Lights System Presentation

33 LIGHT SYSTEM

GENERAL

Lighting System:

Cockpit lighting
Cabin lighting and signs
Emergency lighting
Cargo and service compartment lighting
Exterior lighting

The lighting system includes:

- cockpit lighting,
- cabin lighting and signs,
- emergency lighting,
- cargo and service compartment lighting,
- exterior lighting.

SAFETY PRECAUTIONS

LIGHTS SYSTEM

COCKPIT LIGHTING

CABIN LIGHTING AND SIGNS

EMERGENCY LIGHTING

CARGO AND SERVICE COMPARTMENT LIGHTING

EXTERIOR LIGHTING

COCKPIT LIGHTS SYSTEM

Cockpit lighting system:

- Panel and instrument lighting
- General lighting
- Ambient lighting

The cockpit lighting system include:

- panel and instrument lighting,
- general cockpit lighting (dome light),
- ambient lighting.

COCKPIT LIGHTS CONTROL

Cockpit lighting controls location:

- 3 different panels
- Underneath the glareshield

The cockpit panels and instrument lighting controls are operated from:

- three different panels,
- and underneath the glareshield.

Captain and First Officer supplementary reading lights

- Brightness control
- Beam control

Two supplementary reading lights are operated from each side of the upper part of the overhead panel. Each reading light potentiometer controls the brightness of the related reading light.

Internal light panel controls:

- Overhead panel integral lighting
- Standby compass integral light
- Dome lights
- Annunciator lights

The internal light panel contains the controls for the overhead panel integral lighting, standby compass integral light, the dome lights, and the annunciator lights.

Glareshield integral lighting, P/B switches and FCU displays controlled by 2 potentiometers

Two potentiometers underneath the glareshield control the integral lighting of the glareshield, the P/B switches and Flight Control Unit (FCU) displays.

Flood lights controlled by FLOOD LT

Main panel and pedestal area controlled by INTEG LT

The FLOOD LT potentiometers control the flood lights of their respective areas and the INTEG LT potentiometer, the main panel and pedestal lighting.

Side console lights are controlled from the main instrument panel

The side console light controls are controlled from the left and right sides of the main instrument panel.

READING LIGHT PANEL (54VU)

(25VU)

EFIS CONTROL PANEL (301VU)

Flight Control Unit (FCU) (13VU)

LEFT FLOOD LT PANEL (111VU)

RIGHT FLOOD LT PANEL (112VU)

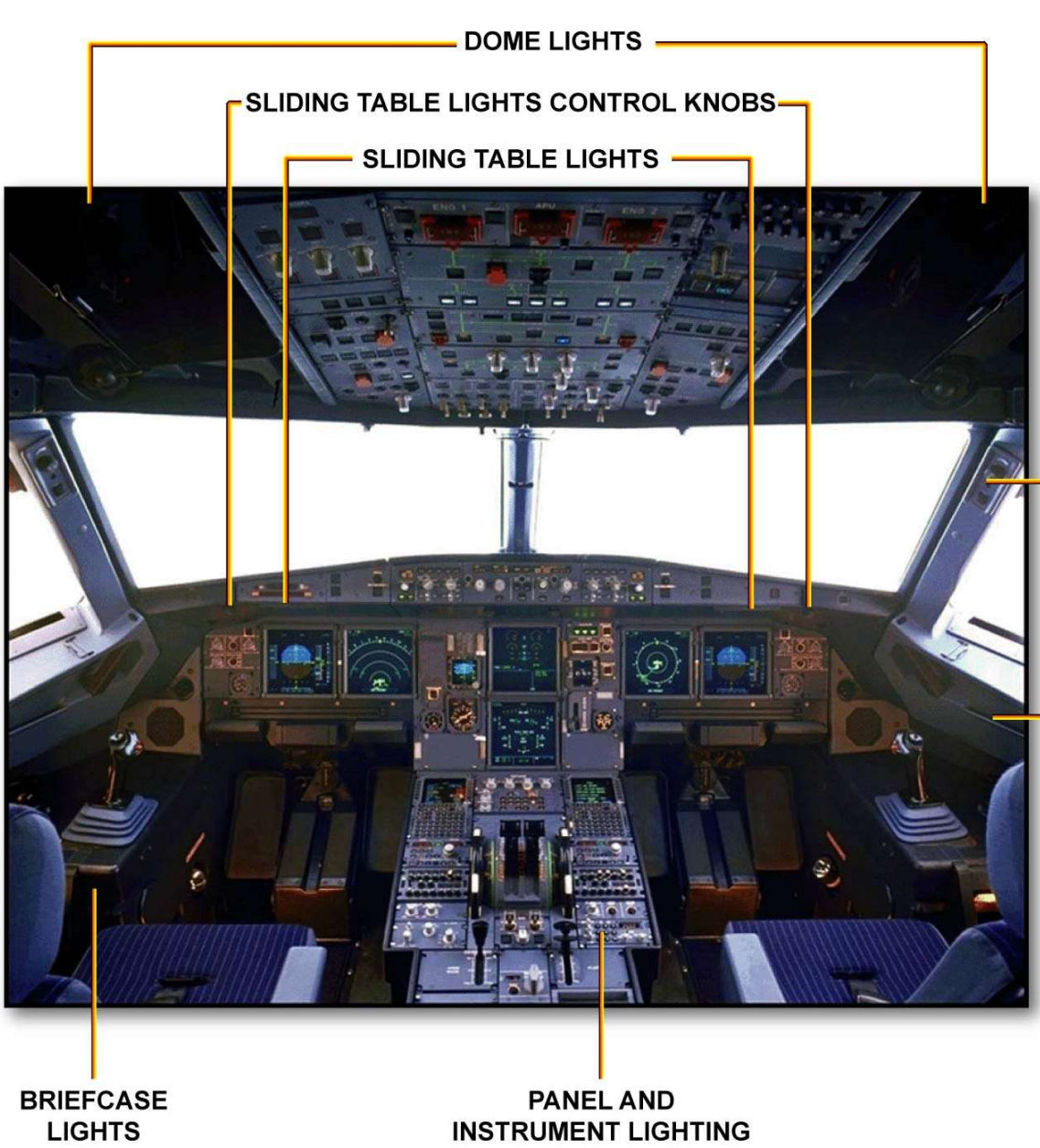
COCKPIT LIGHTS

The general cockpit lighting is supplied by the dome lights
Ambient lighting:
2 supplementary reading lights with a light potentiometer
The general cockpit lighting is supplied by the dome lights.
The ambient lighting is supplied by:
- two supplementary reading lights installed on each side of the upper part of the overhead panel.

Ambient lighting:
Side consoles lights
Briefcase areas
Floor
- Side console lights bring light to:
- the side consoles,
- briefcase areas,
- the floor around the pilot seats.

Ambient lighting:
2 map lights
potentiometer for brightness control
slider for beam control
- Two map lights are controlled by a potentiometer each for brightness control and a slider for beam control.

Ambient lighting:
2 sliding table and map holder light
2 knob to adjust the brightness
Two lights bring light to the sliding tables and the map holder. Two knobs adjust the brightness of these 2 lights.


DOME LIGHTS
SLIDING TABLE LIGHTS CONTROL KNOBS
SLIDING TABLE LIGHTS
MAP LIGHTS
SIDE CONSOLE LIGHTS
BRIEFCASE LIGHTS
PANEL AND INSTRUMENT LIGHTING

DOME LIGHTS

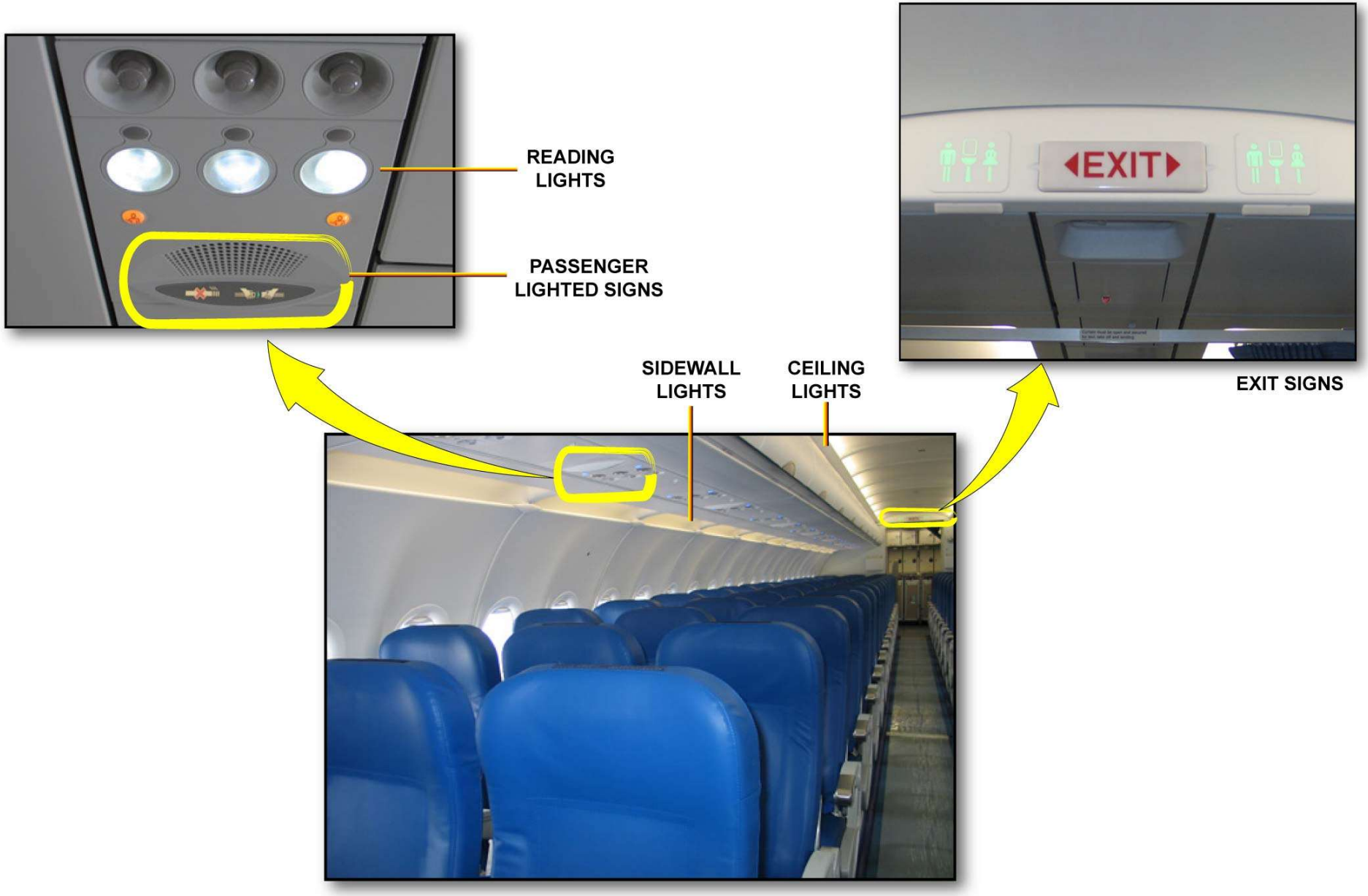
CABIN LIGHTS THROUGH CIDS

Cabin light and sign systems controlled by CIDS
Directors, FAP and DEUs
FAP components:

- CAM
- OBRM
- PRAM

Various cabin light and sign systems are controlled, tested, and monitored by the Cabin Intercommunication Data System (CIDS). The CIDS includes two directors, the Flight Attendant Panel (FAP), and the DEUs. The touch screen FAP controls and indicates the status of the CIDS. Integrated within the FAP are Cabin Assignment Module (CAM), On Board Replaceable Module (OBRM) and Prerecorded Announcement and Music (PRAM) in flash card format.

Director linked to cabin, passenger and crew systems through DEUs
The director communicates through Decoder Encoder Units (DEUs) with the cabin, passenger and crew systems.


READING LIGHTS
PASSENGER LIGHTED SIGNS
EXIT
EXIT SIGNS
SIDEWALL LIGHTS
CEILING LIGHTS

EMERGENCY LIGHTS

Emergency lights in cabin and on fuselage

Emergency lights are installed in the cabin and on the exterior fuselage for overwing emergency exits.

Cabin emergency lights:

Lamps in cabin ceiling panels

Supply lighting of aisle, exits and emergency exits

The cabin emergency lights are lamps in the cabin ceiling panels.

In order to get the sufficient lighting of the aisle, exits and emergency exits, lights are installed on the left aisle seats and near the passenger doors and wing exits.

Lights ON when escape slide deployed

Supplied from emergency power supply units

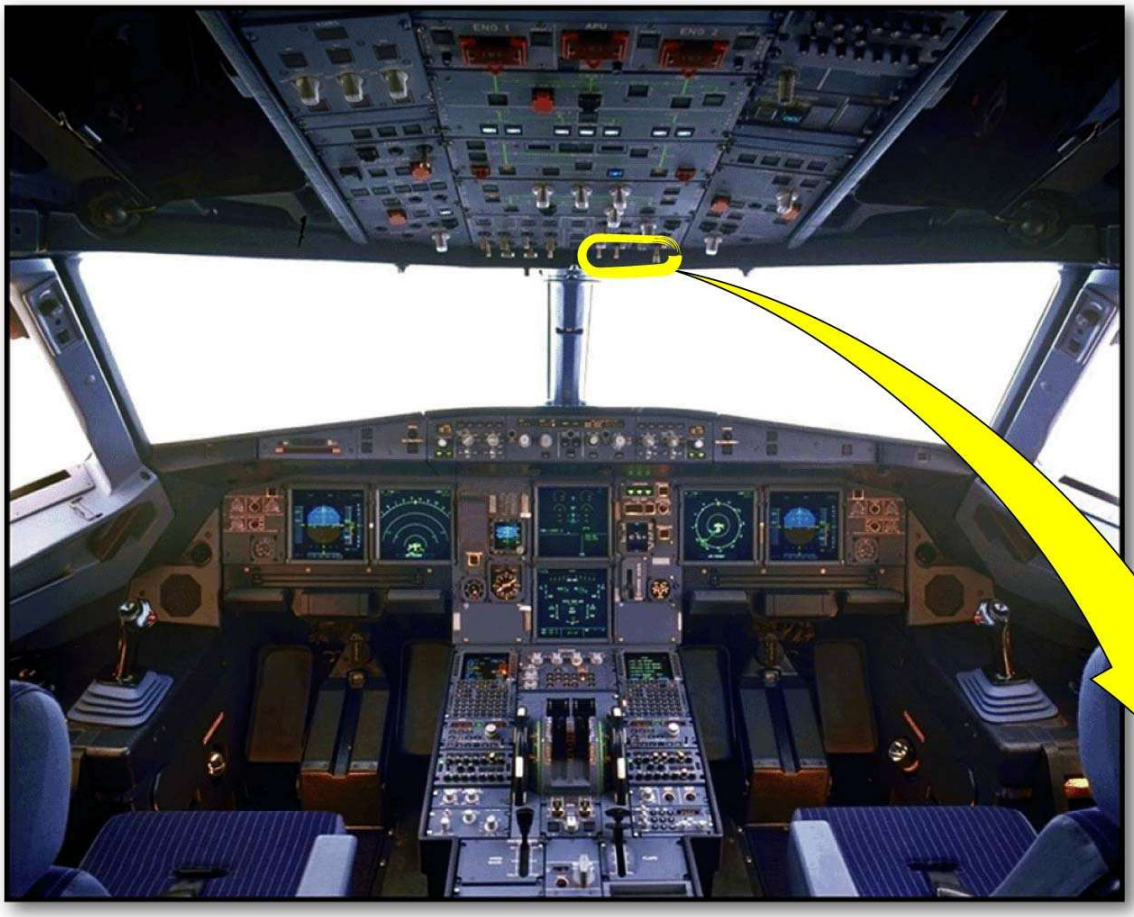
The exterior emergency lights come on automatically whenever the escape slide is deployed. The lights are supplied from the cabin emergency power supply units.

CONTROL AND INDICATING

Cockpit controls

Located on overhead panel

The emergency-lighting system can be controlled by the control switch EMER EXIT LT from the overhead cockpit control panel.



(25VU)


SIGNS
SEAT BELTS
ON
OFF
NO SMOKING
ON
OFF
AUTO
EMER EXIT LT
OFF
ON
ARM
OFF

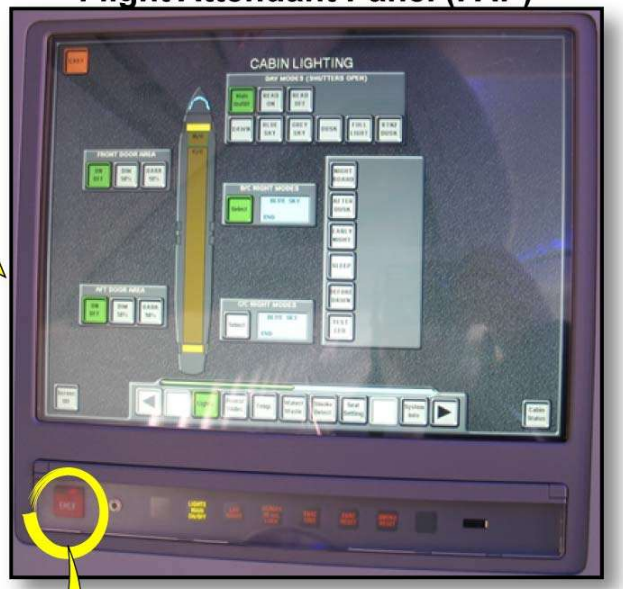
Cabin controls
The red EMERgency pushbutton on the FAP has the same function as the cockpit EMER EXIT LT switch in the ON position.

Purser station
- Made of pages related to systems connected to CIDS
- FAP
- MCDU

The FAP display structure is made of different pages related to the different systems connected to the CIDS.
The FAP is used for monitoring, control and testing. The MCDU provides a testing interface.

PURSER STATION

Flight Attendant Panel (FAP)

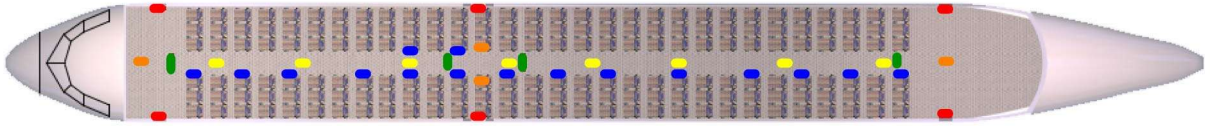


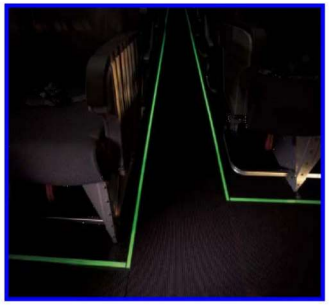
COMPONENT LAYOUT

Cabin emergency lighting

- EMERGENCY EXIT signs
- Ceiling EMERGENCY lights
- ESCAPE PATH lighting

Emergency lights in the cabin include EMERGENCY EXIT signs, Ceiling EMERGENCY lights, ESCAPE PATH lighting, The emergency lights are supplied by several Emergency Power Supply Units (EPSUs).





Exterior emergency lighting

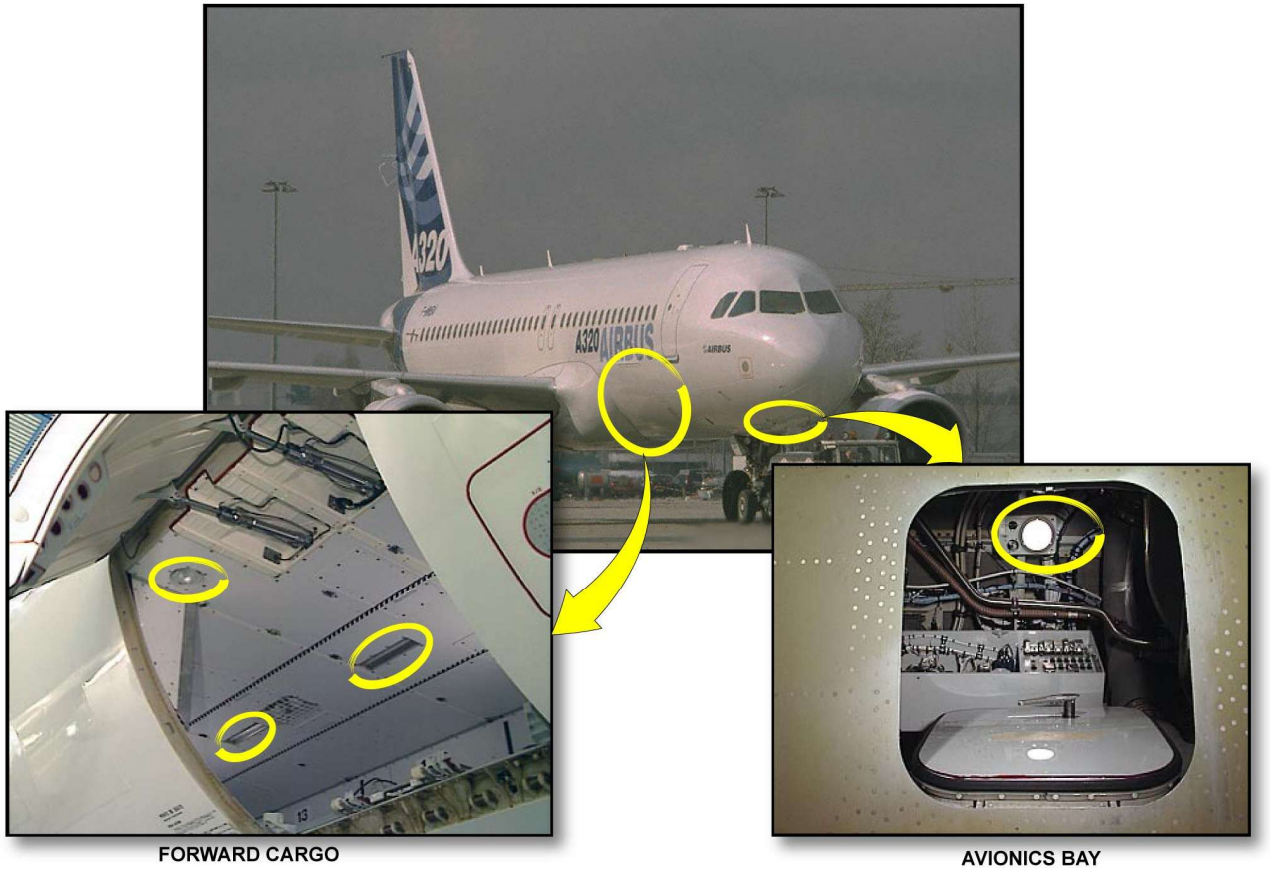
Automatically activated when an overwing emergency exit opened in armed configuration

In the fuselage, there are 4 exterior emergency lights. These lights are automatically activated when an overwing emergency exit door is opened in the armed configuration. The lights come on all along the escape route leading to the aft wing slide. Each escape slide has integrated lighting strips.

CARGO AND SERVICE COMPARTMENT LIGHTS

Cargo and avionics compartment lights

The graphic shows the different cargo and avionics compartment lights.



EXTERIOR LIGHTS
CONTROLS
Controls on the EXT LT panel
The operation for all external lights is on the EXT LT panel on the overhead panel.

COMPONENT LAYOUT

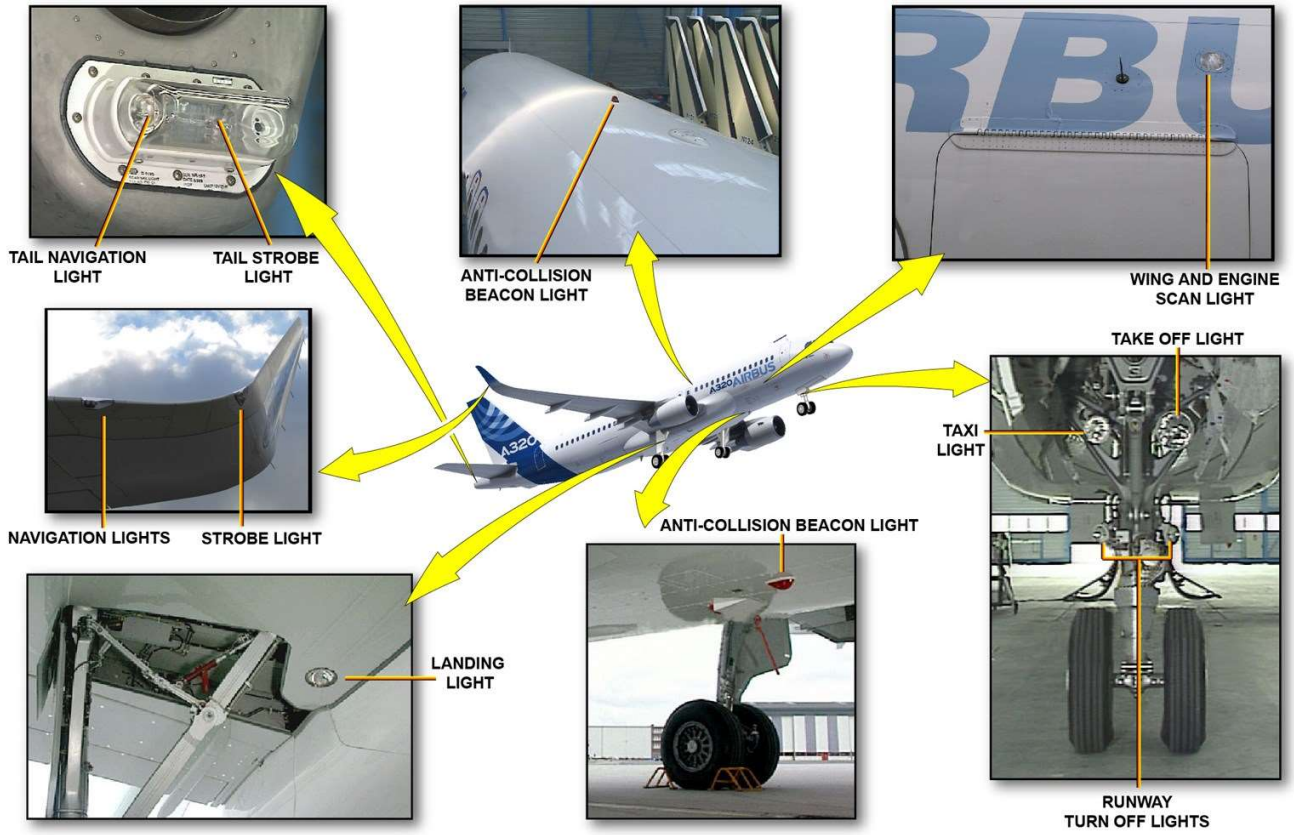
Exterior lighting system components:

Taxi, turn off lights
Navigation, strobe, beacon, wing lights
Take off and landing lights

The exterior lighting system include:

- taxi, turn off lights,
- navigation, strobe, beacon, wing lights,
- take off and landing lights.

NOTE: THE NAVIGATION AND STROBE LIGHTS ARE MODIFIED WITH LED TECHNOLOGY. IN SHARK LET FITTED AIRCRAFTS



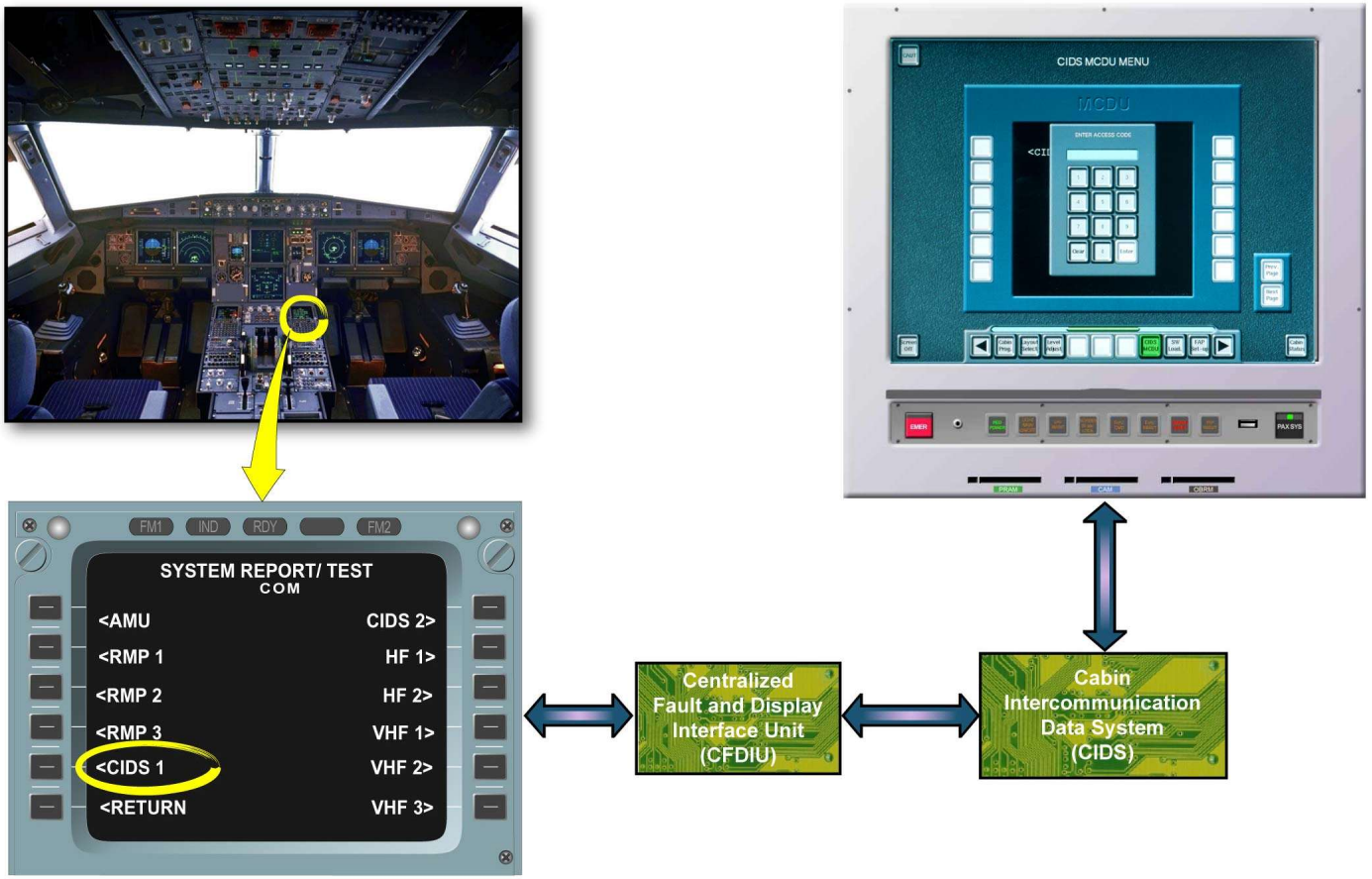
MAINTENANCE/TEST FACILITIES

CIDS related LTs system monitored & tested via MCDU

The CIDS related lights system can be monitored and tested via the MCDU.

CIDS BITE accessible from MCDU through CFDIU or from the FAP

The CIDS BITE is accessible from the MCDU through the Centralized Fault Display Interface Unit (CFDIU) or from the FAP, like it is possible on the MCDU in the cockpit. This page is protected by a password.



SAFETY PRECAUTIONS

AMM safety procedures obedience

When you work on the lights system, make sure that you obey all the Aircraft maintenance Manual (AMM) safety procedures. This will prevent injury to persons and/or damage to the aircraft. Here is an overview of main safety precautions related to the lights system.

Electrical isolation of light systems

Isolate the electrical circuits from the related equipment and the environment to prevent injury to persons and/or aircraft damage.
Do not disconnect the electrical connections for at least two minutes after you de-energize the electrical circuits.

Lamp replacement without direct hand contact

When you change a lamp, do not touch the glass with your fingers. The oil from your skin will quickly cause deterioration of the lamp. If you accidentally touch the lamp glass, clean it with a lint-free cloth.

Eyes protection used for high intensity lights

Do not look directly towards the lights without eyes protection. Their intensity can be high enough to cause permanent damage to your eyes.

No fuel contamination found in landing light assembly

Ignition of fuel in landing light could occur

Make sure that there are no signs of fuel contamination in the landing light assembly. If you find fuel contamination, no person must operate the landing light until:
- you repair the fuel leak,
- you replace the landing light assembly.

If you do not obey this precaution, ignition of the remaining fuel in the landing light can occur.

Safety devices and warning notices put before starting a task

Put the safety devices and the warning notices in position before you start a task on or near:
- the flight controls,
- the flight control surfaces,
- the landing gear and the related doors,
- components that move.

Removal of strobe lights after 5 min after operation

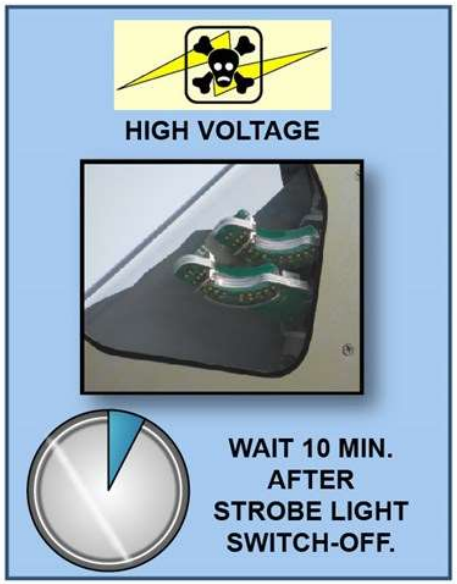
Removal of strobe lights after 10 min electrical circuits de-energization

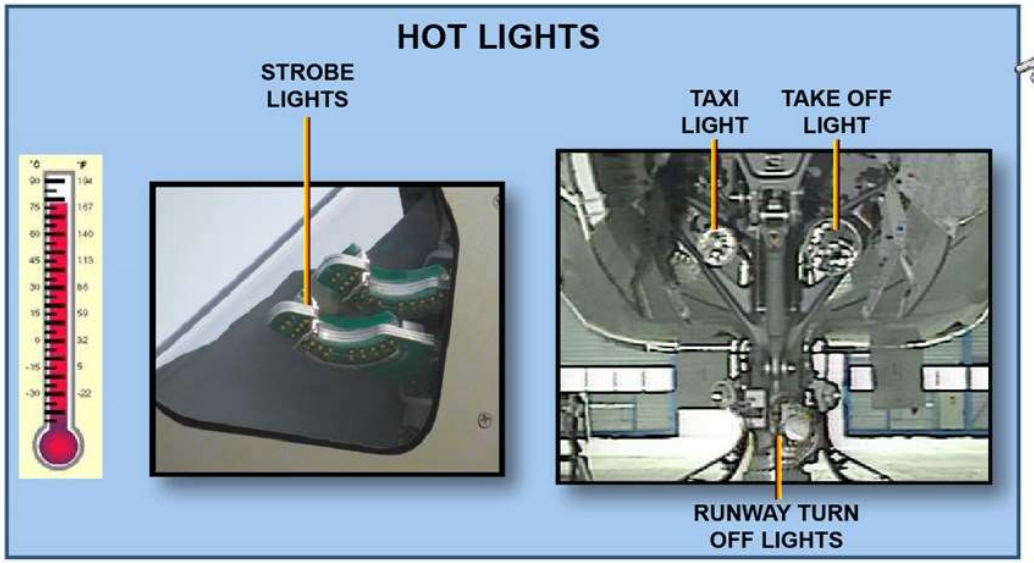
Do not remove a strobe light for at least ten minutes after you de-energize the electrical circuits. The high voltage electrical current in the capacitor of the strobe light is dangerous.
Do not touch the strobe lights for at least 5 minutes after operation. The strobe light will still be hot. Use gloves when removing lamps, oils from your skin can deteriorate the life of the bulbs.

Strobe light with cover removed have dangerous voltages

Be careful if you touch the strobe light with the cover removed and the power on. Some components have dangerous voltages

ISOLATE ELECTRICAL CIRCUITS
BEFORE OPERATION.





Cockpit Annunciator Light Test And Dimming Description and Operation

ANN LT switch:
Test of all CKPT ANN LTs
Lighting controlled by:
Related system
Relative system P/BSW
Power supply:
AC1: 103XP
AC2: 202XP
115 VAC STAT INV: 901XP
AC ESS SHED: 801XP
An ANNunciator LighT test is used for the lighting of all ANN LTs mounted on the panels and instruments in the cockpit. A relay (relative to system) or internal contacts (case of P/BSWs position indication) control the lighting of each ANN LT. Four different busbars:
- AC1 supply with 103XP,
- AC2 supply with 202XP,
- 115 VAC STATic INVerter bus with 901XP,
- ESSential supply with 801XP,
supply the ANN LTs with 5 VAC-400 Hz through the transformers. In the case of emergency supply only busbar 901XP is serviceable.

TRANSFORMERS
Transformers independently supplied with 115V - 400Hz
Transformers supply:
6 VAC-400Hz for ANN LTs on OVHD and instrument panel
6.3 V (full wave rectified) to AUTOLAND, MASTER WARNING, CAUTION LTs and ACPs
There are four transformers; each is supplied with 115 V-400 Hz. Each one is connected to a different busbar.
They supply:
- 5 VAC-400 Hz for the ANN LTs installed on the overhead panel and on the instrument panel,
- 6.3 V voltage (full wave rectified) to supply the AUTO LAND, MASTER WARNING and CAUTION lights and Audio Control Panels (ACPs).

Secondary winding of transformer composed of:
7 x 5 VAC outputs mounted in parallel (protected by a delayed action fuse set at 4A)
2 x 6.3 V outputs
Primary winding has 2 inputs to get the correct dimming level
The secondary winding of each transformer has:
- 7 outputs of 5 VAC each mounted in parallel; each one is protected by a delayed action fuse set at 4 A,
- 2 outputs of 6.3 V each protected by the same type of fuse.
The primary winding of each transformer has two inputs to get the correct dimming level (DIMmed position).

If 115 VAC supply switches over to either input, the secondary winding supplies:
5 VAC (BRT position) or 3 VAC (DIM position),
6.3 VAC (BRT position) or 4.3 VAC (DIM position)
If the 115 V supply is switched over to either input we obtain at the secondary winding:
- the 5 VAC (BRighT position) or 3 VAC (DIM position),
- the 6.3 VAC (BRT position) or 4.3 VAC (DIM position) for rectified voltages.

POWER SUPPLY AND ASSOCIATED C/B

Power supply composed of:

Busbar 103XP (AC1)
Busbar 202XP (AC2)
Busbar 801XP and busbar 901XP in case of electrical emergency configuration
Busbar 206PP (ANN LT test relay coil)

The power supply is composed of:
- busbar 103XP (AC1) which supplies transformer 37LP through the circuit breaker 26LP located on the circuit breaker panel 122VU,
- busbar 202XP (AC2) which supplies transformer 36LP through the circuit breaker 27LP located on the circuit breaker panel 122VU,
- busbar 801XP supplies transformer 31LP through the circuit breaker 29LP located on the overhead panel 49VU,
- busbar 801XP supplies transformer 35LP through the circuit breaker 29LP and the busbar 901XP supplies emergency through the circuit breaker 28LP located on the circuit breaker panel 122VU,
- busbar 206PP supplies the ANN LT test relay coils.

COCKPIT ANN LT SWITCH

3 positions: BRT, DIM, TEST

A switch with 3 positions (DIM, BRT, TEST) is located on the overhead control and indicating panel 25VU. The crew uses this switch to dim the cockpit annunciator lights or to test their operation.

ANN LT TEST AND INTERFACE BOARDS

Located in the avionics compartment

Each one is related to a power supply:

4 supplied by AC1 system
3 supplied by AC2 system
7 supplied by ESS generation

They are located in the avionics compartment in the annunciator light test unit 70VU:
- 4 are related to the ANN LTs supplied by the AC1 system,
- 3 are related to the ANN LTs supplied by the AC2 generation,
- 7 are related to the ANN LTs supplied by the ESS generation.

Boards composed of:

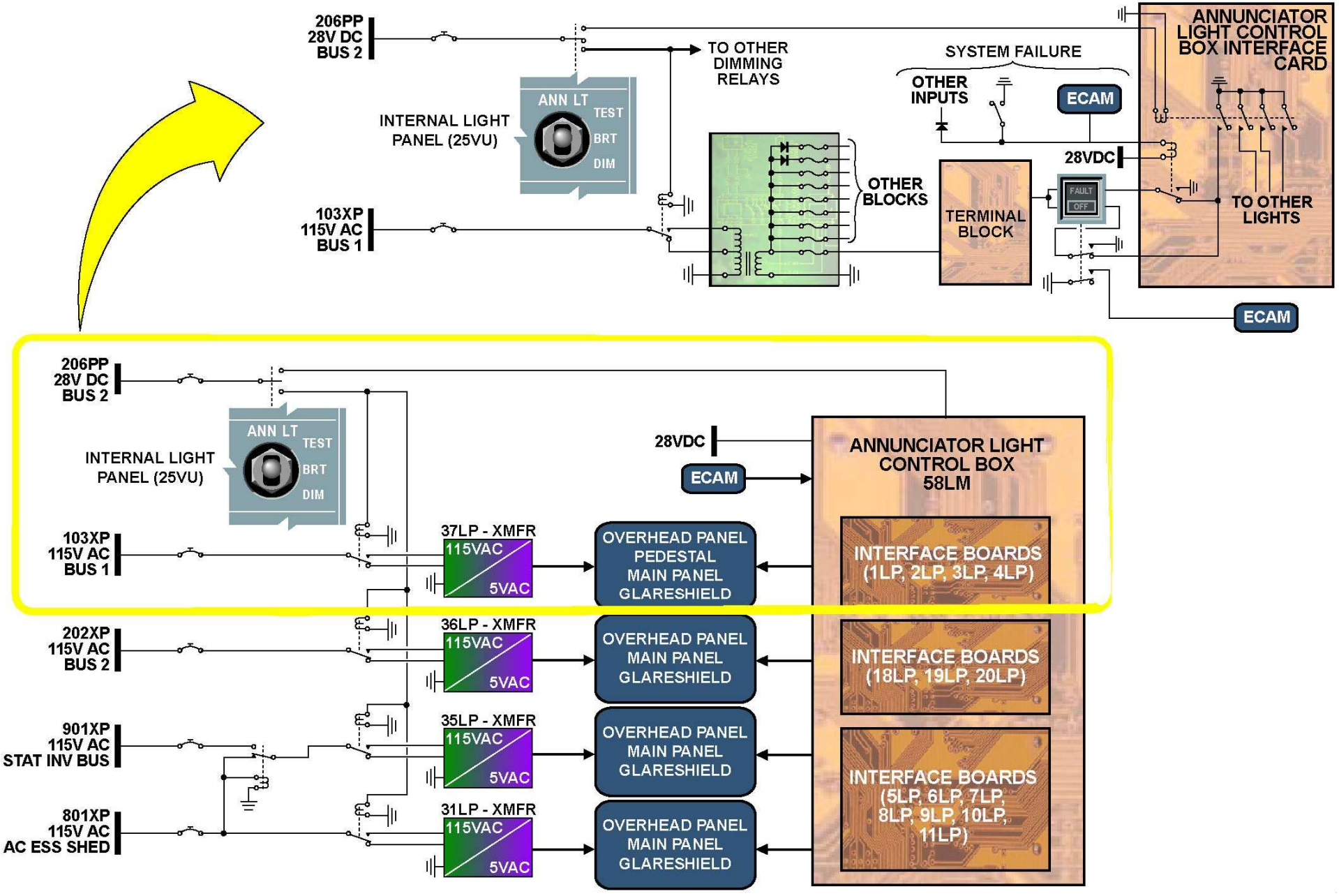
2 relays used for the TEST configuration
10 relays supplied by the various A/C system with 28VDC

Each board comprises:
- 2 relays supplied by busbar 206PP with 28 VDC through circuit breaker 30LP located on the rear circuit breaker panel 122VU. These 2 relays are used for the ANN LT tests when the switch 33LP is in the TEST position,
- 10 relays supplied by the various A/C systems with 28 VDC. They supply the ANN LT with 5 VAC whereas the system data are supplied with 28 VDC

FOUR-STAGES RELAY

4-stages relay used for the high intensity test of the ANN LTs

They are located in the relay box 103VU. They are used for the test of the equipment annunciator lights (high intensity) or of other annunciator lights (ON - OFF). The busbar 206PP supplies 28 VDC to the coil of these relays through the circuit breaker 30LP located on the rear circuit breaker panel 122VU


206PP
28V DC
BUS 2
INTERNAL LIGHT
PANEL (25VU)
ANN LT
TEST
BRT
DIM
TO OTHER
DIMMING
RELAYS
SYSTEM FAILURE
OTHER
INPUTS
ECAM
ANNUNCIATOR
LIGHT CONTROL
BOX INTERFACE
CARD
28VDC
FAULT
OFF
TO OTHER
LIGHTS
103XP
115V AC
BUS 1
OTHER
BLOCKS
TERMINAL
BLOCK
ECAM
206PP
28V DC
BUS 2
INTERNAL LIGHT
PANEL (25VU)
ANN LT
TEST
BRT
DIM
28VDC
ECAM
ANNUNCIATOR LIGHT
CONTROL BOX
58LM
103XP
115V AC
BUS 1
37LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
PEDESTAL
MAIN PANEL
GLARESHIELD
INTERFACE BOARDS
(1LP, 2LP, 3LP, 4LP)
202XP
115V AC
BUS 2
36LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
MAIN PANEL
GLARESHIELD
INTERFACE BOARDS
(18LP, 19LP, 20LP)
901XP
115V AC
STAT INV BUS
35LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
MAIN PANEL
GLARESHIELD
INTERFACE BOARDS
(5LP, 6LP, 7LP,
8LP, 9LP, 10LP,
11LP)
801XP
115V AC
AC ESS SHED
31LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
MAIN PANEL
GLARESHIELD

SYSTEM OPERATION

ANN LT SW is used to:

Test all the ANN LTs in the CKPT

Dim all the ANN LTs in the CKPT in night conditions

The cockpit ANN LT SW is mainly used to test all the ANN LTs in the cockpit or to dim the ANN LTs in night conditions.

ANN LT SW IN BRT POSITION

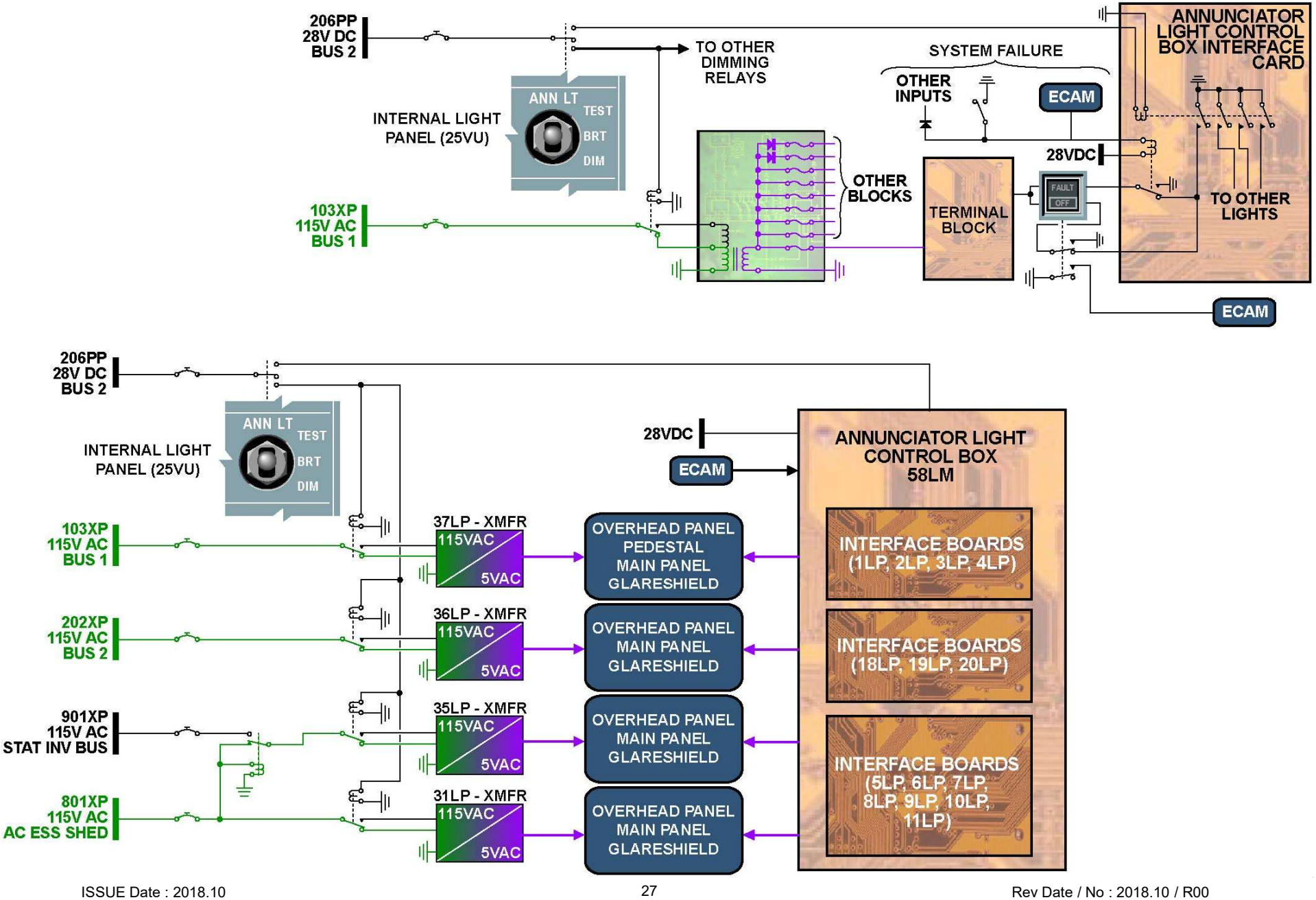
BRT Position: ANN LT switched on in case of:

Related system failure (FAULT)

Action on the relative P/BSW (OFF position)

In this position, the lighting of the ANN LT is activated:

- either if the relative system failed,
- or if there is an action on the relative P/BSW (OFF position).

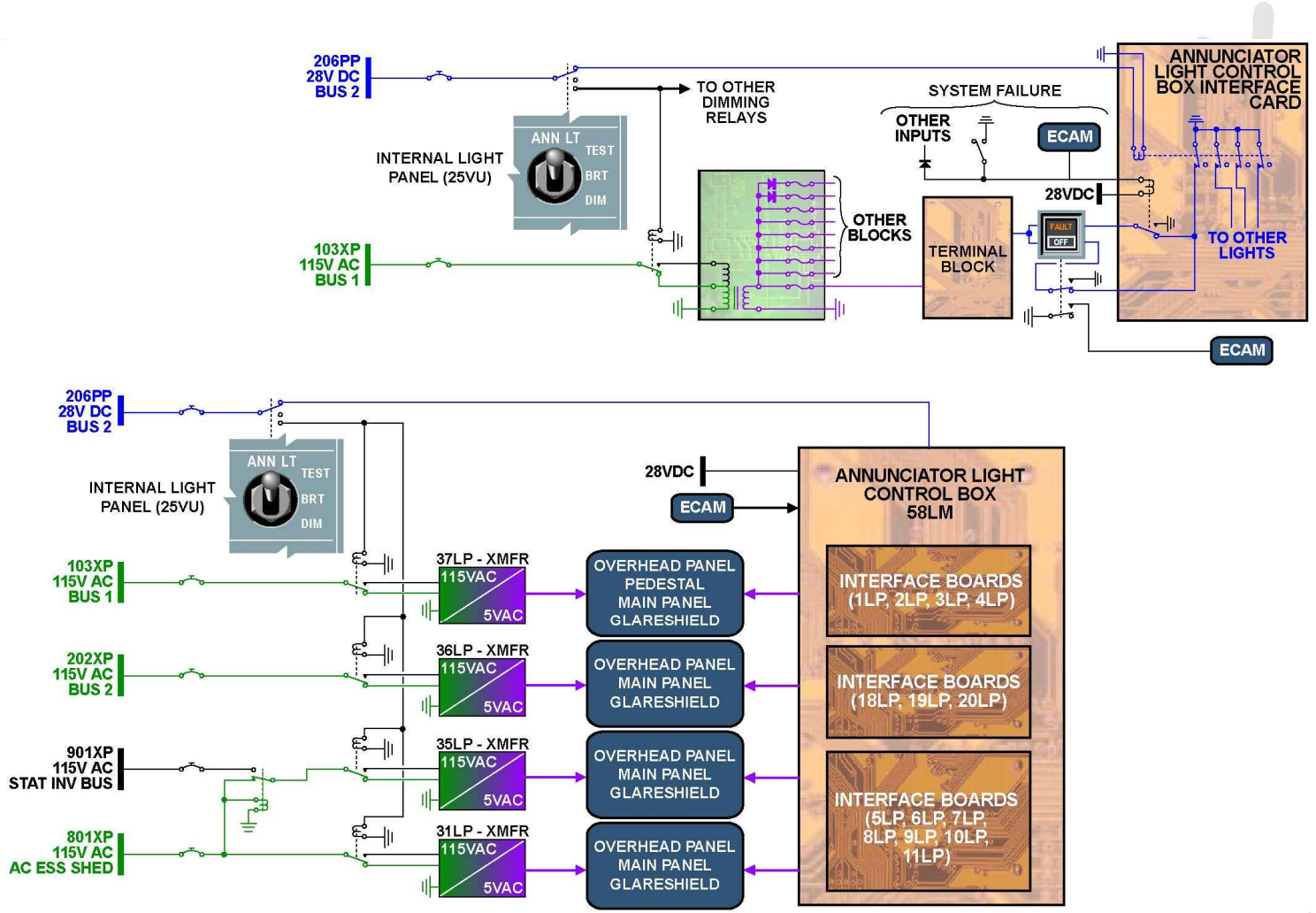

206PP
28V DC
BUS 2
TO OTHER
DIMMING
RELAYS
SYSTEM FAILURE
OTHER
INPUTS
ECAM
ANNUNCIATOR
LIGHT CONTROL
BOX INTERFACE
CARD
ANN LT
TEST
BRT
DIM
INTERNAL LIGHT
PANEL (25VU)
28VDC
OTHER
BLOCKS
TERMINAL
BLOCK
FAULT
OFF
TO OTHER
LIGHTS
103XP
115V AC
BUS 1
ECAM
206PP
28V DC
BUS 2
ANN LT
TEST
BRT
DIM
INTERNAL LIGHT
PANEL (25VU)
28VDC
ECAM
ANNUNCIATOR LIGHT
CONTROL BOX
58LM
103XP
115V AC
BUS 1
37LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
PEDESTAL
MAIN PANEL
GLARESHIELD
INTERFACE BOARDS
(1LP, 2LP, 3LP, 4LP)
202XP
115V AC
BUS 2
36LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
MAIN PANEL
GLARESHIELD
INTERFACE BOARDS
(18LP, 19LP, 20LP)
901XP
115V AC
STAT INV BUS
35LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
MAIN PANEL
GLARESHIELD
INTERFACE BOARDS
(5LP, 6LP, 7LP,
8LP, 9LP, 10LP,
11LP)
801XP
115V AC
AC ESS SHED
31LP - XMFR
115VAC
5VAC
OVERHEAD PANEL
MAIN PANEL
GLARESHIELD

ANN LT SW IN TEST POSITION

TEST position:

All ANN LTs switch on

In this position, the bus 206PP activates the internal coil of the interface board. So cockpit ANN LTs are powered on all cockpit panels.



ANN LT SW IN DIM POSITION

DIM Position:

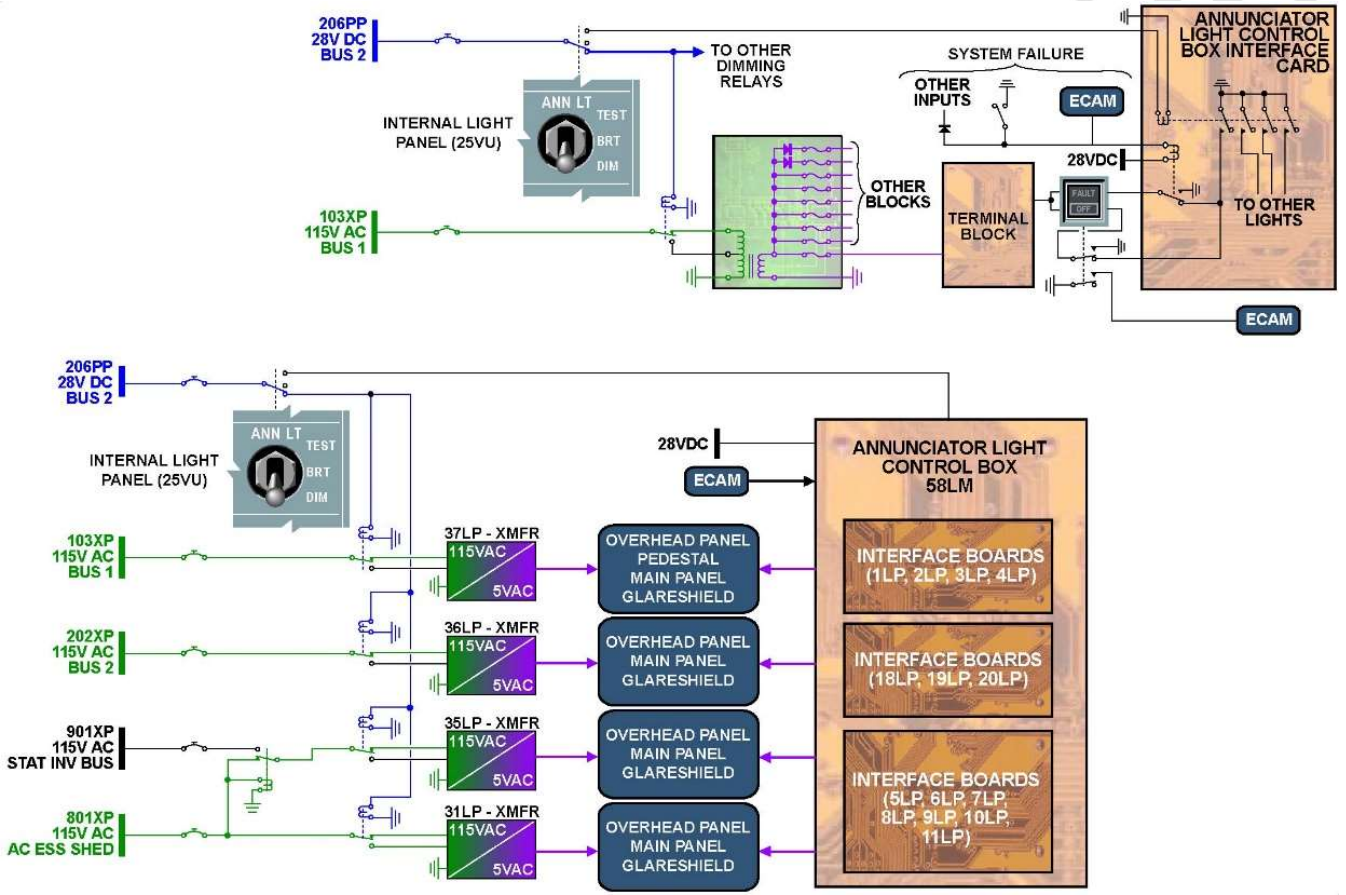
Transformer voltage output decreased in order to dim the ANN LT brightness

Same ANN LT operation as the BRT position

In this position, four-stages relays are activated and modify the transformer voltage output in order to dim the brightness of cockpit ANN LTs.

The lighting of the ANN LT is activated:

- either if the relative system failed,
- or if there is an action on the relative P/BSW (OFF position).



Cabin Lights System Description

GENERAL

CAB lights controlled through CIDS including:
- FAP
- 2 DIRs
- DEUs

DEUs A used for light SYS
DIRs process FAP signals for CAB lights CTL
DIRs transmit signals to DEUs
The cabin lights are controlled through the Cabin Intercommunication Data System (CIDS), which includes the Flight Attendant Panel (FAP), two directors (DIRs) one active, one in standby, and Decoder/Encoder Units (DEUs). Some DEUs are used for the light system, they are called type "A" DEUs. Signals from the FAP are processed by the DIRs to control the cabin lights. The DIRs transmit these signals to each DEU.

CABIN GENERAL LIGHTS

Controlled by DEUs according to FAP selection
FAP controls DEUs:
- Via DIRs
- To give BRT levels: 100%, 50% or 10%
- For related lights

CAB fluorescent lamps have AIBUs
Ballast units receive FAP commands for LT BRT level
Lighting scenarios programmed in CAM flash card
Ballast units get continuous dimming (100% to 5%)
CLEDU COW becomes AIRBUS A320 Family A/C standard equipment for cabin illumination

Control logic of cabin illumination in CAM shall be reprogrammed
The related DEUs control the cabin fluorescent lamps according to the selection on the FAP. The FAP controls the DEUs via the CIDS DIRs to give brightness (BRT) levels which are: 100% BRT, 50% BRT (Dimming 1), 10% BRT (Dimming 2) or different lighting scenarios with brightness levels between 100% to 5% for their related window and/or ceiling lights. The cabin fluorescent lamps have Advanced Integrated Ballast Units (AIBUs). The ballast units receive FAP commands via CIDS DIRs and DEUs A for brightness level control. This is according to different lighting scenarios programmed in the Cabin Assignment Module (CAM) flash card. The ballast units are designed to get a continuous dimming from 100% to 5% light BRT level. There is one reading light for each passenger seat.
Cabin LED Unit Cost Optimized White (CLEDU COW) becomes Airbus A320 Family A/C standard equipment for general cabin illumination replacing AIBUs and fluorescent tubes due to installation of cabin illumination with LED lighting units, the control logic of the cabin illumination in the CAM shall be reprogrammed.

ENTRY LIGHTS

Controlled by DEUs according to FAP selection
FAP controls DEUs:
- Via DIRs
- To give BRT levels: 100%, 50% or 10%

The related DEUs control the entry fluorescent lamps according to the FAP selection. The FAP controls the DEUs via the CIDS DIRs in order to give BRT levels (100%, 50% or 10%).
NOTE: If the engines are running and the cockpit door is open, the CIDS directors signal the DEU of the left forward entry light to set the intensity to 10%.

PASSENGER READING LIGHTS

Activation controlled from PSU or from FAP

Reading LT:

- 1 for each PAX seat
- Sufficient LED LT diffusion angle
- Supplied by DIRS and PISA in PSU
- Test via MCDU or FAP

The passenger reading lights can be controlled with buttons on the Passengers Service Unit (PSU) and through the FAP. The reading lights are not adjustable because the Light Emitting Diode (LED) light diffusion angle is sufficient. Reading lights are supplied by the active CIDS DIR via DEUs A and Passenger Interface and Supply Adapters (PISAs) installed in the Passenger Service Units (PSUs). The test of the passenger reading lights can be done either via the MCDU of from the FAP.

ATTENDANT WORK LIGHTS

Activation controlled by button in FAP area

ATTND work LT:

- LED technology
- Supplied by DIRS and stand alone PISA

Test via MCDU or FAP

The attendant work lights are controlled by buttons in the attendant area or the FAP. The attendant work lights have a LED technology, and are supplied by the active CIDS DIR via DEUs A and stand alone PISAs. The test of the attendant work lights can be done either via the MCDU or from the FAP.

Note: The Mean Time Between Failure (MTBF) of LED reading lights is 100,000 flight hours. Thus, there is no replacement procedure apart from replacing the complete light assembly. Cabin signs must be replaced if three or more LEDs have failed (de-graded performance).

If a full failure of the FAP and/or CIDS occurs or cabin decompression occurs, the entrance lighting comes on automatically to 100% BRT level.

FAP

ETHERNET

CIDS DIRECTOR 1 2

TOP LINES

DEU A

DEU A

DEU A

115V AC

RS 485

AIBU

CABIN FLUORESCENT LAMP

ENTRY FLUORESCENT LAMP

RS 485

AIBU

115V AC

115V AC

LVDS

PISA

PASSENGER READING LIGHTS

115V AC

LVDS

Stand Alone PISA

ATTENDANT WORK LIGHTS

Cabin LED Unit Cost Optimized White (CLEDU COW) replaces AIBUs and the normal Cabin Lights.

AIBU: Advanced Integrated Ballast Unit
CIDS: Cabin Intercommunication Data System
DEU: Decoder/Encoder Unit
FAP: Flight Attendant Panel
LVDS: Low Voltage Differential Signalling
PISA: Passenger Interface and Supply Adapter


SORTIE
EXIT
FAP
Cabin Lighting
Page

GENERAL

FAP:

Main interface with CIDS

To program, monitor & indicate CIDS STS & CAB SYS

SYS pages available by press keys or A/C symbols on screen

SYS pages:

AUDIO

CABIN LIGHTING

DOORS/SLIDES

CABIN TEMPERATURE

WATER/WASTE

The Flight Attendant Panel (FAP) is the main user interface with the Cabin Intercommunication Data System (CIDS). It programs, monitors and indicates the status of the CIDS and related cabin systems. The following system pages are available by pressing the FAP system keys or the respective aircraft symbols on the screen:

- AUDIO page,
- CABIN LIGHTING page,
- DOORS/SLIDES page,
- CABIN TEMPERATURE page,
- WATER/WASTE page.

STANDARD CABIN LIGHTING CONTROL

Lights key on FAP tool bar to display the page

A/C symbol with entry & class lighting zones

ENTRY 1 and/or ENTRY 4 CTLs & displays:

Selection of FWD & after ENTR areas lighting

BRT (100%), DIM 1 (50%), DIM 2 (10%)

1, 2 or 3 independent cabin zones:

FIRST CLASS

BUSINESS CLASS

TOURIST CLASS

Independent lighting zones controlled:

Via related CTLs & displays

With 3 levels: BRT, DIM1 & DIM2

Main On/Off key:

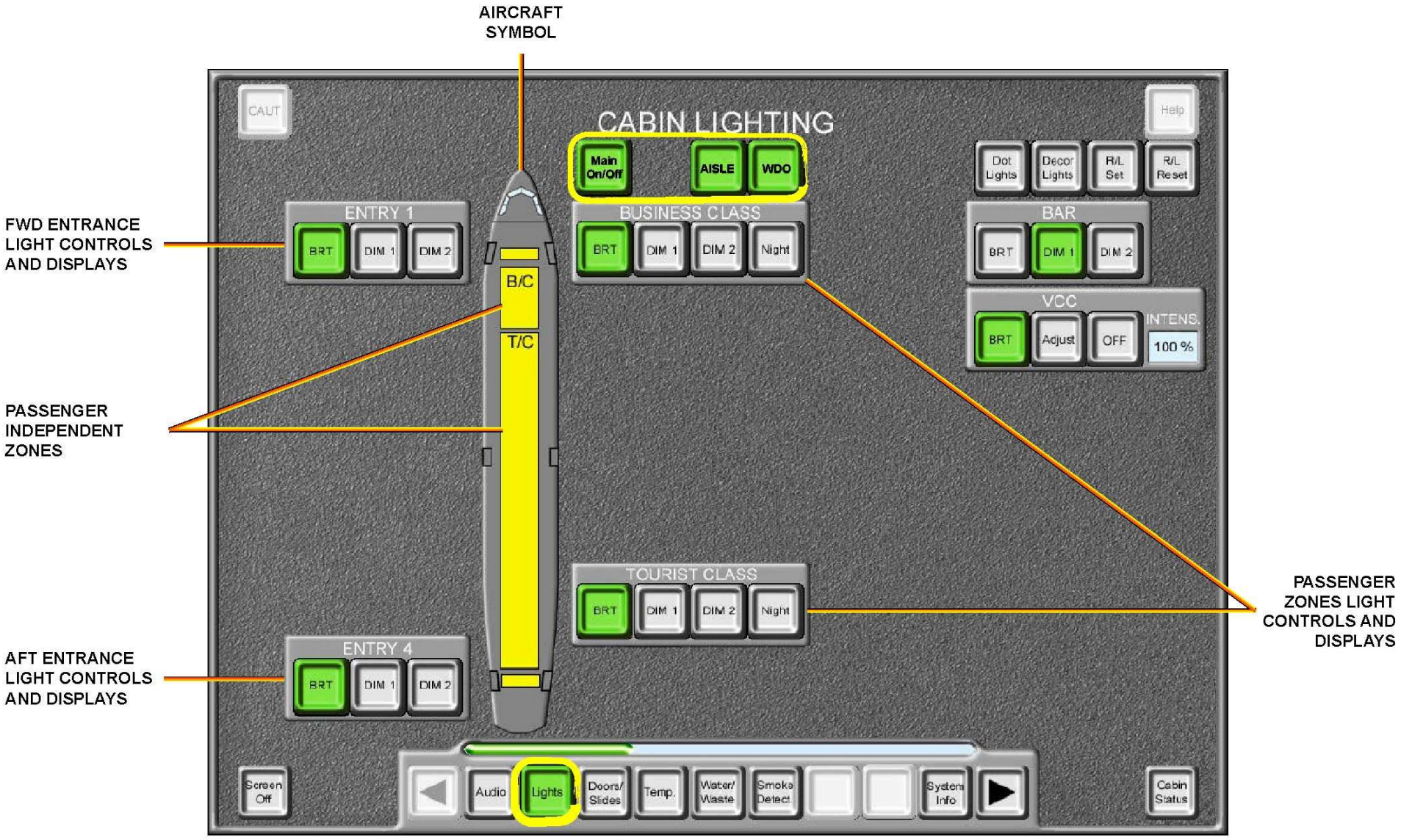
Switch ON/OFF CAB zones & ENTR areas lighting

100% intensity

Only available on GND

AISLE key to switch ON/OFF ceiling lights
WDO key to switch ON/OFF window lights
R/L Set & Reset key to switch ON/OFF the R/Ls
AUTO DIM of FWD ENTR area activated if:
CKPT door opened
Engines are running

CAB decompression: Pax COMPT AUTO switch to BRT
Select Lights key on the FAP tool bar, to display the CABIN LIGHTING page. This page shows an aircraft symbol with the ENTRY and CLASS lighting zones. The ENTRY 1 and/or ENTRY 4 controls and display keys are used for the selection of FWD and aft entrance areas lighting, BRighTness (100%), DIMming 1 (50%), and DIM2 (10%). The cutting-up of the cabin is possible into 1, 2 or 3 independent zones (selection of 1 zone is standard, and optional for 2 and 3 zones) such as FIRST CLASS, BUSINESS CLASS and TOURIST CLASS. To control these zones, controls and displays are available with three levels of lighting, BRT, DIM1 and DIM2. The Main On/Off key is used to switch ON/OFF cabin zone and entrance areas lighting with 100% intensity, this function is only available on ground. The AISLE key is used to switch ON/OFF the ceiling lighting, and the WinDOw key to switch ON/OFF the windows lighting. Additional functions are Reading/Light Set (on) and R/L Reset (off). An automatic DIM of the FWD entrance area is activated if the cockpit door is opened and the engines are running. In case of cabin decompression, the passenger compartment lighting automatically switches to full brightness (100%).



CABIN LIGHTING FLIGHT ATTENDANT PANEL PAGE

Exterior Lights Description and Operation

NAVIGATION LIGHTS

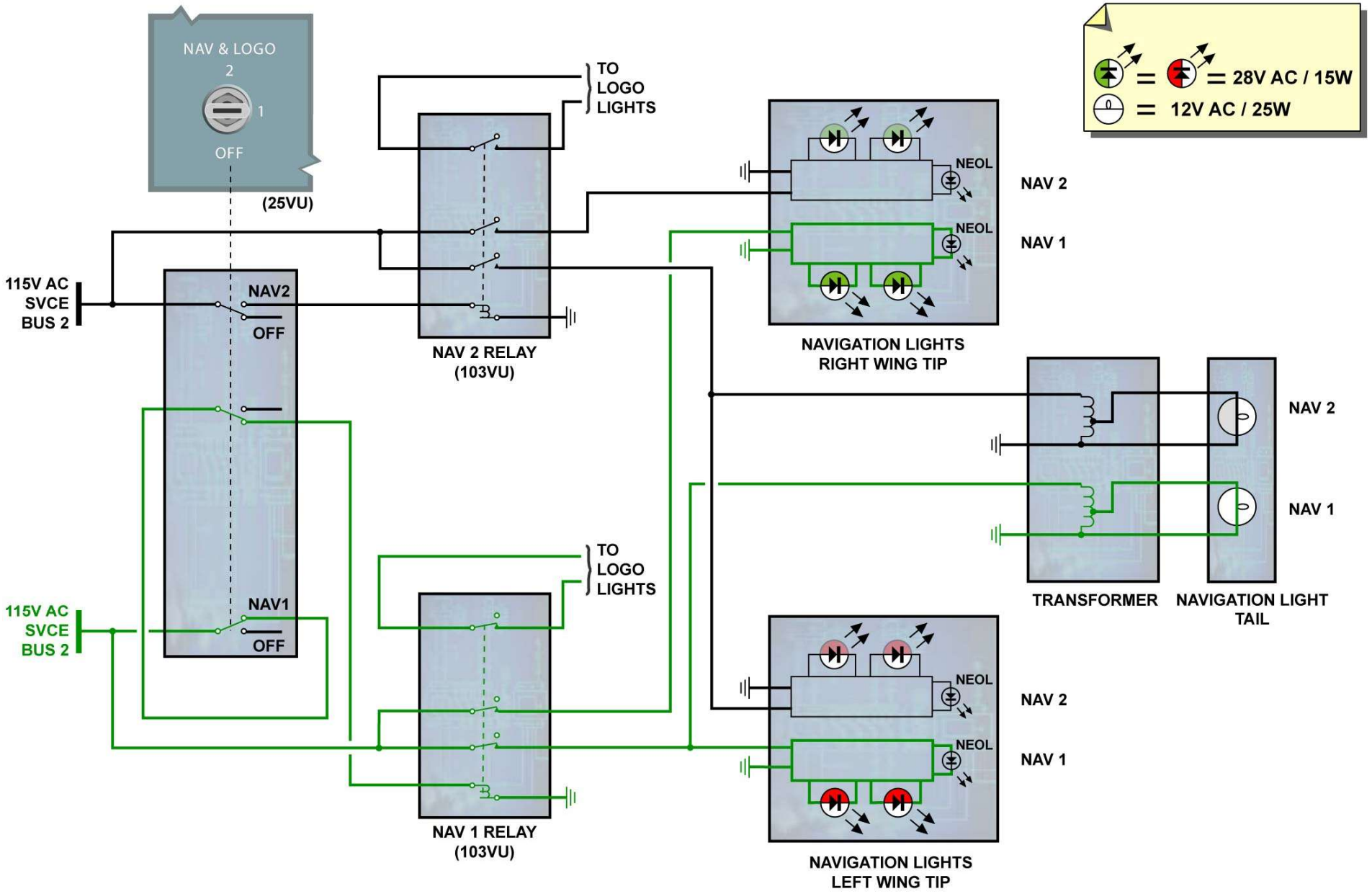
Comp loc LH WING
LANDING & NAVIGATION & STROBE & Upper (Lower) BEACON & ENG SCAN Lights
Comp loc Ext REAR
LOGO Lights & Tail STROBE / NAV Light
Comp loc NLG WHEEL WELL
Runway Turn Off & Taxi & Take Off Lights
Comp loc THS Compartment
Tail Cone Strobe Light Power Supply Unit

2 systems
NAV & LOGO (OFF/1/2) SW
External transformer for tail cone
Flags: LED technology has been selected in the EXTERIOR Lights systems for low maintenance activity and cost, longer operating life and weight reduction.

The navigation lights have two systems, which operate independently. Each system can supply one set of navigation lights (RH wingtip, LH wingtip and tail cone). An integrated transformer for the wingtips and an external transformer for the tail cone are connected to each lamp.
The navigation lights are controlled by a three-position NAVigation & LOGO switch (OFF/1/2).
- 1: turns on the logo lights and the first set of navigation lights,
- 2: turns on the logo lights and the second set of navigation lights,
- OFF: all lights are off.

NOTE: On the next slide, NAV 1 configuration is selected by NAV & LOGO switch, set to the 1 position.

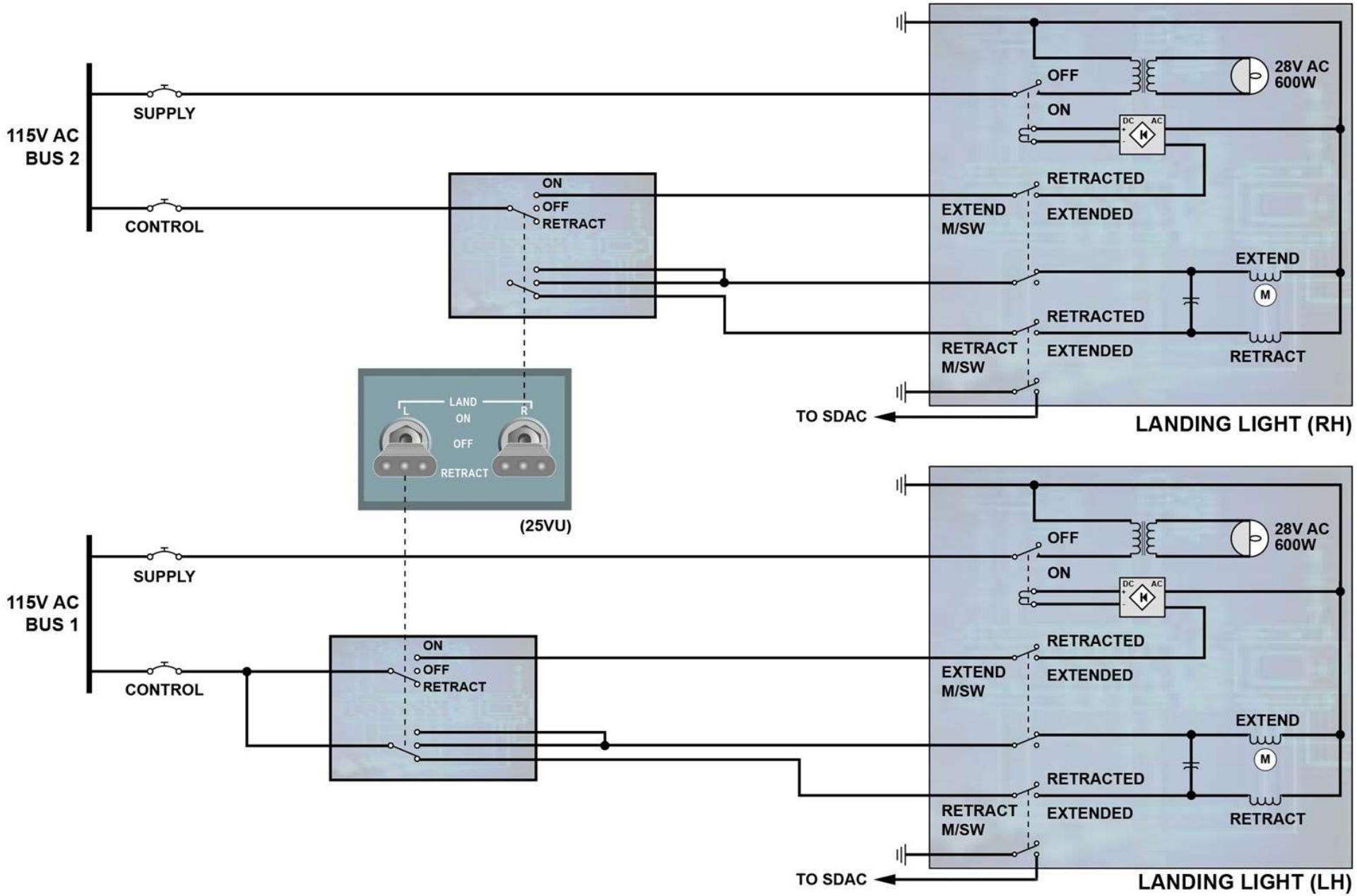
Near End Of Life (NEOL)
NEOL: Blue LED
NAV lights 1 & 2 in a single unit with their PSU
No need for external PSU in RWD compartment
The LED wingtip light assemblies include a Near End Of Life (NEOL) function to indicate when the light is near the end of its useful life.
The NEOL indication is a blue LED which flashes.
The navigation lights 1 and 2 will now be in a single unit together with their Power Supply Unit (PSU) installed on the leading edge.
In the reward (RWD) compartment, there is no longer need of an external PSU, because the related PSU is included in the RWD assembly.


NAV & LOGO
2
1
OFF
(25VU)
= = 28V AC / 15W
= 12V AC / 25W
TO
LOGO
LIGHTS
NEOL
NAV 2
NEOL
NAV 1
NAVIGATION LIGHTS
RIGHT WING TIP
115V AC
SVCE
BUS 2
NAV2
OFF
NAV 2 RELAY
(103VU)
NAV 2
NAV 1
TRANSFORMER
NAVIGATION LIGHT
TAIL
115V AC
SVCE
BUS 2
NAV1
OFF
TO
LOGO
LIGHTS
NEOL
NAV 2
NEOL
NAV 1
NAV 1 RELAY
(103VU)
NAVIGATION LIGHTS
LEFT WING TIP

LANDING LIGHTS

2 independent landing lights
2 LAND SW (ON/OFF/RETRACT)
ECAM message when extended
One landing light underneath each wing can be extended at all A/C speeds. Each landing light has an independent extension/retraction and lighting circuit. Each landing light is controlled by a three-position LAND switch (ON/OFF/RETRACT):
- ON, extends the left (or right) landing light, which comes on automatically when fully extended,
- OFF, shut off landing light but leaves it extended,
- RETRACT, retracts the landing light and shuts it off.
When the landing lights are extended, the "LAND LT" memo message is displayed on the EWD.

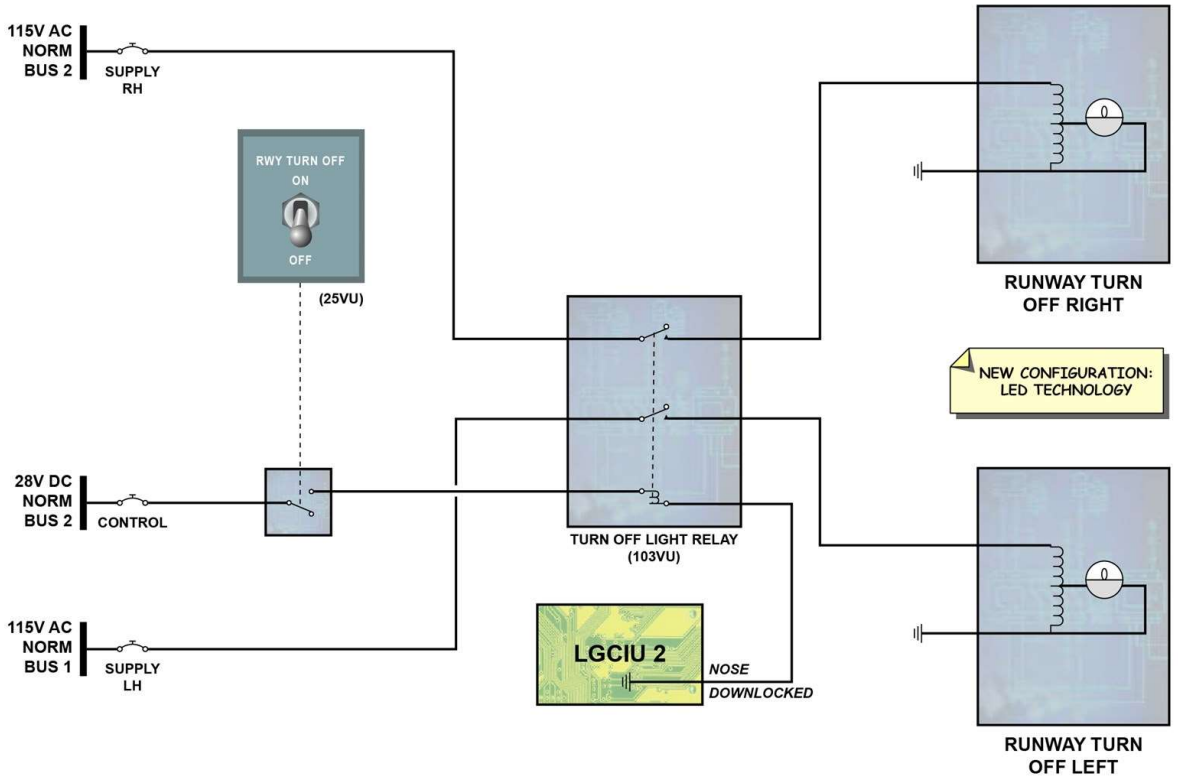
LED technology
Two retractable landing lights with LED technology optical heads, are installed with the same external interface with the A/C than the Current Engine Option (CEO) in SA family.


115V AC BUS 2
SUPPLY
CONTROL
ON
OFF
RETRACT
OFF
ON
28V AC 600W
RETRACTED
EXTEND M/SW
EXTENDED
EXTEND
M
RETRACTED
RETRACT M/SW
EXTENDED
RETRACT
TO SDAC
LANDING LIGHT (RH)
LAND
L
R
ON
OFF
RETRACT
(25VU)
115V AC BUS 1
SUPPLY
CONTROL
ON
OFF
RETRACT
OFF
ON
28V AC 600W
RETRACTED
EXTEND M/SW
EXTENDED
EXTEND
M
RETRACTED
RETRACT M/SW
EXTENDED
RETRACT
TO SDAC
LANDING LIGHT (LH)

RUNWAY TURN-OFF LIGHTS

2 runway turn-off lights on NLG
A RWY TURN OFF SW (ON/OFF)
NLG down-locked logic
Two runway turn-off lights are installed on the NLG.
The RunWaY TURN OFF switch controls the runway turn-off lights:
- ON: Both lights are on if the NLG is downlocked,
- OFF: Both lights are off.

New LED technology
The new configuration consists of two Runway Turn-Off (RTO) lights, with the same external interface with the A/C that the CEO configuration in Single Aisle (SA) fleet, but with LED technology optical heads.



TAXI AND TAKE-OFF LIGHTS

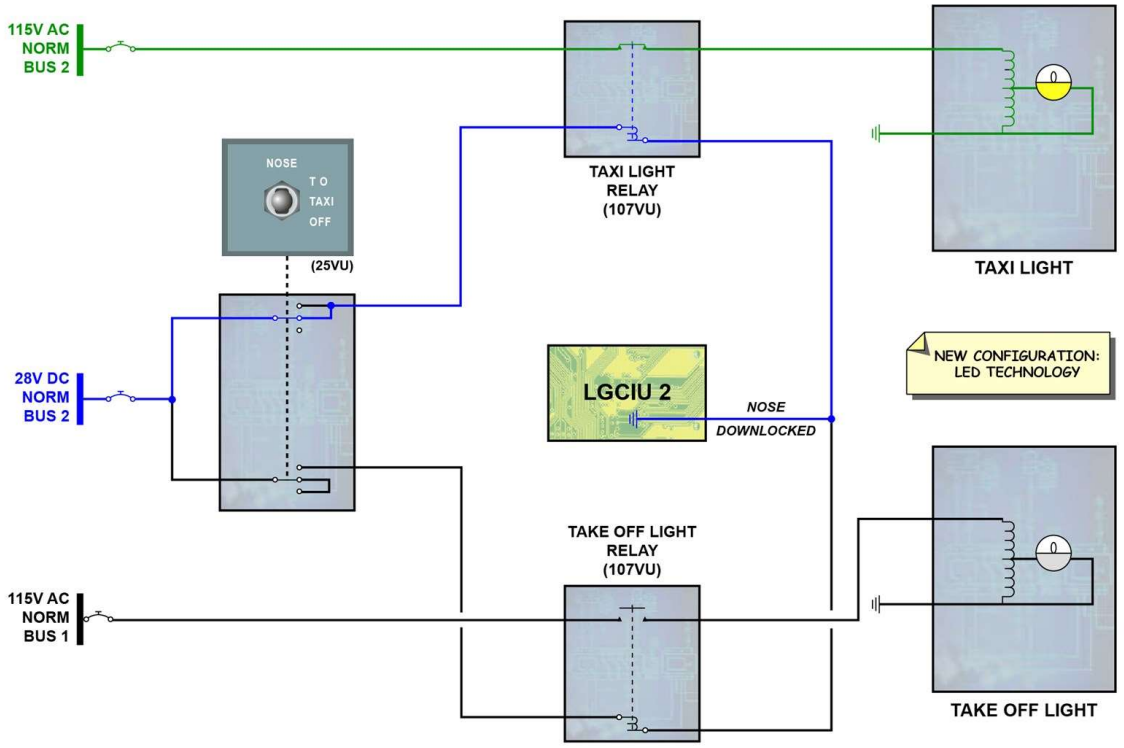
1 taxi light and 1 takeoff light on NLG
NOSE SW (T.O/TAXI/OFF)
NLG down-locked logic

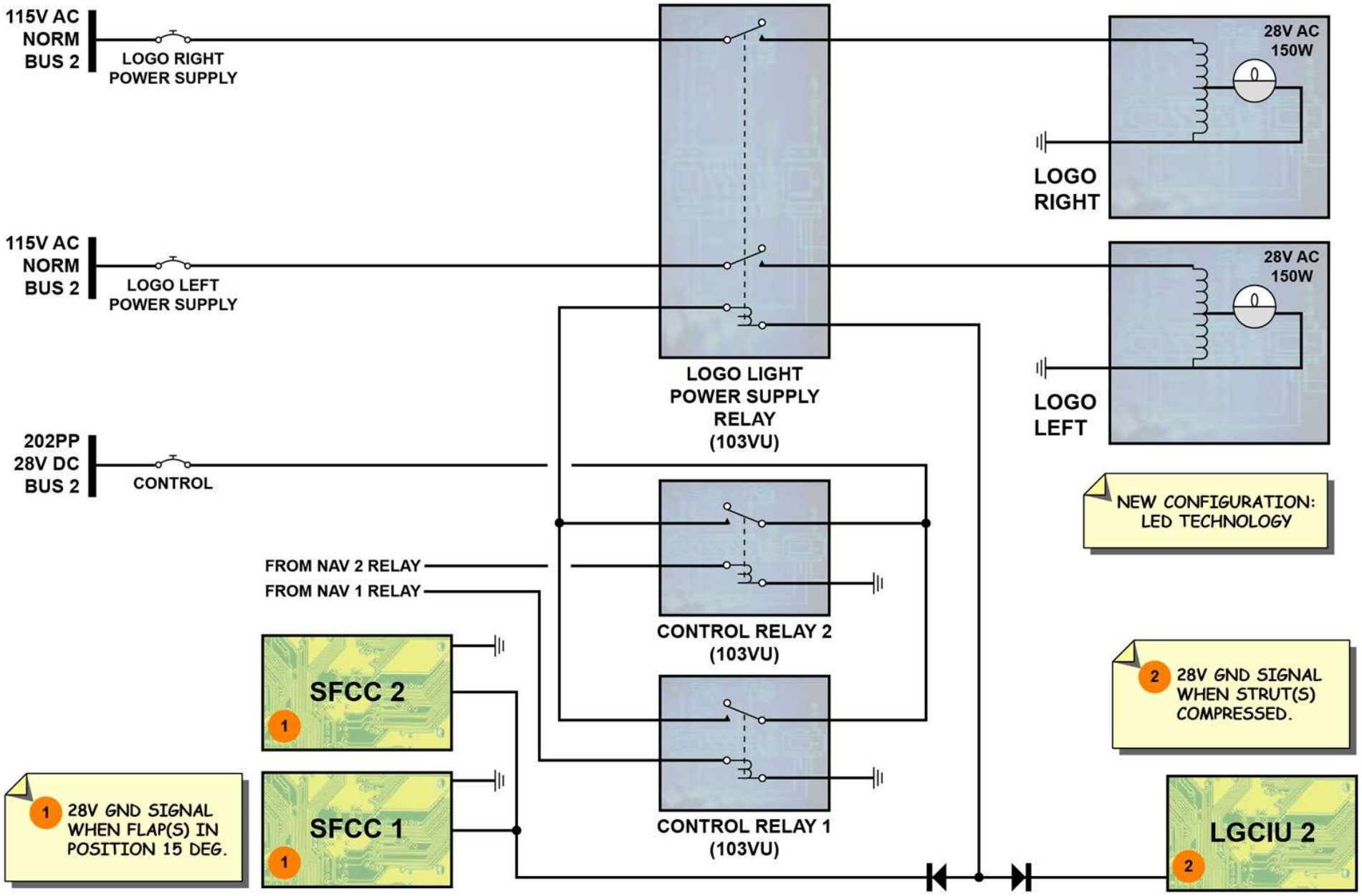
The taxi and takeoff lights are installed on the NLG, in a fixed position. The taxi and takeoff lights are controlled by the three position NOSE selector switch:

- T.O: taxi and takeoff lights are on if the NLG is downlocked,
- TAXI: taxi light is on if the NLG is downlocked,
- OFF: all lights are off.

New LED technology

A taxi light, with the same external interface than the CEO SA fleet but with LED technology optical head is installed.

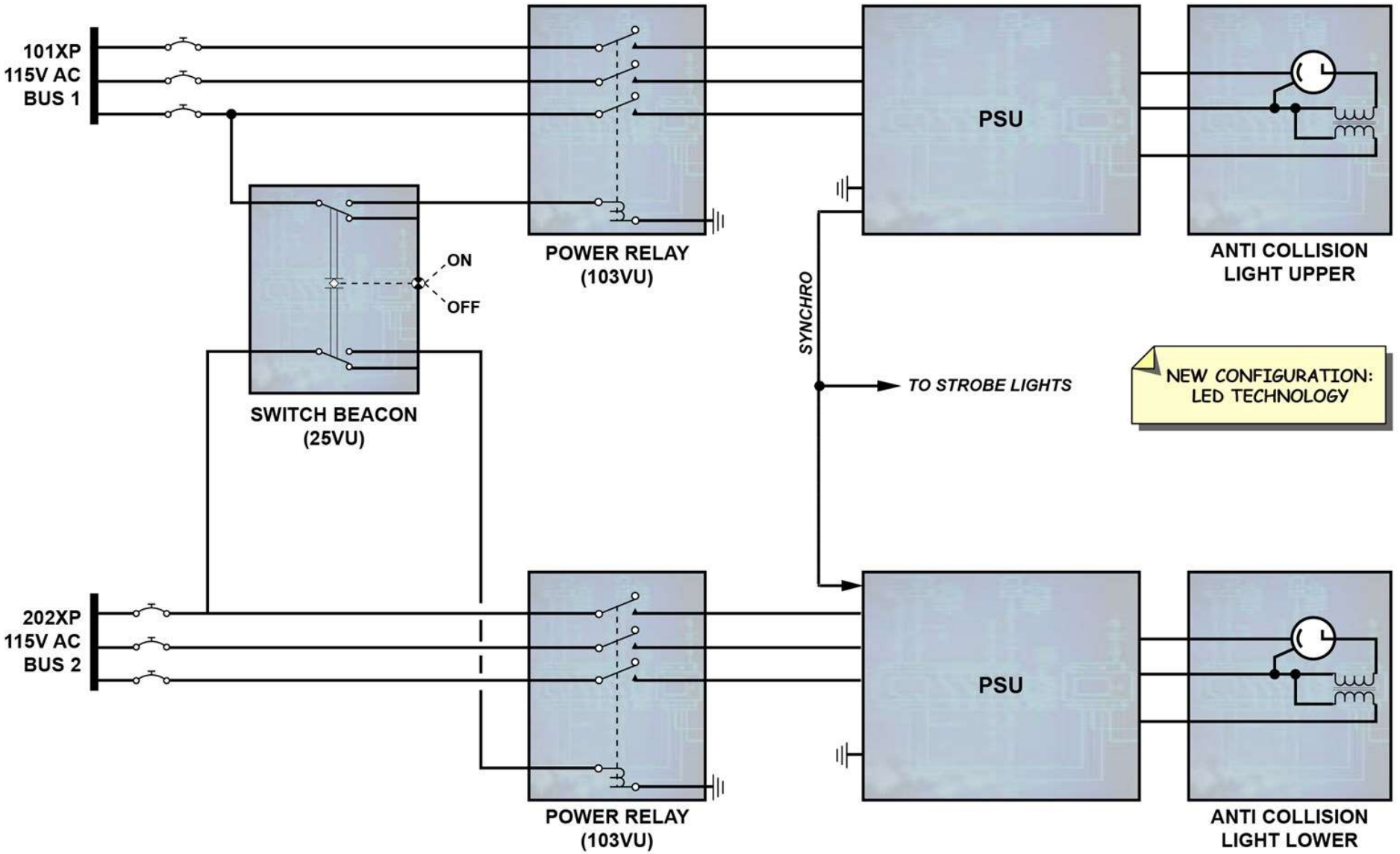



115V AC NORM BUS 2
LOGO RIGHT POWER SUPPLY
115V AC NORM BUS 2
LOGO LEFT POWER SUPPLY
202PP 28V DC BUS 2
CONTROL
LOGO LIGHT POWER SUPPLY RELAY (103VU)
28V AC 150W
LOGO RIGHT
28V AC 150W
LOGO LEFT
NEW CONFIGURATION: LED TECHNOLOGY
FROM NAV 2 RELAY
FROM NAV 1 RELAY
CONTROL RELAY 2 (103VU)
CONTROL RELAY 1 (103VU)
SFCC 2
1
SFCC 1
1
1 28V GND SIGNAL WHEN FLAP(S) IN POSITION 15 DEG.
2 28V GND SIGNAL WHEN STRUT(S) COMPRESSED.
LGCIU 2
2

BEACON LIGHTS

Two beacon lights (upper and lower)
BEACON SW (ON/OFF)
Synchronization with strobe lights
Two beacon lights supply high-intensity red flashing light on the top and at the bottom of the aircraft fuselage. The beacon lights operate alternately in synchronization with the strobe lights. They are supplied and controlled through their related PSU, if the BEACON SW (ON/OFF) is ON.

New LED technology
The system introduces LED technology on the beacon lights. This change involves an evolution for the lights, PSUs and harnesses which connect lights and PSUs.


101XP
115V AC
BUS 1
ON
OFF
SWITCH BEACON
(25VU)
POWER RELAY
(103VU)
PSU
ANTI COLLISION
LIGHT UPPER
SYNCHRO
TO STROBE LIGHTS
NEW CONFIGURATION:
LED TECHNOLOGY
202XP
115V AC
BUS 2
POWER RELAY
(103VU)
PSU
ANTI COLLISION
LIGHT LOWER

STROBE LIGHTS

3 strobe lights (wings and tail cone)
STROBE SW (ON/AUTO/OFF)
Synchronization with beacon lights
"STROBE LT OFF " ECAM memo (if OFF in flight)

Three strobe lights are installed at each wing tip and at tail cone. They are synchronized and operate alternatively with the beacon lights.
They are supplied and controlled through their related PSU according to the STROBE switch position (ON/AUTO/OFF):
- ON: the strobe lights flash white,
- AUTO: the strobe lights come on automatically when the main landing gears are not compressed,
- OFF: the strobe lights are off.

The "STROBE LT OFF" ECAM memo message is displayed if the strobe lights are set to OFF and the aircraft is in flight.
NOTE: The Power Supply Unit for the tail cone strobe light is located in the THS compartment.

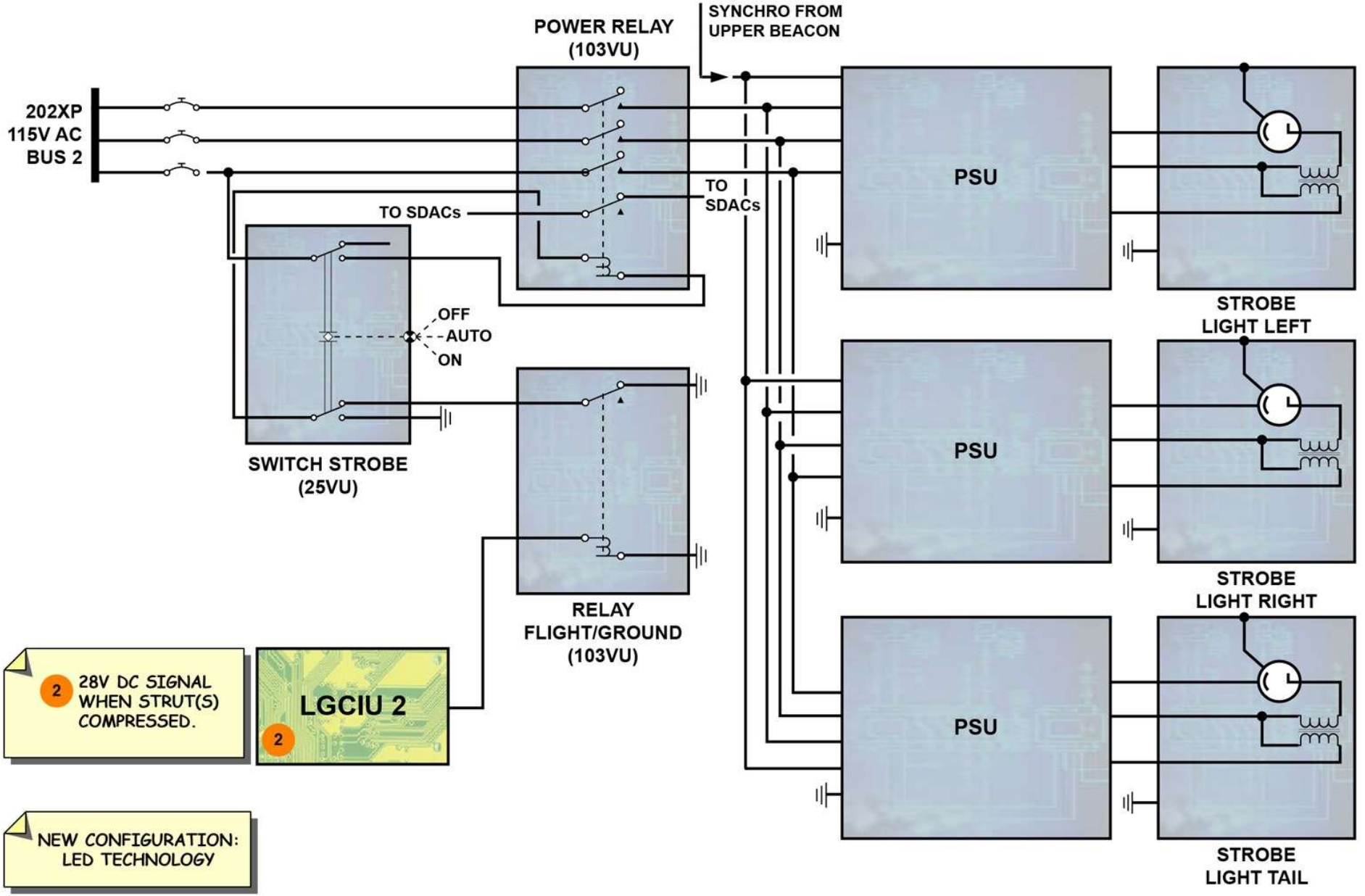
A/C with sharklets

- Near End Of Life (NEOL) function

If the A/C is equipped with sharklets (optional), the strobe light assemblies include a NEOL function to indicate when the light is near the end of its useful life. The NEOL indication is a blue LED which flashes.

New LED technology

LED technology is used for the forward strobe lights. Due to this new technology, the PSUs associated to strobe lights and the harnesses between the light unit and the PSU are also replaced.


POWER RELAY
(103VU)
SYNCHRO FROM
UPPER BEACON
202XP
115V AC
BUS 2
TO SDACs
TO
SDACs
PSU
STROBE
LIGHT LEFT
OFF
AUTO
ON
SWITCH STROBE
(25VU)
PSU
STROBE
LIGHT RIGHT
RELAY
FLIGHT/GROUND
(103VU)
2
28V DC SIGNAL
WHEN STRUT(S)
COMPRESSED.
LGCIU 2
2
PSU
STROBE
LIGHT TAIL
NEW CONFIGURATION:
LED TECHNOLOGY

WING AND ENGINE SCAN LIGHTS

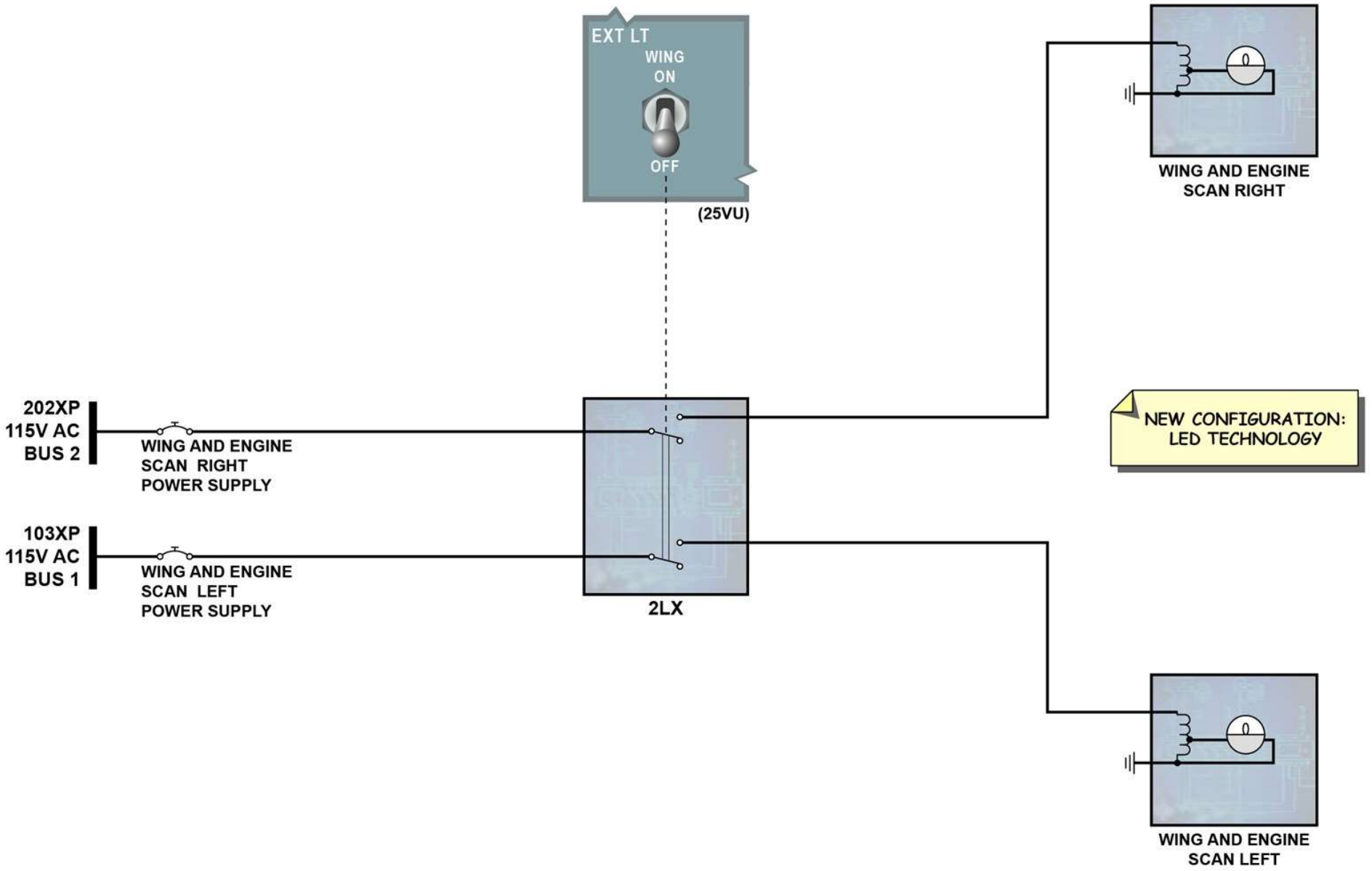
2 wing and engine scan lights

WING SW (ON/OFF)

Two wing and engine scan lights are installed: one on each side of the fuselage. These lights light the leading edge of the wing and the engine air intake to show if ice is accumulating there. The WING switch (ON/OFF) controls these lights.

New LED technology

The system introduces LED technology for the Wing and Engine Scan Lights (WESL).


EXT LT
WING
ON
OFF
(25VU)
WING AND ENGINE
SCAN RIGHT
202XP
115V AC
BUS 2
WING AND ENGINE
SCAN RIGHT
POWER SUPPLY
NEW CONFIGURATION:
LED TECHNOLOGY
103XP
115V AC
BUS 1
WING AND ENGINE
SCAN LEFT
POWER SUPPLY
2LX
WING AND ENGINE
SCAN LEFT

Emergency Lights System Description and Operation

GENERAL
Comp loc Ext LH WING
Left Emergency Overwing Lights 1 & 2

Failure or EMER condition: EMER lighting
EPSUs supply different LTs
EMER LTs: 6 & 28V DC LEDs
Over-wing & escape slide LT in bulbs technology
The emergency lighting system supplies lighting in case of failure of the main lighting system or during emergency conditions. The Emergency Power Supply Units (EPSUs) supply all these different lights. The emergency lights have 6V DC Light Emitting Diodes (LEDs), except for lavatory auxiliary lights (28V DC LEDs). The external emergency lights such as over-wing and escape slide use bulbs technology.

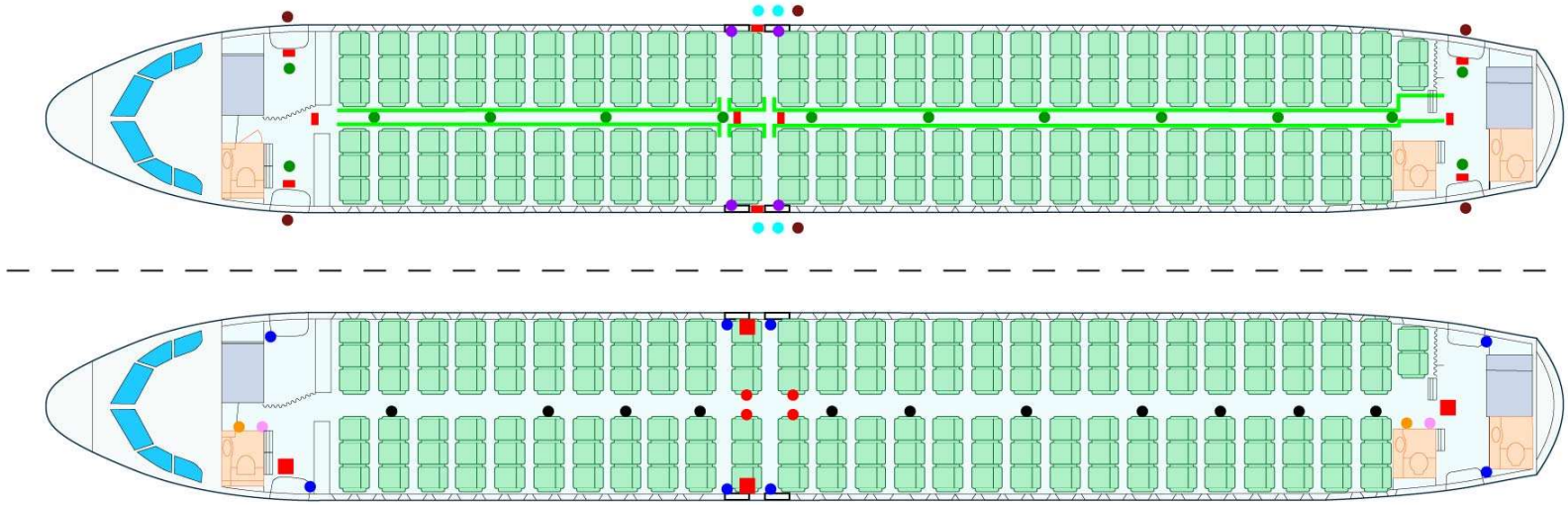
ELECTRICAL SUPPLY
EPSUs operation: 28V DC ESS SHED BUS
115V AC NORM BUS voltage sensing
The EPSUs are supplied with 28V DC from the ESSential SHEDdable BUS for operation and 115V AC from the NORMal BUS voltage sensing.

EPSU
Following LTs supplied:
- Exit signs
- Cabin EMER
- Seat EMER
- Wall mounted
- Escape slide or hatch-handle
- Over-wing EMER
- LAV auxiliary

Monitors AC & DC buses correct voltage
Converts 28V DC into 6V DC for LTs operation
Internal 6V DC BAT

The EPSUs supply the following lights:
- exit signs lights,
- cabin emergency lights,
- seat mounted emergency lights and exit location lights,
- wall mounted emergency exit location light,
- wall mounted exit marking sign,
- wall mounted emergency exit,
- wall mounted emergency light,
- escape slide lights,
- over-wing emergency lights,
- lavatory auxiliary lights,
- and escape hatch-handle lights.

The EPSUs also monitor the correct voltage of the AC and DC buses. The EPSUs convert 28V DC into 6V DC to operate their associated lights. An internal 6V DC battery in each EPSU is charged continuously when the ESS SHED BUS is energized and the system is not activated.



GENERAL
CABIN AND EXTERIOR
EMERGENCY LIGHTS

Emergency Power Supply Unit

Exit Signs:

- **Exit Location Signs**
- **Exit Marking Signs**
- **Escape Hatch - Handle Light**

Escape Path Marking System:

- **Wall Mounted Emergency Exit Location Light**
- **Wall Mounted Exit Marking Sign**
- **Wall Mounted Emergency Exit**
- **Seat Mounted Emergency Light**
- **Seat Mounted Emergency Exit Location Light**
- **Photolumiscent strips**

External Lights:

- **Escape Slide Light**
- **Overwing Emergency Light**

Cabin Emergency Lights:

- **Cabin Emergency Light**

OPERATION

EMER EXIT LT SW:

To CTLs EMER lighting SYS

3 positions: OFF, ARM & ON

Each position sends discrete GND signal to EPSUs

The EMERgency EXIT LighT switch on the overhead panel controls the emergency lighting system. The EMER EXIT LT switch has three positions: OFF, ARMed and ON. Each of these positions sends a discrete ground signal to the EPSUs.

OFF POSITION

GND signal prevents EMER lighting SYS

To be switched on

When AC & DC BUS voltages not available

EMER EXIT LT OFF light comes on

BATs charged when 103XP and 801PP energized.

The system is supplied when the busbars 103XP and 801PP are energized. With the EMER EXIT LT switch and the EMER pushbutton switch on the FAP in the OFF positions, the power supply units control-line OFF is grounded, All lights and signs are off and the battery in each power supply unit is on charge. The EMER EXIT LT OFF annunciator lights come on.

Note: The EXIT signs and the emergency escape hatch-handle lights come on with EMER EXIT LT switch OFF, when the NO SMOKING switch is in the ON position or in AUTO position with landing gear extended, or in option, when the EXIT switch is in the ON position or in AUTO position with landing gear extended.

ARM POSITION

EMER EXIT LT OFF light goes off

NORM BUS voltage not AVAIL:

CAB EMER lighting & seat mounted LTs come on

PWR from 28V DC/6V DC CONV in EPSU

28V DC ESS SHED BUS voltage not AVAIL:

EPSUs BAT supply EMER lighting SYS

BATs no longer charged

In the ARM position the EMER EXIT LT OFF annunciator light goes off. When the 115V AC NORM BUS voltage is not available, the cabin emergency lighting and the FPEEPMS light come on. The power is supplied from the 28V DC/6V DC converter in the related EPSU. When the 28V DC ESS SHED BUS voltage is not available, the batteries of all EPSUs supply the emergency lighting system for at least 10 minutes. The batteries are no longer charged.

ON POSITION

EMER lighting SYS comes on:

CAB EMER LTs

Exit signs

Escape hatch-handle LTs

Seat mounted LTs

EPSU CONV SPLY when DC ESS SHED BUS AVAIL

If 28V DC ESS BUS voltage falls below 16V:

EPSUs BATs SPLY loads

BATs no longer charged

In the ON position the emergency lighting system comes on, as if the EMERgency P/B on the Flight Attendant Panel (FAP) was pushed. The cabin emergency lights, the exit signs, the escape hatch-handle lights and the seat mounted lights come on. The 28V DC/6V DC converters of the EPSUs supply these loads as long as the 28V DC ESS SHED BUS is available. If the 28V DC SHED ESS BUS voltage falls below 16V, the EPSUs internal batteries continue to supply the loads for at least 10 minutes. The batteries are no longer charged.

OTHER CASES

Escape slides integral LTs come on:
- PAX/crew doors opened
- EMER exit doors opened
- EMER exit hatches opened

Over-wing emergency LTs come on if:
- EMER exit hatches opened
- Slides released

Excessive CAB DEPRESS:
- Exit marking signs AUTO comes on
- Location signs AUTO comes on

Independently of the switch positions, the integral lights in the respective escape slides come on when the passenger/crew doors or the emergency exit doors are opened with the escape slides armed. When the emergency exit hatches are open and the slides are released, the respective over-wing emergency lights and the integral lights in the respective escape slide come on. In the event of excessive cabin depressurization, the exit marking signs and the exit location signs automatically come on.

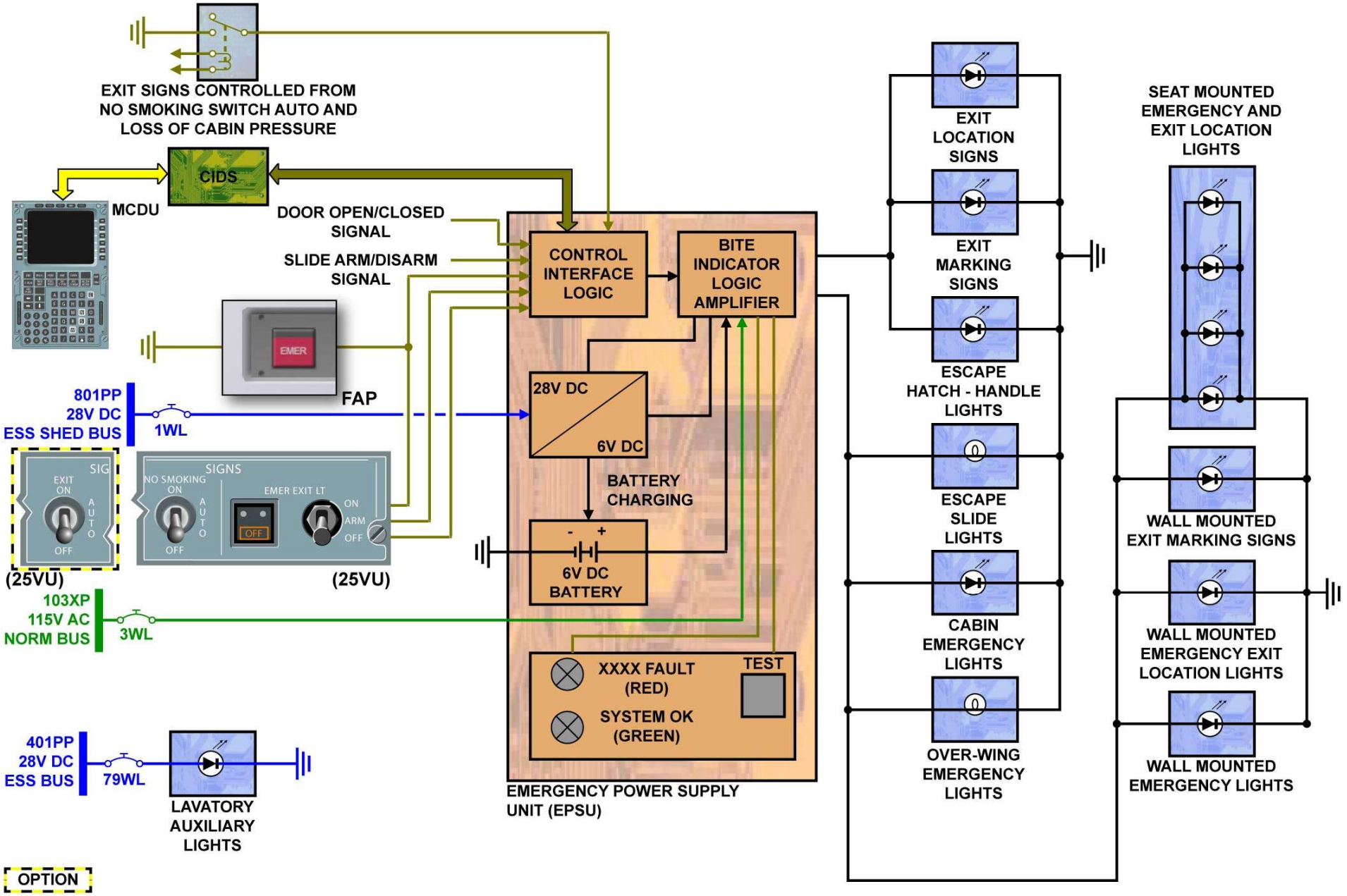
TEST

EPSU circuit to test:
- BAT unit condition
- Logic unit
- Related loads

Done first via MCDU

If EPSU BAT TEST or EPSU SYS TEST on MCDU fail:
- Isolated test must be done
- With P/B located on each EPSU

Each EPSU has a test circuit which tests the condition of the battery unit, the logic unit and the related loads. If a fault is detected it is reported to CIDS. An EPSU SYStem TEST can be triggered from MCDU or CFDS Emulation on FAP. The EPSU BATtery CAPacity TEST can only be triggered from MCDU. The duration of this test is around 3 hours. An individual test on each EPSU must be carried out when the tests through MCDU or CFDS Emulation on FAP fail. This isolated test starts when you push the TEST P/B on the EPSU


EXIT SIGNS CONTROLLED FROM NO SMOKING SWITCH AUTO AND LOSS OF CABIN PRESSURE
CIDS
MCDU
DOOR OPEN/CLOSED SIGNAL
SLIDE ARM/DISARM SIGNAL
CONTROL INTERFACE LOGIC
BITE INDICATOR LOGIC AMPLIFIER
EMER
FAP
801PP
28V DC
ESS SHED BUS
1WL
28V DC
6V DC
BATTERY CHARGING
SIG
EXIT ON
AUTO
OFF
SIGNS
NO SMOKING ON
AUTO
OFF
EMER EXIT LT
OFF
ON
ARM
OFF
(25VU)
(25VU)
6V DC BATTERY
103XP
115V AC
NORM BUS
3WL
XXXX FAULT (RED)
SYSTEM OK (GREEN)
TEST
EMERGENCY POWER SUPPLY UNIT (EPSU)
401PP
28V DC
ESS BUS
79WL
LAVATORY AUXILIARY LIGHTS
OPTION
EXIT LOCATION SIGNS
EXIT MARKING SIGNS
ESCAPE HATCH - HANDLE LIGHTS
ESCAPE SLIDE LIGHTS
CABIN EMERGENCY LIGHTS
OVER-WING EMERGENCY LIGHTS
SEAT MOUNTED EMERGENCY AND EXIT LOCATION LIGHTS
WALL MOUNTED EXIT MARKING SIGNS
WALL MOUNTED EMERGENCY EXIT LOCATION LIGHTS
WALL MOUNTED EMERGENCY LIGHTS

END