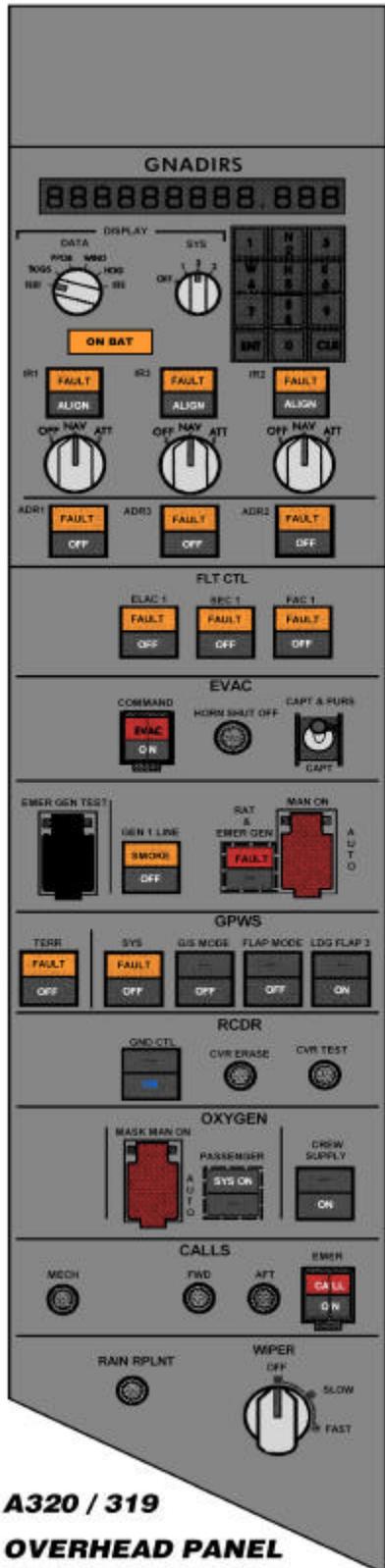


AIRCREW TRAINING SOLUTIONS



Airbus A320 & A319 Study Guide ©



**A320 / 319
OVERHEAD PANEL**

Overhead Panel - Part 1

1) ON BAT LIGHT

The aircraft batteries are powering one or more ADIRU. When power is lost, ADIRU's 2 & 3 will remain ON BAT for 5 minutes, to retain alignment data while generator power can be restored. ADIRU 1 or whichever unit the captain has selected will remain ON BAT until generator power is restored.

2) IR LIGHTS

FAULT - (Flashing FAULT) ATT & HDG may be recoverable.
(Steady FAULT) Fault in IR unit, and is not recoverable.

ALIGN - (Flashing) Alignment fault, No present position entered within 10 minutes or 1° LAT/LONG difference between its last known position.

Note: A dual IR failure will increase landing distance. IR's supply antiskid with deceleration info. Dual IR failure limits the deceleration rate to 5.6 fps².

IR supplies: HDG, ATT, and VS to PFD

ADR supplies: AS, ALT, and backup VS to PFD

The **A320 & A319** have the capability to incorporate GPS inputs to the GNADIRS.

3) NAV SELECTOR

NAV - Normal position for alignment and navigation. Full alignment requires 7-10 minutes. Fast alignments take 3 minutes. A fast alignment may be accomplished only if the IR's have been previously aligned. Fast alignment is accomplished by selecting each IR to OFF then ON within 5 seconds and entering a new present position.

ATT - Used to retain attitude & heading information when IR has faulted

4) ADR P/B

FAULT - Failure of the Air Data Reference system.

OFF - When pressed to **OFF** Air data output is disconnected

5) **GEN 1 LINE P/B**

OFF - Generator 1 Line contactor opens. #1 fuel pump in each wing tank is powered from the generator 1 feeder

SMOKE - Smoke is detected in the avionics ventilation duct

EMERG GEN TEST P/B

This test is normally performed by maintenance. Tests the emergency generator without deploying the RAT.
5 KVA 115/200V 400Hz utilizing the blue hydraulic system.

7) **RAT/EMERG GEN FAULT LIGHT**

FAULT - Emergency generator is not supplying power when:
AC Buses 1&2 are not powered and the **nose landing gear is up**.

A319 - AC Bus 1&2 are not powered, Emergency generator is not supplying power, nose landing gear **extended or retracted**.

8) **EMERG GEN P/B**

AUTO - RAT extends when AC Bus 1&2 are not powered, and airspeed is above 100 knots, **with the nose landing gear up**. The emergency generator, powered by the blue hydraulic system, will couple within 3 seconds if all parameters are normal. The emergency generator will provide electrical power until approximately 140 knots.

A319- RAT extends when AC Bus 1&2 are not powered, **regardless of nose landing gear position**. The **A319** RAT is more efficient. Therefore, the RAT will remain online and provide power (including the shed buses) until approximately 125 knots.

RAT MAN ON - RAT is manually extended. Emergency generator coupling will occur if nose landing gear is retracted.

A319- Gear position is not part of the logic.

9) **TERR P/B**

FAULT - Fault detected in the EGPWS terrain awareness display (TAD) and or terrain clearance floor (TCF) functions. Aircraft relative height (for TAD) is computed using the captains barometric setting and does not have protection for barometric setting errors. TAD and TCF functions utilize FMGC 1 position and offer no protection against position errors.

OFF - EGPWS functions are disabled.

Note: EGPWS display is not available in either the plan mode or while WX radar is displayed.

10) **SYS P/B**

OFF - All GPWS warnings are inhibited

FAULT - GPWS malfunction. All warnings are inhibited

11) **G/S MODE P/B**

OFF - Mode 5 (*Glideslope*) warning is inhibited

12) **FLAP MODE P/B**

OFF - Mode 4 (*Too Low Flaps*) warning inhibited

13) **LDG FLAP 3 P/B**

ON - Mode 4 warnings for Flaps 3 are inhibited. Used when selecting Flaps 3 as the landing configuration. E.g. Single-engine approach, Wind shear and Direct law approaches.

GPWS Modes

Mode 1 = Excessive descent rate	<i>"Sink Rate"</i>
Mode 2 = Excessive terrain closure	<i>"Terrain, Terrain"</i>
Mode 3 = Altitude loss after T/O	<i>"Don't Sink"</i>
Mode 4 = Unsafe terrain clearance	<i>"Too Low Flaps"</i>
Mode 5 = Excessive GS deviation	<i>"Glideslope"</i>

14) **RCDR GND CTL P/B**

AUTO - CVR and DFDR are energized automatically:

- For 5 minutes after initial aircraft power up
- After an engine is started
- In-flight
- CVR and DFDR remain powered for 5 minutes after engine shutdown

ON - CVR and DFDR are energized. The ON light will extinguish after engine start.

15) **CVR ERASE** (*Pressed for two seconds*)

Erases tape when:

- Aircraft is on the ground
- Parking brake is set

16) **CVR TEST** (*Pressed and held*)

Test is activated if RCDR GRD CTL switch is ON and the parking brake is set. A low frequency tone is heard if a headset is plugged in to the CVR test jack on the overhead panel.

17) **OXYGEN MASK P/B**

AUTO - Masks deploy when cabin altitude exceeds 14,000 ft + 0 /-500 ft and a pre-recorded message plays in the cabin. Chemical generators supply Pax O₂ for 13 minutes.

MASK MAN ON - Manually deploys Pax O₂ masks. No automatic pre-recorded cabin message will play.

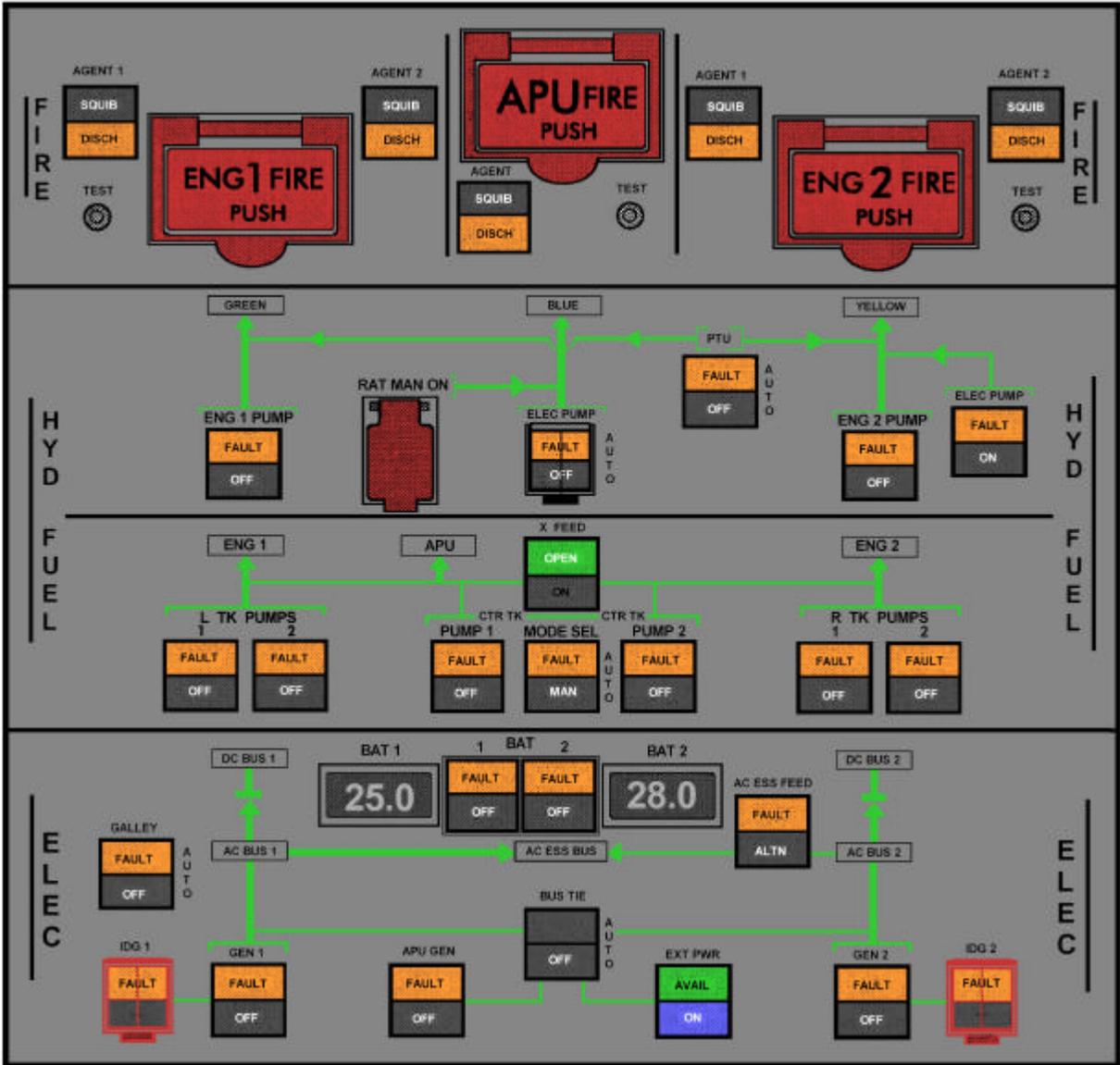
18) **PASSENGER**

SYS ON - Illuminates when control of the O₂ mask doors is actuated and remains on until The TMR RESET P/B on the overhead panel is activated

19) **CREW SUPPLY**

ON - Valve is open, low-pressure oxygen supplied to cockpit
During preflight minimum of 1000 psi on door page

OFF - Manually closes O₂ supply valve



Overhead Panel - Part 2

1) ENGINE FIRE P/B

ILLUMINATED - Engine fire warning activated. Dual gas loops are located in the Pylon, Fan and Core sections. With an inoperative loop, the system will reconfigure to a single loop operation. Losing both loops within 5 seconds will cause a FIRE warning. (Burn through theory)

PUSH -

- Cancels aural warning
- Arms squibs
- Closes LP fuel valve, including the IDG cooling return line
- Closes Hydraulic fire valve
- Closes Bleed valve
- Closes Pack valve
- Deactivates generator

2) APU FIRE P/B

ILLUMINATED - APU fire warning activated. Dual gas loops are located in the APU compartment.
On the ground APU will automatically shutdown and discharge the fire bottle in 10 seconds.

PUSH -

- APU auto shutdown
- Cancels aural warning
- Arms squibs
- Closes LP fuel valve
- APU fuel pump off
- APU Bleed and Crossbleed close
- APU Generator deactivated

3) AGENT P/B

SQUIB - Corresponding FIRE P/B must be pushed to arm the Agent P/B.
Pressed – Bottle discharges.
Pushing #1 starts a 30-second timer on the ECAM.

DISCH - Fire bottle is depressurized. Additionally for an APU thermal discharge, a blow out disc is located on the aft fuselage.

4) **FIRE TEST P/B**

PRESS - Tests respective fire detection and extinguishing systems.

ENGINE (7 lights)	FIRE P/B	APU (5 lights)	FIRE P/B
	2 Squib lights		Squib light
	2 Master warnings		2 Master warnings
	ECAM		ECAM
	Fire light on pedestal		

5) **RAT MAN ON P/B**

Extends RAT providing 2500 psi to the Blue hydraulic system.
The emergency generator is not powered.

6) **PTU P/B**

AUTO - PTU is armed to run when a 500 psi differential pressure exists between the Green and Yellow hydraulic systems.
The PTU is inhibited during the first engine start and self-tests during the second start, provided the parking brake is set.

Note: The PTU logic inhibits its operation anytime:

- Cargo doors are being operated
- Parking brake set with one ENG MASTER selected ON
- Parking brake OFF with one ENG MASTER selected ON and the NWS deactivation pin installed.
- PTU P/B selected OFF
- PTU operation is inhibited for 40 seconds after cargo door operation

OFF - PTU is deactivated. Selecting OFF extinguishes Fault light. The exception being for an overheat, the fault light will remain illuminated until the overheat condition is alleviated.

FAULT - *Green or Yellow systems*

- Low quantity
- Reservoir overheat - 93°C
- Reservoir low air pressure - 23 psi

Note: After starting engines if the PTU failed to test properly, you may get a PTU fault on the ECAM. To reset the PTU turn the Yellow Electric pump ON then OFF after engine start is complete.

7) **BLUE ELECTRIC PUMP** (Receives power from AC Bus # 1)

AUTO - If AC power is available the electric pump is energized:

- In-flight
- On the ground with at least one engine running
- When the blue pump override switch on the MX panel is selected ON

OFF - The pump is de-energized.

- FAULT** -
- Low quantity
 - Reservoir overheat - 93°C
 - Low air pressure - 23 psi
 - Low pump pressure - 1450 psi (Inhibited on the ground with engines stopped)
 - Pump overheat

8) **YELLOW PUMP P/B** (Receives power from AC Bus # 2)

ON - The Yellow pump is energized.

OFF - Pump is de-energized.

- FAULT** -
- Low quantity
 - Reservoir overheat - 93°C
 - Low air pressure - 23 psi
 - Low pump pressure - 1450 psi
 - Pump overheat

Note: The Yellow pump will run when the cargo door manual selector is set to either the open or close position, however, the operation of the flight controls and PTU is inhibited. The cargo door system is a closed loop circuit; if the door manual selector sticks in the on position after the cargo doors are opened, the pump will remain energized and the yellow system will overheat. Turning the Yellow pump switch on will circulate fluid throughout the whole system, alleviating the overheat condition. Contact MX or Ramp personnel to correct the problem.

9) **ENGINE PUMP P/B**

ON - Pump pressurizes when engine is running (3000 psi ±200 psi)

OFF - Pump is depressurized. Selecting OFF extinguishes fault light except for an overheat. Fault light will remain illuminated until the overheat condition is alleviated.

- FAULT** -
- Low quantity
 - Reservoir overheat - 93°C
 - Low air pressure - 23 psi
 - Low pump pressure - 1750 psi

10) **X-FEED P/B**

OFF - The crossfeed valve closes

ON - The X-feed valve opens

OPEN - The X-feed valve is fully open. ON remains illuminated

11) **FUEL PUMP P/B**

- ON** - Pump is energized. Main pumps provide 25 psi, and are fitted with suction valves to allow gravity feeding of the wing tanks to the engine. The main boost pump pressure is lower than the center tank boost pump pressure, which helps to insure that the center tank fuel will be used first.
- OFF** - Pump is deactivated
- FAULT** - Low output pressure

12) **MODE SEL P/B**

- AUTO** - Center tank pump control is automatic. The pumps will run for 2 minutes after engine start, or any time the slats are retracted.
- The center tank pumps will be commanded OFF:
- 5 minutes after the CTR tank low level is reached.
 - When the wing tank inner cells overflow is sensed, from fuel returned from the IDG cooling system. In this case, the center tank pumps will remain off until approximately 1100 pounds of fuel is burned from the wing tanks.
- MAN** - The center tank pumps are manually controlled
- FAULT** - The center tank contains more than 550 pounds of fuel and either wing tank has less than 11000 pounds. This fault light may illuminate when the center tank fuel is burned out of sequence, or during refueling.

13) **CTR TANK PUMP P/B**

- ON** - Pumps are armed if the Mode Select Switch is in AUTO. The pumps will also run if the Mode Select Switch is in MANUAL. The pumps provide 32 psi and are not fitted with suction valve. Therefore, gravity feeding from the center tank is not possible.
- OFF** - Pump is deactivated
- FAULT** - Low output pressure, when pump is operating

14) **BATTERY P/B**

- AUTO** - Batteries are connected to the DC BAT bus when:
- On the ground with no other power sources
 - APU Starting
 - Battery voltage below 26.5V, BCL closes allowing the battery to charge
 - Below 100 knots during emergency electrical configuration.
- OFF** - Battery contactors are open
- FAULT** - The battery contactors are open due to an abnormal increase in the charging current

Note: In the Emergency Power Configuration, Battery #1 powers the static inverter. Battery #1 also powers the AC Essential Bus when airspeed is greater than 50 knots. Battery #2 powers the DC ESS Bus.

On the ground the BCL will open if EXT power or APU power is removed and the battery voltage decreases to 23 volts for 16 seconds. This is to prevent a total depletion of the batteries.

A minimum of 25 volts is required during preflight. If a condition of less than 25 volts exists, the batteries must be charged prior to starting the APU. The BATT switches must be in AUTO to charge. (Approximately 20 minutes is required with EXT power).

15) **GALLEY P/B**

- AUTO -** Main and Secondary galley buses are powered. All galley buses are powered on the ground with either the APU or EXT power on line. The Main galley bus is shed when one generator is operating.
- OFF -** The Main and Secondary galley buses are not powered
- FAULT -** Load of any generator is over 100% rated output

16) **GEN P/B (115/200V 3 phase 400hz 90 KVA)**

- ON -** Field is energized. GLC armed to close.
- OFF -**
 - Generator field is de-energized
 - Line contactor opens
 - Fault circuit is reset

Exception: if a protection fault is caused by a differential fault, the reset action has no effect after the second attempt.
- FAULT -** Opens GLC. GCU protection trip.

17) **IDG P/B**

- FAULT -** IDG oil temperature above 185°C or low oil pressure
The IDG will disconnect when the p/b is pressed for 3 seconds

18) **AC ESS FEED**

- NORMAL -** The AC ESS Bus is supplied from AC Bus #1
- ALTN -** The AC ESS Bus is being powered by AC Bus #2
- FAULT -** The AC ESS bus is not being powered

Note: With main generators lost, either the emergency generator or static inverter supplies the AC ESS bus.

19) **BUS TIE P/B**

- AUTO** - The BTC will open or close automatically to maintain power to AC buses 1&2
One contactor is closed when an engine generator supplies its respective AC Bus with the APU or EXT power supplying the other bus.

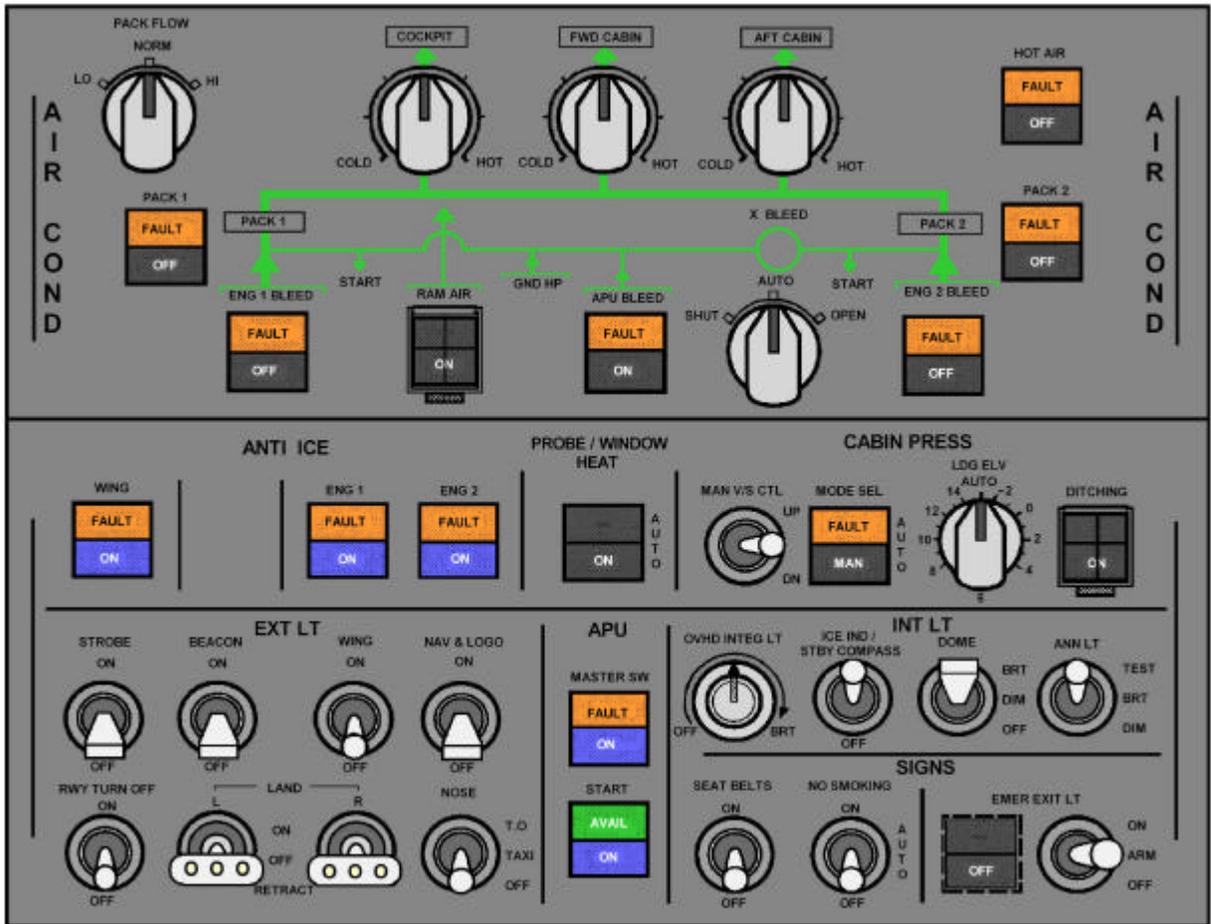
Both contactors will close for a single AC power source.
- OFF** - Both bus tie contactors are open. APU or EXT power cannot energize the aircraft's buses.

20) **EXT PWR P/B**

- AVAIL** - External power is connected and is within limits.
The line contactor is open.
Pressed Momentarily – Opens or closes the line contactor.
- ON** - Line contactor closed. AVAIL light extinguishes.
- Note:** If EXT power is connected and the frequency and voltage destabilize, or placed under a high demand, the flap position indicator will begin to flash. EXT power has priority over the APU. The engine driven generator has priority over EXT power.

21) **APU GEN P/B**

- ON** - The APU generator field is energized. The line contactor is armed to close.
- OFF** -
- The generator field is de-energized
 - The line contactor opens
 - The fault circuit is reset
- FAULT** - Protection Trip. Opens line contactor.
Inhibited when APU speed is too low or during EXT power/engine generator change over.



Overhead Panel - Part 3

1) PACK FLOW SELECTOR

LO, NORM (auto), HI - LO = 80% of bleed air pressure
 NORM = 100% = 44 psi (approx.)
 HI = 120%

In the **LO** position, if the cooling demand is not being met, flow will automatically increase to **NORM** (100%).

HI is automatically selected (regardless of switch position) when one pack is off, or the APU is supplying bleed air.

2) TEMP CONTROLLER

Cold 64°^f, Mid 76°^f, Hot 86°^f

Controls temperature via the Zone controller and trim valves.

The **Zone controller** has a Primary and Secondary channel.
 Failure of the Primary channel causes the hot air and trim valves to close.
 The Secondary controller will then provide a zone temp of 76°^f / 24°^c.

Failure of **only** the Secondary channel has no effect on temperature regulation.

With a Dual channel failure, the packs provide a fixed temp of 70°^f / 20°^c for Pack 1 and 50°^f / 10°^c for Pack 2.

If a **Trim Air valve fails**, optimized temperature control of only that zone is lost.

Hot Air Fault, Optimized temperature is lost. Trim valves close. Pack 1 will control the cockpit temperature; Pack 2 will control the cabin temperature to the mean value of the FWD and AFT selected temperatures.

3) PACK P/B

ON - Pack valve is armed to open.

Pack valves will close for:

- Low pneumatic pressure - 8 psi
- Pack overheat - Compressor outlet 260°C
- FIRE P/B is pressed
- Engine start
- DITCHING P/B is selected

Note: Both valves close during the engine start sequence when the mode selector is set to IGN/CRK. If the second engine is not started within 30 seconds of the first engine, the pack valves will open and then close when the second engine master is selected to on.

OFF - Pack valve is closed

- FAULT -**
- 1) Pack valve disagrees with commanded position or compressor outlet temp exceeds 230°C four times during one flight.
 - 2) Pack outlet temperature above 95°C.

Pack controller primary channel failure causes the inlet and outlet flaps to go full open and the pack flow will remain in the last selected position.

With a secondary channel failure ECAM signals related to the pack are lost.

With a dual channel failure the corresponding pack outlet temp is controlled at 60°F by the pack Anti-ice valve.

4) RAM AIR

ON - The ram air inlet opens. Once the ΔP is below 1 psi, and the DITCHING p/b is in normal, the outflow valve will open to approximately 50%. (Provided it is not in manual)
Ram air is directed to the mixing unit, and should not be opened unless ΔP is less than 1 psi. (FM limit)

OFF - The ram air inlet closed

5) HOT AIR P/B

ON - Valve regulates hot air pressure

OFF - The valve closes, Trim Air valves close, and the fault circuit is reset.

FAULT - Duct overheat is detected at 88°C or 80°C is exceeded four times in one flight. The HOT AIR and TRIM valves close. The Fault light extinguishes when the duct temp cools below 70°C and OFF has been selected.

Note: If the HOT AIR pressure-regulating valve fails closed, the trim air valves are driven closed, Pack 1 controls the cockpit and Pack 2 controls the cabin.

6) **APU BLEED AIR**

ON - APU bleed valve armed. Valve opens with APU RPM above 95% and no leak detected on the APU or left side bleed. When the APU bleed valve opens, the engine bleed valves are commanded closed.

OFF - APU bleed valve is closed

FAULT- APU Leak is detected

7) **ENG BLEED P/B**

ON - Bleed valve is armed to open

The valve will close for any of the following:

- If supply pressure is less than 8 psi
- If the APU bleed valve is open
- There is a bleed leak
- Over temperature
- Overpressure
- Start valve is open
- The FIRE p/b is pressed
- Wing/Engine Anti-ice overheat

FAULT -

- Overpressure downstream of pressure relief valve
- Bleed overheat/Wing/Engine Anti-ice overheat
- Bleed air leak
- Bleed valve not closed during engine start

8) **X BLEED SELECTOR**

SHUT - Cross bleed valve closed

AUTO - The valve will open when the APU bleed air valve is used.

The valve will close when:

- Air is supplied by the engines
- Any leaks are detected
- The APU fire switch is pushed

OPEN - Valve is open

9) **WING ANTI-ICE P/B**

ON - Valves open in flight if pneumatic pressure is available. Bleed air is sent to the outboard slats 3, 4, & 5. Wing Anti-ice may be tested on the ground, the valves will open for a 30-second test sequence after a successful test valves will close and re-arm the system.

In-flight care must be used to maintain bleed temperatures above 150°C to insure symmetrical de-icing capability during low power settings.

OFF - Valves are closed

- FAULT** -
- Valve position disagreement
 - Low-pressure 13 psi
 - A leak is detected
 - On the ground, a Wing Anti-ice test sequence of more than 35 seconds.

When a leak is detected, the Wing Anti-ice valves close automatically.

Wing Anti-ice performance bleed penalty should be applied if Wing Anti-ice will be used from T/O to 1500' AFE

Note: Wing Anti-ice valves are fail safe closed

10) **ENG ANTI-ICE P/B**

ON - Valve opens if engine is running. Continuous ignition is turned on.

OFF - Valve is closed

FAULT - Valve / Switch disagreement

Note: Engine anti-ice valves are fail safe open

11) **PROBE/WINDOW HEAT P/B**

AUTO - Probes and windows are heated in-flight. On the ground, low heat is applied if one or more engines are running. Windows will go from Low to High when T/O power is set. TAT probes are not heated on the ground.

ON - Probes and windows are heated

12) **DITCHING P/B**

NORMAL - Normal system operation

ON - Closes the following:

- Outflow valve (in auto only)
- RAM air inlet
- Avionics vent inlet & extract valves
- Pack control valves

13) **LANDING ELEV**

AUTO - FMGS data is used for pressurization.

MANUAL - Landing elevation can be selected between -2000 to 14,000 ft

Note: In auto or manual the landing elevation will be displayed on ECAM.

14) MODE SEL P/B

AUTO - The outflow valve is controlled by one system at a time. There are two independent controller/systems. Max cabin pressure differential is 8.6 psid, safety relief 8.9 psid. Cabin warning at 9550 ± 350 ft.

The system will automatically change CPC's:

- Due to failure of the active system
- 70 seconds after each landing
- Selecting MAN for at least 10 seconds then back to AUTO

MAN - The MAN V/S CTL switch controls the position of the outflow valve using the backup portion of the #1 CPC

FAULT - Failure of both automatic systems

15) MAN V/S CONTROL SW

UP - Opens the outflow valve. (Mode select in MAN)

DN - Closes the outflow valve. (Mode select in MAN)

16) APU MASTER SW

ON - Power supplied to the APU system; air intake flap opens; fuel isolation valve opens; the AC powered APU fuel pump will operate (if fuel is not supplied via aircraft fuel pumps) the APU page on ECAM appears (not during battery start). APU fuel pump is powered through the static inverter during a battery start.

OFF - ON and AVAIL lights extinguish, RPM goes to 75% for a 60-120 second cool down period, at 7% rpm the inlet flap closes.

FAULT - Automatic shutdown for:

- Fire (ground only)
- ECB sensor fault
- Start/running malfunction

Note: In-flight max operating altitude is 39,000 ft. Bleed air is available up to 20,000 ft. Full electrical power is available up to 25,000 ft. at that point the generator load capacity begins to drop. (Electrical output has priority over bleed air). The APU may be started up to 39,000 ft. An in-flight battery start is limited to 25,000 ft.

A320: During Emergency electrical configuration, the APU may start, however, there may not be sufficient power to close the GLC. Therefore, it is not recommended to attempt an APU start as it essentially wastes 5 minutes of the estimated 30 available minutes of battery power.

A319: During Emergency electrical configuration, the RAT will operate until touchdown starting the APU is recommended

17) **APU START P/B**

- ON** - The APU ECB sequences APU start:
- Starter engaged
 - 7% ignition is supplied
 - 50% starter cuts out, ignition off
 - 95% Avail light comes on APU is available for electric and pneumatic loads.

AVAIL - The on light extinguishes. The APU can now supply bleed and electrical power

Note: Max start EGT - 1038°C, three consecutive starts may be attempted with a 1 minute cooling period between attempts. After the third attempt, a 60-minute cool down is required.

18) **SEAT BELT SW**

- ON** - Seat Belt signs illuminate
OFF - Signs extinguish

19) **NO SMOKING SW**

- ON** - No Smoking and Exit signs illuminate
AUTO - No Smoking and Exit signs illuminate with gear down
OFF - No Smoking and Exit signs extinguish. Exit signs control system is reset.

Note: The No Smoking, Fasten Seat Belt, and Exit signs illuminate automatically with an excessive cabin altitude 11300 ft +/-350 ft regardless of switch position.

18) **EMERG EXIT OFF**

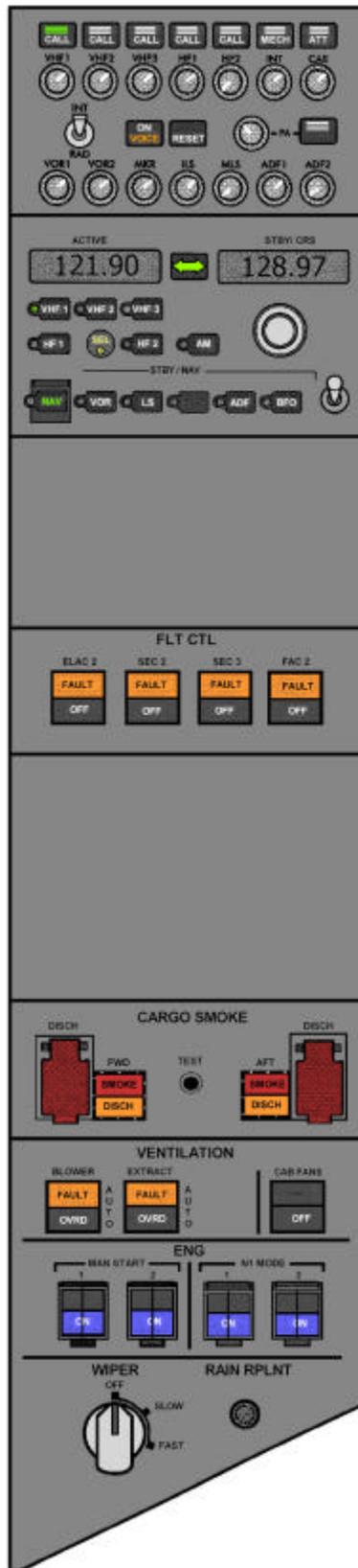
- OFF** - Emergency Exit lights are not armed

19) **EMERG EXIT LT SW**

- ON** - Emergency lights, Exit signs and floor path lights illuminate
ARM - Emergency lights and Exit signs illuminate if AC Bus 1 fails. Floor path markings illuminate if the DC ESS SHED bus fails.
OFF - Lights, signs extinguish

Note: If the associated bus fails, internal batteries will power the lights. Internal batteries always power the floor path lights.

The internal batteries will last for approximately 12 minutes.



Overhead Panel – Part 4

1) **TMR RESET P/B**

ON - Passenger system ON light extinguishes

FAULT - Time delay failure (over 30 seconds) to de-energize the unit door latches

2) **AVIONICS COMPT LT P/B**

AUTO - Avionics compartment lights controlled by door

ON - Compartment lights on

3) **SERVICE INT OVRD P/B**

OFF - Communication via service interphone jacks possible on ground, 10 seconds after landing. ON illuminates to indicate service interphone availability. Service interphones are disabled to prevent interference through interphone system and are controlled by the LGCIU's.

ON - Communication possible without landing gear compression

4) **LEAK MEASUREMENT VALVE P/B**

OFF - MX function: The respective valves close, hydraulic fluid is shut off to the components of that system.

5) **BLUE PUMP OVRD P/B**

ON - The blue electric pump is energized provided the blue electric pump switch is in AUTO

6) **FADEC GND PWR**

ON - The FADEC is electrically supplied on the ground

7) **APU AUTO EXTING TEST P/B**

TEST - MX function: The ON light illuminates. The APU master switch must be on, The APU fire warning; extinguishing and auto shutdown circuits are tested for 10 seconds. The APU will shut down if it is running.

8) **RESET P/B**

Pressed - APU test circuit is reset

9) **FLT CTL P/B**

ON - Corresponding computer is active

OFF - Corresponding computer is not active. Selecting OFF for 10 seconds then ON resets computer.

FAULT - Failure of a computer is detected. Extinguishes when OFF is selected.
Note: ELAC FAULT is normally displayed for 8 seconds after initial power up or power interruption.

2 ELAC's:	Normal Elevator & Stabilizer control. Aileron control	{ Roll normal { LAF normal { Aileron droop { Roll direct
3 SEC's:	Spoiler control Standby Elevator & Stab control	{ Roll normal { Spoilers S/Brake { LAF Normal/ALT (SEC 1&2) { Roll direct
2 FAC's:	Electric Rudder control	{ ELAC yaw order { Yaw ALT { Rudder Trim { Rudder Travel Limiter

Note: With a SEC 1 or 2 failure you will Lose # 1 Thrust Reverser. With a SEC 2 or 3 failure you will Lose #2 Thrust Reverser. Thrust Reversers utilize SEC data for TLA info.

10) **CARGO HEAT HOT AIR P/B (If installed)**

ON - The cargo hot air pressure-regulating valve regulates hot air

OFF - Closes cargo hot air valve

FAULT - Duct overheat. The cargo hot air valve closes. The Fault light extinguishes when the duct temperature cools and OFF is selected.

11) **CARGO HEAT AFT ISOL VALVE P/B (If installed)**

ON - The cargo inlet and outlet isolation valves open and extraction fan runs. Provided there is no smoke in the aft cargo compartment.

OFF - The Inlet and outlet isolation valves close, extraction fan stops.

FAULT - Valve(s) not in agreement with selected position.

12) **CARGO HEAT AFT SELECTOR (If Installed)**

Cold 40^of, Mid 60^of, Hot 80^of

13) **FWD/AFT P/B**

Discharges the selected fire bottle and arms the other bottle for the same cargo bay. DISCH 2 light illuminates 60 minutes after the first bottle is discharged as a reminder to fire second bottle.

A319- Has only **one** bottle, which may be used, in either cargo bay. Pressing the appropriate p/b will discharge the cargo fire bottle into its corresponding cargo compartment.

14) **CARGO SMOKE FWD/AFT**

SMOKE - Smoke is detected by both channels in one of the two identical modules. (Or one channel if the other is faulty)

DISCH- Indicates the fire bottle has been discharged.

15) **CARGO SMOKE TEST**

Smoke detectors are tested in sequence, the SMOKE light illuminates twice, the DISCH light illuminates and the cargo heat isolation valve closes.

16) **BLOWER & EXTRACT P/B**

AUTO - When both switches are in AUTO:
On the ground before T/O power is applied the ventilation system is in the open circuit configuration. Closed circuit if skin temp is below 40^oF.

On the ground after T/O power is applied or in-flight, the vent system will go to the intermediate circuit if skin temp is above 90^of, then as the skin temp cools the system will go to the closed circuit.

OVRD - With either switch in OVRD, the system goes to the closed circuit, and air conditioning air is added to the ventilation air. Blower fan stops if BLOWER in OVRD.
With both switches in OVRD, air is provided from the air-conditioning system and is extracted overboard. The skin heat exchanger is not used. The extract fan remains energized.

BLOWER FAULT - Smoke in the avionics vent duct, Blower Pressure Low or Duct overheat. An external horn will sound if engines are not running.

EXTRACT FAULT - Smoke in the avionics duct, Extract Pressure Low.
An external horn will sound if engines are not running.

17) **CABIN FANS P/B**

ON - The 2 cabin fans run

OFF - The 2 fans stop

18) **ENG MAN START P/B**

ON - The start valve opens if the mode select is in either the CRANK or IGN/START position. Both pack valves close. When engine master switch is set to ON, both A&B igniters fire, and the LP/HP fuel valves open.

OFF - The start valves are closed unless a start cycle is in progress.

19) **N1 MODE P/B**

ON - Thrust control reverts from EPR mode to rated N_1 mode. Following an automatic reversion to N_1 , rated or unrated mode, pressing the p/b confirms the mode.

Note: If the EPR mode fails the FADEC degrades into either a rated N_1 or unrated N_1 mode. Engine limit protections are available in rated N_1 mode but not in-unrated N_1 mode. A/THR is lost; therefore Alpha floor is also lost.

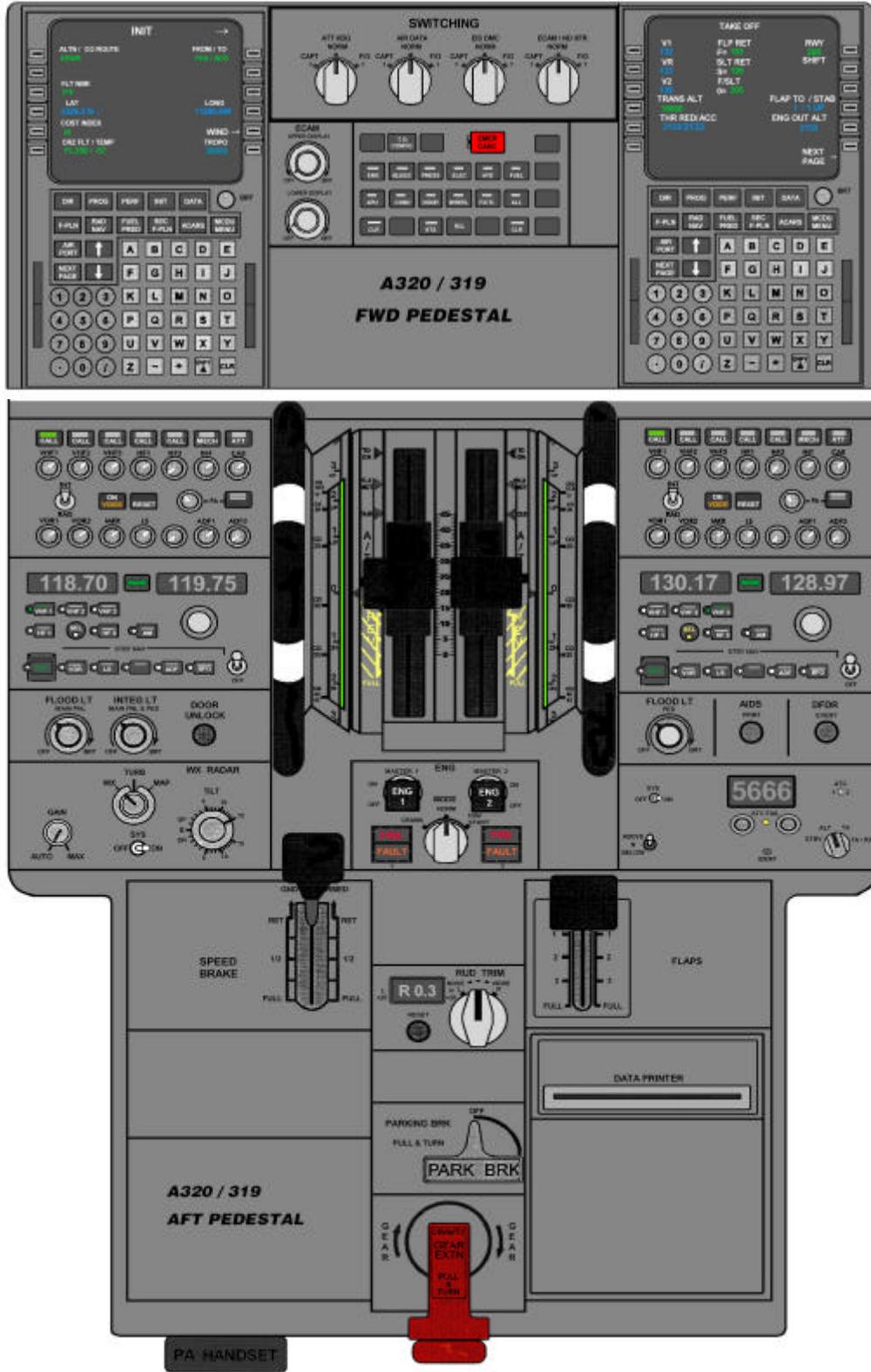
OFF - If available, EPR mode is selected.

20) **WIPER SWITCH**

The rotary switch controls the on side wiper to the desired speed. There is a speed limit of 230 knots to prevent damage to the motor.

21) **RAIN REPELLANT**

When pressed provides a measured application of rain repellent to the windshield. Most systems are deactivated.



Pedestal

1) MCDU

The MCDU is the interface between the crew and FMGC. The FMGC is divided into two main parts:

- The Flight Management portion controls the following:
 - Navigation
 - Flight planning
 - Performance prediction and optimization
 - Navigation radio management
- The Flight Guidance portion controls the following:
 - Autopilot command
 - Flight director command
 - Autothrust command

2) SWITCHING

ATT HDG- NORM = ADIRU 1 supplies data to PFD 1, ND 1 and RMI/VOR DME
 ADIRU 2 supplies data to PFD 2, ND 2
 CAPT 3 = IR 3 Replaces IR 1
 FO 3 = IR 3 Replaces IR 2
IR supplies HDG, ATT, and VS to PFD's

AIR DATA- NORM = ADIRU 1 supplies data to PFD 1, ND 1 and RMI/VOR DME
 ADIRU 2 supplies data to PFD 2, ND 2
 CAPT 3 = ADR 3 Replaces ADR 1
 FO 3 = ADR 3 Replaces ADR 2
ADR supplies AS, ALT and backup VS to PFD

EIS DMC- NORM = DMC 1 supplies data to PFD 1, ND 1 and Upper ECAM
 DMC 2 supplies data to PFD 2, ND 2 and Lower ECAM
 CAPT 3 = DMC replaces DMC 1
 FO 3 = DMC 3 replaces DMC 2

ECAM ND- Allows transfer of SD to either the CAPT or FO ND.

3) RMP

2 RMP's are installed on the Pedestal and 1 on the overhead panel. Each RMP can control any VHF radio, #1 and #2 are connected directly to the transceivers, #3 is connected via #1 or #2 only. The #1 RMP is available during Emergency Electric Configuration.

4) **ACP**

The audio control panels provide the means to select each com/nav radio, interphone, and PA system. #3 ACP should always have PA selected so the CVR can record the PA announcements.

5) **WX RADAR**

Two WX radar systems are installed. Only one transceiver may be used at a time. WX images may be displayed in any mode except the Plan Mode.

6) **ENGINE MASTER PANEL**

ENGINE MASTER 1 & 2

ON- LP fuel valve will open.

During an automatic start, the HP valve will open provided the ENG MODE selector is in IGN/START and N₂ is between 10-16%.

During a manual start the MAN START P/B must be on and the ENG MODE selector must be in IGN/START for the HP valve to open.

OFF- Closes both the LP and HP fuel valves. Resets both channels of the FADEC.

FIRE / FAULT LIGHT

FIRE - Aids the pilot in selecting the correct master switch to turn off in the event of a fire.

FAULT- Illuminates for an automatic start abort.
A disagreement between the HP valve and the FADEC commanded position.

ENG MODE SELECTOR

CRANK- With the Manual Start P/B selected on, the start valve will open, if N₂ is less than 10%.

NORM- Continuous ignition both A&B igniters are automatically selected on when:

- 1.) Engine anti ice is selected on
- 2.) Take-off phase (TOGA/Flex power until 1500')
- 3.) Approach Idle selected (Flaps/Slats extended)
- 4.) In-flight sub idle or surge

IGN/START- If a master switch is on and the N₂ is greater than idle, continuous ignition is selected. (Both A&B igniters)

During an automatic start the A or B igniter will be selected when N₂ is between 10-16%.

During a manual start both igniters are utilized.

On the ground during a normal engine start ignition is automatically cut-off at 43% N₂.

Starter Limits: Two attempts of 2 minutes and one attempt of 1 minute. 15 seconds between attempts and 30 minutes after the third attempt.

7) **TRANSPONDER**

Two transponders are installed, wired through the LGCIU's the transponder is inhibited on the ground when in AUTO. No automatic switching between 1&2 occurs.

8) **SPEED BRAKES**

Ground spoilers will deploy at MLG touchdown or during a rejected T/O at 72 knots if they are armed **and or** at least one engine is selected to reverse. The ground spoilers will retract when thrust levers are set to forward idle or advanced above 20° or the speedbrake handle is disarmed. Spoiler panels 1-5 will deploy to 50° automatically. Panels 1-4 will deploy if selected manually.

The **SPEED BRK** memo will flash amber on the ECAM when speed brakes are extended and either engine is above flight idle. (Approximately 35% N₁)

9) FLAPS	Config.	Slats	Flaps	IAS
	1	18°	0°	230 knots
	1+F	18°	10°	215 knots
	2	22°	15°	200 knots
	3	22°	20°	185 knots
	Full	27°	40°	177 knots

Flaps will retract from 1+F automatically at 210 knots if not selected by the crew.

WTB will lock with an asymmetry, overspeed, uncommanded movement and symmetrical runaway. WTB's cannot be reset in flight.

Slat Alpha Lock occurs when SFCC, utilizing ADIRU supplied information inhibits slat retraction at high AOA or low speed. With AOA greater than 8.6° or speed less than 148 knots, slat retraction from 1 to 0 is inhibited. The lock is removed at 7.6° AOA or 154 knots.

10) **RUDDER TRIM**

Rudder pedal deflection is limited as a function of speed. With a double FAC failure the rudder travel is limited to the deflection limit at the time of the failure. Once slats are extended full rudder travel will be regained.

Rudder trims at a rate of 1° per second to 20°.

Maximum rudder deflection is 25° from 0–160 knots and reduced from 25° to 3.4° at 160 knots – V_{mo}.

10) **PARK BRAKE**

The park brake handle, when selected to ON will deactivate all other brake modes, deactivates the anti-skid and supplies yellow system pressure to the brakes. The Normal brake system uses Green hydraulic pressure and the Alternate brakes use Yellow system pressure, backed up by an accumulator.

The Brake and Accumulator indicator reads Yellow system pressure.

Anti skid is available with both normal and alternate brake systems and is not available with the accumulator.

11) **GRAVITY GEAR**

3 turns clockwise to gravity extend the landing gear:

Turn 1: Isolates the landing gear from the Green hydraulic system and depressurizes the system. Cut-off valve closes.

Turn 2: Gear door uplocks released.

Turn 3: Gear uplocks released. Gear free falls. MLG utilizes spring assist during extension.
NLG utilizes aerodynamic assist.

After successfully manually extending the landing gear, NWS **is not available** due to the cut-off valve being closed and the NLG doors open.