

Chapter I PILOT'S CONTROLS AND EQUIPMENT

(completely revised)

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WARNING

1. The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cockpit or performing any operations upon the aircraft.

2. To avoid inadvertent displacement of the canopy external jettisoning handle (Chap.3) whilst attaching the access ladder, tilt the bottom of the ladder outwards and engage the upper ball end-fittings in the corresponding

fuselage sockets, then engage the lower end-fittings.

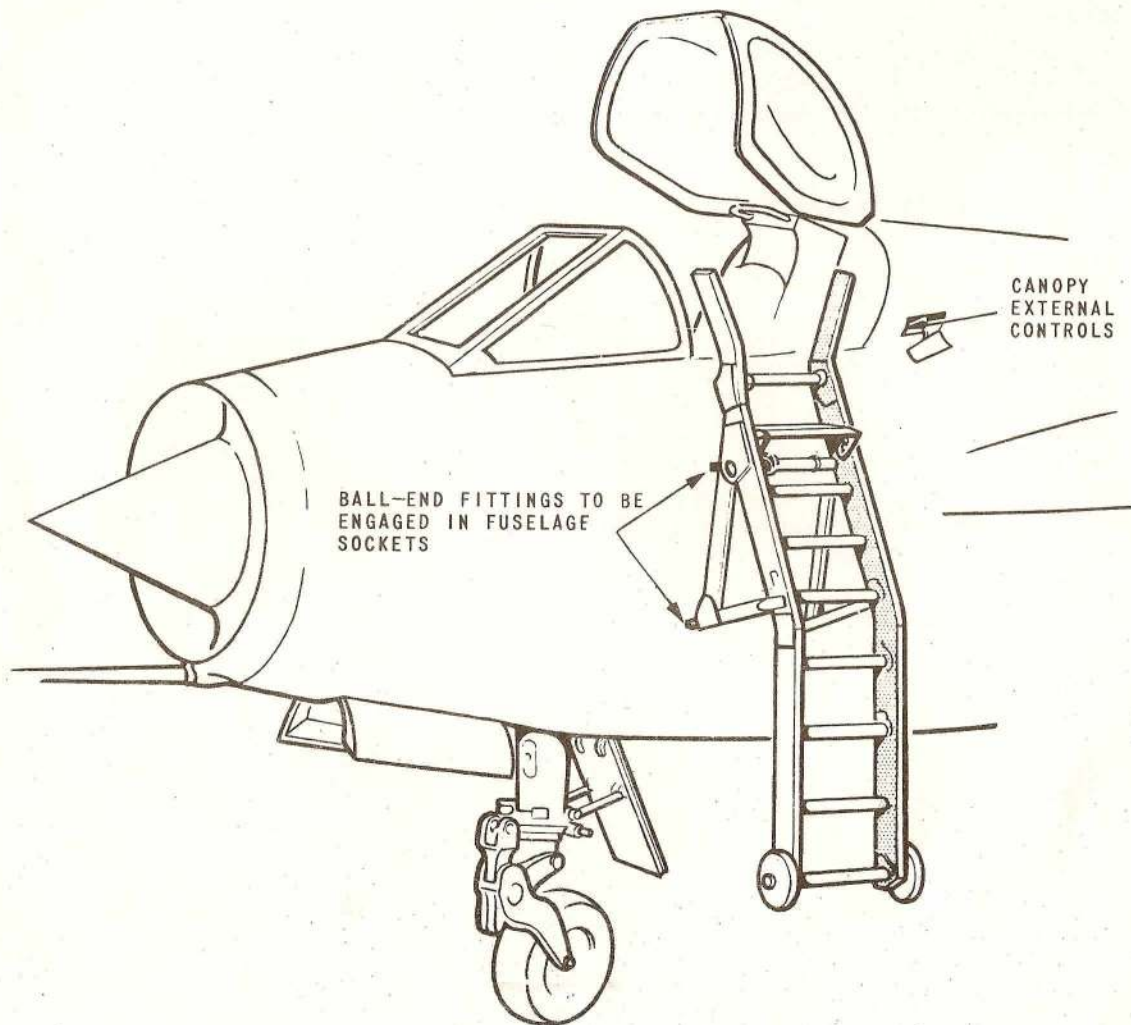


Fig.1. Cockpit access ladder

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Entering the cockpit

1. Entry to the cockpit is gained by climbing a ladder (*Sect.2, Chap.4, Table 1*), after attaching it to the port side of the front fuselage (*fig.1*) and opening the canopy by operating the external controls (*fig.2*). The ladder pick-up points are indicated by external markings stencilled on the fuselage skin, and the canopy external controls are behind a small detachable panel, similarly identified, in the port side of the spine immediately aft of the cockpit. The canopy is opened (after removing the access panel) by first pulling the black coloured locking-handle outboard then operating the adjacent switch controlling the canopy jack; the locking handle also controls canopy seal inflation. A warning buzzer sounds whenever the canopy switch is operated and a CANOPY warning indicator on the auxiliary warnings panel (*fig.10*) is illuminated while the canopy is unlocked. The canopy can also be closed and locked by the external controls.

Note...

If the canopy fails to open when the control switch is operated, the probable cause is low pressure in the services hydraulic system. The pressure can be restored by use of the hand pump (Sect.3, Chap.6). If, after this, the canopy still fails to open refer to the emergency exit procedure contained in Chap.3.

Canopy control from inside the cockpit

2. The occupant of the cockpit opens or closes the canopy by operating the internal control handle and its integral canopy-jack control switch (*fig. 10*). The controls are inter-connected with the external controls (*para. 1*) so that the 'canopy unlocked' and 'canopy moving' warning is given in the appropriate circumstances. The control switch can be operated only when the control handle is in the unlocked (up) position.

Pilot's seat (*fig. 3*)

3. A Mk. 4 BSC fully automatic, light-weight ejection seat, together with a back-type parachute and a survival pack, is installed in the cockpit. Features of the seat include:-

(1) A firing handle at the front of the seat pan, for use in circumstances when it is impossible to reach the face-screen firing handle.

(2) Electrically-operated seat adjustment mechanism controlled by a switch (*fig. 10*) on the port console.

(3) 'Go-forward' harness, operated by a control on the port side of the seat pan.

(4) Seat harness manual release, operated by a lever on the port side of the seat pan, enabling the pilot to release the harness from the seat in case of failure of the automatic release mechanism.

(5) Automatic leg-restraining gear.

(6) A personal equipment connector, mounted on the starboard side of the seat pan, providing simultaneous engagement of the main and emergency oxygen supplies, tel/mic. lead, air ventilated suit supply, and anti-g supply.

Rudder pedals, leg-reach adjustment (*fig. 10*)

4. The rudder bar adjustment mechanism is unlocked by means of a handle, marked

PULL TO ADJUST RUDDER BAR, located above the starboard corner of the flight instrument display panel. Pulling and holding the handle allows the pilot to adjust the rudder bar with his feet. Releasing the handle automatically locks the rudder bar in the selected position.

Hydraulic feel cancellation

5. Tail-plane and rudder hydraulic 'feel' is controlled by a guarded two-position switch on the port console.

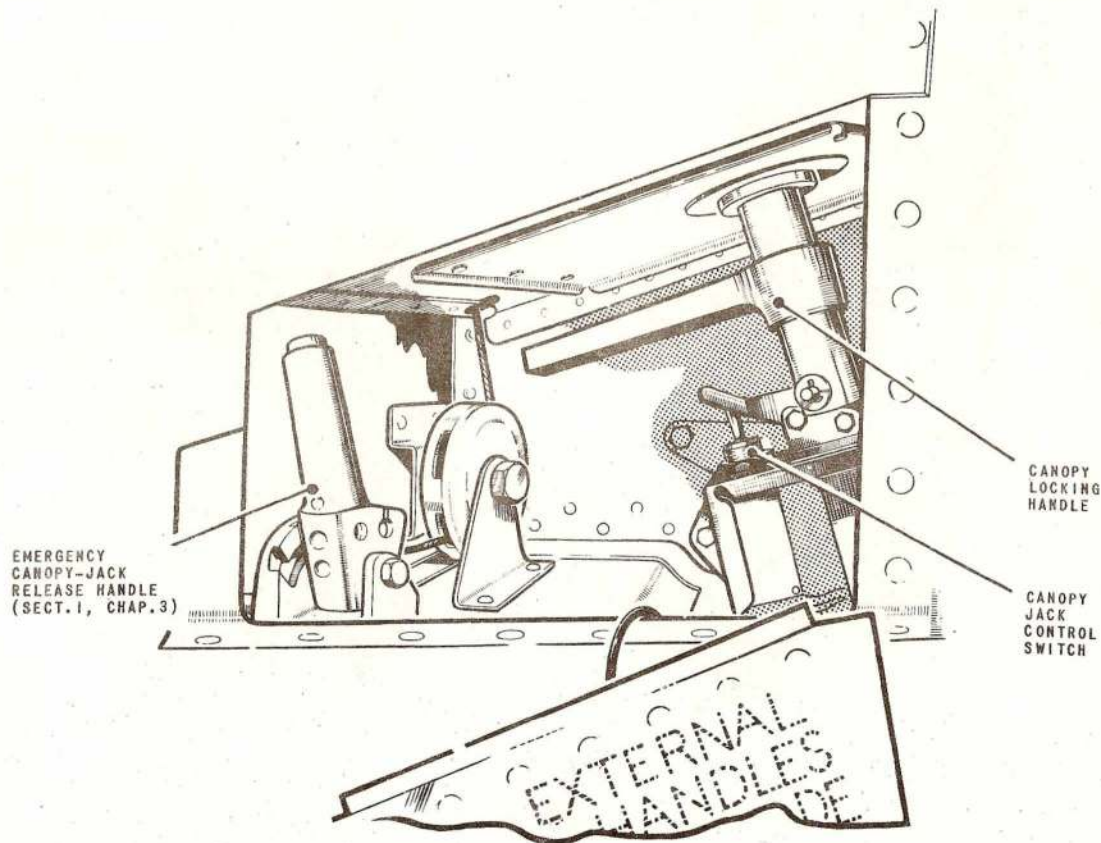


Fig. 2. Canopy external controls

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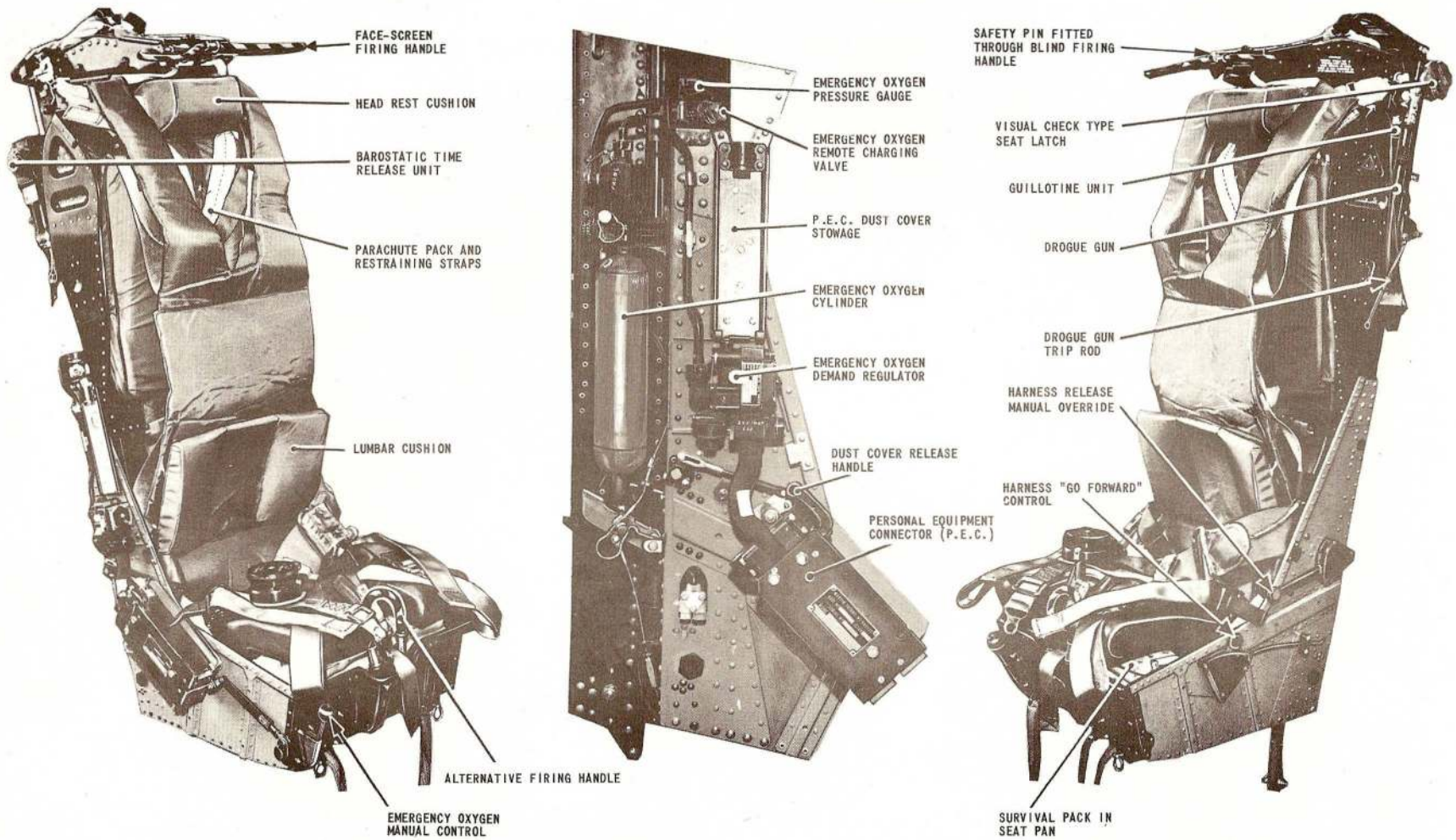


FIG.3. EJECTION SEAT

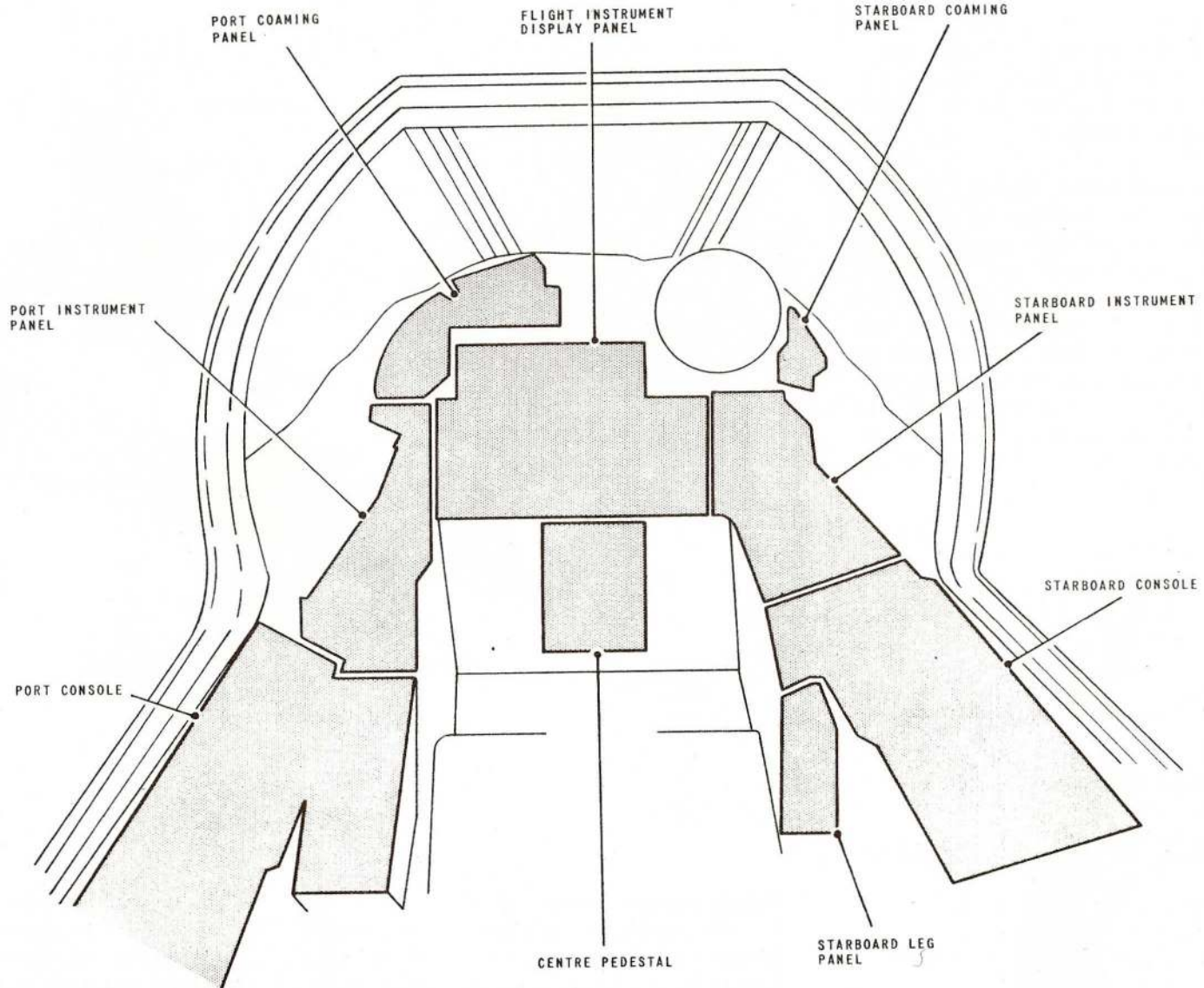


FIG. 4. DISPOSITION OF PRINCIPLE INSTRUMENT AND CONTROL PANELS

The switch is left ON in normal flight conditions, but should excessive 'feel' be experienced the pilot can select OFF. This does not affect spring 'feel' which remains operative.

Instrument and control panels (fig.4)

6. The controls, instruments and indicators, are grouped upon panels facing the pilot and on port and starboard console panels. The titles given to the panels in the illustration are for reference purposes when reading descriptive matter elsewhere in this Publication. For detailed information on the locations of the controls, instruments and indicators refer to fig.7 to 10 and to Chap.3, fig.2.

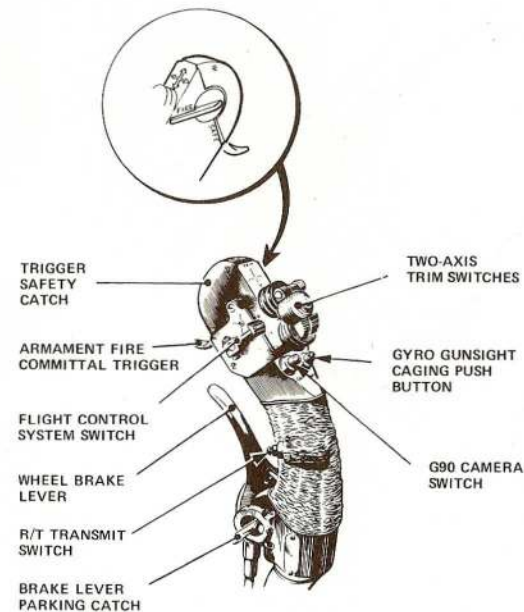


Fig.5. Control column handle

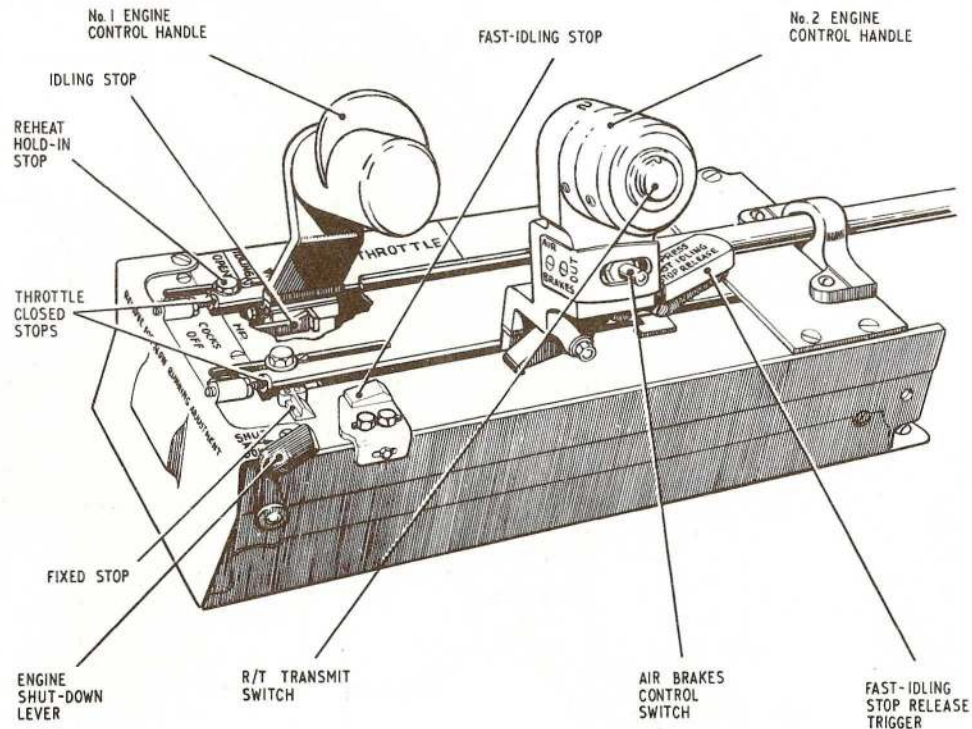


Fig.6. Engine control unit

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Engine control unit (fig.6)

7. The engine control unit, on the port console, has two handles - outboard handle No.1 engine, inboard handle No.2 engine - which slide fore-and-aft to open and close the H.P. cocks and control the full range of power from idling speed to maximum reheat. Transition from cold thrust to reheat thrust is achieved by rocking the handles to port, at the

cold thrust limit and continuing forward movement; when reducing thrust the action is reversed. An adjustable stop arrests backward movement of No.2 handle at the fast idling position; the stop may be passed by depressing a lever on the handle. Both handles are arrested at the IDLING position by further adjustable stops, which are lowered by a single lever on the control unit body

to allow the engines to be shut down. The No. 2 engine handle incorporates the R/T transmitter control-switch and the air-brakes control switch.

Cockpit lighting

8. The cockpit lighting system comprises of general floodlighting, individual instrument lighting, and emergency lighting (*Chap.3*). Normal lighting is

controlled by five dimmer switches on the starboard console. Another dimmer switch, fitted alongside the console, controls the integral lighting of the E2B compass and the stand-by direction indicator. A floodlight, mounted on a swinging arm above the starboard console, illuminates the pilot's note pad or the console as required. A switch unit, mounted on the starboard wind-

screen arch, controls the frequency cards holder illumination. Two high-intensity lamps, one on the port and the other on the starboard windscreen arch, are controlled by a switch on the port coaming panel, these lamps enable the pilot to read essential instruments while affected by temporary flash blindness. For further information refer to Sect.6, Chap.8.

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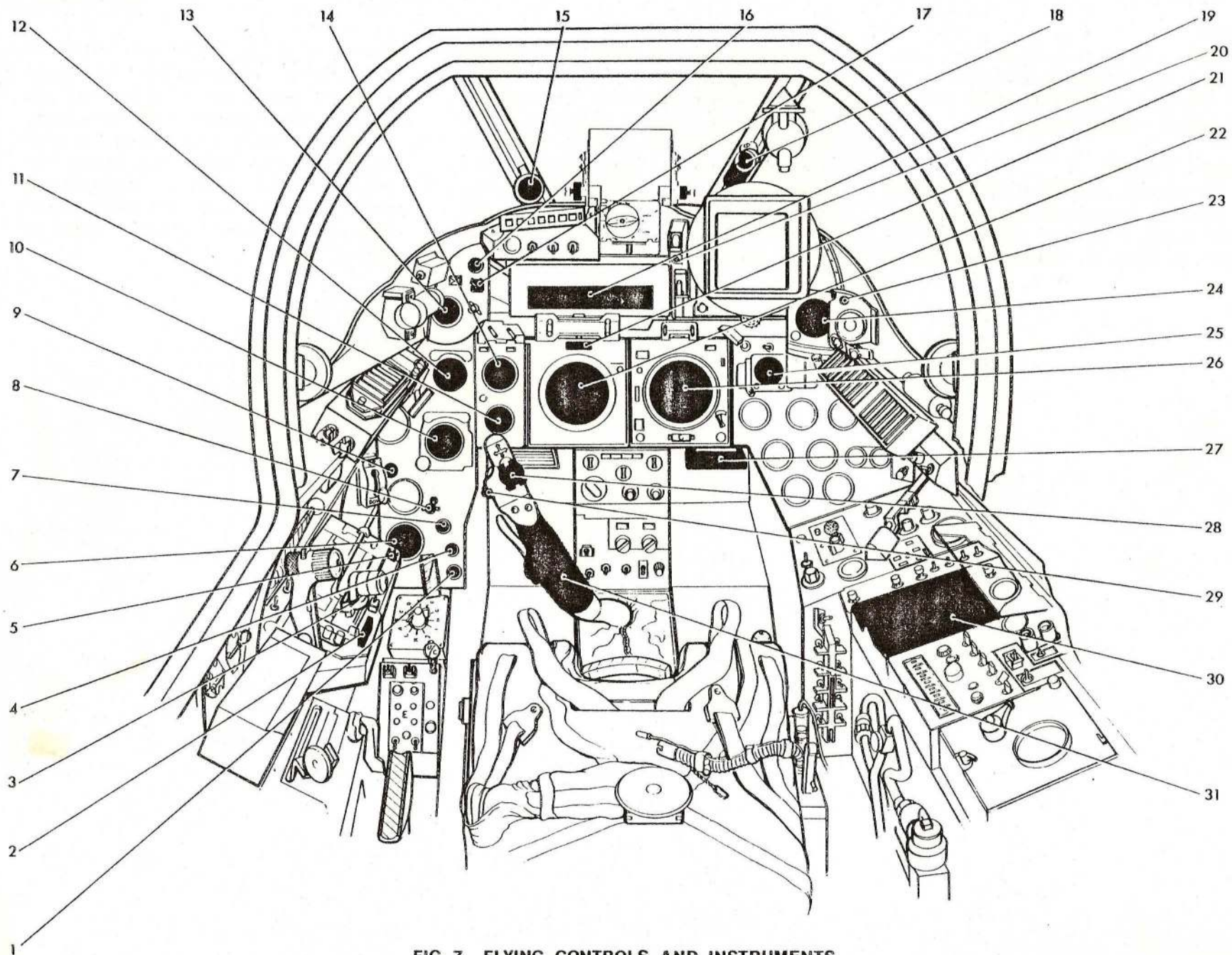


FIG. 7. FLYING CONTROLS AND INSTRUMENTS

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KEY TO FIG.7 (FLYING CONTROLS AND INSTRUMENTS)

- | | | | |
|----|---|----|---|
| 1 | M.R.G. PULL-OFF INDICATOR/SWITCH | 16 | STAND-BY INVERTER INDICATOR
Shows ON when essential instruments are on stand-by power |
| 2 | RUDDER TRIM SWITCHES
Move both switches to port for port rudder and to starboard for starboard rudder | 17 | INVERTER SWITCH |
| 3 | AIR-BRAKES SELECTOR SWITCH
Forward IN, aft OUT; spring loaded to centre off position | 18 | ACCELEROMETER (post Mod.4808) |
| 4 | M.R.G. FAST ERECTION PUSH SWITCH | 19 | STRIP SPEED DISPLAY
Incorporates main airspeed indicator and machmeter |
| 5 | HYDRAULIC FEEL CUT-OFF SWITCH
Lift guard, select OFF to cancel hydraulic feel | 20 | SLIP INDICATOR |
| 6 | THREE-AXIS TRIM AND AIR-BRAKE POSITION INDICATOR | 21 | ATTITUDE INDICATOR |
| 7 | AUTOPILOT TRIM INDICATOR
Indicates magnitude and direction of tail-plane trim applied by the autopilot | 22 | FLIGHT CONTROL SYSTEM MODE INDICATOR (REPEATER) |
| 8 | FLAPS SELECTOR SWITCH | 23 | ACCELEROMETER (pre Mod.4808) |
| 9 | FLAPS POSITION INDICATOR | 24 | NAVIGATION DISPLAY
Presents selected navigation display in response to position of integral switch |
| 10 | STAND-BY ARTIFICIAL HORIZON | 25 | RUDDER BAR |
| 11 | RATE OF CLIMB INDICATOR | 26 | TWO-AXIS TRIM SWITCH
Fore and aft for pitch, port and starboard for roll |
| 12 | STAND-BY ALTIMETER | 27 | FLIGHT CONTROL SYSTEM SWITCH
Forward for flight director FD, centre OFF, aft for autopilot AP |
| 13 | STAND-BY AIRSPEED INDICATOR | 28 | PILOT'S FLIGHT CONTROL SYSTEM CONTROLLER |
| 14 | MAIN ALTIMETER | 29 | CONTROL COLUMN HANDLE |
| 15 | STAND-BY DIRECTION INDICATOR | | |

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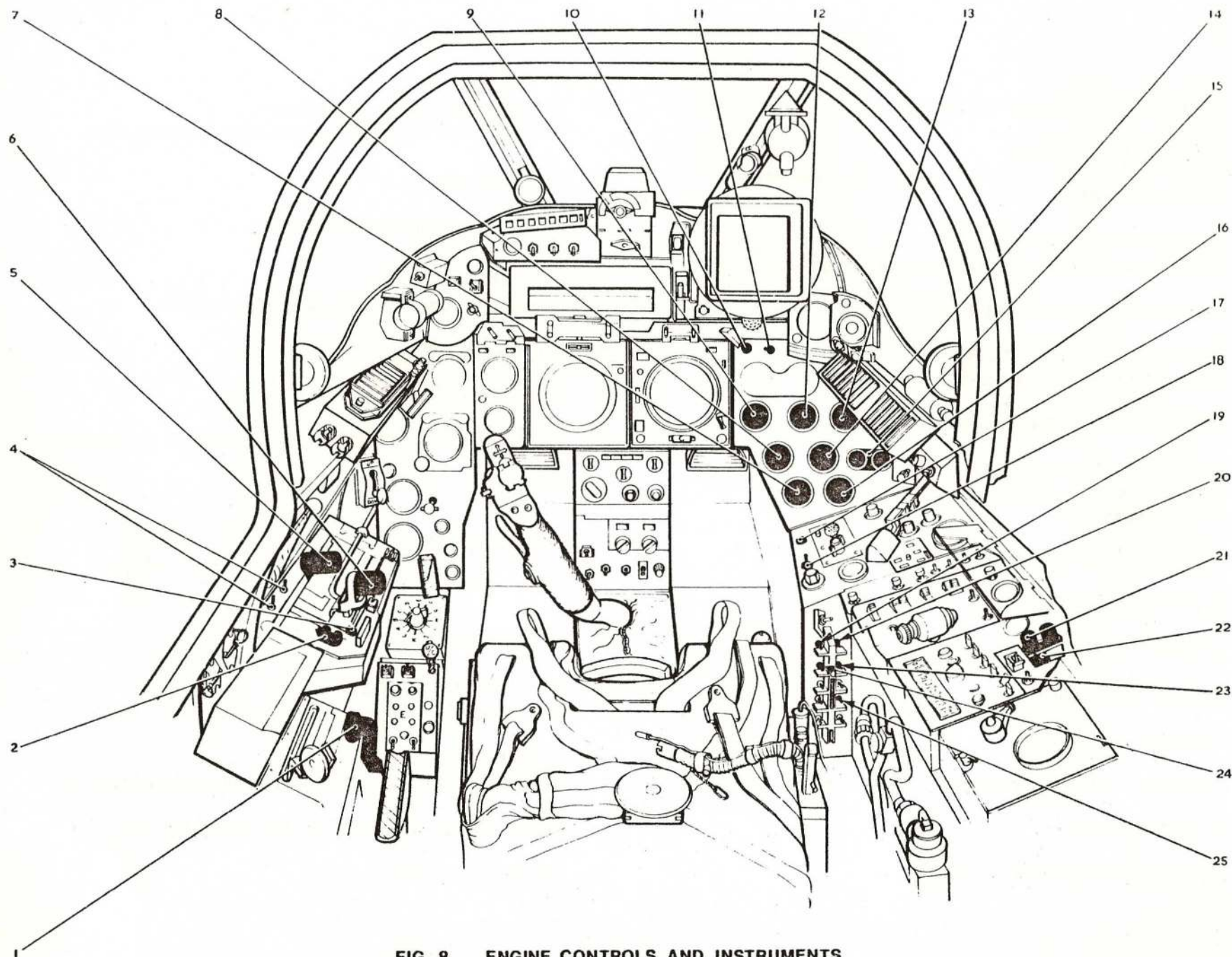


FIG. 8. ENGINE CONTROLS AND INSTRUMENTS

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KEY TO FIG.8 (ENGINE CONTROLS AND INSTRUMENTS)

- | | |
|---|---|
| 1 THROTTLE SERVO-CLUTCH HANDLE
Turn clockwise to engage | 13 FUEL CONTENTS GAUGE (VENTRAL TANK) |
| 2 ENGINE RELIGHT PUSH SWITCHES (NO.1 AND NO.2 ENGINE) | 14 ENGINE SPEED INDICATOR (NO.2 ENGINE) |
| 3 ENGINE SHUT-DOWN LEVER
Press lever forward to release idling stops | 15 JET PIPE NOZZLE POSITION INDICATOR (NO.1 AND NO.2 ENGINE) |
| 4 JET-PIPE TEMPERATURE CONTROL SWITCHES
Wire-locked in AUTO position | 16 JET PIPE TEMPERATURE GAUGE (NO.2 ENGINE) |
| 5 ENGINE CONTROL HANDLE (NO.1 ENGINE)
Controls H.P. cock, engine speed and reheat | 17 FUEL CONTENTS PUSH SWITCH (FLAP TANKS)
Refer to item 9 |
| 6 ENGINE CONTROL HANDLE (NO.2 ENGINE)
Refer to item 5 | 18 FUEL CONTENTS GAUGES TEST SWITCH
Forward to check FULL readings, aft to check EMPTY |
| 7 JET-PIPE TEMPERATURE GAUGE (NO.1 ENGINE) | 19 FUEL COCK SWITCH (PORT)
Controls fuel supply to No.1 engine |
| 8 ENGINE SPEED INDICATOR (NO.1 ENGINE) | 20 FUEL COCK SWITCH (STARBOARD)
Controls fuel supply to No.2 engine |
| 9 FUEL CONTENTS GAUGE (PORT WING TANKS)
◀ Flap tank is gauged only when item 17 is depressed ▶ | 21 ENGINE START PUSH SWITCHES (NO.1 AND NO.2 ENGINE) |
| 10 FUEL TRANSFER INDICATOR (WING-TO-WING)
Illuminated when item 11 is selected | 22 ENGINE START ISOLATION SWITCH |
| 11 FUEL TRANSFER SWITCH (WING-TO-WING)
Select P to transfer from starboard to port and S to transfer from port to starboard. | 23 FUEL TRANSFER PUMP SWITCH (STARBOARD)
Controls transfer from main tank to collector box |
| 12 FUEL CONTENTS GAUGE (STARBOARD WING TANKS)
Refer to item 9 | 24 FUEL TRANSFER PUMP SWITCH (PORT)
Refer to item 23 |
| | 25 ENGINE START MASTER SWITCH
Common to both engines |

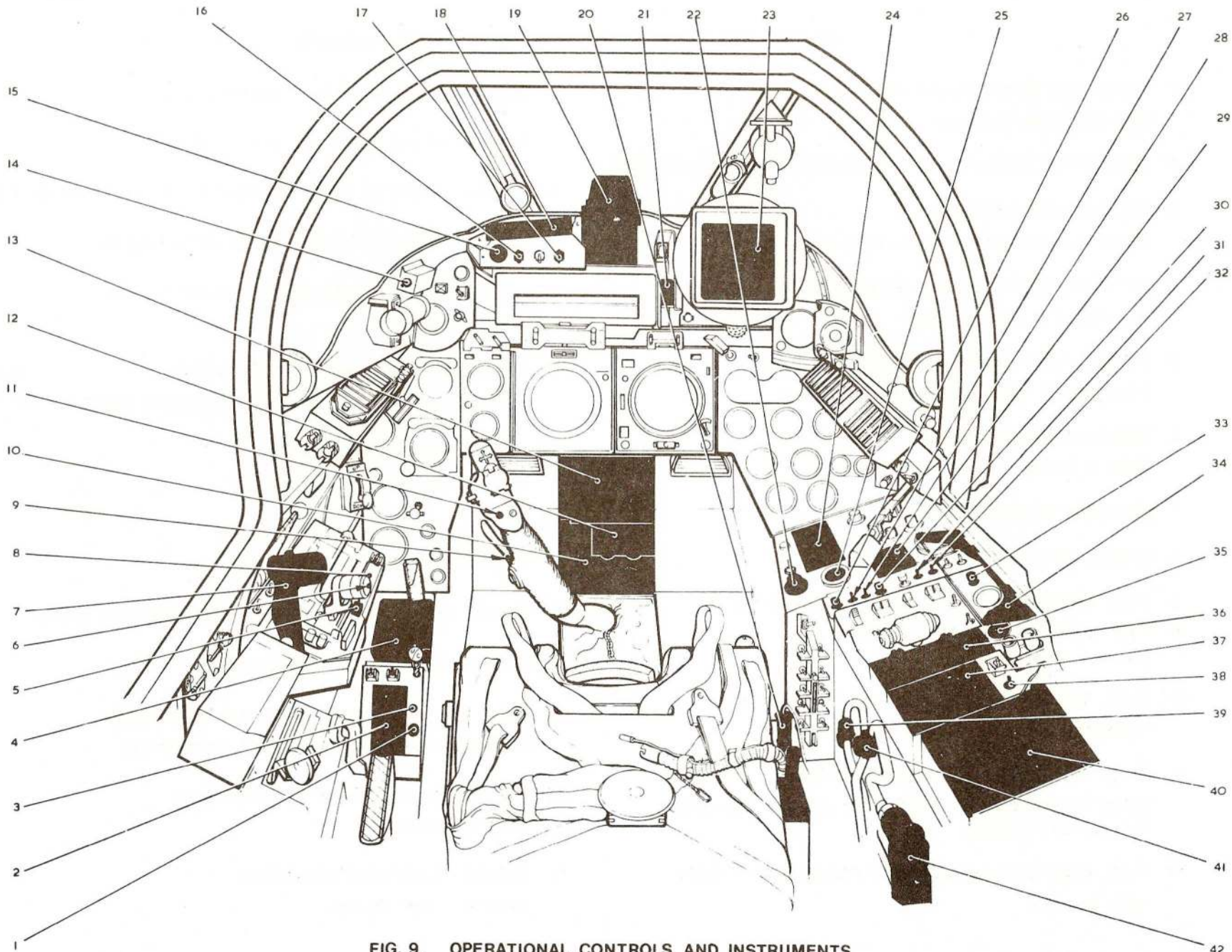


FIG. 9. OPERATIONAL CONTROLS AND INSTRUMENTS

KEY TO FIG.9 (OPERATIONAL CONTROLS AND INSTRUMENTS)

- | | | | |
|------|---|------|---|
| 1 | TELEBRIEFING INDICATOR/SWITCH
Press to transmit | ◀ 23 | AI 23D DISPLAY UNIT ▶ |
| 2 | TACAN CONTROL UNIT | 24 | S-BAND HOMER CONTROL UNIT |
| 3 | STAND-BY U.H.F. GUARD/A SWITCH | 25 | FIRESTREAK ARMED TIME INDICATOR
Indicates elapsed time from the commencement of the
missile arming period OR:-
RED-TOP PURE AIR PRESSURE GAUGE
Minimum take-off pressure indicated by break in white sector
Minimum arming pressure indicated by white line dividing red
and yellow sectors |
| 4 | I.L.S. CONTROL UNIT | ◀ 26 | AI 23D RECORDER SWITCH ▶ |
| 5 | RAIN DISPERSAL/DE-ICE SWITCH | 27 | GUIDED WEAPONS ARM/SAFE SWITCH |
| 6 | R/T PRESS-TO-TRANSMIT SWITCH | 28 | GUIDED WEAPONS PAIRS/SINGLES SWITCH |
| ◀ 7 | AI 23D HAND CONTROLLER ▶ | 29 | ARMAMENT INDICATOR
Indicates the stage reached in the weapon firing sequence |
| 8 | RAIN DISPERSAL/DE-ICE INDICATOR | 30 | GUIDED WEAPONS FIRE CONTROL RESET PUSH SWITCH |
| 9 | R/T PRESS-TO-TRANSMIT SWITCH | 31 | CAMERA IRIS SWITCH |
| 10 | U.H.F./I.L.S. CONTROL PANEL | 32 | CAMERA MASTER SWITCH |
| 11 | G.90 CAMERA PUSH SWITCH | 33 | GUIDED WEAPON TELEMETRY SWITCH |
| 12 | TACAN OFFSET COMPUTER | 34 | FREQUENCY CARD HOLDER |
| 13 | U.H.F./R.T. CONTROLLER | 35 | OXYGEN CONTENTS GAUGE |
| 14 | FLIGHT REFUELLING SWITCH | 36 | I.F.F. FAILURE WARNING LAMP |
| 15 | OXYGEN FLOW INDICATOR | 37 | I.F.F. CONTROL UNIT |
| 16 | FLIGHT REFUELLING PROBE LIGHT SWITCH | 38 | I.F.F. FAILURE LAMP CHECK SWITCH |
| 17 | C.R.T./L.F.S. SELECTOR SWITCH | 39 | A.V.S. FLOW CONTROL VALVE |
| 18 | FLIGHT REFUELLING INDICATOR PANEL
With item 14 set to FL REFUEL indicators show green
until associated tanks are full | 40 | OXYGEN DEMAND REGULATOR |
| 19 | LIGHT FIGHTER SIGHT | 41 | ANTI-G AIR SHUT-OFF COCK |
| 20 | PERSONAL EQUIPMENT CONNECTOR
Connects pilots mic/tel, oxygen, anti-g and A.V.S. supplies.
Separates during seat ejection. | 42 | ANTI-G VALVE |
| ◀ 21 | AI 23D PRESSURE OVERRIDE SWITCH ▶ | | |
| 22 | ARMAMENT MASTER SELECTOR SWITCH | | |

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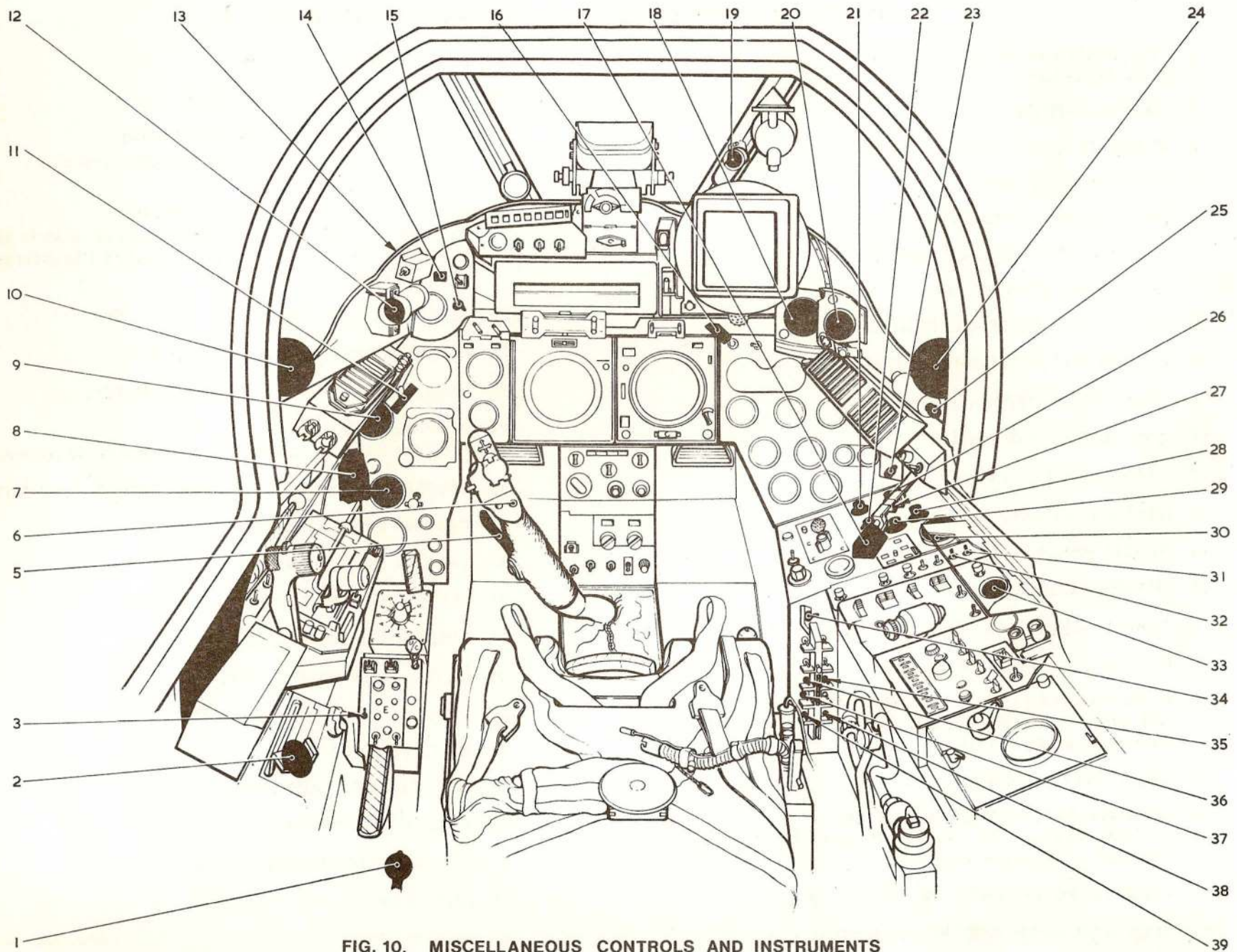


FIG. 10. MISCELLANEOUS CONTROLS AND INSTRUMENTS

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KEY TO FIG.10 (MISCELLANEOUS CONTROLS AND INSTRUMENTS)

- | | | | |
|------|---|----|---|
| 1 | CANOPY CONTROL HANDLE
Pull up to unlock canopy, push down to lock. With handle in unlocked position canopy control switch is exposed. Move switch up to open canopy and down to close. | 21 | COCKPIT LIGHTING SWITCH (PORT FORWARD)
Turn clockwise to switch on, continue turning to increase brilliance |
| 2 | DE-MISTING CONTROL LEVER
OFF - no de-misting, TOP ON - canopy top and windscreen side panels, ALL ON - canopy and windscreen side panels | 22 | COCKPIT LIGHTING SWITCH (PORT)
Refer to item 21 |
| 3 | SEAT HEIGHT ADJUSTMENT SWITCH
 | 23 | COCKPIT LIGHTING SWITCH (STAND-BY D.I. AND E2B COMPASS)
Refer to item 21 |
| 5 | WHEEL BRAKE CONTROL LEVER | 24 | HIGH INTENSITY LAMP |
| 6 | GYRO GUNSIGHT CAGING PUSH BUTTON | 25 | FREQUENCY CARD LAMP SWITCH |
| 7 | ALIGHTING GEAR POSITION INDICATOR | 26 | COCKPIT LIGHTING SWITCH (STARBOARD FORWARD)
Refer to item 21 |
| 8 | ALIGHTING GEAR SELECTOR SWITCH | 27 | SWINGING-ARM FLOODLAMP SWITCH |
| 9 | WHEEL BRAKE ACCUMULATOR PRESSURE GAUGE | 28 | COCKPIT LIGHTING SWITCH (STARBOARD)
Refer to item 21 |
| 10 | HIGH INTENSITY LAMP | 29 | COCKPIT LIGHTING SWITCH (CENTRE)
Refer to item 21 |
| 11 | BRAKING PARACHUTE STREAM HANDLE | 30 | COCKPIT TEMPERATURE SELECTOR |
| 12 | SERVICES HYDRAULIC PRESSURE GAUGE
Hydraulic failure indicated by pointer entering red sector, electrical circuit failure indicated by pointer entering white sector | 31 | TAXYING LAMPS SWITCH |
| ▶ 13 | EJECTION SEAT/CANOPY SAFETY PIN STOWAGES
Pins stowed behind shroud extension | 32 | NAVIGATION LAMPS SWITCH
Select STEADY for navigation lamps only, FLASH for navigation and anti-collision lamps, centre for OFF |
| 14 | HIGH INTENSITY LAMP SWITCH | 33 | CABIN ALTIMETER |
| 15 | BRAKING PARACHUTE JETTISON PUSH SWITCH | 34 | PITOT HEATERS SWITCH
Select NORMAL to connect a.c. supply to both pitot-heads and fuel vent valve heaters |
| 16 | RUDDER BAR ADJUSTER-LOCK RELEASE HANDLE | 35 | COCKPIT AIR-CONDITIONING SWITCH |
| 17 | SWINGING-ARM FLOODLAMP | 36 | BATTERY SWITCH |
| 18 | RAM-AIR TEMPERATURE INDICATOR (post Mod.4808) | 37 | INSTRUMENT MASTER SWITCH |
| 19 | RAM-AIR TEMPERATURE INDICATOR (pre Mod.4808) | 38 | FRONT WINDSCREEN HEATER SWITCH |
| 20 | VOLTMETER | 39 | SIDE WINDSCREEN HEATER SWITCH |

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