Chapter 7

CANBERRA T Mk. 13

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APPENDIX

Introduction

1. The Canberra T Mk. 13 carries a crew of three, each member being provided with an ejection seat. The pupil pilot and instructor occupy side by side positions in the front cockpit; the navigator occupies the rear position on the port side.

2. Two different aircrew equipment assemblies are required, each based on the type of ejection seat provided; the pupil's and instructor's A.E.A. include a Mk. 3CT ejection seat and the navigator's A.E.A. includes a Mk. 3CST ejection seat.

3. This chapter is primarily concerned with the installation of the A.E.A. in the seat, preparation for flying by the crew (dressing and functional testing of the flying clothing), 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 appropriate publication, a reference to which is contained in the appropriate paragraphs and Appendix 1.

COMPOSITION OF THE ASSEMBLIES

4. The aircrew equipment assembly for the pupil and instructor consists of the following items :–

Ejection seat	Mk. 3CT1 (Instructor) Mk. 3CT2 (Pupil)
Parachute assembly	Seat Type Mk. 15
Personal survival pack	Type Y
Negative G restraining strap	Part No.MBEU/660PA
Emergency oxygen set	Mark 7D
Flying clothing assembly	See Appendix 1

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

Ejection seat	Mk. 3CST. Fitted with canopy breakers (M.B. Mod. 943)
Parachute assembly	Back Type Mk. 33
Personal survival pack	Type R (Mod.SR332 to be embodied) c/w cushion Ref.27C/2428
Emergency oxygen set	Mk. 8
Flying clothing	See Appendix 1

Ejection seats

6. The two ejection seats in the front cockpit (Mk. 3CT/1 Instructor, Mk. 3CT/2 Pupil) are basically similar. The instructor's seat, however, is beside the entrance door and the seat guide rail is hinged at the top so that it can swing 5 deg. forward and approximately 20 deg. backward to permit access to the navigator's and pupil's seats. The swinging seat locks in the forward or in the normal flight position by means of a plunger which engages either of two sockets mounted on the aircraft deck in the appropriate positions. This locking plunger can be engaged or retracted by any of three control levers: one on each side of the seat guide rail, (the first being accessible from the entrance door, the second from the pupil's position) and one on the rear of the guide rail accessible to the navigator when in the rear position. Information concerning the seats will be found in A.P.4288, Vol. 1.

7. The navigator's Mk. 3CST seat is fitted with canopy breakers to enable ejection to be made through the rear frangible hatch. The two Mk. 3CT seats are not fitted with canopy breakers and before ejection the aircraft canopy must be jettisoned by means of the manual jettison controls provided. The control column snatch mechanism must also be operated manually prior to ejection (See Pilot's Notes A.P.4326N–P.N.).

8. The Mk. 3CT and Mk. 3CST seats differ only in detail construction and their operation and use is fundamentally the same. Each is ejected from the aircraft by a cartridge-operated gun at a speed of 80 ft./sec. During ejection the seat slides on the guide rail attached to the airframe structure.

Firing handles

9. 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 firing 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. Use of either firing handle on any of the three seats will operate the ejection gun immediately without any delay.

Leg restraint

10. 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 below the front of the seat pan and are then attached to the seat guide rail (in the case of the Mk. 3CT seats), or to anchorage fittings on the aircraft floor (Mk. 3CST seat), with shear rivets. The snubbing units allow the cords to pass freely downwards through the unit but prevent the cords passing upwards except when released by the spring-loaded toggle at the front of each snubbing unit.

11. The leg restraint cords are threaded through rings attached to garters worn by the occupant of the seat. 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 both triggers on each side of the coupling. These garters may be stitched into the legs of the flying suit.

Seat raising gear

12. On all three seats, the seat pan is adjustable for height by means of a handle on the right-hand side of each seat. The plunger in the end of the handle must be depressed before the height can be adjusted.

Automatic equipment

13. Fully automatic facilities are provided to withdraw the parachute canopy and separate the occupant from the seat after ejection. The automatic equipment includes a drogue gun and drogues and a barostatic time-release unit. The drogue gun is operated by a static rod which initiates a time delay of ½ sec. and then fires out a heavy bullet to open the drogue container and extract the drogues, which develop and stabilize the seat. The barostatic time-release is also initiated by another static rod, which trips the release. When the altitude is lower than 10,000 ft. (or other predetermined height) and the deceleration of the seat has reached a value corresponding to a safe parachute opening speed, the time-release mechanism starts and runs for 1¼ sec. After this delay the rack plunger is pressed down by a strong spring and (a) opens the scissor shackle, releasing the drogues from the top of the seat so that they transfer the pull to the apex of the parachute (to which they are attached), (b) release the rear anchorage of the face screen, and (in the case of the navigator's seat) the parachute pack restraining straps, (c) releases the harness from the seat, (d) releases the P.E.C. (navigator's seat) and (e) the leg restraint cords.

14. In the event of malfunctioning of these automatic arrangements, the parachute harness waist belt is provided with two D-handles and the seat has a manual separation lever to release the harness. The first D-handle (nearest the quick-release fitting) disconnects the apex of the parachute from the parachute withdrawal line. When pulled, it exposes the second D-handle which may then be used to deploy the parachute. In the event of failure to eject, the first D-handle is pulled inside the cockpit to enable a manual bale-out to be made in favourable circumstances.

Personal equipment connector (Navigator's seat)

15. The navigator's seat has a personal equipment connector (referred to as the P.E.C.) fitted to the right hand side panel of the seat pan. It enables the main oxygen, emergency oxygen, air-ventilated suit, and Mic/tel leads to be connected or disconnected in one action. It is also linked to the leg restraint system so that the legs are released when the P.E.C. is disconnected. The connector comprises three components :–

(1) Aircraft component – connected to the aircraft structure by a telescopic static rod, and to the personal supply systems in the aircraft.

(2) Seat component – bolted to the seat pan, and connected to the emergency oxygen (see para. 21). This component has an operating linkage from the main barostatic time-release unit and another linkage to the leg restraint system.

(3) Personal component – attached to the flying clothing.

16. As the navigator's seat ascends the guide rail during ejection, the aircraft component of the P.E.C. is detached from the seat component when the static rod becomes fully extended, thus severing and sealing off the connections between the seat and the aircraft; at the same time, the emergency oxygen supply is turned on automatically. Later, when the harness is released from the seat, the personal component is also automatically detached from the seat component.

17. A full description of the personal equipment connector will be found in Sect. 1, Chap. 5. The P.E.C. fitted is the 'Bomber' type having two passages: one passage for the air-ventilated suit supply (forward) and one passage for the main oxygen supply (rear).

18. The navigator is provided with an additional aircraft component mounted on the right-hand side of his instrument bench and provided with separate main and emergency oxygen supplies. This enables the navigator's personal component to be disconnected from the seat P.E.C. and connected to this additional aircraft component, so that he is able to move out of his ejection seat and take up the sextant sighting position.

Emergency oxygen

19. The emergency oxygen cylinder is mounted on the starboard beam of each seat and the supply is turned on automatically, during ejection, by a static line. This static line is led into a conduit attached to the seat guide rail or aircraft structure and emerges at the other end as a yellow/black striped knob on a lever at the right-hand rear side of the seat. Operation of this lever turns on the emergency oxygen supply manually.

20. The emergency oxygen tube on the instructor's and pupil's seats, is attached to the right-hand side of the seat by means of a gate clamp. When the seat is fully equipped this tube is connected to an upper oxygen tube assembly which includes a stirrup quick-release fitting attached to the harness.

21. On the navigator's seat the emergency oxygen is fed to the rear end of the seat component of the P.E.C. (see para. 15) through the inward-relief and excess pressure valve (RV/51). This valve allows excess of oxygen (during the early stages of discharge of the cylinder) to spill out to atmosphere and also permits inward inhalation of supplementary air when the supply of oxygen has dropped off below demand. To prevent dilution of oxygen under normal conditions, however, and to ensure recognition if a 'no-flow' failure of the main oxygen regulator should occur, the inward relief element is fairly heavily spring-loaded so that breathing through it demands a noticeable effort. The excess pressure relief element is barometrically controlled to give pressure breathing above 40,000 ft. altitude, but is only very lightly spring loaded below this altitude. A full description of the valve will be found in Sect. 1, Chap. 6.

22. The navigator's additional P.E.C. aircraft component is provided with a separate emergency oxygen manual operating knob for use should it be necessary to turn on the emergency oxygen while out of the ejection seat.

Harness locks on the seat

23. Provision is made for anchoring the combined harness of the parachute assembly to the seat at a central position below the headrest cushion and on each side at the back of the seat pan. These three anchorages, together with the leg restraint cords, are released automatically in the normal ejection sequence by the operation of the barostatic time-release unit. To permit the occupant to release himself from the seat should the automatic devices fail to operate, a manual separation lever is provided at the rear left hand side of the seat pan. On the navigator's seat this lever, in addition, disconnects the personal component of the P.E.C. and the parachute restraining straps which hold the back type parachute pack in position. The manual separation lever on all three seats is held in a gate to reduce the risk of accidental operation and requires pressing inwards against a spring before it can be released.

24. The upper anchorage of the harness embodies the go-forward spring roller mechanism which permits the occupant to lean forward when required. This is controlled by a spring-loaded lever situated at the forward end of the left-hand side of the seat pan. If the lever is pushed towards the front and is held in that position, the spring roller mechanism is unlocked, permitting the occupant to lean forward. Release of the lever re-locks the mechanism and prevents any further forward movement of the body. On leaning

back the slack is taken up automatically by the spring roller mechanism.

Negative G restraining strap

25. The Mk. 3CT seats utilise an additional harness strap installed separately. This is the negative G restraining strap which is attached to the harness lap straps and rear lock straps that attach the harness to the seat. The negative G restraining strap passes through a special slotted bracket just behind the alternative firing handle and the Y-shaped end is then hooked over the harness lap straps and held by locking the quick-release fitting.

Parachute assemblies

26. A seat type parachute assembly is provided for the Mk. 3CT seats (Instructor and Pupil); a back type parachute assembly is provided for the Mk. 3CTS seat (navigator). Provision is made for attachment of the combined harness of these parachute assemblies to the ejection seat at three points: a D-shackle fitted to the shoulder straps and a lug on each side at the back of the seat strap. Information concerning these items will be found in A.P.1182A, Vol. 1 (2nd. Edn.).

Personal survival packs Type Y and Type R

27. In each seat the personal survival pack serves as a cushion. The Type Y pack used in the Mk. 3CT seats of the instructor and pupil is attached by press studs to the top of the seat type parachute pack. The navigator's Type R survival pack is attached to the lower harness straps by two quick-release couplings at the sides. The lowering line of each survival pack (stowed in the left hand attachment flap of the pack) is attached to the life jacket. The harness attachments are connected when the safety equipment is installed in the seat, and the lowering line or lanyard by the occupant when strapping in. The lowering line of the Type R pack, being attached to the clothing, enables the pack harness attachments to be released during a parachute descent so that the pack falls and hangs clear of the body 15 ft. below, reducing the risk of injury on landing while still being attached to the clothing. The lanyard on the Type Y pack (Instructor and Pupil) prevents the pack being lost on discarding the parachute harness after a descent.

28. A cushion is provided with the Type R pack (Mk. 3CST seat) to cover the lower section of the harness straps both in normal use and during parachute development; it is attached to the harness by press studs.

29. Information concerning the survival packs will be found in A.P.1182C, Vol. 1.

Sequence of events during ejection

30. 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.

(1) As the seat ascends the guide rail, the following sequence occurs:—

(a) The leg restraint cords tighten until the rivets shear in the dead-eyes securing the cords.

(b) The time-delay mechanism for the drogue gun is actuated, the gun being fired after ½ second.

(c) The time-delay mechanism for the barostatic time-release unit is tripped. The delay is variable depending upon aircraft height and speed at the time of ejection.

(d) Pupil's and instructor's seats. The main oxygen and A.V.S. hoses disconnect.

(e) Navigator's seat. The aircraft component of the P.E.C. is separated from the seat component, disconnecting the oxygen and A.V.S. hoses and the Mic/tel leads between the aircraft and the seat.

(f) The emergency oxygen supply is turned on.

(2) After the seat leaves the aircraft the following events occur:—

(a) After ½ second the drogue gun fires and the two drogues stabilize the seat. If the ejection occurs at high

altitude the seat will eventually fall vertically with the occupant restrained by his combined harness from falling forwards. At low altitudes there may not be time for the seat to attain the vertical position. During this phase the occupant will be breathing emergency oxygen from the cylinder carried on the seat.

(b) After the appropriate delay the occupant is released from the seat and his parachute canopy opens automatically. At modern aircraft speeds and heights, the delay is 1¼ seconds after ejection. At high altitude the 1¼ second delay does not start until the seat has descended to 10,000 ft. (or other predetermined height). At high speeds, at or below this height, delay does not start until the seat has decelerated to a safe speed for the parachute canopy to open. On the instructor's and pupil's seats the emergency oxygen tube separates at the quick-release stirrup fitting. On the navigator's seat the personal component of the P.E.C. is released from the seat component.

EQUIPPING THE SEATS

Connections to the aircraft

31. When the seats are installed in the aircraft and are properly equipped the following items are connected to the aircraft :—

(1) *Left-hand side of each seat :—*

(a) Static rod from drogue gun.

(2) *Right-hand side of each seat :—*

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

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

(c) On navigator's seat only: static rod from P.E.C.

(3) *Underneath each seat :—*

(a) Leg restraint cords.

32. Ensure that the seats have been made safe for servicing, before they are equipped, in accordance with current instructions.

Order of equipping the seats

33. It is recommended that the navigator's rear port station should be equipped first, the pupil's station next and the instructor's last, with the seat locked in the normal flight position. This order of equipping is adhered to in the following instructions.

Equipping the navigator's seat

34. The following procedure is to be used when installing equipment in the navigator's seat; refer to figs. 1, 2, 3, 4, 5, 6, 7 and 8 for detail 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 forward.

(2) Pass the emergency oxygen supply tube downwards between the inward relief and excess pressure valve and the seat pan, and connect it to the underside of the valve. Arrange the tube to form an easy sweep and then insert it into the clips on the side of the seat pan. Wirelock the tube connector to the valve mounting bracket utilising the holes provided.

(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 (fig. 1).

Note . . .

Operations 1, 2 and 3 are most conveniently performed before the seat is installed in the aircraft.

(4) Retract the seat locking plunger by operating the lever on the starboard side of the instructor's seat and swing the seat into the forward position to give access to the navigator's station.

Note . . .

The seat pan must be in the fully raised position.

(5) Connect the anchor hook to the static line-cum-manual operating cable.

(6) Ensure that the manual override lever is in the locked position.

(7) Place the parachute assembly in the seat pan with the horseshoe pack uppermost, and its top end to the front of the seat.

(8) Take up the outer shoulder straps of the harness, ensuring they are not twisted (these are attached at the top to a metal D-shackle). Pass the D-shackle through the arch of the parachute pack, from front to rear.

(9) Remove the two parachute restraining straps (stowed in the buckles on each side of the drogue container) and the headrest pad.

(10) Operate the go-forward lever and pull out the webbing strap from under the parachute support bracket. This strap must be held or it will spring back.

(11) Pass the strap up through the D-shackle from underneath.

(12) Each parachute restraining strap has a metal D-ring at one end. Hook these over the lug on the end of the webbing strap (*fig.* 2).

(13) Still holding the webbing (threaded through the harness shackle) and the two restraining straps (hooked over lug), press down the harness release lever on the starboard side of the seat. This lever is immediately below the harness release plunger on the baro-static time-release unit and withdraws the harness locking plunger. (The services of an assistant will be required here).

(14) Insert the webbing end lug in the hole under the parachute support bracket, release the lever and the plunger will lock in the eye of the lug. Check by pulling on the webbing, then allow the webbing strap to wind back.

(15) Lift the horseshoe pack into position on the support bracket and hold it there.

(16) Draw the unattached ends of the parachute restraining straps forwards through the arch and then, in front of the pack, upwards towards the buckles on each side of the drogue container. Ensure the straps are not twisted.

(17) Pass the port strap through the loop in the parachute withdrawal line.

(18) Pass the end of the strap through the headrest strap buckles from the outside through the buckle inwards.

(19) Take the starboard parachute restraining strap and assemble to the starboard buckle similarly. (There is no parachute withdrawal line to pass the strap through on this side).

(20) Pass the ends of the parachute restraining straps through the buckles on each side of the headrest cushion so that the strap ends emerge on the outside of the buckle (*fig.* 3).

(21) Work the straps back and forth in the self-locking buckles until the parachute pack and cushion are strapped down tightly to the seat.

(22) Connect the parachute withdrawal line to the link line by the screw coupling, ensuring:—

(a) That the link line (to the securing pin) passes between the port headrest restraining strap and the side of the drogue container.

(b) That the port lifting line (between the securing pin and the drogue shackle)

has been passed *under* the drogue extraction line (between the drogue gun and the drogue flap securing pin) (*fig.* 4).

(23) On each side, press the main attachment lug on the harness lap strap, into the lower locks at the back of the seat pan (*fig.* 5). They will clip into place. Check for security by pulling in several directions.

(24) Lift the combined harness and hold in the stowed position by pushing the lugs on the harness shoulder straps between the headrest restraining straps and the side of the drogue container.

Note . . .

This operation is for stowage purposes only, to keep the harness straps suspended out of the way until the seat is ready for occupation.

(25) Clear the seat pan. Place the survival pack in position, lowering line to port (it is essential that a pack with Mod. SE/332 is used). Ensure that the transverse seat strap of the harness crosses OVER THE TOP of the pack, at the back.

(26) Connect the quick-release couplings, on each side of the survival pack, to the combined harness.

(27) Press the sticker strap lug into the clip on the inside face of the seat pan bringing the strap up on the inboard side of the survival pack couplings, then over the coupling and down into the clip on the outboard side. Check that the personal survival pack couplings are still connected (*fig.* 6).

(28) Place the cushion on top of the survival pack, and use the press studs to fasten it to the harness seat strap. Tuck the rear corners well into the back of the seat. Pass the leg loops upwards through the centre slot of the cushion (*fig.* 7) and lay the harness crutch loops and lap straps out ready for occupation.

(29) Examine carefully the two D-handles on the left waistbelt of the parachute harness to ensure that the second handle (i.e. furthest from the quick-release fitting) has a cover flap which will be released by operation of the first handle.

(30) EXTEND THE LAP AND SHOULDER STRAPS fully (this should be repeated before EVERY subsequent flight).

(31) Ensure that the safety pin for the emergency oxygen cylinder has been removed.

(32) Ensure that the seat is made safe for parking in accordance with current instructions.

Equipping the pupil's and instructor's seats

35. Before commencing to equip the pupil's and instructor's seats in the forward cockpit ensure that the dual control column is locked forward to provide the maximum access space.

36. The pupil's seat, on the port side, should be equipped first. The following is the procedure: refer to figs. 9, 10, 11, 12, 13, 14, 15 and 16 for detail as necessary :–

(1) Operate the lever on the side of the instructor's seat and swing the seat into the rear position to give access to the pupil's seat.

(2) 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 forward.

(3) Insert the emergency oxygen supply tube in the clips and clamp the end in the gate clamp on the right hand side of the seat pan.

Note . . .

Operations 1, 2 and 3 are most conveniently performed before the seat is installed in the aircraft.

(4) 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 (*fig.* 9).

(5) Connect the anchor hook to the static line-cum-manual operating cable.

(6) Ensure the manual override lever is in the locked position.

(7) Operate the go-forward lever and pull out the webbing strap from under the headrest. This strap must be held or it will spring back.

(8) Pass the strap through the D shackle, on the combined harness, from back to front (*fig.* 10).

(9) Press the lug on the end of the go-forward strap into the hole beneath the headrest. The lug will clip into place as it is engaged by the harness locking plunger. If desired the plunger can be retracted beforehand by use of the lever below the barostat.

(10) Check the locking by pulling on the go-forward strap, then allow the strap to wind back (*fig.* 11).

(11) Take the negative G restraining strap and pass the double white portion through the slotted bracket. The bracket is mounted on the inside face of the front of the seat pan immediately behind the alternative firing handle. Pass the white ends of the strap downwards through the bracket, leaving the blue, Y-section of the strap above the bracket with the adjustment buckle facing forwards.

(12) Check that the bottom edge of the apron is connected to the seat and tension the apron against the clips.

(13) Place the parachute pack in the seat and connect the two halves of the parachute withdrawal line coupling.

(14) Draw the port arm of the white section of the negative G restraining strap assembly across the top of the port front corner of the parachute pack.

(15) Thread the loop on the end of the strap over the lower harness attachment lug on the port side (*fig.* 12).

(16) Raise the pack slightly and position the strap so that it lies over the rip cord housings and then passes downwards underneath the bottom port corner of the pack, nearest the back rest.

(17) Insert the port harness attachment lug in the bottom seat lock on that side.

(18) Repeat operations (9) (10) (11) and (12) for the starboard arm of the negative G restraining strap and assemble them similarly.

(19) Rock the parachute pack until the straps settle into the right attitude and the pack lies correctly in the seat pan. When correctly assembled the negative G restraining strap lies with one arm diagonally across each corner of the pack, underneath the harness sling strap and passing down and underneath each of the inner corners into the seat locks. The blue Y-section lies over the alternative firing handle (*fig.* 13).

Note . . .

It is essential that the white section of the restraining strap does not pass inside any straps of the harness.

(20) Insert the sticker strap lugs on either side of the harness into the clips on each side of the seat pan (*fig.* 16).

(21) Place the personal survival pack on top of the parachute pack with the lanyard draped over the rear starboard side of the seat. Draw up the harness leg loops through the recess in the front of the cushion.

(22) Tilt the parachute pack forward expos-

ing the rear row of press studs. Attach the rear press stud flaps of the survival pack to the parachute pack.

(23) Tilt the parachute pack rearward exposing the front row of press studs and attach the survival pack similarly.

(24) Settle the attached parachute and survival packs squarely in the seat pan.

(25) Take the upper oxygen tube assembly and attach it to the stirrup fitting. This is mounted on the harness near the starboard sticker-strap.

(26) Plug the upper oxygen tube assembly into the emergency oxygen tube socket mounted in the gate clamp on the starboard side of the seat.

(27) Ensure that the drogue link line passes under the headrest strap, and that the drogue extraction line passes over the drogue link line (*fig.* 14).

(28) Take the two lugs of the harness shoulder straps and tuck them behind the flaps on each side of the headrest.

Note . . .

This operation is for stowage purposes only, to keep the straps out of the way until the seat is ready for occupation.

(29) Examine carefully to ensure that the two D-handles on the waistbelt of the parachute harness are in order. The second handle (furthest from the quick-release fitting) should be covered with a press-studded flap which is released by the operation of the first handle.

(30) EXTEND THE LAP AND SHOULDER STRAPS fully. (This should be repeated before EVERY subsequent flight).

(31) Swing the instructor's seat back into the flight position and lock.

(32) Equip the instructor's seat similarly, as described in operations (1) to (30).

37. After equipping the pupil's and instructor's seats, re-check that the safety pins (*para.* 32) are still secure in their proper positions in order to safeguard personnel working in the aircraft. The pins are subsequently dealt with as follows:–

(1) Before boarding of crew. Remove the safety pin from the ejection gun sear on each seat and transfer it to the main firing handle safety lock.

(2) After strapping in. Remove and stow (a) the main firing handle pin and (b) the alternative firing handle pin on each seat.

STRAPPING-IN PROCEDURE

38. Strapping-in procedure should follow the same order as equipping the seats, namely, navigator first, then the pupil and finally the instructor. Ensure that the safety pin of each emergency oxygen cylinder is removed prior to the occupant entering the seat.

Strapping-in: Navigator

39. The strapping-in procedure for the navigator is as follows: refer to figs. 17, 18 and 19 for detail as necessary.

(1) Ensure that the instructor's seat is swung fully forward, and locked in that position, to give access to the navigator's station.

(2) Ensure that the seat has been made safe for parking in accordance with current instructions. Check that the harness lap and shoulder straps have all been fully extended.

(3) Remove the dust cover from the seat component of the P.E.C. and fit it into the stowage on the right-hand side of the seat, if this has not already been done.

(4) Sit in the seat.

(5) Press the front end of the personal component (attached to clothing) of the P.E.C. into the front end of the seat component in an inclined attitude. Press down with a hinging motion until

it clips into place. Test by inserting one or two fingers under the handle and attempting to lift it.

(6) Thread the leg restraint cords through the quick-release couplings on the garters as follows. The cord from the starboard snubbing unit (under the seat pan) is threaded through the garter coupling of 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).

Note . . .

(a) *If there is insufficient length of cord, pull forward on the ring in the front of the snubbing unit to release more cord.*

(b) *Unless the personal component of the P.E.C. is mating correctly with the seat component, the plug will not lock in its socket.*

(7) Similarly, thread the port cord through the right garter and back to the port taper socket, thus crossing the cords. It does not matter which loop is in front, but do not interlace them (*fig.* 17).

(8) Pull back any excess of restraint cord through the snubbing units.

(9) Adjust the height of the seat until a satisfactory flying position is obtained, ideally so that the head is positioned centrally against the headrest cushion. Stretch the arms upwards towards the firing handle to ensure there is no restriction by the clothing to firing handle access.

(10) Connect the survival pack lowering line on the left side to the quick-release coupling on the life jacket or pressure jerkin. The line should lie across the left thigh (*fig.* 18).

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

(12) Connect the lugs on the lap straps to the quick-release fitting (the hoses to the P.E.C. pass under the right lap strap). The back pad should be drawn up by a ground crew member and the lumbar cushion adjusted to suit. Sit well back in the seat. Any slack in the hoses to the P.E.C. should lie below the right lap strap to allow body movement without straining the hoses (*fig.* 18).

(13) Tighten the lap straps. When tightening harness straps in general, 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. After the first tightening, move the body about inside the harness and then re-tighten the lap straps, repeating this process until they are really tight. It is most important that the lap straps are tight since they provide the principal restraint under all stress conditions.

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

(15) Remove the ends of the shoulder straps from the stowed position. Arrange them under the life jacket or jerkin stole. Thread the end fittings through the leg loops. Then connect them to the quick-release fitting (*fig.* 17).

Note . . .

(a) *The leg loops should engage over the metal end fittings, not on the webbing above them, so that they will disengage freely on operating the quick-release fitting.*

(b) *To facilitate this engagement it is*

normally essential that the shoulder straps be let out fully.

(16) Fit the safety clip between the disc knob and body of the quick-release fitting.

(17) Thin subjects will need to tuck the left leg loop carefully behind the first D-handle on the waistbelt.

(18) Take up the slack on the blue inner (underneath) shoulder straps of the harness, then take up the slack in the brown outer (top) shoulder straps. Move the body in the harness as described in operation (13); do not overtighten the shoulder straps and cause the back to arch, as this is a bad attitude for ejection.

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

(20) Put on the flying and protective helmets, if this has not already been done, and fasten the chin straps. Fit the oxygen mask.

Note . . .

If the chin straps are not fastened, the helmet may be wrenched off during ejection. At high altitudes, this would mean the loss of vital oxygen supply.

(21) Connect the Mic/Tel lead and oxygen mask tube. Connect the mask tube spring clip to the D-ring on the life jacket stole.

(22) Reach upwards and check that the main firing handle is within reach; DO NOT PULL.

(23) Conduct pre-flight oxygen checks (see Pilot's Notes).

(24) Ensure that a ground crew assistant removes the safety pins from the main and alternative firing handles and places them in their stowage.

Strapping-in: Pupil and Instructor

40. The pupil, occupying the port-side seat in the cockpit, straps in after the navigator as follows: refer to figs. 20, 21 and 22 for detail as necessary.

(1) Unlock the instructor's seat from the forward position and swing it rearward to give the maximum access to the pupil's seat.

(2) Check that the safety pins are in position in the main and alternative firing handles. Check that the harness straps have been fully extended.

(3) Sit in the seat.

(4) Assemble the leg restraint cords and garter quick-release couplings as follows :—

(a) Thread the cord from the starboard snubbing unit through the garter coupling on the left leg and plug the end fitting of the cord into the starboard taper socket.

(b) Thread the cord from the port snubbing unit through the garter coupling on the right leg and plug the end fitting of the cord into the port taper socket.

Note . . .

The taper sockets are located in different positions on the seats, but are easily located. Fig. 20 illustrates the leg restraint cords after they have been assembled.

(5) Connect the personal survival pack lanyard to the quick-release coupling on the right-hand side of the life jacket and ensure that it passes OVER the right thigh before being connected.

(6) Connect the side quick-release couplings of the personal survival pack to

their corresponding fittings on the life jacket.

(7) Adjust the cords to allow unrestricted operation of the rudder pedals. If there is insufficient length of cord, pull forwards on the ring in front of the snubbing unit to release more cord. Pull back any excess of restraint cord through the snubbing units, leaving enough slack for full rudder operation.

(8) Connect the survival pack lowering line on the left side to the quick-release coupling on the life jacket. The line should lie across the left thigh (*fig.* 22).

(9) Bring the harness waistbelt across the body. Adjust the quick-release fitting so that it lies centrally with the waistbelt across the body.

(10) Pass the right hand lap strap lug through the loop in the right hand arm of the negative G restraining strap Y piece. Clip the lug into the quick-release fitting.

(11) Pass the left hand lap strap lug through the loop in the left arm of the negative G restraining strap Y-section. Clip the lug into the quick-release fitting.

(12) When correctly assembled the two loops of the negative G restraining strap Y-section should cover the lap strap lugs on each side of the quick-release fitting. Tension the negative G restraining strap by means of the buckle. Tighten the lap straps. It is most important that these are really tight since they provide the principal restraint under all stress conditions (*fig.* 20).

(13) Bring the leg loops up between the legs and thread the left one through the metal eye on the left lap strap. Repeat on the right side. If twisted correctly the leg loops will lie flat on the inside of the thighs.

(14) Remove the ends of the shoulder straps from the stowed position. Arrange them under the life jacket stole. Thread the end fittings through their respective leg loops and connect them to the quick-release fitting. The harness leg loops should 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 it is normally essential that the shoulder straps be let out fully.

(15) Fit the safety clip between the disc knob and body of the quick-release fitting.

(16) Thin subjects will need to tuck the left leg loop carefully behind the first D-handle on the waistbelt.

(17) Take up the slack on the blue inner (underneath) shoulder straps of the harness and then take up the slack in the brown outer (top) shoulder straps. When tightening harness straps in general, pull on the running end with one hand to relieve the tension on the buckles. 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 and cause the back to arch, as this is a bad attitude for ejection.

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

(19) Put on the flying and protective helmets, if this has not already been done, and fasten the chin straps.

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.

(20) Take the main oxygen supply hose on the left side of the seat, and route it through the retaining strap on the waistbelt. Connect the supply hose to the oxygen mask tube. Connect the mask tube spring clip to the D-ring on the life jacket stole (*fig.* 22).

(21) Connect the emergency oxygen upper tube assembly (right side) to the oxygen mask tube.

(22) Connect the Mic/Tel lead, and the A.V.S. supply pipe as required (*fig.* 21).

(23) Reach upwards and check that the main firing handle is within reach; DO NOT PULL.

(24) Fit the oxygen mask and conduct pre-flight oxygen checks (see Pilot's Notes).

(25) With assistance from a ground crew member, as appropriate, remove and stow the main and alternative firing handle pins; this operation is delayed until immediately before flight with all crew members fully strapped in.

(26) Swing the instructor's seat forward and lock in the flight position.

(27) Instructor to strap in similarly as described in operations (1) to (23).

EMERGENCIES

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

LEAVING THE SEAT AFTER LANDING

42. (1) Remove the firing handle safety pins from the stowage and fit to the main and alternative firing handles. (Assistance should be obtained, wherever possible, from a member of the ground crew in fitting the pin to the main firing handle).

(2) Pupil and instructor. Disconnect the main and emergency oxygen supply pipes from the mask. Disconnect the Mic/Tel lead. Disconnect the leg restraint cords from the garters by operating the quick-release couplings.

(3) Navigator. Disconnect the personal component of the P.E.C. by pulling upwards on the handle (this will also free the leg restraint cords).

(4) Remove the spring clip from the quick-release fitting and undo the harness; return the quick-release fitting to the locked position. Pupil and instructor only; disconnect the negative G strap from the harness.

(5) Disconnect the lanyard or lowering line and the side quick-release couplings of the personal survival pack, as appropriate.

(6) Navigator to fit the dust cover to the P.E.C.

(7) Vacate the aircraft.

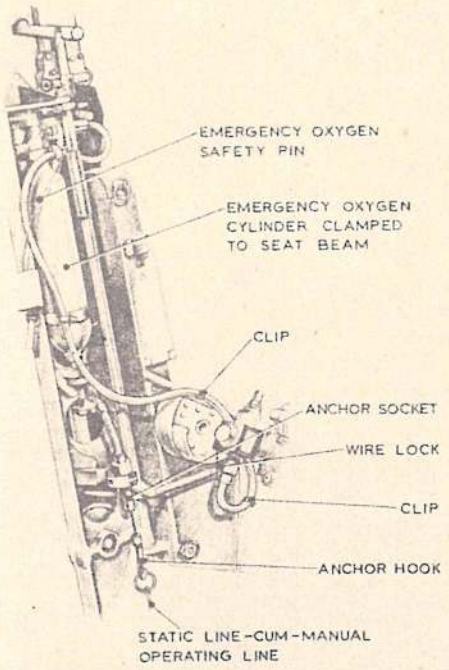

Fig. 1. Arrangement of emergency oxygen supply

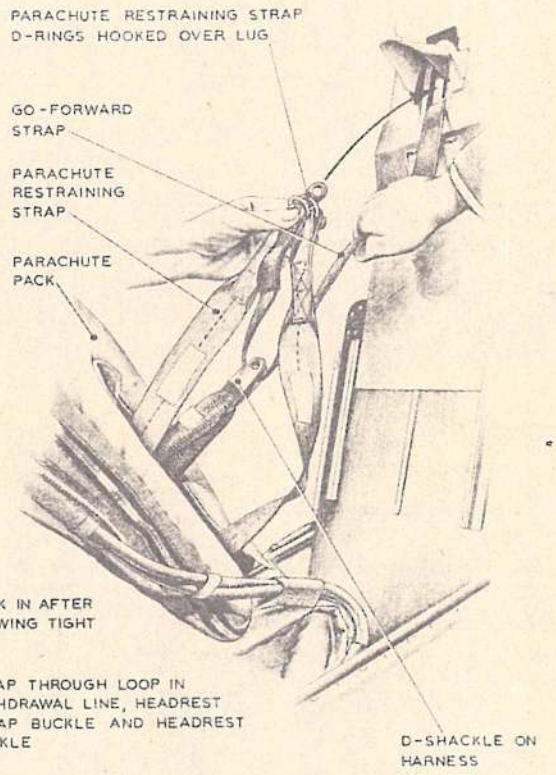

Fig. 2. Installing parachute assembly: stage 1

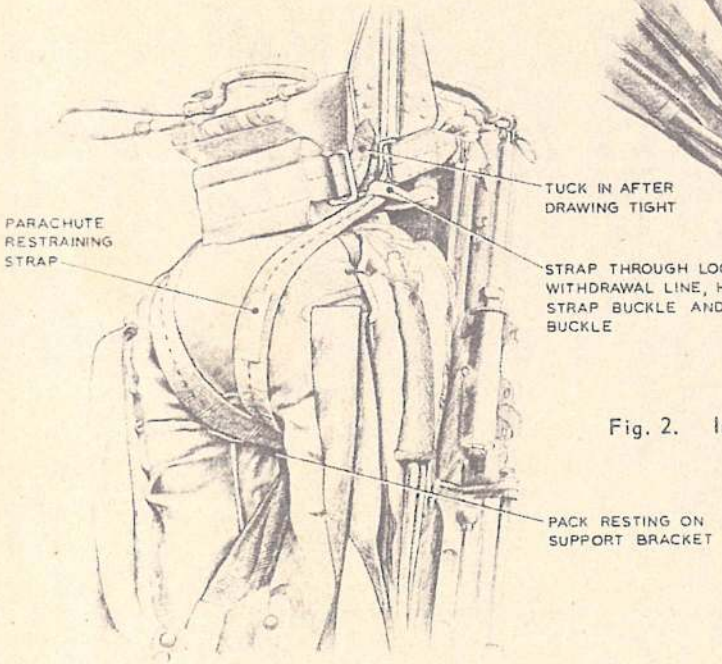

Fig. 3. Installing parachute assembly: Stage 2

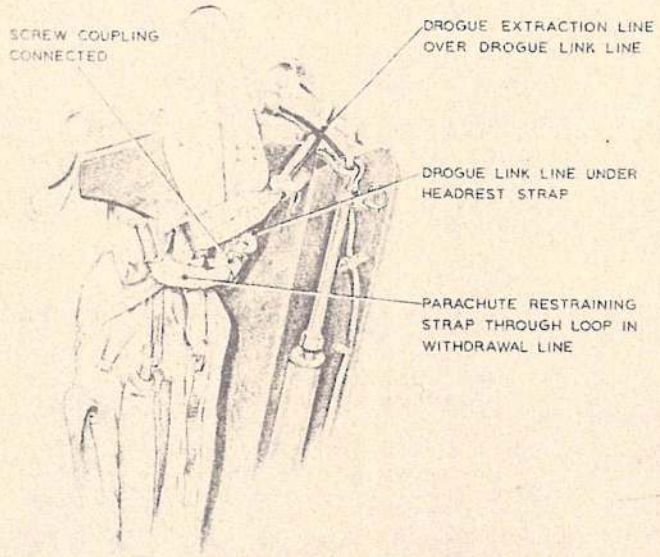

Fig. 4. Arrangement of drogue withdrawal and link lines: Stage 3

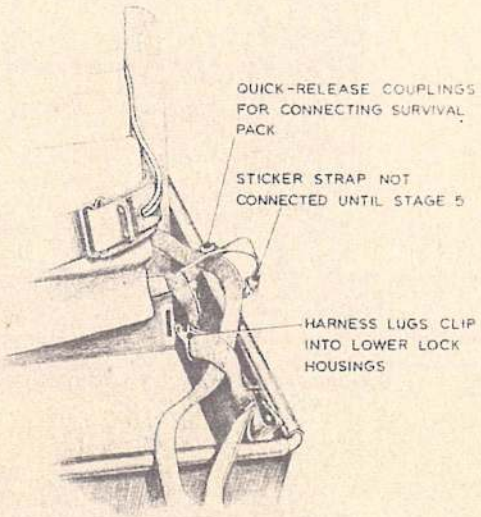

Fig. 5. Installing parachute assembly: Stage 4

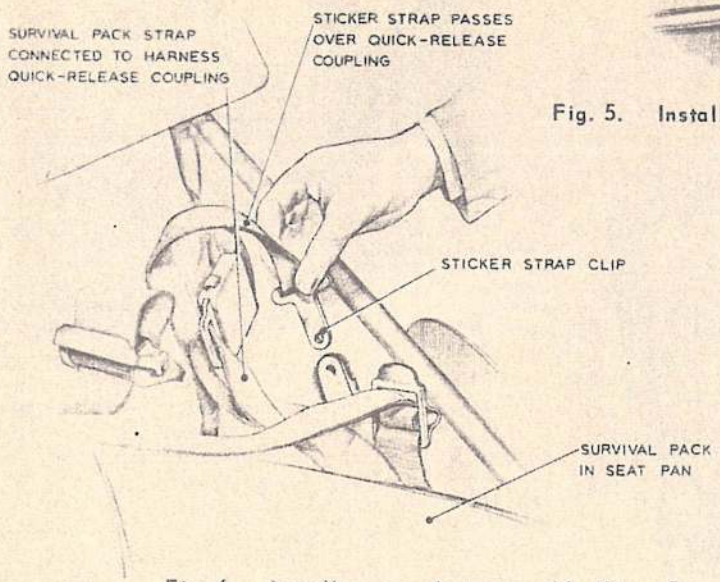

Fig. 6. Installing parachute assembly: Stage 5

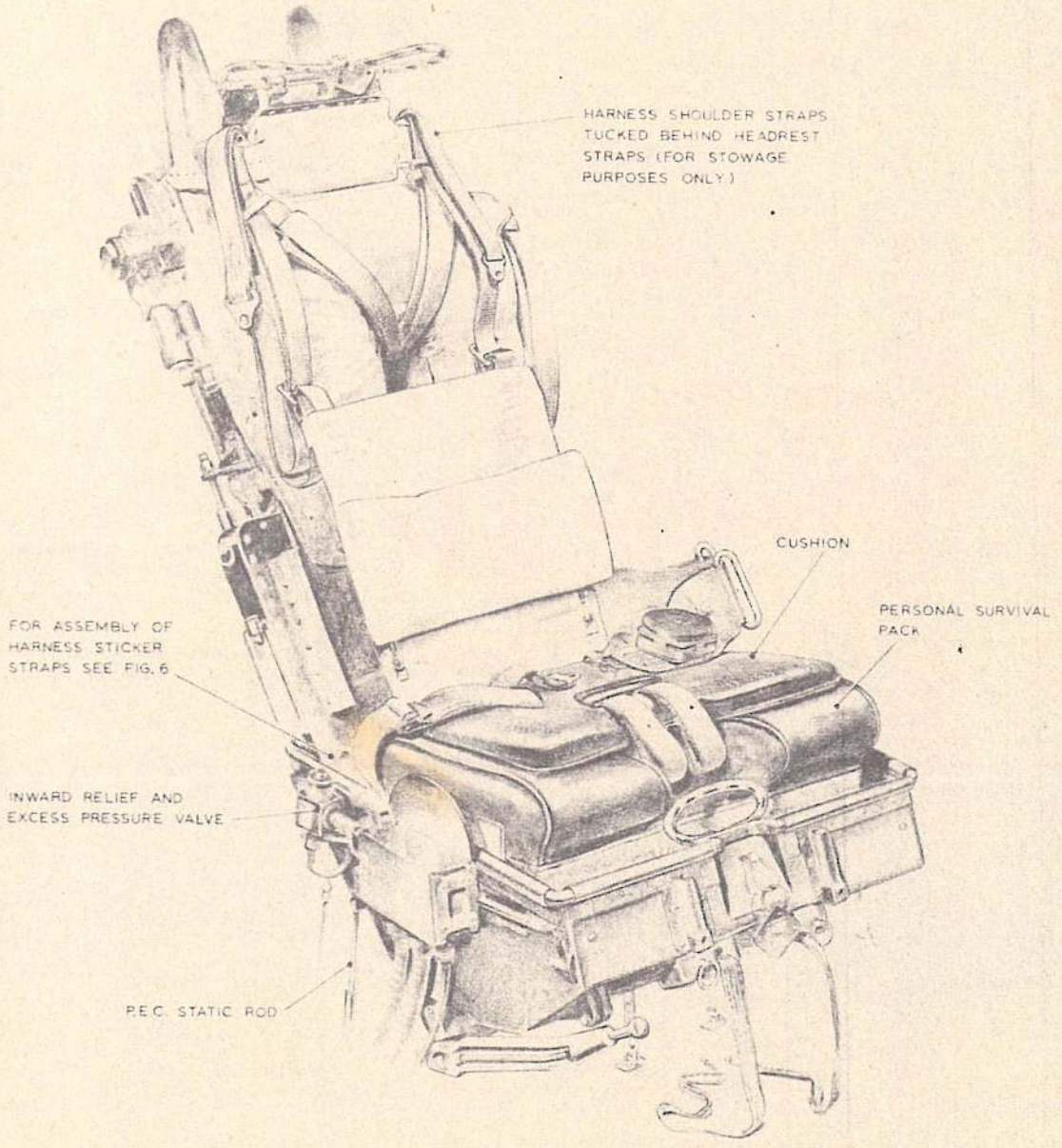

Fig. 7. The navigator's Mk. 3CST seat equipped (1)

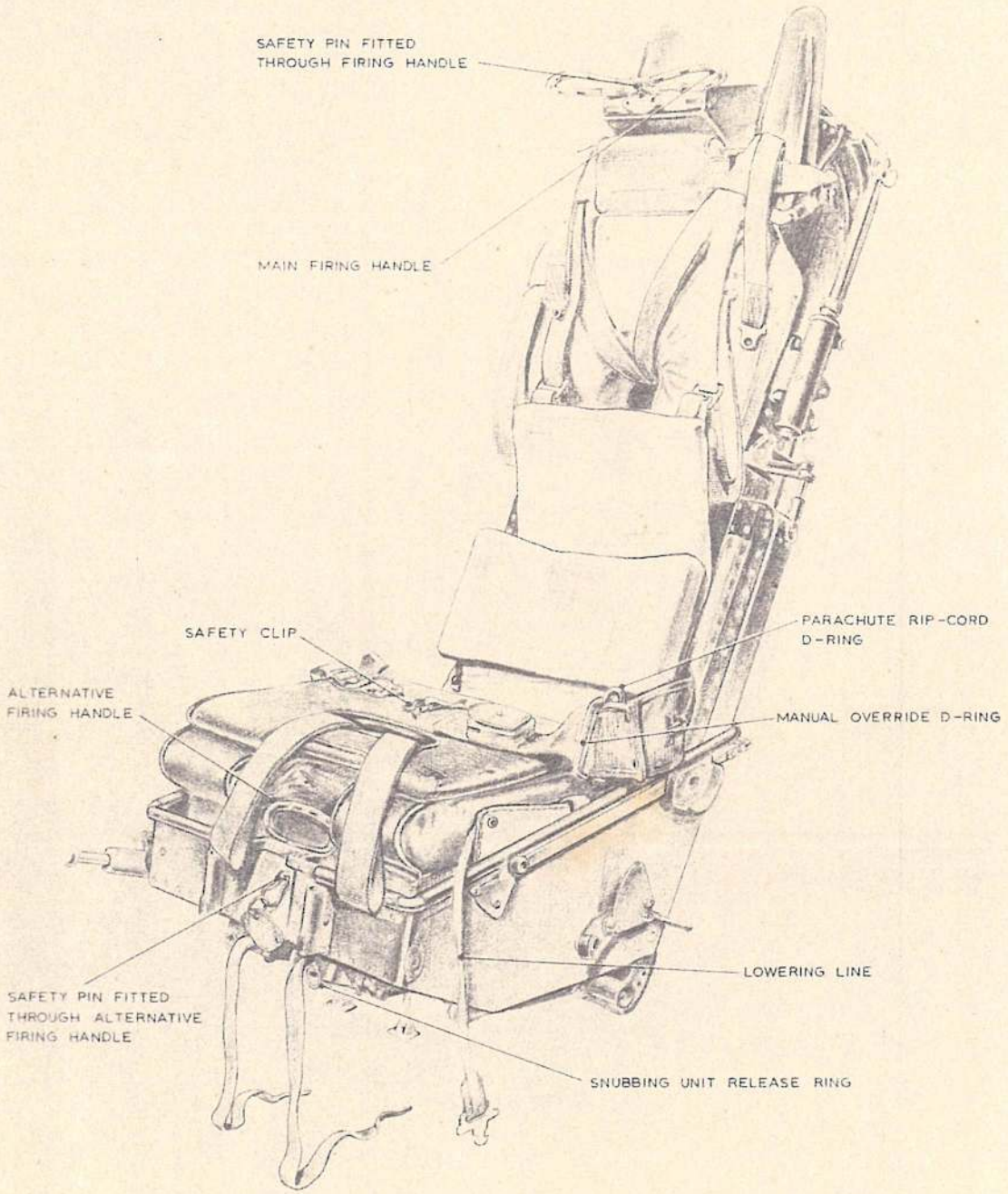

Fig. 8. The navigator's Mk. 3CST seat equipped (2)

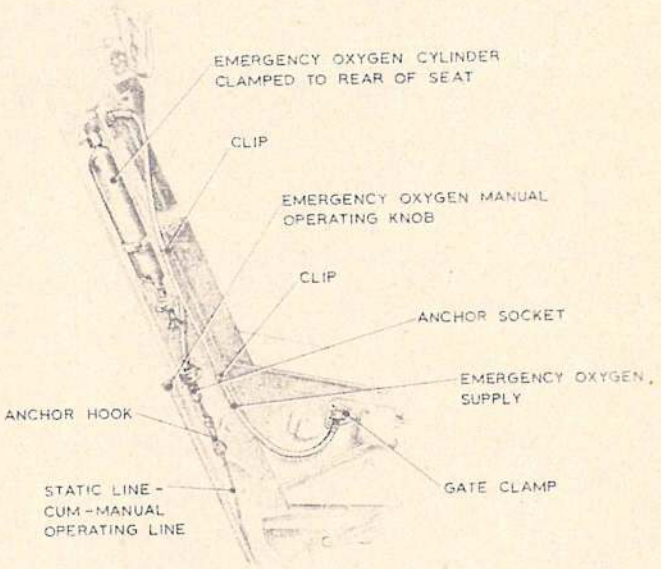

Fig. 9. Arrangement of emergency oxygen supply

Fig. 10. Installing parachute assembly: Stage 1

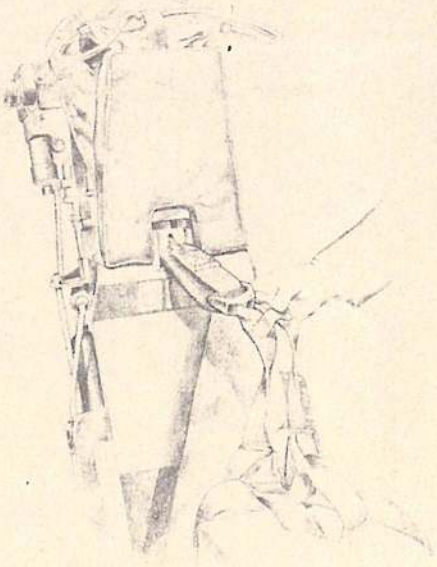

Fig. 11. Installing parachute assembly: Stage 2

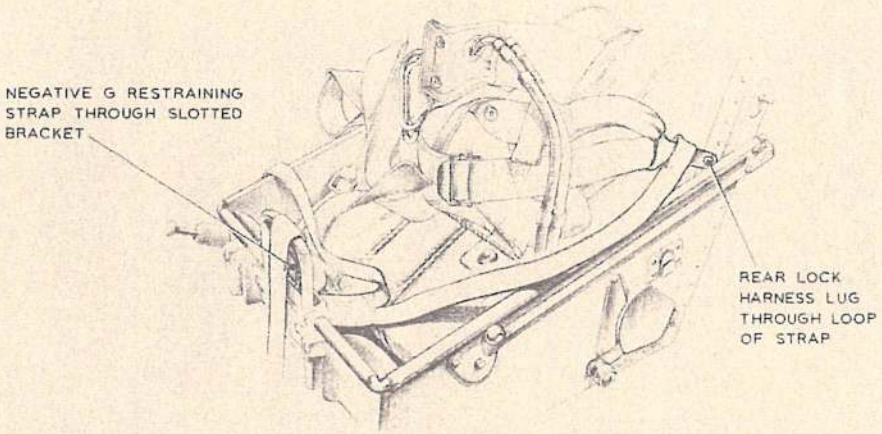

Fig. 12. Installing parachute assembly: Stage 3

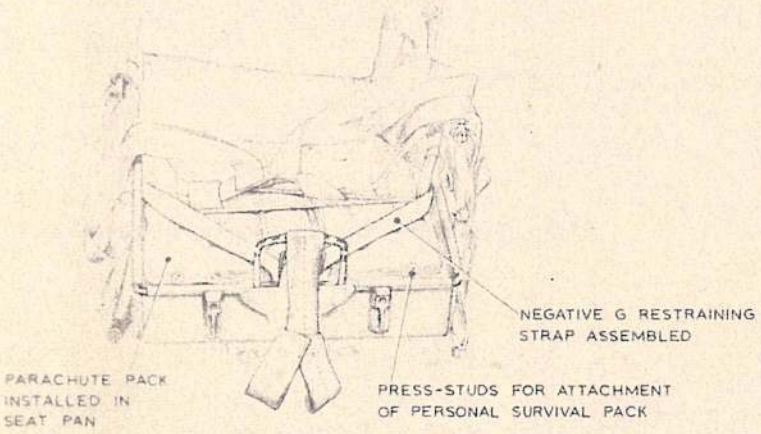

Fig. 13. Installing parachute assembly: Stage 4

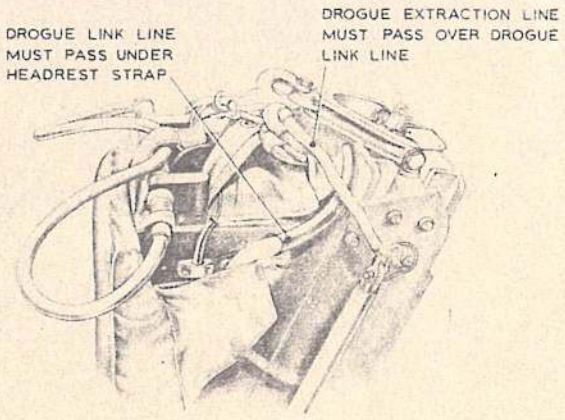

Fig. 14. Arrangement of drogue withdrawal and link lines

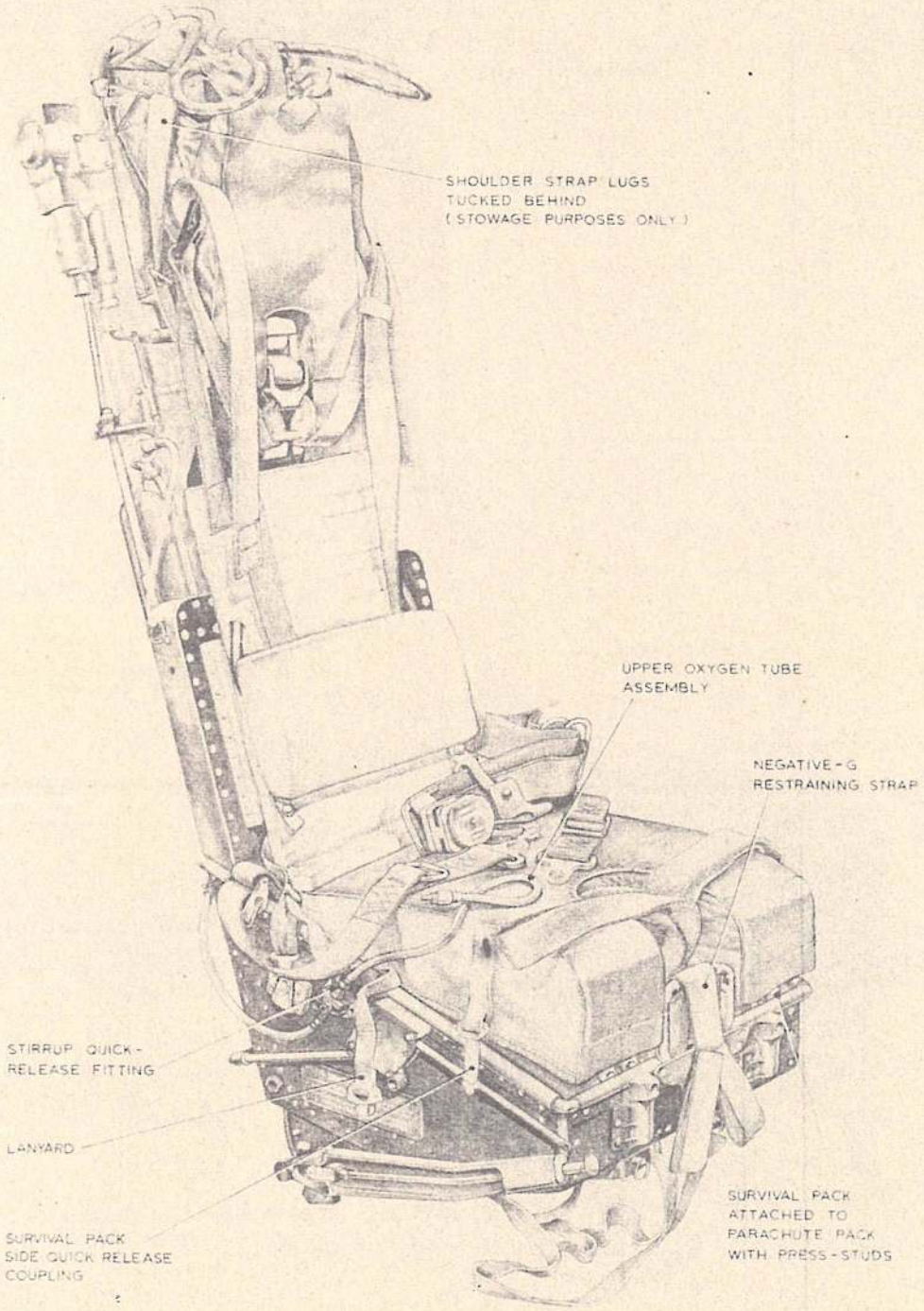

Fig. 15. The pupil's and instructor's Mk. 3CT seats equipped (1)

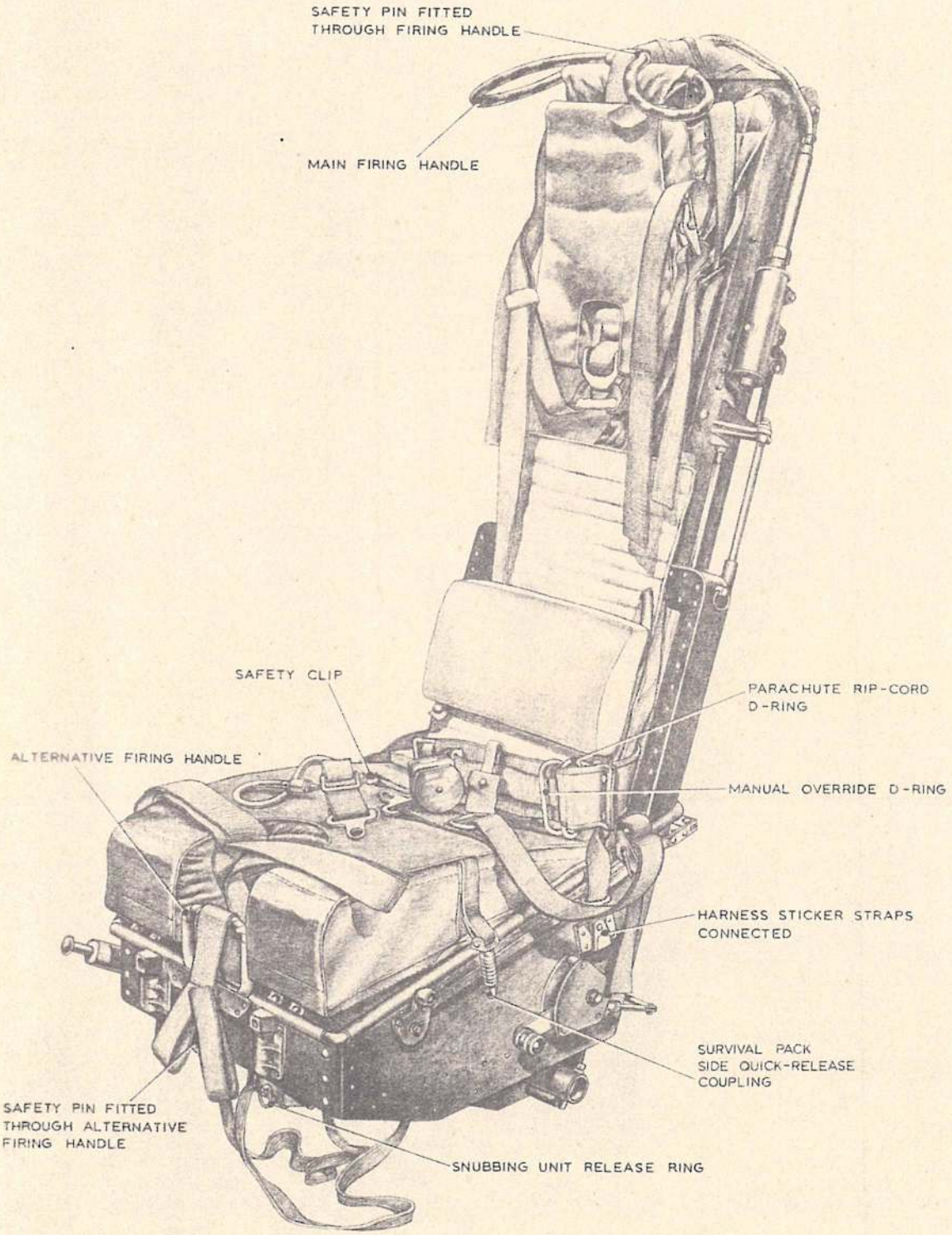

Fig. 16. The pupil's and instructor's Mk. 3CT seats equipped (2)

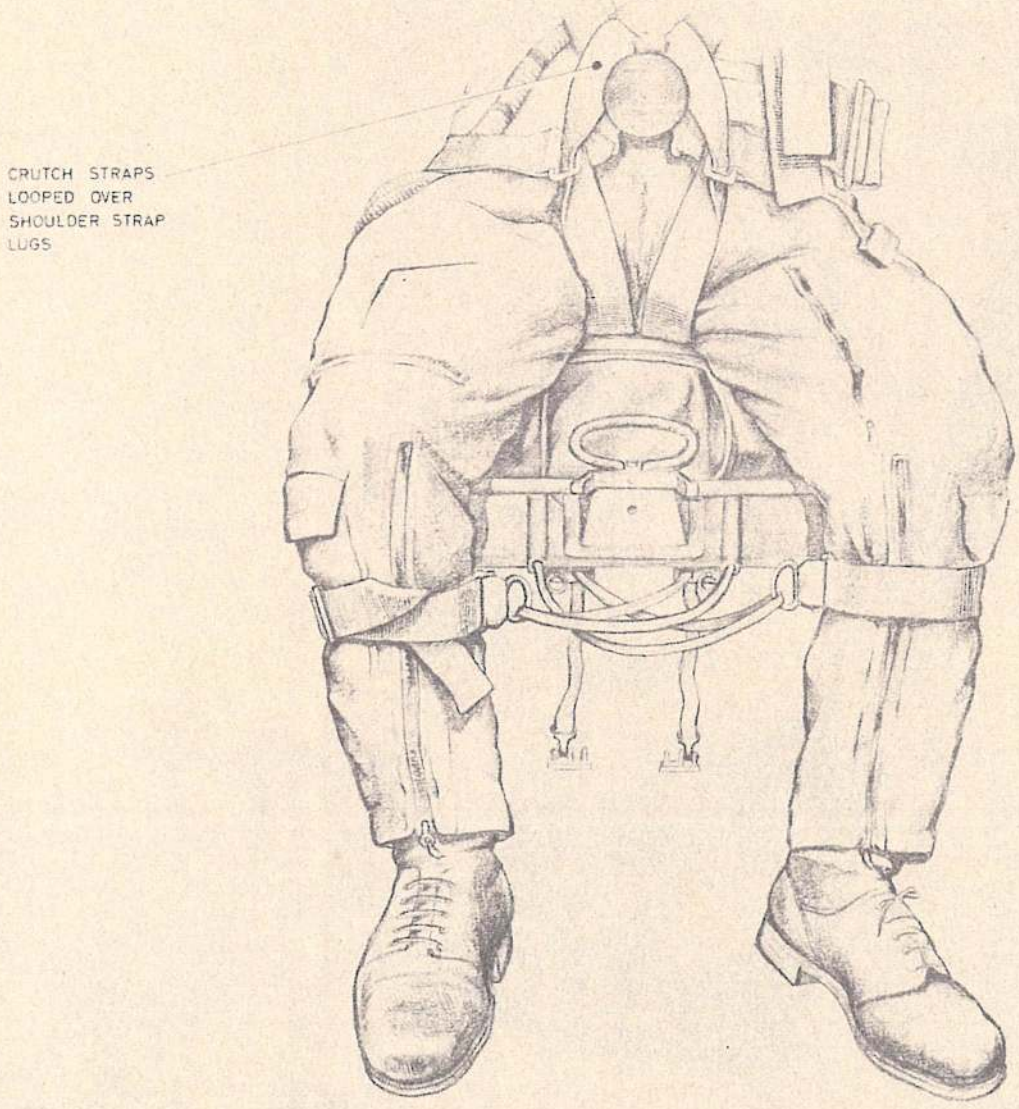

Fig. 17. Assembly of leg restraint cords and harness

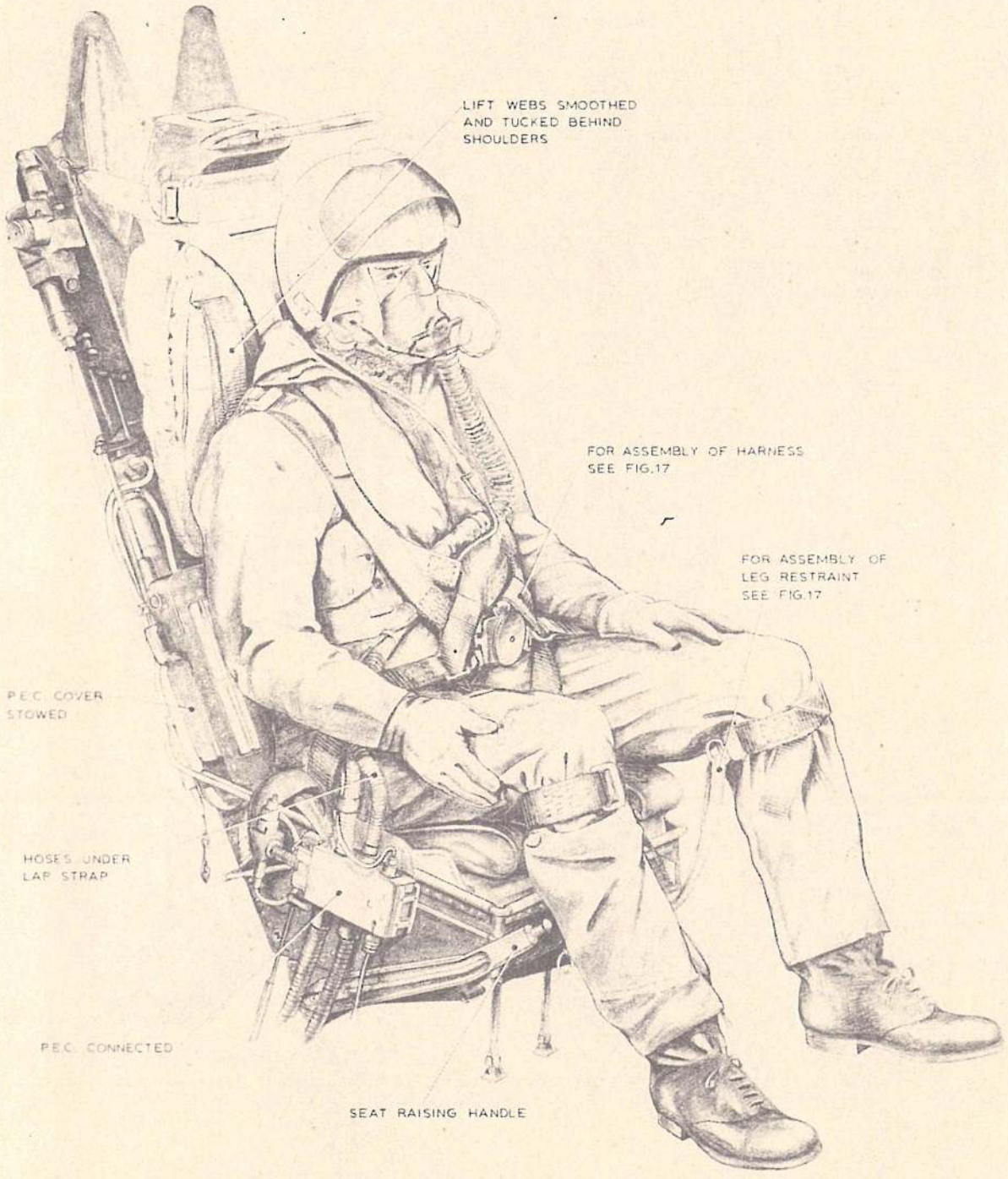

Fig. 18. The navigator's Mk. 3CST seat occupied (1)

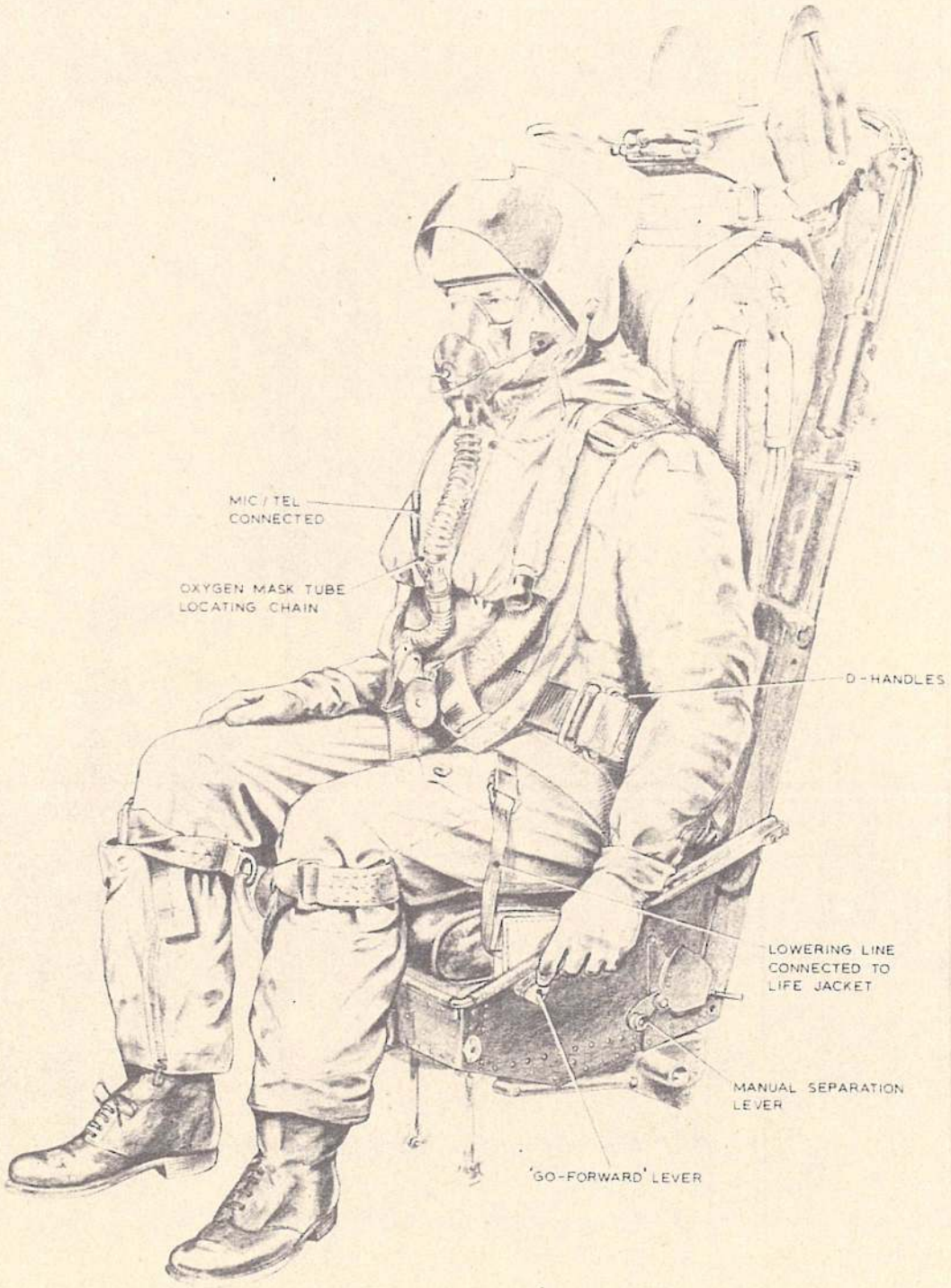

Fig. 19. The navigator's Mk. 3CST seat occupied (2)

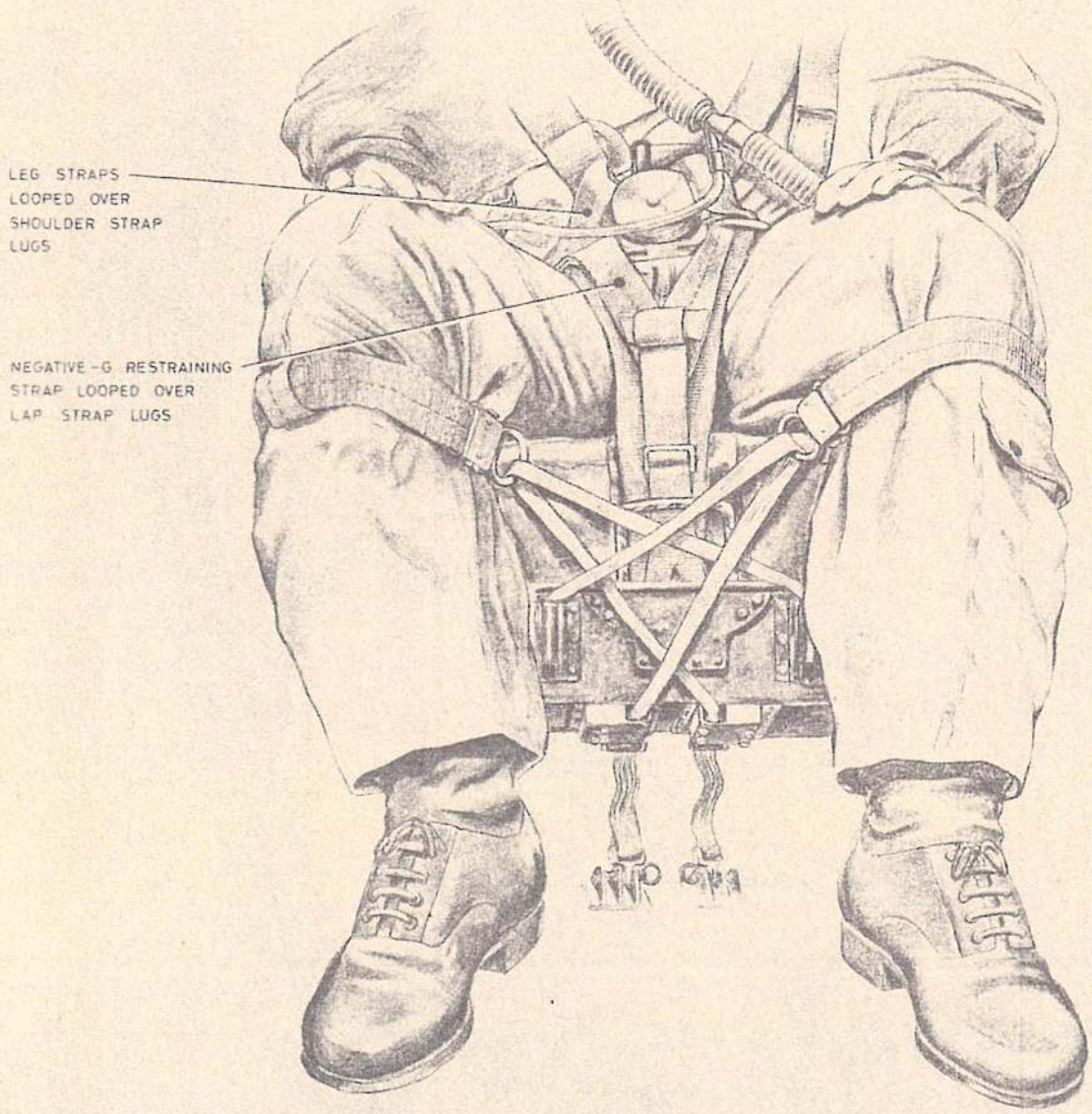

Fig. 20. Assembly of leg restraint cords and harness

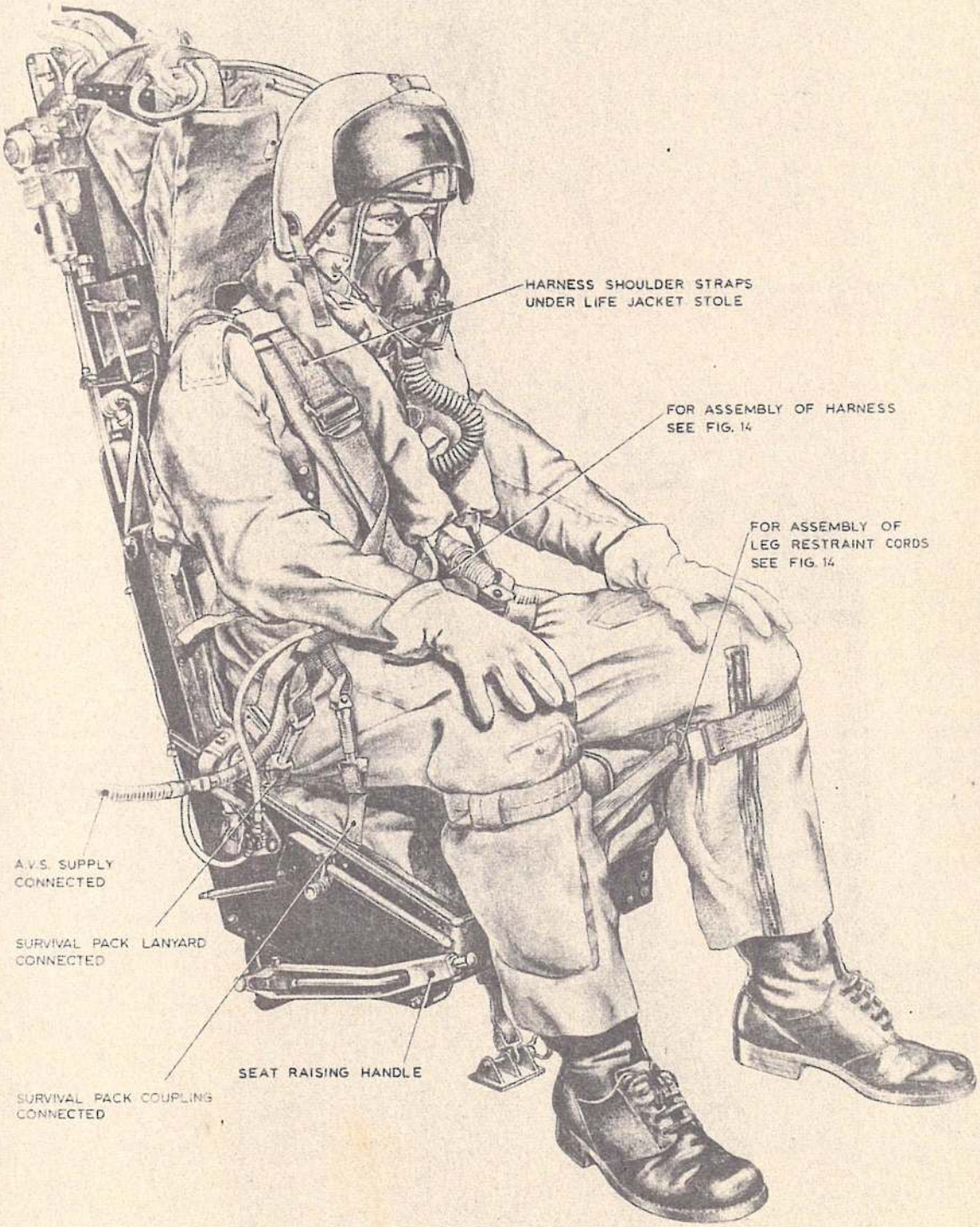

Fig. 21. The pupil's and instructor's Mk. 3CT seats occupied (1)

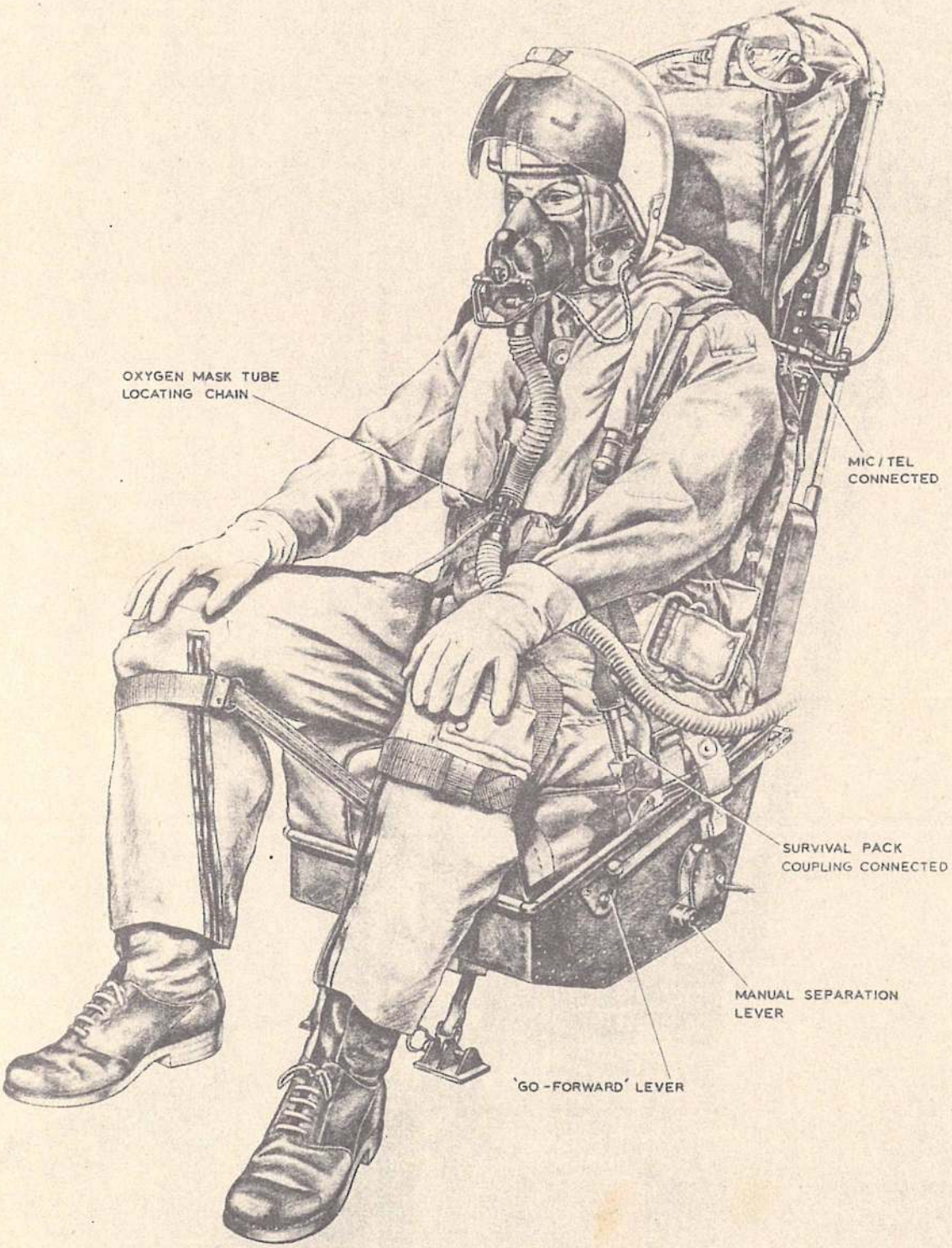

Fig. 22. The pupil's and instructor's Mk. 3CT seats occupied (2)

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