

## SECTION 1

# CONTROLS AND EXITS

### LIST OF CHAPTERS

*Note—A detailed list of contents appears at the beginning of each chapter*

- 1 Pilots' controls and equipment
- 2 Controls and equipment at crew stations
- 3 Emergency controls, equipment and exits

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Chapter 1 PILOT'S CONTROLS AND EQUIPMENT  
(Completely revised)

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1. This chapter gives the location of all the controls, equipment and instruments at the pilot's station, together with the method of operation where this is not obvious. To simplify reference to any particular items, the controls are grouped under three main headings as indicated in the List of Illustrations. In the keys to the figures the words printed in capital letters appear on or near the items concerned.

### Access

#### 2. WARNING...

REFERENCE MUST BE MADE TO THE LETHAL WARNING CARD AT THE FRONT OF THE BOOK BEFORE ENTERING THE AIRCRAFT.

The pilot's station is entered, after opening the hood (para. 3), by ascending a special ladder attached to the port side of the fuselage, and entering through the canopy aperture. A description of the ladder and the method of attaching it to the fuselage side are given in Sect. 2, Chap. 1.

### Hood

3. The hood is opened from outside the aircraft by a switch (marked CANOPY HATCH) in the starboard equipment compartment, access to this compartment being obtained by opening the lower door of the two in the starboard side of the fuselage aft of the sloping pressure bulkhead. To operate the switch, lift the safety guard and hold the switch down until the hood lifts. After entering the aircraft, close the hood by pulling downward on the two handles fitted to the front end of the hood - one on each side. When the hood reaches the closed position, the locking pin actuator is energized by operation of microswitches. The hood should be held in the closed position, by the handles, until the locking pin indicators on the canopy coaming show

that the hood is locked. When not in use, the hood-closing handles may be folded against the hood.

4. The hood is opened from inside the aircraft by a switch (fig. 5, item 15) on the vertical panel at the forward end of the port console. To open the hood, lift the safety guard and hold the switch down until the hood lifts.

5. In an emergency, the hood may be opened manually from outside the aircraft by a handle recessed in the port side of the fuselage aft of the pressure bulkhead. The handle is released by pressing the button beside the handle. After operating the hood by this method, the locking pin mechanism must be reset before resuming normal electrical operation.

### Hood supporting stay

6. A swivel-mounted arm, bolted to the base of the windscreen rear hoop on the starboard side, is provided to support the hood in the open position while taxiing. The arm is normally stowed along the cockpit rail, where it is held in position by means of a spring clip. After opening the hood, the arm is released from the spring clip, and swivelled upwards and forwards and attached to the hood by means of a spring-loaded catch incorporated in a bracket bolted to the forward hoop of the hood.

### Pilot's seat

7. A Martin Baker Mk. 3CS Mk. 2 ejection seat is installed at the pilot's station. For leg reach, the rudder pedals can be adjusted by rotation of a star-wheel located in the centre of the rudder bar. A stowage for the seat safety pin is provided on the canopy port rail.

Personal services connector

8. The pilot is connected to the oxygen system, intercommunication and air system for suit ventilation, through the personal services connector (fig. 6, item 53). This connector is in three parts, the aircraft portion, seat portion and pilot's portion. Except when the seat is removed or ejected, the aircraft portion remains connected to the seat portion which is secured to the starboard side of the seat pan. The pilot's portion, which is connected to his special high-altitude clothing, is connected to the seat portion after entering the aircraft.

Heating and ventilating

9. Air for cabin heating, windscreen demisting, camera heating and ventilated suit is obtained from the engine compressors. An electrically-operated shut-off cock is fitted in the supply from each engine, each cock being controlled by one or two switches (fig. 6, items 6 and 8). These switches must be set ON before heating or cabin pressurisation can be obtained. The temperature of the air delivery to the cabin is governed by a mixing valve, which is electrically controlled by the CABIN AIR switch (fig. 6, item 13). The switch, marked HOT - COLD, is spring-loaded to the centre (off) position. An indicator, mounted above the switch, shows the setting of the

mixing valve. Air enters the pilot's station through two louvres (fig. 5, item 23 and 38), a fish tail outlet at the pilot's feet and through perforated tubes on each side of the seat. A changeover cock, controlled by a toggle handle (fig. 5, item 27), enables the supply to the louvres to be diverted to fish-tail outlets for hood de-misting. The supply to the perforated tubes at the pilot's seat may be shut off at a cock (not illustrated) located on the pressure bulkhead to the port of the pilot's seat.

10. Hot and cold air supplies for the pilot's ventilated suit are directed to a manually-operated control valve (fig. 6, item 52). At the control valve, the supplies are mixed to obtain the desired temperature at the suit, the supply from the control valve being taken to the suit through the personal services connector. A ground cold-air unit must be connected to the cold-air supply, for cooling while the aircraft is standing, the coupling being situated on the starboard side of the fuselage just aft of the front camera compartment.

Cabin pressure dump valve

11. A cabin pressure dump valve for use when abandoning the aircraft in flight, is controlled by switches (fig. 5, item 13) on the port console, adjacent to the throttle controls levers.



Key to Fig. 1 - FLYING CONTROLS (1)  
(completely revised)

- 1 Compass deviation card holder (normally stowed in map stowage box).
- 2 AILERON TRIM control switches. L/off/R, operates in natural sense. One switch controls positive feed, the other earth return; both switches must be operated together.
- 3 RUDDER TRIM control switches L/off/R, operates in natural sense. One switch controls positive feed, the other earth return; both switches must be operated together.
- 4 TAIL TRIM control switches NOSE DOWN (forward)/off/NOSE UP (aft). One switch controls power supply, the other direction of movement; both switches must be operated together.
- 5 FLAPS selector lever. UP/DOWN.  
WARNING...  
DO NOT OPERATE ABOVE 160 KNOTS.
- 6 FLAPS position indicator
- 7 Alighting gear position indicator.  
Three green lights - main wheels and nose wheel down and locked.  
Three red lights - main wheels and nose wheel unlocked.  
No lights - main wheels and nose wheel locked up.  
The red nose wheel light comes on if either throttle is less than one-third open with the undercarriage retracted.
- 8 Alighting gear selector DOWN push-button (green). Press to lower the alighting gear.
- 9 Alighting gear selector UP push-button (red). Press to raise the alighting gear. Electrical lock prevents normal operation of push button when aircraft speed is less than 75 knots. To override lock in emergency turn the metal collar surrounding the button through 60 degrees clockwise and depress the button in the normal manner.
- 10 Zero reader combined heading selector and control unit.
- 11 Rudder AUTOSTABILIZER control switch. OFF/STANDBY/ON.
- 12 DIVE BRAKES control switch. IN (forward)/MID/OUT(aft).
- 13 Radio altimeter Mk. 7B indicator lights. (amber top, green, red bottom).
- 14 Zero reader indicator.
- 15 Machmeter.
- 16 Aileron gear change altitude switch, LOW ALT. (down)/HIGH ALT.
- 17 AILERON CONTROL gear change indicator.
- 18 Rear view mirror.
- 19 E2B compass.
- 20 RUDDER 50% hydraulic POWER FAIL warning light (amber). Light comes on when primary or secondary power supply fails.
- 21 RUDDER 100% hydraulic POWER FAIL warning light (red). Light comes on when both primary or secondary power supplies fail.
- 22 Air speed indicator.
- 23 A.S.I. correction card holder.
- 24 AILERON 100% hydraulic PWR FAIL warning light (red). Light comes on when both port and starboard hydraulic systems fail.
- 25 Gyro horizon.
- 26 AILERON 50% hydraulic PWR FAIL warning light (amber). Light comes on when either port or starboard hydraulic system fails.
- 27 Accelerometer
- 28 Illuminated frequency card holder.
- 29 Altimeter Mk. 29B.
- 30 TANS remote pilot's indicator.
- 31 Gyro unit Mk. 4B compass.
- 32 Rate-of-climb indicator.
- 33 Turn-and-slip indicator.
- 34 TACAN repeater indicator and ADF radio compass slave indicator.
- 35 Autopilot heading selection
- 36 Radio altimeter Mk. 7B.
- 37 ILS MARKER indicator light (amber)
- 38 TURN-AND-SLIP standby PWR supply switch. NORMAL/STANDBY.
- 39 ILS indicator.
- 40 Combined trim indicator. Incorporates indicators for rudder, aileron and tail trim, and air brakes.
- 41 Autopilot ENGAGED magnetic indicator.
- 42 Autopilot READY magnetic indicator.
- 43 Autopilot trim indicator.
- 44 Rudder pedals adjusting starwheel.
- 45 Control column-For details of control wheel refer to fig. 2.

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A.L. 132, Dec. 77

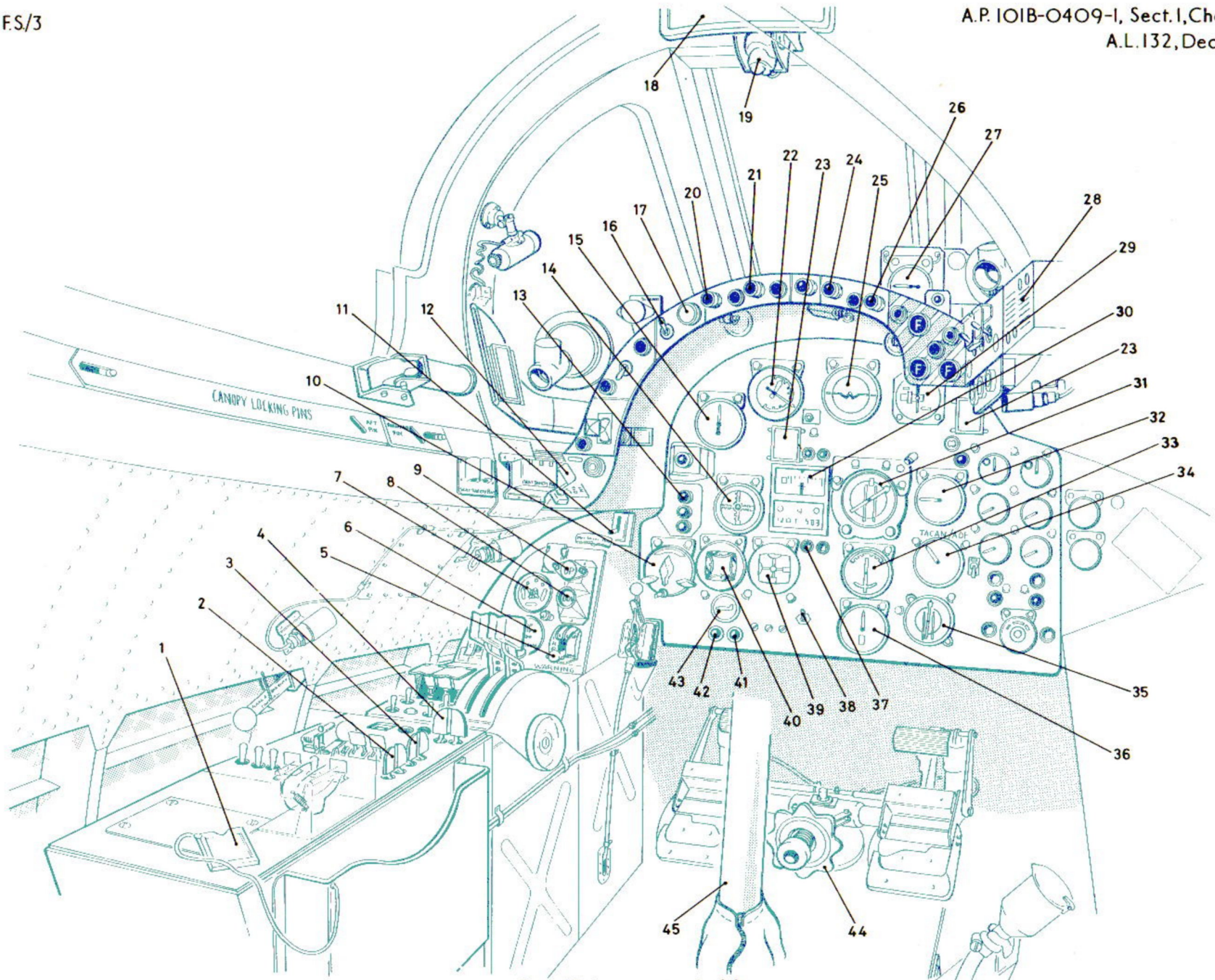


Fig. I Flying controls (I) (MOD 4990 & 5007)

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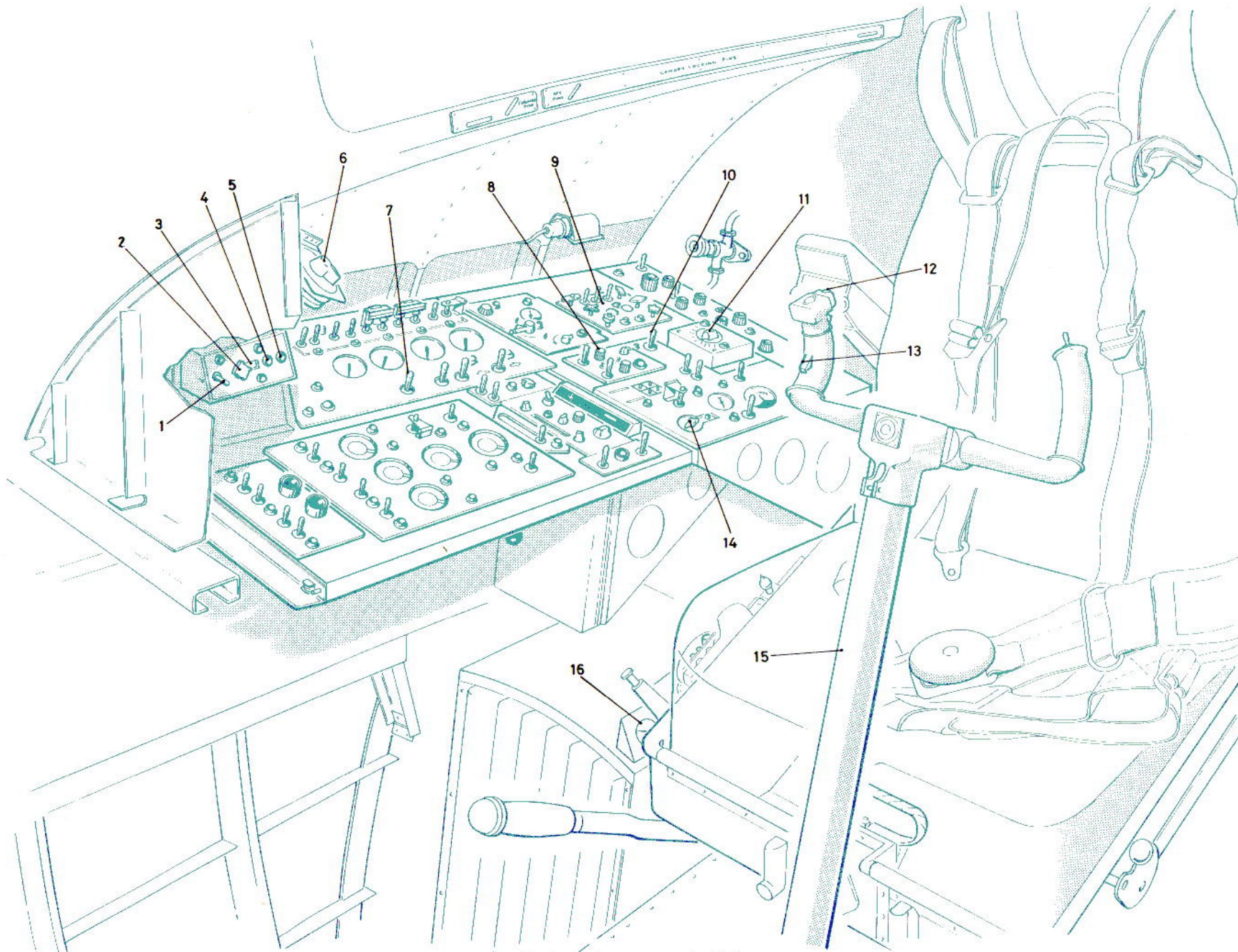


Fig.2 Flying controls (2) ◀MOD 4990▶

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Key to Fig. 2 - FLYING CONTROLS (2)  
(completely revised)

- |   |   |    |   |
|---|---|----|---|
| 1 | Radio altimeter Mk. 7B ON/off switch.                                   | 9  | Autopilot control panel.  |
| 2 | Radio altimeter Mk. 7B LIMIT SELECTOR knob.                             | 10 | ILS ON/OFF switch.  |
| 3 | Radio altimeter Mk. 7B height selection indicator.                      | 11 | ILS channel selector.   |
| 4 | Radio altimeter Mk. 7B TEST switch.                                     | 12 | Tail trim control switches (linked)   |
| 5 | Radio altimeter Mk. 7B RANGE switch 500/5000 ft.                        | 13 | Autopilot cut-out switch.   |
| 6 | ROLL DAMPER OFF/STANDBY/ENGAGE switch.                                  | 14 | Autopilot controller.   |
| 7 | Gyro compass selector switch.<br>D.G. (directional gyro) COMP (Compass) | 15 | Control column.   |
| 8 | ILS VOLUME control.   | 16 | Rudder FEEL SIMULATOR hydraulic pressure gauges.<br>PRIMARY (forward), SECONDARY (aft). |



## Key to Fig. 3 - ENGINE CONTROLS (1)

- 1 THROTTLE/H. P. cock LEVERS friction adjuster. LOCK/UNLOCK
- 2 STARBOARD ENGINE ANTI-ICING magnetic indicator. Shows white when system is ON.
- 3 PORT ENGINE ANTI-ICING magnetic indicator. Shows white when system is ON
- 4 PORT ENGINE ANTI-ICING control switch. ON/OFF
- 5 STARBOARD ENGINE ANTI-ICING control switch. ON/OFF
- 6 JET PIPE TEMP. CONTROL selector switch, port engine. No. 1 ENG. MAX/CRUISE
- 7 JET PIPE TEMP. CONTROL switch, port engine. No. 1 ENG. ON/OFF
- 8 JET PIPE TEMP. CONTROL selector switch, starboard engine. No. 2 ENG. MAX/CRUISE
- 9 JET PIPE TEMP. CONTROL switch, starboard engine. No. 2 ENG. ON/OFF
- 10 Throttle and H. P. cock control levers, incorporating relight buttons on tops of levers. Port engine left, starboard engine right. Throttle box gate labelled S. O. C. (shut-off cock) CLOSED - S. O. C. OPEN - THROTTLE CLOSED - THROTTLE OPEN. The lever cannot be moved forward from the S. O. C. CLOSED position until the spring-loaded latch is raised. Alternatively the latch must be raised to return the lever from the S. O. C. OPEN position to the S. O. C. CLOSED position.
- 11 Engine fire warning lights PRESS TO TEST push-button.
- 12 Combined fire warning light and fire-extinguisher push-button, PORT ENGINE. Press to operate extinguishers.
- 13 Combined fire warning light and fire extinguisher push-button, STARBOARD ENGINE. Press to operate extinguishers.
- 14 No. 1 ENGINE (port) tachometer
- 15 No. 2 ENGINE (starboard) tachometer
- 16 No. 1 ENGINE (port) jet pipe temperature gauge
- 17 No. 2 ENGINE (starboard) jet pipe temperature gauge
- 18 No. 1 ENGINE (port) fuel flowmeter
- 19 No. 2 ENGINE (starboard) fuel flowmeter
- 20 No. 2 ENGINE (starboard) FUEL PRESSURE FAILURE warning light (red)
- 21 No. 1 ENGINE (port) FUEL PRESSURE FAILURE warning light (red)
- 22 No. 2 ENGINE (starboard) OIL PRESSURE FAILURE warning indicator. Shows white when oil pressure falls to 20 p. s. i.
- 23 No. 1 ENGINE (port) OIL PRESSURE FAILURE warning indicator. Shows white when oil pressure falls to 20 p. s. i.

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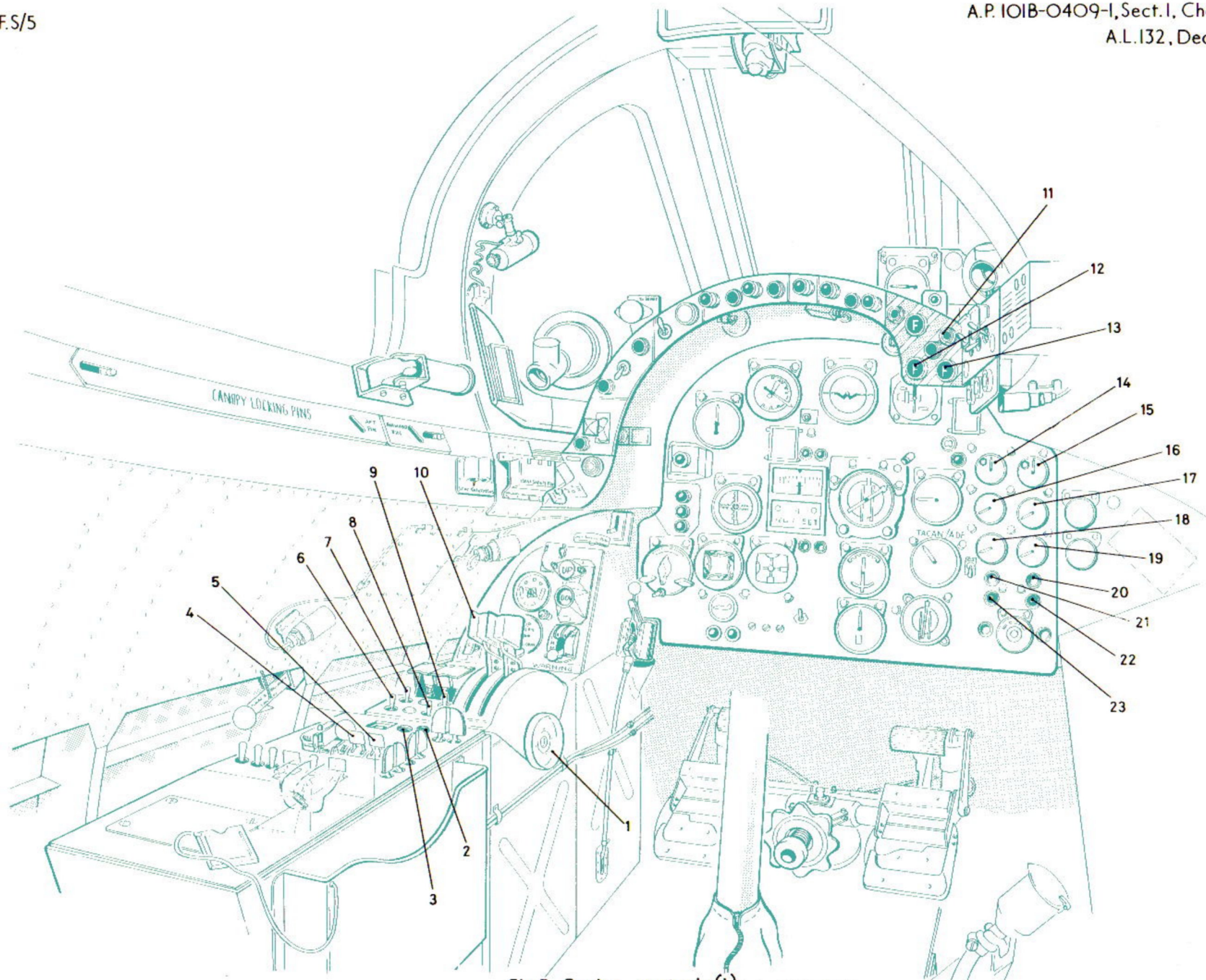


Fig.3 Engine controls (I) MOD 4990 & 5007

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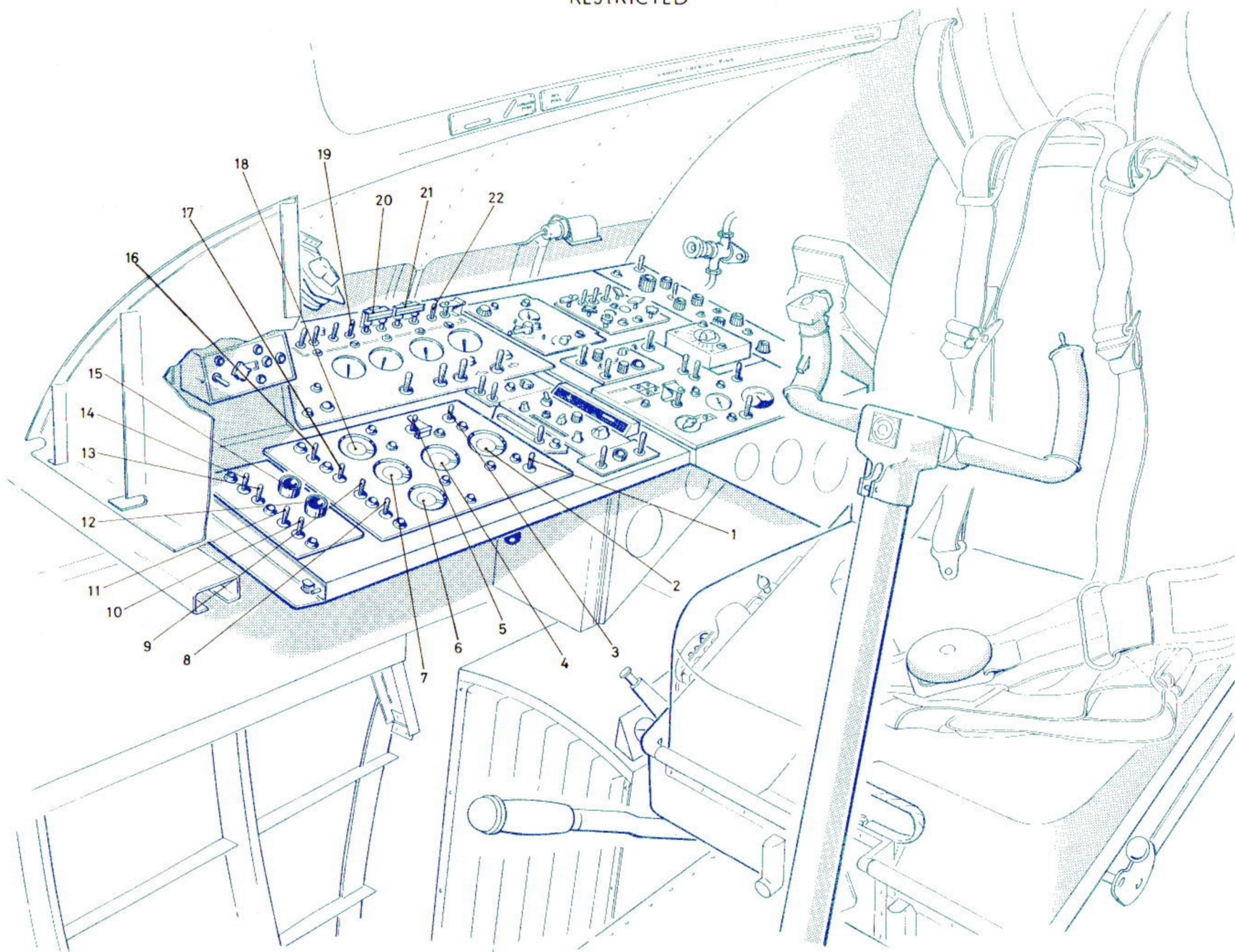


Fig.4 Engine controls (2) ◀MOD 4990▶

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Key to Fig. 4 - ENGINE CONTROLS (2)  
(completely revised)

- |    |  |    |  |
|----|--|----|--|
| 1  | REAR TANK PORT LP pump switch. ON/OFF.                           | 14 | No. 2 ENGINE START IGNITION switch. ON/OFF.  |
| 2  | REAR TANK (No. 5) fuel contents gauge.                           | 15 | No. 2 ENGINE START push-button.  |
| 3  | REAR TANK STARBOARD LP pump switch. ON/OFF.                      | 16 | STARBOARD WING integral tank LP pump switch<br>PUMP ON/OFF.                        |
| 4  | TOP TANKS (No. 1, 2, 3 & 4) fuel contents gauge.                 | 17 | BELLY TANK STARBOARD LP pump switch. ON/OFF.                                       |
| 5  | TOP tank TO BELLY tank TRANSFER COCK switch<br>(guarded) ON/OFF. | 18 | Starboard integral tank fuel contents gauge.                                       |
| 6  | Port integral tank fuel contents gauge.                          | 19 | PORT integral tank LP cocks transfer switch.<br>NORMAL/TRANSFER TO REAR TANK.      |
| 7  | Belly tank fuel contents gauge.                                  | 20 | PORT engine master LP cock switch (guarded.)<br>ENGINE ON/OFF.                     |
| 8  | PORT WING integral tank LP pump switch.<br>PUMP ON/OFF.          | 21 | STARBOARD engine master LP cock switch (guarded)<br>ENGINE ON/OFF.                 |
| 9  | BELLY TANK PORT LP pump switch. ON/OFF.                          | 22 | STARBOARD integral tank LP cocks transfer switch.<br>NORMAL/TRANSFER TO REAR TANK. |
| 10 | No. 1 ENGINE START IGNITION switch. ON/OFF.                      |    |  |
| 11 | No. 1 ENGINE START MASTER switch. ON/OFF.                        |    |  |
| 12 | No. 1 ENGINE START push-button.                                  |    |  |
| 13 | No. 2 ENGINE START MASTER switch. ON/OFF.                        |    |  |



Key to Fig. 5 - OPERATIONAL AND MISCELLANEOUS CONTROLS (1)  
(completely revised)

- 1 Map stowage box
- 2 PHOTOFLASH DOORS position magnetic indicator. Shows OPEN TRANSIT or CLOSED, according to position of doors.
- 3 EXTERNAL LIGHTS MASTER switch. ON/OFF.
- 4 IDENTIFICATION lights switch. STEADY (forward)/OFF/MORSE.
- 5 Canopy jettison handle (under hinged guard) DANGER. PULL TO JETTISON CANOPY.
- 6 LANDING LIGHT switch. HIGH (forward)/LOW/OFF.
- 7 TAXYING LIGHTS switch. ON/OFF.
- 8 NAVIGATION LIGHTS switch. ON/OFF.
- 9 ANTI-COLLISION LIGHTS switch. ON/OFF.
- 10 FLARE bay DOORS EMERGENCY CONTROL lever.
- 11 PHOTOFLASH JETTISON switch (guarded). FLASH JETTISON/off/DOOR DELAY OVERRIDE.
- 12 PHOTOFLASH DOORS selector switch (guarded) OPEN/CLOSED.
- 13 Port console aft floodlamp. Controlled by switch on dimmer panel (fig. 6)
- 14 Ditching/abandoning aircraft switches (guarded) ABANDON/NORMAL, linked to two adjacent dump valve switches. DUMP/NORMAL.
- 15 Canopy unlocking switch (guarded). Lift guard and HOLD switch down UNTIL CANOPY LIFTS.
- 16 Port console forward floodlamp. Controlled by switch on dimmer panel (fig. 6).
- 17 Wing drop tanks jettison button (guarded). FUEL TANK JETTISON.
- 18 CANOPY LOCKING PINS indicators (port and starboard) AFT PIN and FORWARD PIN show LOCKED when locks are engaged.
- 19 SEAT SAFETY PINS stowage. CANOPY JETTISON SEAR aft. TIME DELAY LEVER CANOPY JETTISON forward.
- 20 Canopy closing handles (port and starboard). Hold canopy down until locking pin indicators show LOCKED item 18. Fold forward to stow.
- 21 SEAT SAFETY PINS stowage. SEAT PAN FIRING (aft) GUILLOTINE SEAR, FACE SCREEN or GUN SEAR forward.
- 22 Map reading and general purpose lamp.
- 23 Crew call light. NAV. CALL.
- 24 ANTI-DAZZLE lights control switch. BRIGHT/off/DIM.
- 25 EMERGENCY LIGHTS switch ON/OFF.
- 26 Windscreen demisting control handle. PULL TO DE-MIST.
- 27 Pilot's instrument panel floodlamp. Controlled by item 25.
- 28 DUMP VALVE OPEN light (amber).
- 29 Anti-dazzle light. Controlled by item 24, in conjunction with item 34.
- 30 CABIN PRESSURE FAIL warning light (red).
- 31 Pilot's instrument panel floodlamp. Controlled by item 25.
- 32 Windscreen rain repellent switch.
- 33 Fuselage fire warning light PRESS TO TEST push button.
- 34 Anti-dazzle light. Controlled by item 24, in conjunction with item 29.
- 35 Fuselage and flare bay fire warning light. TANK FIRE.
- 36 F.49 Mk.4 Camera pre-exposure warning light (Pre Mod 4838). Warning lamp (Post Mod. 4838).
- 37 Cabin air conditioning louvre
- 38 UHF STANDBY GUARD switch (guarded). A/GUARD.
- 39 UHF STANDBY PWR SWITCH (guarded). NORMAL/EMERGENCY.
- 40 UHF STANDBY control switch. ON/OFF.
- 41 F.95 camera indicator lights (green).
- 42 Starboard console forward floodlamp. Controlled by switch on dimmer panel (fig.6).
- 43 No.2 INVERTER RESET push-switch.
- 44 STANDBY INVERTER magnetic indicator.
- 45 PORT OXYGEN CONTENTS gauge.
- 46 STARBOARD OXYGEN CONTENTS gauge.
- 47 No. 2 GENERATOR FAILURE warning light (red).
- 48 D C BUSBAR VOLTS voltmeter.
- 49 No. 1 GENERATOR FAILURE warning light, (red).
- 50 Pilot's urine container.
- 51 OXYGEN flow magnetic indicator.
- 52 NAVIGATOR OXYGEN flow magnetic indicator.
- 53 F.49 Mk.2 camera pre-exposure warning light (green).
- 54 Wheel PARKING BRAKES lever.
- 55 UNDERCARRIAGE EMERGENCY lowering handle. PULL.
- 56 Stowage for stopwatch.

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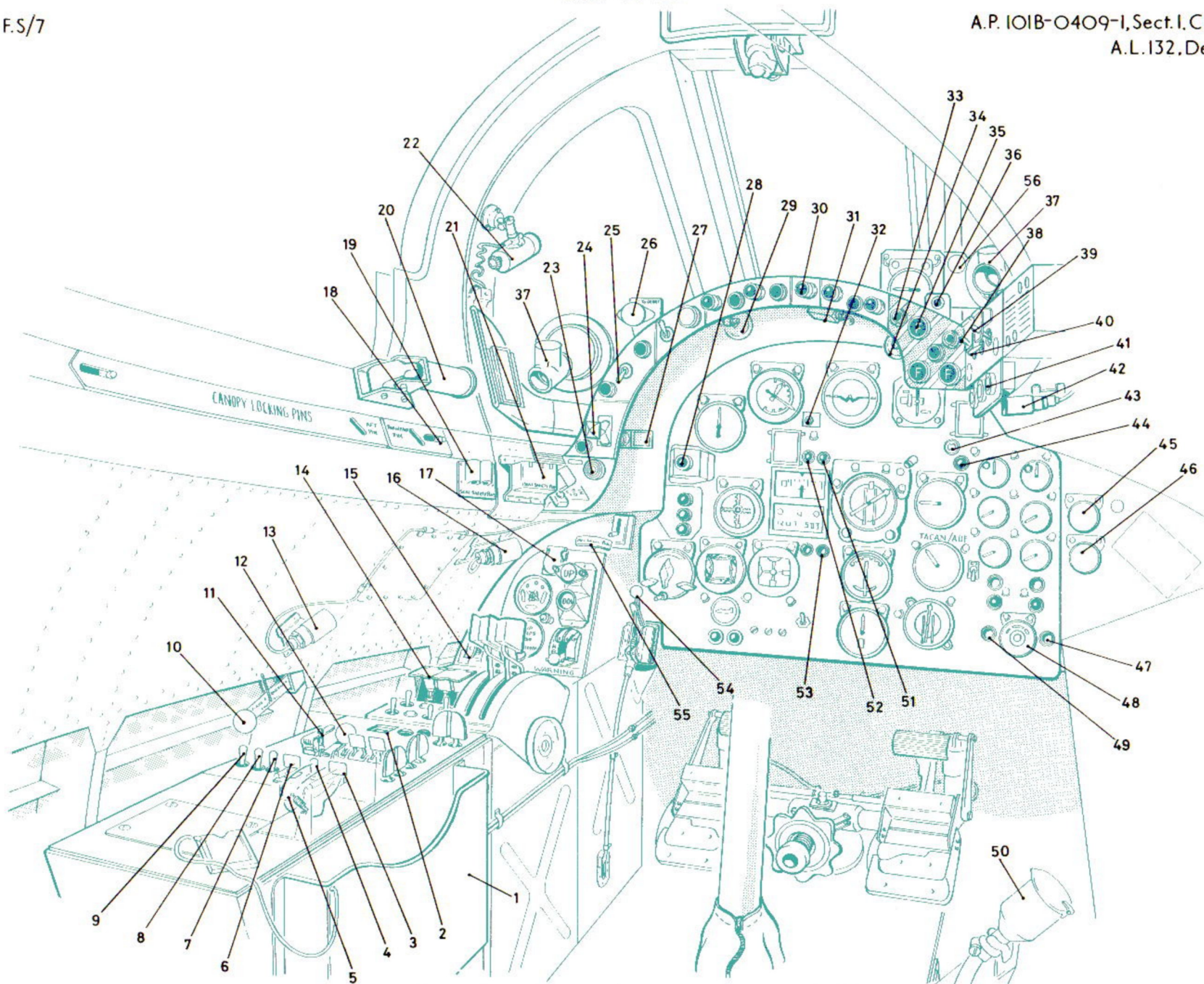
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Fig.5 Operational and miscellaneous controls (I) ◀MOD 4990 &amp; 5007▶

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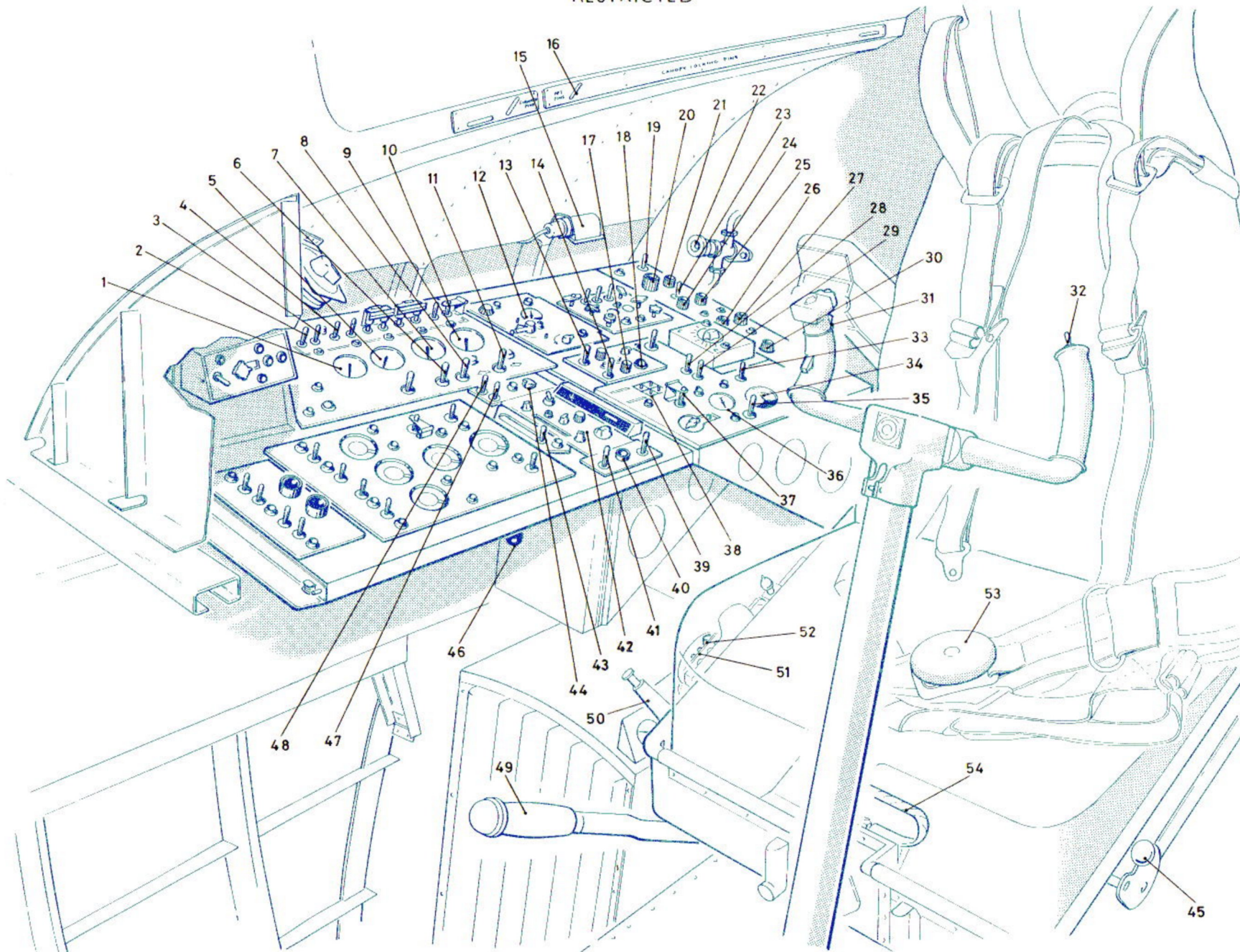


Fig.6 Operational and miscellaneous controls (2) ◀MOD 4990▶

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Key to Fig. 6 - OPERATIONAL AND MISCELLANEOUS CONTROLS (2)  
(completely revised)

- |  |   |
|--|---|
| 1 CABIN ALTITUDE indicator   | 27 PORT CONSOLE dimmer switch   |
| 2 CANOPY DEMIST switch. ON/OFF   | 28 No. 2 GENERATOR control switch. ON/OFF                                   |
| 3 PITOT head heater switch. ON/OFF   | 29 No. 1 GENERATOR control switch. ON/OFF                                   |
| 4 Integral wing tanks VENT VALVES heater switch. ON/OFF.   | 30 REMOTE PILOTS INDICATOR dimmer switch                                    |
| 5 HYDRAULIC services system pressure gauge   | 31 Press to transmit switch   |
| 6 ENGINE AIR TO CABIN shut-off cock control switch, No. 1<br>ENGINE ON/OFF.                                  | 32 F.95 CAMERA master switch. ON/OFF  |
| 7 BRAKES hydraulic pressure gauge  | 33 AUTOPILOT RESET switch   |
| 8 ENGINE AIR TO CABIN shut-off cock control switch, No. 2<br>ENGINE ON/OFF.                                  | 34 A C frequency meter  |
| 9 CABIN AIR heat control valve position indicator.   | 35 No. 1/No. 2 INVERTER VOLTS and FREQUENCY<br>selector switch. No. 1/No. 2 |
| 10 BATTERY master switch (guarded) ON/OFF.   | 36 A C voltmeter  |
| 11 CABIN AIR temperature control switch. COLD (forward)<br>off/HOT (aft).                                    | 37 INVERTER SELECTOR switch<br>No.1/No. 2 (under hinged guard)              |
| 12 Pilot's oxygen regulator Mk. 21B.   | 38 GENERATOR FIELD CIRCUIT BREAKERS<br>No. 12 (outboard), No. 21 (inboard)  |
| 13 Intercomm. ON/OFF switch  | 39 NAVIGATOR'S CU/PILOTS CU switch  |
| 14 Intercomm. NORMAL/EMERGENCY switch  | 40 UHF/VHF PRESS TO MUTE switch   |
| 15 Starboard console aft flood lamp. Controlled by switch on<br>dimmer panel.                                | 41 UHF/VHF switch   |
| 16 CANOPY LOCKING PINS indicators (starboard).<br>FORWARD PINS LOCKED/unlocked.<br>AFT PINS LOCKED/unlocked. | 42 UHF/VHF control panel  |
| 17 UHF/VHF VOLUME switch   | 43 HF MASTER switch ON/OFF  |
| 18 PRESS TO CALL navigator push-button   | 44 UHF/HF/UHF - VHF selector  |
| 19 INVERTER No. 2 GROUND TEST SWITCH. OFF/TO TEST.   | 45 Safety harness manual release level.                                     |
| 20 E2B COMPASS dimmer switch   | 46 Sliding panel adjusting lever  |
| 21 STARBOARD CONSOLE dimmer switch   | 47 UHF AERIAL SELECT switch. LOWER/UPPER                                    |
| 22 Oxygen system master valve (port similar)   | 48 UHF/VHF TONE switch  |
| 23 ACCELEROMETER illumination switch. ON/OFF.  | 49 Hydraulic system hand pump   |
| 24 COAMING PANEL AND VHF SELECTOR dimmer switch.   | 50 Pilot's seat height adjustment lever                                     |
| 25 Main instrument panel dimmer switch   | 51 Personal services connector  |
| 26 DIMMER PANEL dimmer switch  | 52 Ventilated suit air mixing control valve                                 |
|  | 53 Pilot's seat harness   |
|  | 54 Ejection seat alternative firing handle                                  |



## Chapter 2 NAVIGATOR'S CONTROLS AND EQUIPMENT

(Completely revised)

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### Introduction

1. This chapter gives a general description of the navigator's station together with the location, function and operation of controls and equipment.

### Access

2. Entrance to the navigator's station is effected by unlocking the hinged nose by means of an external release handle recessed into the port side of the nose fuselage immediately aft of the hinged nose; a duplicate release handle is provided inside the navigator's station immediately beneath the camera console. The hinged nose, which incorporates an inflatable rubber pressure seal, is held in the open position by a self-locking, knuckle-jointed bracing strut.

### Roof hatch

3. A jettisonable frangible hatch, built up of a glass cloth honeycomb sandwich and a shaped light alloy frame is located in the upper surface of the nose structure immediately above the navigator's seat. The hatch incorporates an inflatable rubber seal.

4. For ground servicing, an external release handle is provided; this is recessed into the skin and is located on the starboard side adjacent to the forward end of the hatch. An internal release handle, located on the starboard side of the navigator's station below the forward end of the hatch, is provided for jettisoning in emergency. A cabin pressure dump valve is used when abandoning the aircraft in flight.

### Seat

5. A Martin Baker Mk. 4QS ejection seat is install-

ed at the navigator's station and is described in A.P. 4288. Adjustable footrests are positioned on either side of the base of the 'B' scope in the hinged portion of the nose.

### Personal services connector

6. The navigator is connected to the oxygen system, intercomm. and air system for pressurized suit ventilation, through the personal services connector; this connector is in three parts, the aircraft portion, seat portion and navigator's portion. Except when the seat is removed or ejected, the aircraft portion remains connected to the seat portion, which is secured to the starboard side of the seat pan. The navigator's portion, which is connected to his pressure suit, is connected to the seat portion after entering the aircraft.

### Heating and ventilating

7. Air for cabin heating and the navigator's ventilated suit, etc., is obtained from the same source as that for the pilot's station, i.e. the engine compressors, and the description given in Chap. 1, and Sect. 3, Chap. 8, is generally applicable. A temperature control and flow valve is situated at the forward end of the starboard console.

### Chartboard

8. A hinged chartboard with stowage space for charts, etc., is attached to the lower cross channel member beneath the navigator's forward instrument stowage racks. Small drawers on each side of the chartboard provide a stowage for dividers, etc.

Note...

The chartboard must not be used to support loads.

### Instruments and control panels

9. Facing the navigator are the main instrument



panels and radio and radar equipment racks. Camera control units are mounted on the port side adjacent to the port console, which houses the day and night camera control panels. A camera mounting structure is attached to the floor on each side of the navigator's seat between frames 3 and 4, and in the hinged portion of the nose.

10. The starboard console incorporates various radar control units, radio altimeter indicator, the oxygen regulator and dimmer switch panels.

#### Lighting

11. The forward instrument panels are illuminated by bridge and pillar lamps, and the night camera control and dimmer switch panels are fitted with 'translite' panels. Flood lamps provide localized illumination of the main instrument panel and port and starboard consoles, and general illumination is provided by a cabin lamp on the starboard side below the glove stowage. Lighting is controlled by dimmer switches on the starboard console.

#### Curtains

12. Black-out curtains are provided for the port and starboard windows, and are folded up and stowed when not in use.

#### Stowages

13. Stowages are provided on the starboard side for leak stoppers, asbestos gloves, crash axe and first aid equipment, and on the port side for signal cartridges, sanitary container and an alternative stowage for a type 80 or 97 camera controller. Inspection lamp and lead stowages are provided on the port side of the ejection seat guide rail.

#### Signal discharger

14. A pressure cabin signal discharger is mounted immediately aft the port window. It is so designed that the pistol may be loaded or unloaded without loss of cabin pressure. The pistol may however be removed for firing from the hand.

#### Change of role

15. In certain roles (Sect. 5, Chap. 1, Group A & B) alternative controls and equipment may be fitted at the navigator's station; e.g. item 10, fig. 1.

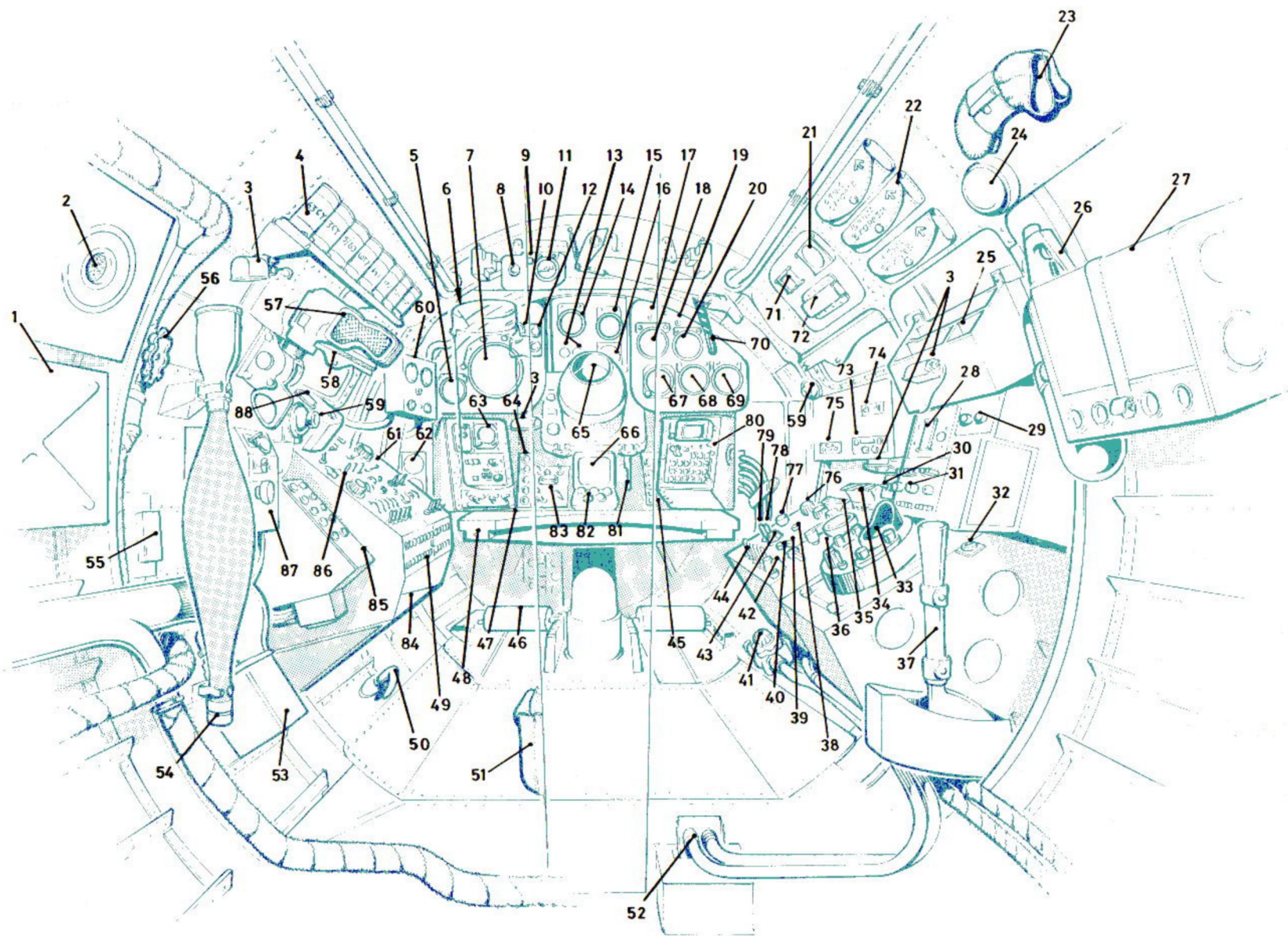


Fig.1. Navigator's station controls, instruments & equipment.  
 (MODS. 4990 & 4997)



## KEY TO FIG. 1

- 1 VHF & Intercomm. test panel.
- 2 Dry air de-misting system silica gel tell-tale window.
- 3 Floodlamp - Controlled by dimmer.
- 4 Signal cartridges stowage rack. (eight cartridges).
- 5 Fuel flowmeter (Pre-Mod 4838).
- 6 Inspection lamp stowage box (mounted on side seat rail).
- 7 G4B compass master indicator. Type E.5.
- 8 DUMP VALVE OPEN warning lamp (amber).
- 9 TEST lamp for ABANDON AIRCRAFT circuit.
- 10 Fuel manual density corrector.
- 11 Cabin pressure gauge.
- 12 OXYGEN system magnetic indicators.
- 13 Push switch & warning lamp. Post Mod 4838.
- 14 Fuel flowmeter. Post Mod. 4838.
- 15 Indicator Type 7. Post Mod 4838.
- 16 Compass deviation card holder. Post Mod 4838.
- 17 ABANDON AIRCRAFT warning lamp (red).
- 18 Airspeed indicator.
- 19 HATCH UNLOCK warning light (red) & press to test button.
- 20 Air temperature indicator.
- 21 Compass deviation card.
- 22 Leak stopper stowage.
- 23 Asbestos glove stowage.
- 24 Boarding lamp.
- 25 Navigator's book stowage.
- 26 Fire extinguisher.
- 27 First aid stowage.
- 28 Undercarriage fuses.
- 29 Engine speed indicator test plugs.
- 30 Mk. 1 19F. ALT. VIBRATOR SWITCH ON/OFF.
- 31 IFF. control panel.
- 32 UHF. STANDBY TEST SOCKET.
- 33 High level radio altimeter.
- 34 DUMP VALVE switches (under hinged guard).  
DUMP/NORMAL.
- 35 Navigator's instrument stowage.
- 36 Navigator's oxygen regulator panel.
- 37 Fire axe stowage.
- 38 VHF PRESS TO TRANSMIT push switch.
- 39 Pilot's ANTI-DAZZLE lights alternative switch.
- 40 Navigator's CALL lamp (aft) & CALL PILOT push button.
- 41 Ventilated suit air mixing control valve.
- 42 TACAN control unit, TYPE 7750.
- 43 TACAN changeover switch. Intercomm/Radio Compass.
- 44 No. 3 INVERTER START/STOP switch.  
No. 3 INVERTER RUN switch.  
No. 5 INVERTER STOP switch.  
No. 5 INVERTER START switch.  
No. 6 INVERTER ON/OFF switch.
- 45 Camera indicator panel, from top to bottom:-  
F.89 camera PORT, STARBOARD & CENTRE film indicator.  
warning lamps (green), 3 off, 'FLASHES GOING' indicator lamp.
- 46 Navigator's adjustable footrests.
- 47 Navigator's hinged table.
- 48 Pencil drawer.
- 49 Fuse panel (cover omitted for clarity).
- 50 Hinged nose locking mechanism internal handle.
- 51 Inspection lamp (Item 6) lead stowage.
- 52 Ventilated suit connectors.
- 53 Ratio selector.
- 54 Sanitary container.
- 55 Pre-exposure warning relay.
- 56 Hot air manual control valve.
- 57 Signal pistol.
- 58 Black-out curtain. Starboard similar.
- 59 Air conditioning punkah louver.
- 60 F.89. IMC. setting controller. (Night role C)  
Replaced by F.49 Mk. 4 controller (Day role B)  
(Pre Mod 4838) Control Box (Post Mod 4838).
- 61 Night camera panel - for details see Fig. 2.

KEY TO FIG. 1 (contd)  
(completely revised)

- 62 Compass deviation card holders (2) Pre Mod 4838.
- 63 Navigator's instrument panel.  
Heading select switch.  
Ground speed/drift indicator.  
Platform control unit.  
Doppler ON/OFF switch.  
S.G.P. NORMAL - START/REV switch.  
System NORMAL - TEST switch.
- 64 Camera functioning lights (5) From top to bottom.  
F96 PORT OUTER OR STBD. OBLIQUE;  
PORT INNER; STBD INNER;  
STBD. OUTER OR PORT OBLIQUE; F49.
- 65 Reconnaissance view-finder.
- 66 Chartboard lamp. controlled by item 76.
- 67 Altimeter Mk. 30A.
- 68 Radio compass bearing indicator.
- 69 TACAN indicator.
- 70 Navigator's escape hatch release handle.
- 71 Correction card holder.
- 72 SEAT SAFETY PINS stowage. SEAT PAN FIRING (fwd)  
GUILLotine SEAR (mid) FACE SCREEN (aft).
- 73 HF remote control unit Type M53.
- 74 HF TUNE & OPERATE lamps.
- 75 VHF/UHF CONTROL RADIO SET TYPE C1607/7.
- 76 Navigator's station lighting dimmer switches (3).  
CHART BOARD LAMP (fwd) SWITCH & DIMMER.  
PANEL (mid) DASHBOARD (aft).
- 77 IFF FAIL warning lamp (amber) & press to test push button.
- 78 RADIO ALTIMETER ON/OFF SWITCH.
- 79 RADIO ALTIMETER TUNING switch.
- 80 TANS computer.
- 81 Reconnaissance view finder controls.
- 82 FLASHES GONE magnetic indicators (5).
- 83 Radio compass control unit.
- 84 Stowage pack for camera console fuse chart. etc.
- 85 F49. Mk. 3 distribution box.
- 86 Day camera panel (details see fig. 2).
- 87 Camera controller. Type 97.
- 88 Intervalometer.

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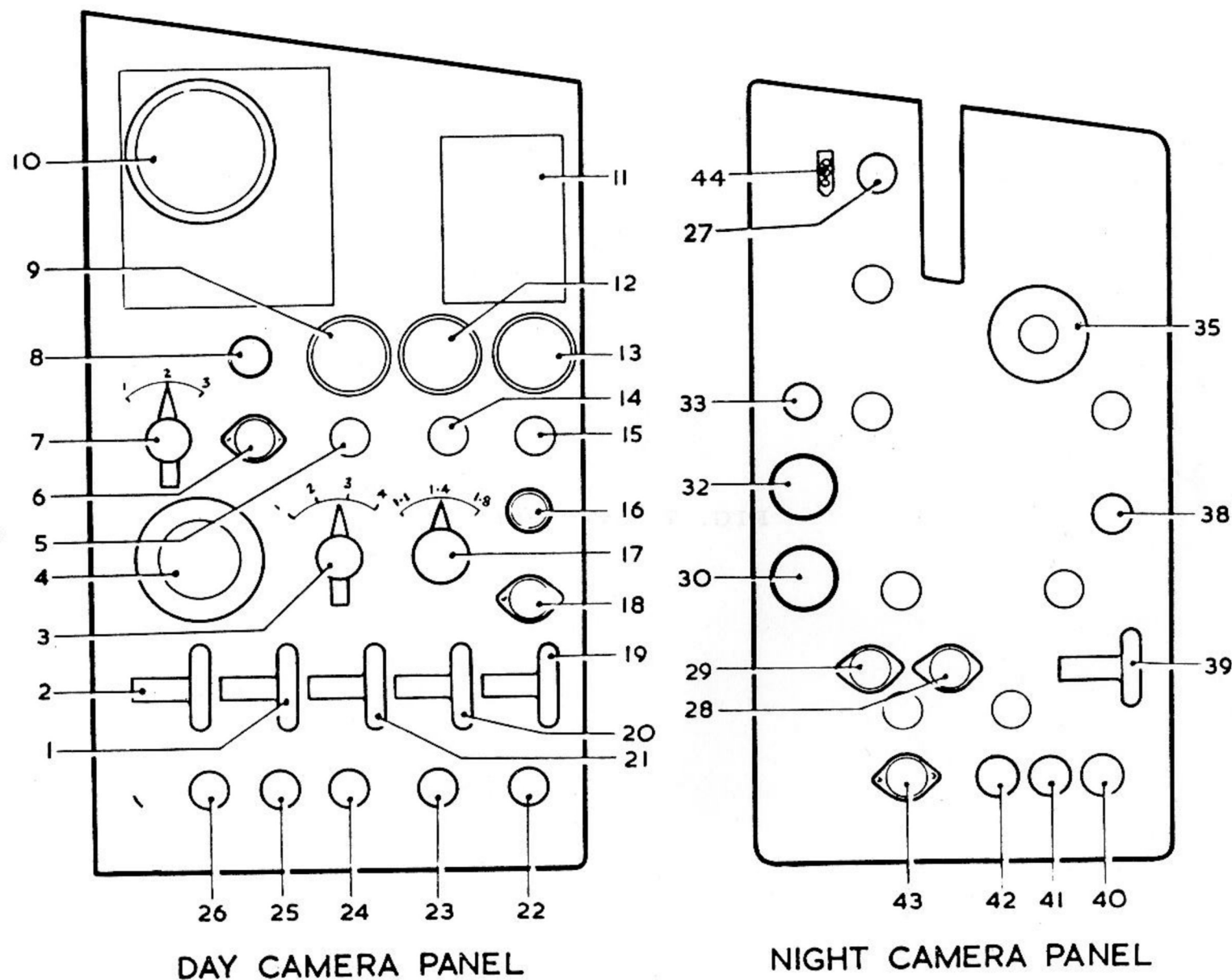


Fig. 2 Camera console

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## KEY TO FIG. 2

- |    |  |      |  |
|----|--|------|--|
| 1  | Frame counter - PORT INNER                             | 24   | STBD. INNER F96 CAMERA master switch                                 |
| 2  | Frame counter - PORT OUTER OR STBD OBLIQUE             | 25   | PORT INNER F96 CAMERA master switch                                  |
| 3  | F96 camera 4-position IRIS selector                    | 26   | PORT OUTER OR STBD OBLIQUE F96 CAMERA master switch                  |
| 4  | IMC control switch                                     | 27   | ARMAMENT SAFETY SWITCH LIVE warning lamp (amber). Press to test.     |
| 5  | Frame speed selector switch. 8 FPS/4 FPS. PORT camera  | 28   | FLASH STOP push switch   |
| 6  | F95 CAMERA TEST switch. Push to test                   | 29   | CAMERA STOP push switch  |
| 7  | F95 camera 3-position IRIS selector                    | 30   | FLARE DOOR OPEN magnetic indicator (fully open white, closed black)  |
| 8  | F95 camera HEATER AND IRIS switch                      | 31   | ▶ ◀  |
| 9  | Footage indicator - PORT camera                        | 32   | CAMERA DOOR OPEN magnetic indicator (fully open white, closed black) |
| 10 | Intervalometer - F96 camera and F49 camera             | 33   | CAMERA DOOR control switch   |
| 11 | SPARE FUSES container                                  | 34   | ▶ ◀  |
| 12 | Footage indicator - CENTRE camera                      | 35   | Camera PANEL CONTROL DIMMER switch                                   |
| 13 | Footage indicator - STBD camera                        | 36   | ▶ ◀  |
| 14 | Frame speed selector switch. 8 FPS/4 FPS CENTRE camera | 37   | ▶ ◀  |
| 15 | Frame speed selector switch. 8 FPS/4 FPS STBD. camera  | 38   | F97/F89 camera TEST switch   |
| 16 | Re-set warning lamp (green)                            | 39   | 1. 75 IN. FLASHES REMAINING counter                                  |
| 17 | F49/F96 camera RATIO selector switch, 1-1, 1-4, 1-8    | ◀ 40 | SIMULT switch (F49 cameras)  |
| 18 | Re-set switch. PUSH BUTTON TILL LAMP (item 16) LIGHTS  | 41   | VERT F96 IMC switch  |
| 19 | F49 camera frame counter                               | 42   | VERT F96 MASTER switch ▶   |
| 20 | Frame counter STBD OUTER OR PORT OBLIQUE               | 43   | CAMERA START and FLASH RELEASE push switch                           |
| 21 | Frame counter  | 44   | ARMAMENT SAFETY SWITCH. LIVE/SAFE (under hinged guard)               |
| 22 | F49 camera master switch                               |      |  |
| 23 | STBD. OUTER OR PORT OBLIQUE F96 CAMERA master switch   |      |  |



## Chapter 3 EMERGENCY CONTROLS, EQUIPMENT AND EXITS

(Completely revised)

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## Illustration

	Fig.
Emergency controls, equipment and exits ... ..	1

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KEY TO FIG. 1

- |   |  |   |
|---|--|---|
| 1 Navigator's roof HATCH UNLOCK warning lamp (red)  | 15 Fuselage and flare bay fire warning lamp PRESS-TO-TEST push-button  | 28 FLARE bay DOORS EMERGENCY CONTROL lever. Push to operate   |
| 2 Navigator's roof HATCH JETTISON handle - PUSH   | 16 E2B compasses   | 29 Ditching/abandoning aircraft switches (guarded) ABANDON/NORMAL, linked to two adjacent dump valve switches, DUMP/NORMAL  |
| 3 Panel - comprising:-<br>DUMP VALVE OPEN warning lamp (amber)<br>ABANDON AIRCRAFT warning lamp (red)<br>TEST lamp for ABANDON AIRCRAFT circuit<br>Cabin pressure gauge | 17 AILERON 100% hydraulic POWER FAIL warning lamp (red). Comes on when both port and starboard hydraulic systems fail  | 30 TURN-AND-SLIP standby POWER supply switch NORMAL/STANDBY   |
| 4 External handle for unlocking hatch (on coaming)  | 18 CABIN PRESSURE FAIL warning lamp (red)  | 31 Turn-and-slip indicator  |
| 5 LEAK STOPPERS   | 19 RUDDER 100% hydraulic POWER FAIL warning lamp (red). Comes on when primary and secondary power supplies fail  | 32 Pilot's emergency oxygen control   |
| 6 Fire extinguisher   | 20 RUDDER 50% hydraulic POWER FAIL warning lamp (amber). Comes on when primary or secondary power fails  | 33 Pilot's ejection seat alternative firing handle  |
| 7 First aid stowage   | 21 EMERGENCY LIGHTS switch. ON/OFF   | 34 Hydraulic system hand pump   |
| 8 Asbestos gloves   | 22 Pilot's ejection seat firing handle   | 35 Emergency batteries  |
| 9 Navigator's ejection seat firing handle   | 23 UNDERCARRIAGE EMERGENCY lowering handle. PULL   | 36 No. 1 (left) and No. 2 (right) ENGINE FUEL PRESSURE FAILURE warning lamps (red), (upper pair) and No. 1 (left) and No. 2 (right) ENGINE OIL PRESSURE FAILURE warning indicators (show white when oil pressure falls to 20 p.s.i.) (lower pair) |
| 10 AILERON 50% hydraulic POWER FAIL warning lamp (amber). Comes on when either port or starboard hydraulic system fails   | 24 Wing drop tanks jettison button (guarded). FUEL TANK JETTISON   | 37 Navigator's roof hatch   |
| 11 Combined fire warning lamp and fire extinguisher push-button, PORT ENGINE. Press to operate fire extinguisher system   | 25 Undercarriage UP selector push-button (red). In an emergency turn the metal collar surrounding the button through 60 deg. clockwise and depress the button in the normal manner | 38 Signal pistol  |
| 12 Combined fire warning lamp and fire extinguisher push-button, STARBOARD ENGINE. Press to operate fire extinguisher system  | 26 Canopy jettison handle (under hinged guard). DANGER. PULL TO JETTISON CANOPY  | 39 Signal cartridges stowage rack   |
| 13 Engine fire warning lamps PRESS TO TEST push-button  | 27 PHOTOFLASH JETTISON switch (guarded). FLASH JETTISON/off/DOOR DELAY OVERRIDE  | 40 External handle for opening hinged nose  |
| 14 Fuselage and flare bay fire warning lamp. TANK FIRE (red)  |  | 41 Fire axe   |
|   |  | 42 Navigator's ejection seat alternative firing handle  |
|   |  | 43 Navigator's emergency oxygen control   |
|   |  | 44 DUMP VALVE switches (guarded). DUMP/NORMAL   |

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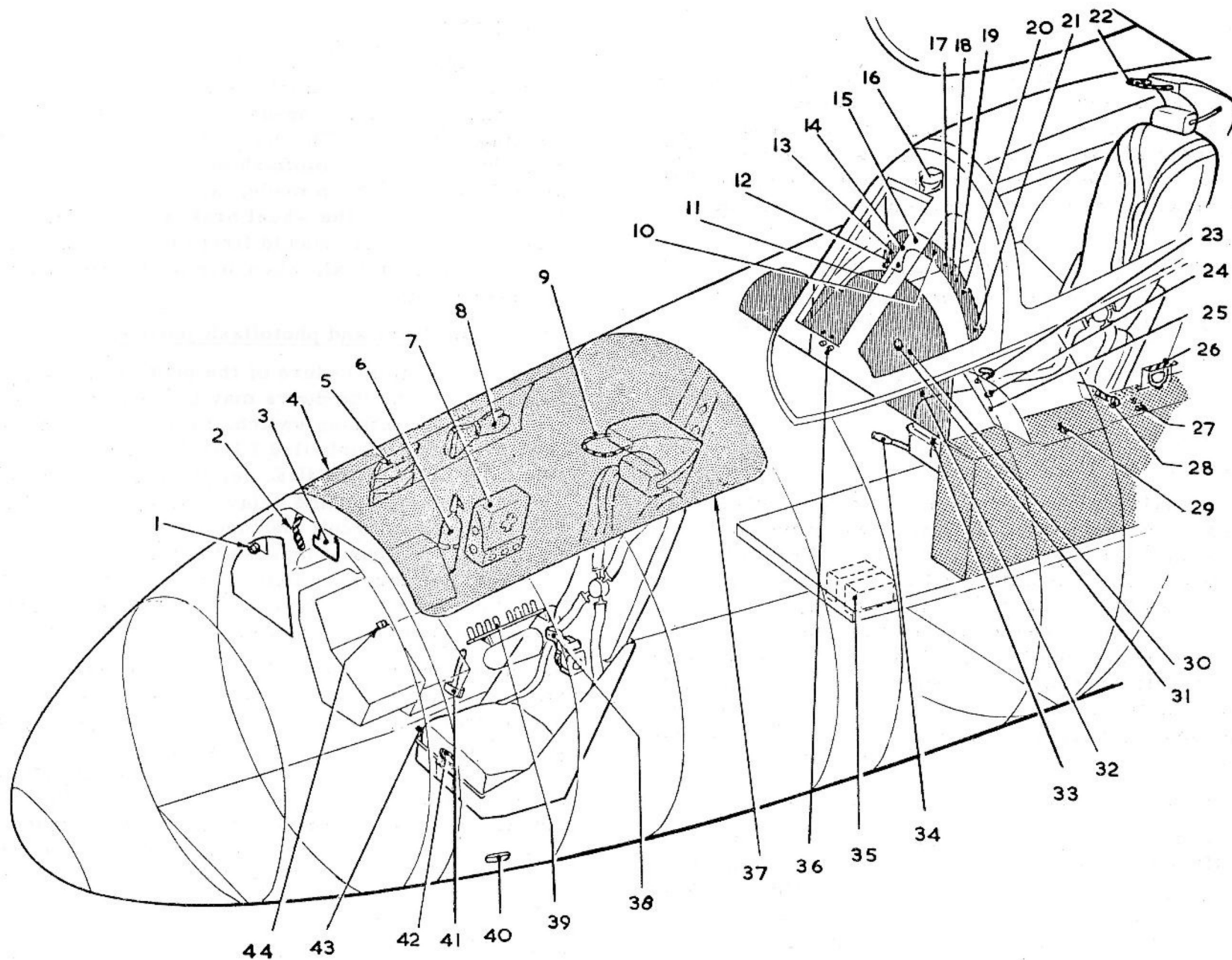


Fig. 1 Emergency controls, equipment and exits

## Introduction

1. This chapter describes the location of emergency controls, equipment and exits, and the methods of operation where this is not obvious. Location of the various controls and equipment is shown pictorially in fig. 1. A full description of the systems employed together with the servicing procedure, is given in the following sections:-

Sect. 3, Chap. 10	Oxygen system
Sect. 3, Chap. 11	Emergency equipment
Sect. 4, Chap. 5	Fire protection system
Sect. 5, Chap. 1	Electrical system

## EMERGENCY CONTROLS

### Hydraulics

#### Alighting gear lowering

2. A mechanical selector for lowering the undercarriage in an emergency, is positioned immediately above the alighting gear control panel. The RED-painted handle is labelled UNDERCARRIAGE EMERGENCY PULL. To operate the selector, the handle is pulled aft to its full extent, and is retained in this position by a spring lock incorporated in the handle. This handle is used in the event of an electrical fault rendering the normal alighting gear control inoperative, and functions irrespective of the position of that control.

#### Alighting gear raising

3. An interlock override is incorporated in the UNDERCARRIAGE UP push button, for raising the alighting gear in an emergency. The override is brought into operation by turning the collar around the UP button through 60 deg clockwise and pressing the button in the normal manner.

#### Hand pump

4. The hydraulic system hand pump, located on the starboard side of the pilot's seat, is used in the event of a failure of the engine-driven pumps or the associated supply circuit. The hand pump will operate the alighting gear and photoflash doors after the appropriate selection has been made, and will also supply fluid pressure for the wheel brakes. The relative emergency controls should first be operated in case the fault is electrical, when use of the hand pump will be unnecessary.

### Photoflash doors and photoflash jettison

5. In the event of failure of the photoflash doors selector switch, the doors may be opened by use of the photoflash jettison switch, located on the pilot's port console, and labelled FLASH JETTISON - OFF - DOOR DELAY OVERRIDE. Selection of this switch energises the door time delay switch, breaks the normal door close circuit and operates the door OPEN relay. The jettison supply to the flash carrier is completed by the operation of separate microswitches when the doors are fully open. The doors are automatically closed on completion of the time delay period.

6. Should the relay fail, however, the flashes may still be jettisoned after operating the emergency manual control lever mounted on the fuselage structure immediately above the pilot's port console. This lever is labelled FLARE DOORS EMERGENCY, and to open the doors the lever is moved down to the full extent of its travel and is retained in this position by a spring lock. The flash jettison switch is then held in the JETTISON position while the stores are being released.

### Emergency lighting

7. Three yellow lamps mounted on the coaming



round the dashboard, form the pilot's emergency lighting, and are brought into operation by means of an ON/OFF switch located on the port side of the coaming panel. Power for these lamps and for the pilot's emergency turn-and-slip indicator, is supplied by emergency batteries mounted on the sloping bulkhead at the starboard side of the pilot's seat.

#### Wing tip tank jettison

8. A push button switch covered by a hinged flap labelled FUEL TANK JETTISON and identified by black and yellow stripes, is positioned on the under-carriage panel at the forward end of the pilot's port console. Operation of the push-button detonates the charge in three explosive bolts by which each tank is attached to the wing tip, and severs the bolts.

#### Fire warning and extinguisher systems

##### Engines

9. Combined red fire warning lamps and fire extinguisher push-buttons, identified by black and yellow stripes, are provided for each engine; these warning lamps are located on the starboard side of the coaming panel. Illumination of either lamp indicates a fire in the respective engine nacelle, and depressing a push-button initiates the operation of the extinguisher system.

Before pressing the push-button the pilot must ensure that the respective cabin air gate valve is set to OFF.

##### Fuel tank and flare bay

10. A red warning lamp situated on the starboard side of the coaming panel, and adjacent to the engine fire extinguisher push buttons, gives warning of fire in the fuel tank and flare bays. No extinguisher push-buttons are provided, as the operation of the system is automatically initiated. The flame detector

switches are self re-setting and the warning lamp ceases to be illuminated when the fire is extinguished. The fire protection system is described in Sect. 4, Chap. 5.

### EMERGENCY EQUIPMENT

#### Pilot

##### Ejection seat

11. A Martin Baker Mk. 3CS ejection seat is installed at the pilot's station; this seat is fully described in A. P. 109A-0001-1.

##### Emergency compass

12. A type E2B emergency compass is mounted beneath the rear view mirror in the centre of the windscreen rear hoop immediately above the main instrument panel.

##### Turn-and-slip indicator

13. Power to operate the turn-and-slip indicator in the event of failure of the electrical system is supplied by the emergency batteries; this supply is brought into operation by moving the switch labelled TURN AND SLIP STANDBY SUPPLY to the ON position. The switch is located on the port side of the turn and slip indicator.

#### Navigator

##### Ejection seat

14. A Martin Baker Mk. 4QS ejection seat is installed at the navigator's station, and is described in A. P. 109A-0001-1.

##### Hand extinguisher

15. A hand operated water/glycol fire extinguisher is mounted on the starboard side aft of the navigator's starboard console.

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### Crash axe and asbestos gloves

16. A crash axe is stowed on the aft end of the navigator's starboard console, and asbestos gloves are located on the structure immediately above the extinguisher.

### First aid

17. A first aid outfit is mounted on the starboard side immediately aft of the fire extinguisher.

### Leak stoppers

18. Three black canvas envelopes, labelled LEAK STOPPER, and each containing one leak stopper, are mounted on the starboard side immediately below the frangible hatch coaming. In the event of damage to the pressure cabin, a leak stopper may be applied to the damaged area to minimise loss of cabin pressure. The method of application is described in A.P. 4340, Vol. 1, Sect. 1.

### Signal discharger and cartridge stowage

19. A signal discharger in a pressure cabin mounting is located on the port side aft of the navigator's window. The pistol may be removed from the pressure sealed mounting for hand operation. Signal cartridges are stowed in clips above the navigator's window, adjacent to the pistol.

### Emergency oxygen

20. The pilot and navigator each have an emergency reserve of oxygen contained in a cylinder attached to the back of his ejection seat. A supply tube from the cylinder is connected to the aft end of the personal services connector. When the ejection seat is used the aircraft portion of the connector into which the normal oxygen supply is fed, is detached by the upward movement of the seat; this action cuts off the normal oxygen supply and operates the emergency

cylinder by means of a cable attached to the structure. In the event of oxygen failure at high altitude, the emergency supply may be brought into use by a full upward pull on a release knob mounted at the forward end of the starboard side of the seat pan. The knob is identified by black and yellow stripes.

## EMERGENCY EXITS

### Pilot

#### Canopy jettison and control column snatch unit

21. The pilot's canopy is jettisoned automatically by operation of the seat ejection control by means of a cartridge gas system, and is fully described in Sect. 3, Chap. 1. This system also operates the elevator break strut and control column snatch unit. A snatch unit fitted within the pilot's port console is connected to the lever at the outboard end of the elevator torque shaft on the control column, and its purpose is to move the control column forward and hold it against the instrument panel, to give the pilot an unobstructed exit when using the ejection seat.

22. A break strut interposed in the elevator control run is parted simultaneously with the release of the spring operated snatch unit; this ensures that the elevator controls are not affected by the forward movement of the control column under the action of the snatch unit.

23. For ditching purposes the canopy may be jettisoned independently by the full upward movement of the CANOPY JETTISON HANDLE. This handle is located at the aft end of the port console.

### WARNING...

ALL PERSONNEL ARE WARNED OF THE DANGER OF INTERFERING WITH THE CONTROLS ASSOCIATED WITH THIS EQUIPMENT.

ON NO ACCOUNT IS THE CONTROL COLUMN RELEASE AND CANOPY JETTISON CONTROL TO BE OPERATED, EXCEPT WHEN IT IS INTENDED TO ABANDON THE AIRCRAFT IN FLIGHT. THIS IS MOST IMPORTANT.

Navigator

Roof hatch

24. A frangible, jettisonable hatch built up of glass-cloth honeycomb sandwich is installed at the navigator's station. A pair of mechanically linked guarded switches is mounted at each crew station, allowing either crew member to 'dump' the cabin pressure prior to abandoning the aircraft.