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October 1977

(Superseding AP1182 Vol. 1

Book 1 Chap 3)

**AIRCREW EQUIPMENT ASSEMBLIES  
EJECTION SEAT TYPE 3B  
(VAMPIRE T 11 AIRCRAFT)**

**GENERAL AND TECHNICAL INFORMATION**

BY COMMAND OF THE DEFENCE COUNCIL

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**AMENDMENT RECORD**

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LETHAL WARNING

1. The assisted escape system and associated explosive operated jettison mechanisms fitted to aircraft are a potential source of lethal injury to personnel and damage to Government property if inadvertently operated.
2. Safety devices in the form of safety pins, levers and switches are provided for use when the aircraft is on the ground to safeguard against this danger.
3. On entering the cockpit/cabin of an aircraft, it is the responsibility of the individual to be able to recognise the assisted escape system safety devices in that aircraft and to ensure that they are correctly applied at all times in accordance with para 4 below.
4. Instructions for the correct positioning of the assisted escape system safety devices in each aircraft type and mark are detailed in the Servicing Schedules and Aircrew Manual related to that aircraft.
5. Attention is drawn to the lethal hazard presented to ground personnel by the operation of the Miniature Detonating Cord (MDC) canopy fragmentation system in emergency conditions with the aircraft on the ground. For further details, refer to AP 110N-0311-1 and Air Diagram 110N-0311-D1.

## MODIFICATION RECORD

This publication is technically up-to-date in respect of the modifications listed below:-

Mod No	Brief Details
ES2811	Trip rods - intro neoprene friction bush
ES2880	Drogue gun shackle - intro nut and bolt in lieu Q.R. pin
ES2969	Face screen strap - Safety pin MBEU 24949 - intro
ES3150	Improved seat harness - intro
ES3173	5ft drogue - black nylon wrapped
ES3292	Revised negative-g strap
ES3452	Harness box - Spacer tubes introduced

Chapter 1AIRCREW EQUIPMENT ASSEMBLIES  
EJECTION SEAT TYPE 3B

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INTRODUCTION (fig 1 and 2)

1 Two identical Type 3B ejection seats are fitted in the Vampire T11 aircraft. This publication is primarily concerned with the installation of the aircrew equipment assembly (A.E.A.) in the seat, the strapping-in procedure, the drill to be used when leaving the seat after landing and the flying clothing (Annex 1).

COMPOSITION OF THE ASSEMBLY

2 The aircrew equipment assembly consists of the following items:-

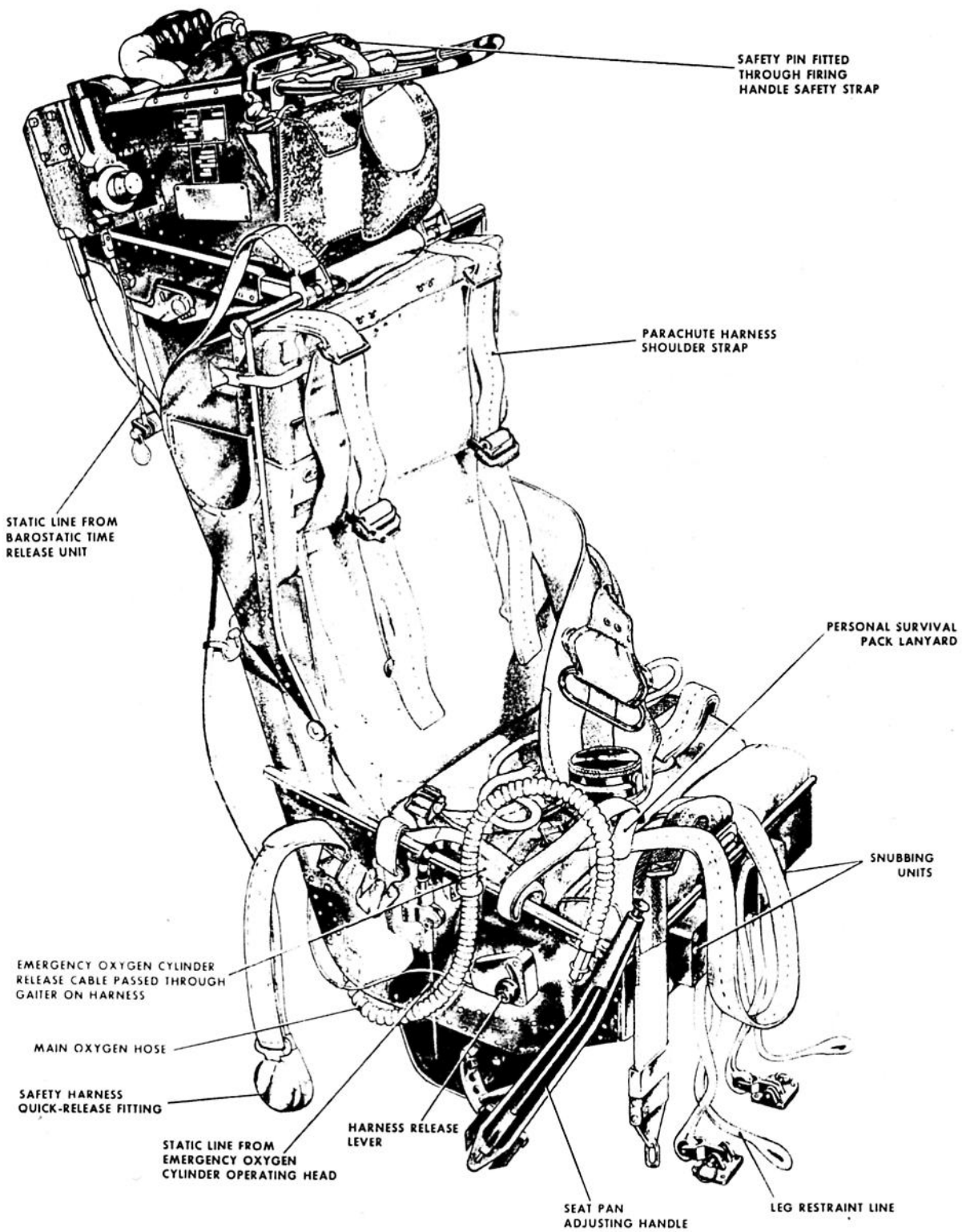


Fig. 1 The seat equipped (starboard view)

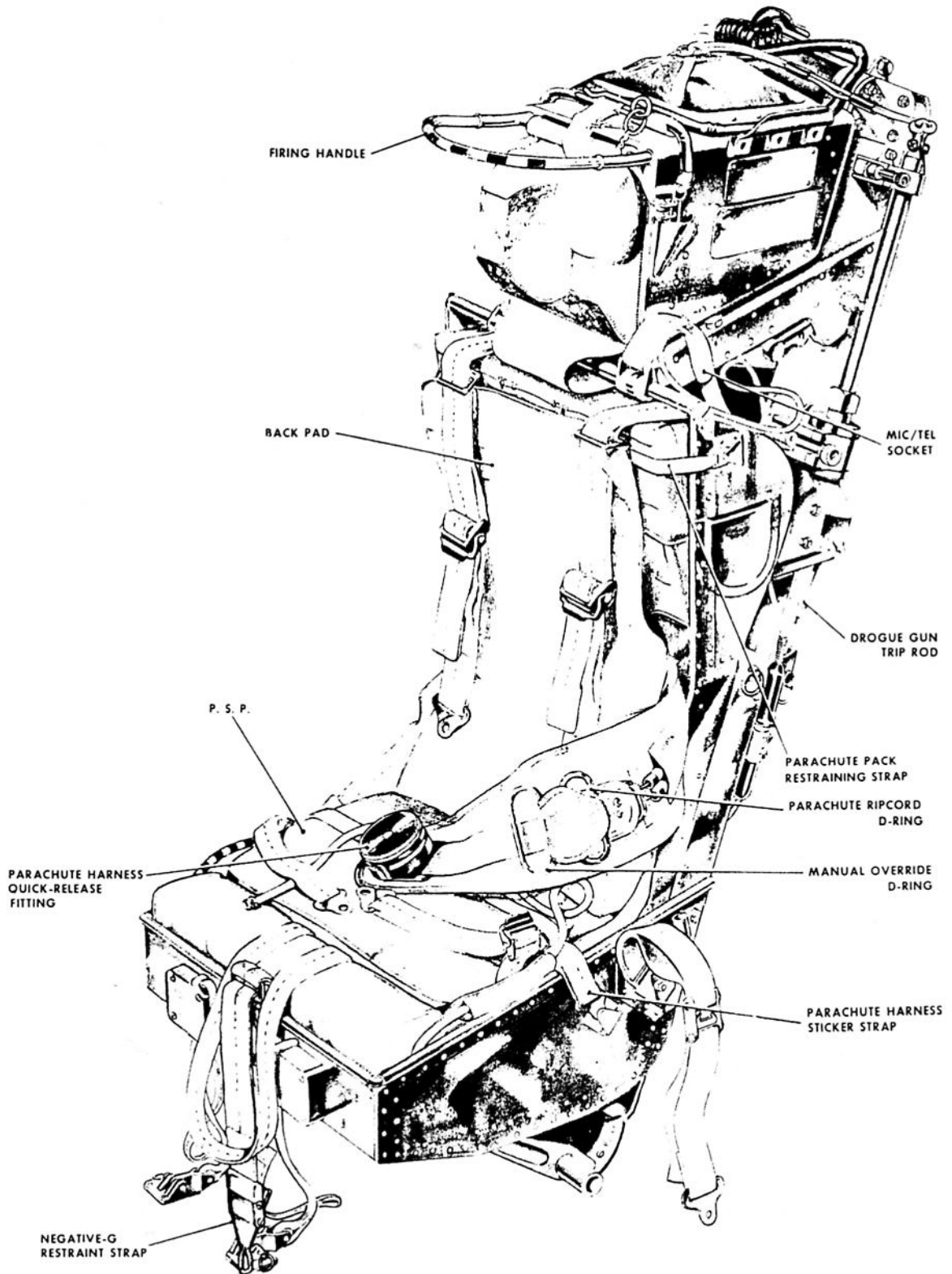


Fig. 2 The seat equipped (port view)



Equipment	AP No.	Contractor
Ejection seat Type 3B Safety harness and cable assembly Type 11 Mk 2	4288, Vol.1, Part 1	Martin-Baker
Parachute assembly Type 19 Personal survival pack Type W or Type Q	1182B, Vol.1 and 6 108C-0110-1	Martin-Baker Irvin
Emergency oxygen set Mk 4 Flying clothing	1182C, Vol.1, Book 2 107D-1002-12 In accordance with local orders.	RFD/GQ L. Adams

### DESCRIPTION

#### PARACHUTE ASSEMBLY

3 A back type parachute assembly is fitted into the parachute container and is retained by two lugs attached to the pack by two spring clips on the outside of the parachute container. The parachute assembly is attached to the apron withdrawal line. The parachute harness is equipped with two lugs on the end of short straps which are fitted into sticker strap clips on the outside faces of the seat pan sides to restrain the occupant in the seat after operation of the harness release mechanism. The developing parachute pulls the occupant from the ejection seat separating the sticker strap lugs from the clips. This slight check in separation precludes the possibility of collision between man and seat during parachute deployment.

4 Two D-handles are provided on the harness waist belt for use in the event of failure of the automatic release facilities. Operation of the first handle disconnects the parachute withdrawal line and exposes the second handle, which when pulled deploys the parachute.

#### LEG RESTRAINT SYSTEM

5 The leg restraint system is fitted to the ejection seat to draw back and restrain the occupant's legs close to the seat pan during ejection, thus preventing injury to the legs due to flailing. The system consists of two leg restraint lines, two snubbing units and a leg garter on each of the occupant's legs positioned just below the knee. The lower end of each leg restraint line is attached to a bracket on the aircraft floor by a fitting incorporating a shear rivet designed to fail at a predetermined load. From this fitting each line is routed upwards through a snubbing unit on the front face of the seat pan, through the D-ring of the opposite leg garter and then the shoulder straps are passed down through the loops on the end of each line before the lugs are engaged in the safety harness quick release fitting.

6 The snubbing units allow the lines to pass freely down through the units but prevent the lines passing upwards except when released by pressing the spring-loaded button underneath each snubbing unit.

### NEGATIVE-G RESTRAINT STRAP

7 A negative-g restraint strap is fitted to the seat pan to restrain the occupant when subjected to negative-g conditions. The strap is secured to an anchorage on the inside front face of the seat pan and the upper end terminates in an angled metal loop which passes over the lug of the port lap strap before it is locked into the safety harness quick-release fitting. The strap is tightened by pulling down on the free end of the strap and released by pulling down on a tab attached to the buckle.

### EMERGENCY OXYGEN (fig 3)

8 An emergency oxygen cylinder is located in the front of the seat pan with the head of the cylinder on the port side. A release cable in a housing is routed through a gaiter on the parachute harness and the end fitting is secured in a bracket on the starboard side of the seat pan. A static line is connected to the release cable to turn on the emergency oxygen supply on ejection. The emergency oxygen delivery tube passes through a tunnel on the parachute harness on the port side before being connected to the oxygen mask tube assembly.

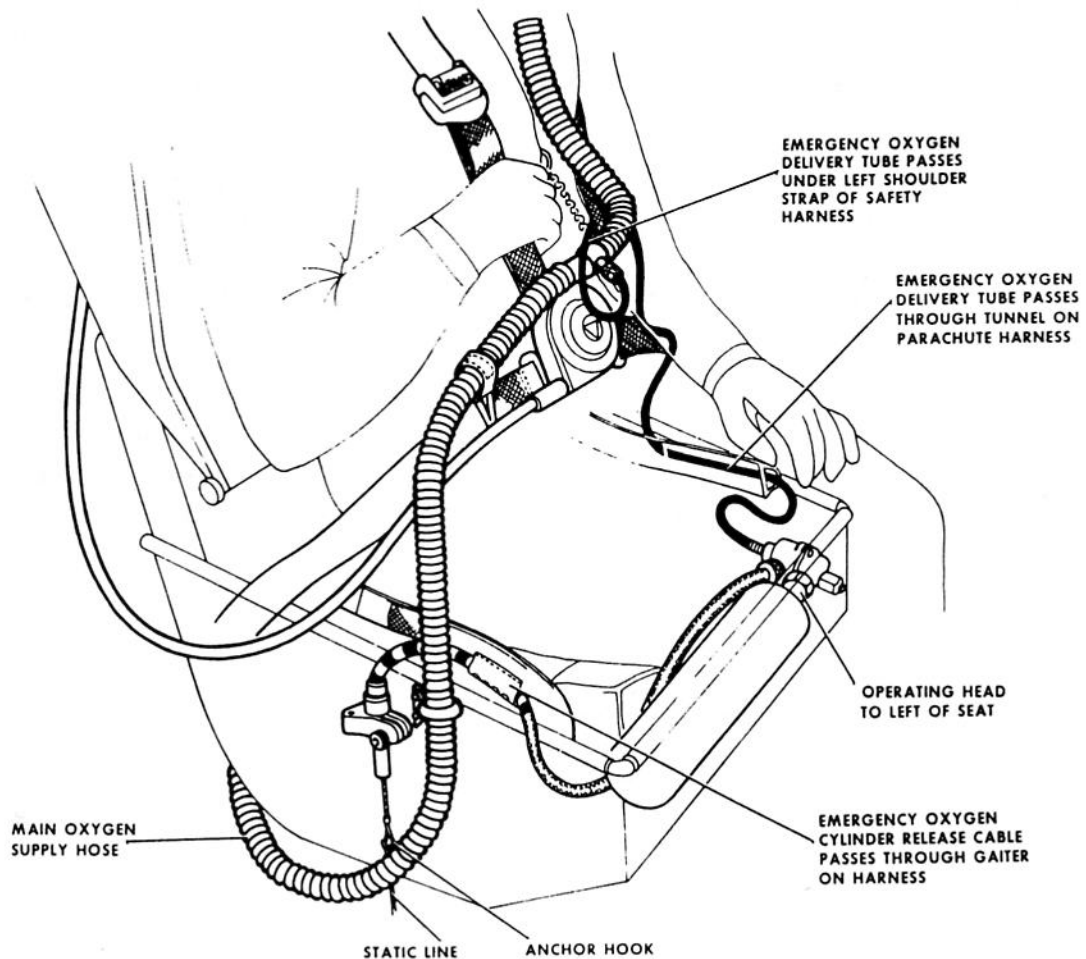


Fig 3 Emergency oxygen system

## SEQUENCE OF EVENTS DURING EJECTION

9 When the face screen firing handle is pulled, the ejection gun is fired and the seat ejected. As the seat ascends the guide rails, the following sequence occurs:-

- 9.1 The leg restraint lines tighten to draw back and restrain the occupant's legs until the shear rivets fail.
- 9.2 The drogue gun sear is withdrawn by the trip rod actuating the drogue gun mechanism.
- 9.3 The barostatic time-release unit static line withdraws the firing pin.
- 9.4 The main oxygen supply hose and the mic/tel lead are disconnected from the aircraft supply.
- 9.5 The emergency oxygen supply is turned on.
- 9.6 Approximately 0.5 seconds after ejection, the drogue gun fires, ejecting the piston and deploying the drogues to stabilize and retard the seat. If the ejection occurs at high altitude the seat will eventually fall in a near vertical attitude with the occupant restrained from falling forward by the seat safety harness. At low altitudes there may not be time for the seat to attain the near vertical position. During this phase the occupant will be breathing emergency oxygen from the system fitted to the seat.
- 9.7 When conditions of height and speed are such that the barostat and/or g-switch are no longer restraining the time-release unit mechanism, the unit will commence to function and after the delay of 1.25 seconds has elapsed, it operates. The safety harness quick-release fitting will be actuated and the drogues released from the scissor shackle. The pull of the drogues is transferred to the drogue to parachute attachment line and apron, freeing the face blind and headrest pad and straightening the apron causing the occupant to pitch forward. The parachute is then withdrawn and deployment of the parachute lifts the occupant out of the seat pulling the sticker strap lugs from their clips. At the same time the main oxygen hose, emergency oxygen delivery tube and the mic/tel lead are disconnected.

## CONNECTIONS TO THE AIRCRAFT

10 On an installed ejection seat, the following items are connected to the airframe:-

- 10.1 Port side of the seat:-
  - 10.1.1 Drogue gun trip rod.
  - 10.1.2 Mic/tel lead.

## 10.2 Starboard side of seat:-

10.2.1 Barostatic time-release unit static line.

10.2.2 Emergency oxygen cylinder release cable static line.

10.2.3 Main oxygen supply hose.

## 10.3 Underside of the seat:-

10.3.1 Leg restraint lines.

EQUIPPING THE SEAT

11 The following procedure is to be used when installing the equipment in the seat. Refer to fig 1 to 4 as necessary.

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

11.2 Place the safety harness shoulder straps over the top of the parachute pack container and ensure that the safety harness lap straps and the leg restraint lines are clear of the seat pan.

11.3 Ensure that the lower edge of the apron is secured to the lower extension of the parachute pack container.

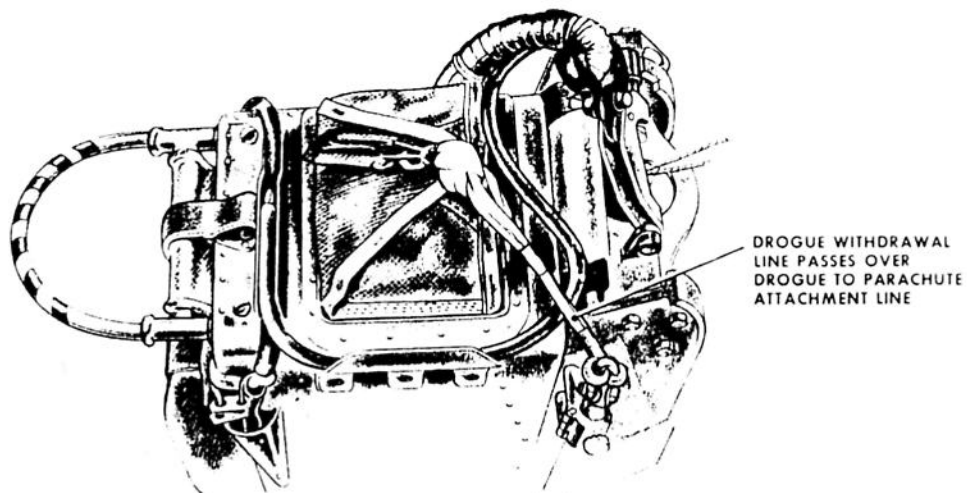


Fig 4 Top of the drogue container

- 11.4 Tension the apron against its clips, then insert the parachute pack into the container. Before pushing the pack fully home, connect the two halves of the parachute withdrawal line coupling.
- 11.5 Push the pack fully home into the container, then fit the pack restraining straps into the spring clips on the side of the container.
- 11.6 Arrange the parachute harness to follow the inner contours of the seat pan and insert the sticker strap lugs into the spring clips on the sides of the seat pan.
- 11.7 Ensure that the operating head of the emergency oxygen cylinder is to the port side of the seat pan and that the delivery tube passes through the tunnel on the port side of the parachute harness.
- 11.8 Arrange the release cable housing to pass behind the emergency oxygen cylinder, then through the gaiter on the starboard side of the parachute harness.
- 11.9 Ensure that the release cable and delivery tube are not kinked.
- 11.10 Connect the screwed union of the emergency oxygen release cable to the corresponding union on the anchor section of the static line.
- 11.11 Engage the end fitting of the release cable housing with the anchor socket, then connect the anchor hook to the static line.
- 11.12 Place the personal survival pack on the parachute harness in the seat pan, then pull the harness back pad upwards as far as possible. Ensure that the front of the pack is to the front of the seat and that the lanyard is draped over the starboard side of the seat pan.
- 11.13 Remove the safety pin from the emergency oxygen cylinder operating head, then ensure that the tell-tale wire is unbroken.

#### STRAPPING-IN PROCEDURE

- 12 The procedure for strapping-in is as follows. Refer to fig 3 to 8 as necessary:-
  - 12.1 Ensure that the seat has been made safe for parking in accordance with current instructions.
  - 12.2 Ensure that the safety equipment is correctly fitted and that the emergency oxygen cylinder is not overlapping the seat pan.
  - 12.3 Sit in the seat and fit the leg restraint garters just below the knees, ensuring that the D-rings are to the inside of the legs. The loose ends of the garters are to be tucked in on the inside of the legs.

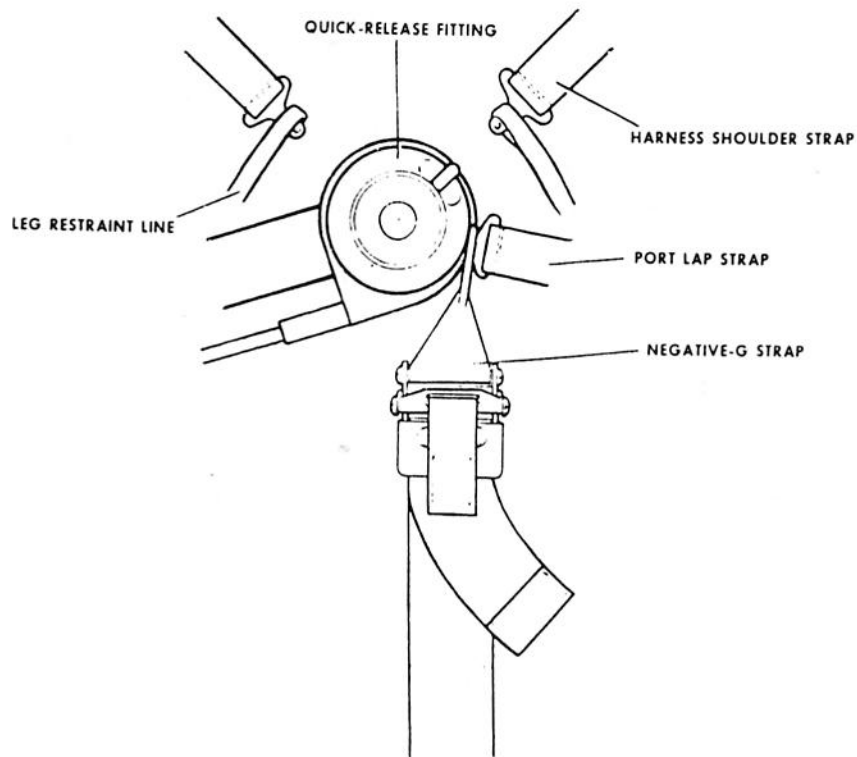


Fig 5 Attachment of negative-g restraint strap and leg restraint lines to safety harness

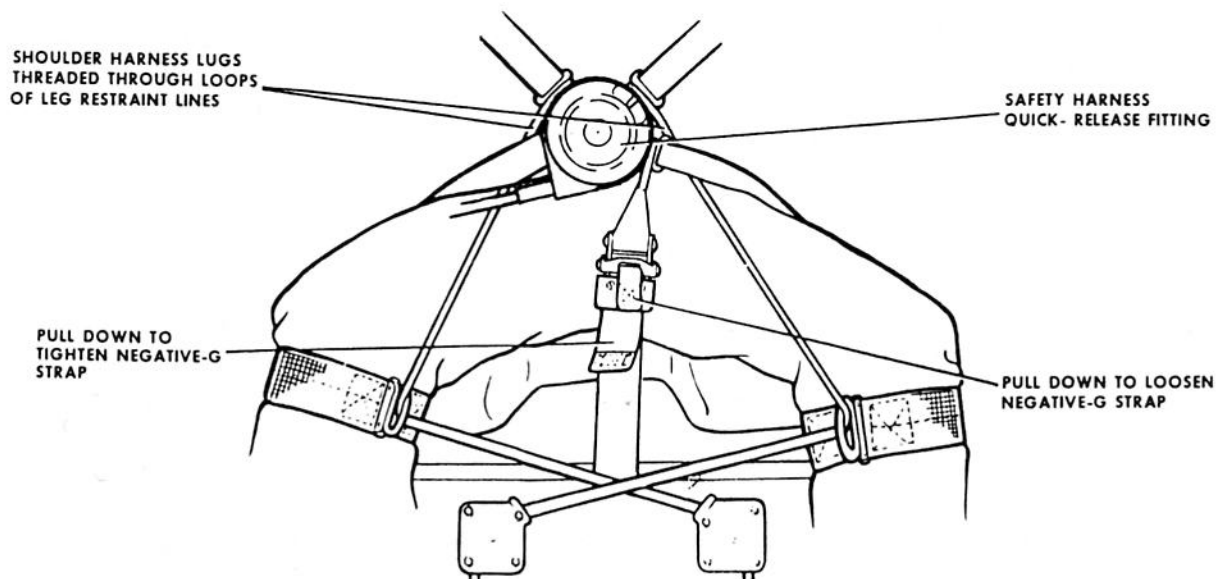


Fig 6 Arrangement of negative-g restraint strap and leg restraint lines

Note...

When fitting a lug into the quick-release fitting it is necessary to turn the disc knob until the yellow line passes the dots on the body, hold it in this position and insert the lug. Repeat for the other lugs.

12.4 Connect the lanyard of the personal survival pack to the life preserver ensuring that the lanyard passes outside the left leg. Connect the quick-release couplings at each side of the survival pack to the life preserver.

12.5 Connect the parachute harness shoulder straps to the quick-release fitting. Ensure that the shoulder straps lie under the life preserver stole.

12.6 Pass the parachute harness leg straps through the leg loop, then connect the lugs to the quick-release fitting.

12.7 Tighten the shoulder straps so that the quick-release fitting is located centrally just above the solar plexus. Tighten the parachute harness leg straps, ensuring that the harness is as tight as possible consistent with comfort, and that the quick-release fitting is as high as possible.

12.8 Bring the negative-g strap up between the legs, pass the lug of the port lap strap of the safety harness through the eye of the negative-g strap lug, then insert the lap strap into the quick-release fitting on the starboard lap strap. Do not tighten the straps.

12.9 Pass the port leg restraint line through the D-ring of the right leg garter, then under the starboard lap strap of the safety harness. Pass the starboard shoulder strap lug through the loop at the end of the leg restraint line and secure the lug in the quick-release fitting.

12.10 Pass the starboard leg restraint line through the D-ring of the left leg garter, then under the port lap strap of the safety harness. Pass the port shoulder strap lug through the loop at the end of the leg restraint line, then secure the lug in the quick-release fitting.

12.11 Tighten the lap straps of the safety harness. Tighten the negative-g restraint strap by pulling downwards on the free end of the blue strap. Move the body about inside the harness, then retighten the lap straps and negative-g restraint strap. Repeat the operations until the straps are as tight as possible as they provide the principle restraint under all stress conditions. The negative-g restraint strap can be loosened by pulling down on the yellow tab attached to the snubber lever. Ensure that the parachute harness quick-release fitting and manual over-ride D-ring are not covered.

12.12 Tighten the safety harness shoulder straps. Do not overtighten as this may arch the back resulting in a poor ejection posture.

12.13 Don the helmet, then connect the mic/tel lead.

12.14 Connect the oxygen mask tube assembly to the main oxygen hose, then adjust the hose in the loop on the safety harness lap strap so that full head movement is possible. Connect the locating chain to the life preserver.

12.15 Pass the emergency oxygen supply tube under the port shoulder strap of the safety harness, over the main oxygen supply hose, then connect it to the oxygen mask tube assembly.

Note...

If the supply tube is too long, it may be passed under both shoulder straps.

12.16 Adjust the height of the seat, ideally until the head is in the centre of the headrest cushion.

12.17 Adjust the leg restraint lines to permit the required leg movement.

12.18 Reach upwards and ensure that the face screen firing handle can be reached with both hands together. DO NOT PULL.

12.19 With assistance, remove and stow the safety pin.

### EMERGENCIES

13 Instructions for dealing with emergencies are contained in the Aircrew Manual and Flight Reference Cards.

### LEAVING THE SEAT AFTER LANDING

14 The following procedure is to be adhered to when leaving the aircraft after landing:-

14.1 Ensure that the safety pin is fitted to secure the face screen firing handle.

14.2 Disconnect the main and emergency oxygen supplies from the mask tube assembly.

14.3 Release the safety harness, then return the quick-release fitting to the FASTEN position.

14.4 Free the leg restraint lines, then the negative-g restraint strap.

14.5 Operate the parachute harness quick-release fitting, then release the parachute harness. Return the quick-release fitting to the locked position.



14.6 Disconnect the personal survival pack lanyard and two side attachment straps from the life preserver.

14.7 Disconnect the mic/tel lead.

14.8 Vacate the aircraft.

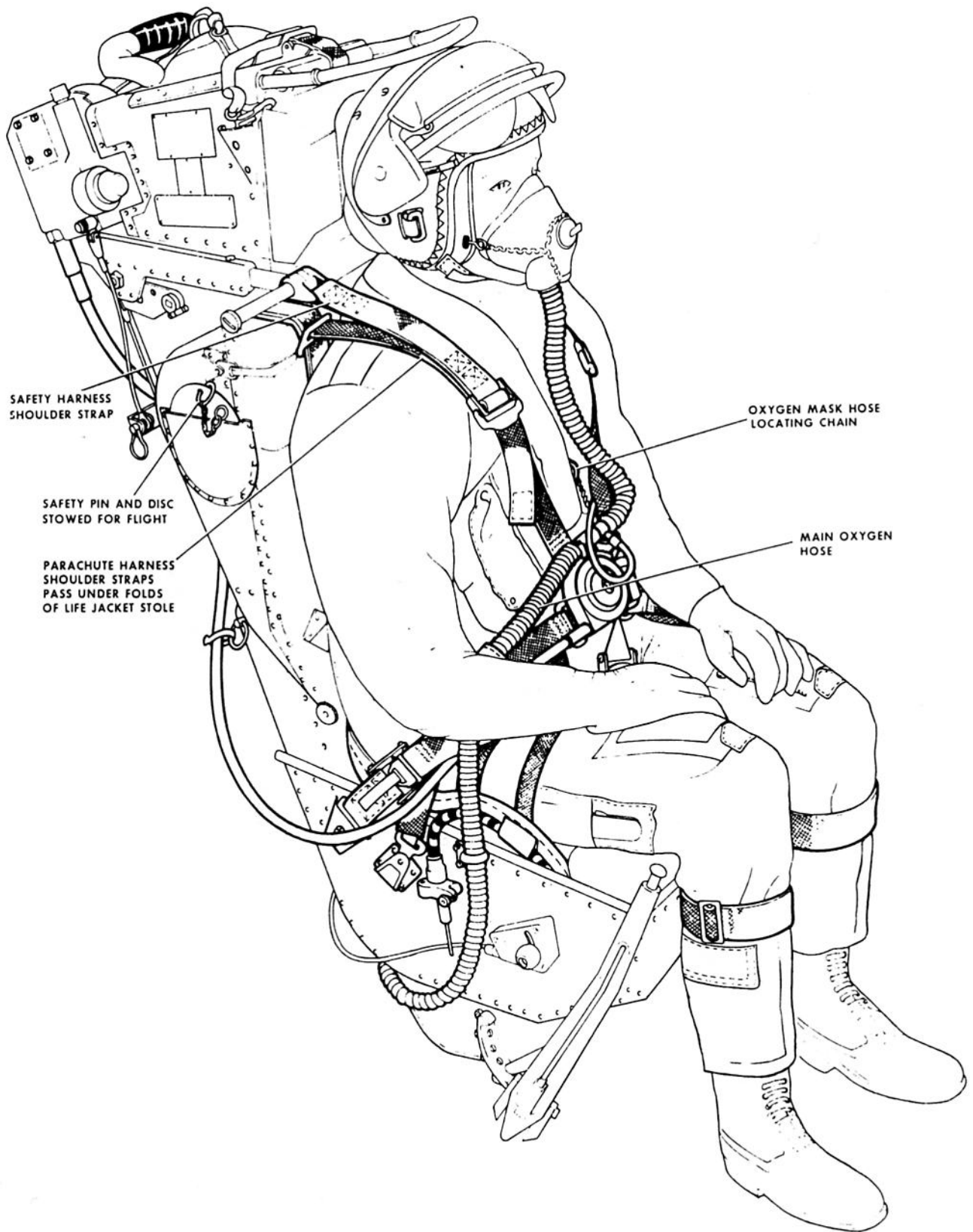


Fig 7 The seat occupied (starboard view)

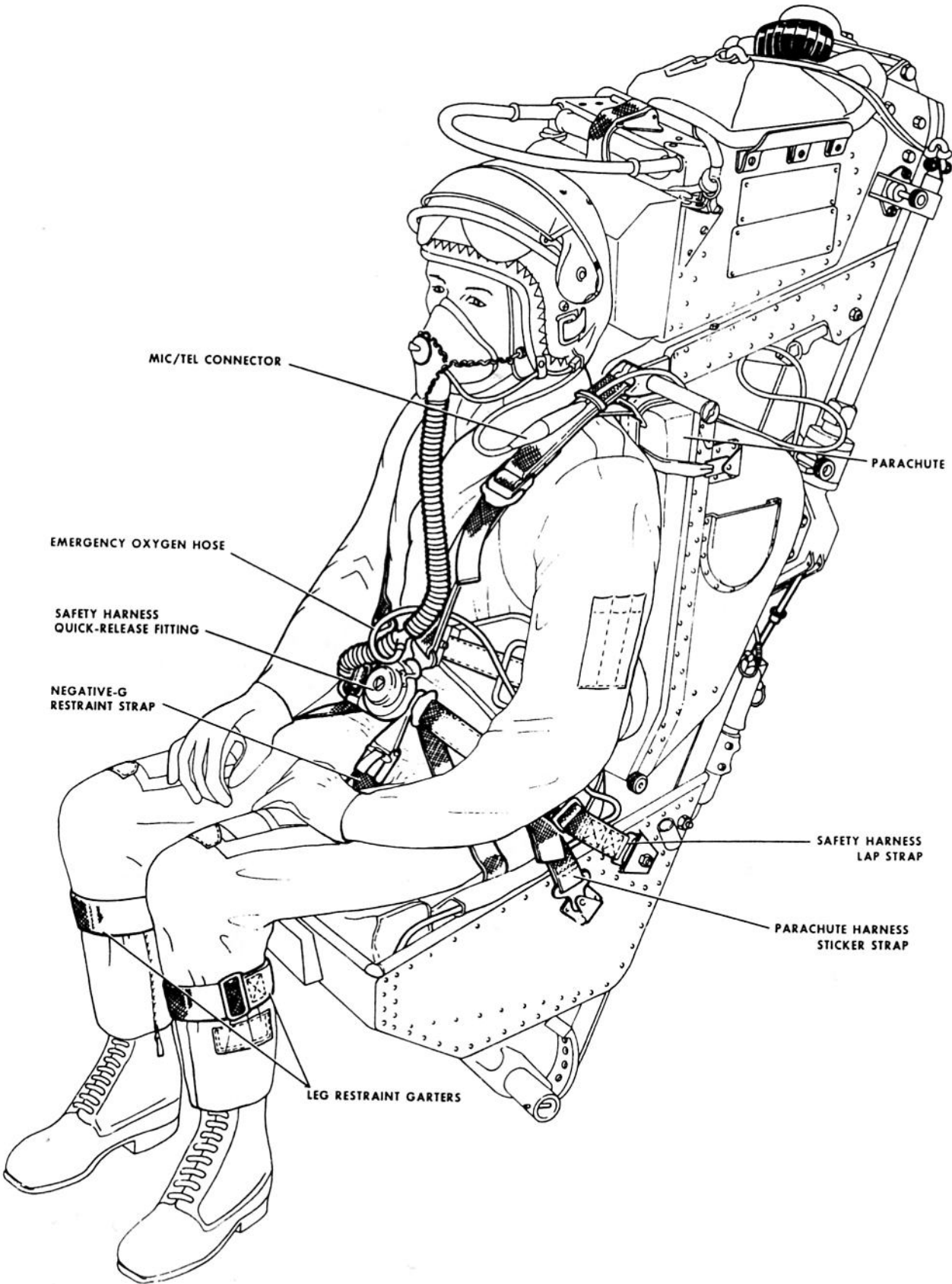


Fig. 8 The seat occupied (port view)

Chapter 1 Annex A

FLYING CLOTHING ANNEX

GENERAL

1 A flying clothing schedule is not issued for this aircraft. Flying clothing used shall be in accordance with local orders.