Airbus H225 Super Puma

Hype Performance Group
https://HypePerformanceGroup.com

Manual Version: 1.0
Manual Date: 2024/11/14

Introduction

Hype Performance Group, in collaboration with The Microsoft Corporation, is proud to present the Airbus H225. This release is the most detailed model to date in our line of Airbus Helicopters simulation software for Microsoft Flight Simulator.

This simulation software, inclusive of related materials and documents, is a computer virtual rendition as part of a video game / computer virtual simulator. Materials of, and those associated with, this product are NOT INTENDED FOR ANY TYPE OF PHYSICAL FLIGHT, or training, pilot familiarization, recurrent training, or operational awareness training for physical flight. The included software and manuals are not to be used for training or familiarity with any aircraft. The software and manuals included with this product are not assumed to provide procedures for use on any aircraft and are for entertainment purposes ONLY.

Background

The H225 is a long-range, all-weather, heavy-lift helicopter manufactured by European rotorcraft company Airbus Helicopters, a division of Airbus. It is piloted by two and can accommodate up to 28 passengers, although it typically seats between 19 and 24 in standard configurations. The helicopter is known for its multi-role versatility and serves a very broad spectrum of mission sets, including military, offshore oil field support, law enforcement, commercial passenger and cargo transport, search and rescue (SAR), air ambulance and medical evacuation (medevac), business and VIP transport, firefighting, disaster relief, humanitarian assistance, construction, and industrial maintenance and support.

The story of the H225 began with the SA 330 Puma, a medium-lift, multi-role utility helicopter developed by French aerospace company Sud Aviation. The twin-engine Puma, which took its maiden flight on April 15, 1965 and entered service in 1968, was created as a clean-sheet initiative based on a French military request for a tactical multi-mission helicopter. The Puma, which could carry up to 16 passengers, proved a great success. French aviation firm Aérospatiale took over production of the helicopter in the 1970s and developed a successor, the AS 332 Super Puma. With more robust engines, an enhanced transmission, and aerodynamic refinements, the Super Puma had a higher cruise speed, greater range, and improved efficiency over its progenitor. Aérospatiale began production of the Super Puma in 1978 and delivered the first airframes in 1981. The AS 332 Super Puma was eventually manufactured by successor company Eurocopter and then Airbus Helicopters. It remains in production today as the Airbus Helicopters H215.

In the late 1990s, Eurocopter began an initiative to create an evolved variant of the Super Puma with an operational emphasis on offshore oil field support. Designated the EC225 Super Puma, this new iteration boasted new rotor blade technology, better avionics, more powerful and efficient engines, and an evolved transmission, among other improvements. The helicopter took its maiden flight on November 27, 2000 and it was introduced into service in December of 2004.

Airbus Helicopters, which succeeded Eurocopter in 2014, changed the name of the airframe to the H225 in 2015.

The twin-engine H225 is renowned for its all-weather capability, notably its ability to operate in severe icing conditions and harsh maritime environments. Its broad ranging functionality stems from its configurable design, both in its cabin and its exterior. Its interior can be fitted for a wide variety of applications and seating arrangements, and it can accommodate rescue hoists, sensors, external fuel tanks, and searchlights on its exterior. The military version, the H225M, can be fitted with a wide range of weapons and implements to support several types of combat mission sets from anti-submarine warfare to logistical support.

The H225 features an advanced 5-blade main rotor system, a 5-blade anti-torque tail rotor, and retractable tricycle landing gear. It boasts an advanced glass cockpit with four color screens and a robust suite of flight assist and situational awareness systems. It is powered by two Safran Makila 2A1 turboshaft engines that each produce up to 2,101 shaft horsepower. The engines feature redundant, dual-channel FADEC (full authority digital engine control) systems.

The H225 measures 64 feet in length, stands 16 feet, 4 inches tall, and has a main rotor diameter of 53 feet, 2 inches. It has a maximum range of 702 miles, a service ceiling of 20,000 feet above sea level, and a climb rate of 1,710 feet per minute. It cruises at 163 miles per hour and has a maximum speed of 201 mph.

Terminology and Symbols

Representation of illuminated indications

When illuminated, the lights are shown with its original color: XXXX or XXXX or XXXX
When not illuminated, the lights are shown in gray color: XXXX.

Terms

Term	Definition
AC	Alternating Current
ACAS	Airborne Collision Avoidance System
ADC	Air Data Computer
ADF	Automatic Direction Finder (Radio)
AEO	All Engines Operative
AFCAU	AFCS Auxiliary Unit
AFCS	Auto Flight Control System
AHRS	Altitude Heading Reference System
ALT	Alternator or Altitude
ALT.A	Selected Altitude
AMC	Aircraft Management Computer
ANAV	Self-contained Navigation
AP	Autopilot
APM	Autopilot Module (Aircraft computer)
AVCS	Active Vibration Control System
BAT, BATT	Battery
BRG	Bearing
BRT	Brightness
CRHT, CR.HT	Cruise Height (Radio Altitude Hold)

CRS	Course
DA	Decision Altitude or Density Altitude
DC	Direct Current
DIST	Distance
DH	Decision Height
DME	Distance Measuring Equipment
DTG	Distance To Go
DTK	Desired Track
DTU	Data Transfer Unit
ECP	Engine Control Panel
ECS	Environmental Control System
EID	Electronic Instrument Display
ELEC	Electric
EMER	Emergency
ENG	Engine
FADEC	Full Authority Digital Engine Control
FCP	Flight Control Panel
FDS	Flight Display System
FMS	Flight Management System
FND	Flight & Navigation Display
FLI	First Limit Indicator
FILT	Filter
FLT	Flight
GA	Go Around
GPU	Ground Power Unit
GPS	Global Positioning System

GSPD	Ground Speed
GS, G/S	Glide Slope
HDG	Magnetic Heading
HEEL	Helicopter Emergency Egress Lighting
H.HT	Hover Height
Hσ	Density Altitude
Hp	Pressure Altitude
hPa	Hectopascal
HOV	Hover
HSI	Horizontal Situation Indicator
HTAWS	Helicopter Terrain Awareness System
HTG	Heating
HYD	Hydraulic
IFR	Instrument Flight Rules
IGB	Intermediate Gearbox
IGE	In Ground-Effect (Hover)
IAS	Indicated Airspeed
ICS	Intercom System (Radio)
IDENT	Identification (Transponder)
IFR	Instrument Flight Rules
IGB	Intermediate Gearbox
ILS	Instrument Landing System
IM	Inner Marker
IMC	Instrument Meteorological Conditions
ISA	International Standard Atmosphere
ISIS	Integrated Standby Instrument System

KT	Knot
LDG	Landing
L/G	Landing Gear
LH	Left-Hand Side
LOC	Localizer
LSK	Line Select Key
MCP	Maximum Continuous Power
MFD	Multi-Function Display
MGB	Main Gearbox
MKR	Marker
MM	Middle Marker
MPAI	Multi-Purpose Air Intake
MSL	Mean Sea Level
MTOW	Maximum Takeoff Weight
M'ARMS	Modular Airborne Recorder System Monitoring System
NAV	Navigation
NAVD	Navigation Display
N1	Gas Generator Speed
N2	Free Turbine Speed
NDB	Non-Directional Beacon (ADF)
NM	Nautical Miles
NR	Rotor RPM
NVG	Night Vision Goggles
OAT	Outside Air Temperature
OEI	One Engine Operative
OEI CT	OEI Continuous (No Rating)

OEI LO	OEI Low (2 minute power rating available)
OEI HI	OEI High (30 second power rating available)
OGE	Out of ground-effect (Hover)
OH	Overhead Panel
OM	Outer Marker
PA	Pressure Altitude
P.FLT	Pre-Flight
PWR	Power
R/C	Rate of Climb
R/D	Rate of Descent
RA	Radio Altimeter
RB	Rotor Brake
RCU	Reconfiguration Unit
RDR	Radar
REL	Released
RH	Right-Hand Side
RNAV	Area Navigation
RNG	Range
RPM	Revolutions Per Minute
SPD	Speed
SCT	Sector
STD	Standard
TAS	True Airspeed
TAWS	Terrain Awareness System
TEMP	Temperature
TGB	Tail Gearbox

TKE	Track Angle Error
TOP	Takeoff Power
TOT	Turbine Outlet Temperature (Exhaust Gas Temperature)
TRQ	Torque
TRK	Track
TRU	Transformer/Rectifier Unit (converts AC to DC)
TTG	Time To Go
UHF	Ultra High Frequency
V	Volt
VFR	Visual Flight Rules
VHF	Very High Frequency (Radio)
VMS	Vehicle Monitoring System
VNE	Velocity Never Exceed Speed
VOR	VHF Omnidirectional Range
V/S	Vertical Speed
V.TOSS	Velocity Takeoff Safety Speed
VNE	Velocity Never Exceed
Vy	Optimum climb speed
WBS	Water Bombing System
WCP	Warning Caution Panel
WPT	Waypoint
WT	Weight
WXR	Weather radar
XMSN	Transmission
XTK	Cross-Track Error

Specifications

Dimensions

D-value ..... 19.50 m
Rotor diameter ..... 16.20 m
Internal volume ..... 15.50 m^3

Characteristics

Crew + passengers ..... 1 or 2 pilots + 19 passengers
Max takeoff weight (MTOW) ..... 11,160 kg
Max takeoff weight with external load ..... 11,200 kg
Useful load ..... 5,401 kg
Fuel tank capacity ..... 2,506 kg
Engine type ..... 2 x Safran Makila 2A1
Takeoff power ..... 1,567 kW / 2,101 shp
One engine inoperative (OEI 30s) ..... 1,784 kW / 2,392 shp

Performance

Maximum speed ..... 149 kt
Cruise speed ..... 141 kt
Never exceed speed ..... 175 kt
Range ..... 463 nm
Service ceiling ..... 19,400 ft
Rate of climb ..... 1,710 ft/min

Limitations

All limitations in this section are mandatory.

Approved Flight Conditions

- This helicopter is approved for daytime and nighttime VFR and IFR operations

Restrictions

- Acrobatic flying.
- Extended rearward flight liable to allow exhaust gasses to enter the cabin.
- Intentional running landings on soft ground.
- Deliberate penetration into clouds with massive vertical development.
- Intentional full auto-rotation landings.
- Downwind flight with the bleed valve not in OFFSET position.
- Intentional single-engine flight in normal operation, except for maintenance test flight.
- Fuel transfer between tank groups during takeoff or landing.
- Flight in known icing conditions.
- Use of CRHT mode in IMC above land.
- Back Course.
- Takeoff without checking grid intakes when:
    - In conditions of light or moderate sleet or falling snow, if the period of ground run or taxiing has exceeded 20 minutes.
    - Conditions of blowing sleet or snow, or in conditions of heavy falling sleet or snow.

NOTE: Heavy sleet or snow conditions are considered to exist when the horizontal visibility is below 400m.

Minimum Flight Crew

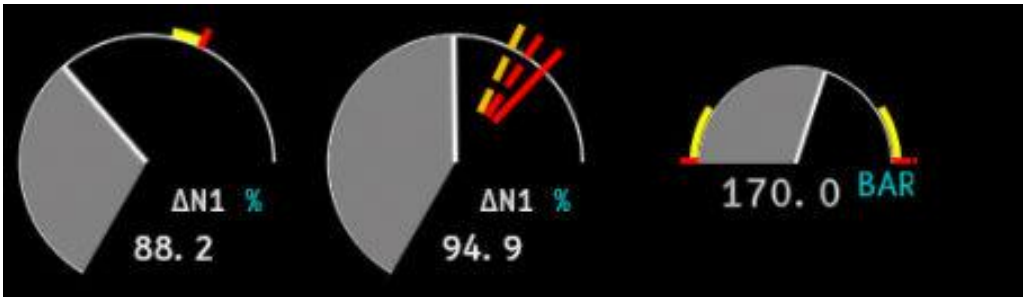
VFR……..……...……...1
IFR…….……2

NOTE: The pilot in command may occupy either the left or right cockpit seat.

Passenger Transport

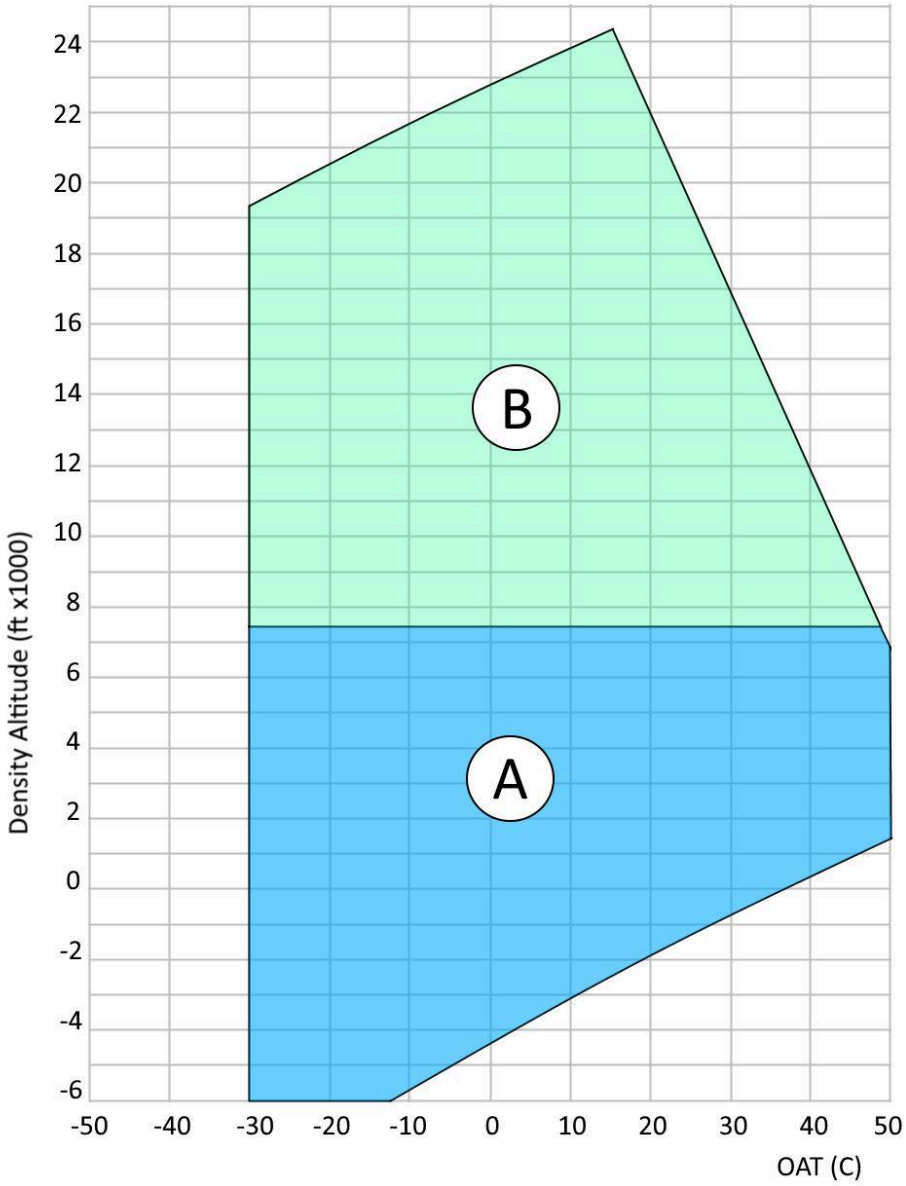
Maximum number of persons on board…….……...27
Maximum number of passengers transported…….25

Color Code and Instrument Markings



	Limitation
	Caution range
	Normal range
	Transient Limit value
	Equipment Operating Limit
	AEO Takeoff Power
	Maximum Continuous OEI Limit
	OEI LO Limit
	OEI HI Limit
	FADEC armed stop

Altitude Limitations



Envelope A: Takeoff and landing
Envelope B: In Flight Only

Maximum altitude for takeoff and landing ……..….. 7,400 ft (Density Altitude)
Maximum altitude in flight ……..……. 24,000 ft (Density Altitude)

Weight Limitations

- Minimum weight in flight .....7,200 kg (15,873 lb)
- The maximum takeoff and landing weight with internal load…….. 11,000 kg (24,251 lb)

Temperature Limitations

From -15°C to ISA+25°C (without exceeding +40°C).

Airspeed Limitations

- VNE Below 5 000 ft ..... 175 kt
- VNE Above 5 000 ft …….....175 kt - 3 kt/1,000 ft
- VNE power-off = VNE power-on limited to ..... 150 kt
- Maximum airspeed with lateral (sliding and plugging) doors open..... 150 kt
- Maximum airspeed while operating the lateral (sliding and plugging) doors ..... 55 kt
- Maximum airspeed while operating the landing light ..... 110 kt
- Maximum airspeed with landing gear extended, retracted or in operation.....VNE power-on

Taxiing Limitations

- Maximum taxiing ground speed ..... 40 kt
- Maximum braking ground speed..... 35 kt

IFR Operating Limitations

- With the basic AP..... IAS > 50 kt
- With IAS upper mode engaged ..... IAS > 30 kt
- In case of both APM failure ..... 120 kt > IAS > 80 kt

  Leave IMC as soon as possible.
- The use of G/S Mode is limited to 6.5 degrees
- ILS maximum decision altitude is 150 ft

Rotor Starting Limitations

- Wind envelope for starting or stopping the rotor: Refer to the following figure.
- Maximum N1 with rotor brake applied .....68 % on one engine
  (High wind procedure with other engine shut down)
- Operation of an engine with the rotor brake applied ..... Limited to 5 min

It's forbidden to:

- Start the first engine with the rotor brake released with wind stronger than 30 kt.
- Start more than one engine with the rotor brake tightened.
- Start with ambient wind stronger than 40 kt.

Rotor Stopping Limitations

- Maximum NR for rotor brake application .....45% (120 rpm)
- Minimum time interval between first and second rotor brake applications ……. 5 min
- Minimum time interval between: second and third rotor brake applications ..... 15 min
  (Including at least 10 min of rotation)
- Maximum ground slope for stopping the rotor:
  - Lateral .....5°
  - Longitudinal .....Nose down: 6°, Nose up: 10°

Engine Operating Limitations

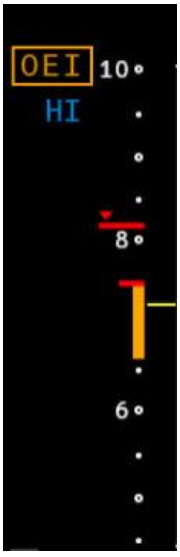
- Engine starting and relighting are authorized throughout the aircraft flight envelope.
- Air intake electric heater anti-icing maximum operating temperature……. +10°C
- After starting the engines, maintain the engine control switch to IDLE, until engine oil temperature is above +10 °C.

Flight Parameter Limitations - First Limit Indicator (FLI)

The first limit indicator (FLI) displays the extent of the current limiting parameter (torque, N1, TOT ENG. 1 or ENG. 2) on a scale graduated from 0 to 10 representing the collective pitch lever travel range.

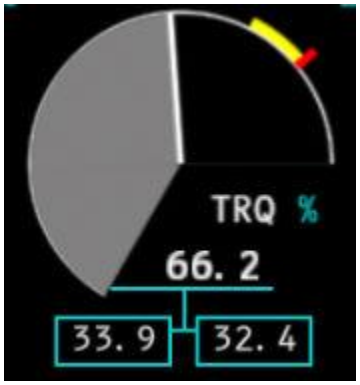
The FLI will display the relevant limits for the given condition (AEO or OEI).

The "blue line" on the FLI indicates the OEI power that would be immediately available when in AEO condition, should the aircraft lose an engine.

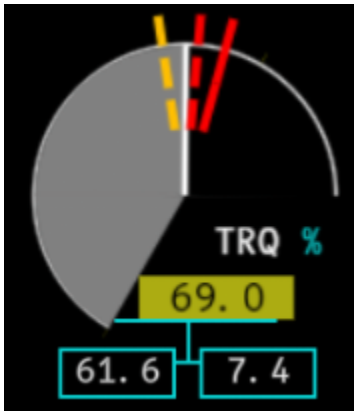


Main Gearbox (MGB) Torque Limitations

AEO



OEI

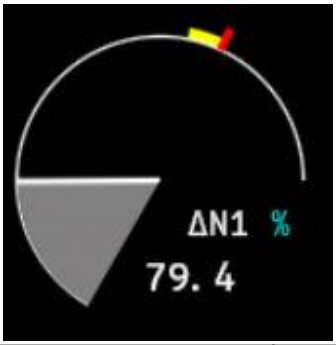


AEO	Torque %
Max Transient	110
Takeoff Power (TOP) IAS < 45 kt (5 minutes max)	100
Max Continuous Power (MCP) IAS < 45 kt **(hover)**	85.4
Max Continuous Power (MCP) IAS > 60 kt	82.7

OEI	Torque %
OEI HI	78.4
OEI LO	71.9
OEI CT	63.4

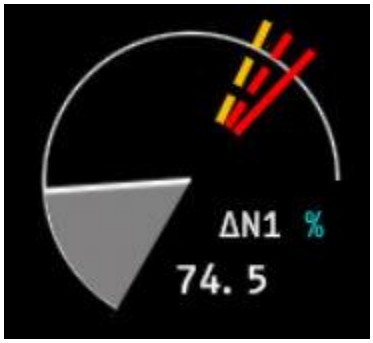
N1 Gas Generator Limitations

AEO



AEO	N1 %
Max Transient	1.56
Takeoff Power (TOP) (5 minutes max)	0.0
Max Continuous Power (MCP)	-2.92

OEI



OEI	Torque %
OEI HI (30 seconds max)	3.54
OEI LO (2 minutes max)	1.56
OEI CT	0.80

Exhaust Gas Temperature (TOT) Limitations

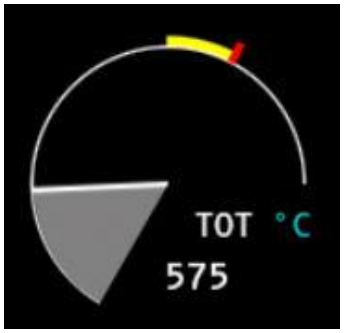
Engine starting:

- Max continuous ..... 780°C
- Max transient (5 seconds) ..... 830°C
- Max transient (2 seconds) ..... 840°C

NOTE: Engine starting automatic shut-off occurs when TOT reaches 900 °C.

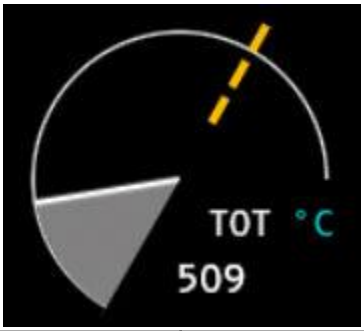
Engine operation:

AEO



AEO	TOT (°C)
Max Transient	847
Takeoff Power (TOP) (5 minutes max)	801
Max Continuous Power (MCP)	754

OEI



OEI	TOT (°C)
OEI HI (30 seconds max)	847
OEI LO (2 minutes max)	814

Main Rotor RPM (NR) Limitations

Triple RPM indicator (NR, N2 for each engine) with red failure flag

Power-On flight:

- Nominal rotor speed ..... 100 % to 103.8 %
- Maximum continuous rotor speed .....103.8 %
- Minimum stabilized rotor speed.....92.9 %
- Minimum transient rotor speed in flight.....83 %

Power-Off flight:

- Maximum continuous rotor speed .....109.5 %
- Maximum transient rotor speed (20 s max.) .....117 %
- Minimum rotor speed at airspeeds below 100 Kt .....83 %
- Minimum rotor speed at airspeeds above 100 Kt.....92.9 %

Aural warning thresholds:

- NR max. .....109.5 %
- NR min. ..... 95.5 %

Free-Turbine (N2) Limitations

The free turbine speed (N2) is displayed on the Rotor speed (NR) indicator in equivalent Rotor %, where 100 rotor % corresponds to 23,000 free turbine rpm.

Compliance with NR limitations ensures that the N2 limitations are not exceeded.

	N2 RPM	**Equivalent NR**
Max Transient	25,488	111
Max Continuous	24,340	106
Min Continuous	21,355	93
Min Transient	18,370	80

NOTE: Engine over speed shutdown: 116.8% equivalent NR.

Fuel Pressure Limitations

Pressure range in normal operation:

- Min Pressure ..... 0.35 bar
- Max Pressure ..... 1.5 bar

Engine Oil Temperature & Pressure Limitations

- Max Temperature ..... 120°C
- Max Pressure ..... 6 bar
- Min Pressure ..... 1.6 bar

MGB Oil Temperature & Pressure Limitations

- Max Temperature ..... 128°C
- Min Temperature ..... -10°C at takeoff
- Min Pressure ..... 0.4 bar

Hydraulic System Limitations

Main (LH) hydraulic system:

- Minimum Pressure ..... 110 bar
- Nominal Pressure..... 175 bar
- Maximum Pressure ..... 210 bar

Auxiliary (RH) hydraulic system:

- Minimum Pressure ..... 110 bar
- Nominal Pressure..... 175 bar
- Maximum Pressure ..... 210 bar

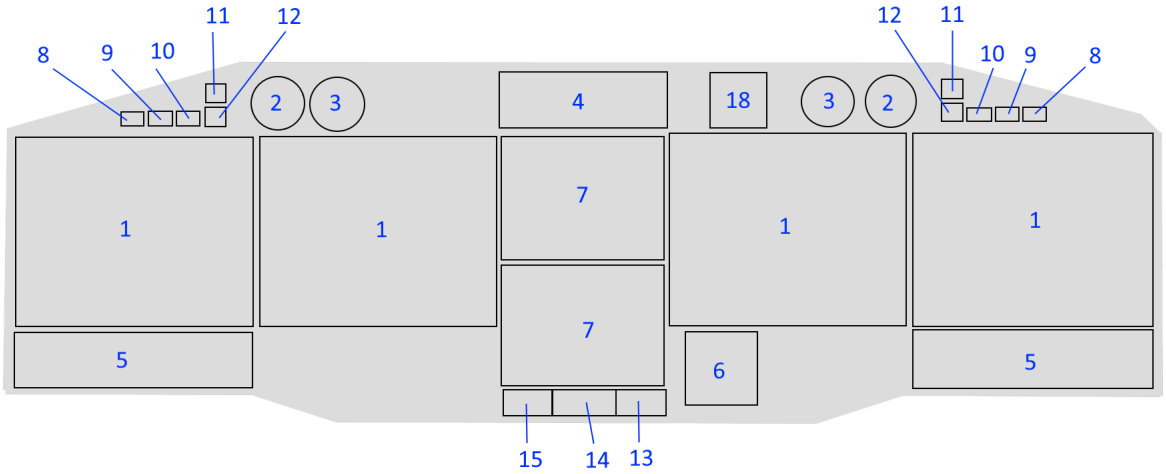
Electrical System Limitations

AC System:
- Max supply voltage …….. 132 V
- Min supply voltage ……. 98 V

DC System:
- Max supply voltage ……..... 32 V
- Min supply voltage ……. 14 V

Cockpit Arrangement

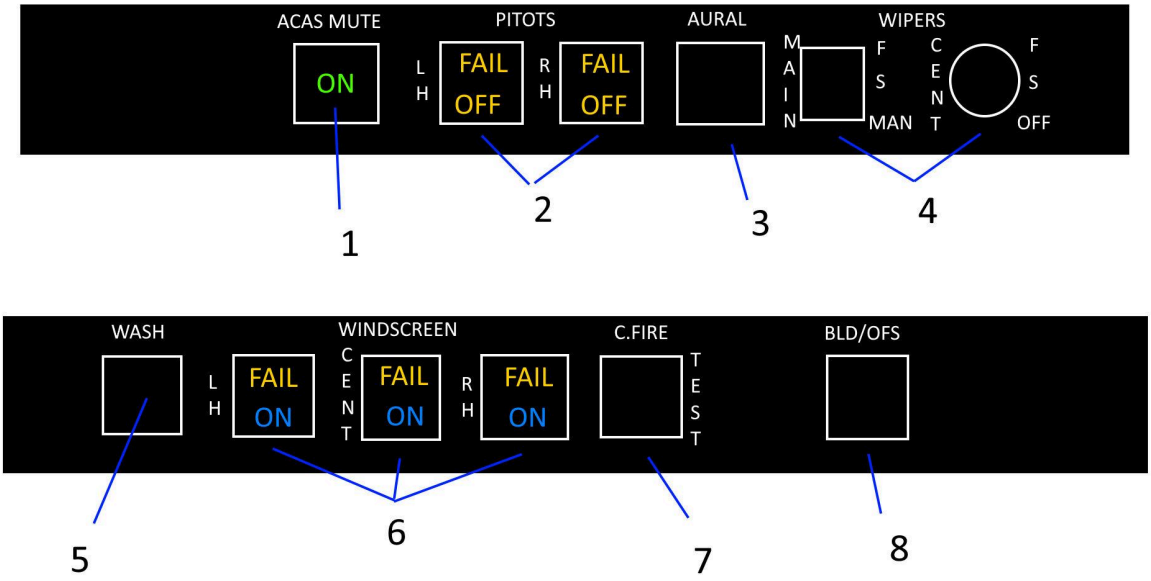
Instrument Panel



No.	Description
1	Multifunction Flight data Display (MFD1, MFD3, MFD2, MFD4)
2	Triple RPM pilot and copilot indicator (NR, N2 1 and N2 2)
3	Clock
4	Warning caution panel
5	Flight Control Panel (FCP1, FCP2)

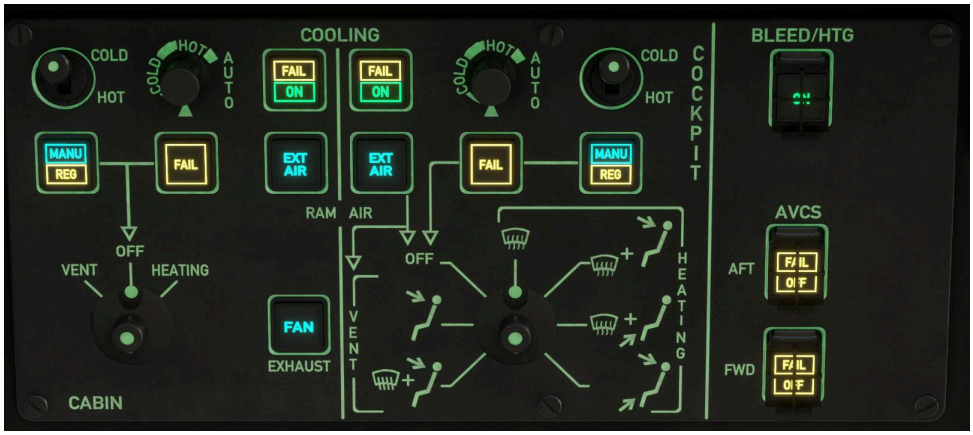
6	Integrated Standby Instrument System (ISIS)
7	Vehicle monitoring system (EID1, EID2)
8	L/G Landing gear not down warning light
9	WARN Master warning light
10	CAUT Master caution light
11	ICE Ice warning light
12	NR ILS button and indicator light
13	ISIS lighting switch
14	Emergency hydraulically-driven generator control pushbuttons
15	Auxiliary hydraulic pump pushbutton
18	Emergency Locator Transmitter control unit

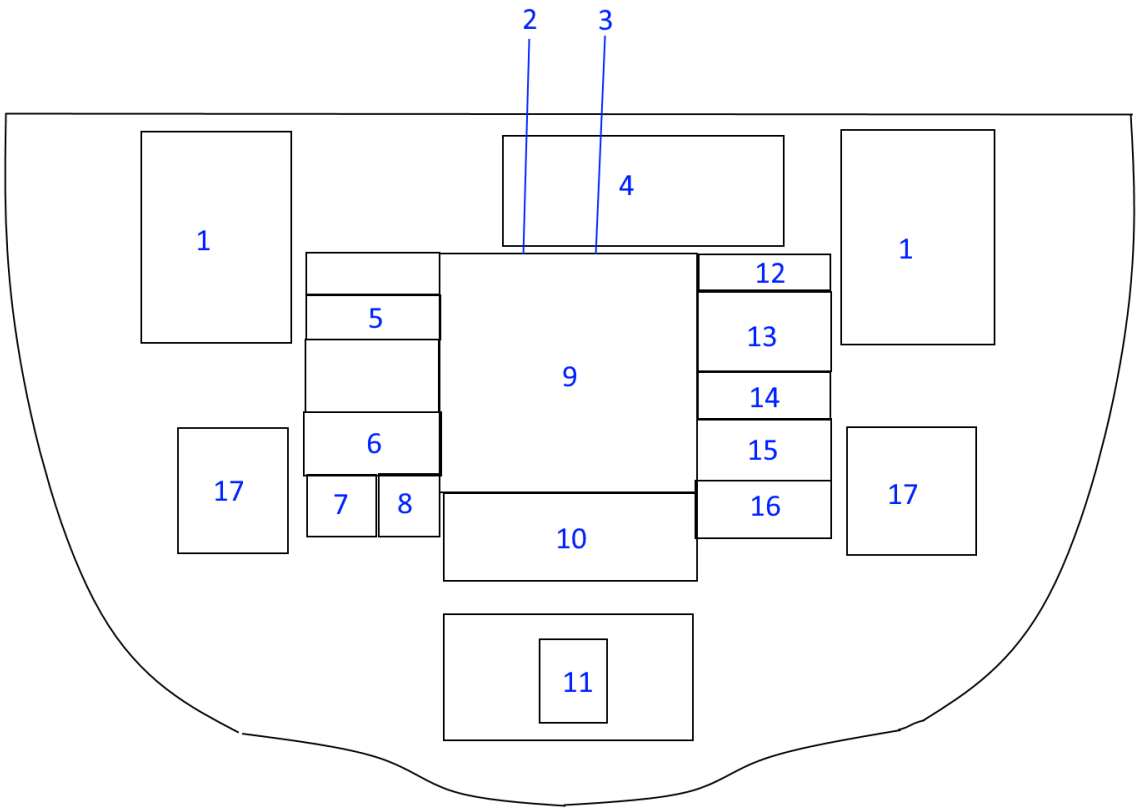
Instrument Sub-Panel



No.	Description
1	ACAS Mute push button
2	Pitot head heat push buttons
3	Aural warning system push button
4	Windshield wipers control switches
5	Windshield washer control switch
6	Windshield de-icing control push buttons
7	Cargo fire test push button
8	BLEED OFFSET push button

Overhead Panel (OH)

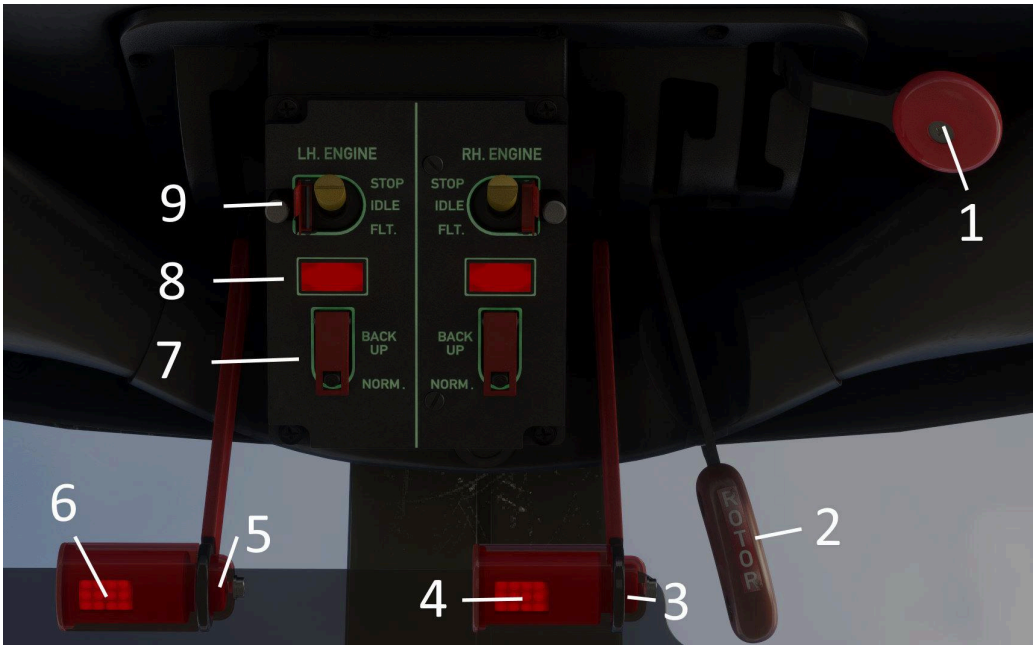




No.	Description
1	Pilot and copilot emergency cut-out handles
2	MGB and engines chip burner control switch
3	IGB and TGB temperature test control switch
4	Comfort system, BLEED HTG pushbutton and AVCS control panel
5	Mission selector switch
6	Engine air intakes control panel
7	MGB fire detection control panel
8	Emergency lubrication system control pushbutton and emergency cooling system control pushbutton
9	Electric power system control and monitoring panel
10	Engine fire detection, extinguishing, test control and indicating
11	Engines control panel

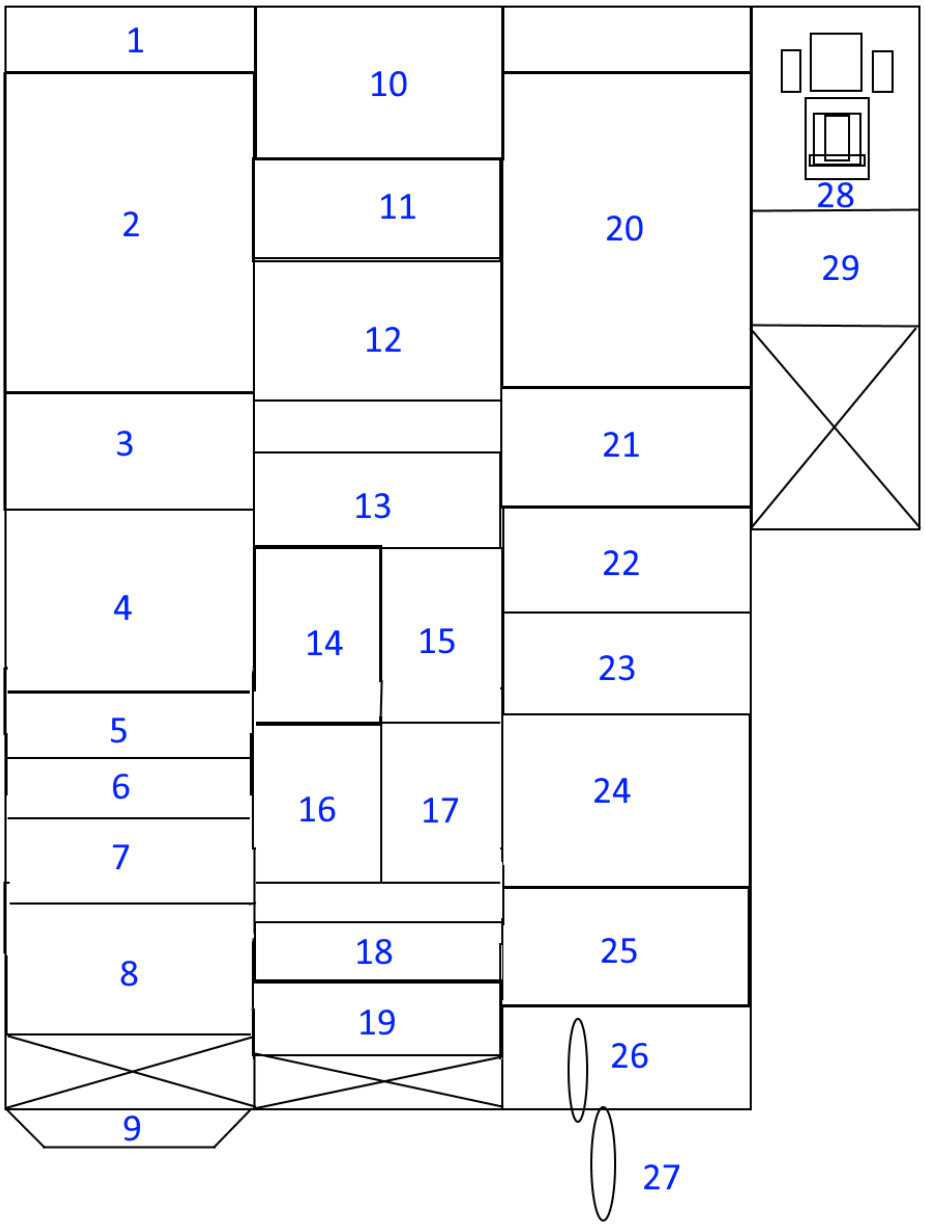
12	Cabin temperature indicator
13	Internal lighting control panel
14	Lighting control panel
15	External lighting control unit
16	Auxiliary engines control panel
17	Map light with control switch (pilot & copilot)

Engine Control Panel



No.	Description
1	Safety valve control lever
2	Rotor braking control lever
3	RH engine fuel shutoff
4	Engine red light warning repetition
5	LH engine fuel shutoff
6	Engine red light warning repetition
7	FADEC Normal vs. Back-Up selection
8	FADEC failure, engine fire or low engine oil pressure.
9	Engine control switch: - STOP: Engine stop - IDLE: N1 idle - FLT.(FLIGHT): Engine controlled to follow the NR variable law NOTE: IDLE or FLT will start the engine.

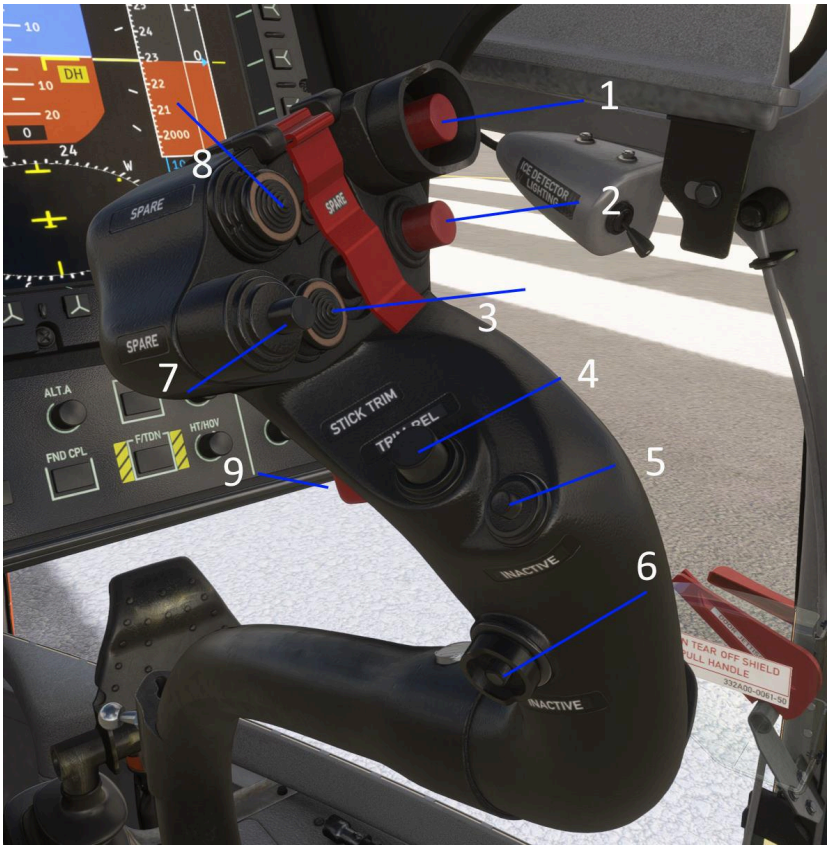
Center Console



No.	Description
1	Door and cowling locking indicator panel
2	Copilot FMS control unit
3	Copilot ICS control unit
4	COBHAM C5000 Tactical radio
5	NPX138 control unit

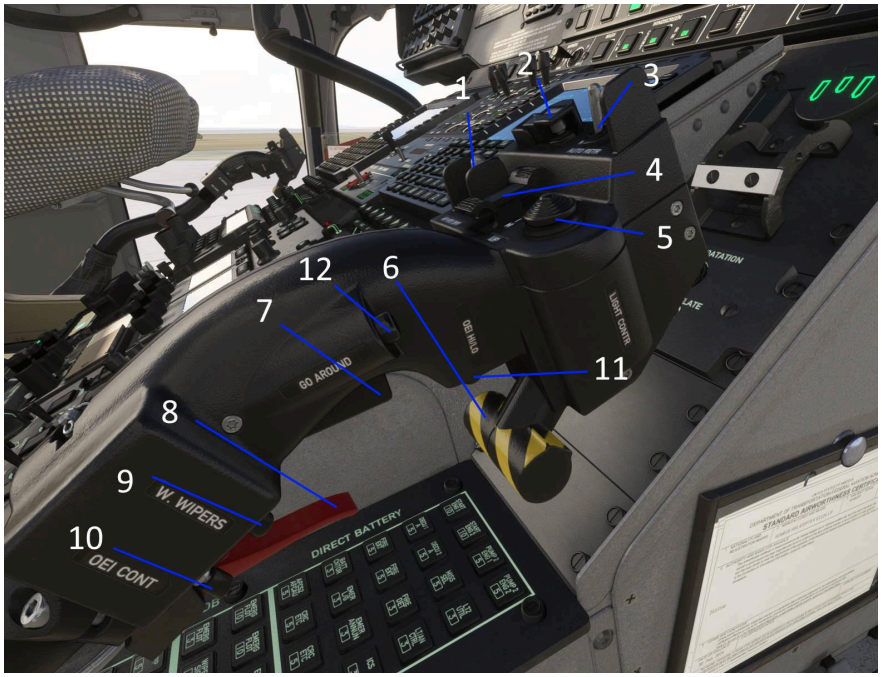
6	TARGA data loader
7	SkyConnect tracker
8	Signs Indicator
9	Connector sockets for FMS Data transfer unit (DTU)
10	Main fuel tank management panel
11	Pressure refueling control panel *Inoperative.*
12	External forward fuel tanks control unit
13	Weather radar control unit
14	Copilot VHF/NAV control unit
15	Pilot VHF/NAV control unit
16	ADF control unit
17	Transponder control unit
18	HF/SSB control unit
19	TAWS control unit
20	Pilot FMS control unit
21	Pilot ICS control unit
22	M'ARMS control unit
23	FMS power pushbuttons, RA control unit
24	Reconfiguration Control Unit (RCU)
25	Automatic flight control auxiliary unit (AFCAU)
26	Parking brake and landing gear emergency extension handles
27	Nose landing gear locking control
28	Landing gear control and monitoring panel
29	Emergency floatation control unit

Cyclic Control



No.	Description
1	Sling Load Release
2	Spare
3	4-way Cyclic Beep Trim
4	Cyclic Trim Release
5	Disengage upper modes
6	Spare or DH Suspend
7	Spare or Ground Speed Standard mode engage/disengage
8	Spare
9	ICS switch

Collective Control



No.	Description
1	Autopilot hydraulic CUT-OFF
2	Hoist emergency load release (Shear)
3	Landing light switch (ON/OFF/RETRACT)
4	Collective trim (up/down)
5	Landing light orientation control
6	Emergency flotation deploy
7	Go Around
8	Sling load emergency release
9	Windshield wipers
10	OEI CT Rating selector
11	OEI Rating toggle selector switch (HI/LO)
12	Collective Trim Release

Performance

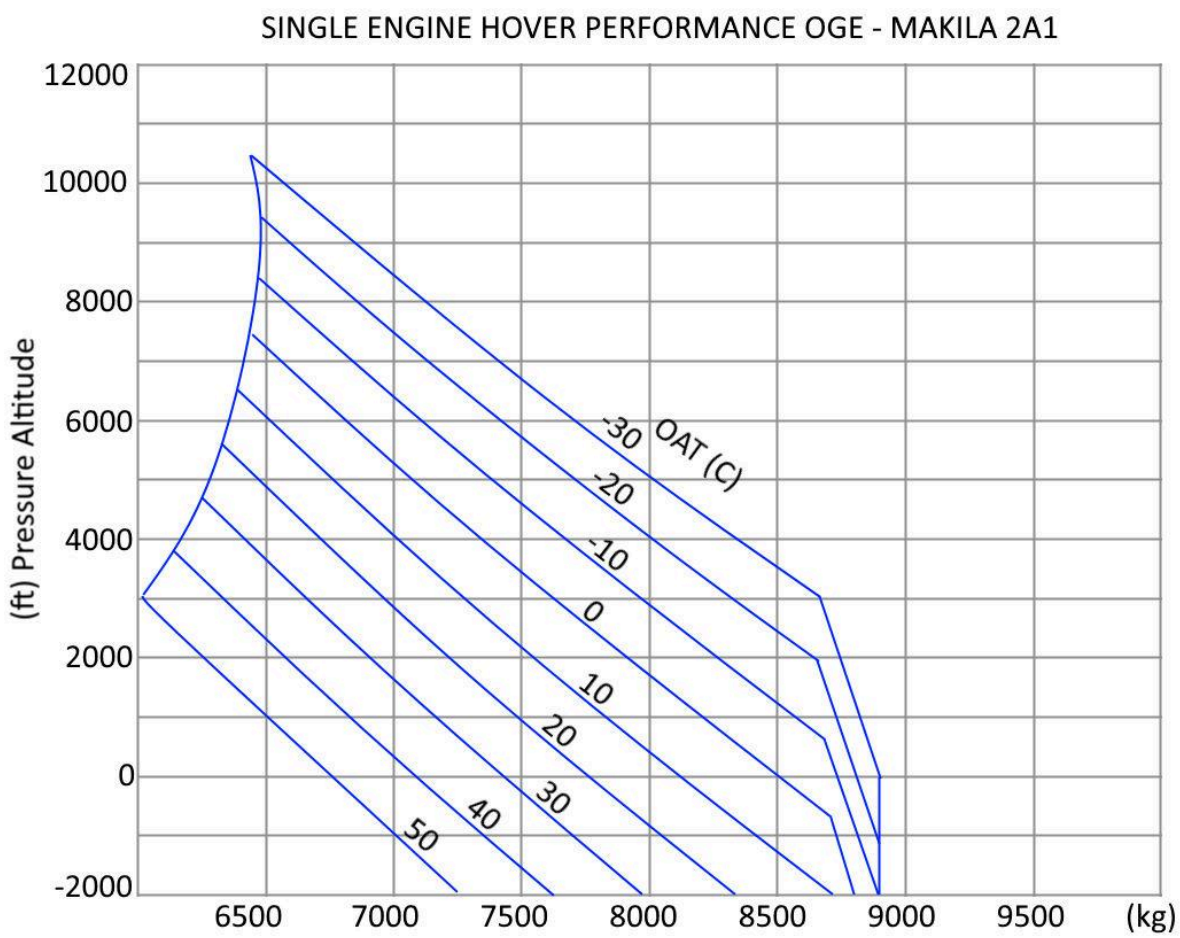
Performance information for Makila 2A1 engines.

Twin-Engine Hover Performance OGE

Conditions:

- Both engines at takeoff rating (or maximum torque 100%)
- Zero wind
- No Bleed Air

Single-Engine Hover Performance OGE



Conditions:

- One engine at OEI LO rating (or maximum torque 71.9%)
- Zero wind
- No Bleed Air
- NR = 96%

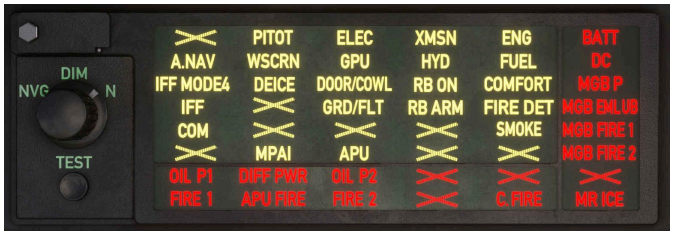
Systems Description

This section explains each aircraft system with some detail.

Master Caution System

Master Caution indications

- The illumination of a red warning light on the WCP causes the **WARN** light to blink.
- The illumination of an amber light on the WCP causes the **CAUT** light to illuminate.
- The system must be reset after any failure shown by the **WARN** or **CAUT** light.



Warning Caution Panel (WCP)

Warning Caution Panel Items

Item	Description
Dimmer Switch	**N**: Normal (daytime) lighting intensity **DIM**: Night lighting intensity **NVG**: Lowest setting (for use with night vision goggles)
TEST Button	Press to begin the light test. Press again to stop the light test.
OIL P1 **OIL P2**	Engine oil pressure is low
FIRE 1 **FIRE 2**	Engine fire detected
MGB FIRE 1 **MGB FIRE 2**	MGB Fire detected
DIFF PWR	More than 5% N1 differential between the engines
C.FIRE	Cargo fire detected
BATT	Battery failure

DC	DC system unpowered by any TRU
MGB P	MGB Oil pressure low
MGB EMLUB	MGB Emergency lubrication system is active
MR ICE	Not Installed.
ELEC	See the electrical panel on the Overhead Panel.
FUEL	See the Fuel Management Panel on the Center Console.
ENG XMSN HYD	See the EID ENG or VEH page, or the Engine Control Panel.
COMFORT	See the Comfort panel on the Overhead Panel.
MPAI DEICE	See the Multi-Purpose Air Intakes (MPAI) panel on the Overhead Panel.
DOOR/COWL	See the Doors/Cowlings panel on the Center Console.
FIRE DET	See the Engine and MGB Fire Detection panels on the Overhead Panel.
A.NAV	A.NAV mode unavailable
COM	ICS panel failure
GND/FLT	Ground/Flight sensing failure.
GPU	Ground Power is connected
PITOT	See the PITOT LH and RH status on the Instrument Panel.
WSCRN	See the Windshield de-ice controls on the Instrument Panel.
RB ON	Rotor Brake is currently on
RB ARM	Rotor Brake is armed
SMOKE	Cargo smoke is detected

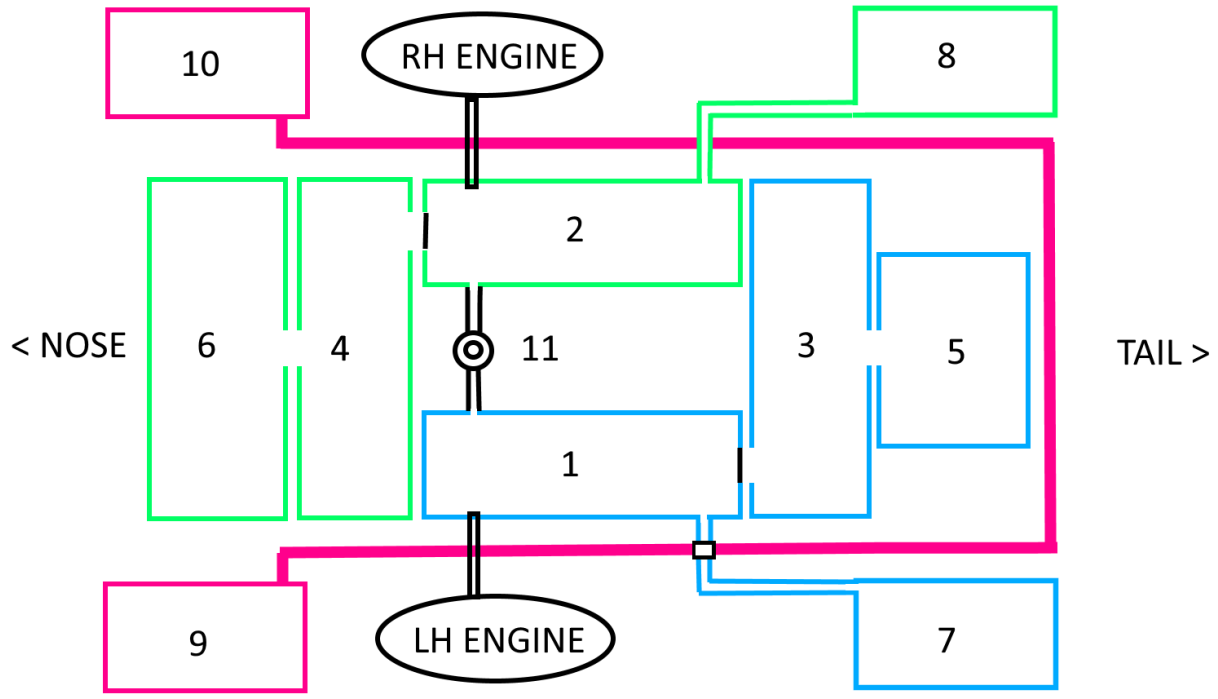
Fuel System

Fuel is provided to the engines from 10 tanks, split into two groups. The left-hand (LH) group feeds the left engine, and the right-hand (RH) group feeds the right engine. A transfer pump is provided to move fuel between groups.

A series of flaps connect the main group tanks together. Fuel is always pulled into the feed tank as long as there is any tank in the structural group tanks The External tanks are emptied based on the group having sufficient space for fuel.

Two boost pumps (a total of four) provide pressurized fuel to each engine, however the engine suction is still enough to light and maintain engine fuel flow without any booster pumps.

Fuel Tank Configuration



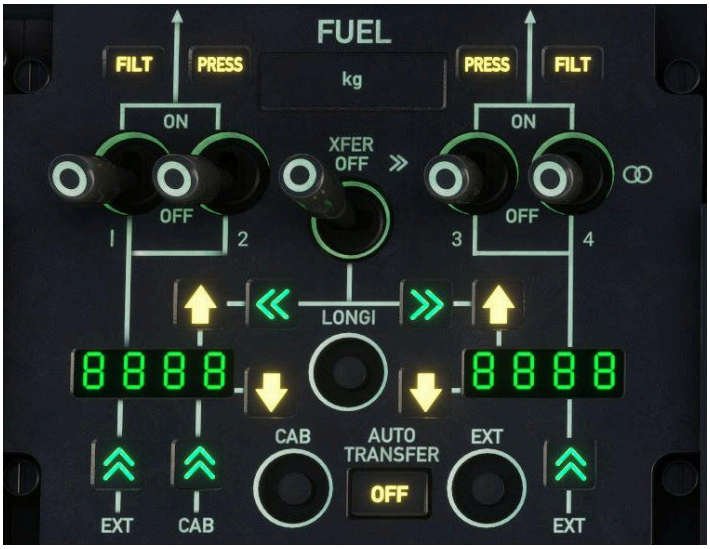
No.	Description
1	LH Feed Tank (Structural) Quantity: 226L
2	RH Feed Tank (Structural) Quantity: 216L
3	LH Transverse Tank (Structural) Quantity: 240L

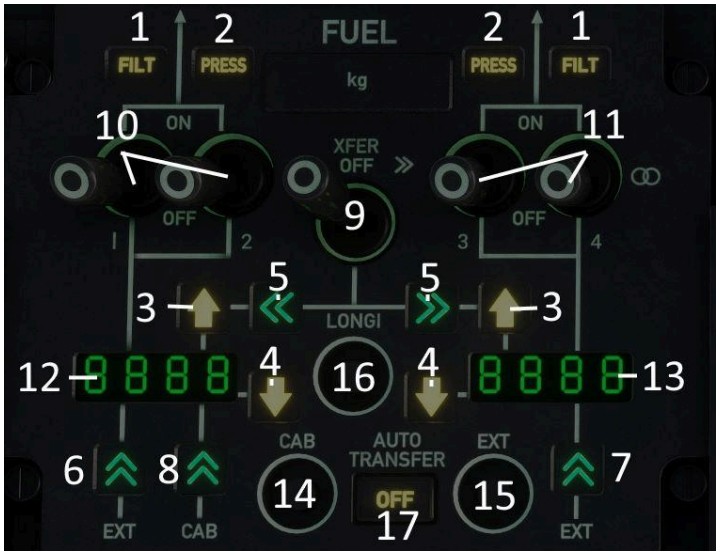
4	RH Transverse Tank (Structural) Quantity: 414L
5	LH Rear Tank (Structural) Quantity: 396L
6	RH Forward Tank (Structural) Quantity: 478L
7	LH External Tank Quantity: 300L
8	RH External Tank Quantity: 300L
9	LH Forward External Tank Quantity: 300L
10	RH Forward External Tank Quantity: 300L
11	Transfer pump (between groups)

Structural tanks 6+4 and 3+5 are logically connected and will maintain the same fill level at all times.

Left Group Structural Quantity ……..…… 1,180L
Right Group Structural Quantity ……..…….. 1,390L

Fuel Management Panel





No.	Description
1	FILT Fuel filter bypass or impending bypass
2	PRESS Low fuel pressure
3	Fuel High Level - Structural group is full
4	Fuel Low Level in Feed tank
5	Fuel flow between groups (transfer in progress)
6	Fuel flow from LH External tank to LH structural group

7	Fuel flow from RH External tank to RH structural group
8	Fuel flow from Forward external tanks into LH structural group
9	Transfer switch Left (Transfer fuel from right group to left group) Neutral (No Transfer) Right (Transfer fuel from left group to right group)
10	LH Engine boost pumps 1 & 2
11	RH Engine boost pumps 3 & 4
12	LH Fuel Display
13	RH Fuel Display
14	Forward External Fuel Quantity Check
15	EXT Fuel Quantity Check
16	Longitudinal Fuel Quantity Check

Fuel Quantity Display

Fuel quantity displays will change based on whether AUTO TRANSFER is on or off, and also whether or not the pilot is holding down the LONGI, EXT or CAB buttons.

Auto Transfer…… OFF

AUTO TRANSFER: **OFF**

State	LH Display	RH Display
No Button Pushed	LH Structural Quantity	RH Structural Quantity
LONGI Pushed	LH Feed Quantity	RH Feed Quantity
EXT Pushed	LH Rear External Quantity	RH Rear External Quantity
CAB Pushed	LH+RH Forward External Quantity	OFF

Auto Transfer…… ON

AUTO TRANSFER: **OFF**

State	LH Display	RH Display
No Button Pushed	LH Structural Quantity + LH Rear External + LH+RH Forward External	RH Structural Quantity + RH Rear External
LONGI Pushed	LH Feed Quantity	RH Feed Quantity
EXT Pushed	LH Forward External Quantity	RH Forward External Quantity
CAB Pushed	LH+RH Forward External Quantity	OFF

Forward External Tank Fuel Sub-Panel

The external tank sub-panel displays the quantity within the Forward External fuel tanks. The switch enables controlling when fuel is transferred from the forward tanks into the LH structural group. Both forward tanks are connected to the LH structural group.

Position	Function
FW TK	Automatic Transfer of fuel in the forward tanks to the LH structural group, when sufficient quantity is available and AUTO TRANSFER is on.
OFF	Inhibit Transfer
LH EXT	Force-Transfer fuel to the LH group

FAIL indicates failure or the end of fuel transfer.

Automatic Transfer Logic

When Auto Transfer is active (**OFF**), fuel will be automatically transferred from the external tanks when sufficient quantity is available within the target group.

NOTE: Automatic Transfer is prohibited during takeoff and landing phases, it should always be switched off.

Forward External Tank Automatic Transfer Logic

The forward external tanks are both connected to the LH fuel group. This means you will need to balance fuel in flight if you are using the forward tanks. Automatic transfer will transfer first the forward external tanks then once capacity is sufficient the rear external tank.

Manually balancing fuel

You must manually balance fuel if you use the forward external tanks (because they drain into the LH group only) or if an imbalance develops naturally during flight.

To balance fuel, select the Transfer switch from the neutral position into either Left or Right. The fuel flow indication (**>>** or **<<**) should illuminate shortly.

Powerplant

- The LH engine is designated ENGINE 1 and the RH engine is ENGINE 2.
- Both engines are mounted forward of the main gearbox in separate fireproof compartments.
- Each engine comprises: a governing (speed management) system, self-contained lubrication system and a self-contained starter system.

Rotor Brake

- The rotor brake is powered by the LH hydraulic system.
- There is a safety valve which must be open (armed) in order for the rotor brake to activate. This prevents unintentional activation of the rotor brake when in flight.
- Static braking is available for high wind engine start procedures. Static braking forces are higher and will prevent the rotor turning when the engine is at lower N1 values.

Warning Caution Panel indications

Item	Description
RB ARM	Rotor brake safety valve is armed, and the rotor brake will be applied if the handle is activated
RB ON	The rotor brake is currently applied

Enable Static Braking

Behind the pilot's right shoulder is a switch which may be used to configure the rotor brake to use static braking or dynamic braking.

Static braking is used only during a high wind start, where the rotor brake is applied until the first engine reaches IDLE.

Switch Position	Description
DOWN	Only dynamic braking is available (21LB)
UP	Static braking force is available (150LB)

Electrical System

The aircraft features a redundant AC and DC electrical system with various protection features.

The system comprises:

- Two alternators that generate electricity when the rotor is spinning
- One alternator that generates electricity from a hydraulic motor, this enables generating electricity from the hydraulic system in the event of loss of both main alternators.
- Main aircraft battery
- Standby aircraft battery
- Three Transformer-Rectifier units, one for each alternator. TRUs convert electricity from AC into DC.

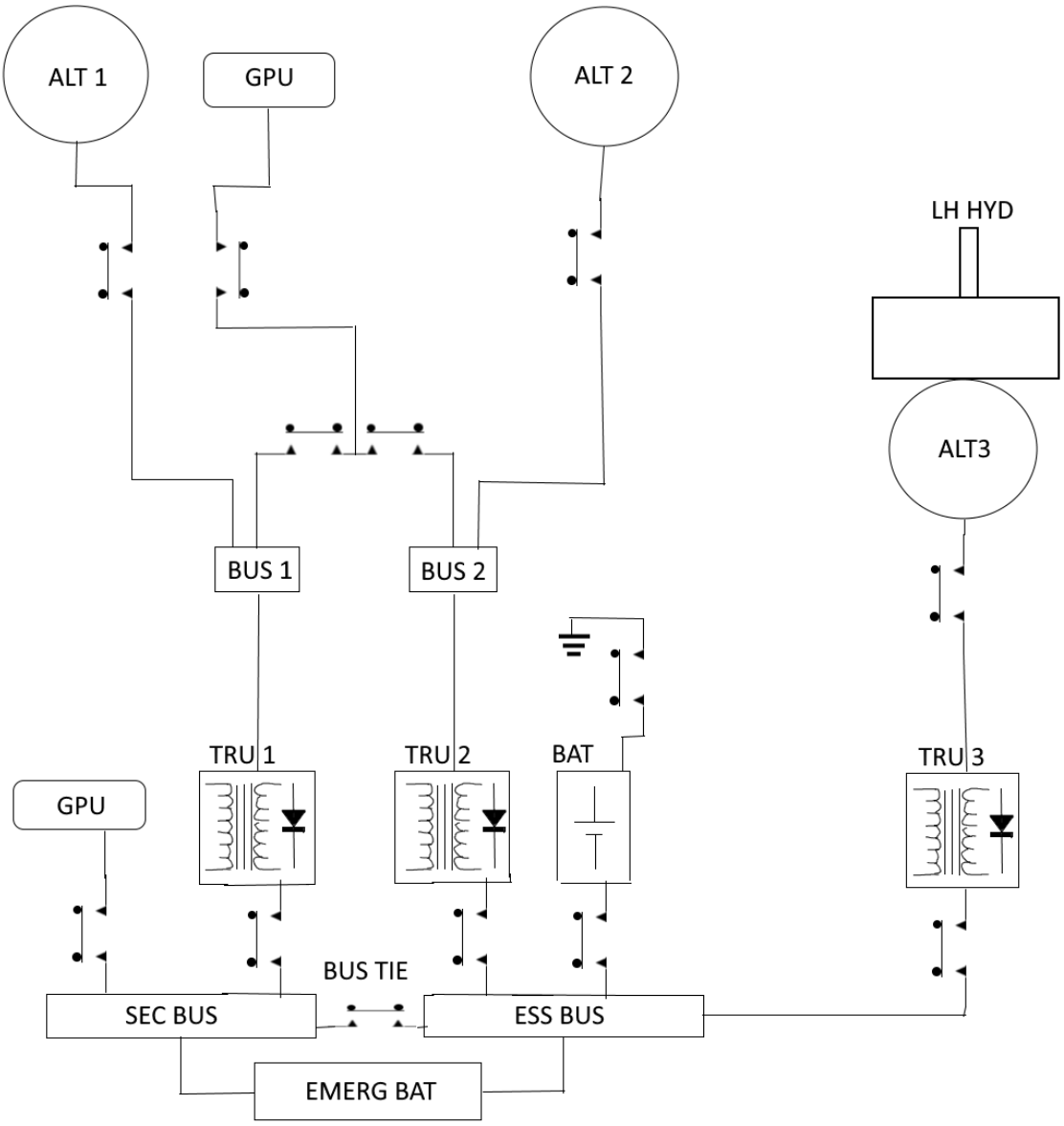
Overview:

- The electrical system supplies the aircraft with 115V AC and 28V DC power.
- AC electric power is produced by two alternators driven by the main gearbox. Each alternator (ALT 1 or ALT 2) supplies power to a distribution bus (BUS 1 or BUS 2).
- DC power is produced by two transformer-rectifier units (TRU 1 and TRU 2). TRU 1 connects BUS 1 to SEC BUS and TRU 2 connects to ESS BUS.
- The aircraft main battery (BAT) is connected to ESS BUS.
- A second standby battery (STBY BAT) is also connected to ESS BUS as an ultimate backup source of power in the event of loss of both alternators and the main battery (such as when using the emergency cut-off gang bar)..
- A hydraulically driven generator (EMERG SUPPLY) provides power to the ESS BUS after 2 minutes.

Warning Caution Panel Indications

Item	Description
BAT T	Battery temperature >70C
DC	All TRUs are unpowered
ELEC	A yellow light is illuminated on the electrical control panel

System Topology



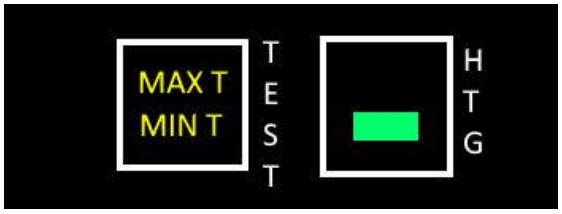
Item	Description
BAT	Main battery
EMERG BAT	Emergency battery
ALT1, ALT2	Main alternator driven by the main gearbox
ALT3	Emergency alternator driven by LH HYD system.

TRU1, TRU2	Transformer Rectifier Unit for the main alternators
TRU3	Transformer Rectifier Unit for the emergency alternator
GPU	Ground Power Unit Can be connected to either AC or DC systems. If the GPU is connected to the DC system, then the AC system will remain unpowered.
ESS BUS	Essential (primary) DC bus
SEC BUS	Secondary DC bus
BUS TIE	The bus tie connects both DC buses such that the SEC bus can take power from the ESS bus or vice versa. The switch on the overhead panel will force the tie open, isolating each bus from each other.

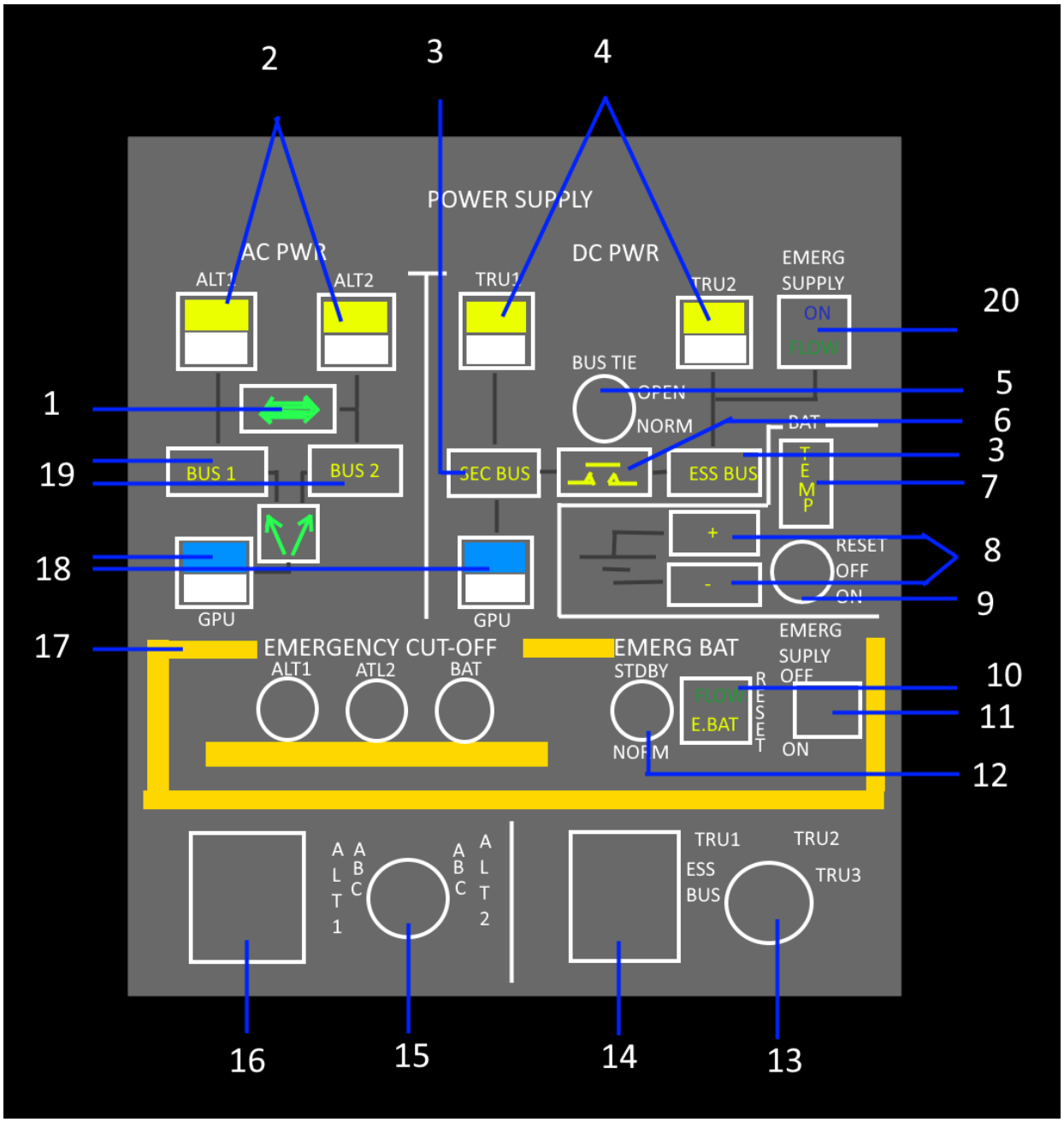
Emergency Supply Heating

The Emergency Supply Heating system ensures that the LH hydraulic system fluid temperature is within range suitable for the emergency generator to be driven and generate sufficient power.

Controls are on the lower part of the instrument panel and on the overhead panel.



Item	**Description**
MAX T	LH Hydraulic fluid temperature is above 108C
MIN T	LH Hydraulic fluid temperature is below 17C
TEST Button	Press to test proper indication of the indicating logic
	Heating is on. Temperature is managed between +22C and +32C
EMERG Supply Switch Overhead Panel	Unstable switch. Activate or deactivate the hydraulic generator.



No	Item	Description
1	<==>	Power is flowing from ALT to the opposite bus.
2		ALT failure or selected OFF
3	SEC BUS or ESS BUS	Voltage failure or short circuit on the bus

4		TRU failure or selected OFF
5	Bus Tie Switch	Manual control of the bus tie
6	Bus Tie Open Indicator	Bus tie is open (either manually or automatically)
7	**TEMP**	Battery temperature is 10C higher than ambient temperature
8	**+** or **-**	Battery positive or negative line contactor open
9	BAT Switch	Main aircraft battery switch. **RST**: Reset the battery after a failure **OFF**: Disconnect the battery **ON**: Activate automatic coupling of the battery
10	EMERG BATTERY RESET	Push to reset the standby battery circuit
11	EMERG SUPPLY Switch	Unstable switch. Activate or Deactivate the emergency power supply.
12	EMERG BAT Switch	STDBY: Standby NORM: Normal
13	DC Source Selector	Selects for monitoring either TRU1, TRU2, ESS BUS or EMERG SUPPLY (TRU3)
14	DC Source Monitor	Monitor voltage and amperage on the selected (13) source.
15	AC Source Selector	Selectors for monitoring the phases on ALT1 and ALT2
16	AC Source Monitor	Monitor voltage and amperage on the selected source.
17	Emergency Cut-Off Gang Bar	Cuts off all electricity generators and the main battery
18	GPU Connection (DC and AC)	Enables coupling ground power to the aircraft. Push to connect or disconnect.
19	**BUS 1** or **BUS 2**	Voltage failure or short circuit on the bus
20	EMERG SUPPLY Indication	**ON**: The alternator is driven by the hydraulic system **FLOW**: TRU3 is connected to the ESS BUS. Activation takes approximately 2 minutes before the generator is active.

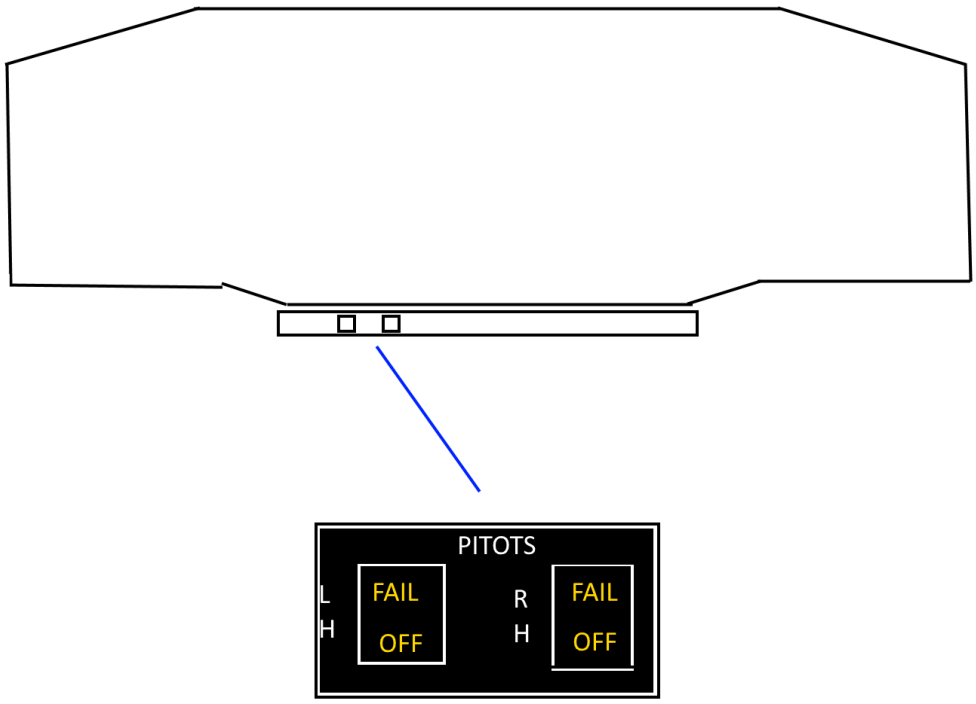
2, 4		ALT or TRU is switched off.

Air Data System

The aircraft air data system provides pressure values such that airspeed and altitude can be determined. Air data parameters are displayed on the MFDs and the standby instruments.

Pitot Head System

- Pitot heads are installed forward of the cockpit.
- Pitot head heating is controlled by push buttons on the lower instrument panel.



Item	Description
LH and RH switch	Toggle the selected heater.
PITOT Warning Caution Panel	Pitot failure indicated on the lower instrument panel.
FAIL Lower Instrument Panel	PItot failure
OFF Lower Instrument Panel	Pitot is switched off

Hydraulic Power Systems

Overview:

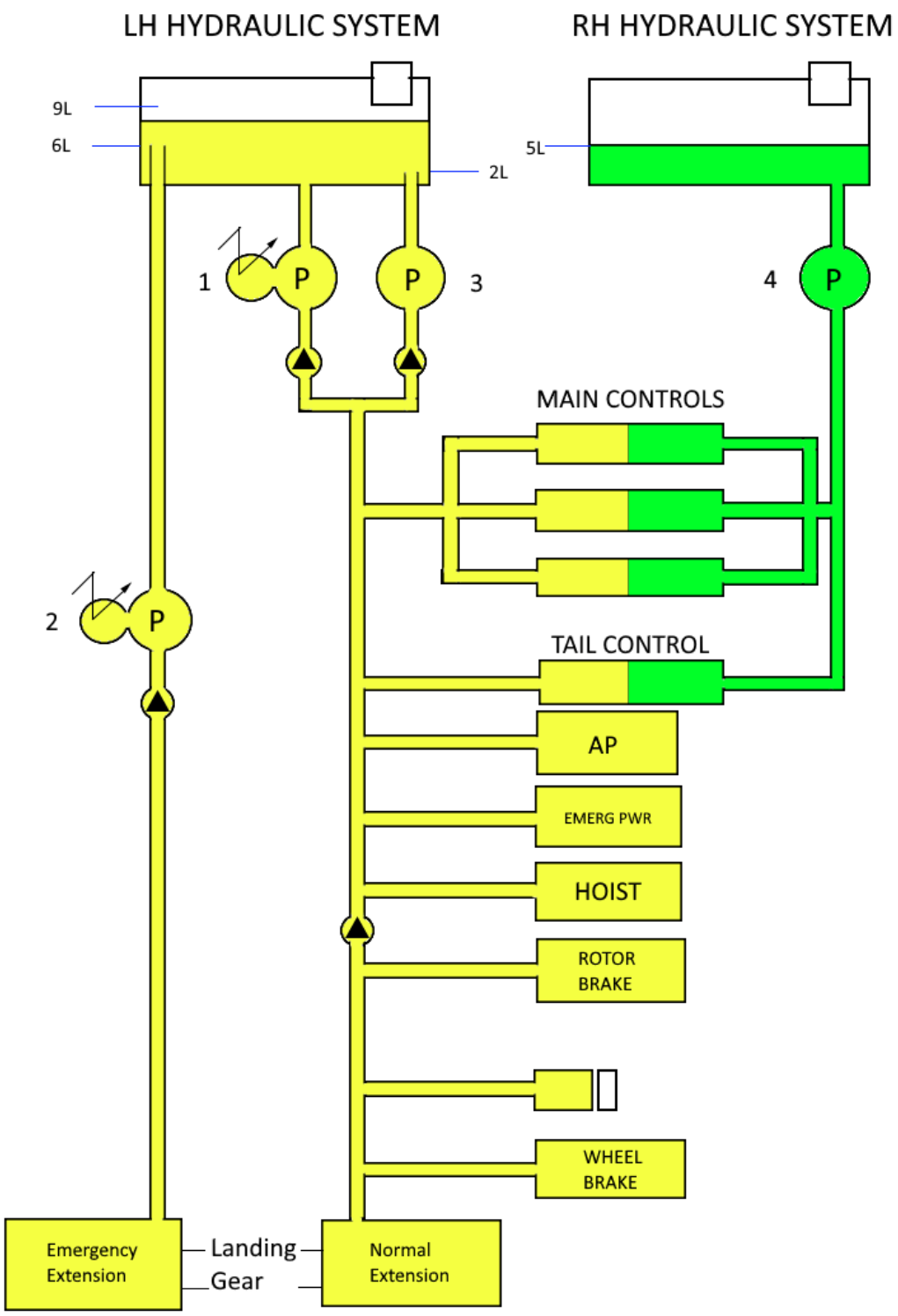
- The hydraulic installation consists of two fully independent systems, a left-hand and right-hand system.
- Both systems are normally powered by a pump driven by the main gearbox.
- Main pumps supply the system at a pressure between 170 and 175 bar
- The electric auxiliary pump will pressurize the LH system in the absence of the LH main pump.
- A standby electric pump connected to the LH system can be used for emergency landing gear extension.
- Each system has a total fluid quantity of 9 Liters.
- The rotor brake and wheel brakes are connected to the accumulator, which provides pressure after the rotor has stopped from storing residual system pressure in a mechanical device.

Left-Hand System	**Right-Hand System**

- Supplies Main Controls
- Supplies Tail Control
- Supplies all other equipment
  - Rotor brake
  - Wheel brakes
  - Emergency Power Generator
  - Hoist
  - Autopilot
	- Supplies Main Controls
	- Supplies Tail Control

- Standby emergency pump to lower the landing gear	

Item	**Location**
Accumulator	Aft of the center console, next to the copilot seat.
A.PUMP switch	Instrument Panel
AP HYD CUT-OFF Switch	Collective
AP HYD Switches	AFCS Auxiliary Unit (Center Console)


LH HYDRAULIC SYSTEM
RH HYDRAULIC SYSTEM
9L
6L
2L
5L
1
P
P
3
4
P
MAIN CONTROLS
2
P
TAIL CONTROL
AP
EMERG PWR
HOIST
ROTOR BRAKE
WHEEL BRAKE
Emergency Extension
Landing Gear
Normal Extension

Item	Description
1	Electric auxiliary pump (A.PUMP)
2	Emergency extension pump
3	LH main pump
4	RH main pump
MAIN CONTROLS	Boosted cyclic control
TAIL CONTROL	Boosted pedal/tail rotor control
AUTOPILOT	Boosted autopilot actuator Services: - Trim Feeling - Auto trim - Auxiliary servo control
EMERG PWR	Emergency power generator
HOIST	Rescue Hoist reel in/out function
WHEEL BRAKE	Wheel brakes are pressurized by an accumulator after shutdown. The accumulator is aft of the center console on the floor.
ROTOR BRAKE	Rotor braking function after engine shutdown or during high wind first engine start.
LANDING GEAR	Normal Extension: Activated by switch. Emergency Extension: Activated by switch.

Warnings and indications

Item	Location	Description
RH.P	VMS Vehicle	
RH.LVL	VMS Vehicle	Reservoir level is below 2 L
MH.P	VMS Vehicle	
MH.P+RH.P	VMS Vehicle	Pressure drops to less than 110 bar
LH.LVL	VMS Vehicle	Reservoir level is below 4 L
AUX.P	VMS Vehicle	Pump switched off OR LH pressure less than 110 bar

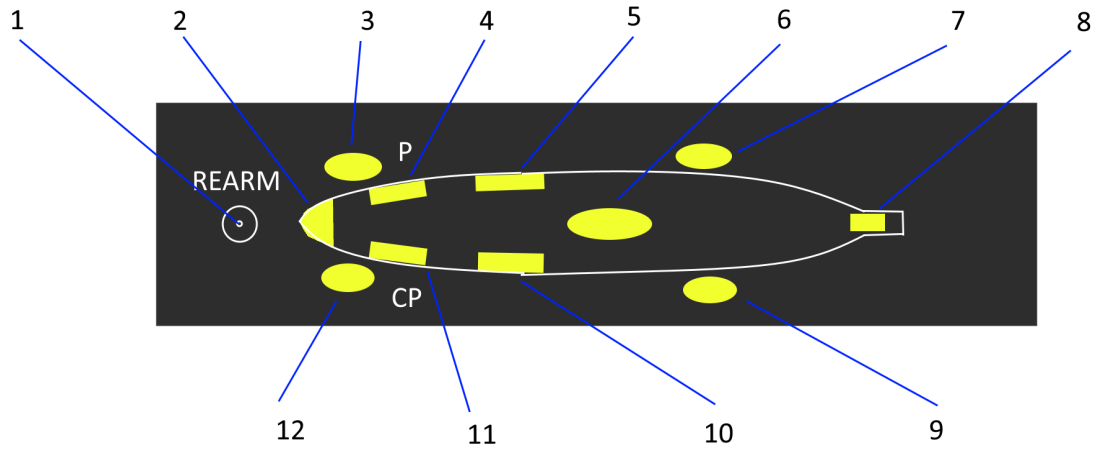
AP.P	VMS Vehicle	Autopilot unit is receiving less than 70 bar
A.PUMP	VMS Vehicle	Short-circuit on electric pump supply line
PUMP	Landing Gear	Emergency extension pump is active.
HYD	WCP	Illuminating of any yellow hydraulic indication on VMS Vehicle.

Door & Cowling Indication System

The door and cowling indicating system is designed to warn the pilot when one of the doors or cowlings are incorrectly closed.

When a door opens, the corresponding light illuminates, and subsequently the **DOOR/COWL** warning on the WCP, and then subsequently the **CAUT** light will illuminate. Pressing either of the **CAUT** lights switches it off and resets the warning circuit for future indication.

Pressing the **REARM** pushbutton on the indication panel switches off the **DOOR/COWL** light on the warning-caution panel. This feature might be used when operating with the door open for hoisting operations.



No.	Description
1	Rearm pushbutton Press to suppress the **DOOR/COWL** indication on WCP while still keeping a door open (for example during hoisting). Further doors opening will still trigger **DOOR/COWL** indication. Once the door closes it will automatically be reset and subsequent opening will trigger **DOOR/COWL** again.
2	Radome compartment indicator light
3	RH compartment door indicator light
4	Pilot's door indicator light
5	RH cabin door indicator light
6	Engine and MGB cowling indicator light
7	RH sponson indicator light
8	Tail compartment indicator light

9	LH sponson indicator light
10	LH cabin doors indicator light
11	Copilot's door indicator light
12	LH compartment door indicator light

Vehicle Monitoring System (VMS)

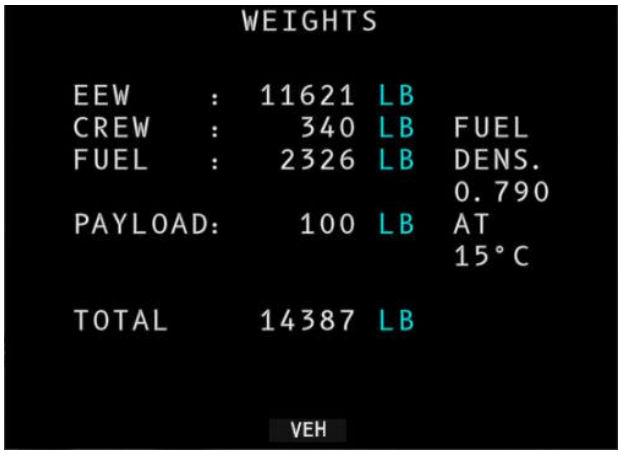
The VMS presents data collected from aircraft computers and sensors.

The VMS is presented on two EID (Engine Instrument Displays).

When both EIDs are on, the top EID shall always display the Engine (ENG) page and the bottom EID should generally be used to display the Vehicle (VEH) page when use of another page is not required.

Performance (PERFPO) Page

Computation of total weight. The performance page enables viewing and editing of the aircraft fuel and payload information.

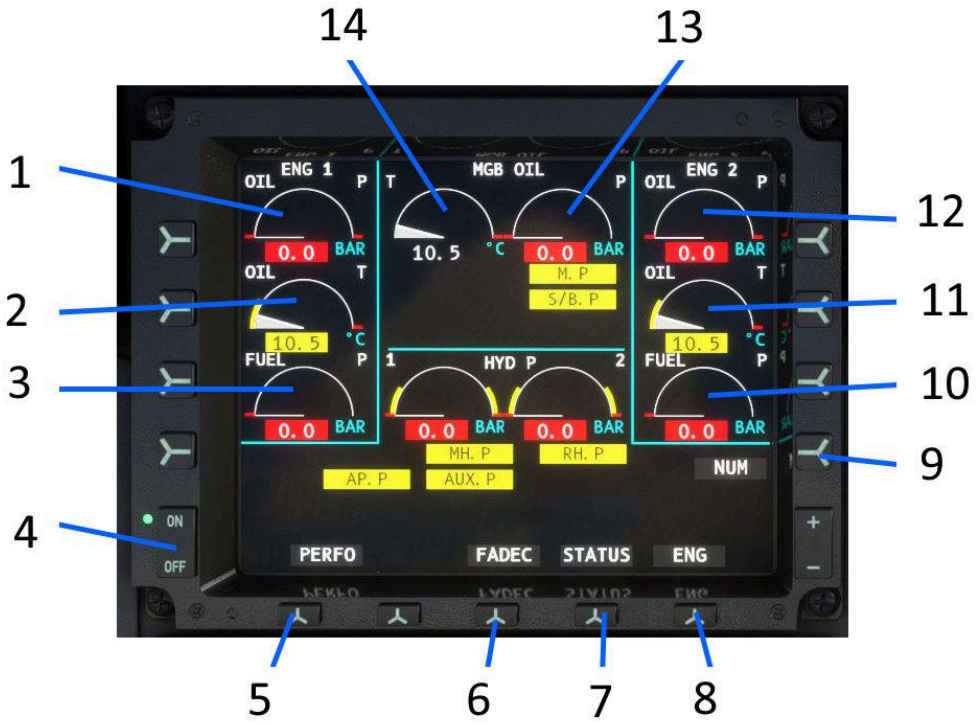


The performance page will always reflect the latest data from the simulator. Use the Weight & Balance dialog to modify fuel and payload. The information between the Weight & Balance dialog is always synchronized with the information on the performance page and on the FMS.

Vehicle (VEH) Page

Vehicle Parameters. The Vehicle page monitors engine oil temperature and pressure, fuel pressure, MGB oil temperature and pressure, and hydraulic system temperature and pressure. A set of warning flags are also indicated here.

Press the NUM key to show or hide the digital value of parameters which are in range. Parameters out of range will be automatically highlighted and the digital value displayed.



No.	Description
1	Engine 1 oil pressure
2	Engine 1 oil temperature
3	Engine 1 fuel pressure
4	Toggle power to the EID display
5	**PERFPO**: Open the Performance page
6	**FADEC**: Open the FADEC page
7	**STATUS**: Open the Aircraft Status page
8	**ENG**: Open the engine page. The ENG page is normally displayed permanently on the upper EID.
9	**NUM**: Display numbers (digital values) of parameters which are within their normal operating range.
10	Engine 2 fuel pressure

11	Engine 2 oil temperature
12	Engine 2 oil pressure
13	MGB oil pressure
14	MGB oil temperature

Warning and Caution indications

Flag	Description
MGB.T	Excessive temperature in MGB.
IGB.T	Excessive temperature in IGB.
TGB.T	Excessive temperature in TGB.
M.P	The oil pressure at filter in the MGB is below 3.65 bar
S/B.P	Standby lubrication system depressurization.
CHIP	Metal particles detected in MGB, IGB or TGB.
MH.P	Pressure drop in the Main Hydraulic system (less than 110 bar).
RH.P	Pressure drop in the Right Hydraulic system (less than 110 bar).
AP.P	Hydraulic pressure in the Autopilot unit is less than 70 bar.
AUX.P	Hydraulic pressure in the system is less than 110 bar.
LH.LVL	Left hydraulic reservoir level below 4L.
RH.LVL	Right hydraulic reservoir level below 2L.
A.PUMP	Auxiliary electric pump switched OFF or short-circuit on electric auxiliary pump power supply line.
AMC 1 **AMC 2**	AMC reconfiguration. Both pilot and copilot are now using the respective AMC.

FADEC Page

The FADEC page displays data sent by each FADEC and the FADEC tests.

N1 and N2 cycle counters as well as session count will increment each time the engine is started or the aircraft is loaded respectively.

STATUS Page

Aircraft status page.

Engine (ENG) Page

The engine page displays primary engine monitoring indications. It should be visible at all times on the upper EID.

Flag	Description
HI LO CT	OEI High, Low or Continuous FADEC topping limit.
IDLE	Engine is in IDLE position
BLEED	P3 bleed valve failure
FADEC	FADEC Major failure
GOV	Illuminated: minor failure Flashing: redundancy failure
CHIP 1 CHIP 2	Metal particles detected in engine oil.
T	Training mode
START	Engine starter is active
FAIL	Engine failure
NR FADEC	Non-AFCS FADEC governing law
OAT 24.5 C	Outside air temperature.

Flight Display System (FDS)

The display system is composed of four multifunction display units (MFD).

The outer right and left Multi-Function Displays (MFD) are dedicated to the Flight & Navigation Display (FND) format. The display format on the inner MFDs is selectable by the crew (default format at power-up is NAVD).

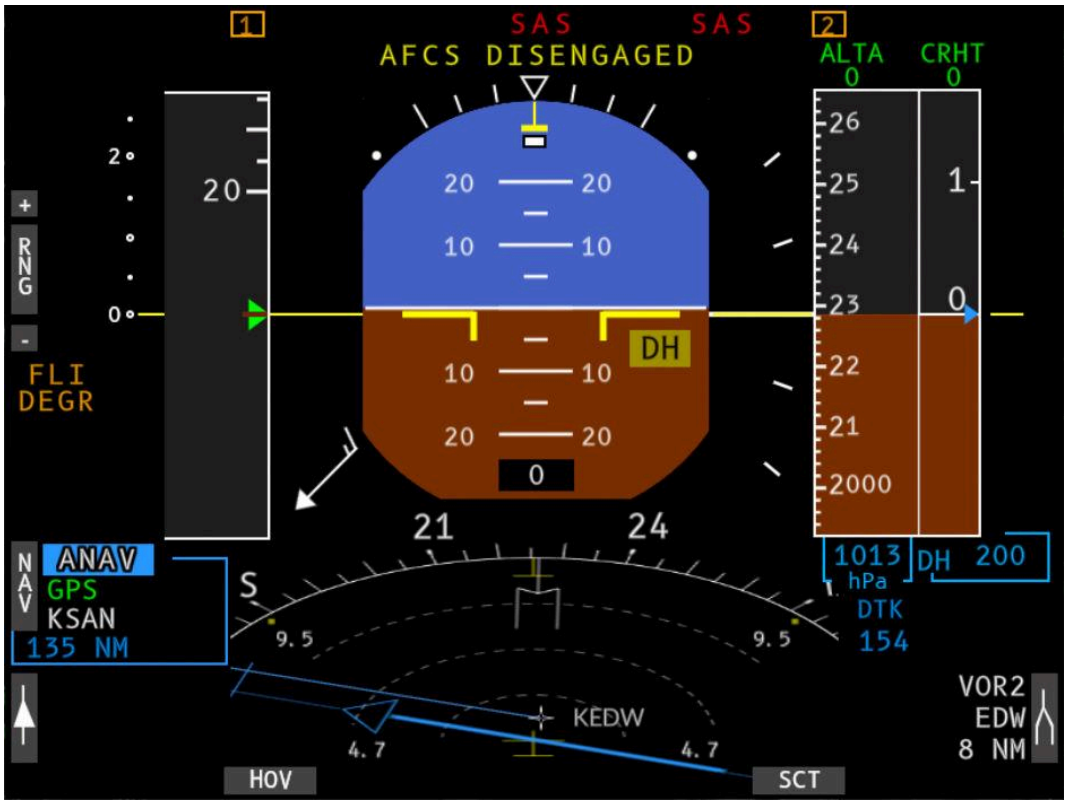
A Flight Control Panel (FCP) allows system control.

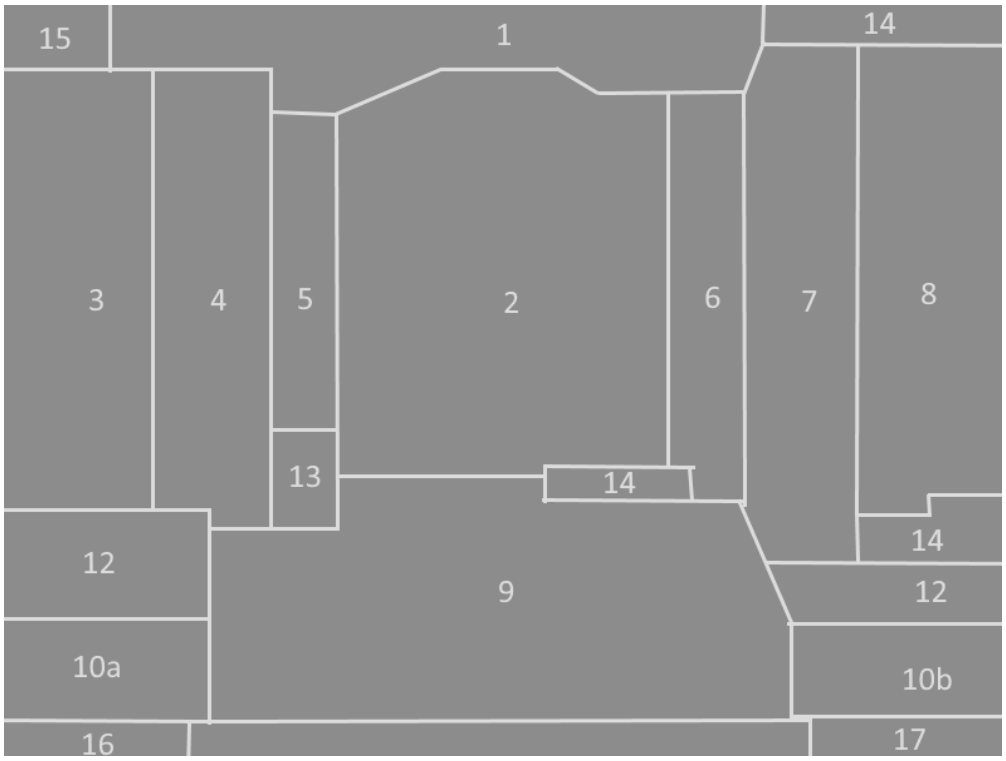
Indication and background colors

Colors below represent data, such as on the FND and NAVD pages.

Color	Description
	Limitations, faults and warning messages
	Engaged AP modes, AP parameters
	Units, miscellaneous indications, references, etc.
	Armed AP modes, crew selection
	ILS and approach data
	Limitations and caution messages
	Scales, miscellaneous data
	Helicopter symbol, instantaneous data
	Background color for scales
	ADI ground, ground track data
	ADI sky
	Background color for key labels

Flight & Navigation Display (FND) Page





No.	Description
1	AFCS status strip
2	Attitude zone
3	First limitation and collective pitch scale zone
4	Indicated airspeed zone.
5	Glideslope zone.
6	Vertical speed zone
7	Altitude zone
8	Radio height zone
9	Compass heading rose zone
10	Pointer identification zone: Single needle.
12	Navigation data zone.
13	Wind data zone.
14	Miscellaneous data zone.
15	Messages zone.
16	Reconfiguration zone
17	Pointer identification zone: Double needle.

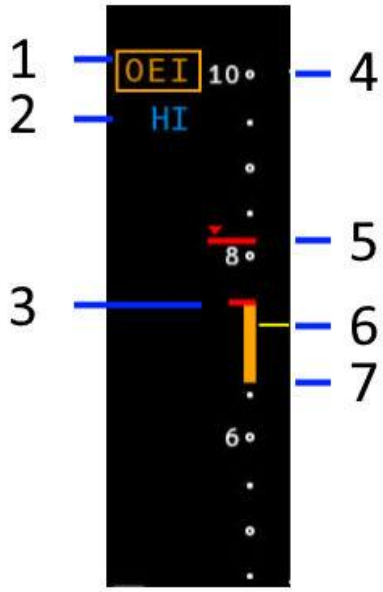
Bezel Keys:

Key	Function
NAV	Cycle the main navigation source
Single Bearing Pointer	Cycle the bearing pointer source
Double Bearing Pointer	Cyle the bearing pointer source
SCT	Select SCT (Sector) Lower Format
HOV	Select HOV (Hover) Lower Format
HSI	Select HSI (Horizontal Situation) Lower Format

RNG+ RNG-	Increase or decrease the map range

First Limit Indicator

The First Limit Indicator (FLI) is one of the most important instruments in the cockpit. It provides a real-time view of the extent of the lowest limit imposed by the engines (either N1, torque or TOT). The background of the FLI is the collective travel range, expressed as 0-10. As the collective moves up and down, the active limits are displayed relative to the expected collective position where those limits will be imposed.



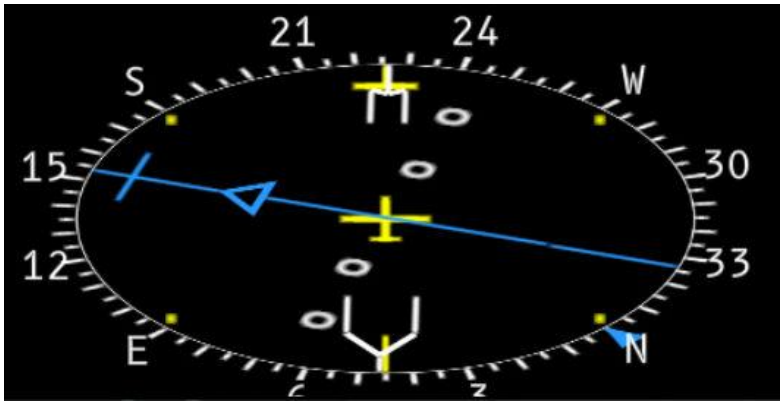
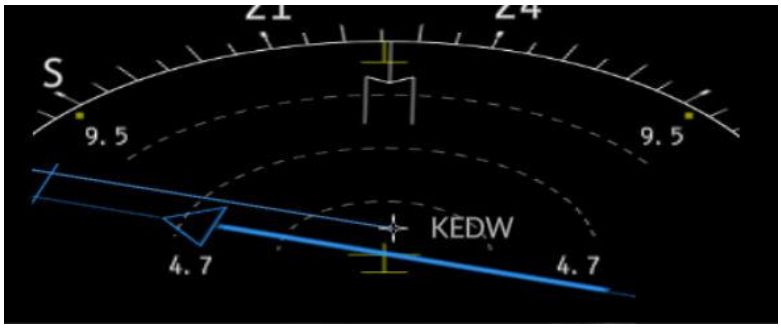
No.	Description
1	[OEI]: The aircraft is operating single engine.
2	OEI rating. The OEI rating determines the point by which the FADEC will stop commanding more engine power and the NR will droop when collective pitch is moved beyond the limit. HI: High (30 second power available) LO: Low (2 minute power available) CT: Only maximum continuous power is available
3	Maximum takeoff power (top of amber box, if visible)
4	Maximum collective position (0-10)
5	Transient limit.
6	Current collective position
7	Maximum continuous power (bottom of the amber box, if visible)
	The “blue line” indicates OEI power available when in AEO.
	[X] Bleed heating is active

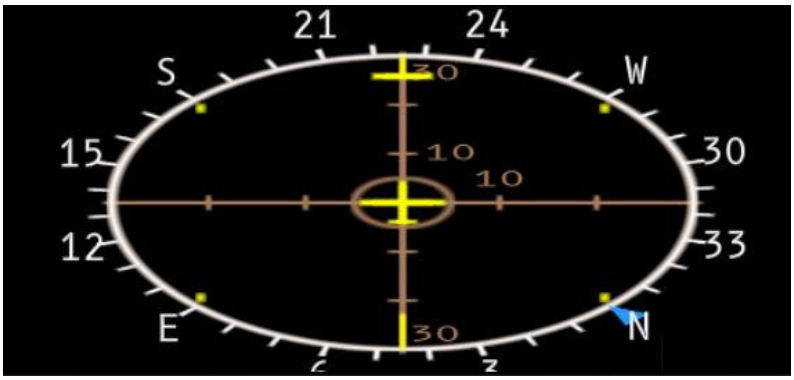
Additional FLI indications:

Item	Description
FLI DEGR	FLI unavailable, possibly due to loss of both APMs.
FLI FAIL	Total FAIL failure

FND Lower Formats

The lower FND format may be selected by the pilot. The use of HSI mode is required while on an approach with lateral guidance.

Mode	Description
HSI	Horizontal Situation Indicator  Displays the navigation source and deviation, as well as single and dual bearing pointers.
SCT	Sector  Displays a 45 degree sector view, with flight plan overlay, nav source indication and bearing pointers.
HOV	Hover

	 Ground speed lines help to orient the pilot to a hover. Green VX and VY indications are used for ground speed setpoints.

AFCS Status Strip

Each column represents a specific axis.
Rows represent active modes (top) and armed modes (bottom).

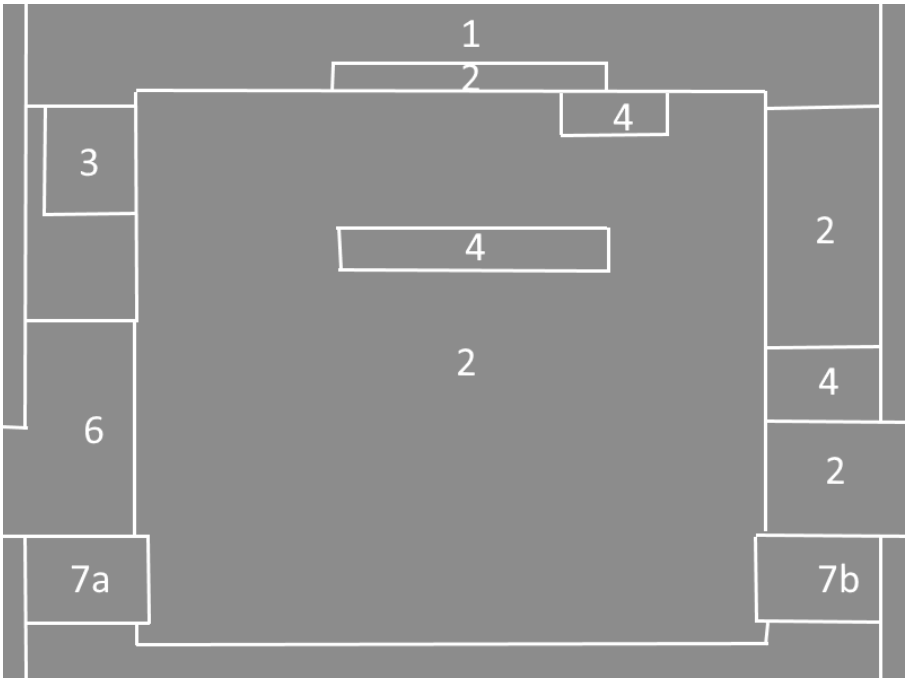
Collective (Active)	Roll/Yaw (Active)	Pitch (Active)
Collective (Armed)	Roll/Yaw (Armed)	Pitch (Armed)

Indications:

Item	**Description**
SAS	Total failure of stabilization on this axis **Remain hands-on at all times.**
SAS	Partial loss of stabilization on this axis (back-up mode)
[1] or [2]	Failure of one APM
AFCS DISENGAGED	Loss of both APMs. Upper Modes not available
HDG	Partial failure but the mode is still engaged
HDG	Mode is active (currently controlling the aircraft)
ALT.A	Mode is armed (will become active when conditions are met)
	When no active mode is visible, basic stabilization is engaged.

Navigation Display (NAVD) Page

The NAVD page provides access to various display subformats, navigation to radio navaids or FMS, and weather radar overlay.



No.	Description
1	Navigation zone.
2	Compass rose zone.
3	Wind data zone.
4	Miscellaneous data zone
6	Data dedicated zone.
7a	Pointer identification zone: Single pointer.
7b	Pointer identification zone: Double pointer.

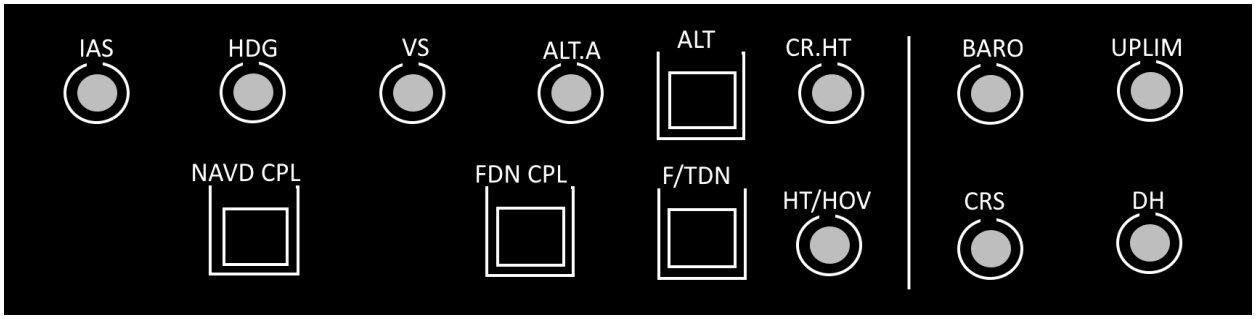
Bezel Keys:

Key	Function
NAV	Cycle the main navigation source
Single Bearing Pointer	Cycle the bearing pointer source
Double Bearing Pointer	Cyle the bearing pointer source
SCT	Select SCT (Sector) Mode
ROS	Select ROS (Rose) Mode

RNG+ RNG-	Increase or decrease the map range
WXR	Toggle weather radar overlay
ALTR	Toggle display of alternate route
CHRN	Activate the chronometer function STRT: START and STOP by simple push action. RSET: RESET the counter to 00:00

Flight Control Panel (FCP)

The FCP is the pilot interface to the AFCS as well as changing data values on FND and NAVD pages, as well as coupling AFCS navigation to a displayed nav source on FND or NAVD.



FDS Functions

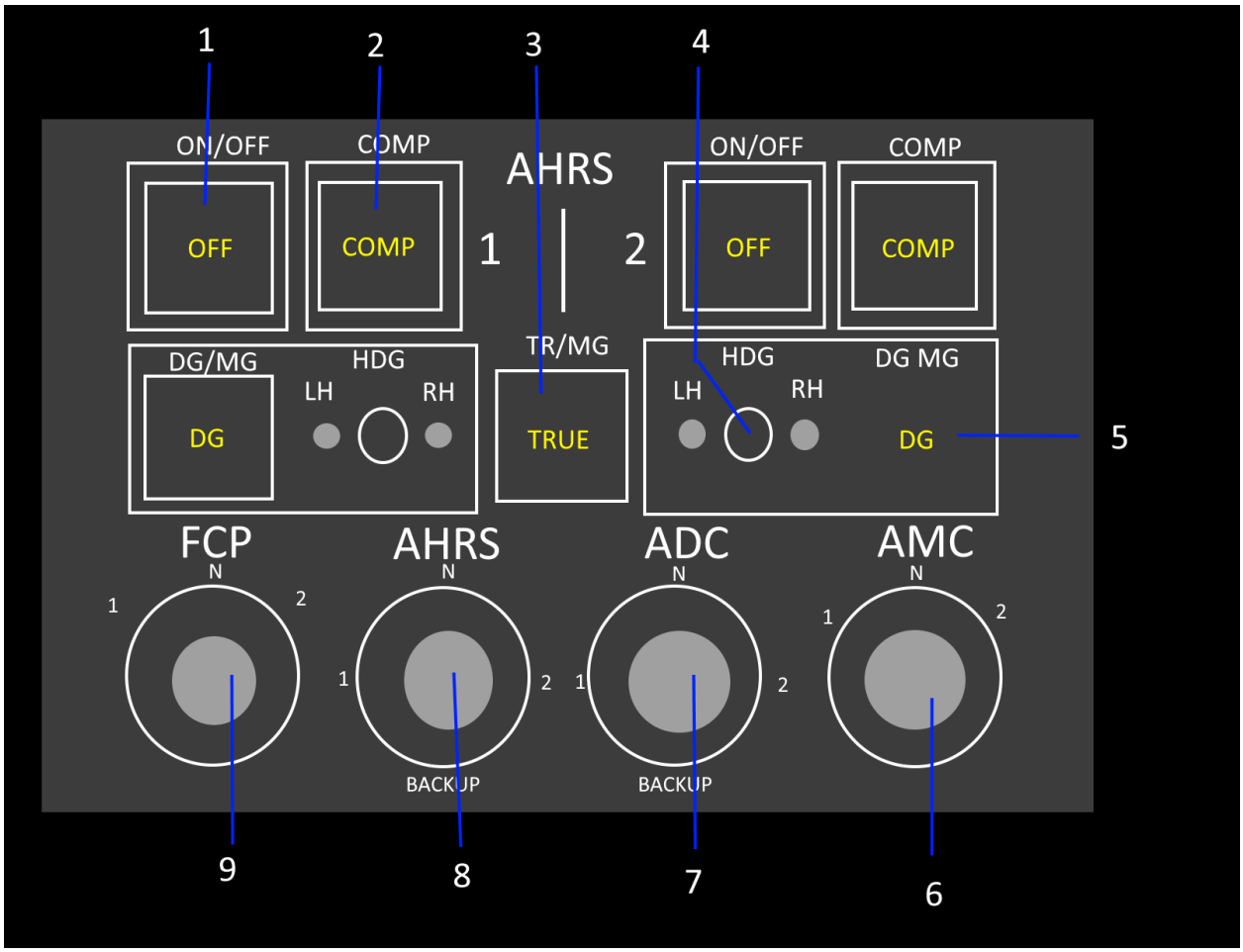
Function	Description
BARO	**ROTATE**: Adjust the barometric reference between 900 hPa and 1,050 hPa. **PUSH**: Toggles between the standard barometric reference of 1,013.25 hPa (STD) and the preset barometric reference.
UPLIM	Adjust the upper limit (altitude and height). **ROTATE**: - Between DH+50 ft and 2,500 ft for the radio height upper limit. - Between DA+50 ft and 15,000 ft for the barometric altitude upper limit. - Rotation above maximum value selects OFF position of upper limit **PUSH**: Toggles the radio height or barometric upper limit. *Inoperative.*
CRS	Adjust the course. **ROTATE**: Adjust the course **PUSH**: Toggle between FND and NAVD if different sources are displayed The selected course is displayed [CRS 200]
DH	Adjust the decision height **ROTATE**: Adjust the decision height between 0 and 2,500ft

Autopilot Functions

Function	Description
IAS	**PUSH**: Toggle Airspeed Hold. **ROTATE**: Pre-Selection and capture of airspeed.
HDG	**PUSH**: Toggle Heading Hold. **ROTATE**: Pre-Selection and capture of heading.
VS	**PUSH**: Toggle Vertical Speed Hold. **ROTATE**: Pre-Selection and capture of Vertical Speed.
ALT.A	**PUSH**: Engage VS mode and capture the selected altitude. **ROTATE**: Pre-Selection of an altitude value.
ALT	Toggle Altitude Hold
CR.HT	**PUSH**: Toggle Radio Height Hold. **ROTATE**: Pre-Selection and capture of Radio Height.
NAVD CPL	Toggles coupling to the navigation source selected on NAVD
FND CPL	Toggles coupling to the navigation source selected on FND
F/TDN SAR Option	Fix and Transition Down. Transition to a hover at a preset height for a given marked location.
HT/HOV SAR Option	Adjust Hover height capture and hold. Adjust Hove speed capture and hold.

Reconfiguration Control Unit (RCU)

In case of failure, the crew can use the RCU to reconfigure all the sensors.

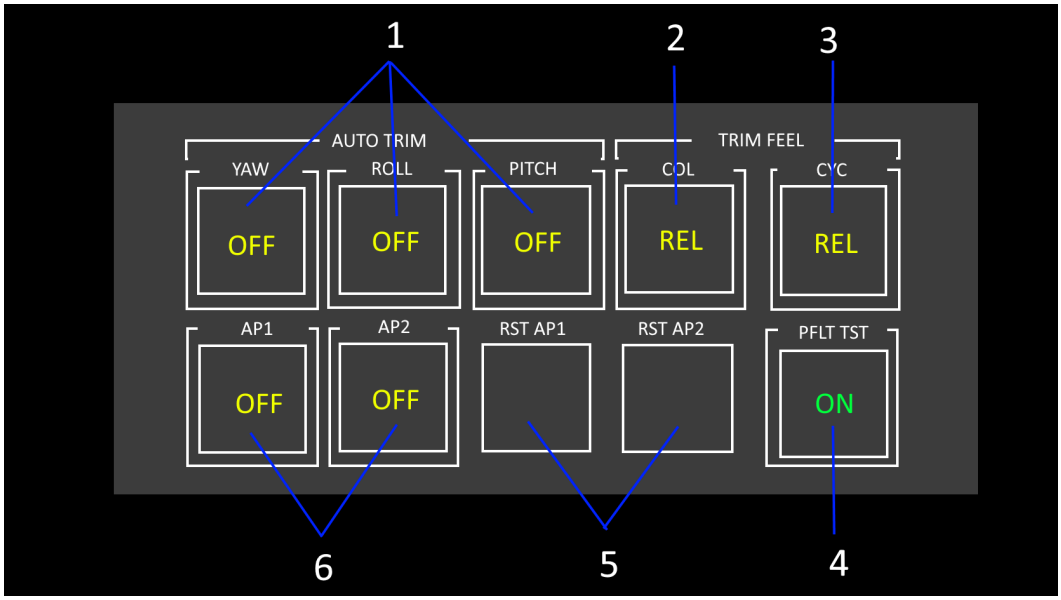


No.	Description
1	ON/OFF pushbutton: Switches on the AHRSs.
2	COMP pushbutton: Compensates the directional gyros.
3	TRUE/MG pushbutton: Selects true or magnetic heading.
4	Three-position HDG switch with two spring-loaded positions (LH and RH): Slews the DG heading in the desired direction (left or right).
5	DG/MG pushbutton: Toggle Directional Gyro or Magnetic Gyro mode.
6	Select the AMC Configuration: - N. Normal Operation. Copilot and Pilot use AMC1. Data comparison between AMC1 and AMC2.

	- 1. Both on AMC1. No data comparison - 2. Both on AMC2. No data comparison.
7	Select the ADC Configuration: - N. Normal Operation. Copilot uses ADC1 and the pilot uses ADC2. Data comparison between ADCs is active. - 1. Both on ADC1. No data comparison - 2. Both on ADC2. No data comparison. - BACK-UP. Both on ISIS ADC. No data comparison.
8	Select the AHRS Configuration: - N. Normal Operation. Copilot uses AHRS1 and the pilot uses AHRS2. Data comparison between AHRSs is active. - 1. Both on AHRS1. No data comparison - 2. Both on AHRS2. No data comparison. - BACK-UP. Both on ISIS AHRS. No data comparison.
9	Select the FCP Configuration: - N. Normal Operation. Copilot uses FCP1 and Pilot uses FCP2.. - 1. Both on FCP1. - 2. Both on FCP2.

AFCS Auxiliary Unit (AFCAU)

The AFCAU is used to enable or disable AFCS functions.



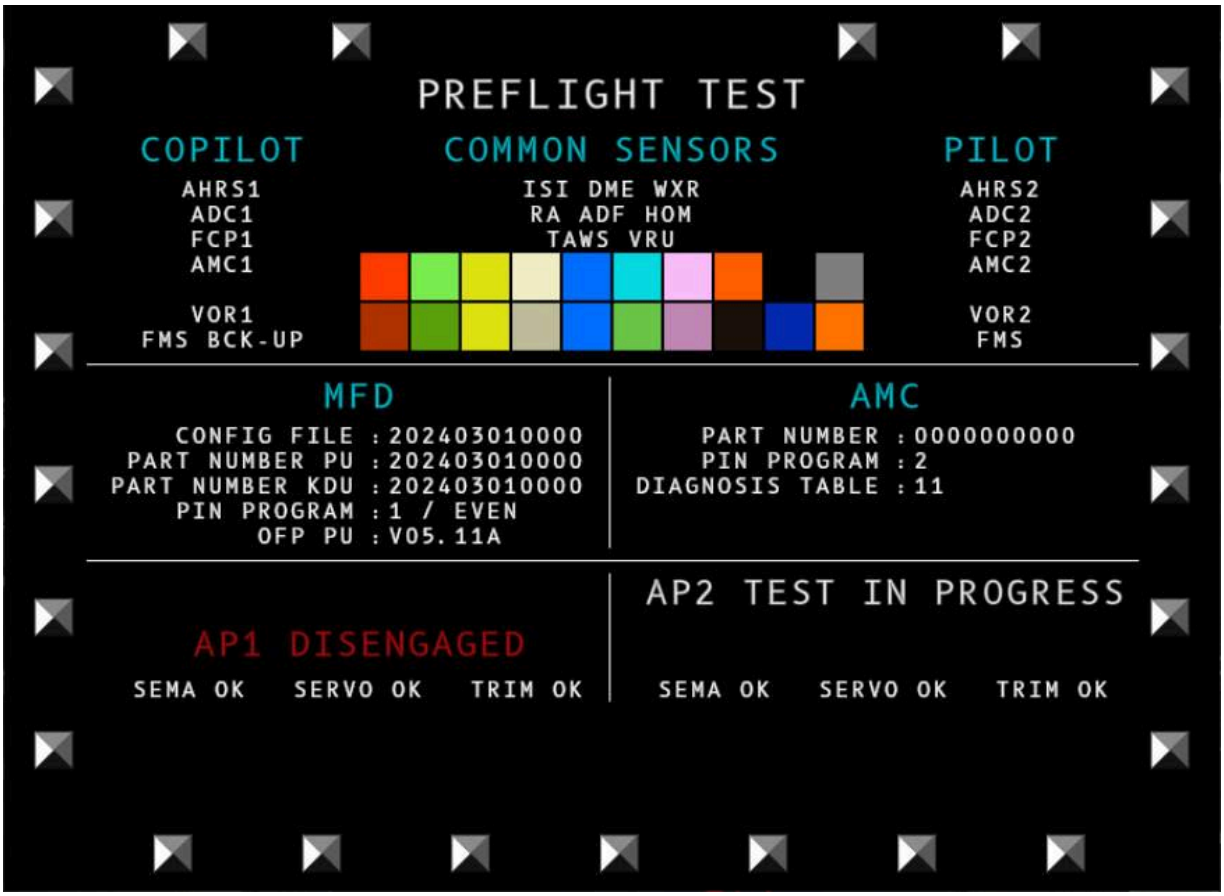
No.	Description
1	AUTO-TRIM pushbuttons: Inhibit the AP command signal output to the considered trim actuator on the yaw, roll and pitch axes. **OFF**: Auto trim is switched off for the relevant axis.
2	TRIM FEEL COL button: Releases the collective trim actuator anchoring. **REL**: Trim released on collective.
3	TRIM FEEL CYC button: Releases the cyclic trim actuator anchoring. **REL**: Trim released on cyclic.
4	PREFLIGHT TEST button: Initiates or cancels the preflight tests of the display system and the AFCS. **RUN**: indicates that the pre-flight test is in progress.
5	RST AP1 or RST AP2: Push to reset APM1 or APM2.
6	AP engagement. **OFF**: AP is switched off.

Auto-flight control system (AFCS)

The AFCS provides automatic flight control in the four axes of helicopter control. It operates in basic stabilization mode and higher level upper modes.

Pre-Flight Test

Activate the pre-flight test to verify equipment configuration and AFCS prior to flight.



- Activate the AFCS by pressing the **P.FLT** button on the AFCAU. Cancel the test by pressing the button again. The button will indicate **RUN** while the test is running.
- While active, all MFDs will be replaced with the pre-flight test page.
- APM1 and APM2 will be engaged in isolation and then verified in sequence.
- Once you see **AP TEST OK** for both sides, you may close the pre-flight test by pressing the **P.FLT** button again.

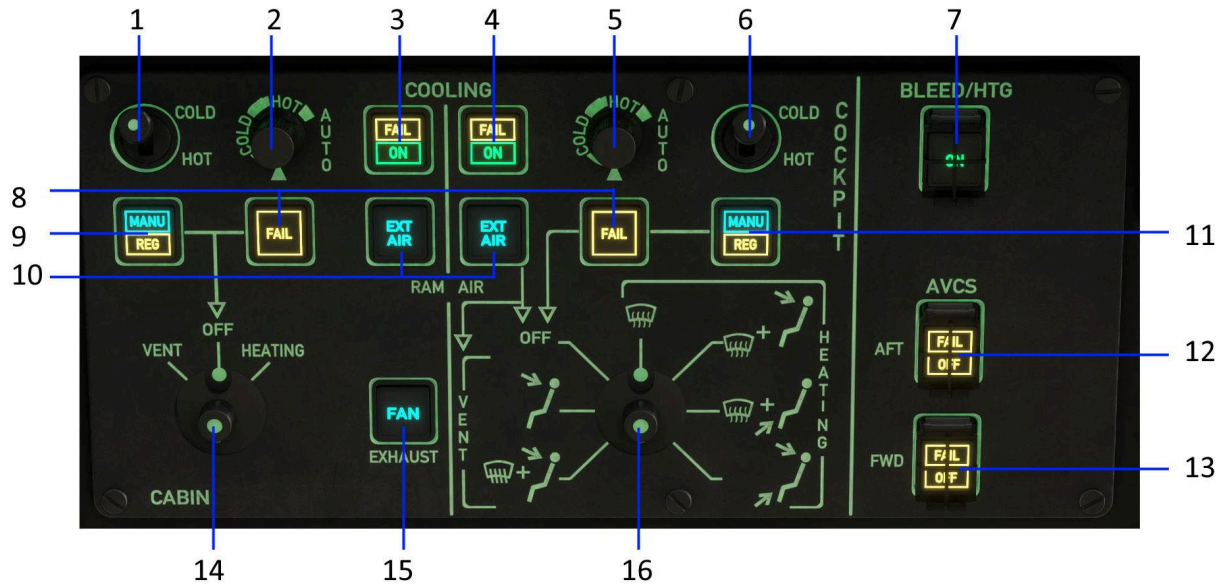
Item	Description
APi TEST IN PROGRESS	The APi test is in progress. Wait for competition.
APi TEST INTERRUPTED	APi test was interrupted by the crew.
APi DISENGAGED	APi is disengaged. This is expected when the system disengaged the AP which is not currently being tested
APi TEST OK	APi test was successful.
APi TEST FAILED	APi test failed.

NOTE: APi will be either AP1 or AP2.

Comfort System

The aircraft has heating, cooling, and ventilation systems for the cockpit and passenger cabin. The main controls are on the rear overhead panel. Air may optionally be ingested from outside and mixed with heated air before being delivered.

The engine P3 bleed valve is used to divert hot air through a heat exchanger.



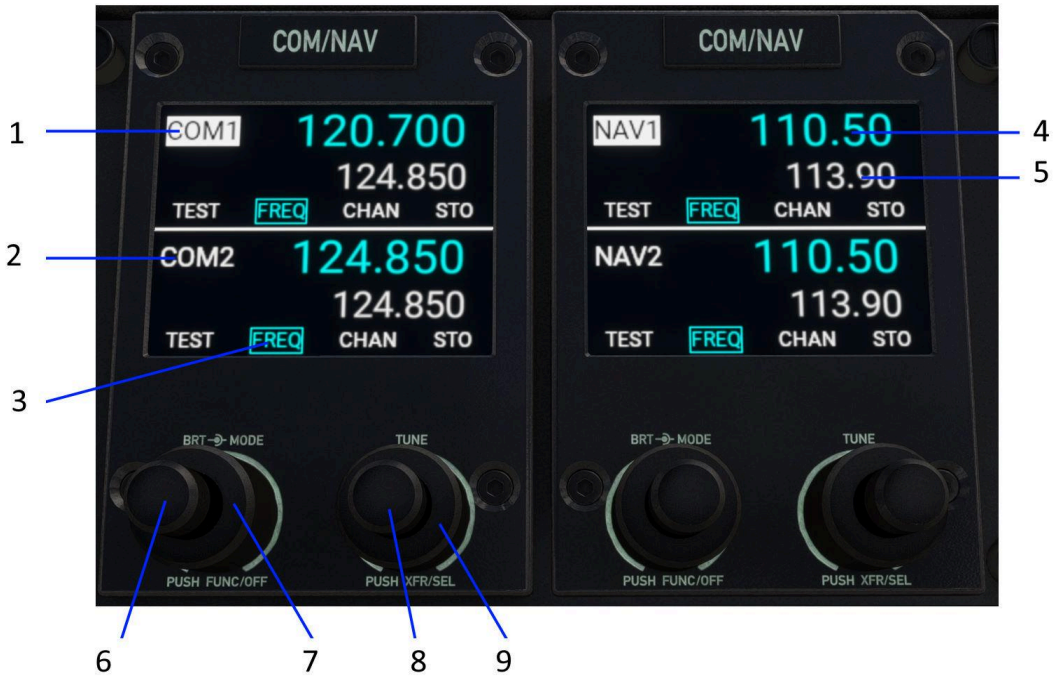
No.	Description
1	CABIN HOT/COLD Switch Unstable 3 position switch. Used to manually adjust the regulating valve.
2	Adjust cockpit temperature setpoint (or AUTO)
3	Press to toggle cabin Air Conditioning. ON: Cooling is activated FAIL: Failure of compressor, loss of power, lack of refrigerant.
4	Press to toggle cockpit Air Conditioning. ON: Cooling is activated FAIL: Failure of compressor, loss of power, lack of refrigerant.
5	Adjust cabin temperature setpoint (or AUTO)
6	COCKPIT HOT/COLD Switch Unstable 3 position switch. Used to manually adjust the regulating valve.
7	Toggle bleed heating after an OEI inhibition of P3 bleed valve (when performance margins are assured).

8	**FAIL**: Air mixture is above 90C or failure of N1 signal.
9	**MANU**: Manual regulation (1). **REG**: Air mixture >80C, manual regulation required.
10	Controls the cabin air inlet.
11	**MANU**: Manual regulation (6). **REG**: Air mixture >80C, manual regulation required.
12	Cabin AVCS (Active Vibration Control System) switch. **FAIL**: Major failure of the system. **OFF**: Switched off by the crew.
13	Cockpit AVCS (Active Vibration Control System) switch. **FAIL**: Major failure of the system. **OFF**: Switched off by the crew.
14	Cabin ventilation and heating selector
15	Toggles the spent-air extractor fan (exhaust)
16	Cockpit ventilation and heating position selector

COMFORT will illuminate on the Warning Caution panel when any amber light is illuminated on the comfort panel.

Tuning COM/NAV and ADF Radios

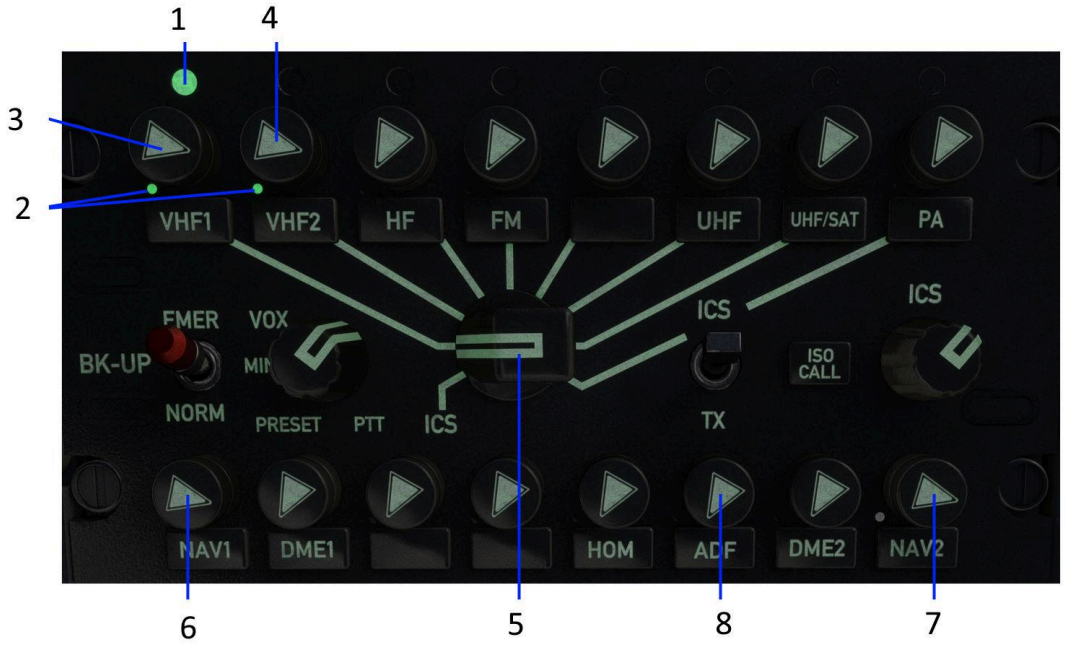
The COM, NAV and ADF radios have a dedicated tuning panel on the center console. The FMS is also able to tune and view the radio frequencies.



No.	Description
1	Selected (active) radio. Tuning and transfer will occur on the active radio standby frequency
2	Inactive radio
3	Active Mode *Only FREQ (frequency) mode is supported* **NOTE:** You may search and enter navaids by name via the FMS.
4	Active frequency
5	Standby frequency
6	**ROTATE**: Change display brightness **PUSH SHORT**: Change Function (Inop.) **PUSH LONG**: Toggle power ON/OFF
7	**ROTATE**: Change Mode. (Inop.)
8	**ROTATE**: Tune standby frequency (decimal part)

9	**ROTATE**: Tune standby frequency (whole part) **PUSH SHORT**: Transfer active and standby frequencies. **PUSH LONG**: Toggle active radio.

Audio Control Panel



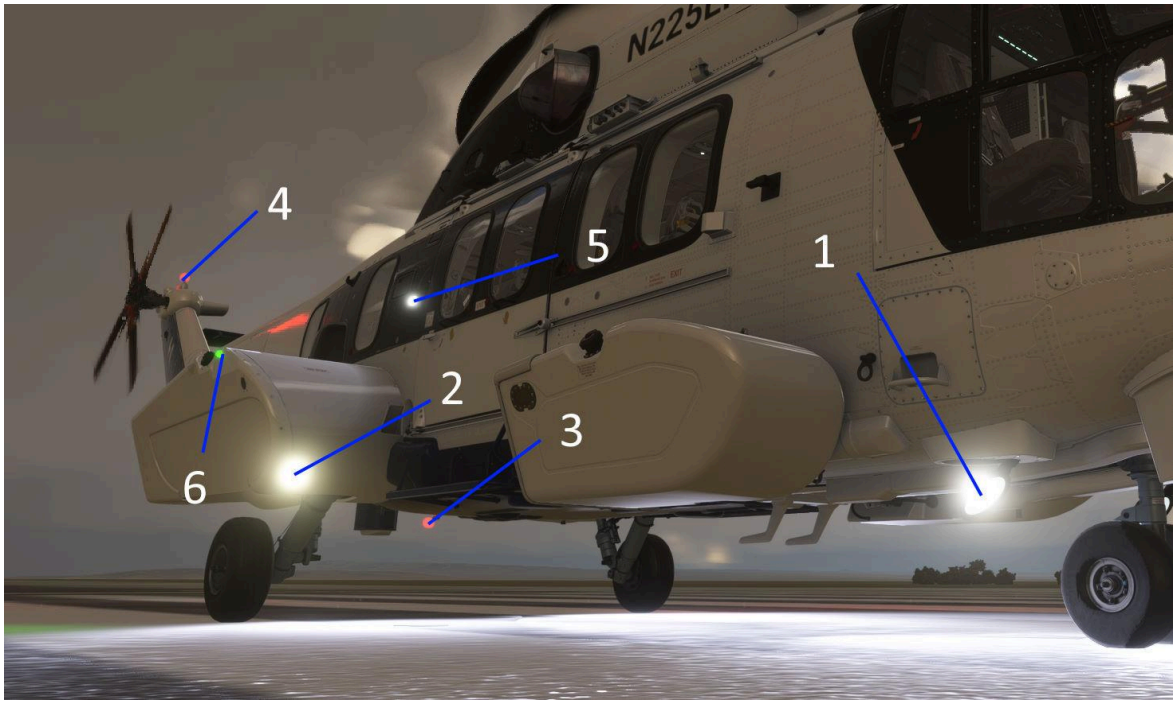
No.	Description
1	Transmitting status LED
2	Receiving status LED
3	COM1 Volume
4	COM2 Volume
5	Transmit selector (COM1 or COM2)
6	NAV1 Volume
7	NAV2 Volume
8	ADF Volume

Interior Lighting

Item	Description
COPILOT, PED, OVHD, PILOT	Integral panel (green) lighting. For simulation purposes, all are tied together.
COCKPIT	Main cockpit light. Neon tube light in the rear of the cockpit, providing ambient light
STORM LT	Storm Light. Used during storms to illuminate the center area to prevent fatigue from lighting strikes.
CABIN	Cabin lighting for the rear passengers. OFF/DIM/ON(HIGH).
EMERGENCY	Emergency exit lights. **OFF**: Lights will not activate **ARMED**: Lights will activate when a door opens or hard landing **ON**: Lights are on.
SAFETY BELTS	Fasten Seat Belt Signs for passengers in the rear cabin.
NO SMOKING	No Smoking Signs. Not Installed.
HEEL	Helicopter Emergency Egress Lights. Green lights which guide occupants to egress in case of a ditching.

Exterior Lighting

The aircraft has various exterior lights which are controlled from the cockpit.

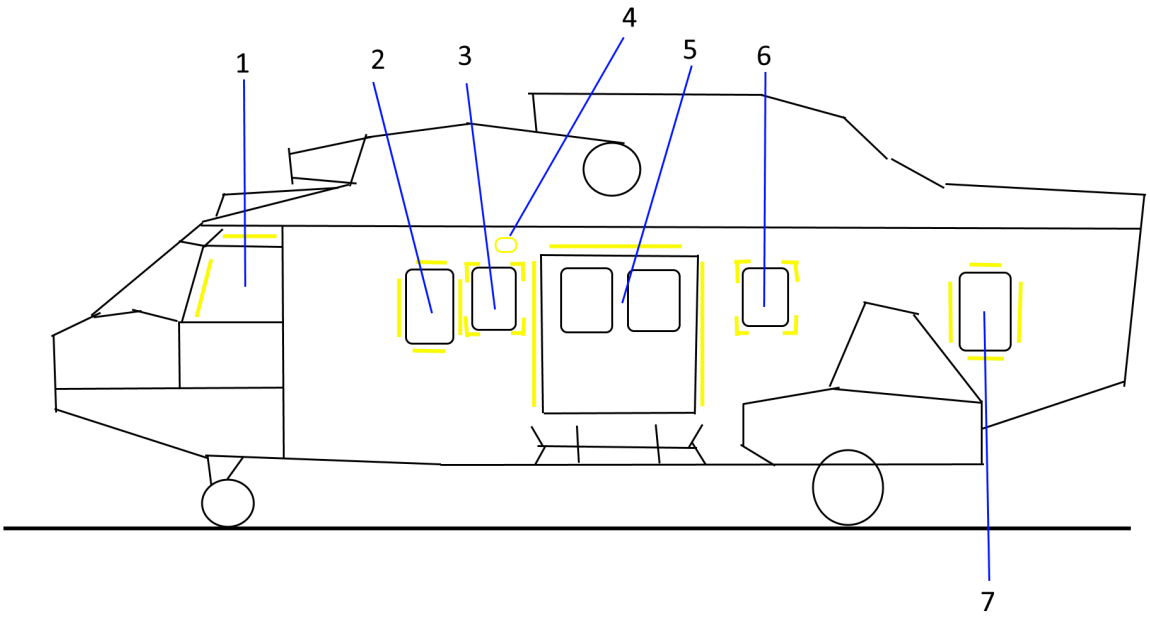


No.	Item	Description
3, 4	A.COLL	Anti-collision beacon. A red flashing light on the belly and tail of the aircraft. The BOTH position will also flash a white strobe light.
6	POS	Position (navigation) lights.

2	FLOODS	Lights forward of the rear sponsons, acting as further landing illumination.
5	DINGHY LT	Dinghy Light or life raft light. This light illuminates the aircraft near the doors and assists in passenger egress into life rafts after a successful ditching.
1	LANDING LTS	Landing light authority selector. This does not turn on or off the light. For sim use, click **LDG LT** light on the landing gear panel to toggle the landing light.

Helicopter Emergency Egress Lighting (HEEL)

The HEEL lighting is designed to provide light at the cabin emergency exits (windows and doors) and the cockpit doors in the event of immersion in water. The lights are bright green and assist people in escaping the aircraft after it has landed on and likely submerging.



The HEEL system consists of a series of lights and a self-contained battery.

No.	Description
1	Cockpit doors
2	Windows 1
3	Windows 2
4	Door jettison controls
5	Cabin plug doors
6	Windows 5
7	Windows 6

Activation

HEEL lights are operated by their switch on the Overhead Panel.

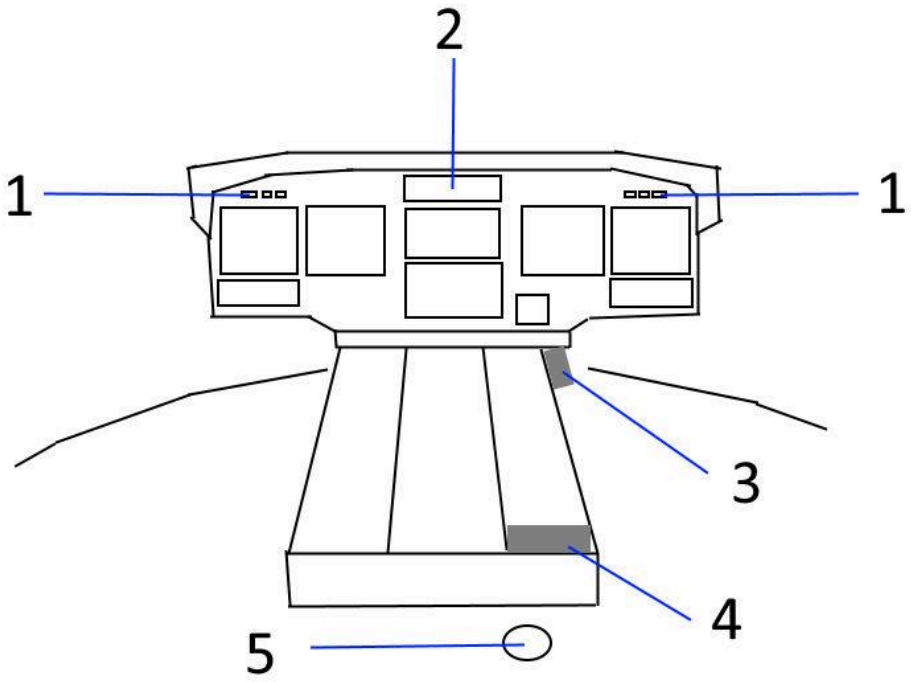
Switch Position	Function

OFF	Lights will not activate.
ARM	Upon immersion in water, the lights will automatically activate.
ON	Lights activate unconditionally, this is used for testing the lights.

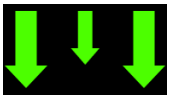
Landing Gear

The aircraft is fitted with retractable landing gear. The gear is hydraulically actuated, normally by the left system and optionally by an electrically driven emergency extension pump.

The landing gear is normally activated by the handle below and in front of the pilot collective.



Landing gear indications

No.	Item	Description
1	L/G (flashing) Instrument Panel	Landing gear is not down and aircraft speed is less than 60kt
2	GND/FLT Warning Caution Panel	Ground/Flight sensing logic fault
	PUMP Landing Gear Panel	Emergency extension pump is active
	 Landing Gear Panel	Landing gear is down and locked. One arrow corresponds to each wheel.

	Landing Gear Panel	Landing Gear is in transition, it is not currently either up or down nor locked.

Landing gear controls

No.	Item	Description
3	Landing Gear Panel	Forward and below the pilot collective
4	Parking Brake	Center Console
4	Emergency Extension	Center Console
5	Nose Wheel Lock	Aft of the center console

Multi-Purpose Air Intakes (MPAI)

The MPAI are installed forward of the engine intakes and provide two features:

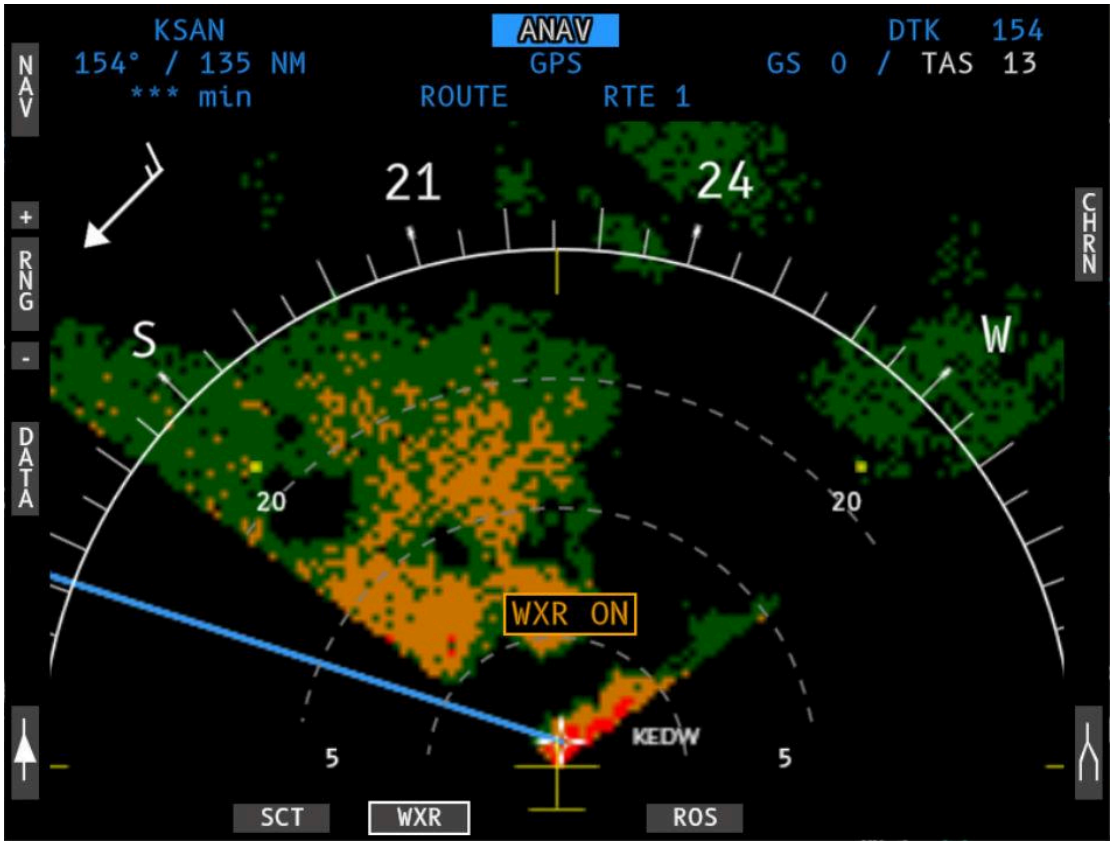
- Engine anti-icing via electric mats
- Air inlet filters (sand filters)

The MPAI panel on the Overhead Panel is used for monitoring and control.

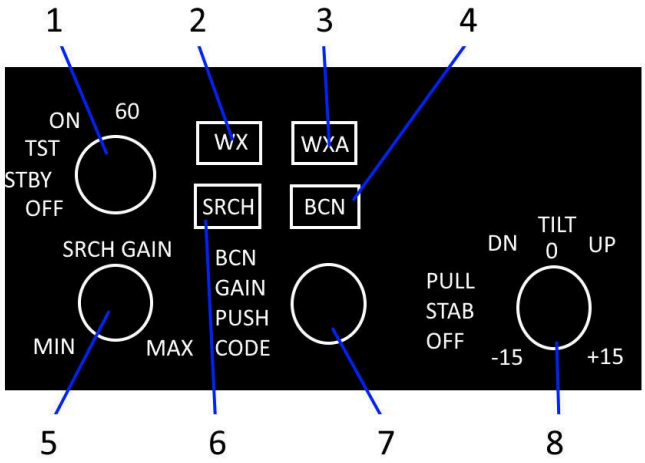
Item	Description
MPAI on WCP	A yellow light is illuminated on the MPAI panel.
FAN	Sand ejector fan is running.
BULL	Bullet circuit is powered and in motion.
RH or LH	Anti-ice is on for the specified side.
SAND FILTERS Switch	3 Stable positions: **AUTO L/G**: Filters enabled when L/G is down **OFF**: Filters never enabled **CONTINUOUS**: Filters always enabled **NOTE**: When filters are enabled, bullets will close.

Weather Radar (WXR)

This aircraft is equipped with weather radar which may be used to avoid flying into thunderstorms or other bad weather.



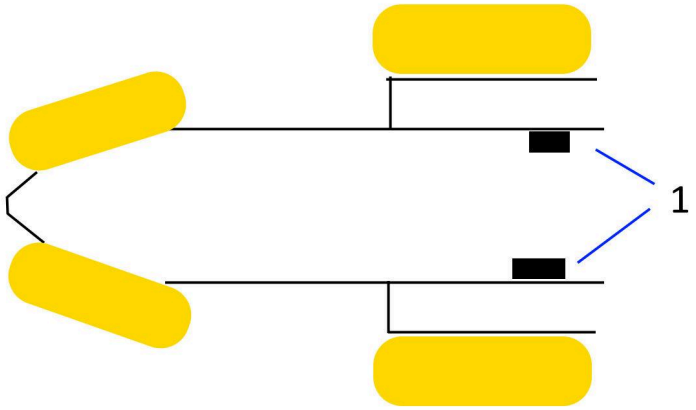
Item	Description
WXR Key	Toggle weather overlay on or off
WXR	Total failure of weather radar, or circuit switched off.
WXR ON	Radar is on while the aircraft is on the ground. **Switch the radar off to avoid injury to personnel working around the aircraft.**
WXR STANDBY	Radar is in standby mode.



No.	Description
1	Radar function selector with 5 states. **OFF**: Off **STBY**: Standby mode, for ground. **TST**: Radar system test **ON**: ON at 120 degrees angle **60**: ON at 60 degrees angle
2	Weather Mode
3	Weather+Alerting Mode *Altering mode not available in the simulator*
4	Beacon Mode *Beacon mode not available in the simulator*
5	Search Gain control. Used for manually setting the gain in search (SRCH) mode.
6	Search Mode button *Search mode not available in the simulator*
7	Selects the desired beacon code
8	Tilt control (of the vertical angle) *Tilt control not available in the simulator*

Emergency Floatation System

The helicopter is equipped with an emergency floatation system. The floats are designed to allow helicopter egress and may or may not keep the helicopter upright after a ditching.



Item	Description
1	Circuit breaker boxes

Restrictions

- The emergency floatation gear system must only be used for ditching.
- Normal landing on water is **prohibited**.
- Takeoff is prohibited after ditching
- With floats armed or inflated, VNE is limited to……150kt

The system is controlled by:

Item	Description
Float Control Panel	Arming and disarming of the system.
Collective control (both)	Inflate button
Water immersion sensor	Activities the floats when armed and actively sensing water

Indications:

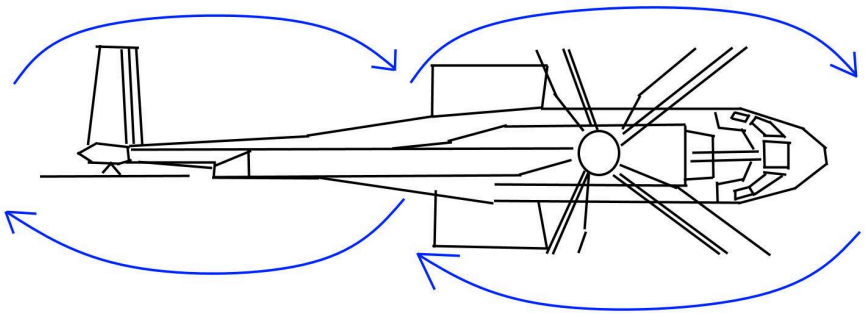
Item	Description
1 or 2	Float circuit is energized and will deploy when the inflate button is pressed or when the immersion sensor is activated.

Normal Procedures

Checklists are adapted from a real-life H225 operator and the H225 flight manual.

- Procedures marked as *memory* should be done from memory and without referencing the checklist card.
- Entries marked with **SUP** indicate reference to a procedure in the supplemental checklist section. Run the supplemental checklist (if applicable) and then return to the flow.

Pre-Flight Checks



Route of travel during pre-flight checks.

External Checks: 1. Head the aircraft into the wind. 2. Area around the aircraft ..... Clean, obstacle-free 3. RH air intakes ..... General check 4. RH Engine exhaust pipes .....Blanks removed 5. Main rotor blades (5)..... General check 6. RH side cowlings .....Locked 7. RH side landing gear ..... General check 8. RH side skin, cowling panels, Windows……..... General check 9. Fuel tank filler caps .....Closed and locked 10. RH fuel filters..... Check 11. Access panels/doors ..... Closed 12. RH side static .....Covers removed 13. RH side tail rotor guard ..... General check 14. Tail rotor blades ..... General check 15. Horizontal stabilizer..... General check 16. LH side tail rotor guard..... General check 17. SSB antenna ..... Check 18. LH side static.....Covers removed 19. LH side landing gear ..... General check 20. LH fuel filters ..... Check 21. LH side skin, cowling panels, Windows..... General check 22. LH side cowlings .....Locked	

23. LH Engine exhaust pipes ..... Blanks removed
24. LH air intakes ..... General check
25. Nose compartment..... Closed
26. Nose landing gear ..... General check

Internal Checks - Cabin:

1. Access doors .....Check
2. Fire extinguisher ..... In place, check
3. Emergency axe ..... In place
4. Oxygen equipment ..... In place, check
5. Electrical equipment rack panels .....Closed
6. Flight control rack .....Closed
7. Freight tied down .....Check

Internal Check - Cockpit:

1. Access doors .....Check
2. Autopilot filter .....Check
3. Flight control rigging holes..... Blanked off.
4. Fire extinguisher ..... In place, check
5. Stand by static port valves..... Set to NORMAL
6. Circuit breakers..... All set

Checks before starting engines:

1. Seats.....Adjusted, latched, checked
2. Pilot's seat armrests..... Raised
3. Pedals .....Adjusted
4. Harnesses.....Adjusted, secure.
5. Doors ..... Closed, locked.

Before Start

27. Parking Brake..... ON
28. Bake Accumulator..... CHECK
29. Circuit Breakers..... IN
30. General CUT-OUT Handles..... IN
31. Ventilation, Cooling, Heating..... OFF
32. AVCS..... ON
33. Mission Selector..... OFF
34. ALT, TRU's, Bus Tie..... On/Normal
35. Lighting Switches..... As Required
36. Training Idle Switches..... Normal/Guarded
37. Engine Control Switches..... Pin Removed
38. Engine Back-Up Switches..... Normal/Guarded
39. Fuel Shut-Off Switches..... Forward
40. Rotor Brake Lever..... Forward
41. Rotor Brake Arming Lever..... AFT/RB ARM
42. Pitot & Windshield heating..... OFF
43. Wipers..... Manual/OFF

44. Alternate Static 1 and 2……..……..……... Normal 45. Landing Gear……..…. Lever Down/Pin Removed 46. AP HYD Switches, Landing light switches……..… Normal/OFF 47. Radio, Navaids, Pressure Refuel switches……..…….. OFF	

Engine Start

1. Helmets/Headsets……..……. ON 2. If DC GPU is to be used……..…… PRESS ON 3. Battery Switch ……..…… ON/Check 25V 4. If Battery Start, MFDs & AHRS……..…….. OFF 5. Triple RPM…….....…….. Check FADEC Test Flag Removed 6. If AC GPU ……..……... Press ON 7. Chip Detectors ……..……. TEST 8. IGB/TGB ……..……. TEST 9. Engine & MGB Fire Warnings ……..…… LINE & FIRE TEST 10. Master Caution Panel……..…… TEST 11. VMS PERFPO Page ……..……... Enter Weight 12. VMS FADEC Page ……..… Record N1 and N2 Cycles 13. VMS NUM……..……. PRESS ON 14. C.FIRE……..……. TEST 15. Flight Controls……..……. CHECK 16. Cyclic……..…… CONFIRM CENTERED 17. Seatbelts……..……. ON 18. Doors……..…… CLOSED and LOCKED 19. All Booster Pumps……..……. ON 20. First engine…….. FLT (use IDLE below 10C) 21. Engine T's and P's……..……. CHECK 22. MFDs and AHRS……..…….. ON 23. NAVD MFD DATA……..... SELECT GWT 24. GPU Switch/Cord/Light……..….. PRESS OFF/Disconnect/OFF 25. A.PUMP & EMERG SUPPLY HTG ……..……. ON 26. OEI HI, LO, and CT……..…..… CHECK ALL, SET CT 27. Power Supply Panel……..……... CHECK 28. Second Engine……... IDLE 29. T's and P's……..… CHECK 30. NR ILS……... ON 31. Second Engine…… FLT (>10C)	**SUP #1** No Entry. **SUP #2** **SUP #3 (high wind)**

After Engine Start

1. NR ILS……..…. OFF 2. Engine Switches……. GUARDED 3. Rotor Brake Arm Lever…….. Forward/RB ARM 4. Heating, Ventilation, Cooling…….. TEST and SET 5. EMERGENCY & HEEL lights…… TEST and ARM As Required	**SUP #4**

6. Cabin & All Other Lighting……... As Required 7. Standby Compass……. Check Within 10 Degrees 8. Pitot & Windshield Heating…….. ON/As Required 9. Avionics & FMS……. ON 10. Radar Altimeter……..…... TEST, ON 11. Booster Pumps…….. TEST, ON 12. Fuel Panel…….. TEST 13. AFCS P.FLT……... TEST 14. AP2 and then AP1…… ON 15. Avionics……. TEST and SET 16. Altimeters & ISIS……. SET 17. TAWS and ACAS…… SET 18. Clocks……... SET 19. ANTI-ICING/MPAI…… TEST/SET (Anti-Icing ON below +5C) 20. Doors/Cowlings…… CLOSED/LOCKED/DOOR 21. Cabin, Pax, Ground Crew, Chocks……... SECURE/CLEAR	**SUP #5** **SUP #6** **SUP #7** **SUP #8**

Before Taxi

1. VMS PERFPO……. Update As Required 2. WCP, T's & P's……. CHECK 3. Fuel Quantity……. CHECK 4. Parking Brake…….. OFF 5. Nose Wheel……... UNLOCKED	

Before Takeoff

1. Takeoff & Departure Briefing……... COMPLETE 2. VMS PERFPO Page ……. Update As Required 3. Heater Switches…….. OFF 4. WCP, T's & P's ……. CHECK 5. Upper Modes ……. Set As Required 6. Fuel Quantity……. CHECK 7. Fuel Transfer/Auto Transfer……. OFF/OFF 8. Transponder……. ALT 9. Nose Wheel…….. LOCK 10. Parking Brake …….. As Required	

Hover *(Memory)*

1. FLI Power Margin……. Announce 2. WCP, T's & P's…….. CHECK 3. Flight Instruments……. CHECK	

After Takeoff/Go Around

1. Landing Gear……..….. UP 2. WCP, T's & P's…….…. CHECK 3. Upper Modes……. VERIFY As Required 4. WX Radar…… ON As Required	

Cruise

1. Cruise Power……... SET 0.7 below MCP 2. ENG Anti-Icing …….. ON when below +5C 3. Fuel (Every 30 Minutes) …….. CHECK/Transfer As Required 4. Engine Power Check …… Complete As Required	

Before Landing

1. Landing Gear Lever……... DOWN 2. Avionics …….. Set As Required 3. Landing Briefing……..…. Complete 4. Landing Gear ……..… Check Down, 3 Green 5. Fuel Transfer & Auto Transfer ……..... OFF/OFF 6. Heater …… Switches Off 7. WCP, T's & P's ……..…. CHECK 8. Parking Brake …….. As Required 9. Crew, Pax, Cargo ……..… SECURE	

Final Landing Checks *(Memory)*

1. Landing Gear …….. Check Down, 3 Green 2. WCP, T's & P's ……. CHECK 3. Parking Brake …….. As Required 4. Landing Clearance……. Received	

After Landing

1. Nose Wheel……. UNLOCK As Required 2. WX Radar……. STANDBY	

Shutdown

1. Parking Brake ……... ON 2. Flight Controls ……... Neutral	

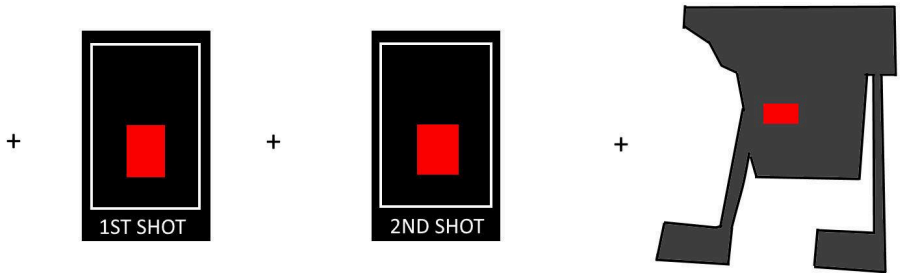
3. Collective Lock ..... ON 4. Engine Rinse/Wash/Dry..... As Required 5. AP1 & AP2 ..... OFF 6. A.PUMP and EMERG SUPPLY HTG ..... OFF 7. Sub-panel ..... All Switches OFF 8. Avionics, Traponder, Radio Altimeter, Radar..... OFF 9. Booster Pumps..... OFF 10. Landing Light ..... OFF 11. Ventilation, Cooling, Heating ..... OFF 12. Anti-Ice ..... OFF 13. Engine Control Switches..... IDLE 1 second, then OFF 14. MFDs and AHRS ..... OFF As Required 15. Rotor Brake Arm Lever ..... AFT/**RB ARM** 16. Rotor Brake Lever ..... NR < 45%, APPLY 17. All Lighting Switches ..... OFF 18. Engine Safety Pins..... Install 19. VMS FADEC Page ..... Record N1/N2 Cycles 20. FMS ..... Record Flight Data/OFF 21. M'ARMS Data Transfer ..... DONE 22. BATT Switches ..... N1<5%, OFF 23. EMER BAT ..... Check **FLOW** 24. Chocks, Covers, Visual Post Flight..... IN/Complete	

Supplemental Procedures

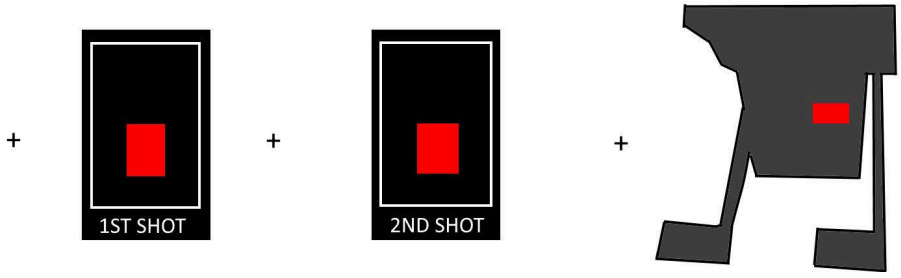
1. Engine & MGB Fire Detection Tests

Engine FIRE EXTINGUISHER circuit test:

1. ENGINE 1 - FIRE SIMU.....PRESS
   WARN + **FIRE 1** + Aural



2. ENGINE 2 - FIRE SIMU.....PRESS
   WARN + **FIRE 2** + Aural



3. ENGINE 1 - LINE TEST .....PRESS
   CAUT + **FIRE DET**
4. ENGINE 2 - LINE TEST .....PRESS
   CAUT + **FIRE DET**

MGB FIRE DETECTION circuit test:

5. MGB FIRE DETECTION 1 .....TEST FIRE
   WARN + **MGB FIRE 1** + Aural
6. MGB FIRE DETECTION 2 .....TEST FIRE
   WARN + **MGB FIRE 2** + Aural
7. MGB FIRE DETECTION 1 .....TEST LINE
   CAUT + **FIRE DET**
8. MGB FIRE DETECTION 2 .....TEST LINE
   CAUT + **FIRE DET**

2. Flight Controls Check

1. A.PUMP…… ON (Check Pressure) 2. AP HYD Switches …….. OFF 3. Collective Lock ……..…. OFF 4. All Controls ……..... Free Travel 5. AP HYD Switches …… ON 6. Collective Lock …… ON 7. Pedals ……. Neutral 8. AP 1 or 2 ……... ON 9. Cyclic Centering Button …….. PRESS 10. Cyclic ……. CENTERED 11. AP 1 or 2 ……. OFF 12. A.PUMP …….. OFF	

3. High Wind Start

1. A.PUMP…….. ON 2. Rotor Brake Lever ……..... DYNAMIC POSITION (21LB) 3. RB ON …….... ILLUMINATED 4. Static Braking Enable Lever …… 150LB 5. Rotor Brake Lever ……..... STATIC POSITION (150LB) 6. Engine Control Switch …….. FLT or IDLE As Required a. Abort start if rotor turns before IDLE b. Do not run engine >5MIN with rotor brake applied c. Release rotor brake and continue start at IDLE 7. Rotor Brake Lever ……. FORWARD 8. Continue Checklist ……... ENGINE START ITEM 21	

4. Heater Test

1. Cockpit Switch…… OFF 2. Cabin Switch……... HEATING / [X] ON 3. Cabin Heat…… CHECK 4. Cabin Switch …….. VENT / [X] OFF 5. Cockpit Switch…… HEATING / [X] ON 6. Cockpit Heat…….. CHECK 7. Switches Set…….. As Required	

5. Radio Altimeter Test

1. Set DH (Both Sides)..... 50’ 2. RADALT Test Toggle Switch……... MOVE TO 1 and HOLD 3. Indications…….. CONFIRM for LHP 4. RADALT Test Toggle Switch……... MOVE TO 2 and HOLD	

5. Indications…….. CONFIRM for RHP	

6. Booster Pump Test

Conduct once for ENG1 and again for ENG2.

1. Both Pumps……... ON 2. No 1 Pump ……... OFF (Pressure >0.5bar) 3. No 2 Pump….. OFF (FUEL on WCP and PRESS on fuel panel) 4. No 1 Pump……..… ON (FUEL and PRESS, Pressure >0.5bar) 5. Both Booster Pumps……..... ON	

7. Pre-Flight (P.FLT) Test

1. Collective Lock……... OFF 2. Controls……... Neutral 3. AP1 and AP2……..…. OFF 4. P.FLT TEST Button……..….. PRESS ON 5. MFD Test Pages……..…. DISPLAYED 6. Flight Controls…….. CHECK MOTION 7. AP2 and AP1……CHECK TEST OK 8. P.FLT TEST Button……...….. PRESS OFF 9. Collective Lock……..…. ON	

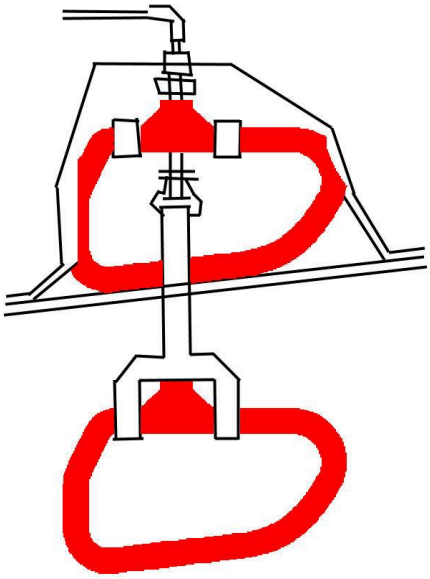
8. Anti-Icing / MPAI Test

1. LH and RH anti-icing push buttons……..... ON 2. LH and RH lights……..… ILLUMINATED 3. Sand Filter Switch……..…. OFF 4. LH and RH anti-icing push buttons….. PUSH OFF / LH and RH 5. Bullets……..…. Check OPEN 6. Sand Filter Switch……..…… Continuous 7. Bullets……..…. Check CLOSED 8. Sand Filter Switch……...… Auto L/G 9. Bullets……..…. Check OPEN then CLOSED 10. Switches Set……..…. As Required	

Emergency Procedures

Use of General CUT-OUT Handles

The General CUT-OUT handles are located above each pilot's head and are to be used only when on or close to the ground in the event of a hazardous landing.



Activating either handle (by pulling down) shuts off both engines and cuts off all electrical consumers except:

- Engine fire extinguishing system
- Cockpit utility lights
- Emergency Floats
- Standby instruments
- Emergency Exit Lights
- Triple RPM indicator

Use of the Electrical Emergency Cut-Off Gang Bar

Pulling the emergency cut-off gang bar forward will cut off:

- The main battery
- ALT1 and ALT2
- Isolate all consumers except those directly connected to the hot battery bus
- EMERG BAT ……..…… FLOW

Flight Management System Supplement

CMA9000 System Overview

The CMA9000 is a capable FMS for rotorcraft and fixed-wing aircraft.

Display Function Buttons

The FMS has 6 Line-Select keys on the left and right side of the screen. These correspond to the functions labeled next to the key.

LSK1 LSK2 LSK3 LSK4 LSK5 LSK6		RSK1 RSK2 RSK3 RSK4 RSK5 RSK6
	SCRATCHPAD LINE	

Text entered on the FMS is entered into the **scratch pad**, which is the line at the bottom of the screen. This text can be modified by typing and then entered into a field by selecting the adjacent Line Select Key.

Keypad Function Buttons

No.	Description
1	**FAIL** Major system failure.
2	**MSG** Alert-level system message is currently visible in the scratchpad
3	**POS** FMS is operating in dead-reckoning mode (without GPS position)
4	**OFST** Parallel track (OFFSET) is currently active.
5	**NPA** Non-precision approach (NPA) is currently active.
6	**GSM** Incoming call on the GSM network
7	**SMS** A Short Message Service (SMS) message has been received.

8, 9	**PREV** and **NEXT** buttons. Move forward or backward within the set of pages available for the current view. Page number is shown in the upper right corner **1/N**
10	MENU: Access to the MCDU menu
11	**EXEC**: Execute unsaved changes and make them active.
12	Unsaved changes are present that need to be executed to become active. Press EXEC to save the changes once they are verified, or find the **DELETE** or **CLEAR** button on screen to undo the changes.
13	**BRT**: Change screen brightness.
14	**RADIO**: Access the **RADIO** page.
15	**FUEL**: Access the **RADIO** page.
16	**MARK**: Save the current aircraft position for later navigation. **NOTE**: After marking, **PREDEF WPT** page is displayed.
17	**HOLD**: Access the **HOLD** page.
18	**FIX**: Access the **FIX INFO** page.
19	**INIT/REF**: Access the **INIT/REF INDEX** page.
20	**RTE**: Access the **ROUTE** page.
21	**DEP/ARR**: Access the **Departures & Arrivals INDEX** page.
22	**LEGS**: Access the **LEGS** page.
23	**PROG**: Access the **PROGRESS** page.
24	**CLR:** Clear key. Clears one character at a time from the scratchpad. When the scratchpad is empty, it will insert **DELETE** into the scratchpad, which can be used to remove items (e.g. remove entries from the legs page.)
25	**L1, LSK1**: Left 1 Line. Left Select Key 1.
26	**L2, LSK2**: Left 2 Line. Left Select Key 2.
27	**L3, LSK3**: Left 3 Line. Left Select Key 3.
28	**L4, LSK4**: Left 4 Line. Left Select Key 4.

29	**L5, LSK5**: Right 5 Line. Left Select Key 5.
30	**L6, LSK6**: Right 6 Line. Left Select Key 6.
31	**R1, RSK1**: Right 1 Line. Right Select Key 1.
32	**R2, RSK2**: Right 2 Line. Right Select Key 2.
33	**R3, RSK3**: Right 3 Line. Right Select Key 3.
34	**R4, RSK4**: Right 4 Line. Right Select Key 4.
35	**R5, RSK5**: Right 5 Line. Right Select Key 5.
36	**R6, RSK6**: Right 6 Line. Right Select Key 6.

Execute Function

Modifications to the active flight plan will require EXEC to be pressed, the corresponding green light will be illuminated when there are unsaved changes to the active flight plan.

Flight Plan Functions

Entering origin and destination airports

1. Open the ROUTE page by pressing the **RTE** button.
2. Key the origin airport into the scratchpad such as **KSEA**. Select **LSK1** to insert it.
3. Key the destination airport into the scratchpad such as **KPAE**. Select **RSK1** to insert it.
4. Select **EXEC** to save the changes.
5. Open the MFD **NAVD** page and observe a direct route between KSEA and KPAE.

Add En-route legs

1. Open the LEGS page by pressing the **LEGS** button.
2. Enter a waypoint such as **ROESH** in the scratchpad
3. Press LSK1 to sequence the new waypoint ahead of **KPAE**. Waypoints are sequenced prior to the selected waypoint entry location.
4. Press **EXEC** to save the changes, and observe the new route on **NAVD**.

NOTE: Use the **CLR** key to enter DELETE into the scratchpad, which can be used to remove a single waypoint. Additionally you may “move up” a waypoint to remove one or more waypoints.

Selecting Departure procedures

1. Open the DEPARTURES/ARRIVALS INDEX by pressing the **DEP/ARR** button.

2. Select **DEP** under RTE 1
3. On the departures page, select a runway such as **34C** and a departure procedure such as **ISBERG1**. Select a departure transition if applicable.
4. Press **EXEC** to save the changes, and observe the new route on **NAVD**.

NOTE: You may also enter the runway on the ROUTE page.

Selecting Arrival and Approach procedures

5. Open the DEPARTURES/ARRIVALS INDEX by pressing the **DEP/ARR** button.
6. Select ARR under RTE 1
7. On the arrivals page, select an approach such as **RNAV RW34L** and an arrival procedure and transition if applicable.
8. Press **EXEC** to save the changes, and observe the new route on **NAVD**.

Autopilot navigation following the flight plan

1. On NAVD or FND, press the **NAV** button to cycle through sources. Select the FMS source
2. Press the **CPL FND** or **CPL NAVD** button on the Flight Control Panel (FCP) to begin navigation

NOTE: The source must remain visible for the AFCS to continue following that navigation source.

Aircraft Functions

Find nearby airports and Navaids

1. Select INIT/REF, then NEAREST, then AIRPORT or VHF/NAV
2. Wait for the data to load
3. A list is presented of the nearest 50 airports or navaids

Tune COM1 or COM2 radio

1. Open the **RADIO** page by pressing the **RADIO** button.
2. Key in a new frequency in the scratchpad, such as 121.70
3. Select RSK1 or RSK2 for COM1 or COM2
4. The frequency will be entered into the standby slot, press the same SK a second time to swap it to the active frequency.

Tune NAV1 or NAV2 radio

5. Open the **RADIO** page by pressing the **RADIO** button.
6. Key in a new frequency in the scratchpad, such as 116.80

7. Select RSK3 or RSK4 for NAV1 or NAV2
8. The frequency will be entered into the standby slot, press the same SK a second time to swap it to the active frequency.

Enter transponder code

1. On the **RADIO** page, enter the new 4-digit transponder code
2. Press RSK4 to enter the code into the standby slot
3. Press RSK4 again to swap the active and standby slots

Turn transponder ON and OFF

4. On the **RADIO** page, Select the **ATC** menu at RSK5.
5. Press RSK3 to cycle between transponder states. Press RSK2 to toggle MODE C reporting.

Advanced Functions

Mark on top (create waypoint)

1. Press the MARK button as you overfly a location
2. The PREDEF WPF page will open with the MARK position indicated
3. Press RSK1 to copy the position to the scratchpad
4. Create a new user waypoint by clicking NEW USER WPT
5. Enter the position into LSK2
6. Enter an identifier into RSK1
7. SAVE to save the waypoint to the user database

NOTE: View the PREDEF WPT page without marking a new position, by using INIT/REF -> WPT LISTS -> PREDEF WPT to access the page.
NOTE: The JOYSTICK position is the DMAP cursor and may also be used to easily create new user waypoints.

Enter PlaceBearing/Distance waypoint

You may create a new fix based on an existing fix and a bearing/radial and distance.

A fix may be entered with a bearing and distance such as:
`KSEA000/10` Fix: KSEA with Bearing: 000 and Distance 10 NM
`KSEA180/10/R` Fix: KSEA with Radial: 180 and Distance 10 NM

After creation, the waypoint will be visible with an incrementing identifier, such as **`KSEA01`**

Enter or modify a holding pattern

Enter /H into the scratchpad on the LEGS page, then select a waypoint. This will promote the waypoint to a hold and display the HOLD page. On this page you may select the hold details such as Right or Left turns, leg time and the inbound course. Use EXEC to save the changes.

Enter / into the scratchpad to clear the hold procedure from a given waypoint.

Enter or modify a search pattern (SAR)

1. Enter /S into the scratchpad on the LEGS page, then select a waypoint. This will promote the waypoint to a search pattern and display the SEARCH PATTERN page.
2. Enter the pattern details such as the type, leg length and track spacing. Select between Square, Ladder or Sector patterns
3. Press **ACTIVATE** to save into the modified flight plan. You may check the results on NAVD.
4. Press **EXEC** to commit the changes to the active flight plan.

Enter / into the scratchpad to clear the SAR procedure from a given waypoint.

Editing the Company Database

The Company Database may be edited at the following location:
`Community\hpg-airbus-h160\\html_ui\HPGH160-System\CMA9000\COMPANY_DATABASE.json`

Company database contains:

- Routes with origin, destination and en-route waypoints as they would be entered on the LEGS page.
- Custom waypoints
- Information for the IDENT page

Editing the User Database

The user database is created automatically but may be edited by the user if needed.
The location for Windows Store is:
`%LocalAppData%Packages\Microsoft.FlightSimulator_8wekyb3d8bbwe\LocalState\packages\microsoft-aircraft-ah225civil\work`

The structure and information contained is identical to the Company Database.

Select flight plan from company route list

1. From the ROUTE page, select **CO ROUTES**
2. Select from the list of routes

3. The route will be applied immediately, **!WAIT** will be displayed multiple times while looking up data. You may be asked to disambiguate waypoints.
4. Press **EXEC** to commit the changes to the active flight plan.

NOTE: Company database must be installed.