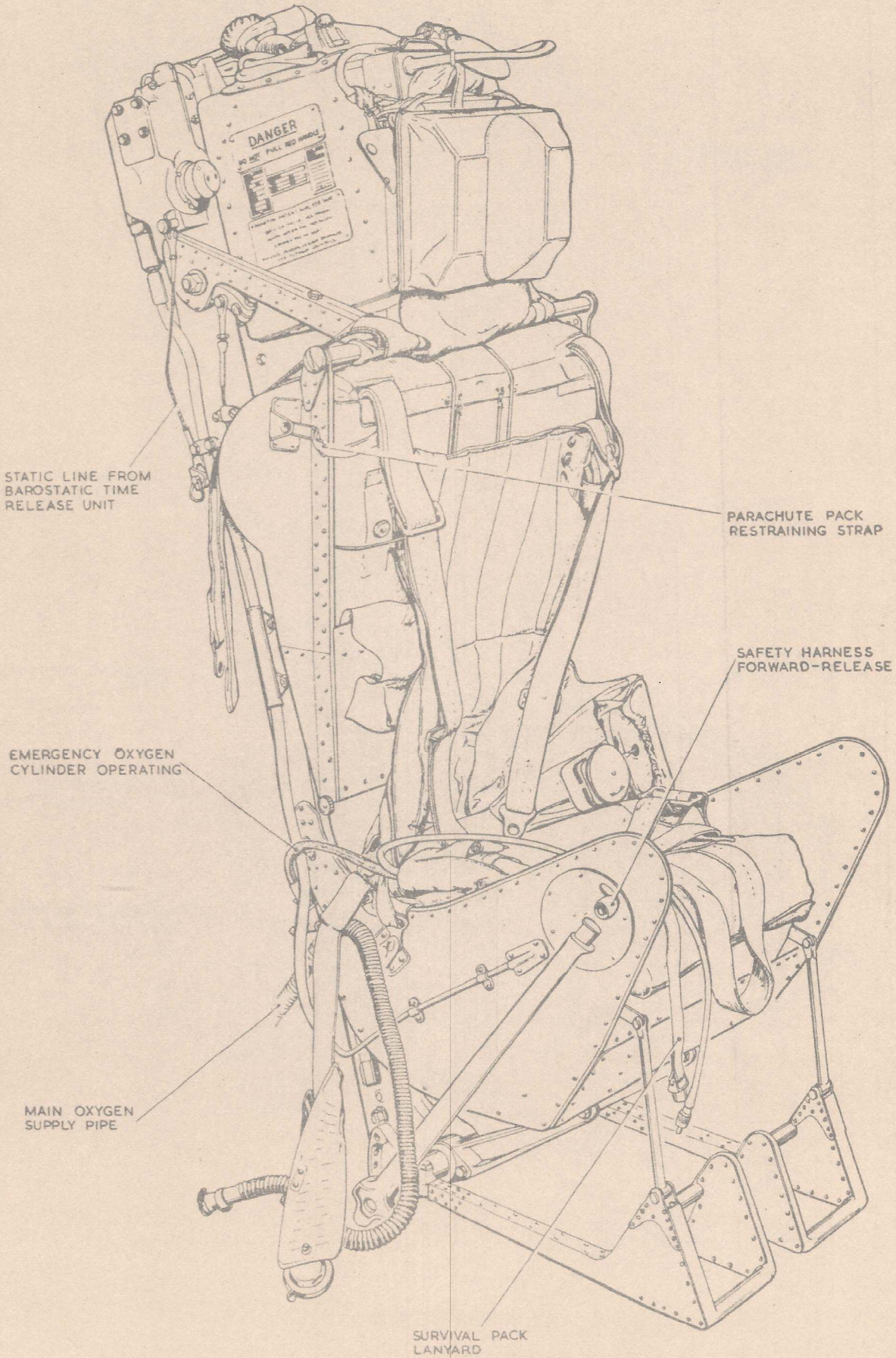

Fig. 1. The seat equipped (1)

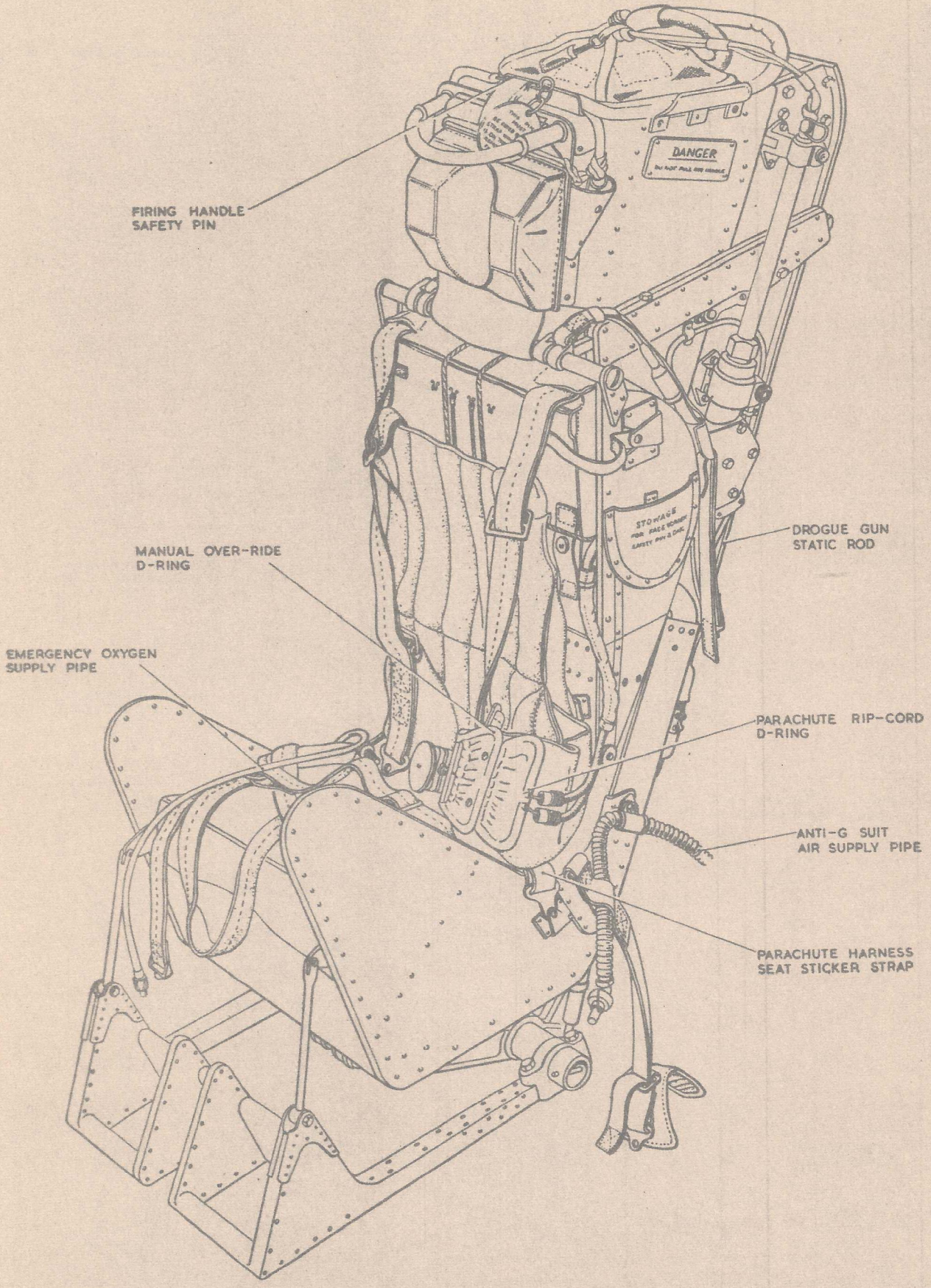

Fig. 2. The seat equipped (2)

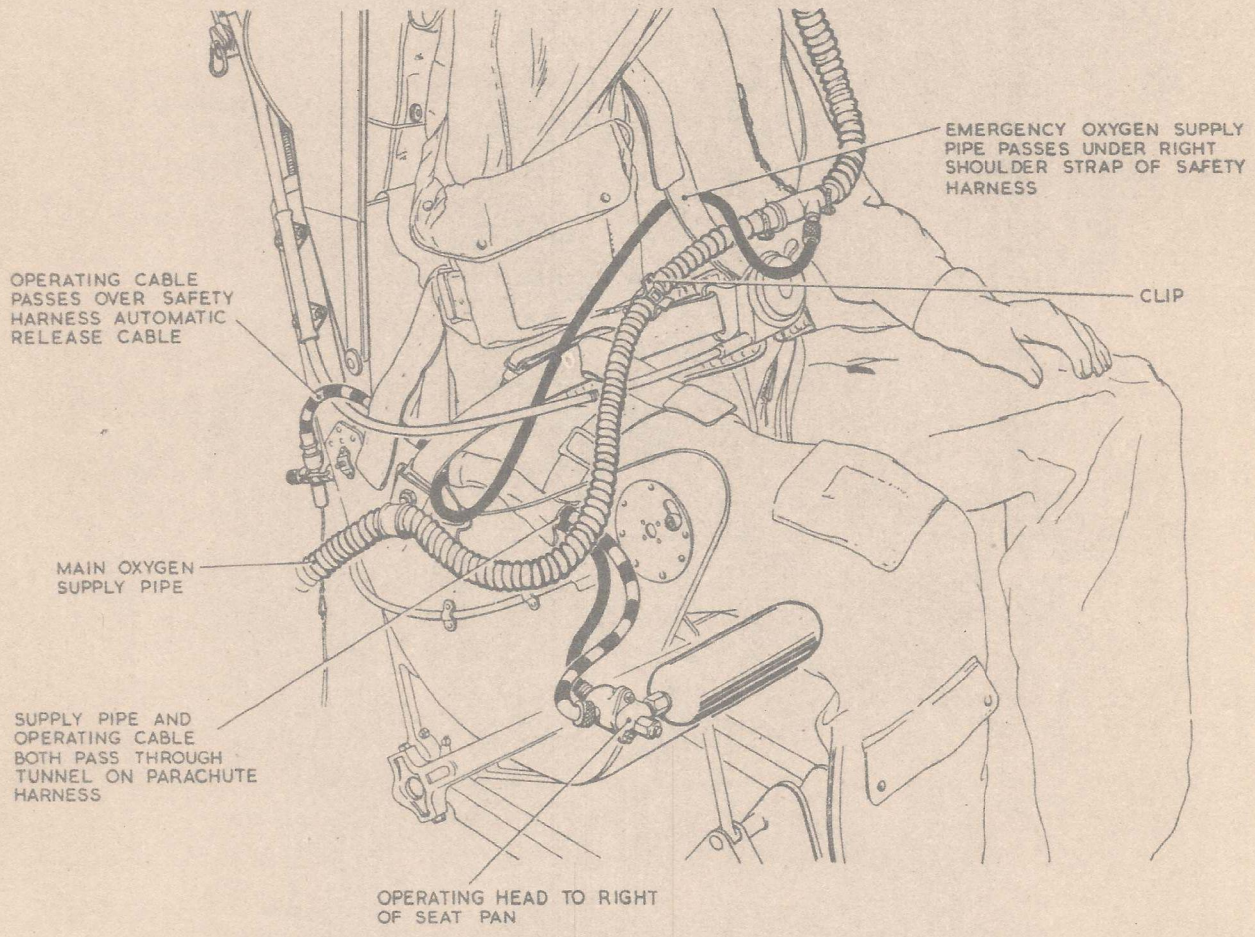

Fig. 3. Arrangement of oxygen pipes on the seat

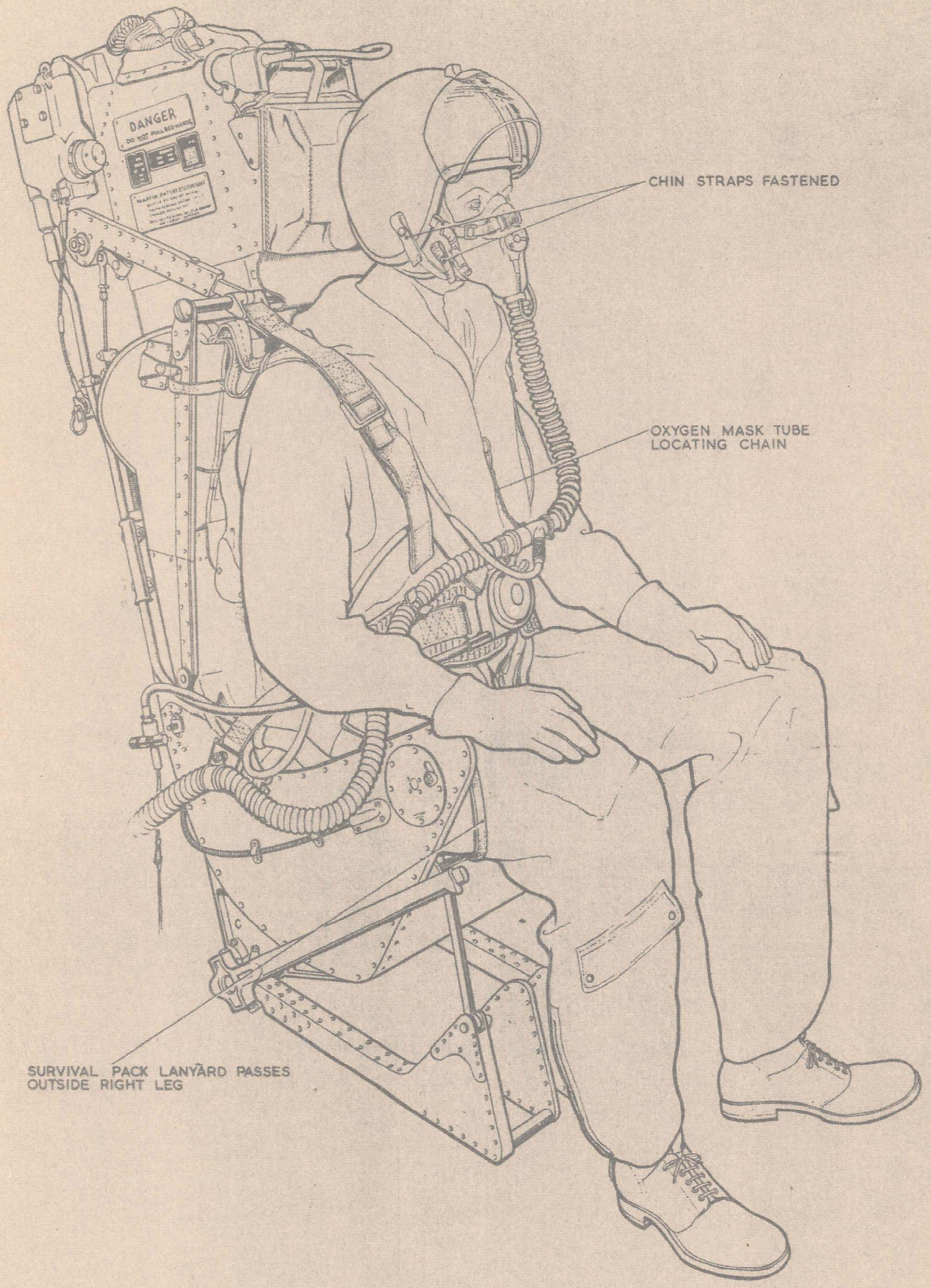

Fig. 4. The seat occupied (1)

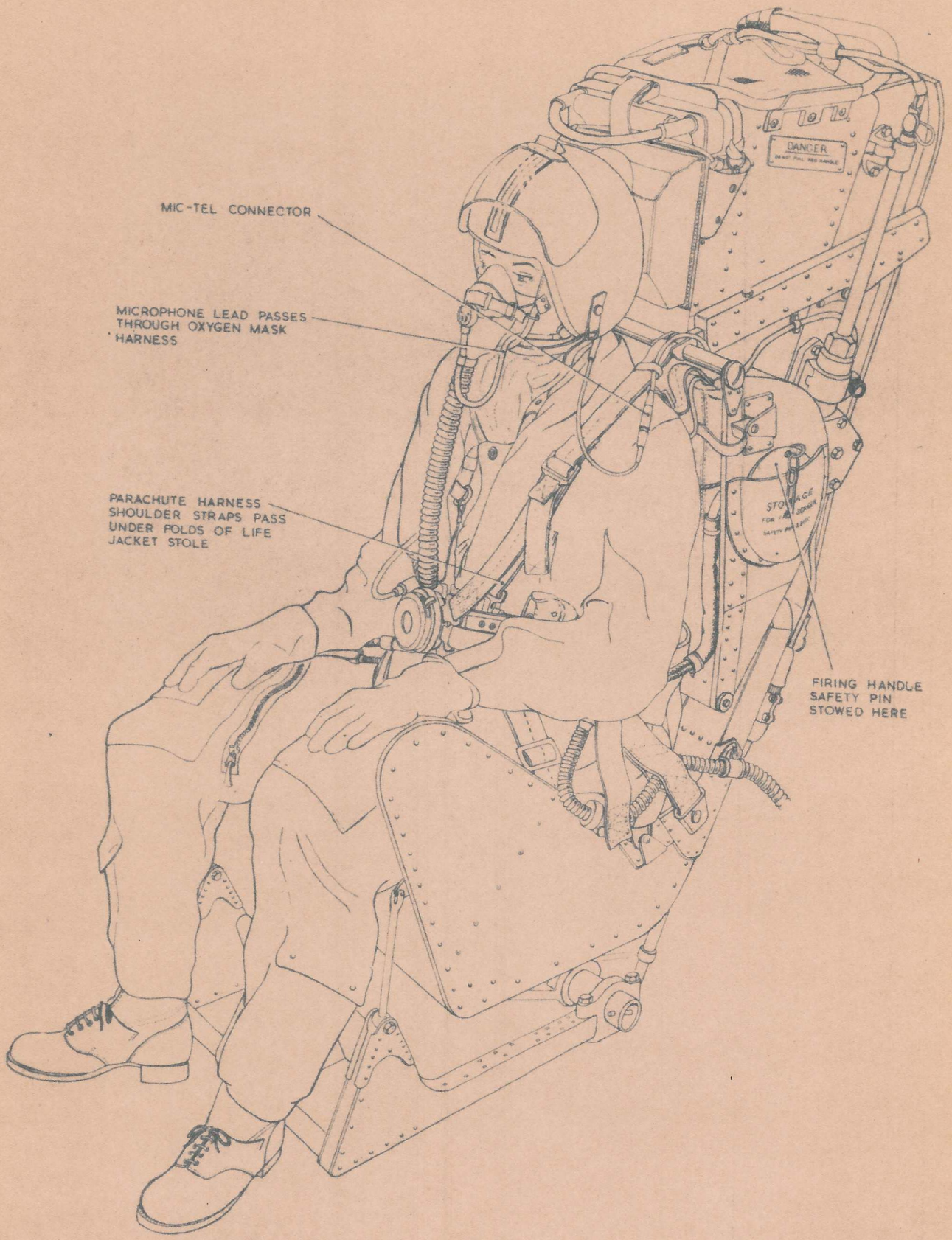

Fig. 5. The seat occupied (2)

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