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Appendix 2

AIRCRAFT FITTED WITH TYPE 4HA EJECTION SEATS

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. Type 4HA Mk. 1 seats are being fitted to the Hunter T Mk. 7 by aircraft modifications. When modifications are embodied, details of the aircrew equipment assembly are contained in this appendix.

COMPOSITION OF THE ASSEMBLY

2. Two aircrew assemblies are provided, but as they are identical, reference will be made to one assembly only throughout this appendix.

3. The assembly comprises the following items:—

Ejection seat	Type 4HA Mk. 1
Parachute assembly	Back type Mk. 41
Personal survival pack	Type R
Emergency oxygen set	Mk. 7B
Flying clothing	See Appendix 1

Type 4HA Mk. 1 seat

4. The Type 4HA seat is ejected by a cartridge-operated gun. During ejection, it slides in two guide rails attached to the cylinder tube of the ejection gun, the rails being fitted with brackets which enable the gun to be fitted to the aircraft structure. It should be noted that low level ejection may be made with either seat if necessary.

5. A combined safety and parachute harness is used in conjunction with the seat, it is a component of the parachute assembly and is attached to the seat at three quick-release points. A personal survival pack is housed in the seat pan where it forms a cushion for the occupant; in addition, a comfort cushion is fitted to the seat strap of the combined harness and rests on the survival pack.

6. An emergency oxygen supply is carried in a cylinder clamped to the rear of the seat pan; the end-fitting of the supply tube from this cylinder is fitted into a clamp on the starboard side of the seat pan and an emergency oxygen upper tube assembly is fitted to the supply tube to convey the oxygen to the user's mask. A stirrup quick-release fitting disconnects the upper tube assembly from the supply tube as the

occupant is separated from the seat after ejection. The emergency oxygen supply is turned on automatically during ejection by a trip lever mounted on the back of the seat pan; a manual control knob on the front of the seat pan enables the supply to be turned on during flight if desired.

7. Leg restraint cords are fitted through snubbing units under the front of the seat pan to ensure that the legs are drawn back to the seat and held there during ejection, thereby preventing injury due to the legs being blown apart by air blast. One end of each leg restraint cord is secured to a floor anchorage bracket by a shear pin; the other end of each cord is provided with a taper plug which is fitted into a spring loaded taper socket in the front of the seat pan. The taper plugs are released automatically during separation after ejection, but, a lever is provided on the starboard side of the seat which, when operated, enables the leg cords to be released without unlocking the main harness locks when leaving the seat after flight.

8. Seat height is adjusted by a lever at the starboard side of the seat pan; the plunger in the end of the lever must be depressed before the seat can be raised or lowered. The harness 'go-forward' lever is fitted to the forward end of the port side of the seat pan; operation of the lever to the fully forward position followed by release to the central position, permits the occupant to move forwards and backwards at will. Movement of the lever to the rear position prevents further forward movement of the occupant and, as he leans back, the slack in the webbing strap is taken up and held firmly.

9. Two firing handles are fitted to each seat. The face screen handle projects from the front of the drogue container and has an integral screen which protects the face from air blast during ejection. The seat pan firing 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 firing handle, e.g. when subjected to high G forces.

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

11. Fully automatic facilities are provided to withdraw the parachute canopy and separate the occupant from the seat after ejection. In the event of failure of the automatic facilities, a manual separation lever is provided on the port side of the seat pan, which when operated releases the occupant from the seat. The manual separation lever is held in a gate to reduce the risk of accidental operation and requires pressing inwards against a spring before it can be operated.

12. As the occupant separates from the seat after operation of the manual separation lever, a static line attached to the rear of the parachute pack withdraws the sear from the guillotine gun, causing the guillotine to operate and sever the parachute withdrawal line, thus separating the seat structure from the parachute. The parachute is then deployed by pulling the D-handle of the parachute rip cord attached to the waistband of the harness.

13. A full description of the Type 4HA seat will be found in A.P.4288D, Vol. 1; detailed information concerning the back type Mk. 41 parachute assembly, and the type R personal survival pack will be found in A.P.1182A, Vol. 1 and A.P.1182C, Vol. 1, respectively.

Connections to the aircraft

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

(1) *Port side of seat:–*

(a) Mic/Tel lead.

(b) Static line from drogue gun.

(c) Anti-G suit air supply hose.

(2) *Starboard side of seat:–*

(a) Main oxygen supply hose.

(b) Static rod from barostatic time-release unit.

(3) *Front of the seat:–*

(a) Leg restraint cords.

(4) *Top of the seat:–*

(a) Canopy jettison unit operating cable.

EQUIPPING THE SEAT

15. Before equipping the seat, ensure that the following safety precautions have been taken.

(1) Safety pins inserted in sears of canopy jettison mechanism and ejection gun breech.

(2) Safety pin inserted in drogue gun safety lock.

(3) Safety pin inserted in guillotine gun sear.

(4) Safety pin inserted in seat pan firing handle.

16. The following procedure is to be used when installing the equipment in the seat, reference being made to fig. 1 to 7 inclusive for detail as necessary.

(1) Fit the emergency oxygen cylinder into its clamping brackets on the rear of the seat pan. Secure the supply tube end fitting in the clamp on the starboard side of the seat pan and fit the tube into the spring clip on the rear of the seat pan (*fig.* 3).

(2) Ensure that the emergency oxygen supply manual control knob on the starboard side of the front face of the seat pan is pushed down fully; connect the operating cable from the cylinder head to the actuating arm on the rear of the seat pan, with the pip pin secured to the seat structure by a short length of chain (*fig.* 3).

(3) Place the parachute pack on its support bracket on the seat structure, threading the guillotine static line through the grommeted aperture in the back of the seat structure and ensuring that the harness straps are not twisted.

(4) Open the paddle spreaders and pass the 'O' ring of each parachute pack restraining strap over its appropriate spreader. Ensure that each 'O' ring is pushed well back towards the pivot end of its spreader paddle and close the spreaders inwards towards each other as far as they will go.

(5) Push the harness 'go-forward' lever fully forward, release it to its centre position and pull out the webbing strap of the top harness lock. Pass the strap downwards through the yoke on the harness shoulder straps, ensuring that the yoke is in its natural position and that the straps are not twisted.

(6) Insert the lug on the end of the webbing strap between the extremities of the paddle spreaders and into the attachment point on the back of the seat. Push the lug in until it locks in position.

(7) Connect the two halves of the parachute withdrawal line/link line coupling. Open the yellow spring loaded hinged guard at the top of the guillotine and route the parachute withdrawal line through the guillotine aperture. Close the guard and ensure that it correctly retains the withdrawal line. Ensure that the drogue withdrawal line passes over the drogue link line (*fig.* 4).

(8) Position the wedge pad on the parachute pack and ensure that it fits correctly under the drogue container.

(9) Pass the port side parachute pack restraining strap over the top of the pack, over the parachute withdrawal line, through the buckle on the short strap at the port side of the drogue container and then forward through the buckle on the port side of the wedge pad. It is important that the parachute withdrawal line/link line coupling is routed OUTSIDE the short strap (*fig.* 4).

Note . . .

When passing the strap through the buckle on the short strap at the side of the drogue container, ensure that it passes through the buckle from the outside inwards (fig. 4).

(10) Pass the starboard side parachute pack restraining strap over the top of the parachute pack, through the buckle on the short strap at the starboard side of the drogue container and then forward through the buckle at the starboard side of the wedge pad. Refer to the note following sub-para. (9).

(11) Fully tighten the port pack restraining strap and then the starboard strap, so that the pack and wedge pad are held firmly in the seat.

(12) Attach the guillotine static line to the sear of the guillotine.

(13) Thread the white 'Y' piece of the negative-G strap through the bracket at the front of the seat pan and through the brackets at the rear, then position each loop over its corresponding harness attachment lug on the back of the combined harness. Insert each harness attachment lug into its seat pan lock, so that it locks into position.

Note . . .

The legs of the white 'Y' piece of the negative-G strap are marked 'PORT' and 'STARBOARD' and it is essential that they are so positioned to ensure that the strap is installed correctly.

(14) Lift the harness straps and place the personal survival pack in the seat pan. Drape the lowering line over the port side of the pan and connect the quick-release couplings on the pack to their mating members on the harness.

(15) Insert the harness sticker straps into the clips on the inside of the seat pan; ensure that the straps pass outside the personal survival pack side quick-release couplings.

(16) Arrange the harness and auxiliary cushion on the personal survival pack; ensure that the straps are not twisted.

(17) Pass the end fitting of the emergency oxygen upper tube assembly through the stirrup quick-release fitting and connect it to the supply tube fitting. Check the connection for security of attachment.

(18) Remove and retain the safety pin from the emergency oxygen cylinder operating head.

(19) After the seat has been equipped, it is to be restored to the "before flight" condition as follows:–

(a) Remove the safety pin from the drogue gun safety lock and reconnect the drogue gun static rod to the bracket attached to the ejection gun.

(b) Remove the safety pin from the sear of the ejection gun and insert the safety pin into the face screen firing handle.

(c) Check that the safety pin is still in position in the seat pan firing handle.

STRAPPING-IN PROCEDURE

17. The procedure is as follows; refer to fig. 5, 6 and 7 for detail as necessary:–

(1) Ensure that the safety pins are fitted through the face screen and seat pan firing handles and remove the safety pins from the canopy jettison sear and the guillotine sear.

(2) Sit in the seat.

(3) Connect the lowering line of the personal survival pack to the life-jacket; ensure that the line passes OUTSIDE the left leg.

(4) Connect the anti-G air supply hose to the suit.

(5) Thread the leg restraint cords through the quick-release couplings of the garters as follows:–

(a) The cord from the starboard snubbing unit is threaded through the garter coupling on the left leg and the end fitting of the cord is then plugged into the starboard taper socket (on the front of the seat pan).

(b) The cord from the port snubbing unit is threaded through the garter coupling on the right leg and the end fitting of the cord is then plugged into the port taper socket.

This will result in crossing the cords; it does not matter which cord is in front, but they must not be interlaced (*fig.* 5).

Note . . .

If there is insufficient length of either cord, pull forward on the ring in the front of the appropriate snubbing unit to release and withdraw more cord.

(6) Pull back any excess of leg restraint cord through the snubbing units, leaving enough slack for full rudder movement.

(7) Bring the harness waistbelt across the body. Adjust the quick-release fitting so that it lies central with the waistbelt close to the body.

(8) Ensure that the blue 'Y' piece of the negative-G strap is positioned to the REAR of the seat pan firing handle and DOES NOT PASS THROUGH THE FIRING HANDLE. Pass the right-hand lap strap lug through the loop in the right-hand fork. Clip the lug of the lap strap into the quick-release fitting.

(9) Pass the left-hand lap strap lug through the loop in the left-hand fork. Clip the lug into the quick-release fitting.

(10) When correctly assembled, the two loops of the 'Y' piece cover the lap strap lugs on each side of the quick-release fitting (*fig.* 5). Tension the negative-G restraining strap and tighten the lap straps; it is most important that these are really tight, since they provide the principal restraint under all stress conditions. To tension the negative-G strap, pull DOWNWARDS on the blue strap. To loosen, pull DOWNWARDS on the yellow tab attached to the buckle.

(11) Bring the leg loops up between the legs and thread the left loop through the metal eye on the left lap strap; thread the right loop through the metal eye on the right lap strap. If twisted correctly, the leg loops will lie flat on the inside of the thighs.

(12) Remove the ends of the shoulder straps from the stowed position and arrange them under the life-jacket stole. Thread the end fittings through the leg loops and connect them to the quick-release fitting. The leg loops are to engage on the metal end fittings and not on the webbing above them, so that they will disengage freely on operating the quick-release fitting. To facilitate this engagement the shoulder straps should be fully extended (*fig.* 5).

(13) Tighten the blue inner (underneath) shoulder straps of the harness, then tighten the brown outer (top) shoulder straps. When tightening harness straps, pull on the running end with one hand to relieve the tension on the buckle. After the first tightening, move the body about inside the harness and then re-tighten, repeating this process until the harness is really tight. Do not however, overtighten the shoulder straps, as this causes the back to arch, which is a bad attitude for ejection.

(14) This tightening will ruck the section of the lift webs lying between the inner and outer straps. The assistance of a ground-crew member should be obtained to pull back the lift webs through the metal runners on the shoulders and then stow the excess neatly, by lengthening the loops in the lift webs behind the back.

(15) Put on the flying and protective helmets, and fasten the chin straps. Fit and tighten the oxygen mask.

Note . . .

If the chin straps are not fastened,

the helmets may be wrenched off during ejection; at high altitudes this would mean the loss of vital oxygen supply.

(16) Connect the main oxygen supply hose to the oxygen mask tube, and adjust the hose in the becket on the harness lap strap to achieve unrestricted head movement.

(17) Connect the emergency oxygen upper tube assembly to the oxygen mask tube.

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

(19) Adjust the seat height to bring the head in the centre of the wedge pad.

(20) Connect the Mic/Tel lead.

(21) Close the cockpit hood.

(22) The occupant of the port seat removes the safety pin from the face screen firing handle of the starboard seat, and the safety pin from his own seat pan firing handle.

The occupant of the starboard seat removes the safety pin from the face screen firing handle of the port seat and the safety pin from his own seat pan firing handle. The pins are then placed in their respective stowages.

EMERGENCIES

18. Instructions for dealing with emergencies are contained in A.P.4347G–P.N.

LEAVING THE AIRCRAFT AFTER LANDING

19. When leaving the aircraft after landing the following procedure should be used:–

(1) Before opening the cockpit hood, remove the safety pins from their stowages and fit them into the face screen and seat pan firing handles. The occupant of the port seat fits the pin into the starboard seat face screen firing handle and vice versa.

The occupant of each seat fits the safety pin in his own seat pan firing handle.

(2) Disconnect the main and emergency oxygen supplies from the oxygen mask tube.

(3) Disconnect the Mic/Tel lead.

(4) Operate the harness quick-release fitting, free the straps, and return the quick-release fitting to the locked position.

(5) Operate the leg restraint cord release lever on the starboard side of the seat pan and remove the leg restraint cords from the garters. Alternatively, the legs may be released by operating the quick-release couplings on the garters and leaving the male components on the leg restraint cords; in this instance the leg line release lever is not to be operated.

(6) Disconnect the personal survival pack lowering line from the life-jacket.

(7) Disconnect the anti-G suit air supply hose from the suit and fit the blanking plug in the end of the hose.

(8) Leave the cockpit and insert the safety pins in the sears of the guillotine and canopy jettison mechanism before leaving the aircraft.

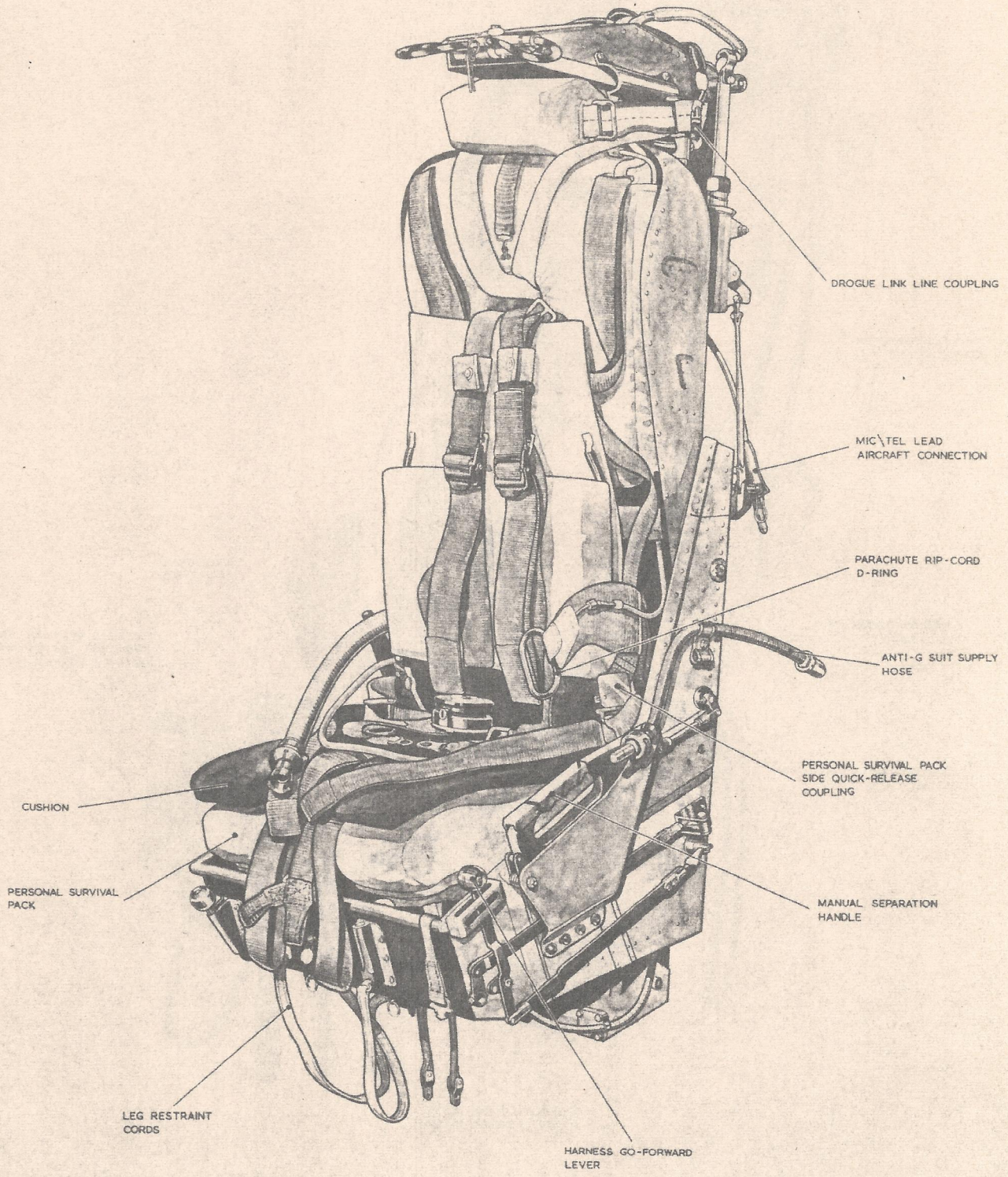

Fig. 1. The Type 4HA Mk. 1 seat equipped (1)

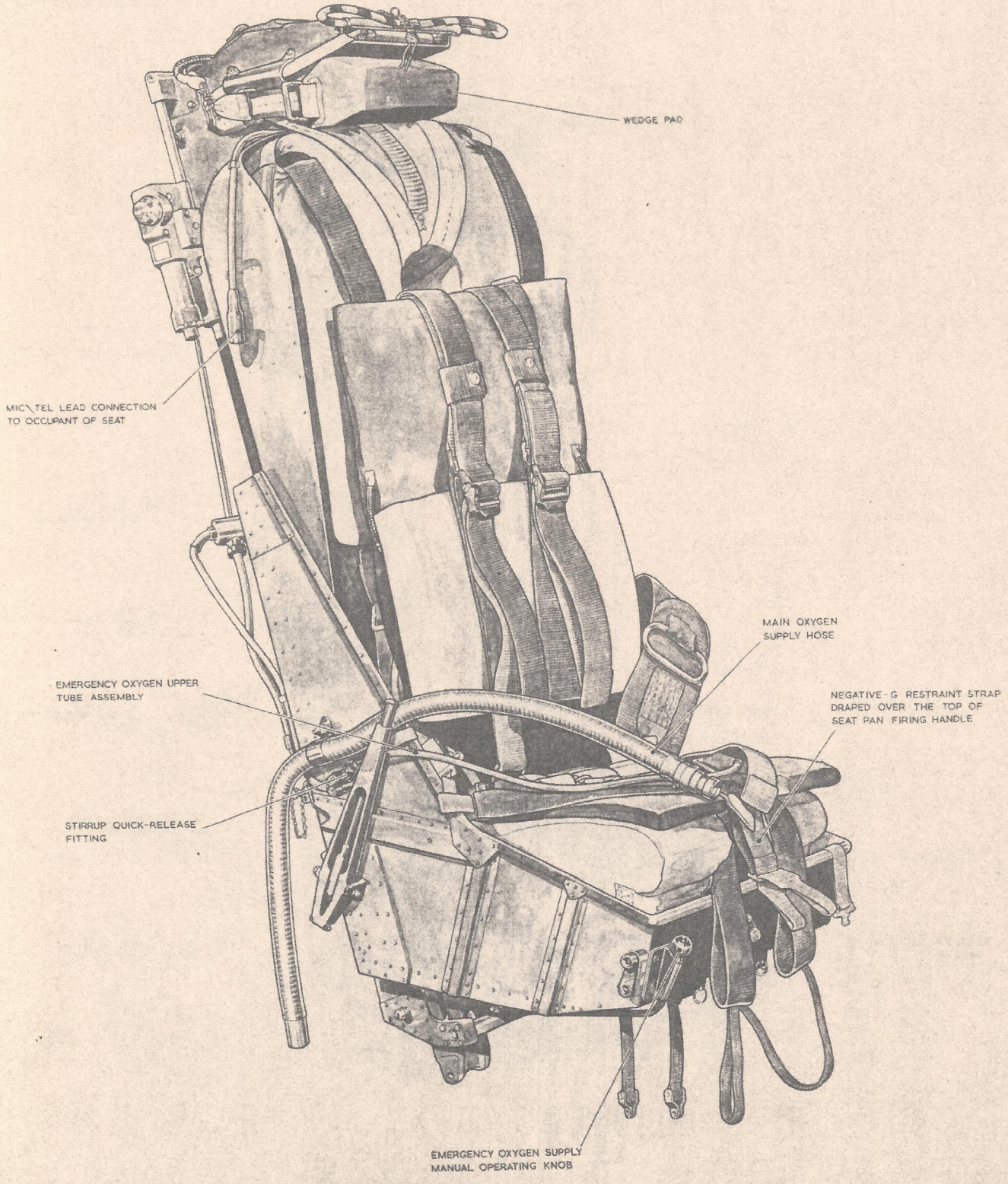

Fig. 2. The Type 4HA Mk. 1 seat equipped (2)

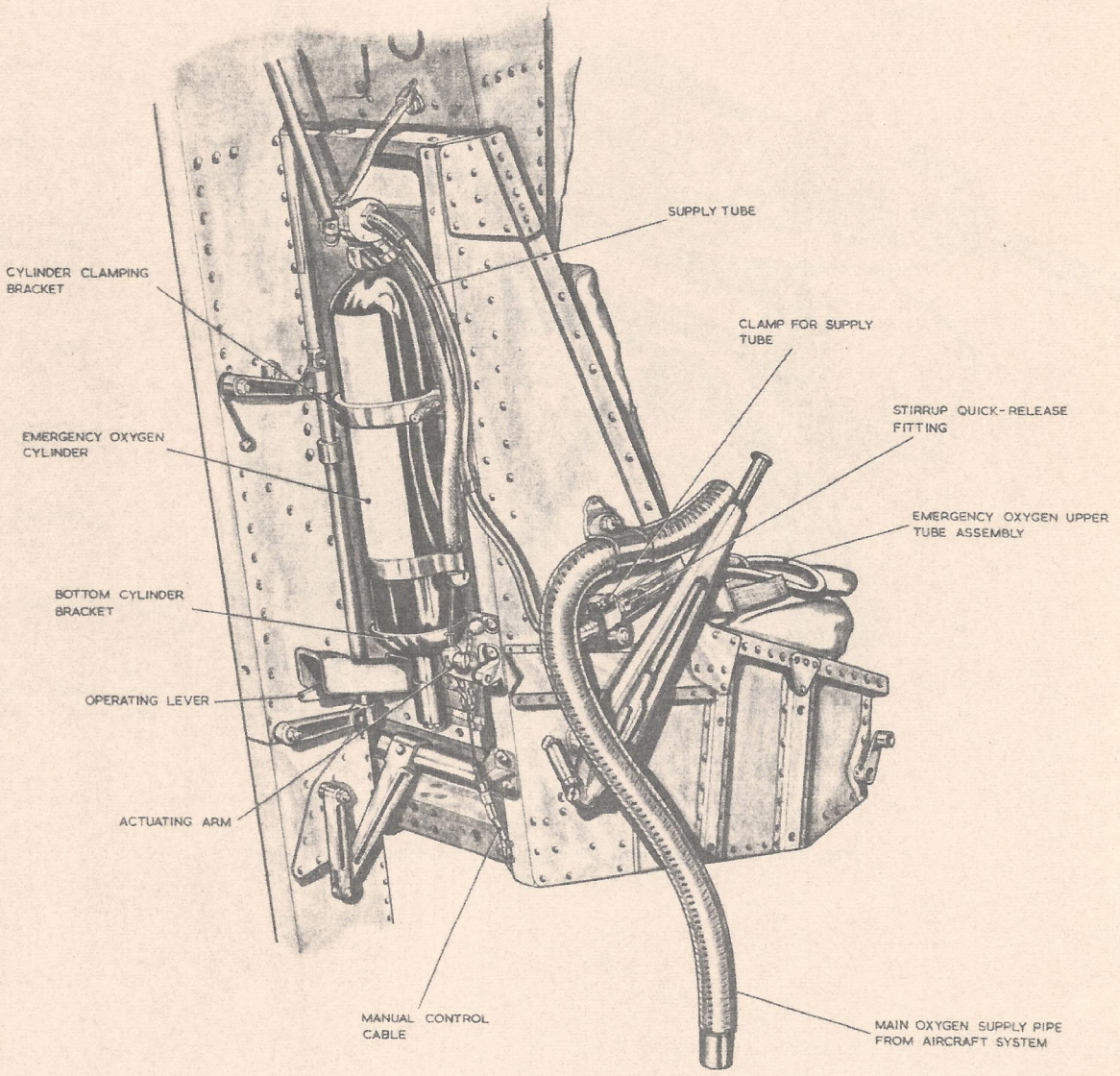

Fig. 3. Arrangement of oxygen supply on seat

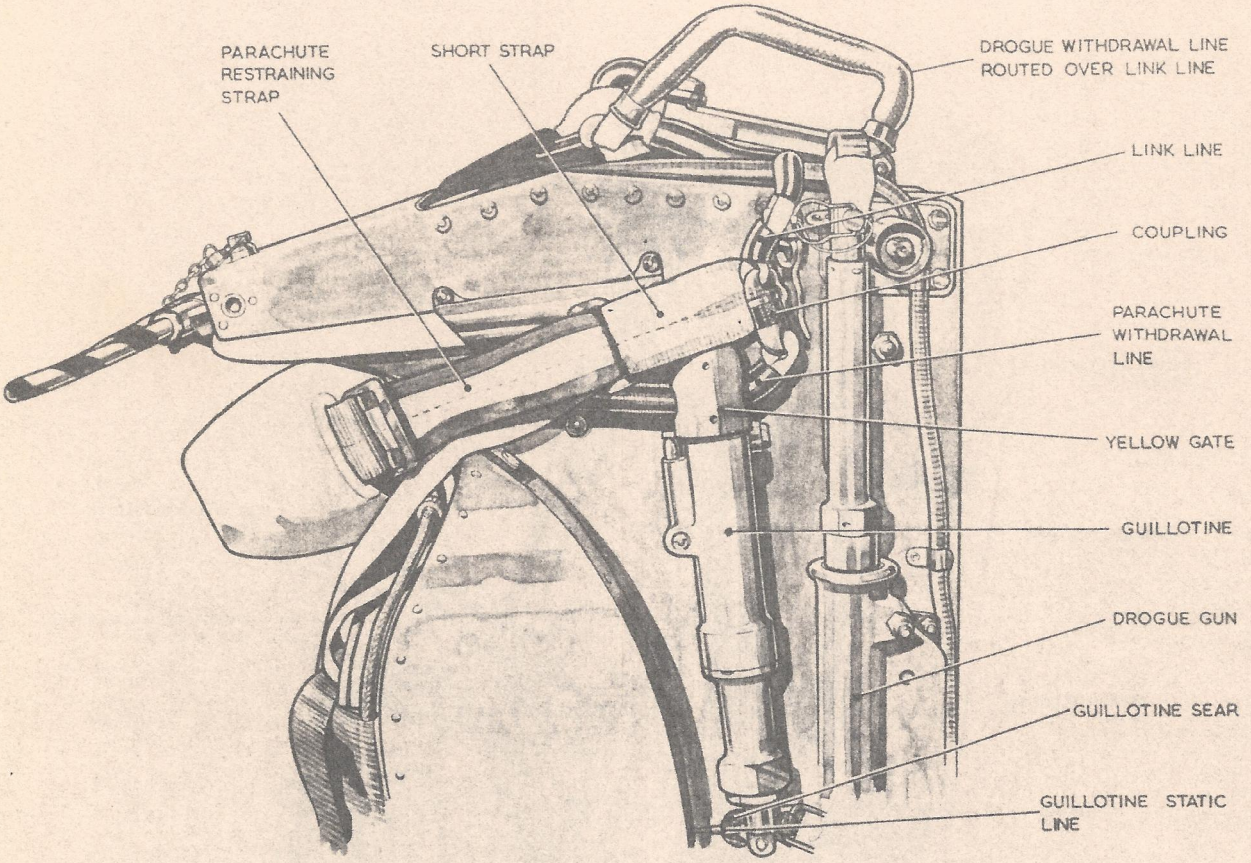

Fig. 4. Arrangement on port side of drogue container

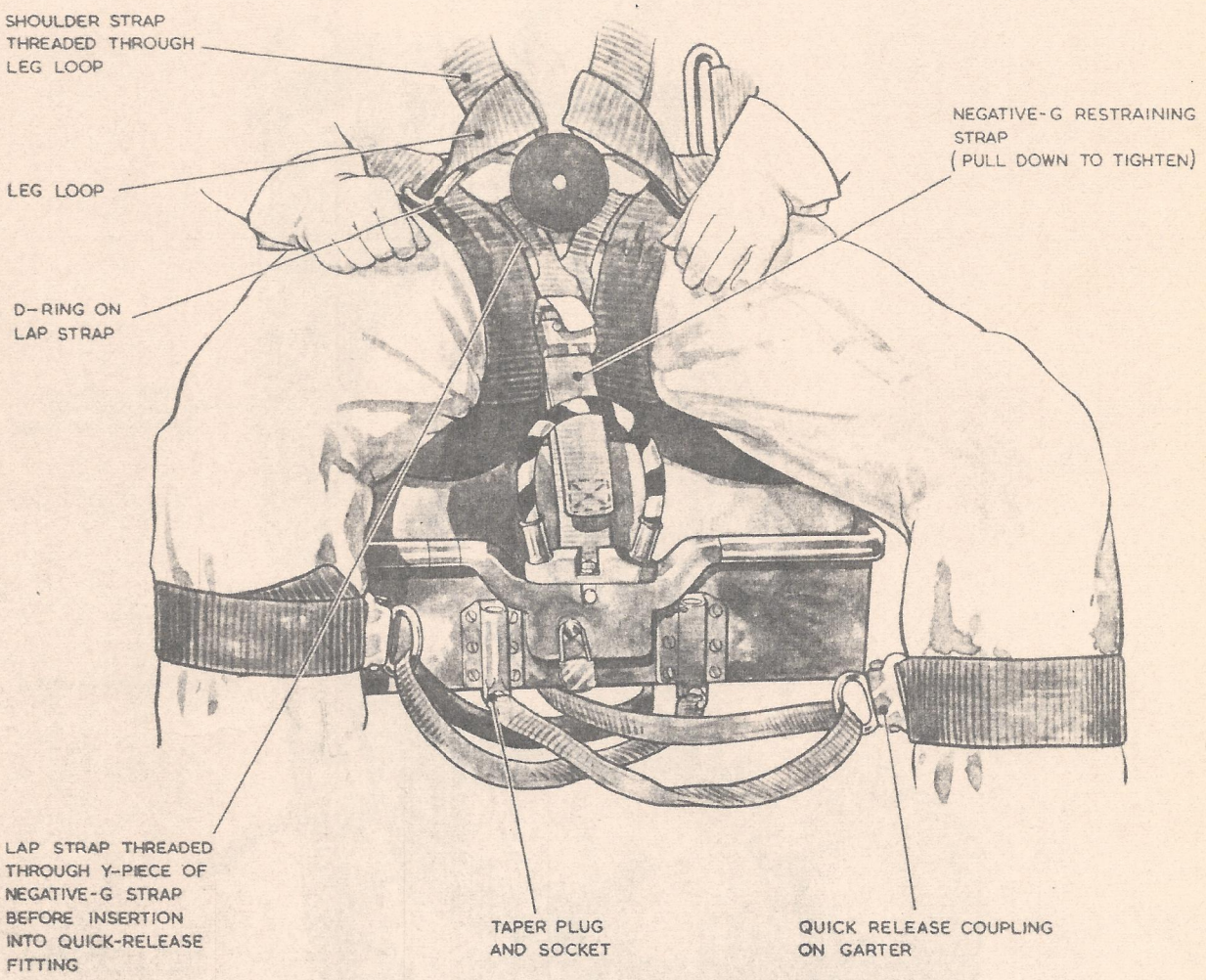

Fig. 5. Arrangement of leg restraint cords and harness

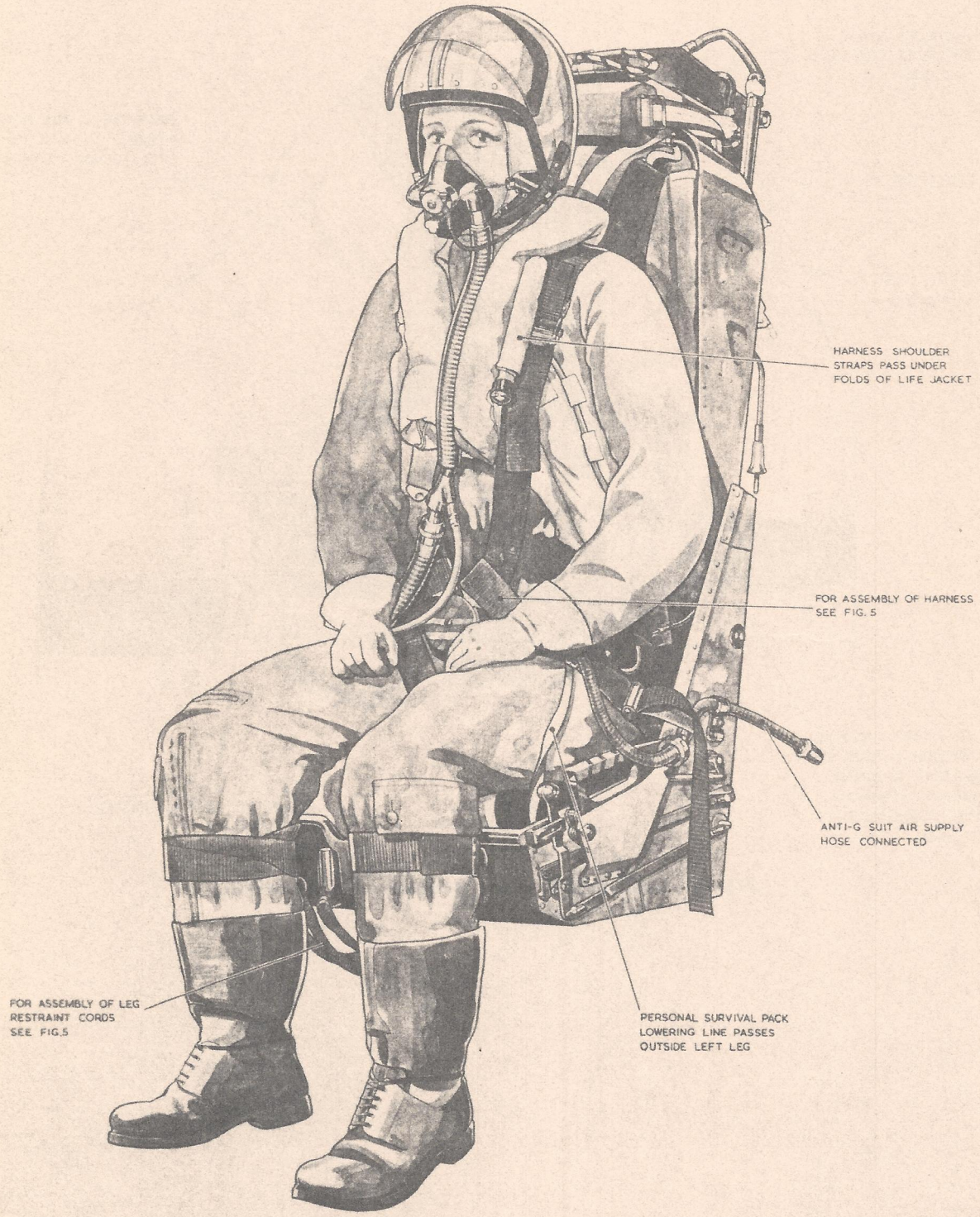

Fig. 6. The Type 4HA Mk. 1 seat occupied (1)

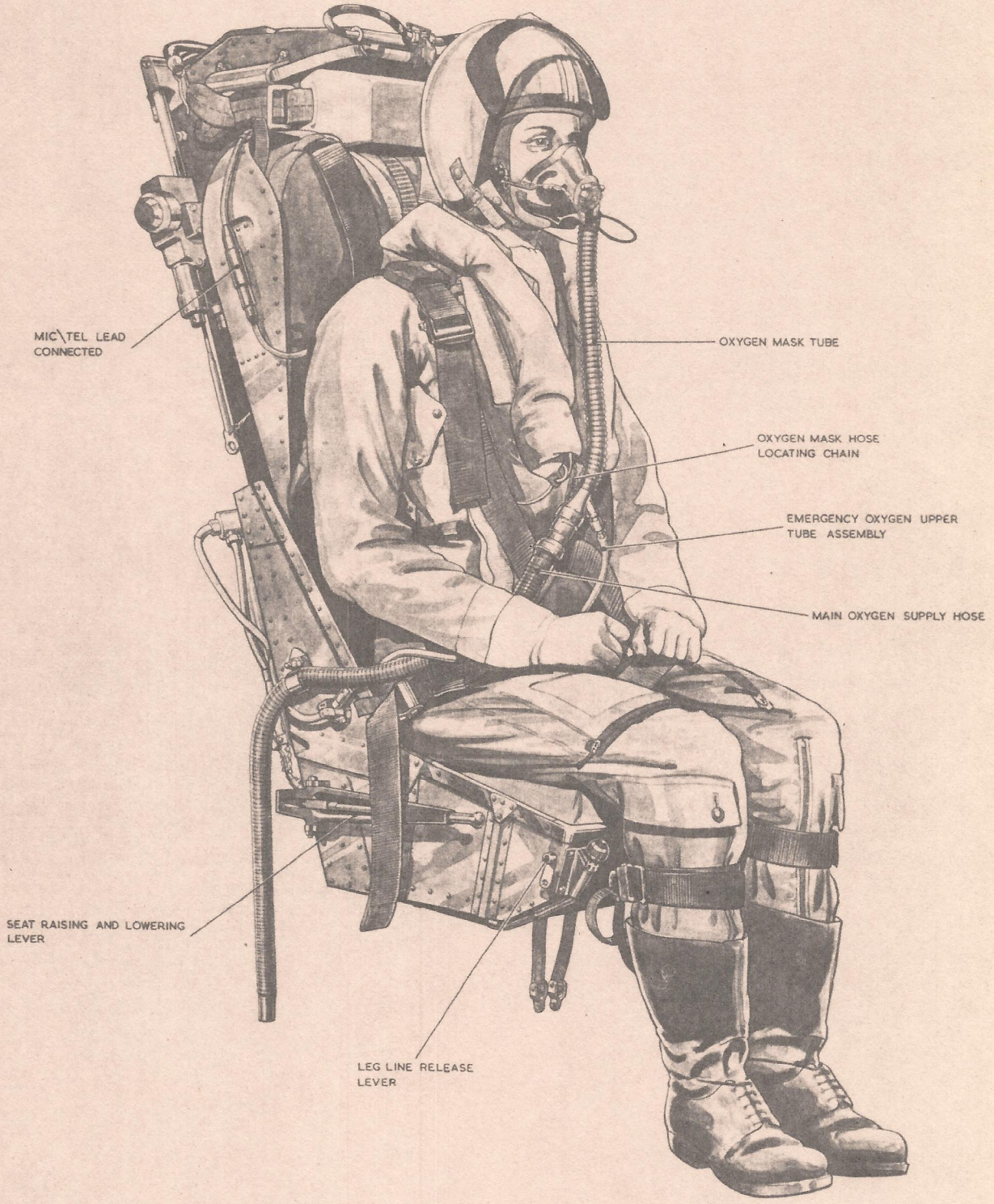

Fig. 7. The Type 4HA Mk. 1 seat occupied (2)

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