Introduction

This Systems guide is an essential tool for all ATR flight crew and engineer to learn or review ATR systems operation. To make learning process easier, systems are introduced in a user-friendly and efficient training method, including diagram and schematic display as appropriate.

This guide is a comprehensive document that efficiently complements FCOM 1st part – Systems description. Systems are organized as per FCOM chapter, including their ATA classification along with cockpit location. Cockpit panels familiarisation is presented with each relevant system description in a separate annex.

This new guide release is intended for training on ATR 42-500 and 72-212A. It presents a generic aircraft not customized to your own aircraft systems. Should you find any discrepancy between Systems guide and your customized ATR operational documentation (AFM, FCOM & QRH), the latter takes precedence.

NB: This Systems guide is also available for ATR 42-300 and 72-200 not PEC. This document will also be developed for the ATR-600.

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A. Aircraft general

FCOM 1.00
1. Doors location

- Cargo door
- Emergency exit type III
- Service door / emergency exit type I
- Pilot emergency hatch
- Pilot communication hatch
- Rear entry door / emergency exit type I
- Aft avionics compartment door
- Forward avionics access hatch

ATA 52
2. Cargo door panel

**ARMED light**
- Selector armed green light is ON, when actuator selection switch working conditions are met:
  - cover panel opened
  - door unlocked by operating handle: all hooks are disengaged and FWD latchlock is unfastened

**LCHD light**
- Blue light is ON when all door hooks and latch locks are fully engaged

**GND HDL light**
- Ground handling bus ON BAT red light is ON when ground handling bus is directly supplied by HOT main bat bus; means that the battery is discharging even if the BAT toggle switch is in OFF position (visible even when the cover panel is closed)
  - The refueling panel is open
  - The cargo door control panel is open
  - The passenger door is open and alert, that the battery is discharging before leaving the aircraft

**Actuator selection switch**
- Is used to operate the door (OPEN or CLOSE) when the CARGO DOOR ARMED green light is on

**Panel cover switch**
- Connects the ground handling bus on line when the panel cover is opened and allows operation of cargo door: During the opening, a self test of the MFC 1A and 2A is performed to initiate the control system of the cargo door.

**CARGO LIGHT switch**
- Allows activation of the cargo bay light from outside

3. Doors panel

**DOORS lights**
- CABIN and CARGO aural alarms are inhibited when the Condition Lever 1 is on FTR or FUEL SO
- SVCE and FWD COMPT aural alarms are inhibited when the Condition Lever 2 is on FTR or FUEL SO

**CAB OK and SVCE OK**
- Light on when SW TEST depressed and check microswitches operation

**SW TEST**
- Tests continuity of microswitch system (on ground, doors opened)

**UNLK**
- At least 1 micro switch is opened
4. External lights

A - Navigation lights
B - Taxi and T/O lights
C - Landing lights
D - Wing lights
E - Beacon lights
F - Strobe lights
G - Logo lights
H - Emergency light

Cabin panel

Memo panel
5. EXT LT panel

- **BEACON and NAV** supplied by SVCE BUS and BUS 1
- **LOGO** supplied by SVCE BUS
- **TAXI & T.O** Supplied by ACW BUS 2

6. MEMO panel

- **NO SMKG** illuminates blue when associated switch is selected ON
- **SEAT BELTS** illuminates blue when associated switch is selected ON

7. Signs panel

- **NO SMKG and SEAT BELTS** Blues Lts on MEMO panel when ON. (DC BUS 2)
- **ARM** Emergency lights illuminate when <18 V on STBY bus or if both DC GEN off line. Emergency lights extinguish when >20V on STBY bus and at least 1 GEN operating
- **DISARM** system deactivated

**Supply:**
- **DC STBY or 6 V BAT packs**
- **SUPPLY:** DC STBY or 6 V BAT packs
8. Internal lighting

ATA 33
9. LT panel

**INST**
Selects activation and intensity of main panel instrument integral lighting

**DSPL knob**
selects activation and intensity of all digit lighting

**PNL rotary selector**
selects activation and intensity of glareshield, pedestal and overhead panels instrument integral lighting

**FLOOD knob**
selects activation and intensity of pedestal panel flood lighting. *(OFF TO BRT)*

10. ANN LT panel

To check and control the intensity of:
– the annunciator lights on the overhead and pedestal panels
– the overhead panel flow bars
**TEST**: All the associated lights come on bright
**BRT**: associated light illuminate bright
**DIM**: associated light are dimmed

11. Side panel

**CAPT CONSOLE LT knob**
selects activation and intensity of the respective lateral console

**CAPT READING LT knob**
selects activation and intensity of the respective spot light

12. FLT COMPT LT panel

**DOME switch**
**BRT**: dome lights are supplied with maximum intensity
**DIM**: dome lights are dimmed
**OFF**: both dome are off
**DOME light**: the F/O dome light becomes BRT when the switch in BRT or DIM if:
– dual DC GEN loss
– or on ground, with BAT supply only

**STORM switch**
On position, flood lights are ON with maximum intensity and fluorescent tubes are ON

**STBY COMPASS switch**
to illuminate the STBY COMPASS
**ON** and **OFF** position
B. Multi Function Computer

FCOM 1.01
Numerous logic functions are performed by two independent computers (MFC1 and MFC2).
Each computer includes two independent modules (A and B)

The purpose of these computers is to:
– monitor, control, authorise operation of the aircraft systems
– manage system failures and flight enveloppe anomalies and command triggering of associated warning

Example:

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>FUNCTION</th>
<th>MODULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLIGHT</td>
<td>STICK PUSHER</td>
<td>1A:○ 1B:○ 2A:○ 2B:○</td>
</tr>
<tr>
<td>CONTROLS</td>
<td>STALL WARNING</td>
<td>1A:○ 1B:○ 2A:○ 2B:○</td>
</tr>
</tbody>
</table>

- The stick pusher function is integrated in modules 1A, 1B, 2A and 2B.
- The stall warning function is integrated in modules 1B and 2B.
- The stick pusher function is available if modules (1A AND 2A) OR (1A AND 2B) OR (1B AND 2A) OR (1B AND 2B) operate. This function is therefore not available if modules (1A AND 1B) OR (2A AND 2B) are lost.
- The stall warning is available if modules 1B OR 2B operate. This function is therefore not available if modules 1B AND 2B are lost.
C. Centralized crew alerting system

FCOM 1.02
1. Cockpit philosophy

In normal operation, all the lights are extinguished (Dark cockpit philosophy). With few exceptions, the lights illuminate to indicate a failure or an abnormal condition.

- Normal operation
- Warning indication
- Caution indication
- Other than normal basic operation
- Temporarily required system in normal operation
- Back up or alternate system selected
2. CCAS description

The CCAS draws crew's attention when a failure is detected and guides the crew to the system affected by the failure.

Three types of visual devices are used: – MASTER WARNING and MASTER CAUTION lights
– CREW ALERTING PANEL (CAP) lights
– LOCAL ALERT lights

Detection sequence

<table>
<thead>
<tr>
<th>INFORMATION</th>
<th>IDENTIFICATION</th>
<th>ISOLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: ACW Generator 1 failure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Diagram showing CCAS components and alerting system]
### 3. Crew alerting panel

**CONFIG**
- T/O config test or PL’s at T/O with:
  - PWR MGT not at T/O
  - flaps not at 15°
  - trim out of green sector
  - TLU LO SPEED green light not illuminated
  - AIL LOCK light illuminated
  - Parking brake handle not fully released (PLs only)

**FWD SMK**
Forward cargo smoke

**HYD**
- Either tank < 2.5 l
- Either pump drain > 121°
- Either pump < 1500 PSI and good conditions to run

**DOORS**
Any door not seen locked

**AUDIO**
RCAU failure or power loss

**IDLE GATE**
Automatic idle gate system failure

**PRKG BRK**
Parking brake not fully released

**RCL**
When pressed: all inhibited or cancelled caution lights will illuminate (recall) if the respective system is still degraded or manual cancellation of T/O INHI

**CLR**
When pressed, all amber lights are cleared, except PRK BRK, GPWS and MAINT PNL

**LDG GEAR NOT DOWN**
Any gear not seen down and locked and:
1. flaps 25° or flaps 30°, ZRA < 500 ft and PL at low power
2. at least one PL at FL and ZRA < 500 ft (inhibited until 2.5 min after gear up)

**PITCH DISCONNECT**
Elevator uncoupling

**PROP BRK**
Prop brake not locked in full locked or in full released position

**FLAPS UNLOCK**
Spurious Flaps retraction more than 3° (42-500), 4° (72-212A) when flaps extended

**LOOP**
Engine fire loop fault

**ANTI ICING**
Loss of heating: windshield, horns, prop, static probes (on GND only), Pitot probes, Alpha probes and TAT probes (in flight only)
Common air manifold < 14 PSI, distribution valves fault, ice detector fault, inflation sequence not correct, air temp > 230°, Mode sel auto fault, APM fault

**WHEELS**
Anti-skid failure or brake temp > 160° (42-500) > 150° (72-212A)

**GPWS FAULT**
GPWS computer fault or power loss

**T.O. INHI**
When pressed: eng oil, smoke lights, all caution lights are inhibited (except PRKG BRK, GPWS FAULT, MAINT PNL, EFIS COMP, FLT CTL and ENG.)
4. EMER audio cancel & TO config test

EMER AUDIO CANCEL
Guarded switch, cancel the aural specific of an undue continuous aural except for landing gear, VMO, VFE, VLE, stall warning, pitch trim whooler, landing gear, AP disconnection

TO CONFIG TEST
- To check T/O configuration (PWR MGT in T/O+ TLU LO SPD illuminated + pitch trim in green sector+flaps 15° + ail lock light extinguished) by simulating power levers at T/O position, except PARK BRAKE
- To perform an automatic RECALL
5. Aural alarms

**C. Centralized crew alerting system**

**CLACKER**
- $V_{MO}$
- $V_{LO} - 5$ kt
- $V_{FE} - 5$ kt

**DOOR BELL**
- Hostess or ground calls

**WHOOLER**
- Pitch trim in motion (more than 1s)

**CAVALRY CHARGE**
- AP Disconnects

**C CHORD**
- Altitude alerts

**CRICKET**
- Stall warning associated
- STICK SHAKER/PUSHER
- AOA (Angle Of Attack)

**CALLS**
- ATTND
- MECH
- EMER
- CALL

- CALL
- RESET
1. Pneumatic system

The pneumatic system supplies aircraft systems which use pressurized air:
These systems are:
- Air conditioning
- Ventilation
- Pressurization
- De-icing

1.1. Schematic
1.2. AIR BLEED panel

**ENG BLEED**
Controls both bleed and HP valves. Spring loaded closed. Must have air and electricity to open. Auto closure when OVHT, leak, overpressure, fire T pulled, when UPTRIM is triggered or prop break on (left one only). Inhibited during eng start.

**OVHT**
either duct temp switch above 274°C. CAP. Auto closure bleed valves (LP and HP). May be reset after cooling.

**ENG BLEED FAULT**
Bleed valve disagreement with selected position (or in case of OVHT or LEAK). CAP. Associated valves auto closed.

**GRD X FEED**
Spring loaded closed. Ground only inhibited in flight. Auto opens when only one bleed valve is opened.

**PACK VALVE**
Spring loaded closed. Must have air and elect power to open. 6” delay on RH valve for pax comfort.

**PACK VALVE FAULT**
pack valve disagreement with pb / or OVHT downstream pack comp. (>204°C). CAP. Valve auto closed. Ground cooling turbo fan failure.

**LEAK**
activates when T° detected by bleed loop exceeds 153 ±8°C. CAP. Auto closure after 1” of following valves: Bleed, HP, pack and GND Xfeed if left bleed leak affected. DO NOT RESET BLEED.
2. Air conditioning

The air conditioning system is provided to keep the flight compartments to the required temperature, pressure, humidity and cleanliness for the comfort of the passengers and crew.

2.1. Schematic

Cooling of air:
- by two ground turbo fans:
  - IAS ≤ 150 kt and landing gear is retracted for less than 10 min
  - IAS ≤ 150 kt and landing gear is extended.
- by ram air when IAS > 150 kt
2.2. COMPT TEMP panel

**RECIRC FAN**
Assists pack air flow

**COMPT INDICATOR**
Duct temperature limited to 88°C (191°F) by pneumatic temp.limiter

**TEMP SEL**
- **OVHT**: duct overheat > 92 °C + AIR on CAP. Pack valve will not auto close
- **AUTO**: the temperature is closed by the electronic temperature controller, taking into account:
  - duct temperature
  - zone temperature demand selector
  - associated compartment temperature
  - aircraft skin temperature

**TEMP SEL**
- **OFF**: manual temperature control

**FLOW**
- **NORM**: 22 psi (pack valves)
- **HIGH**: 30 psi (pack valves)

**RECIRC FAN FAULT**: fan low speed or motor overheat + AIR on CAP. No auto disconnect

**MAN**
- compt temp knob controls directly temp control valve
3. Avionics ventilation

The ventilation system provides cooling through ambient air extraction to limit the internal operating temperature of the electronic equipment.

3.1. Schematic

3.2. AVIONICS VENT panel

**EXHAUST MODE**

**NORM**
- On ground, ENG 1 off: extract fan on, OVBD valve full open, U/F valve closed
- Air/ground, ENG 1 on: extract fan operates, OVBD valve closed, U/F valve opened

**OVBD**
- Extract fan off
- OVBD valve partially opened (in flight only), U/F valve closed

**FAULT**
- Fan failure/overheat (fan inhibited for 120 s. after eng start or after a GPU power on. **AIR** on CAP)
- OVBD valve in disagreement with OVBD valve SW position
- The full open position is possible only if the delta P is <1 psi

**OVBD VALVE**
- AUTO except for emergency
- Direct control of OVBD valve
4. Pressurization

Compressed air is delivered by the packs. Pressure is controlled by the amount of cabin air discharged outboard.

4.1. Schematic

- FL 250 = DIFF 6 PSI
  - Cabin altitude = 6740 ft
  - Normal rate = 50% aircraft
  - VS, max +600 ft/min
  - FL 200 = DIFF 5 PSI

- Normal rate = 30% aircraft
  - VS, max +550 ft/min
  - FL 100 = DIFF 4 PSI

- 3500 ft
  - Cabin altitude = aircraft altitude

- T/O elevation up to 3500 ft
  - Baro setting by CAPT
    - Altimeter (ADC 1) or 1013 (ADC 2) if failure ADC 1

- Landing elevation
- Cabin pressure

- Electropneumatic outflow valve
- Safety device if DIFF > 6.35 PSI or < -0.5

- Manual controller knob
  - AUTO MODE
  - MAN MODE

- Pneumatic outflow valve

- Normal rate – 400 ft/min
  - Fast rate – 500 ft/min

- – 300 ft before LDG
  - 0 ft after LDG

4. Pressurization ATA 21

Compressed air is delivered by the packs. Pressure is controlled by the amount of cabin air discharged outboard.

4.1. Schematic

- FL 250 = DIFF 6 PSI
  - Cabin altitude = 6740 ft
  - Normal rate = 50% aircraft
  - VS, max +600 ft/min
  - FL 200 = DIFF 5 PSI

- Normal rate = 30% aircraft
  - VS, max +550 ft/min
  - FL 100 = DIFF 4 PSI

- 3500 ft
  - Cabin altitude = aircraft altitude

- T/O elevation up to 3500 ft
  - Baro setting by CAPT
    - Altimeter (ADC 1) or 1013 (ADC 2) if failure ADC 1

- Landing elevation
- Cabin pressure

- Electropneumatic outflow valve
- Safety device if DIFF > 6.35 PSI or < -0.5

- Manual controller knob
  - AUTO MODE
  - MAN MODE

- Pneumatic outflow valve

- Normal rate – 400 ft/min
  - Fast rate – 500 ft/min

- – 300 ft before LDG
  - 0 ft after LDG
4.2. Cabin pressure indicators

**ALT**
Cabin alt: based on 29.92 in.hg (1013.2 Hpa)

**DIFF**
Differential pressure: max +6.35/-0.5

**FLAG**
OFF flag

**RATE**
Cabin rate of climb

4.3. AUTO PRESS panel

**AUTO PRESS** (DC BUS)
Memorize departure field elevation up to 3500 ft

**DUMP**
FUNCTION ON (guarded pushbutton)
Both outflow valves fully open in auto mode only.

**ELV SET**
Trigger switch to set landing elevation

**DESCENT RATE**
NORM: -400 ft/min
FAST: -600 ft/min
Fast is used when Vs > -1500 ft/min

**TEST**
Displays alternately 18800 and -8800, FAULT appears on MAN pb.
Test is inhibited in flight

4.4. MAN RATE KNOB and CABIN PRESS panel

**NORM**
AUTO MODE position. When used in MAN mode, cabin rate selection +2500/-1500 fpm

**FAULT**
digital controller failure. CAP + AIR on CAP

**MAN**
digital controller out of operation.
(no more digits in landing elevation display)
E. Automatic flight control system

FCOM 1.04
**E. Automatic flight control system**

1. **Schematic**

- **FD bars**
  - SW to set ON/OFF

- **CRS 1 knob**
  - Selects course on CAPT EHSI

- **CRS 2 knob**
  - Selects course on F/O EHSI

- **HDG knob**
  - Selects HDG bug on both EHSI

- **ALT knob**
  - Controls the preselected altitude on ADU

- **ALT**
  - To set ON/OFF

- **FD bars**
  - (Horizontal bar for vertical modes and vertical bar for lateral modes)

- **ADU**

- **AFCS CONTROL PANEL**
  - Quick DISC/TCS

- **AFCS COMPUTER**

- **QUICK DISC/TCS**

- **AP OFF**

- **Touch Control Steering pb**
  - Allows to control temporarily the aircraft. AP arrows extinguish. In basic mode, attitude limits $< \pm 15^\circ$ and bank angle limits $< \pm 35^\circ$
2. ADU

- **RESET**
  - Cancel a caution message

- **MESSAGES**
  - DISENGAGED ANNUN DATA FAULT
  - ENGAGE INHIBIT CPL DATA INVALID AHRS DATA INVALID DADC DATA INVALID AFCS DATA INVALID AP INVALID

- **ARMED and CAPTURED MODE LATERAL MODE**
  - HDG SEL LO
  - HDG SEL HI
  - VOR VOR
  - LNAV LNAV
  - LOC LOC*
  - BC BC

- **ARMED and CAPTURED MODE VERTICAL MODE**
  - ALT ALT*
  - IAS -- KTS
  - IAS 160 KTS
  - VS ---- FPM
  - VS - 600 FPM
  - GS GS*
  - GA

3. AFCS control panel

- **BANK pb**
  - Selects LOW bank angle (15°) or HIGH bank (27°)

- **HDG mode**
  - To use FD with HDG SEL

- **NAV mode**
  - To use FD with VOR and LNAV course

- **APP mode**
  - To use FD with ILS information course (lateral and vertical)

- **BC mode**
  - To use FD with localizer in back course

- **STBY pb**
  - Cancels all FD modes (both armed and captured) and return in basic modes with AP engaged

- **IAS mode**
  - To use FD with a desired indicated airspeed

- **ALT mode**
  - To use FD with a desired altitude

- **AP pb**
  - Engages autopilot and yaw damper and disengages only autopilot

- **YD pb**
  - Engages yaw damper and disengages yaw damper and autopilot if engaged

- **Pitch wheel**
  - To adjust VS or IAS or pitch attitude in basic mode

- **VS mode**
  - To use FD with a desired vertical speed

- **CPL pb**
  - Permit to couple AP/FD on CAPT or P/O side
  - Double coupling below 1200 ft RA

42-500/72-212A
F. Communications

FCOM 1.05
1. Schematic

The communication system provides communication between:
- aircraft and ground stations
- cockpit crew stations
- cabin attendant station
- ground crew stations

**CAPT SIDE**
- oxy mask mike
- hand mike
- boom set
- head set
- PTT switch
- nose wheel steering control
- loudspeaker
- loudspeaker audio level
- audio control panel

**OBSERVER SIDE**
- oxy mask
- boom set
- head set
- PTT switch

**F/O SIDE**
- oxy mask mike
- hand mike
- boom set
- head set
- PTT switch
- loudspeaker
- loudspeaker audio level
- audio control panel

2. PTT selector and NOSE WHEEL STEERING CONTROL SW

**PTT selector**
interphone: forward position
neutral: center position
radio: backward position

**NOSE WHEEL STEERING CONTROL switch**
When depressed, BOOM SET or OXY mike is connected for transmission
3. Audio control panel

**Transmission keys**
Only one key can be engaged at a time. It illuminates white when selected.

**Volume control knob**
to receive volume from associated communication or navigation facilities.

**STO button**
allows entering six frequencies in the memory. When depressed, the upper window displays the channel number of available memory (CH1 to CH6).

**TEST button**
is used to initiate the radio self-test diagnostic routine.

4. VHF

**ON/OFF switch**
energizes the control box and the associated VHF. When pulled, allows override of the automatic squelch.

**STO button**
allows entering six frequencies in the memory. When depressed, the upper window displays the channel number of available memory (CH1 to CH6).

**ACT button**
When depressed, second line displays dashes, and first line can directly be turned for frequency selection.

5. AUDIO SEL pb

**FAULT**
iluminates amber and the CCAS is activated when an associated RCAU processing board failure or power loss is detected.

**INT/RAD selector**
Provides selection of transmission mode when using OXY MASK or BOOM SET mike.
- INT: hot mike position. Interphone is always operative between crew stations. Other transmissions require to select a transmission key and use a PTT pb.
- NEUTRAL: only handmike is usable as long as one transmission key is selected.
- RAD: This position is required to automatically connect for transmissions BOOM SET and OXY MASK mikes without using a PTT pb.

**XFR/MEM switch**
This is a three positions spring loaded toggle switch:
- NEUTRAL
- XFR: exchanges preset and active frequency.
- MEM: successive actions cycle the six memory frequencies through the display.

**AUDIO SEL**
Controls functioning of associated RCAU processing board.
- NORM: RCAU functions normally
- ALTN: affected crew station is connected directly to VHF 1 for CAPT station or VHF 2 for F/O station. Volume is adjusted by affected loudspeaker volume control.

6. Loudspeaker volume knobs

**LOUDSPEAKER**
Communication reception. In case of aural alert:
- normal volume is always available regardless of knobs position.
- during any transmission the volume of both loudspeakers is muted.

**VOICE ONLY key**
When depressed, it inhibits NAV receivers station identification. Light illuminates amber when selected.
7. TCAS control box

**TCAS rotary selector**
- **STBY**: TCAS system is under power but intruder visualisation, traffic advisory mode or resolution advisory are not operative.
- **AUTO**: normal operating mode of TCAS.
- **TA ONLY**: disables the RA mode of operation.

**TEST**
TCAS test function operates the test during cockpit preparation. Using in flight, TCAS operation are inhibited for up to 20°.

8. EMER LOC XMTR panel

**AUTO TEST RST**
is used in case of undue alert or to test the emergency beacon. Two cases are possible for the test:
- Network X MIT ALERT illuminates amber during 2°.
- Failure XMIT ALERT flash during 15 seconds.

**Switch**
AUTO transmission is made automatically at least on 121.5 MHz, 243 MHz and 406 MHz when deceleration exceeds 5 g.
MAN allows commanded operation or test.

9. Cabin attendant handset

**Cabin attendant handset**
PA: public address to make an announcement to passengers.
INT: internal communications with crew.
EMER: emergency call.

10. Handmike and handset

**CALLS**
ATTND to call cabin from cockpit.
One time for a normal call.
Three times for an emergency call.
MECH to call the ground crew from cockpit.
A horn is generated.
In case of cabin crew or ground crew call, depress RESET to cancel both associated visual and aural alerts.

11. CALLS panel

**EMER**
illuminates in case of emergency call from cabin.
12. Head set / boom set / hand mike panels

Head set / boom set panel / hand mike panels
allows connection of a boom set, a head set and a hand mike

13. ATC box

**IDENT button**
when depressed, causes the transponder to transmit IDENT signal

**Power and mode switch**
OFF: control box and receiver are deenergized
STBY: system is under power but does not transmit replies
ON: transponder replies to both mode A and mode C interrogations but without flight level information
ALT: normal operating position. Transponder replies with flight level information

**PRE button**
Push and hold the PRE button allow to select a preset code for storage. The storage code can be recalled by momentarily pressing the PRE button again

**TEST button**
Initiates the radio self test routine

14. CVR panel

**COCKPIT VOICE RECORDER**
Monitor indicator for test only. Movement of pointer in white band indicates all channels are operative

**HEADSET jack**
When headset is plugged into the jack:
- cockpit sounds picked up by the microphone are audible
- erase tone is audible when ERASE pb is depressed

**TEST pb**
When depressed and held, the test circuit is activated
- the pointer moves to a location between graduations 8 and 10
- If a headset is plugged into the jack, the 600 Hz signal is heard

**ERASE pb**
Provides fast erasure of tape recordings when the landing gear shock absorbers are compressed and parking brake is set (depress for 2 sec. to completely erase). During erasure, a 400Hz audio signal can be heard in the headset

**B - MICROPHONE**
Picks up cockpit conversations and alert sounds

15. Crew oxygen mask

A micro is incorporated inside the crew oxygen mask
G. Electrical systems

FCOM 1.06
1. Sources of power

Three kinds of current are available:
- Direct current (DC)
- Alternating current with constant frequency (AC)
- Alternating current with variable frequency (ACW)

Two DC starter/generators
- <45% NH starter mode
- >61.5% NH generator mode

Two batteries

DC GPU

Two AC wild frequency alternators
- minimum NP 66%

ACW GPU

Two inverters

DC power 28 VDC

AC power
- VAC 26 V
- VAC 115 V

TRU (Emergency supply)

ACW power
- 115V/200V

The TRU provides power to the emergency loads in case of dual DC generators loss. It is supplied by the ACW bus 2.
The DC Starter Generator is driven by the HP spool through the Accessory Gear Box (AGB)
- From 0 to 45% NH as a Starter
- Above 61.5% as a Generator

The ACW Generator is driven by the Reduction Gear Box, and is available with NP > 66%

In Hotel Mode or with the propeller feathered, there is no ACW.
When the propeller is unfeathered (CL in AUTO), The NP is maintained at a minimum of 70.8%, in order to have ACW (minimum 66%)
2. DC-AC schematic

2.1. Normal supply: On ground with battery only

The **GROUND HANLING BUS** is supplied only on ground, in three different ways:

- BAT OFF or BAT ON with the EXT PWR not available, the GND HDLG BUS is supplied by the HOT MAIN BAT BUS for ground servicing only when:
  - The refueling panel is open
  - The cargo door control panel is open
  - The passenger door is open
- BAT OFF or BAT ON with the EXT PWR available but not ON, the GND HDLG BUS is supplied directly from the EXT PWR
- BAT ON with EXT PWR ON or with one GEN on line, the GND HDLG BUS is supplied by the DC SVCE BUS.

**NOTE:** The GND HDLG BUS is disconnected when airborne.
2.2. Normal Supply: On ground with external power

The BTC is closed and the GPU supplied all the DC and AC busses. Even if the GEN are available, the GPU has always the priority.
2.3. Hotel mode or DC GEN 1 FAULT

The BTC is closed and the GEN 2 supplied all the DC and AC busses.

In hotel mode the GND HDLG BUS is supplied by the DC BUS 1 through the DC SVCE BUS.
2.4. Normal supply: with two generators on line

The BTC is opened and each GEN supply its own busses. On ground the GND HDLG BUS is supplied by the DC BUS 1 through the DC SVCE BUS, and disconnected when airborne.
2.5. Emergency supply: In dual DC GEN LOSS with the battery toggle switch on OVRD

The BAT toggle switch has to be selected to OVRD. The OVRD position allows to be sure that busses are supplied by their respective battery by overriding all protections. This position is protected by a guard.
2.6. Emergency supply: In dual DC GEN LOSS with the battery toggle switch on OVRD and second OVRD selected

After a Dual DC GEN loss, the UNDV is triggered when the DC STBY BUS < 19.5 V. Then, by pushing on the OVRD the DC and AC STBY BUS are transferred from the HOT MAIN BAT BUS to the HOT EMER BAT BUS.
2.7. Emergency supply: In dual DC GEN LOSS with TRU

The TRU connected to the ACW BUS 2 supplies DC EMER BUS, DC ESS BUS, DC&AC STBY BUSSES.
3. DC-AC panel

**UNDV**
DC STBY < 19.5 V. (No CAP)

**BUS OFF**
Associated bus deenergized. ELEC on CAP

**INV FAULT**
Under/over voltage at INV output. INV failure or supply loss. Auto-Xfer of all AC busses to remaining inverter. ELEC on CAP

**OVRD**
Insures basic mode operation by overriding all other protections

**ON**
Basic mode: STBY busses supplied by HOT MAIN BAT BUS. Ext or gen power: DC STBY bus transferred to HOT EMER BAT BUS AC STBY BUS to DC BUS 1

**OFF**
ESS BUS, DC STBY BUS + INV 1 are isolated from HOT MAIN BAT BUS. DC EMER BUS is isolated from HOT EMER BAT BUS

**BTC**
Allows BPCU to control BTC operation. Ext power, hotel mode or single gen operation, BTC is closed (green flow bar)

**ISOL**
BTC and BTR opened (released out)

**DC GEN 2**
FAULT: protection trip by GCU. Auto reset if underspeed: in other cases manual. BTC auto closes

**AVAIL**
GPU has been checked by BPCU for over/under voltage, over current and polarity

**EXTERNAL PWR**
AVAIL + ON. GPU has priority on both generators

**OVRD**
Xfer/stby busses from HOT MAIN to HOT EMER BAT BUS

**Arrows**
Emergency supply indicators (respective battery discharging)

**TRU**
ON PB in. TRU is connected to ACW BUS 2. Arrow illuminates amber when DC EMER, DC STBY, INV 1, AC STBY and DC ESS BUS are supplied by TRU

**EMER BAT CHG**
FAULT: Overheat detected by MFC or failure of contactor. ELEC on CAP. Contactor auto opens if: thermal runaway/bus voltage <25 V. Start sequence: Bat sw on OVRD

**DC BUS OFF**
Respective bus not supplied. ELEC on CAP

**DC SVCE/UTLY BUS**
In automatic shedding:
One of the DC SVCE/UTLY 1 and 2 busses is shed 1 bus SHED (BCPU). ELEC on CAP.
In OFF all DC SVCE/UTLY 1 and 2 busses are shed. DC SVCE supplies power in flight and on ground during airplane servicing operations. UTLY BUSSES supply non-essential loads

**DC GEN 1**
Generatorault Lt. Extinguishes above 61.5% NH if GEN is operating normally

**X START FAIL**
Opposite generator has not come on line to assist start at 10 % NH
ACW supplied by the External Power
- When the ACW GPU is available (AVAIL) but not ON, the GPU supplies only the ACW Service Bus, if the GND Service Bus switch, on the flight attendant panel, is ON.
- When the ACW GPU is ON, the GPU supplies through the BTC, the ACW BUS 1, the ACW BUS 2 and the ACW SVCE BUS.
- Even if one ACW generator is available, the GPU has always the priority.

ACW in Hotel mode or with the propeller feathered

**NOTE:** An ACW Generator is available if the NP is above 66%.
- When the right engine is running in hotel mode, the NP=0.
- When the engines are running but the propeller is feathered, the NP is below 20%
In both cases the ACW Busses are not supplied

The propeller unfeathered and one ACW GEN on line
On ground, when the propeller is unfeathered, the engine is running on fuel governing mode.
The fuel governing mode, maintain a minimum NP of 70.8%, in order to have the ACW available (ACW GEN on line at 66%)
The ACW GEN supplies, the ACW BUS 2 and ACW BUS 1 through the BTC, but the SVCE BUS is shed (one generator is not able to supply all the busses)

**CAUTION:** on ground in case of an EEC or PEC fault, the fuel governing mode is lost and the ACW generator is not available (NP<66%)
ACW BUS 1
ACW GEN 1
ACW GEN 2
SVCE BUS

ACW BUS 2
ACW GEN 1
ACW GEN 2

Normal condition in flight
- The ACW GEN 1 supplies the ACW BUS 1 and the ACW SVCE BUS
- The ACW GEN 2 supplied the ACW BUS 2.
- The TRU is connected to the ACW BUS 2

One Generator Fault
When one generator is fault, the other one supplies the ACW BUS 1 and the ACW BUS 2 through the BTC.
The SVCE BUS is automatically shed (one generator is not able to supply all the busses)

5. ACW panel

5. ACW panel

ACW GEN 1 /2
FAULT: Auto reset in case of under/over speed: manual reset otherwise.
ACW SVCE BUS auto shed if 1 GEN is out

ACW BUS OFF
Associated bus not supplied

AC WILD ELEC PWR
BTC
ACW BUS OFF
ACW BUS 1
ACW BUS 2

AC GEN 1
FAULT OFF
AVAIL ON

AC GEN 2
FAULT OFF

EXT PWR
AVAIL + ON
GPU has priority on both GEN

ACW GEN 2 and ACW GEN 1
Min NP for ACW = 66%.
The fuel governing mode maintains a MIN NP of 70.8% to be always above 66%.
The fuel governing mode is cancelled with the propeller feathered (No ACW)
6. Breaker panels

6.1. Overhead panel

6.2. Electric rack behind F/O
The aircraft is equipped with fire fighting, oxygen, first aid equipment and emergency lightning.

1. Emergency equipment situation

- halon extinguisher
- crash axe
- flash light
- goggles
- oxygen masks
- fire resistant gloves
- hood
- goggles
- oxygen mask
- water extinguisher
- flash light
- smoke hood
- emergency exit type III
- emergency exit type III
- first aid kit
- bag containing oxygen masks
- smoke hood
- type I service door
- type I entry door
- oxygen bottle
- oxygen mask
- life jacket
- flash light
- halon extinguisher

2. Emergency lighting system
3. First aid kit

- Contains bandages, burn dressings, small adhesive dressings, antiseptic wound cleaner, adhesive wound closures, disposable resuscitation aid, wound dressings, large and small, adhesive tape, safety pins and scissors, simple analgesic, antiemetic, nasal decongestant, first-aid handbook, splints, suitable for upper and lower limbs, gastrointestinal antacid, anti-diarrhoeal medication, disposable gloves.

4. Crash axe

- Crash axe with pick and edge
- Handle insulated up to 2000V to open of a door or a compartment

5. Megaphone

- Megaphone 72 only

6. Flashing light

- With batteries, morse code switch

7. Life jacket

- With oral inflation tube, CO2 sparklets, inflation red toggle, whistle, straps, battery, light

8. Escape rope

- Used to evacuate the cockpit
9. Gloves

To protect against fire

10. Water extinguisher

Water extinguisher
- 2 liters of water with an anti-ice additive
- Discharge time: 30 to 40 "

11. Halon extinguisher

Halon extinguisher
- 1.2 kg of halon gas
- Discharge time: 8 to 10 "

12. Oxygen schematic

To flight crew members

Modules for 42-500 and 72-212A

Oxygen bottle
13. Oxygen panel

- **MAIN SUPPLY**
  - pb in: crew supply only

- **HP INDICATOR**
  - oxygen bottle pressure.
  - Red arc 0 to 85 psi
  - Green arc 85 to 2025 psi
  - If below 1400 psi, use table

- **PAX SUPPLY**
  - ON 25% for 42-500/72-212A
  - LO PR supply below 50 psi

14. Cockpit crew oxygen mask

- **PRESS TO TEST AND RESET**
  - permits a test of oxygen flow without removing the mask from the container. It is springloaded to the reset position

- **N/100% PUSH**
  - rocker controls the selection of normal or 100% oxygen for mask delivery. It is locked in the 100% position by the unlock rocker

- **EMERGENCY**
  - selector activates pressurization of mask delivery flow when N/100% rocker is at 100%

- **BLINKER**
  - displays a yellow cross when there is oxygen flow and black when there is none.

- **OXYGEN MASKS**
  - quick donning inflatable harness type release clips: squeezing them to unlock the container doors

15. Portable oxygen bottle

- **Portable oxygen bottle (green)**
  - with pressure gauge and re-charge valve
  - 120 liters under pressure (1800 psi)
  - duration: 30 min at 4 ltr/mn
  - 1 bottle → 42-500
  - 2 bottles → 72-212A

16. Passenger oxygen mask

- **12 Oxygen masks for 42-500**
- **19 Oxygen masks for 72-212A**
  - equipped with valves, bag and elastic strap

17. Protective breathing equipment

- **Protective breathing equipment (PBE)**
  - to supply 15 min pure oxygen with hood, visor, speaking diaphragm and oronasal mask
  - 2 PBE → 42-500
  - 3 PBE → 72-212A

- **PBE stowage box**
I. Fire protection

FCOM 1.08
The fire protection system provides detection, warning and extinguishing for each engine, cabin and lavatory.

1. Schematic

2. Avionics FWD and AFT smoke detection
I. Fire protection

3. Fire handle

AGENT 1
DISCH: Bottle depressurized. Opposite agent DISCH light will also illuminate on other fire panel. Bottle located in the wing fairing of the associated side.

SQUIB TEST
Electrical test of the squibs

FAULT TEST
MC + SC + LOOP on CAP. Fault lights in A/B loop pb.

LOOP
FAULT: change in resistance, inhibits fire signal until turned off. Loop on CAP (DC emer)

ENGINE FIRE HANDLE
Pulled on the respective engine:
- PROP: feather
- FUEL: LP valve closed
- AIR: BLEED and HP valve closed
- DEICING: deice and shutoff valve closed
- ELEC: DC and ACW gen. disconnected

AGENT 2
SQUIB armed when T handle pulled. Discharges bottle. (DC EMER/HOT MAIN BAT)

OFF
 takes respective loop out of parallel circuit. Allows other loop to activate fire signal alone.

FIRE TEST
MW + CRC + ENG 1 FIRE on CAP + fire handle illuminated + FUEL S/O light on CL (if out of FUEL S/O position)

NORM
one fan runs

FAULT: the fan is out of order and illuminates amber + CCAS is activated

ALTN: The alternate fan runs, ALTN light illuminates white

4. Compartment smoke panel

SMK TEST
Tests the smoke detectors working

COMPT SMK

NORM
One fan runs

FAULT: the fan is out of order and illuminates amber + CCAS is activated

ALTN: The alternate fan runs, ALTN light illuminates white

5. Condition levers fuel light

FUEL SO
Illuminates red in case of fire signal from associated engine. Extinguishes after CL is set at fuel shut off position or if fire detection signal stops

ATA 35
J. Flight control
FCOM 1.09
The elevators, ailerons and rudder are mechanically actuated.

The spoilers and flaps are hydraulically actuated.

1. Roll schematic

In case of jamming, pitch control will be recovered by disengaging the pitch coupling system (by applying a differential force of 52 daN).

2. Pitch schematic
3. Yaw schematic

Stick Shaker/Pusher PB – FAULT light indicates a stick pusher or stick shaker failure – OFF position: enables to switch OFF the stick pusher and the stick shaker system.

4. Gust lock

GUST LOCK lever permits to lock mechanically the roll and pitch axes against the wing gusts. The PL travel is limited to slightly above FL.

For aircraft equipped with a spring tab on the aileron, the roll locking system is composed of two electro-mechanical locking devices. The AIL LOCK is triggered whenever one of the locking actuators is in disagreement with the gust lock position (lock or unlock position).

5. Stick Shaker/Stick Pusher push button and light

PITCH PUSHER illuminates to indicate that the stick pusher is operating.
6. Spoilers position indicator

**SPOILERS position indicator**
When illuminated, each blue light indicates that the associated spoiler is not in the fully retracted position (more than 2.5° aileron travel).

7. Pitch trim asym light

**PITCH TRIM ASYM**
Light illuminates to indicate a pitch tabs desynchronization greater than 0.7°.

8. Trim position indicator

**Pitch trim position**
Indicates the right trim actuator controlled tab travel. A green sector identifies the take off range. If take off (or take off config test) is performed with pitch trim out of this range, CONFIG warning will be generated by the CCAS.

**Yaw trim position**
Indicates units of trim motor displacement.

9. Trim controls

**Roll TRIM control SW**
Controls the roll trim actuator. For operation, both sws must be moved and held in the same direction (L WING DN or R WING DN) to energize the system (safety reasons). The roll trim is inhibited during autopilot operation. When the autopilot is engaged, the "RETRIM R(L) WING DOWN" message can be triggered on the ADU. This message authorizes to retrim on the dedicated side. The other side is still inhibited.

**STBY PITCH control SW**
Is a guarded sw which controls the electrical motors of each trim actuator. Action on this switch will disengage the autopilot.

**Pitch trim rocker**
Two switches installed on each control wheel. It is necessary to operate both rocker switches to activate the normal electrical motor of each trim actuator and to control nose up or down. The switches are spring loaded to neutral position. An aural whooler is generated by the CCAS if trim is used for more than 1 second. Action on this switch will disengage the autopilot.
10. Flaps schematic

11. Flaps position indicator

EXT flag appears to indicate that the flaps valve is hydraulically commanding flap extension. If EXT flag appears when flaps are extended, it means that there is a leak in the flaps hydraulic circuit.

FLAPS position indicator shows the flaps position.

12. Flaps control lever

FLAPS control lever controls the flaps operation. Distinct positions correspond to flaps 0°, 15°, 30° (72PEC) or 25°, 35° (42PEC).
K. Flight instruments
FCOM 1.10
The Avionics Standard Communication Bus (ASCB) system allows transmission of data in all directions between computers of the aircraft. The ASCB is controlled by the AFCS computer.

Private line: When the ASCB is failed, the private line is used as a back up, to transmit data from the AHRU to the SGU.

**Video Bus**

AFCS (Auto Flight Control System) receives data from the two ADC, AHIRS, SGU, the radio altimeter, the GNSS and from some sensors. It generates commands to the flight control actuators and to the FD bars. The AFCS is the ASCB controller too.

AHRU (Attitude and Heading Reference Unit) includes an Inertial measurement unit (INU) composed of three gyrometers and three accelerometers. The AHRU receives inputs from its associated flux valve and the TAS, fed by both ADC, is used to compute gyro erection.

ADC (Air Data Computers) is supplied with static air pressure (static ports), total air pressure (pitot ports), total air temperature (TAT probe). With these inputs, the ADC computes pressure altitude, VS, IAS, TAS, TAT, SAT.

SGU (Symbols Generator Unit):
- collects all the data, coming
  * from the ASCB (AFCS, AHRU, ADC)
  * from navigation sources (VOR, ILS, DME, ADF, GNSS)
  * from the remote controller (CRS, HDG)
- converts the data in video format, for the EFIS (EADI, EHSI)
- transfers the video data, from the weather radar or the EGPWS to the EHSI
2. EADI

Lateral ARM and CAPTURE mode

Horizon and pitch scale is white and has reference marks at 5, 10, 15, 20, 30, 40 and 60° nose up and 5, 10, 15, 20, 30, 45 and 60° nose down. Above 40° nose up and below 30° nose down, red arrows come into view.

FAST/SLOW indicator shows the difference between speed bug and actual speed (±10 Kts)

DH indication

Runway symbol appears lower than 200 ft

ROLL ATTITUDE scale 0, 10, 20, 30, 45 and 60°

Vertical ARM and CAPTURE mode

FLIGHT DIRECTOR command bars (magenta)

GLIDESLOPE indication

LOCALIZER indication

RADIO ALTITUDE indication

SLIP indicator

3. EHSI

HDG BUG selected by the remote HDG knob

POINTER (O) indicates the bearing to a station by N°1 system (VOR 1 or ADF 1).

POINTER (◇) indicates the bearing to a station by N°2 system (VOR 2 or ADF 2)

NAV SOURCE annunciator

DISTANCE display to the selected VOR/DME or ILS/DME station

CRS pointer and deviation

GROUND SPEED/TIME TO GO annunciator
4. EHSI with composite mode

- HDG select display
- Selected HDG BUG
- Selected COURSE POINTER
- HDG SCALE

5. EHSI - ARC MODE with terrain or weather radar information

- QUADRANTAL HEADING SCALE
  ARC with quadrantal heading scale MODE on an arc showing 45° either side of actual heading
- 044 Digital heading display
- SELECTED RANGE SCALE

6. Source failure alert

- SGU FAILURE alert
  A and B part failure and all information disappears from EADI and EHSI

- AHRS FAILURE
  the associated information immediately disappear from both CRTs. ATT FAIL message is displayed

- SGU FAILURE alert
  C part failure and a red cross appears on EADI and EHSI

- AHRS FAILURE
  the associated information immediately disappear from both CRTs. HDG FAIL message is displayed
7. Sources switching panel

- **ATT/HDG pb** enables to use AHRS 2 information. When captain pb is depressed, SYS 2 illuminates white on CAPT pb, CAPT 2 illuminates green on F/O pb.

- **VOR/ILS pb** enables to use VOR/ILS 2 information. When captain pb is depressed, SYS 2 illuminates white on CAPT pb, CAPT 2 illuminates green on F/O pb.

8. EFIS control panel

- **MAP pb** permits to select MAP selection with waypoints of the flight plan.

- **FULL/ARC pb** permits to select FULL or ARC mode on EHSI.

- **N°1 BRG (⊙) selector** to select blue bearing pointer to VOR 1 or to ADF 1 or to GPS active waypoints (RB NAV 1).

- **ADI knob**
  - outer knob (ADI DIM) to select ON/OFF and to set brightness
  - inner knob (DH TST) to set decision height from -10 to 990 ft + test if you push it
  - TEST: to test EFIS System and the radioaltimeter (RA)

- **HSI knob**
  - outer knob (HSI DIM) to select ON/OFF and to set brightness
  - inner knob (WX DIM) to set ON/OFF weather radar traces

- **GSPD/TTG pb** permits to select ground speed or time to go.

- **V/L pb** to select the VOR/LOC mode.

- **RNV pb** to select the GPS mode.

- **N°2 BRG (⊙) selector** to select green bearing pointer to VOR 2 or to ADF 2 or to GPS active waypoints (RB NAV 2).
9. Weather radar control

9.1. Primus 800

GAIN
setting to set receiving amplification

MODE selector
OFF radar is off
STBY radar is ON but no pulse is sent by antenna
TEST range at 100 NM, 3 arcs green, yellow and red
WX normal operating position, intensity of weather obstacles is displayed by different colors (black: no cloud; green: normal cloud; yellow: dense; red: severe storm)
G MAP enables to display ground obstacles (black, pale blue, yellow, magenta)

TGT pb
activates target alert

GCR pb
activates ground clutter reduction function to discriminate echoes usually coming from the ground

RCT pb
activates Rain Echo Attenuation Compensation technique function and permits display with more accuracy the weather situation behind storms

TILT control
to adjust radar antenna in pitch axis from 15° down to 15° up

RANGE selector
to select the distance scale. 2 concentric arcs of circle are displayed

9.2. Primus 660

The range pushbutton are used to select the operating range of the radar

GAIN
setting to set receiving amplification

MODE selector
OFF radar is off
STBY radar is on but no pulse is sent by antenna
TEST range at 100 NM, 3 arcs green, yellow and red
WX normal operating position, intensity of weather obstacles is displayed by different colors (black: no cloud; green: normal cloud; yellow: dense; red: severe storm)
G MAP enables to display ground obstacles (black, pale blue, yellow, magenta)

TGT pb
activates target alert

RCT pb
activates Rain Echo Attenuation Compensation technique function and permits display with more accuracy the weather situation behind storms

TILT control
to adjust radar antenna in pitch axis from 15° down to 15° up

10. AHRS erect PB

AHRS erect pb
illuminates amber when the associated AHRS loses the TAS signal from the ADC. If the aircraft is stabilized (unaccelerated level flight) a gyro fast erection may be performed by depressing the associated pb for 15 s.
11. TAT/SAT indicator

TAT indicator
indicates total air temperature

SAT indicator push button
indicates static air temperature, when pushed

TAS indicator
indicates true air speed

12. CLOCK

CHRONO
depress once to start, once to stop, once to reset

TIME KNOB
Pull then rotate knob to set time

CLOCK
Hours and minutes pointer

REVOLVING BEZEL
Indicates elapsed time from start mark

13. RCDR panel

RCDR pb
when depressed, both cockpit voice recorder and digital flight data recorder are energized (manual mode). ON it illuminates blue

RESET pb
when depressed, inhibits recording in the manual mode

14. STBY instruments

STANDBY COMPASS
Hidden in up position. Compass control should be place on DN for use. The compass rose is graduated in 10 degrees increments

STANDBY HORIZON
Attitude sphere marked every 5 degrees of pitch axis, to ±80 degrees. Roll angle is given by a scale marked at 10, 20, 30, 60, and 90 degrees. Setting knob when pulled, causes a rapid erection if the instrument is powered

STANDBY AIRSPEED INDICATOR
displays the airspeed as calculated from standby static and standby pitot pressures. Scale from 40 Kt to 320 Kt

STANDBY ALTIMETER
With baro set knob, altitude pointer and Hpa counter
15. Airspeed indicator

**AIRSPEED INDICATOR**
Displays the airspeed. Scale from 60 Kt to 400 Kt.

**VMO POINTER**
In red and white strips indicates the max airspeed computed by the associated ADC which represents VMO/MMO. An aural warning (clacker) will be generated by the CCAS if overshoot.

**MOBABLE INDICES**
(bugs) in four colors

**OFF/RED FLAG**
Indicates a failure affecting the VMO channel or the airspeed indicator

**SPEED SELECTOR**
To set a desired speed during a given phase of flight and controls the reference on the EADI FAST/SLOW scale.

16. Altimeter

**ALTIMETER**
With baro set knob in Hpa and IN HG

**ALTIMETER**
With baro set knob in MB and IN HG

**ALTITUDE ALERT**
Illuminates amber when altitude alert is triggered (+ 1000 ft or + 250 ft)

17. RMI

**RADIO MAGNETIC INDICATOR (RMI)**
Is coupled to the opposite AHRS with a compass rose, showing magnetic heading, two pointers.

**Selector switch**
Permit to switch VOR 1 or ADF 1 information which is represented on simple yellow needle.

**Selector switch**
Permit to switch VOR 2 or ADF 2 information which is represented on double green needle.
18. Flight data entry panel

**FLIGHT NUMBER AND DATA ENTRY PANEL**
Panel enables through 4 thumbwheels to insert different data: hour, minutes, month, day, year.

**EVENTS pb**
When momentarily depressed, the tape records are marked to identify a special event.

**STATUS SYST Lt**
Illuminates amber when
- the DRDR is failed
- the DFDR or QAR (if installed)
(quick access recorder)
electrical power is lost
- QAR (if installed) 80 % full

**STATUS FDAU Lt**
Illuminates amber when the FDAU is failed.

**DATA DISPLAY**
Date and time may be displayed and selected through the UPDATE pb and the data entry panel.

**UPDATE pb**
First left thumbwheel of data entry panel must be on 9 position
- first sequence: hours and minutes
- second sequence: year
- third sequence: month and day

19. TCAS VERTICAL speed indicator

**TEST switch**
Activates indicator self-test when depressed, indicator will display a test pattern.

**OPEN DIAMOND**
Shows other traffic. Range and bearing of other aircraft within surveillance range and selected range and altitude for display.

**GREEN ARC**
Recommended vertical speed to resolve corrective resolution advisory.

**POINTER**
(White) indicates present vertical speed. Pointer displayed when vertical speed is valid.

**SOLID CIRCLE**
Intruder. TA generated. Range and bearing relative to own aircraft.

**A/B Mode button**
Select display of traffic (relative to own aircraft altitude)
Above: +9900 ft to −2700 ft
Below: +2700 ft to −9900 ft
In normal position, viewing of traffic from 2700 ft below to 2700 ft above.

**RANGE RING**
(White) 2 miles radius range about own aircraft.

**TRAFFIC DATA**
(Same color as associated traffic symbol): Relative altitude of intruder aircraft. If altitude is not available, traffic data is not displayed.

**RANGE (6 NM or 12NM)**
Selected forward range of traffic display.

**SOLID DIAMOND**
Traffic within ± 1200 ft and 6 NM of own aircraft.

**TRAFFIC ARROW**
(Same color as associated traffic symbol): Climb or descent rate (>500 ft/min) of intruder aircraft.

**TRAFFIC DATA**
(Same color as associated traffic symbol): Relative altitude of intruder aircraft. If altitude is not available, traffic data is not displayed.

**AIRCRAFT**
Own aircraft symbol.

**RNG**
Range push button selects range of display. (6NM or 12NM)

**RED ARC**
Do not enter range if vertical speed is outside of arc (preventive);
Exit range if vertical speed is within arc (corrective resolution).
L. Fuel system

FCOM 1.11
1. Schematic

The fuel is stored in two tanks, one in each wing. Each tank is fitted with:
- a vent surge tank to ensure positive pressure and allows a thermal expansion without spillage
- a main wing tank
- a feeder tank, always full to protect the engine feed system against negative or lateral load factors

**ATR 42**

Total quantity 4500 kg

**ATR 72**

Total quantity 5000 kg

---

**L. Fuel system**

**ATA 28**
2. Starting procedure

ENGINE SHUT DOWN WITH ELECTRICAL PUMP RUNNING
Both fuel engine electrical pumps push buttons are pressed IN and green RUN lights illuminate.
The electrical pumps are energized and begin to supply fuel to engines.
The FEED LO PR amber light extinguishes when the pressure is > 4 psi on the line.
At the same time, the feeder jet pump is activated by the electrical pump output pressure, to supply and maintain the feeder tank full.
3. Normal procedure

ENGINE RUNNING / NORMAL OPERATION OF THE FUEL SYSTEM
After engine starting, the flow, from return line of the HMU, opens the Motive Flow Valve, in order to supply the Engine Feed Jet Pump.
The Engine Feed Jet Pump begins to operate by driving fuel from the feeder tank.
At the same time, it supplies the Feeder Jet Pump.
When the Engine Feed Jet Pump outlet pressure reaches 8.5 PSI, the electrical pump is de-energized after 30s time delay.
In normal operation of the fuel system, the engine is only supplied by the Engine Feed Jet Pump and the electrical pump is de-energized.

Conditions to energize the electrical pump (See details on pages hereafter)
– Cross feed operation
– Engine Feed Jet Pump outlet pressure drops below 5 psi
– Low Level
4. Cross feed procedure

Cross feed valve could be used to supply an engine from the opposite tank. The cross feed is not used to transfer fuel from one tank to the other tank. With the Xfeed valve push button pressed IN, the valve opens, green flow bar is horizontal. Both electrical pump are energized.

By selecting OFF the corresponding PUMP push button, the electrical pump is de-energized and the motive flow valve is supplied to close. The engine is fed through the opposite tank.
5. Engine feed jet pump low pressure   ATA 28

In the event of engine feed jet pump failure, the pressure switch (< 5 psi) provides electrical pump running control which ensures fuel supply to the engine. The electrical pump delivers the necessary flow rate for engine consumption.
6. Low level

When the low level is triggered on one tank, its electrical pump is automatically activated.

Two cases of low level:
- LO LVL with fuel quantity indicator < 160 kg → Low level of the remaining fuel in the tank.
- LO LVL with fuel quantity indicator > 160 kg → Feeder tank not full due to a failure of the feeder jet pump. In this condition, the fuel is transfered from the main tank to the feeder tank through the flappers.
In case of engine fire, when corresponding engine fire handle is pulled, it closes associated LP shut off valve.
8. Fuel panel

**FEED LO PR**
Delivery pressure < 4 PSI. Pump failure or fuel starvation. CAP.

**FLOW BAR**
Shows position of valve. No bar: valve fault or moving.

**RUN**
Illuminates green when elec fuel pump is running.

**XFEED valve**
Activates both elect fuel pumps.

**PUMP**
Control electrical pump power and jet pump motive flow valve.
Runs automatically if:
- jet pump press < 5 PSI or till reaching 8.5 PSI during engine start.
- XFEED in line
- fuel LO LVL
  * When the quantity is < 160 kg
  * When the quantity is > 160 kg, but the feeder tank is not full (Feeder jet pump failure)
- during fuel quantity test

**FUEL TEMPERATURE in °C**

9. Fuel QTY panel

**LO LVL Lt**
- When the quantity is <160 kg or
- When the quantity is >160 kg, but the feeder tank is not full (Feeder jet pump failure)

**TEST pb**
When pushed in, displays all 8’S + LO LVL LTS + CAP + elect pumps energized. Refuel valves auto close.

10. XFEED advisory light

**FUEL X FEED**
Illuminates as soon as the fuel crossfeed is selected on.
M. Hydraulic system

FCOM 1.12
The aircraft has two hydraulic systems, designated blue and green. Each system is pressurized by an electric pump, supplied by ACW power. The blue system is also provided with an auxiliary pump, supplied by DC power (automatic or manual mode).

1. Schematic

[Diagram of hydraulic system with labels for nose wheel steering, landing gear, flaps, spoilers, propeller brake, braking, emergency and parking, normal filling, and alert level.]
2. HYD PWR panel

**BLUE PUMP**
Supplied by ACW, controlled by DC EMER BUS

**GREEN PUMP**
Supplied by ACW, controlled by DC BUS 2 or DC EMER BUS

**LO PRESS**
< 1500 psi. CAP (no auto off)

**LO PR**
pump delivery pressure less than 1500 psi. CAP. No auto off.

**OVHT**
drain > 121°C (250°F). CAP. (no auto off).

**X FEED**
Pb released Xfeed closed. if LO LVL auto closes. (DC STBY BUS).

**LO LEVEL**
associated compartment <2.5 l. HYD on CAP.

**Auxiliary pump**
Automatic running conditions (simultaneously):
– AUX Pump pb depressed
– at least one engine running
– blue system press <1500 psi
– prop brake off
– gear lever down
(supply: DC BUS 2 or Hot main bat bus)

3. Pressure indicator

**Blue HYD SYST**
Blue system hydraulic pressure indicator.

**Green HYD SYST**
Green system hydraulic pressure indicator.

4. AUX pump pedestal switch

**AUX PUMP pedestal switch**
– energizes for 30”, the auxiliary DC hydraulic pump with the HOT MAIN BAT BUS
– supplies power to the pressure indicators

**NOTE:** intensive use could discharge the main battery.
N. Ice and rain protection

FCOM 1.13
Aircraft ice protection is provided by a pneumatic and an electrical system adapted for the critical areas. Ice detector monitors ice accretion. It is connected to the CCAS.

1. Schematic

AILERON HORNS (ELECTRICAL)

WINGS BOOTS (PNEUMATIC)

ENGINE AIR INTAKE BOOTS (PNEUMATIC)

HORIZONTAL TAILPLANE BOOTS (PNEUMATIC) / RUDDER AND ELEVATOR HORNS (ELECTRICAL)

WINSHIELD (ELECTRICAL)

SIDE WINDOWS (ELECTRICAL)

ICING EVIDENCE PROBE (ELECTRICAL)

PROBES (ELECTRICAL)

ICE DETECTOR
2. Probes and windshield HTG

**CAPT WIPER rotary selector**
- **OFF**: wiper stops at the end of travel (park) position.
- **SLOW**: wiper operates at 80 cycles/min
- **FAST**: wiper operates at 130 cycles/min

**PITOT tube**
- not heated, CAP (ACW bus 1 for CPT and ACW bus 2 for F/O).

**STAT**
- Static port not heated (On ground only, not monitored in flight), CAP (DC BUS)

**WINDSHIELD HTG**
- ACW supply, Outer surface +2°C Inner +21°C

3. Rain protection

**CAPT WIPER rotary selector**
- **OFF**: wiper stops at the end of travel (park) position.
- **SLOW**: wiper operates at 80 cycles/min
- **FAST**: wiper operates at 130 cycles/min

**F/O WIPER rotary selector**
- **OFF**: wiper stops at the end of travel (park) position.
- **SLOW**: wiper operates at 80 cycles/min
- **FAST**: wiper operates at 130 cycles/min

4. Ice detector panel and icing AOA

**FAULT**
- detector failure or supply loss (ACW BUS 2), CAP

**ICING AOA Lt**
- (DC emer BUS), Illuminates green as soon as 1 horn anti-icing on. Stall alarm + stick shaker threshold lowered. When light ON, the angle of attack for the stall warning is reduced. It can be extinguished manually only by releasing ICING AOA P/B provided both horns anti-icing are selected OFF

**ICING**
- Illuminates amber when ice accretion is detected provided both horns anti-icing and airframe de-icing are selected ON.

**ICING**
- flashes amber when ice accretion is detected and horns anti-icing and/or airframe de-icing are not selected ON
5. De-icing schematic

ATR 42

N. Ice and rain protection
6. Anti-icing & de-icing panel

**PROP**
ACW supply. Inhibited below NP 63%

**FAULT**
power loss on at least 1 blade.
ANTI-ICING on CAP

**MODE SEL PROP**
NORM: 10" on per 3 blades;
then 10" off between cycles.
ON (HIGH POWER): 20" on
per 3 blades.
No pause between cycles.

**MODE SEL AUTO**
Automatic selection of cycle depending on ADC1/2 to
MFC1B/2B
FAULT when ADC or MFC fail:
Fast mode is automatically selected for ENG and
AIRFRAME DEICING and High Power for PROP ANTI-ICE.
MAN: manual selection of cycles depending on SAT

**ENG**
FAULT: distribution valve opened but no air pressure.
OR valve closed and pressure detected OR AFR
AIR BLEED off and air temp above deice valve >230°C for
more than 6".

**ENG ON**:
signal sent to MFC to start deice cycle on the
engine air intake, deice valve opened even if AFR AIR
BLEED off

**MODE SEL ENG AND AIRFRAME**
SLOW: 240"/cycle
FAST: 60"/cycle

**AFR AIR BLEED**
FAULT: air downstream deice valve <14 psi more than 10"
OR Air upstream of the deice valve > 230°C.

**HORNS**
ACW supply. Inhibited on ground. Either horn activates
AOA Lt

**HORNS FAULT**
Power loss. ANTI-ICING on CAP

**SIDE WINDOWS**
Defog only. FAULT for power loss. CAP (DC BUS)

**DE ICING**
air is always available regardless of bleed pb.
NORM: 60" / cycle
SLOW: 240" / cycle

**FAULT**
both MFC modules have failed to control boots cycles.
The monitoring is performed by the stby controller

**AFR AIR BLEED**
OVRD: no MFC. Boots inflated by separate stantby controller (cycle 60")

**AIR FRAME**
FAULT: valve opened but no downstream press. OR
valve closed and downstream press detected. CAP

**AIR FRAME ON**:
signal sent to MFC to start deice cycle on the
airframe

**AFR AIR BLEED**
OFF: isol valves closed.
Deice valves closed unless ENG 1 / 2 deice on.

**MODE SEL AUTO**
Automatic selection of cycle depending on ADC1/2 to
MFC1B/2B
FAULT when ADC or MFC fail:
Fast mode is automatically selected for ENG and
AIRFRAME DEICING and High Power for PROP ANTI-ICE.

**MAN**: manual selection of cycles depending on SAT

**ENG ON**:
signal sent to MFC to start deice cycle on the
engine air intake, deice valve opened even if AFR AIR
BLEED off

**MODE SEL ENG AND AIRFRAME**
SLOW: 240"/cycle
FAST: 60"/cycle

**AFR AIR BLEED**
FAULT: air downstream deice valve <14 psi more than 10"
OR Air upstream of the deice valve > 230°C.

**HORNS**
ACW supply. Inhibited on ground. Either horn activates
AOA Lt

**HORNS FAULT**
Power loss. ANTI-ICING on CAP

**SIDE WINDOWS**
Defog only. FAULT for power loss. CAP (DC BUS)

**DE ICING**
air is always available regardless of bleed pb.
NORM: 60" / cycle
SLOW: 240" / cycle

**FAULT**
both MFC modules have failed to control boots cycles.
The monitoring is performed by the stby controller

**AFR AIR BLEED**
OVRD: no MFC. Boots inflated by separate stantby controller (cycle 60")

**AIR FRAME**
FAULT: valve opened but no downstream press. OR
valve closed and downstream press detected. CAP

**AIR FRAME ON**:
signal sent to MFC to start deice cycle on the
airframe

**AFR AIR BLEED**
OFF: isol valves closed.
Deice valves closed unless ENG 1 / 2 deice on.

**MODE SEL AUTO**
Automatic selection of cycle depending on ADC1/2 to
MFC1B/2B
FAULT when ADC or MFC fail:
Fast mode is automatically selected for ENG and
AIRFRAME DEICING and High Power for PROP ANTI-ICE.

**MAN**: manual selection of cycles depending on SAT

**ENG ON**:
signal sent to MFC to start deice cycle on the
engine air intake, deice valve opened even if AFR AIR
BLEED off

**MODE SEL ENG AND AIRFRAME**
SLOW: 240"/cycle
FAST: 60"/cycle

**AFR AIR BLEED**
FAULT: air downstream deice valve <14 psi more than 10"
OR Air upstream of the deice valve > 230°C.

**HORNS**
ACW supply. Inhibited on ground. Either horn activates
AOA Lt

**HORNS FAULT**
Power loss. ANTI-ICING on CAP

**SIDE WINDOWS**
Defog only. FAULT for power loss. CAP (DC BUS)

**DE ICING**
air is always available regardless of bleed pb.
NORM: 60" / cycle
SLOW: 240" / cycle

**FAULT**
both MFC modules have failed to control boots cycles.
The monitoring is performed by the stby controller

**AFR AIR BLEED**
OVRD: no MFC. Boots inflated by separate stantby controller (cycle 60")

**AIR FRAME**
FAULT: valve opened but no downstream press. OR
valve closed and downstream press detected. CAP

**AIR FRAME ON**:
signal sent to MFC to start deice cycle on the
airframe

**AFR AIR BLEED**
OFF: isol valves closed.
Deice valves closed unless ENG 1 / 2 deice on.

7. De icing indicator (memo panel)

**DE ICING LIGHT**
– Illuminates when airframe deicing syst is ON
– Flashes when airframe deicing syst still selected ON 5 min after last ice accretion detection
0. Landing gear

FCOM 1.14
1. Landing gear description

The landing gear is hydraulically operated. In case of hydraulic failure, it may be extended by gravity.

2. Brakes schematic
3. LDG GEAR position indicators

System 2
UNLK gear not locked in selected position or (on GND) uplock box not opened.
Green Lt down lock engaged.

System 1
UNLK gear not locked in selected position or (on GND) uplock box not opened.
Green Lt down lock engaged.

4. Landing gear handles

LDG GEAR EMERGENCY EXTENSION HANDLE
permits to unlock the landing gear

GEAR HANDLE RED LIGHT
any gear not sensed down and locked with some conditions. CAP.

5. Brakes temperature and antiskid

BRK TEMP
HOT Any brake T° > 160°C

F (FAULT)
wheel channel failure. CAP

OFF
Pb released, system deactivated

ANTISKID
Operative if speed > 10 kts.
Activates when speed > 23 kts + 50% diff between wheels (locked wheel protection).
Braking action inhibited at touchdown as long as wheel spin up speed < 35 kts or 5 sec. (touchdown protection).
CAUTION: THE TEST INHIBITS BRAKES

TEST pb
(inhibited if speed > 17 kts)
= MC + SC CAP 4F amber lt.
Test duration: 3 sec. in flight and 6 sec. on ground

6. Emergency parking brake handle

EMERGENCY BRAKE HANDLE
permits to apply a metered pressure.
The brake accumulator allows at least six braking applications without any antiskid operation if the blue hydraulic system is not available

PARKING BRAKE
permits a full pressure on the brakes. When brake handle is not in the fully released position, amber PRKG BRK caution light illuminates on CAP and is taken into account by the T/O CONFIG. (Springloaded to the off position)

7. Steering handwheel

N/W STEERING SW
activates or deactivates the nose wheel steering system (guarded type in the ON position)
OFF: unpressurizes the steering system (91° of deflection)

THE STEERING HAND WHEEL
controls the nose wheel angle up to 60° in either direction:
– clockwise: steering to the right
– counter clockwise: steering to the left
P. Navigation system

FCOM 1.15
4. EGPWS alert modes

The Enhanced Ground Proximity Warning System provides visual and aural alerts in case of dangerous flight path conditions which would result inadvertent ground contact if maintained.

The EGPWS performs the following alert modes:
- Basic GPWS modes
  * Mode 1: excessive descent rate
  * Mode 2: excessive terrain closure rate
  * Mode 3: altitude loss after take-off
  * Mode 4: unsafe terrain clearance
  * Mode 5: below glideslope
  * Mode 6: altitude callouts
- Enhanced modes:
  * Terrain Clearance Floor (TCF)
  * Terrain Awareness & Display (TAD)
**MODE 1**
excessive descent rate

**MODE 2**
excessive terrain closure rate

**MODE 3**
altitude loss after take-off
MODE 4
unsafe terrain clearance

MODE 5
below glideslope
The Terrain Clearance Floor (TCF) mode creates an increasing terrain clearance envelope around the airport runway directly related to the distance from the runway.
This function uses the aircraft geographic position from the GPS, aircraft altitude, and a worldwide terrain database to predict potential conflicts between the aircraft flight path and the terrain, and to provide aural alerts and graphic displays of the conflicting terrain.

5. EGPWS pb

GPWS illuminates red as long as any mode 1-2-3-4 alert is activated, accompanied by the voice alert for the particular mode.

6. EGPWS selector

EGPWS selector is guarded in the norm position. FLAP OVRD mode 4 alert caused by flap extension is inhibited to avoid nuisance in case of flapless landing.
7. Global navigation satellite system (GNSS)

The Global Navigation Management System (GNSS) receives and processes Global Positioning System (GPS) signals. The GNSS provides en route and terminal area guidance, autopilot coupling, roll steering and vertical deviation (non-coupled), along defined flight plan, selected on the MCDU.
Q. Power plant
FCOM 1.16
1. Engine schematic

Aircraft fitted with
- two Pratt & Whitney, PW 127 F (72-212A), E (42-500) or M (42-500/72-212A)
- two, six blades propellers (Hamilton)

It is a free turbines engine, composed of 3 concentric shafts of spools:
- The shaft of the HP spool composed of the HP turbine and the HP compressor (rotation speed of the HP spool: NH). The HP spool drives the accessory gear box (AGB)
- The shaft of the LP spool composed of the LP turbine and the LP compressor
- The Power shaft composed of 2 power turbines (Free turbines). This 2 power turbines drive the propeller through the reduction gear box (RGB) (rotation speed of the propeller NP)

**REDUCTION GEAR BOX**
These equipments are fitted on the RGB
- the ACW generator
- the Propeller Valve Module (PVM)
- the propeller pump (HP) and overspeed governor
- the auxiliary feathering pump
- the propeller brake (on RH engine only)

**HIGH PRESSURE COMRESSOR**
centrifugal type

**LOW PRESSURE COMRESSOR**
centrifugal type

**HIGH PRESSURE TURBINE**

**POWER TURBINE**

**DIFFUSER PIPES**

**ANNULAR COMBUSTION CHAMBER**

**LOW PRESSURE TURBINE**

**ACCESSORY GEAR BOX**
driven by the HP spool.
Drives
- the DC starter/generator
- the HP fuel pump
- the engine oil pumps

6 blades propeller
2. Power and propeller controls

The different powers of the engine are: (SHP: Shaft Horse Power)

- **RTO (Reserve Take Off)** (maximum power) 2750 SHP Used in case of an engine flame out during take off (up trim) or in case of go around (ramp)
- **MCT (Maximum continuous)** 2500 SHP
- **TO (Take Off 0.9 RTO)** 2475 SHP
- **Climb** 2192 SHP
- **Cruise** 2132 SHP

**Power (PWR) = Torque (TQ) x NP**

For the same power: If TQ increases, NP decreases
If TQ decreases, NP increases

Power setting is characterized by constant power lever (PL) and condition lever (CL) positions. The power adapted to the flight phase is selected by the pilot through a power management selector (PWR MGT).

- With input coming from the PWR MGT and the position of the PL, the EEC (Engine Electronic Control) control the fuel flow to the engine.

> **MAX PWR (Full stop):** Maximum Power → TQ up to 115% (On emergency only)

> **GO around position (Beginning of the ramp):** RTO → TQ up to 100%

**NOTCH position:**
- **PWR MGT in → TO:** NP 100% and 0.9 RTO → TQ up to 90%
- **MCT** → NP 100% and TQ up to 90.9% (72-212A) → NP 100% and TQ up to 100% (42-500)
- **CLB** → NP 82% and TQ up to 97% (72-212A) → NP 82% and TQ up to 109.7% (42-500)
- **CRZ** → NP 82% and TQ up to 94.5% (72-212A) → NP 82% and TQ up to 108.3% (42-500)

**Reversion in manual mode when EEC FAULT (green band <52°):**

**Flight Idle position**

**Ground Idle position**

**Reverse position**
Regardless of the PWR MGT position, NP is at 100% AUTO position:
→ Blade angle governing mode. The NP is regulated by the PEC (Blade angle change). PWR MGT in:
  → TO → NP = 100%
  → MCT → NP = 100%
  → CLB → NP = 82%
  → CRZ → NP = 82%

→ Fuel governing mode. The NP is regulated by the EEC (Fuel Flow change) ground operation in low power. The NP is maintained at 70.8% to have the ACW available. (The ACW generator is on line when NP > 66%)

FTR (Feather position). The fuel governing mode is cancelled (No ACW generator)

Fuel Shut Off position. Close the shut off valve on the HMU
- The PWR MGT has four positions: TO, MCT, CLB, CRZ
- Considering that CLs are in AUTO and the PLs are at this position marked by the notch, the control system delivers max rated power corresponding to the mode selected (the max rated power is delivered only when the engine is not thermodynamically limited)

**ATR 72-212A**

![Diagram](image)

**NORMAL OPERATION, EEC ON, ISA CONDITIONS**

- TO  PWR = 2475 SHP  NP=100%  TQ = 90%
- MCT PWR = 2500 SHP  NP=100%  TQ = 90,9%
- CLB PWR = 2192 SHP  NP=82%  TO = 97%
- CRZ PWR = 2132 SHP  NP=82%  TO = 94,5%

The RTO (Reserve Take-Off) is obtained in case of up trim (one engine out during take off) or with the PL to the ramp
- RTO  PWR = 2750 SHP  NP=100%  TQ = 100%

**ATR 42-500**

![Diagram](image)

**NORMAL OPERATION, EEC ON, ISA CONDITIONS**

- TO  PWR = 2160 SHP  NP=100%  TQ = 90%
- MCT PWR = 2400 SHP  NP=100%  TQ = 100%
- CLB PWR = 2400 SHP  NP=82%  TO = 109,7%
- CRZ PWR = 2132 SHP  NP=82%  TO = 108,3%

The RTO (Reserve Take-Off) is obtained in case of up trim (one engine out during take off) or with the PL to the ramp
- RTO  PWR = 2400 SHP  NP=100%  TQ = 100%
3. Engine indicators

**INTERNAL BUG**
- Computed by FDAU; shows RTO MGT on T/O, otherwise max TQ depending on PWR MGT selection

**TORQUE ind. (DC EMER)**
- 2 probes located on the reduction gear box shafts sends signal to the AFU (Auto Feathering Unit) and to the EEC (Engine Electronic Control) which supply the torque indicator.
- The AFU controls the pointer and the EEC controls the digital display

**NP ind.**
- DC ESS from 0 to 120%

**ITT ind.**
- (DC ESS) from 0 to 1200°C
- Red point: 20° max
- Red point + S: 5°max on start
- H: limite for hotel mode operation

**TEST**
- 115 % (blue dot)

**OIL PRESS ind.**
- (Main DC BUS) from 0 to 90 PSI

**OIL LOW PRESS Lt**
- <40 PSI. A separate press sw activates CCAS below 40 PSI

**OIL TEMP**
- (Main DC BUS) from 0 to 130°C

**FUEL FLOW Ind.**
- (Main DC BUS)

**FUEL USED readout**
- (Main DC BUS)

**NH /NL ind**
- (DC ESS) NH actual display from 0 to 120%

**TORQUE ind.**
- White TQ bug manually selected

**TEST**
- 115 % (blue dot)

**KNOB**
- To set white TQ bug

**NP ind.**
- NP actual display

**ITT ind.**
- ITT actual display

**ALERT**
- When ITT > 800°C or 715°C in hotel mode Lt CAP

**TEST**
- 1150°C (blue dot)

**NH /NL ind**
- (DC ESS) NH actual display from 0 to 120%

**FUEL FLOW Ind.**
- (Main DC BUS)

**FU reset knob**
- FU reset to 0 when pulled

**FU reset knob**
- FU reset to 0 when pulled
4. ENG START panel

CRANK
dry motoring (no ignition)

START A OR B
on ground, only exciter A or B is supplied (except for the position A&B)
In flight regardless of start selection (A, B or A+B) both exciters are energized

ON
starter engaged. At 45% NH, light goes off and the starter is disconnected

FAULT
illuminates when:
- remains ON with NH >45%
or – GCU failure during start
or – starter failure
or – ENG 2 only: ENG START selector on start position + PROP BRK ON + GUST lock not engaged

ON
Continuous ignition (both A & B). Memo panel light.

READY
engagement or disengag. conditions are met:
- A/C on ground
- gust lock engaged
- CL on FTH or FUEL S/O
- blue hyd press available on the prop brake input >2100psi
- Fire handle not pulled

UNLOCK
PROP BRAKE not fully locked or not fully released. After 15 sec: CAP alarm. Also used to check lock/unlock time:
- 5 sec. to unlock
- 10 sec. to lock

PROB BRK
Brake fully locked same indication on the memo panel

5. ENG control panel

ARMING CONDITIONS
PWR MGT sel on TO +ATPCS pb in +both PL > 49° +both TQ > 46% = (arm green LT illuminated)

LO PITCH
blade angle < FI (8°) CAP in flight only

UP TRIM
signal sent to respective eng during ATPCS sequence. Eng power = RTO

ATPCS
- ARM on ground = uptrim + auto FTR (2.15” delay)
- ARM in flight (in case of go around) = auto FTR only

EEC
acts on stepper motor to regulate Fuel Flow

FAULT flashing
EEC failure. The fuel flow is frozen to maintain the power
FAULT steady: EEC failure, HMU base law = reversion
When FAULT flashing, never deselect the EEC.
Retard first, the PL in the green sector (FAULT become steady: PL < 62°)

OFF
HMU base law = reversion
6. PWR MGT panel

PWR MGT
2 co-axial sw. (LH: bottom / RH: TOP) providing FDAU, PEC and EEC with basic power requirements

OFF
PEC is deactivated and NP is limited at 102.5% if power is sufficient

SQL CH
illuminates when one channel is lost (2" for self test when advancing CL from FTR to AUTO)

FAULT
illuminates when both PEC channels are lost. CAP

42/72 PEC

7. ATPCS test panel

ATPCS
selector allows to check the correct functioning of the ATPCS. This rotary selector is spring loaded to neutral position

8. Idle gate

IDLE GATE FAIL
light illuminates amber and the CCAS is activated when the gate does not engage automatically in flight or does not retract at landing

IDLE GATE LEVER
enables manual override in case of failure of the automatic logic or no DC power.
In flight: push
On ground: pull. A red band appears
Annexes
Annex 1. Cockpit panels

**Annexes**

**SQUIB TEST**
Elec test of squibs.

**FAULT**
resistance/capacitance. Inhibits fire signals until turned off.
LOOP in CAP (DC EMER)

**SQUIB**
ammed when T handle pulled. Discharges bottle. (DC EMER / HOT MAIN BAT).

**DISCH**
bottle depressurized. Opposite agent DISCH Lt will also illuminate on other fire panel.

**TLU FAULT**
system disagree / two ADC failures / ADC data incoherence / TLU position synchro failure. T/O or T/O Config Test and TLU not LO SPD

**TLU manual operation**
Above 195 kts (42) / 185 kts (72): HI SPD
Below 190 kts (42) / 180 kts (72): LOW SPD

**SPLR**
activates when >2.5° aileron travel. Lt ON=Spoiler not fully retracted (BLUE HYD PWR).

Light on when SW TEST depressed and all door microsws opened. (Passengers and service doors opened)

At least 1 microsw is opened. (DC BUS 2)
Tests continuity of microsw. System (on ground, doors opened).

Fuel delivery pressure below 4 PSI. Pump failure or fuel starvation. CAP
Shows position of valve. No bar = valve fault or moving.

**RUN**
Illuminates green when elec fuel pump is running.

**OFF**
disconnect the elect pump and force to close the motive flow valve

**Feeder Tk Fuel Temp Ind**
LH only (DC BUS 1)
(Range –60°C/0°C)

Both domes (DC BUS 1) F/O only in basic mode (DC EMER),
Use in basic mode to limit Lts in cabin. Light on the RH side only,
Two fluorescent lights under glareshield.

**ENGINE FIRE HANDLE**
Pulled: on the respective engine
Prop Feather
Fuel LP valve closed
Air Bleed valve closed
Dece Dece & shutoff valve closed
Elect DC & ACW gen. disconnected
Squibs Armed (Lts illuminated)
Hydraulic Hyd prop brake (eng 2 only)

**Fire test**
MW+CRC+ ENG 1 FIRE on CAP
+FIRE handle illuminated
+FUEL S/O Lt on CL (if out of Fuel S/O position)

**Fault test**
MC+SC+ loop on CAP
FAULT Lts on A/B Loop pb.

**OFF**
Takes respective loop out of parallel circuit. Allows other loop to activate fire signal.

The opening of the cargo door control panel cover. Self Test of MFC 1A/2A.

**FAULT**
Malfunction or electrical supply fault: AUTO disengagement – CAP
Most amber LTS / some red LTS are lost on CAP if dual fault of 1B & 2B.

Gear position secondary system as sensed by MFC 2.

**UNLK**
gear not in selected position or uplock not opened (on Gnd)

**Green Lt**
down lock engaged

Controls XFEED valve. Activates both elect fuel pumps.
Controls elect pump power supply and jet pump motive flow valve. Runs automatically if:
Jet pump press <5 PSI or Xfeed in line or Fuel LO LVL
– <160 kg
– >160 kg (with feeder tank not full) or During Fuel Quantity test

To call cabin from cockpit (SC)
To be called by cabin attendant: blue Lt and door bell. Canceled when pressing RESET pb.

To call mechanic= HORN is activated
To be called by mechanic: Blue LT and Door Bell. Canceled when depressing RESET Pb

Do not use above 160 kts. ESS BUS.
UNDV
DC STBY <19.5V. No CAP.

OVRD
Transfert of STBY buses from HOT MAIN to HOT EMER BAT BUS.

INV FAULT
Inv failure or supply loss Auto-Xfer of all AC buses to remaining inverter. CAP,
Emergency supply indicators (Amber arrows) (Respective battery discharging).

ON
Pb pressed IN (ON illuminated WHITE). TRU is connected to AOW BUS 2 – ARROW illuminates amber when supply of DC EMER BUS, DC STBY BUS, INV 1 (AC STBY BUS) and DC ESS BUSS from TRU is effective.

FAULT
Battery charger failure detected by MFC. CAP,
Contactor Auto opens (MFC) if: thermal runaway/Bus voltage <25V / start sequence/Bat sw on OVRD.
Respective bus not supplied. CAP.

SHED
One of the DC SVCE / UTLY 1 and 2 busses is shed (BPCU).
CAP.
OFF: all the DC SVCE BUS/ UTLY 1 and 2 busses are shed.
Opposite generator has not come on line to assist start at 10% NH (on ground only). Generator FAULT LT Extinguishes above 61.5% NH if GEN is operating normally.

ON
started engaged. At 45% NH, light out, starter disengages automatically.

CRANK
dry monitoring (no ignition).

START
selects a start sequence. In flight regardless of start selection (A, B, A+B) both exciters are energized.

Prop Brake not fully locked or not fully released. After 15 sec = CAP.

Supplied by AOW.

On external power, pedestal PB must be on to power CVR test

Associated bus deenergized. CAP.

OVRD
insures basic mode operation by overriding all other protections.

ON
Basic mode: STBY Busses supplied by HOT MAIN BAT BUS.

OVRD
insures basic mode operation by overriding all other protections.

EXT or GEN power: DC STBY BUS transferred to HOT EMER BAT BUS; AC STBY BUS to DC BUS 1.

OFF
ESS BUS, DC STBY BUS + INV 1 are isolated from HOT MAIN BAT BUS.
DC EMER BUS is isolated from HOT EMER BAT BUS.

Allows BPCU to control BTC operation (Bus Tie Contacto).
Ext power, Hotel mode or single gen operation. BTC is closed (green flow bar).

ISOL
BTC opened (released out).
BTR (Bus Tie Relay) locked open (Tie between AC Busses)

AVAIL
GPU has been checked by BPCU for over/under voltage, over current and polarity.

AVAIL+ON
The GPU supplies the electrical system. GPU has priority on both generators.

FAULT
Protection triggered by GCU.
Auto reset if underspeed: in other cases manual reset.

BTC auto closes.

ON
started engaged. At 45% NH, light out, starter disengages automatically.

CRANK
dry monitoring (no ignition).

START
selects a start sequence. In flight regardless of start selection (A, B, A+B) both exciters are energized.

Prop Brake not fully locked or not fully released. After 15 sec = CAP.

Supplied by AOW.

On external power, pedestal PB must be on to power CVR test

Associated bus deenergized. CAP.

OVRD
insures basic mode operation by overriding all other protections.

ON
Basic mode: STBY Busses supplied by HOT MAIN BAT BUS.

OVRD
insures basic mode operation by overriding all other protections.

EXT or GEN power: DC STBY BUS transferred to HOT EMER BAT BUS; AC STBY BUS to DC BUS 1.

OFF
ESS BUS, DC STBY BUS + INV 1 are isolated from HOT MAIN BAT BUS.
DC EMER BUS is isolated from HOT EMER BAT BUS.

Allows BPCU to control BTC operation (Bus Tie Contacto).
Ext power, Hotel mode or single gen operation. BTC is closed (green flow bar).

ISOL
BTC opened (released out).
BTR (Bus Tie Relay) locked open (Tie between AC Busses)

AVAIL
GPU has been checked by BPCU for over/under voltage, over current and polarity.

AVAIL+ON
The GPU supplies the electrical system. GPU has priority on both generators.

FAULT
Protection triggered by GCU.
Auto reset if underspeed: in other cases manual reset.

BTC auto closes.

FAULT
illuminates when:

starter remains ON with NH>45% or GCU failure during start or starter failure or ENG2 only PROP BRK ON+Gust lock not engaged (Starting not inhibited).

ON
Continuous ignition (both A & B). Memo panel light.

READY
engagement or disengagement cond. Are met:

– A/C on ground
– gust lock engaged – CL on FTH of FUEL S/O
– blue hyd press > 2100 PSI
– fire handle not pulled

PROP BRK
Prop brake fully locked. Memo panel light.

Supplied by DC SVCE BUS (Back up DC BUS 1).

Supplied by DC BUS 2.
Main BLUE PUMP
Supplied by ACW, controlled by DC EMER BUS.

AUX PUMP
Running conditions:
– AUX PUMP pb depressed
– at least one engine running
– blue system press <1500 psi
– gear lever down
(supply: DC BUS 2 or HOT MAIN BAT BUS)

OVHT
Temp >121°C (250°F), CAP (no auto off)

Associated bus not supplied

AVAIL
GPU has been checked by BPCU

AVAIL + ON
GPU supplied ACW system. GPU has always the priority on both GEN

AUTO reset in case of under/over speed: manual reset otherwise. ACW SVCE BUS auto shed if one GEN is out.

ALPHA
ACW supply
Amber LT illuminates in case of Failure or Pwr loss. CAP.

TAT
no heated. CAP (ACW supply). Heating inhibited on ground.

PITOT
tube not heated. CAP (ACW BUS for CPT & F/O).

PITOT STBY
not heated (CAP). AOW bus 1 or 115 AC STBY BUS as back up.

ON
ACW supply (inhibited when NP <63%).

FAULT
power loss on at least 1 Blade. CAP.

NORM
10 sec on per 3 blades; then 10 sec off between cycles.

ON
HIGH POWER
20 sec on per 3 blades. No pause between cycles (ON LT illuminates BLUE).

MODE SEL AUTO
Automatic selection of cycle depending on ADC1/2 input to MFC1B/2B.

FAULT
when ADC or MFC fail
Fast mode is automatically selected for ENG and AIRFRAME DEICING and High Power for Prop Anti-ice.

MAN
mode enables manual selection of cycles depending on SAT (MAN illuminated WHITE). DEICE air is always available regardless of bleed pb.

FAST: 60 sec / cycle
SLOW: 240 sec / cycle (SLOW illuminates BLUE)

FAULT
distribution valve opened but no air press.
OR valve closed and press. Detected OR air temp upstream of the deice valve >230°C for more than 6 sec.

ON
deice valve opened even if AFR AIRBLEED off.

Blue LTs on MEMO panel when ON (DC BUS2).

ON emergency exit lights illuminated.
Supply: 6V Bat packs.

ARM
– lights on if DC STBY BUS <18V
– lights off if DC STBY >20V
– or in case of dual DC GEN loss

DISARM
system desactivated

Main GREEN PUMP
Supplied by ACW, controlled by DC ESS BUS.

XFEED
PB released. Xfeed closed PB pressed: ON LT illuminated WHITE. Xfeed valve selected OPEN. (Except in case of LO LVL where the Xfeed is locked closed)

LO PR
pump delivery pressure less than 1500 psi. CAP. No auto off.

LO LEVEL
associated compartment <2,5 lt. CAP. Xfeed opening inhibited.

BTC
Allows BPCU to control BTC operation.
Ext Pwr or simple GEN operation: BTC is closed (Green Flow BAR).
Auto closure when either ACW GEN drops off line.

ISOL
BTC opened (Pb released out). Min NP for ACW= 66%.

FAULT
valve opened but no downstream press. OR valve closed and downstream press. Detected. CAP.

ON
signal sent to MFC to start deice cycle on the airframe.

FAULT
both MFC modules controlling boots have failed resulting in an incorrect inflation sequencing.

OVRD
no MFC. Boots inflated by a separate standby controller. Fast cycle only (cycle 60°).

ON
Air downstream deice valve <14 psi more than 10 sec. Air upstream deice valve >230°C. CAP.

OFF
isol valves closed. Deice valves closed unless ENG 1/2 deice on.
Tests all three smoke detections (elec, fwd, aft smoke Red alarms in CAP).
Stops extract fan, only on ground (FAULT on EXHAUST MODE).
To restart extract fan it is necessary to reset EXHAUST MODE Pb.

PB in: Crew supply only.
If below 1400 psi, use table.

NORM
– On ground, ENG 1 off: extract fan on. OVBD valve full open, U/F valve closed.
– On ground, ENG 1 on: extract fan on. OVBD valve closed, U/F valve opened.

FAULT
Fan failure / overheat (fan inhibited for 120s after every eng start. AIR light in CAP).

OVBD
Extract fan off. OVBD valve partially opened (in fight only). U/F valve closed.

Duct temperature limited to 88°C (191°F) by pneumatic temp limiter.

NORM: 22 psi
HIGH: 30 psi
regulated by pack valve
Spring loaded closed. Ground only. Auto opens when only 1 Bleed valve is opened.
Controls both Bleed and HP valves. Spring loaded closed. Must have air & elec to open. Auto Bleed valve closes when Ovht, Leak, Overpressure (> 80 psi), Fire T pulled, when UPTRIM is triggered or prop brk on (left one only). Inhibited during eng start.

FAULT
Bleed valve disagreement with selected position (case of Ovht, Overpressure or Leak).
CAP. Associated valves auto closed.

OVHT
either bleed duct temp thermal switch above 274°C. CAP. Associated valves auto closed.
May be reset after cooling.

Do not use above 160 knots. DC BUS 2.
STBY HORIZON (DC EMER) Red and black flag: elec supply loss or gyro speed insufficient.

STBY IAS and ALT Ind both supplied by Stby pitot and static source: completely independent from CPT / F0 systems.

PWR MGT 2 co-axial sw, (LH: Bottom/ RH: Top) providing FDAU, PEC, PIU and EEC with basic power requirements.

SGL CH illuminates when one channel is lost (2 sec on, for self test when advancing CL from FTR to AUTO).

FAULT: illuminates when both PEC channels are lost CAP. OFF: PEC is deactivated and Np is limited at 102.5% by the overspeed governor if power is sufficient.

TEST pb when pushed in, displays all 8’s + LO LVL LTs, + CAP + elect Pumps energized. Refuel panel disabled during test and refuel valves auto close.

LO LVL Lt – When the quantity is <160kg or – When the quantity is >160kg, but the feeder tank is not full (Feeder jet pump failure) Elec pump auto runs. CAP.

TAS Ind from selected ADC indicates TAS from 68 to 600 kts; if ADC not valid it displays (---).

TAT Ind from selected ADC indicates TAT; if ADC not valid it displays (---).

FAULT detector failure or supply loss (ACW BUS 2). CAP. (FAULT LT supplied by DC EMER).

ICING steady ice accretion is detected and both horns anti icing + airframe deicing are selected ON. MC + SC.

ICING flashing ice accretion is detected and either horn and/or airframe selected OFF. MC + SC.

PTT pb press for 3 sec.
– Icing will flash if system works correctly.
– FAULT LT illuminate steady if ice detector failure is detected.

ICING AOA Lt illuminates green as soon as 1 horn anti-icing ON. Stall alarm (stick shaker threshold lowered). It can be extinguished manually only by releasing ICING AOA Pb (DC EMER) provided both Horns anti-icing selected OFF.

TAT °C
-01.034

TAS KNOTS
034

SAT °C
034

TAT °C
034

TAS KNOTS
034

SAT °C
034

ICE DETECT

FAULT

TEST pb

LO LVL Lt

TAS Ind

TAT Ind

SAT pb
Arming conditions:
PWR MGT sel on TO
+ATPCS pb in
+ both PL >49°
+ both TQ > 53%/42)
both TQ > 46%/72
ARM green LT on.

ATPCS
- ARM on ground = uptrim +
  auto FTR (2.15° delay)
- ARM in flight (In case of go
  around) = auto FTR only.

UPTRIM
signal sent to respective eng during ATPCS sequence. Eng power = RTO.

LO PITCH
blade angle < 8° (below FL) CAP in flight only.

TORQUE Ind (DC EMER)
2 probes sending info:
- to pointer (via AFU),
- to digital counter (via EEC).
Internal bug
computed by FDAU; shows RTO when PWR MGT on TO, otherwise max TQ depending on PWR MGT selection.

NP Ind
(DC ESS)
LIMITS
From 0 to 120%.
TEST
115% (blue dot).

ITT Ind
(DC ESS)
From 0 to 1200°C.
Red point: 840° (20 sec max)
Red point+S: 950° (5 sec max on START).

FUEL CLOG
Fuel press loss in corresponding HP pump fuel filter (DC BUS 1/2)
ΔPSI >25 PSI: CAP Filter blocked and by-passed when ΔPSI >45.

FUEL TEMP Ind
sensor before HP pump (DC BUS 1/2).
From –54 to +45°C.

OIL PRESS
(DC BUS 1/2).
From 0 to 90 psi

OIL LOW PRESS Lt
< 40 PSI. A separate press sw activates CCAS below 40 PSI

OIL TEMP
(DC BUS 1/2)
From 0 to 130°C

FUEL FLOW Ind
(DC BUS 1/2)
FU reset knob
FU reset to 0 when pulled.

FUEL USED Readout
(DC BUS 1/2)

ATPCS
Trigger
one TQ <18% (42)
one TQ <18% (72).
Cancel
PWR MGT out of TO or ATPCS pb OFF or at least one PL retarded <49° or both TQ <53%.

EEC
acts on stepper motor, to regulate Fuel Flow.

FAULT flashing
EEC Failure. The fuel flow is frozen to maintain the power. (Do not deselect EEC when flashing)
The PL has to be retarded to the green sector before deselection of the EEC

FAULT steady
EEC Failure. HMU base law = reversion.
Fault become steady when the PL is retarded in the green band.

OFF
HMU base law = reversion.

TORQUE Ind
White TQ bug manually selected.
Knob enables setting of white TQ bug.
LIMITS
From 0 to 137% (42)/0 to 109.5% (72).
Actual TQ display.
Dashes ( - - - - ) for an Handling Bleed Valve failure (anti surging system of the engine)
TEST
115% (blue dot)

FUEL USED Ind
(DC ESS)
Thin pointer: NL
(104.2% max)
Wide pointer and digital display: NH
(102.7% mar)
TEST
115% (blue dot)

NH-NL Ind
(DC ESS)
> 800°C (or > 715°C on ENG2 in hotel mode). CAP.

TEST
1150° (blue dot)
Unlock
- Gear not locked in handle selected position (on ground, up lock box not open)

Green Lt
- Gear downlock engaged

Green Hyd Press Ind.
- BRK ACCU Press in blue system
- For Emer brakes max. 6 applications. DC STBY
- Blue Hyd Press Ind

Antiskid
- Operational if speed > 10kts.
- Activates when Spd > 23kts + 50% diff between wheels.
- Braking action inhibited at touchdown as long as wheel spin and spd < 35 kts or for 5 sec

Fault
- Wheel channel failure. CAP
- OFF: Pb released, system deactivated
- TEST pb: inhibited if speed > 17 kts
  - MC + SG + CAP + 4F amber Lt
  - Test duration:
    - 3 sec in flight
    - 6 sec on ground
  - CAUTION: THE TEST INHIBITS BRAKES!

Hot
- Any brake > 160°C (42), > 150° (72), CAP

Lo-spd
- ON < 190 kts (42), 180 kts (72) = TLU released allow full rudder travel
- OFF > 195 kts (42), 185 kts (72) Not ON < 190 kts (42), 180 kts (72) = maximum Xwind 15 kts.

Fault
- Stick shaker or pusher failure.
- OFF: turns off both shaker and pusher

Roll
- Shows LH aileron trim controlled tab travel. All Motor pwr = DC EMER

Yaw
- Shows units of trim motor displacement

Pitch
- Shows right trim actuator controlled tab travel. If not in green arc at TO, CONFIG in CAP

DE ICING Lt
- A) Illuminates when airframe deicing syst is ON.
- B) Flashes when airframe deicing syst still selected ON 5 min after last ice accretion detection

Auto press (DC bus 1)
- +550 up to FL 200
- +620 above FL 200
- Memorizes departure field elev up to 3500 ft

Elv set
- Select switch to set landing elevation
- FAST: descent rate increased from –400 to –500 ft/mn
  - To be used if VS > –1500 fpm

Test
- Displays alternatively 18800 and –8800, FAULT appears on MAN pb
  - (Test inhibited in FLT)

Dump
- ON (guarded): both outflow valves fully open in AUTO mode only

Norm
- AUTO mode selection
- MAN: digital controller out of operation. No more digits in landing elevation display

Fault
- Digital controller failure. CAP
Weather radar control panel
Control the weather radar but the EGPWS too (for the power supply and the range). If OFF, the GPWS is triggered on CAP.

Gust lock
AIL LOCK triggered whenever one of the locking actuators is in disagreement with the gust lock lever position (lock or unlock position).

MCDU (Multifunction Control Display Unit)
Access to the GNSS, MPC and ACARS (Data Link).
When ACARS is installed, the aircraft is fitted with 2 MCDU.

Cockpit door control panel

To config test pb:
Check if the TO configuration is correct for take-off:
– PWR MGT TO
– Flaps 15°
– Pitch trim in the green band
– TLU LO SPD
– no AIL LOCK light
The same test is performed when advancing the PL with this additional requirement:
– Parking Brake released

GA push button
When depressed the GA FD mode is selected with:
– HDG HOLD lateral mode with the wings level
– GA vertical mode

HYD AUX PUMP CONTROL
(HOT MAIN BAT BUS)
– Aux pump stopped 30" after p/b released (MFC supplied)
– Aux pump stopped after p/b released (MFC not supplied)

IDLE GATE
IDLE GATE FAIL
Activated when the idle gate does not engage automatically in flight or does not extend automatically on ground.
In this case the idle gate lever enables manual override in case of failure of the automatic logic:
– In flight: push
– On ground pull (an amber band appears)

FDEP (Flight Data Entry Panel)
Can not be fitted on aircraft equipped with the MPC. In that condition the flight number has to be entered through the MCDU.

Status light
STATUS FDAU light
Illuminates amber when the FDAU is failed
STATUS SYST light
Illuminates amber when DFDR fail or the DFDR electrical supply is lost

Aileron, rudder & stby pitch trims
ATPCS test (static or dynamic)

Manual recording on DFDR or CVR (when supplied by GPU)
Manual recording stopped with the reset p/B

MPC option without FDEP

ADF 2
VHF 2
ATC 1/2

F/O AUDIO CONTROL PANEL

Panel & flood light control

TCAS control panel

F/O EFIS CONTROL PANEL

CAPT EFIS CONTROL PANEL

CAPT AUDIO CONTROL PANEL

Weather Radar Control

Panel & flood light control

TCAS control panel
**Annexes**

### EGPWS (or TAWS if T2CAS equipped)

**GPWS switch and associated lights:**

- **ON:** All basic GPWS modes are operative
- **FLAP OVRD:** In reduced flap landing, to inhibit the mode 4 alert
- **OFF:** All basic GPWS modes inhibited.
- **OFF:** Light come on

**FAULT:**

- **GPWS FAULT:** Some or all GPWS basic modes are lost
- **TERR FAULT:** Some or all enhanced modes are lost
- **OFF:** All enhanced (TCF&TAD) modes inhibited

**SWITCHING PANEL**

When facing a failure on the Attitude/heading or VOR/ILS or SGU, it permits to recover the information from the other side. Priority is always given to the captain.

**MKR**

Allows selection of marker sensitivity (LO or HI)

**AUDIO 1/2 SEL**

- **FAULT:** When the associated RCAU part is failed.
- **ALTN:** Affected crew station is connected directly to:
  - VHF1 if CAPT station is affected.
  - VHF2 if F/O station is affected.

**A/ERECT FAIL**

Associated AHRS loses the TAS signal from the ADC. The AHRS is operating in basic attitude mode. Aircraft stabilized, gyro fast erection when pushing on the P/B for 15s

**DSP SEL P/B**

- **RDR:** Weather Radar display on EFIS
- **TERR:** Terrain display on EFIS

**Even if RDR is selected, in case of terrain warning an automatic pop out permit to have the terrain display on EFIS**

**ADC SWITCH**

To feed either from ADC1 or ADC2
- EEC1/2
- TAT/SAT/TAS indicator
- GNSS
- FDAU

**FAULT:** Some or all the systems here above, are fed by the ADC 1 when the ADC 2 is selected (relays defect)

Never faulty if selected to ADC 1

**AP OFF**

Both lights illuminate or flash red when autopilot, associated to the cavalry charge aural alert

**GUIDANCE**

in CAT II, when an Excess deviation is detected

**STICK PUSHER**

Illuminates when stick pusher is operating

**CRUISE SPEED LOW**

**DEGRADED PERF**

**INCREASE SPEED**

**F-ATCS**
APM alert lights:

**CRUISE SPEED LOW**
Cruise only. An abnormal drag increase induces a speed decrease >10kt

**DEGRADED PERF**
Cruise and climb. An abnormal drag increase induces a speed decrease or a loss of rate of climb

**INCREASE SPEED**
After degraded perf. Drag abnormally high and IAS lower than RED BUG + 10 kt

APM Weight rotary selector
Before take off (Both engines running), it should be set to minimum weight then to take off nearest weight. Only taken into account if the selector has been changed. No effect for any change in flight.

If no selection, an internal calculation computed at the beginning of the flight, is used.

**APM FAULT**
Failure in the APM function computation

**APM Test PTT**
Performed daily

LOUDSPEAKERS VOLUME KNOBS
Individual knob for each loudspeaker

CONSOLE LT knob
Control the lights of the associated lateral console

READING LT knob
Control the respective spot light

MASTER WARNING
MASTER CAUTION

CRUISE SPEED LOW
APM TEST PTT

72-212A

42-500

Annexes p.119
ALT knob controls the preselected altitude on ADU

NAV 1
- CRS 1 knob selects Course on CAPT EHSI
- HDG knob selects HDG bug on both EHSI
- Pitch wheel to adjust
  - VS or
  - IAS or
  - Pitch attitude in basic mode

NAV 2
- CRS 2 knob selects Course on F/O EHSI

STBY COMPASS
Hidden in up position. Compass Control should be place on DN For use. The compass rose is graduated in 10 degrees increments

LATERAL MODE
- VOR
  - ARMED MODE
  - CAPTURED MODE
  - TRACKED MODE

VERTICAL MODE
- ALT
  - ARMED MODE
  - CAPTURED MODE
  - TRACKED MODE

CRS 1 knob selects Course on CAPT EHSI

AP pb engages autopilot and yaw damper and disengages only autopilot

YD pb engages yaw damper and disengages yaw damper and autopilot if engaged

CPL pb permit to couple AP/FD
On CAPT or F/O side
In CAT 2 (ILS selected on NAV 1&2)
- 1200 ft RA: Dual coupling < >
- 800 ft RA: CAT 2 invalid if still in single coupling
- 500 ft RA: ILS excess dev activated
- 100 ft RA: GS excess dev deactivated
**N/W STEERING**

**ON**: The steering solenoid valve is electrically armed. The steering is available with an angle up to 60° in either direction.

**OFF**: The steering system is unpressurized. Should be OFF for towing and push back. The steering is disconnected with an angle up to 91° in either direction.

---

**Nose wheel steering Push To Talk**

When depressed, BOOM SET or OXY mike is connected for transmission over the selected communication facility.

---

**Position of the selector:**

**EXT PWR**
DC panel indicates the DC GPU voltage & current.
AC panel indicates the AC GPU voltage, load & current.

**GEN 1/2**
DC panel indicates the DC Generator voltage & current.
AC panel indicates the ACW Generator voltage, load & current.

**INV 1/2**
No indication on DC panel.
AC panel indicates the AC Inverter voltage, load & current.

**MAIN and EMER BAT**
DC panel indicates the DC Main & Emer Battery voltage & current.
No indication on AC panel.

---

**PRELIMINARY COCKPIT PREPARATION: OXYGEN MASK TEST**

**INT/RAD SELECTOR** (On AUDIO CONTROL PA)
- SET TO INT
- PRESS TO TEST AND RESET PB

**NOTE**: Hose and mask charged with oxygen. Observe blinker momentarily turns yellow and must turn dark if there is no leak.

- HOLD RED GRIPS ON EACH SIDE OF THE HOSE
- PRESS

**NOTE**: Oxygen pressure inflates the harness. Observe blinker momentarily turns yellow and must turn dark.

- PRESS TO TEST AND RESET PB
- HOLD EMERGENCY KNOB
- SELECT

**NOTE**: Emergency flow is tested. Observe blinker momentarily turns yellow during oxygen flow and must turn dark when the knob is released.

**NOTE**: In this 3 cases, check that oxygen flow sounds though loudspeakers.

**OXY LO PR LIGHT**
- CHECK EXTINGUISHED

**N/100% Selector**
- SET to 100%
**FLIGHT DECK VENTILATION ISOLATION**

**EXTRACT AIR FLOW**

**CAUTION:** Close only in case of FWD COMPT smoke

Enables, in case of smoke in the forward cargo compartment, to isolate the flight deck ventilation preventing smoke to enter the flight compartment

**MAIN PNL**

Before the flight, check that all the switch and selector are in the normal position. If not, the MAINT PNL is illuminated on the CAP

**BITE LOADED magnetic indicator**

Indicates that a failure has been recorded by the maintenance system. Report to maintenance

**BRK TEMP TEST**

When depressed, MC, SC, WHEEL on CAP and HOT amber light illuminates
### Annex 2. Abbreviations

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<th>Anti-icing Advisory System</th>
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<td>AC</td>
<td>ARINC Communication Addressing</td>
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<td>ACARS</td>
<td>and Reporting System</td>
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<td>AC BTC</td>
<td>AC Bus Tie Contactor</td>
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<td>AC BTR</td>
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<td>ADC</td>
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<td>ADF Automatic Direction Finding</td>
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<td>ADS</td>
<td>ADS Air Data System</td>
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<td>ADU</td>
<td>ADU Advisory Display Unit</td>
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<td>A/ERECC</td>
<td>A/ERECC Auto Erection</td>
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<td>A/FEATH</td>
<td>A/FEATH Auto Feathering</td>
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<td>AFT</td>
<td>AFT Rear Part</td>
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Yours faithfully,

Your ATR Training and Flight Operations support team.