A330-200
TECHNICAL TRAINING MANUAL

MECHANICS / ELECTRICS & AVIONICS COURSE

23 COMMUNICATIONS

GE Metric

For Training Purposes Only
Issued By SPL/GK March 2006

This document must be used
for training purposes only.

Under no circumstances
should this document be used as a reference.

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GENERAL SYSTEM PRESENTATION

HF/VHF
SELCAL (SELective CALling)
ACARS
SATCOM
Passenger Address
CIDS
Passenger Entertainment
Interphone
Solid State Cockpit Voice Recorder

HF/VHF

There are two radio communication systems: HF and VHF.

- 2 HF systems for long range voice communication.
- 3 VHF systems for short range voice communication.

SELCAL (SELective CALling)

The purpose of the SELCAL system is to give visual and aural indications to the flight crew, concerning calls received through HF or VHF systems.

ACARS

The Aircraft Communication Addressing and Reporting System (ACARS) allows direct, easy and real-time exchange of data between the aircraft and ground station through a VHF3 link or the SATCOM system.

The following data is provided :

- To the ground :
  - Departure and arrival reports, Fuel/Position reports, Pre-flight, In-flight, Post-flight reports, In-flight modification reports, In-flight F-PLN modification reports, Engine or Auxilary Power Unit (APU) incident reports, Real-time failure messages and ECAM warnings, Avionics data (BITE data), Maintenance post flight reports, In-flight generated monitoring reports, Automatic maintenance reports, etc...

- From the ground :
  - Weather reports, operational messages (free text / formatted) F-PLN, Take-off initialization data and Wind data, etc...

SATCOM

The MULTICHANNEL AVIATION SATELLITE COMMUNICATIONS SYSTEM(MCS SATCOM) is a worldwide mobile Communication System providing continuous Voice and Data Communications Services to and from the A/C through SATELLITE NETWORK.

The MCS SATCOM provides, to the Flight Crew, Data Communications with ACARS System when the VHF3 link is not available.

The MCS SATCOM provides, to the Passengers, voice and Services communications through the CABIN COMMUNICATIONS SYSTEM(CCS).

PASSENGER ADDRESS

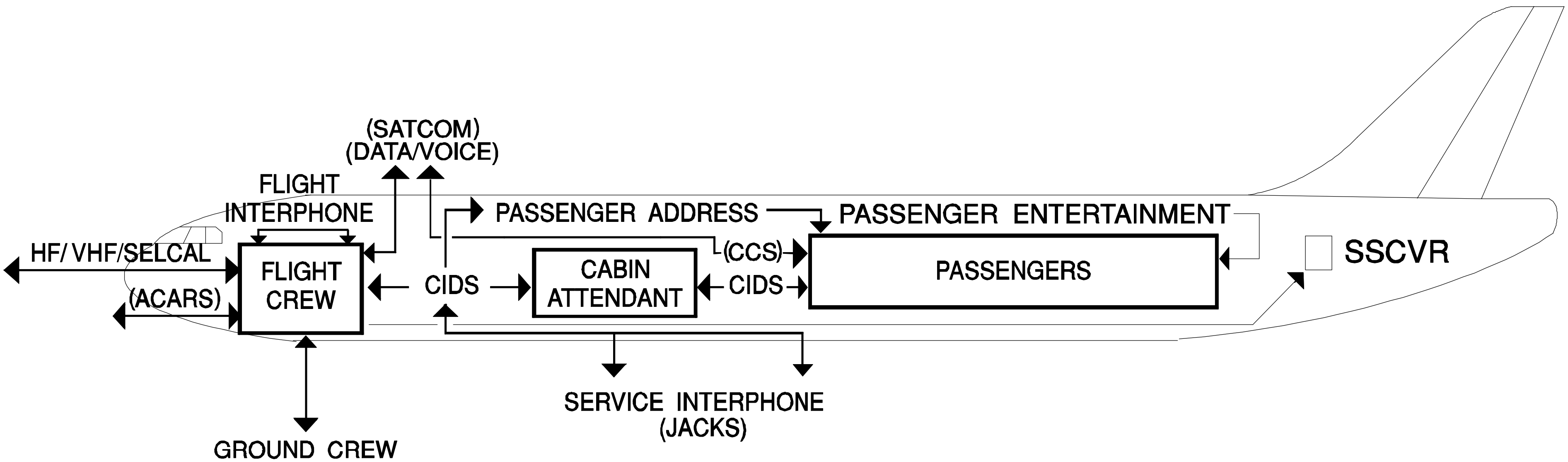
The Passenger Address allows voice announcements to be broadcast to all passengers, from the cockpit and Attendant stations through the Cabin Intercommunication Data System (CIDS).

CIDS

The CIDS is designed to interface Flight crew, Cabin Attendants, Passengers, Ground service and various cabin systems dedicated to Cabin Attendant or Passenger use.

The Cabin Intercommunication Data System (CIDS) is used to control, test and monitor various cabin systems dedicated to Cabin Attendant or Passenger use.

It performs the following functions :
- Passenger Address, Cabin and Flight crew interphone, Passenger lighted signs, Passenger call, Cabin illumination, Emergency evacuation signalling, Lavatory Smoke Detection, Reading lights, Slides and Doors pressure indication, Water ice protection, Potable water indication, Waste indication and Air conditioning control.



LEGEND:
(LRU): OPTIONAL LRU(s)

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PASSENGER ENTERTAINMENT

The Passenger Entertainment System (PES) provides Music, Movies and Video to the Passengers.

INTERPHONE

There are 3 interphone systems on the aircraft :

The Cabin interphone, the Flight interphone and the Service interphone :

- The Cabin Interphone System allows communication between the Flight Crew and the Cabin Attendant stations.

- The Flight Interphone System allows communication between the Flight Crew and the Ground Mechanic at the Nose Landing Gear.

- The Service Interphone enables communication between the various interphone jacks, flight deck and cabin attendant handsets.

SOLID STATE COCKPIT VOICE RECORDER

The Solid State Cockpit Voice Recorder (SSCVR) records in flight and on ground crew conversations and radio communications in solid state memories.

SYSTEM CONTROL AND INDICATING

Cockpit
Cabin
Avionics Bay
Nose Landing Gear

COCKPIT

In the cockpit, we find :

- 3 Audio Control Panels (ACPs) for the selection of communication systems (in transmission and reception) and for the control of the received audio signal levels.

- 3 Radio Management Panels (RMPs) for the selection of radio communication and navigation frequencies.

- 1 Audio Switching panel for the reconfiguration of channels, in case of ACP failure.

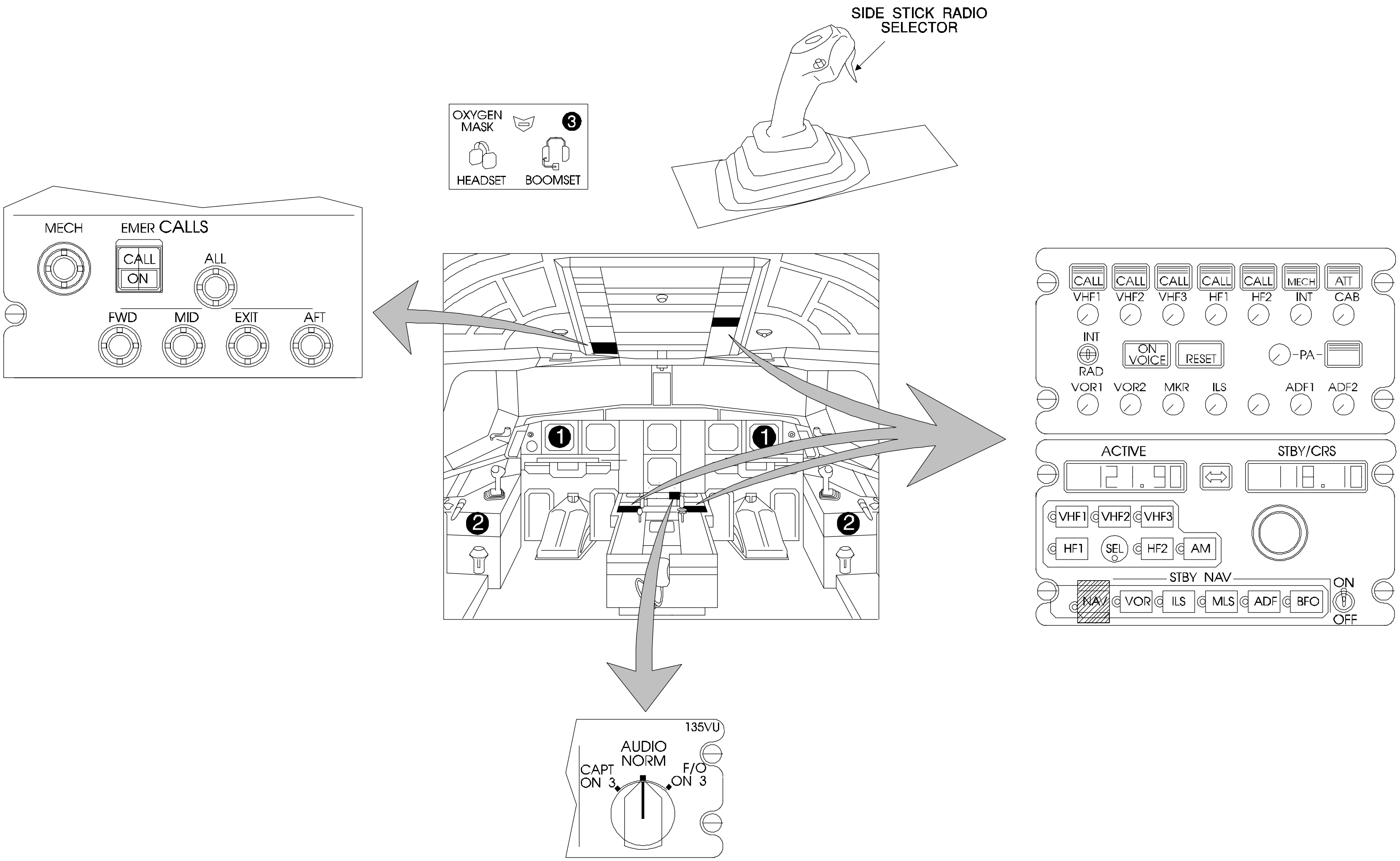
- 1 CALLS panel for Crew member-to-Ground mechanic or Crew member-to-Attendant calls.

- And various acoustic equipment.

The acoustic equipment comprises :

- 2 loudspeakers with volume control (1)
- 2 side stick radio selectors
- hand-microphones (2)
- headsets (3)
- boomsets (3)
- oxygen mask microphones (3).

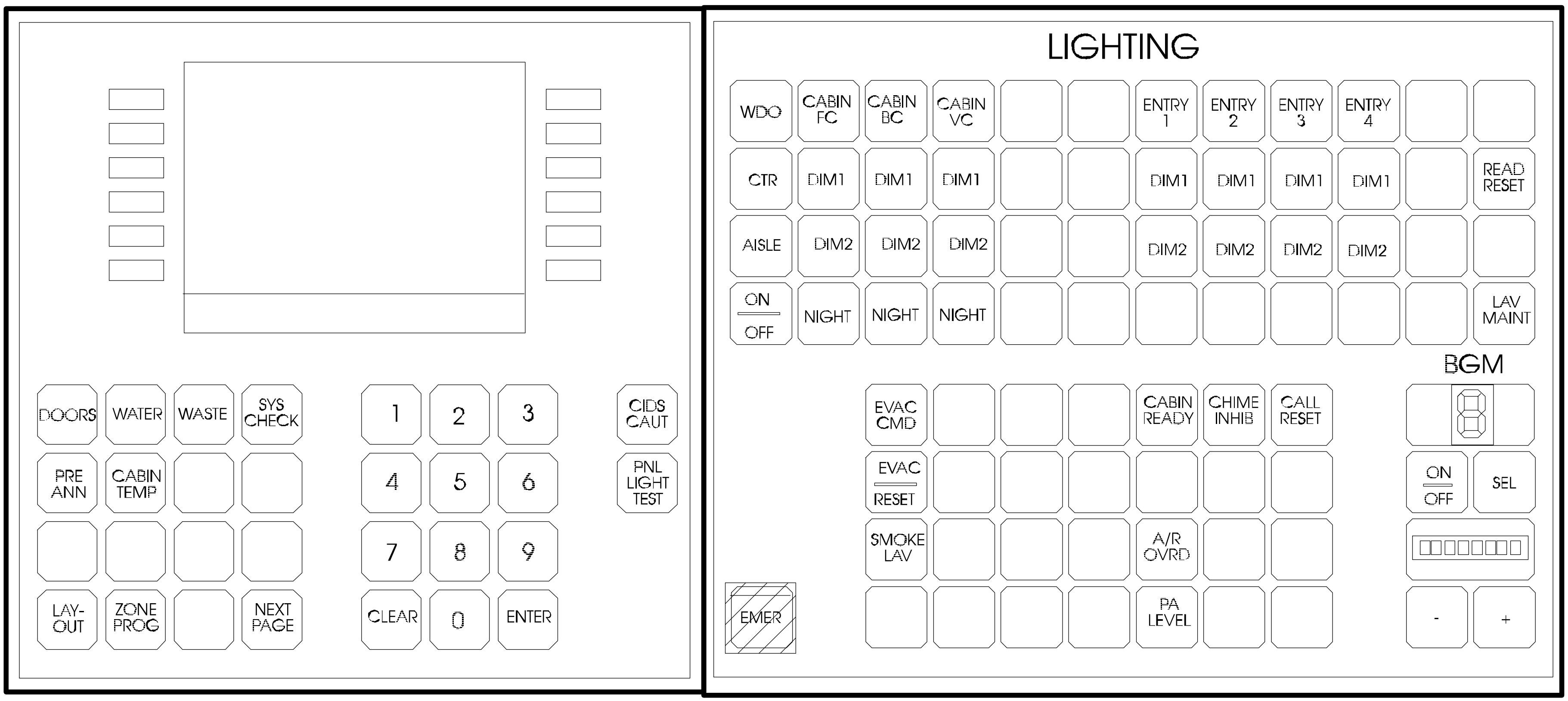
Facilities are provided in the cockpit for headsets and boomsets (3).


SIDE STICK RADIO SELECTOR
OXYGEN MASK
HEADSET
BOOMSET
MECH
EMER CALLS
CALL
ON
ALL
FWD
MID
EXIT
AFT
CALL VHF1
CALL VHF2
CALL VHF3
CALL HF1
CALL HF2
MECH INT
ATT CAB
INT
RAD
ON VOICE
RESET
PA
VOR1
VOR2
MKR
ILS
ADF1
ADF2
ACTIVE
STBY/CRS
121.90
118.10
VHF1
VHF2
VHF3
HF1
SEL
HF2
AM
STBY NAV
NAV
VOR
ILS
MLS
ADF
BFO
ON
OFF
135VU
AUDIO
NORM
CAPT
ON 3
F/O
ON 3

CABIN

Panels are installed in the cabin, for the control and monitoring of the various cabin systems :

- The Forward Attendant Panel (FAP) near the forward left Passenger/Crew door (door 1).



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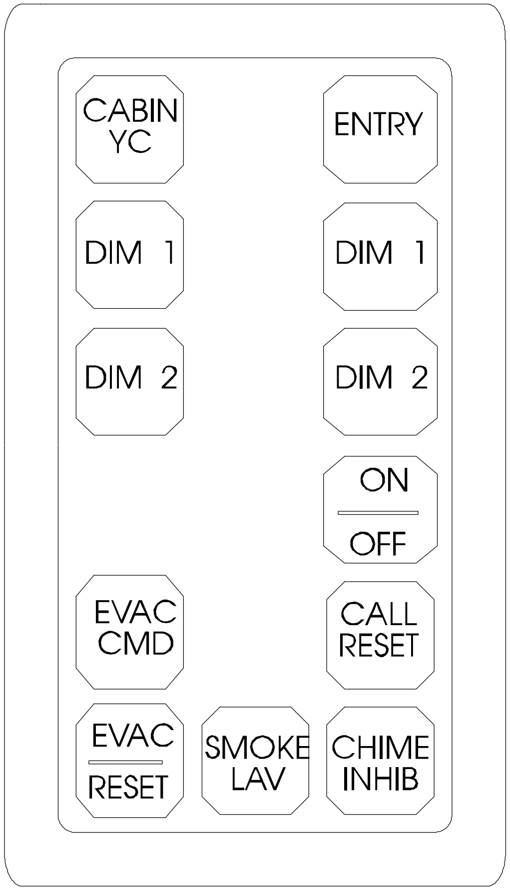
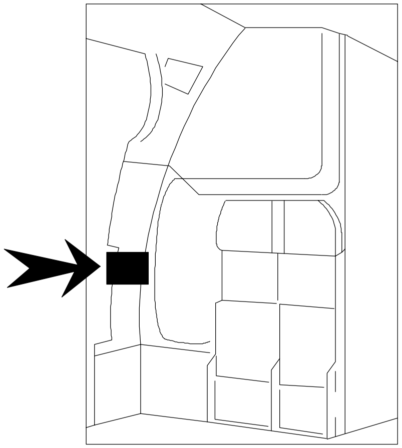
Additional Attendant Panels (AAPs), located near the doors and dedicated to cabin zones.
Two basic AAPs are installed near the AFT passenger crew door (door 4).





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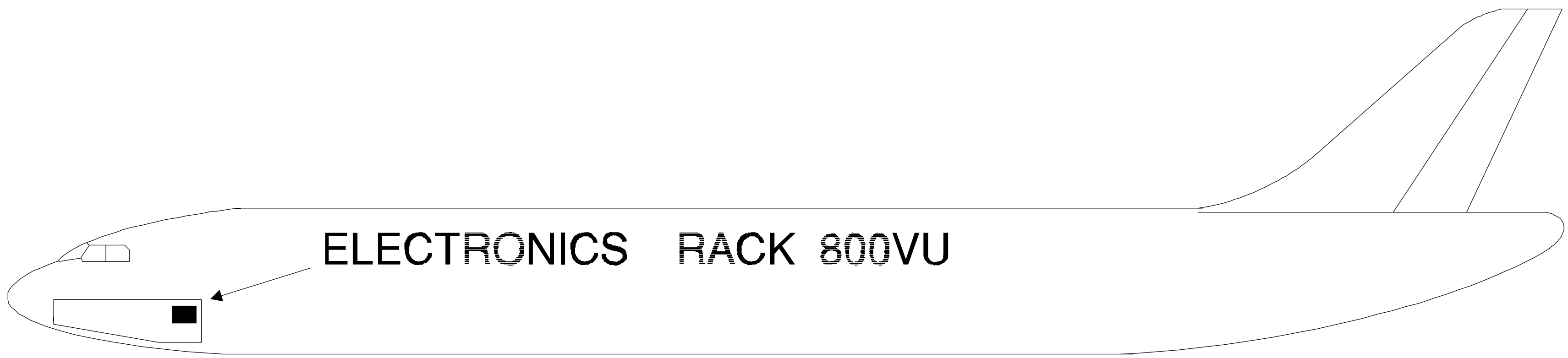
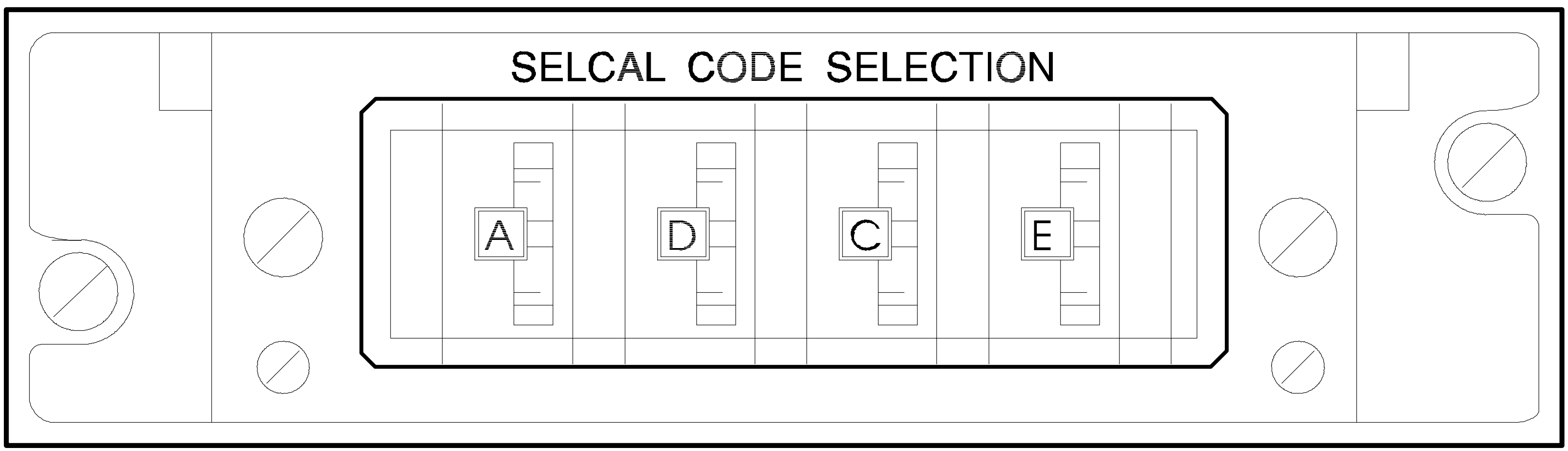
AVIONICS BAY

In the avionics bay :

- The SELCAL code panel is installed for coding the SELCAL code assigned to the aircraft and a space is provided for an optional Audio Control Panel.





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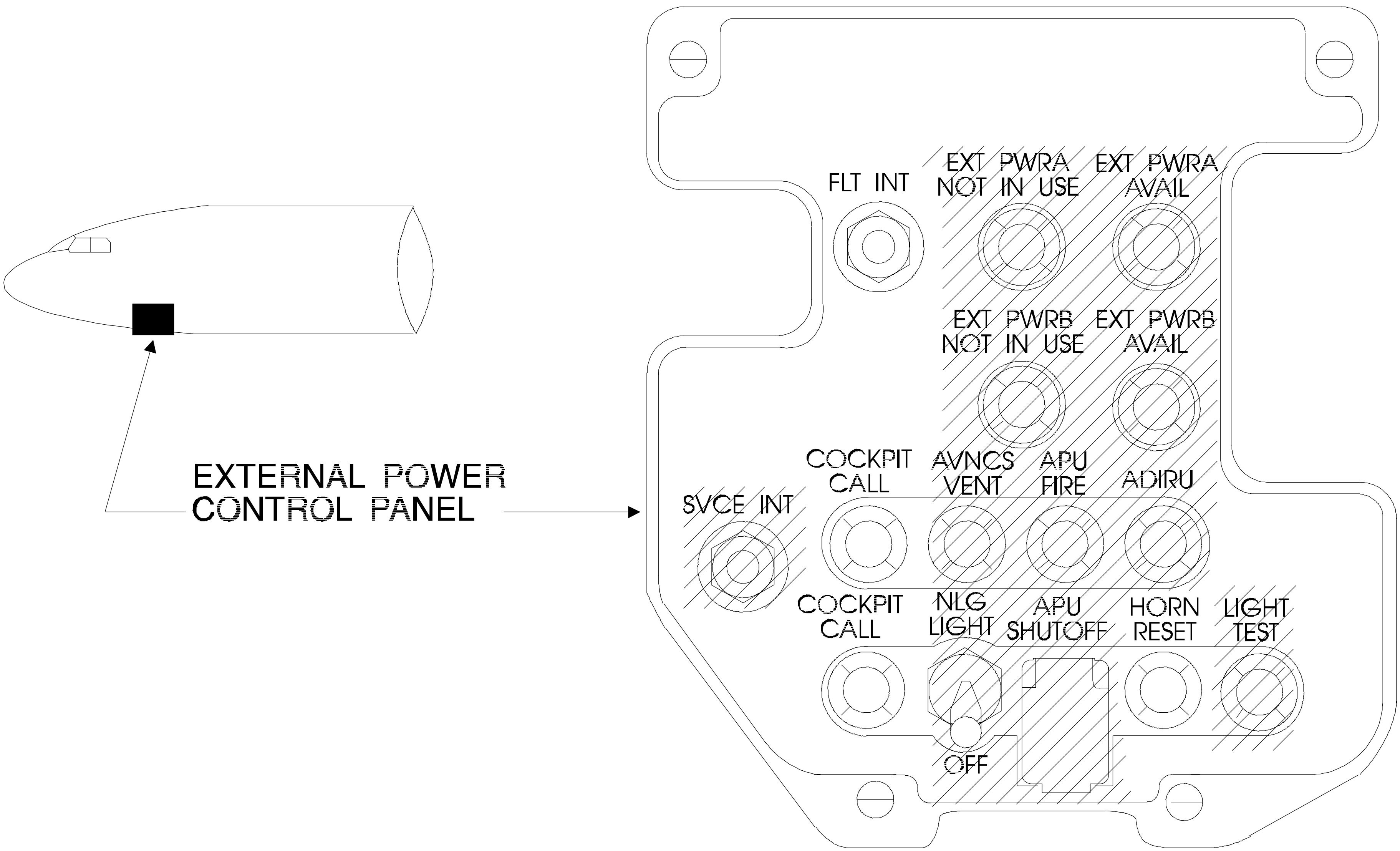
NOSE LANDING GEAR

On the EXTERNAL POWER CONTROL panel :

- A Ground Crew Call panel is installed for ground mechanic to crew member calls.



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STUDENT NOTES

SPEECH COMMUNICATION PRESENTATION

COM/NAV Systems
Radio Management Panel (RMP)
Audio Control Panel (ACP)
Audio Management Unit (AMU)

COM/NAV SYSTEMS

The Speech Communication System comprises 2 HF and 3 VHF systems.

2 HF and 3 VHF systems are used for long and short range radio communications, between the aircraft and the ground stations, or between two aircraft.

According to the selection of the Navigation System, the Navigation audio signals are transmitted to the Flight Crew via the Audio Management Unit (AMU).

RADIO MANAGEMENT PANEL (RMP)

There are 3 Radio Management Panels :

- RMP1, RMP2 and RMP3.

The 3 RMPs are used for frequency selection.

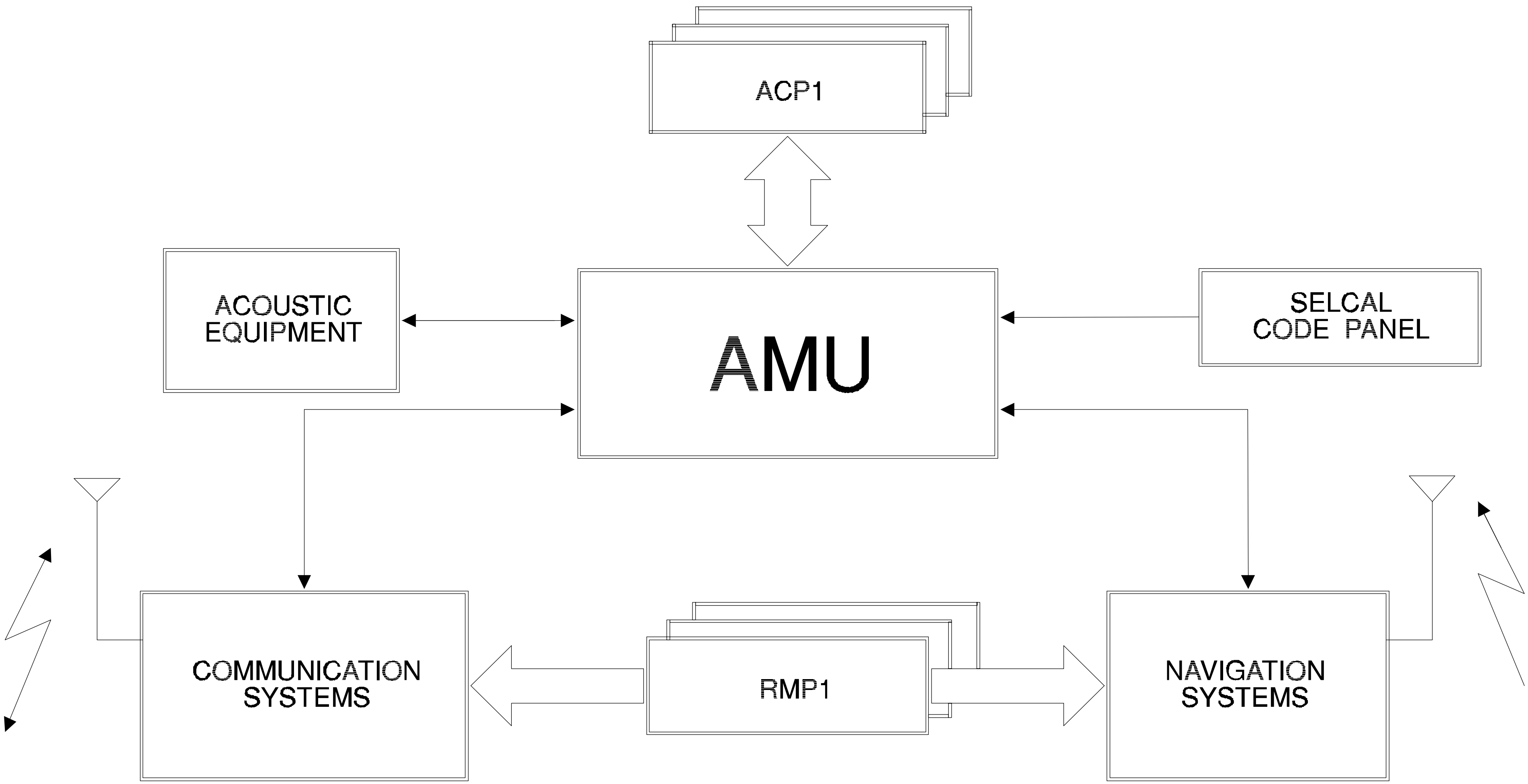
The Radio Management Panels (RMPs) are also used for the selection of radio navigation frequencies in back up mode when the Flight Management Guidance and Envelope Computers (FMGECs) have failed.
RMP3 cannot control radio navigation frequencies.

AUDIO CONTROLS PANEL (ACP)

There are 3 Audio Control Panels (ACPs).
Each ACP allows the crew to use the various radio communication systems for transmission and control of the received radio and navigation audio signals.

The 3 Audio Control Panels (ACPs) also allow the crew to :

- Visualize the various calls :
  SELCAL, ground crew calls and calls from the cabin attendants.
  The ACPs are connected to the Audio Management Unit (AMU) via an ARINC 429 bus.



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AUDIO MANAGEMENT UNIT (AMU)

The Audio Management Unit (AMU) acts as an interface between the users and the various radio communication and navigation systems for transmission and reception.

The Audio Management Unit (AMU) is controlled by the ACPs.

The SELCAL decoding function is integrated in the AMU.

SELective CALling (SELCAL).

Various types of acoustic equipment are used for transmis- sion and reception.

The acoustic equipment comprises :

- 2 loudspeakers
- 2 radio side-stick selectors(on the side-sticks)
- 3 oxygen mask microphones
- boomsets, headsets and hand-microphones

STUDENT NOTES:

STUDENT NOTES

RADIO MANAGEMENT PANEL PRESENTATION

Radio Management Panel (RMP) Description
Windows
Transfer P/B
Communication Keys
SEL Indicator
Amplitude Modulation (AM) Key
Dual Selector Knob
Navigation Keys
ON/OFF Switch

RADIO MANAGEMENT PANEL (RMP) DESCRIPTION

The RMPs are used for the selection of radio communication frequencies. They are also used for the selection of radio navigation frequencies as back-up of the Flight Management Guidance and Envelope Computers (FMGECs).

There are 3 RMPs for frequency selection :

- each RMP can control any VHF or HF system.
- RMP1 and RMP2 can control the radio navigation systems in back-up mode.
- RMP3 cannot control the radio navigation systems.

The 3 RMPs permanently dialog so that each RMP is informed of the last selection made on any of the other RMPs.

If two RMPs fail, the remaining RMP controls all the VHF and HF transceivers.
The transmission of data to the communication and navigation systems and the dialog between the RMPs are performed through ARINC 429 buses.

WINDOWS

There are 2 display windows :

- the ACTIVE window displays the operational frequency.
- the STandBY/CouRSE window displays the standby frequency and also the course in back-up navigation mode.

The windows are liquid crystal displays with a high contrast.

TRANSFER P/B

When the TRANSFER key is pressed, the operational frequency becomes the STandBY frequency and the STandBY frequency becomes the operational frequency.

COMMUNICATION KEYS

There are 5 pushbutton keys for the radio communication systems.
When a key is pressed, the ACTIVE and the STandBY frequencies are automatically displayed in the dedicated windows.

SEL INDICATOR

The SEL indicator light comes on WHITE, when a non dedicated Radio Management Panel takes control of the system frequency selection.

The normal configuration is :

- RMP1 allocated with VHF1
- RMP2 allocated with VHF2
- RMP3 allocated with VHF3, HF1/2.

If VHF2 is selected on RMP1, the SEL light comes on WHITE on RMP1 and RMP2.

AMPLITUDE MODULATION KEY

The Amplitude Modulation (AM) key is associated with the HF system for communication with stations using amplitude modulation transceivers.

DUAL SELECTOR KNOB

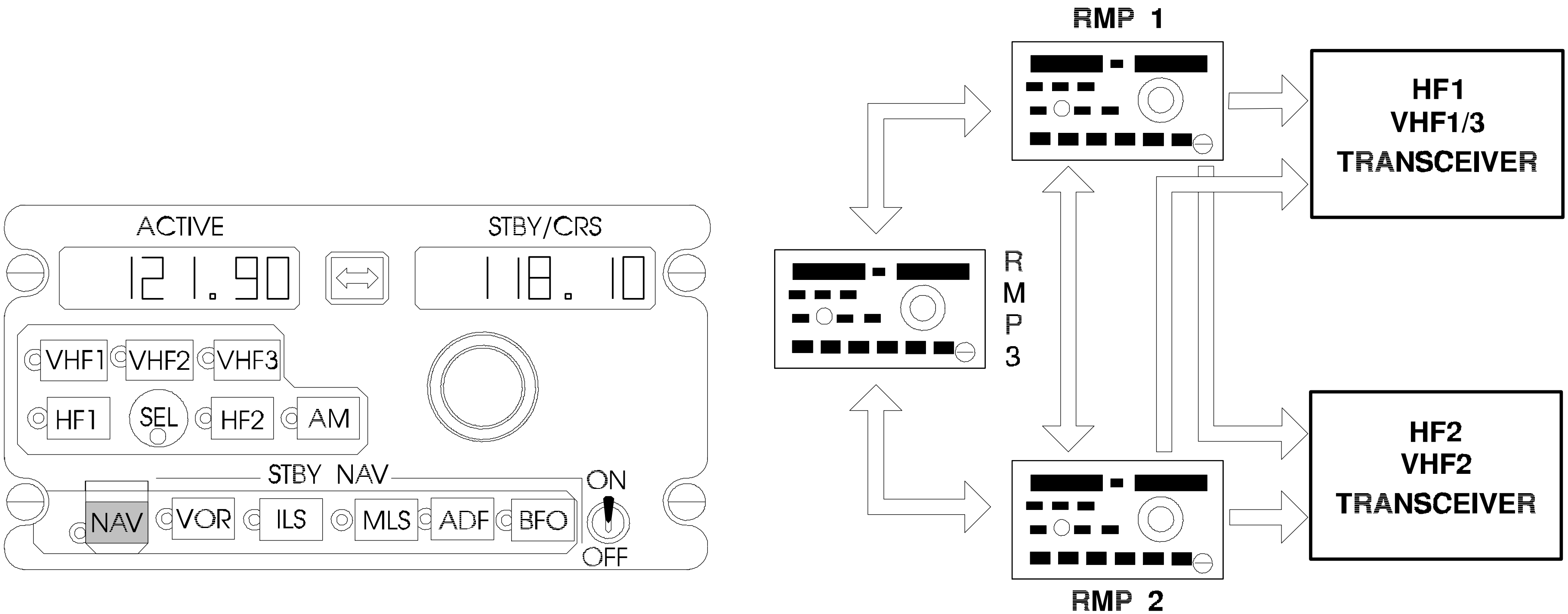
The DUAL SELECTOR KNOB is used for the selection of the frequency/course displayed in the STandby/Course window.

NAVIGATION KEYS

The NAVigation guarded pushbutton key allows the radio navigation systems to be selected, in back-up mode only, when the Flight Management Guidance and Envelope Computers (FMGECs) have failed.
In radio navigation back up mode, navigation frequency/course selection is performed using the dual selector knob.

ON/OFF SWITCH

The latching ON/OFF switch allows the crew to set the RMP on or off.



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STUDENT NOTES:

RADIO MANAGEMENT D/O

Description
Operation

DESCRIPTION

RMP1 and RMP2 have two ARINC 429 data buses connected to the radio communication transceivers :

- COM BUS 1 delivers the VHF1, VHF3 and HF1 frequencies,
- COM BUS 2 delivers the VHF2 and HF2 frequencies.

Three dialog buses ensure exchange of information between the three RMPs.

Each RMP periodically transmits its context on its dialog bus.

RMP3 controls the radio communication transceivers through dialog buses and RMP1 and RMP2. PORT SELECT DISCRETE lines determine which port (A or B) is active.

RMP1 is allocated with VHF1, RMP2 is allocated with VHF2 and RMP3 is allocated with VHF3, HF1 and HF2.

Each time the system operates in a different configuration, the SEL indicator on the involved RMPs come on.

The ACARS Management Unit (MU) controls VHF3 frequencies through PORT A.
The port select discrete is controlled by the ACARS MU.
RMP1 is connected to the central maintenance system (CMS) through the two central maintenance computers (CMC1 and CMC2). The CMCs send the option status, defined by means of the pin programming, to the RMPs.

In order to increment the fault memories in case of CMC failure, the LANDING GEAR CONTROL INTERFACE UNIT 1 (LGCIU1) is connected to RMP1 and LGCIU2 is connected to RMP2 and RMP3.

In the event of RMP1 failure, RMP3 becomes the main unit for BITE information.

If only, RMP2 is available, communication with the CMC is lost.

OPERATION

In normal configuration, RMP3 sends frequencies to the radio communication transceivers via its dialog buses and through RMP1 and RMP2.

In normal operation, RMP1 and RMP2 send frequencies to PORT A radio communication transceivers.

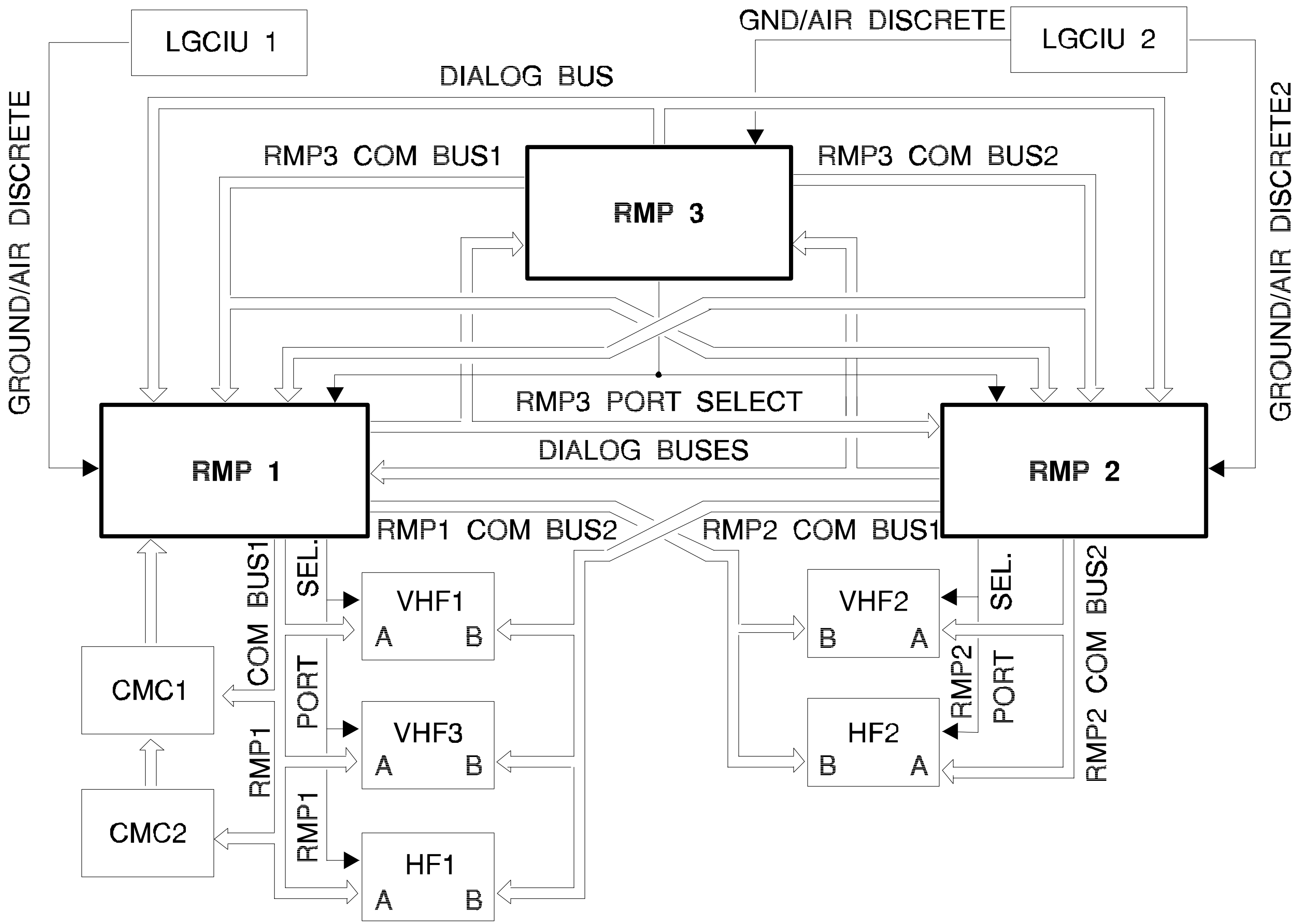
In case of failure of one RMP, the other RMPs control all the radio communication transceivers via their dialog buses and through RMP1 and RMP2.

When one RMP is defective, the displays become black. If the ON/OFF switch is set to OFF, the reconfiguration enables the control of the onside radio communication transceivers.

If RMP1 and RMP2 fail, RMP3 controls all the radio communication transceivers.

In case of RMP3 and RMP2 failure, RMP2 PORT DISCRETE selects PORT B on the side 2 transceivers.

In this case, RMP1 controls all the radio communication transceivers.
In case of RMP3 and RMP1 failure, RMP1 COM DISCRETE selects PORT B on the side 1 transceivers.


LGCIU 1
GND/AIR DISCRETE
LGCIU 2
DIALOG BUS
GROUND/AIR DISCRETE
GROUND/AIR DISCRETE2
RMP3 COM BUS1
RMP 3
RMP3 COM BUS2
RMP3 PORT SELECT
RMP 1
DIALOG BUSES
RMP 2
RMP1 COM BUS2
RMP2 COM BUS1
SEL.
RMP1 COM BUS1
VHF1
A
B
VHF2
B
A
SEL.
RMP2 COM BUS2
CMC1
PORT
VHF3
A
B
RMP2
PORT
HF2
B
A
CMC2
RMP1
HF1
A
B

STUDENT NOTES:

RADIO MANAGEMENT PANEL USE

VHF Mode
HF Mode

VHF MODE

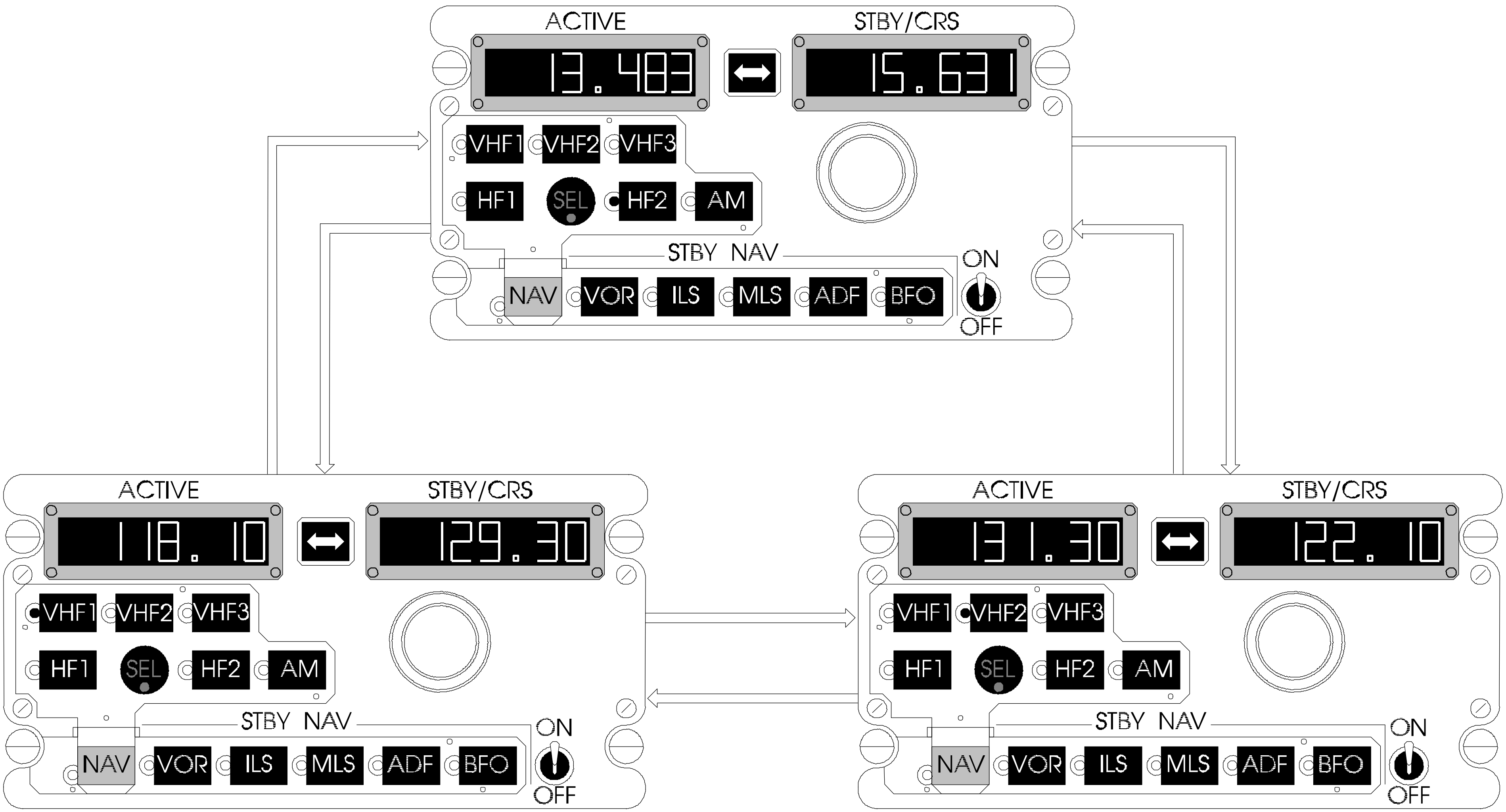
The Radio Management Panels (RMP) are used for radio communication equipment frequency selection. They are also used for radio navigation equipment frequency selection in back up mode.

When the ON/OFF switch is set to ON, the RMP displays the previously selected frequency. Only the stand-by frequency can be modified by means of the dual selector knob. When the desired frequency has been selected in the stand-by window, the transfer pushbutton must be pressed to render it active. The displayed values are changed over and the RMP modifies its output data accordingly.
The new active frequency is transmitted to all RMPs through the dialog buses.

The preset frequency can not be exchanged between the RMPs as long as it remains in stand-by.
Each time the system operates in a different configuration (cross selection), the SEL indicator lights, on the allocated RMP and on the RMP on which the selection is made, come on white.
When the VHF2 trancseiver is selected on RMP 1, the SEL indicator lights on RMP 1 and RMP 2 come ON white.

HF MODE

HF2 is associated with RMP 3. The system operates in cross selection. The SEL indicator lights on RMP 1 and RMP 3 come on.
It is possible to modify the frequency displayed in the stand-by window.
The AM pushbutton controls the selection of the amplitude modulation (AM) mode for the HF transceivers. By default, the single side board (SSB) mode is selected on the corresponding HF system.
This selection is memorized when another system is selected. The other RMPs take into account this selection through their dialog buses.



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STUDENT NOTES

AUDIO INTEGRATING SYSTEM PRESENTATION

Principle
Transmission
Reception
Flight Interphone
SELCAL (SELective CALling)
Calls

PRINCIPLE

The Audio Management Unit (AMU) is the heart of the Audio Integrating System.
The AMU acts as an interface between the users and the various radio communication and navigation systems.

The AMU provides the following functions :

- radio transmission,
- radio and navigation reception,
- SELCAL calls,
- visual and aural warnings of the ground crew and the Cabin Attendant calls,
- flight interphone,
- interface with the Cockpit Voice Recorder (CVR),
- emergency function for the Captain and the First Officer.

TRANSMISSION

For transmission, the AMU collects the microphone inputs from the various acoustic equipment and directs them to the radio communication transceivers selected on the Audio Control Panels (ACPs).

RECEPTION

For reception, the AMU collects the audio outputs from the various communication and navigation systems and directs them to the various crew stations and acoustic equipment, whatever the selection made on the ACPs.

FLIGHT INTERPHONE

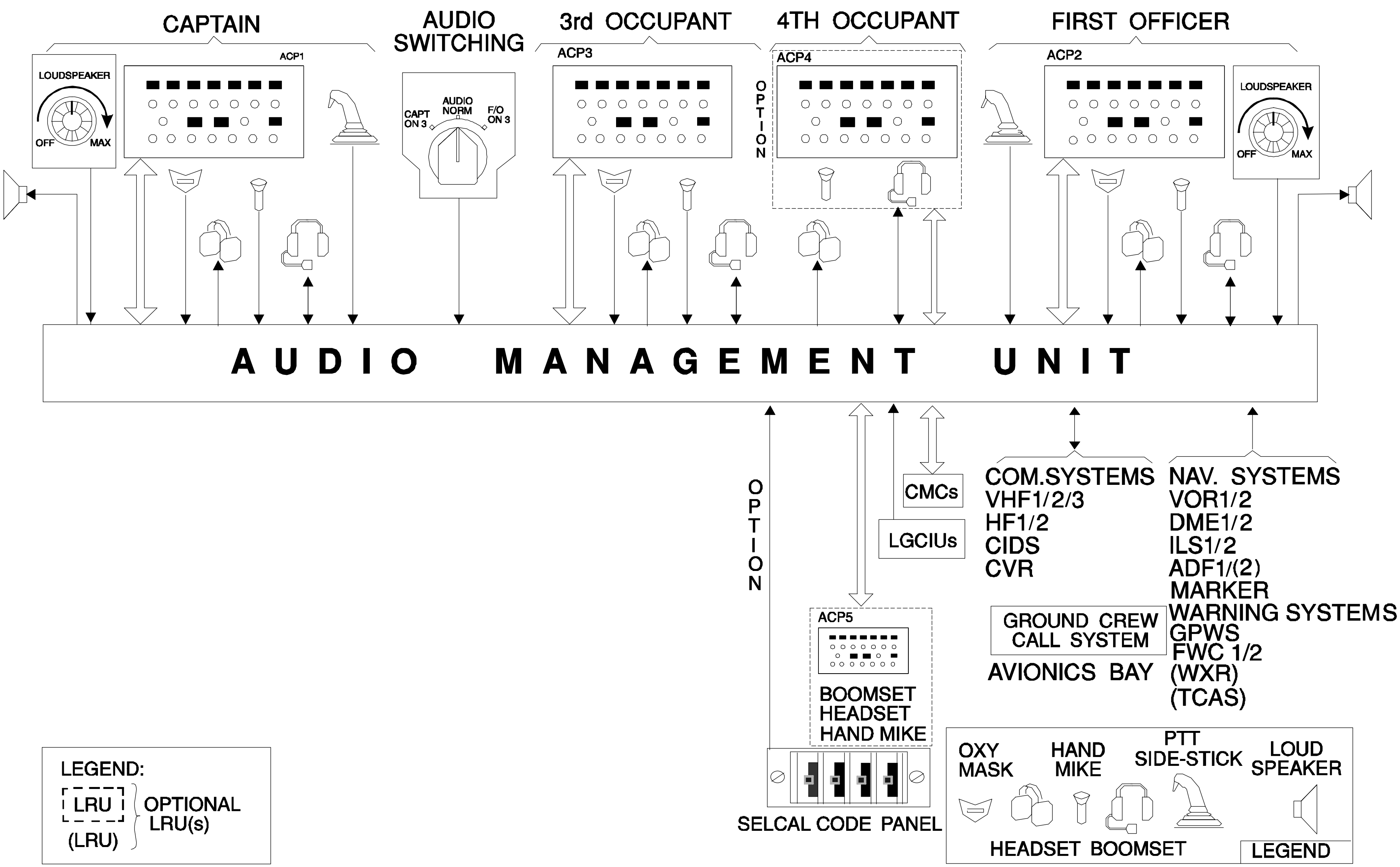
The flight interphone allows telephone links between the various crew stations in the cockpit and between the cockpit and the ground mechanic through the External Power Control Panel.

SELCAL (SELective CALling)

The SELCAL system provides the crew with aural and visual indications from ground stations equipped with a coding device.

CALLS

Ground crew and cabin Attendants calls are visualized on the Audio Control Panels (ACPs).



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STUDENT NOTES:

AUDIO CONTROL PANEL PRESENTATION

Audio Control Panel (ACP) Presentation
Transmission Key
Passenger Address (PA) Key
Reception Knob
ON VOICE
RESET
INT/RAD Switch

AUDIO CONTROL PANEL (ACP) PRESENTATION

3 basic Audio Control Panels are provided in the cockpit for the Captain, First Officer and 3rd occupant.
Two other optional ACPs can be installed, one in the cockpit for the 4th occupant and one in the avionics bay for ground service.

Each Audio Control Panel (ACP) allows :

- the use of various radio communication and radio navigation facilities installed in the aircraft for transmission and reception of the audio signals,
- the display of various calls (SELCAL, ground crew calls and calls from the Cabin Attendants),
- the use of flight, cabin and service interphone systems.

The Audio Control Panels (ACPs) are connected to the Audio Management Unit (AMU) via an ARINC 429 bus.

TRANSMISSION KEY

The front face features :

- seven rectangular pushbutton keys for transmission.

Transmission channel selection :

- when a transmission key is pressed (CALL, MECH or ATT), three green bars come on.
- the selected system is ready for transmission.
- only one radio system can be selected at a time for transmission.

When a new transmission key is pressed, the green bars come on and the previously selected key is disabled.

When a SELCAL/CALL, MECHanic or ATTendant call is received, the associated system key flashes amber and a buzzer sound is heard.

CALL : For a SELCAL/CALL (HF/VHF).
MECH : For a ground mechanic call.
ATT : For a call from Attendant station.

PASSENGER ADDRESS (PA) KEY

The PA key is used for Passenger Address announcements.

When the Passenger Address (PA) key is pressed, 3 green bars come on.
Boomsets oxygen masks or hand-microphones can be used for Passenger Address announcements.
The PA key must be pressed and held during the transmission time.

RECEPTION KNOB

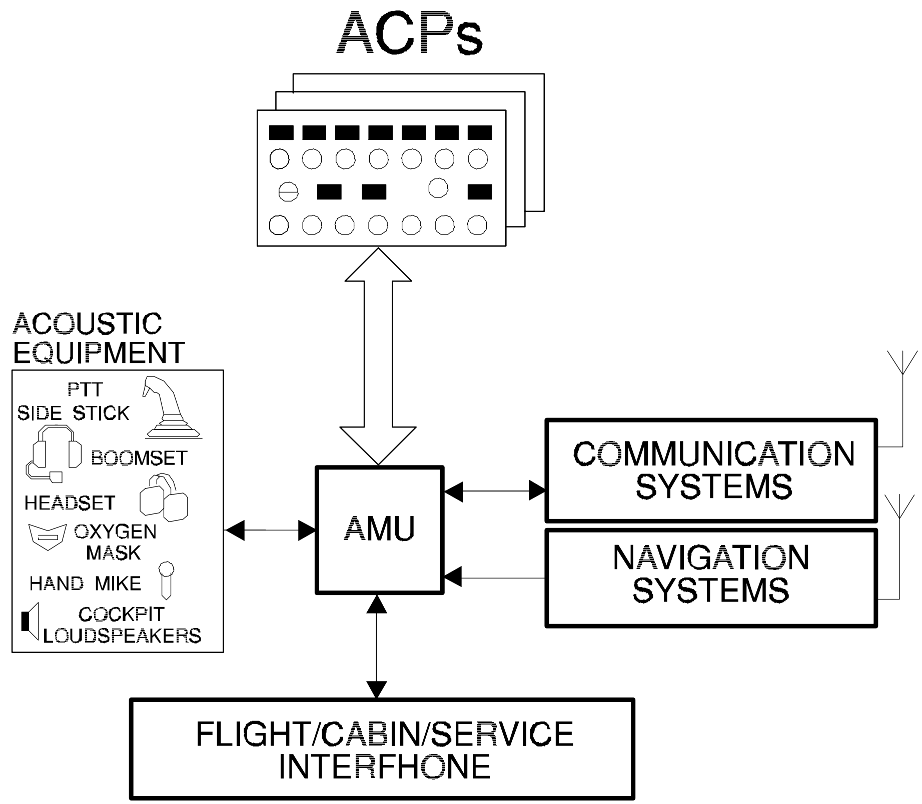
The fifteen Reception knobs, with associated potentiometers, are used for the selection of reception channels and adjustement of the received audio signals.

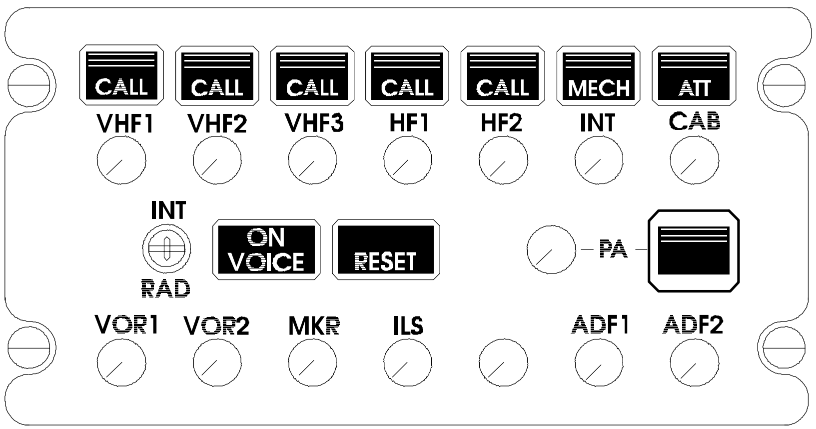
The 15 reception knobs are also pushbut ton switches of the pushpush type : Pressed in : The reception is inhibited Released out : Reception Knob comes on white and the reception is active.

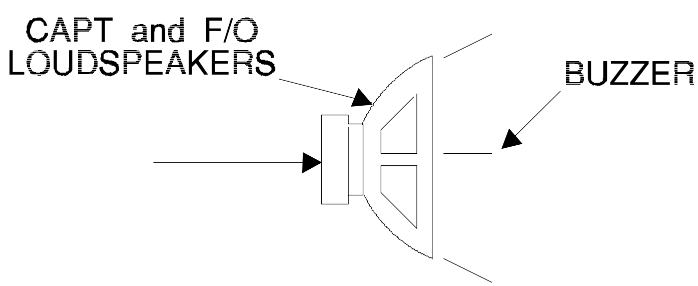
ON VOICE

The ON VOICE key is used for attenuating morse code identification signals from ADF and VOR navigation systems, in order not to hinder voice reception information.

When the VOICE pushbutton key is pressed, the ON legend comes on green.







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RESET

The RESET key is used for cancelling any amber lighted calls and buzzer sounds.

The RESET key cancels any amber lighted calls and buzzer sounds.

INT/RAD SWITCH

The INTERPHONE/RADIO selector switch is used for selecting radio or interphone mode.
It is a three-position switch.

Neutral position :

The transceiver is in reception mode.

RAD position :

The radio system selected on the ACP changes from reception mode to transmission mode.
For transmission, the switch must be held in the RAD position.

INT position :

The flight interphone operates regardless of the transmission key selection.
When the PTT is activated, the interphone is cut : Radio transmission has priority over INT selection on the ACP.

STUDENT NOTES:

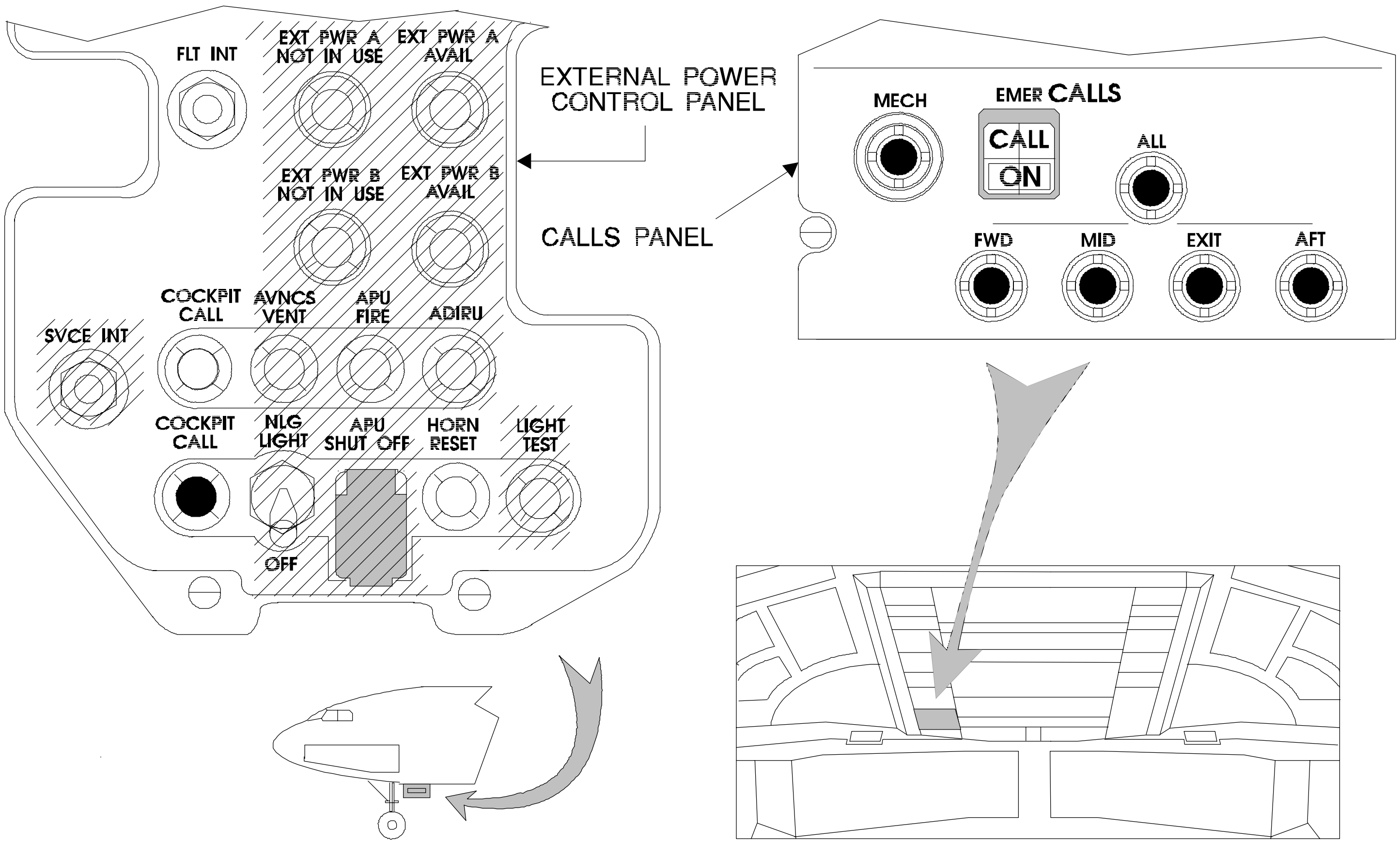
STUDENT NOTES

CALL PANELS PRESENTATION

COCKPIT CALL Pushbutton
COCKPIT CALL light and MECH Pushbutton
HORN RESET Pushbutton
FLT INT Jack
FWD/MID/EXIT/AFT Pushbutton
ALL Pushbutton
EMERgency Pushbutton

COCKPIT CALL PUSHBUTTON

To initiate a communication between the cockpit and the ground, the flight crew uses the CALLS panel, and the ground mechanic uses the EXTERNAL POWER CONTROL panel to call each other.



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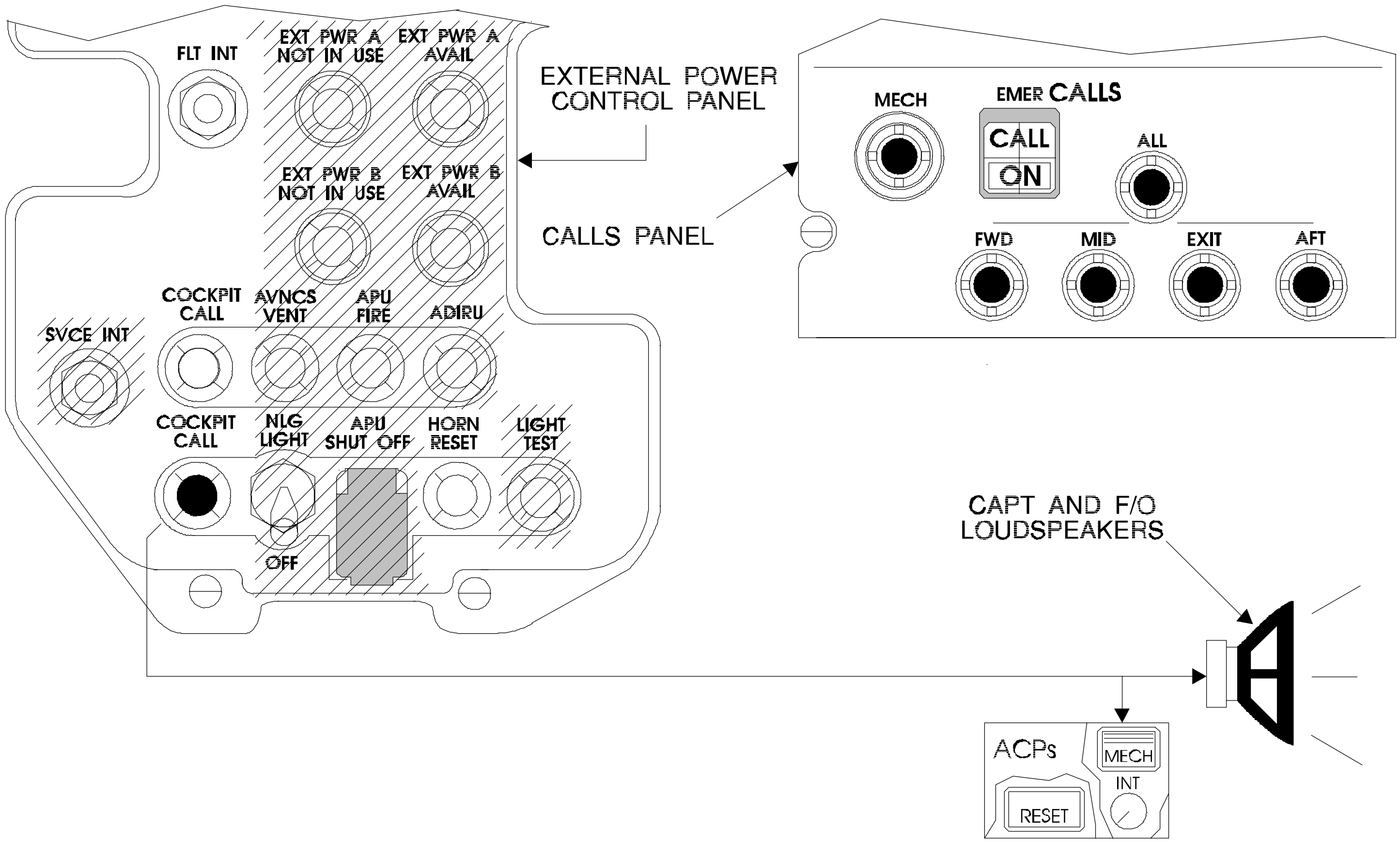
To call the flight crew, the ground mechanic has to switch on the COCKPIT CALL pushbutton :

- the MECHanic light flashes amber on the Audio Control Panels and a buzzer sounds through the loudspeakers in the cockpit.

The MECHanic light goes off if the RESET key is pressed (on any ACP) or automatically goes off after 60 seconds.



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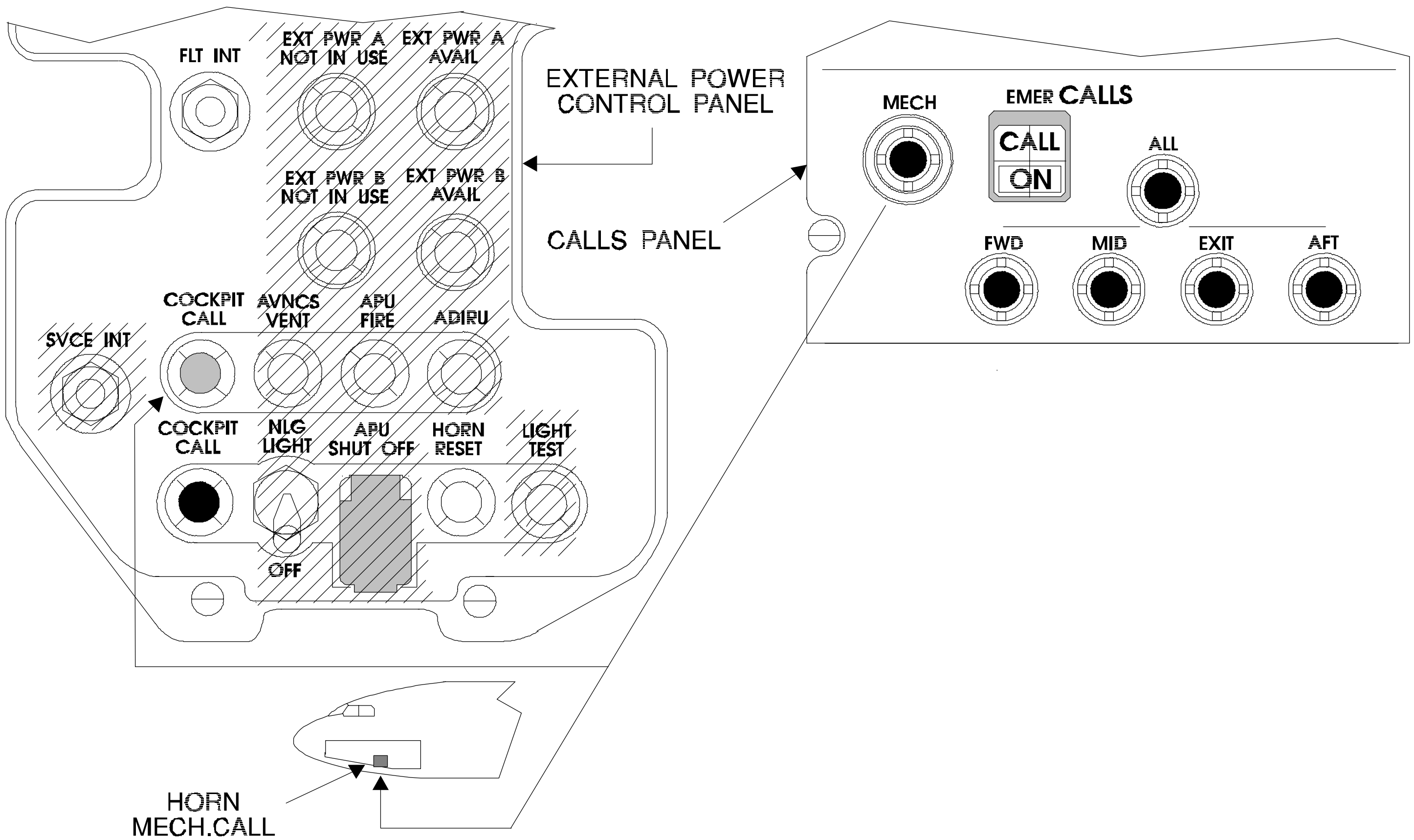
COCKPIT CALL LIGHT AND MECHANIC PUSHBUTTON

The COCKPIT CALL light comes on blue and the external horn sounds in the nose landing gear well when the MECHanic pushbutton is pressed.

When the MECH (Mechanic) pushbutton is released, the external horn stops but the COCKPIT CALL indicator light remains on.



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HORN RESET PUSHBUTTON

The HORN RESET pushbutton is used to reset the blue COCKPIT CALL light.

The HORN RESET pushbutton will also reset the external horn for the following circuits :

- APU FIRE on ground
- ADIRS ON BAT (Batteries) on ground
- BLOWERS LO FLOW on ground with engines shut down.

FLIGHT INTERPHONE JACK

The FLight INTerphone Jack is used by the ground mechanic to communicate with the flight crew.

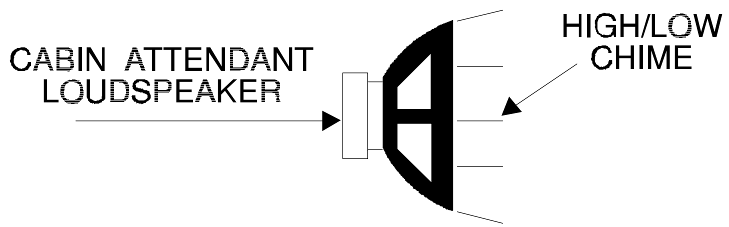
FWD/MID/EXIT AFT P/B

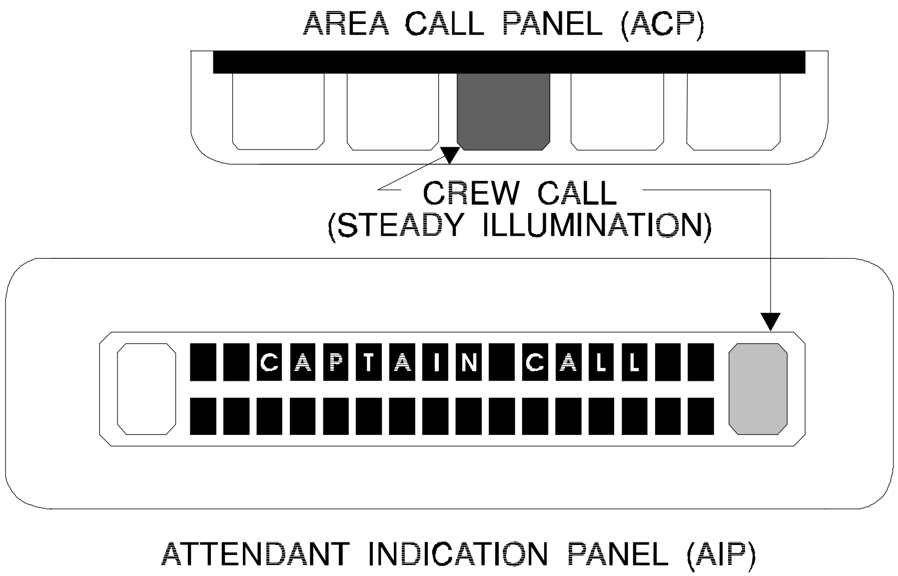
The flight crew has the possibility to call the cabin attendants from the CALLS panel.

When the FWD/MID/EXIT or AFT pushbutton is pressed :

- A pink light comes on, on the corresponding Area Call Panel (ACP).

- CAPTAIN CALL message appears on the corresponding Attendant Indication Panel (AIP), a green light comes on and a high/low chime sounds through the corresponding loudspeaker.





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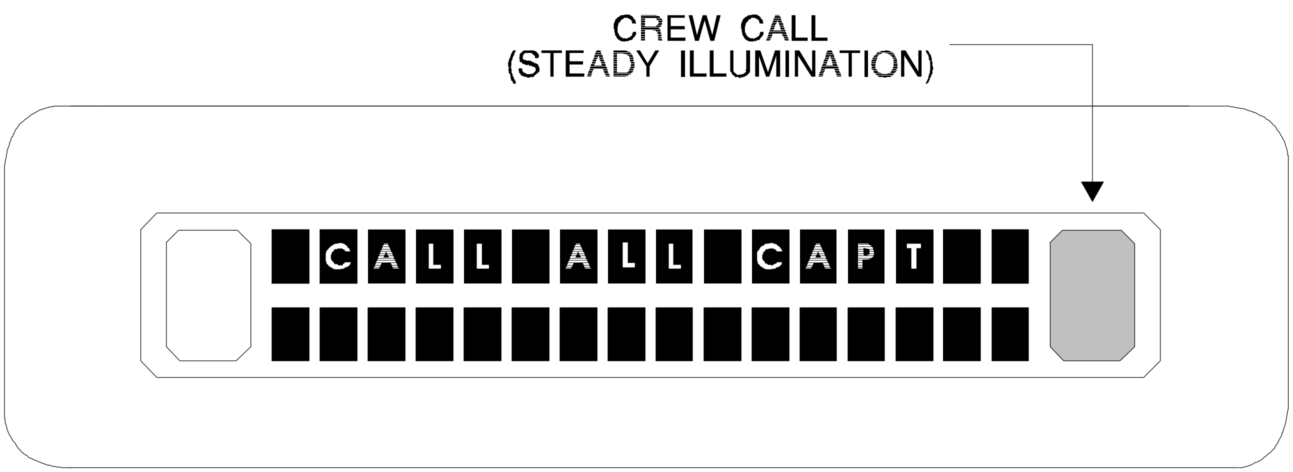
ALL PUSHBUTTON

Same function as the FWD/MID/EXIT or AFT pushbutton, but for all Cabin Attendant stations with CALL ALL CAPTain message on the Attendant Indication Panels (AIPs).



ATTENDANT INDICATION PANEL (AIP)

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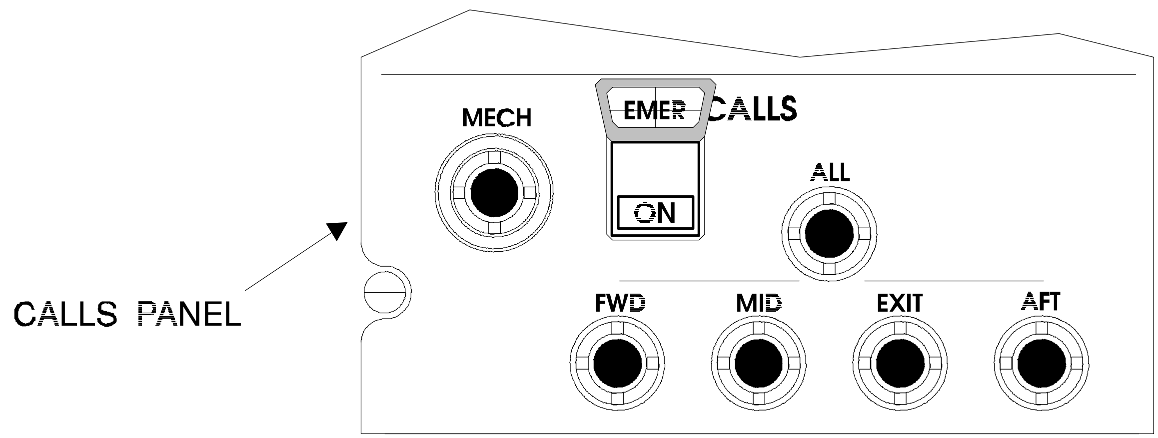
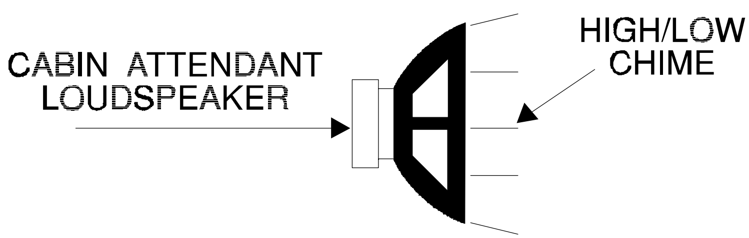
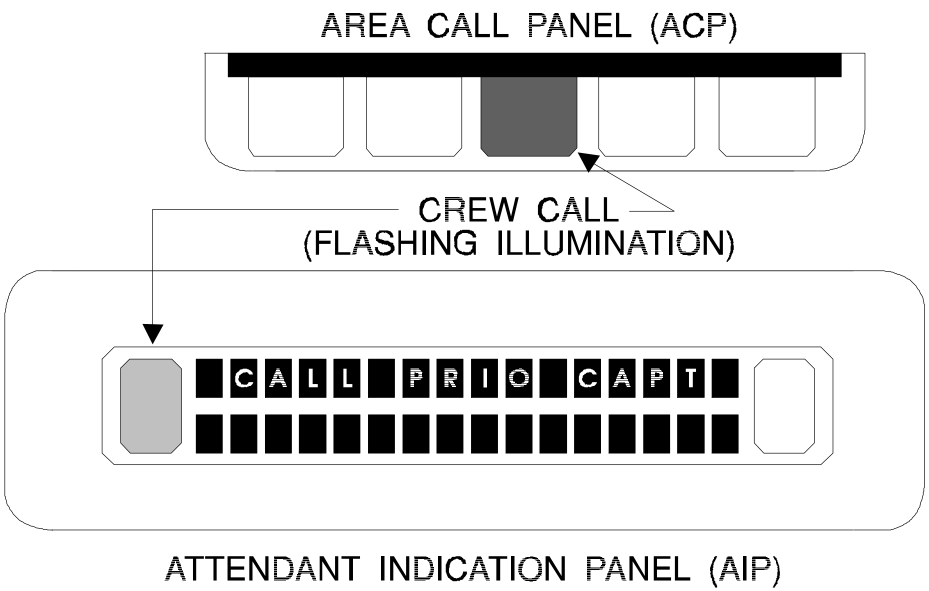
EMERGENCY PUSHBUTTON

When the guarded EMERgency pushbutton is pressed :

- a pink light flashes on all Area Call Panels.
- CALL PRIOrity CAPTain message appears on all Attendant Indication Panels, a red light flashes and three high/low chimes sound through all loudspeakers.







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STUDENT NOTES:

AUDIO MANAGEMENT UNIT D/O

Audio Management Unit Architecture
Audio Card Functions
Cockpit Amplifier Cards
Selcal Call Bite Card
Flight Interphone
Emergency Switching

AUDIO MANAGEMENT UNIT (AMU) ARCHITECTURE

The AMU comprises :

- audio cards,
- three cockpit amplifier cards,
- a SELCAL BITE card,
- a flight interphone card,
- an emergency function.

Audio cards :

- Captain
- First Officer
- 3rd occupant
- optional 4th and 5th occupant.

Cockpit amplifier cards :

- Captain
- First Officer
- Emergency cockpit.

AUDIO CARD FUNCTIONS

The audio cards provide the following functions :

- transmission, reception and volume adjustement for radio, interphone and passenger announcements.
- processing,
- ARINC transmission and reception,
- power supply.

COCKPIT AMPLIFIER CARDS

The cockpit amplifier cards ensure the amplification, through loudspeakers, for the audio signals from and to the Captain and First Officer. They also amplify warning signals from the flight warning computers (FWC) and the ground proximity warning system (GPWS). The muting function is done by the cockpit amplifiers.

SELCAL CALL BITE CARD

The SELCAL CALL BITE card provides the following functions :

- decoding of selective calls,
- comparison between the received code and the code setting on the SELCAL control panel,
- decoding of discrete attendant calls and mechanic calls,
- transmission of calls to FWC and to audio control panels (ACP) via the corresponding audio cards,
- call cancelation and system re-initialization after a call, when a reset action is performed.

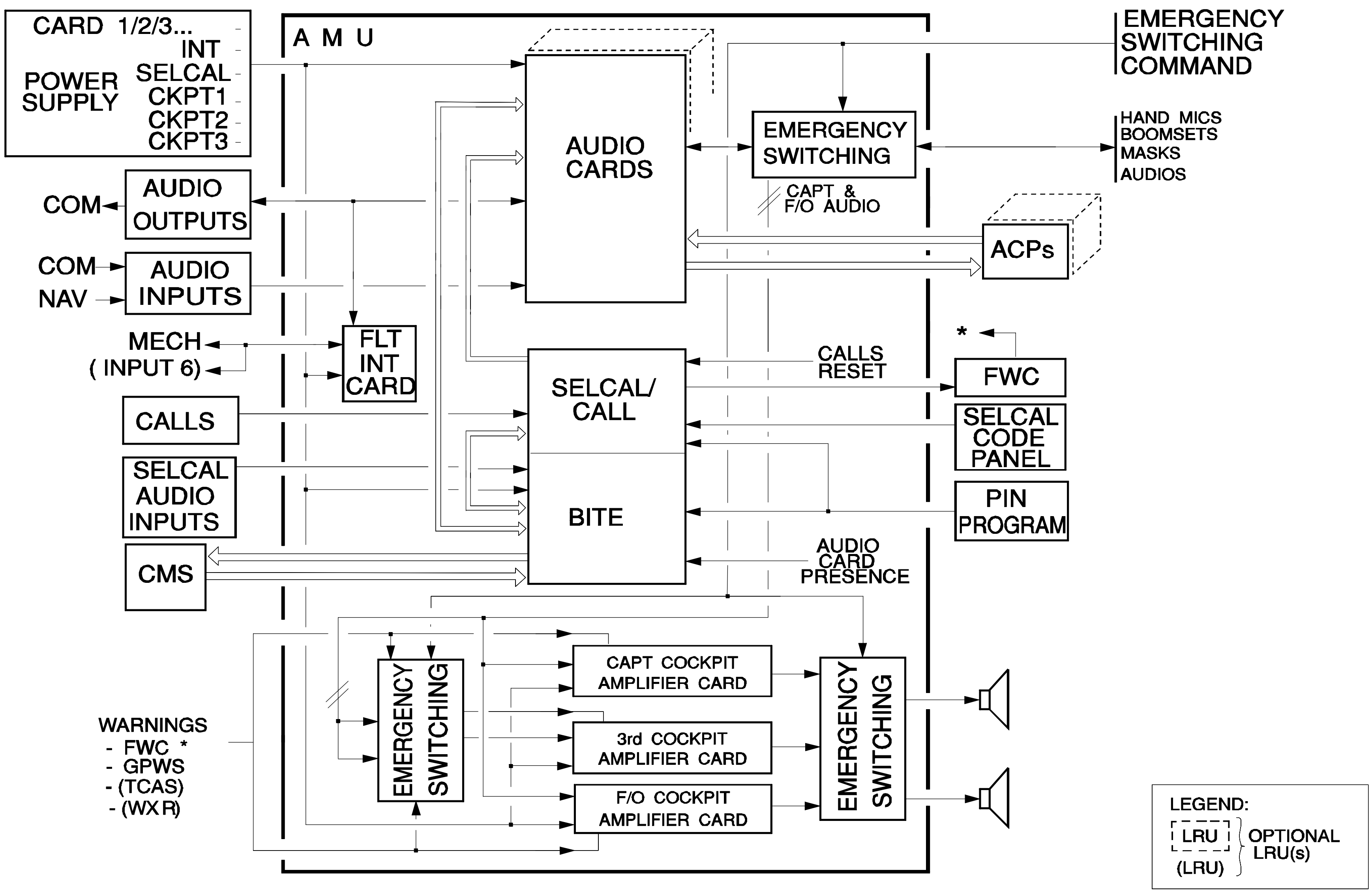
The SELCAL CALL BITE card also decodes the Pin-Programming in order to send the options/status information to the audio cards, the ACPS and the CMS.

FLIGHT INTERPHONE CARD

The flight interphone card provides audio links between the various crew stations in the cockpit, between the cockpit and the ground crew and between the cockpit and the avionics compartment (INPUT6).

EMERGENCY SWITCHING

The emergency switching allows acoustic equipment to be switched, from Captain or First Officer, to the 3rd occupant audio card. The emergency switching also switches the audio and warning signals to the 3rd occupant cockpit amplifier card.



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STUDENT NOTES

AUDIO SWITCHING D/O

FQW4200 GE Metric

GENERAL

In case of emergency, there are two emergency ways to recover a a failure of the Captain or First Officer audio channel :

- the automatic emergency mode and,
- the manual emergency mode.

A switching audio selector, located on the center pedestal, is used to perform the manual mode.
When a manual audio switching is performed, "AUDIO SWTG" is displayed on the ECAM right memo.

AUTOMATIC EMERGENCY MODE

In case of failure of the ACP or ACP-AMU connection, the concerned audio channel, in the AMU, automatically switches to the automatic emergency mode.

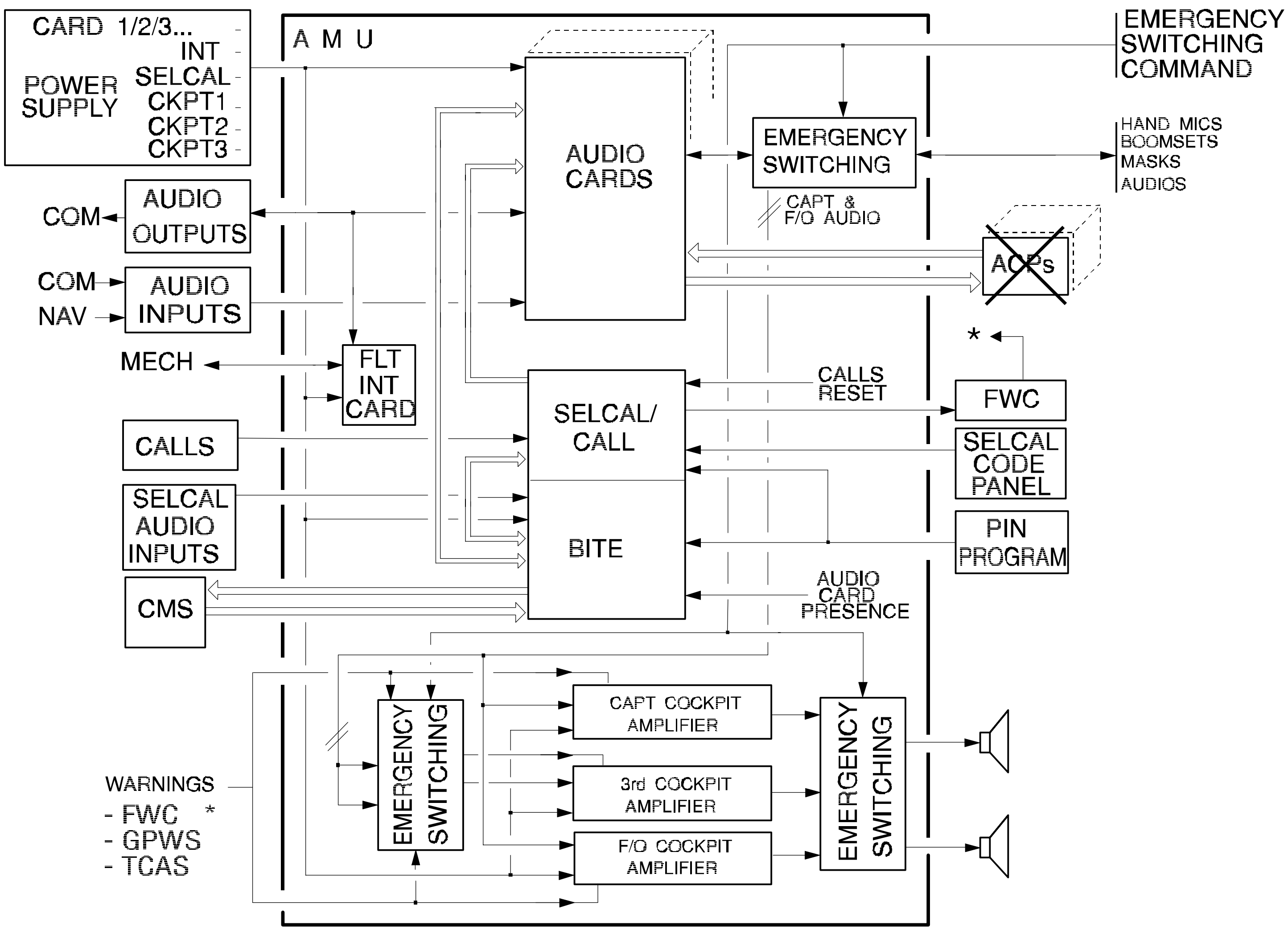
This mode does not affect the warning indication function.

This mode consists in defining a preprogramming configuration for the reception level controls and radio transmission selection, until the manual emergency mode is selected.

Preprogrammed level in reception :

- VHF 1 : 5mW
- HF 1 : 5mW
- INT : 5mW

0mW for the other system reception levels.
Preprogrammed transmission system selection : INT.



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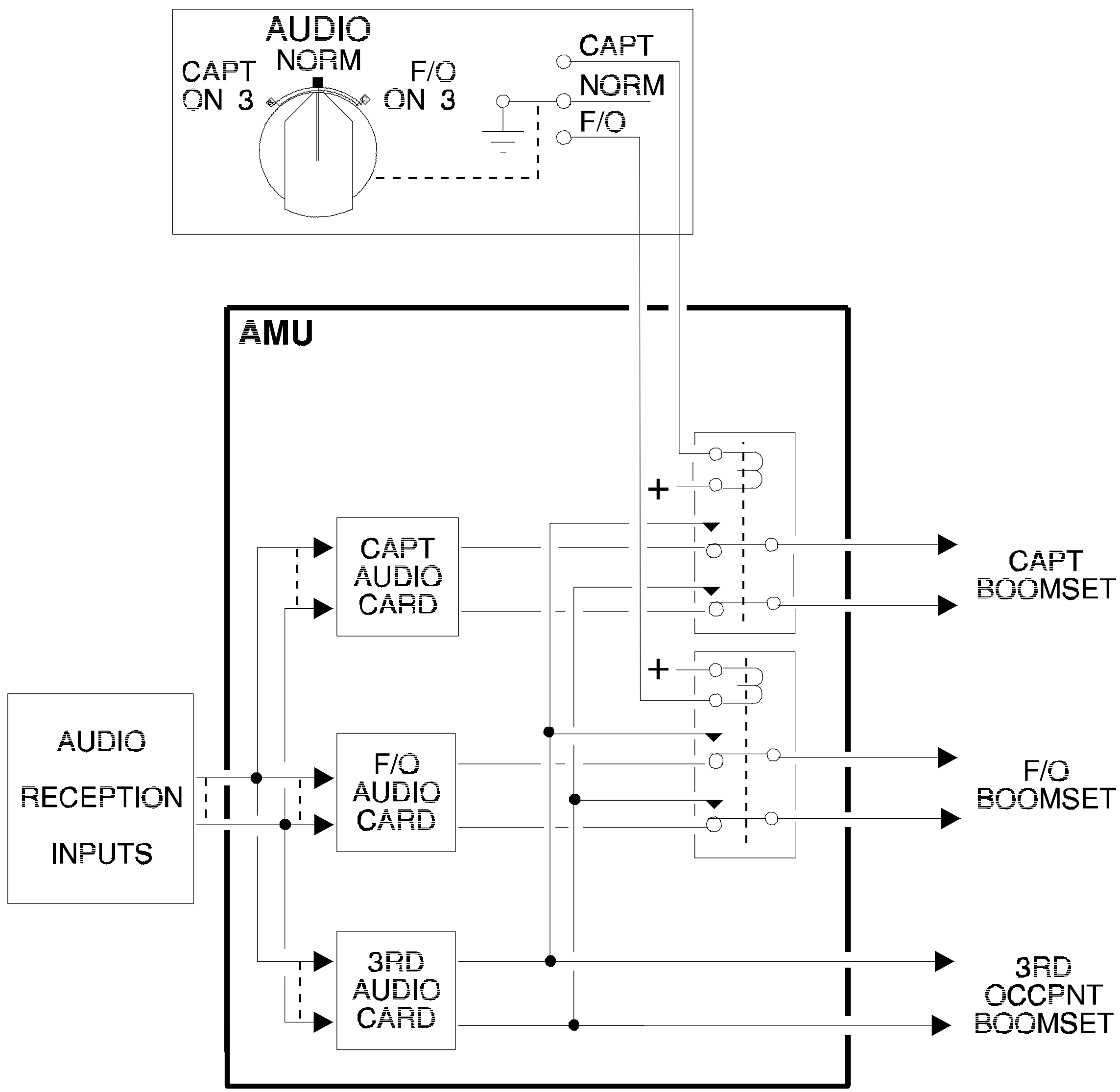
MANUAL EMERGENCY MODE

In normal reception operation, each boomset is connected to its reception channel.

In reception, with a failure of the Captain channel, setting the audio switching selector to the Captain ON 3 position, switches the Captain channel to the third occupant channel.
The CAPTAIN channel is in parallel with the 3rd occupant channel.

In reception, with a failure of the First Officer channel, setting the audio switching selector to the First Officer on 3 position, switches the First Officer channel to the third occupant channel.
The F/O channel is in parallel with the 3rd occupant channel.



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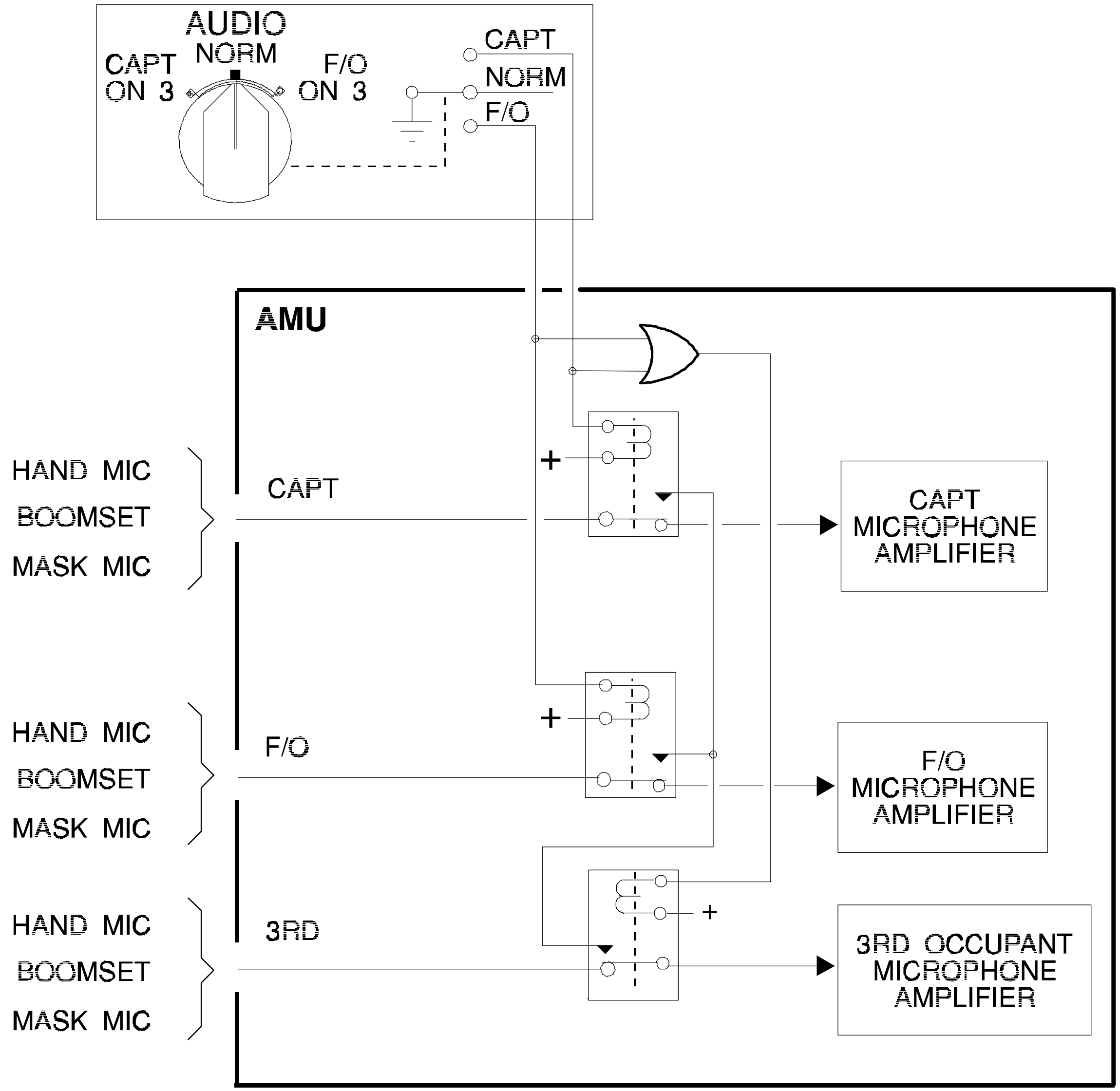
In normal transmission operation, each channel is connected to its microphone amplifier.
In transmission mode with a failure of the Captain channel, setting the audio switching selector to the CAPTain ON 3 position, switches the Captain microphone to the third occupant microphone amplifier. The microphone of the third occupant is disconnected from the 3rd occupant microphone amplifier.
The Captain microphone is connected to the 3rd occupant microphone amplifier.

In transmission mode, with a failure of the First Officer channel, setting the audio switching selector to the First Officer on 3 position, switches the First Officer microphone to the third occupant microphone amplifier.
The microphone of the third occupant is disconnected from the 3rd occupant microphone amplifier.
The F/O microphone is connected to the 3rd occupant microphone amplifier.



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In normal operation, the Captain audio card is connected to the left cockpit loudspeaker, through the Captain cockpit amplifier.
The First Officer audio card is connected to the right cockpit loudspeaker, through the First Officer cockpit amplifier.

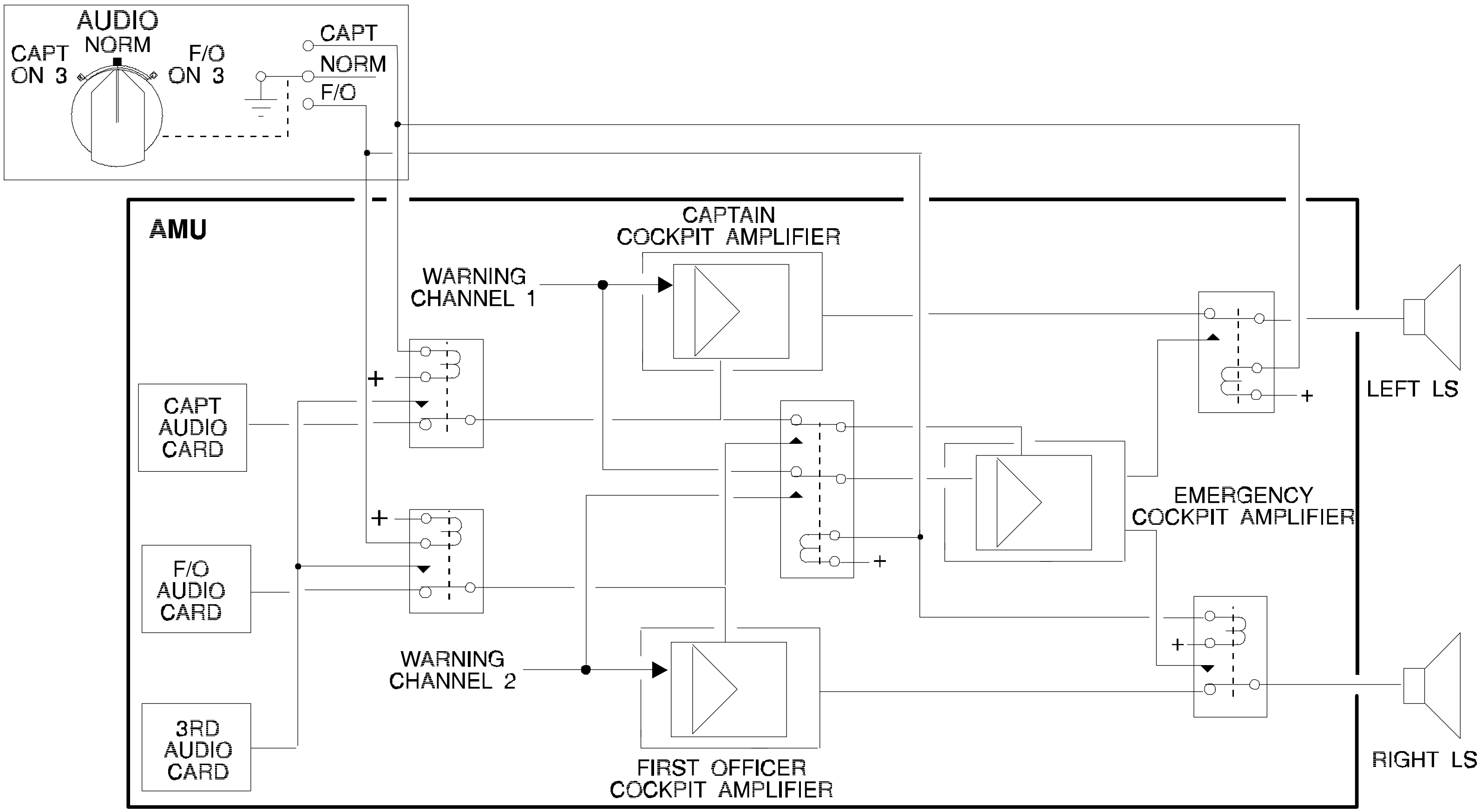
WARNING 1 is connected to CAPTAIN COCKPIT AMPLIFIER
WARNING 2 is connected to F/O COCKPIT AMPLIFIER.

In case of a failure of the Captain channel, setting the audio switching selector to the Captain on 3 position, switches the left cockpit loudspeaker to the emergency cockpit amplifier.

WARNING 1 is connected to EMERGNCY COCKPIT AMPLIFIER.
WARNING 2 is connected to F/O COCKPIT AMPLIFIER.

In case of a failure of the First Officer channel, setting the audio switching selector to the First Officer on 3 position, switches the right cockpit loudspeaker to the emergency cockpit amplifier.

WARNING 1 is connected to CAPTAIN COCKPIT AMPLIFIER.
WARNING 2 is connected to EMERGENGY COCKPIT AMPLIFIER.



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STUDENT NOTES

AUDIO MANAGEMENT UNIT INTERFACES

CIDS
Communication Transceivers
Navigation Receptors
SELCAL Code Panel
Cockpit Voice Recorder
Display Management Computers
Service Interphone
External Power Control Panel
Flight Data Interface Unit
Central Maintenance Computers
Cockpit Loudspeakers And Volume Controls
PIN Programming
Audio Control Panels
Acoustic Equipment
Audio Switching
Flight Warning Computers
Ground Proximity Warning Computer
Landing Gear And Control Unit
Traffic Collision Avoidance System
Weather Radar

CIDS

Audio lines and discrete key lines are used for Passenger Address announcements and interphone communications.
Discrete lines are used for attendant and cockpit calls.

COMMUNICATION TRANSCEIVERS

Audio and PTT lines are used for transmission and reception.
An audio line sends the received SELCAL code to the AMU.

NAVIGATION RECEIVERS

Audio lines send the navigation receiver audio signals to the AMU.

SELCAL CODE PANEL

Discrete lines transmit the SELCAL code selected on the SELCAL code panel to the AMU.

COCKPIT VOICE RECORDER

Audio lines connect Captain, First officer and 3rd occupant audio channels to the Cockpit Voice Recorder (CVR) to be recorded.

DISPLAY MANAGEMENT COMPUTERS

By means of discrete lines the Display Management Computers (DMCs) inform the AMU of the ILS selection, so that the AMU can switch the DME audio identification signal from the VOR reception to the ILS reception.

SERVICE INTERPHONE

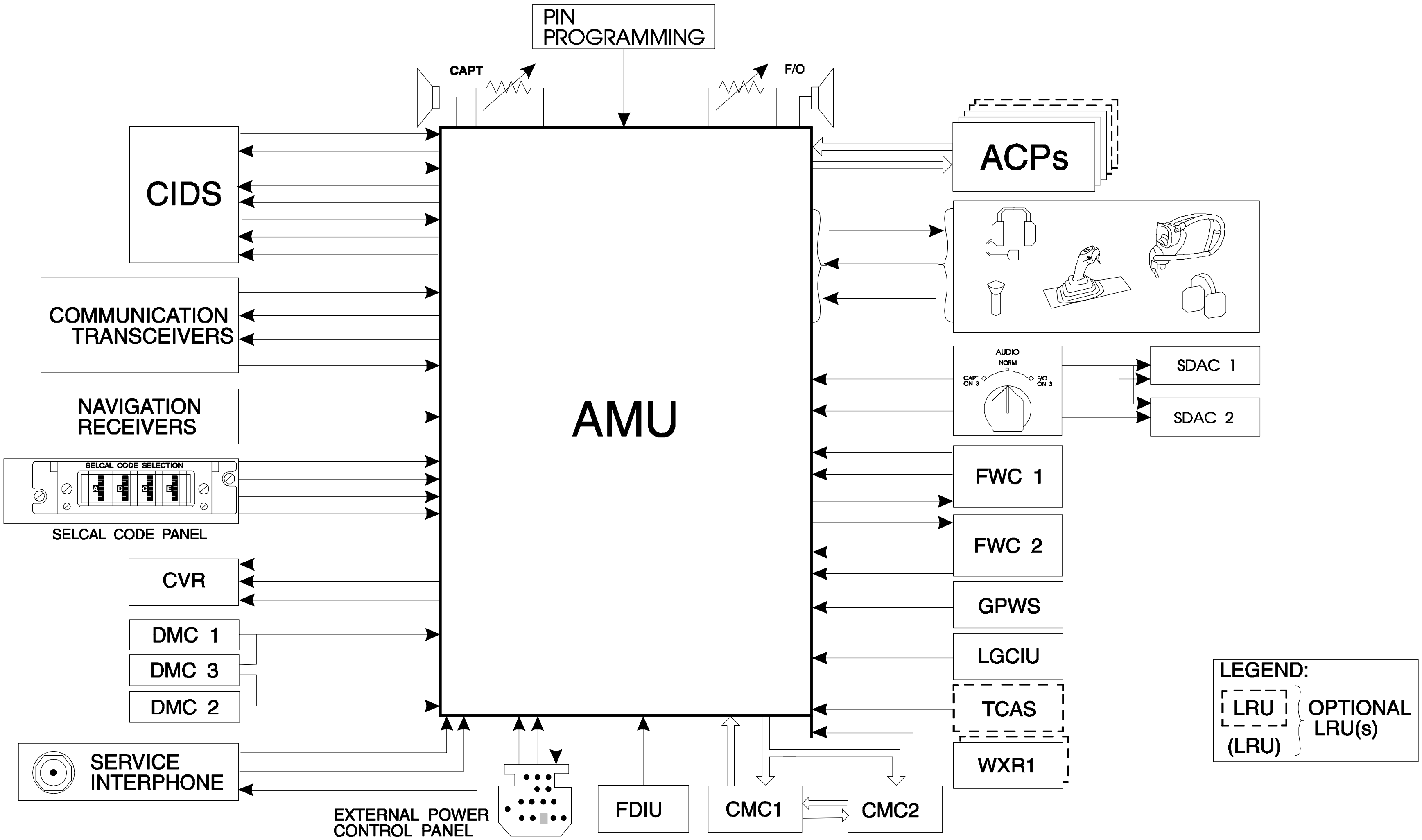
Audio lines and a discrete line (PTT) connect the jack located in the avionics bay to the AMU.

EXTERNAL POWER CONTROL PANEL

Audio lines enable interphone conversations between the ground mechanics and the crew in the cockpit.
In case of a ground mechanic call, a discrete line sends a ground from the External Power Control Panel to the AMU.

FLIGHT DATA INTERFACE UNIT

The Flight Data Interface Unit (FDIU) sends a time signal to the AMU, for the CVR.
The Time signal is added to the 3rd occupant channel.



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CENTRAL MAINTENANCE COMPUTERS

ARINC 429 data buses ensure two ways of communication with the Central Maintenance Computers (CMCs) for the BITE function. They also transmit the status of the pin programing and the AMU identification word.

COCKPIT LOUDSPEAKERS AND VOLUME CONTROLS

Two loudspeakers and their volume controls are connected through audio lines to their cockpit amplifier cards in the AMU.

PIN PROGRAMMING

Discrete lines are used to identify the optional functions and the optional systems installed on the aircraft.

AUDIO CONTROL PANELS

The AMU is controlled by means of the Audio Control Panels (ACPs) through ARINC 429 data buses.

ACOUSTIC EQUIPMENT

Headsets, boomsets, hand mikes and oxygen masks are connected to the AMU through audio lines.
The side stick and hand mike PTT provide a ground to the AMU via discrete lines.

AUDIO SWITCHING

Discrete lines switch the audio cards in the AMU. This switching signal is also sent to the System Data Acquisition Concentrators (SDACs) in order to display a message on the ECAM.

FLIGHT WARNING COMPUTERS

Each Flight Warning Computer (FWC) is connected to the cockpit amplifiers in the AMU by means of audio lines.
Discrete lines are used to trigger the SELCAL buzzer signal in the FWCs.

GROUND PROXIMITY WARNING COMPUTER

Audio lines connect the Ground Proximity Warning Computer (GPWC) to the cockpit amplifiers in the AMU for warnings broadcasting.

LANDING GEAR AND CONTROL UNIT

In flight with the main landing gear extended, the Landing Gear Control and Interface Unit (LGCIU) sends a ground through a discrete line to the AMU. This signal is used to increment the flight Memories in case of a CMC1 and CMC2 failure and to connect or disconnect the flight interphone jack located on the external power control panel.

TRAFFIC COLLISION AVOIDANCE SYSTEM

Audio lines are connected to the AMU in order to broadcast to the CAPTain and F/O loudspeakers the aural advisories computed by the TCAS.

WEATHER RADAR

Audio lines are connected to the AMU in order to broadcast to the CAPTain and F/O loudspeakers the Predictive Windshear audio signal generated by the Weather Radar.

HF SYSTEM PRESENTATION

Purpose
Principle
Components

PURPOSE

The HF system is used for long range voice communications.

The HF system allows long distance voice communications between different aircrafts (in flight or on ground) or between the aircraft and a ground station.

PRINCIPLE

Let’s see the main components of the HF system.

For voice communication, the crew uses acoustic equipment :

- 2 side-stick radio selectors
- 2 loudspeakers
- 3 oxygen mask microphones
- Facilities for boomsets, headsets and hand microphones.

The Audio Management Unit (AMU) acts as an interface between the flight crew and the HF system.

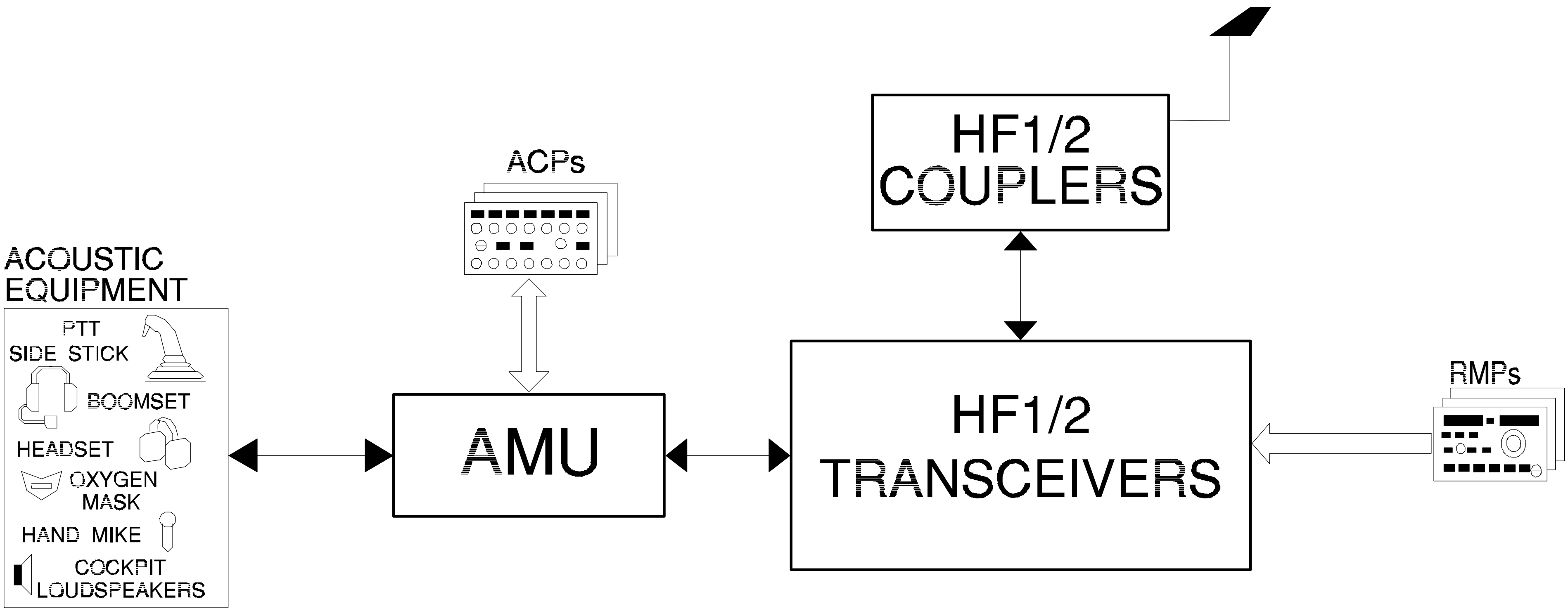
The Audio Control Panels (ACPs) allow selection of HF1 or 2, in transmission or reception mode, and control of the received audio signals only.

The Radio Management Panels (RMPs) are used for selecting the HF frequencies.

The HF transceiver, tuned on the frequency selected by one of the 3 Radio Management Panels (RMPs), transforms the audio signals into HF signals (in transmission mode) or HF signals into audio signals (in reception mode).

The coupler provides impedance matching between the HF shunt-type antenna and the transceiver.

For HF1 and HF2 systems, the HF shunt-type antenna is common.



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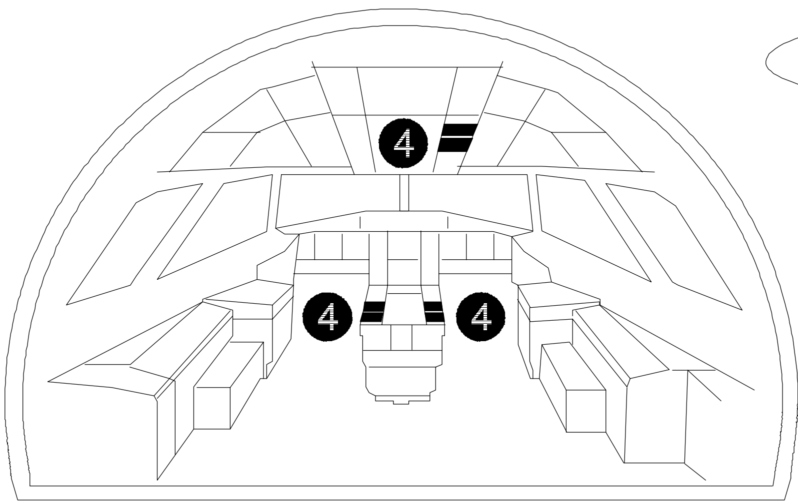
COMPONENTS

The HF system comprises:

- 2 HF transceivers (1)
- 2 HF couplers (2)
- 1 shunt-type antenna (3)



associated with control systems:

- 3 RMPs (4)
- 3 ACPs (4)
- 1 AMU (1)

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HF SYSTEM D/O

General
System Architecture
Interface
Characteristics

FQW4200 GE Metric

GENERAL

The High Frequency (HF) system provides long distance voice communications in the High Frequency band for airborne applications.

SYSTEM ARCHITECTURE

The RMPs are used for HF1 and HF2 frequency control.
The HF transceiver has 2 serial input ports :

- Serial input port A,
- Serial input port B.

In normal conditions, both transceivers are tuned through port A from any RMP.

The secondary port B is dedicated to RMP2(1) when RMP1(2) and RMP3 are failed.
The port selection is done through the PORT SELECTION information line.
The selected frequency and mode function information sent to the HF system is a serial 32-bit word.
The HF tuning word requires two successive 32-bit words to provide the complete tuning data.

The Audio Control Panels (ACPs) are used for HF transmission or reception selection mode and control of the received audio signal levels through the AMU.

The Audio Management Unit (AMU) acts as an interface between the users and HF systems for transmission and reception of audio signals.

The PTT key line is a ground signal sent to the transceiver through the AMU.

NOTE :

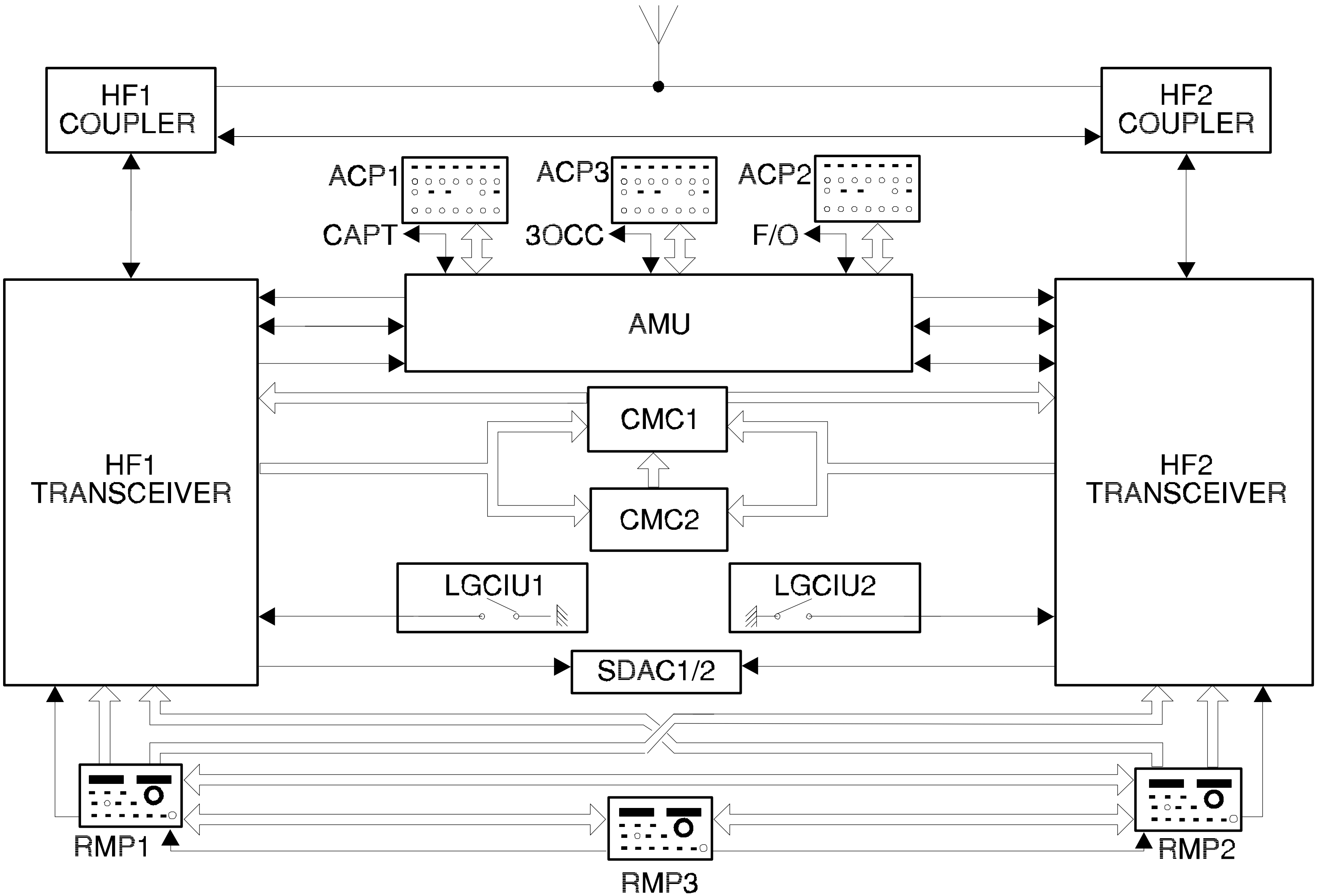
The SELCAL function is integrated in the AMU.

For maintenance purposes, a Built In Test Equipment (BITE) is integrated in the HF transceiver.

The BITE maintains 2-way communications with the Centralized Maintenance Computers (CMCs) through ARINC 429 buses.

The BITE is used to detect and identify internal and external transceiver failures, to store maintenance data in a memory, to inform the external maintenance monitor, the Centralized Maintenance Computer, and to execute tests.

When the aircraft is in flight with landing gear down or not, a discrete ground signal is sent to the HF transceivers.



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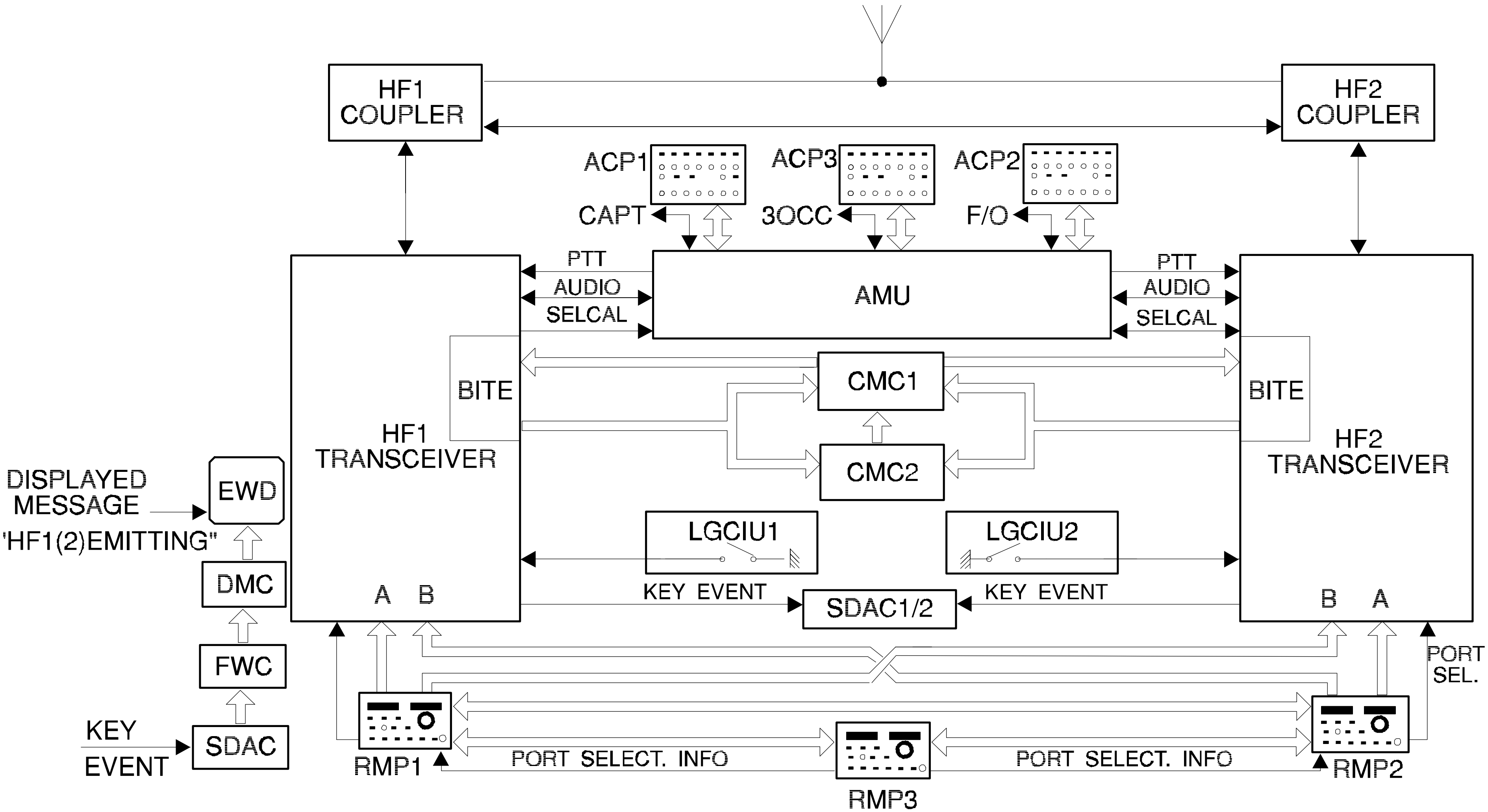
The Landing Gear Interface Units send the FLIGHT/GROUND aircraft status used by the HF BITE, in order to increment the fault memory, in case of failure of the CMCs.

If the transmission lasts more than 1 minute, the "HF1 EMITTING" or "HF2 EMITTING" amber message is displayed on the Engine Warning Display.



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INTERFACE

The HF transceiver is linked to other systems through 3 types of lines :
- first, ARINC 429 buses with the RMPs and the CMCs.

The signal used are serial 32-bit word with a dedicated label.

Label 037 HF tuning word.

The 1st word contains :

- Label 037
- Mode (SSB/AM/USB/LSB)
- 1khz, 10khz, 100khz
- 1Mhz, 10Mhz
- Sign/status
- Parity

The 2nd word contains :

- Label 037
- Continuous Wave (CW) enable
- 100hz
- Sign/status
- Parity

From RMPs to HF transceivers, two successive serial 32-bit tuning words with label 037, dedicated only to HF transceivers.

For maintenance purposes, the HF BITE transmits failure messages with label 356 to the CMCs.

The label 377 (EQUIPMENT IDENTIFICATION) is also sent to the CMCs.
To elaborate the HF BITE, the CMCs transmit FLIGHT/GROUND status information to the transceivers through label 227.

- second, Discrete lines, from or to systems,

The electrical level used by the KEY EVENT, the PTT key line the FLIGHT/ GROUND status or the PORT SELECTION information is a Ground/Open Circuit.
DISABLE1/DISABLE2 : For a dual HF system installation, pin X of coupler 1(2) must be connected to pin Y of coupler 2(1), to prevent any severe damage to the isolation amplifiers of both couplers.

- third, Analog lines, used for audio signals, sidetone and the SELCAL information.

CHARACTERISTICS

The HF transceiver complies with the standard defined by ARINC 719.
TRANSMITTER

Rf Output power :
SSB : 400 W pep, 125 W average
AM : 125 W
TUNE: 72 to 85 W average

Output impedance :
50 Ohms

FREQUENCY RANGE

2.0000 to 29.9999 Mhz (wide)
2.8000 to 23.9999 Mhz (narrow)
Out-of-range selection indicated by aural tone.

STUDENT NOTES:

STUDENT NOTES

VHF SYSTEM PRESENTATION

Purpose
Principle
Components

PURPOSE

The VHF is used for short range voice communications.

The VHF system allows short distance voice communications between different aircrafts (in flight or on ground) or between the aircraft and a ground station.

PRINCIPLE

Let’s see the main components of the VHF system.

For voice communications, the crew use acoustic equipment.

- 2 side-stick radio selectors.
- 2 loudspeakers.
- 3 oxygen-masks.
- Facilities for boomsets, headsets and hand-microphones.

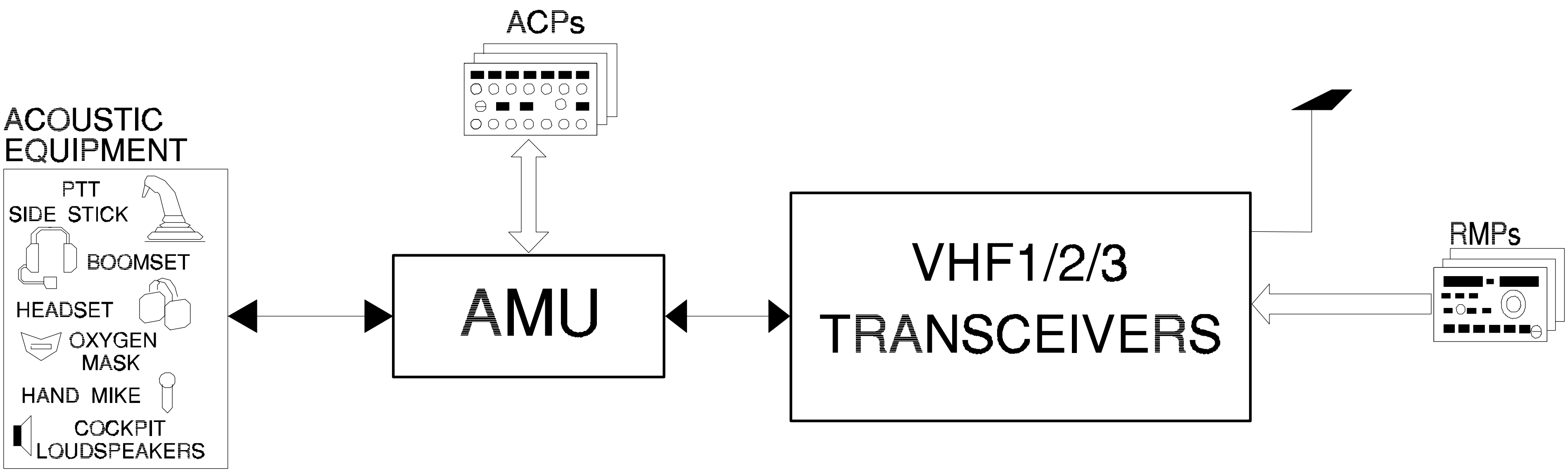
The Audio Management Unit (AMU) acts as an interface between the crew and the VHF system.

The Audio Control Panels (ACPs) allow selection of the VHF1, 2 or 3, in transmission or reception mode, and control of the received audio signals only.

The Radio Management Panels (RMPs) are used for selecting the VHF frequencies.

The VHF transceiver, tuned on the frequency selected by one of the 3 Radio Management Panels (RMPs), transforms the audio signals into VHF signals (in transmission mode) or VHF signals audio signals (in reception mode).

Note: The VHF3 is dedicated to ACARS system, but can be used for radio voice communications.



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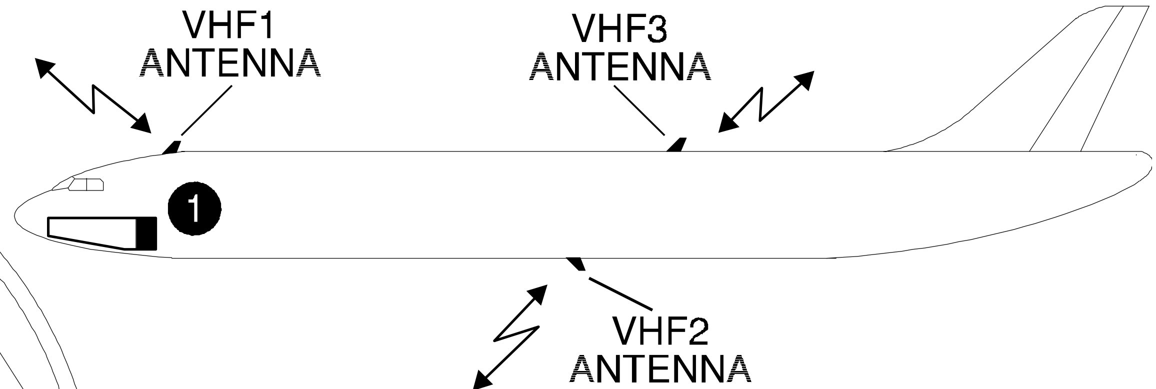
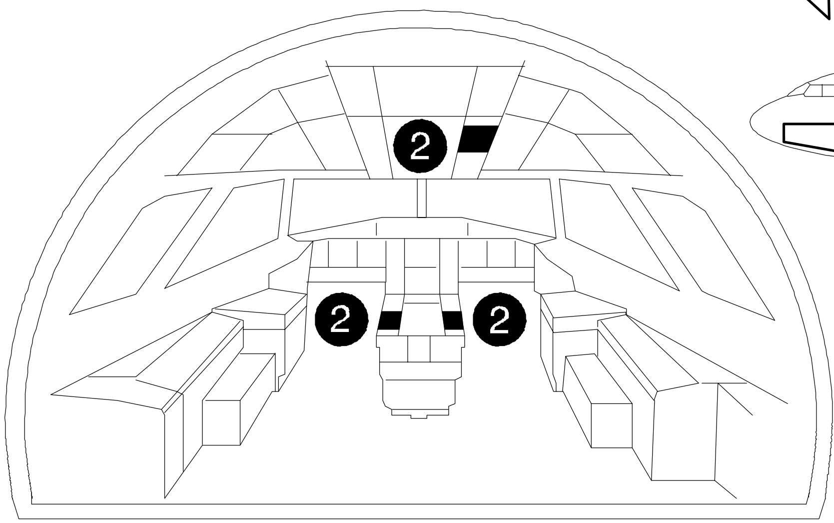


The VHF system comprises:

- 3 VHF transceivers (1)
- 3 Blade antennae



associated with control systems:

- 3 RMPs (2)
- 3 ACPs (2)
- 1 AMU (1)

VHF SYSTEM D/O

General
System Architecture
Interface
Characteristics

FQW4200 GE Metric

GENERAL

The Very High Frequency (VHF) system provides short distance voice communications in the band for airborne applications.

The basic version is equipped with 3 VHF transceivers used for voice communications.

The Very High Frequency (VHF) transceivers can also be used for DATA link communications with the ACARS system.

For data link communications, only VHF3 is connected to the ACARS system. VHF3 is dedicated to ACARS but can be used for voice communicatons.
The choice is done by the airline through pin programming on the ACARS connector.

SYSTEM ARCHITECTURE

The RMPs are used for VHF1, 2 and 3 frequency control.
The VHF transceiver has 2 serial input ports : Serial input port A and serial input port B.
In normal conditions, the transceivers are tuned through port A from any RMP.

The secondary port B is dedicated to RMP2(1) when RMP1(2) and RMP3 have failed.
The port selection is done through the PORT SELECTION information signal.
The selected frequency information sent to the VHF system is a serial 32-bit word.
The VHF requires one serial 32-bit word for complete tuning data.

The Audio Control Panels (ACPs) are used for VHF transmission or reception selection mode and control of the received audio signal levels through the AMU.

The Audio Management Unit (AMU) acts as an interface between the users and VHF systems for transmission and reception of audio signals.

The PTT key line is a ground signal sent to the transceivers through the AMU.

NOTE :

The SELCAL function is integrated in the AMU.

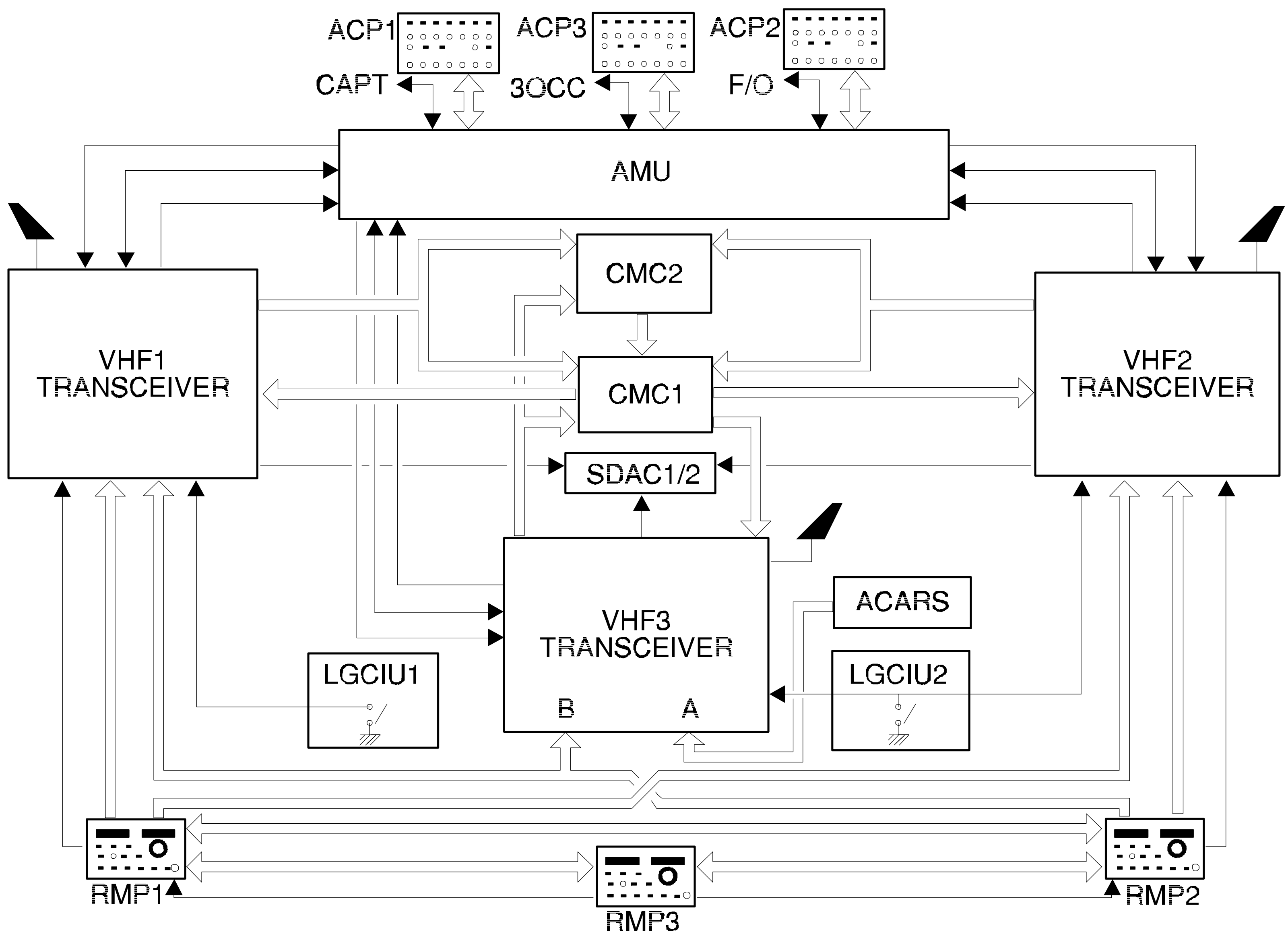
For maintenance purposes, a Built In Test Equipment (BITE) is integrated in the VHF transceiver.

The BITE is used to detect and identify internal and external transceiver failures, to store maintenance data in a memory, to inform the external maintenance monitor, the Centralized Maintenance Computer (CMC) and to execute tests.

The BITE maintains 2-way communications with the Centralized Maintenance Computers (CMCs) through ARINC 429 buses.

The Landing Gear Interface Units send the FLIGHT/GROUND aircraft status used by the VHF BITE, in order to increment the fault memory, in case of failure of the CMCs.

When the aircraft is in flight with landing gear down or not, a discrete ground signal is sent to the VHF transceivers.



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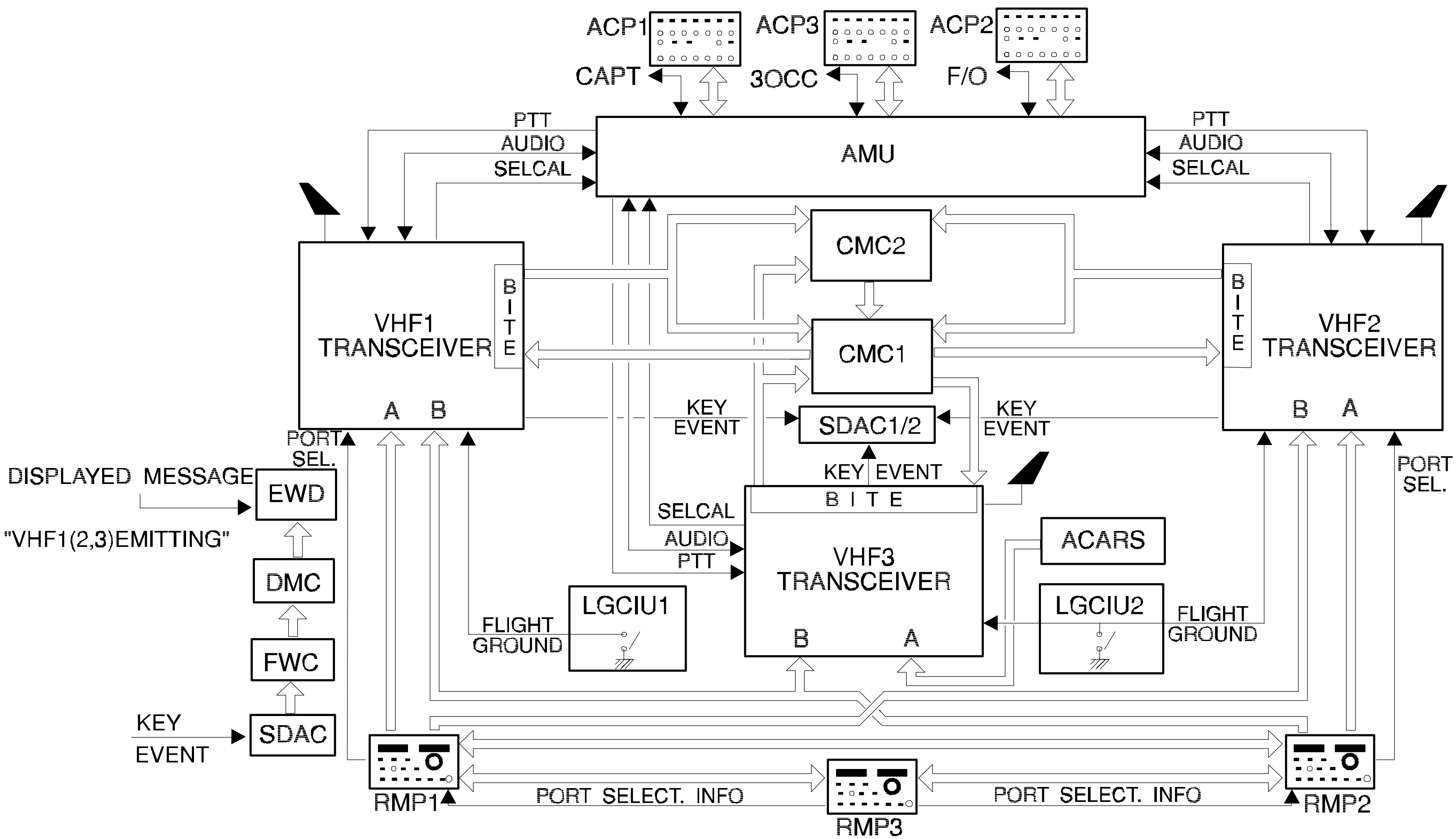
The System Data Acquisition Concentrators collect the transmission information from the transceivers, through the KEY EVENT information discrete signal.

If the transmission lasts more than 1 minute, the "VHF1 EMITTING", "VHF2 EMITTING" or "VHF3 EMITTING" amber message is displayed on the Engine Warning Display (EWD).



FQW4200 GE Metric

INTERFACE

The VHF transceiver is linked to other systems through 3 types of lines :

- first, ARINC 429 buses with the RMPs and the CMCs.

  The signals used are serial 32-bit words with a dedicated label.

  From RMPs to VHF transceivers, one serial 32-bit tuning word with label 030, dedicated only to VHF transceivers.

  Label 030 VHF tuning word. The serial 32-bit word contains :

  - Label 030
  - 1khz, 10khz, 100khz
  - 1Mhz, 10Mhz
  - Sign/status
  - Parity

  For maintenance purposes, the VHF BITE transmits failure messages with label 356 to the CMCs.

  The label 377 (EQUIPMENT IDENTIFICATION) is also sent to the CMCs.
  To elaborate the VHF BITE, the CMCs transmit FLIGHT/GROUND status to the VHF transceivers through label 227.

- second, Discrete lines, from or to systems.

  The electrical level used by the KEY EVENT, the PTT key line, the PORT SELECTION or the FLIGHT/GROUND status information is Ground/Open Circuit.

- third, Analog lines, used for audio signals, sidetone and the SELCAL information.

CHARACTERISTICS

The VHF transceiver complies with the standards defined by ARINC 716.

TRANSMITTER

Rf Output power : 25 W (nominal)
Output impedance : 50 Ohms
Power supply : 28 VDC

FREQUENCY RANGE

118.000 Mhz to 137.975 Mhz

STUDENT NOTES:

STUDENT NOTES

FQW4200 GE Metric

SELCAL SYSTEM PRESENTATION

Purpose
Principle
Components

PURPOSE

The SELCAL system provides aural and visual indications of the calls received from ground stations equipped with a coding device.

The communication systems used for SELCAL reception, are :

VHF1, VHF2, VHF3, HF1 and HF2.

PRINCIPLE

The ground station transmits a selective call code, via VHF or HF transmitters.

The SELCAL code panel is used to provide the AMU with the SELCAL code dedicated to the aircraft.

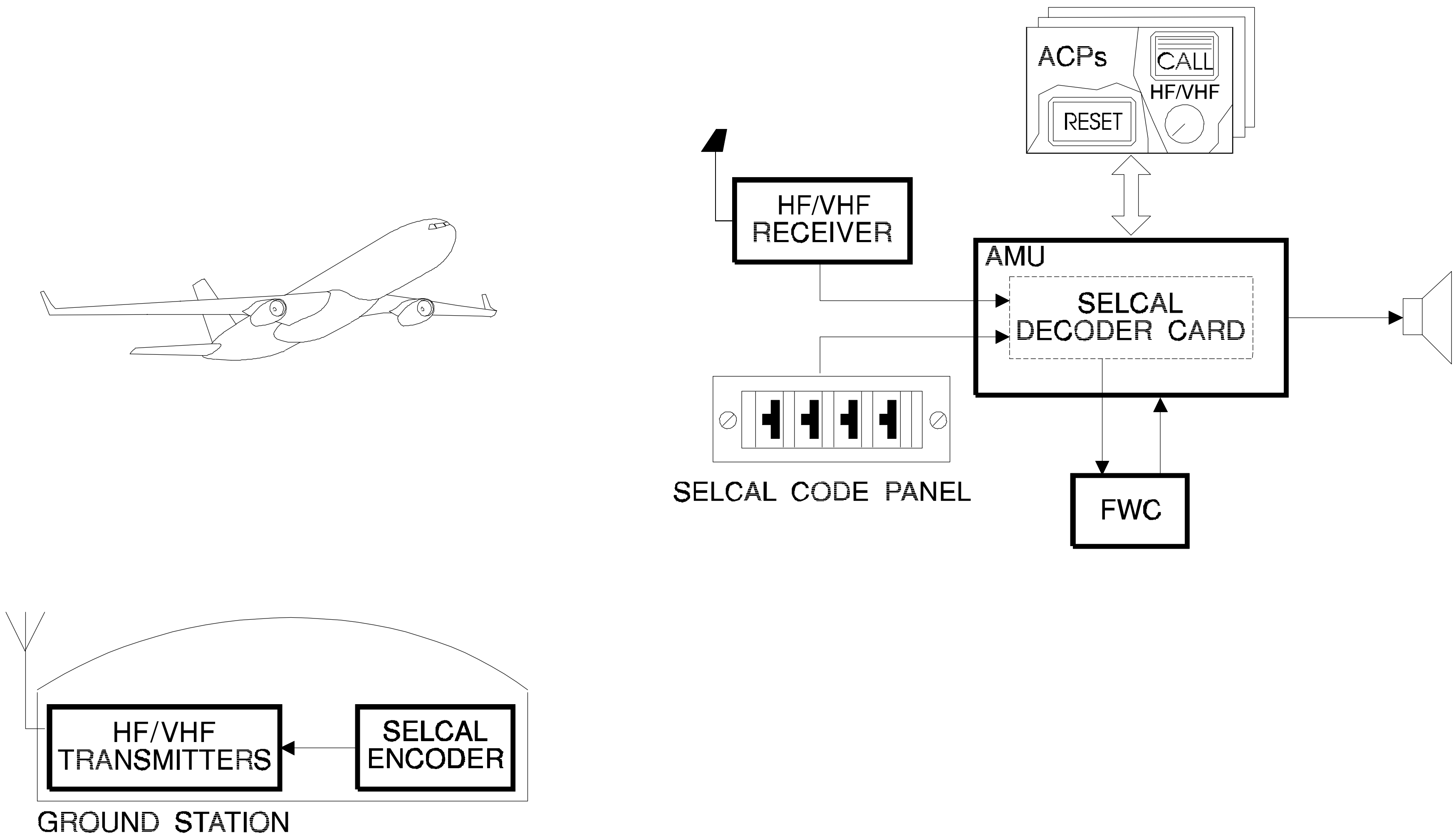
The SELCAL decoder card compares the code selected on the SELCAL code panel with the received code. Once detected, the information is sent to the Flight Warning Computer (FWC), which generates a buzzer sound.

The SELCAL decoding function is integrated in the Audio Management Unit (AMU) on the SELCAL decoder card.

When the RESET key on the ACP is pressed, the aural and visual indications are cancelled.

After amplification in the AMU, the buzzer sound is broadcast by the loudspeakers and the "CALL" legend flashes AMBER on the various ACPs.

The "CALL" legend on each Audio Control Panel (ACP), associated to the system which receives the call, flashes AMBER.



FQW4200 GE Metric

COMPONENTS

The components of the SELCAL system are :

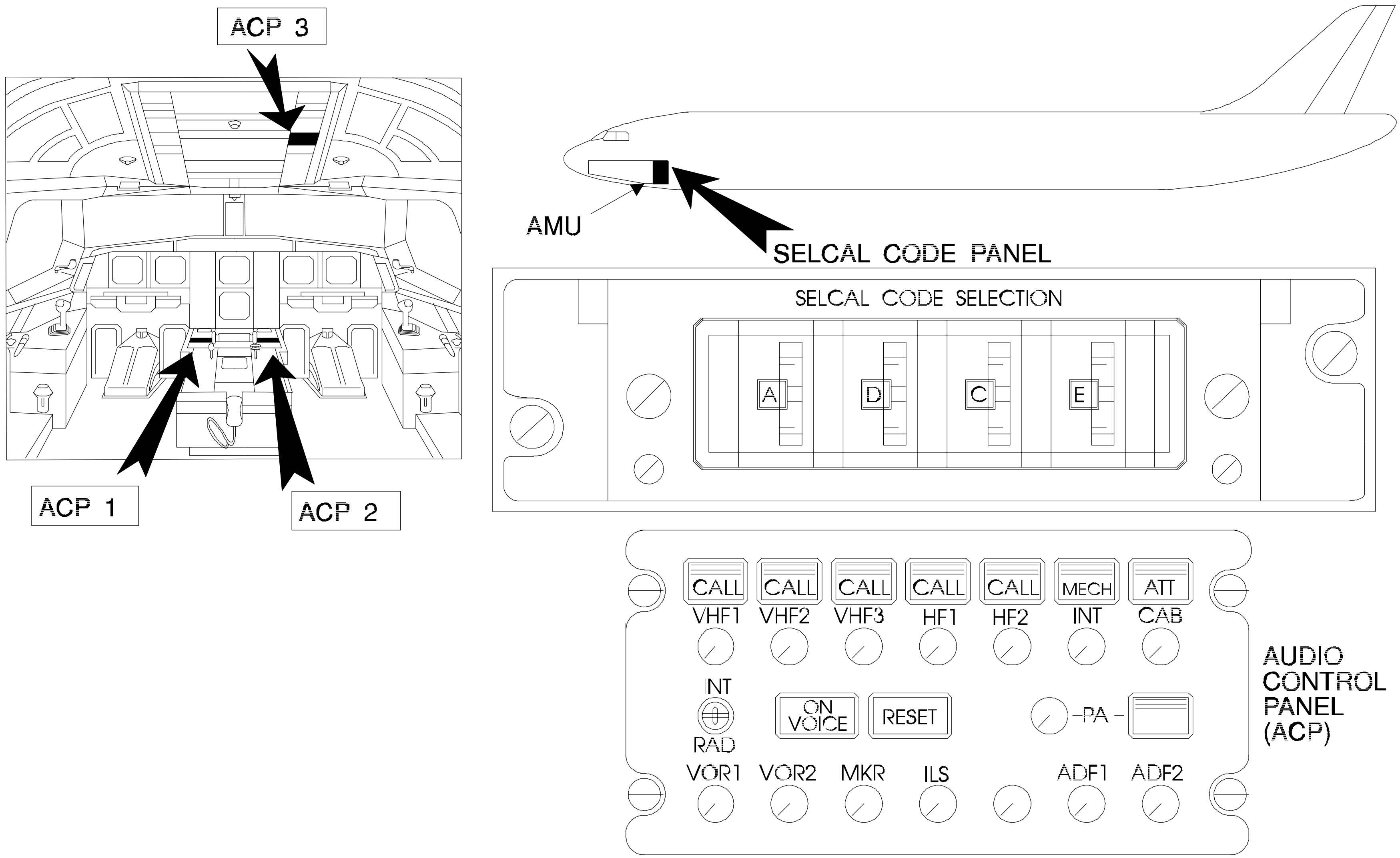
In the avionics bay :

- 1 SELCAL code panel

and a SELCAL decoding card integrated in the Audio Management Unit (AMU).

In the cockpit :

- the flashing amber "CALL" light of Audio Control Panels (ACPs) associated to the HF and VHF systems.



FQW4200 GE Metric

STUDENT NOTES:

SELCAL CALL D/O

General
Selcal Operation
Ground Call
Attendant Call

GENERAL

The SELCAL and CALL functions are performed in the Audio Management Unit (AMU) by the SELCAL/CALL card.
This card receives SELCAL calls from the ground stations via the communication channels, a SELCAL code from the SELCAL code panel, CALLs from the ground crew and the attendant stations and provides visual and aural warnings.

The SELCAL card also sends information about the pin programming options to the audio cards and the ACPs.

SELCAL OPERATION

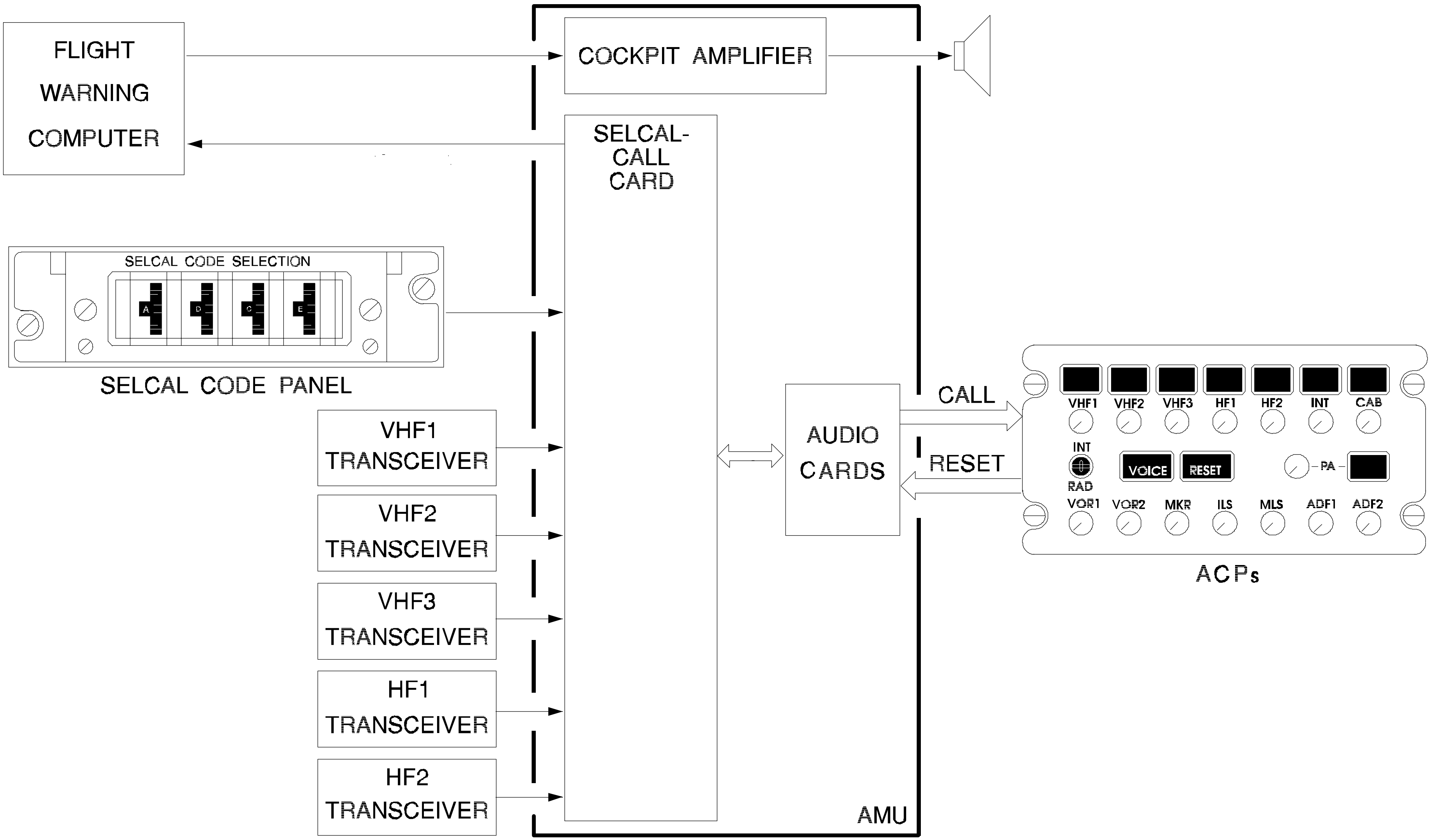
The SELCAL/CALL card has 5 inputs connected to the communication receiver SELCAL outputs.
These inputs are permanently scanned, and when a SELCAL signal is present, a comparison is made with the code programmed on the SELCAL code panel.

When the 2 codes agree, a message is sent to the various ACPs, via the corresponding audio cards.

On the ACPs, the CALL light, corresponding to the communication channel used, flashes amber.

At the same time, data is sent to the flight warning computers (F.W.C.). The FWCs send an audio call buzzer to the loudspeakers, through the cockpit amplifier in the AMU.

The CALL is cancelled using the RESET key on one ACP, or selecting the called channel and activating the PTT.


FLIGHT
WARNING
COMPUTER
COCKPIT AMPLIFIER
SELCAL-
CALL
CARD
SELCAL CODE SELECTION
SELCAL CODE PANEL
VHF1
TRANSCEIVER
VHF2
TRANSCEIVER
VHF3
TRANSCEIVER
HF1
TRANSCEIVER
HF2
TRANSCEIVER
AUDIO
CARDS
CALL
RESET
AMU
VHF1
VHF2
VHF3
HF1
HF2
INT
CAB
INT
RAD
VOICE
RESET
PA
VOR1
VOR2
MKR
ILS
MLS
ADF1
ADF2
ACPs

GROUND CALL

Two types of calls may be received by the SELCAL/CALL card :

- ground call and,
- cabin attendant call.

When the cockpit call pushbutton, located on the external power control panel is pressed a ground information is sent to the SELCAL/CALL card and to the FWC.
The FWC activates the buzzer signal and send it to the cockpit amplifiers in the AMU to be broadcast through the loudspeakers.

The SELCAL card sends a signal through the various audio cards to the ACPs.
The MECH legend flashes amber for 60 seconds on the ACPs.

The visual call is automatically cancelled and the circuit reinitialized after 60 seconds or when the RESET pushbutton is pressed in, on any ACP.

The automatic reset may be cancelled with the AMU pin programming.

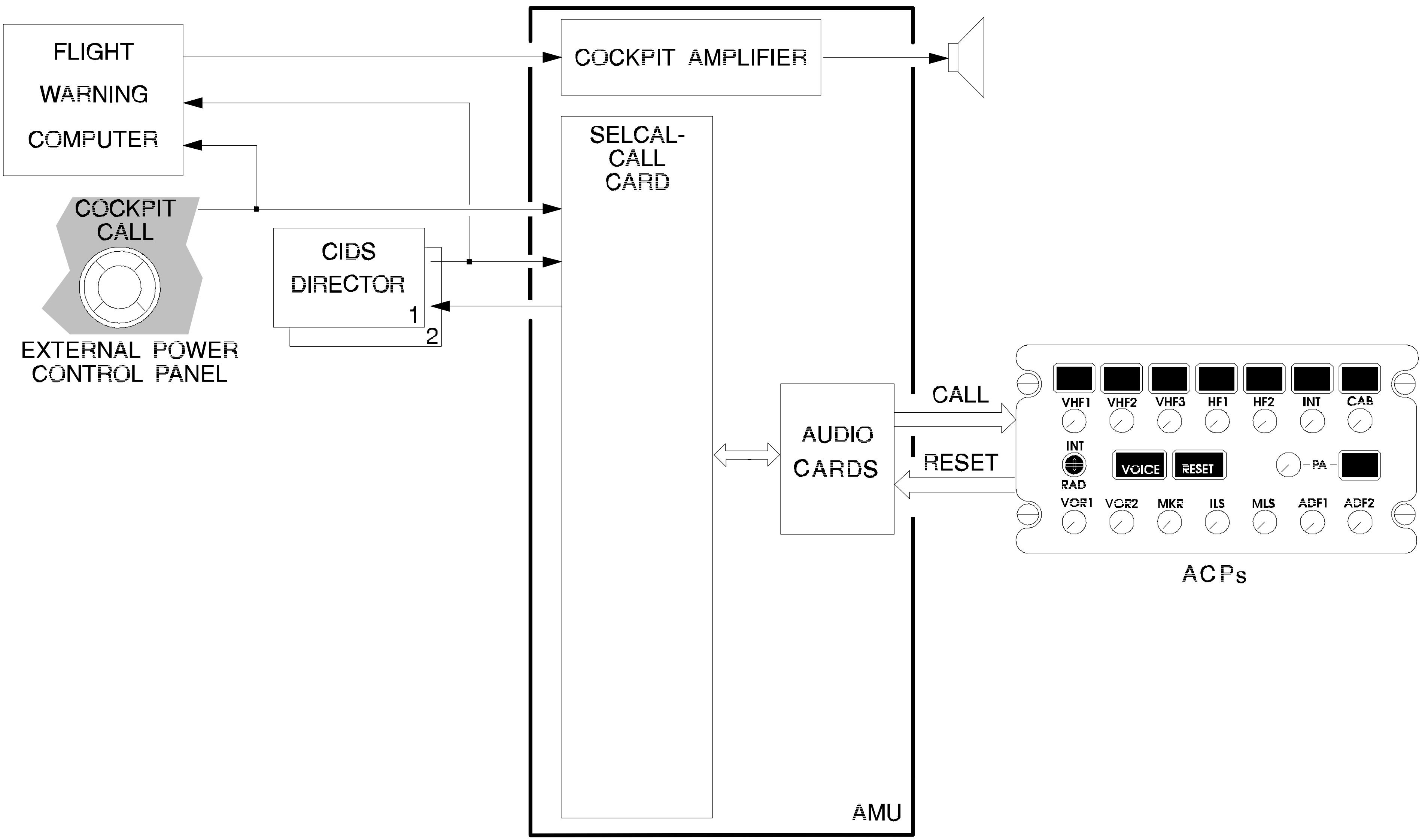
ATTENDANT CALL

When a call is made from a cabin attendant station, the cabin intercommunication data system (CIDS) generates a ground information to the SELCAL/CALL card and to the FWC.
During one second, the FWC activates the buzzer signal and send it to the cockpit amplifier in the AMU to be broadcast through the loudspeakers.

The SELCAL/CALL card sends a signal through the various audio cards to the ACPs.
The ATT legend flashes for 60 seconds on the ACPs.

The visual call is automatically cancelled and the circuit reinitialized after 60 seconds or when the RESET pushbutton is pressed in, on any ACP.

An information is also sent to the CIDS for reinitialization.
The automatic reset may be cancelled with the AMU pin programming.



FQW4200 GE Metric

STUDENT NOTES:

FLIGHT INTERPHONE OPERATION

Transmission
INT/Radio Switch
INT Pushbutton
Reception
Operation

TRANSMISSION

There are two ways to select the flight interphone transmission mode on the Audio Control Panels (ACPs) :

- the INT/RAD switch and,
- the INT pushbutton.

INT/RADIO SWITCH

The INT position of the INT/RAD switch on the ACPs enables permanent use of the flight interphone transmission without PTT action.

When the INT/RAD switch is set to INT, the accoustic equipment is connected to the transmission line.

In this mode, all radio transceivers can be normally used, because the radio functions have priority over the interphone.
The interphone is momentarily cut during a radio transmission.

The RAD position of the INT/RAD switch is only used for transmission. In this position, the selected transceiver is switched from reception to transmission.

The RAD position of the INT/RAD switch is a spring loaded position and is in parallel with all PTT lines.

INT PUSHBUTTON

The INT pushbutton allows the flight interphone transmission to be selected.
In this mode, the flight interphone is used like a radio channel.
A PTT signal is needed to activate the microphone.

The accoustic equipment is connected to the flight interphone transmission line.

To disconnect the flight interphone the INT pushbutton must be pressed again or another system must be selected.

In this mode a radio channel cannot be used.

RECEPTION

The INT knob allows the flight interphone reception to be selected and the volume to be adjusted, whatever the selected way of transmission.
To select the flight interphone, the INT knob must be released out.

The accoustic equipment is connected to the flight interphone reception line.

Several receivers can be selected together.

To disconnect the flight interphone reception, the INT knob must be pressed in.

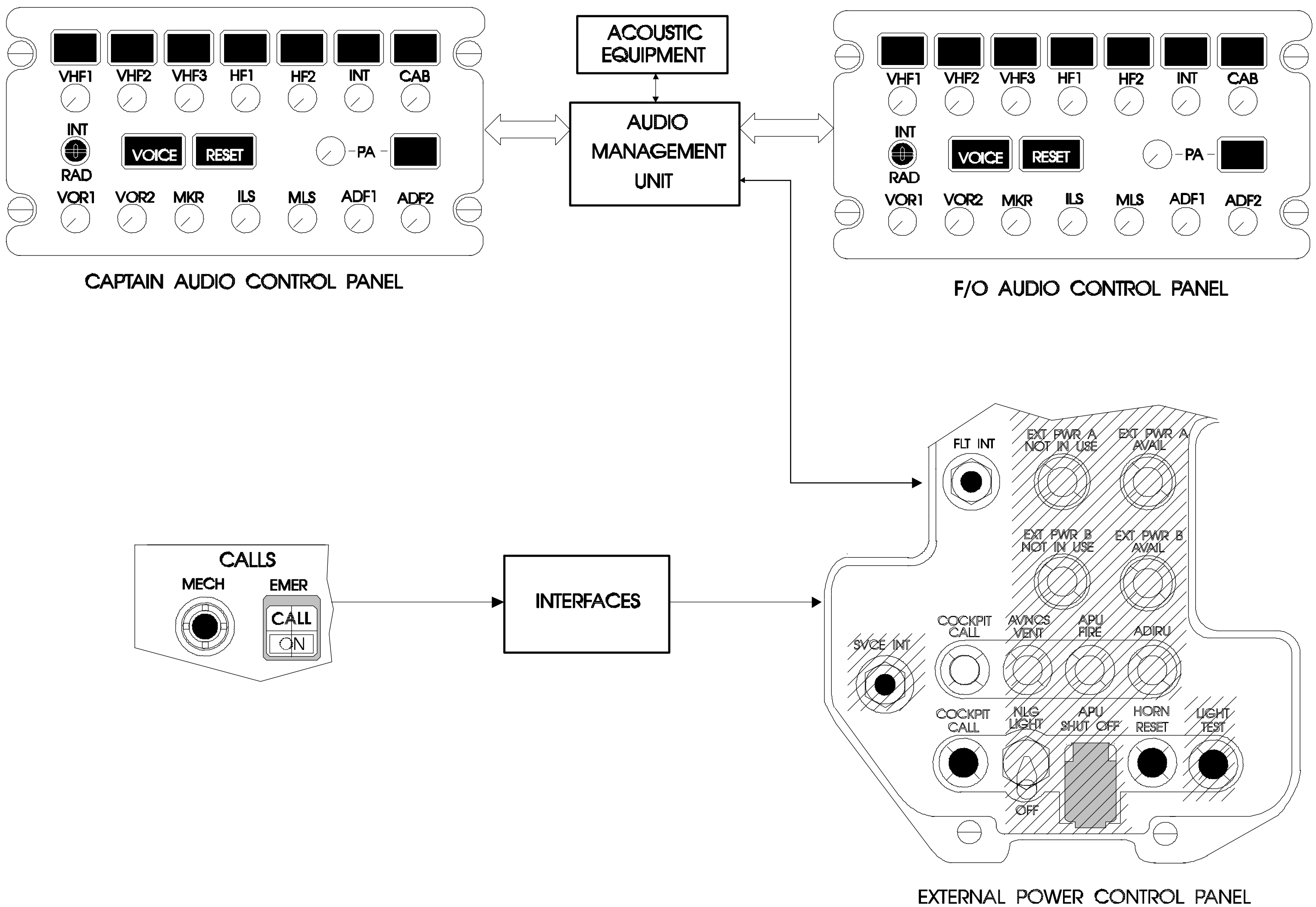
OPERATION

Before establishing a flight interphone communication between the cockpit and the ground, it is necessary to call the ground crew.

On the external power control panel, the blue COCKPIT CALL light comes on and the horn sounds as long as the MECH pushbutton on the CALLS panel in the cockpit is pressed.

In the same way, before establishing a flight interphone communication between the ground and the cockpit, it is necessary to call the crew in the cockpit.

On the Captain and First Officer audio control panel, the MECH legend flashes amber and the buzzer sounds for 60 seconds.
The call can be cancelled by the RESET pushbutton.


ACOUSTIC EQUIPMENT
AUDIO MANAGEMENT UNIT
VHF1
VHF2
VHF3
HF1
HF2
INT
CAB
INT
RAD
VOICE
RESET
PA
VOR1
VOR2
MKR
ILS
MLS
ADF1
ADF2
CAPTAIN AUDIO CONTROL PANEL
F/O AUDIO CONTROL PANEL
CALLS
MECH
EMER
CALL
ON
INTERFACES
FLT INT
EXT PWR A NOT IN USE
EXT PWR A AVAIL
EXT PWR B NOT IN USE
EXT PWR B AVAIL
SVCE INT
COCKPIT CALL
AVNCS VENT
APU FIRE
ADIRU
COCKPIT CALL
NLG LIGHT
APU SHUT OFF
HORN RESET
LIGHT TEST
OFF
EXTERNAL POWER CONTROL PANEL

STUDENT NOTES

RADIO COMMUNICATION OPERATION

Frequency Selection
Transmission Mode
Reception Mode
Operation

FREQUENCY SELECTION

On the Radio Management Panel (RMP), when the ON/OFF switch is set to ON position, two frequencies previously selected, appear in the windows.

To select a new frequency in a different system, the corresponding key must pressed in on the RMP.
The associated green light comes on.

The desired frequency can be selected in the STBY/CRS window using the dual selector knob.

Pressing the transfer pushbutton, activates the frequency and displays it in the active window, whereas the previous active frequency becomes stand-by.

TRANSMISSION MODE

To connect the transmission line to the chosen transmitter, the corresponding transmission key must be pressed in on the Audio Control Panel (ACP).

Only one transceiver can be selected at the same time.

This selection can be disabled when :

- the transmission key, previously selected, is pressed in again.
- another transmitter is selected.

RECEPTION MODE

On the Audio Control Panel, the reception knob allows connection of the headset to the transceiver reception.

To select a receiver, the corresponding reception knob must be released out.
The reception knob comes on white.

To adjust the reception level, the selected reception knob must be turned.

The communication can now be established.

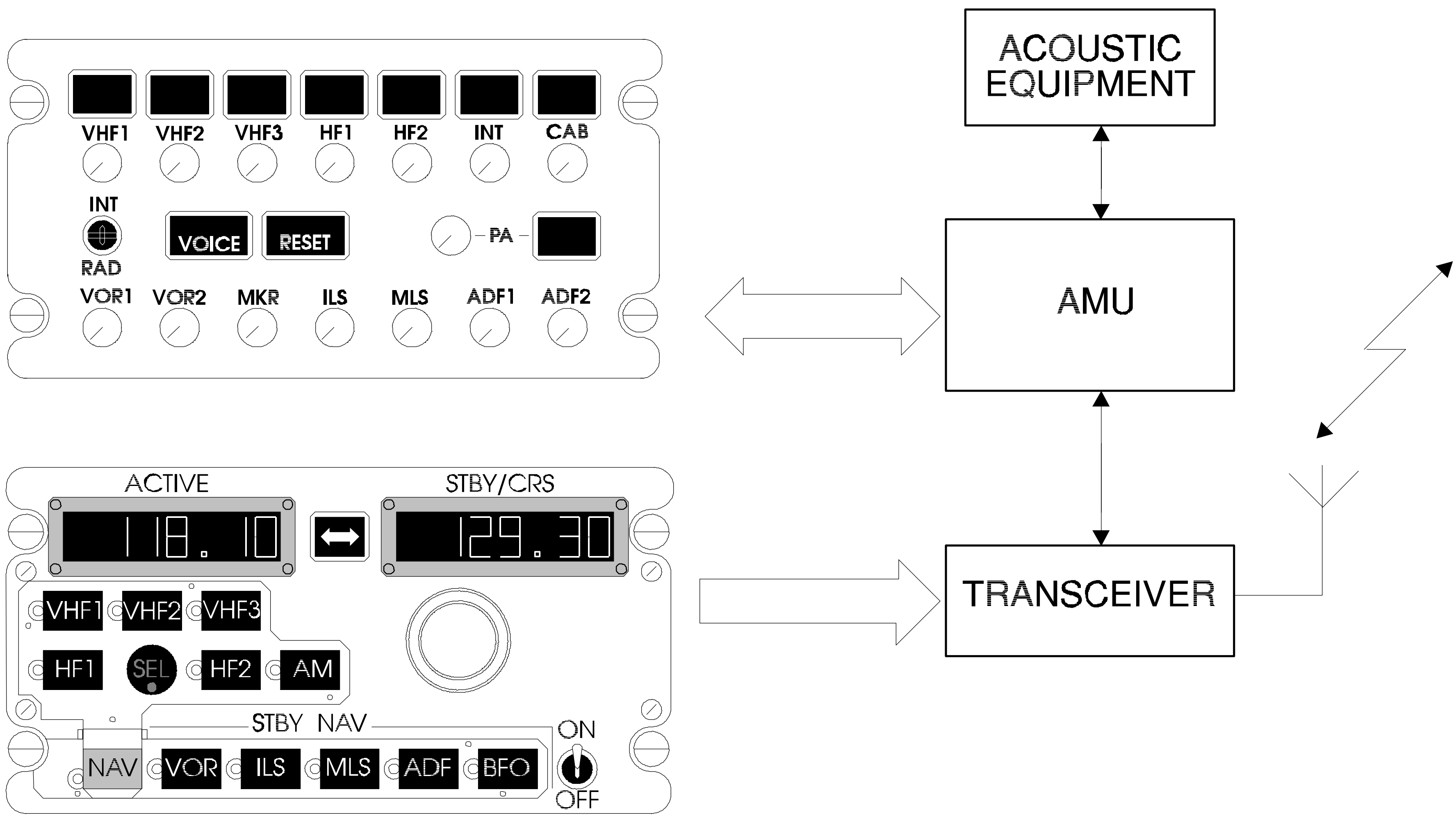
OPERATION

When a PTT switch is pressed in, the hand mike is connected and the VHF1 transceiver transmits.

The boomset mike is always connected.

On the ACP, several reception knobs can be selected simultaneously.

If the reception knob is pressed in again, the receiver is disconnected and the white light goes off.



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STUDENT NOTES

STATIC DISCHARGING

Principle
Components

PRINCIPLE

During flight, the aircraft becomes charged with static electricity.

Random discharges of this static electricity would cause interference in the communication and navigation systems.

The purpose of the static dischargers is to decrease the effect of interferences in the communications and navigation systems.

COMPONENTS

Two types of static dischargers are installed on the aircraft.

At the tips, the dischargers are mounted at 30 degrees on angular retainers.

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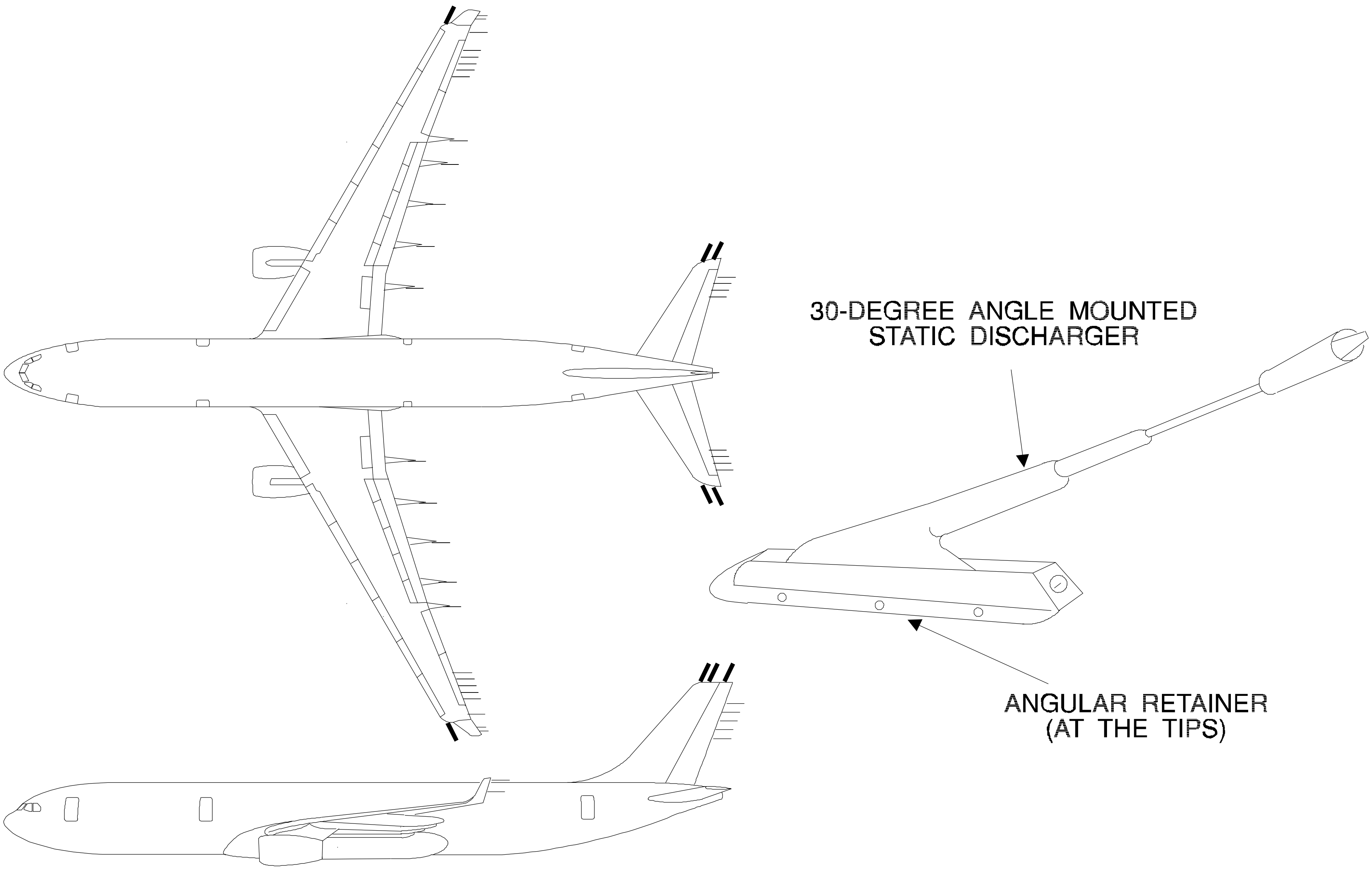
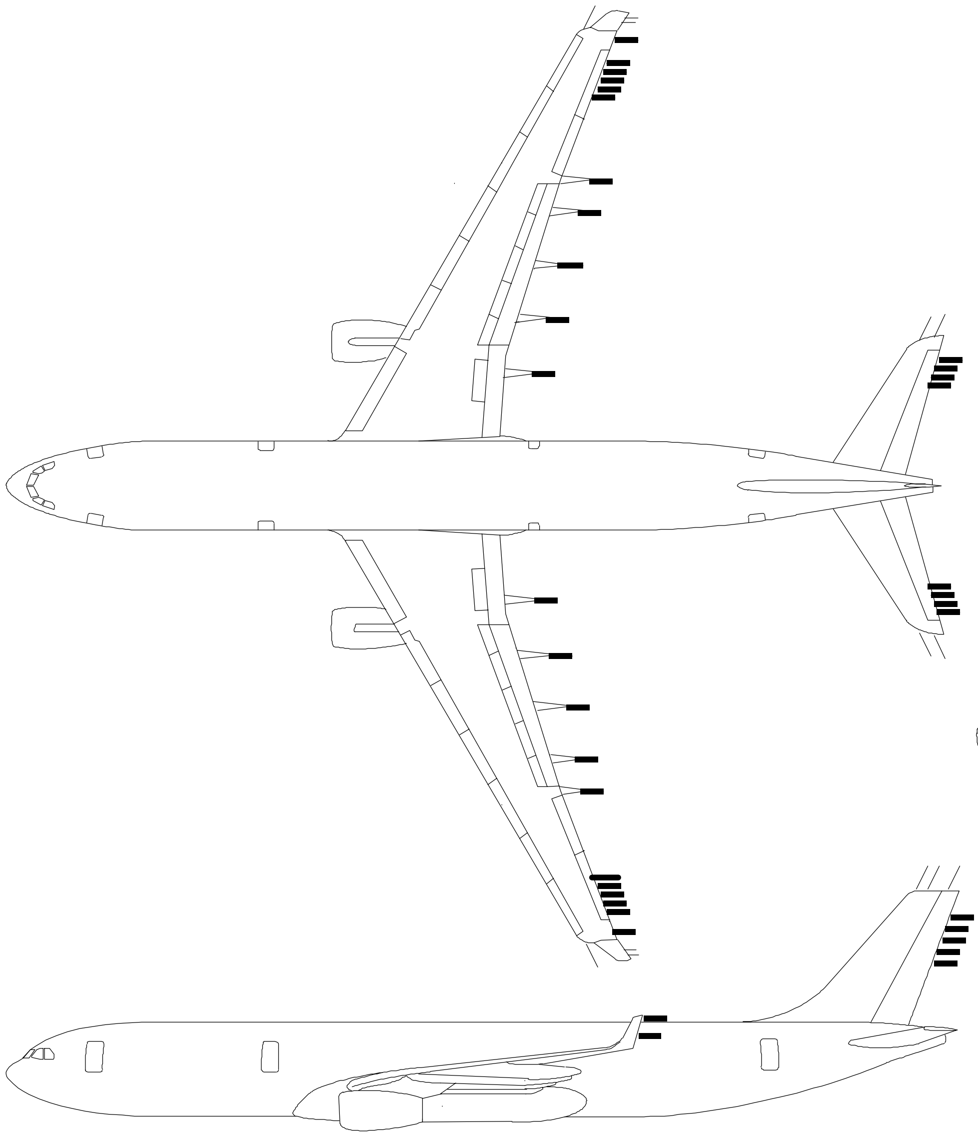
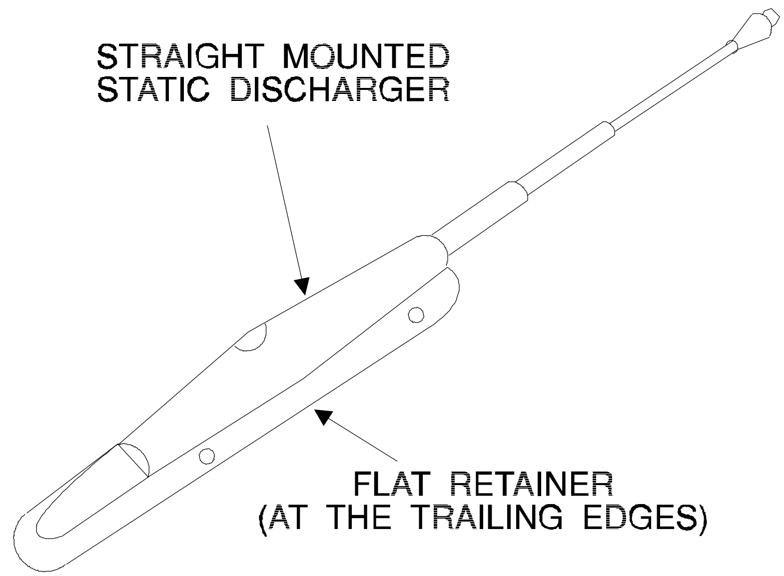


FQW4200 GE Metric

At the trailing edges, the dischargers are straight mounted on flat retainers.





FQW4200 GE Metric

STUDENT NOTES:

WARNINGS

VHF EMITTING
HF EMITTING
ACARS FAULT.

VHF EMITTING

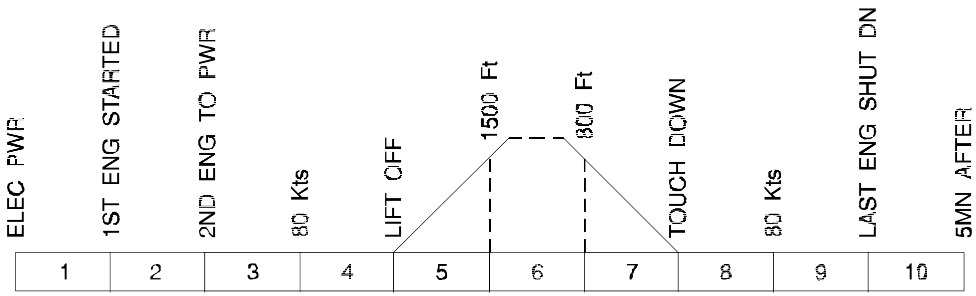
When a VHF transceiver emits for more than 60 seconds, the master caution light comes on amber, the single chime sounds and a message appears on the upper ECAM display unit.

HF EMITTING

When a HF transceiver emits for more than 60 seconds, the master caution light comes on amber, the single chime sounds and a message appears on the upper ECAM display unit.

ACARS FAULT

When the ACARS MU fails, an amber message appears on the upper ECAM display unit.



E/WD : FAILURE TITLE	AURAL WARNING	MASTER LIGHT	SD PAGE CALLED	LOCAL WARNINGS	FLT PHASE INHIB
VHF 1 (2)(3) emitting HF 1 (2) emitting Transceiver emitting more than 60s	SINGLE CHIME	MASTER CAUT	NIL	NIL	3, 4, 5 7, 8
ACARS 1 FAULT ACARS MU failure	NIL	NIL	NIL	NIL	3, 4, 5 7, 8

STUDENT NOTES

SPEECH COMMUNICATION COMPONENTS

Safety Precautions
HF Tansceiver
HF Coupler
HF Antenna
VHF Transceiver
VHF Antenna
Mechanic Call Horn
AMU
ACP
Selcal Code Panel
Static Dischargers
RMP

SAFETY PRECAUTIONS

WARNING: MAKE SURE THAT ALL the CIRCUITS in MAINTENANCE are ISOLATED BEFORE YOU SUPPLY POWER to the A/C. UNWANTED ELECTRICAL POWER CAN BE DANGEROUS.

STUDENT NOTES

HF TRANSCEIVER

FIN/ZONE
FIN: 1RE1, 1RE2
ZONE: 121, 122

COMPONENT DESCRIPTION
The FRONT FACE of the HF TRANSCEIVER FEATURES:
- A TRANSPORTATION HANDLE
- An IDENTIFICATION PLATE
- A SQUELCH/LAMP TEST PUSHBUTTON
- 2 JACKS for PHONE and MIC and 3 RED WARNING LEDs for FAILURE INDICATION.

IN SITU TEST
CORRECT OPERATION of the TRANSCEIVER CAN BE CHECKED with the RED LEDS on its FACE:
- LRU FAIL: if OUTPUT POWER DROPS, MICROPROCESSOR or SYNTHESIZER FAILS.
- KEY INTERLOCK: with COUPLER FAILURE, EXCESSIVE TUNING TIME or ANTENNA REACTANCE.
- CONTROL INPUT FAIL: with ABSENCE of LABEL, INSUFFICIENT REFRESH RATE or MESSAGE not VALID.
- SQL/LAMP TEST: When PRESSED, all the RED LEDS COME ON and the SQUELCH is DISABLED(BACKGROUND NOISE is HEARD in the HEADSET).

REMOVAL/INSTALLATION
NO SPECIFIC TOOLS ARE REQUIRED for REMOVAL/INSTALLATION of the HF TRANSCEIVER.

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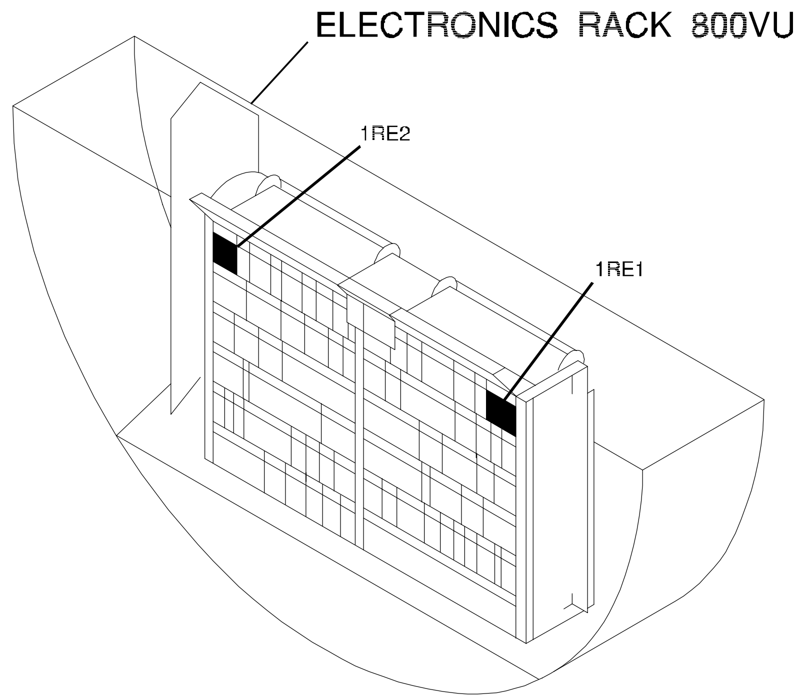
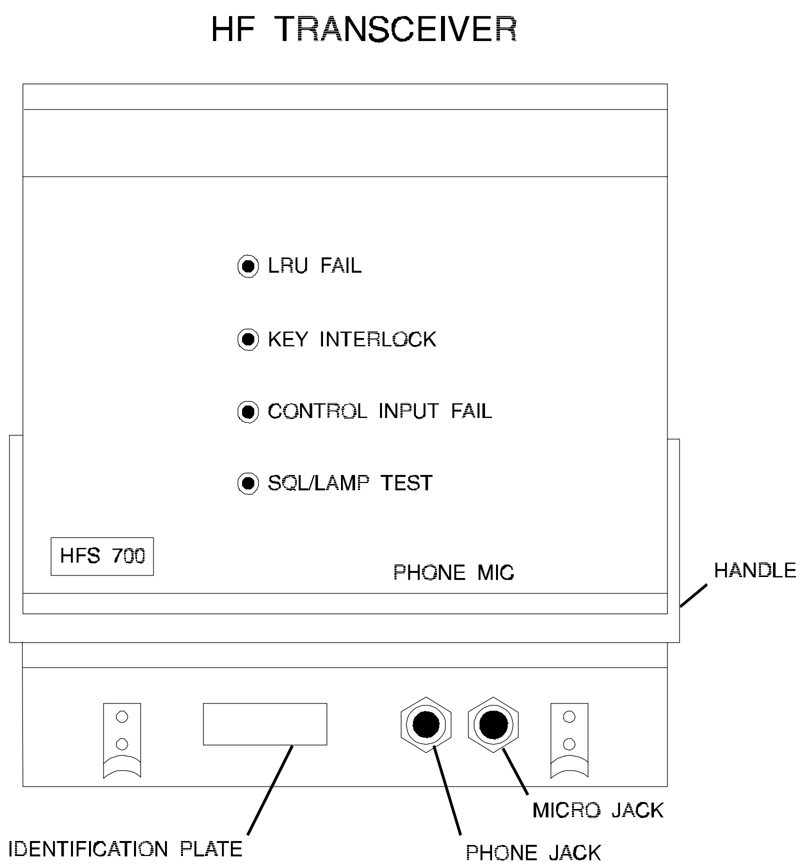




FQW4200 GE Metric

HF COUPLER

FIN/ZONE

FIN: 3RE1, 3RE2

ZONE: 323

COMPONENT DESCRIPTION

The HF COUPLER is a PRESSURIZED SEALED BOX. The front face features:

- A CONNECTOR J1 for connection with the TRANSCEIVER
- A COAXIAL CONNECTOR J2 for connection to the TRANSCEIVER
- A CONNECTOR J3 for test equipment connection
- A PRESSURIZING VALVE
- A FAULT WARNING LIGHT
- An IDENTIFICATION PLATE

IN SITU TEST

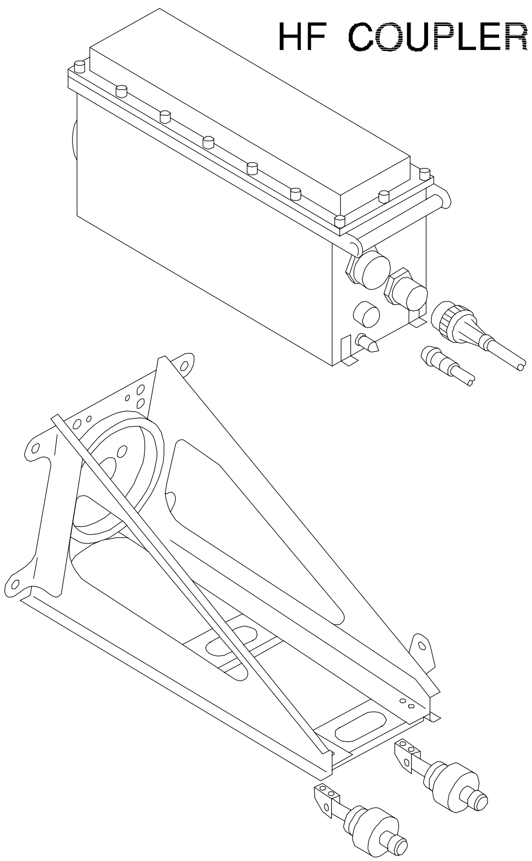
NO IN SITU TEST is POSSIBLE. BUT, for CORRECT OPERATION, the HF ANTENNA COUPLER CAN BE CHECKED by MEANS of the FAULT WARNING LIGHT on its FACE.

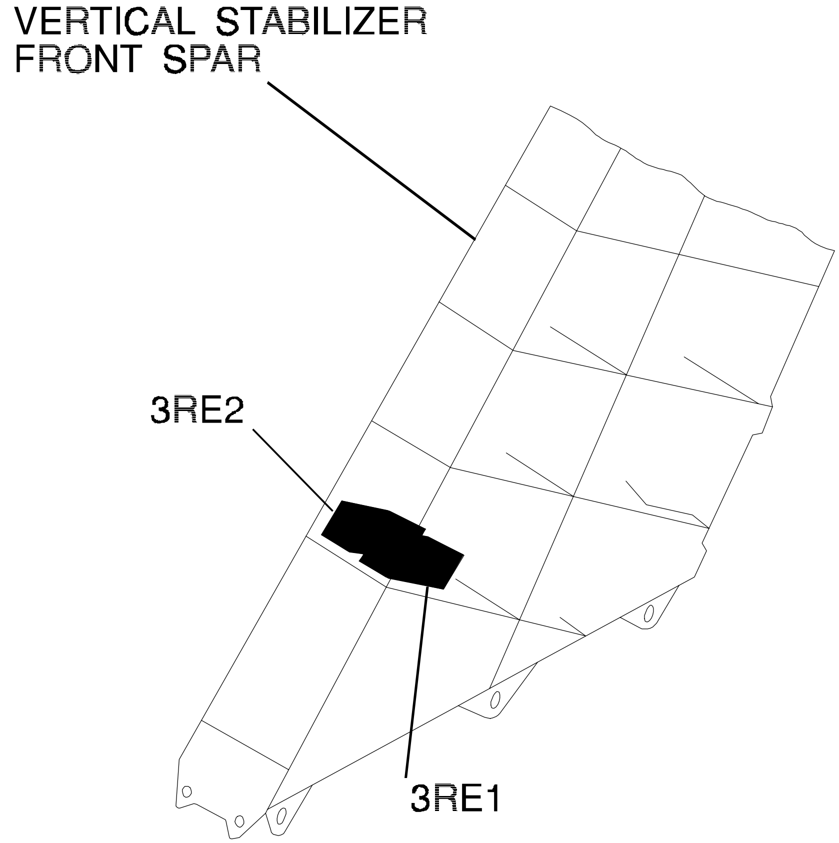
REMOVAL/INSTALLATION

NO SPECIFIC TOOLS are REQUIRED for the COUPLER REMOVAL/INSTALLATION.

SAFETY PRECAUTIONS

PUT the WARNING NOTICES in the COCKPIT to TELL PERSONS NOT TO OPERATE the FLIGHT CONTROLS DURING REMOVAL/INSTALLATION of the HF COUPLER.





FQW4200 GE Metric

HF ANTENNA

FIN/ZONE

FIN: 6RE
ZONE: 322

COMPONENT DESCRIPTION

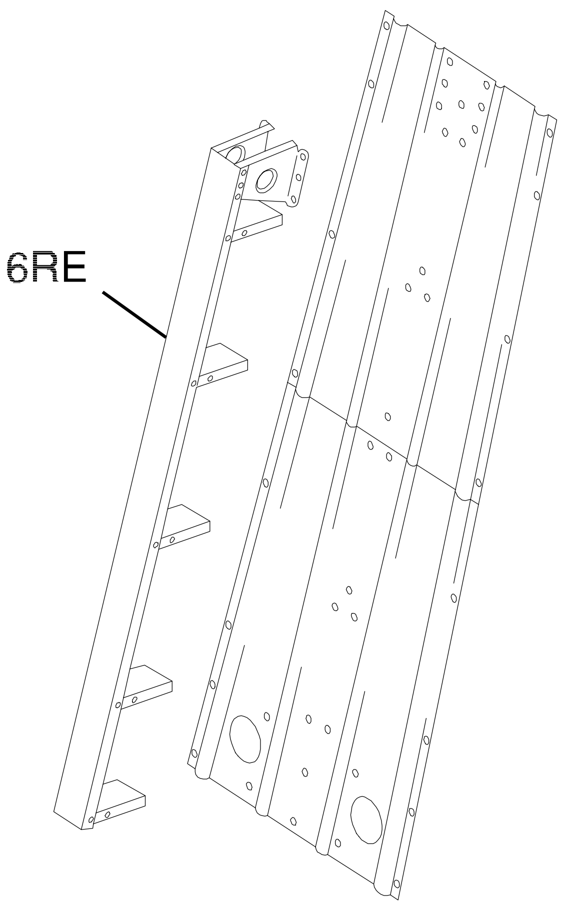
The HF ANTENNA is a STRUCTURAL SHUNT-TYPE ANTENNA integrated inside the lower part of the VERTICAL STABILIZER LEADING EDGE.

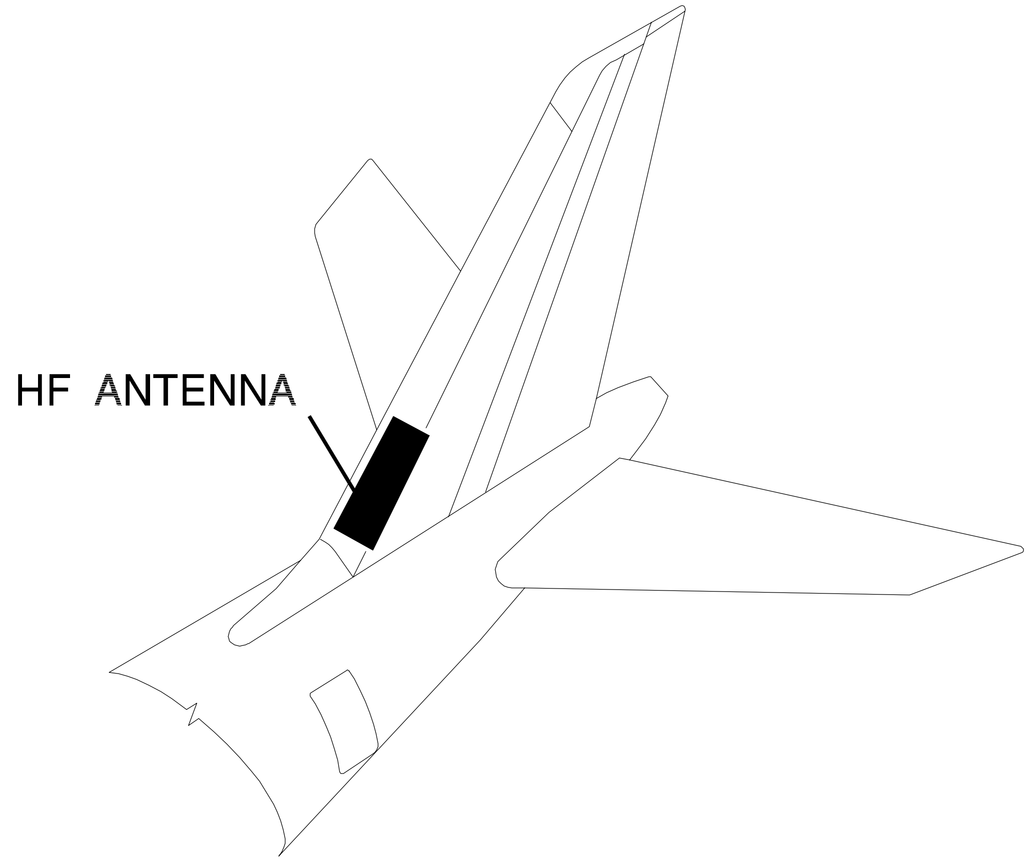
REMOVAL/INSTALLATION

NO SPECIFIC TOOLS ARE REQUIRED for the REMOVAL/INSTALLATION of the HF ANTENNA. SPECIAL and DANGEROUS MATERIALS are REQUIRED for the INSTALLATION of the HF ANTENNA.

SAFETY PRECAUTIONS

PUT the WARNING NOTICES in the COCKPIT to TELL PERSONS not to OPERATE the FLIGHT CONTROLS DURING REMOVAL/INSTALLATION of the HF ANTENNA.
SPECIAL MATERIAL is USED for the INSTALLATION of the HF ANTENNA: OBEY the MANUFACTURER’S INSTRUCTIONS, THIS MATERIAL is DANGEROUS.





FQW4200 GE Metric

VHF TRANSCEIVER

FIN/ZONE

FIN: 1RC1, 1RC2, 1RC3
ZONE: 121, 122, 123,

COMPONENT DESCRIPTION

The FRONT FACE features:

- Two JACKS (PHONE/MIC)
- a SQUELCH/TEST pushbutton switch
- a TRANSPORTATION HANDLE
- an IDENTIFICATION PLATE and LED INDICATORS for STATUS INDICATION.

IN SITU TEST

CORRECT OPERATION of the TRANSCEIVER is CHECKED by means of the various LEDS on the front FACE.
When the SQ/TEST pushbutton is PRESSED:

- The SQUELCH is disabled (background noise is heard in the headset).
- The COM(red & green) and the DATA IN(red) LEDS come on (for 3 seconds approximately).

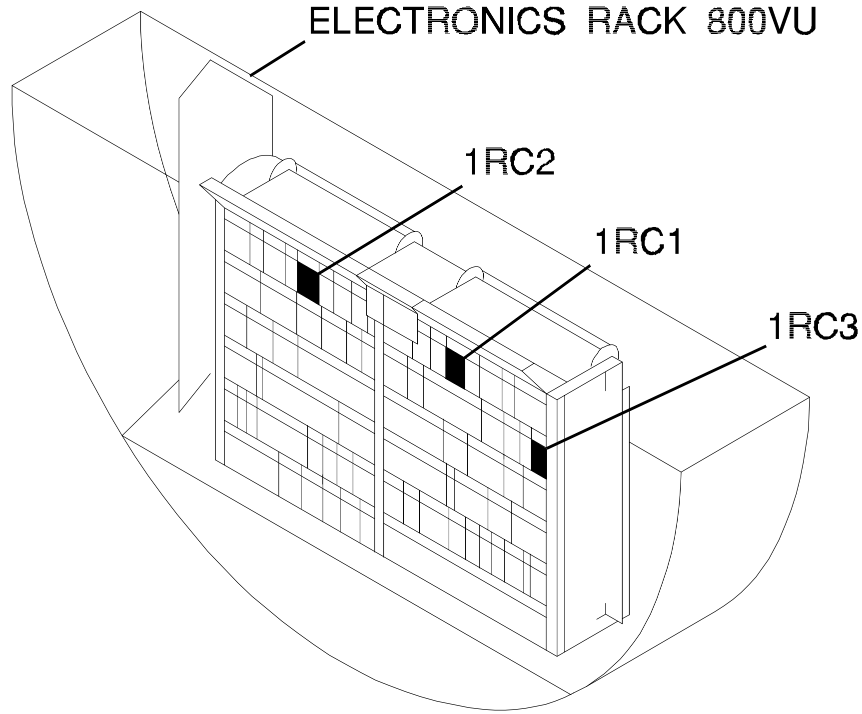
When the SQ/TEST pushbutton is released:

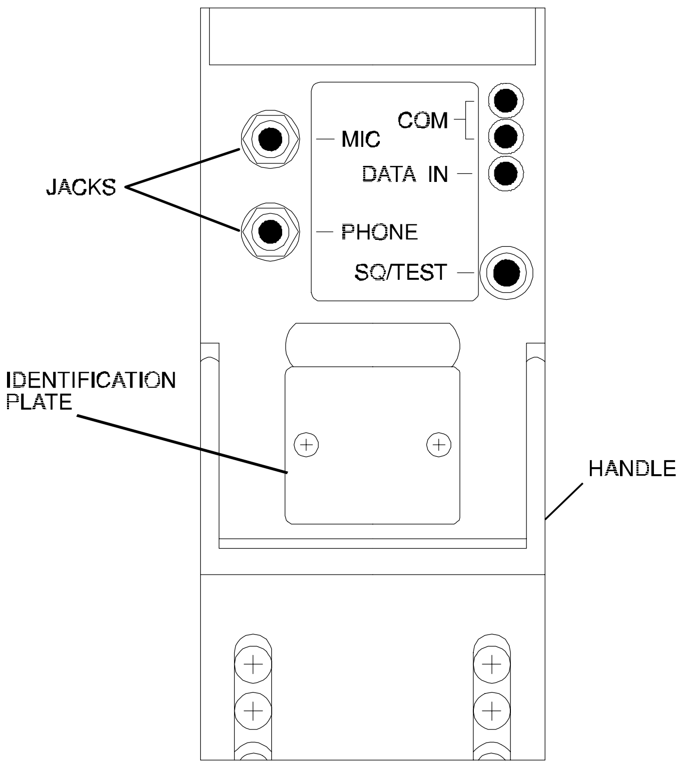
ALL the LEDS GO OFF and the TEST is PERFORMED (3 seconds approximately).

When the TEST is COMPLETED, the LEDS will COME ON ACCORDING to the result.

REMOVAL/INSTALLATION

NO SPECIFIC TOOLS are REQUIRED for the REMOVAL/INSTALLATION of the VHF XCVR.





VHF TRANSCEIVER

FQW4200 GE Metric

VHF ANTENNA

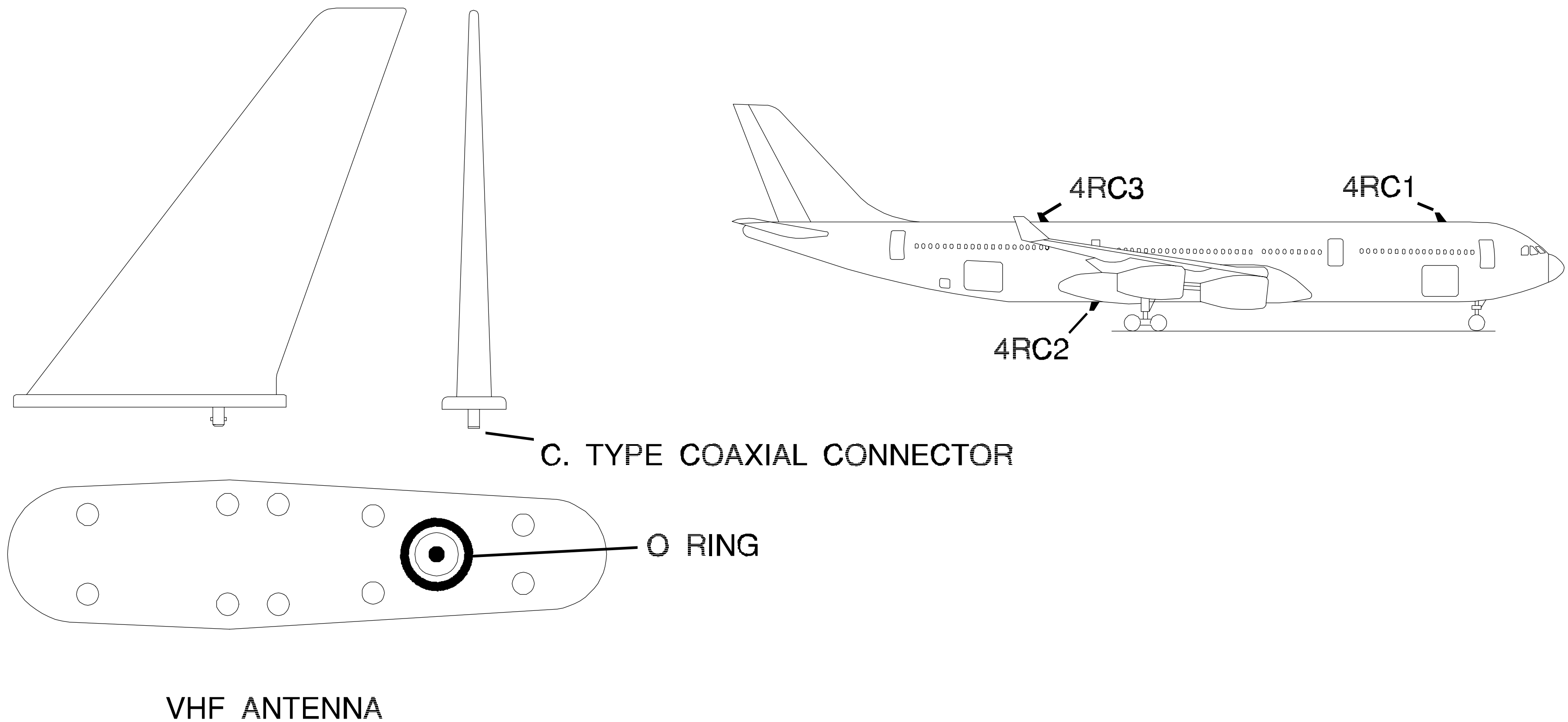
FIN/ZONE
FIN: 4RC1, 4RC2, 4RC3
ZONE: 230, 150, 260

COMPONENT DESCRIPTION
The VHF ANTENNA is a WHITE BLADE ANTENNA.
This ANTENNA is composed of:
- an ALUMINIUM BASE PLATE
- a LAMINATED RADOME
- a DURALINOX LEADING EDGE
- a C-TYPE COAXIAL CONNECTOR SURROUNDED by a SEAL

REMOVAL/INSTALLATION
NO SPECIFIC TOOLS ARE REQUIRED for the REMOVAL/INSTALLATION of the VHF ANTENNA.

NOTE: ON REMOVAL, MAKE SURE the COAXIAL CONNECTOR DOES NOT GO BACK INTO the FUSELAGE.

SAFETY PRECAUTIONS
WARNING: SPECIFIC and DANGEROUS MATERIALS are USED for the INSTALLATION of the VHF ANTENNA.
OBEY the MANUFACTURER'S INSTRUCTIONS WHEN YOU USE the SPECIAL MATERIALS: THESE MATERIALS ARE DANGEROUS.



FQW4200 GE Metric

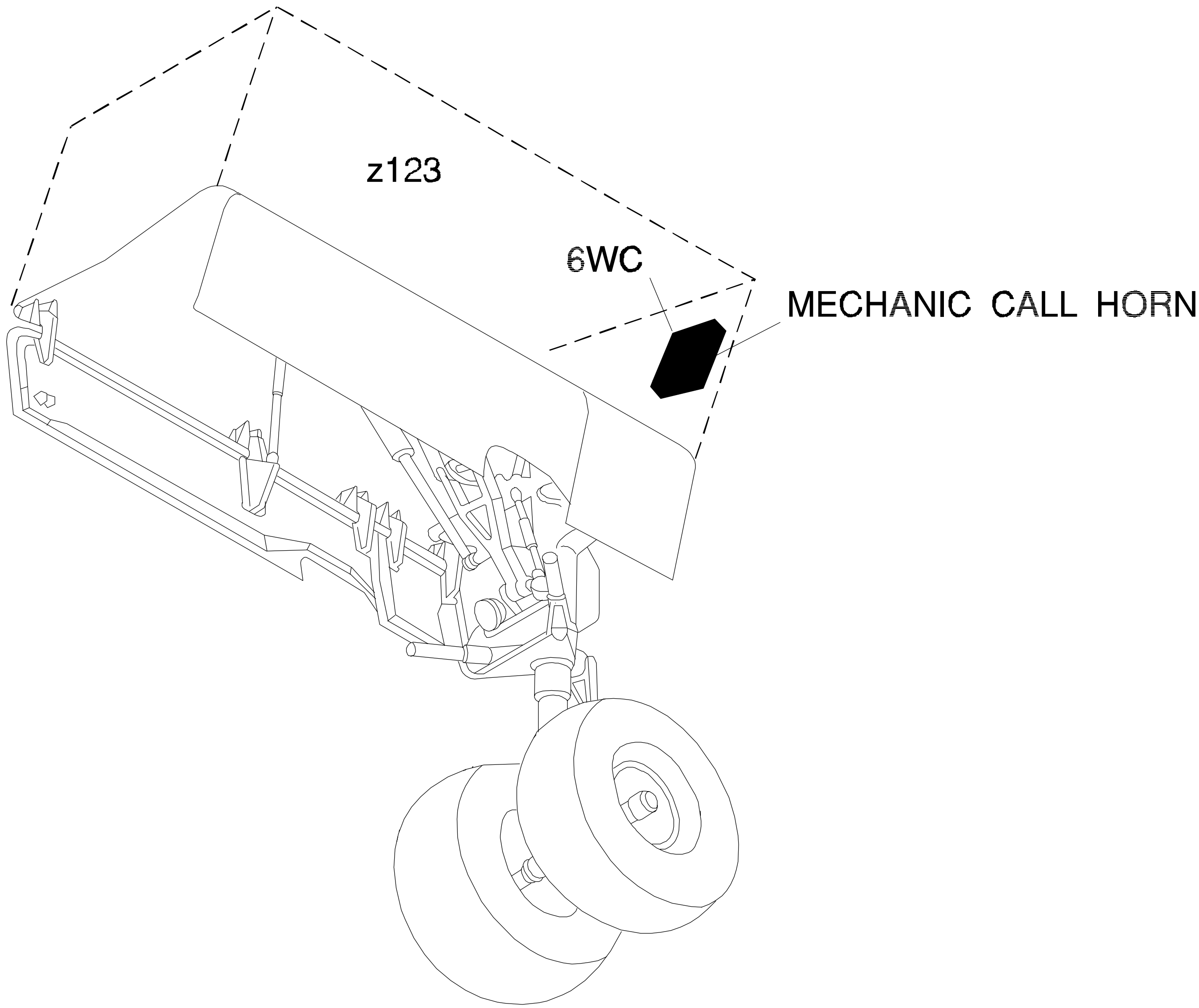
MECHANIC CALL HORN

FIN/ZONE
FIN: 6WC
ZONE: 123

IN SITU TEST
On the PANEL 211VU: PUSH the CALLS/MECH pushbutton switch and RELEASE it: The HORN in the NOSE GEAR WELL MUST OPERATE as LONG as YOU PUSH the CALLS/MECH pushbutton switch.

REMOVAL/INSTALLATION
NO SPECIFIC TOOLS ARE REQUIRED for the REMOVAL/ INSTALLATION of the MECHANIC CALL HORN.

SAFETY PRECAUTIONS
In the COCKPIT, on the PANEL 312VU: MAKE SURE THAT the WARNING NOTICE is INSTALLED to TELL PERSONS NOT TO OPERATE the LANDING GEAR.



FQW4200 GE Metric

AMU

FIN/ZONE

FIN: 1RN

ZONE: 122

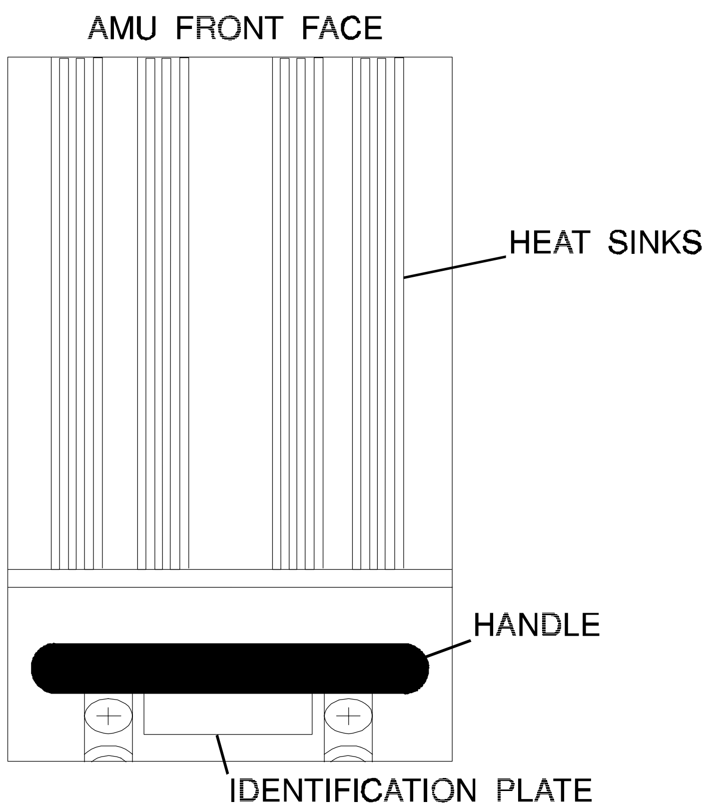
COMPONENT DESCRIPTION

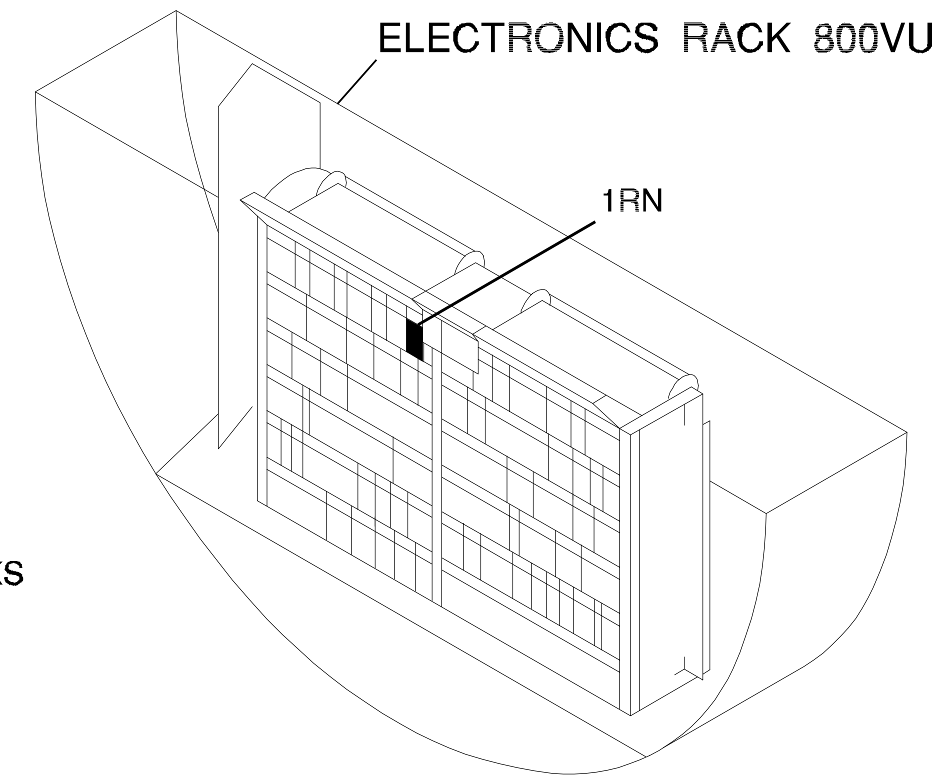
The FRONT FACE FEATURES:

- HEAT SINKS for DISSIPATION of the HEAT for the AMPLIFIER CARDS and an IDENTIFICATION PLATE.

REMOVAL/INSTALLATION

NO SPECIFIC TOOLS ARE REQUIRED for the REMOVAL/INSTALLATION of the AMU.

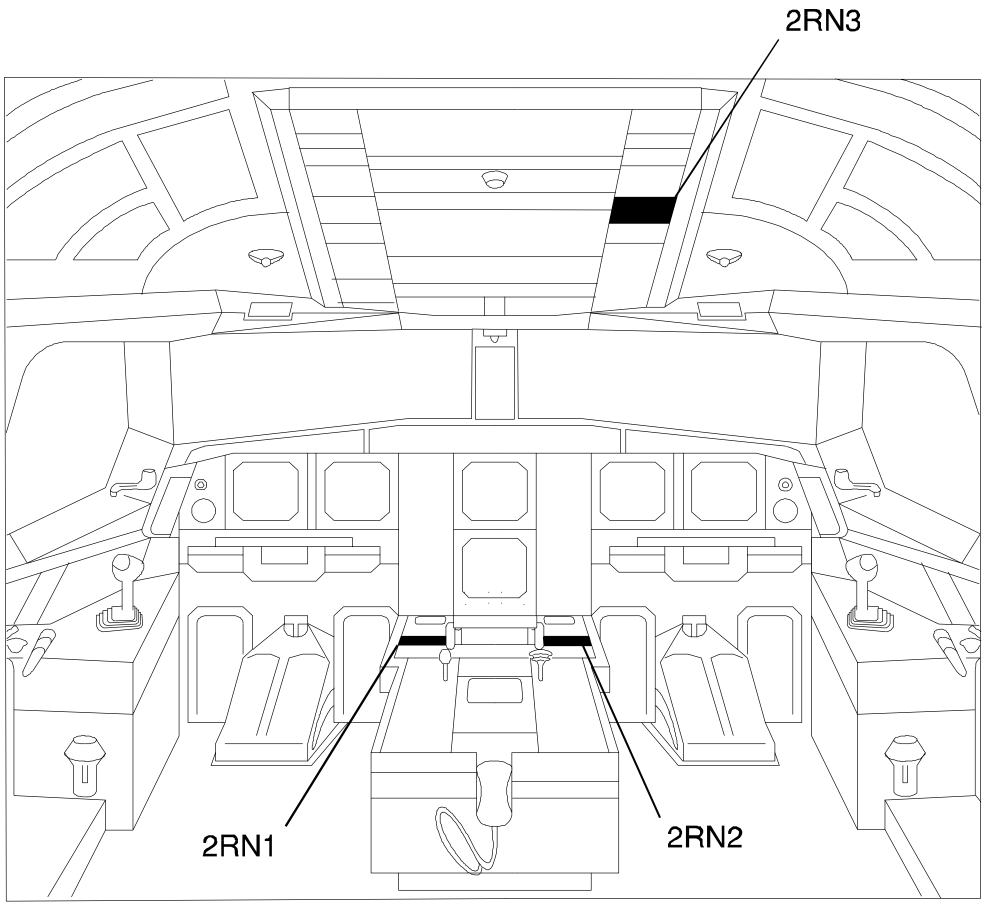


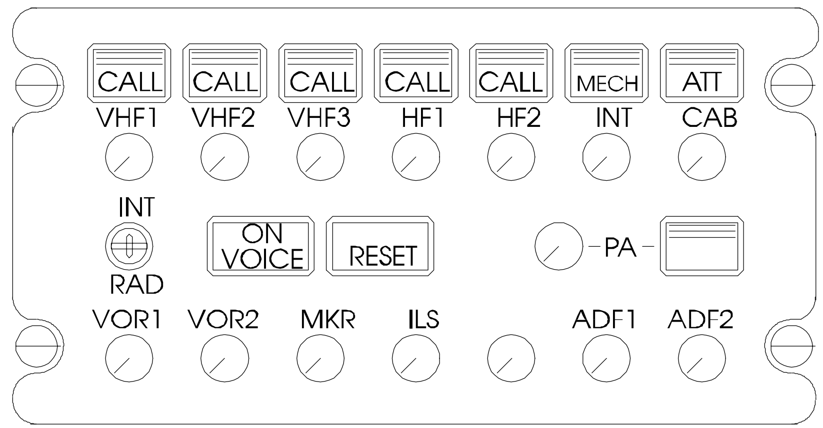


FQW4200 GE Metric

ACP

FIN/ZONE
FIN: 2RN1, 2RN2, 2RN3
ZONE: 210, 210, 212





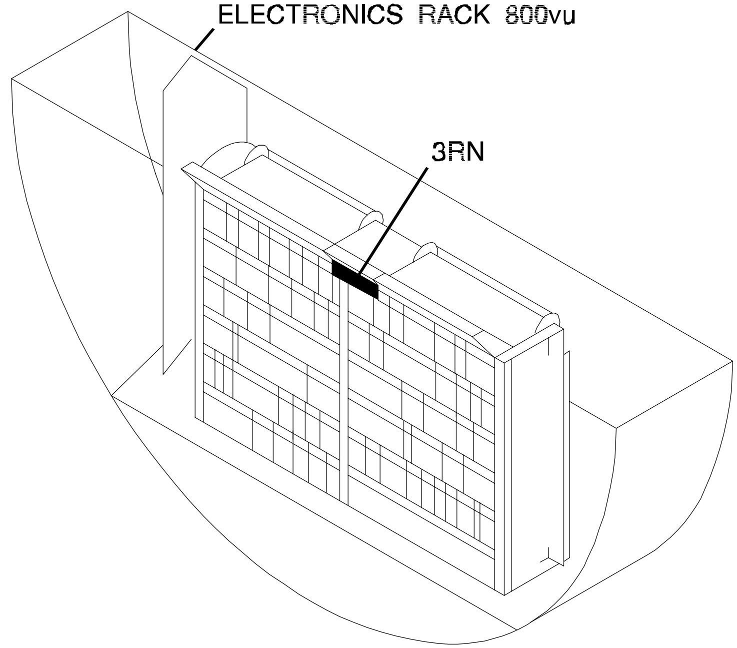
AUDIO CONTROL PANEL(ACP)

FQW4200 GE Metric

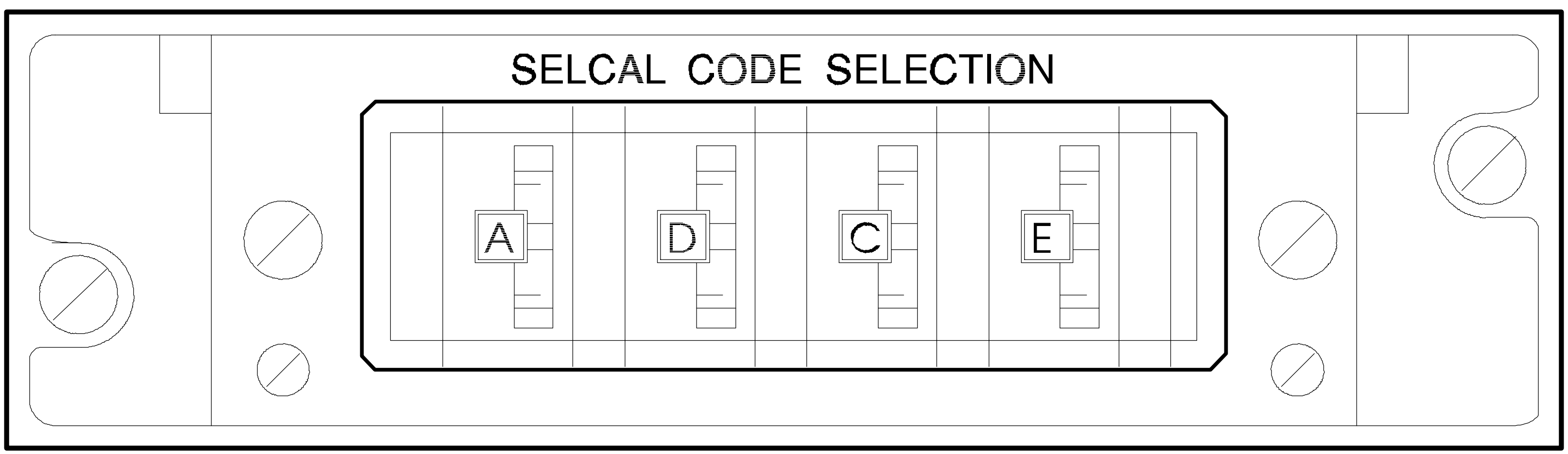
SELCAL CODE PANEL

FIN/ZONE
FIN: 3RN
ZONE: 122

COMPONENT DESCRIPTION
The FRONT FACE FEATURES:
- 4 THUMBWHEELS for the SELECTION of the CODE made up of 4 LETTERS.
- A PLEXIGLASS COVER over the THUMBWHEELS.



SELCAL CODE PANEL



FQW4200 GE Metric

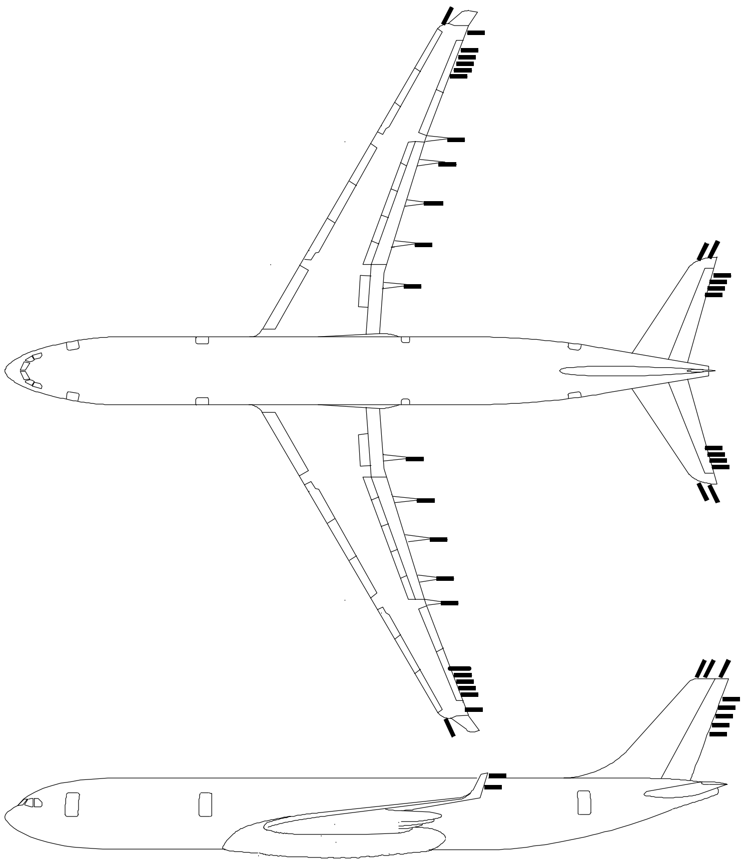
STATIC DISCHARGERS

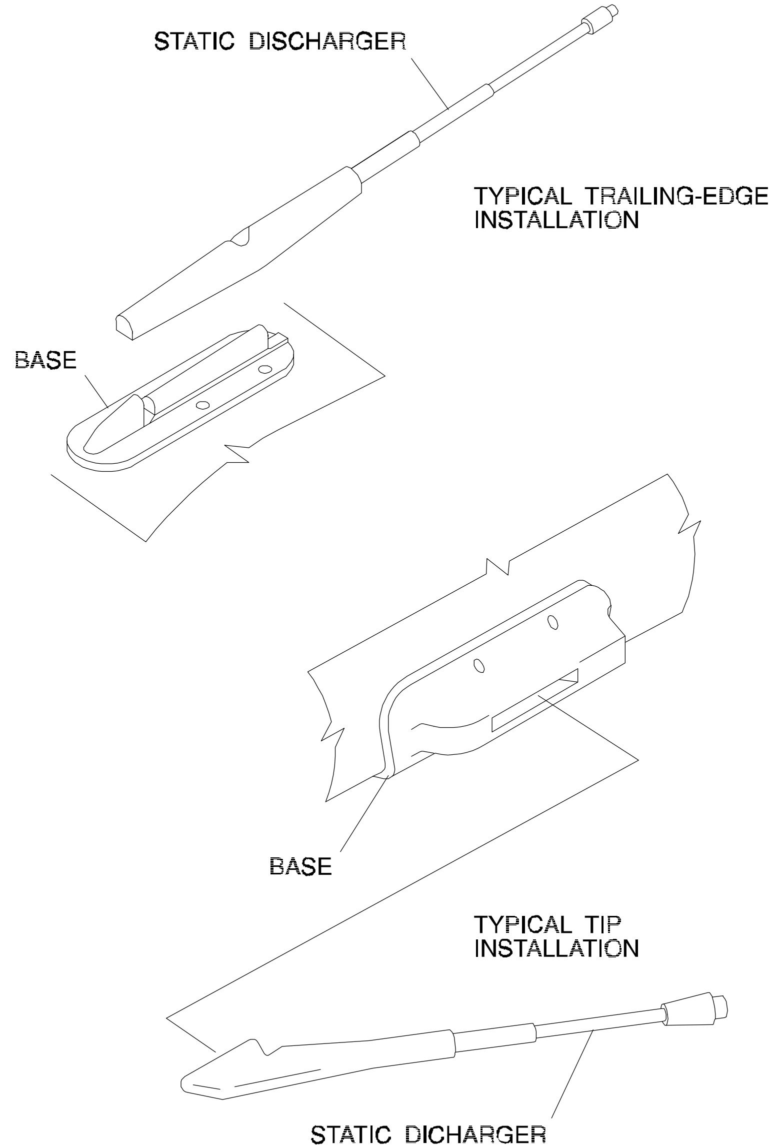
IN SITU TEST

DO a RESISTANCE TEST BETWEEN the STATIC DISCHARGER and the DISCHARGER BASE. REFER to the TASK 23-61-00-200-801.

SAFETY PRECAUTIONS

MAKE SURE that the WARNING NOTICES are in the COCKPIT to TELL PERSONS NOT TO OPERATE the APPLICABLE.CONTROLS.





FQW4200 GE Metric

RMP

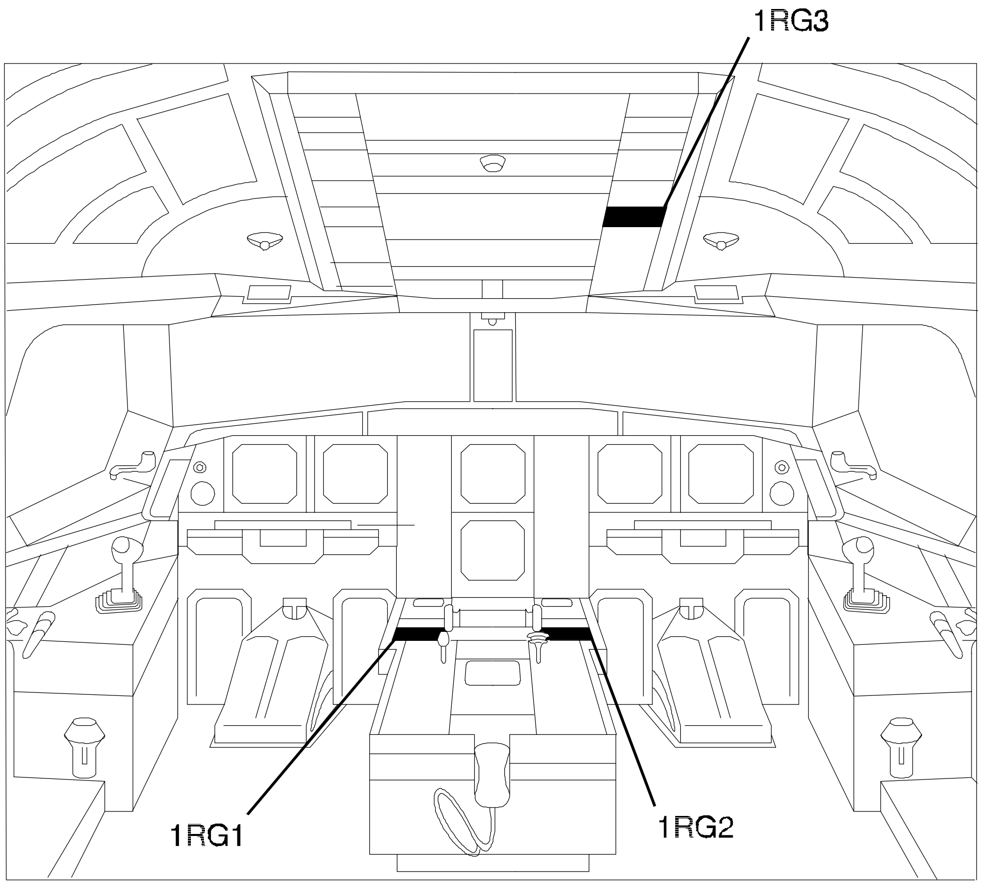
FIN/ZONE

FIN: 1RG1, 1RG2, 1RG3

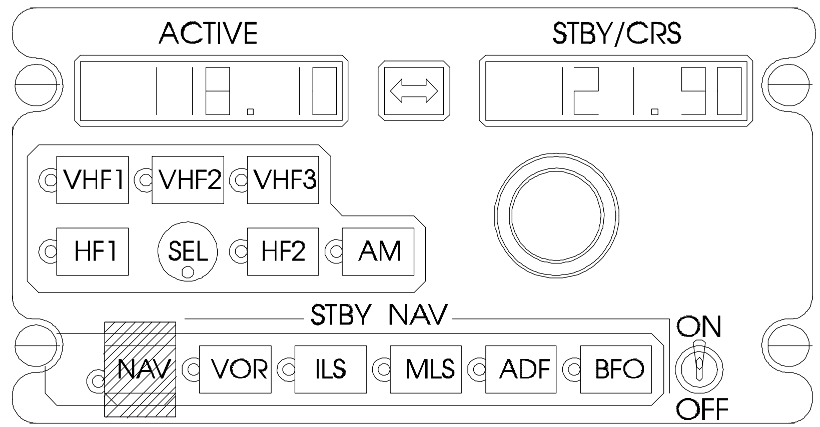
ZONE: 210

IN SITU TEST

NO IN SITU TEST is POSSIBLE. BUT, as an ALTERNATIVE PROCEDURE, you can do the RMP OPERATIONAL TEST(REFER to the AMM TASK 23-81-00-710-801).



RADIO MANAGEMENT PANEL(RMP)



FQW4200 GE Metric

STUDENT NOTES

CIDS DESIGN PHILOSOPHY

General
Functions
Director
Forward Attendant Panel (FAP)
Decoder Encoder Unit A (DEU A)
Decoder Encoder Unit B (DEU B)

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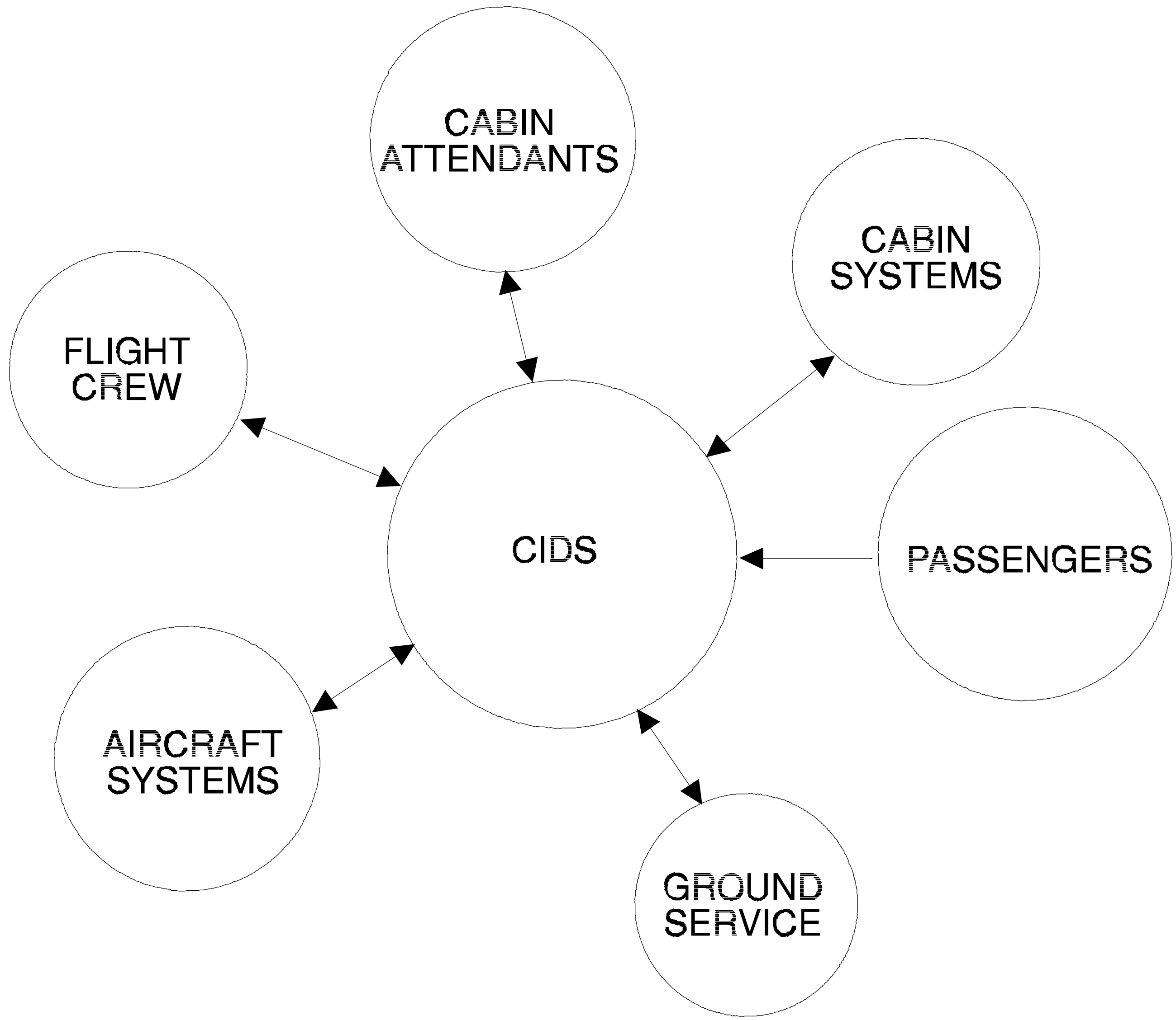
GENERAL

The CIDS is a microprocessor based system used to control, test and monitor the various cabin systems dedicated to Cabin Attendant and Passenger use.

The CIDS is also designed to provide a high flexibility for different airline demands : complex and time expensive hardware changes are not necessary.



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FUNCTIONS

The CIDS provides control, monitoring and data processing of various cabin systems through DATA BUS lines.

There are space provisions to connect the CIDS with additional functions and future systems.

DIRECTOR

The DIRECTORS are the major components of the CIDS.
They act as an interface between the aircraft and cabin systems and the cockpit controls and indicating in order to process the controls of the cabin systems.

The CIDS is provided with two identical DIRECTORS.
For accomplishment of their functions, the DIRECTORS use a predefined program stored in their memories.

FORWARD ATTENDANT PANEL

The Forward Attendant Panel (FAP) is installed at the Forward Attendant Station.
From the FAP, the various cabin systems can be controlled and monitored.

The Cabin Assignment Module (CAM) is part of the Forward Attendant Panel (FAP).
The CAM is plugged into the FAP.
It stores all the cabin layout and programmable information used by the DIRECTORS.

The Programming and Indication Module (PIM) is used for cabin system indications and cabin programming operations.

The Programming and Indication Module (PIM) is used for programming or cabin system status monitoring.
It is equipped with a full coloured graphic Liquid Crystal Display (LCD) and a standard keyboard.

DECODER ENCODER UNIT A (DEU A)

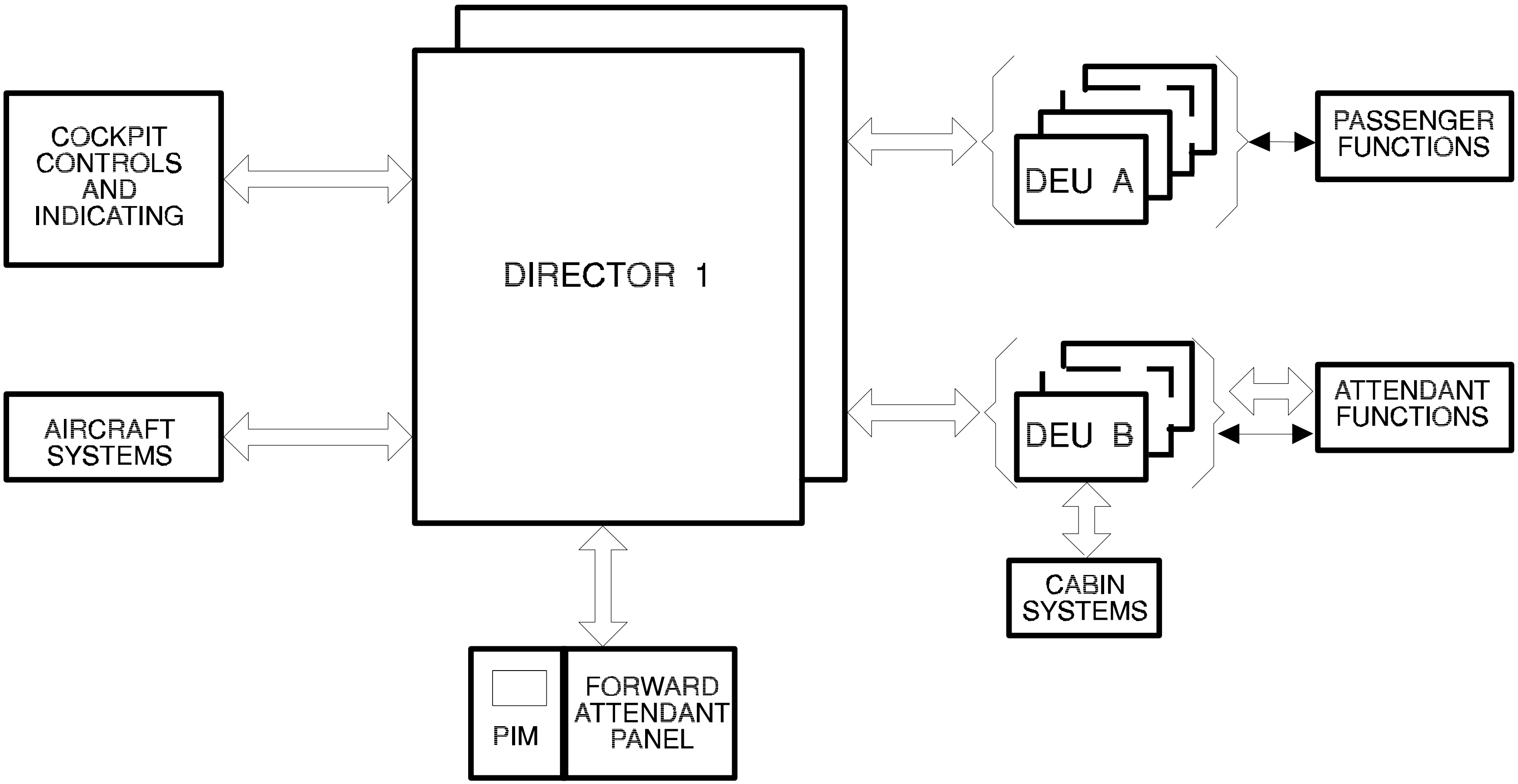
Decoder Encoder Unit A (DEU A) is a component of the CIDS.
It provides an interface between the DIRECTORS and the cabin systems dedicated to passenger use.

The type A DEUs are connected to the DIRECTORS through DATA BUS lines.
The digital information, transmitted by the DIRECTORS to the DEUs A, are converted into analog and discrete signals.
The analog and discrete signals, received from the cabin systems and transmitted to the DIRECTORS by the DEUs A, are converted into digital information.

DECODER ENCODER UNIT B (DEU B)

Decoder Encoder Unit B (DEU B) is a component of the CIDS.
It provides an interface between the DIRECTORS and the cabin systems dedicated to Cabin Attendant use.

The type B DEUs are connected to the DIRECTORS through DATA BUS lines.
The digital information, transmitted by the DIRECTORS to the DEUs B, are converted into analog, discrete and RS 232 signals by the DEUs B.
The analog, discrete and RS 232 signals, received from the cabin systems and transmitted to the DIRECTORS are converted into digital information.



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STUDENT NOTES:

CIDS PRESENTATION

DIRECTORS

The DIRECTORS form the heart of the CIDS.
Their purpose and functions are to control and to act as an interface between the systems and equipment, integrated or connected to the CIDS, and the Flight Crew, the Cabin Attendants and the Passengers.
The DIRECTORS provide easy and quick system reconfiguration for installation of options, CIDS expansion or major cabin modifications through software changes.

To accomplish their functions, the DIRECTORS use predefined programs stored in their memories.
The software is stored on a removable memory module, the ON-BOARD REPROGRAMMING MEMORY MODULE (OBRM), plugged into the front face of the DIRECTORS.
The DIRECTORS are each equipped with identical OBRMs.

COCKPIT CONTROLS AND INDICATING

From the cockpit, the Flight Crew can control some cabin systems or equipment used for the CALL, EVACuation or INFOrmation SIGNS.

The Passenger Address HANDSET can be used by the crew to communicate with the passengers.
The SERVICE INTERPHONE OVERRIDE is only used on ground, when the aircraft is on jacks, to connect the cockpit and cabin with the ground service jacks.

AIRCRAFT (A/C) & CABIN SYSTEM

Various types of aircraft system information are used by the DIRECTORS to activate, deactivate or monitor functions in the cabin.

These functions are controlled or monitored by the Cabin Attendants through the FORWARD ATTENDANT PANEL (FAP) and ADDITIONAL ATTENDANT PANELS (AAPs).

FORWARD ATTENDANT PANEL (FAP)

The FORWARD ATTENDANT PANEL (FAP) is used by the Cabin Attendants for the control and monitoring of the various cabin systems.

The FORWARD ATTENDANT PANEL (FAP) is divided in three modules :

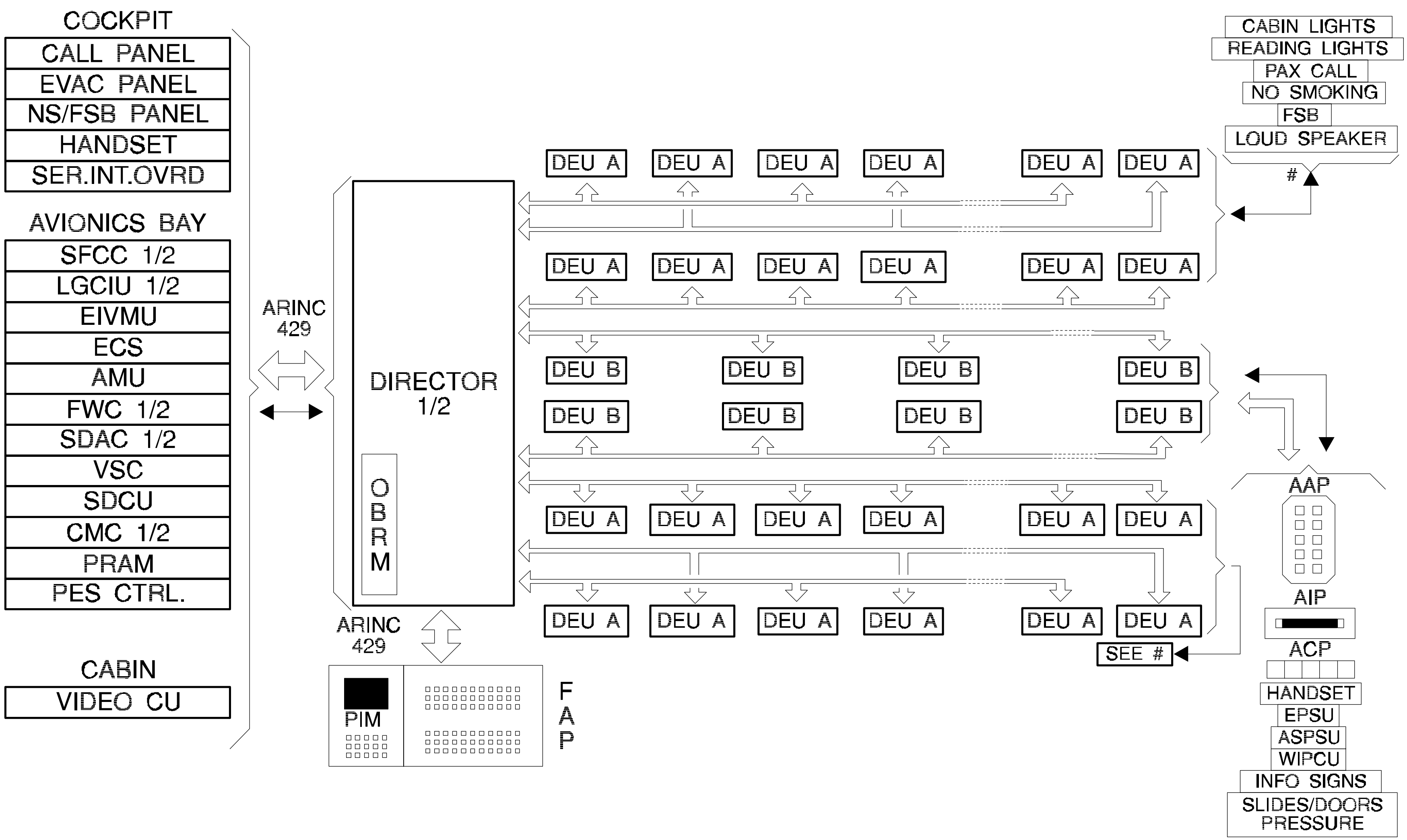
On the right :
Keys for controlling the Lights, the Boarding Music and various Cabin systems, such as EVACuation or LAVatory SMOKE.

On the left :
The PROGRAMMING and INDICATION MODULE (PIM) for systems status monitoring and cabin modification programming.

And integrated in the FAP, behind the front face of the FAP :
A plugged-in memory module, the CABIN ASSIGNMENT MODULE (CAM).

The CABIN ASSIGNMENT MODULE (CAM) defines all the modifiable system properties and cabin layout information.

e.g :
It defines whether chimes accompany Passenger announcements or whether the loudspeakers are to be used for Attendant or PAX announcements.



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DEU A

The type A DEUs act as an interface between the DIRECTORS and the Passenger System Units.
The type A DEUs are connected to the DIRECTORS through six HIGH SPEED TOP LINE DATA BUSES.
All the type A DEUs are addressable units.

The type A DEUs interface with the Passenger equipment through discrete and analog lines.
The Passenger equipment includes the loudspeakers, the PAX lighted signs, the PAX-CALL buttons and lights, the PAX reading lights and the general cabin illumination ballast units.

DEU B

The type B DEUs act as an interface between the DIRECTORS and the Cabin Attendant systems.
The type B DEUs are connected to the DIRECTORS through two HIGH SPEED MIDDLE LINE DATA BUSES.
All the type B DEUs are addressable units.

The type B DEUs interface with the CABIN CREW equipment through RS232 buses and analog and discrete lines.
The Cabin Attendant equipment includes Additional Attendant, Area Call and Attendant Indication Panels, Handsets, Info signs, Slide/Door pressure sensors, Emergency and Autonomus Standby Power Supply Units and Water Ice Protection Control Unit.

STUDENT NOTES:

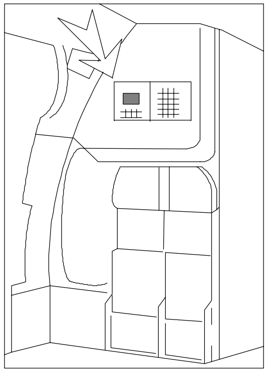
STUDENT NOTES

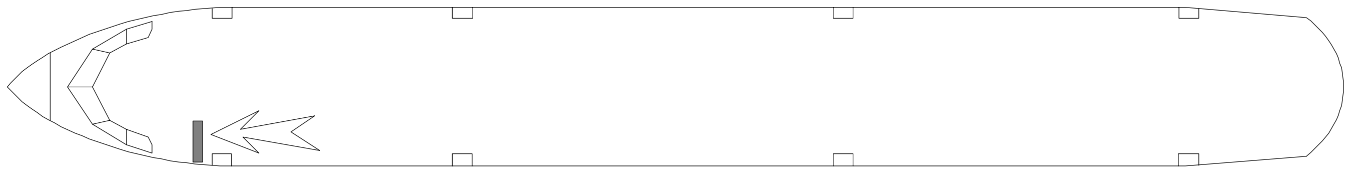
FAP PRESENTATION

General
Light Module
Music Module
Miscellaneous Module
Programming and Indication Module

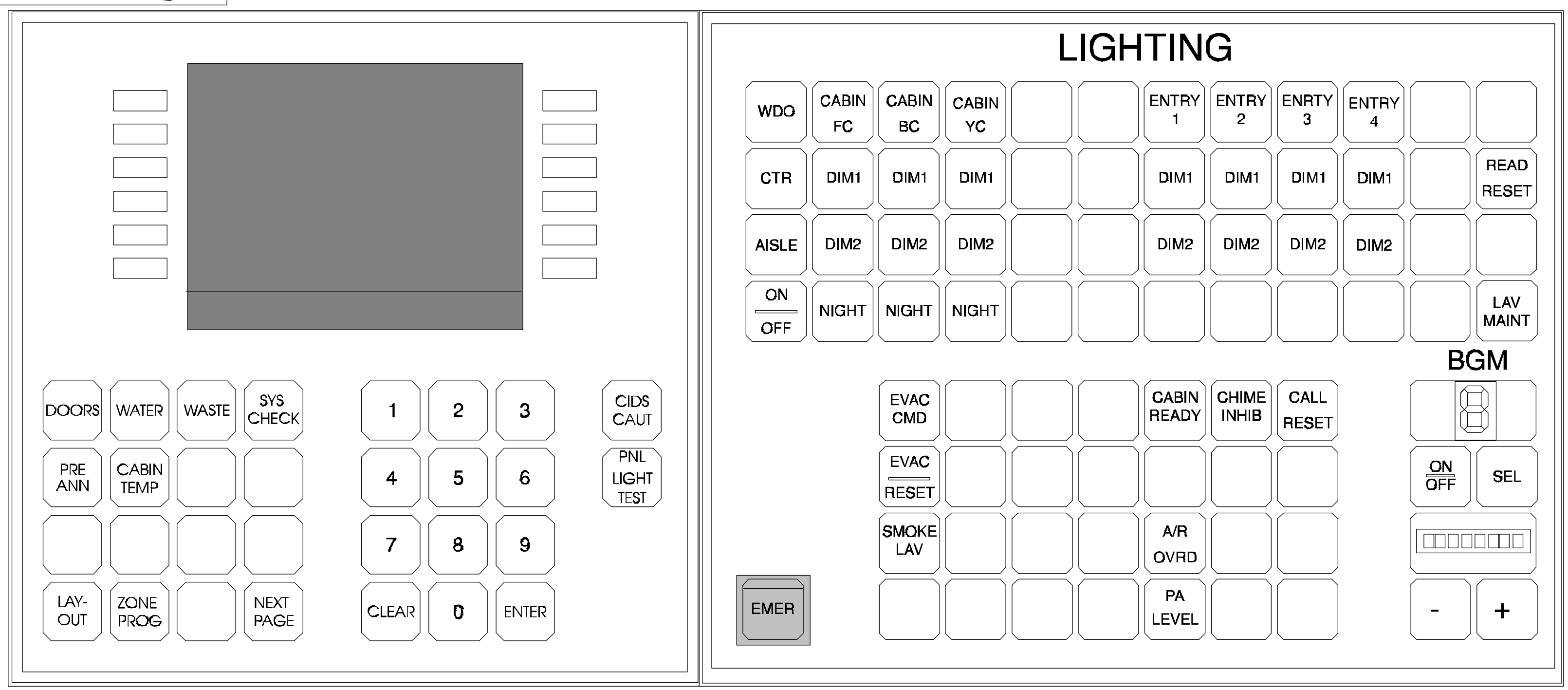
GENERAL

The Forward Attendant Panel (FAP) is installed at the Forward Attendant Station. From the FAP, the Cabin Attendants can control various cabin systems and visualize the status of the systems.
The Programming and Indication Module (PIM), on the left side, is used by the Cabin Attendants for systems status indications and programming operations.
The FAP is equipped with a plug in memory cassette, the Cabin Assignment Module (CAM), located behind the front face panel. The CAM is a programmable memory and contains the system properties and cabin layout configuration data.





Forward Attendant Panel (FAP)



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LIGHT MODULE

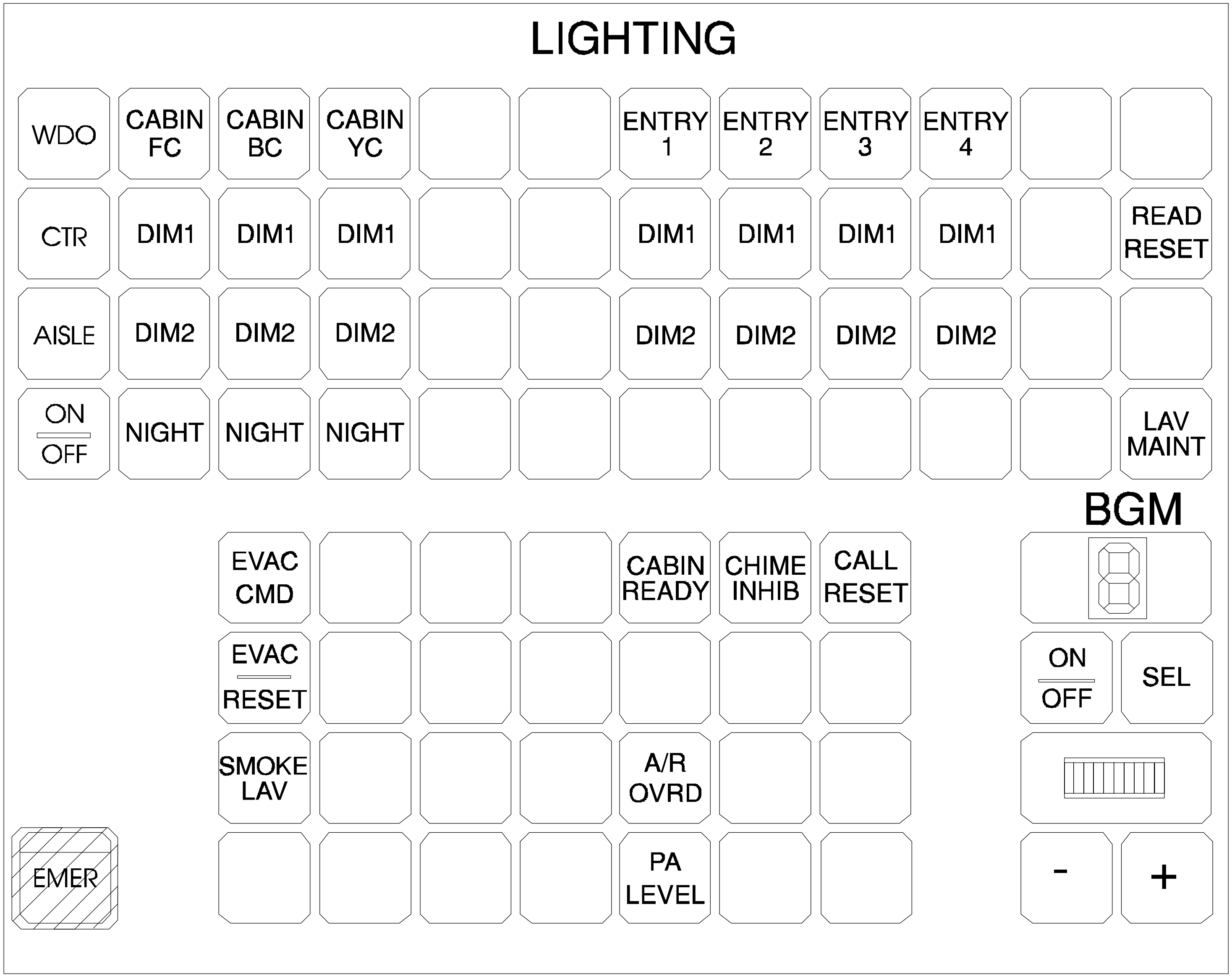
From the FAP, the Cabin Attendants can control all the cabin lights. At power up, the FAP is automatically switched on and all the cabin lights come on at full brightness.
When all the lights are off, the selection of DIM1/2, CABIN or ENTRY key is directly possible without pressing the ON key first. The ON/OFF key is used to switch the FAP off or on, after power up.
The READ RESET key is used to re-initialize all the passenger reading lights integrated in the Passenger Service Units (PSUs).
For servicing purposes, when the LAVatory MAINTenance key is pressed, the lavatory light comes on at full brightness.

MUSIC MODULE

The lower part of the FAP features a MUSIC module, for selecting the channel and adjusting the volume of the Boarding Music System.

MISCELLANEOUS MODULE

The lower part of the FAP features a MISCELLANEOUS module for controlling various cabin systems:
The EVACUATION COMMAND key activates or deactivates aural and visual signals in the cabin and cockpit for the initialization of the evacuation process.
Activating the EVAC CMD key shall have different results depending on the position of the EVAC selector in the cockpit.
When the EVAC/ RESET pushbutton is pressed, the EVAC tone and indications on the Attendant Indication Panels (AIPs) and Area Call Panels (ACPs), in the assigned zone, are switched off.
The SMOKE LAVATORY key is used to warn the Cabin Attendants in case of smoke in a lavatory or in the crew rest compartment.
The SMOKE LAV key is switched on in steady or flashing mode, if assigned in the Cabin Assignement Module (CAM). Visual and aural indications in the cabin are reset by pressing the SMOKE LAV key. The flashing or steady light of the SMOKE LAV key is activated as long as the smoke signal is transmitted to the Directors.
The CALL RESET key is used to reset the activated call indications in the zone associated to the FAP.
When the CHIME INHIB key is pressed, the chime signal broadcast in the cabin zone, assigned to the call, is inhibited.
When the CABIN READY key is pressed, the cockpit is informed that the cabin is ready for departure. As an option, a message is displayed on ECAM.
The AUDIO/REPRODUCER OVERRIDE key is used to stop the Passenger Entertainement and Music System for Passenger Address annoucements in the cabin.
The PASSENGER ADDRESS LEVEL key is used to increase the passenger announcement level in the cabin.
The EMERGENCY guarded pushbutton is used for switching the emergency lighting system on and off.



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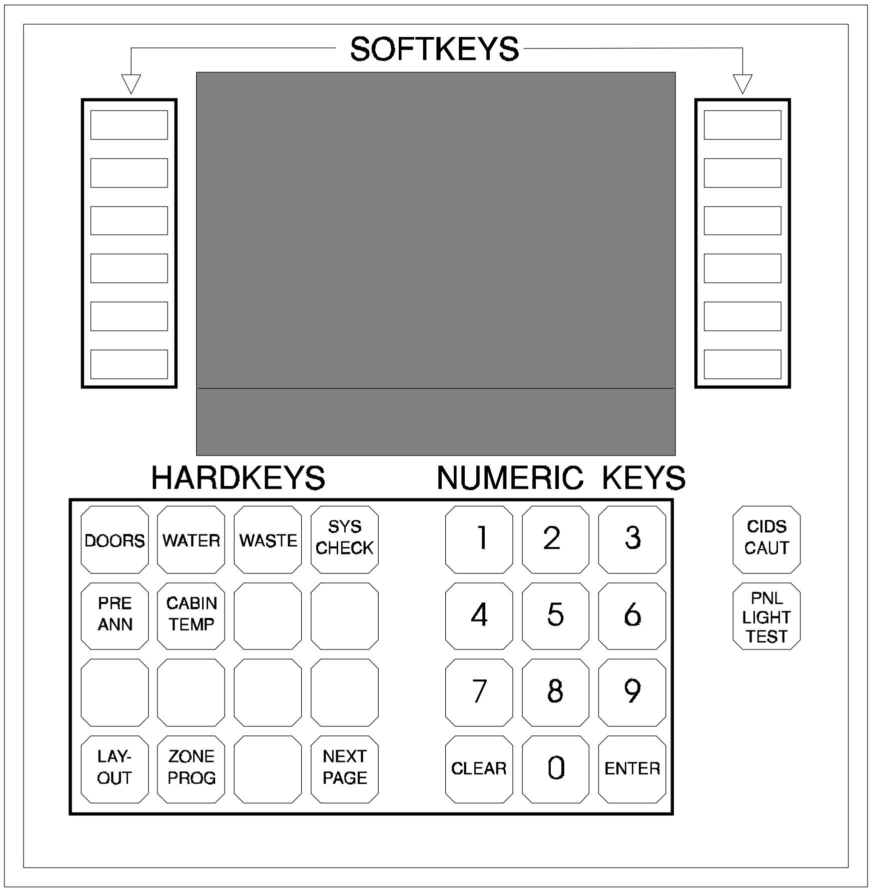
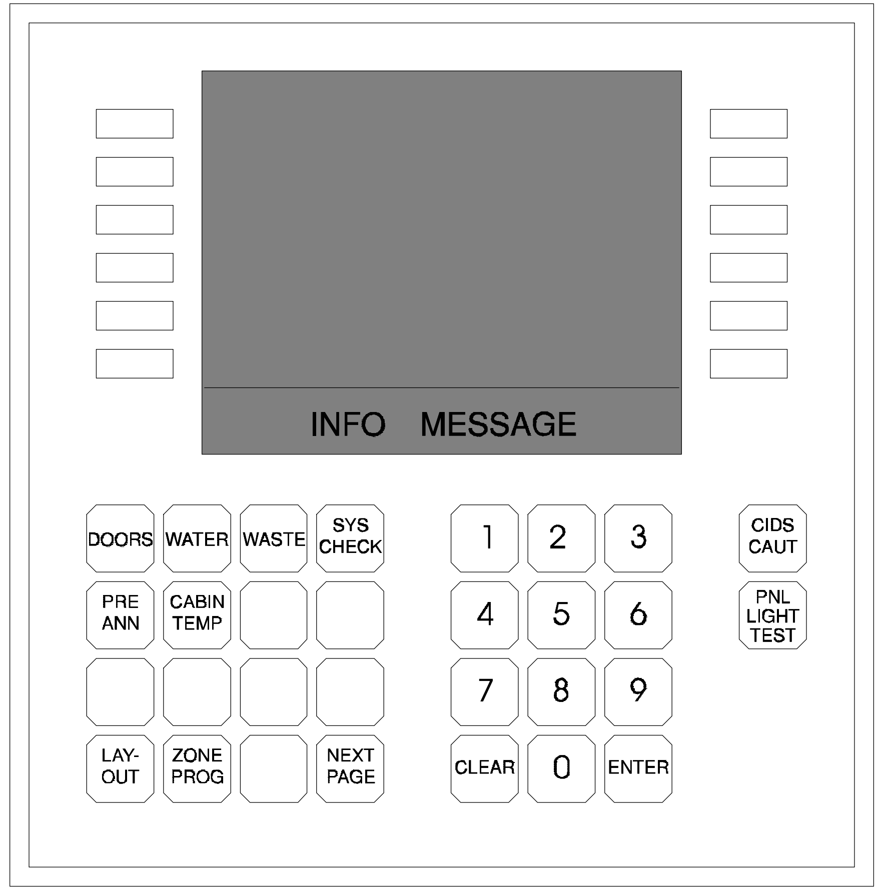
PROGRAMMING AND INDICATION MODULE

The Programming and Indication Module (PIM) is used for cabin system status indications and cabin programming operations.
12 SOFTKEYS are attached to the PIM display for menu guided operations :
- 6 on the right
- 6 on the left

The PIM has a standard keyboard with 12 pushbuttons, to allow numeric inputs to the system. Additionally the PIM is equipped with "hardkeys" to achieve direct access to the respective menus:
- DOORS (Status, Bottle and Slide bottle pressure)
- WATER/WASTE indications
- SYSTEM CHECK mode for CIDS INTERNAL, WATER ICE PROTECTION, VACUUM LAV. and SMOKE DETECTORS.

The CIDS CAUTION Light comes on amber when a Cabin Attendant action is required, following a CIDS malfunction detection. The CIDS CAUTION Light (CCL) initiates an INFO message on the display.
The INFO message displayed on the PIM, initiates a failure message page. This failure message page is used in the DOORS/SLIDES or the SYSTEM CHECK modes. In flight, the CCL can be reset by pushing it. It comes on again in case of another failure or automatically after landing, if the failure still exists.
The PANEL LIGHT TEST key is used to test all the FAP lights.





FQW4200 GE Metric

STUDENT NOTES

ADDITIONAL ATTENDANT PANEL PRESENTATION

General
Light Control
EVAC CMD and EVAC RESET
CALL RESET and CHIME INHIB
SMOKE LAV

GENERAL

From the AAPs, the Cabin Attendants can control various cabin systems, in the same way as the Forward Attendant Panel (FAP). The location of the AAPs is function of the airline cabin zone layout.
The AAP front face layout is function of the cabin zone location and of the airline options. The basic version is provided with 2 AAPs.

LIGHT MODULE

At power up, the AAP is automatically switched on and all the cabin lights come on at full brightness. However the Cabin Attendants can control some cabin lights associated to the AAPs.
When all the lights are switched off, DIM1/2, CABIN and ENTRY can be directly selected without pressing the ON switch. The ON/OFF key switches the AAP on or off after power up.

EVAC CMD AND EVAC RESET

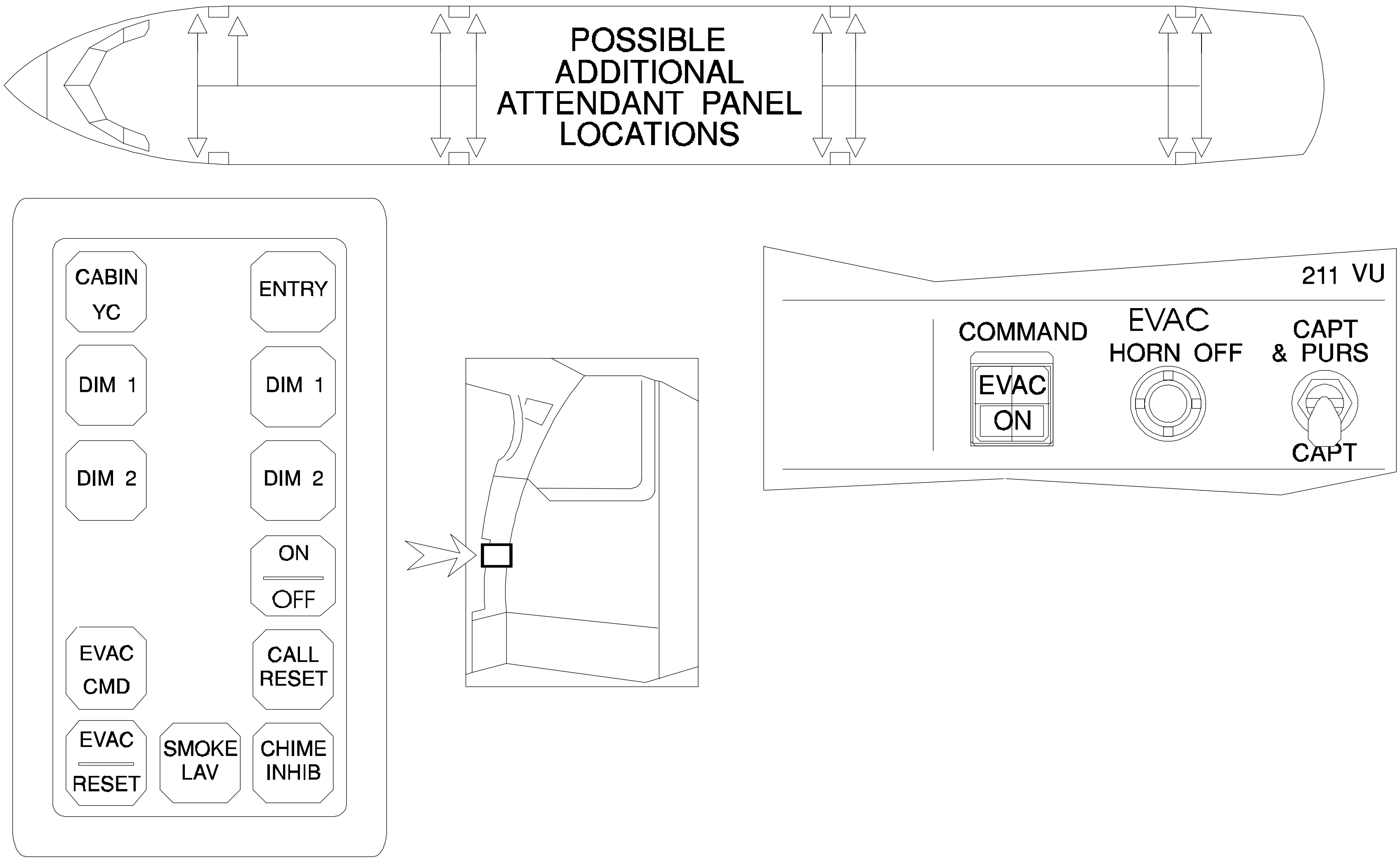
The EVAC COMMAND key activates or deactivates audible and visual signals in the cabin and cockpit for initialization of the evacuation process. Activating the EVAC CMD shall have different results depending on the position of the EVAC selector in the cockpit.
When the EVAC/RESET key is pressed at any AAP, the EVAC tone in the assigned zone and indications on the Attendant Indication Panels and Area Call Panels are switched off.
The EVAC/RESET button at any AAP shall still remain flashing, until the initial station cancels the EVAC command.

CALL RESET AND CHIME INHIB

The CALL RESET key is used to reset the activated call indications associated to the zone. When the key is pressed, the aural and visual indications associated to the AAP are cancelled.
When the CHIME INHIB pushbutton is pressed, the chime signal broadcast in the cabin zone assigned to the call, is inhibited.

SMOKE LAV

The SMOKE LAVatory key is used to warn the Cabin Attendants in case of smoke in a lavatory or in the crew rest compartment.
If a lavatory smoke warning is triggered, the SMOKE LAV key comes on steady or flashes, if programmed in the Cabin Attendant Module (CAM). When the SMOKE LAV key is pressed, the visual and aural indications in the cabin are reset. The SMOKE LAV light is activated as long as the smoke signal is transmitted to the Directors.



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ADDITIONAL ATTENDANT PANEL(AAP)

STUDENT NOTES

POWER SUPPLY CONFIGURATION

GENERAL

The CIDS is continuously energized by 28VDC supply, in flight and on ground.

With the EMERGENCY mode activation, the power consumption has to be reduced.
The DIRECTORS are able to provide the minimum and essential functions to the flight crew, the cabin attendants and the passengers.

NORMAL CONDITIONS

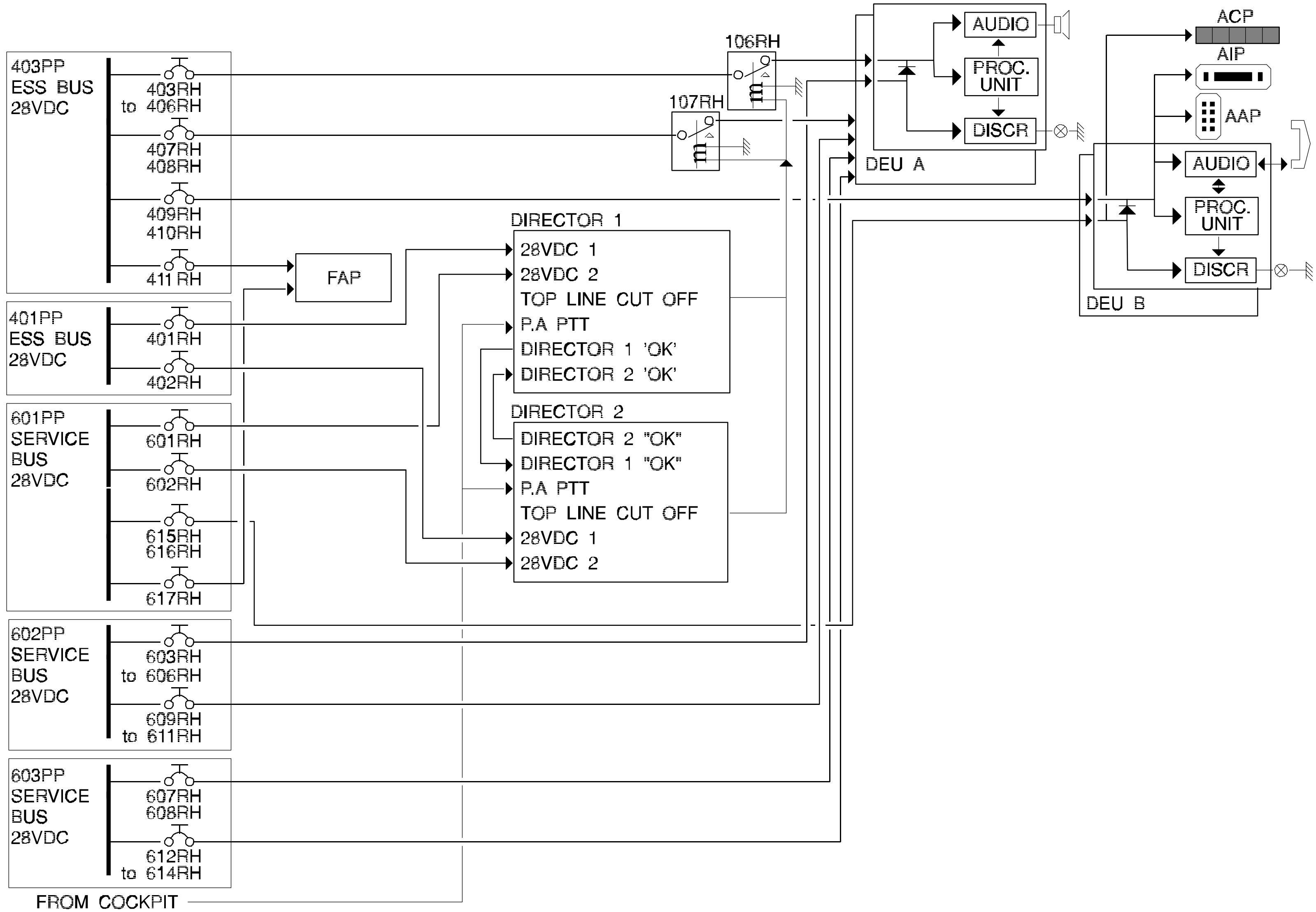
The essential and service bus bars provide 28VDC power supply to the CIDS.

The 28VDC service bus bar is connected to the active and hot-standby DIRECTORS, the FAP, the non essential circuits of the type A and B DEUs (lights and discrete signals), the ACPs, the AIPs and the AAPs through the type B DEUs.

The 28VDC essential bus bar is connected to the active and hot-standby DIRECTORS, the FAP, the essential circuits of the type A and B DEUs (audio and processing units) for the Passenger Address or the cabin interphone.

The type A DEU are connected to the 28VDC essential bus bar through two top line cut-off relays 106RH and 107RH.

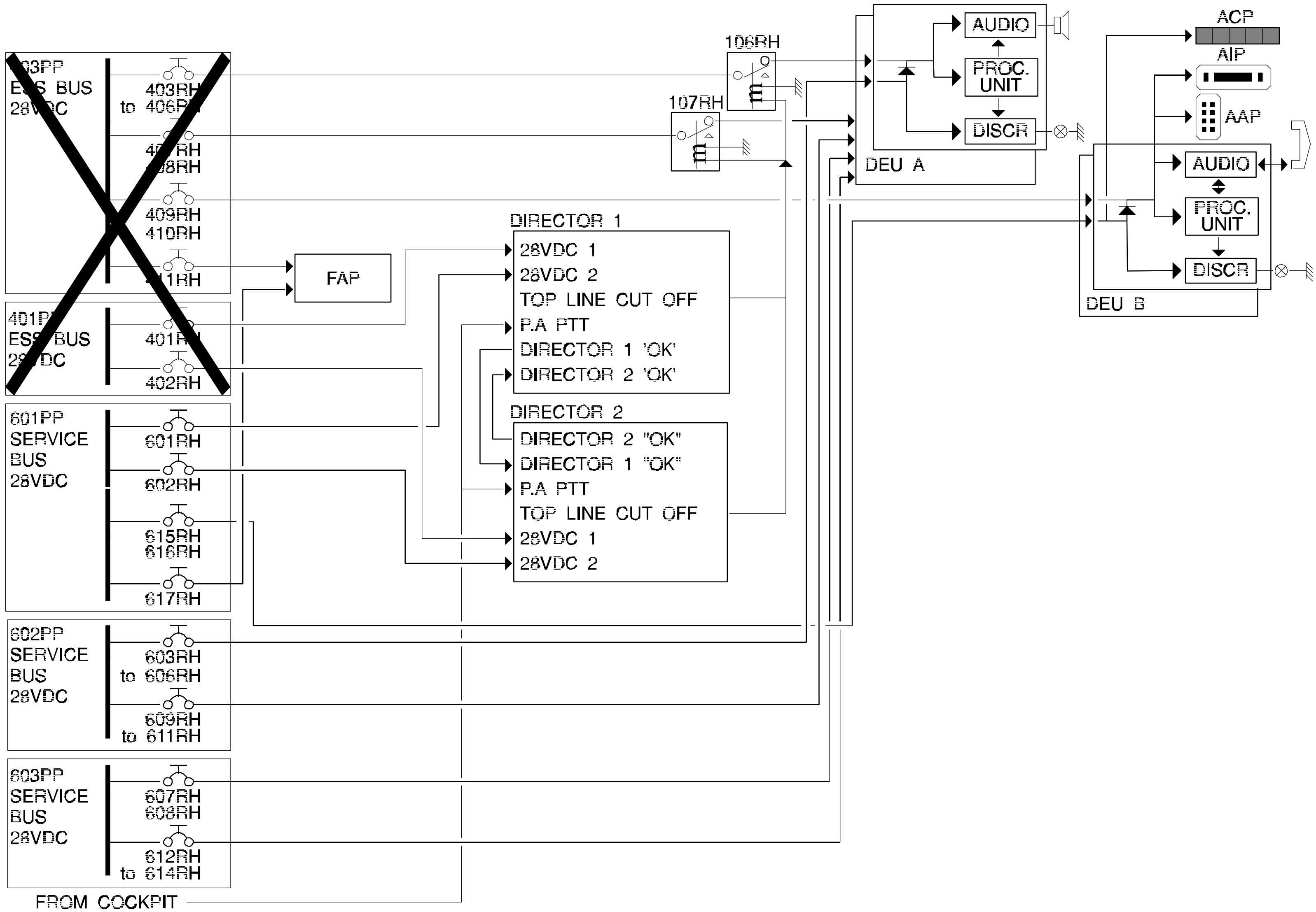
Note that the DIRECTORS have two power inputs.
The 28VDC essential bus bar is connected to the 28VDC 1 INPUT.
The 28VDC service bus bar is connected to the 28VDC 2 INPUT.


403PP
ESS BUS
28VDC
403RH
to 406RH
407RH
408RH
409RH
410RH
411 RH
401PP
ESS BUS
28VDC
401RH
402RH
601PP
SERVICE
BUS
28VDC
601RH
602RH
615RH
616RH
617RH
602PP
SERVICE
BUS
28VDC
603RH
to 606RH
609RH
to 611RH
603PP
SERVICE
BUS
28VDC
607RH
608RH
612RH
to 614RH
FROM COCKPIT
FAP
DIRECTOR 1
28VDC 1
28VDC 2
TOP LINE CUT OFF
P.A PTT
DIRECTOR 1 'OK'
DIRECTOR 2 'OK'
DIRECTOR 2
DIRECTOR 2 "OK"
DIRECTOR 1 "OK"
P.A PTT
TOP LINE CUT OFF
28VDC 1
28VDC 2
106RH
107RH
AUDIO
PROC. UNIT
DISCR
DEU A
ACP
AIP
AAP
AUDIO
PROC. UNIT
DISCR
DEU B

28VDC ESS BUS FAILURE

In case of 28VDC essential bus bar failure, the DIRECTORS, the FAP and the type A and B DEUs switch automatically to the 28VDC service bus bar power supply.

The essential circuits of the type A and B DEUs (audio and processing units) are then supplied with the 28VDC service bus bar.


403PP
ESS BUS
28VDC
403RH
to 406RH
407RH
408RH
409RH
410RH
411RH
401PP
ESS BUS
28VDC
401RH
402RH
601PP
SERVICE
BUS
28VDC
601RH
602RH
615RH
616RH
617RH
602PP
SERVICE
BUS
28VDC
603RH
to 606RH
609RH
to 611RH
603PP
SERVICE
BUS
28VDC
607RH
608RH
612RH
to 614RH
FROM COCKPIT
FAP
DIRECTOR 1
28VDC 1
28VDC 2
TOP LINE CUT OFF
P.A PTT
DIRECTOR 1 'OK'
DIRECTOR 2 'OK'
DIRECTOR 2
DIRECTOR 2 "OK"
DIRECTOR 1 "OK"
P.A PTT
TOP LINE CUT OFF
28VDC 1
28VDC 2
106RH
107RH
AUDIO
PROC. UNIT
DISCR
DEU A
ACP
AIP
AAP
AUDIO
PROC. UNIT
DISCR
DEU B

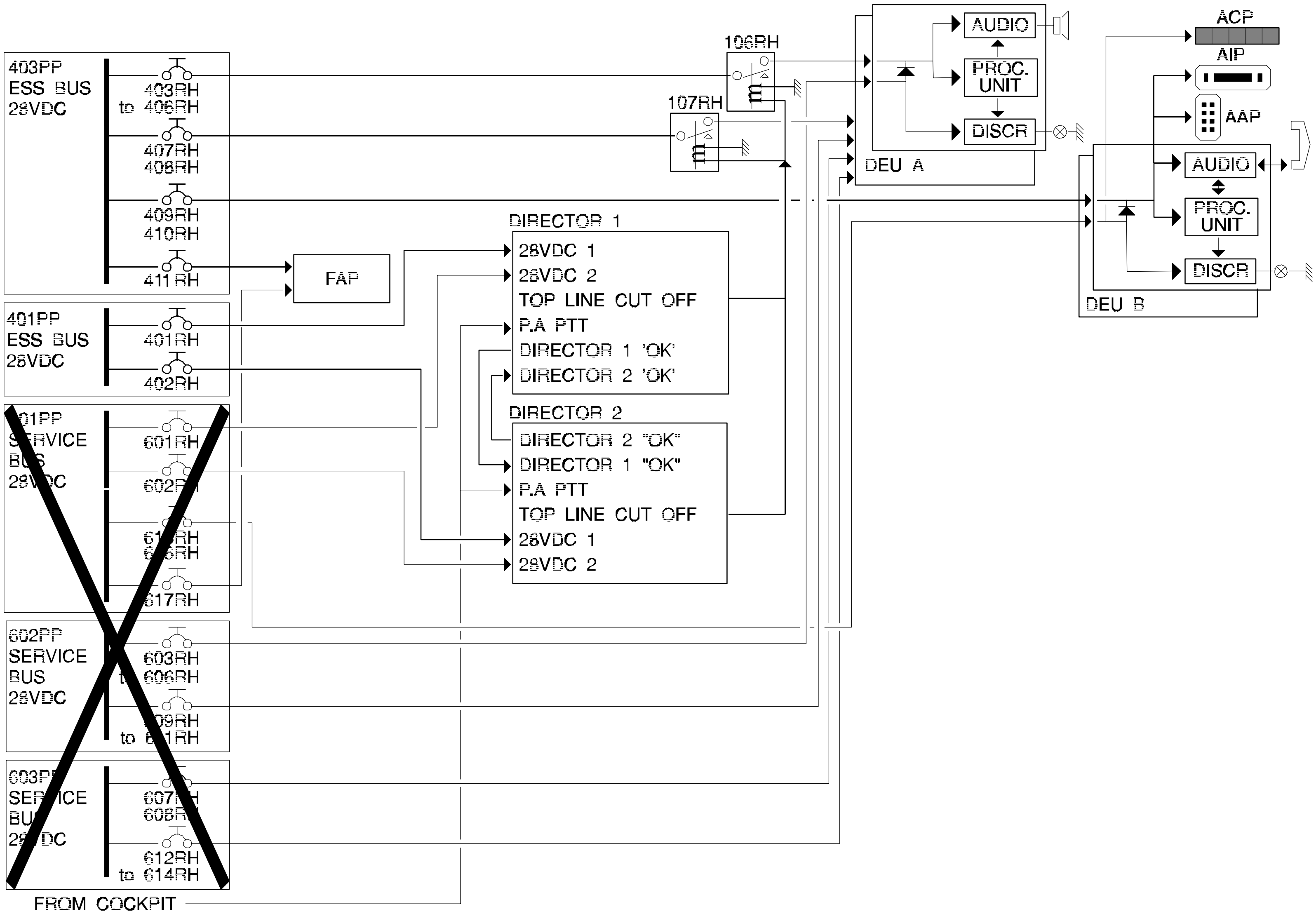
EMERGENCY MODE ACTIVATION

The EMERGENCY mode is activated if a failure of the 28VDC service bus bar is detected and the 28VDC essential bus bar is available.

The 28VDC essential bus bar supplies the FAP, the DIRECTORS (active and standby) and all the essential circuits of the type B DEUs.

The type A DEUs are no longer supplied :

The active DIRECTOR sends a top line cut off signal to the 106RH/107RH top line cut-off relays.

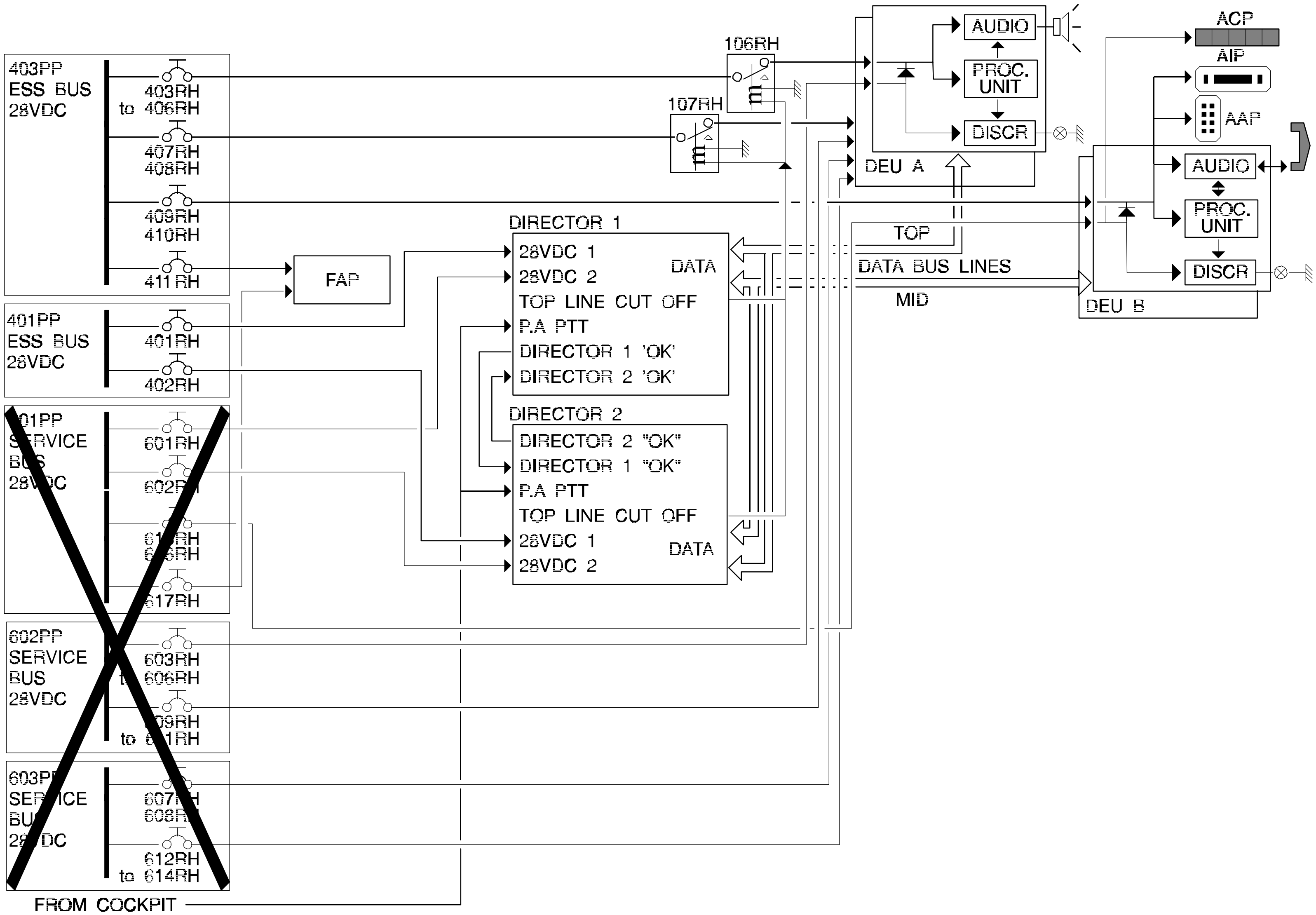

403PP
ESS BUS
28VDC
403RH
to 406RH
407RH
408RH
409RH
410RH
411 RH
401PP
ESS BUS
28VDC
401RH
402RH
601RH
602RH
617RH
602PP
SERVICE
BUS
28VDC
603RH
606RH
603P
607
608
612RH
to 614RH
FROM COCKPIT
FAP
106RH
107RH
DIRECTOR 1
28VDC 1
28VDC 2
TOP LINE CUT OFF
P.A PTT
DIRECTOR 1 'OK'
DIRECTOR 2 'OK'
DIRECTOR 2
DIRECTOR 2 "OK"
DIRECTOR 1 "OK"
P.A PTT
TOP LINE CUT OFF
28VDC 1
28VDC 2
AUDIO
PROC. UNIT
DISCR
DEU A
ACP
AIP
AAP
AUDIO
PROC. UNIT
DISCR
DEU B

EMERGENCY MODE ACTIVATION

To broadcast a Passenger Address announcement in the cabin, the type A DEUs must be supplied.

When the PA keyline is activated, from the cockpit or the cabin, the active DIRECTOR de-energizes the 106RH/107RH top line cut-off relays.

The essential circuits of the type A DEUs are supplied.
The Passenger Address announcement can be broadcast in the cabin.


403PP
ESS BUS
28VDC
403RH
to 406RH
407RH
408RH
409RH
410RH
411 RH
401PP
ESS BUS
28VDC
401RH
402RH
601PP
SERVICE
BUS
28VDC
601RH
602RH
617RH
602PP
SERVICE
BUS
28VDC
603RH
to 606RH
to
603PP
SERVICE
BUS
28VDC
612RH
to 614RH
FROM COCKPIT
FAP
106RH
107RH
DIRECTOR 1
28VDC 1
28VDC 2
DATA
TOP LINE CUT OFF
P.A PTT
DIRECTOR 1 'OK'
DIRECTOR 2 'OK'
DIRECTOR 2
DIRECTOR 2 "OK"
DIRECTOR 1 "OK"
P.A PTT
TOP LINE CUT OFF
28VDC 1
28VDC 2
DATA
AUDIO
PROC. UNIT
DISCR
DEU A
TOP
DATA BUS LINES
MID
ACP
AIP
AAP
AUDIO
PROC. UNIT
DISCR
DEU B

STUDENT NOTES

DIRECTOR D/O

General
Functions
Director Memories
Switchover/Switchback Functions
Director Power-up
Emergency Mode Activation

GENERAL

The DIRECTOR is the main component of the CABIN INTER-COMMUNICATION DATA SYSTEM(CIDS). The purpose of the DIRECTOR is to act as an INTERFACE between the COCKPIT, the AVIONICS EQUIPMENT and the CABIN SYSTEMS.

For redundancy, two DIRECTORS are provided : DIRECTOR 1 and DIRECTOR 2.

DIRECTOR 1 is normally fully active and monitors and controls all the CIDS systems.
DIRECTOR 2 is normally partially active, in a "HOT STANDBY" mode.•
The two units operate in parallel and independently with exactly the same DATA and information, but DIRECTOR 2 has its outputs deactivated.

FUNCTIONS

The DIRECTOR performs the following functions :

- Handling of the 8 DATA BUS LINES for transmission, reception and adaptation of the controls, commands and digitized audio signals.

- Control and monitoring of the various CIDS components,

- Handling of the status and controls of the cockpit, cabin and avionics systems for activation or deactivation of functions in the cockpit and cabin and realization of the programming functions stored in the main memories of the DIRECTORS.

The DIRECTOR performs also its own self-test, initializes all the DIRECTOR connected units and activates the EMERGENCY MODE with minimum power consumption in order to provide the essential functions to the CABIN ATTENDANTS and PASSENGERS. The DIRECTORS and the connected equipment are separatly tested.

DIRECTOR MEMORIES

The DIRECTOR’S memory is divided into 4 MEMORY ZONES :

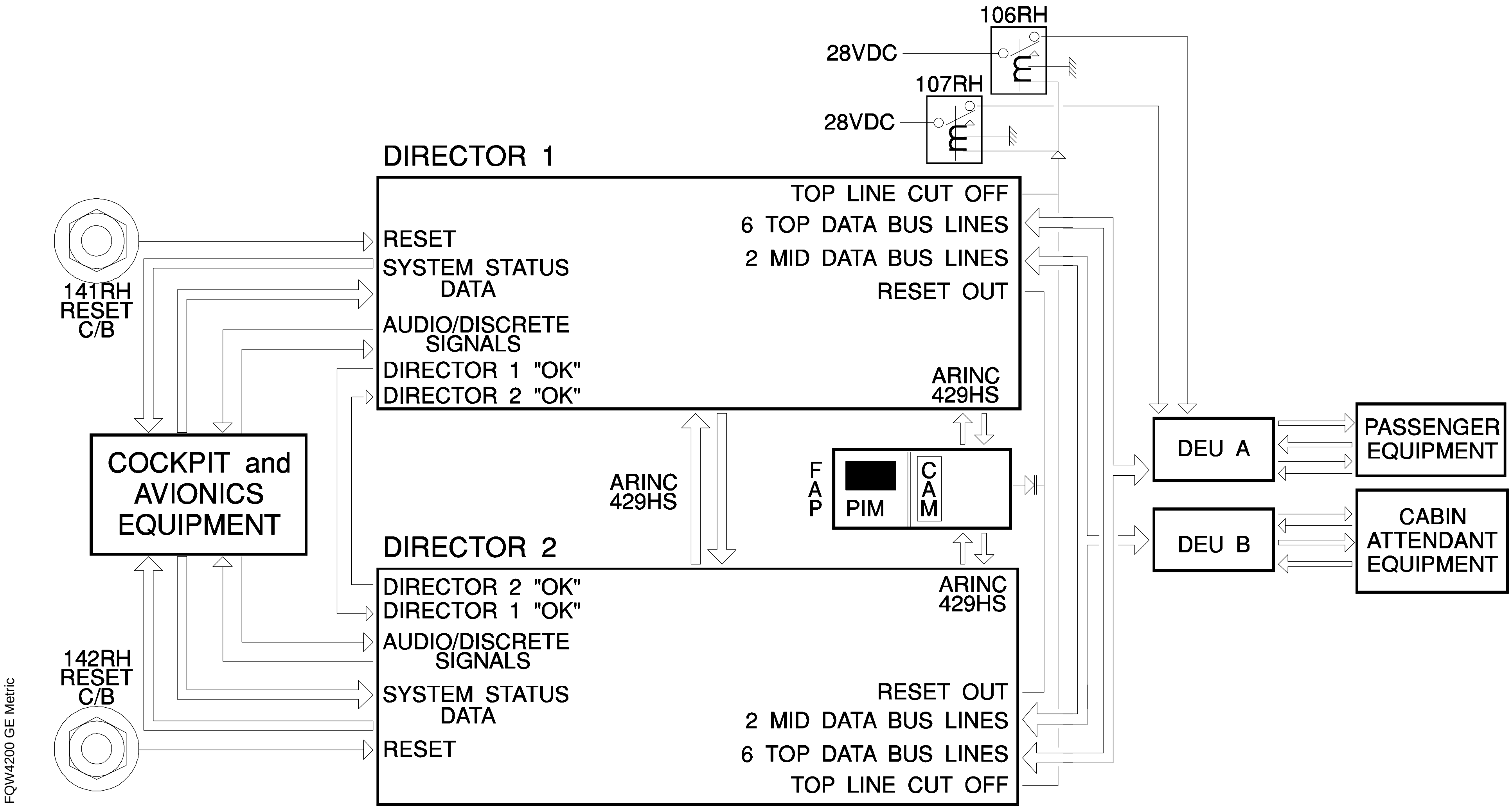
- The ON-BOARD REPROGRAMMING MODULE,
- The "MANDATORY LAYOUT MEMORY",
- The "LAST USED LAYOUT MEMORY",
- The "WORKING LAYOUT MEMORY".

- The ON-BOARD REPROGRAMMING MODULE (OBRM) contains the software for accomplishment of all the CIDS functions. The major system changes are done through the OBRM.

- The "MANDATORY LAYOUT MEMORY contains the MANDATORY CABIN LAYOUT.

- The "LAST USED MEMORY" contains the LAST USED CABIN LAYOUT,

- The "WORKING MEMORY" contains the CABIN LAYOUT used during the flight.


106RH
28VDC
107RH
28VDC
DIRECTOR 1
TOP LINE CUT OFF
6 TOP DATA BUS LINES
2 MID DATA BUS LINES
RESET OUT
RESET
SYSTEM STATUS
DATA
AUDIO/DISCRETE
SIGNALS
DIRECTOR 1 "OK"
DIRECTOR 2 "OK"
ARINC
429HS
141RH
RESET
C/B
COCKPIT and
AVIONICS
EQUIPMENT
ARINC
429HS
F
A
P
PIM
C
A
M
DEU A
DEU B
PASSENGER
EQUIPMENT
CABIN
ATTENDANT
EQUIPMENT
DIRECTOR 2
DIRECTOR 2 "OK"
DIRECTOR 1 "OK"
AUDIO/DISCRETE
SIGNALS
SYSTEM STATUS
DATA
RESET
ARINC
429HS
RESET OUT
2 MID DATA BUS LINES
6 TOP DATA BUS LINES
TOP LINE CUT OFF
142RH
RESET
C/B
FQW4200 GE Metric

SWITCHOVER/SWITCHBACK FUNCTIONS

The DIRECTOR BITE provides the SWITCHOVER condition to the 2nd DIRECTOR when the CIDS DATA BUS DRIVERS or the AUDIO CIRCUITS of DIRECTOR 1 fail.

Additionally, without BITE INFORMATION, if the POWER SUPPLY CIRCUITRY or the PROCESSING UNIT fails, the SWITCHOVER to the 2nd DIRECTOR is performed.

If the BITE of DIRECTOR 1 detects a minor failure, the SWITCHOVER to the 2nd DIRECTOR is performed, provided DIRECTOR 1 receives the "DIR OK" discrete signals.

The SWITCHBACK from the 2nd DIRECTOR to DIRECTOR 1 is performed when DIRECTOR 2 is completely lost or when the DATA BUS DRIVERS or the PROCESSING UNIT or the AUDIO CIRCUITS or the POWER SUPPLY CIRCUITS fail.

DIRECTOR 2 has an INTERLOCK CIRCUITY with the "DIR OK"" input and output signals. That is used as an electrical INTERLOCK for the STANDBY DIRECTOR.

DIRECTOR POWER-UP

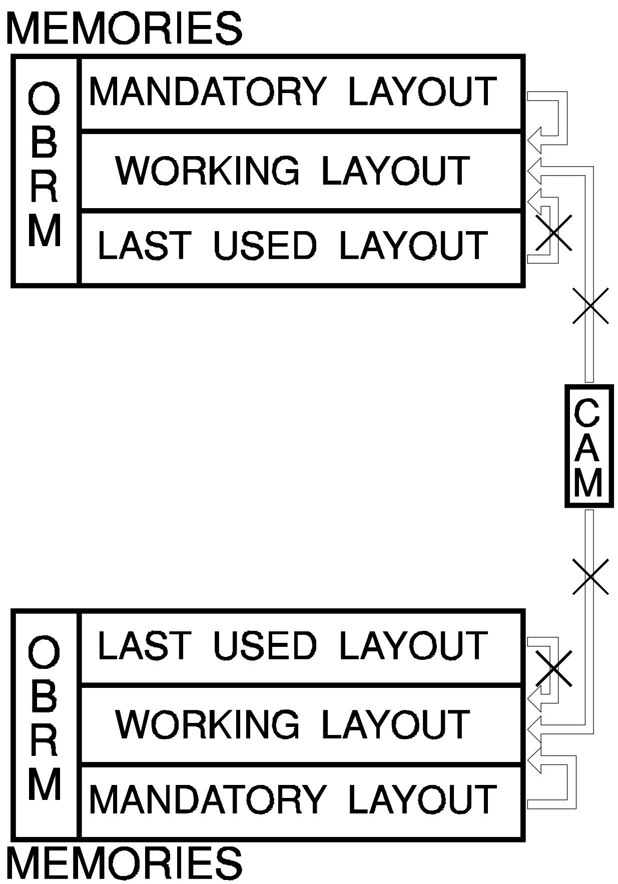
At CIDS POWER-UP :

- all the DIRECTOR'S INTERFACES are disabled,
- all the DIRECTOR'S RAM MEMORIES are reset and the DIRECTORS are initialized.

During INITIALIZATION, the "LAST USED LAYOUT" is loaded in the "WORKING LAYOUT " MEMORY.

The "LAST USED LAYOUT" is compared with the "LAST USED CAM LAYOUT", stored in the CAM MEMORIES.If there is no difference, no CAM DATA DOWNLOAD is required.

The ACTIVE LAYOUT is displayed on the "POWER-UP TEST" page of the PROGRAMMING and INDICATION MODULE(PIM).



PIM DISPLAY

POWER UP TEST
IN PROGRESS
DURATION: 40 SEC

ACTIVE LAYOUT:
CAM 1(2,3,1M,2M or 3M)

POWER UP TEST
IN PROGRESS
DURATION: 40 SEC

NO CAM DATA AVAILABLE

ACTIVE LAYOUT:
LAST USED DIR LAYOUT

POWER UP TEST
IN PROGRESS
DURATION: 40 SEC

NO CAM DATA AVAILABLE
NO LAST USED LAYOUT AVAILABLE

ACTIVE LAYOUT:
MANDATORY LAYOUT

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If there is a difference between the "LAST USED LAYOUT" and the "LAST SELECTED CAM LAYOUT", the SELECTED CAM LAYOUT is loaded in the DIRECTOR'S WORKING MEMORY.
The NEW SELECTED CAM LAYOUT is displayed on the POWER-UP TEST page.
During CAM operation, INFO MESSAGES are displayed on the POWER-UP TEST page of the PIM display.
If the SELECTED CAM LAYOUT load fails, because the DATA transfer fails or the CAM is not plugged into the FAP, the DIRECTORS use the "LAST USED LAYOUT".
If the "LAST USED LAYOUT" and the CAM DATA are not available, the "MANDATORY LAYOUT MEMORY" is loaded in the "WORKING LAYOUT MEMORY".

When the INITIALIZATION and CONFIGURATION of the CIDS SYSTEM has been completed, the CIDS SYSTEM is fully operational.

The DIRECTORS hold all the NECESSARY DATA for the configuration and initialization of the FAP, the PIM, the DIRECTOR'S interfaces and the TYPE A and B DEUs.

For each TYPE A DEU PASSENGER ADDRESS AMPLIFIER, the GAIN, the FREQUENCY characteristics and the CHANNEL ASSIGNMENT are programmed.

When the INITIALIZATION and CONFIGURATION of the CIDS SYSTEM has been completed, the CIDS SYSTEM is fully operational.

The DIRECTORS hold ALL the NECESSARY DATA for configuration and initialization of the FORWARD ATTENDANT PANEL (FAP), the PROGRAMMING and INDICATING MODULE (PIM), the DIRECTOR'S INTERFACES and the TYPE A and B DEUs.

For each TYPE A DEU PASSENGER ADDRESS AMPLIFIER, the gain, the frequency characteristics and the channel assignement are programmed.

EMERGENCY MODE ACTIVATION

When the 28VC NORMAL POWER SUPPLY is lost, the EMERGENCY MODE is activated. In order to reduce the POWER CONSUMPTION, all the non essential circuits of the DIRECTORS are SWITCHED OFF.

The ESSENTIAL functions and circuits of the DIRECTORS are still supplied with the 28VDC ESSENTIAL :

- The POWER SUPPLY circuits,
- The PROCESSING UNIT,
- The CIDS DATA BUS DRIVER,
- The PASSENGER ADDRESS and INTERPHONE systems and the EVAC function.

Additionally the POWER SUPPLY of the TYPE A DEUs is disconnected by the DIRECTORS when no PA ANNOUNCEMENTS is broadcast.

STUDENT NOTES:

STUDENT NOTES

DEU A D/O

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GENERAL

The DEU type A is designed to interface between the DIRECTORS and the various cabin systems or equipment dedicated to the PASSENGER use.
Up to 56 DEUs type A can be installed in the cabin.

The various cabin systems or equipment connected to the DEU type A are :

- two DIRECTORS, through six HIGH SPEED DATA BUS LINES,

- eight BALLAST UNITS for the cabin lights,
- six PASSENGER SYSTEM and INTERFACE UNITS (PSUs/PIUs),

- one NIGHT LIGHT.

In the PSU/PIU are integrated the following Passenger Systems or equipment :

- one READING LIGHT POWER SUPPLY UNIT (RLPSU) for the reading lights,
- PASSENGER SIGNS (No Smoking/Fasten Seat Belt/Non Smoker/Return to Seat and Class Divider Signs),
- one PAX CALL SWITCH,
- one PAX CALL LIGHT,
- one LOUDSPEAKER.

TOP LINE DATA BUS

The DEU type A is connected to the DIRECTORS through one of the six HIGH SPEED TOP DATA BUSE LINES.

These lines are bidirectional serial high speed data buses (5 Mbits/s).

The data transmitted on the TOP DATA BUS LINES are :

The DEU A coded address, the addressed commands and controls to the Passenger Cabin Systems, the PCM coded audio signal and the BITE information results of all the DEUs type A collected in the DIRECTORS for transmission to the CMCs.

The DEU has an interlock for the transmitting function to prevent continuous transmission on the DATA BUS.

DEU A FUNCTIONS

The DEU type A performs various internal functions necessary to the correct working of the interfaces and of the DEU type A itself.

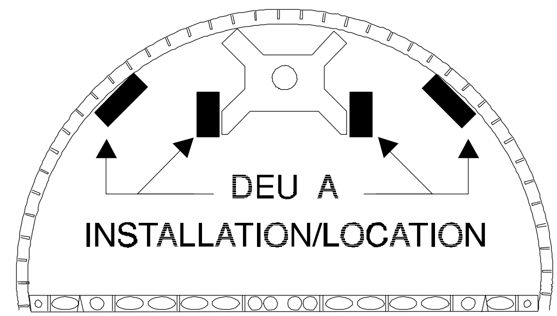
The DEU A performs the following functions :

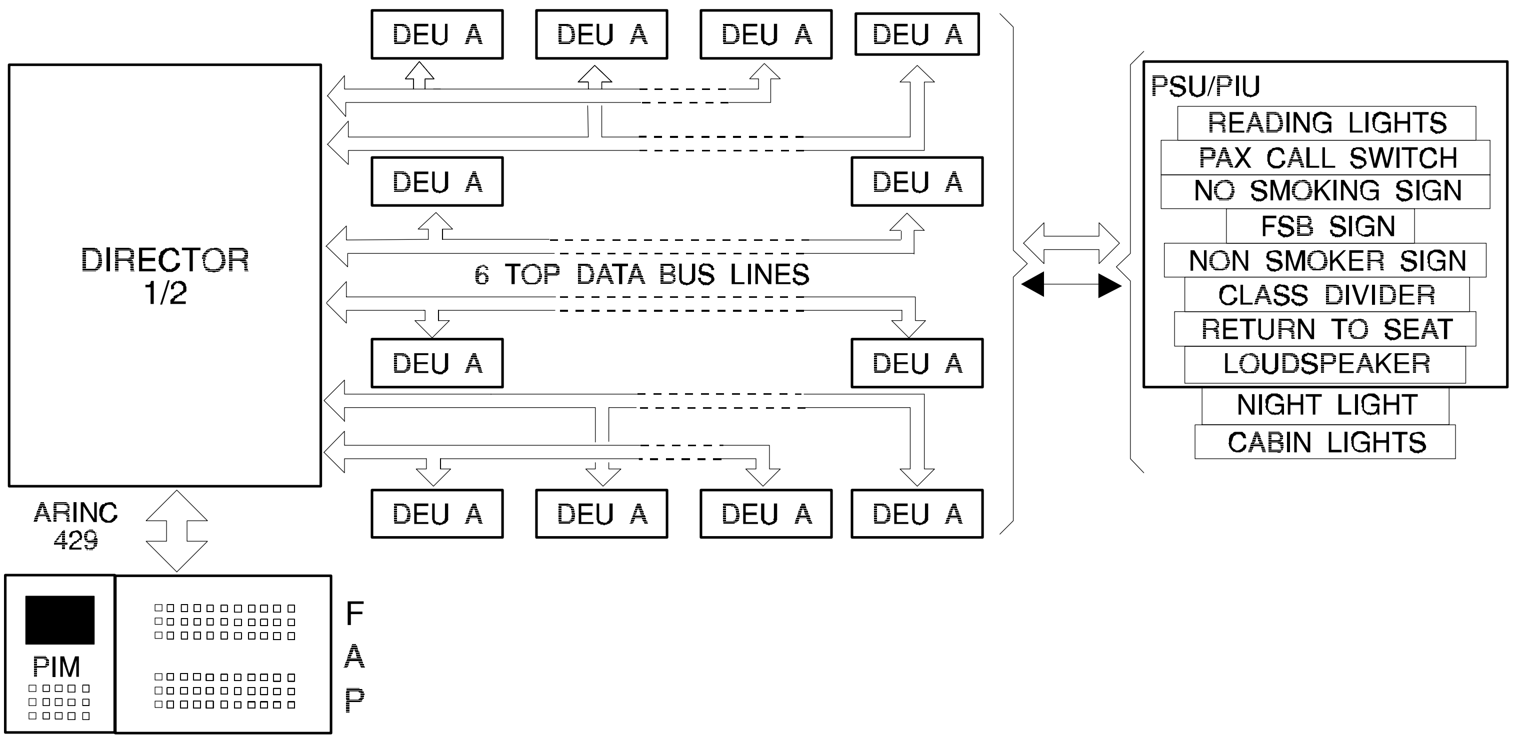
Adaptation, processing and conversion of the commands, controls and signals of the interface circuits, transmission of data, digitized audio signals and DEU and interface BITE information, fail passive for data bus or interfaces in case of DEU A failure, setting of the gain amplifier and of the programmed filters according to control data received from the director and EMERGENCY MODE activation with minimum consumption.

In case of data bus or DIRECTORS failure, the DEU A activates the FAIL SAFE MODE operation.
In this mode, the DEU A maintains the current status of all the discrete signal outputs for 3 minutes approximately.

After this delay, all the discrete outputs switch to their predefined fail safe state :

The associated cabin lights come on with full brightness and the NON SMOKER SIGN (CLASS DIVIDER) comes on.
All the audio inputs/outputs are immediately switched off.





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DEU A INTERFACE

The DEU type A is connected to the various system or equipment through data buses, analog and discrete lines.

The RS 232 DATA lines are used for remote testing and monitoring of the READING LIGHT POWER SUPPLY UNIT (RLPSU) for BITE information transmission to the CENTRAL MAINTENANCE COMPUTERS (CMCs), through the CIDS DIRECTORS.

The analog lines are used for the PASSENGER ADDRESS broadcasting through the Passenger loudspeakers.

The discrete lines are connected to the DEU A for controls of the various Passenger Cabin equipment or systems such as the PASSENGER SIGNS, the PAX CALL SWITCH associated to the PAX CALL LIGHT, the NIGHT LIGHT and the BALLAST UNIT used to control the dimming of the cabin lights.
The CLASS DIVIDER discrete signal is used to inform the CAM, for the Cabin zone programming, that a CLASS DIVIDER is connected.

The EVAC TONE SELECTION discrete is used for EVAC tone frequency selection.

The two frequencies are : 3.5 Khz or 1.75 Khz.

POWER SUPPLY

With NORMAL CONDITIONS, the DEU type A is supplied with the 28VDC ESSENTIAL and SERVICE bus bars.

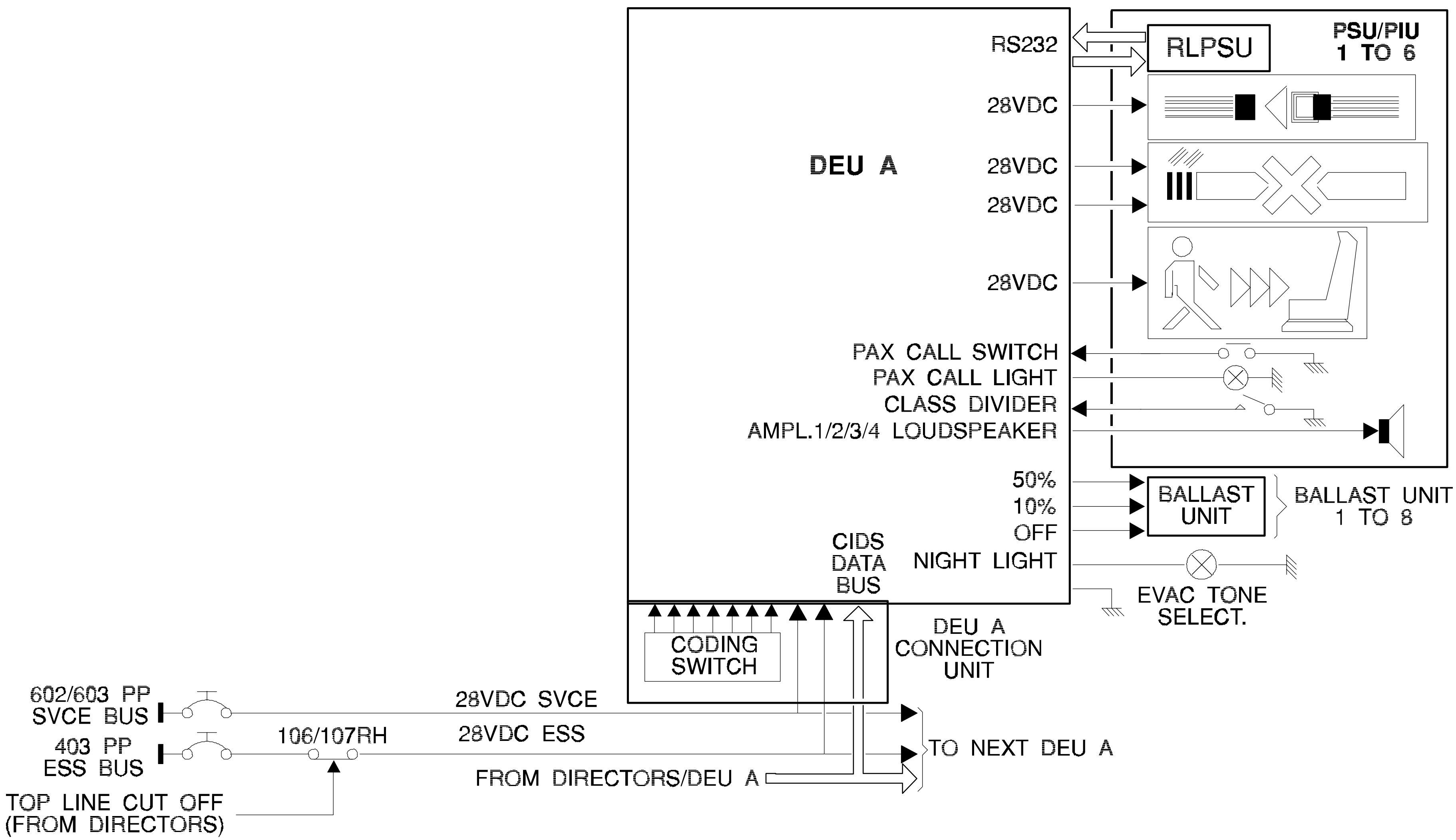
IN NORMAL CONDITIONS :

The 28VDC essential bus only supplies the essential circuits of the DEU A, such as the logic device, the CIDS data bus driver and the audio unit.

The 28VDC SVCE bus supplies the power consuming and the non essential circuits of the DEU A such as the lights and all the discrete circuits.

The EMERGENCY mode is activated if the SERVICE bus bar is lost and the ESSENTIAL bus bar available.

If no Passenger Address announcements are broadcast in the cabin, and in order to decrease the power consumption, the active DIRECTORS send a TOP LINE CUT-OFF signal to the 106RH/107RH relays.
The relays are energized and all the DEUs type A are no more supplied by the 28VDC ESSENTIAL bus bar.



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STUDENT NOTES:

DEU B D/O

GENERAL

The DEU type B is designed to interface between the DIRECTORS and the various cabin systems or equipment dedicated to the CABIN ATTENDANT use.
Up to 9 DEUs type B can be installed in the cabin.

The various cabin systems or equipment connected to the DEU type B are :

- two DIRECTORS, through two HIGH SPEED DATA BUS LINES,
- two Additional Attendant Panels (AAPs),
- two Attendant Indication Panels (AIPs),
- two Area Call Panels (ACPs),
- two Handsets,
- one Emergency Power Supply Unit (EPSU),
- one Autonomous Standby Power Supply Unit (ASPSU),
- one Water Ice Protection Control Unit (WIPCU),
- large INFO SIGNS (No Smoking/Fasten Seat Belt),
- SLIDES/DOORS pressure switch indication.

MIDDLE LINE DATA BUS

The DEU type B is connected to the DIRECTORS through one of the two HIGH SPEED MIDDLE DATA BUS LINES.

These lines are bidirectional serial high speed data buses (5 Mbits/s).

The data transmitted on the MID DATA BUS LINE are :

The DEU B coded address, the addressed commands and controls to the cabin systems, the PCM coded audio signal and the BITE information results of all the DEUs type B collected in the DIRECTORs for transmission to the CMC.

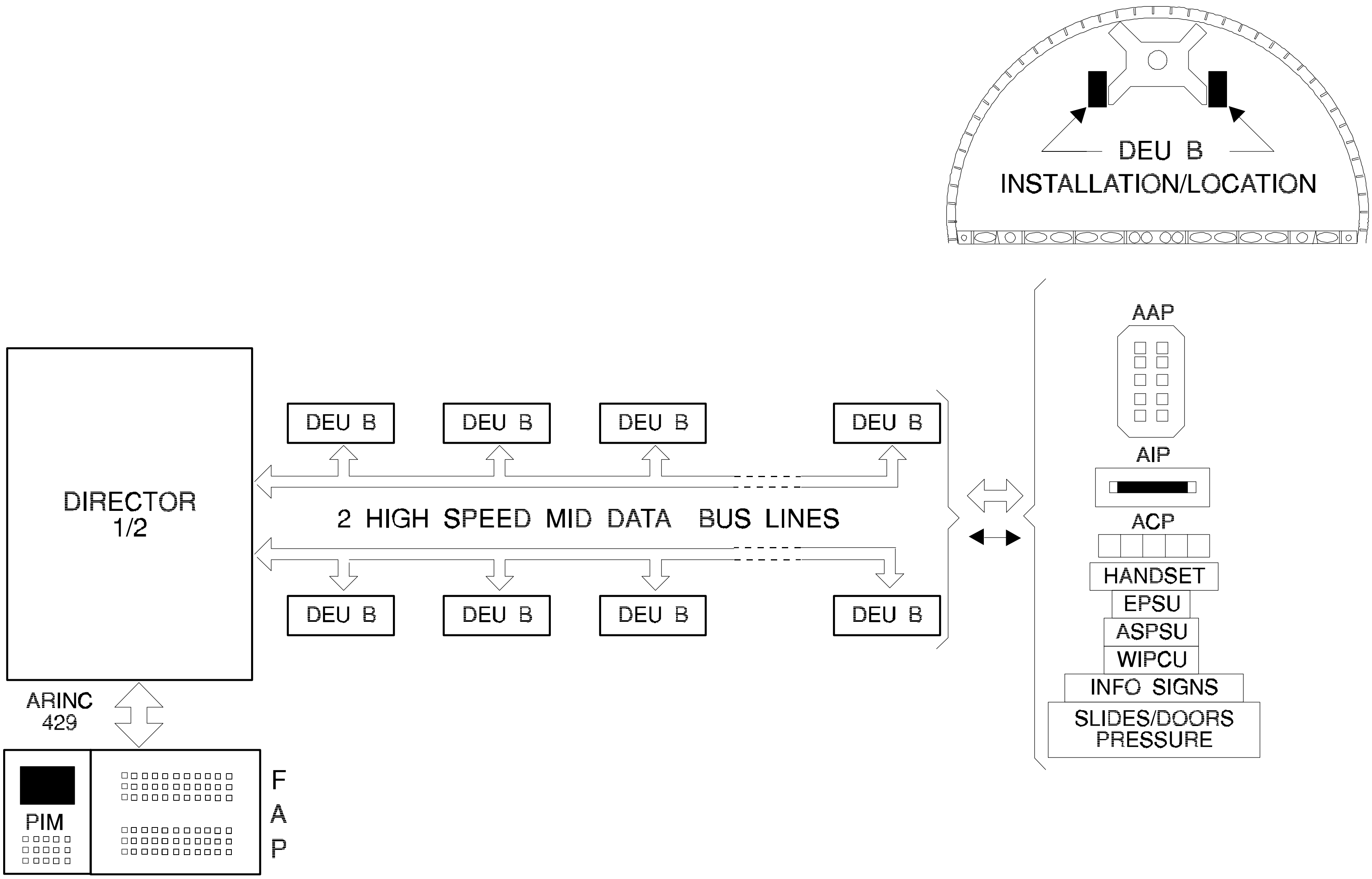
The DEU has an interlock for the transmitting function to prevent continuous transmission on the DATA BUS.

DEU B FUNCTIONS

The DEU type B performs various functions.

The DEU B performs the following functions :

Adaptation, processing and conversion of the commands, controls and signals of the interface circuitry, transmission of data and digitized audio signals via the data bus, fail passive for data bus or system interface in case of DEU B failure, test of the interfaces for BITE information transmission to the CIDS DIRECTORS and EMERGENCY MODE activation with minimum power consumption.



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DEU B INTERFACE

The DEU type B is connected to various cabin systems or equipment through data bus, analog and discretes lines.

Two types of data lines are connected to the DEU type B :

One HIGH SPEED DATA BUS and RS 232 data lines.

The DEU type B is connected to the CIDS DIRECTORS through HIGH SPEED DATA bus for controls, status, BITE and audio data transmission.

The RS232 data lines are used for the control and the monitoring of panels and BITE data transmission.
Some RS232 DATA lines are also used for testing and monitoring purposes of cabin systems, such as the ASPSU, WIPCU and the EPSU.

The analog lines are connected to the DEU B for audio signal transmission or reception with the HANDSET.

The discrete lines are connected to the DEU B for SLIDES/DOORS pressure or PTT handset switches status transmission.

The AREA CALL PANELS (ACPs) also receive discerete lines for illumination of the colour fields.

POWER SUPPLY

With NORMAL CONDITIONS, the DEU B is power supplied with the 28 VDC ESSENTIAL and NORMAL buses.

IN NORMAL CONDITIONS :

The 28VDC ESSENTIAL bus only supplies the essential circuits of the DEU type B, such as the logic device, the data bus driver and the audio circuit.

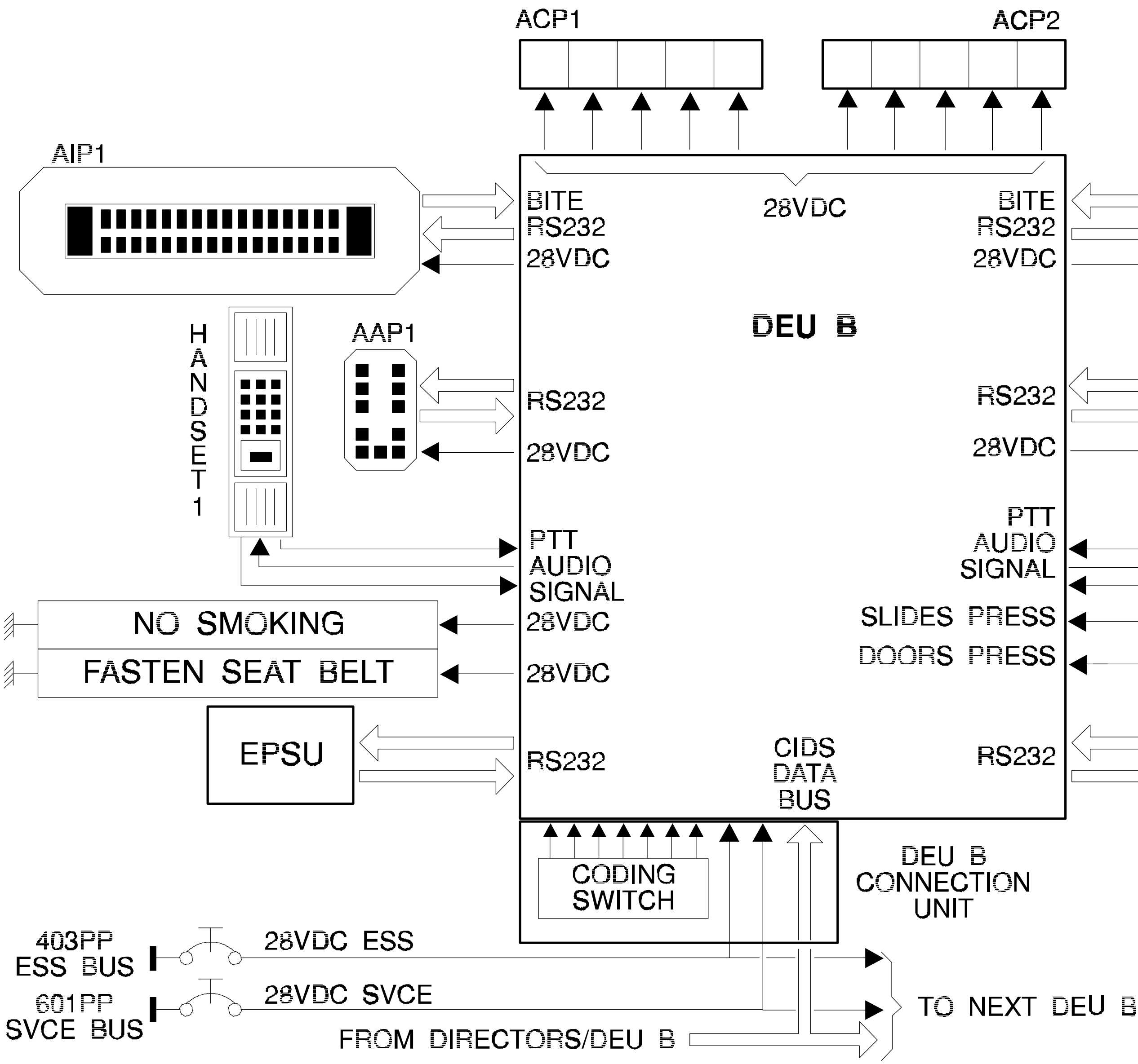
The 28VDC SERVICE bus supplies the power consuming and the non essential circuits of the DEU type B.

If the 28VDC SERVICE bus bar failed and the 28VDC ESSENTIAL bus bar is available, the EMERGENCY mode is activated.

EMERGENCY MODE ACTIVATION :

The power consuming circuit of the DEU B and some equipment such as the ACPs, AAPs and AIPs are no more supplied with the 28VDC.

The essential circuits of the DEU type B, such as the audio and processing circuits are still supplied.



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STUDENT NOTES:

DEU CONNECTION MOUNT D/O

Purpose
Functions and Description

PURPOSE

The DEU CONNECTION UNITS are used for interconnection of thetype A or B DEUs with the high speed DATA BUS LINES and DC power supply.

The DEU CONNECTION UNITS also provide easy and quick removal and installation of the DEUs in the cabin.

FUNCTIONS AND DESCRIPTION

All the type A or B DEUs are addressable units.
The DEU CONNECTION UNIT provides the DEU's coded address through 2 coding switches.

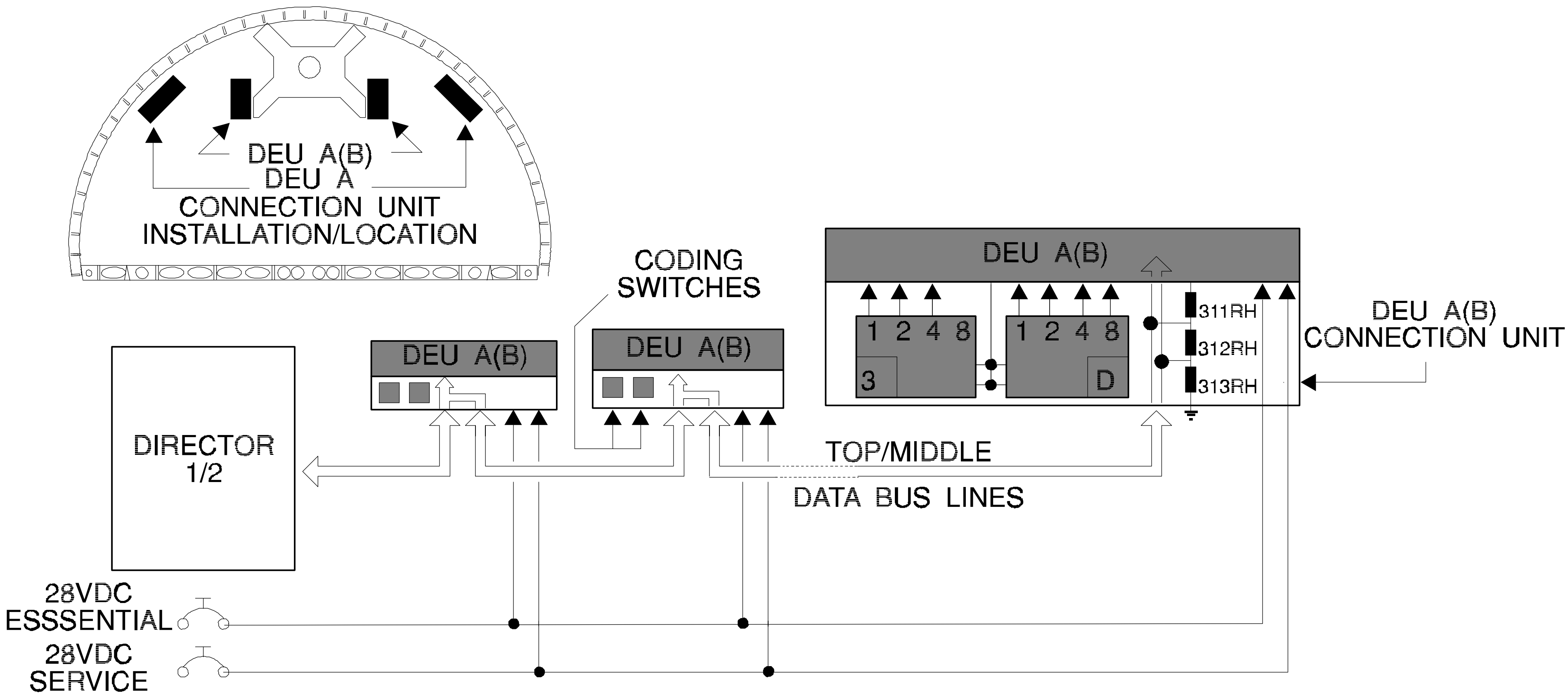
A resistor assembly mounted in the last DEU CONNECTION UNIT of each TOP or MIDDLE DATA BUS LINE is installed for impedance matching and continuity test.

In case of DEU CONNECTION UNIT removal or installation, the same coded address must be selected for the new DEU CONNECTION UNIT.

With this method, the DEU (A or B) removal, installation or replacement can be done without coding switch modifications.

NOTE :

A placard giving the coded address is placed close to the DEU CONNECTION UNIT.
DEU CONNECTION UNITS type A and B are not interchangeable because of their mechanical characteristics.



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STUDENT NOTES

PASSENGER ADDRESS D/O

General
PA Level
PA Priority
PA with the Cockpit Handset
PA with Cockpit Acoustic Equipment
PA from Cabin Attendant Handset

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GENERAL

The passenger address announcements, initiated from the cockpit or the cabin attendant stations, are broadcast via the passenger, attendant and crew rest loudspeakers.

PA announcements are also transmitted through the passenger headset, if the Passenger Entertainment System is activated, in order to draw passenger attention.

In the cockpit, one handset or various acoustic equipment can be used for PA announcements. In the cabin, only Cabin Attendant handsets are used.
Prerecorded PA announcements and boarding music, manually or automatically activated and broadcast via all the passenger, attendant and crew rest loudspeakers, are part of the passenger address system and they will be dealt with in the prerecorded announcement and music chapter.

PA LEVEL

The PA level is fixed and cannot be adjusted in the cabin, except when one engine is running or a rapid cabin decompression occurs.

- When at least one engine is running, the PA level is automatically increased by + 6dB,
- Or by + 4dB, in case of rapid cabin decompression.

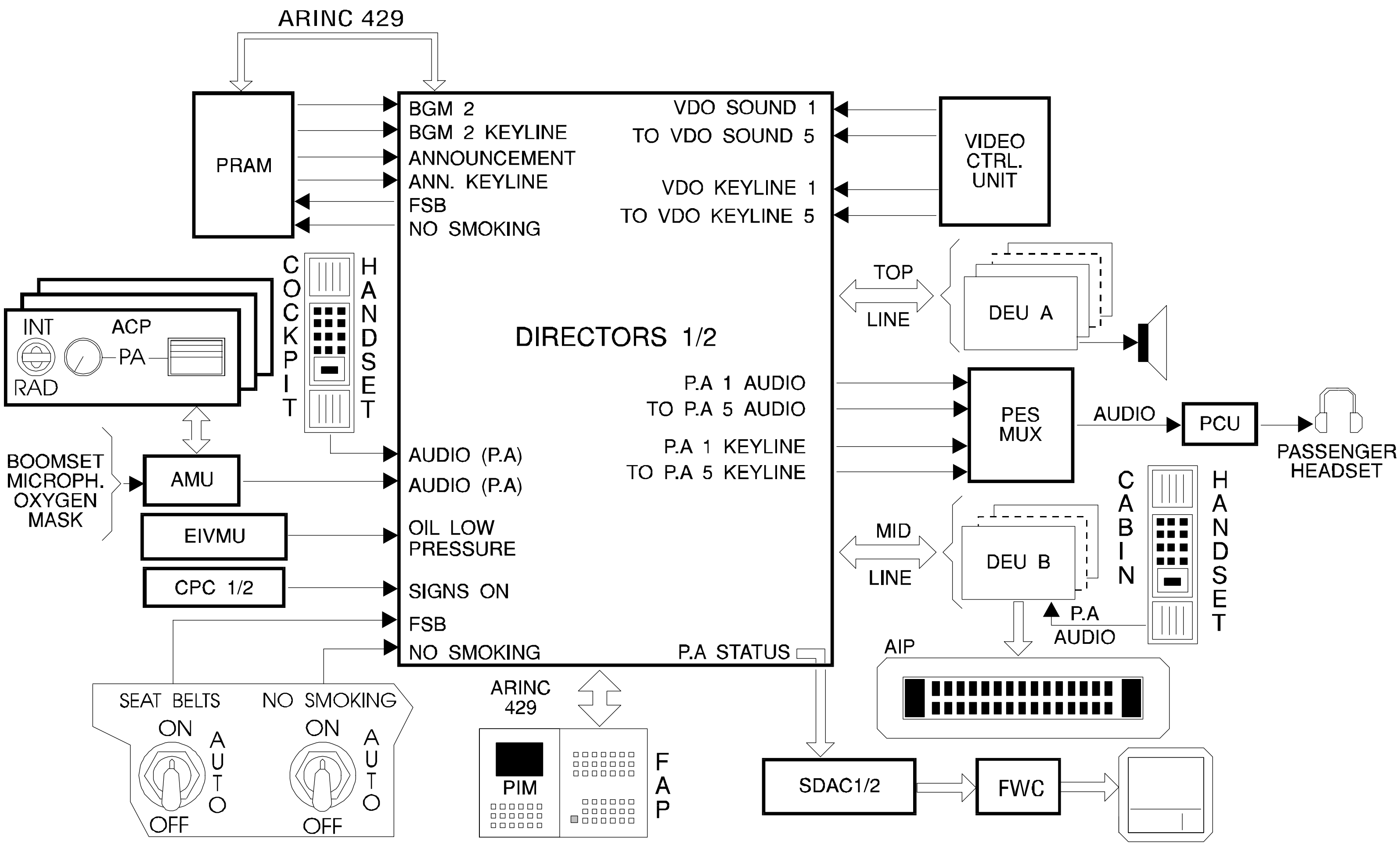
NOTE :

With the A/C on ground and the engines not running, when the PA level key on the FAP is pressed, if fitted, the PA level in the cabin is increased.

PA PRIORITY

Any PA announcement, broadcast in the cabin or crew rest compartment, has a priority level.
These priority levels are programmed in the Cabin Attendant Module.

- PA from the cockpit, (higher priority),
- PA from the attendant handset, (2nd priority),
- PA from the PRerecorded Announcement module (PRAM), (3rd priority),
- PA from the Passenger Entertainment System Video (PES Video), (lower priority).



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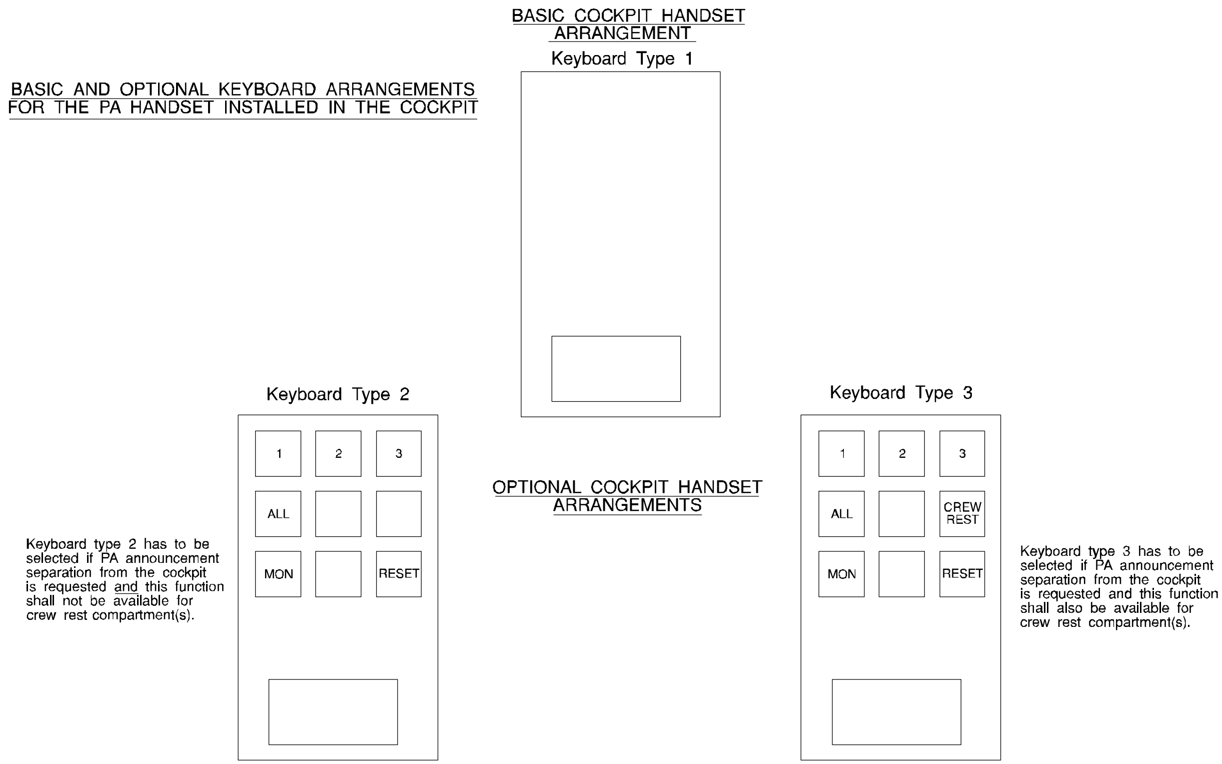
PA WITH THE COCKPIT HANDSET

The cockpit handset is mounted on the center pedestal and is fitted with an integrated PTT switch.
When the PTT is pressed, corresponding to the direct PA function, all the lower priority PA sources are overridden.
The PA announcement is broadcast through all the cabin loudspeakers and passenger headsets.
In the cockpit, a "PA IN USE" message is displayed in the left memo area of the Engine Warning Display (EWD).
In the cabin, a "DIRECT PA/PA ALL IN USE" is displayed on all the AIPs and a high-low chime is broadcast via all the loudspeakers.

PA announcement can be broadcast to a CAM programmed zone or area, if the cockpit handset is fitted with an appropriate keyboard.

For the DIAL PROCEDURE to DEDICATED ZONE or AREA, see the CABIN HANDSET DIAL PROCEDURE page.



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DIAL CODES (VIA THE COCKPIT HANDSET ONLY)

no.	Selected PA function	Dial Procedure	Affected loudspeakers in PA audio zones	Required Keyboard Type	Status	Remarks
C1	Direct PA	push PTT after taking the handset off the hook without performing a dial procedure	all passenger and attendant areas and crew rest area(s)	1, 2 or 3	Basic	
C2	PA ALL	ALL + PTT	all passenger and attendant areas without crew rest area(s)	2 or 3	Option	applicable if announcement separation from the cockpit handset is requested
C3	PA 1	1 + PTT	passenger and attendant areas in 1st cabin zone	2 or 3	Option	applicable if announcement separation from the cockpit handset is requested
C4	PA 2	2 + PTT	passenger and attendant areas in 2nd cabin zone	2 or 3	Option	applicable if announcement separation from the cockpit handset is requested
C5	PA 3	3 + PTT	passenger and attendant areas in 3rd cabin zone	2 or 3	Option	applicable if announcement separation from the cockpit handset is requested and a 3rd cabin zone exists
C6	PA Crew Rest	CREW REST + PTT	crew rest compartment	3	Option	applicable if announcement separation from the cockpit handset is requested and only one crew rest compartment is installed (functions "C7" and "C8" excluded)
C7	PA Crew Rest no. 1	CREW REST 1 + PTT	crew rest compartment no. 1	3	Option	applicable if announcement separation from the cockpit handset is requested and more than 1 crew rest compartment is installed (excludes function "C6")
C8	PA Crew Rest no. 2	CREW REST 2 + PTT	crew rest compartment no. 2	3	Option	applicable if announcement separation from the cockpit handset is requested and a second crew rest compartment is installed (excludes function "C6")
C9	PA monitoring	Take the handset off the hook without performing a dial procedure	no PA audio distribution, but highest priority PA audio can be monitored via handset earphone	1	Basic	applicable if announcement separation from the cockpit handset is not requested (excludes function "C10")
C10	PA monitoring	MON	no PA audio distribution, but highest priority PA audio can be monitored via handset earphone	2 or 3	Option	applicable if announcement separation from the cockpit handset is requested (excludes function "C8")
C11	Reset	RESET	none, the previously selected function will be cancelled	2 or 3	Option	applicable if announcement separation from the cockpit handset is requested

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PA WITH COCKPIT ACOUSTIC EQUIPMENT

For PA announcements with cockpit acoustic equipment, the Audio Control Panel has to be used.

When the PTT is activated, the PA key on the Audio Control Panel must be pressed and held during all the transmission time.
The PA announcement is then broadcast.

In the cockpit, "PA IN USE" is display on the left memo area of the EWD.
In the cabin, a "DIRECT PA/PA ALL IN USE" message is displayed on all AIPs and a high-low chime is broadcast via all the cabin loudspeakers and passenger headsets.

PA FROM CABIN ATTENDANT HANDSET

Each attendant station is equipped with a handset and a dedicated AIP.
When the handset is taken of its hook, a dialling tone of 400 hz is heard and a hash (#) symbol is displayed at the top line of the dedicated AIP.

When the PTT key is pressed, corresponding to the direct PA function, the confirmation message "DIRECT PA/PA ALL IN USE" is displayed on all the AIPs and a high-low chime is broadcast to all the cabin loudspeakers and passenger headsets.
In the cockpit, the "PA IN USE" message is displayed on the left memo area of the EWD.

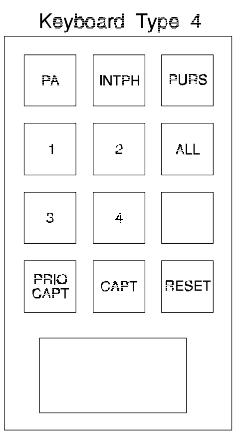
PA announcements can be broadcast to CAM programmed zones or areas (5 maximum).

If the PA announcement is impossible, the "BUSY" message is displayed on the dedicated AIP.
When the handset is on its hook or the RESET key is pressed, the PA announcement is over.

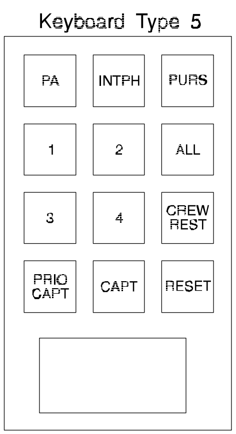
For the DIAL PROCEDURE to DEDICATED ZONE or AREA, see the CABIN HANDSET DIAL PROCEDURE page.

BASIC AND OPTIONAL KEYBOARD ARRANGEMENTS FOR THE PA/INTERPHONE HANDSETS INSTALLED IN THE CABIN

BASIC CABIN HANDSET ARRANGEMENT



OPTIONAL CABIN HANDSET ARRANGEMENT



Keyboard type 5 has to be selected if crew rest compartments are installed

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DIAL CODES (VIA CABIN ATTENDANT HANDSETS ONLY)

no.	Selected PA function	Dial Procedure	Affected loudspeakers in PA audio zones	Required Keyboard Type	Status	Remarks
A1	Direct PA	push PTT after taking the handset off the hook without performing a dial procedure	all passenger and attendant areas and crew rest area(s)	4 or 5	Basic	
A2	PA ALL	PA + PTT	all passenger and attendant areas without crew rest area(s)	4 or 5	Basic	applicable if only one cabin zone is requested
A3	PA ALL	PA ALL + PTT	all passenger and attendant areas without crew rest area(s)	4 or 5	Basic	only applicable if more than one cabin zone is requested
A4	PA 1	PA 1 + PTT	passenger and attendant areas in 1st cabin zone	4 or 5	Basic	only applicable if more than one cabin zone is requested
A5	PA 2	PA 2 + PTT	passenger and attendant areas in 2nd cabin zone	4 or 5	Basic	only applicable if more than one cabin zone is requested
A6	PA 3	PA 3 + PTT	passenger and attendent areas in 3rd cabin zone	4 or 5	Basic	only applicable if more than two cabin zones are requested
A7	PA Crew Rest	PA CREW REST + PTT	crew rest compartment	5	Option	applicable if one crew rest compartment is installed (functions "A8" and "A9" excluded)
A8	PA Crew Rest no. 1	PA CREW REST 1 + PTT	crew rest compartment no. 1	5	Option	applicable if more than 1 crew rest compartment is installed (excludes function "A7")
A9	PA Crew Rest no. 2	PA CREW REST 2 + PTT	crew rest compartment no. 2	5	Option	applicable if more than 2 crew rest compartments are installed (excludes function "A7")

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STUDENT NOTES:

CALL SYSTEM D/O

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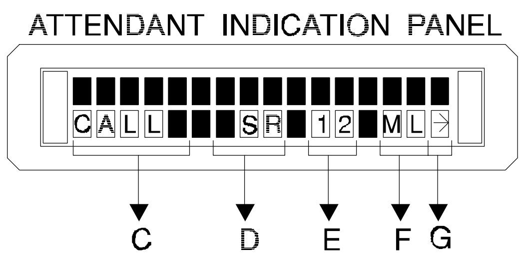
GENERAL

Any call activated from a passenger seatrow, crew rest compartment or a lavatory, activates aural and visual indications in the associated call cabin-zone.

Passenger and crew rest calls can also be activated from control units connected to the Passenger Entertainment and Service System (PES/PSS). The passenger call lights, assigned to passenger seats, are also used as seatrow identifiers during boarding.

PAX CALL



SECTION	INDICATION
C (5 CHARA.)	PASSENGER CALL
D (3 CHARA.)	SEATROW
E (2 CHARA.)	SEATROW NUMBER
F (2 CHARA.)	MID LEFT
G (1 CHARA.)	MORE THAN 1 CALL OTHERWISE, BLANK

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The passenger call switches, integrated in the Passenger Service and Passenger Interface Unit, are Located above each Passenger seat.

Associated to the passenger call :

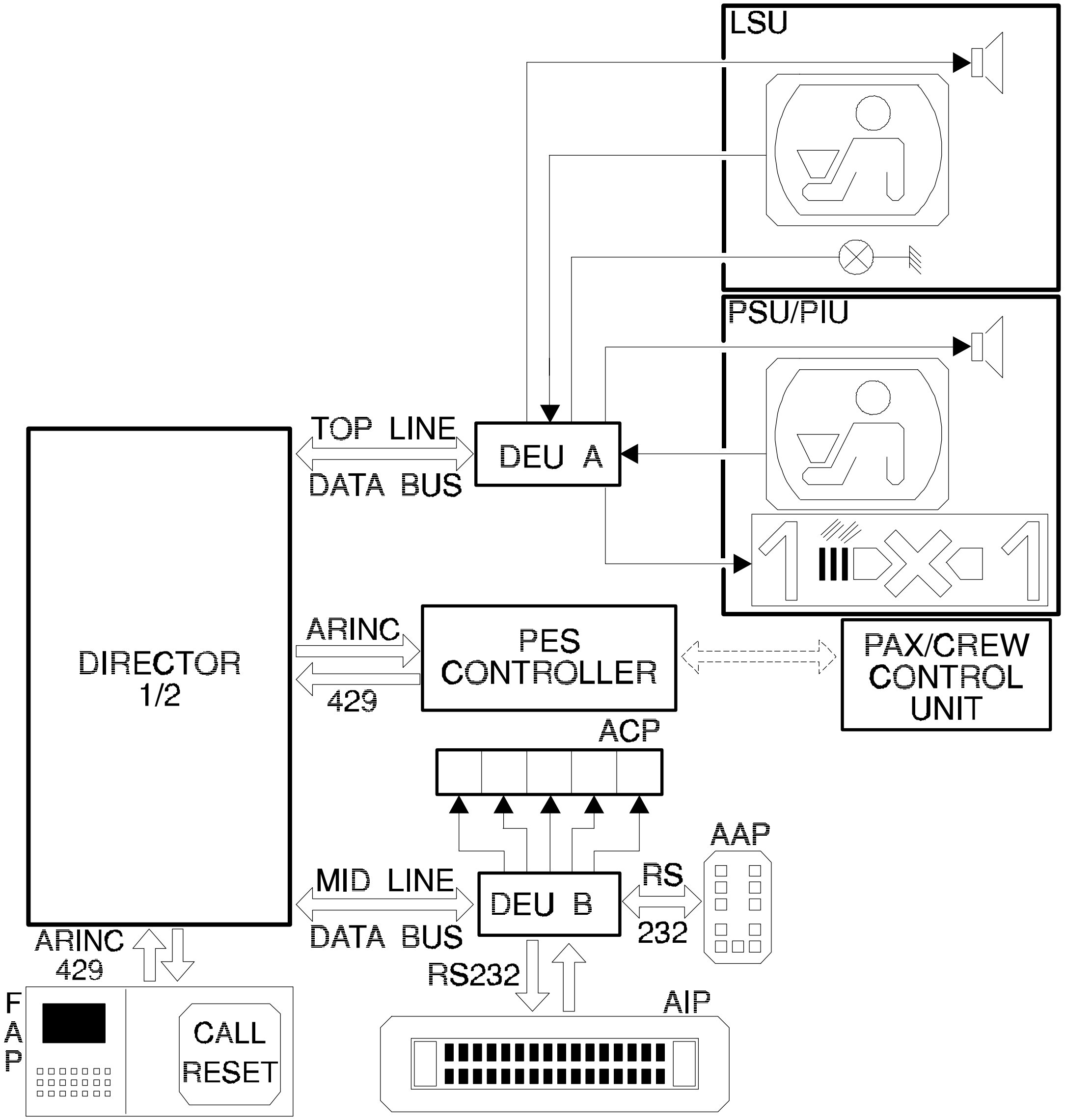
- The passenger call pushbutton and the seatrow number lights comes on,
- The ACP blue field color comes on,
- A high chime is broadcast in the call cabin-zone,
- Indications are displayed on the AIP, and the CALL RESET key, on the FAP and on the associated AAP, illuminates.

When the call pushbutton is pressed a second time, all the associated visual indications are reset.

The activated visual call indications can be reset with the CALL RESET key integrated in the FAP, AAP or the Cabin Passenger Management System (CPMS) if provided.

The CALL RESET key, on the FAP or the CPMS, is used for all cabin-zones.

The CALL RESET key, on the AAP, is used for the associated cabin-zone.



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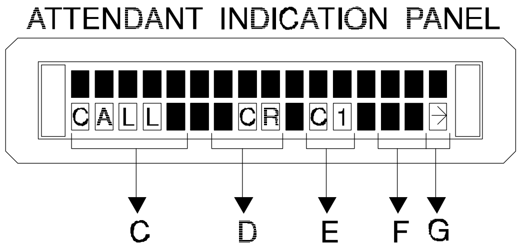
CREW REST CALL



SECTION	INDICATION
C (5 CHARA.)	PASSENGER CALL
D (3 CHARA.)	CREW REST
E (2 CHARA.)	CREW REST NUMBER
F (2 CHARA.)	BLANK
G (1 CHARA.)	MORE THAN 1 CALL OTHERWISE, BLANK

The Crew Rest Compartments are also fitted with call pushbuttons integrated in the Crew Rest Unit, which provides the same functions as the Passenger Service And Interface Unit.

Various visual and aural indications are activated in the associated call cabin-zone.

Assigned to the crew rest call :

- The call pushbutton light comes on,
- The ACP blue color field comes on,

- A high chime is broadcast in the dedicated call cabin-zone,

- Indications are displayed on the AIP, and the CALL RESET key, on the FAP and on the associated AAP, comes on.

When the call pushbutton is pressed a second time, all the associated visual indications are reset.

The activated visual call indications can be reset with the CALL RESET key integrated in the FAP, AAP or the CPMS, if provided.
The CALL RESET key, on the FAP or the CPMS, is used for all cabin-zones.
The CALL RESET key, on the AAP, is used for the associated cabin-zone.

CALL FROM THE PCU

Seat row or crew rest calls can also be activated from the PAX or CRew Control Units connected to the Passenger Entertainment System.
These units are called Passenger Control Units.

The Passenger Control Unit is integrated in the armrest of the passenger seat. The control unit dedicated to the crew rest, is installed in the Crew Rest Compartments.

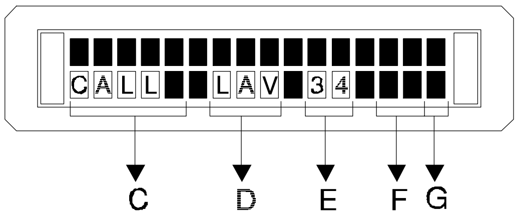
A call command received from the Passenger Entertainment System, activates the same call logic as the call command from the PSU/PIU through the type A DEU.

The call activated from the control unit, can be reset from the Passenger Control Unit, by pressing the call pushbutton a second time.

The reset command is transmitted through the PES and activates the same reset logic as the respective reset command from the PSU/PIU, through the type A DEU.

CALL FROM THE LAVATORY

ATTENDANT INDICATION PANEL



SECTION	INDICATION
C (5 CHARA.)	PASSENGER CALL
D (3 CHARA.)	LAVATORY
E (2 CHARA.)	LAVATORY NUMBER
F (2 CHARA.)	BLANK
G (1 CHARA.)	BLANK

Passenger calls can be also activated from the lavatories, fitted with Lavatory Service Units (LSUs).

Associated to the call lavatory-zone :

- The amber call light, outside, on the lavatory wall,
- The ACP amber field color comes on,
- Indications are displayed on the AIP,
- A chime is broadcast in the lavatory zone, and the CALL RESET key on the FAP and on the associated AAP, comes on.

When the call pushbutton is pressed a second time, all the associated visual indications are reset.

The activated visual call indications can also be reset with the CALL RESET key integrated in the FAP, AAP or the CPMS, if provided.

The CALL RESET key, on the FAP or the CPMS, is used for all cabin-zones. The CALL RESET key, on the AAP, is used for the associated cabin-zone.

STUDENT NOTES

CABIN AND COCKPIT INTERPHONE D/O

GENERAL

The cabin and cockpit interphone system enables telephone communications between the attendant stations and between the attendant stations and the cockpit.

One or several communication links can be connected to the calling station or the cockpit.

The conference mode enables communication between more than two interphone sources.
Different communication modes can be performed with a predefined priority degree.
A communication is always initiated by a dial procedure with the ATTENDANT HANDSET or by pushbuttons on the CALLS PANEL in the cockpit.

PRIORITY

Each call is associated to a priority.
Additionally, the different interphone sources have call assigned priorities.

High priority
- emergency call,
- call from the cockpit,
- all attendant call,
- normal call.

Low priority

CALL INDICATIONS

Aural and visual indications are activated when a call is initiated in the cabin or in the cockpit.
The aural and visual indications are reset with the RESET KEY on the ACP.

IN THE CABIN :

When a call is initiated, visual and aural indications are activated on the AIPs and ACPs, associated to the called station.
Hi-lo chimes are also broadcast in the assigned zones through the cabin loudspeakers.

IN THE COCKPIT :

A buzzer is broadcast when the amber attendant light on the ACPs is activated.
In case of an emergency call activation, the emergency call light and the amber attendant call light on the ACPs are activated.

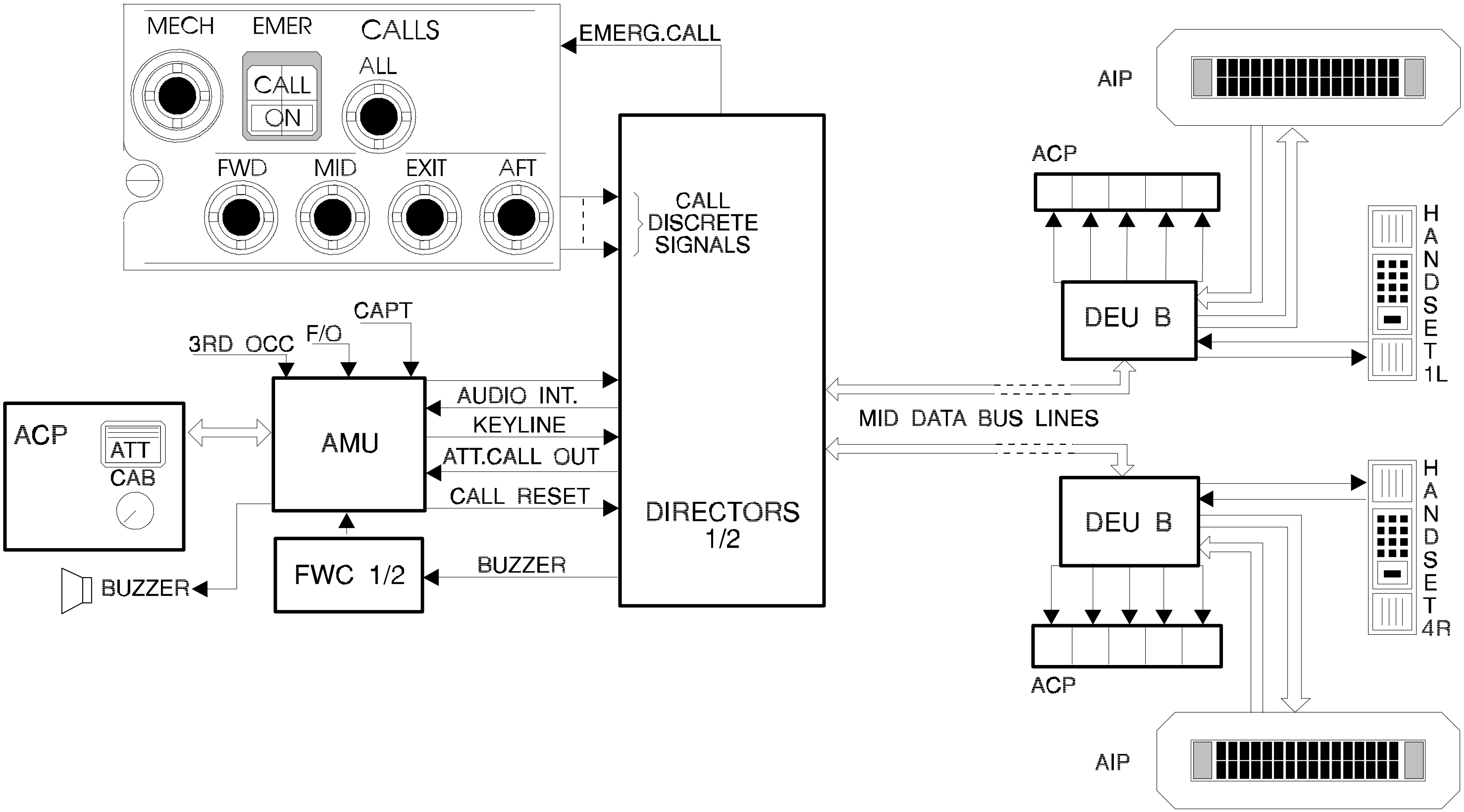
CALL FROM THE CABIN

Interphone communications are performed with the attendant station handsets which are connected to the type B DEUs.

To initiate a call take the handset off the hook and then dial the code on the keyboard.

One, two or three keys can be used, if programmed in the CAM.

The call triggers aural and visual indications, provided the called station is not engaged or if the calling station or the initiated call mode has sufficient priority.
When the communication link is established, all the visual indications in the cabin are reset when the cabin handset is taken off its hook.



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CALL FROM THE COCKPIT

Calls from the cockpit are initiated from the call panel which is connected to the directors.
Connection of the cockpit to the cabin interphone system is performed using the CAB key on the ACPs.

The call pushbuttons on the CALLS panel enable the crew to select the attendant station.

ALL ATTENDANT CALL

When a "ALL ATTENDANT CALL" communication mode is selected from the cockpit or from the cabin, all the called stations are switched to a common link to the calling station (including cockpit).

In the cockpit, the "ALL" pushbutton on the CALLS panel must be pressed.
In the cabin, on the handset keyboard, the "ALL" key must be pressed.

Cockpit calls all cabin attendant stations :

- steady pink light on all cabin ACPs,
- steady green light on all cabin AIPs,
- "ALL CAPT" on all cabin AIPs,
- hi-lo chime sounds once from all cabin loudspeakers.

The call is reset :

- after 1 minute, if any handset is taken off the hook,
- when the last handset is taken on the hook.

Cabin attendant station calls all other cabin attendant stations :

- steady pink light on all other cabin ACPs,
- steady green light on all other cabin AIPs,
- "CALL ALL ATTND" on all other AIPs,
- hi-lo chime sounds once from all other cabin loudspeakers.

NORMAL CALL

When a "NORMAL CALL" is initiated from a cabin handset, a CAM defined number of stations are called.

The called station, which takes off the hook first, is switched to an independent link to the calling station.
The call can be performed with the purser, captain or any attendant key.

When the NORMAL CALL is initiated from the cockpit as in the previous case, the called station, which takes off the hook first, is connected.
One of the FWD, MID, EXIT and AFT pushbuttons is used.

Cockpit calls FWD, MID, EXIT or AFT stations :

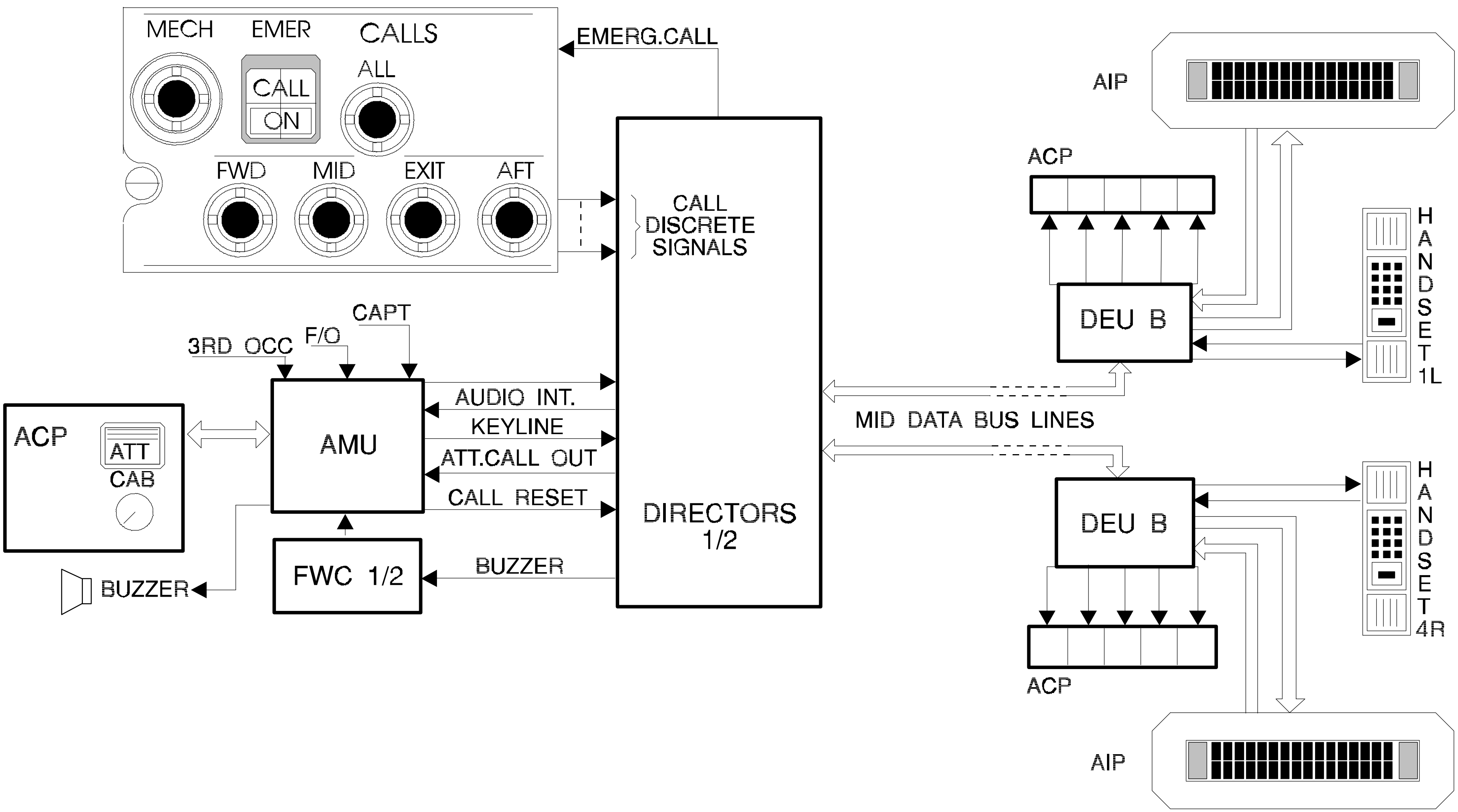
- steady pink light on corresponding cabin ACP,
- steady green light on corresponding cabin AIP,
- "CAPTAIN" on corresponding AIP,
- 1 hi-lo chime from corresponding loudspeaker.

One cabin station calls another :

- steady pink light on corresponding cabin ACP,
- steady green light on corresponding cabin AIP,
- "1L ATTND" (calling station) on corresponding AIP,
- 1 hi-lo chime from corresponding cabin loudspeaker.

Cabin attendant station calls the cockpit :

- flashing "ATT" light on all cockpit ACPs,
- the buzzer sounds.


MECH
EMER
CALLS
CALL
ON
ALL
FWD
MID
EXIT
AFT
EMERG.CALL
CALL DISCRETE SIGNALS
CAPT
F/O
3RD OCC
AUDIO INT.
KEYLINE
ATT.CALL OUT
CALL RESET
ACP
ATT
CAB
AMU
FWC 1/2
BUZZER
BUZZER
DIRECTORS 1/2
AIP
ACP
DEU B
HANDSET 1L
MID DATA BUS LINES
DEU B
HANDSET 4R
ACP
AIP

EMERGENCY CALL

The emergency call has the highest priority.
An emergency call from the cockpit initiates communication links to all connected cabin stations on a common link.

The emergency call pushbutton on the CALLS panel must be pressed.

An EMER CALL from any attendant station handset only calls the cockpit.

Emergency call from the cockpit :

- flashing pink light on all cabin ACPs,
- flashing red light on all cabin AIPs,
- "PRIO CAPT" on all cabin AIPs,
- 3 hi-lo chimes from all cabin attendant loudspeakers.

Emergency call from the cabin :

- the "ATT" light flashes on all cockpit ACPs,
- the "EMER" light flashes on the CALLS panel,
- the buzzer sounds 3 times.

PRIORITY CALL OPERATION

When a busy station gets a higher priority call, the previous link is interrupted to establish the new higher priority link.

Visual indications are displayed on the AIP of the called and disconnected station.

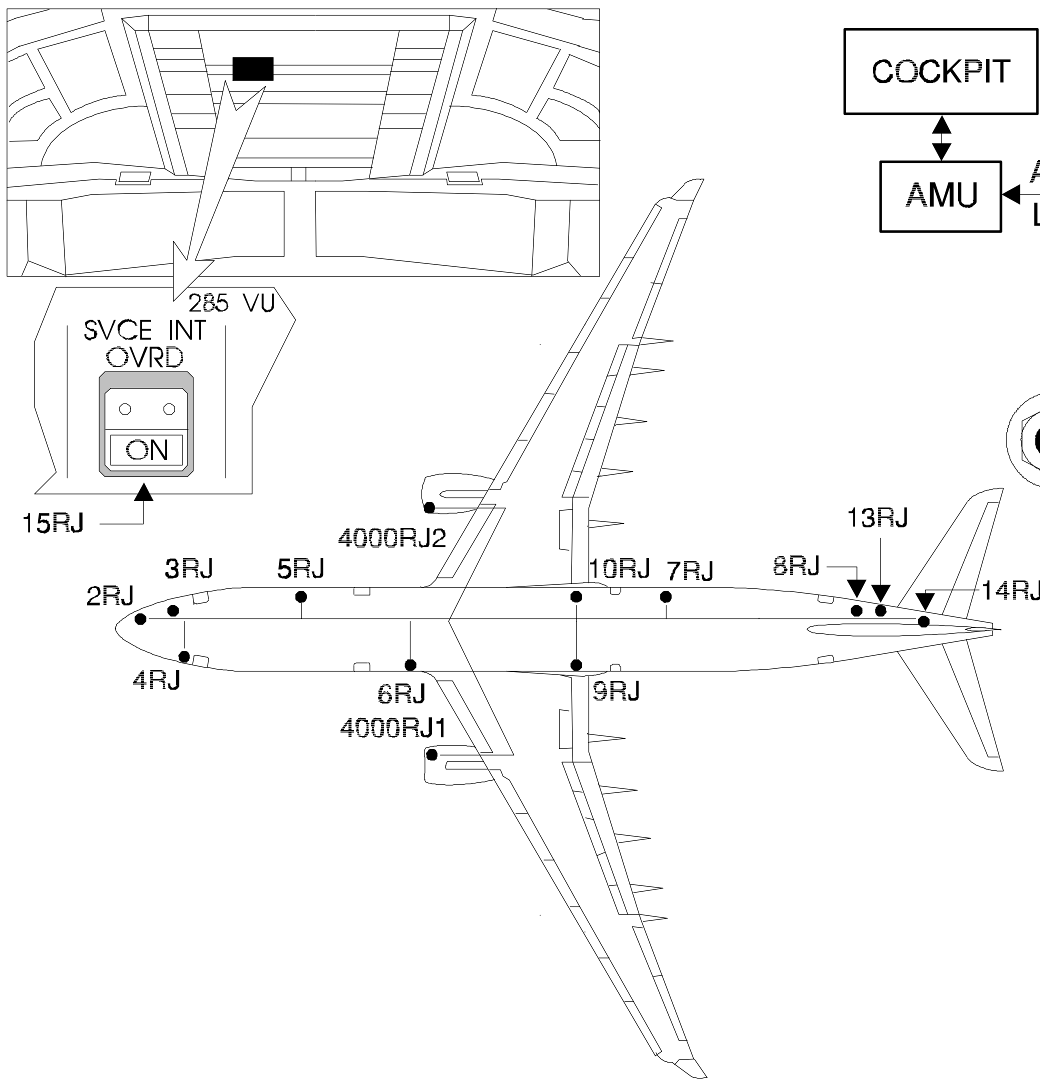
SERVICE INTERPHONE D/O

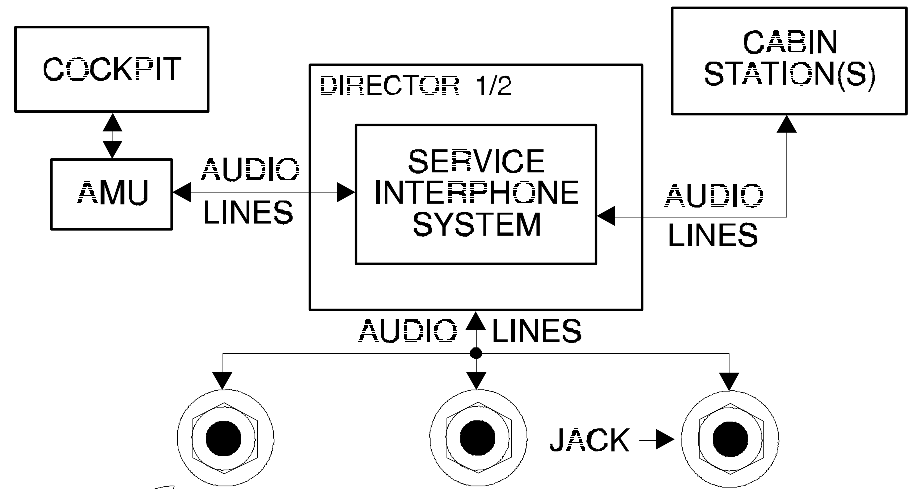
GENERAL

The SERVICE INTERPHONE SYSTEM enables voice communications, on the ground only, between the SERVICE INTERPHONE JACKS, the cockpit and the cabin stations.

SYSTEM DESCRIPTION

The 13 SERVICE INTERPHONE JACKS are connected to the Cabin Intercommunication Data System (CIDS) and located around or in the aircraft.





FIN	LOCATION
2RJ	ON EXT. POWER PANEL
3RJ	IN FWD AVIONICS BAY
4RJ	IN AFT AVIONICS BAY
5RJ	IN FWD CARGO COMP.
6RJ	AT AIR CONDITION BAY
7RJ	ON LIGHT PANEL
8RJ	AT FLIGHT DATA RECD.
9RJ	IN HYDRAULIC COMP.
10RJ	IN HYDRAULIC COMP.
13RJ	AT TRIM ACTUATOR
14RJ	IN APU COMPARTMENT
4000RJ1 (2)	AT ENGINE No 1 (2)

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LGCIU & SERVICE INTERPHONE OVERRIDE CONDITIONS

The SERVICE INTERPHONE SYSTEM is integrated in the CIDS DIRECTORS.

There are 2 modes to connect the JACKS to the SERVICE INTERPHONE.

The AUTOMATIC mode :

On ground only, with the Nose Landing Gear down and compressed or with the GROUND POWER UNIT A/B connected.

The Landing Gear Interface Units (LGCIUs) send a ground signal to the SERVICE INTERPHONE SYSTEM, integrated in the DIRECTORS which are part of the Cabin Intercommunication Data System (CIDS).

The MANUAL mode :

The SERVICE INTERPHONE OVERRIDE pushbutton 15RJ, on the overhead panel, must be pressed so that the white ON light comes on.

The aircraft is on the ground with no signal from the LGCIUs. (e.g: The LGCIUs are not supplied). When the SERVICE INTERPHONE OVERRIDE pushbutton is pressed, a ground signal is send to the DIRECTORS.

OPERATIONS FROM COCKPIT

To establish a speech communication from the cockpit with the SERVICE INTERPHONE JACKS, the CABin key on any AUDIO CONTROL PANEL (ACP), must be pressed.

The audio signals are transmitted to the JACKS through the Audio Management Unit (AMU), the SERVICE INTERPHONE SYSTEM, integrated in the CIDS DIRECTORS and the audio lines.

OPERATIONS FROM CABIN STATION(S)

To establish a speech communication from the cabin with the SERVICE INTERPHONE JACKS, the INTERphone key on the cabin attendant HANDSET must be pressed two times.

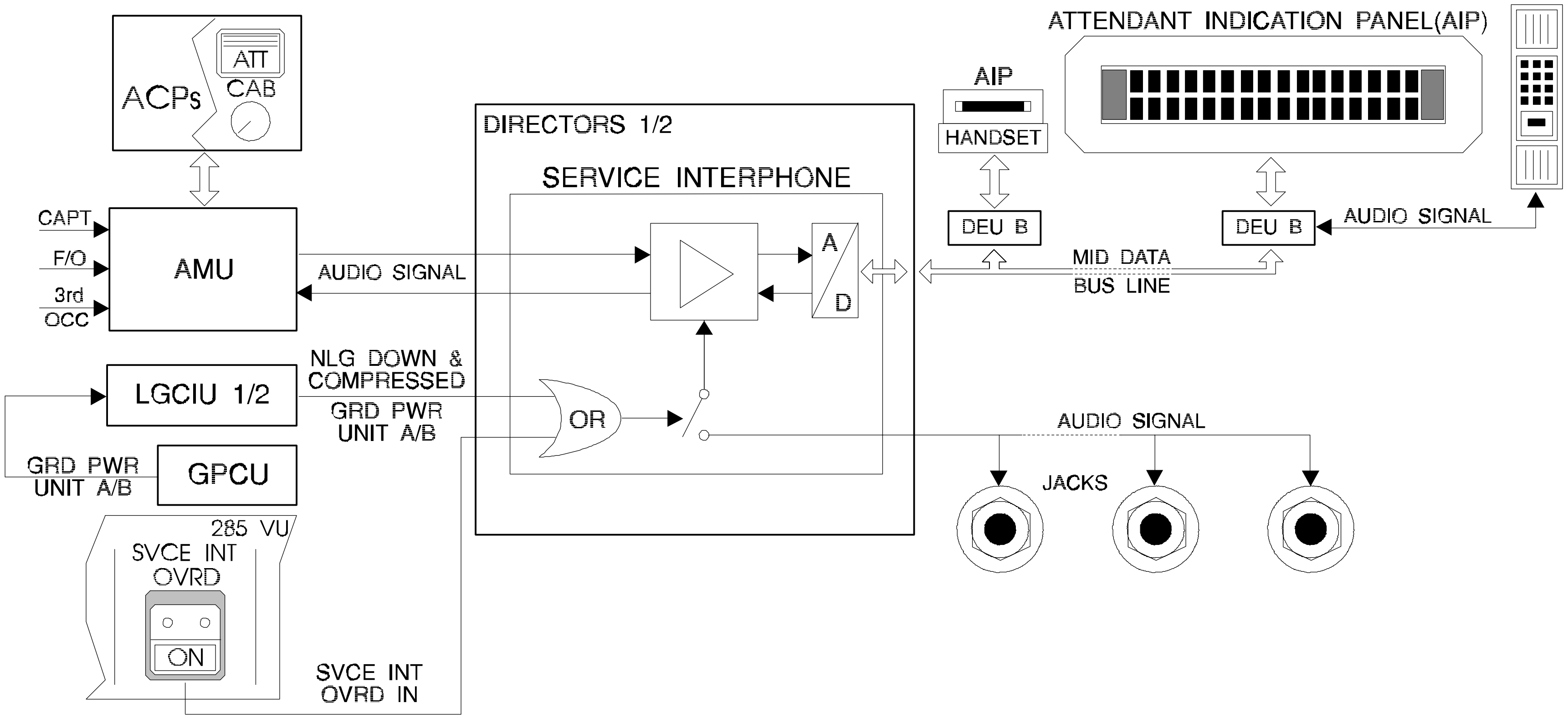
In the cabin, on all the ATTENDANT INDICATION PANELs, the steady "SERV INT IN USE" message appears.

The audio signals are digitized through the Decoder Encoder Units B and transmitted through the MID DATA BUS LINES to the DIRECTORS.

After conversion to analog signals, they are transmitted to the JACKS though audio lines.

NOTE :

When the CABin and INTerphone keys are pressed (respectively on the ACPs in the cockpit and on the handset in the cabin), speech communications can be established between the cockpit, the cabin stations and the JACKS.



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STUDENT NOTES:

WARNINGS

CIDS 1+2 FAULT
CIDS PA FAULT
CIDS CAUTION LIGHT

CIDS 1+2 FAULT

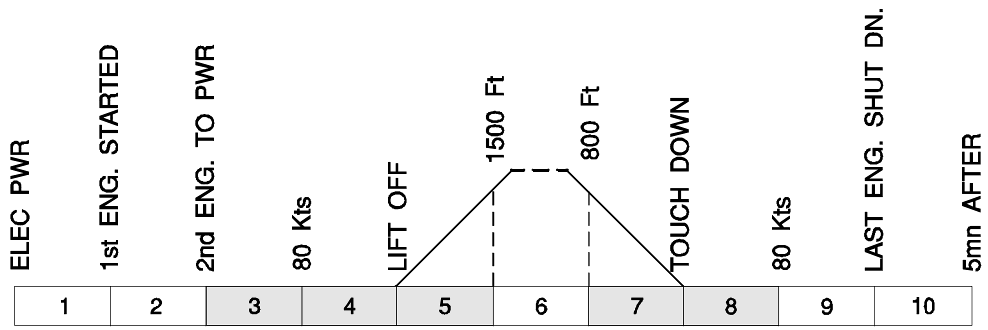
In case of total loss of cabin intercommunication data system (CIDS) director 1 and 2, the MASTER CAUTION light comes on amber, the single chime sounds and a message appears on the upper ECAM display unit.

The warning is inhibited during flight phases 3, 4, 5, 7 and 8.

CIDS PA FAULT

In case of loss of passenger address system, the MASTER CAUTION light comes on amber, the single chime sounds and a message appears on the upper ECAM display unit.

The warning is inhibited during flight phases 3, 4, 5, 7 and 8.

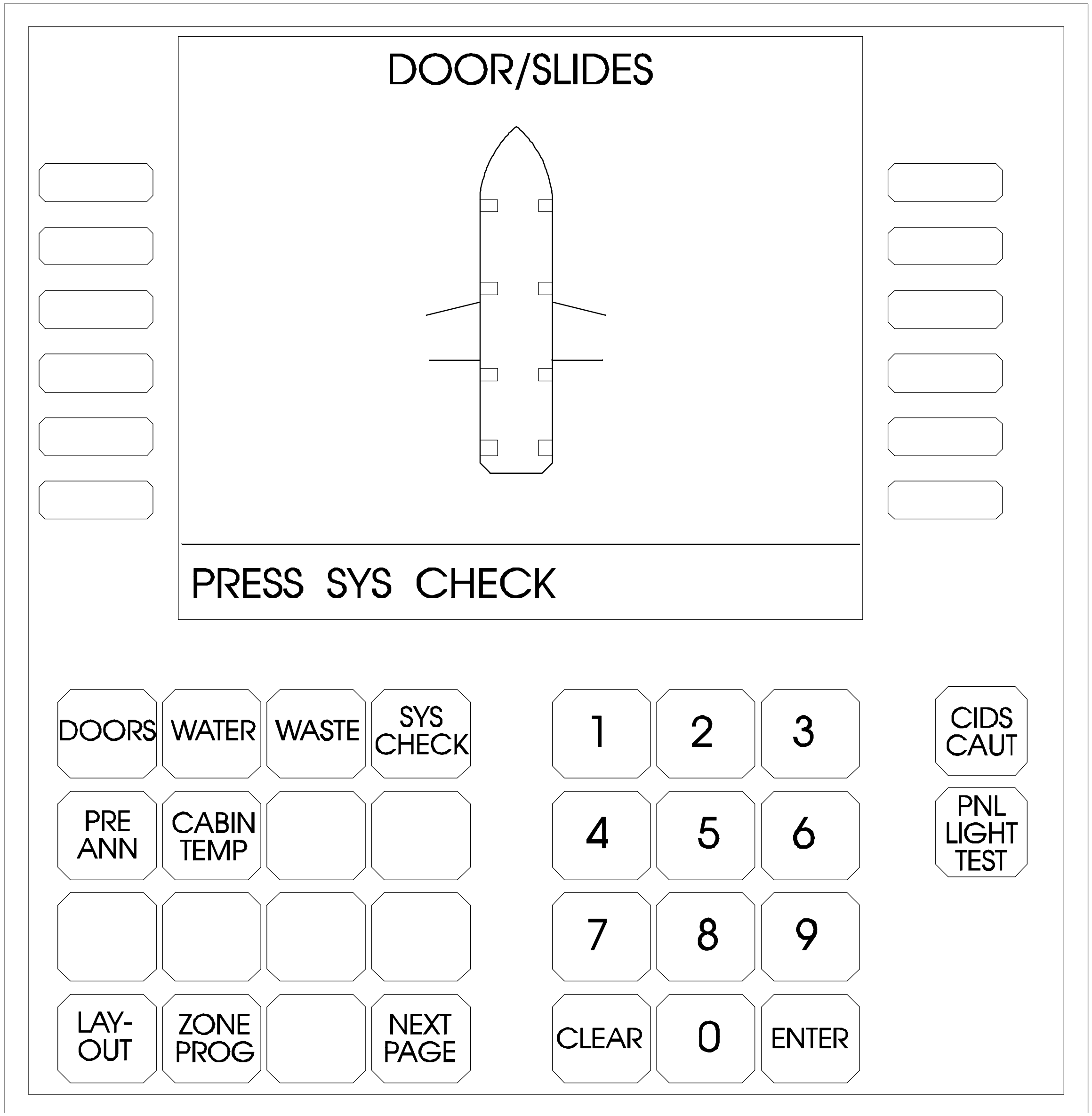


E/WD : FAILURE TITLE	AURAL WARNING	MASTER LIGHT	SD PAGE CALLED	LOCAL WARNINGS	FLT PHASE INHIB
CIDS 1 + 2 FAULT Total loss of CIDS	SINGLE CHIME	MASTER CAUT	NIL	NIL	3, 4, 5, 7, 8
CIDS PA FAULT Loss of passenger address part	SINGLE CHIME	MASTER CAUT	NIL	NIL	3, 4, 5, 7, 8

CIDS CAUTION LIGHT

In case of a CIDS class 1 failure, the CIDS CAUTION light flashes and the corresponding system page appears on the screen.

If another system page is displayed, a message appears at the bottom of the screen to indicate to the attendant which system hard key must be pressed in order to obtain the failure information.



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STUDENT NOTES

PIM UTILIZATION STATUS AND PROGRAMMING

General
Power-Up page
Free Use

GENERAL

The PIM is a part of the FAP installed at the forward attendant station.

The PIM is used by the cabin crew for cabin system status indications and cabin programming operations.

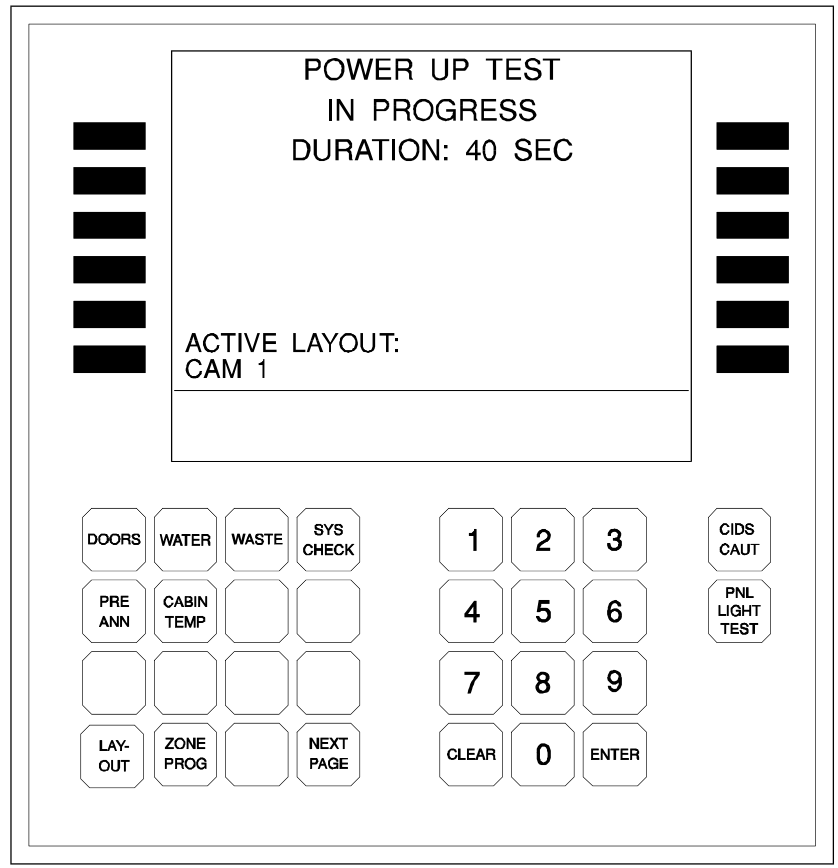
any amber messages, displayed on the PIM, are failure indications to inform the cabin crew about the status of the cabin system(s): no action is required. But, for some of them, an action is necessary!

Cabin system tests are not possible from the PIM. They can only be performed from the MCDUs.

Note: The "amber" messages are in fact displayed in yellow.

POWER-UP PAGE

At power-up, the integrity of the CIDS system is tested and the selection of the ACTIVE LAYOUT is made.



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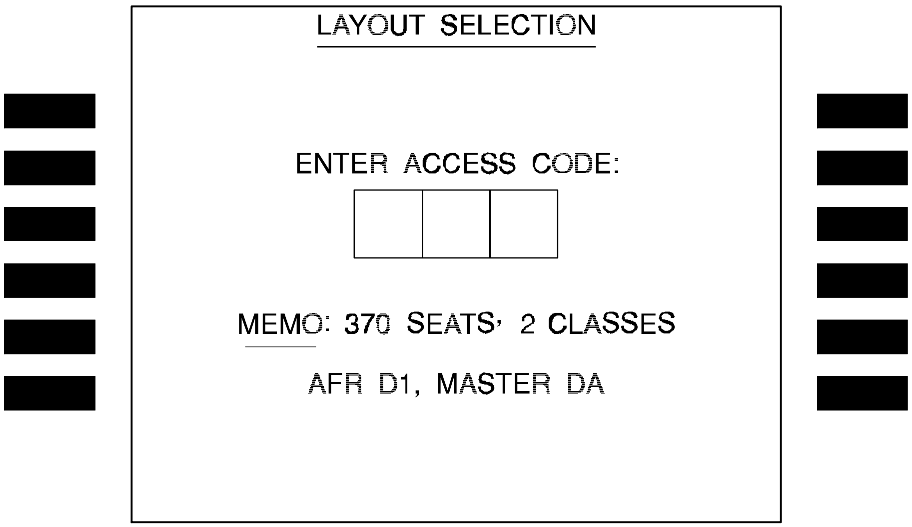
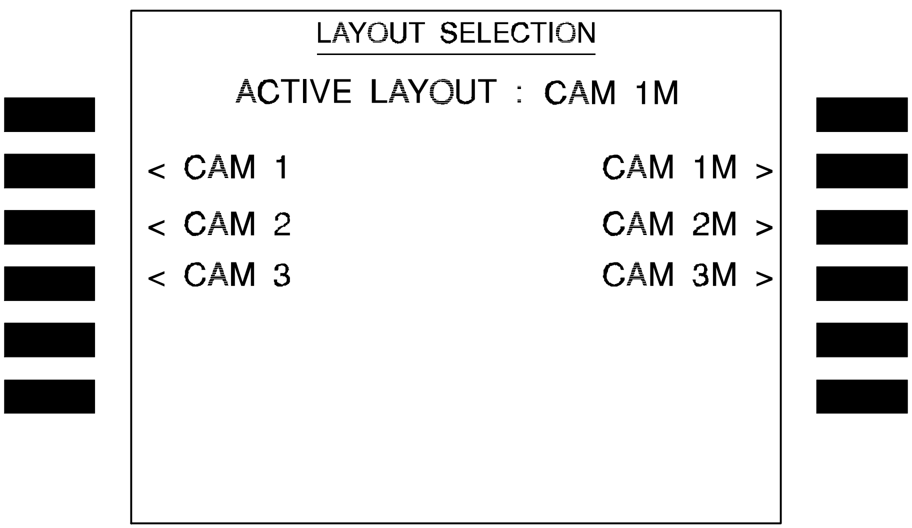




KEY FUNCTIONS

LAYOUT SELECTION PAGES

The LAYOUT SELECTION mode enables the cabin crew to choose one, from a maximum of 3, predefined and modifiable cabin layouts stored in the CAM.

When the "LAYOUT" key is pressed, the CABIN LAYOUT SELECTION page is displayed.

The LAYOUT SELECTION mode is code protected and only accessible on the ground.

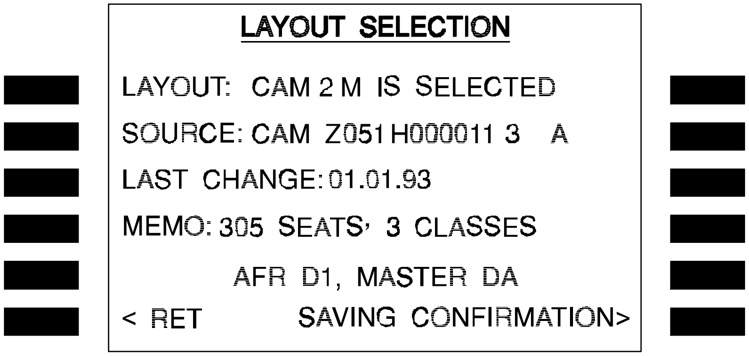
A 3 digit access code has to be entered with the PIM numeric keyboard.

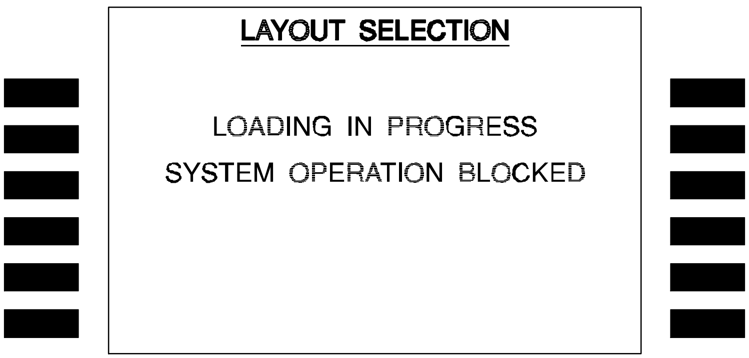
Typing mistakes are corrected with the CLEAR key.

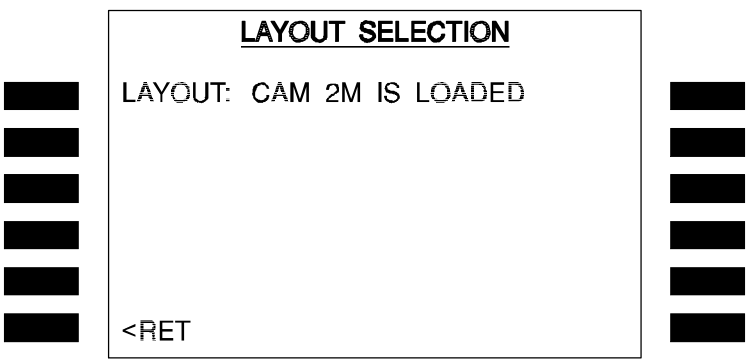
When the correct access code is entered, the CAM LAYOUT SELECTION page is displayed.

Up to 3 predefined CAM layouts and up to 3 modifiable CAM layouts are displayed with the ACTIVE LAYOUT.

The CAM layout selection is made with the associated softkeys.







After selection of a CAM layout, the LAYOUT INFO page is displayed with the following information:

- CAM layout name
- Layout part number
- Date of the last change

and 3 lines of information.

If the layout selection is impossible, an info message will be displayed on the PIM:

"LAYOUT SELECTION CURRENTLY
DISABLED"

When the new cam layout selection is accepted, the CONFIRMATION MESSAGE is displayed.

If the layout change has failed, an amber message is displayed:

LOADING FAIL
PREVIOUS LAYOUT IN USE
PRESS RETURN TO CONTINUE

Pressing the LAYOUT SELECTION key at any time, again aborts the layout selection process.

Before a 10 minute time out, you can perform a new layout selection with the "RETurn" softkey.

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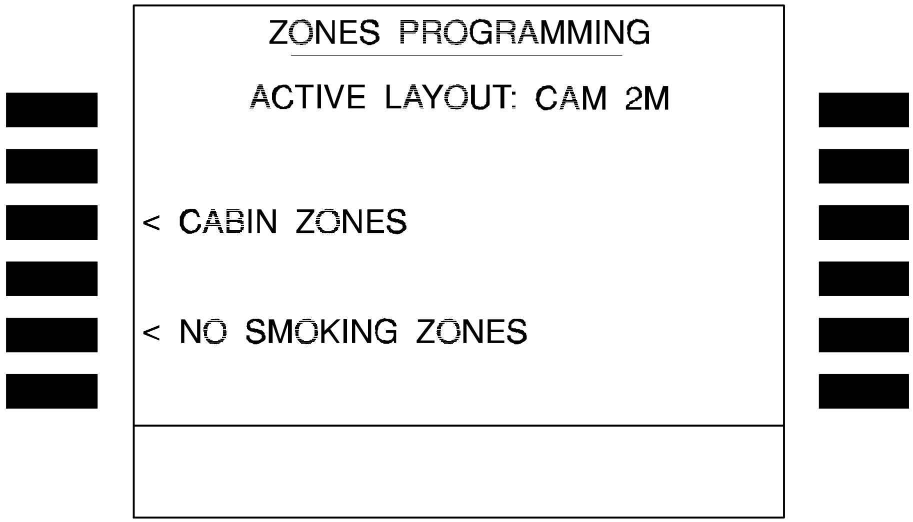


ZONES PROGRAMMING PAGES

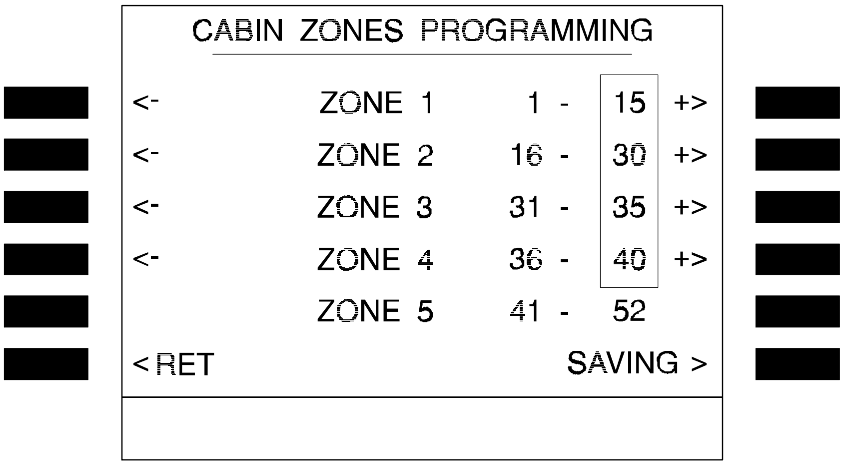
When the ZONE PROGRAMMING key is pressed, the ZONES PROGRAMMING MENU page is displayed.

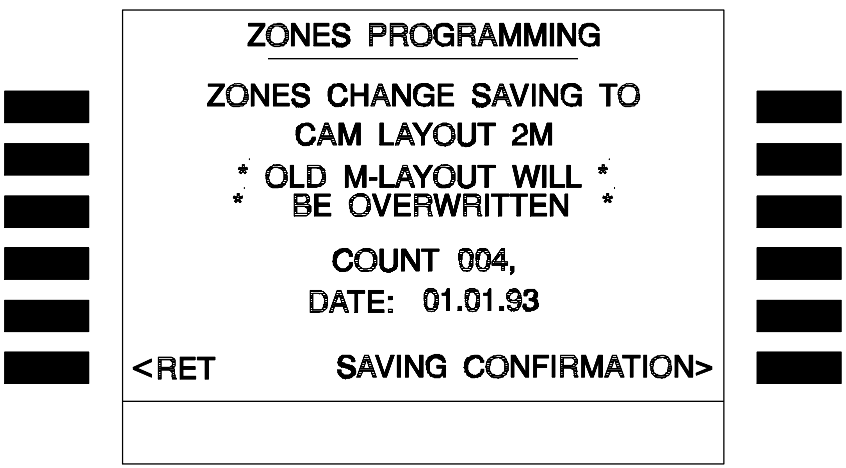
It provides the cabin and the NO SMOKING ZONES PROGRAMMING functions.

The cabin and the NO SMOKING ZONES are the only programmable functions provided to the cabin crew.

The cabin related functions, defined by the customers as the number of cabin zones, the passenger address, the general cabin illumination, the PAX audio, the PAX call and the PES audio zoning are stored in the CAM and not modifiable through the PIM.

<CABIN ZONES PROGRAMMING PAGES





With the CABIN ZONES PROGRAMMING function, the cabin crew can easily modify the length of each cabin zone.

The maximum number of cabin zones is 5.

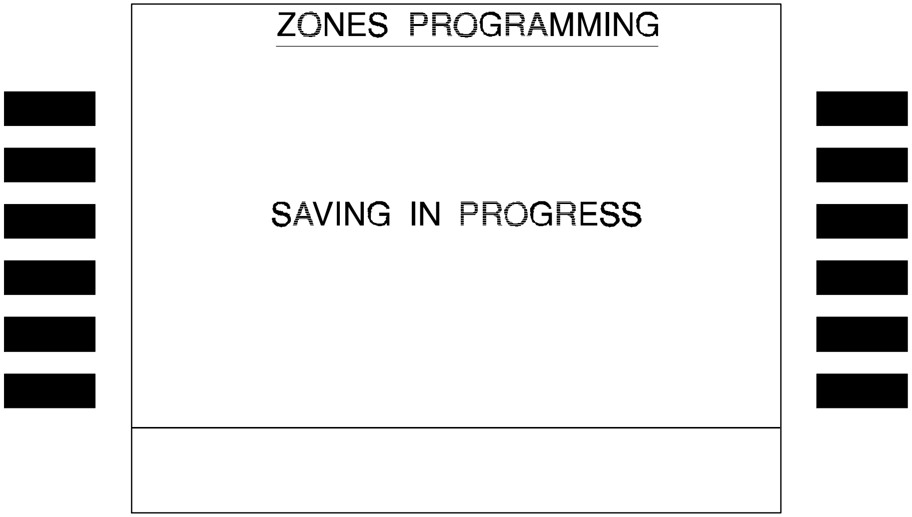
A cabin zone cannot be deleted or created.

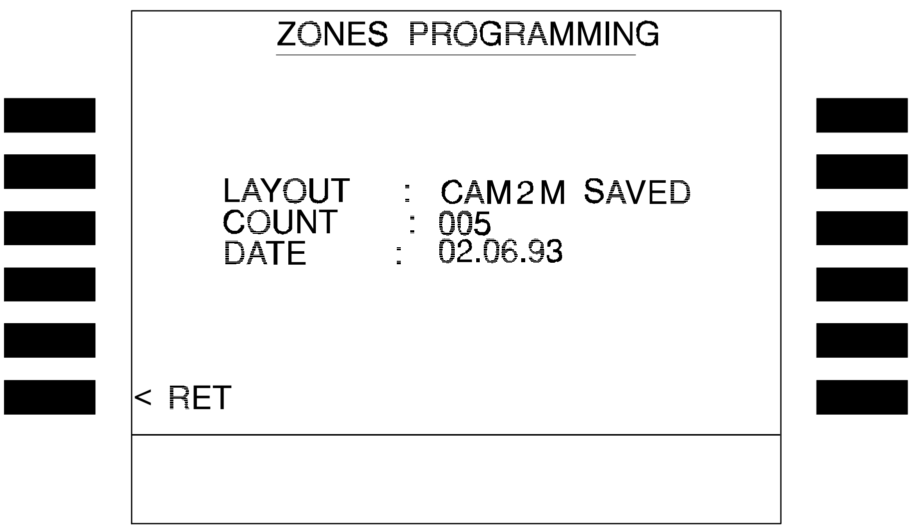
Only the zone ends are programmable, except the last cabin zone, which is fixed.

The smallest cabin zone consists of one seatrow: the begin and end seatrow number are identical.

If the decrease or increase of the end zone is not possible, the respective symbol "+" or "-" disappears.

When the cabin zone length changes have been made, the new zoning is stored in the active director and in the respective CAM memory by pressing the "SAVING" softkey.





If the saving transfer is completed, the SAVING page appears with:

- The saved CAM layout name
- The count + 1 number

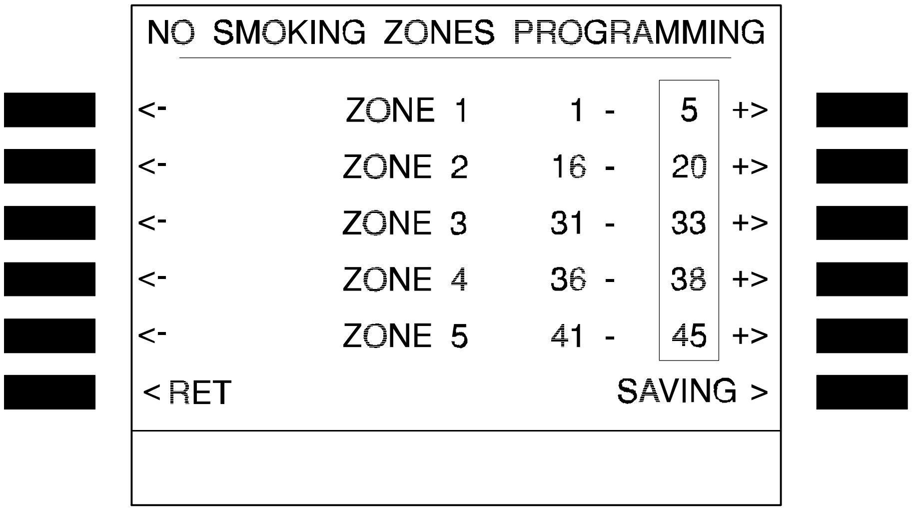
and the new date.

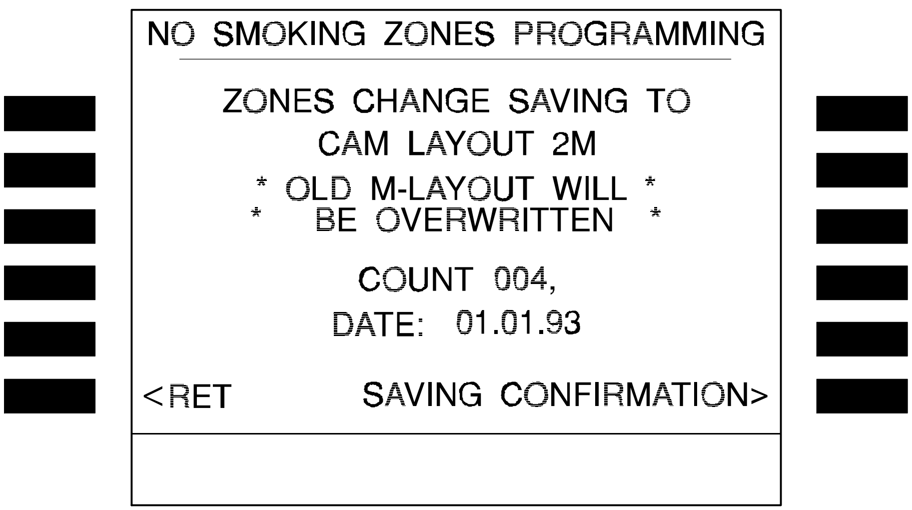
If the layout transfer is not successful, the SAVING FAILURE page (below) is displayed.

SAVING FAILURE
LAYOUT: CAM 2M NOT UPDATED
OLD LAYOUT : CAM 2M
COUNT : 04
DATE : 20.07.91
PRESS RETURN TO CONTINUE

The director uses the last used layout again.

The FAILURE page is displayed until the "RETURN" softkey is pressed.





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< NO SMOKING ZONES PROGRAMMING PAGES

With the NO SMOKING ZONES PROGRAMMING function, the cabin crew can easily modify the length of the no smoking zones.

There are 2 versions of the no smoking zone arrangement, according to the customers choice.

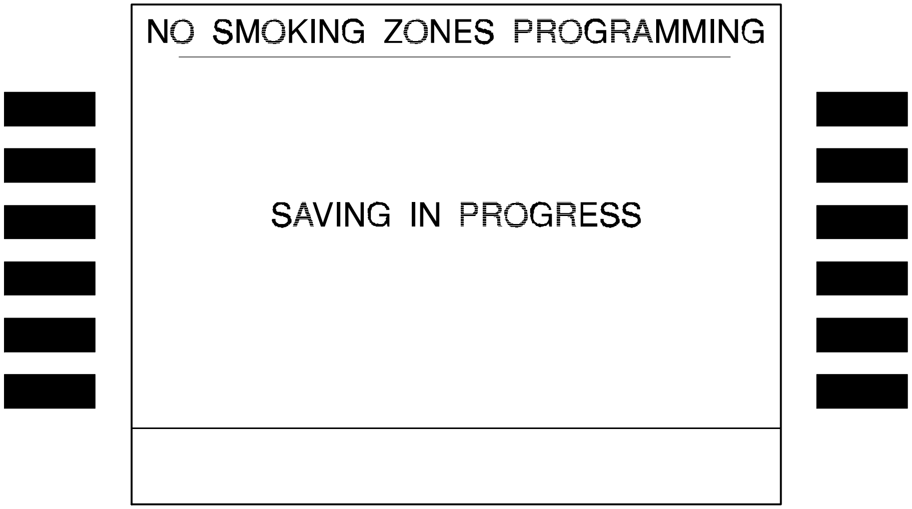
First version:
The beginning of the zone is fixed and the cabin zone end is symmetrical and programmable.

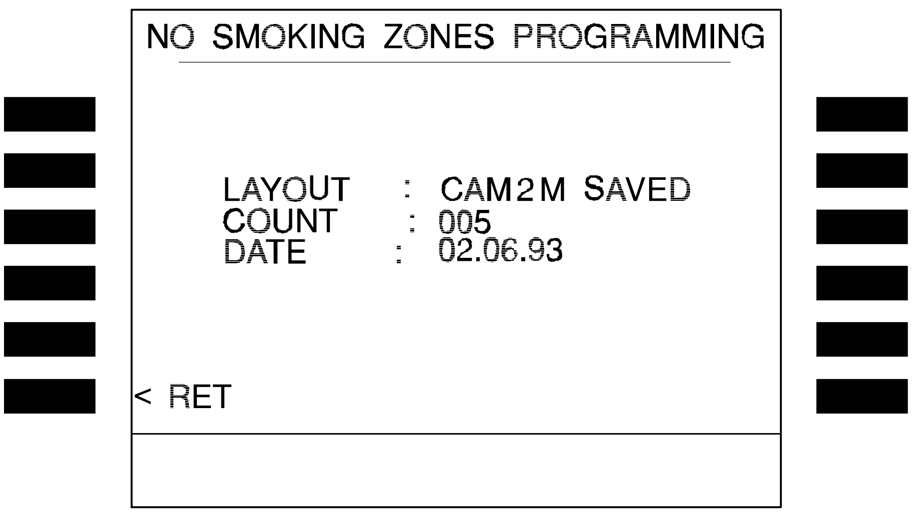
If the cabin zone length has changed, the number of no smoking seatrows within this cabin zone remains constant until the cabin zone is smaller than the NS zone.

In this case, the NS zone is limited to the new length of the cabin zone.

An NS zone can be deleted by programming, if the seatrow end number is smaller than the seatrow begin number.

When the No Smoking zone length changes have been made, the new zoning is stored in the active director and in the respective CAM memory by pressing the "SAVING" softkey.





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- The saved CAM layout name
- The Count + 1 number

and the new date.

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LAYOUT: CAM 2M NOT UPDATED
OLD LAYOUT : CAM 2M
COUNT : 04
DATE : 20.07.91
PRESS RETURN TO CONTINUE

The director uses the last used layout again.

The FAILURE page is displayed until the "RETURN" softkey is pressed.

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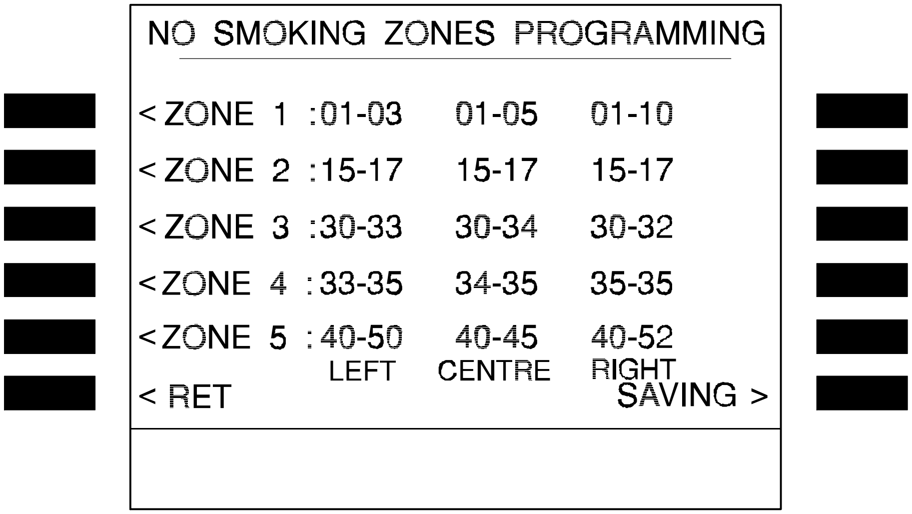

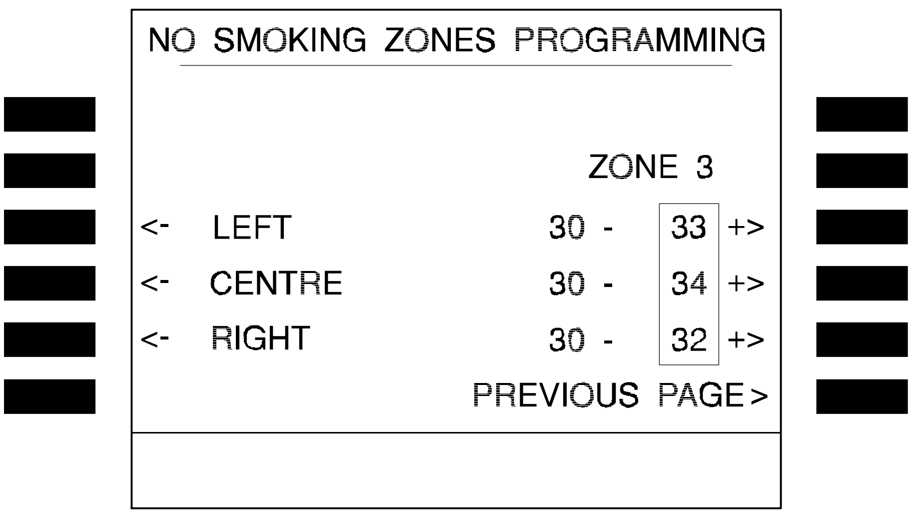

Here is the 2nd version of the No Smoking zone arrangement:

The beginning of the zone is fixed and the cabin zone end is symmetrical and programmable per column.

For No Smoking zone changes, select first the zone number with the associated softkey.

The No Smoking zone 3 programming is displayed with the zone end programmable per column.

When the No Smoking zones changes have been made, get the previous page and press the "SAVING" softkey.

At that step, the procedure is identical to the previous one.

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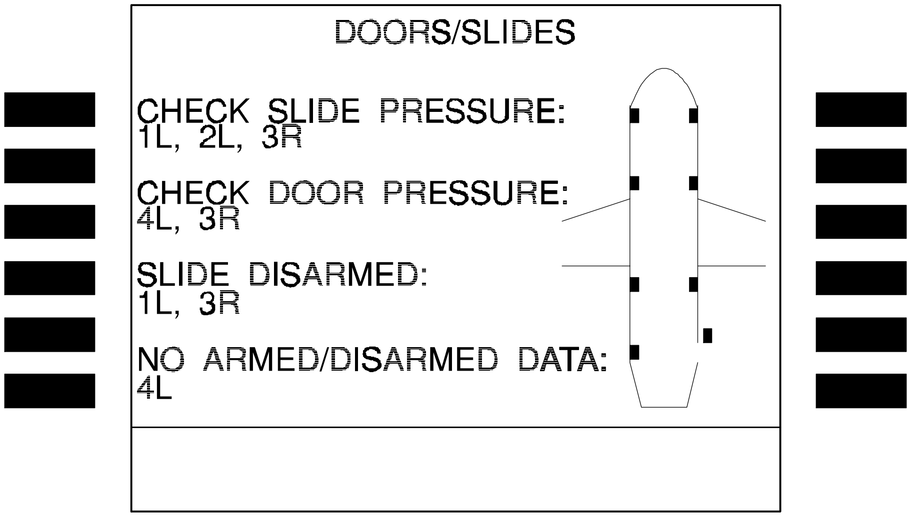

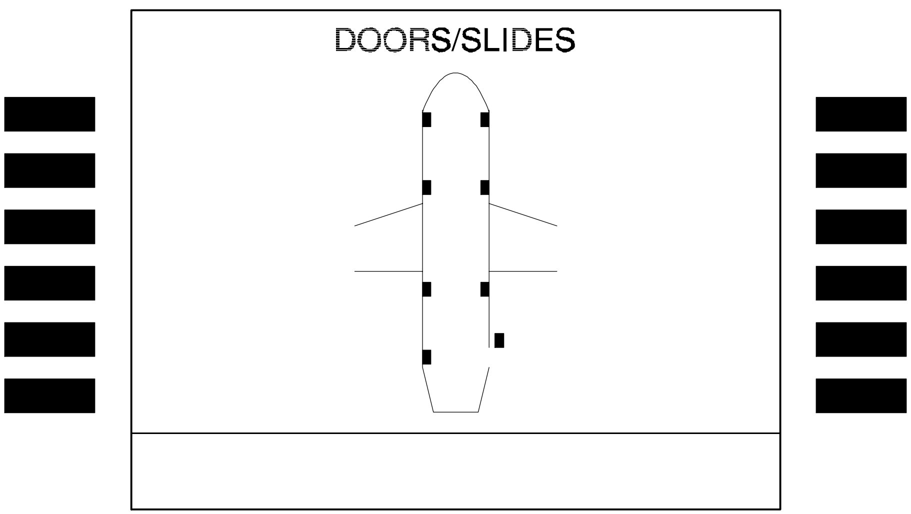

DOORS PAGE

When the DOORS key is pressed, the DOORS/SLIDES page is displayed. This is the manual mode.

The DOORS/SLIDES page provides the doors status with the doors and the slides bottle pressure, the slides disarmed and the no armed/disarmed data indications.

When the SELECTED SYSTEM key is pressed a 2nd time, the SYSTEM page is switched off.

When the directors receive, from the door emergency actuator and (or) slide bottle pressure switches, one or more door and (or)slide pressure low signals or slide disarmed signals, the DOORS/SLIDES page or the info row message "SELECT DOORS" will be automatically displayed.

Note: For open door(s), there will be no "Slide Disarmed" indications.

With no detected failures, the DOORS/SLIDES page is displayed without failure indications.

Only the doors status remains.

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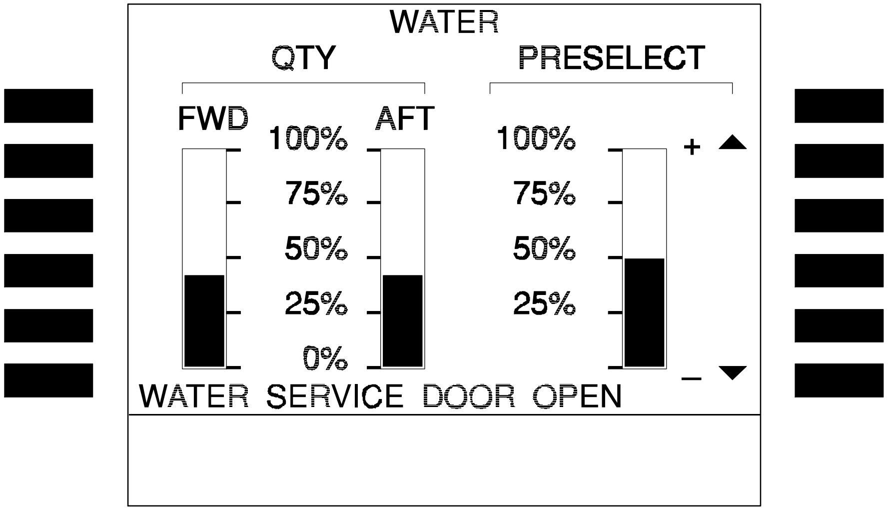

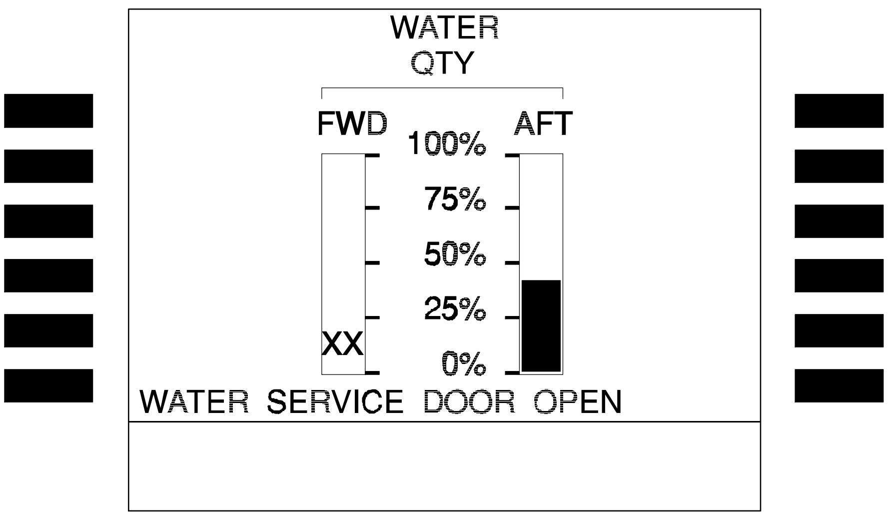

WATER PAGE

When the WATER key is pressed, the bar graphs of the forward and aft potable water tanks and of the water quantity preselection are displayed.

This is the manual mode.

When the A/C is on the ground and the water service door open, the WATER page is automatically displayed with the info message "WATER SERVICE DOOR OPEN".

- The preselection is in 25% steps.
- 0% is not selectable.
- The resolution of the water tank is 1%.

For water quantity preselection, use the softkeys associated to the up and down arrows.

There is a 2nd version of the WATER page with no preselection quantity bargraph.

In that case, the water preselection quantity is located on the water panel.

"XX" means: No data from the respective water tank(s) is available.

If no director and/or vacuum system controller data is available, an info message is displayed:

"NO WATER QTY DATA AVAILABLE
NO WATER PRESELECT AVAILABLE"

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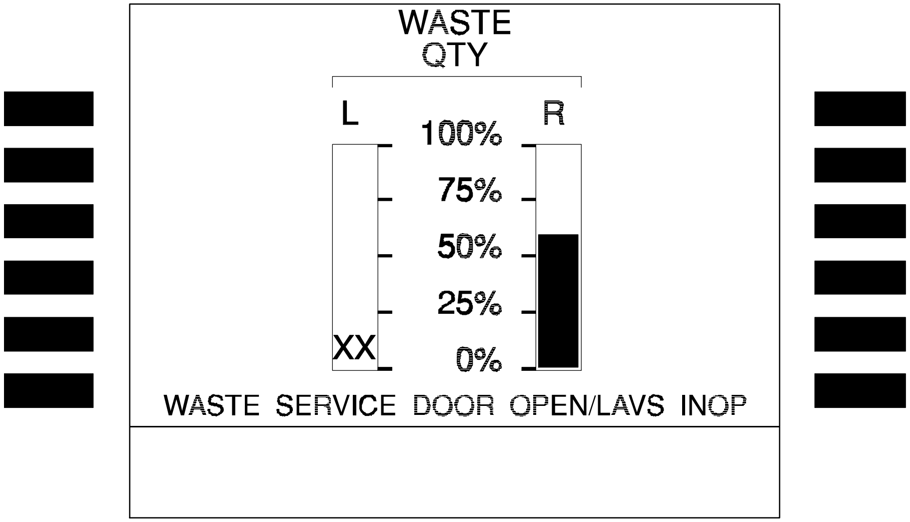

WASTE PAGE

When the WASTE key is pressed, the bar graphs of the left and right waste tanks are displayed.

This is the manual mode.

With the A/C on the ground and the "WASTE SERVICE DOOR OPEN" command, the WASTE page and the system message "WASTE SERVICE DOOR OPEN/LAV INOP" are automatically displayed.

With no director and/or VSC data available, the info text "NO WASTE QTY DATA AVAILABLE" is displayed.

"XX" means: From the respective waste tank(s), no data available.

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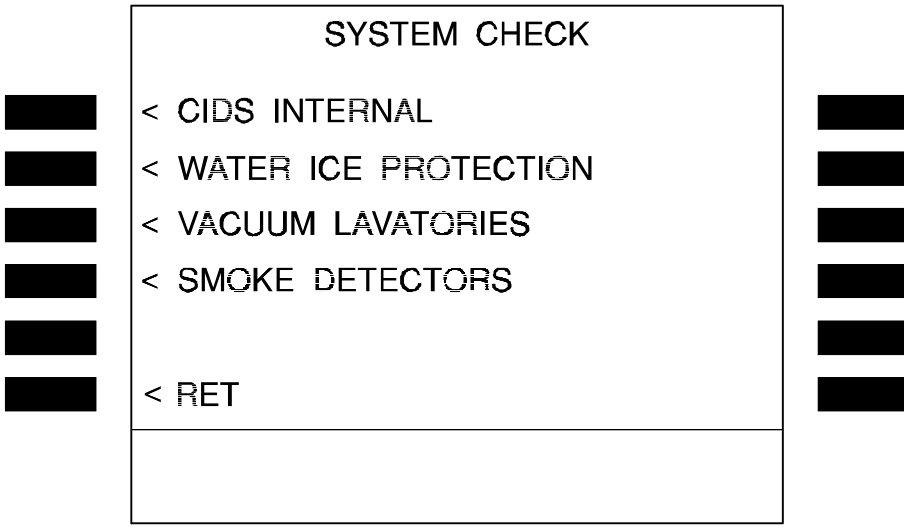
SYSTEM CHECK PAGES



The SYSTEM CHECK menu provides the menu of several cabin systems for status indication.

The SYSTEM CHECK MENU page may be called up when the SYSTEM CHECK key is pressed for preflight checks.

This is the manual mode.

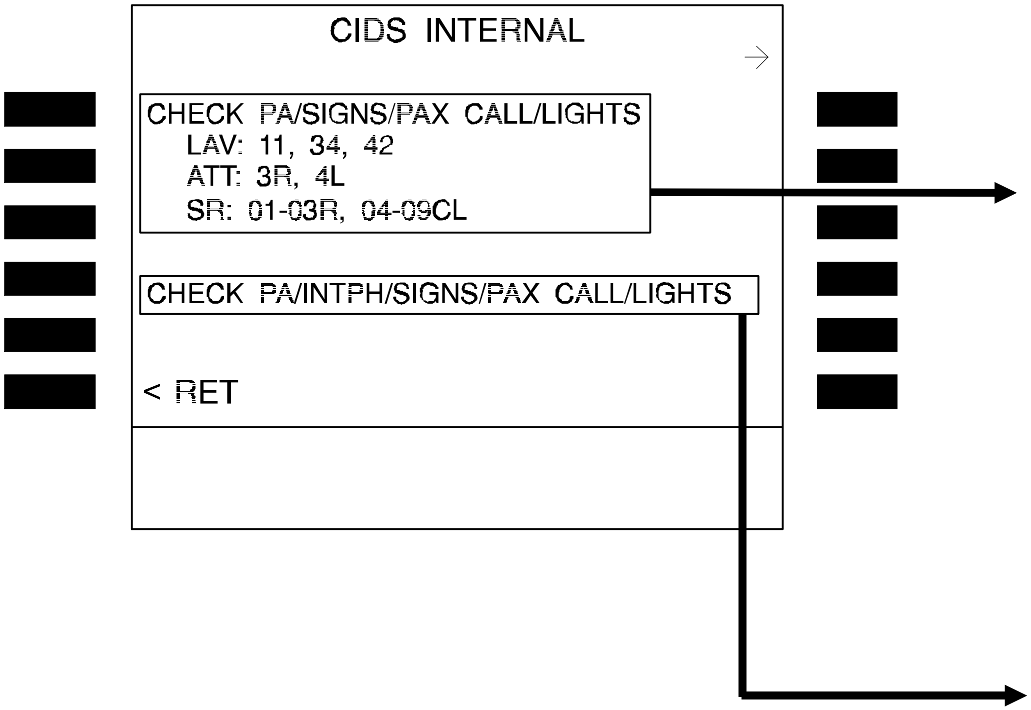
Additionally, on receiving the respective system failure information, the SYSTEM CHECK page or the info row message "SELECT SYSTEM CHECK" will be automatically displayed whatever the flight phase.

The CIDS Caution Light (CCL) flashes amber in order to draw the cabin crew’s attention systems affected by failures, will be displayed in amber with the " <" sign flashing .

With no failure(s), the system message is displayed in white and the "<" is steady.

Note: If the "SYSTEM CHECK" page is selected with failure message(s) displayed, you cannot switch off the "SYSTEM CHECK" page, until the FAILURE MESSAGE page is displayed.

For selection of the system status, press the associated softkey.



< CIDS INTERNAL

The CIDS INTERNAL page can display up to 7 failure messages.

These messages are sent by the active director and show the current status of the CIDS system.

This failure message is displayed in case of failure of at least 1 type A DEU or top line data failure.

The location of the failed equipment will be also displayed.

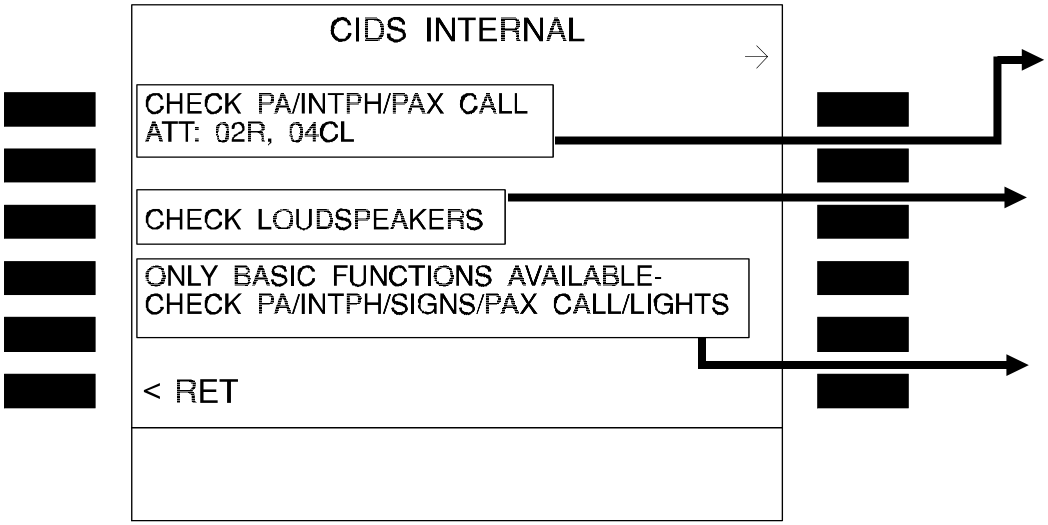
If the CIDS is not completly powered with normal and essential busbars, the following power fail message will be displayed:

SYSTEM CHECK FUNCTIONS
CURRENTLY DISABLED
(NOT ALL POWER CONNECTED)

This failure message appears if the active director detects a major failure or if a FAP or CAM related failure is detected.

This failure message has priority over the first failure message.

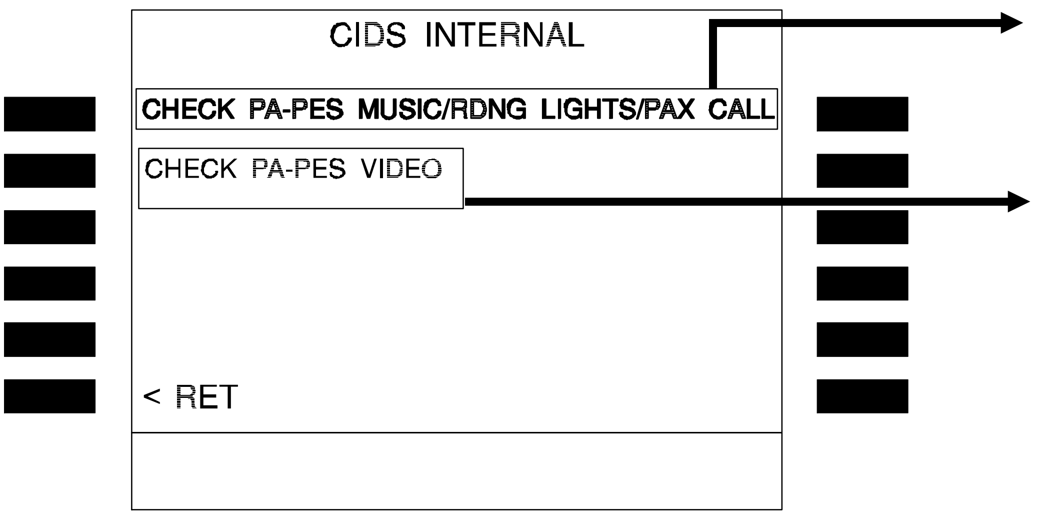
The first message, including the locations, will disappear, if the 2nd message has to be displayed.



This failure message will appear in case of at least one type B DEU or mid line data bus failure.
The location of the failed equipment will be also displayed.

This failure message will be displayed in case of failure of at least 5% of all the loudspeakers.

This failure message is displayed in case of mandatory layout use.

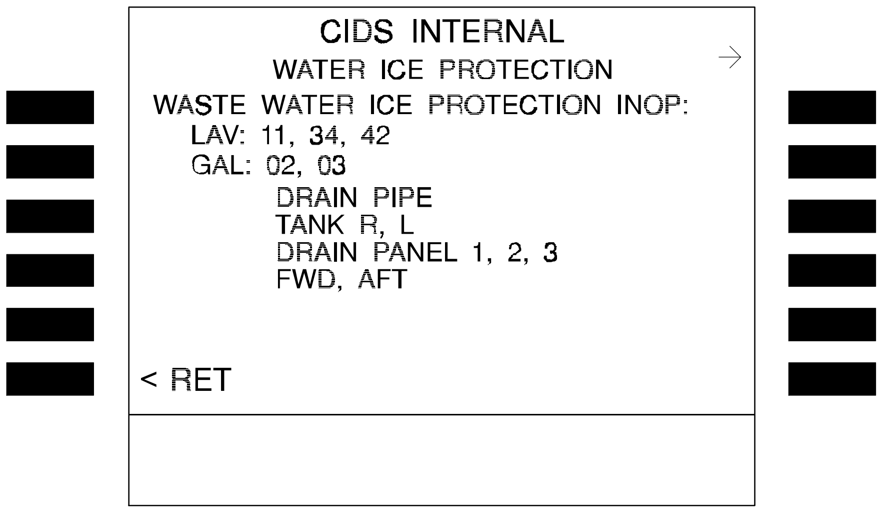


This failure message is displayed if no data from the Passenger Entertainment System (PES) to the directors or from the CAM to the PES is transmitted.

This failure message is displayed if the CAM layout transmission to the passenger video system fails.

When you go back to the SYSTEM CHECK MENU page, the flashing "<" becomes steady: it means that the failure has been seen by the cabin crew.

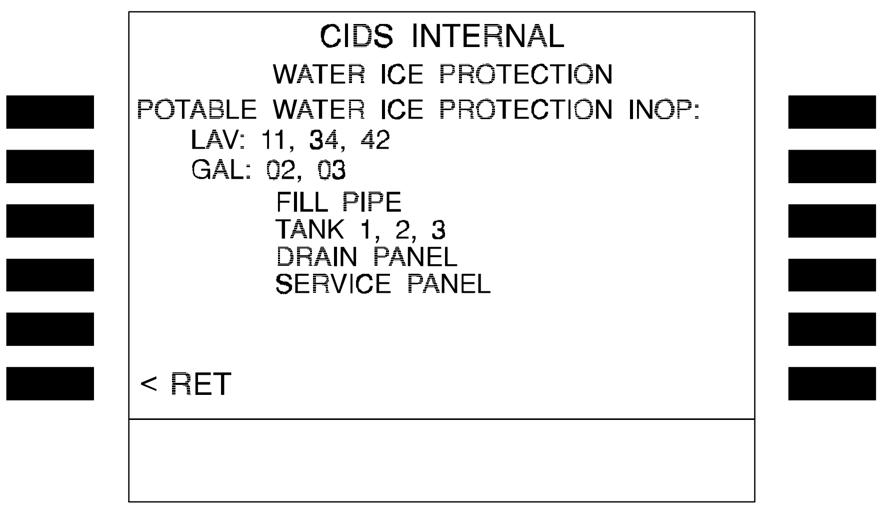
The system text is still amber.



< WATER ICE PROTECTION

The WATER ICE PROTECTION page displays failure messages of failed equipment due to the failures of the waste water ice protection system, with respective location.

Cabin crew action may be required during flight.



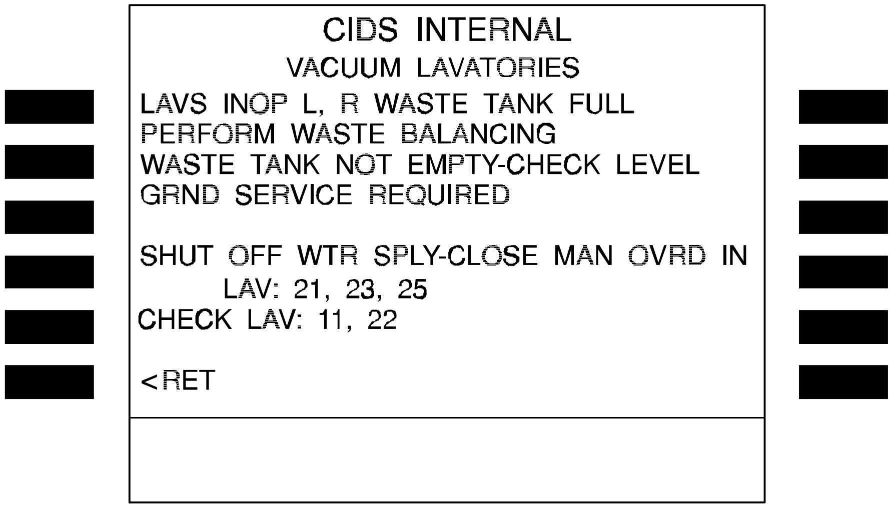
< POTABLE WATER

This page is the same as the previous, but concerns the potable water ice protection system.

Cabin crew action may be required during flight.

When you go back to the SYSTEM CHECK MENU page, the flashing "<" becomes steady: it means that the failure has been seen by the cabin crew.

The system text is still amber.

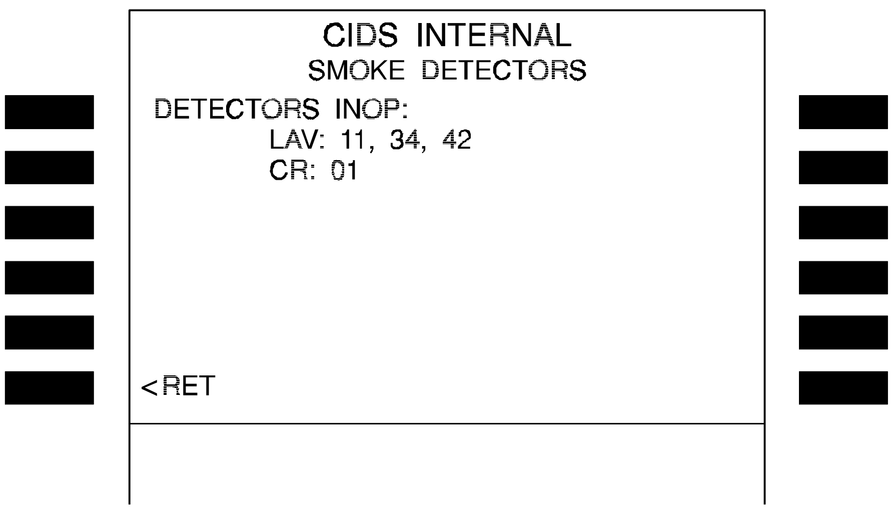


< VACUUM LAVATORIES

The VACUUM LAVATORIES page displays failure messages of the vacuum lavatory system.

Cabin crew action may be required during flight!
When you go back to the SYSTEM CHECK MENU page, the flashing "<" becomes steady: It means that the failure has been seen by the cabin crew.

The system text is still amber.



< SMOKE DETECTORS

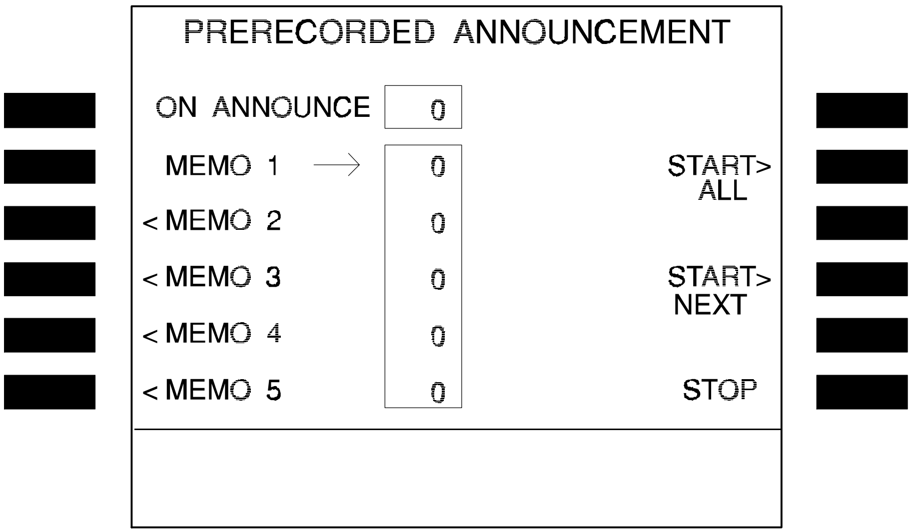
The SMOKE DETECTORS page displays the failed smoke detector(s) location.

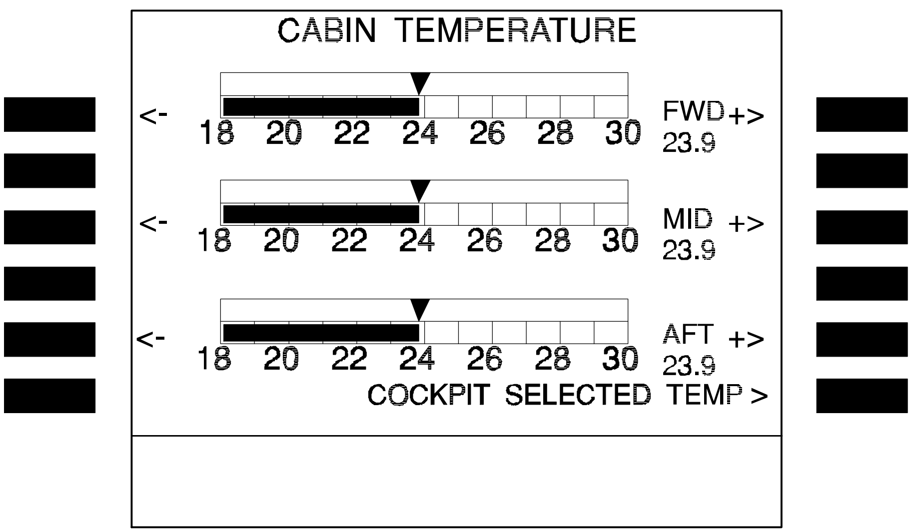
Cabin crew action may be required during flight.

When you go back to the SYSTEM CHECK MENU page, the flashing "<" becomes steady: It means that the failure has been seen by the cabin crew.

The system text is still amber.

If a second page is displayed, the "<" sign appears in the upper right corner.





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PREANNOUNCEMENT PAGE

When the preannouncement key is pressed, the PRAM page is displayed.

CABIN TEMPERATURE PAGE

When the CABIN TEMPerature key is pressed, the cabin temperature is displayed with three bar graphs associated to the forward, mid and aft cabin zones, for cabin zone temperature selection.

The purpose of the CABIN TEMPERATURE page is to provide the cabin crew with the cabin temperature selection.

The true temperature is displayed on the right hand side.

The cabin selected temperature is indicated by an arrow and can be adjusted to +/- 2.5°c with a resolution of 0.5°c.

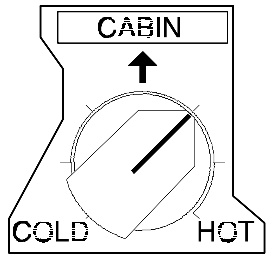
As an option, the temperature can be indicated in degrees Fahrenheit(64 - 86°F).

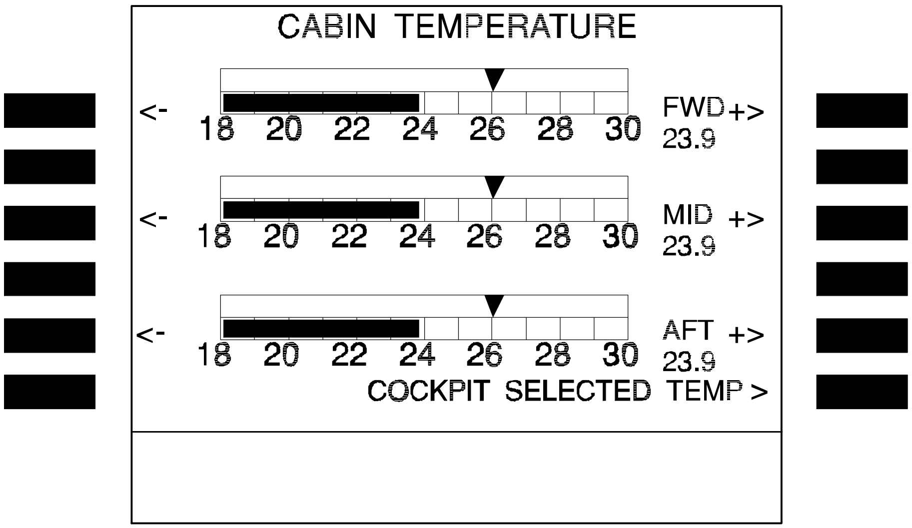
The CABIN TEMPERATURE page cannot be displayed automatically.

For temperature preselection, use the softkeys associated to the "+" or "-" signs.

When the COCKPIT SELECTED TEMPerature softkey is pressed, the cabin selected temperatures switch back to the cockpit selected temperature.

With no data from the active director, the "-/+" signs and the text "COCKPIT SELECTED TEMP" are blanked.





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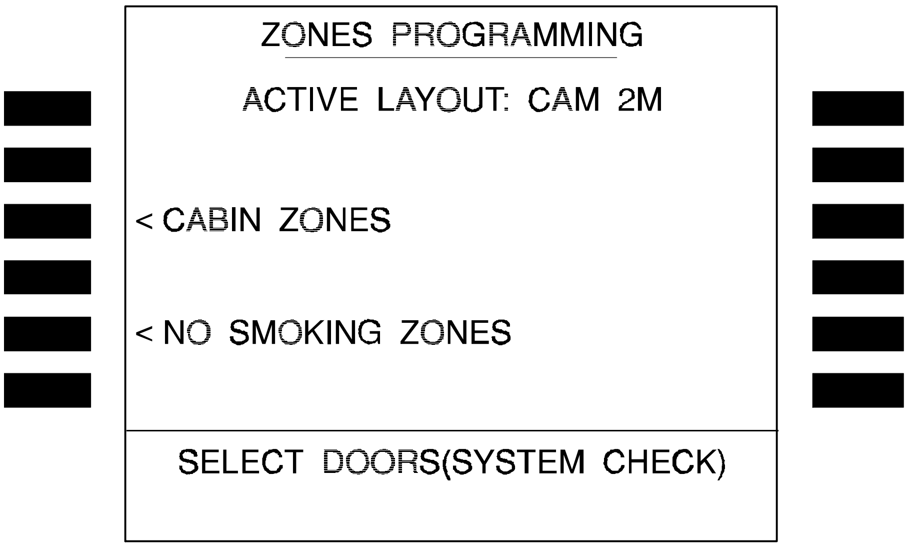
The system message "NO TEMPERATURE SELECT AVAILABLE" is displayed.

With no data from the zone controller, the system message "NO CABIN TEMPERATURE AVAILABLE" is displayed.

If both data are not available, the following info text is displayed on a separate page.

"NO TEMPERATURE DATA AVAILABLE
NO TEMPERATURE SELECT AVAILABLE"



CIDS CAUTION LIGHT(CCL)

The CIDS Caution Light (CCL) operates as a visual warning in order to draw the cabin crew attention.

The CCL is automatically activated by system failure conditions which also directly call up a FAILURE MESSAGE page or an info row message on the PIM, if the SYSTEM page is already displayed.

The CCL and the info row message are only associated to the DOORS/SLIDES and the SYSTEM CHECK pages.

In flight, the CCL is reset by pushing it.
It comes on again if another failure appears or automatically after landing if the failure still exists.

Note: The reset of the CCL has no effect on the PIM failure messages.

PANEL LIGHT TEST KEY

When the PANEL LIGHT TEST key is pressed, the FAP front face key illumination is tested.

STUDENT NOTES

Integrated Light Control Box
Exit Signs Relay 8WL

DIRECTOR INTERFACES

Reset Breaker
Central Maintenance Computer
System Data Acquisition Concentrator
Audio Management Unit
Cockpit Handset
Service Interphone Boomsets
Calls Panel
Signs Panel
Engine Interface And Vibration Monitoring Unit
Landing Gear Control And Interface Unit
Slat Flap Control Computer
Flight Warning Computer
Service Interphone Override Pushbutton
Multipurpose Bus/Cabin Passenger Management System
Forward Attendant Panel
Directors
Cockpit Door Switch
Evac Panel
Cabin Pressure Relay 19WR
Cabin Pressure Controller
Vacuum System Controller
Environmental Control System/Zone Controller
Smoke Detection Control Unit
Audio Reproducer
Video System Control Unit
Prerecorderd Announcement Module
Passenger Entertainment And Passenger Service System
DEU B
DEU A
Pin Programing
Sterile Cockpit Switch

RESET BREAKER

The DIRECTORS can be manually reset with the RESET BREAKER located on the RESET PANEL on the overhead panel.

CENTRAL MAINTENANCE COMPUTER

LOW SPEED ARINC 429 data buses are used for BITE DATA transmission to the CENTRAL MAINTENANCE COMPUTERS.

SYSTEM DATA ACQUISITION CONCENTRATOR

LOW SPEED ARINC 429 data buses are used for transmission of cabin system status information to the SDACs to be displayed on the ECAM.

The SDACs transmit to the DIRECTORS the DOORS position information used on the DOORS page of the PIM.

The DOORS position information is also used for activation of the ROW NUMBERING LIGHT, after a Passenger call during boarding.

A discrete signal is sent to the SDACs for CIDS operation status information.

AUDIO MANAGEMENT UNIT

Audio and discrete lines are used for transmission or reception of the PASSENGER ADDRESS announcements or INTERPHONE communications.

Discrete lines are used for activation or deactivation of the PASSENGER ADDRESS, INTERPHONE, ATTENDANT CALL and Attendant call RESET functions.

COCKPIT HANDSET

A COCKPIT HANDSET is connected to the DIRECTORS for PASSENGER ADDRESS announcements to the cabin.

SERVICE INTERPHONE BOOMSETS

BOOMSETS are connected to the DIRECTORS for SERVICE INTERPHONE communications.

CALLS PANEL

Discrete lines are used for activation of CALLS to the cabin Attendants or to the Ground Mechanic with dedicated visual and aural indications.

SIGNS PANEL

Discrete lines are used for manually or automatically activating or deactivating the INFO SIGNS in the cabin.

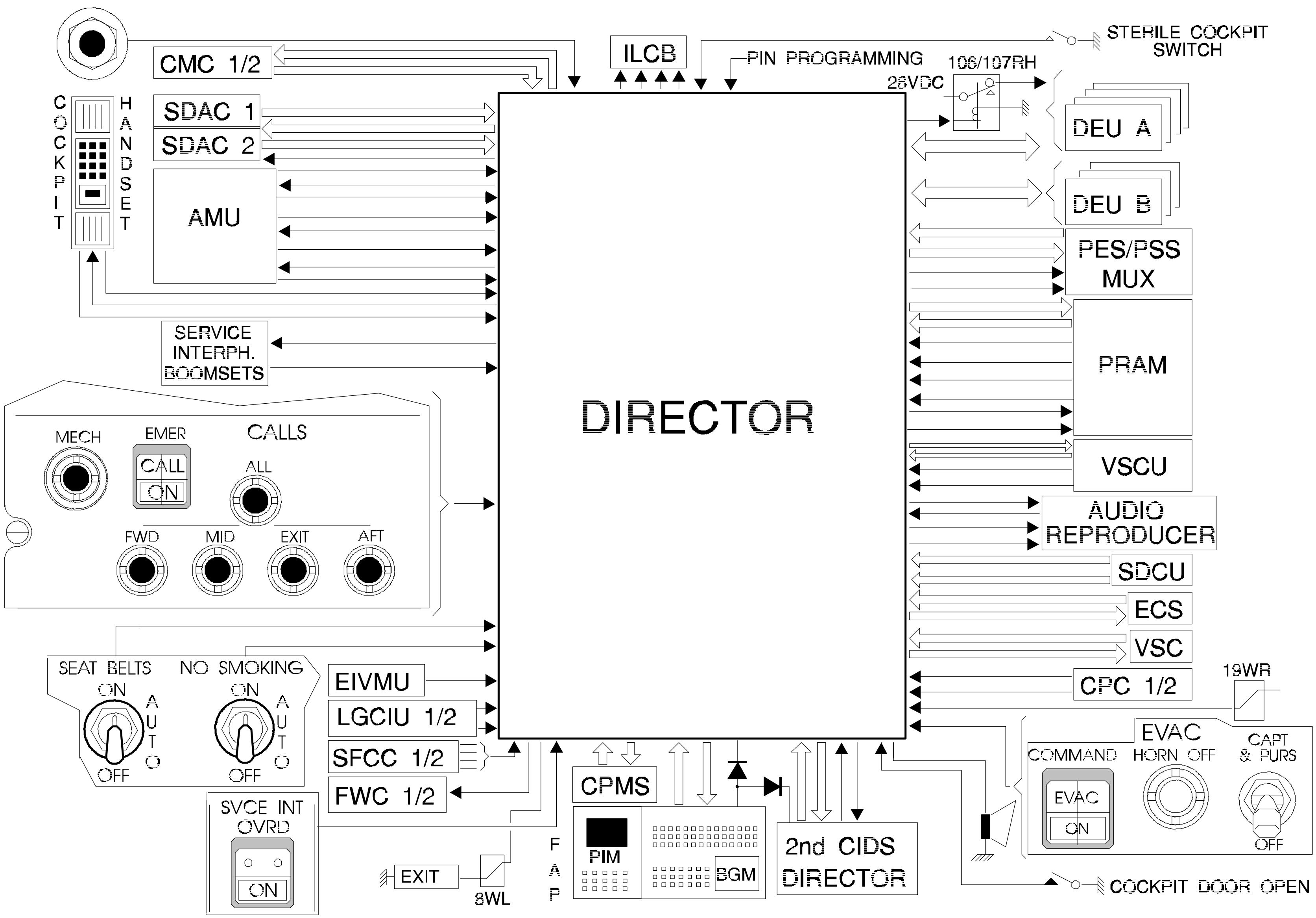
NO SMOKING/FASTEN SEAT BELT messages will inform the cockpit crew on the ECAM of the NO SMOKING/FASTEN SEAT BELT switch status.

ENGINE INTERFACE AND VIBRATION MONITORING UNIT

A discrete signal is used to automatically increase or decrease the PASSENGER ADDRESS LEVEL in the cabin when the engines are started or stopped.

LANDING GEAR CONTROL AND INTERFACE UNIT

Two discrete lines are used for incrementation of the FAULT MEMORY or activation or deactivation of the SERVICE INTERPHONE and NO SMOKING/FASTEN SEAT BELT signs when the INFO switches are in the auto position.



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SLAT FLAP CONTROL COMPUTER

Discrete signals are used for automatically activating or deactivating the NO SMOKING/FASTEN SEAT BELT info signs in the cabin.

FLIGHT WARNING COMPUTER

A discrete line is used for activation of aural warnings in the cockpit, through the FLIGHT WARNING COMPUTER.

SERVICE INTERPHONE OVERRIDE PUSHBUTTON

A discrete line is used to activate or deactivate the SERVICE INTERPHONE SYSTEM when the aircraft is on the ground with the LANDING GEAR not compressed or the EXTERNAL POWER PLUG not connected.

MULTIPURPOSE BUS/CABIN PASSENGER MANAGEMENT SYSTEM

HIGH SPEED ARINC 429 data buses are used for transmission of the cabin system control and status and cabin commercial information.

FORWARD ATTENDANT PANEL

HIGH SPEED ARINC 429 data buses are used for transmission and reception of the controls, status and BITE system information.

A discrete line is used for RESET purposes at power up of the CIDs.

DIRECTORS

HIGH SPEED ARINC 429 data buses are used for data exchange between the ACTIVE and STANBY DIRECTORS.
The discrete lines are used for the synchronization of the two DIRECTORS.

COCKPIT DOOR SWITCH

The COCKPIT DOOR SWITCH discrete signal is used to automa- tically dim the lights and attenuate the PA level, at the entrance door, when the engines are running.

EVAC PANEL

Discrete lines are used to activate or deactivate aural and visual indications in the cockpit and cabin after activation of the EVAC SYSTEM.

CABIN PRESSURE RELAY 19WR

The CABIN PRESSURE RELAY discrete signal is used to automatically increase the PA level in the cabin in case of rapid cabin decompression when the cabin altitude is above 14000 feet.

CABIN PRESSURE CONTROLLER

Discrete lines are used to automatically activating or deactivating the NO SMOKING, FASTEN SEAT BELT, RETURN TO SEAT and EXIT SIGNS in the cabin, when the cabin altitude is above 11300 feet.

VACUUM SYSTEM CONTROLLER

LOW SPEED ARINC 429 data buses are used for transmission of the WASTE TANKS information to be displayed and monitored on the WASTE page of the PIM.

ENVIRONMENTAL CONTROL SYSTEM/ZONE CONTROLLER

LOW SPEED ARINC 429 data buses are used for the transmission of the programmed cabin zone temperature data to the ECS and the control of the three cabin zones with the CABIN TEMPERATURE page displayed on the PIM.

SMOKE DETECTION CONTROL UNIT

LOW SPEED ARINC 429 data buses are used for transmission of the SMOKE DETECTION WARNINGS information to the FAP and of the SMOKE DETECTORS status to the PIM.

The SMOKE DETECTOR INOPERATIVE information is displayed on the SMOKE DETECTORS page of the PIM.

AUDIO REPRODUCER

Audio and discrete lines are used for broadcasting and selection of the BOARDING MUSIC in the cabin.

The OVERRIDE discrete signal, transmitted from the FAP, is used to interrupt the AUDIO REPRODUCER.

VIDEO SYSTEM CONTROL UNIT

Audio and discrete lines are used for transmission of the VIDEO SOUND to the dedicated zone, according the KEYLINE CONTROL.

HIGH SPEED ARINC 429 data buses are used for status and BITE system transmission.

PRERECORDERD ANNOUNCEMENT MODULE

Audio and discrete lines are used for the broadcasting of the BOARDING MUSIC and PRERECORDED PASSENGER ADDRESS ANNOUNCEMENTS, manually or automatically activated by controls.

The LOW SPEED ARINC 429 data buses are used for transmission of the BITE and status system and also for remote control and selection of the PRERECORDED ANNOUNCEMENTS with the PRAM page of the PIM.

PASSENGER ENTERTAINMENT AND PASSENGER SERVICE SYSTEM

Audio and discrete lines are used for PASSENGER ADDRESS announcement distribution according to the P.A ZONE KEYLINE.

HIGH SPEED ARINC 429 data buses are used for control, monitoring and BITE system transmission.

DEU B

TWO BIDIRECTIONAL MIDDLE DATA BUS lines are used for the transmission of the controls, audio data, BITE and status system information of the Attendant cabin systems.

DEU A

Six BIDIRECTIONAL TOP DATA BUS lines are used for the transmission of the controls, audio data, BITE and status information of the various Passenger cabin systems.

The TOP LINE CUT OFF RELAY discrete signal is used to activate or deactivate the TOP LINE CUT OFF RELAYS when the EMERGENCY mode is activated, in order to cut the supply of the type A DEUs and decrease the power consumption.

PIN PROGRAMING

Discrete signal is used to determine the ACTIVE or STANDBY DIRECTOR.

STERILE COCKPIT SWITCH

Discrete signal is used for activation or deactivation of visual indications on the ATTENDANT INDICATION and AREA CALL PANELS to inform the Attendants not to enter the cockpit.

INTEGRATED LIGHT CONTROL BOX

Discrete lines are used for activation or deactivation of the INDICATOR LIGHTS when a function or system is activated or deactivated.

EXIT SIGNS RELAY 8WL

Discrete line is used for activation or deactivation of the EXIT SIGNS when the NO SMOKING signal, from the SIGNS PANEL, or the SIGNS ON signals, from the CPCs, are activated or deactivated.

FAP AND AAP INTERFACES

FAP INTERFACE

The FORWARD ATTENDANT PANEL (FAP) is connected to the DIRECTORS through two HIGH SPEED DATA BUSES.
The transmitted data is controled, programming or monitoring information for the cabin systems.

The FAP also transmits BITE information to the DIRECTORS.
The received DATA is information on the status of the cabin systems for indication on the PROGRAMMING and INDICATING MODULE (PIM).

The DIRECTORS transmit a RESET discrete signal to the FAP for initialization at power up.

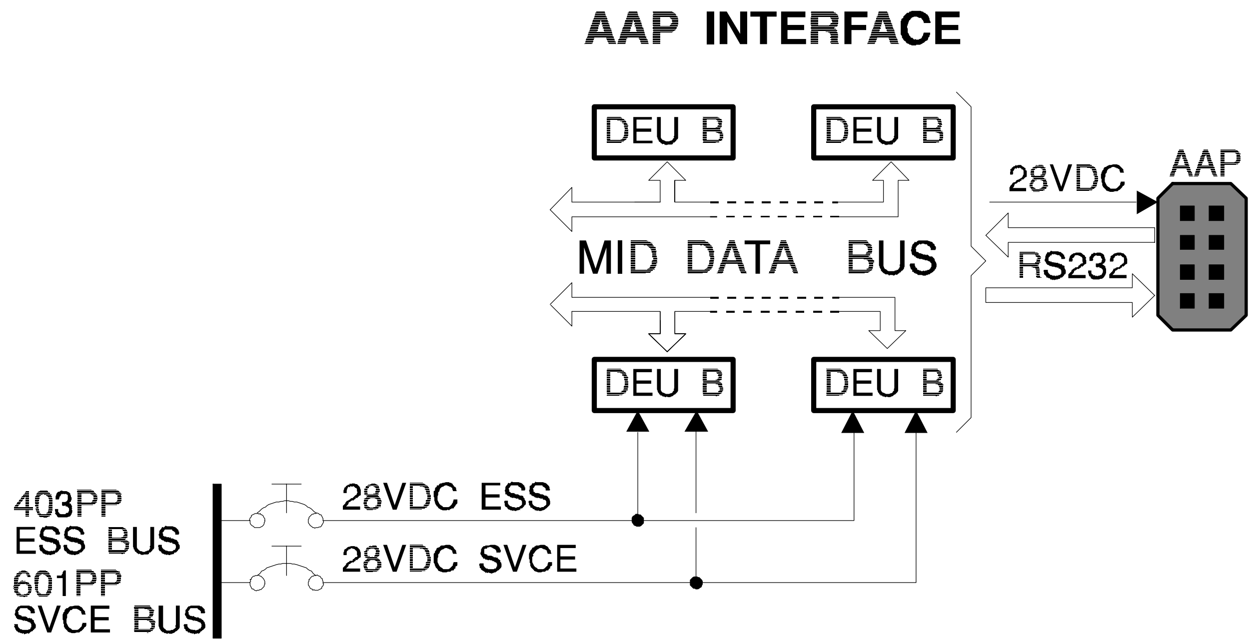
The FAP is also connected to the EMERGENCY LIGHTING SYSTEM/EMERGENCY POWER SUPPLY UNIT (ELS/EPSU) through discrete lines for activation of the EMERGENCY LIGHTING SYSTEM.

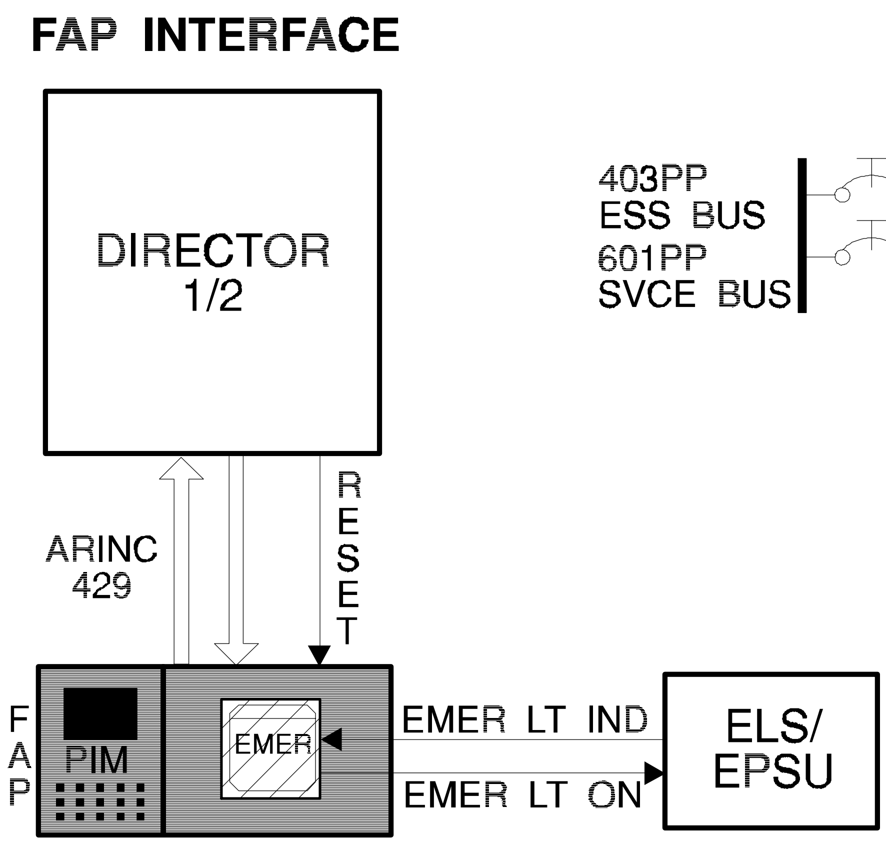
AAP INTERFACE

The ADDITIONAL ATTENDANT PANEL (AAP) is connected to the type B DEUs through RS232 data buses for transmission or reception of the controls and indicating of cabin system status.

The BITE message is also transmitted to the DEUs type B through the RS232 data lines for fault information.

The AAP is supplied with 28VDC through the type B DEU.





FQW4200 GE Metric

STUDENT NOTES

CIDS COMPONENTS

Safety Precautions
ACP
FAP
AAP
CAM
AIP
Director
DEU A
DEU B
Loudspeaker
PSIU
Handset

FQW4200 GE Metric

SAFETY PRECAUTIONS

Identify all the electrical wires, before you disconnect them. Make sure that the electrical connectors are clean and in the correct conditions

STUDENT NOTES

AREA CALL PANEL(ACP)

FIN/ZONE

FIN: 340RH
ZONE: 200

COMPONENT DESCRIPTION

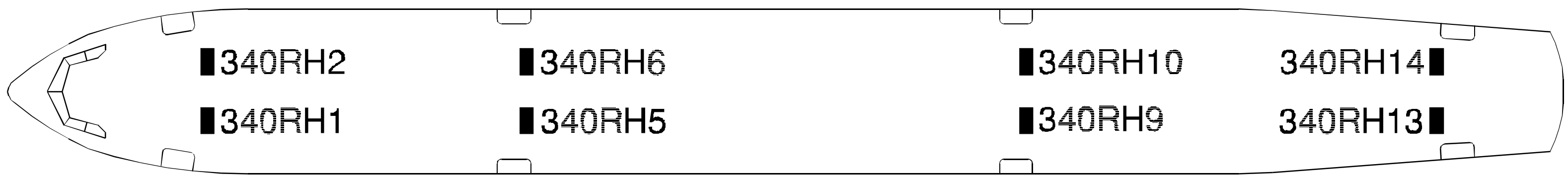
The AREA CALL PANEL has 5 COLOUR FIELDS CORRESPONDING to the CALL INITIATED in the COCKPIT, in the CABIN or in the LAVATORIES.

IN SITU TEST

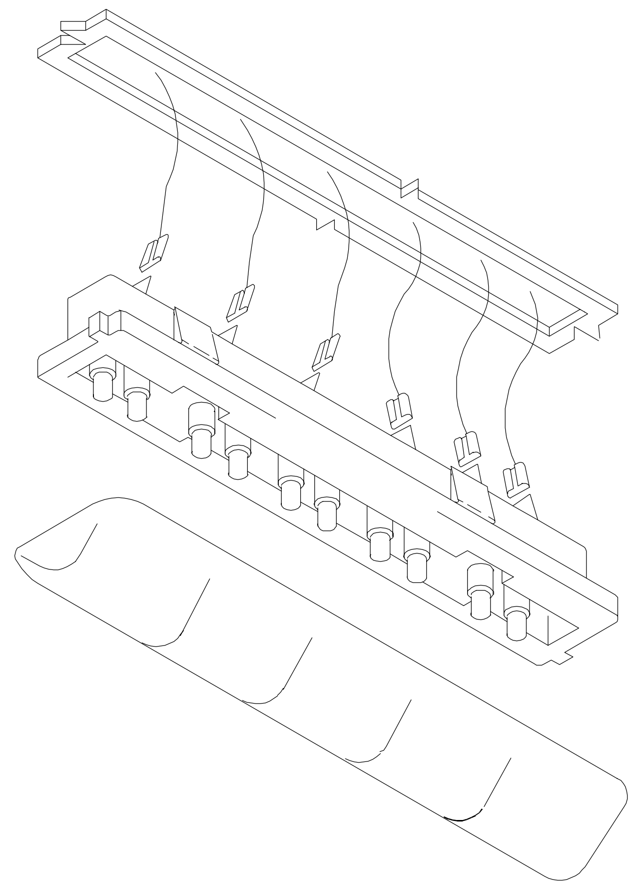
No in situ test is possible.
To perform an ACP test, do the INTERFACE and POWER-UP TEST of the CIDS.

REMOVAL/INSTALLATION

For the REMOVAL of the ACPs, IDENTIFY ALL the ELECTRICAL WIRES BEFORE you DISCONNECT THEM.



AREA CALL PANEL LOCATION



AREA CALL PANEL(ACP)

FQW4200 GE Metric

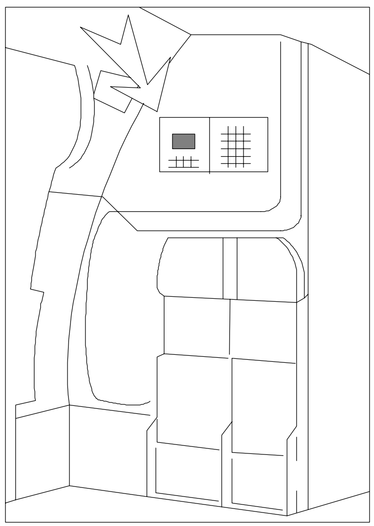
FORWARD ATTENDANT PANEL(FAP)

FIN/ZONE
FIN: 120RH
ZONE: 221

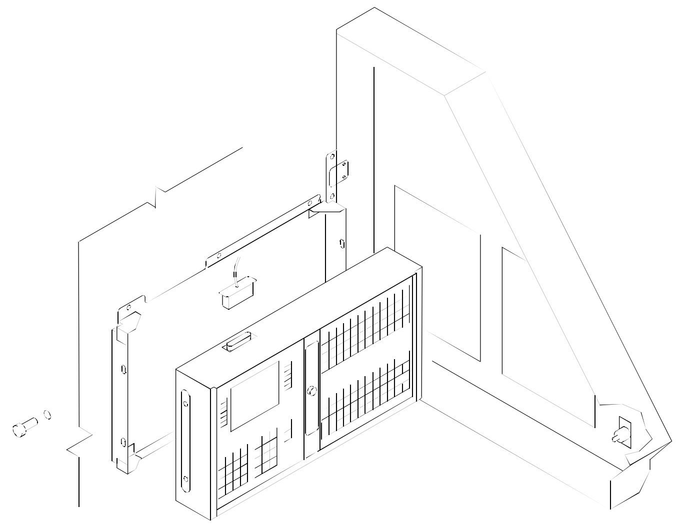
COMPONENT DESCRIPTION
The FAP is divided into three parts:
- The LIGHTS, AUDIO and MISCELLANEOUS MODULE(LAMM) with keys for CONTROL, STATUS and MONITORING FUNCTIONS.
- The PROGRAMMING and INDICATING MODULE(PIM) with a DISPLAY and KEYBOARD for STATUS or PROGRAMMING FUNCTIONS.
- The CABIN ASSIGNEMENT MODULE(CAM), plugged into the front face of the FAP.

COMPONENT LOCATION
The FAP is located at the FORWARD ATTENDANT STATION.

IN SITU TEST
DO the INTERFACE and POWER-UP TEST of the CIDS.



FORWARD ATTENDANT STATION



FORWARD ATTENDANT PANEL(FAP)

FQW4200 GE Metric

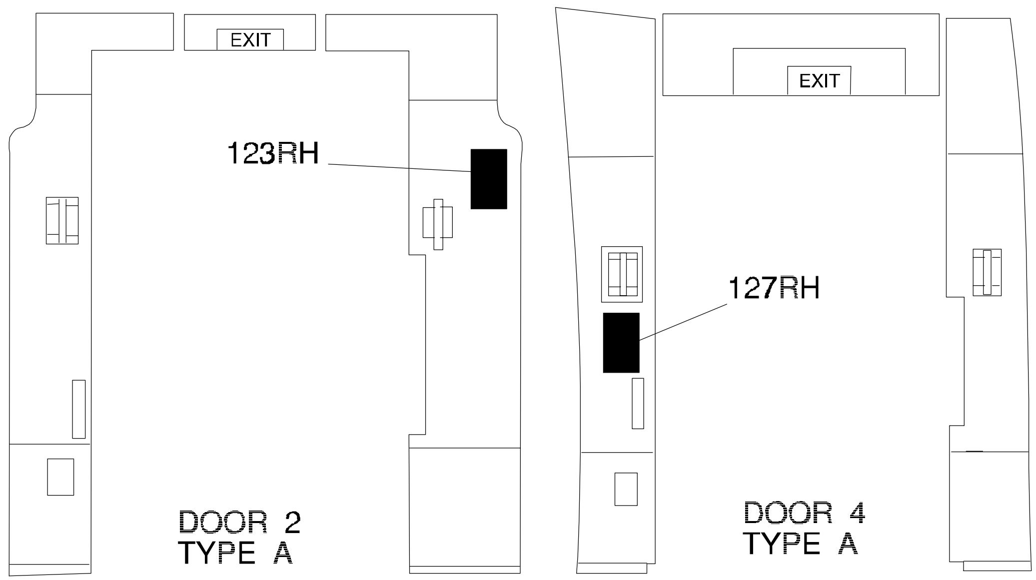
ADDITIONAL ATTENDANT PANEL(AAP)

FIN/ZONE
FIN: 123RH, 127RH
ZONE: 241, 271

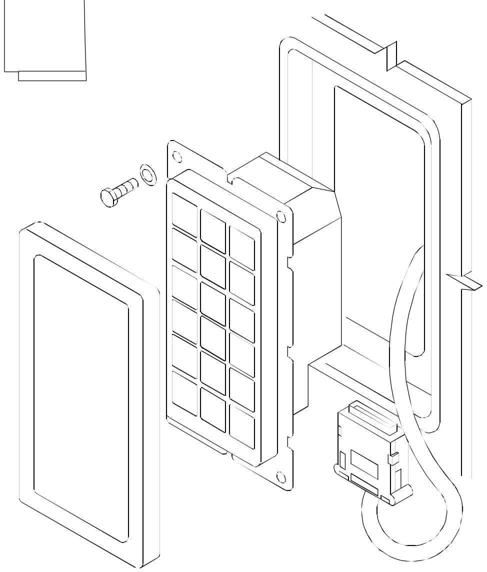
COMPONENT DESCRIPTION
The AAP front face features softkeys for Cabin Function Conrtol, according to the Airline choice.

COMPONENT LOCATION
The ADDITIONAL ATTENDANT PANELS(AAPs) are installed at the CABIN ATTENDANT STATIONS, on the door frame linings.

IN SITU TEST
No in situ test is possible.
To perform an AAP test, do the interface and power-up test of the CIDS.



ADDITIONAL ATTENDANT PANEL LOCATION



ADDITIONAL ATTENDANT PANEL(AAP)

FQW4200 GE Metric

CABIN ASSIGNMENT MODULE(CAM)

FIN/ZONE

FIN: 115RH

ZONE: 221

COMPONENT LOCATION

The CABIN ASSIGNMENT MODULE(CAM) 115RH is plugged into the front face of the FORWARD ATTENDANT PANEL(FAP).

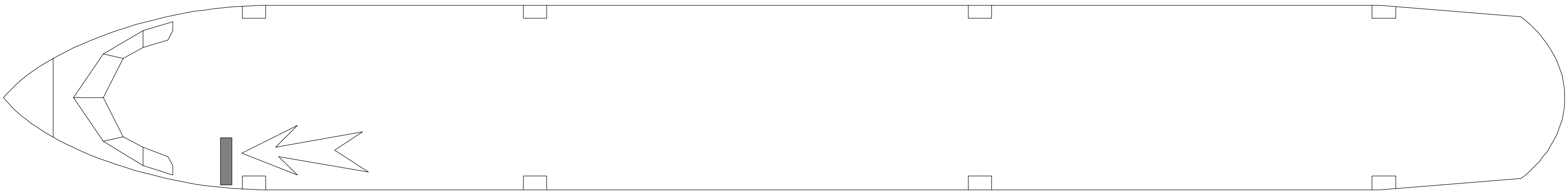
IN SITU TEST

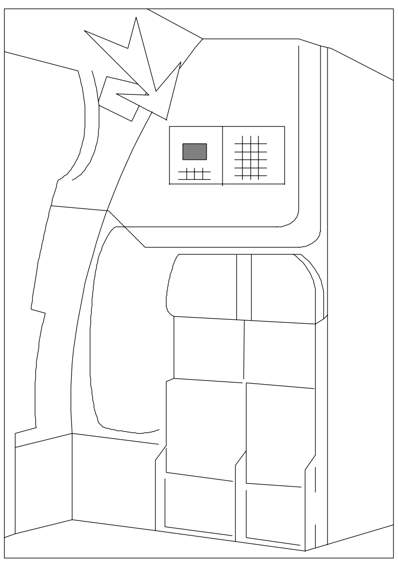
No in situ test is possible.

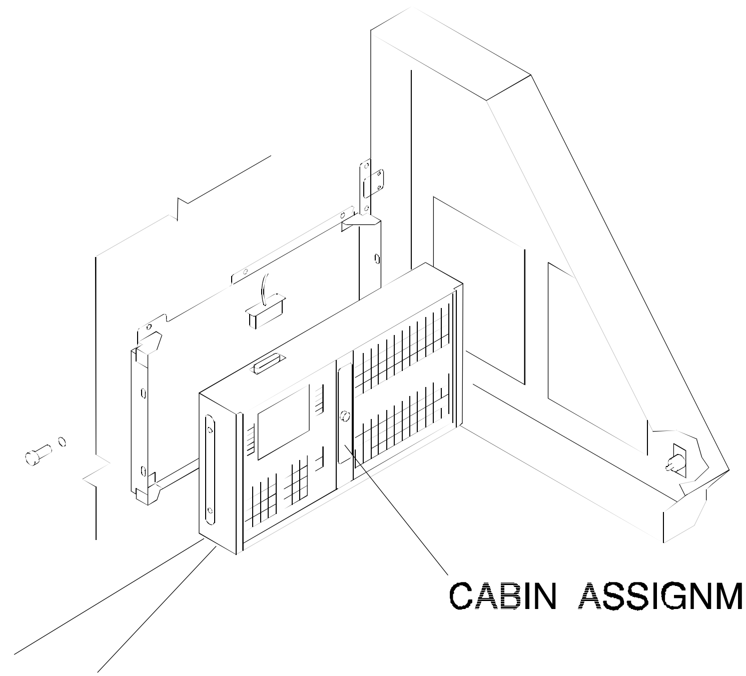
The test of the CAM is performed through the MCDU with the Interface and Power-up test of the CIDS.

SAFETY PRECAUTIONS

CAREFULLY remove(install) the CAM from(onto) the FORWARD ATTENDANT PANEL(FAP).







FQW4200 GE Metric

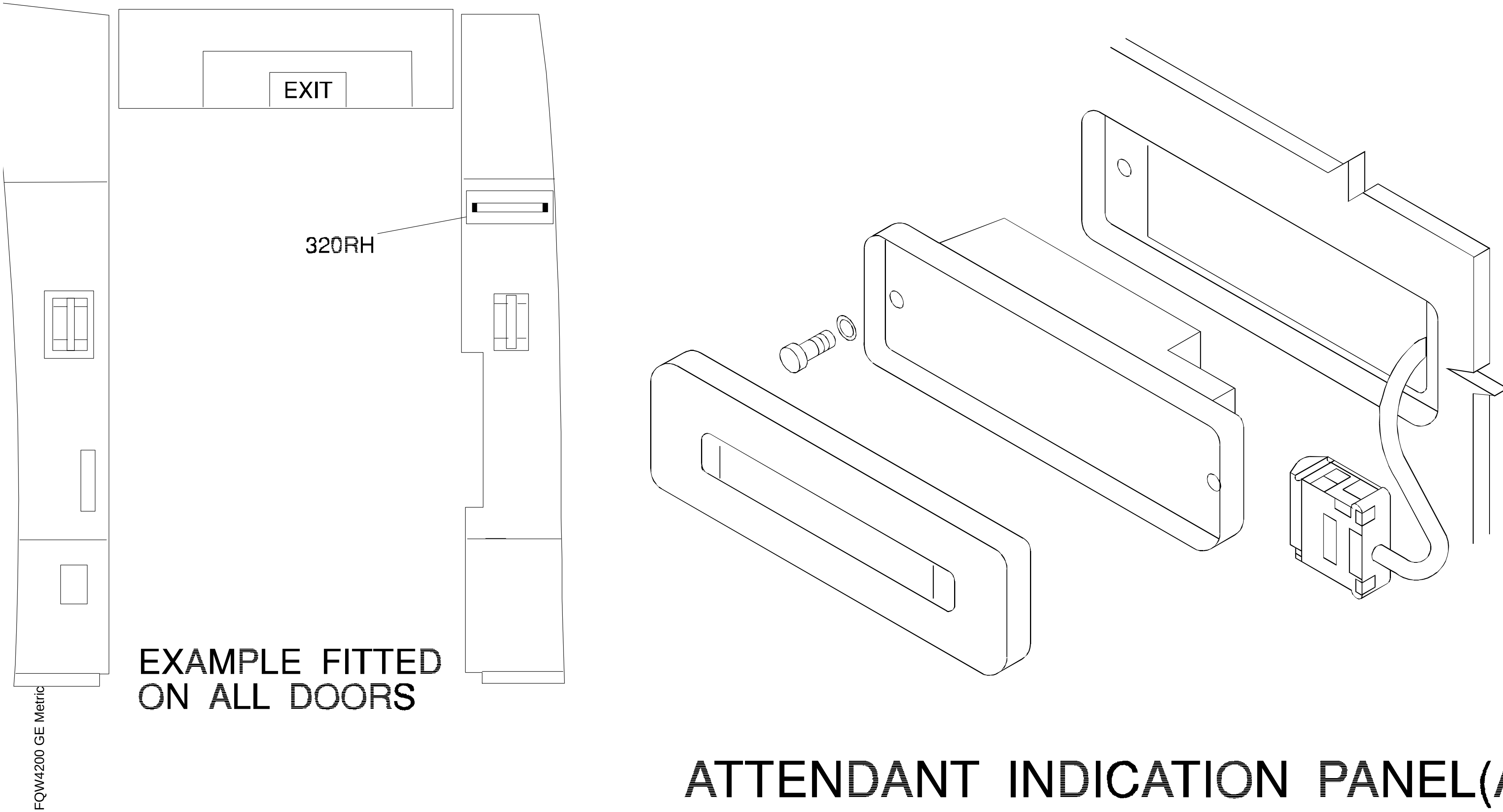
ATTENDANT INDICATION PANEL(AIP)

FIN/ZONE
FIN: 320RH
ZONE: 200

COMPONENT DESCRIPTION
The ATTENDANT INDICATION PANEL(AIP) is a display panel which has two indicator lights (red and green) and a DISPLAY AREA for the indication of messages in two rows.

COMPONENT LOCATION
The ATTENDANT INDICATION PANEL(AIP) is installed on the door frame linings, at each Cabin Attendant Station which has a handset.

IN SITU TEST
No in situ test is possible. The test of the AIP is performed through the MCDU with the Interface and Power-up test of the CIDS.



ATTENDANT INDICATION PANEL(AIP)

DIRECTOR

FIN/ZONE

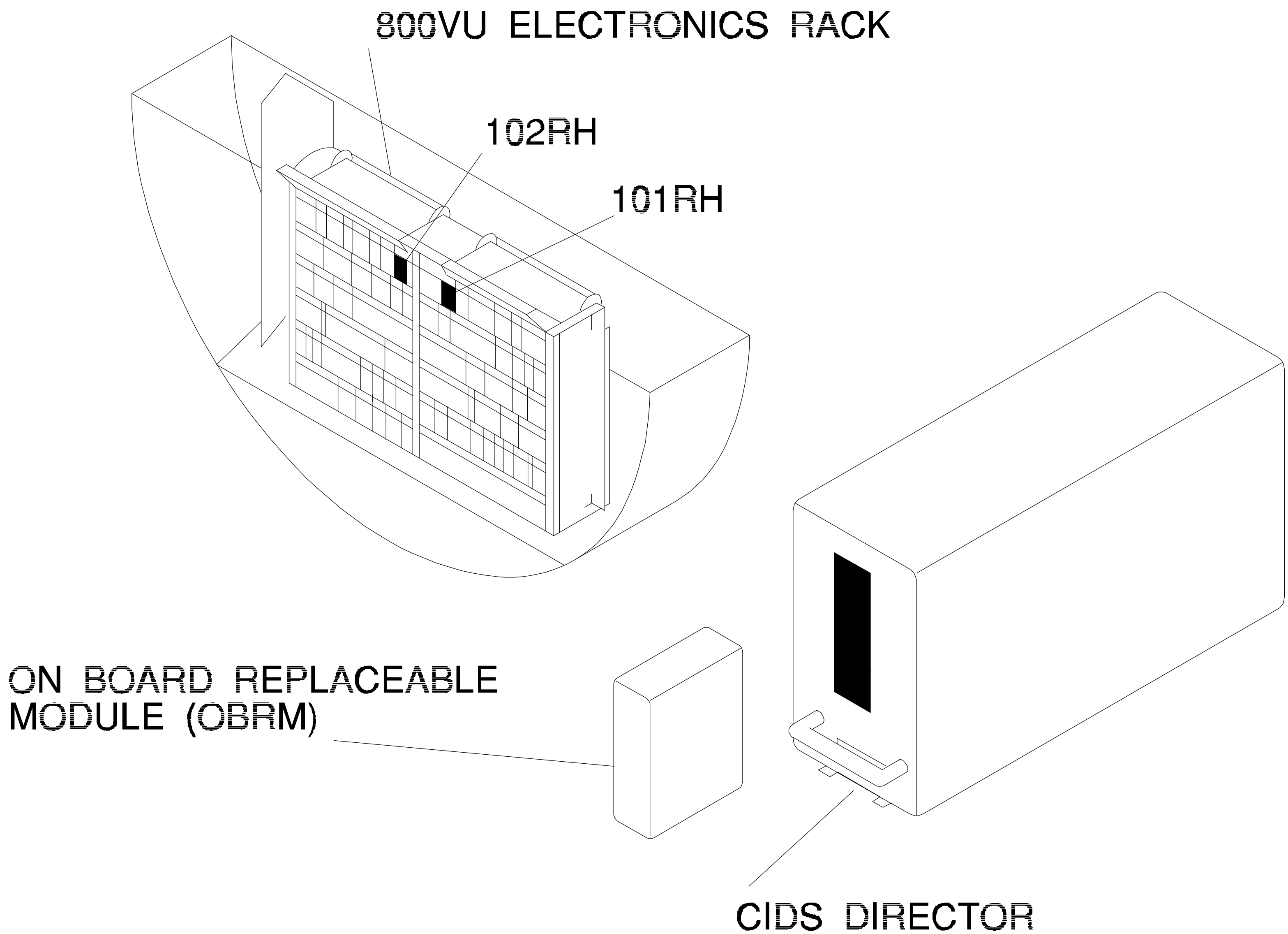
FIN: 101RH, 102RH
ZONE: 121, 122

COMPONENT DESCRIPTION

The front face of the DIRECTOR is equipped with a plugged-in removable MEMORY CASSETTE, the ON BOARD REPLACEABLE MODULE(OBRM).

IN SITU TEST

There is no IN SITU TEST.
The test of the DIRECTOR is performed with the MCDU through the BITE TEST of the CIDS DIRECTOR.



FQW4200 GE Metric

DECODER ENCODER UNIT A(DEU A)

FIN/ZONE

FIN: 200RH

ZONE: 200

COMPONENT DESCRIPTION

The DECODER ENCODER UNIT type A is a rectangular box on which four connectors are connected.

IN SITU TEST

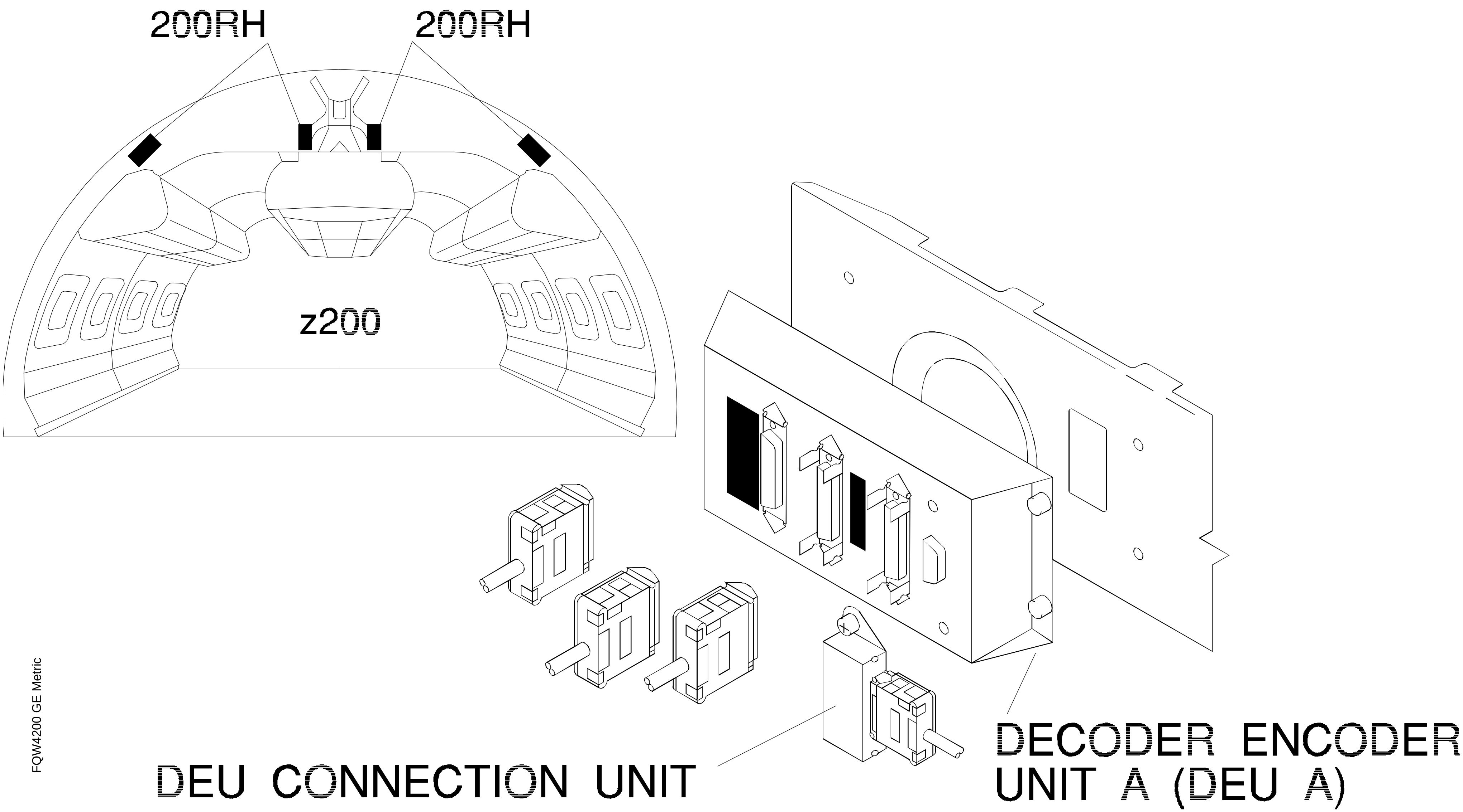
There is no IN SITU TEST.

The test of the type A DEUs is performed through the MCDU with the INTERFACE and POWER-UP test of the CIDS.

REMOVAL/INSTALLATION

At removal of the type A DEU, do not disconnect the electrical connector at the connection unit, which is safetied with lockwire.

At installation of the type A DEU, make sure that the coding pins are in the same configuration as the removed type A DEU.



FQW4200 GE Metric

DECODER ENCODER UNIT B (DEU B)

FIN/ZONE

FIN: 300RH

ZONE: 200

COMPONENT DESCRIPTION

The DECODER ENCODER UNIT type B is a rectangular box on which three connectors are connected.

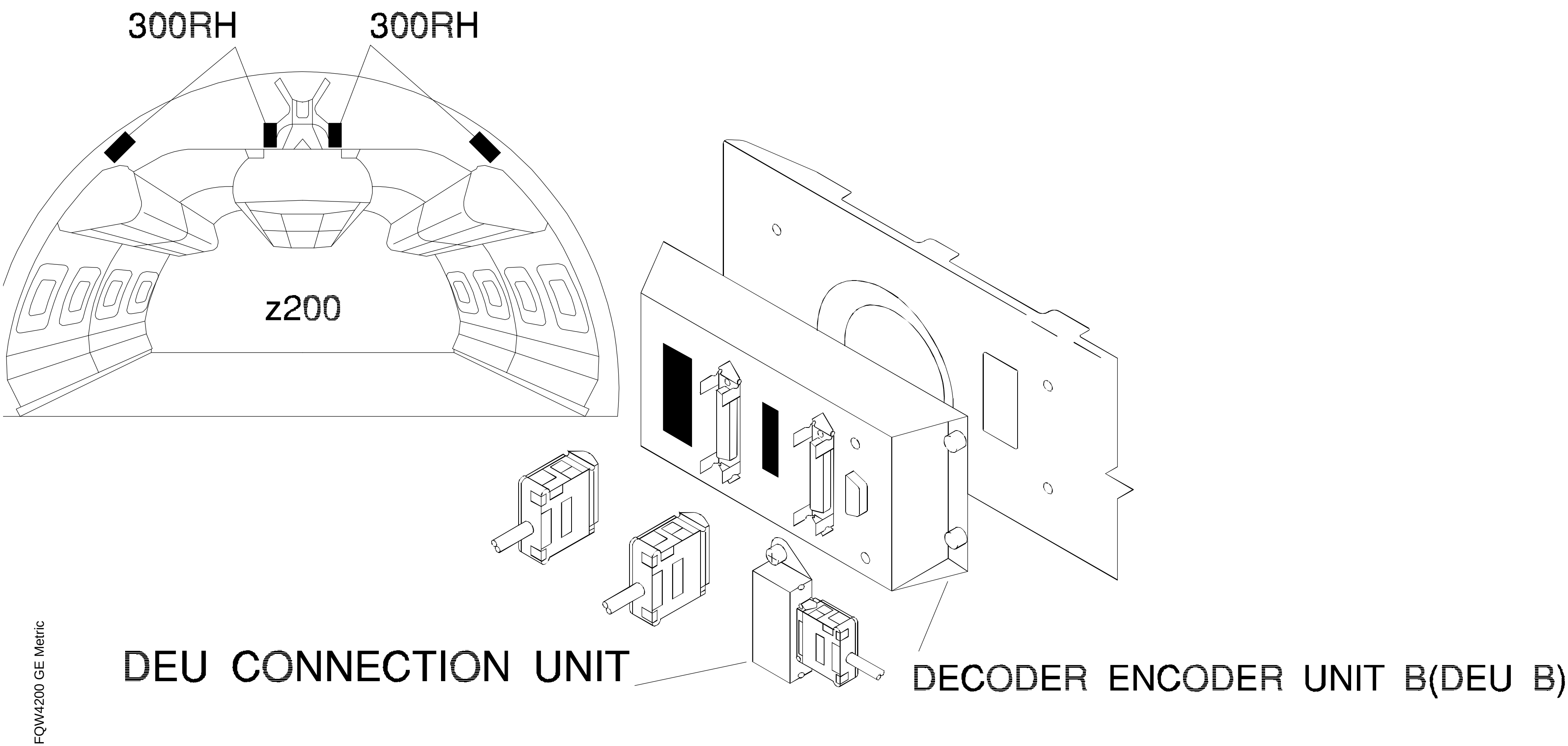
IN SITU TEST

There is no IN SITU TEST for the type B DEU.

The test of the DEU type B is performed through the MCDU with the INTERFACE and POWER-UP test of the CIDS system.

REMOVAL/INSTALLATION

At removal of the type B DEU, do not disconnect the electrical connector at the connection unit, which is safetied with lockwire. At installation of the type B DEU, make sure that the coding pins are in the same configuration as the removed type B DEU.

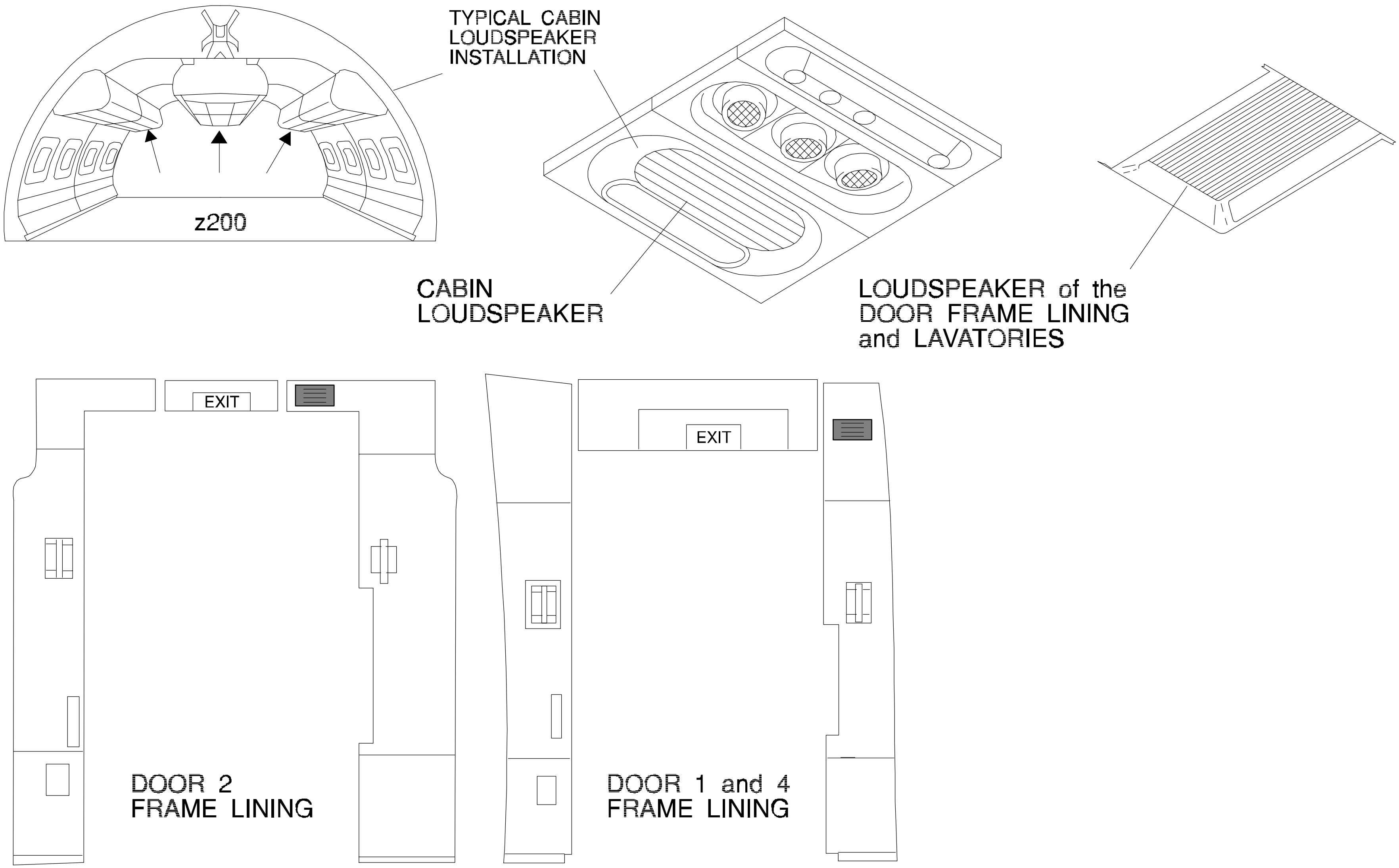


FQW4200 GE Metric

LOUDSPEAKER

FIN/ZONE
FIN: 550RH to 552RH, 571RH to 578RH
ZONE: 200

COMPONENT LOCATION
The Loudspeakers are installed in the Cabin above the Passenger seats, at the Door frame linings and in the Lavatories.



FQW4200 GE Metric

PASSENGER SERVICE and INTERFACE UNIT(PSIU)

FIN/ZONE

FIN: TBD
ZONE: 230, 250 and 260

COMPONENT DESCRIPTION

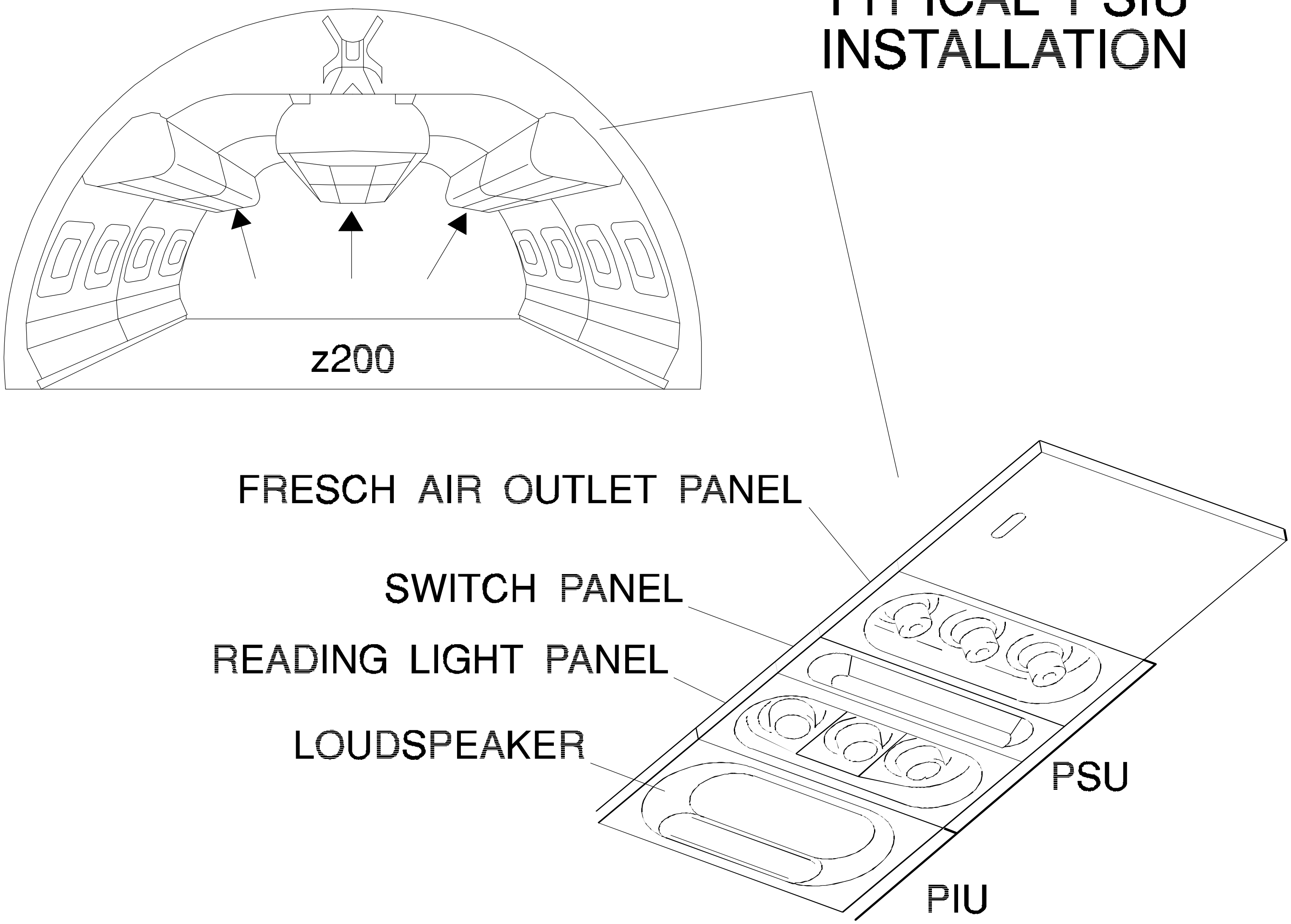
Each PSIU has two primary units: The Passenger Service Unit(PSU) and the Passenger Information Unit(PIU).
The PSU is equipped with:
- a switch panel with an Attendant Call pushbutton,
- a seat-row number,
- a non- smoker area/call light,
- a reading light panel,

and a fresh air outlet panel.
The PIU is installed above every second seat row to give acoustic and visual information: The PIU is equipped with a loudspeaker and a NO SMOKING/ FASTEN SEAT BELT sign.

IN SITU TEST

No IN SITU TEST can be performed on the PSIU.
To do a test, do the INTERFACE and POWER-UP TEST of the CIDS.

TYPICAL PSIU INSTALLATION

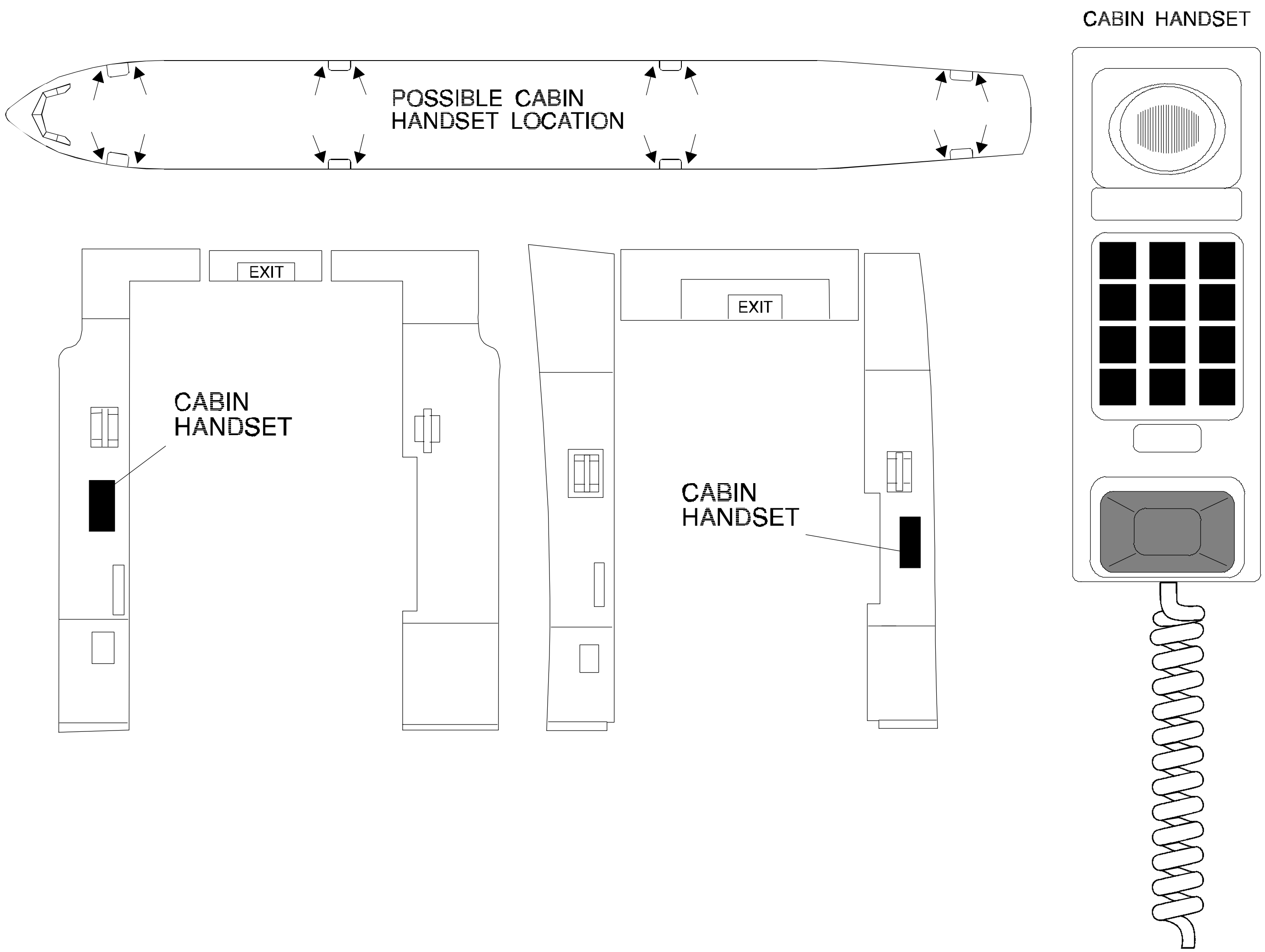


FQW4200 GE Metric

CABIN HANDSET

FIN/ZONE
FIN: 330RH
ZONE: 200

COMPONENT LOCATION
The CABIN HANDSET is located on the Door Frame Lining, at the Cabin Attendant Station.



FQW4200 GE Metric

STUDENT NOTES

PASSENGER ENTERTAINMENT SYSTEM PRESENTATION

General
PES
PES Video
PRAM

GENERAL

The passenger address and entertainment system comprises the following basic functions :

- Pre-Recorded Announcements and boarding Music system (PRAM),
- Passenger Entertainment System (PES),
- Passenger Entertainment System Video (PES video).

The PES comprises the PES music, the passenger address and the passenger service.

PES

The PES transmits pre-recorded music programs, passenger address information, video and video sounds to the passengers.
The audio signals can be heard through headphones connected to the Passenger Control Units (PCU).

The PCU allows several music channels and video audio channels to be selected and the volume to be adjusted.

The PCU also allows the reading lights and passenger calls to be remotely controlled through the Passenger Service System (PSS).

All pre-recorded announcements (video and sound) and the passenger address messages, heard in the headphones through the PCU, have priority over the music and video sound entertainment channels.

The anouncements and passenger address messages are also broadcast through the passenger address loudspeakers, via the CIDS.

The PES audio reproducers supply music channels to the controller and boarding music channels to the CIDS director.
The CIDS broadcasts the boarding music through the passenger address loudspeakers.

Boarding Music (BGM) channel and volume control is performed on the Forward Attendant Panel (FAP).

The PES controller is connected to the CMCs to ensure the passenger entertainment bite function.

PES VIDEO

The PES video shows pre-recorded video movies and video announcements through video projector units and different display units in the passenger compartement.
The video sound is transmitted to the PES controller and to the CIDS.

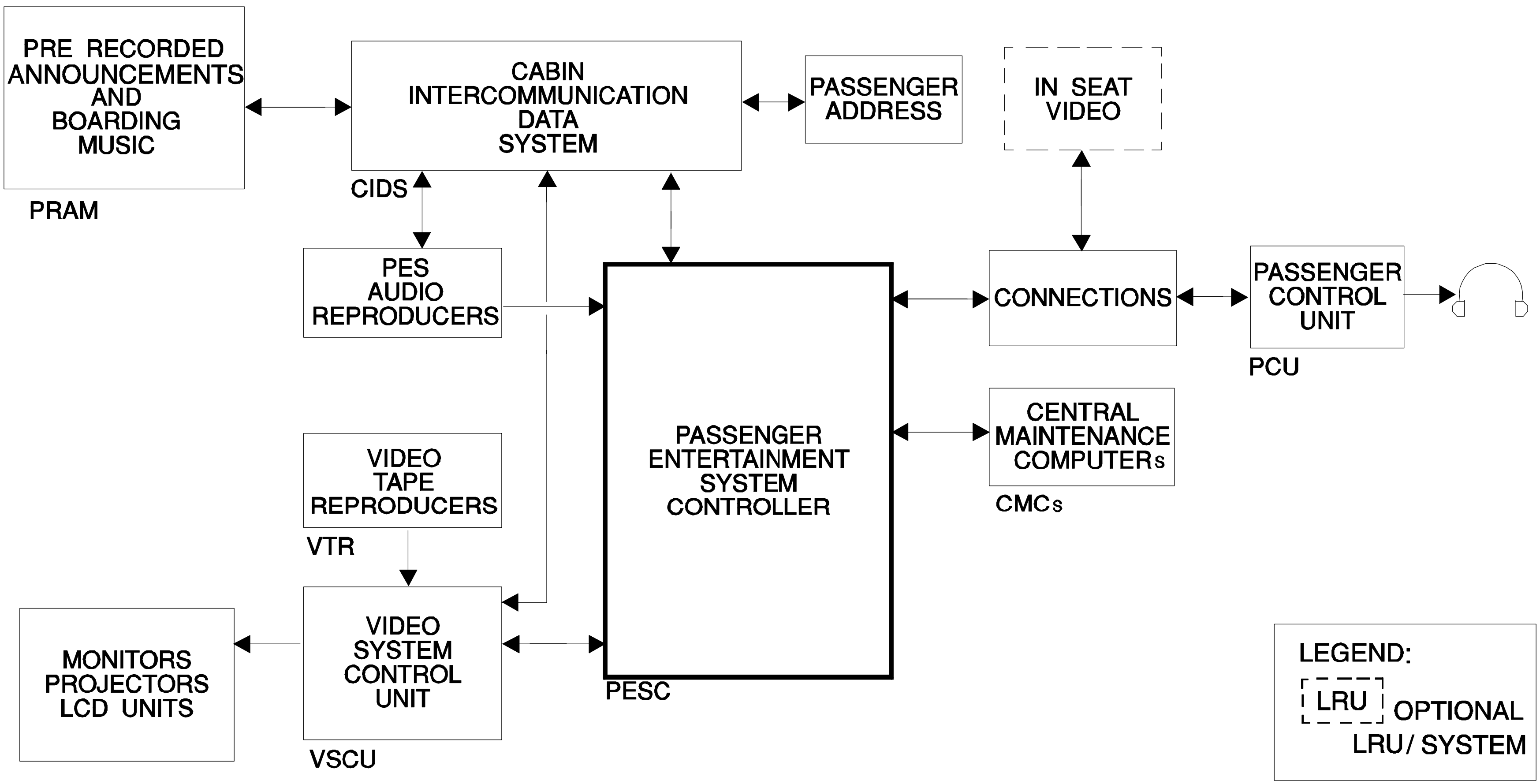
Therefore video sounds can be heard from the headset through the PCU or from the cabin passenger address loudspeakers.

The in seat video display units are supplied through the PES controller.

PRAM

The PRAM is an audio tape reproducer which contains pre-recorded announcements and boarding music supplied to the CIDS director.
The announcements are also sent to the PES controller.

The PRAM is controlled from the FAP.



FQW4200 GE Metric

STUDENT NOTES

PASSENGER MUSIC ENTERTAINMENT SYSTEM D/O

PES Controller
ADB
FDB
SEB
PCU
Audio Reproducer
Bite

PES CONTROLLER

The Passenger Entertainment System controller (PES controller) generates a radio frequency signal which contains the audio information from the audio reproducers (A/R), and Video System Control Unit (VSCU), passenger address announcements from the Cabin Intercommunication Data System (CIDS) and video signals from the VSCU.

If passenger address announcements are to be made, the CIDS sends a keyline signal to the audio reproducers to stop them.

A coaxial cable transmits the radio frequency signal to the Seat Electronic Boxes (SEB), according to the zone selection through the Area Distribution Boxes (ADB) and the Floor Disconnect Boxes (FDB).
The SEBs only transmit the selected audio signal to the headsets through the Passenger Control Unit (PCU).

A zone selection, for Passenger Address (PA) and video sounds, for a maximum of 5 zones, is made through keylines.

If the optional in seat video system is installed, the PES controller adds the contents of the video signal from the PES video to the radio frequency signal.

The PES controller sends this signal to the video seat electronic boxes (VSEB) through ADBs and FDBs.

Passenger Service System (PSS) digital data is exchanged between the PES controller and the PCU.
The PES controller transmits this data through an ARINC 429 data bus to the CIDS director.

ADB

The Area Distribution Box (ADB) is an electronic distribution box.
Each ADB can supply a maximum of 4 FDB, a further ADB, a SEB in the Crew Rest Compartment (CRC) or, when the in seat video is installed, a Video Seat Electronic Box (VSEB).

Each ADB has a pin coded address for the zone association.
Termination resistors are installed at each free ADB to ADB or ADB to crew rest compartment (CRC) output connector.

FDB

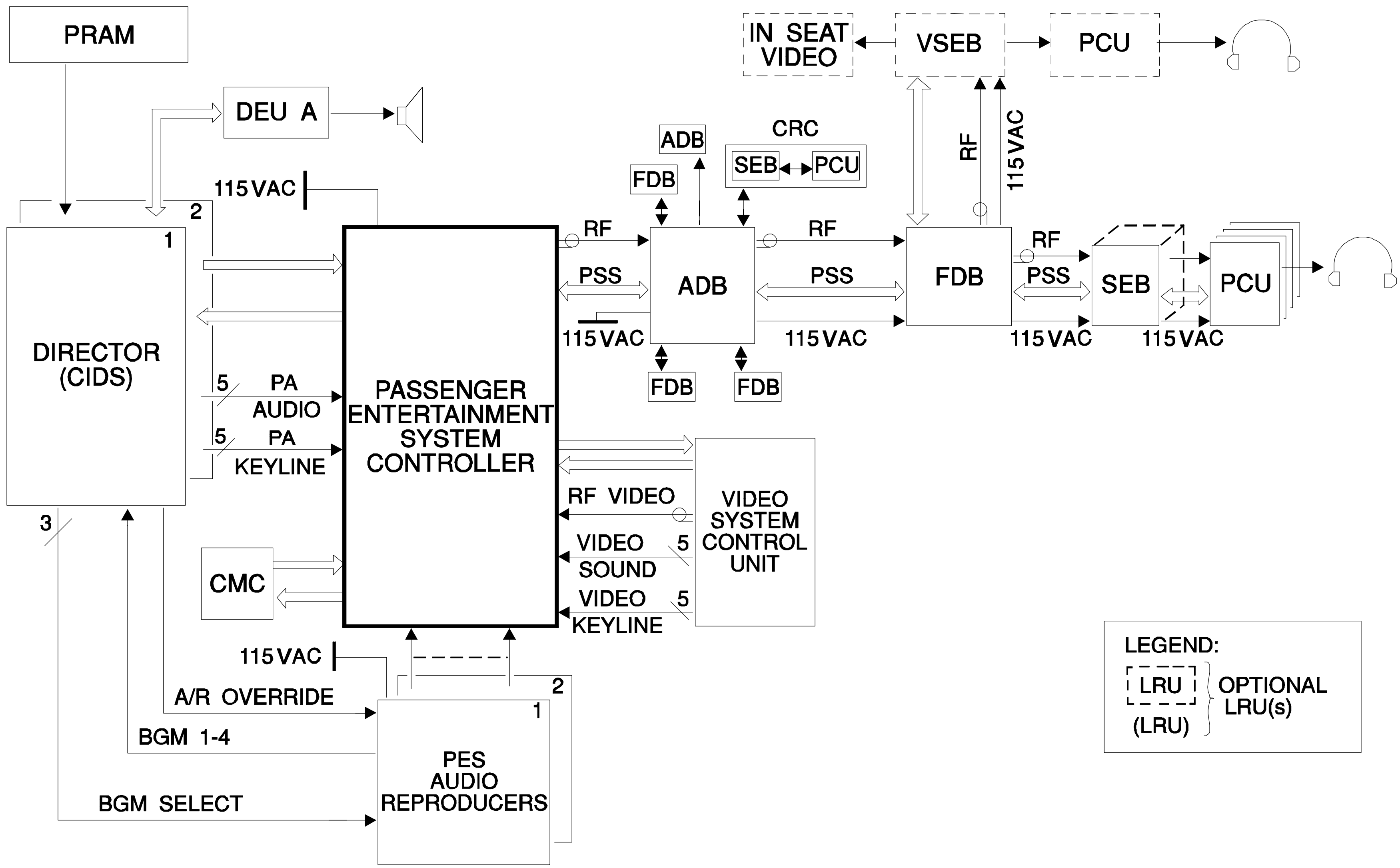
Each FDB supplies a maximum of 2 SEB columns.
When the in seat video is installed, the FDB supplies the VSEB.

SEB

The Seat Electronic Box (SEB) changes the combined radio frequency audio signal back to its original analog form and only transmits the selected program to the PCU.
Each SEB supplies a maximum of 4 PCUs.
The SEBs receive PCU selected data and transmit it to the CIDS director, through the PSS and through the PES controller.

PCU

The Passenger Control Unit (PCU) allows the passengers to select, to adjust the volume and to hear music and video sounds.
The PCU also allows the passengers to control the passenger reading lights and the passenger calls.
Each PCU has a stereophonic transducer to drive a stereo pneumatical headset, or a jack for an electrical headset, or both.



FQW4200 GE Metric

AUDIO REPRODUCER

The Audio Reproducers (A/R) provide different music programs from tape cassettes or compact disks, to the PES controller.
The audio reproducers also send one music program, among 4 music programs, for boarding music (BGM), to the CIDS director.
The BGM program selection is done through 3 keylines from the CIDS director.

Boarding music program selection and volume control are controlled from the Forward Attendant Panel (FAP).

BITE

The BITE is used for detection and isolation of systems and component faults.
All BITE data of the PES music is assembled in the PES controller.

The PES controller transmits the bite data through an ARINC 429 data bus to the CMCs.

The BITE data transmission to the CMCs is made continuously in normal mode and on request in interactive mode.
In interactive mode, the BITE is connected to the MCDU through the CMC.

The PES controller starts an automatic self test after power up and a manual self test after transmission of the related MCDU command.

STUDENT NOTES:

STUDENT NOTES

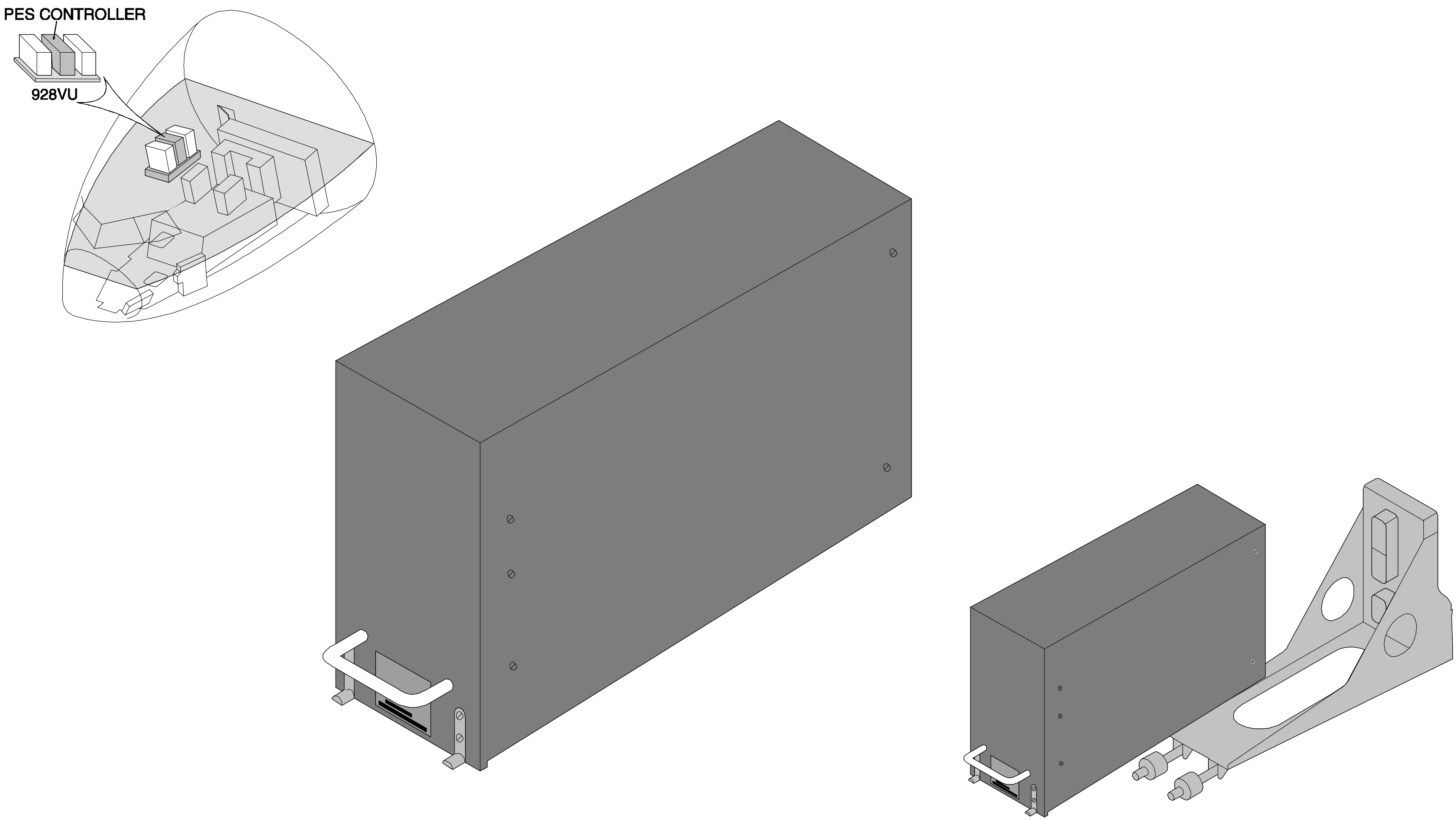
PASSENGER ENTERTAINMENT SYSTEM MUSIC COMPONENTS

PES Controller
Audio Reproducer
Area Distribution Box
Floor Disconnect Box
Seat Electronic Box
Passenger Control Unit

PES CONTROLLER

FIN / ZONE
Fin : 8MK
Zone : 122

COMPONENT DESCRIPTION
The front face of the Passenger Entertainment Controller (PES Controller) is fitted with a handle and two lugs.
The PES Controller is Buyer Furnished Equipment (BFE).



FQW4200 GE Metric

AUDIO REPRODUCER

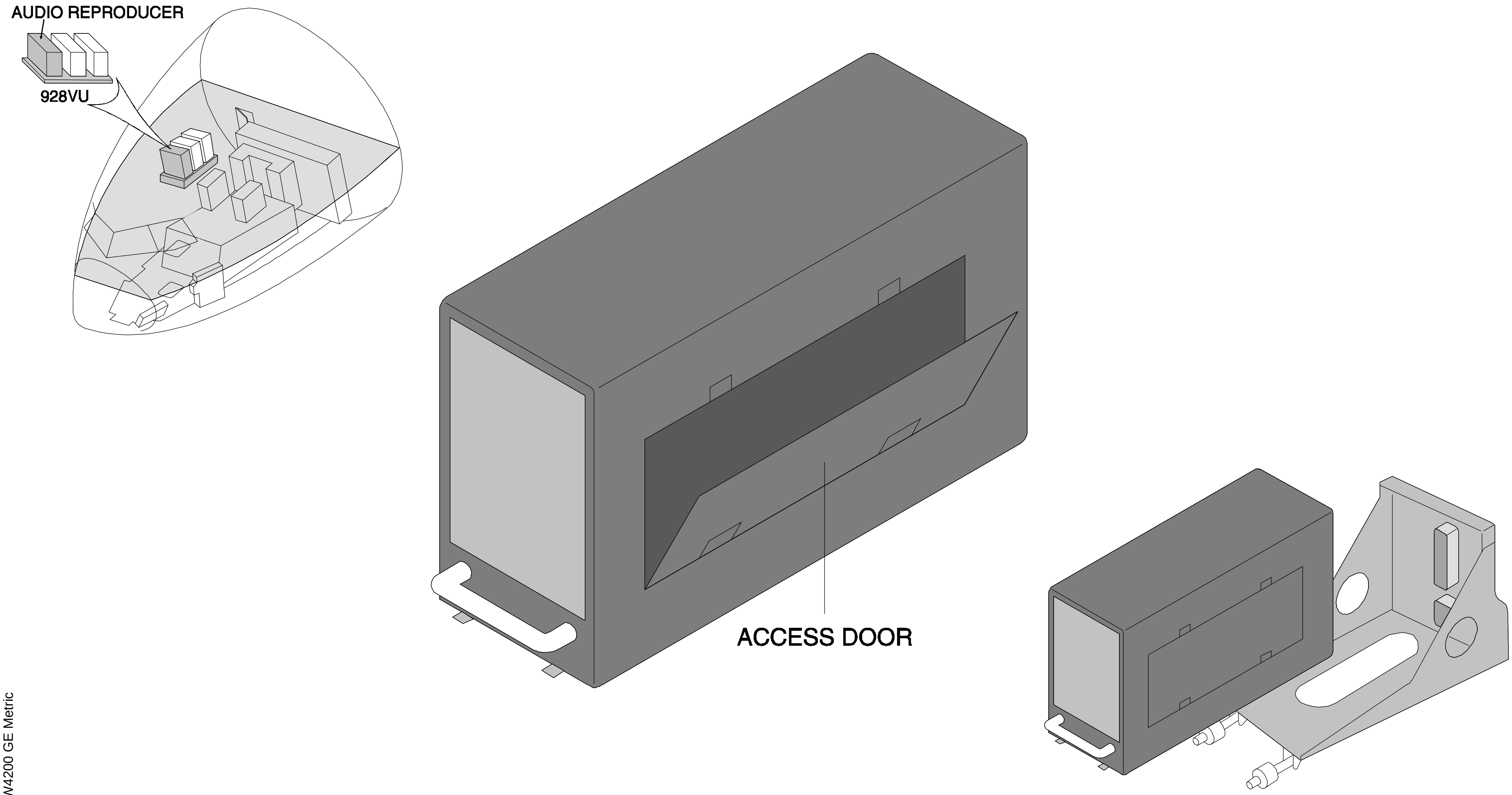
FIN / ZONE
Fin : 30MK
Zone : 122

COMPONENT DESCRIPTION

An access door, located on the side of the audio reproducer (A/R), allows the tapes to be installed.

NOTE:
The audio reproducers can also be installed in the cabin, depending on the airlines choice.

The A/R is BFE.



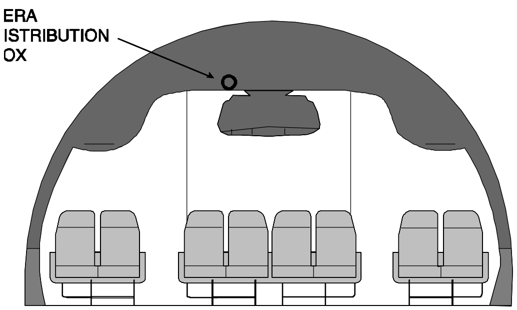
FQW4200 GE Metric

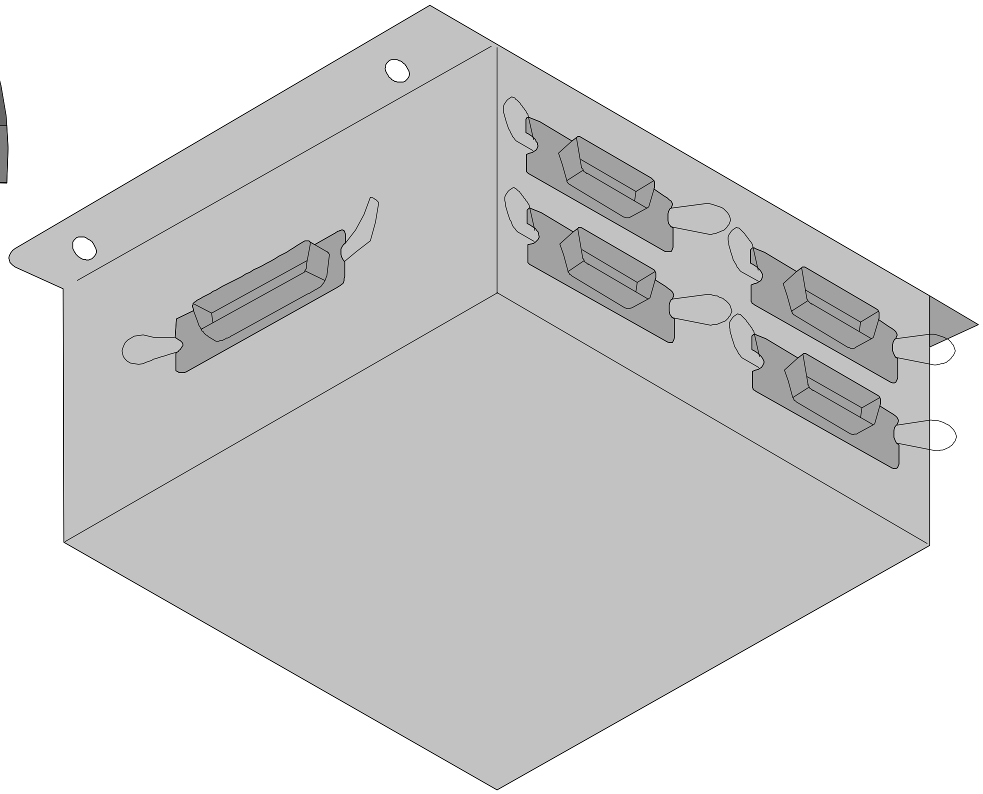
AREA DISTRIBUTION BOX

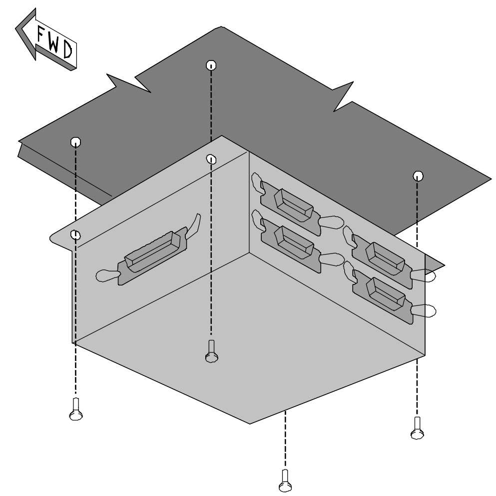
FIN / ZONE
Fin : 81MK
Zone : 132

COMPONENT DESCRIPTION

The Area Distribution Boxes (ADBs) are installed on the cabin ceiling:
The ADB is BFE.







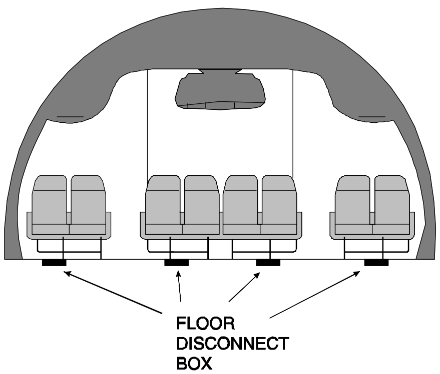
FQW4200 GE Metric

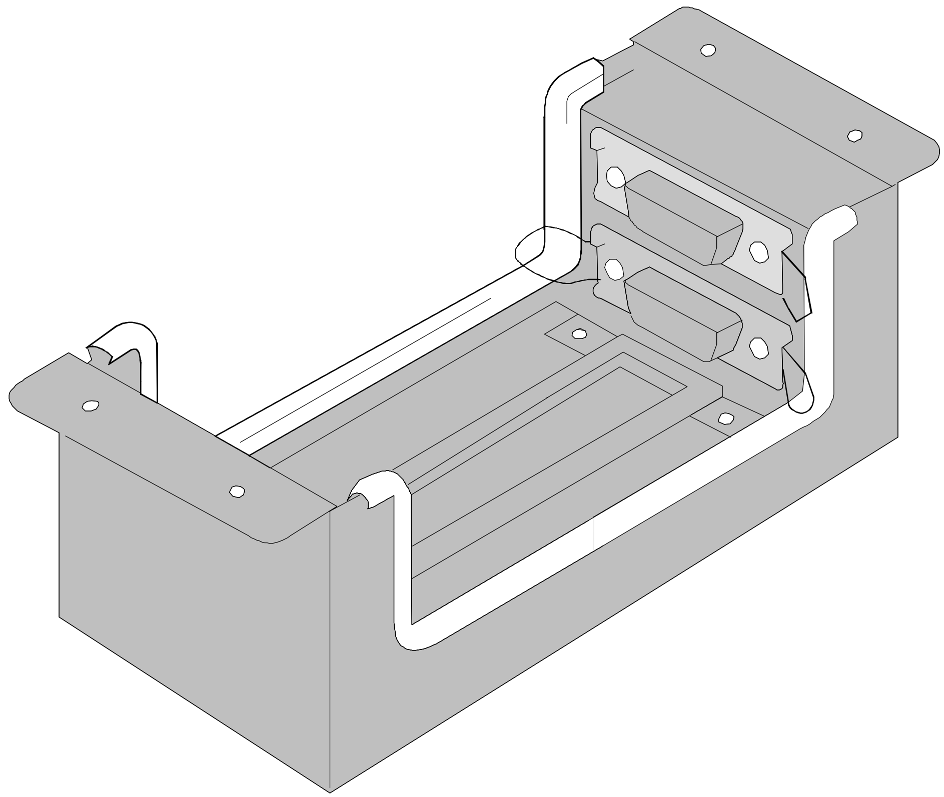
FLOOR DISCONNECT BOX

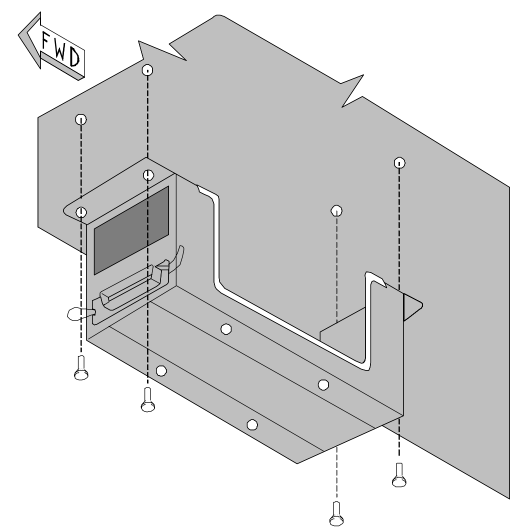
FIN / ZONE
Fin : 80MK
Zone : 131

COMPONENT DESCRIPTION

The Floor Disconnect Boxes (FDBs) are installed on the cargo ceiling:
The FDB is BFE.







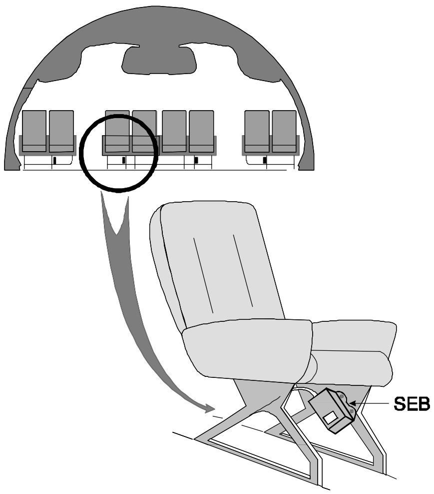
FQW4200 GE Metric

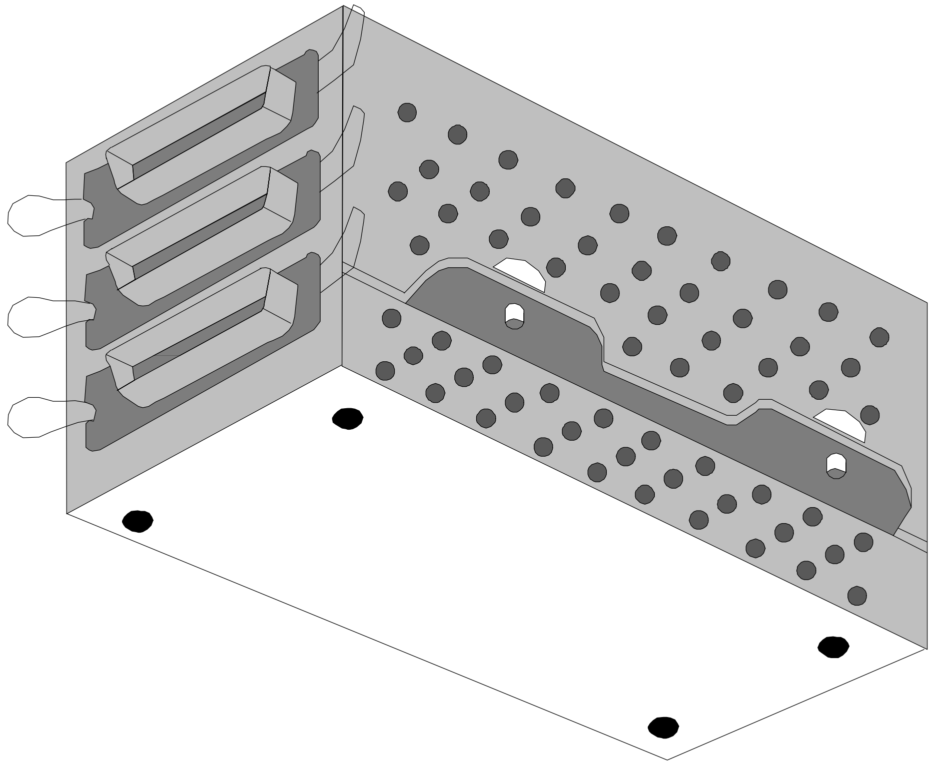
SEAT ELECTRONIC BOX

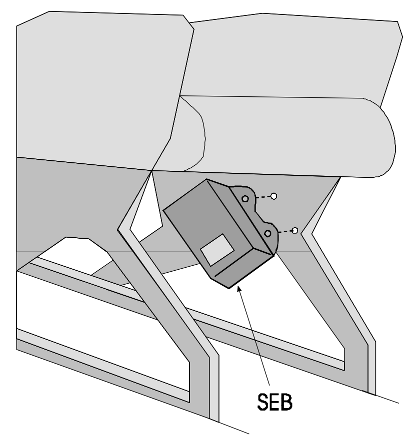
FIN / ZONE
Fin : 90MK
Zone : 200

COMPONENT DESCRIPTION

The Seat Electronic Boxes (SEBs) are installed on the seat legs.
The SEB is BFE.







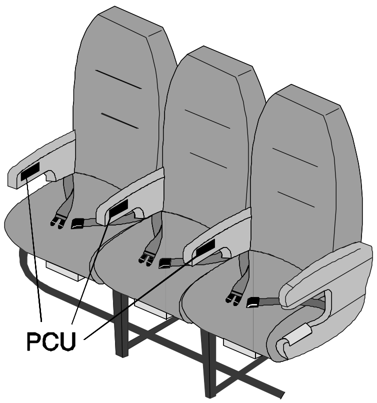
FQW4200 GE Metric

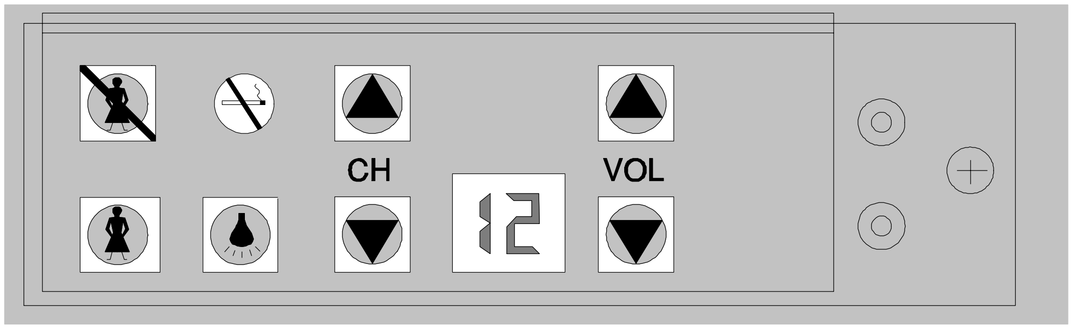
PASSENGER CONTROL UNIT

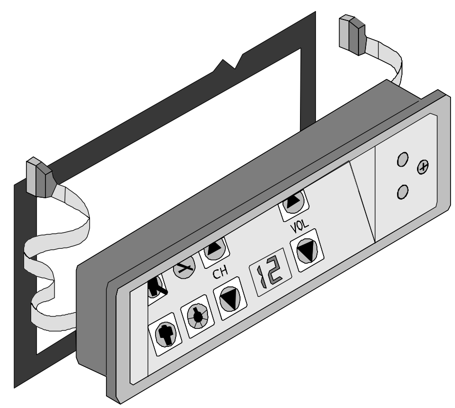
FIN / ZONE
Fin : 200MK
Zone : 200

COMPONENT DESCRIPTION

The Passenger Control Units (PCUs) are installed on the seat armrest.
The PCU is BFE.







FQW4200 GE Metric

STUDENT NOTES

PES VIDEO D/O

VSCU
VTR
Tapping Unit
Bite
Visual Displays

VSCU

The Video System Control Unit (VSCU) controls the Passenger video Entertainment System (PES video).
The VSCU receives video and audio signals from the Video Tape Reproducers (VTR).
It generates a radio frequency signal which contains the video signals and sends it through the tapping units to the related display units.
As an option, when the video is in use a message is displayed on ECAM.

The VSCU operates in the following formats:

- PAL,
- SECAM,
- NTSC.

The VSCU sends the video sounds to the PES controller and to the Cabin Intercommunication Data System (CIDS) director.
The passengers can hear the video sounds through headsets connected to the Passenger Control Units (PCU) or from the Passenger Address (PA) loudspeakers.

Each PA announcement overrides the PES video sounds in the related zones and stops the video tape reproducers.

In case of a rapid cabin decompression, the VSCU stops the video transmission and controls the retraction of the overhead monitors installed in the center overhead stowage compartment.

If in seat video is installed, the VSCU sends a radio frequency signal, which contains the video signals, to the PES controller.

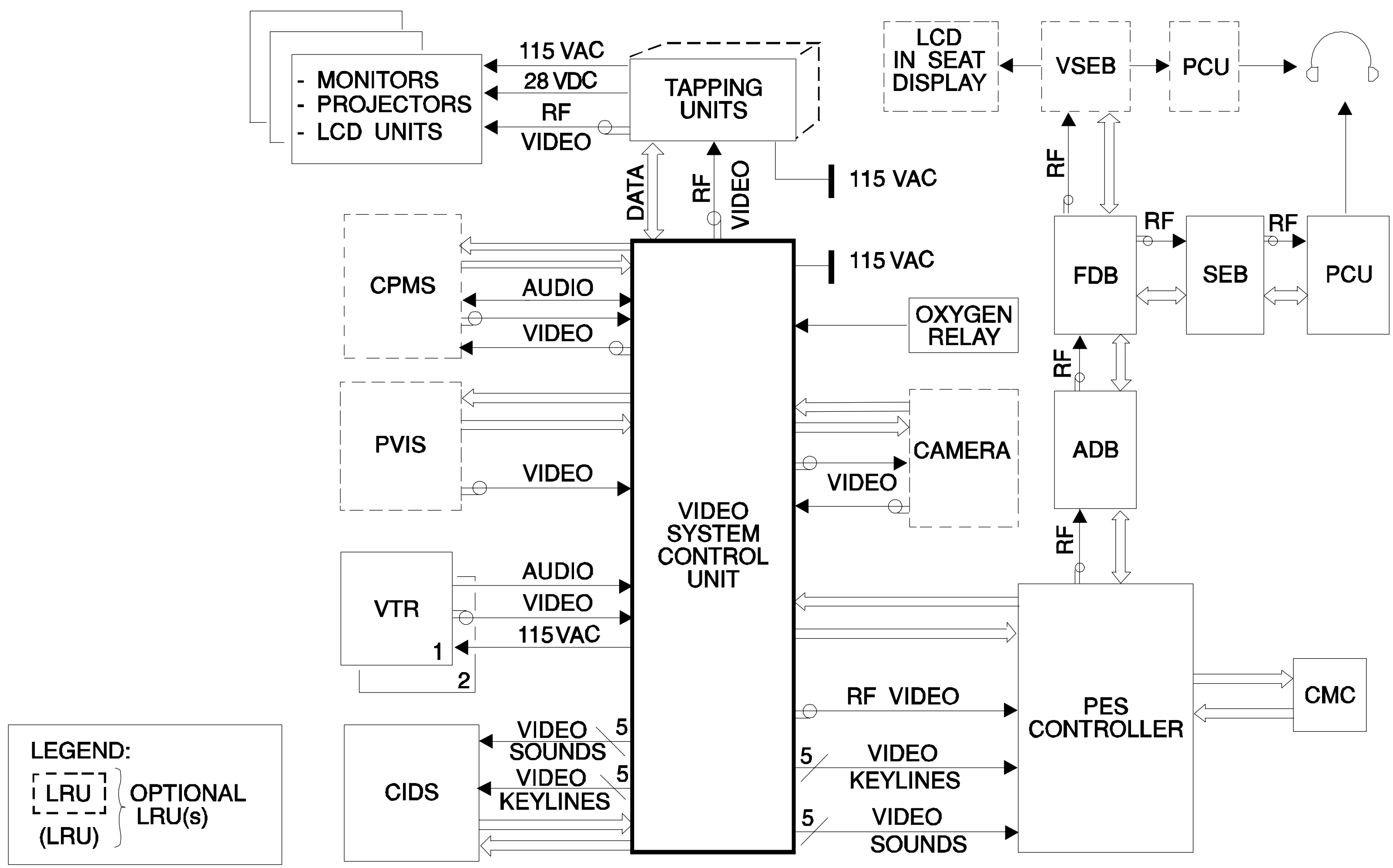
The interface between the optional Cabin and Passenger Management System (CPMS) and the VSCU allows the following functions :

- remote control of the video system, camera control unit and Passenger Visual Information System (PVIS),
- display of news and advertisements given by the CPMS,
- preview of video programs.

The Passenger Video Information System (PVIS) is an option that receives information which is processed, formated and transmitted as video signals to the VSCU.
The VSCU transmits this information to the display units.

As an option, the video camera converts optical images into video signals compatible with the video system.
This signal is sent to the VSCU and can be displayed on the video display units.

The camera can be remotely controlled from the CPMS.



FQW4200 GE Metric

VTR

The Video Tape Reproducers (VTR) supply audio and video signals to the VSCU.
The VTRs are remotely controlled from the VSCU.
On the front panel of the VTRs, all the operation controls are installed.

The following video systems are possible :

- VHS,
- SVHS,
- BETA,
- VIDEO 8,
- High band video 8.

The following signal formats are possible :

- PAL,
- SECAM,
- NTSC.

TAPPING UNIT

The tapping units distribute the video signals to the display units in each cabin zone.
A maximum of 12 tapping units can be installed along the cabin ceiling.
Each tapping unit can supply a maximum of 3 displays or video projector units.

Each tapping unit has a pincoded address to give a unique address to the unit. This enables the VSCU to control each monitor output of the tapping unit individually.

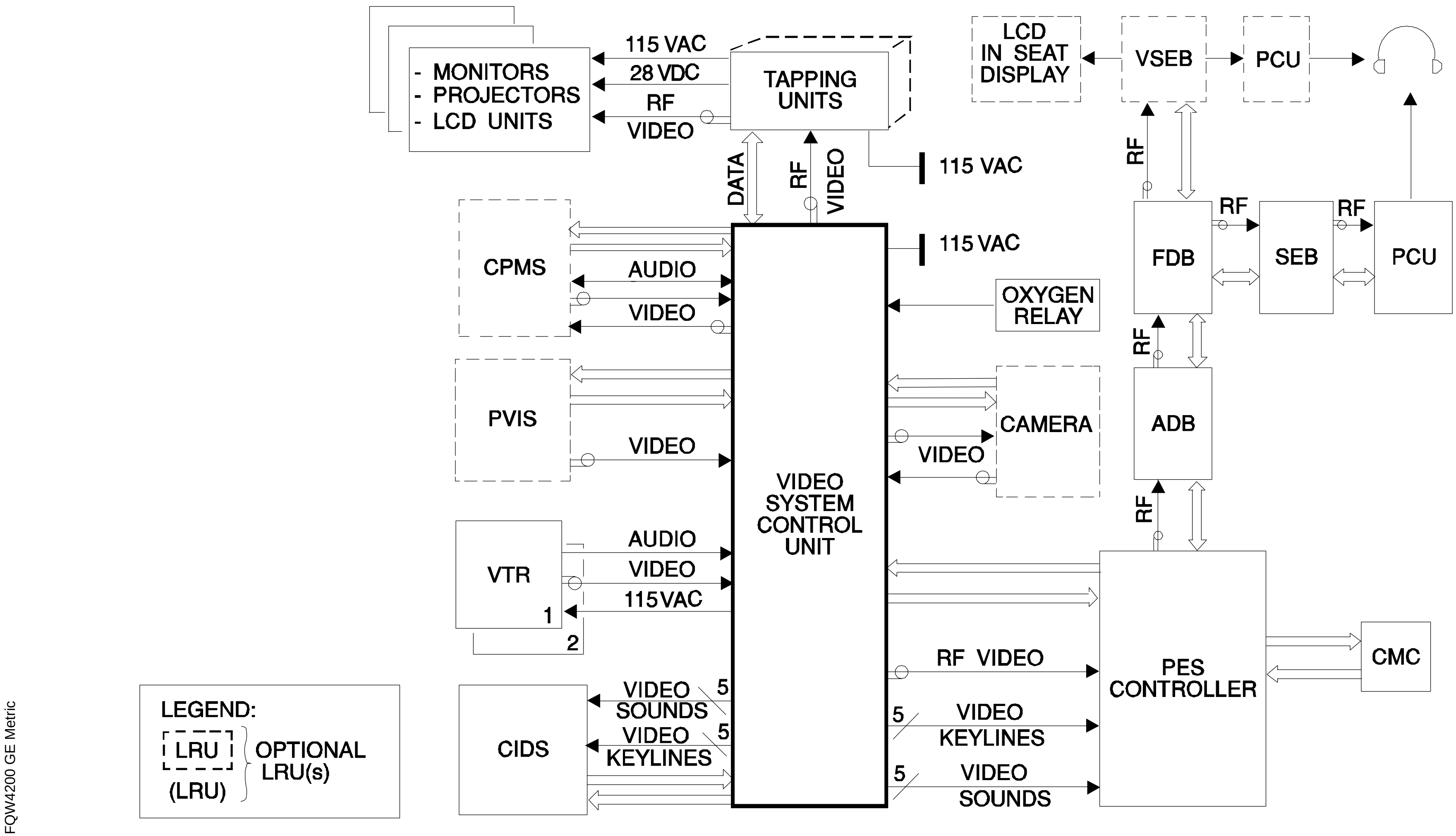
BITE

The BITE is assembled into the video system.
All the PES video BITE data is transmitted through an ARINC 429 data bus to the PES controller.
The PES controller sends this data through an ARINC 429 data bus to the Centralized Maintenance Computer (CMC).

The VSCU starts an automatic self test after power up and a manual self test after transmission of the Multipurpose Control and Display Unit (MCDU) command.

In CMC interactive mode, the BITE is connected to the Multipurpose Control and Display Unit (MCDU) through the CMC, to show the maintenance data, start a test or to show the Line Replaceable Unit (LRU) identification.

The BITE failure transmission to the CMC is made continuously in normal mode, and on request in interactive mode.


- MONITORS
- PROJECTORS
- LCD UNITS
115 VAC
28 VDC
RF
VIDEO
TAPPING UNITS
115 VAC
DATA
RF
VIDEO
LCD IN SEAT DISPLAY
VSEB
PCU
RF
FDB
RF
SEB
RF
PCU
RF
ADB
RF
CPMS
AUDIO
VIDEO
115 VAC
OXYGEN RELAY
PVIS
VIDEO
CAMERA
VIDEO
VIDEO SYSTEM CONTROL UNIT
VTR
AUDIO
VIDEO
115VAC
1
2
PES CONTROLLER
CMC
RF VIDEO
CIDS
VIDEO
SOUNDS
5
VIDEO
KEYLINES
5
5
VIDEO
KEYLINES
5
VIDEO
SOUNDS
LEGEND:
LRU
(LRU)
OPTIONAL LRU(s)
FQW4200 GE Metric

VISUAL DISPLAYS

Different units are possible in the passenger compartment :

- video projectors with video projector screens,
- Cathode Ray Tube (CRT) monitors,
- Liquid Cristal Display (LCD) units.

Each video projector or display unit is connected to the nearest tapping unit.

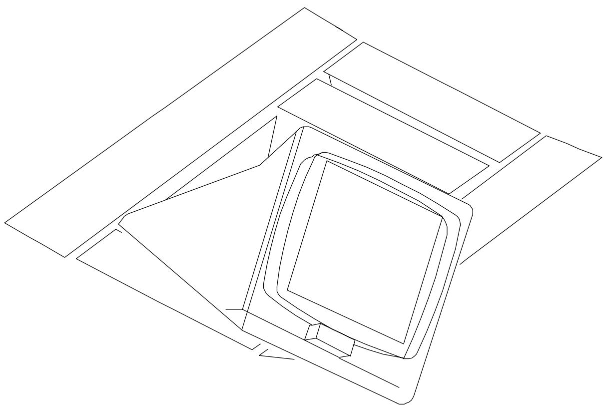
Each display unit operates with these formats :

- PAL,
- SECAM,
- NTSC.

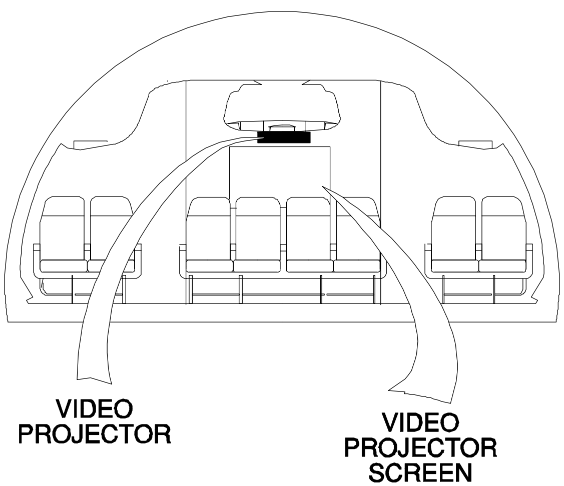
A retraction mechanism is used to move the overhead display units, installed in the center overhead compartment, into stowed or viewing position.
Each monitor is automatically energized in the viewing position, and de-energized in the stowed position.

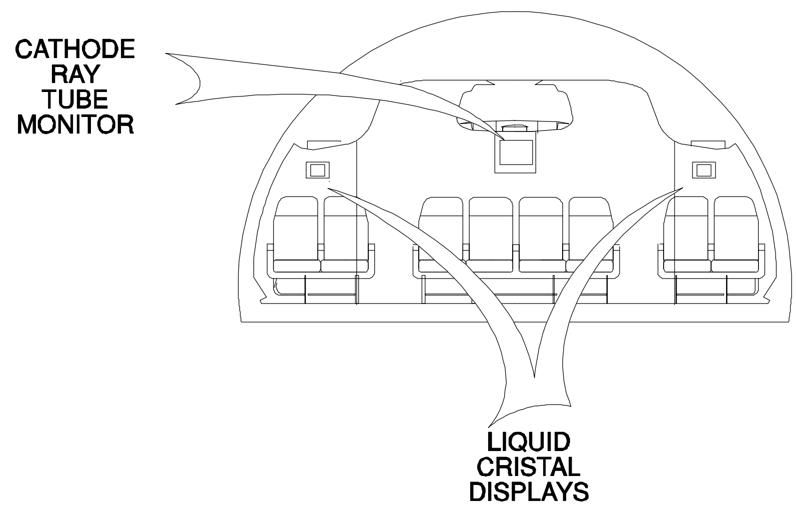
The monitors move automatically into the stowed position when :

- an electrical power loss occurs for more than 200 ms
- a mechanical resistance occurs while the display unit moves down
- a rapid cabin decompression occurs.



OVERHEAD DISPLAY UNIT





FQW4200 GE Metric

STUDENT NOTES:

PASSENGER ENTERTAINMENT SYSTEM
VIDEO COMPONENTS

Video System Control Unit
Video Modulator Unit
Tapping Unit
Video Seat Electronic Box
Monitor 19"
Monitor 16"
Projector
Liquid Cristal Display
Video Tape Reproducer
Passenger Control Unit
Cabin Management Terminal

VIDEO SYSTEM CONTROL UNIT

FIN / ZONE

FIN : 200MH

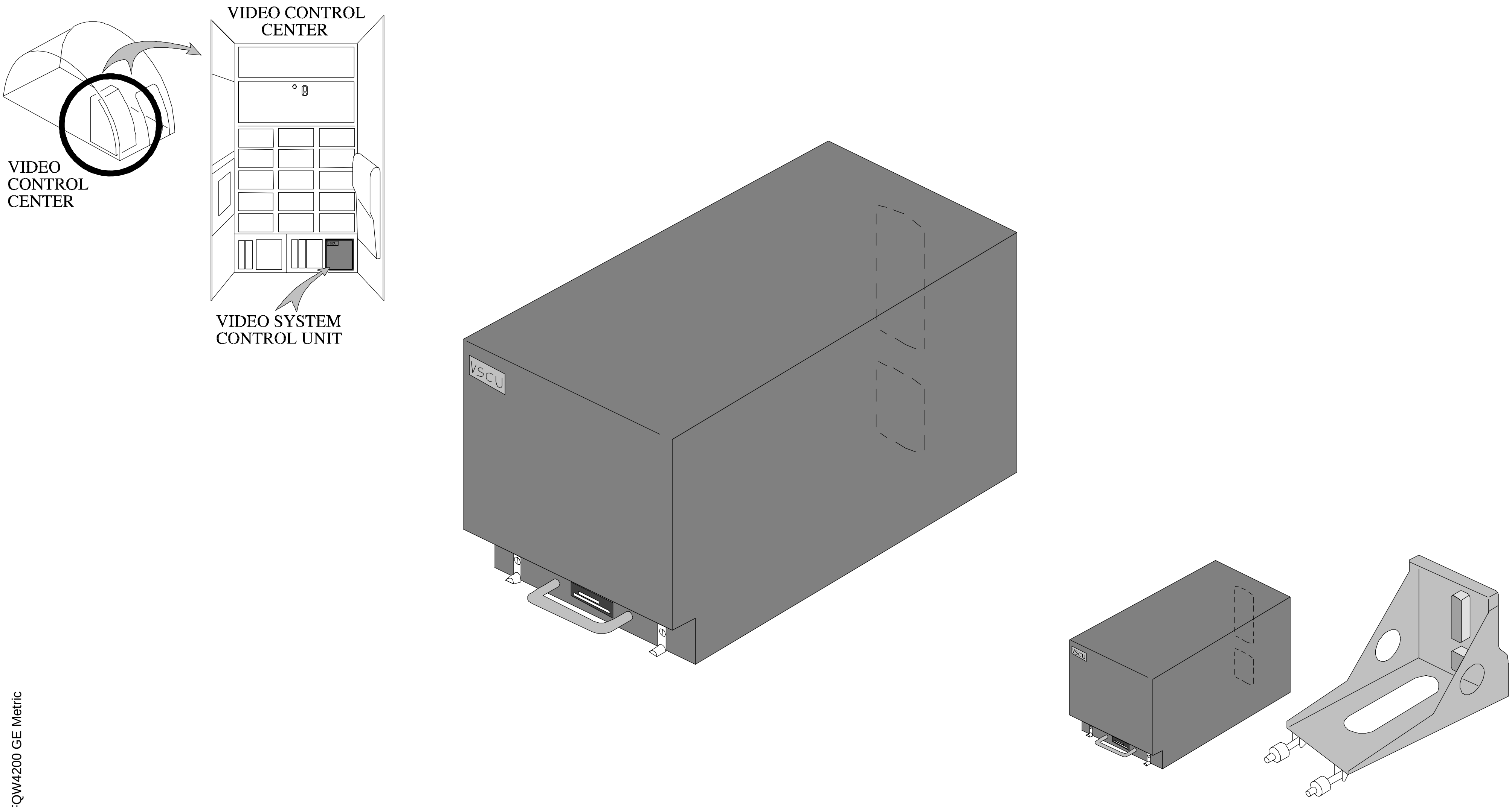
ZONE : 223

COMPONENT DESCRIPTION

The Video System Control Unit (VSCU) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION

No specific tool are required for removal - installation of the VSCU.



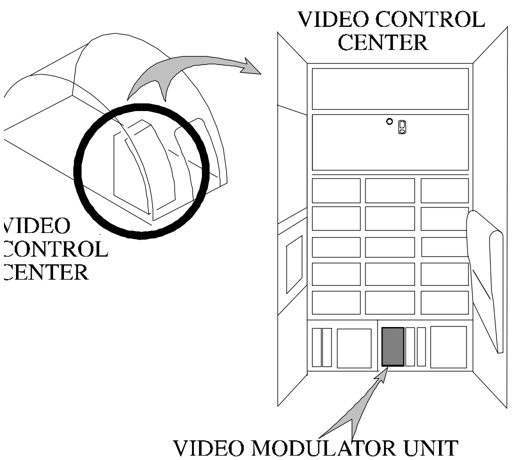
FQW4200 GE Metric

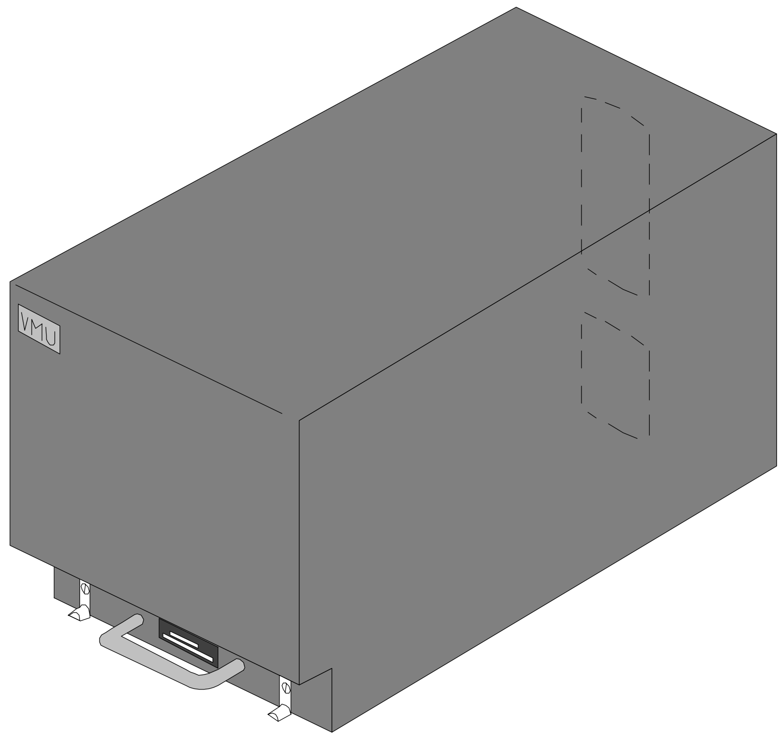
VIDEO MODULATOR UNIT

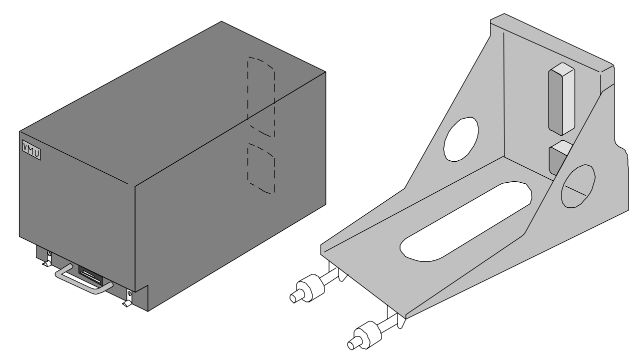
FIN / ZONE
FIN : 202MH
ZONE : 221

COMPONENT DESCRIPTION
The Video Modulator Unit (VMU) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the VMU.







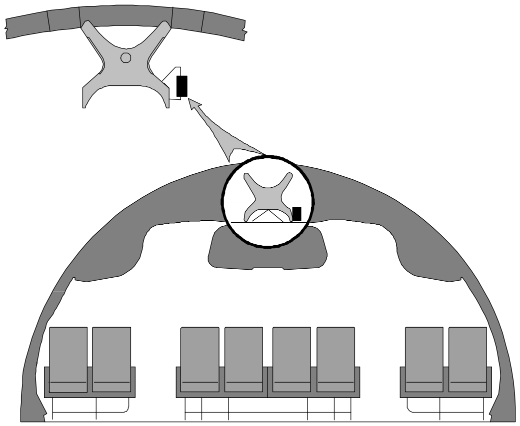
FQW4200 GE Metric

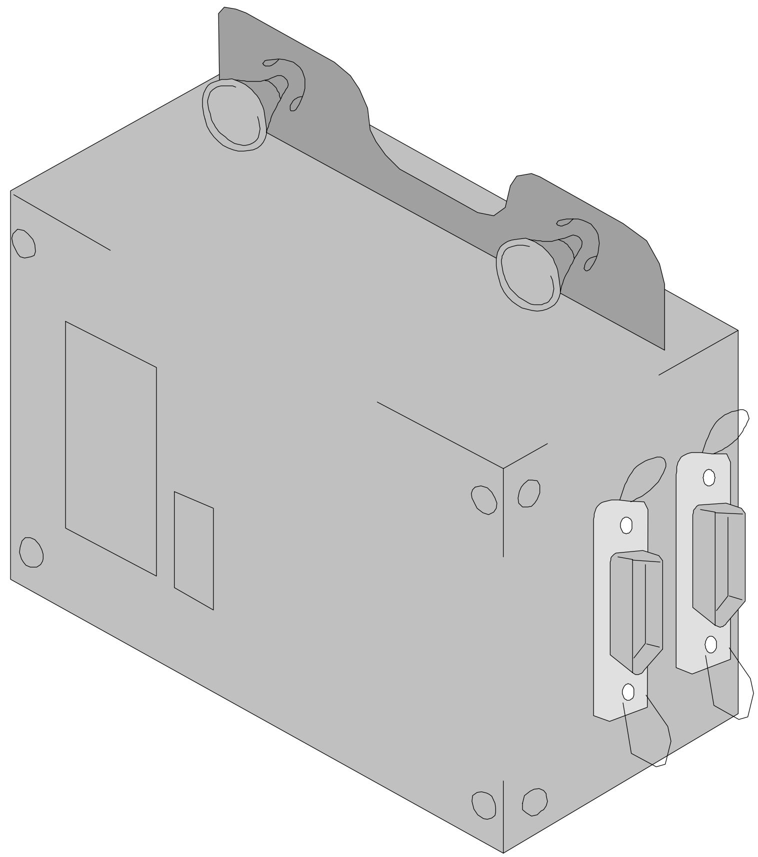
TAPPING UNIT

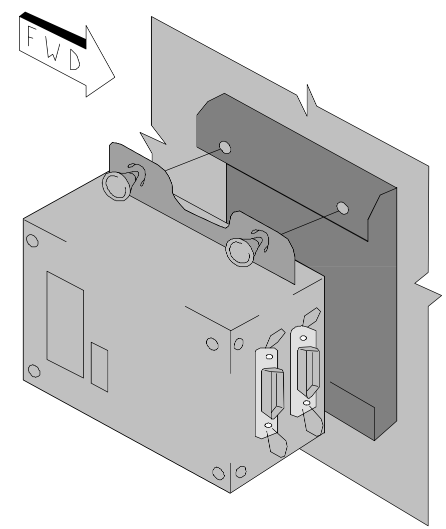
FIN / ZONE
FIN : 50MH
ZONE : 200

COMPONENT DESCRIPTION
The Tapping Unit (TU) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the Tapping Unit.







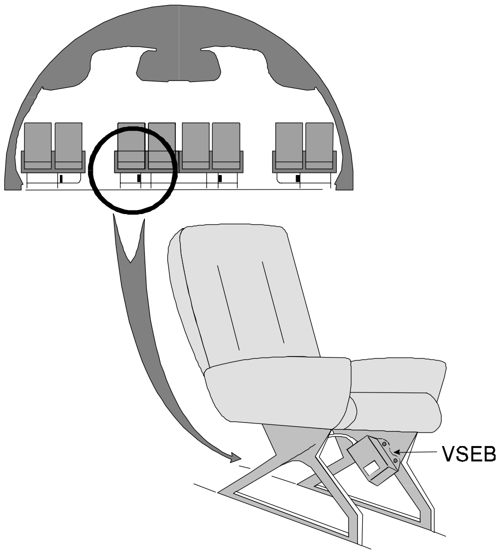
FQW4200 GE Metric

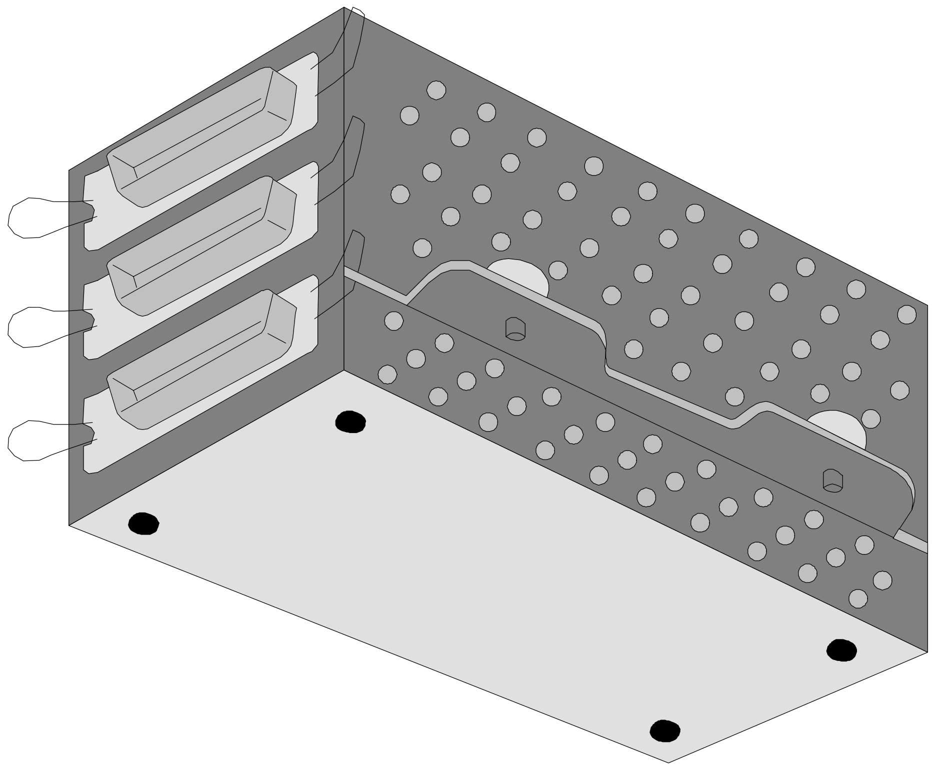
VIDEO SEAT ELECTRONIC BOX

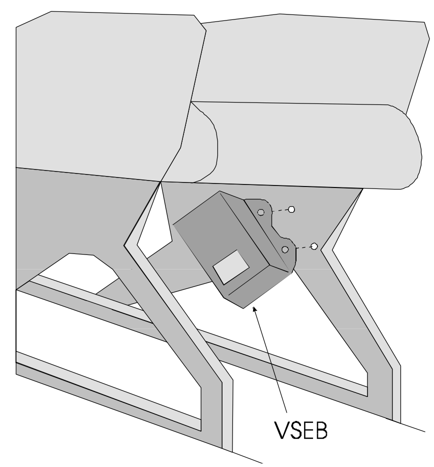
FIN / ZONE
FIN : 95MK
ZONE : 200

COMPONENT DESCRIPTION
The Video Seat Electronic Box (VSEB) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the VSEB.







FQW4200 GE Metric

MONITOR 19 INCH

FIN / ZONE

FIN : 151MH

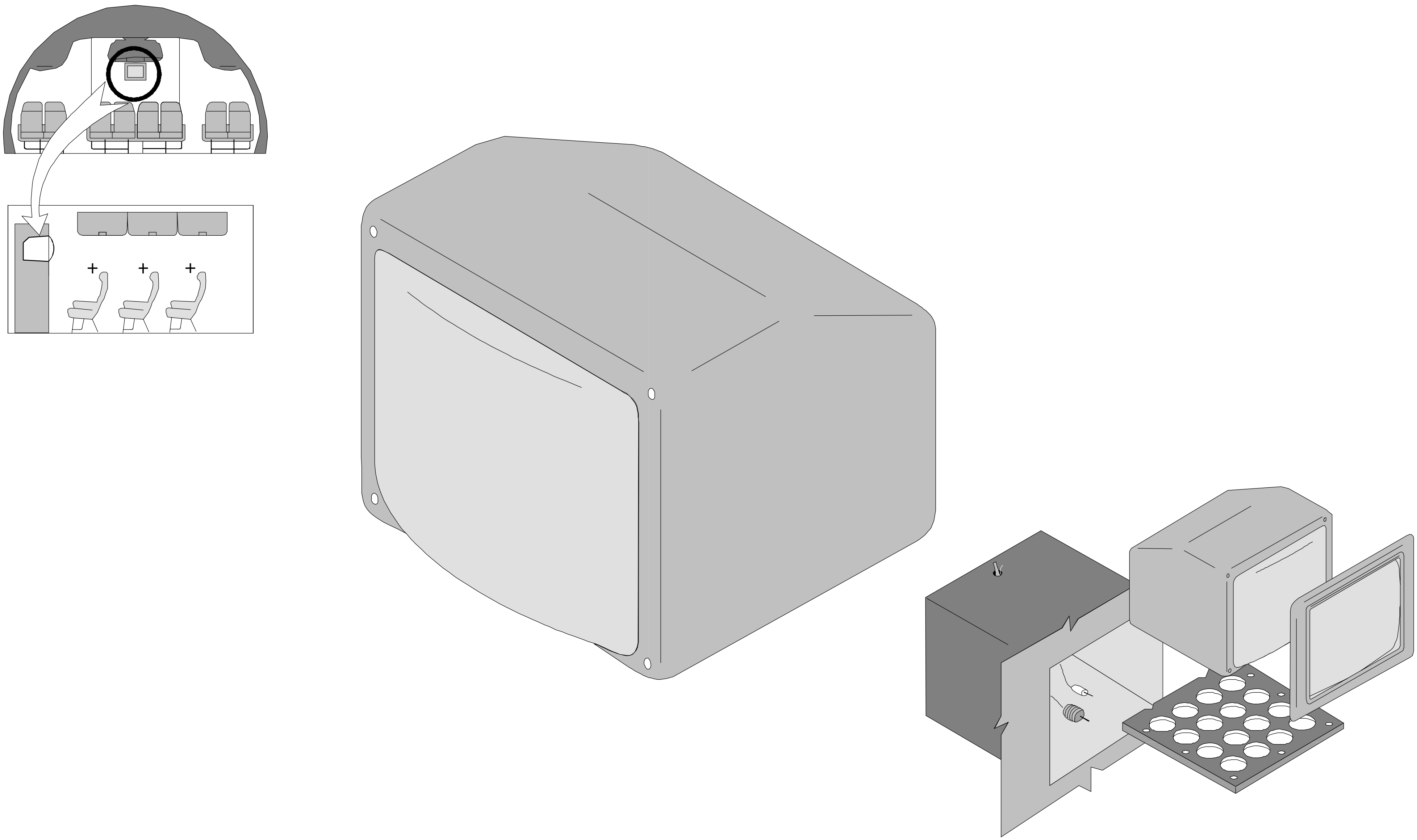
ZONE : 200

COMPONENT DESCRIPTION

The 19 inch monitor is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION

No specific tool are required for removal - installation of the 19 inch monitor.



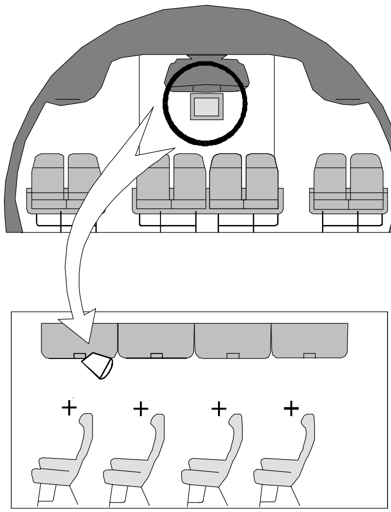
FQW4200 GE Metric

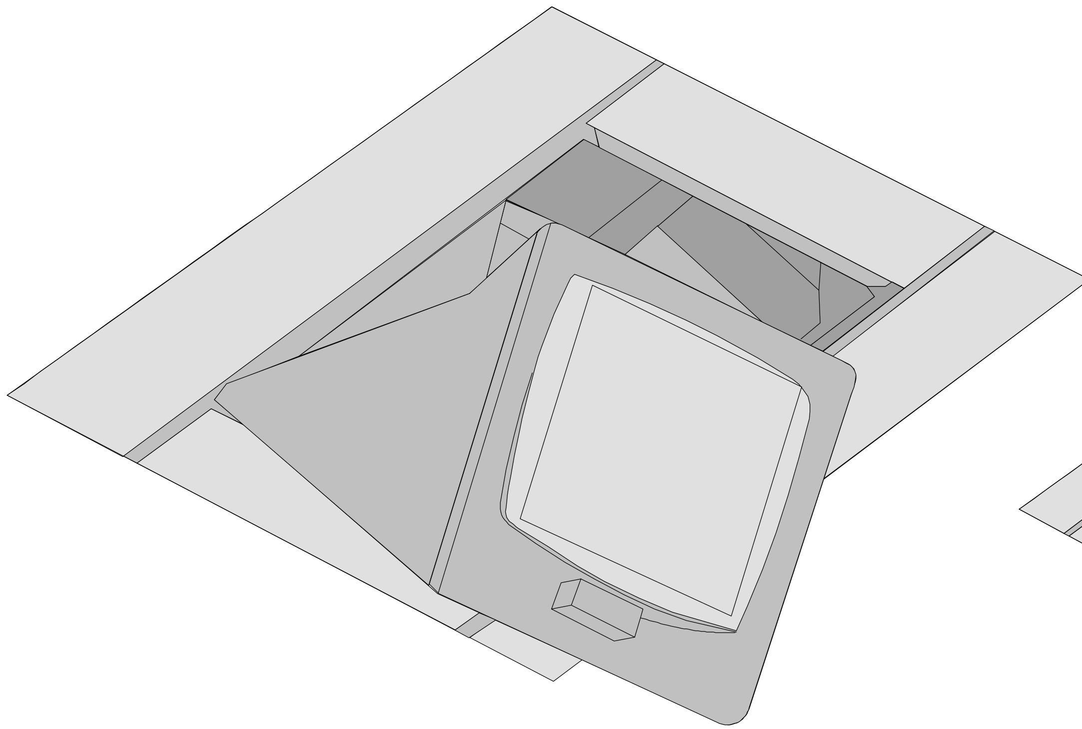
MONITOR 16 INCH

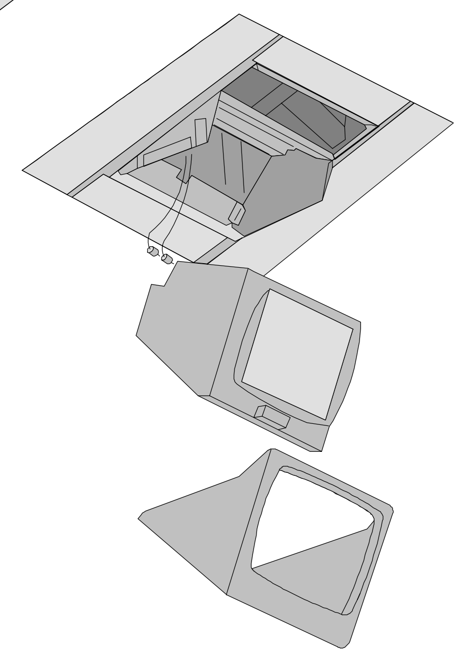
FIN / ZONE
FIN : 105MH
ZONE : 200

COMPONENT DESCRIPTION
A retraction mecanism extends or retracts the monitor outside or inside the center overhead stowage compartment.
The 16 inch monitor is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the 16 inch monitor.







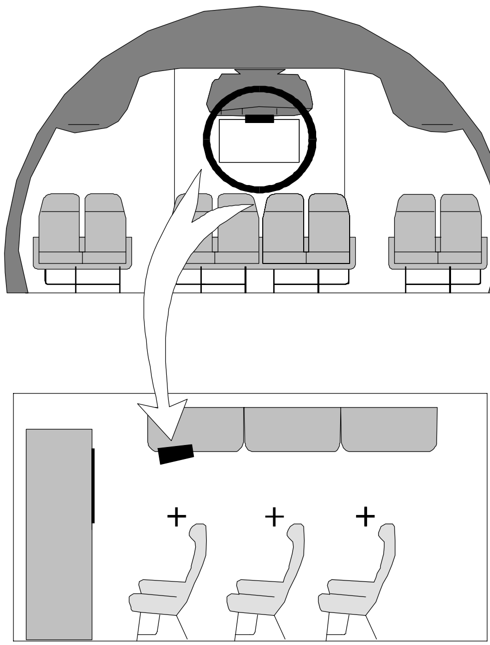
FQW4200 GE Metric

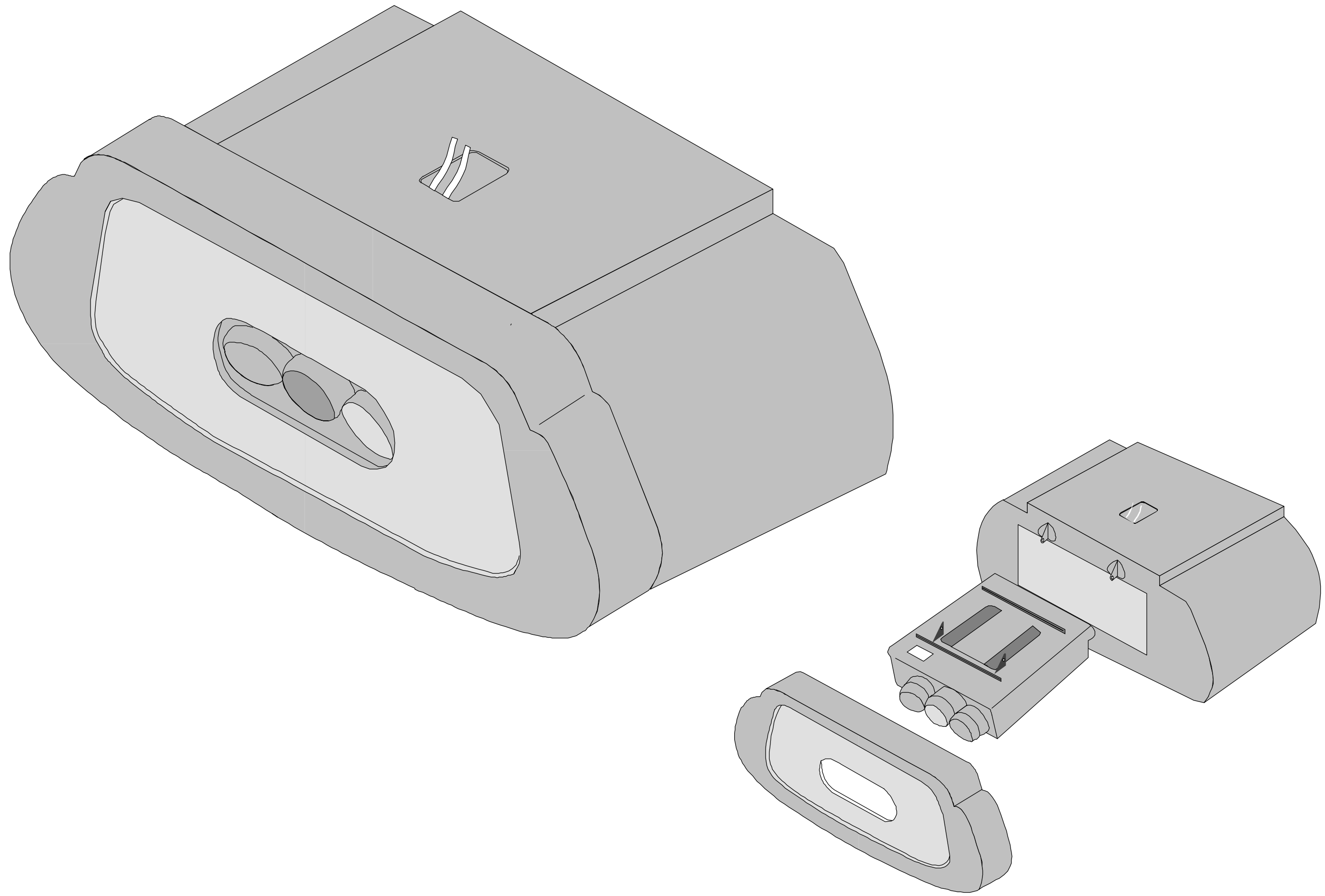
PROJECTOR

FIN / ZONE
FIN : 151MH
ZONE : 200

COMPONENT DESCRIPTION
The projector is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the projector.





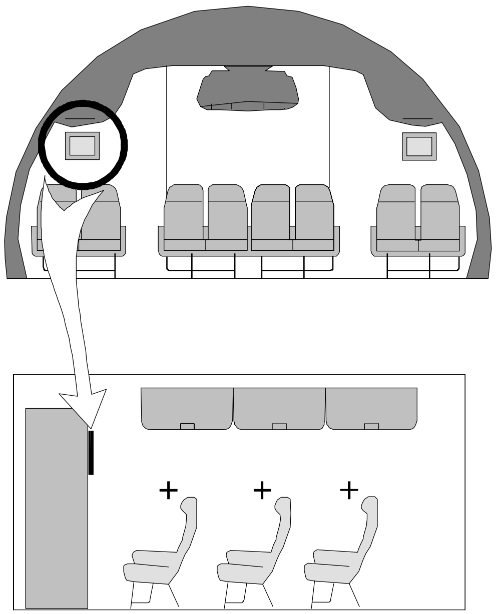
FQW4200 GE Metric

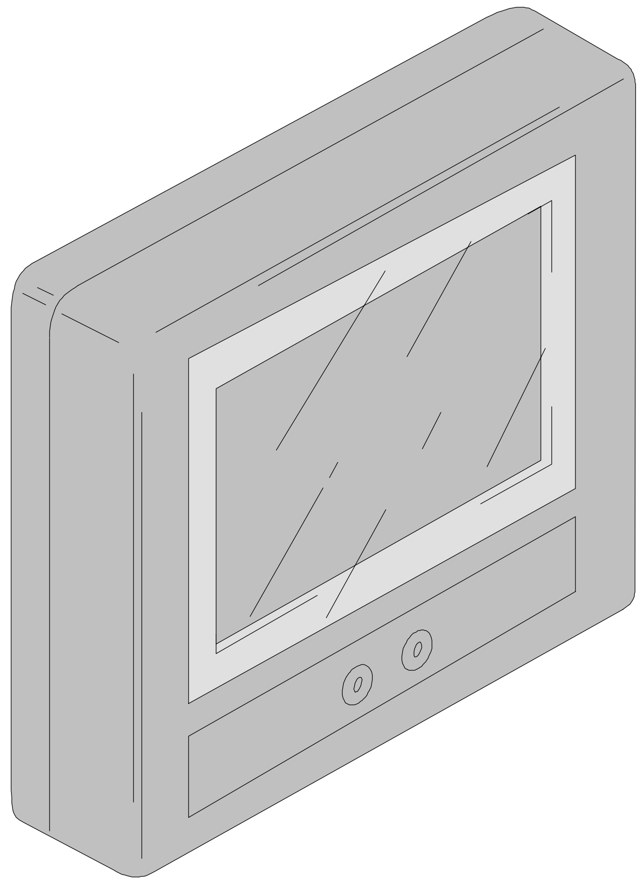
LIQUID CRISTAL DISPLAY

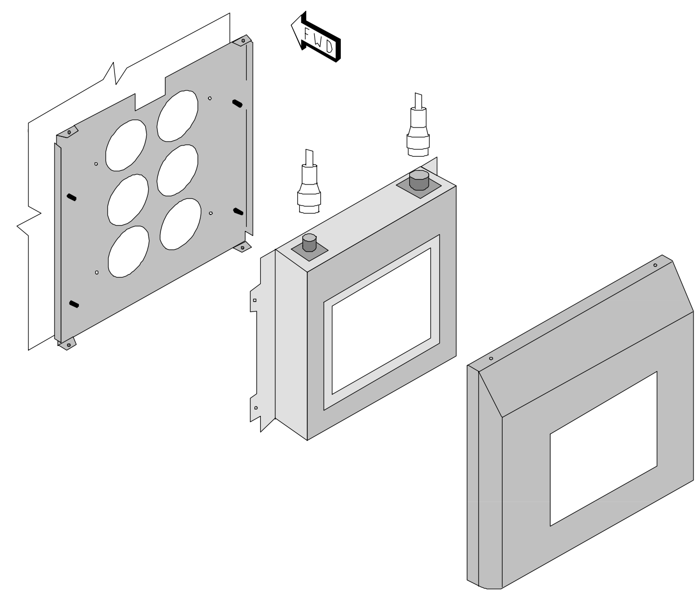
FIN / ZONE
FIN : 115MH
ZONE : 200

COMPONENT DESCRIPTION
The Liquid Cristal Display (LCD) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the LCD.







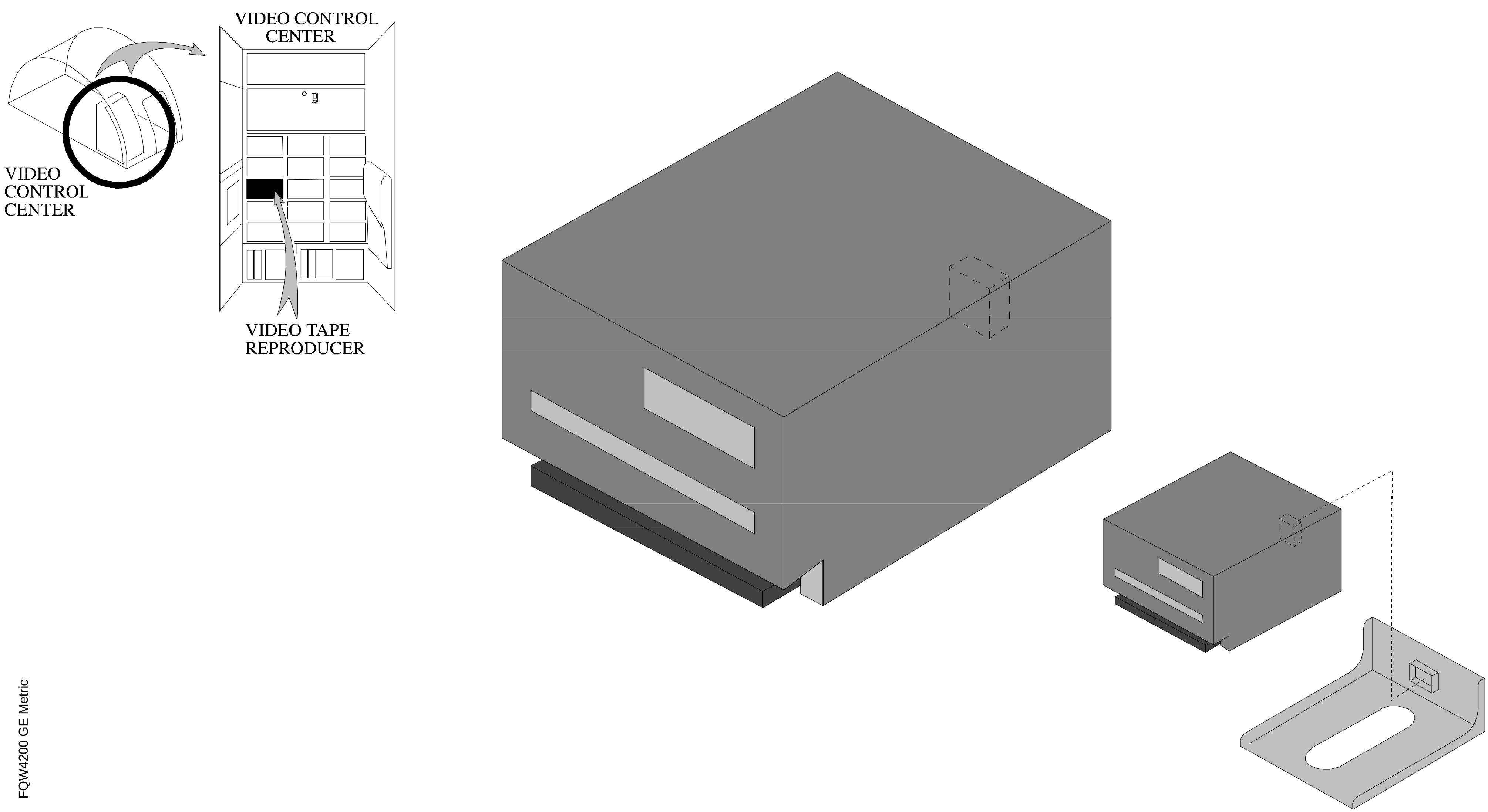
FQW4200 GE Metric

VIDEO TAPE REPRODUCER

FIN / ZONE
FIN : 30MH
ZONE : 200

COMPONENT DESCRIPTION
All controls are located on the front panel of the VTR.
The Video Tape Reproducer (VTR) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the VTR.



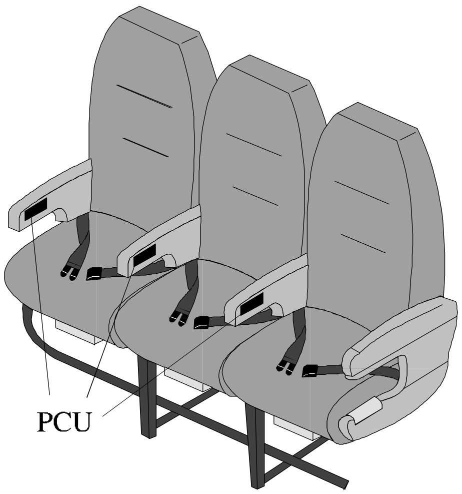
FQW4200 GE Metric

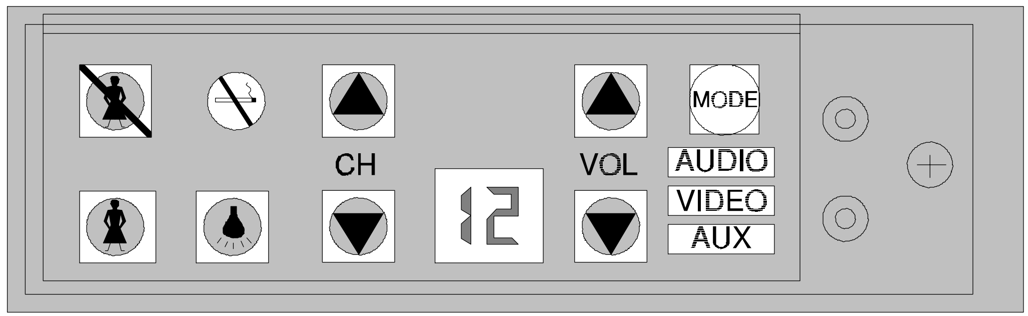
PASSENGER CONTROL UNIT

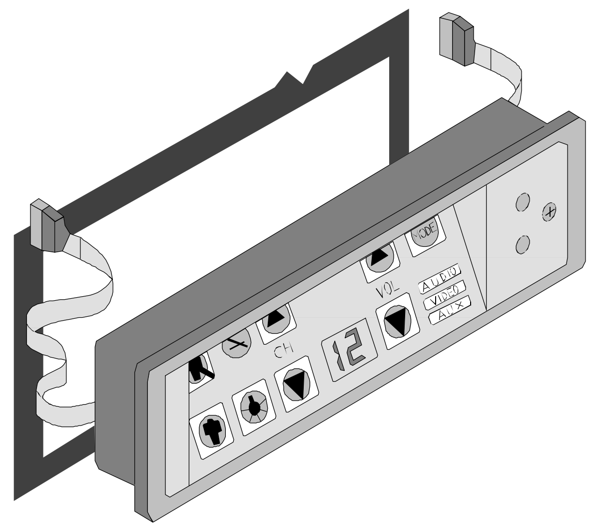
FIN / ZONE
FIN : 200MK
ZONE : 200

COMPONENT DESCRIPTION
The Passenger Control Unit (PCU) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the PCU.







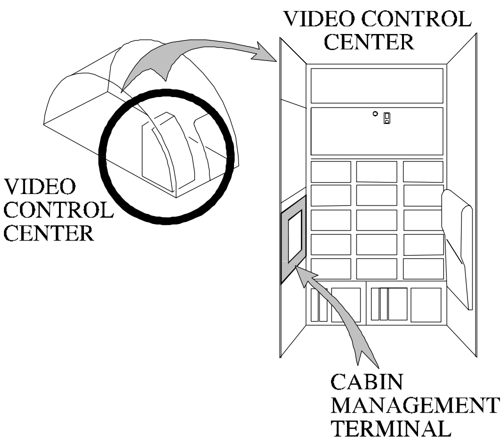
FQW4200 GE Metric

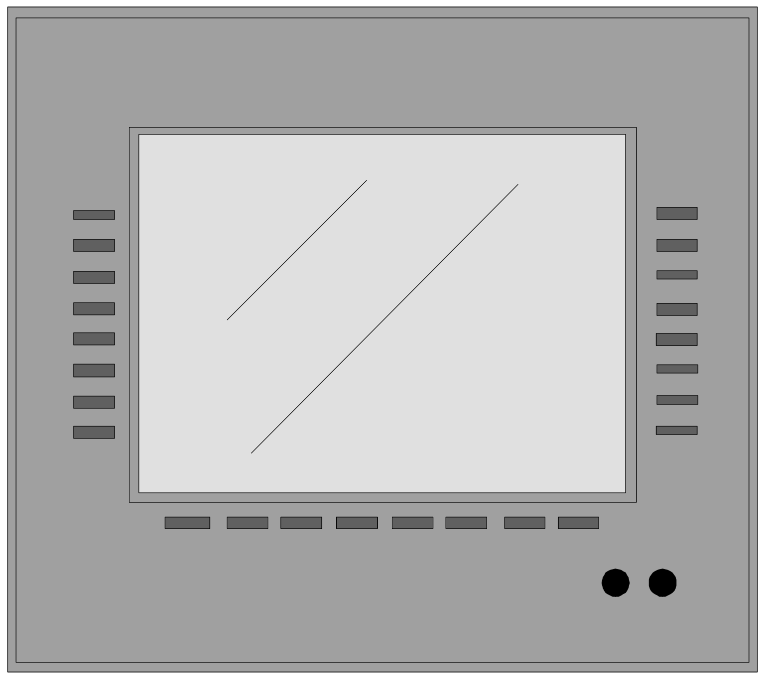
CABIN MANAGEMENT TERMINAL

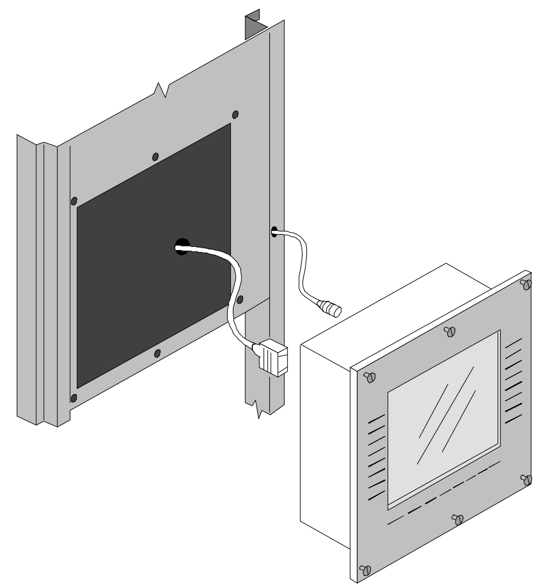
FIN / ZONE
FIN : 201MH
ZONE : 221

COMPONENT DESCRIPTION
The Cabin Management Terminal (CMT) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the VCP







FQW4200 GE Metric

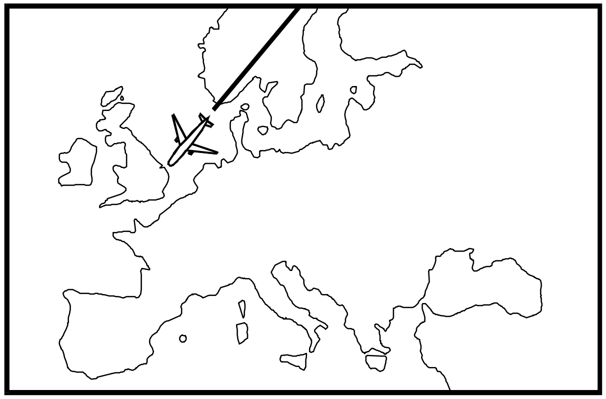
STUDENT NOTES

PASSENGER VISUAL INFORMATION SYSTEM D/O

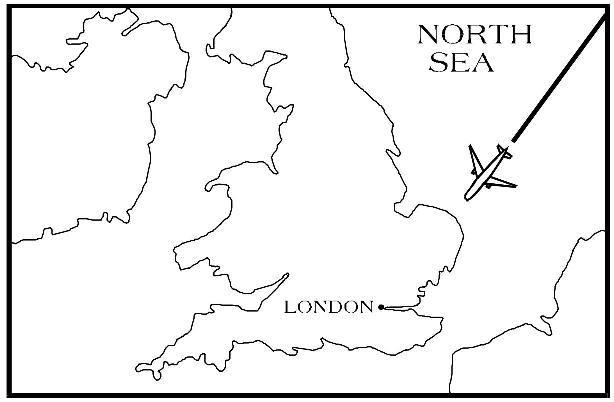
PRESENTATION

The passenger visual information System (PVIS), gives continously updated flight and destination information to the passengers through the video display units.
Information is given to the passengers either in text form or in multicolored maps.
Several modes can be selected:

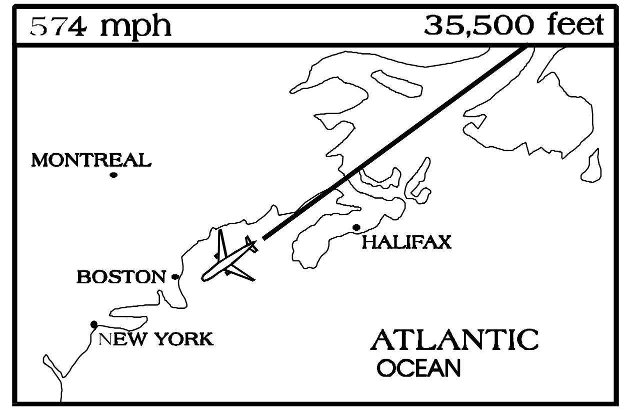
- MAP mode : map display,
- INFO mode : flight information pages,
- LOGO mode : logos display,
- AUTO mode : automatic cycling of all pictures.



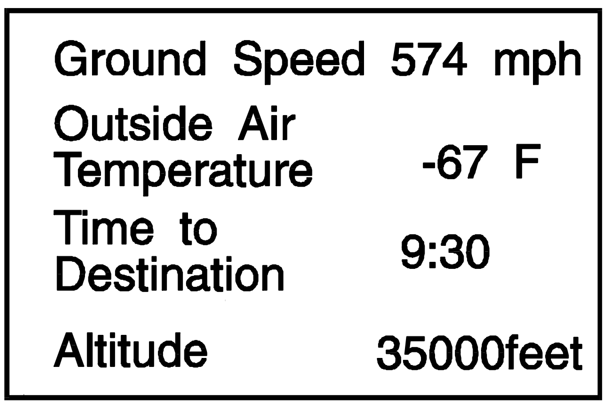
LOW RESOLUTION MAP GIVING
THE POSITION OF THE AIRCRAFT



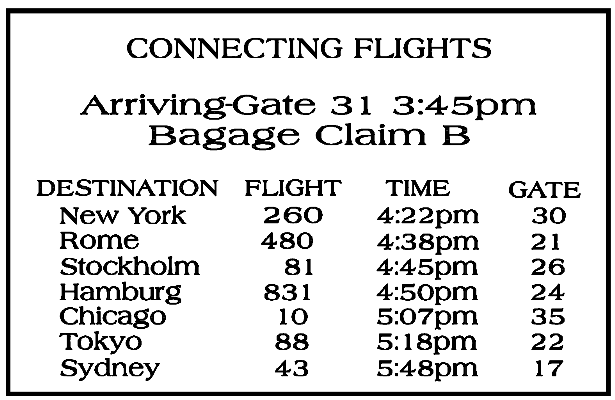
HIGH RESOLUTION MAP GIVING
THE DESTINATION AND THE
EXACT POSITION



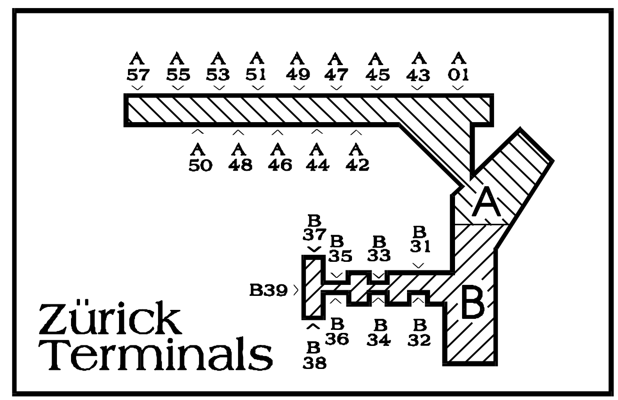
LOW RESOLUTION MAP GIVING
THE POSITION OF THE AIRCRAFT
WITH FLIGHT INFORMATION



FLIGHT INFORMATION
IN TEXT MODE



CONNECTING GATE INFORMATION
TRANSMITTED TO THE ACARS



TERMINAL CHARTS

FQW4200 GE Metric

PASSENGER VIDEO INFORMATION SYSTEM SCREENS

D.I.U.

The PVIS comprises the Digital Interface Unit (DIU) and the Cabin Control Unit (CCU). The Digital Interface Unit (DIU) is the PVIS main unit.
The Digital Interface Unit (DIU) is a computer. It is connected to the aircraft avionics systems and to the Passenger Entertainment System Video (PES Video).
The DIU interfaces with :
- Air Data Inertial Reference Unit 2 (ADIRU2),
- Flight Management Guidance and Envelope Computer 2 (FMGEC2),
- Passenger Entertainment System Video (PES Video),
- Central Maintenance Computer 1 (CMC1).

The DIU processes all the information and selects the appropriate maps and points of interest stored in its memory.
The DIU is also connected to other systems :
- the Aircraft Communications Addressing and Reporting System (ACARS),
- the Multipurpose Disk Drive Unit (MDDU),
- the Cabin and Passenger Management System (CPMS).

The DIU is supplied with 28 VDC.

ADIRS

The Air Data Inertial Reference System (ADIRS) is connected to the DIU through two unidirectional ARINC 429 data buses.
- one ARINC 429 low speed data bus transmits the actual air data,
- one ARINC 429 high speed data bus transmits the inertial reference data.

F.M.G.E.C

Flight Management Guidance and Envelope Computer 2 (FMGEC2) is connected with the DIU through an unidirectional ARINC 429 data bus.
FMGEC2 sends data to the DIU. Certains parameters riquiring an input (destination, flight time,...) can be entered either by the cabin staff or loaded from FMGEC2.

C.M.C.

Central Maintenance Computer 1 (CMC1) is connected to the DIU through an unidirectional ARINC 429 low speed data bus.

ACARS

The Aircraft Communications Addressing and Reporting System (ACARS) is connected to the DIU through an ARINC 429 low speed data bus.
The ACARS allows connecting gate, arrival information, messages and other data to be uplinked from ground stations.

MDDU

The Multipurpose Disk Drive Unit (MDDU) is connected to the DIU through an ARINC 429 data bus.
Configuration file, placename updating for maps, airport identifier data base and time zone data base can be loaded and updated with the Multipurpose Disk Drive Unit (MDDU).

C.P.M.S

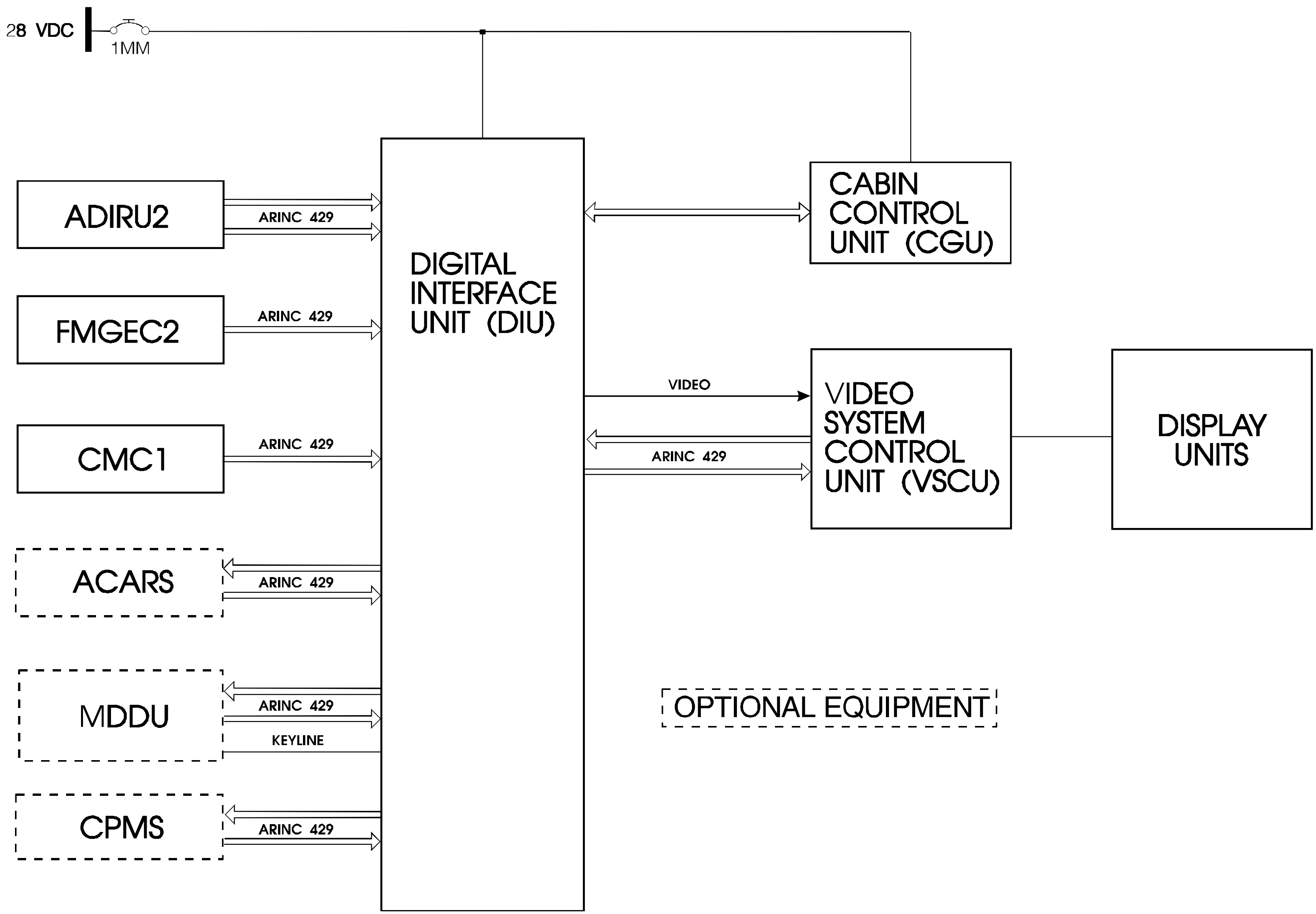
The Cabin and Passenger Management System (CPMS) is connected to the DIU through a bidirectional ARINC 429 low speed data bus.
The Cabin Passenger Management System (CPMS) controls and monitors the PVIS by means of the Cabin Management Terminal (CMT).

OPERATION

The DIU reads data from the FMGEC and the ADIRS through ARINC 429 data buses. This information is processed, formated and transmitted as a video signal to the PES Video.
The Video System Control Unit (VSCU) transmits this information to the display units to be displayed.

BITE

A test is performed automatically at power up or manually from the control unit.
The result of this test is transmitted to the Video System Control unit (VSCU).



FQW4200 GE Metric

STUDENT NOTES

PASSENGER VISUAL INFORMATION SYSTEM COMPONENTS

Digital Interface Unit
Cabin Management Terminal

DIGITAL INTERFACE UNIT

FIN / ZONE

FIN : 3MM

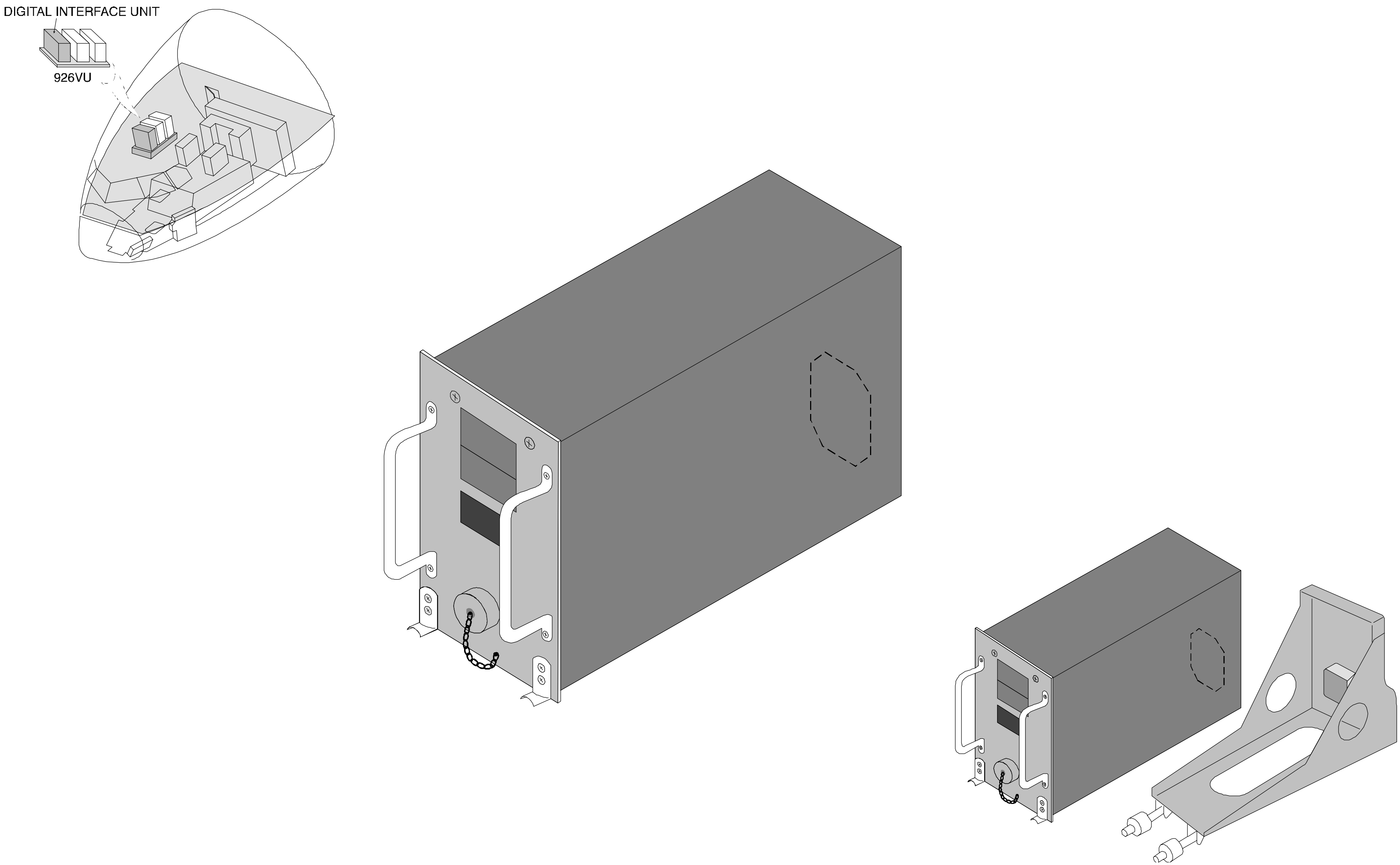
ZONE : 221

COMPONENT DESCRIPTION

The Digital Interface Unit (DIU) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION

No specific tool are required for removal - installation of the DIU.



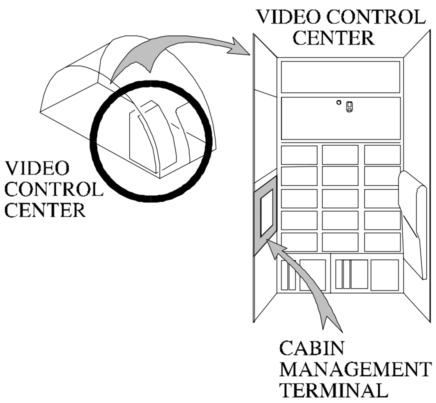
FQW4200 GE Metric

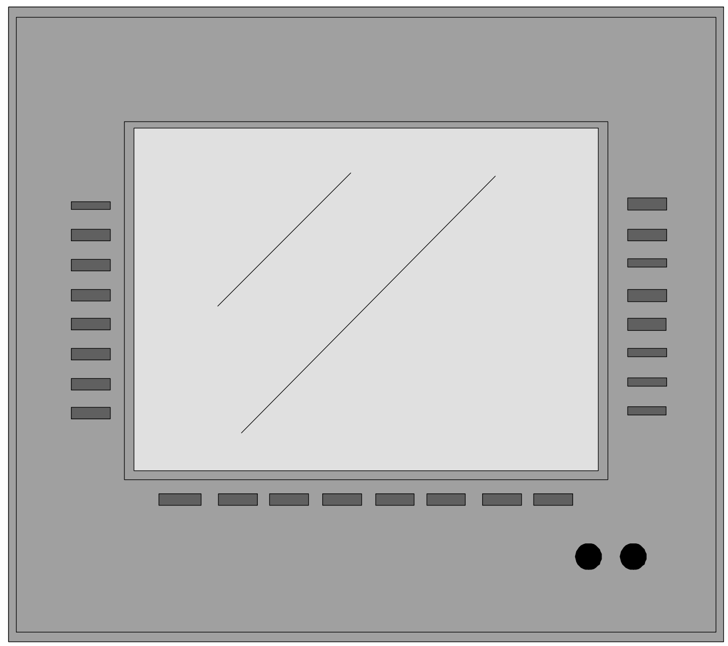
CABIN MANAGEMENT TERMINAL

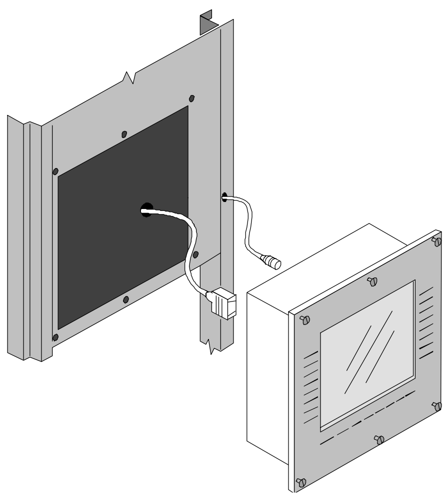
FIN / ZONE
FIN : 201MH
ZONE : 241

COMPONENT DESCRIPTION
The Cabin Management Terminal (CMT) is Buyer Furnished Equipment (BFE).

REMOVAL - INSTALLATION
No specific tool are required for removal - installation of the CMT







FQW4200 GE Metric

STUDENT NOTES :

CABIN PASSENGER MANAGEMENT SYSTEM D/O

C.P.M.S.

The Cabin Passenger Management System (CPMS) provides cabin system controls and monitoring, management reporting and passenger service enhancements.
The main features of the CPMS are :

- management of all cabin related data,
- support of passenger service and passenger information,
- remote control of cabin systems,
- concentration of BITE data from other cabin systems.

In order to provide a high degree of configuration flexibility, allowing a lot of cabin layout combinations, the system is software controlled. The CPMS comprises :

- a Cabin Passenger Management Unit (CPMU),
- a Cabin Management Bus (CPMB) with 4 tapping connectors,
- a Cabin Management Terminal (CMT),
- a CMT keyboard,
- a Floppy Disk Drive (FDD).

C.P.M.U.

The Cabin Passenger Management Unit (CPMU) is the master controller for the CPMS. It manages and controls all cabin related data.
An automatic BITE test is performed on power-up and upon request.
The CPMU is powered with 115 VAC.
The CPMU interfaces with 12 ARINC 429 ports.
The CPMU communicates with the Cabin Management Terminal (C.M.T.).
The CPMU is connected to :

- the Multipurpose Disk Drive Unit (MDDU),
- the ACARS Management Unit (ACARS MU),
- the Central Maintenance Computers (CMCs),
- the Cabin Intercommunication Data System director 1 (CIDS director 1),
- the Air Data Inertial Reference Unit 2 (ADIRU 2),
- the Passenger Entertainment System controller (PES controller),
- the Passenger Visual Information System (PVIS),
- the Flight Management and Guidance Enveloppe Computer 2 (FMGEC 2).

C.P.M.B.

The Cabin Passenger Management Bus (CPMB) is installed in the cabin celling. Four tapping connectors are fitted along the CPMB to connect the CPMS components.
At the end of the CPMB a termination connector ensures the correct impedance matching of the CPMB.
The CPMB contains a power line and 3 twisted shielded data lines which transfer data between the CPMS units.
The power line supplies all CPMS units with 115 VAC.

M.D.D.U. (OPTIONAL)

The Multipurpose Disk Drive Unit (MDDU) allows the CPMS software to be updated and data to be loaded and unloaded.
The MDDU is connected to the CPMU through two ARINC 429 data buses at high speed.
A discrete line allows the MDDU and the CPMU to be connected by means of the DATA LOADER selector switch B located on the overhead panel.

A.C.A.R.S. M.U. (OPTIONAL)

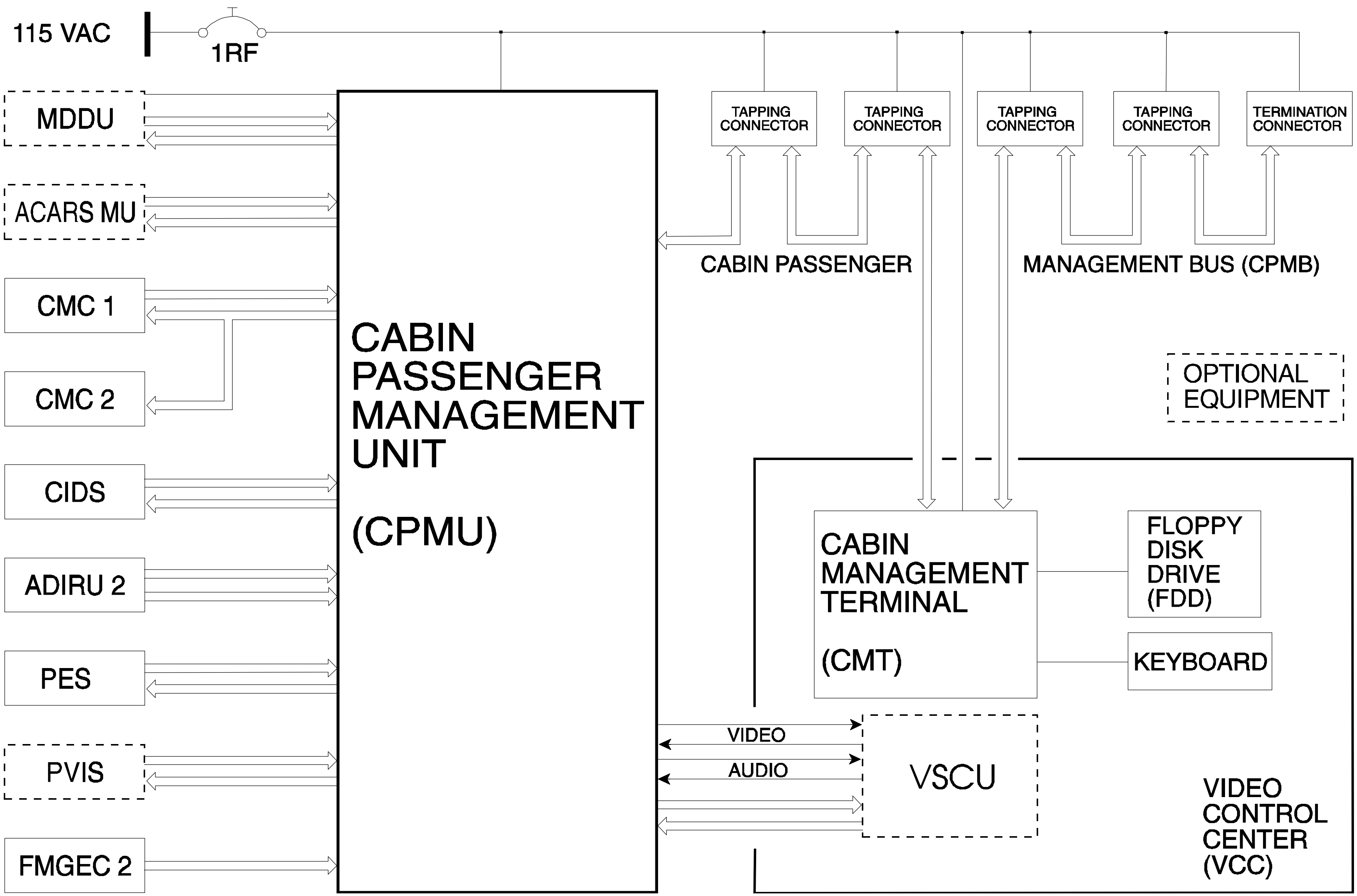
The Aircraft Communication Addressing and Reporting System (ACARS) is used to exchange data between the CPMS and ground stations.
The ACARS is connected to the CPMU through two ARINC 429 data buses at low speed.

C.M.C.

The CPMS is connected to the Central Maintenance Computers (CMCs) to ensure the BITE function.
The Central Maintenance Computers (CMCs) are connected to the CPMS through two ARINC 429 data buses at low speed.

C.I.D.S.

The Forward Attendant Panel (FAP) is remotely controlled from the CMT through the CPMU and via the CPMB.
The Cabin Intercommunication Data System (CIDS) director 1 is connected to the CPMS through two ARINC 429 data buses at high speed.



FQW4200 GE Metric

A.D.I.R.U.

The Air Data Reference Unit (ADIRU2) sends to the CPMU the Inertial Reference (IR) and the Air Data Reference (ADR). This information is used by the Passenger Visual Information System (PVIS) to display the aircraft position and flight information.
The ADIRU2 is connected to the CPMU through two ARINC 429 data buses:

- the Inertial Reference (IR) data are transmitted at high speed,
- the Air Data Reference (ADR) data are transmitted at low speed.

P.E.S.

The Passenger Music Entertainment System (PES music) is remotely controlled from the Cabin Management Terminal (CMT) through the CPMU.
The PES controller is connected to the CPMU through two ARINC 429 data buses.

P.V.I.S. (OPTIONAL)

The Passenger Visual Information System (PVIS) is remotely controlled from the Cabin Management Terminal (CMT) through the CPMU.
The PVIS is connected to the CPMU through two ARINC 429 data buses at low speed.

F.M.G.E.C.

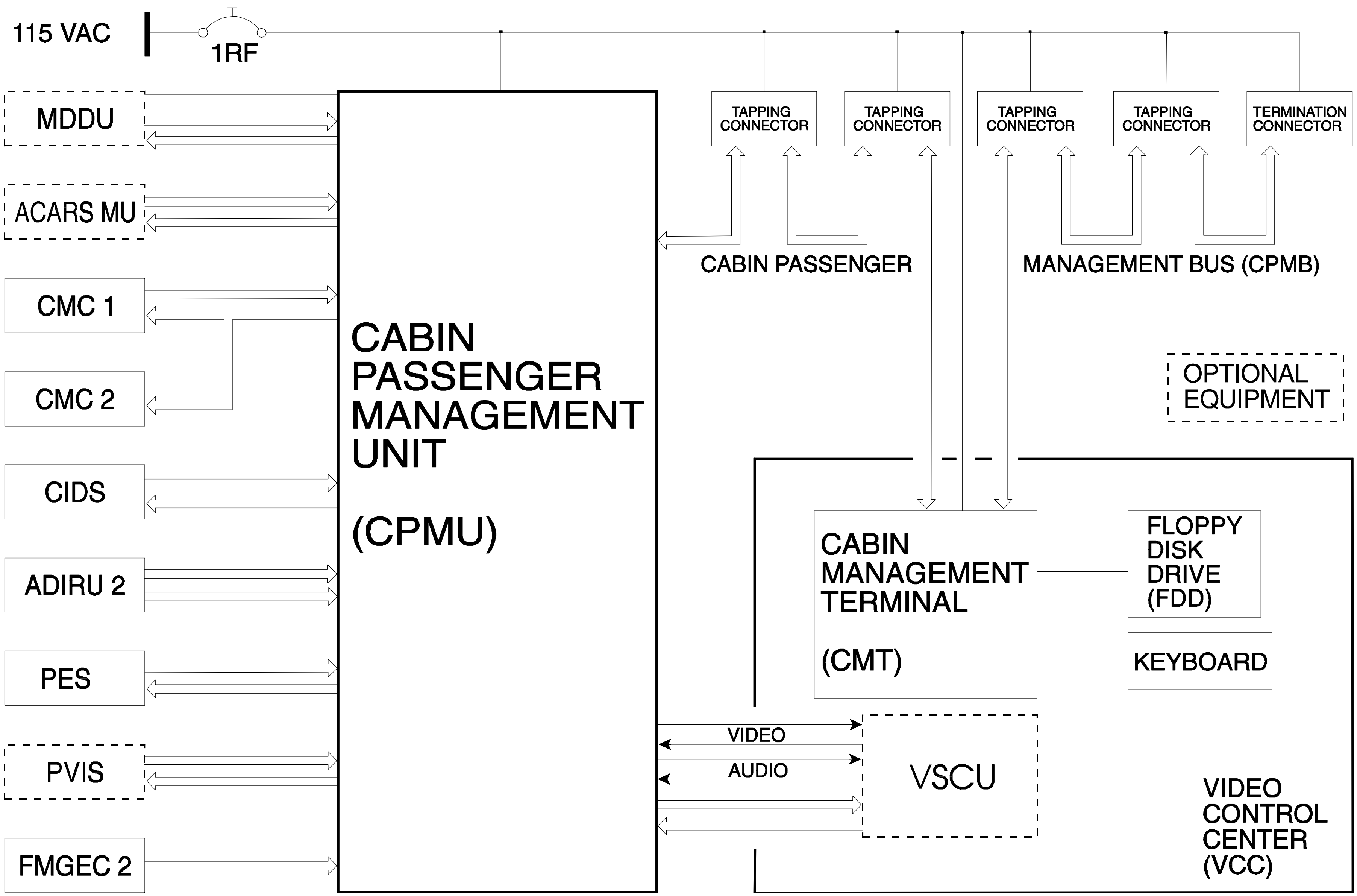
The Flight Management Guidance and Enveloppe Computer 2 (FMGEC 2) sends flight information to the PVIS through the CPMU.
The FMGEC2 is connected to the CPMU through an ARINC 429 data bus at low speed.

V.S.C.U. (OPTIONAL)

The Video System Control Unit (VSCU) is remotelly controlled from the (CMT) through the CPMU.
The VSCU is connected to the CPMU through two ARINC 429 data buses at high speed.
The VSCU has audio and video interfaces with the CPMU through 2 video lines (IN/OUT) and 2 digital video sound lines (IN/OUT).

C.M.T.

The Cabin Management Terminal (CMT) is a cabin crew workstation that provides central commands and control of all the cabin passenger systems installed on the aircraft.
The CMT is connected to the CPMU via the CPMB.
A keyboard is connected to the CMT for data entry. A Floppy Disk Drive (FDD) is connected to the CMT for loading and unloading data.
The CMT is a Personnal Computer (PC) using a 11" color Liquid Cristal Display (LCD) equiped with select keys. The CMT includes a video overlay sub system for video preview and audio jack for audio preview.
The CMT performs self test at power-up.



FQW4200 GE Metric

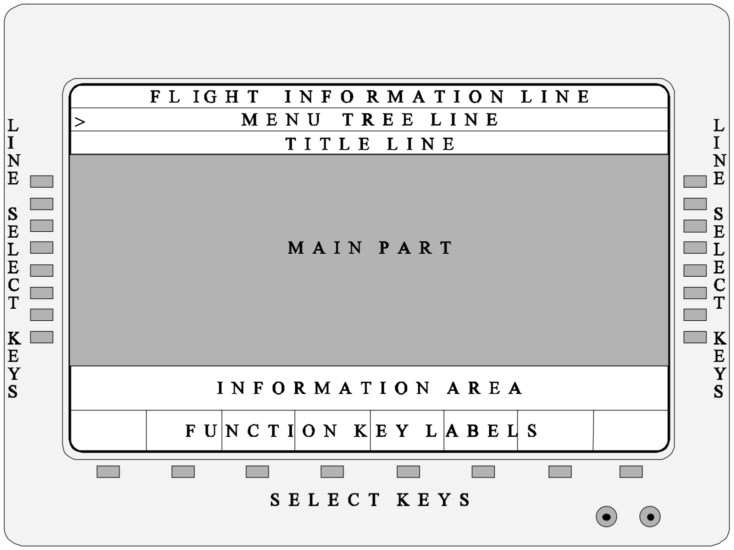
OPERATION

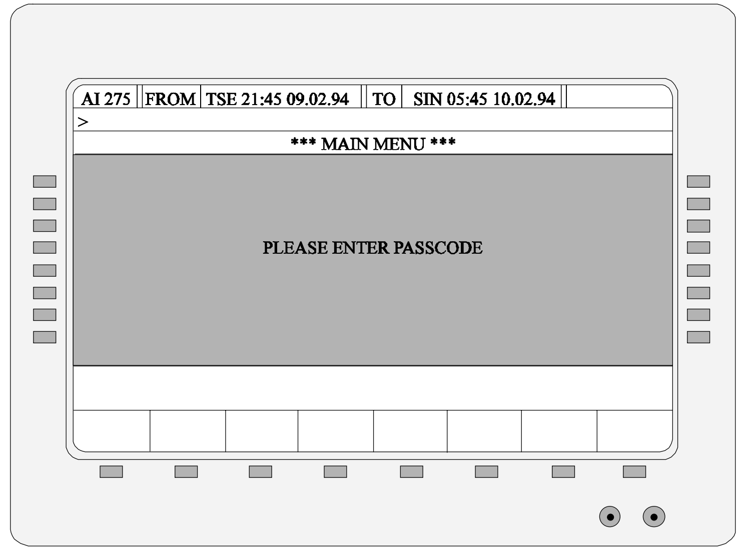
The screen of the CMT is divided into 6 areas. Only the background color of the main part is grey. The other area backgrounds are white.
The 8 keys on the bottom of the screen are menu select keys. The 8 keys on each side of the screen are line select keys.

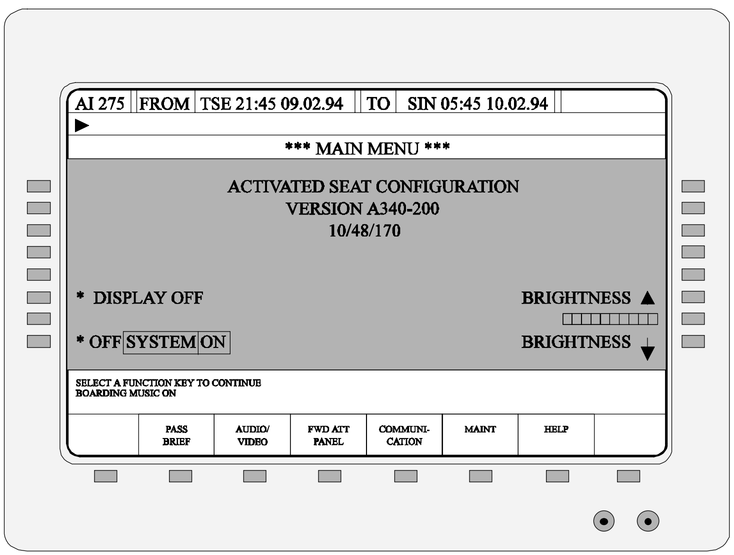
When the PASS-CODE is enterred the MAIN MENU page comes on. In the function key label lines the menu items are identified.
When DISPLAY OFF is selected the CMT screen is switched off. The screen is also switched off after 15 mn of use inactivity. To reactivate the display one key must be pressed.

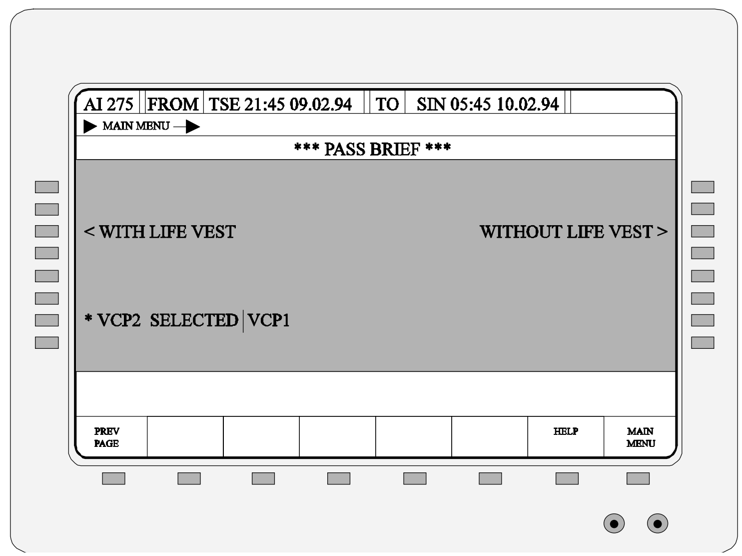
When SYSTEM OFF is selected all the AUDIO/VIDEO equipment is deactivated.
Note : the HELP menu is always available and explains the operation of the current menu page.

The PASSENGER BRIEFING (PASS BRIEF) menu provides video and audio passenger announcements for the passenger briefings.
In all the cabin classes, video Cassette Player 1 (VCP1), overhead monitors and Passenger Address (PA) are selected and ready. This eliminates the need to make all of these selections.







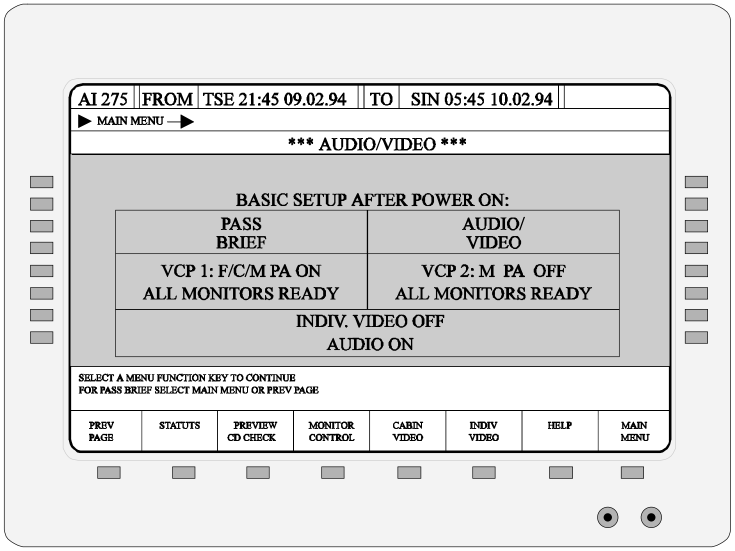


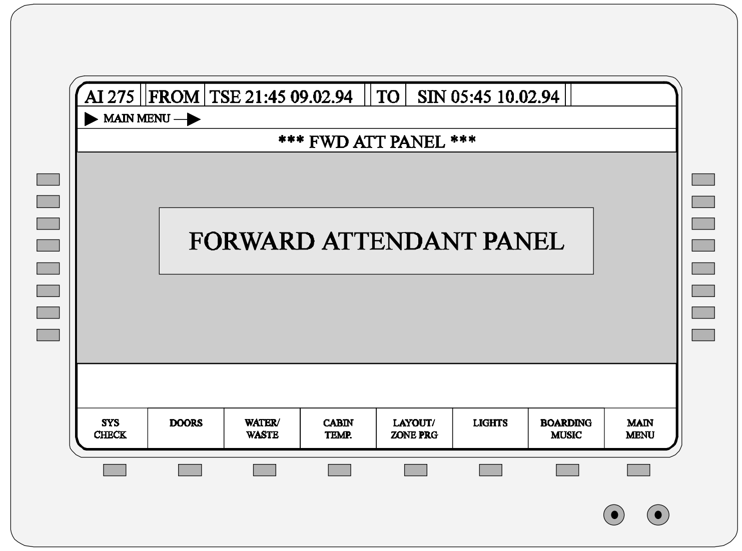
FQW4200 GE Metric

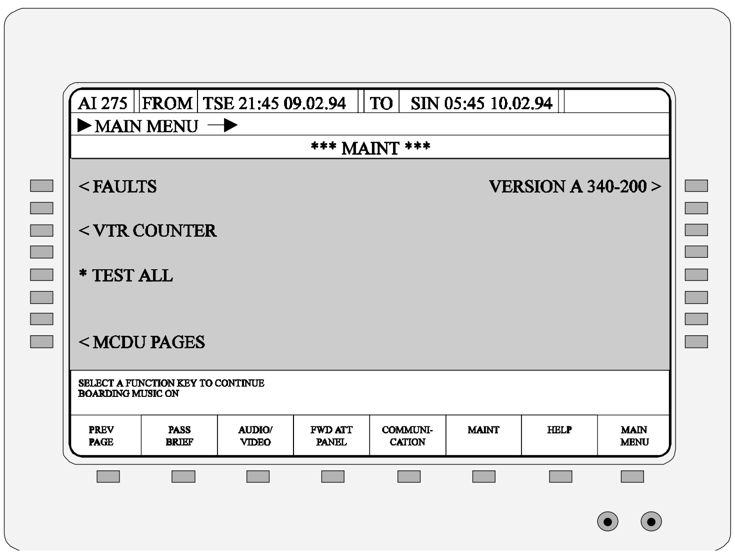
The AUDIO/VIDEO menu shows the default setting for passenger briefing, overhead video and individual video. It enables audio and video to be preview and distributed in the various zones in the aircraft.
STATUS : displays the current status of the video and PA system. PREVIEW/CD CHECK : allows previewing of the video and audio programs.
MONITOR CONTROL : allows the user to turn ON or to turn OFF the monitors.
CABIN VIDEO : controls the connection of video sources to the cabin. INDIV VIDEO : controls the connection of individual video source to the various cabin classes.

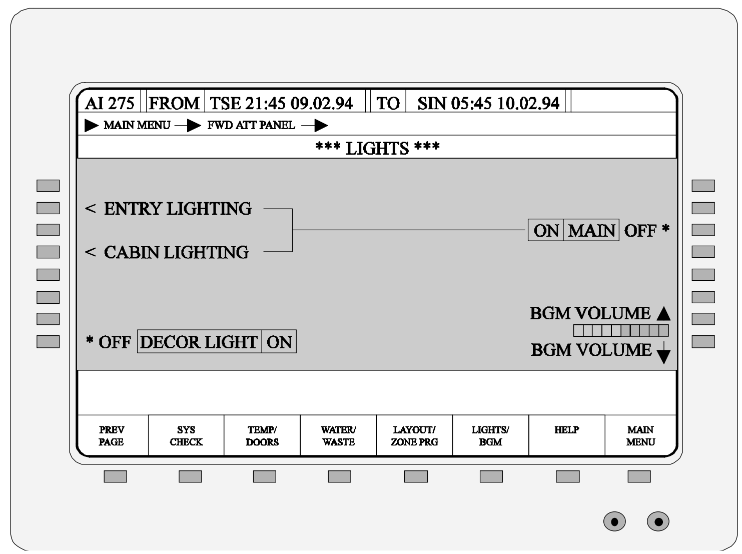
The MAINTenance menu is only used by the maintenance crew through a pass-code. Only the FAULTS menu is available on flight. The other menus are only selectable on ground.
FAULTS : lists all the faults existing on the cabin entertainment system. VTR COUNTER : displays the number of hours left before changing the heads of the Video Tape Reproducers (VTRs).
TEST ALL : starts a BITE test of all the PES components installed in the aircraft. The result of this test is displayed on the CMT.
MCDU pages : displays the PES MCDU pages on the CMT.
VERSION : displays a list of aircraft layouts selectable if needed.

The Forward Attendant Panel (FAP) menu is an emulation of the CIDS FAP facilities. All the functions of the FAP can be remotely controlled from the CMT.
The SYStem CHECK, DOORS, WATER, WASTE, CABIN TEMPerature, LAYOUT and ZONE PROGramming menus are the same as used in the Forward Attendant Panel (FAP) of the CIDS.
For the LIGHTS and the BOARDING MUSIC the CMT provides specific menus. They provide the same selections available on the FAP hard-wired pushbuttons.









FQW4200 GE Metric

STUDENT NOTES

CABIN PASSENGER MANAGEMENT SYSTEM (CPMS) COMPONENTS

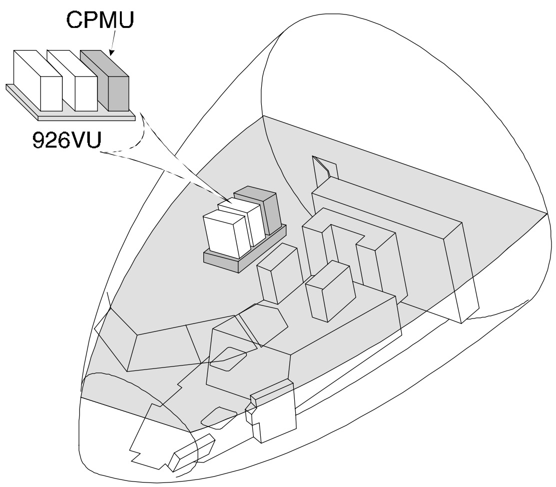
Cabin Passenger Management Unit (CPMU)
Cabin Management Terminal (CMT)
CMT keyboard
Floppy disk drive

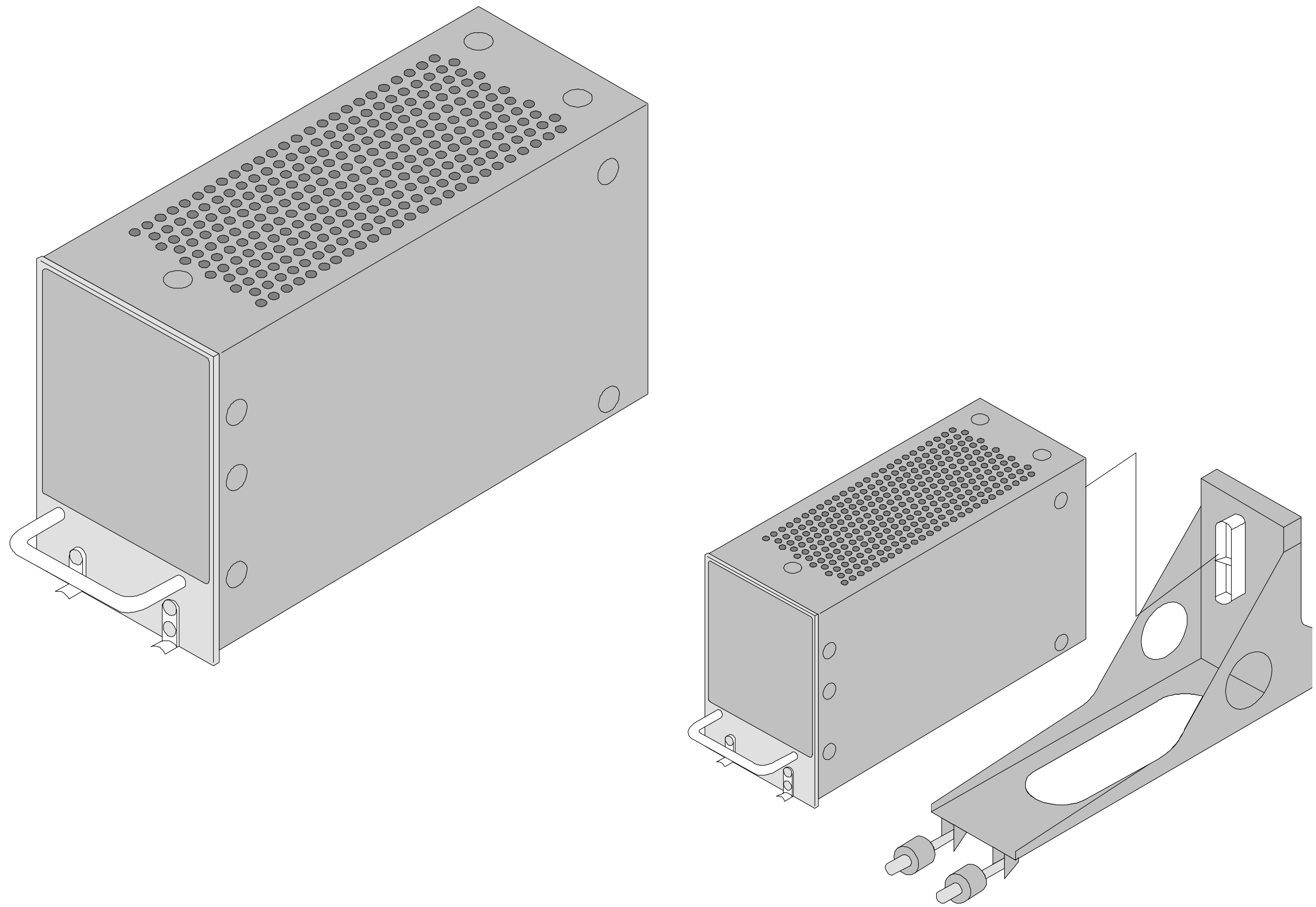
CABIN PASSENGER MANAGEMENT UNIT (CPMU)

FIN : 10RF.

ZONE : 120.

COMPONENT DESCRIPTION :
The CPMU is Buyer Furnished Equipment (BFE).





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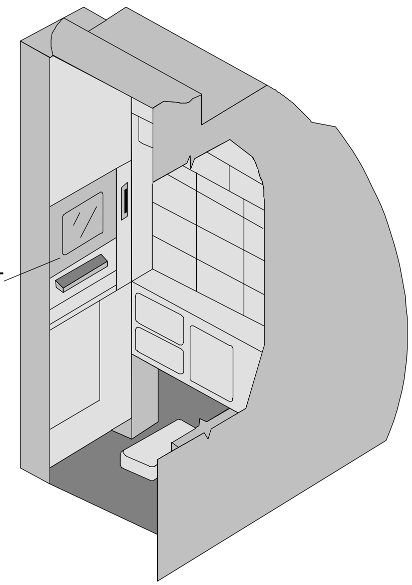
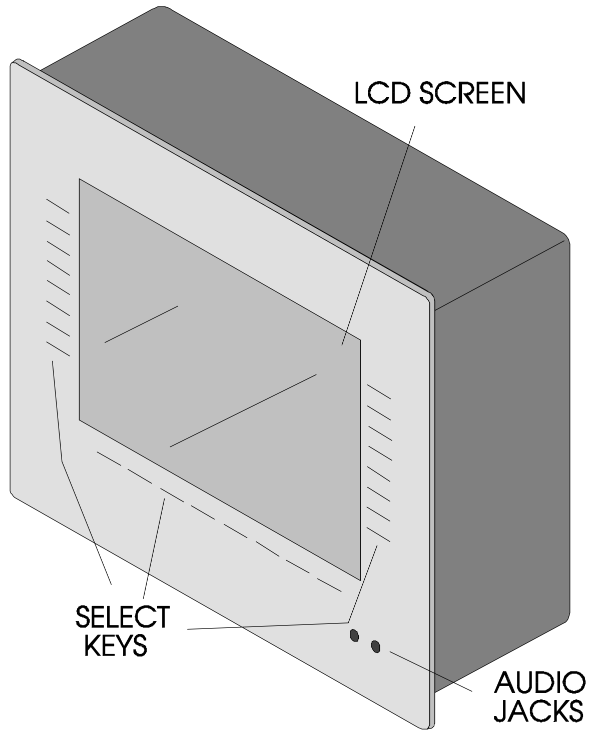
CABIN MANAGEMENT TERMINAL (CMT)

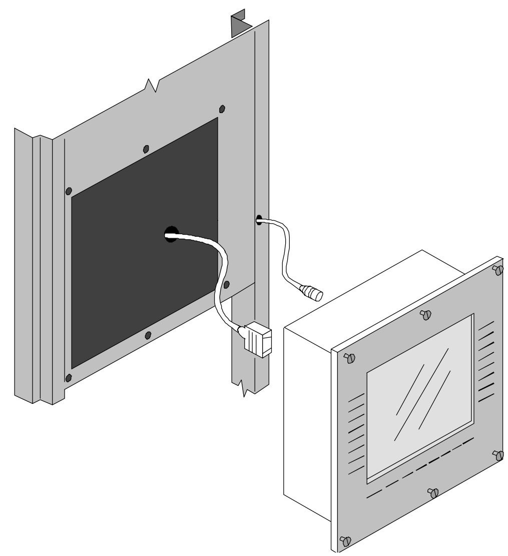
FIN : 201MH.

ZONE : 221.

COMPONENT DESCRIPTION :
The CMT is Buyer Furnished Equipment (BFE).







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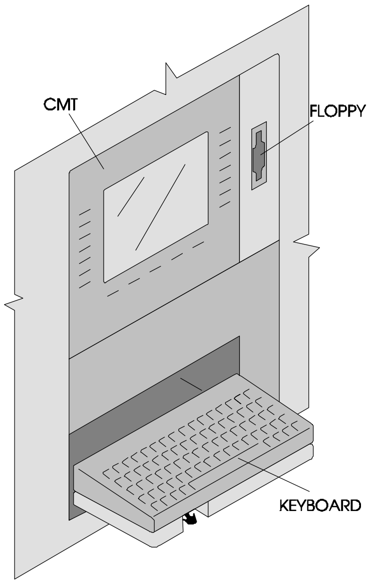
CABIN MANAGEMENT TERMINAL KEYBOARD

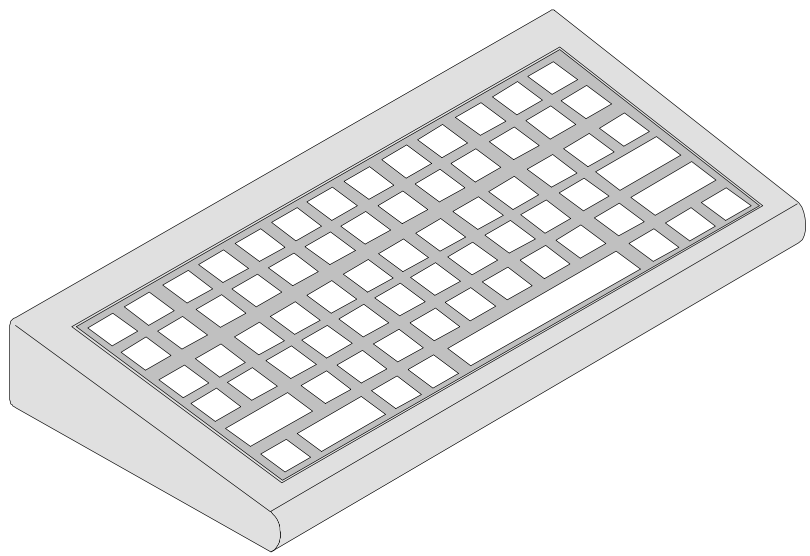
FIN : 31RF.

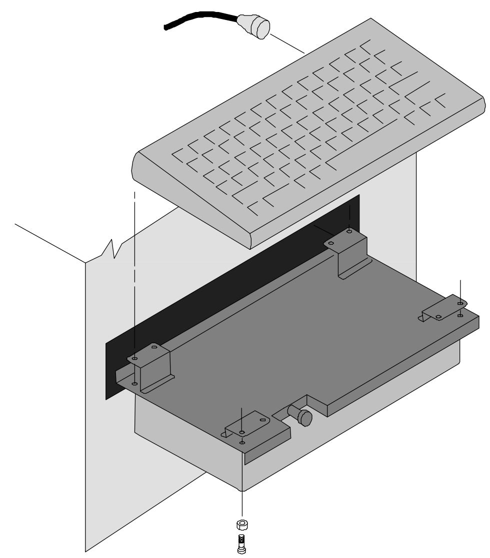
ZONE : 241.

COMPONENT DESCRIPTION :

The keyboard can be retracted under the CMT. The CMT keyboard is Buyer Furnished Equipment (BFE).







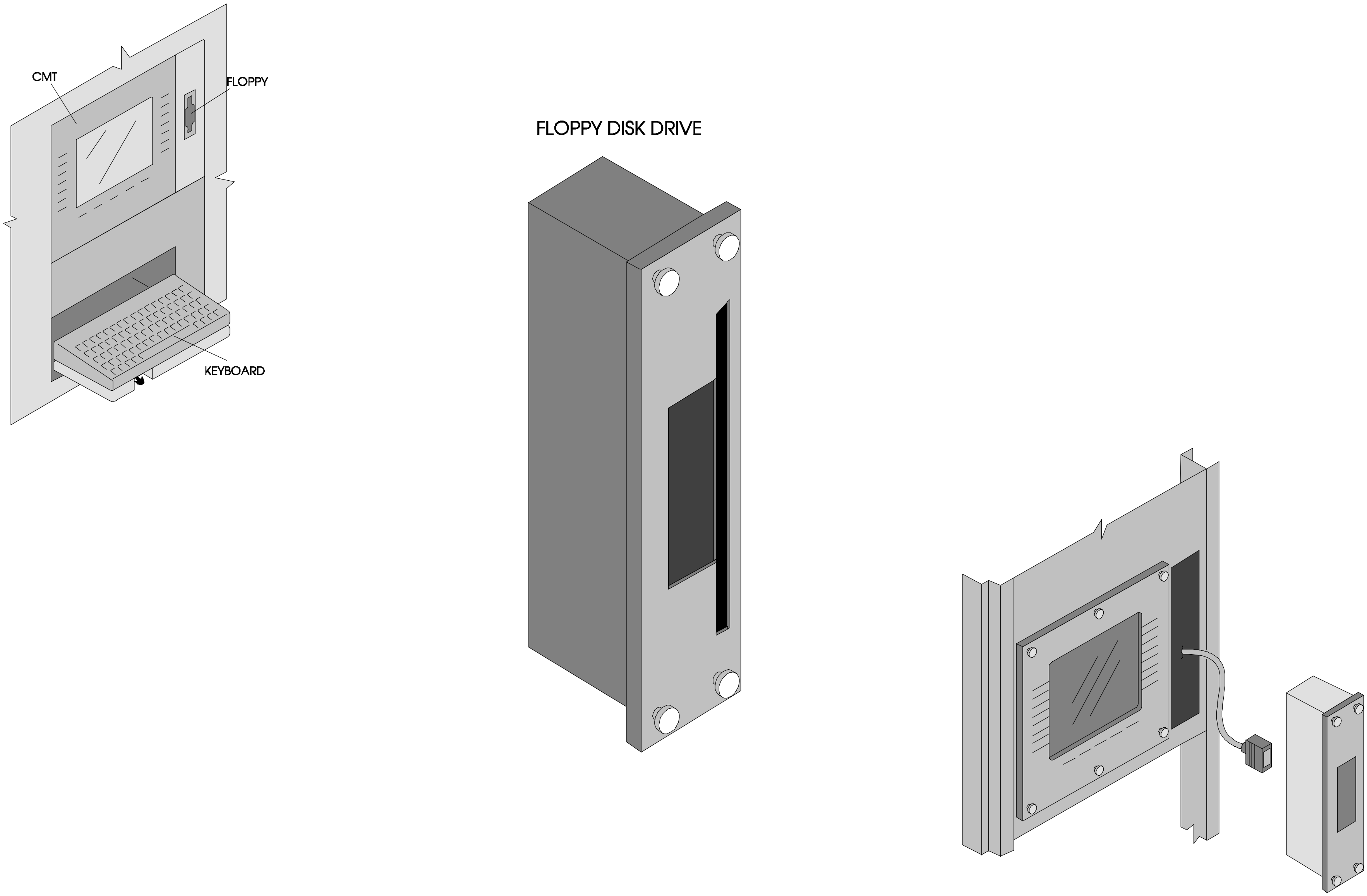
FQW4200 GE Metric

FLOPPY DISK DRIVE

FIN : 32RF.

ZONE : 241.

COMPONENT DESCRIPTION :
The floppy disk drive is Buyer Furnished Equipment (BFE).



FQW4200 GE Metric

STUDENT NOTES

ACARS PRESENTATION

Purpose
Principle
Components

Aircraft Communication Addressing and Reporting System (ACARS)

PURPOSE

The ACARS Data Link System is an air/ground communication network that enables the aircraft to function as a mobile terminal associated with modern airline command, control and management systems.

The ACARS is used to transmit or receive automatically or manually generated reports or messages to or from a ground station.

The ACARS is dedicated to Maintenance, Operation and Commercial purposes.

The choice of ACARS applications and the definition of the operational programs are under Airline responsibility because of high customization of the system.

The ACARS is a Buyer Furnished Equipment (BFE).

PRINCIPLE

The ACARS can manage both transmission or reception of data.

Ground-to-air and air-to-ground digital messages are transmitted or received via the VHF3 transceiver.

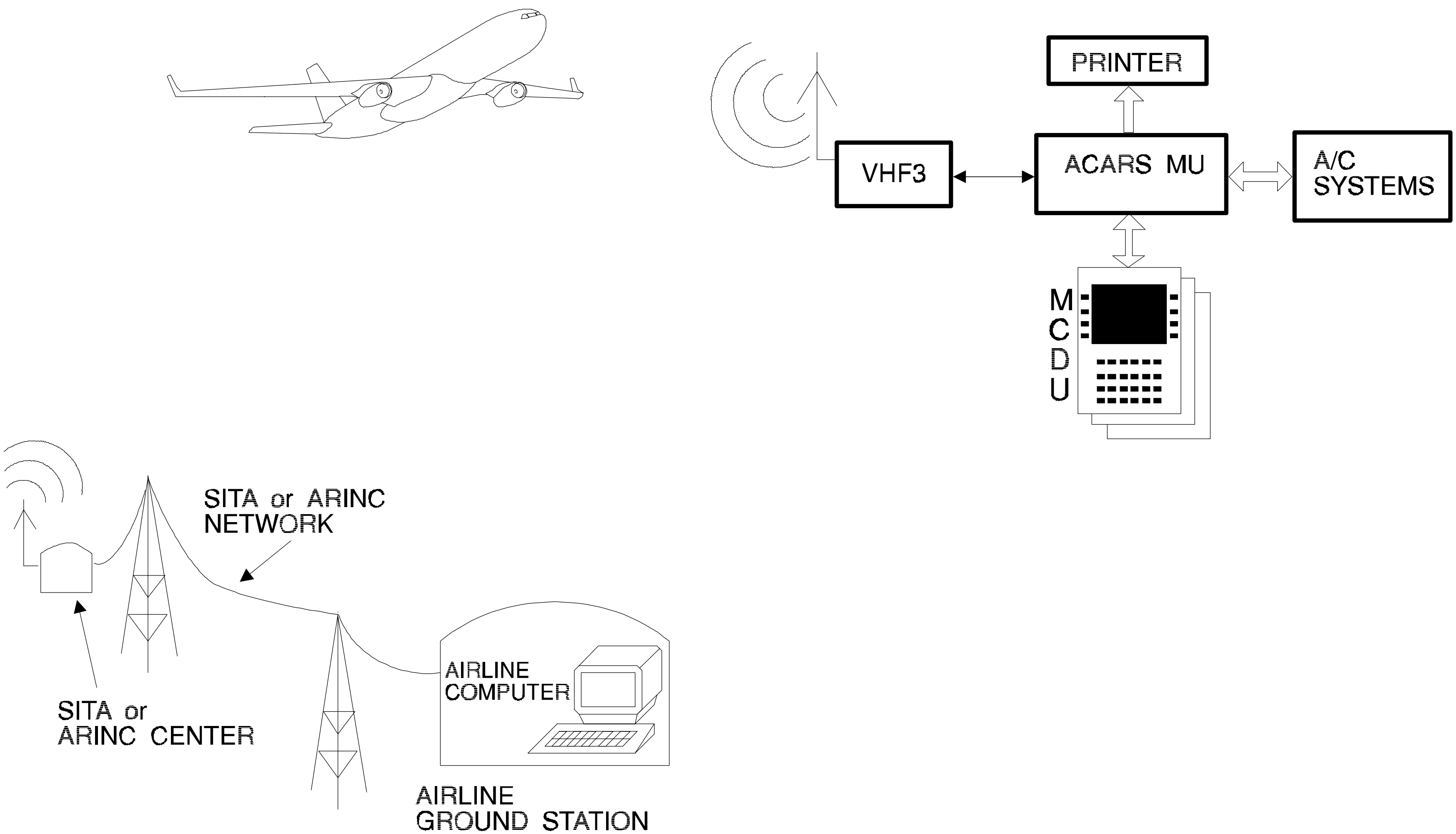
VHF3 is mainly dedicated to the ACARS Data Link System, but can be used as a backup for voice communications.

The transmitted information is relayed via the ground stations to a central computer where data is converted into airline messages.

A ground network (SITA for EUROPE, ARINC for the USA), transmits the data from the ground receiver to the airline main base.

SITA network is exclusively dedicated to the airline community, transmitting technical, commercial, flight operation and safety information.

Any of the ACARS functions can be modified by the airline, through the ACARS MANAGEMENT UNIT programming.



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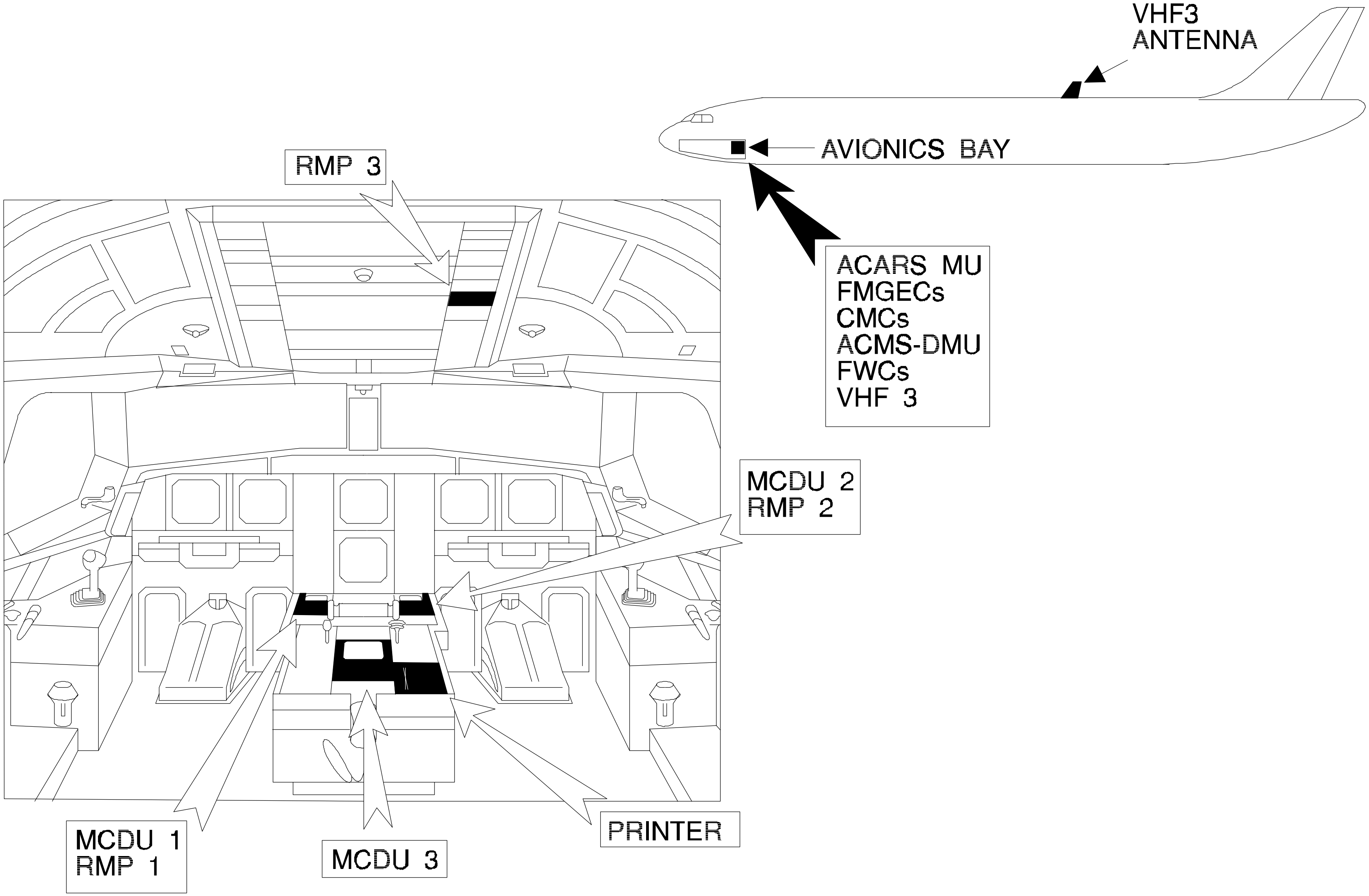
COMPONENTS

The ACARS Management Unit is connected to various computers :

- Flight Management function of the Flight Management Guidance and Envelope Computers (FMGECs).
- Central Maintenance Computers (CMCs).
- Data Management Unit (DMU) and Flight Warning Computers (FWCs).

Various units are used to control the ACARS MU :

- 3 Multipurpose Control Display Units (MCDUs).
- 1 Printer and 3 Radio Management Panels (RMPs), located in the cockpit.



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STUDENT NOTES

ACARS D/O

General
ACARS MU
MCDU
FMGEC
ACMS DMU (OPTION)
CMC
Printer
FWC/SDAC
MDDU (OPTION)
VHF3 Frequency Selection
VHF3 Audio Selection
RMP
SATCOM (OPTION)
Data Coding

GENERAL

The Aircraft Communication Addressing and Reporting System (ACARS) allows data to be exchanged between the aircraft and the ground through the VHF3 transceiver. A dialog exists between the ACARS Management Unit (MU) and the aircraft avionics systems. This exchange of data is performed through ARINC 429 buses.
The aircraft communicates with the airline through ground networks. All the networks are interconnected, therefore data is transmitted over any network. There are 4 networks in the world :

- ARINC in the USA,
- CANADIAN in Canada,
- JAPANESE in Japan,
- SITA in the other regions.

ACARS MU

The ACARS Management Unit (ACARS MU) manages all tasks related to the ACARS. It controls both emission and reception of data through the VHF3 transceiver.
The ACARS MU transmits data to the various aircraft systems through its two general output buses. It receives data from the avionics systems through their general input buses.
The ACARS MU is supplied with 115 VAC.

MCDU

The ACARS MU is interfaced with three Multipurpose Control and Display Units (MCDUs). The dialog between one MCDU and the ACARS MU is initiated when ACARS is selected on the MCDU menu.
The MCDU enables the following functions :

- display of data transmitted by the MU, the ground station or by peripheral computers,
- selection of the various ACARS MU functions,
- test and entry of data by the crew.

MCDU 1 and 3 are connected to the ACARS MU general output bus 1 and MCDU 2 is connected to the ACARS MU general output bus 2. Of the 3 MCDUs, MCDU 3 has the highest priority for the ACARS MU.

FMGEC

Through the ACARS, the Flight Management Guidance and Envelope Computers (FMGECs) inform the airline of the configuration of the aircraft. The airline can initialize and update the flight plan in the FMGECs through ACARS.
FMGEC 1 and 2 exchange data with ACARS MU through ARINC 429 buses at low speed.
The FMGECs send a pre-flight and a post-flight report via ACARS MU by manual action through the MCDUs. They also send report on ground request via the ACARS MU. The FMGECs also automatically send the in-flight report to the ACARS MU after take off.

ACMS DMU (OPTION)

The ACARS MU transmits data to and receives data from the Aircaft Condition Monitoring System (ACMS). The ACMS transmits 14 basic reports and 3 programmable reports to the ACARS MU. Each report generated by the ACMS can be programmed individually for transmission to the ACARS MU either automatically or manually.

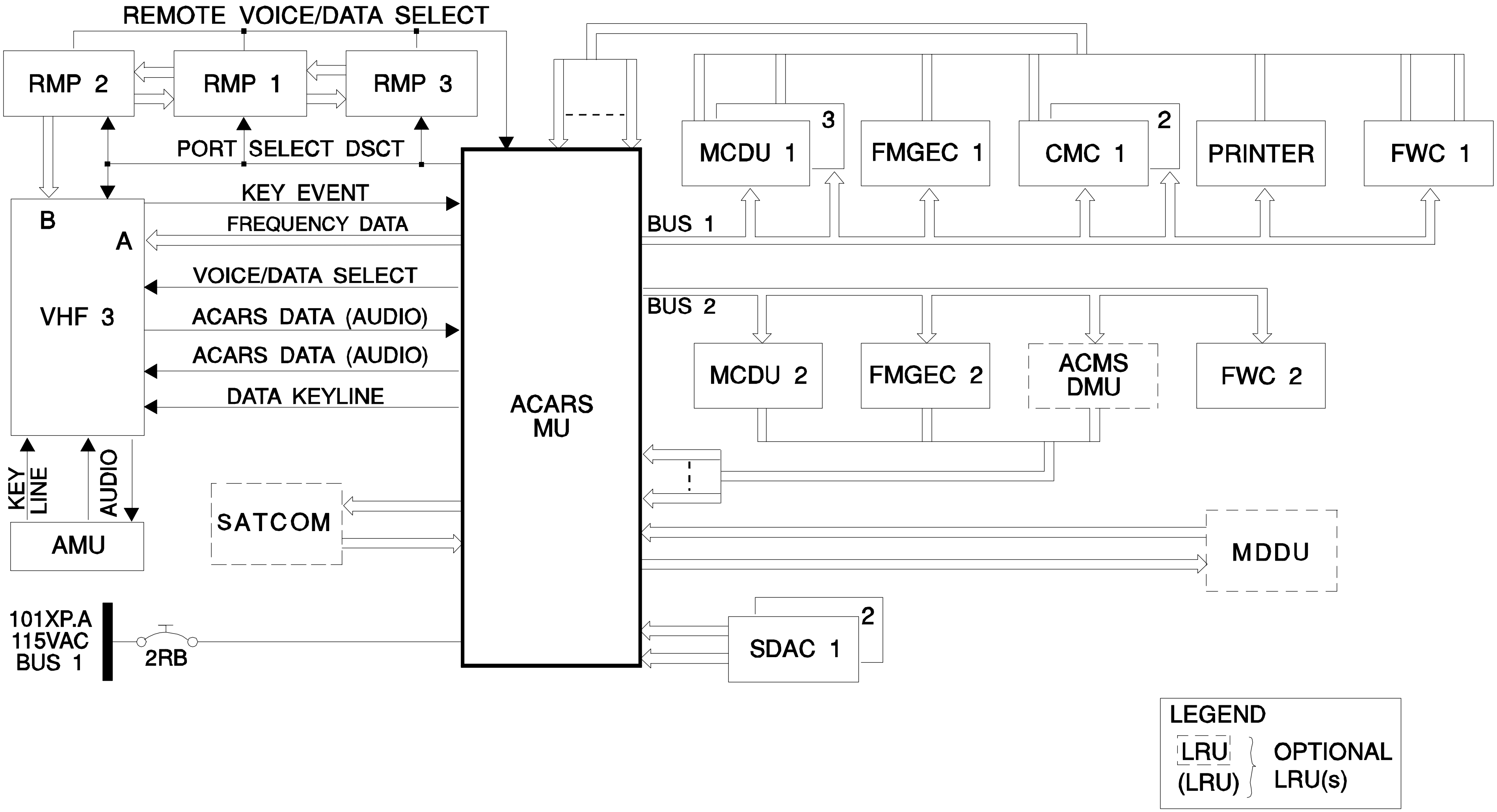
CMC

The ACARS MU receives data from the Central Maintenance Computer (CMC) at low speed. The CMC transmits automatically or manually the following messages to the ACARS MU :

- post flight report on ground or current flight report in flight,
- real time failure and real time warning in flight,
- BITE data messages and class 3 report on ground.

The ACARS MU transmits its own maintenance information to the CMCs.
The ACARS MU is provided from the CMC with the following :

- aircraft identification (tail number),
- flight number and flight phase,
- identification of departure and destination airports,
- date and time,
- installed optional systems.



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PRINTER

The ACARS MU is connected to the multipurpose cockpit printer through its general output bus 1. The ACARS MU can buffer data printing, when the printer is buzy with another system.

FWC/SDAC

The ACARS MU receives parameters sent by the System Data Acquisition Concentrators (SDACs) 1 and 2 and the Flight Warning Computers (FWCs) 1 and 2 at high speed.
The ACARS MU sends a status parameter to the FWCs at low speed. The parameters sent by SDAC 1, SDAC 2 and FWC 1 allow the ACARS MU to establish the EVENT TIME OOOI (pax door closed, gear down and compressed...).
FWC 1 and FWC 2 display on the Engine Warning Display (EWD), one of four ACARS configurations provided by the ACARS MU.
The four possible configurations are :

- ACARS MSG : an ACARS message has been received by the aircraft,
- ACARS STBY : loss of communication between aircraft and ground,
- VHF3 VOICE : VHF3 operates in VOICE mode,
- ACARS CALL : a message requesting a voice conversation has been received from the ground.

MDDU

The Multipurpose Disk Drive Unit (MDDU) allows the ACARS MU to be loaded with its operationnal software stored in a diskette.

The MDDU is connected to the ACARS MU by means of the DATA LOADER selector switch A located on the overhead panel.

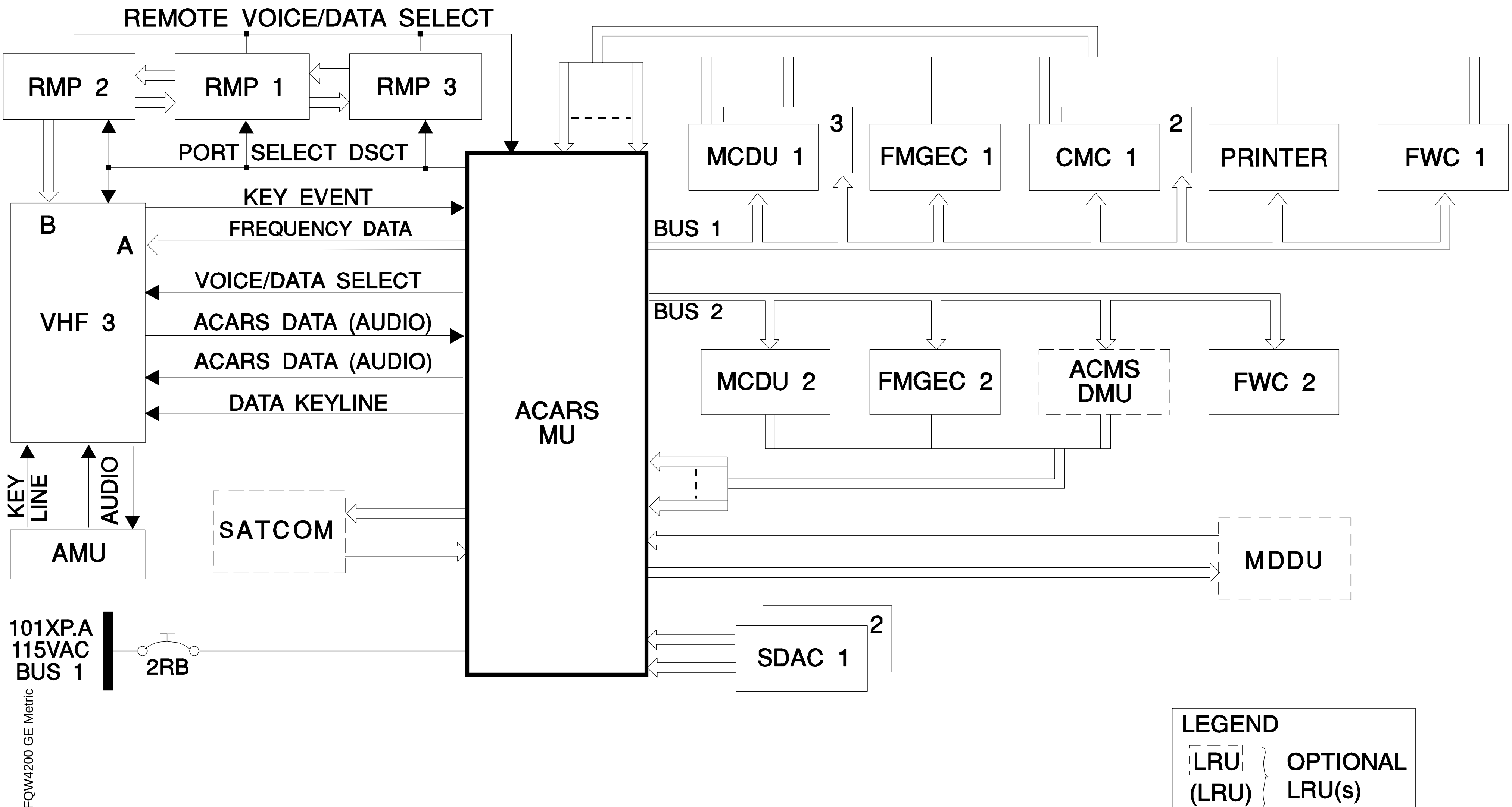
VHF3 FREQUENCY SELECTION

VHF3 can be tuned either via the ACARS MU automatically or manually using the MCDUs, or via the Radio Management Panels (RMPs) depending on the PORT SELECT discrete status.
The PORT SELECT discrete status is manually controlled by the selection made on the RMPs, or automatically by the ACARS MU. When the PORT SELECT DISCRETE is grounded, the ACARS MU tunes the VHF3 through its input A.
When the PORT SELECT DISCRETE is in open circuit, the RMPs tune the VHF3 through its input B.

VHF3 AUDIO SELECTION

VHF3 will handle audio information from ACARS MU or from the Audio Management Unit (AMU) depending on the VOICE DATA SELECT discrete status.
When the VOICE DATA SELECT discrete is grounded, VHF3 handles audio information from the ACARS MU. When the VOICE DATA SELECT discrete is in open circuit, VHF3 handles audio information from the AMU.

The frequency controlled from the MCDUs is used to establish a phone communication between the aircraft and the ground or to force the MU to work with another frequency for data.
These selections can be defined by means of a pin program .


REMOTE VOICE/DATA SELECT
RMP 2
RMP 1
RMP 3
PORT SELECT DSCT
KEY EVENT
FREQUENCY DATA
B
A
VHF 3
VOICE/DATA SELECT
ACARS DATA (AUDIO)
ACARS DATA (AUDIO)
DATA KEYLINE
KEY LINE
AUDIO
AMU
SATCOM
101XP.A
115VAC
BUS 1
2RB
ACARS MU
BUS 1
BUS 2
MCDU 1
3
FMGEC 1
CMC 1
2
PRINTER
FWC 1
MCDU 2
FMGEC 2
ACMS DMU
FWC 2
MDDU
SDAC 1
2
LEGEND
LRU
(LRU)
OPTIONAL LRU(s)
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RMP

Each RMP receives the PORT SELECT discrete. When this discrete is grounded, each RMP displays the same kind of information in VHF3 mode:

- ACARS in the ACTIVE window,
- a frequency in the stand-by window.

Note : VOICE DATA SELECT can be grounded or open.
When this discrete is in open circuit, each RMP displays the same kind of information as in VHF3 mode :

- the same frequency in the ACTIVE display,
- ACARS in the stand-by display.

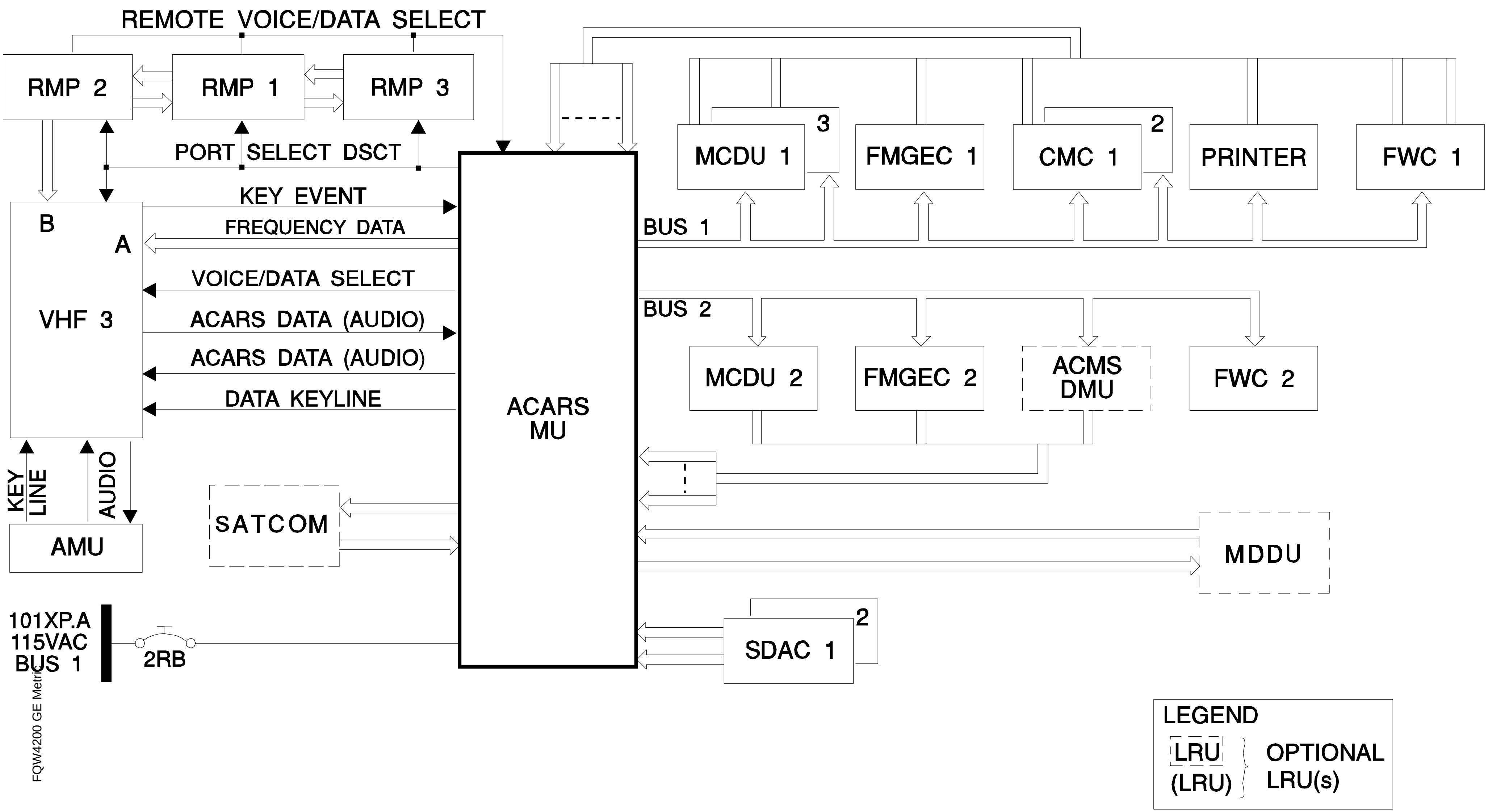
Note : VOICE DATA SELECT is in open circuit.

The PORT SELECT discrete can be changed automatically or manually by the ACARS MU or manually by one RMP.
Each time the TRANSFER KEY in one RMP is selected, the REMOTE VOICE/DATA SELECT discrete status will change momentarily forcing the ACARS MU to change the PORT SELECT and VOICE SELECT discrete status.
As a consequence, VHF3 changes from VOICE to DATA or DATA to VOICE mode and RMPs will switch the display between ACTIVE and STAND-BY windows.

SATCOM

When the VHF3 data link with the ground cannot be estalished, the ACARS MU transmits and receives data through the SATCOM.

VHF3 always has priority over the SATCOM.
The ACARS MU software manages this priority.



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DATA CODING

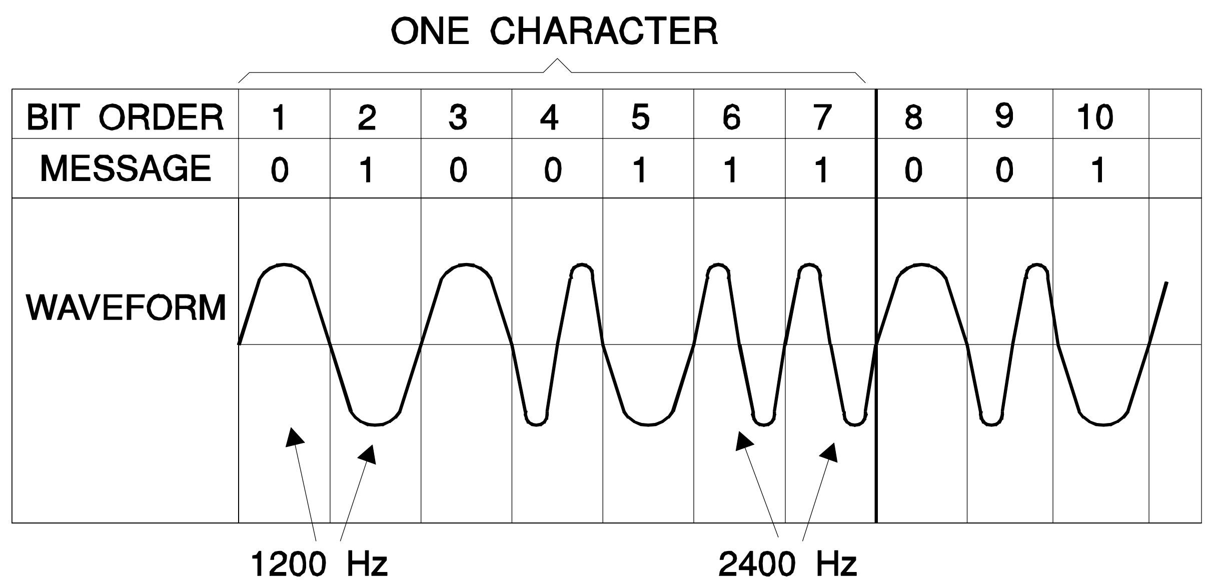
The data exchanged between the ACARS MU and VHF3 transceiver are coded by two types of frequencies of modulation : 1200 and 2400 hertz. On the waveform, the end of the period determines the nature of the bit encoded:

- a positive slope for binary 1,
- a negative slope for binary 0.

The result of this coding is that the transmission rate is 2400 bit per second from aircraft to ground and vice versa.
A zero-bit is coded by a positive half period of 1200 Hz if it is preceded by one-bit, and by a 2400 Hz period starting by the negative half period when this bit is preceded by a zero-bit.
A one-bit is coded by a negative half period of 1200 Hz if it is preceded by a zero-bit, and by a 2400 Hz period starting by the positive half period when this bit is preceded by a one-bit.

BITS				b7 b6 b5	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
b4	b3	b2	b1	HEX	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	a	P	'	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s

ISO ALPHABET No 5



STUDENT NOTES

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ACARS COMPONENT

ACARS

ACARS

FIN/ZONE

FIN: 1RB1

ZONE: 110

COMPONENT DESCRIPTION

The front face features:

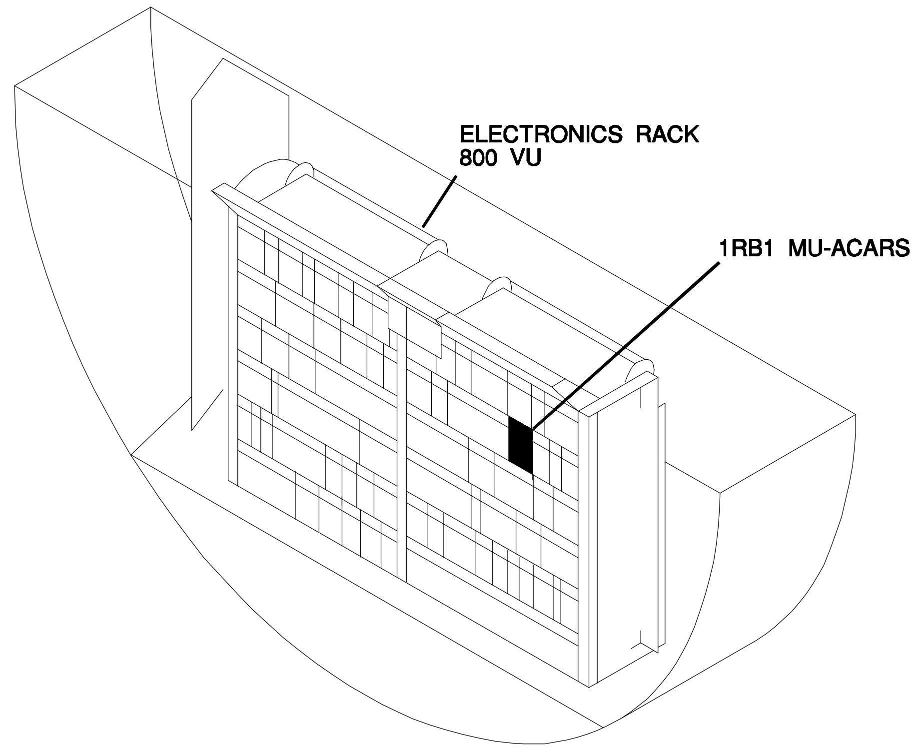
- an indication plate
- a handle
- two leds for failure indication
- and a reset pushbutton

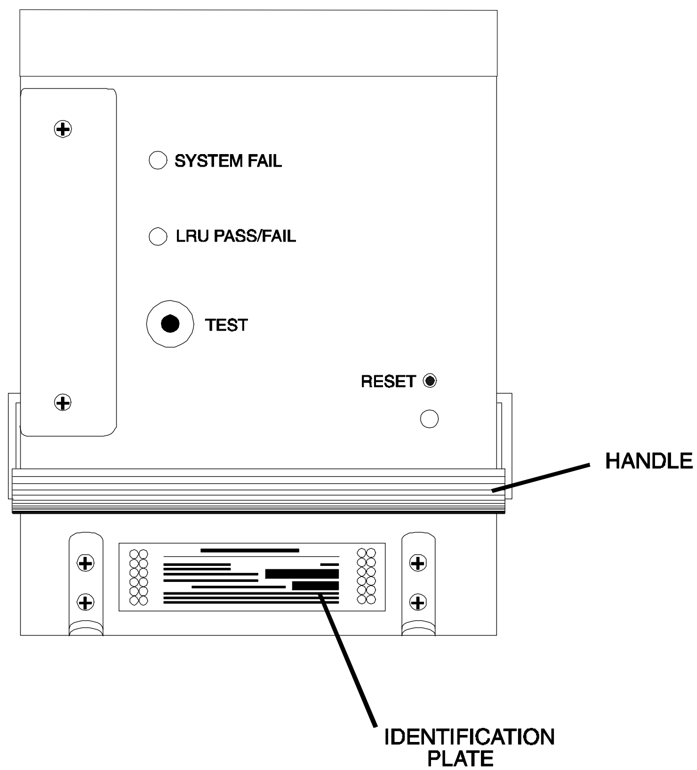
REMOVAL/INSTALLATION

No specific tools are required to remove or install the ACARS Management Unit.

SAFETY PRECAUTIONS

Open, safety and tag the ACARS circuit breaker 2RB. Carefully remove/install the ACARS from/into the rack.





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STUDENT NOTES

MCS SATCOM SYSTEM PRESENTATION

Introduction
Space Segment
Ground Earth Station (GES)
Aircraft Earth Station (AES)

INTRODUCTION

The MULTICHANNEL AVIATION SATELLITE COMMUNICATIONS SYSTEM (MCS SATCOM) is a worldwide mobile communications system providing continuous VOICE and DATA COMMUNICATIONS SERVICES to and from the Aircraft.

In addition to the Airborne Avionics (Referred to as an AIRCRAFT EARTH STATION), the total MCS SATCOM system consists of the SPACE SEGMENT (SATELLITE NETWORK), GROUND EARTH STATIONS (GESs) and Public as well as Private Voice and Data terrestrial telecommunications networks.

SPACE SEGMENT

The SPACE SEGMENT comprises Satellite in GEOSYNCHRONOUS ORBITS, providing air-ground packet-switched data services and voice communications using conventions and capabilities which are standardized worldwide.

The Satellites function as communication transponders to support L-band links to and from the Aircraft and provide links to and from GROUND EARTH STATIONS (GESs).

There are two space segment providers for Airline Aeronautical Satellite Communications.

The first is the INTERNATIONAL MARITIME SATELLITE ORGANIZATION (INMARSAT), whose system is in place today to provide worldwide coverage.
The other is AMERICAN MOBILE SATELLITE CONSORTIUM (AMSC) sytem and TELESAT MOBILE Inc.(TMI), which will provide satellite coverage for North America in the mid 1990s.

The Satellites operated by both AMSC and TMI will back each other up.

The communications system of either AMSC or TMI will support public, private radio and data networks.

GROUND EARTH STATION (GES)

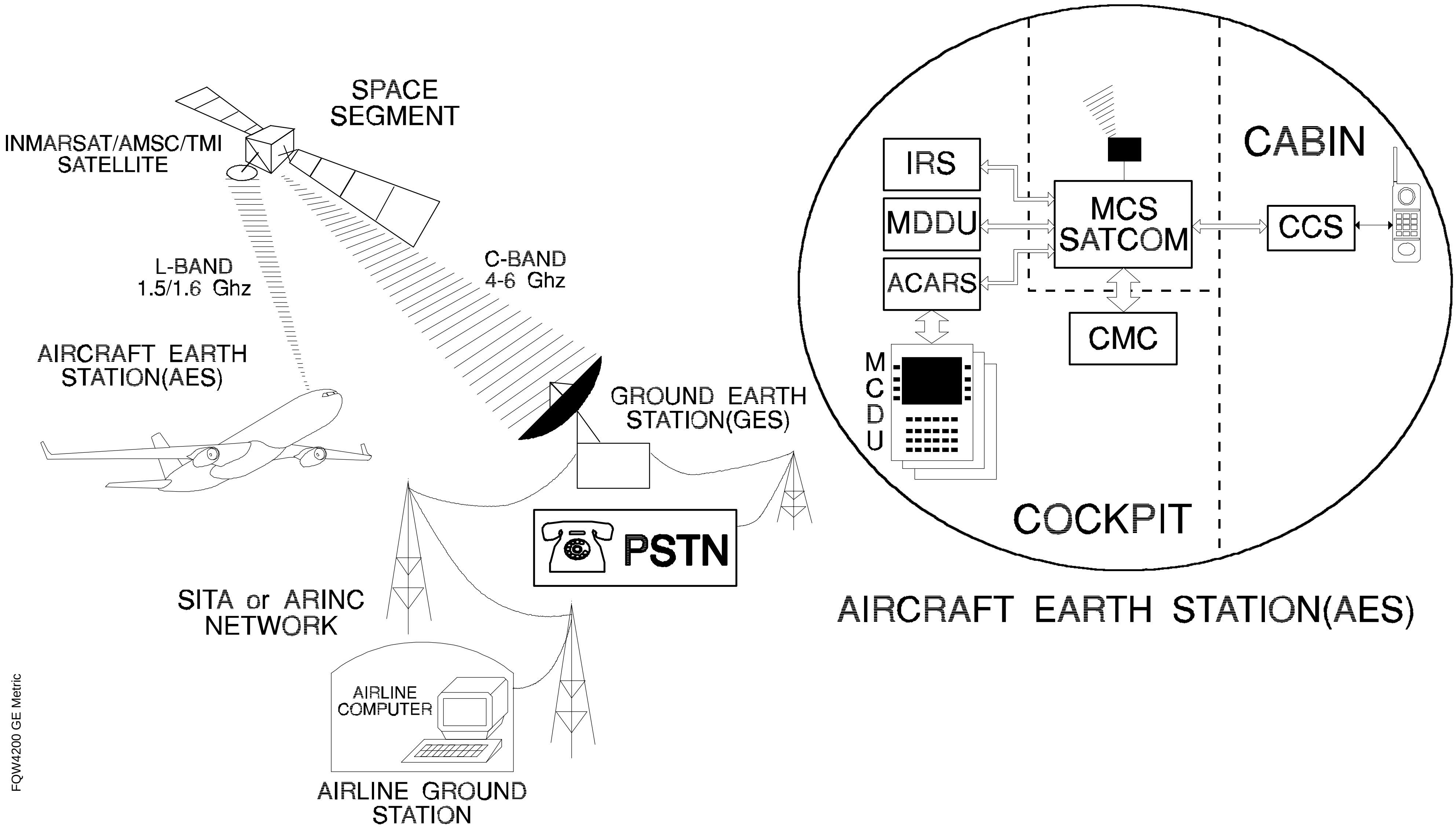
Each GROUND EARTH STATION (GES) has the necessary equipment to communicate with terrestrial networks and communicate through satellites with the Aircraft.

The GESs are designed to provide the Airline customer with a divers routing of national and international VOICE and DATA communications via submarine cable, satellite and microwave links to all destinations

Automatic traffic management systems ensure efficient routing of communications using optimum links into Public Switched Telephone Networks (PSTN) and avoiding multiple satellite connections whenever possible.

The GESs are strategically placed globally to provide redundancy and diversity in the terrestrial extension of communications

The aircraft will be connected to a GES via a "in-view" satellite depending on the service preference table settings in the AES Satellite Data Unit.



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AIRCRAFT EARTH STATION (AES)

The AIRCRAFT EARTH STATION (AES) comprises the AVIONICS and ANTENNA subsystems, whose primary function is to interface with the SPACE SEGMENT for communications with the GESs.

The AES accepts DATA and VOICE messages from various sources, encodes and modulate this information onto appropriate Radio Frequency carriers to be relayed by satellite to GESs.

Standard interface include the ACARS, IRS, MDDU, MCDUs and CABIN COMMUNICATIONS SYSTEM (CCS), for Passenger telephone.

Channels are also provided for voice and data communications with Air Traffic Control (ATC).

COLLINS MCS SATCOM D/O

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MCS SATCOM PRESENTATION

The MCS SATCOM supports DATA and VOICE communications at a rate from 600 bits per second to 21 Kbits per second.
The MCS SATCOM comprises:
- the Satellite Data Unit (SDU),
- the Radio Frequency Unit (RFU),
- the High Power Amplifier (HPA).

The SDU and RFU provide all essential services required to accomodate effective air/ground communications, via satellite, using the antenna and related RF components.
The SDU manages the RF link protocols on the satellite side and provides the appropriate interface with communications management avionics.
The HPA boosts the signal to be transmitted to the satellite.

SATELLITE DATA UNIT

The SDU is the main processing element of the MCS SATCOM avionics and provides Aircraft Earth Station (AES) control and monitoring.
The SDU contains a maximum of 6 channels, 1 for management data and 5 for user voice and data, capable of providing simultaneous full duplex operation.

Depending on customer requests, these channels support:
- cabin voice/data communications,
- cockpit voice communications,
- flight related data.

The SDU:
- controls timing functions,
- performs voice and data digitalizing,
- performs coding/decoding functions,
- defines system protocols,
- provides other system interfacing.

When signal processing is completed, the coded voice/data signal is sent to the RFU.

The SDU is connected to:
- the ADIRS to provide the Beam Steering Unit (BSU) with relative azimuth and relative elevation so that the High Gain Antenna (HGA) can directly be pointed at the satellite for optimum reception and transmission,
- the CMS for BITE,
- the ACARS when the VHF link with ground station is not possible,
- the MDDU for data loading.

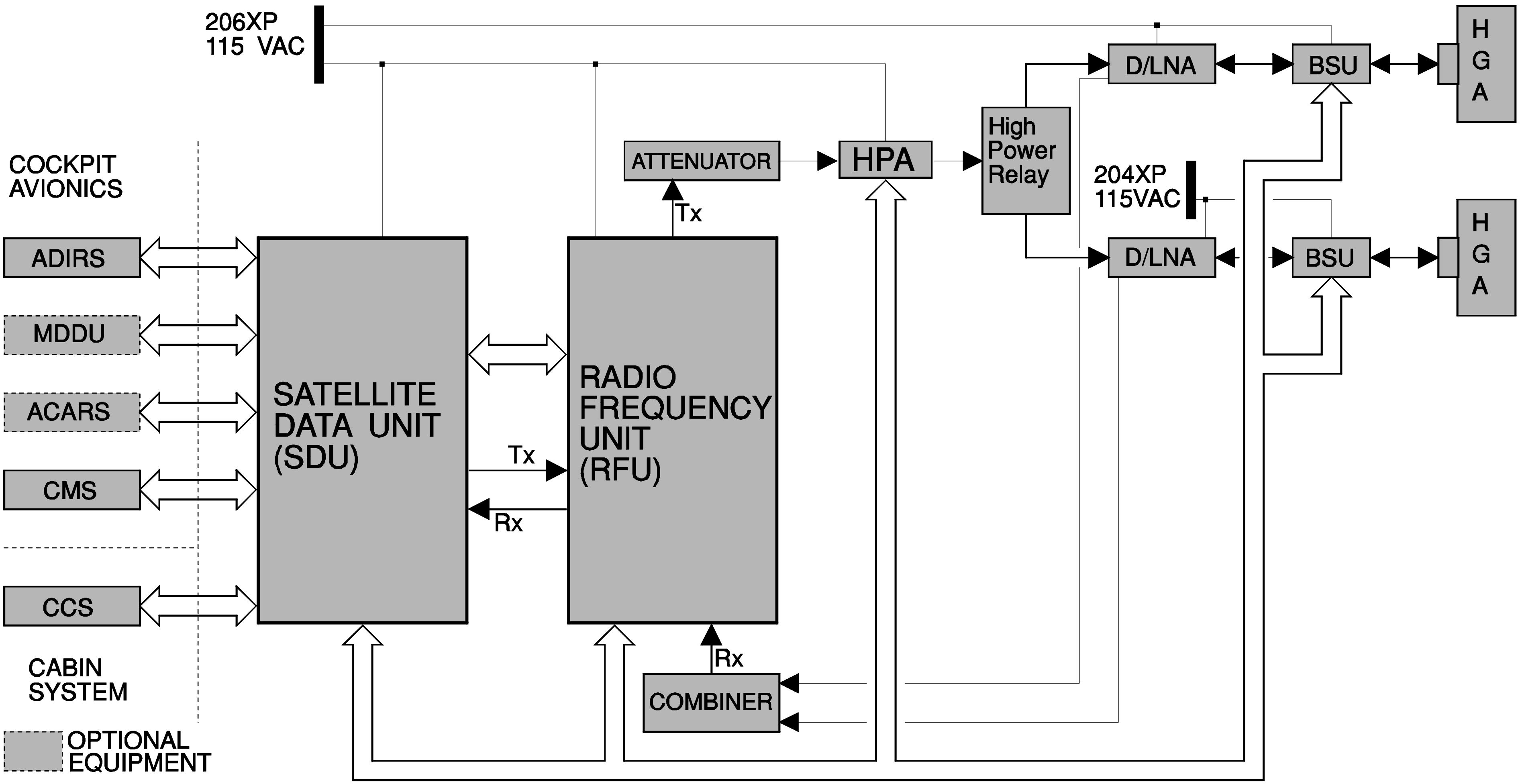
RADIO FREQUENCY UNIT

The RFU converts IF signal from SDU to L-band radio frequency signal for transmission to the satellite and vice-versa.
The signal is sent to the HPA through an attenuator and received from both Diplexer/Low Noise Amplifier (D/LNA) through a combiner.

L-band transmission frequency: from 1.6255 GHz to 1.6605 GHz
L-band reception frequency: from 1.530 GHz to 1.559 GHz.

HIGH POWER AMPLIFIER

The HPA is only used for signal transmission and amplifies the RFU generated L-band signal to a power level required for proper transmission to the satellite.
The power level is permanently adjusted in order to minimize the satellite power consumption.
The linear HPA provides the required average output power, 60 watts per channel, while passing multiple signals without generating excessive intermodulations.
The HPA also monitors the BSU activation depending on the satellite position.



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BEAM STEERING UNIT

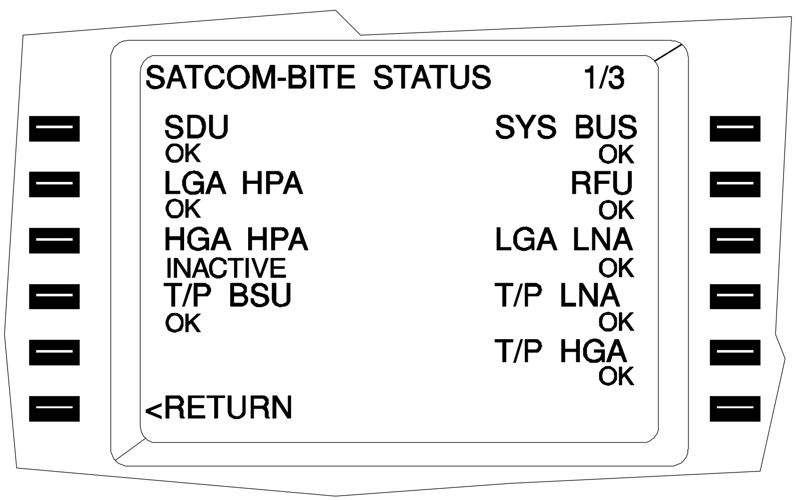
The BSU receives commands from the SDU and converts them in order to control an electronic antenna to point its beam at the satellite.

BITE

The SDU is interfaced with the CMS for BITE purposes via an ARINC 429 bus.
The RFU, HPA and BSU can be tested through the SDU via ARINC 429 buses. They also provide HGA and D/LNA status.

	OK	INACTIVE	FAULT	NONE
SYSTEM BUSES	X	X		
SDU	X		X	
RFU	X	X	X	X
BSU	X	X	X	X
HGA HPA	X	X	X	X
D/LNA	X		X	X

Possible reported status



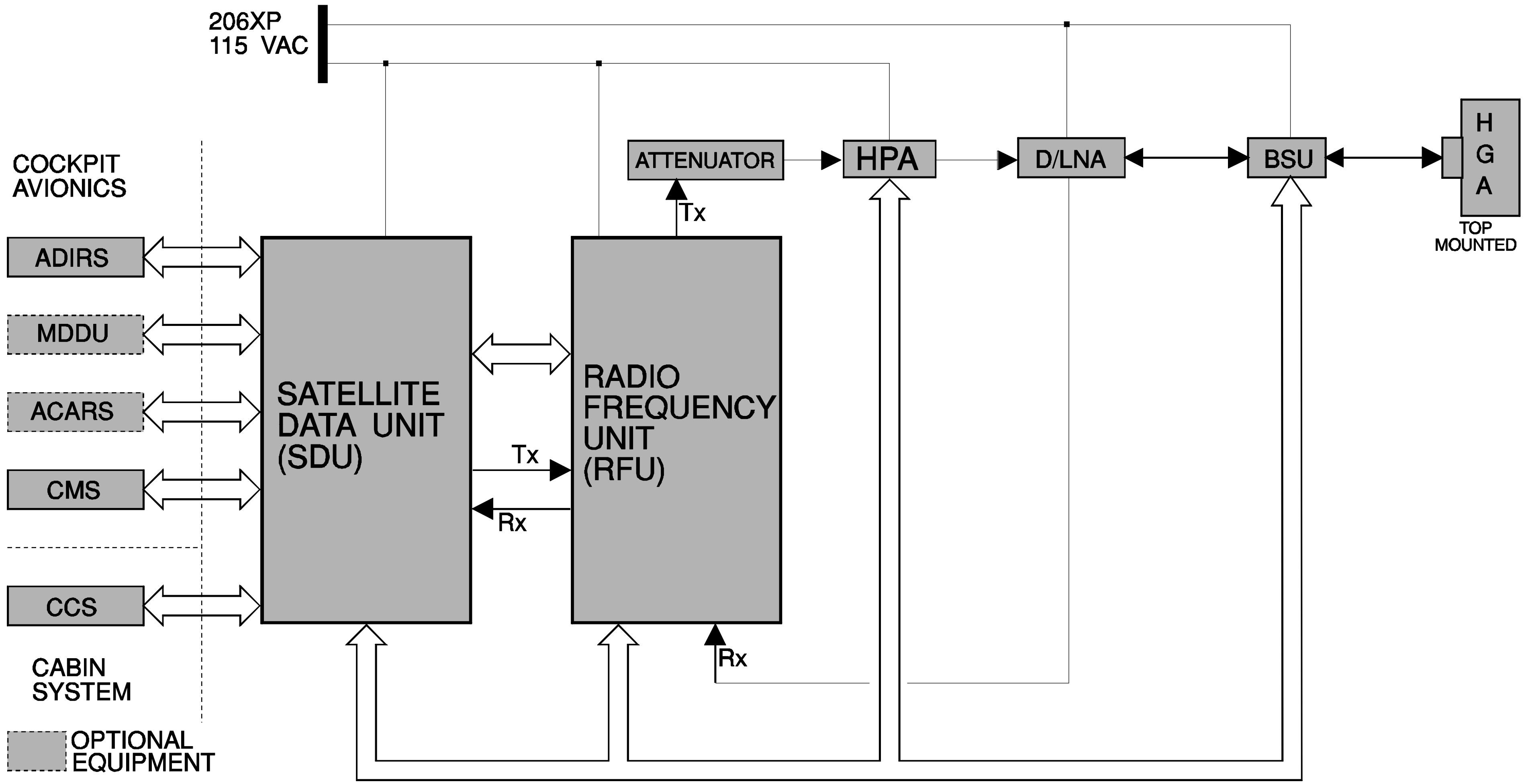
Sample of SATCOM-BITE status MCDU page

FQW4200 GE Metric

OTHER CONFIGURATIONS

On the basis of this architecture, several configurations are possible including or not an additional Low Gain Antenna (LGA), a second SDU/RFU or several HPAs.

The main alternative is the single top mounted HGA suppressing the HPR and the combiner if no LGA is available.



FQW4200 GE Metric

STUDENT NOTES

COLLINS MCS SATCOM COMPONENTS

Satellite Data Unit
Radio Frequency Unit
High Power Amplifier
Diplexer / Low Noise Amplifier
Side Wall Mounted Beam Steering Unit
Side Mounted High Gain Antennae
Avionics Bay Beam Steering Unit
Top Mounted High Gain Antenna

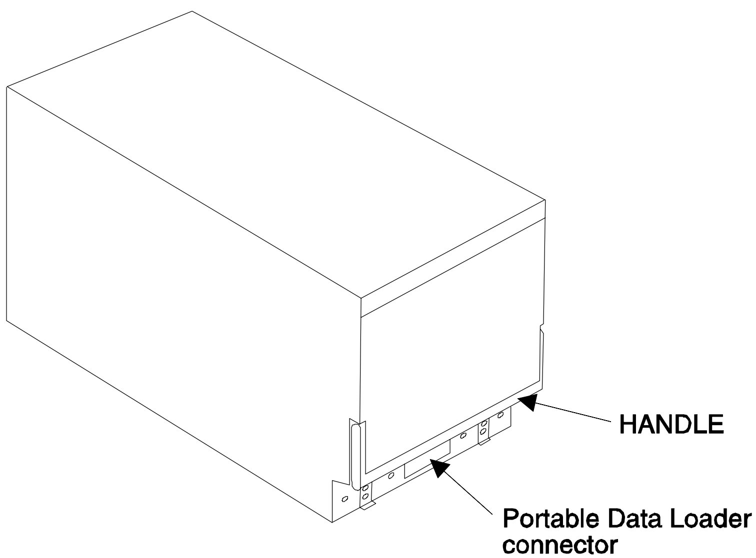
SATELLITE DATA UNIT

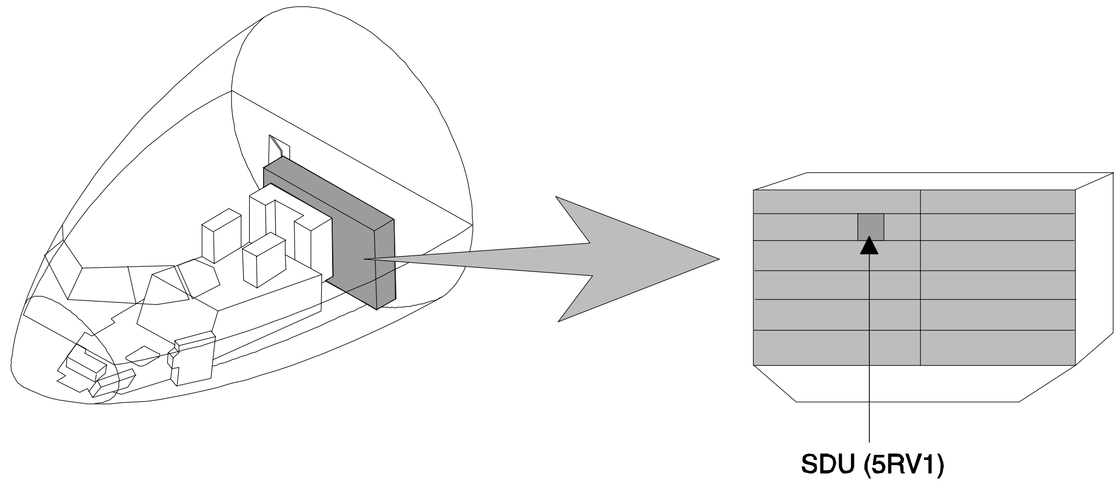
FIN/ZONE

FIN: 5RV1
Zone: 120

COMPONENT DESCRIPTION

A plug is provided on the front face of the SDU for in situ data loading.





Satellite Data Unit

FQW4200 GE Metric

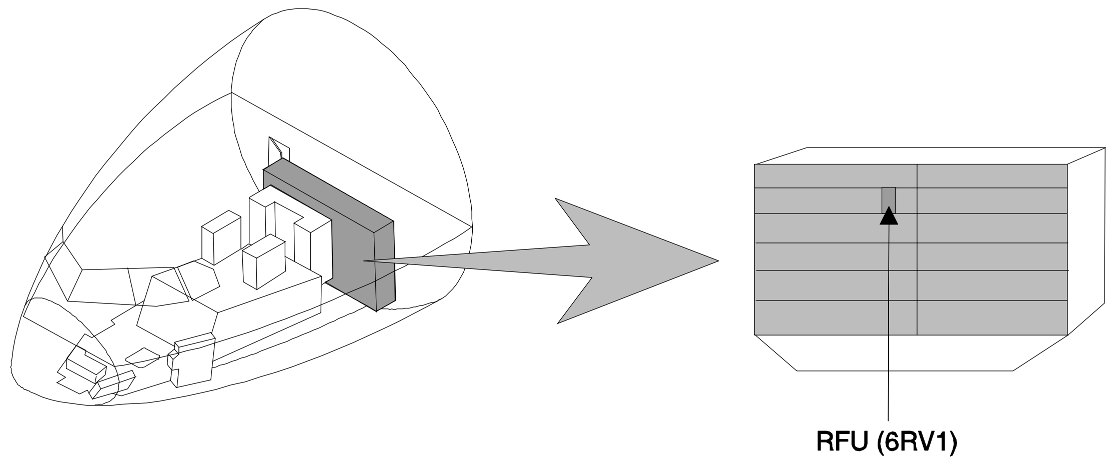
RADIO FREQUENCY UNIT

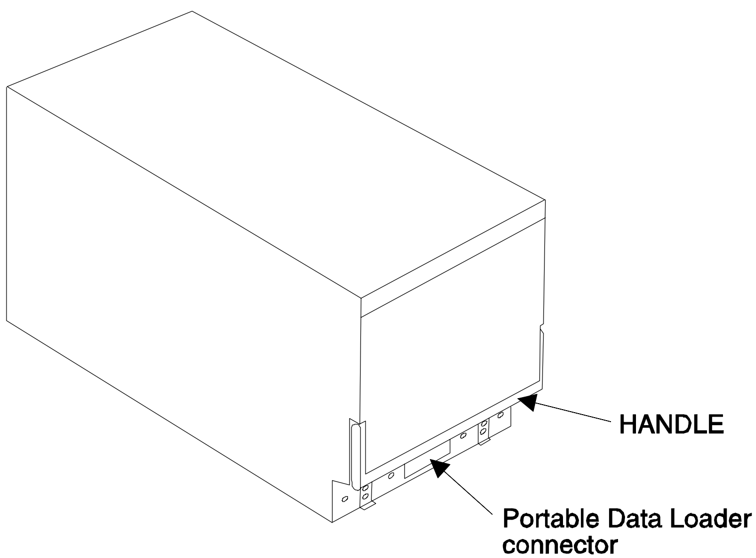
FIN/ZONE

FIN: 6RV1
Zone: 120

COMPONENT DESCRIPTION

A plug is provided on the front face of the RFU for in situ data loading.





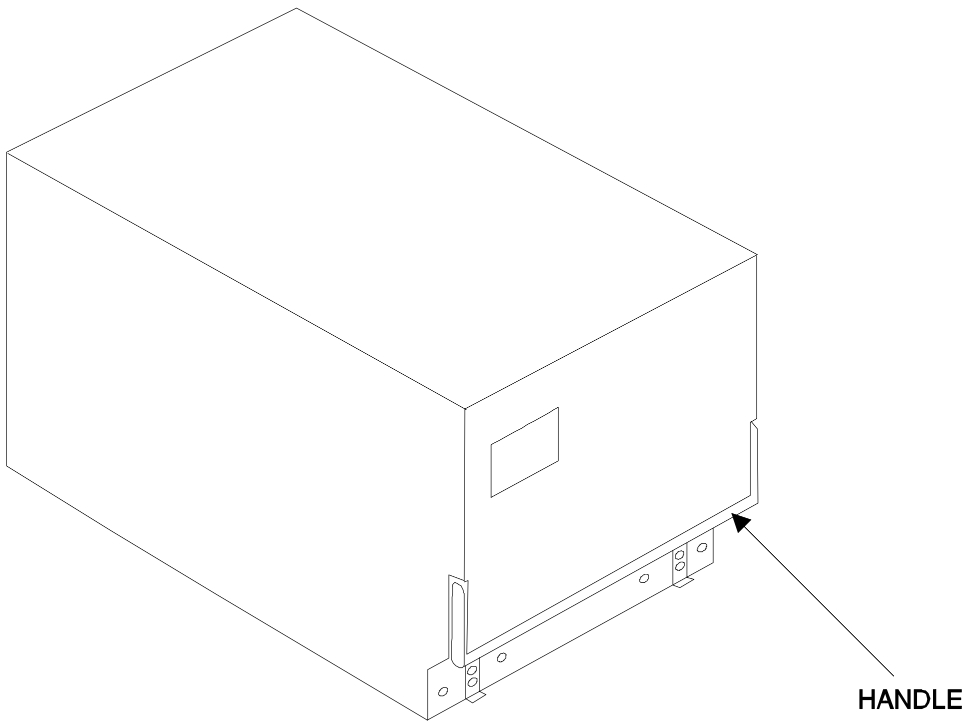
Radio Frequency Unit

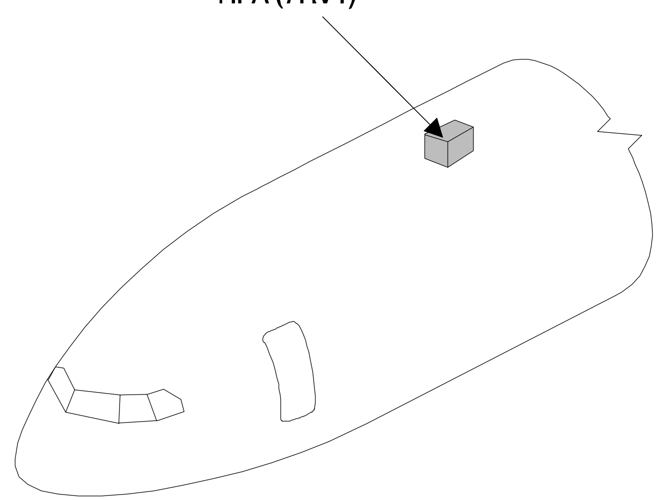
FQW4200 GE Metric

HIGH POWER AMPLIFIER

FIN/ZONE

FIN: 7RV1
Zone: 230





High Power Amplifier

FQW4200 GE Metric

DIPLEXER / LOW NOISE AMPLIFIER

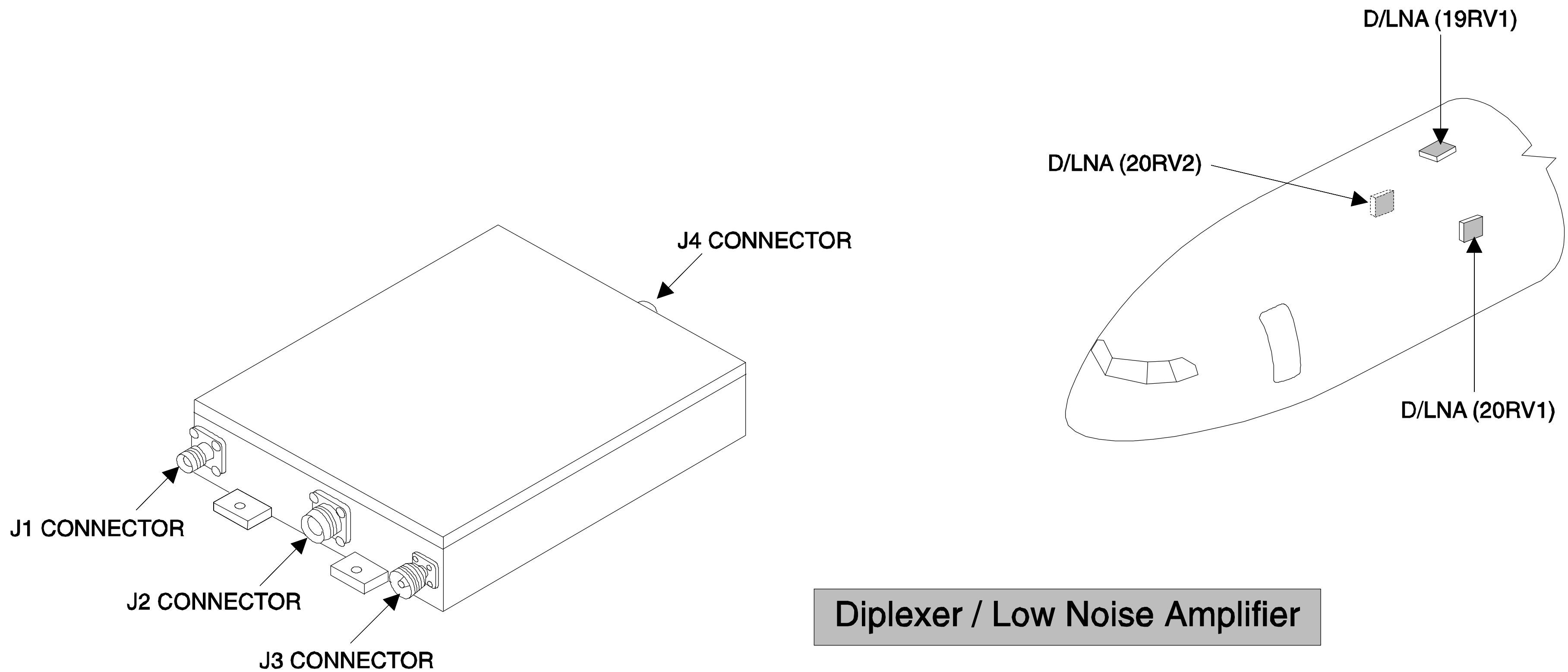
FIN/ZONE

FIN: 20RV1, 20RV2
Zone: 234
or
FIN: 19RV1
Zone: 230

COMPONENT DESCRIPTION

The D/LNA features:
on the front side:
- a J1 connector for connection with the combiner,
- a J2 connector for connection with the BSU,
- a J3 connector for connection with the High Power Amplifier.

on the back side:
- a J4 connector for connection with the BSU.



Diplexer / Low Noise Amplifier

FQW4200 GE Metric

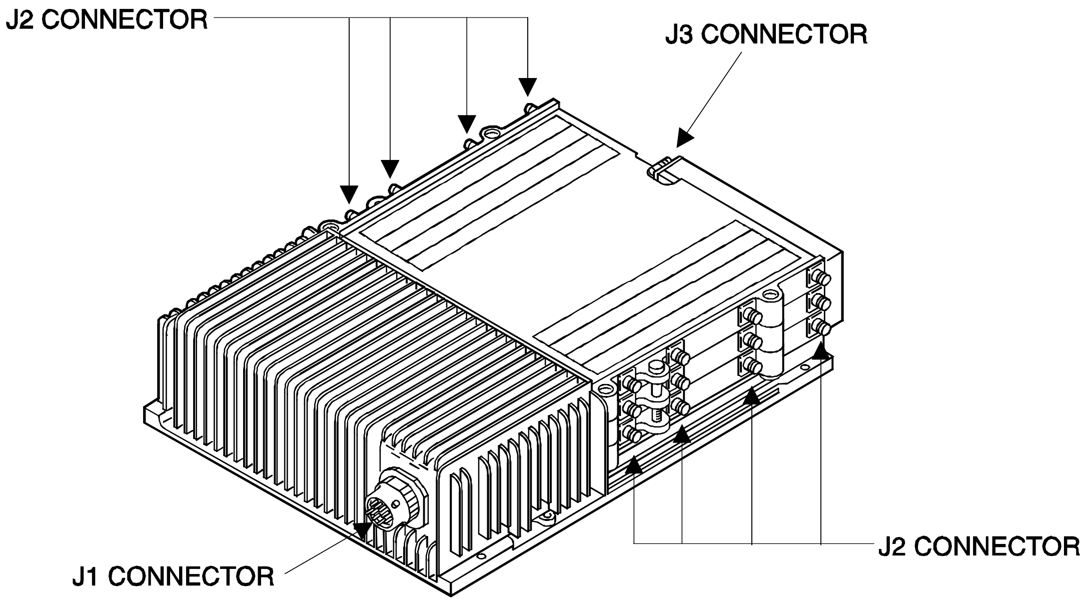
SIDE WALL MOUNTED BEAM STEERING UNIT

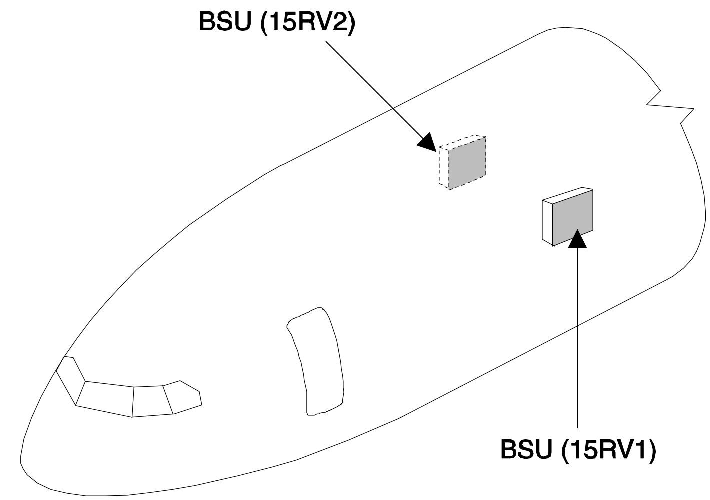
FIN/ZONE

FIN: 15RV1, 15RV2
Zone: 234

COMPONENT DESCRIPTION

The BSU features:
- on the front side, a J1 connector for control and power input/output,
- on the back side, a J3 connector for connection with the BSU and the D/LNA,
- on the left and right sides, 12 coaxial J2 connectors on each side for connection with the antennae.





Side Wall Mounted Beam Steering Unit

FQW4200 GE Metric

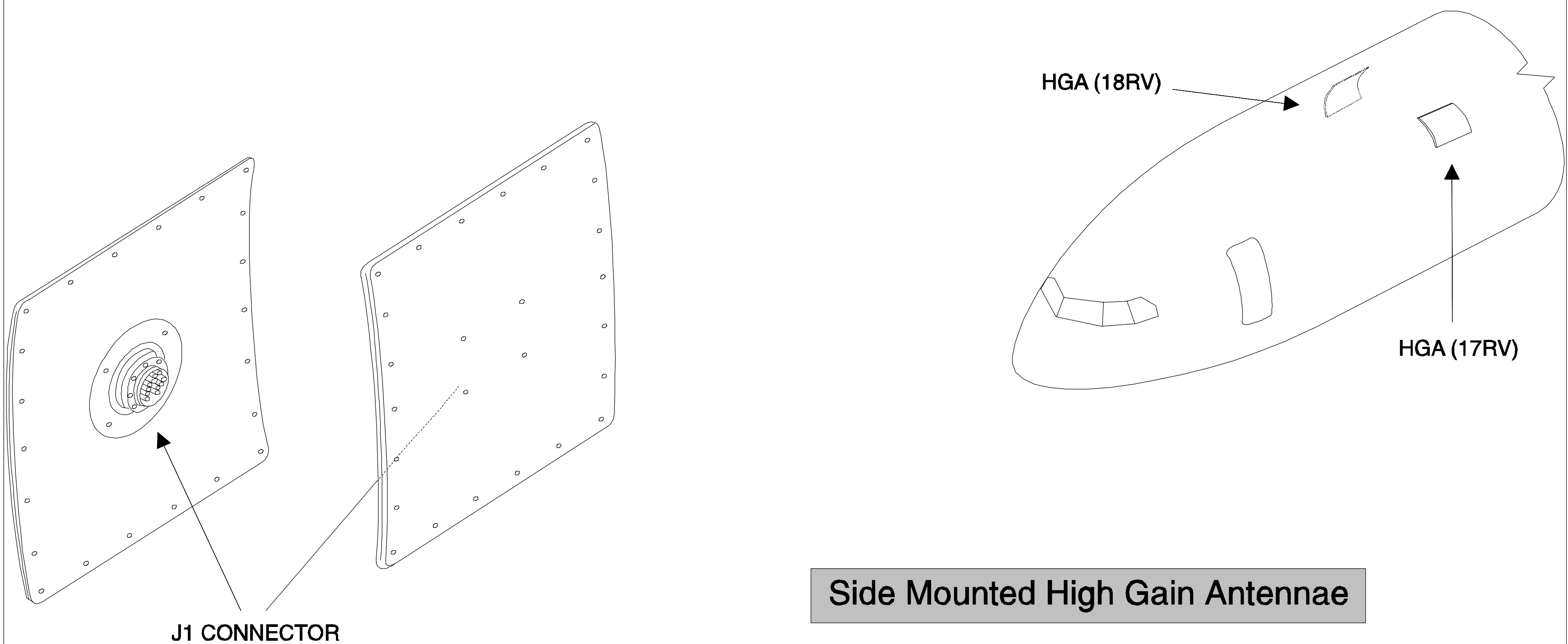
SIDE MOUNTED HIGH GAIN ANTENNAE

FIN/ZONE

FIN: 17RV, 18RV
Zone: 234

COMPONENT DESCRIPTION

The High Gain Antennae are externally installed on either side of the fuselage with an elevation angle of approximately 45 degrees.
They are equipped with a J1 connector for connection with the BSU.



Side Mounted High Gain Antennae

FQW4200 GE Metric

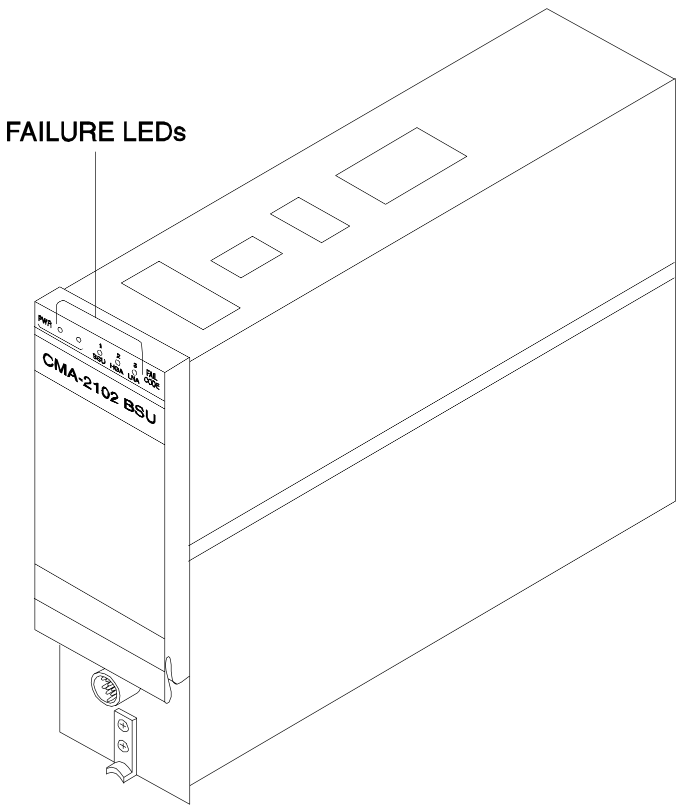
AVIONICS BAY BEAM STEERING UNIT

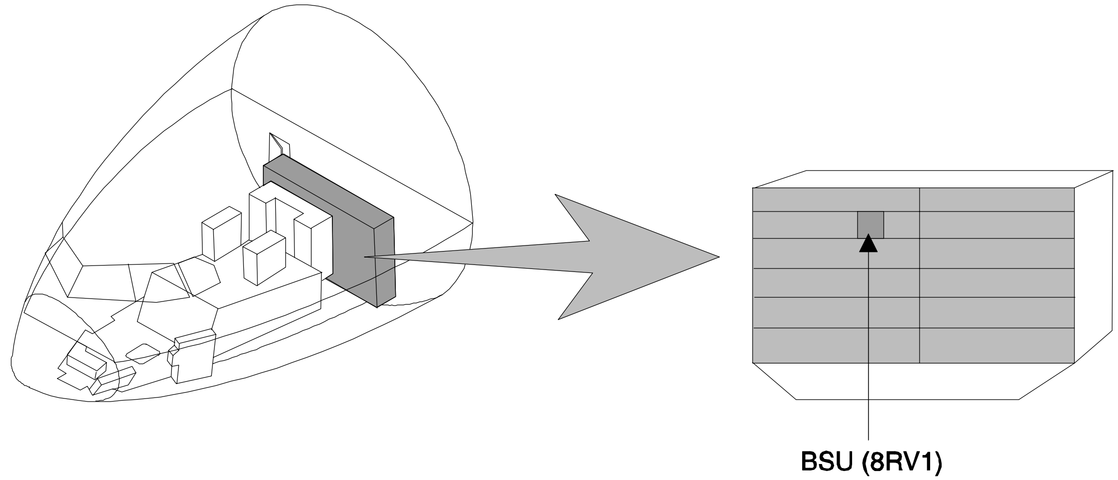
FIN/ZONE

FIN: 8RV1
Zone: 120

COMPONENT DESCRIPTION

This BSU can be provided for a top mounted antenna management. The BSU front face features four red LEDs and one green LED to indicate, while in either operational or diagnostic mode, a failure in the operational integrity of the BSU power status.
LEDs will remain on until corrective action is performed.





Avionics Bay Beam Steering Unit

FQW4200 GE Metric

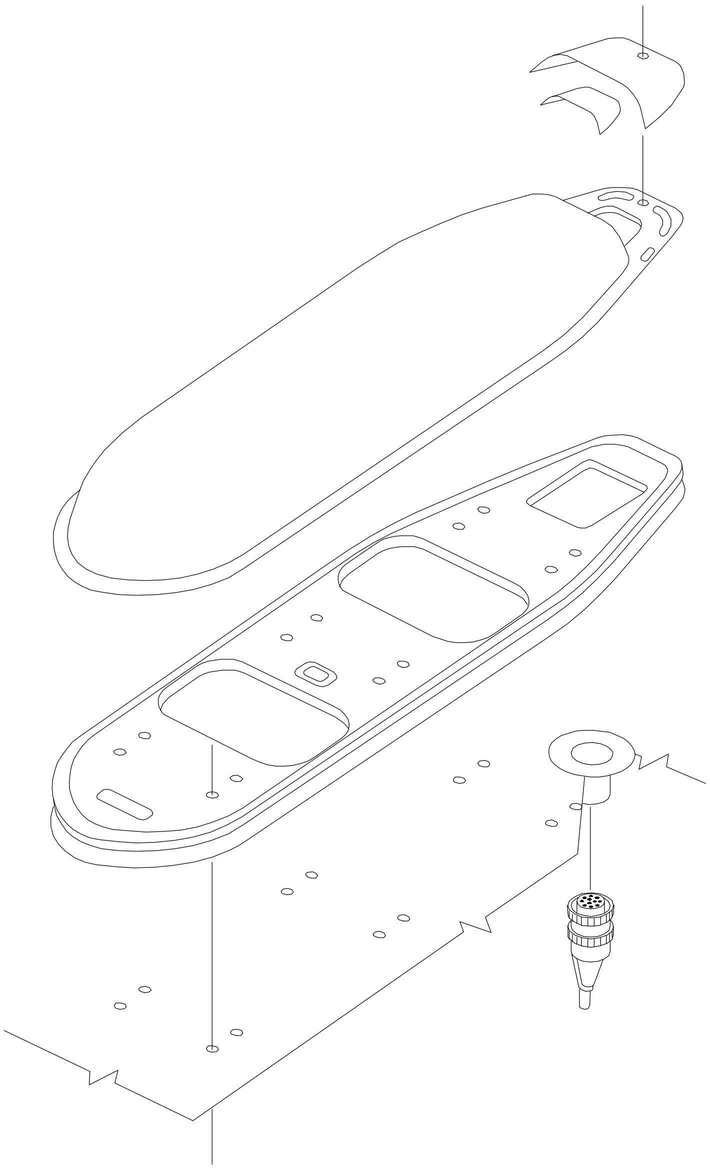
TOP MOUNTED HIGH GAIN ANTENNA

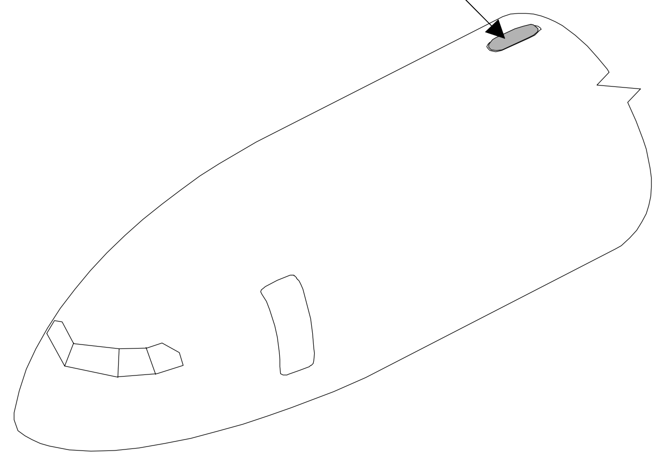
FIN/ZONE

FIN: 16RV1
Zone: 230

COMPONENT DESCRIPTION

The top mounted High Gain Antenna is mounted with an adapter plate on the fuselage. It is equipped with a J1 connector for connection with the BSU and a J2 connector for connection with the D/LNA.





Top Mounted High Gain Antenna

FQW4200 GE Metric

STUDENT NOTES

HONEYWELL MCS SATCOM D/O

MCS SATCOM PRESENTATION

The MCS SATCOM supports DATA and VOICE communications at a rate from 600 bits per second to 21 Kbits per second.
The MCS SATCOM comprises :
- the Satellite Data Unit (SDU),
- the Radio Frequency Unit (RFU),
- the High Power Amplifier (HPA).

The SDU and RFU (if available) provide all essential services required to accomodate effective air/ground communications, via satellite, using the antenna and related RF components.
The SDU manages the RF link protocols on the satellite side and provides the appropriate interface with communications management avionics.
The HPA boosts the signal to be transmitted to the satellite.

SATELLITE DATA UNIT

The SDU is the main processing element of the MCS SATCOM avionics and provides Aircraft Earth Station (AES) control and monitoring.
The SDU provides 3 channels, 1 for management data and 2 for user voice and data, capable of providing simultaneous full duplex operation.

Depending on customer requests, these channels support :
- cabin voice/data communications,
- cockpit voice communications,
- flight related data.

The SDU :
- controls timing functions,
- performs voice and analog data digitalizing,
- performs coding/decoding functions,
- defines system protocols,
- provides other system interfacing,
- transmits/receives signals to/from L-Band.

If no RFU is available, the SDU is directly connected to the HPA.

The SDU is connected to :
- the ADIRS to provide the Beam Steering Unit (BSU) with relative azimuth and relative elevation so that the High Gain Antenna (HGA) can directly be pointed at the satellite for optimum reception and transmission,
- the CMS for BITE,
- the ACARS when the VHF link with ground station is not possible,
- the MDDU for data loading.

RADIO FREQUENCY UNIT

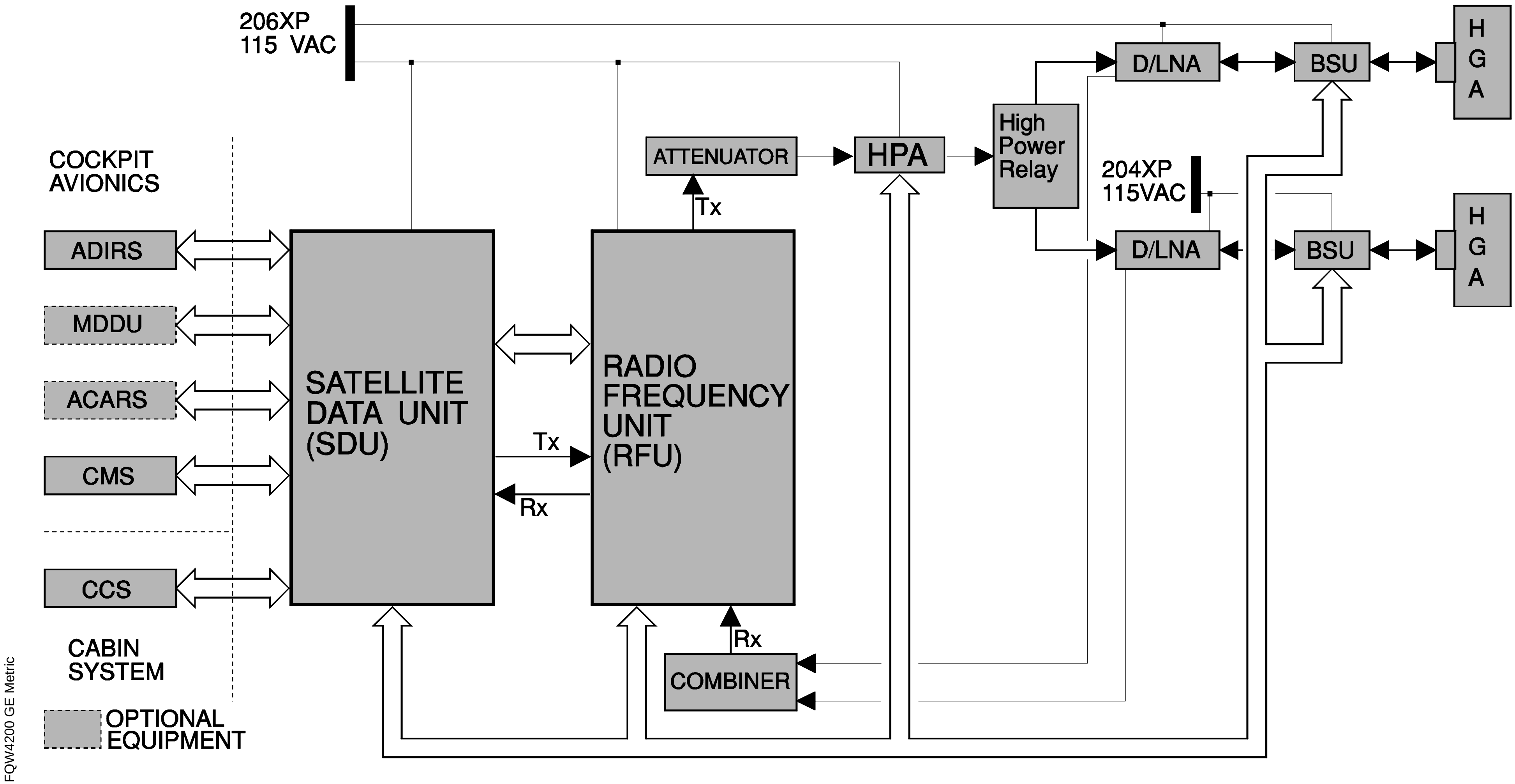
The RFU provides 3 additional channels for digital voice/data. The signal goes through the SDU to the RFU without any processing.
The RF signal is sent to the HPA through an attenuator and received from both Diplexer/Low Noise Amplifier (D/LNA) through a combiner.

L-band transmission frequency : from 1.6255 GHz to 1.6605 GHz
L-band reception frequency : from 1.530 GHz to 1.559 GHz.

If the 3 RFU channels are busy, the data is sent back to the SDU and processed by the SDU. Then the RF signal is sent to the RFU to be amplified by the HPA.

HIGH POWER AMPLIFIER

The HPA is only used for signal transmission and amplifies the RFU generated L-band signal to a power level required for proper transmission to the satellite.
The power level is permanently adjusted in order to minimize the satellite power consumption.
The linear HPA provides the required average output power, 60 watts per channel, while passing multiple signals without generating excessive intermodulations.
The HPA also monitors the BSU activation depending on the satellite position.


206XP
115 VAC
COCKPIT
AVIONICS
ADIRS
MDDU
ACARS
CMS
CCS
CABIN
SYSTEM
OPTIONAL
EQUIPMENT
SATELLITE
DATA UNIT
(SDU)
Tx
Rx
RADIO
FREQUENCY
UNIT
(RFU)
ATTENUATOR
Tx
HPA
High
Power
Relay
Rx
COMBINER
D/LNA
D/LNA
BSU
BSU
204XP
115VAC
H
G
A
H
G
A
FQW4200 GE Metric

BEAM STEERING UNIT

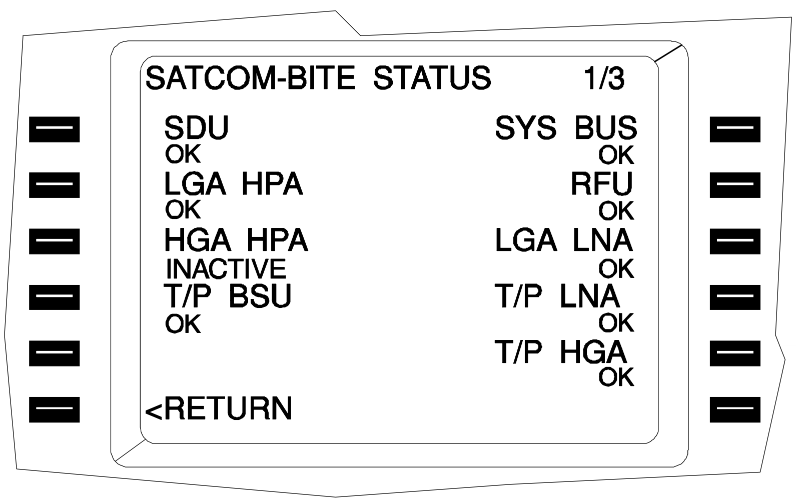
The BSU receives commands from the SDU and converts them in order to control an electronic antenna to point its beam at the satellite.

BITE

The SDU is interfaced with the CMS for BITE purposes via an ARINC 429 bus.
The RFU, HPA and BSU can be tested through the SDU via ARINC 429 buses. They also provide HGA and D/LNA status.

	OK	INACTIVE	FAULT	NONE
SYSTEM BUSES	X	X		
SDU	X		X	
RFU	X	X	X	X
BSU	X	X	X	X
HGA HPA	X	X	X	X
D/LNA	X		X	X

Possible reported status



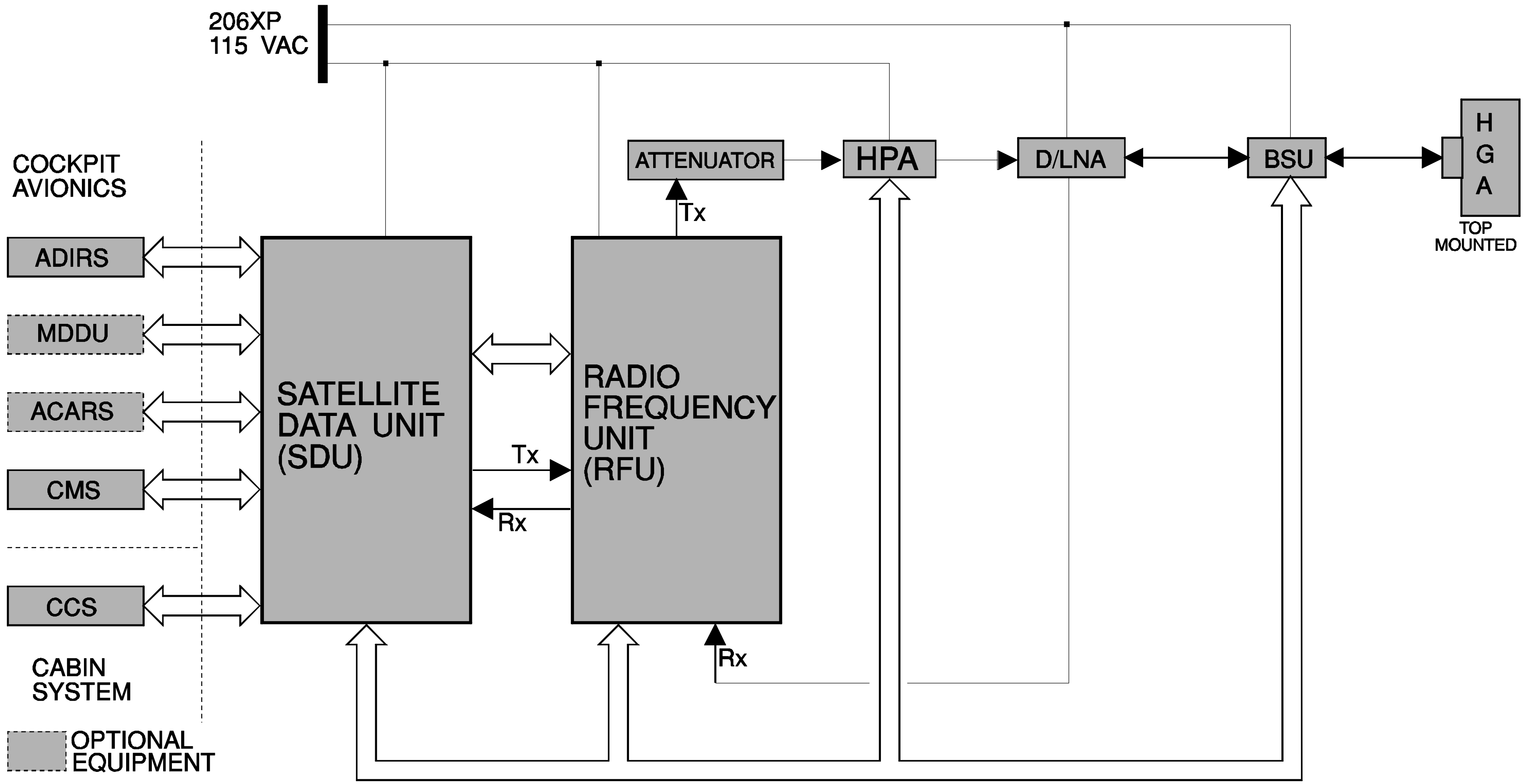
Sample of SATCOM-BITE status MCDU page

FQW4200 GE Metric

OTHER CONFIGURATIONS

On the basis of this architecture, several configurations are possible including or not an additional Low Gain Antenna (LGA), a second SDU/RFU or several HPAs.

The main alternative is the single top mounted HGA suppressing the HPR and the combiner if no LGA is available.



FQW4200 GE Metric

STUDENT NOTES

HONEYWELL MCS SATCOM COMPONENTS

Satellite Data Unit
Radio Frequency Unit
High Power Amplifier
Diplexer / Low Noise Amplifier
Side Wall Mounted Beam Steering Unit
Side Mounted High Gain Antennae
Avionics Bay Beam Steering Unit
Top Mounted High Gain Antenna

SATELLITE DATA UNIT

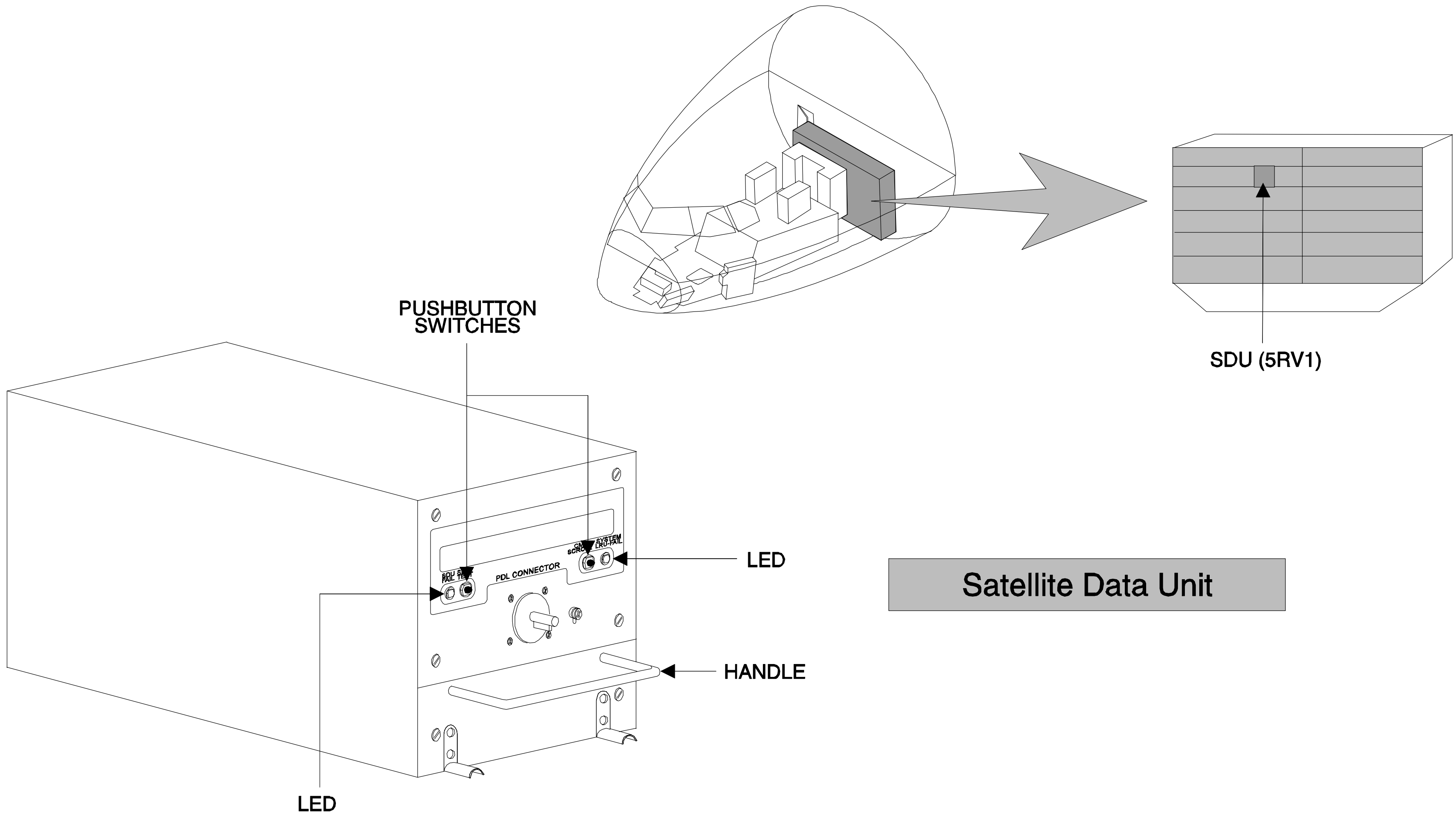
FIN/ZONE

FIN: 5RV1
Zone: 120

COMPONENT DESCRIPTION

The face of the SDU features:

- two red SDU FAIL and SYSTEM LRU FAIL Light Emitting Diodes (LEDs),
- a 20-character display capable of displaying alpha-numeric characters,
- two momentary action pushbutton switches :
  - SDU TEST for SDU testing; the result is displayed on the LEDs,
  - CM/SCROLL for alpha-numerical display scrolling,
- a plug for in situ data loading.



Satellite Data Unit

FQW4200 GE Metric

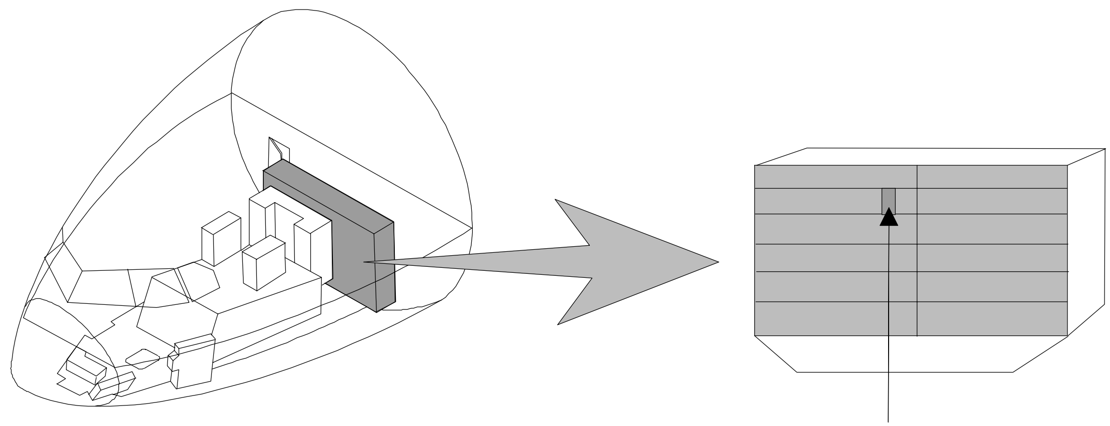
RADIO FREQUENCY UNIT

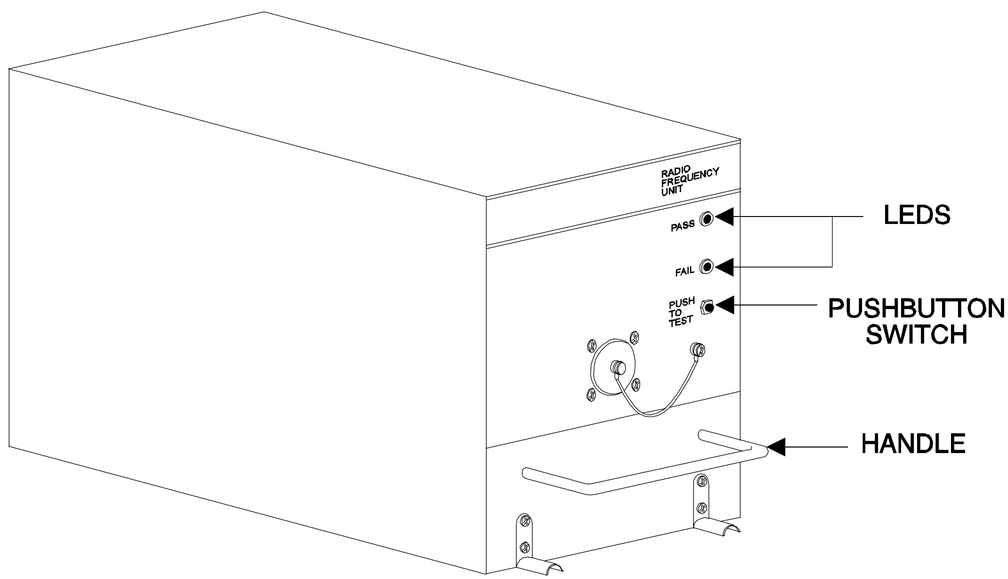
FIN/ZONE

FIN: 6RV1
Zone: 120

COMPONENT DESCRIPTION

The face of the RFU features:
- a PUSH TO TEST pushbutton switch,
- a red FAIL LED,
- a green PASS LED,
- a plug for in situ data loading.





Radio Frequency Unit

FQW4200 GE Metric

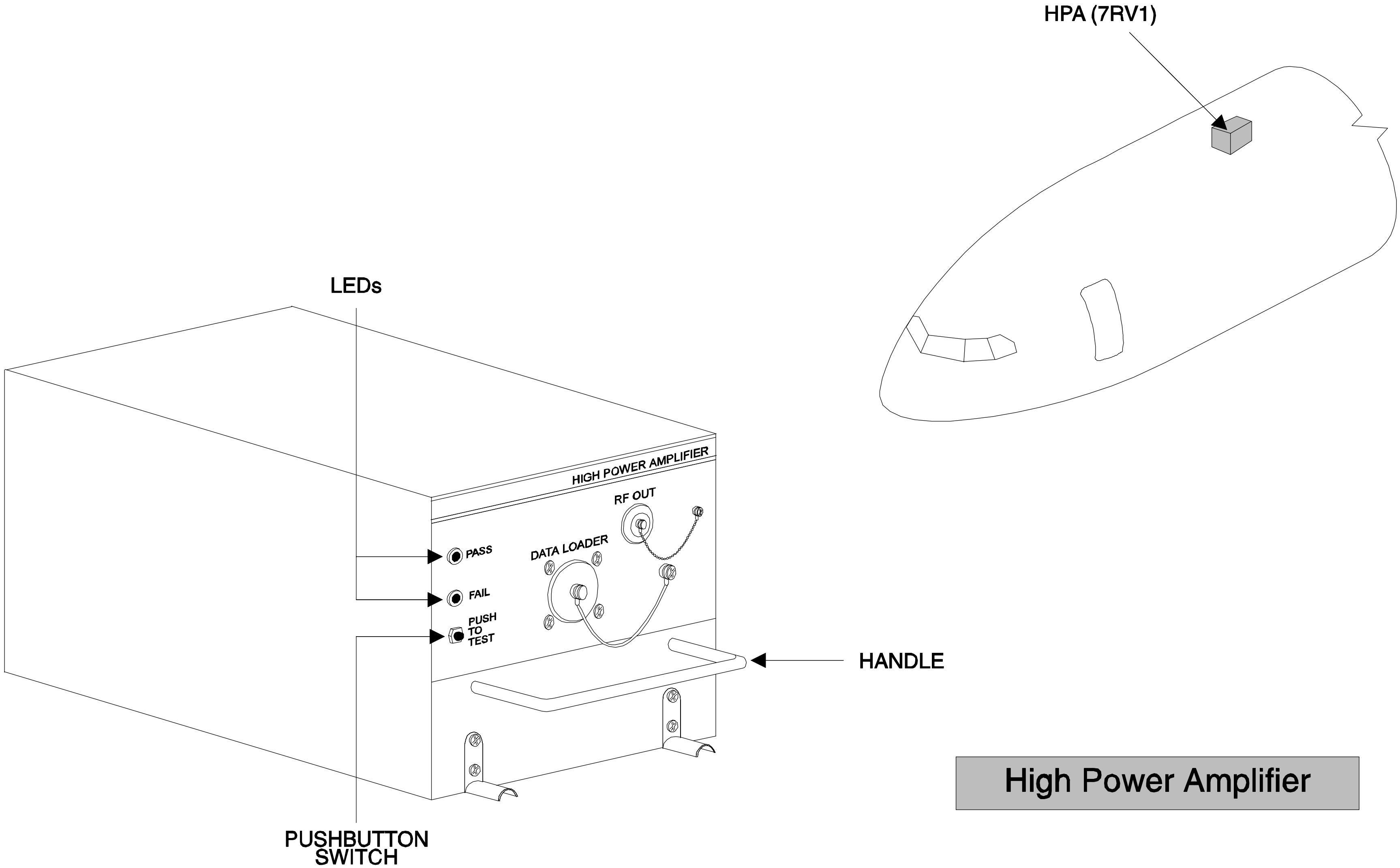
HIGH POWER AMPLIFIER

FIN/ZONE

FIN: 7RV1
Zone: 230

COMPONENT DESCRIPTION

The face of the HPA features:
- a PUSH TO TEST pushbutton switch,
- a red FAIL LED,
- a green PASS LED,
- a plug for in situ data loading.



High Power Amplifier

FQW4200 GE Metric

DIPLEXER / LOW NOISE AMPLIFIER

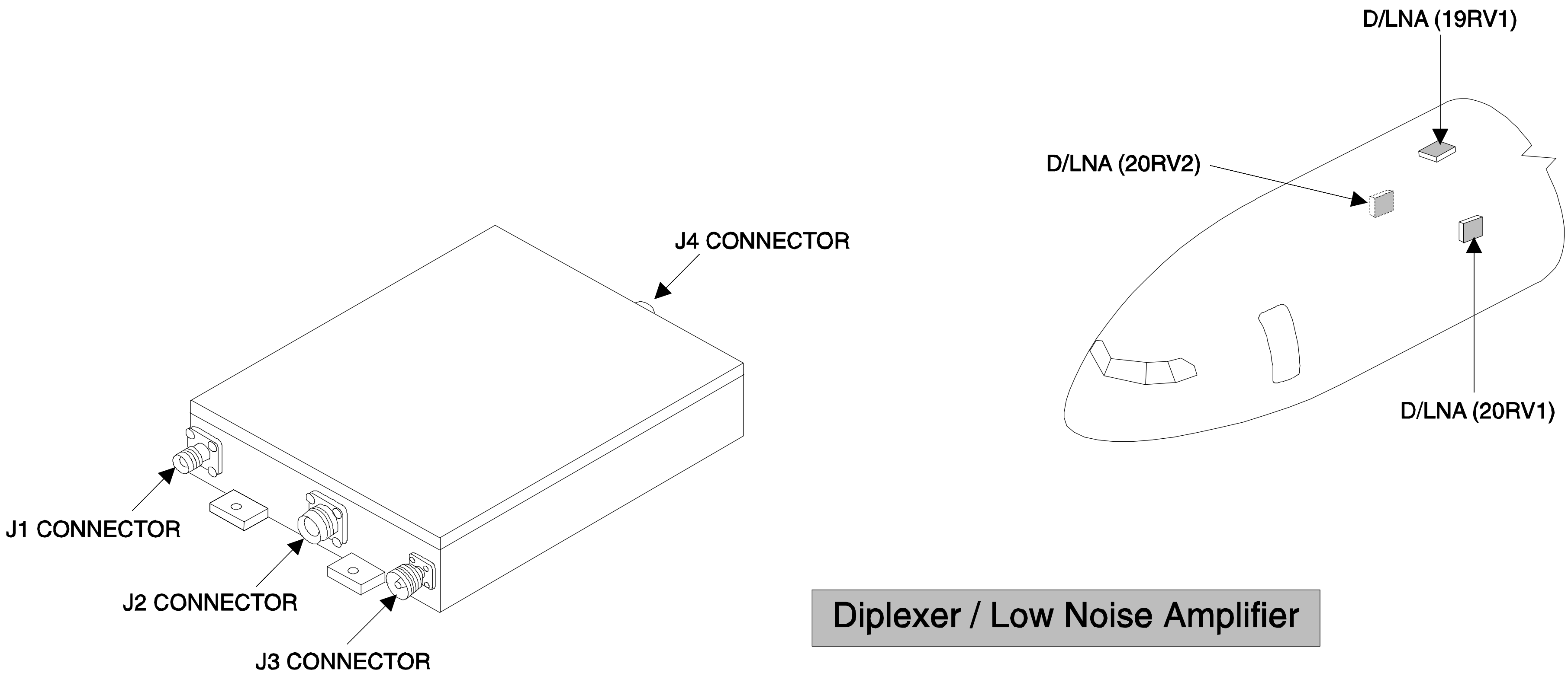
FIN/ZONE

FIN: 20RV1, 20RV2
Zone: 234
or
FIN: 19RV1
Zone: 230

COMPONENT DESCRIPTION

The D/LNA features:
on the front side:
- a J1 connector for connection with the combiner,
- a J2 connector for connection with the BSU,
- a J3 connector for connection with the High Power Amplifier.

on the back side:
- a J4 connector for connection with the BSU.



Diplexer / Low Noise Amplifier

FQW4200 GE Metric

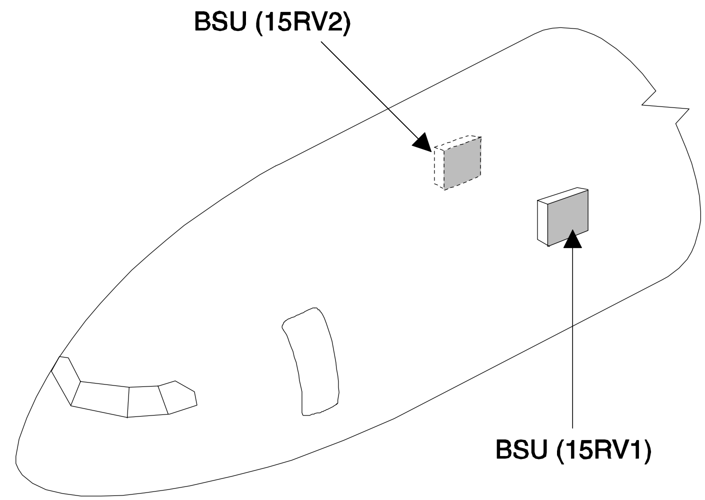
SIDE WALL MOUNTED BEAM STEERING UNIT

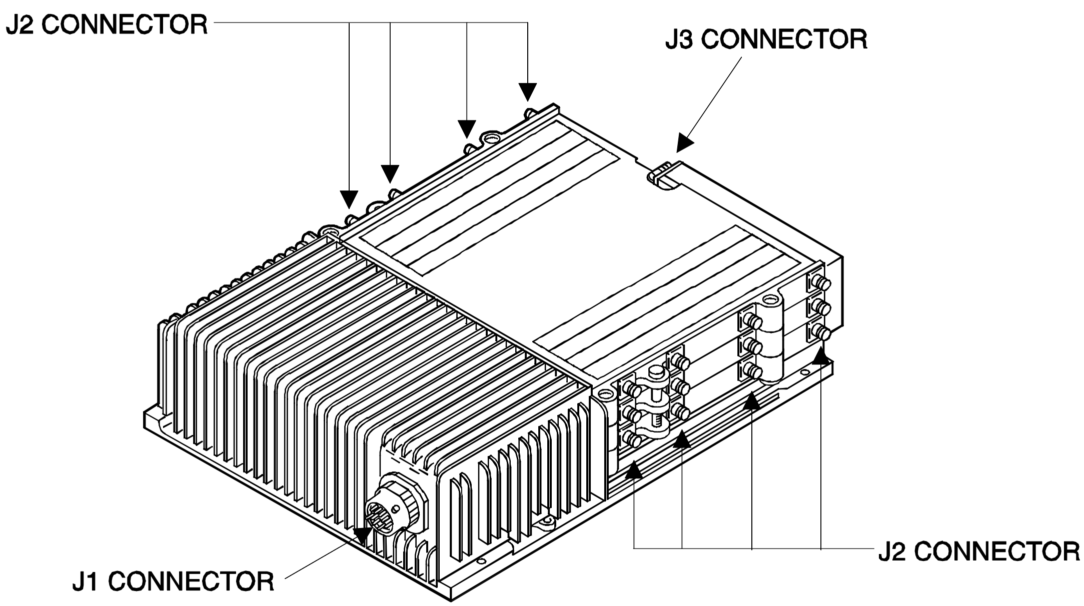
FIN/ZONE

FIN: 15RV1, 15RV2
Zone: 234

COMPONENT DESCRIPTION

The BSU features:
- on the front side, a J1 connector for control and power input/output,
- on the back side, a J3 connector for connection with the BSU and the D/LNA,
- on the left and right sides, 12 coaxial J2 connectors on each side for connection with the antennae.





Side Wall Mounted Beam Steering Unit

FQW4200 GE Metric

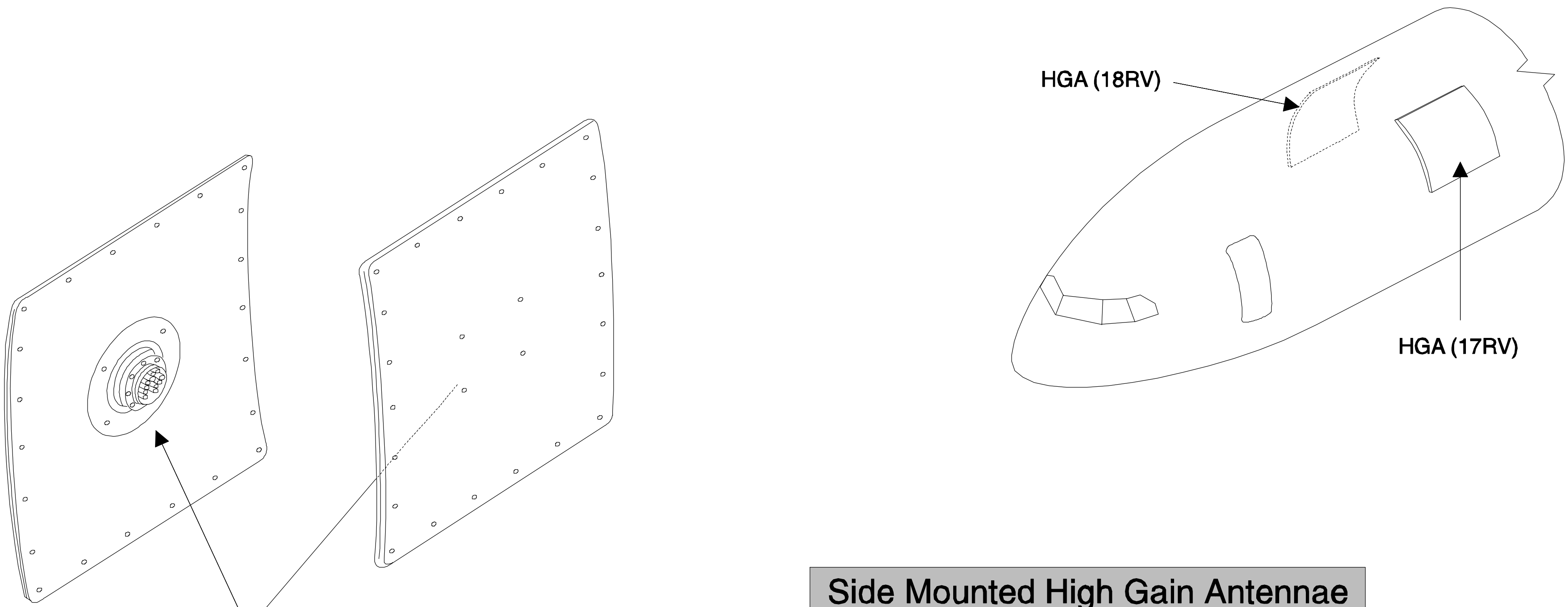
SIDE MOUNTED HIGH GAIN ANTENNAE

FIN/ZONE

FIN: 17RV, 18RV
Zone: 234

COMPONENT DESCRIPTION

The High Gain Antennae are externally installed on either side of the fuselage with an elevation angle of approximately 45 degrees.
They are equipped with a J1 connector for connection with the BSU.



Side Mounted High Gain Antennae

FQW4200 GE Metric

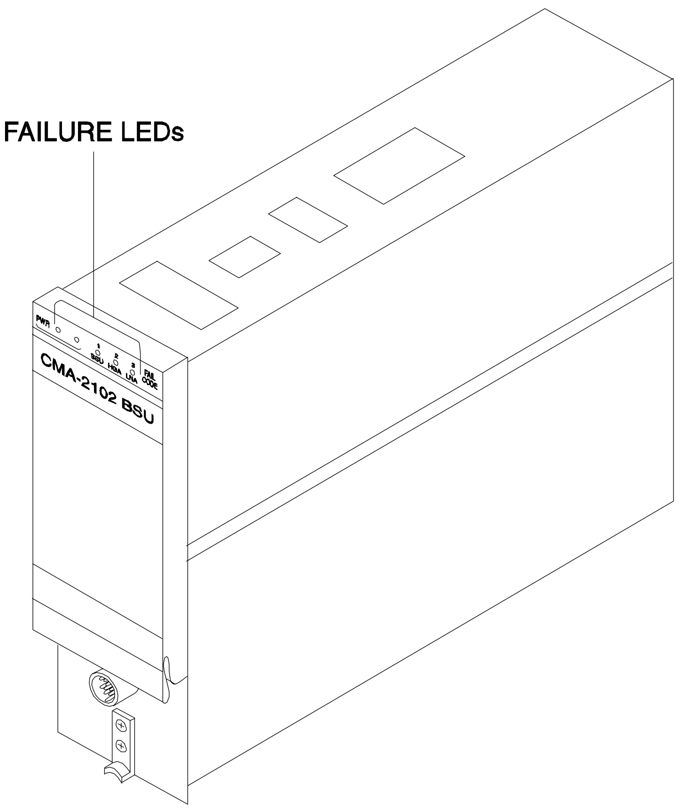
AVIONICS BAY BEAM STEERING UNIT

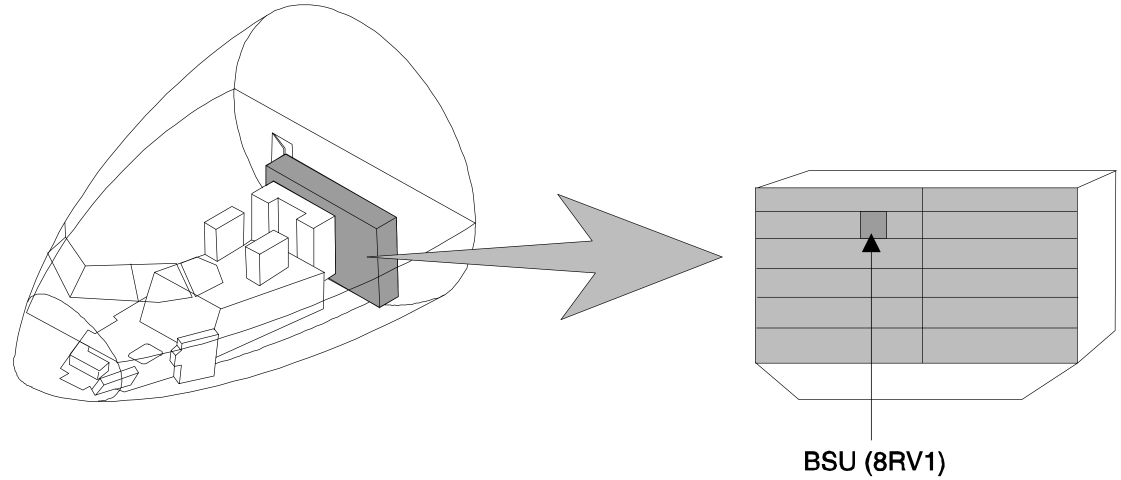
FIN/ZONE

FIN: 8RV1
Zone: 120

COMPONENT DESCRIPTION

This BSU can be provided for a top mounted antenna management. The BSU front face features four red LEDs and one green LED to indicate, while in either operational or diagnostic mode, a failure in the operational integrity of the BSU power status.
LEDs will remain on until corrective action is performed.





Avionics Bay Beam Steering Unit

FQW4200 GE Metric

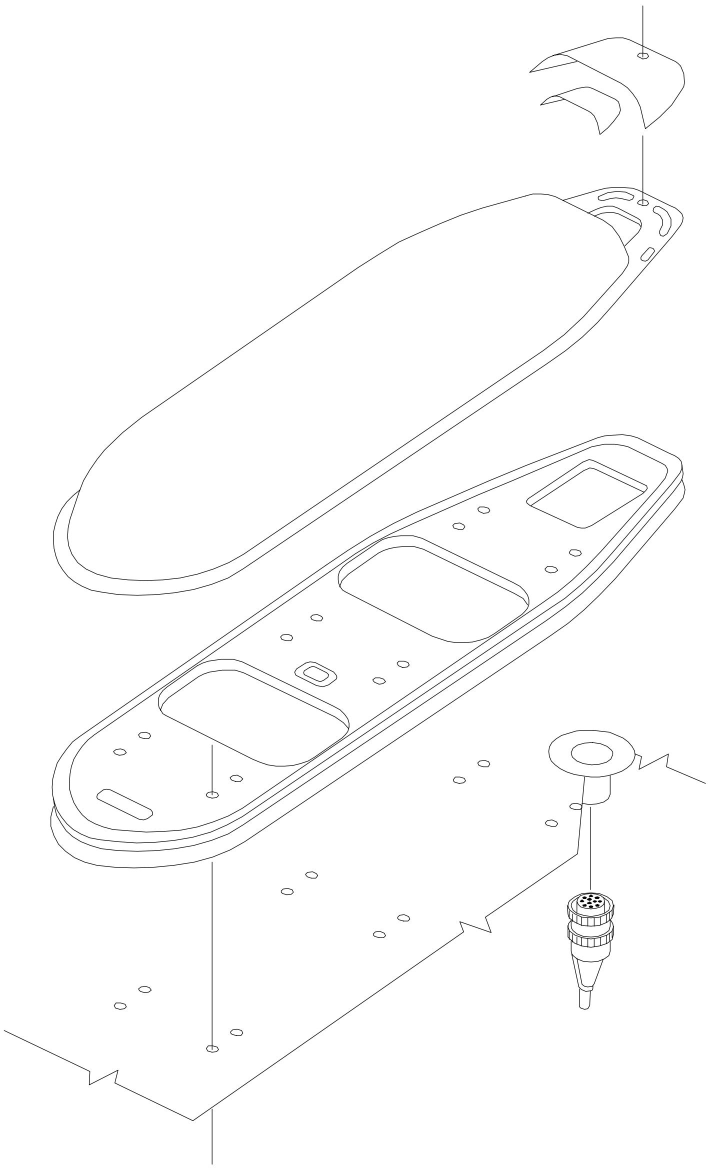
TOP MOUNTED HIGH GAIN ANTENNA

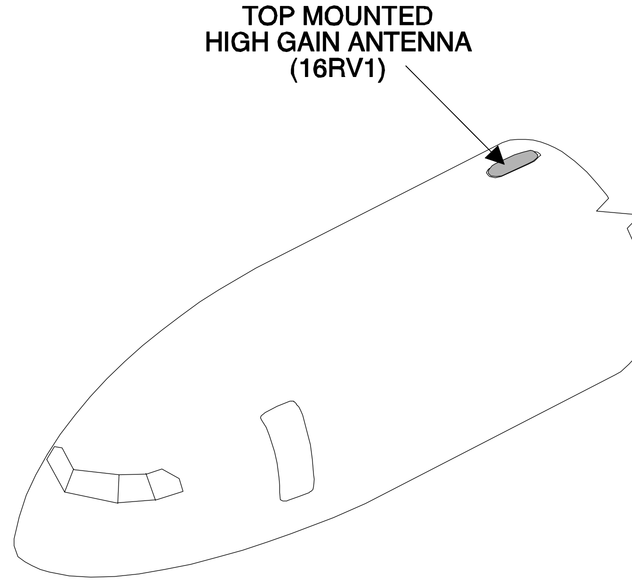
FIN/ZONE

FIN: 16RV1
Zone: 230

COMPONENT DESCRIPTION

The top mounted High Gain Antenna is mounted with an adapter plate on the fuselage. It is equipped with a J1 connector for connection with the BSU and a J2 connector for connection with the D/LNA.





FQW4200 GE Metric

Top Mounted High Gain Antenna

STUDENT NOTES

COCKPIT VOICE RECORDING PRESENTATION

Principle
Components
Control Unit

PRINCIPLE

The SOLID STATE COCKPIT VOICE RECORDER(SSCVR) records crew conversations and communications on SOLID STATE MEMORIES, in flight or on ground when at least one engine is running or up to 5 minutes after the last engine shut down.

This is the automatic mode.

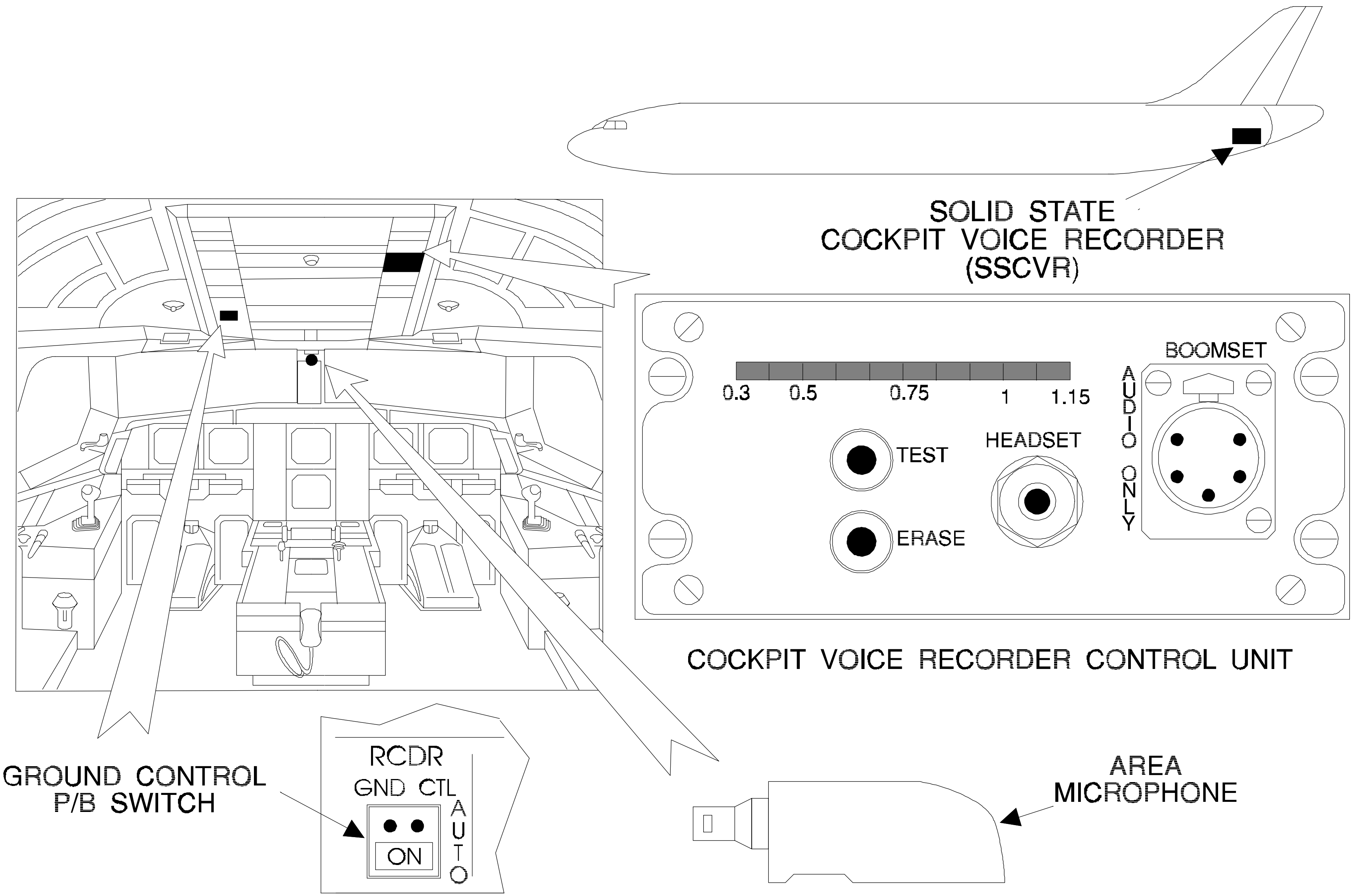
The SOLID STATE COCKPIT VOICE RECORDER (SSCVR) can operate in manual mode on the ground.

The SSCVR basically allows 30 minutes of recording, and 2 hours with MEMORY EXTENSION(+90 minutes).

COMPONENTS

The components of the COCKPIT VOICE RECORDING system are :

- The Solid State Cockpit Voice Recorder.
- The Cockpit Voice Recorder control unit, for manual control and monitoring of the CVR, on ground or in flight.
- The area microphone, located below the overhead panel, is used for recording direct crew conversations and aural warnings in the cockpit.
- The ground control pushbutton switch is used to energize the Solid State Cockpit Voice Recorder on ground for manual operation.



FQW4200 GE Metric

CONTROL UNIT

The front face of the CVR control unit features :

- a "TEST" pushbutton switch, for aural and visual monitoring, associated with,
- a "HEADSET" jack,
- a "BOOMSET" plug,
- and a "DISPLAY" for test results.

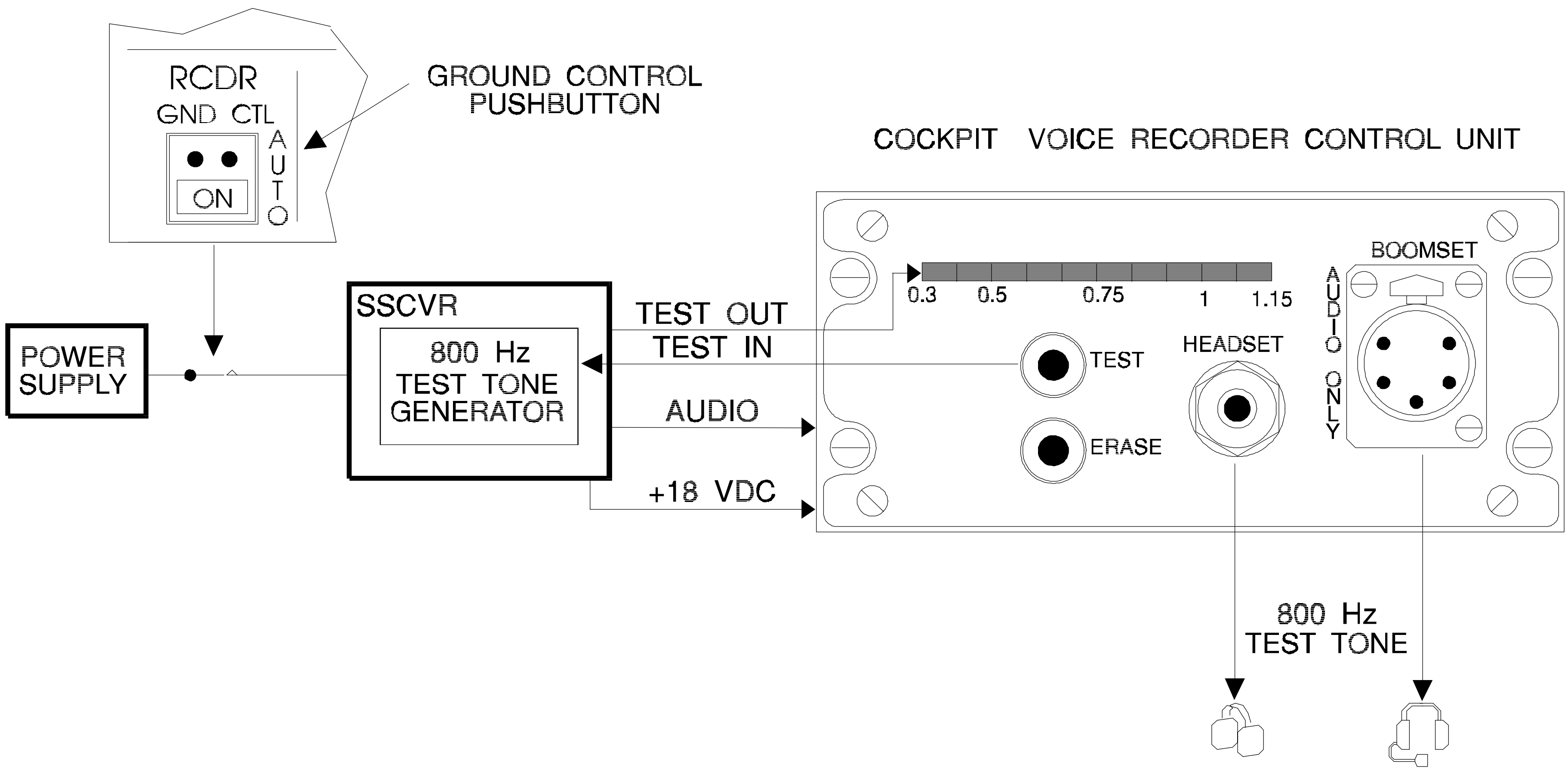
The SSCVR is automatically energized in flight or on ground, when at least one engine is running or for 5 minutes after last engine shut down.

For manual control, on the ground, the SSCVR has to be energized by pressing the Recorder Ground Control "RCDR GND CTL" pushbutton.

When the "TEST" pushbutton switch is pressed, a test tone is heard for approximately 1 to 2 seconds.

The "ERASE" pushbutton switch is used for manual erasure of recording, on ground only with engines stopped and parking breake "ON".
It must be pressed for at least two seconds.

For complete manual erasure of the tape, the CVR has to be energized.
The SSCVR is energized for 5 minutes after last engine stopped or when the "GROUND CONTROL" pushbutton is set to on.



FQW4200 GE Metric

STUDENT NOTES:

FQW4200 GE Metric

SSCVR SYSTEM D/O

Principle
System Architecture
Operation Control and Indicating

PRINCIPLE

The Solid State Cockpit Voice Recorder (SSCVR) is designed to record crew conversations and communications on SOLID STATE MEMORIES, in flight or on ground, and to preserve them in case of an aircraft accident.

The recordings are made in SOLID STATE MEMORIES which basically provides a 30 minutes recorded interval of continuous operation or 2 hours with memory extension (+90 minutes).

All data recorded 30 minutes or 2 hours ago is automatically erased by the recording of new data.

SYSTEM ARCHITECTURE

The SSCVR system consists of :

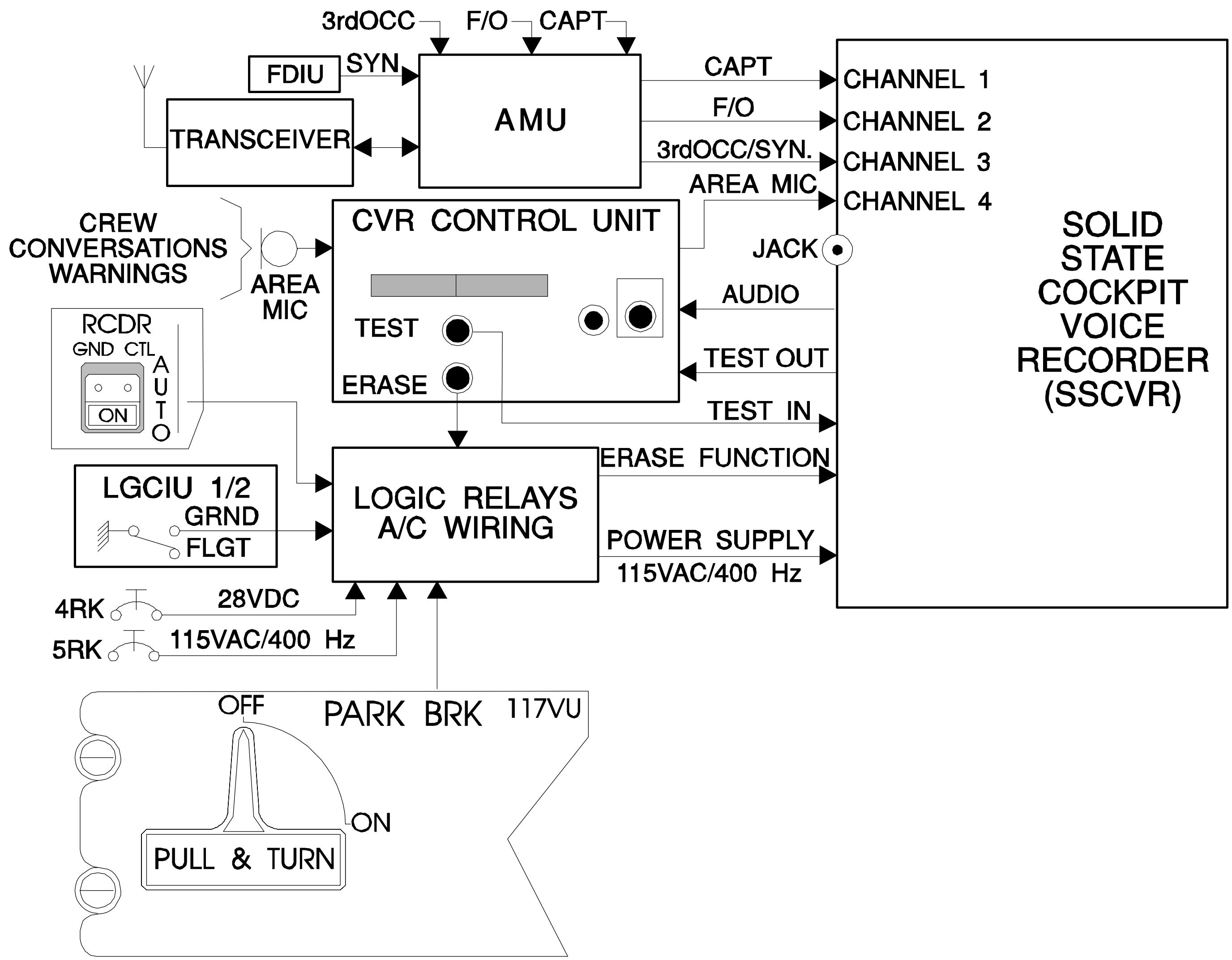
- A remote microphone to record direct conversations and warnings in the cockpit.
- A CVR Control Unit, located in the cockpit on the overhead panel.

The Cockpit Voice Recorder Control Unit provides power for the area microphone, filters and preamplifies the audio signals from the area microphone and allows the control and monitoring of the SSCVR through the ERASE and TEST pushbuttons.

- A SSCVR, located in the AFT pressurized equipment bay.

The SSCVR records all the transmitted and received radio communications, the Passenger Address announcements, the flight interphone conversations between flight crew members, all the aural warnings and the direct conversations in the cockpit.

- And a logic relays aircraft wiring system, composed of relays, the function of which is to allow the power supply of the SSCVR for normal, TEST or ERASE operation, under specific conditions.


3rdOCC
F/O
CAPT
FDIU
SYN
AMU
TRANSCEIVER
CAPT
F/O
3rdOCC/SYN.
AREA MIC
CHANNEL 1
CHANNEL 2
CHANNEL 3
CHANNEL 4
SOLID STATE COCKPIT VOICE RECORDER (SSCVR)
CREW CONVERSATIONS WARNINGS
AREA MIC
CVR CONTROL UNIT
TEST
ERASE
JACK
AUDIO
TEST OUT
TEST IN
RCDR
GND CTL
ON
AUTO
ERASE FUNCTION
LOGIC RELAYS A/C WIRING
LGCIU 1/2
GRND
FLGT
POWER SUPPLY
115VAC/400 Hz
4RK
28VDC
5RK
115VAC/400 Hz
OFF
PARK BRK
117VU
ON
PULL & TURN

OPERATION CONTROL AND INDICATING

The recording system consists of four identical recording channels.

All the channels are independent of each other.

The recorded audio signals from/to the Captain, the First Officer and the 3rd occupant go through the Audio Management Unit (AMU).

The crew conversations or warnings are recorded through the CVR Control Unit.

The Flight Data Interface Unit (FDIU) provides the SSCVR with the synchronization signal, via the AMU, added to the 3rd occupant audio signal.

A strap fitted on the rear connector of the AMU enables the selection between the FAA and the CAA recording options.

The FAA requires that all the transmitted or received communications are recorded.

In transmission, the side tone only is recorded.

The FAA requirements are almost the same as the CAA requirements, except that, in addition to the FAA, the noises picked up by the boomset and oxygen mask microphone must be recorded, even when the PTT is not activated.

POWER SUPPLY

To power the SSCVR, on ground or in flight, two modes are available : The automatic and the manual mode.

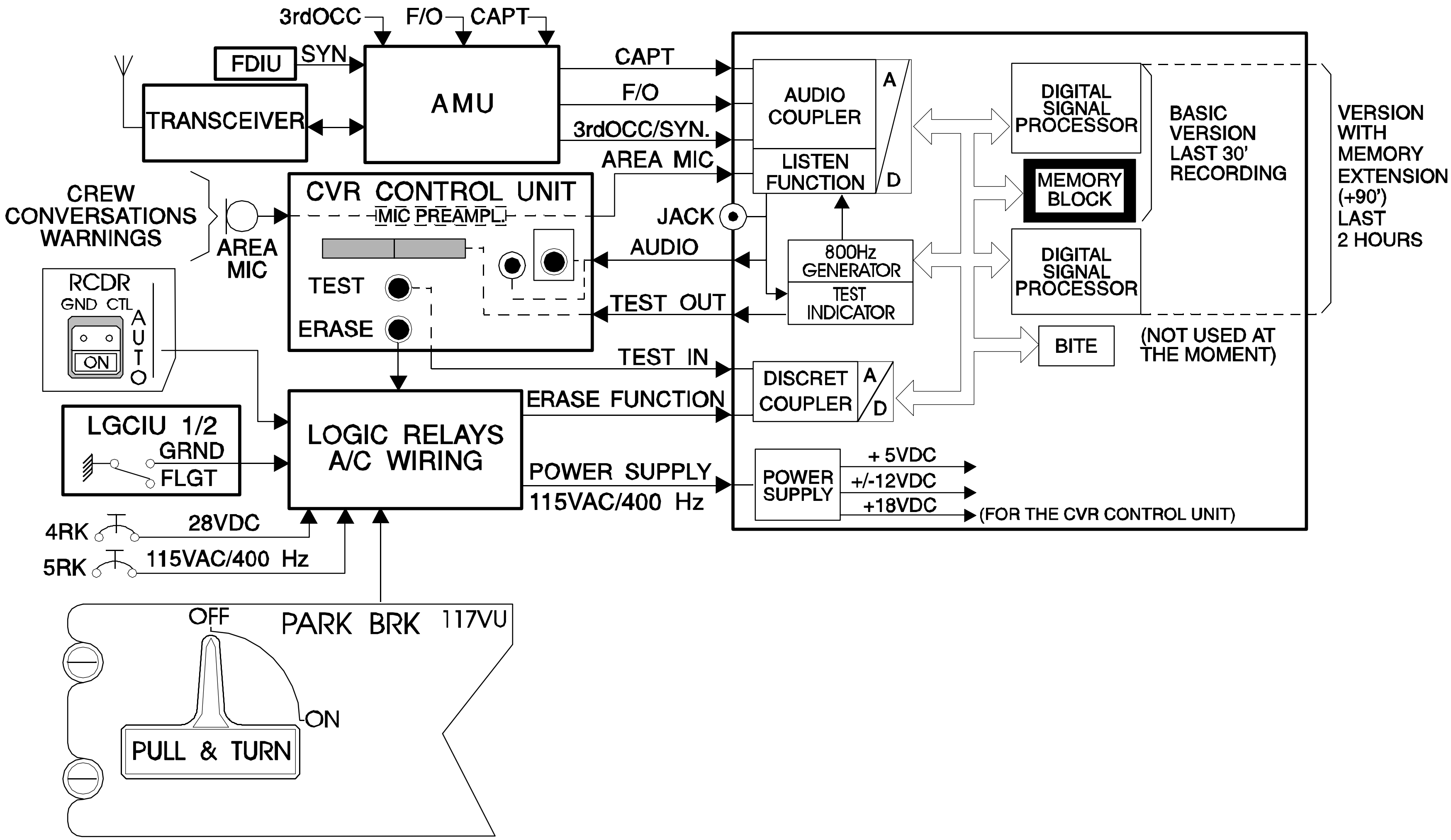
These two modes are conditioned by the logic relays aircraft wiring.

The SSCVR is automatically supplied with 115 VAC/400 Hz, when the aircraft is :

- On the ground, during the first 5 minutes of energization of the electrical network.
- On the ground, with at least 1 engine running.
- In flight.
- Or on the ground, up to 5 minutes after the last engine is stopped.

The manual selection of the power supply is done through the RECORDING GND CTL pushbutton.

The manual selection of the SSCVR power supply, on ground only, is used to test the SSCVR for correct operation, to record the checklist before one engine is started or to erase the SOLID STATE MEMORIES, if required.



FQW4200 GE Metric

TEST and MONITORING

The TEST and MONITORING functions are initiated from the CVR control unit.

They can be done on ground or in flight.

MONITORING FUNCTION

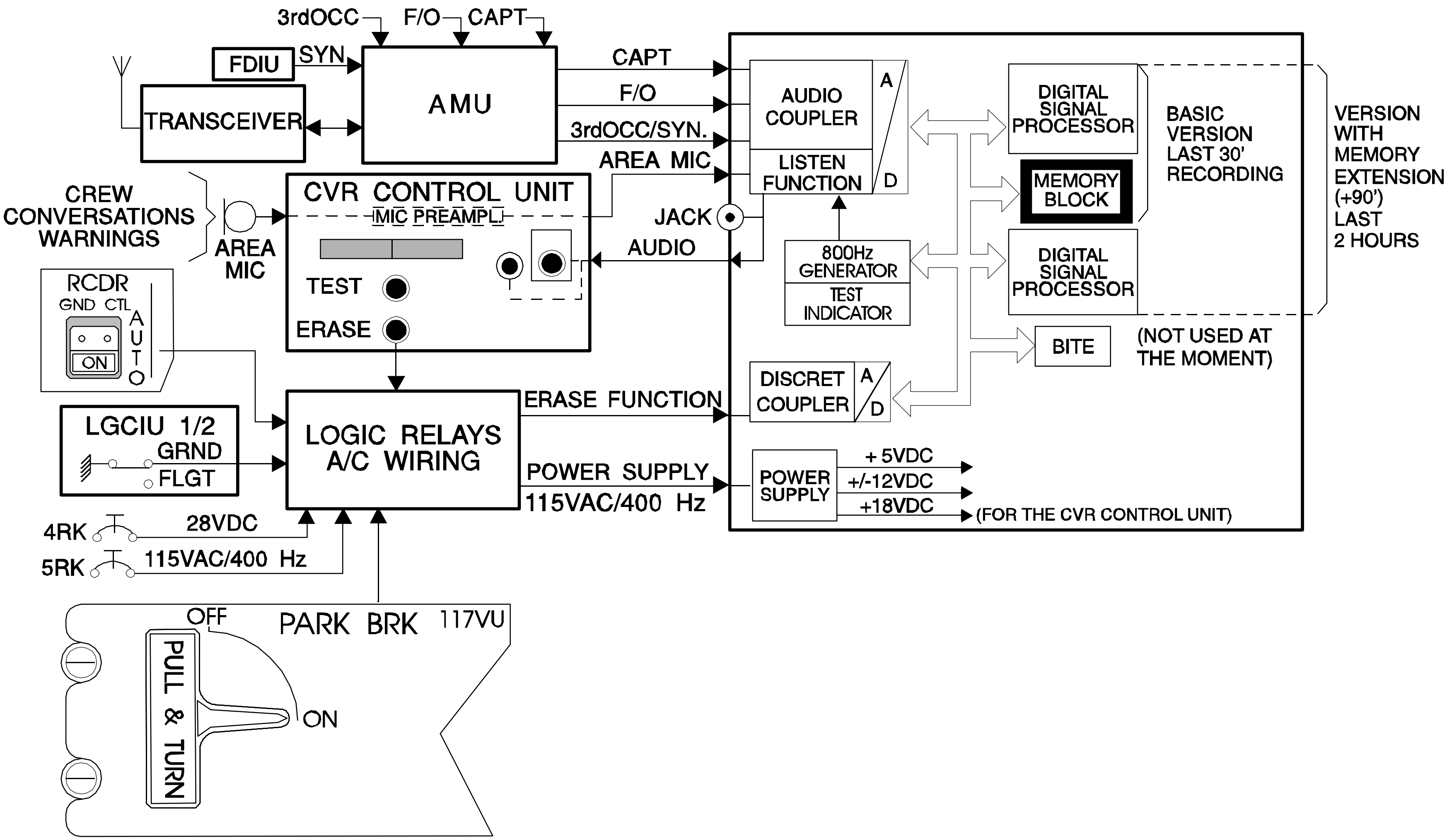
The monitoring of the four channels is possible by connecting a headset on the front face of the CVR Control Unit.
A 800 Hz tone is heard for 1 to 2 seconds.
The display is used for level signal control.

The monitoring can be performed by connecting a headset directly to the SSCVR.

ERASE FUNCTION

The ERASE function is manually initiated from the CVR Control Unit by pressing the ERASE pushbutton for at least 2 seconds.

The PARKing BRAKE must be on, the landing gear down and compressed.



FQW4200 GE Metric

STUDENT NOTES:

FQW4200 GE Metric

SSCVR COMPONENTS

Solid State Cockpit Voice Recorder
SSCVR Control Unit
Area Microphone

SOLIDE STATE COCKPIT VOICE RECORDER

FIN/ZONE

FIN: 2RK
ZONE: 172

COMPONENT DESCRIPTION

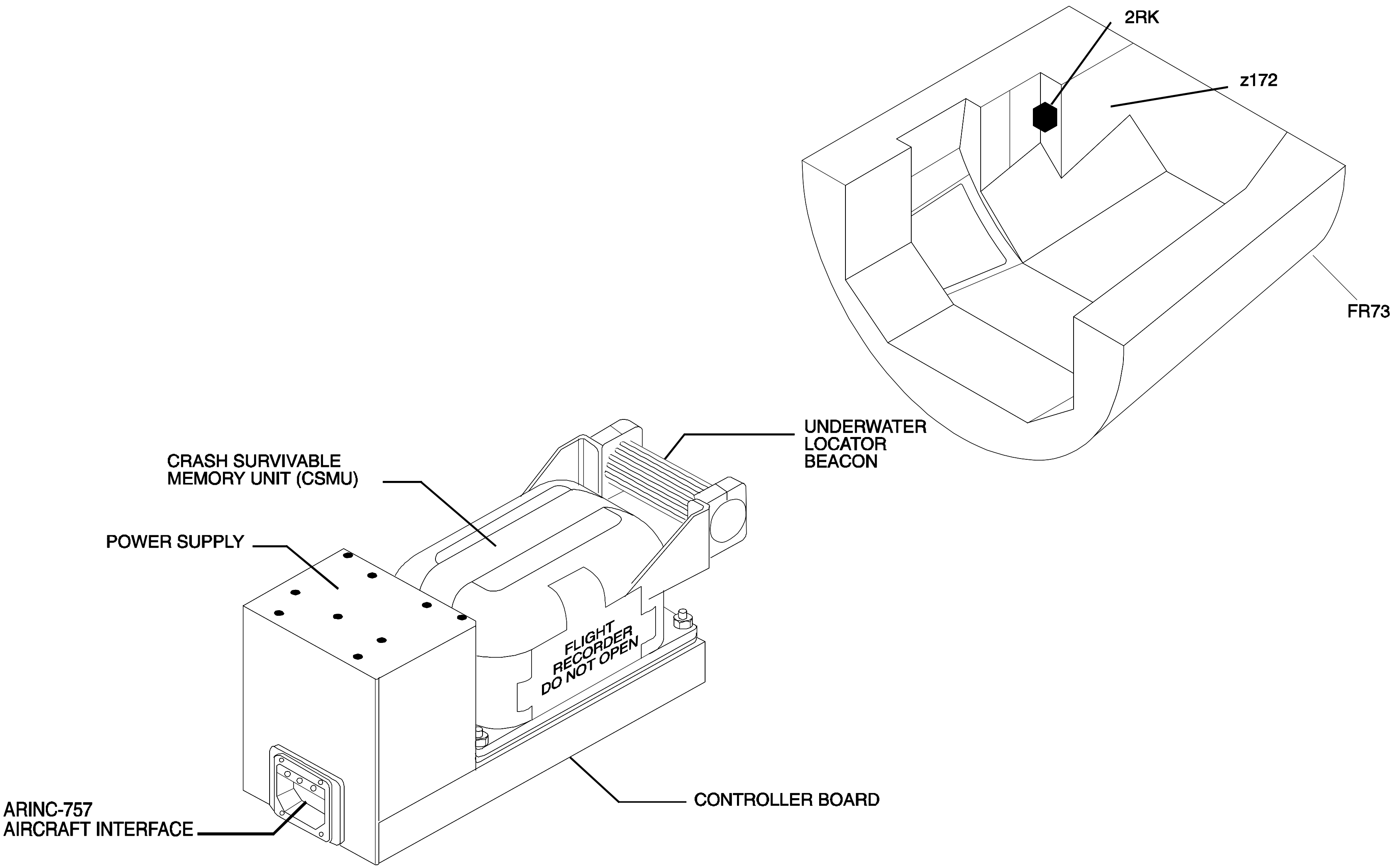
The SSCVR is a single Line Replaceable Unit (LRU).
The SSCVR chassis includes 3 Shop Replaceable Units (SRUs) and an optional underwater locating device.
SRUs include:
- Interface and Control Board (ICB)
- 115 VAC/28VDC Dual Voltage Power Supply (PS)
- Crash Survivable Memory Unit (CSMU)
- Underwater Locator Beacon (ULB)

REMOVAL/INSTALLATION

No specific tools are required to remove or install the SSCVR Unit.

SAFETY PRECAUTIONS

Carefully remove/install the SSCVR from/into the RACK.
Note: make sure that you do not damage the electrical connector pins.



FQW4200 GE Metric

SSCVR CONTROL UNIT

FIN/ZONE

FIN: 1RK
ZONE: 212

COMPONENT DESCRIPTION

The front face features:

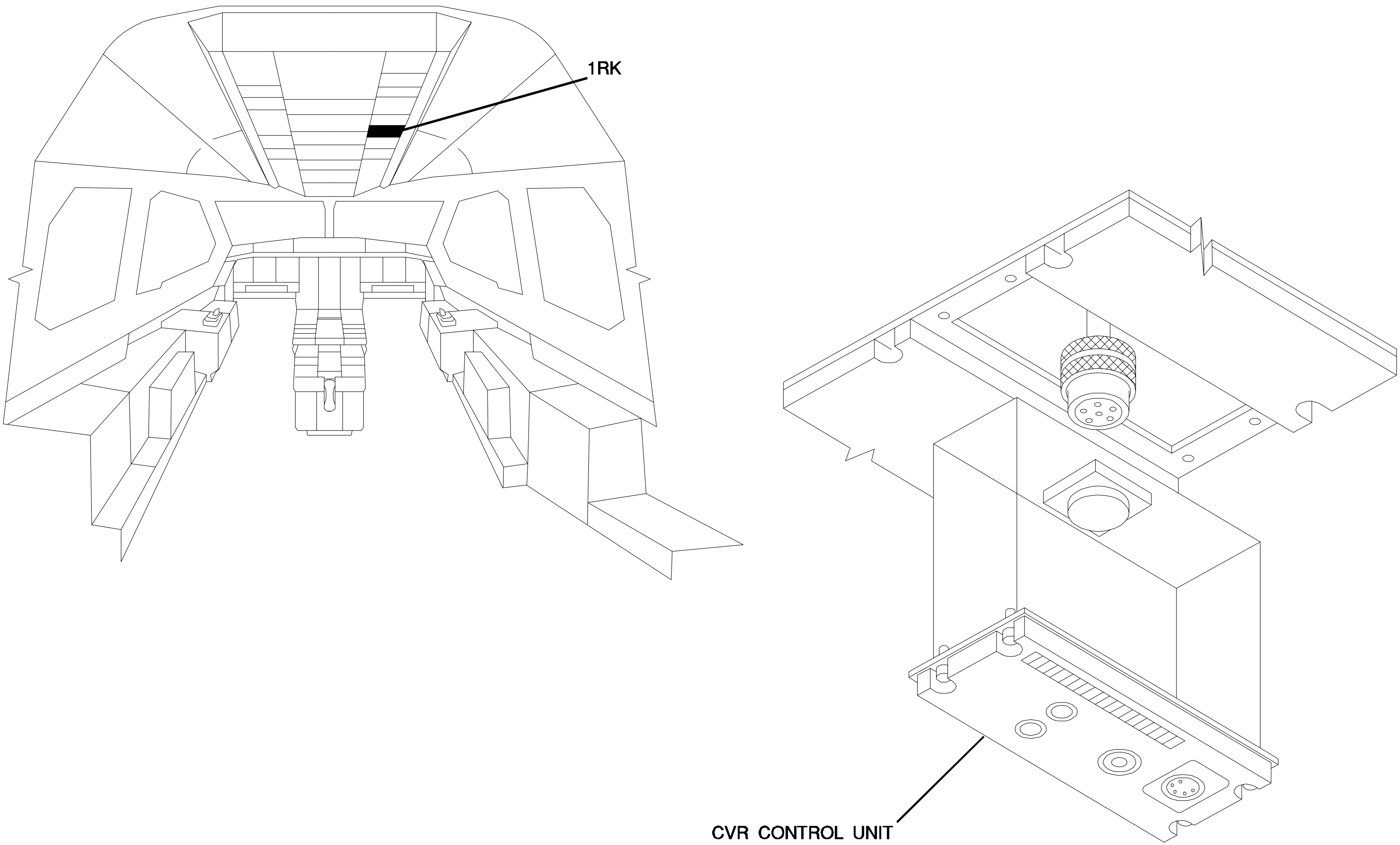
- a test pushbutton switch
- an erase pushbutton switch
- a led display for the test function
- a headset jack
- a boomset receptacle (AUDIO OUTPUT ONLY)

IN SITU TEST

The in situ test is performed when the test pushbutton of the SSCVR Control Unit is pressed. As a complementary procedure, you can perform the operational test of the SSCVR Control Unit (Refer to the AMM task 23-71-00-710-801).

REMOVAL/INSTALLATION

No specific tools are required for the removal/installation of the SSCVR Control Unit



FQW4200 GE Metric

AREA MICROPHONE

FIN/ZONE

FIN: 14RK
ZONE: 210

COMPONENT DESCRIPTION

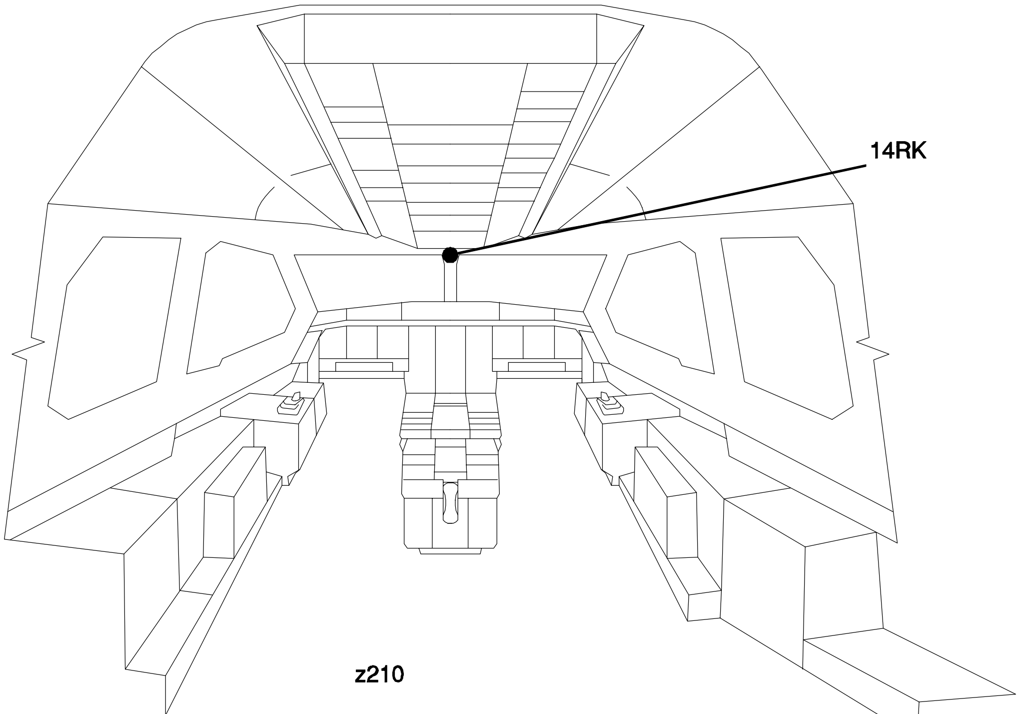
The remote microphone 14RK is a capacitor-type microphone.

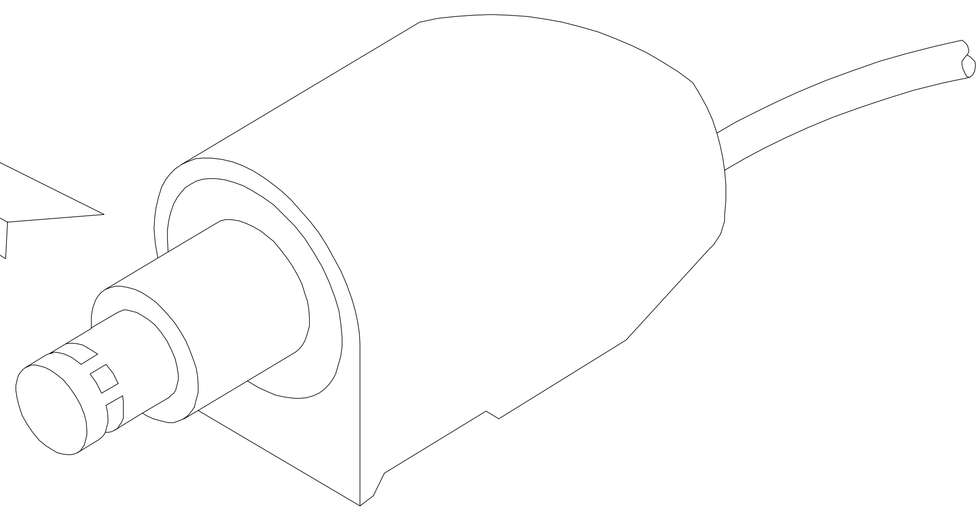
IN SITU TEST

No in situ test is possible. But the SSCVR microphone can be checked through the operational test of the SSCVR recording logic (only the operational test of the FLT/GRND power supply of the SSCVR). Refer to the AMM subtask 23-71-00-710-802.

REMOVAL/INSTALLATION

No specific tools are required for the removal/installation.





FQW4200 GE Metric

AREA MICROPHONE

STUDENT NOTES