Chapter 2

CANBERRA T Mk. 4

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Introduction

1. The Canberra T Mk. 4 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 and the navigator occupies the rear position on the port side. Prior to the introduction of Mod. 2350 the pupil pilot and instructor occupied static seats; information dealing with the A.E.A. for aircraft still fitted with static seats will be found in Appendix 1 of this chapter.

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. 1CN ejection seat.

3. 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 is locked in the forward or in the normal flight positions by a plunger which engages one of the two sockets mounted on the aircraft deck, which are fitted at the appropriate positions. This locking plunger can be engaged or retracted by any of the three control levers provided; 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.

4. Because of this arrangement, the recommended order of equipping the ejection seats is (a) at the navigator's station, (b) at the pupil pilot's station and (c) at the instructor's station with the seat locked in the normal flight position; this order is adhered to in the text. Instructions for strapping-in and leaving the aircraft after landing are given, after a brief description of the various components of the A.E.A. and their function; full details will be found in the publications referred to in the appropriate paragraphs.

COMPOSITION OF THE ASSEMBLIES

Navigator's A.E.A.

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

Ejection seat	Mk. 1CN
Safety harness	Type ZG
Parachute assembly	Seat Type Mk. 11
Personal survival pack	Type M
Emergency oxygen set (in parachute pack)	Mk. 4
Flying clothing	*To be included later*

Instructor's and Pupil's A.E.A.

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

Ejection seat	Mk. 3 CT1 (Instructor) Mk. 3 CT2 (Pupil)
Parachute assembly	Seat type Mk. 15
Personal survival pack	Type Y
Negative G restraining strap	Part No.MBEU/660PA
Emergency oxygen set	Mk.7D
Flying clothing	*To be included later*

EJECTION SEATS

The Mk. 1CN ejection seat

7. The Mk. 1CN seat 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 aircraft structure.

8. The seat pan is adjustable for height by a handle on the right-hand side of the seat. The

plunger in the end of the handle must be depressed before the height can be adjusted.

9. On the same side of the seat pan, mounted on the thigh guard, is the harness 'go-forward' lever which, when operated, permits the occupant to lean forward in the seat. When assuming the normal sitting position, the 'go-forward' mechanism is locked by its ratchet and prevents the occupant leaning forward again until the lever is operated.

Firing handle

10. The firing handle, which projects from the front of the drogue container, has an integral face screen. Pulling this handle fires the ejection gun and operates the seat immediately.

Leg restraint system

11. 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 in front of the seat pan and are then attached to the aircraft floor by shear rivets. The snubbing units allow the cords to pass freely down through the unit but prevent the cords passing upwards, except when released by pressing the spring button underneath each unit.

12. The leg restraint cords are threaded through rings attached to garters worn by the occupant just below the knees and are then looped around the shoulder strap lugs of the safety harness at the quick-release fitting. 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 the triggers on each side of the coupling simultaneously.

Automatic safety harness release

13. An automatic harness release is mounted on the left-hand side of the seat, connected by means of a guarded cable and conduit to the safety harness quick-release fitting. The release contains a spring-controlled time-delay mechanism which is set in operation by the withdrawal, on ejection, of a pin connected by static line to the seat guide rail. After an appropriate delay the spring mechanism is tripped, opening the harness quick-release fitting and freeing the occupant from the seat. The automatic harness release does not interfere with the normal opening and closing of the quick-release fitting.

Sequence of events during ejection

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

(1) The leg restraint cords tighten until the rivets shear in the floor anchorages.

(2) The static line on the automatic harness release withdraws the pin which sets the time-delay mechanism in motion. The time delay is two seconds.

(3) The main oxygen supply hose is disconnected from the aircraft connection. The supply hose to the A.V.S. (if used) is disconnected. The Mic/Tel lead is disconnected at the push-pull connection.

(4) The static line to the emergency oxygen cylinder is pulled, turning on the emergency oxygen supply.

(5) As the ejection seat leaves the aircraft another static line pulls taut and fires the drogue gun. This deploys the drogue which first checks the forward speed of the seat and then stabilizes it in a slightly forward attitude.

(6) Two seconds after withdrawal of the automatic harness release pin (see (2)), the safety harness quick-release fitting opens automatically and the occupant leaves the seat. The main and emergency oxygen supplies are disconnected at the oxygen mask tube; the helmet Mic/Tel lead is disconnected from the seat lead.

(7) Separation from the seat causes the

static line attached to the seat to withdraw the pin in the automatic parachute release and actuate the barostatic delay.

(8) If ejection has taken place below 13,000 ft. the parachute rip cord will be withdrawn after a delay of 3½ to 4½ sec. and the parachute will deploy. If above 13,000 ft. the rip cord withdrawal mechanism is held by the barostat until the descent reaches this altitude; after a further delay of 3½ to 4½ sec. the parachute will open. The parachute rip cord can be withdrawn manually (overriding the barostat) at any time after separation from the seat, by pulling the lower striped emergency operating knob on the parachute harness waist belt.

The Mk. 3CT ejection seat

15. The Mk. 3CT ejection seat is ejected from the aircraft by a cartridge operated gun at a speed of 80 ft./sec. During ejection the seat slides on a guide rail attached to the aircraft structure.

Firing handle

16. Two firing handles are fitted on the Mk. 3CT ejection seat. The main handle projects from the front of the drogue container and has an integral face screen; the alternative firing handle is located in 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 will operate the ejection gun immediately.

Leg restraint system

17. 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 floor anchorages with shear rivets. The snubbing units allow the cords to pass freely down through the unit but prevent the cords passing upwards except when released by the spring-loaded toggle at the front of each snubbing unit.

18. The leg restraint cords are threaded through rings attached to garters worn by the occupant of the seat. The garters may be stitched into the legs of the flying suit and are provided with small quick-release couplings; the rings (which are usually threaded on the leg restraint cords beforehand) have lugs which fit 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.

Seat raising mechanism

19. The seat pan is adjustable for height by a handle on the right-hand side of the seat. The plunger in the end of the handle must be depressed before the height can be adjusted.

Automatic equipment

20. 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, decelerate and stabilize the seat. The barostatic time-release unit is also initiated by a static rod, which actuates the release mechanism. 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-delay mechanism is operated 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) releases the rear anchorage of the face blind, (c) releases the harness from the seat, and (d) releases the leg restraint cords.

Harness locks on the seat

21. 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 rear inner face 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 a 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. 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 released.

22. 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

23. A negative-G restraining strap is attached to the harness lap straps and the rear anchorage straps which 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.

Sequence of events during ejection

24. The following is the normal sequence of events after the firing handle has been operated.

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

(a) The leg restraint cords tighten until the rivets shear in the floor anchorages.

(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) The main oxygen hose and A.V.S. hose are disconnected from the aircraft supply.

(e) The emergency oxygen supply is turned on.

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

(a) After ½ sec. 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 deploys automatically. At modern aircraft speeds and heights, the delay is 1¼ sec. after ejection. At high altitude the 1¼ sec. delay does not start until the seat has descended to 10,000 ft. At high speeds (at 10,000 ft. or below) delay does not start until the seat has decelerated to a safe speed for the parachute canopy to open. The emergency oxygen tube separates at the quick-release stirrup fitting.

25. Information concerning both the Mk. 1CN and the Mk. 3CT ejection seat will be found in A.P.4288 series.

EMERGENCY OXYGEN

26. The navigator's emergency oxygen cylinder is installed in the seat type parachute pack, but the operating cable conduit is clamped by the anchor socket to the rear of the seat. The cable,

which runs through the conduit, is connected to another static line by an anchor hook so that the emergency oxygen is turned on automatically on ejection. A ball handle is incorporated in the static line assembly to turn on the emergency oxygen supply manually if required.

27. The emergency oxygen cylinders for the instructor and pupil are mounted on the starboard beams of each Mk. 3CT ejection seat and the supply is turned on automatically (also by a static line) during ejection. 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 the lever turns on the emergency oxygen supply manually.

28. The emergency oxygen tube is attached to the right-hand side of the seat by 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.

PARACHUTE ASSEMBLIES

29. The seat type Mk. 11 parachute assembly used by the navigator incorporates a combined automatic and manual release attached to the harness waistbelt. The manual release consists of the rip cord, terminating in a knob situated at the lower part of the casing, which is pulled to release the canopy and initiate deployment; this knob is only used when the automatic release cannot be employed (manual bale-out) or if the automatic release fails after leaving the aircraft (manual separation).

30. The automatic release mechanism is set in operation by the withdrawal of a pin at the end of a static line cable as the occupant separates from the seat after ejection. This cable is in two sections which are coupled together at a position approximately midway between the release and the point of anchorage on the seat pan. Incorporated in the mechanism is a disconnect-key which is turned to break the cable coupling and immobilise the mechanism; this key is situated under a cap on the casing above the manual operation knob. When the key is turned the static line is uncoupled and at the same time the barometric time-delay device is locked, so that subsequently the parachute can only be operated manually.

31. The seat type Mk. 15 parachute assembly used by the instructor and pupil also incorporates an automatic and manual release system for deploying the canopy; this operates in conjunction with the barometric time-release units on the Mk. 3CT ejection seat which release the combined harness and parachute at a selected altitude. The operating sequence is explained in para. 20.

32. In the event of malfunctioning of the automatic system on the Mk. 3CT ejection seat, the parachute harness waistbelt on the Mk. 15 parachute assembly is provided with two D-handles and the seat has a manual separation lever to release the harness. The first D-handle (nearer the quick-release fitting) disconnects 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 a failure of the ejection seat to operate, the first D-handle is pulled (while the seat occupant is still in the cockpit) to enable a manual bale-out to be made in favourable circumstances.

33. Detailed information on the parachute assemblies will be found in A.P.1182A, Vol. 1 (2nd Edition).

PERSONAL SURVIVAL PACKS

34. The navigator's personal survival pack Type M is placed on top of the seat type parachute pack and in normal flight serves as a cushion; it is attached to the life jacket by quick-release couplings during strapping in. A lanyard (which connects to another quick-release coupling on the life jacket) is provided to prevent the pack being lost when discarding the parachute harness after a descent. The personal survival pack has a slotted hole in the centre which provides a passage for the leg loop of the parachute harness.

35. The Type Y pack used by the instructor and pupil is attached by press studs to the top of the parachute pack. This is also connected to the life jacket by quick-release couplings during strapping in, together with the lanyard which in this instance emerges from the right-hand attachment flap of the pack. The lanyard serves the same purpose as that on the Type M

pack of the navigator, i.e. it prevents the pack being lost on discarding the combined harness after a descent, since it is attached to the life jacket by a quick-release coupling.

36. Detailed information on both of personal survival packs will be found in A.P.1182C.

EQUIPPING THE NAVIGATOR'S SEAT

Connections to the aircraft

37. When the navigator's seat is installed in the aircraft and is properly equipped the following items are connected:–

(1) *Left-hand side of the seat:–*

(a) Mic/Tel lead push-pull connection.

(b) Static line from the drogue gun.

(c) Static line from the automatic safety harness release.

(d) Static line from the automatic parachute release. This is not connected to the aircraft but to the left-hand side of the seat pan.

(2) *Right-hand side of the seat:–*

(a) Main oxygen supply hose. This is clipped to the right-hand lap strap of the safety harness.

(b) Static line and manual control knob to anchor hook of the emergency oxygen assembly.

(c) A.V.S. air supply hose (if fitted this may be on either the left or right-hand side).

(3) *Underneath the seat:–*

(a) Leg restraint cords.

Equipping the seat

38. The following procedure is to be used when equipping the seat; refer to figs. 1 and 2 for detail as necessary:–

(1) Ensure that the seat has been made safe for servicing in accordance with current instructions.

(2) Undo the safety harness and clear the straps from the seat pan. Ensure that the quick-release fitting is in the locked position.

(3) Place the parachute in the seat pan; spread out the harness straps to leave the seat clear. Connect the parachute static line (on the seat) to the baro-static time-release operating cable at the disconnect unit. Alternatively, if the disconnect unit is already coupled, connect the static line to the seat by means of the eyebolt spliced on the end.

(4) Place the personal survival pack on top of the parachute pack with the connecting lanyard on the right. Pull the leg loop of the parachute harness through the aperture in the centre of the survival pack.

(5) Connect the emergency oxygen cable housing fitting in the gate clamp at the rear of the seat. The cable must lie OUTSIDE the parachute harness and INSIDE the safety harness. Connect the anchor hook to the static line-cum-manual operating cable.

(6) Remove the safety pin from the emergency oxygen cylinder.

(7) Check that the knurled cap on the automatic harness release static line is screwed into the curved tube at the left-hand rear of the seat.

(8) Open the parachute harness straps ready for occupation of the seat; ensure that the quick-release fitting is in the locked position.

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

EQUIPPING THE INSTRUCTOR'S AND PUPIL'S SEATS

Connections to the aircraft

39. 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) A.V.S. air supply hose (if fitted this may be either on the right or left-hand side).

(3) *Underneath each seat:–*

(a) Leg restraint cords.

Equipping the seats

40. 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, and that the seats have been made safe for servicing in accordance with current instructions.

41. The Pupil's seat (on the port side) is equipped first and the following procedure is to be adopted; refer to fig. 3 to 10 for detail as necessary:–

(1) Retract the seat locking plunger by operating 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.

(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.

(5) Connect the anchor hook to the static line-cum-manual operating cable (*fig.* 3).

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

(7) Operate the 'go-forward' lever and pull out the webbing strap from the slot below the drogue container. 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.* 4).

(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.* 5).

(11) Take the negative-G restraining strap and pass the double white section 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 forward.

(12) Check that the bottom edge of the apron is connected to the seat and arrange the apron to follow the contours of the seat.

(13) Place the parachute pack in the seat

and connect the two halves of the parachute withdrawal line coupling.

(14) Draw the port side arm of the white portion 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.* 6).

(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 side corner of the pack, near the back rest.

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

(18) Repeat operations (9) to (12) using the starboard arm of the negative-G restraining strap and assembling 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-piece lies over the alternative firing handle (*fig.* 7).

Note . . .

It is essential that the white portion 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 the sides of the seat pan (*fig.* 10).

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

(22) Tilt the parachute pack forward to expose the rear row of press studs and attach the rear press studded flaps of the survival pack to the parachute pack.

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

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

(25) Take the upper oxygen tube assembly and attach to the stirrup quick-release fitting. This is mounted on the strap connected to 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.* 8).

(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 clear until the seat is ready for occupation.

(29) Ensure that the two D-handles on the waistbelt of the parachute harness are correctly positioned. The second handle (i.e. furthest from the quick-release fitting) is 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 is to be repeated

before EVERY subsequent flight).

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

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

(33) Equip the instructor's seat similarly, as described in operations (1) to (31).

42. After equipping the pupil's and instructor's seats, ensure that the seats have been made safe for parking in accordance with current instructions.

STRAPPING-IN PROCEDURE

43. The strapping-in procedure is to follow the same order as equipping the seats, namely, navigator first, then the pupil and finally the instructor.

Strapping-in: Navigator

44. Strapping-in procedure is as follows: refer to fig. 11 to 13 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. Fit the leg restraint garters, if this has not already been done. (The garters may be stitched into the flying suit, or fitted before entry to the aircraft).

(3) Connect the personal survival pack lanyard to the quick-release coupling on the right of the life jacket so that the lanyard lies across the right thigh.

(4) Connect the side quick-release couplings of the personal survival pack to the two corresponding fittings on the life jacket.

(5) Connect the parachute harness shoulder straps to the quick-release fitting. The shoulder straps are to lie under the life jacket stole.

(6) Pass the parachute harness leg straps through the leg loop and couple them to the quick-release fitting.

(7) Adjust the quick-release fitting so that it lies centrally with the waist-belt close to the body.

(8) Tighten the shoulder straps first so that the parachute harness quick-release fitting will lie above and clear of the safety harness quick-release fitting when this is assembled.

(9) Tighten the parachute harness leg straps. When tightening harness straps 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.

(10) Insert the safety clip behind the disc knob of the parachute harness quick-release fitting.

(11) Connect the air supply hose to the air ventilated suit if worn.

(12) Fasten the lap straps of the safety harness but do not tighten.

(13) Thread the leg restraint cords through the quick-release coupling rings on the garters as follows. The cord emerging from the snubbing unit behind the left leg passes through the garter ring on the right leg and UNDER the safety harness lap strap. Insert the lug of the right shoulder strap of the safety harness through the loop at the end of the cord and secure the right shoulder strap in the quick-release fitting. Similarly, the cord emerging from the snubbing unit behind the right leg passes through the garter ring on the left leg, and UNDER the safety harness lap strap. Insert the lug of the left shoulder strap of the safety harness through the loop at the end of the cord and secure the left shoulder strap in the quick-release fitting.

(14) If there is insufficient cord, press and hold the plunger under the snubbing unit and pull more cord through; if there is too much, pull back any

excess through the unit in the opposite direction (it is unnecessary to press the plunger in this instance).

(15) Tighten the safety harness lap straps first, then tighten the shoulder straps.

Note . . .

Ensure that the harness quick-release fitting is as low as possible to expose the parachute harness fitting. The emergency oxygen release cable and emergency oxygen supply tube must be under the safety harness and over the parachute harness.

(16) Connect the main and emergency oxygen supply to the oxygen mask tube and the locating chain to the life jacket. Any excess of emergency oxygen tube is to be coiled up and tucked between the seat thigh guard and the side of the personal survival pack (loose loops of cable or hose constitute a hazard on ejection).

(17) Connect the Mic/Tel lead.

(18) Check that the cap on the static line disconnect and barostat override control is in place. If the cap has been removed, try to replace it; if it cannot be refitted, the parachute assembly will not operate automatically and is to be replaced.

(19) Adjust the height of the seat. Ideally, the head is to be located in the centre of the headrest cushion.

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

(21) Ensure that the chin straps of both helmets are fastened, fit the oxygen mask and perform pre-flight oxygen checks.

Note . . .

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

(22) Remove the safety pin from the firing handle safety lock and place it in its stowage.

Strapping-in: Pupil and instructor

45. The pupil (occupying the port seat in the cockpit) straps in after the navigator. Adopt the following procedure and refer to fig. 14, 15 and 16 for detail as necessary:–

(1) Ensure that both seats have been made safe for parking in accordance with current instructions.

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

(3) Sit in the seat.

(4) Thread the leg restraint cords through the quick-release couplings on the garters as follows. Thread the cord from the starboard snubbing unit (under the seat pan) through the garter coupling of the left leg and plug the end-fitting of the cord into the starboard taper socket (on the front of the seat pan).

Note . . .

On the Mk. 3CT seat the taper plugs fit into holes near the top of the taper sockets.

(5) 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.* 14).

(6) 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.

(7) Connect the personal survival pack lanyard to the life jacket quick-release coupling on the right so that the lanyard lies across the right thigh.

(8) Connect the side quick-release couplings of the personal survival pack to the two corresponding fittings on the life jacket.

(9) Bring the harness waistbelt across the body. Adjust the quick-release fitting so that it lies central with the waistbelt close to 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-piece. Clip the lug into the quick-release fitting.

(12) When correctly assembled the two loops of the negative-G restraining strap Y-piece cover the lap strap lugs on each side of the quick-release fitting. 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 (*fig.* 14).

(13) Bring the leg loops up between the legs and thread the left loop through the metal eye on the left lap strap; pass 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.

(14) 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 harness 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 are normally extended 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) 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 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; this causes the back to arch which is a bad attitude for ejection.

(18) This tightening will ruck the section of 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 locating chain to the D-ring on the life jacket stole (*fig.* 16).

(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 hose (when an A.V.S. is worn) (*fig.* 15).

(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.

(25) With assistance from a ground crew member, if available, remove the main and alternative firing handle pins and stow (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) The instructor straps in as described in operations (1) to (25).

EMERGENCIES

46. For drill and procedure to be taken in emergencies refer to Pilot's Notes A.P.4326D-P.N.

LEAVING THE SEAT AFTER LANDING

Instructor and pupil

Proceed as follows:–

47. (1) Remove the 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) Disconnect the main and emergency oxygen supply and the Mic/Tel lead.

(3) Disconnect the air ventilated suit, if worn.

(4) Disconnect the leg restraint cords from the garters by operating the quick-release couplings.

(5) Remove the spring clip from the combined harness quick-release fitting; undo the harness and negative-G restraining strap. Return the quick-release fitting to the locked position.

(6) Disconnect the personal survival pack from the life jacket and allow the lanyard to drape over the right-hand side of the seat pan.

(7) The instructor leaves his seat first and swings it into the rearward position to allow the pupil to leave. After the pupil has left his seat the seat is swung into the forward position to allow the navigator to leave.

Navigator

Proceed as follows:–

48. (1) Remove the firing handle safety pin from its stowage and fit through the safety strap (assistance should be obtained, wherever possible, from a member of the ground crew).

(2) Disconnect the main and emergency oxygen supply and the Mic/Tel lead.

(3) Disconnect the air ventilated suit, if worn.

(4) Release the safety harness; pull out the safety clip and release the parachute harness.

(5) Disconnect the personal survival pack from the life jacket and allow the lanyard to drape over the right-hand side of the seat pan.

(6) Disconnect the leg restraint cords.

(7) Leave the seat.

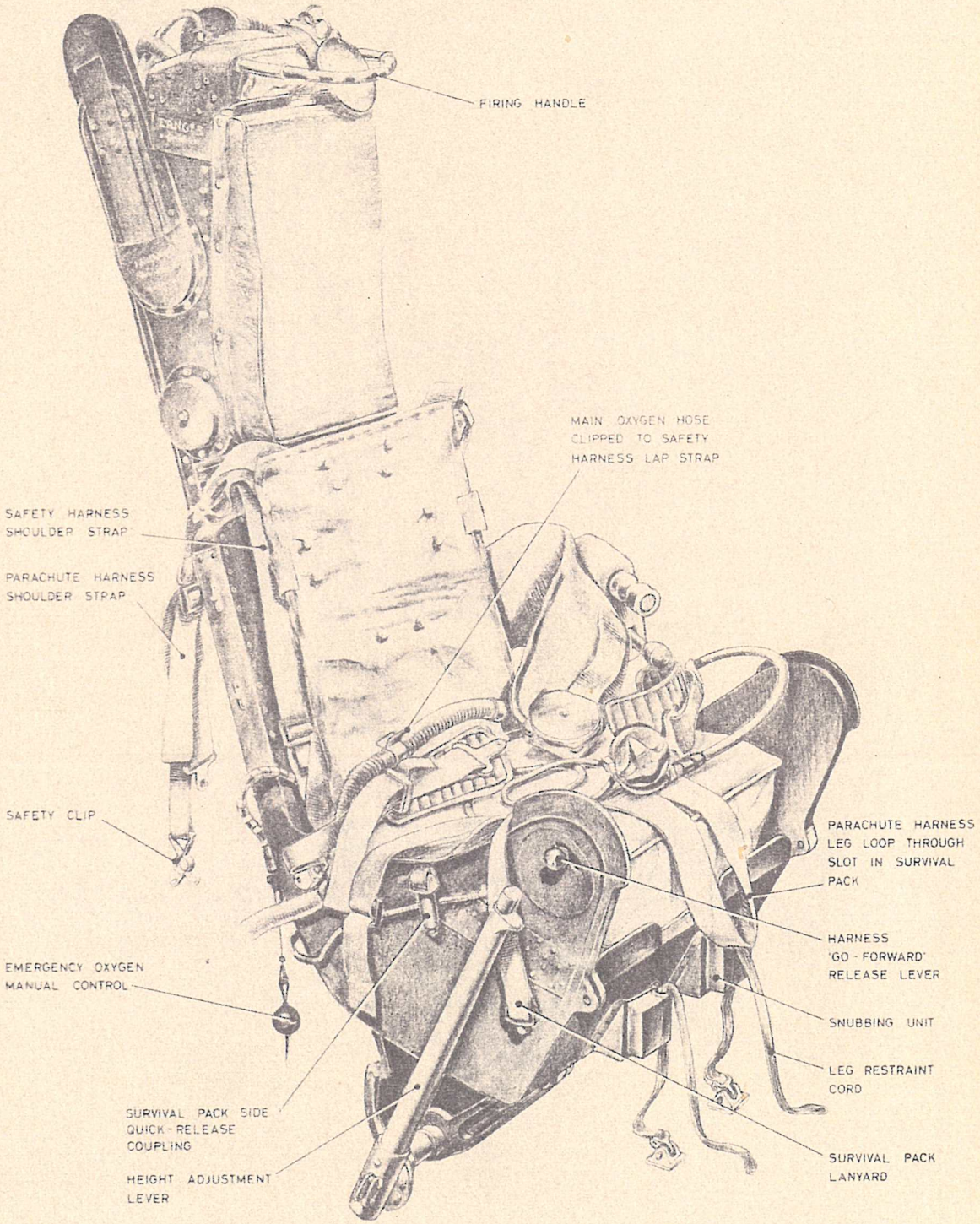

Fig. 1. The Mk. 1CN seat equipped (1)

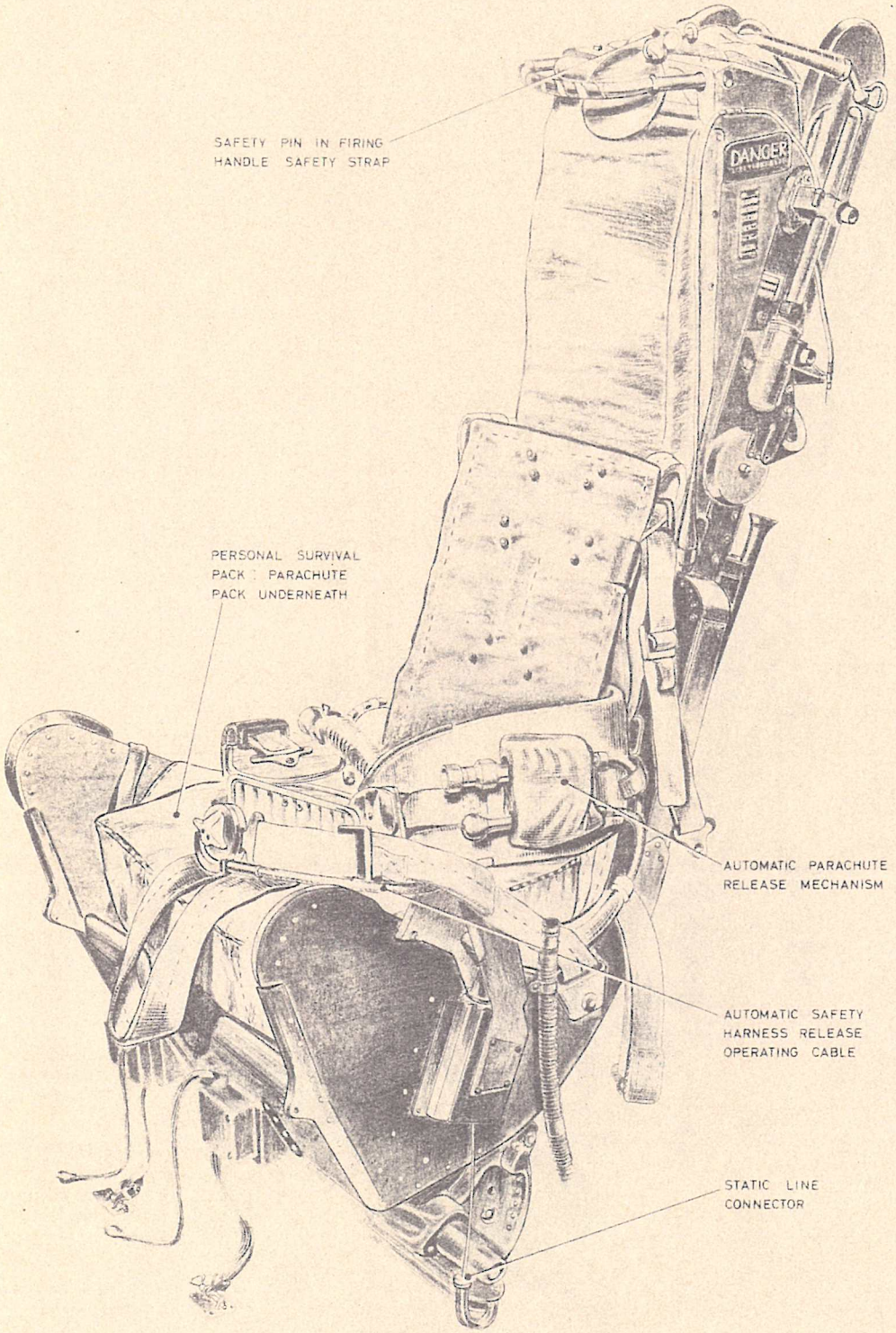

Fig. 2. The Mk. 1CN seat equipped (2)

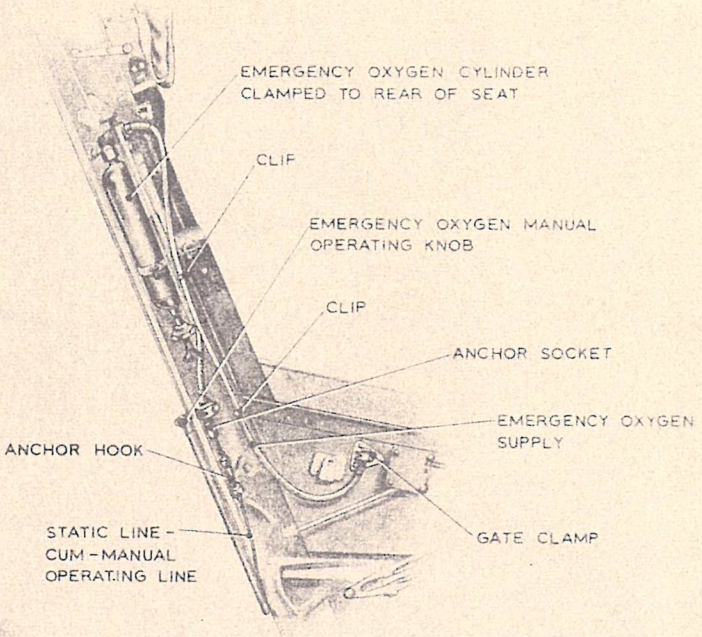

Fig. 3. Arrangement of emergency oxygen supply

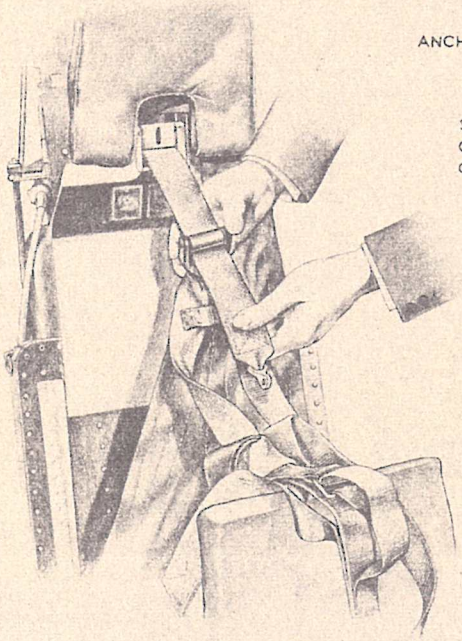

Fig. 4. Installing parachute assembly (Stage 1)

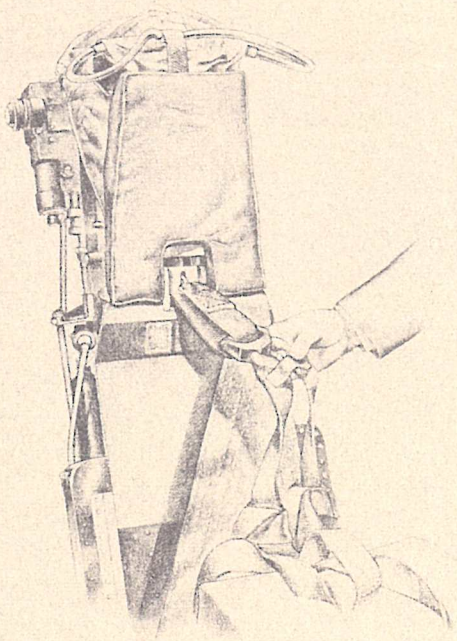

Fig. 5. Installing parachute assembly (Stage 2)

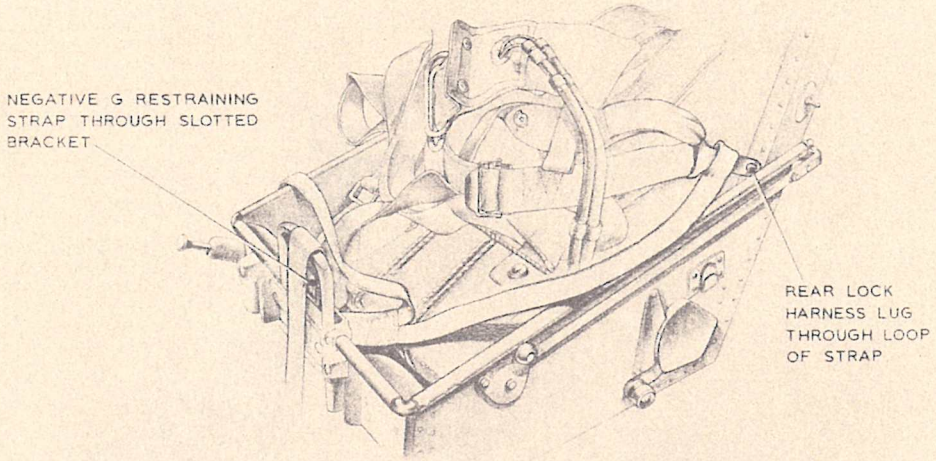

Fig. 6. Installing parachute assembly (Stage 3)

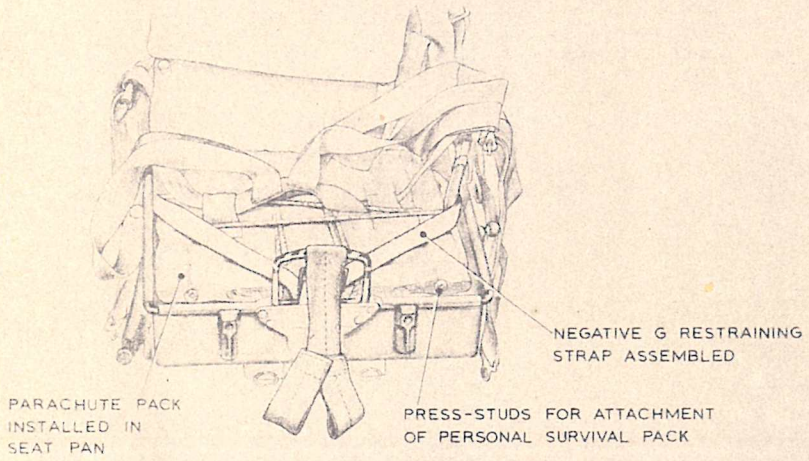

Fig. 7. Installing parachute assembly (Stage 4)

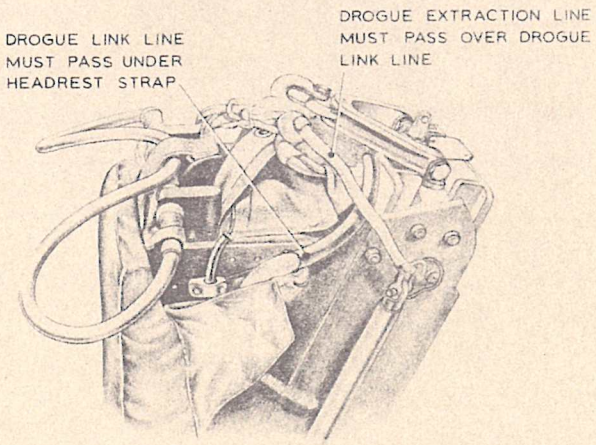

Fig. 8. Arrangement of drogue withdrawal and link lines

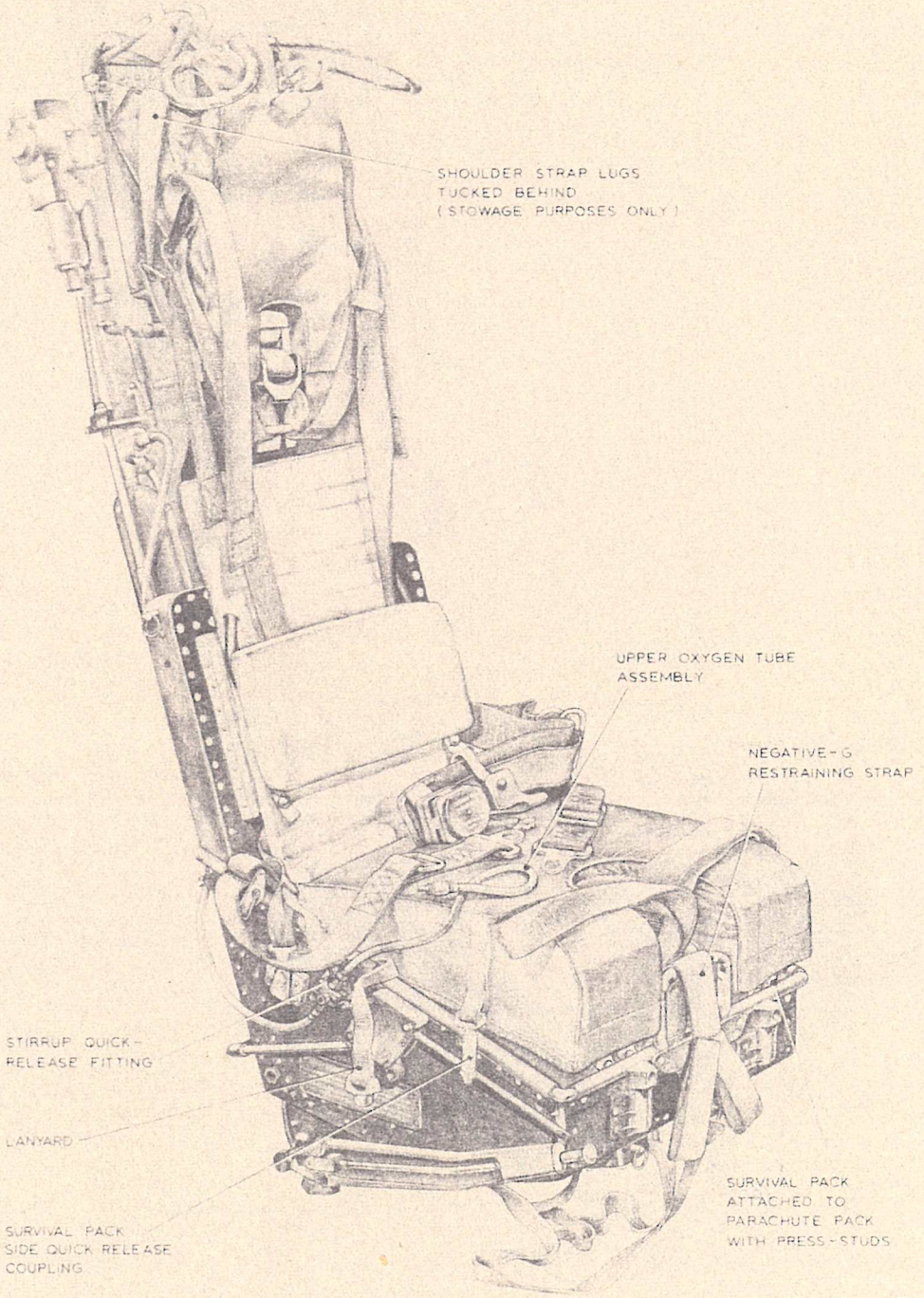

Fig. 9. The Mk. 3CT seats equipped (1)

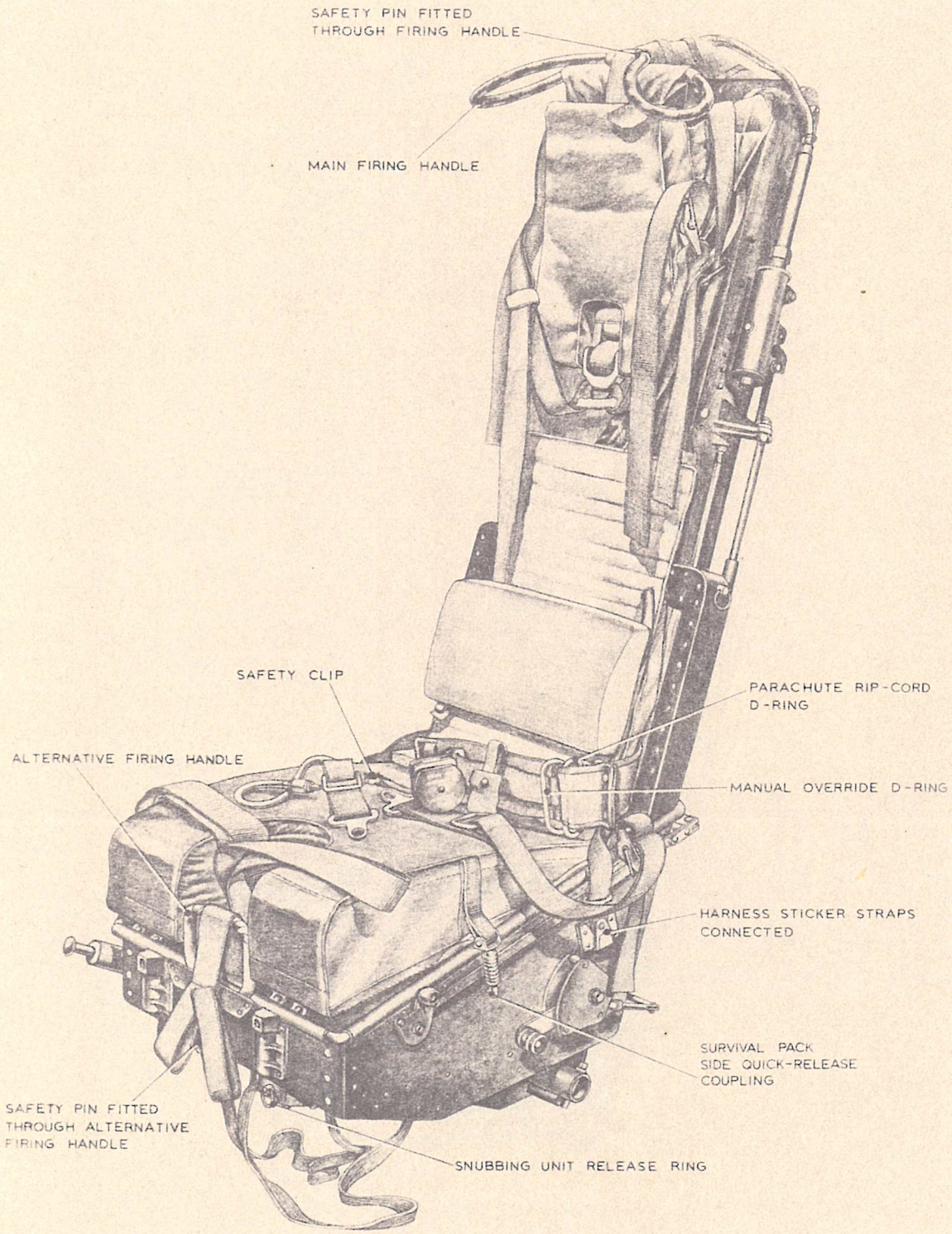

Fig. 10. The Mk. 3CT seats equipped (2)

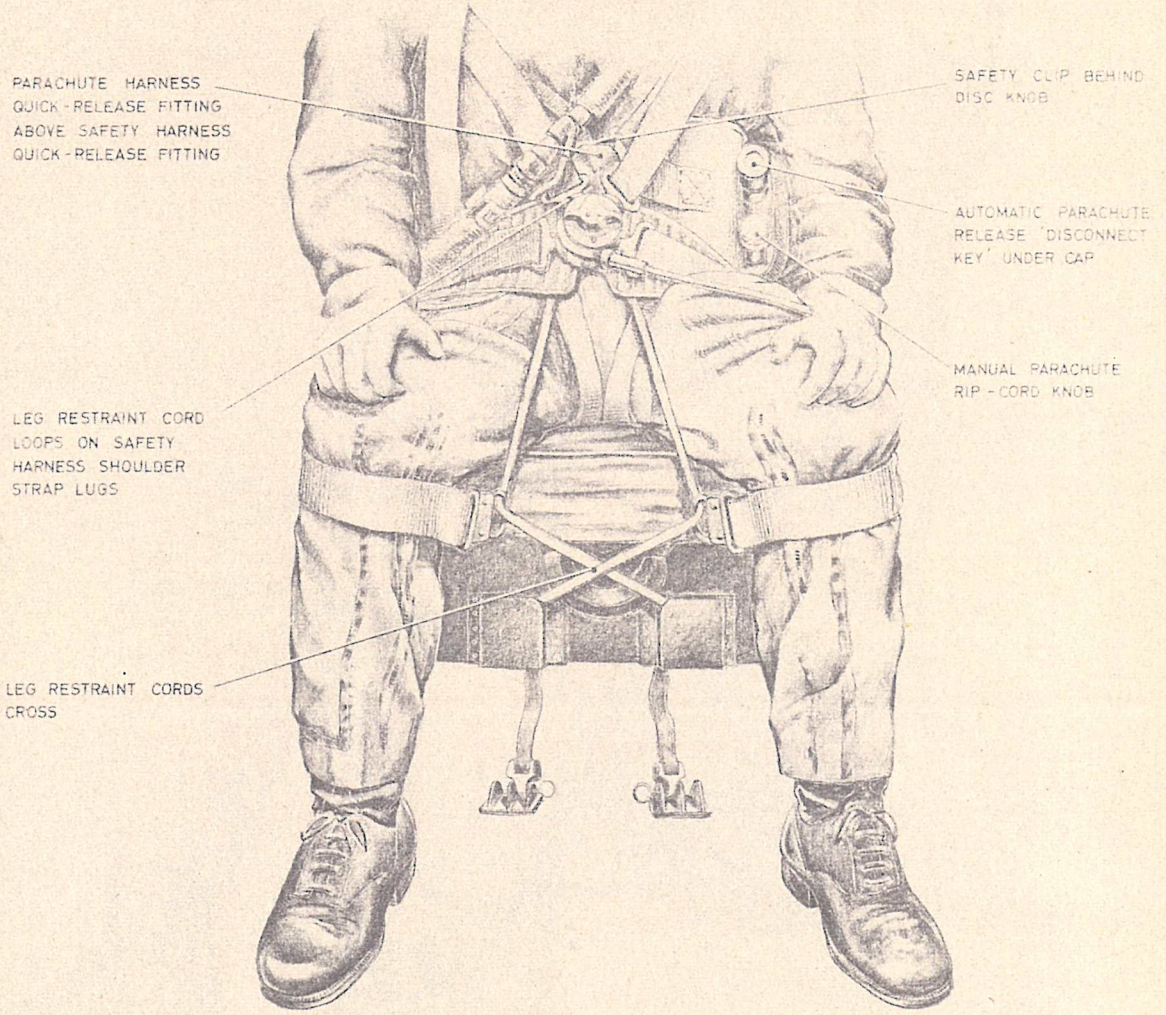

Fig. 11. Assembly of leg restraint cords and harness (Navigator)

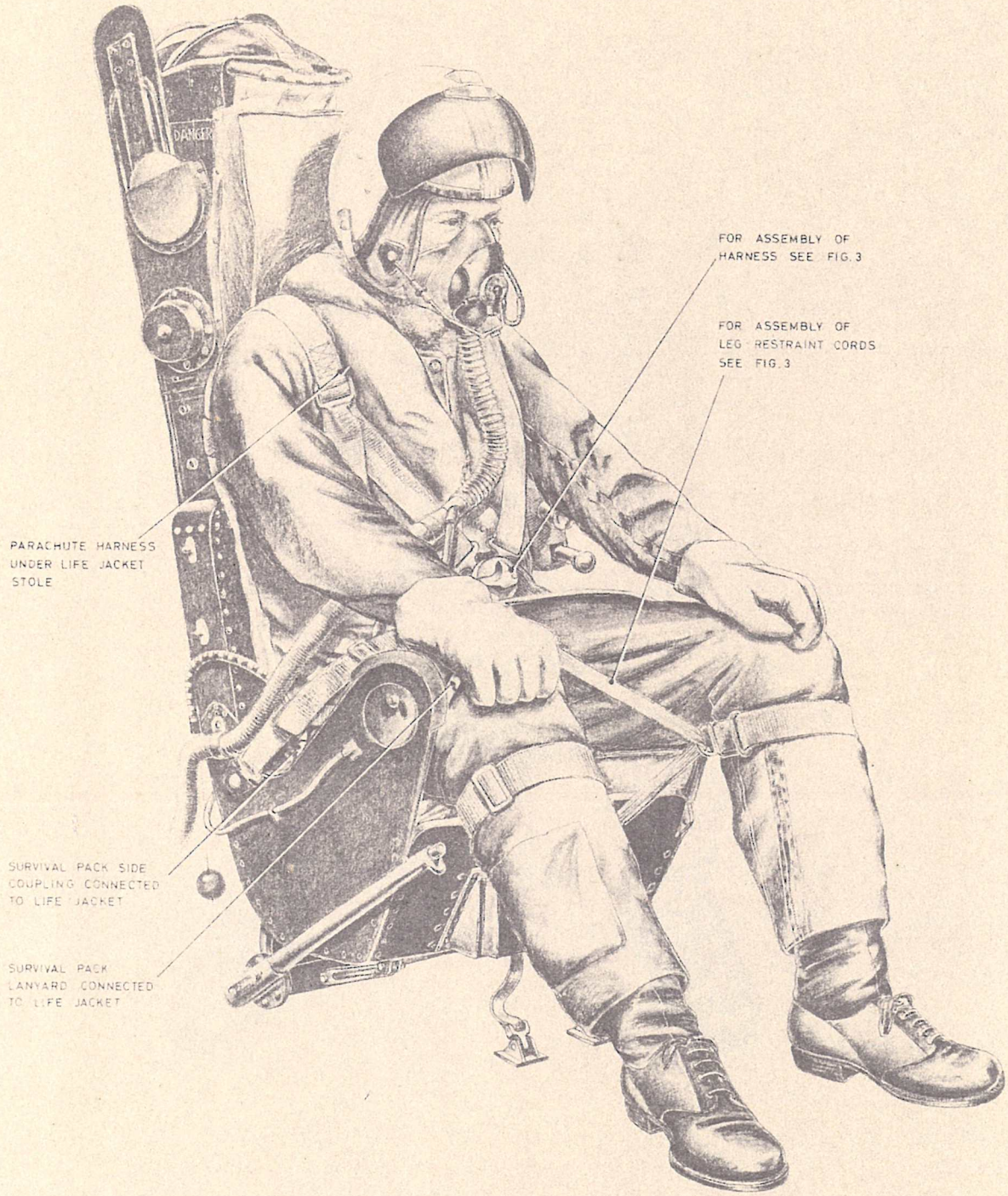

Fig. 12. The Mk. 1CN seat occupied (1)

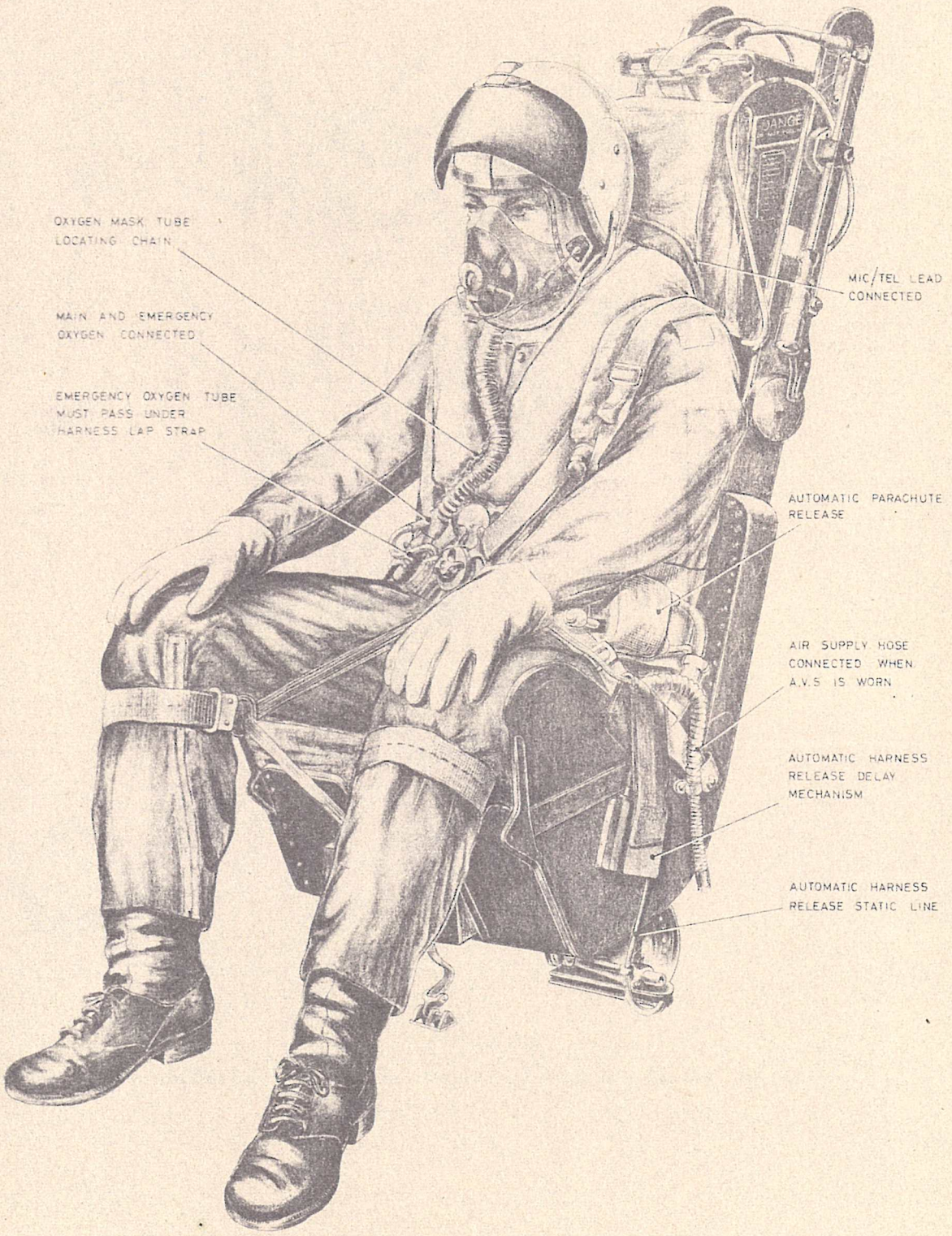

Fig. 13. The Mk. 1CN seat occupied (2)

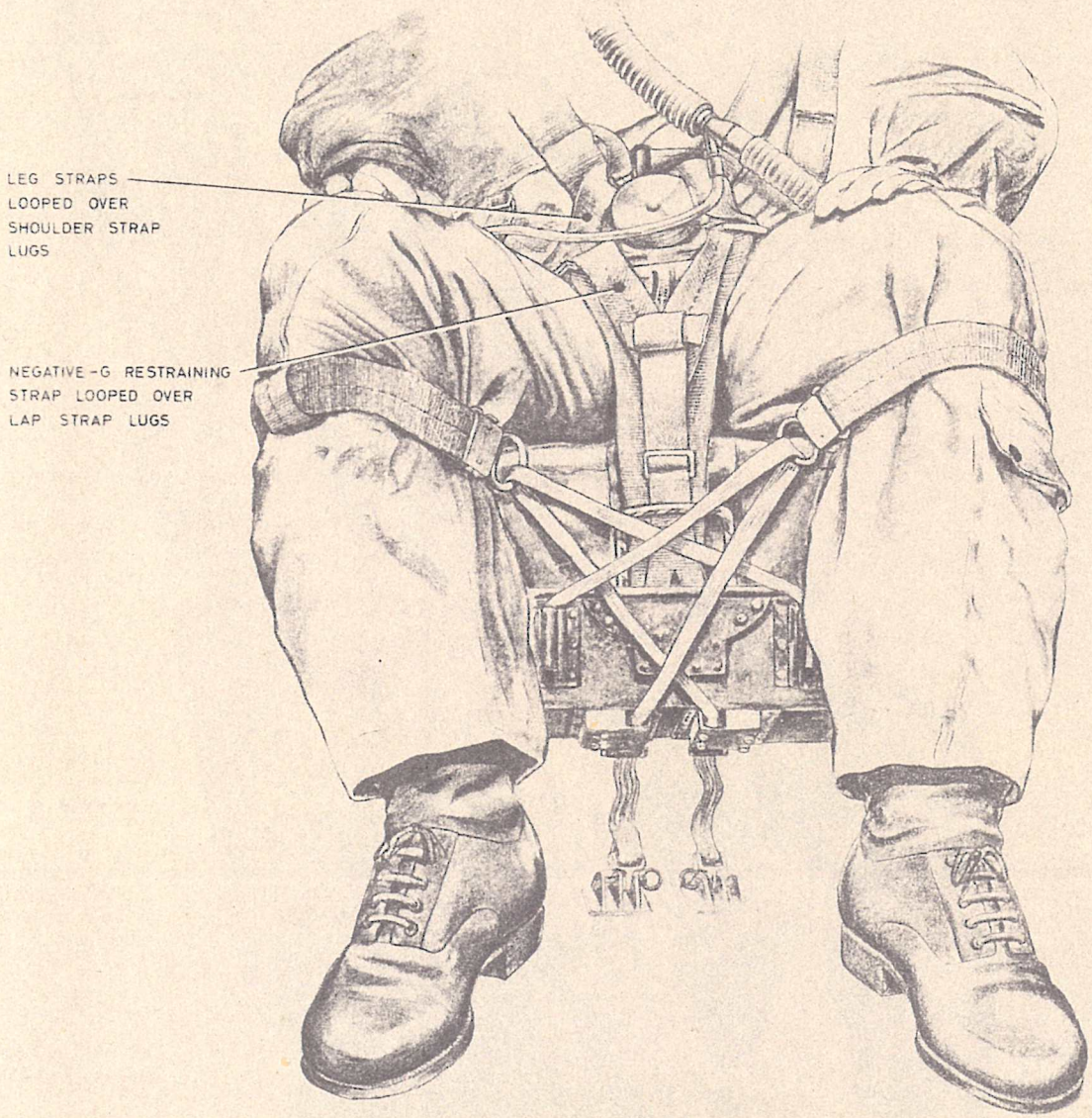

Fig. 14. Assembly of leg restraint cords and harness (Pupil and Instructor)

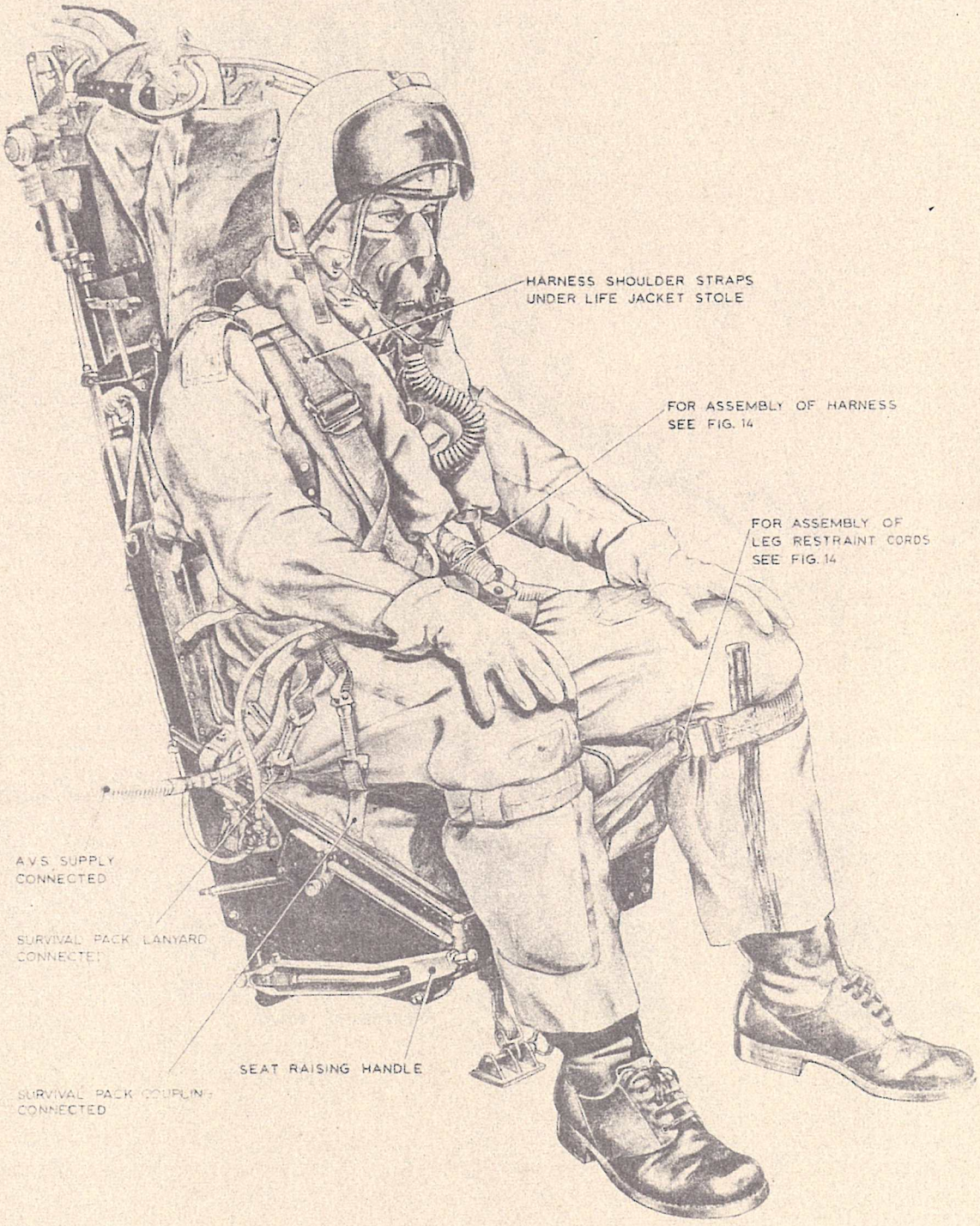

Fig. 15. The Mk. 3CT seats occupied (1)

Fig. 16. The Mk. 3CT seats occupied (2)