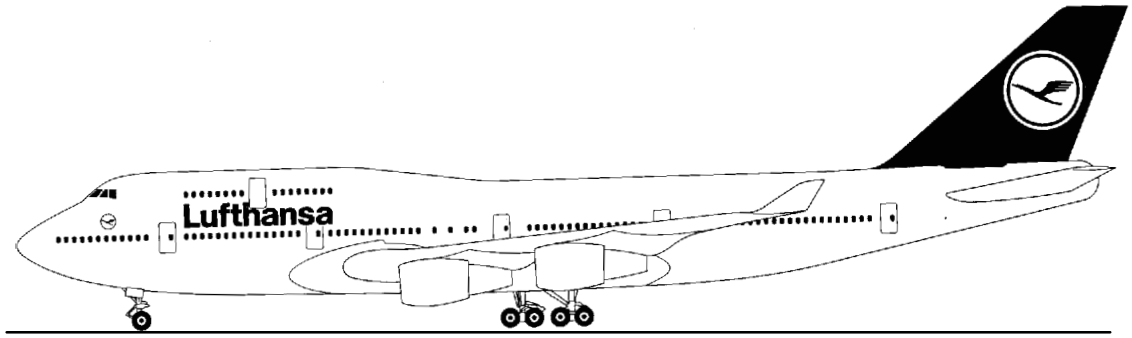
Lufthansa Technical Training

Training Manual B 747-400



ATA 23-42
CABIN INTERPHONE

ATA Spec 104 Level 3

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ATA 23-42 CABIN INTERPHONE

CABIN INTERPHONE SYSTEM

The cabin interphone system (CIS) is a communication system which connects attendant stations with:

- The flight deck
- Other attendant stations

The cabin interphone system is part of the advanced cabin entertainment and service system (ACESS).

Figure 1 CABIN INTERPHONE SYSTEM - INTRODUCTION

CABIN INTERPHONE SYSTEM

General Description

The cabin interphone system (CIS) lets the attendants communicate with;

- Other attendants
- The flight crew

Attendants use the cabin interphone handsets (CIHs) to call other attendants or the flight deck. There is a CIH at each attendant station. The flight crew uses the pilots' call panel (PCP) to call an attendant station. To talk with the attendant at the station, the pilots use the:

- Flight deck handset (FDH)
- Flight interphone system

Attendant to Attendant Calls

To make a call, an attendant enters a dial code at the CIH. This code goes through the local area controller (LAC) to the cabin interphone controller (CIC). The CIC tells the passenger address controller (PAC) to sound a chime at the called attendant station. The CIC also tells the LAC to

light a call light at the called attendant station. When an attendant at the called station takes the CIH out of its holder, the CIH is active (the CIH goes off-hook). When this occurs, the CIC connects the two CIHs so that the attendants can talk to each other.

Attendant to Flight Deck Calls

When an attendant calls the flight deck, the dial code goes through the LAC to the CIC. The CIC then causes:

- The modularized avionics and warning electronics assembly (MAWEA) to sound a chime in the flight deck
- The PCP to show a message
- The CAB INT call light on-the audio control panels (ACPs) to come on

When the pilot takes the FDH off-hook, the CIC connects the call so that the attendant can talk with the pilot. The Pilot can also use the flight interphone system to talk with the attendant.

Flight Deck to Attendant Calls

To call an attendant station, the pilot enters a dial code on the PCP. This causes a chime to sound and a call light to come on at the attendant station. The pilot then talks to the attendant with the FDH or through the flight interphone system.

Normal/Alternate Circuit

The CIC has these two fully redundant circuits:

- Normal
- Alternate

Each circuit can do all CIC functions. Usually, the normal circuit is on. If the normal circuit becomes defective, the CCTM has a switch which can make the alternate circuit come on.

Passenger Address Announcements

When an attendant enters a passenger address dial code on a CIH, the CIC sends the audio from the CIH to the PAC. The CIC also tells the PAC the area for the announcement. The passenger address system sends the audio to the speakers in that area.

Ground Crew Call

To call the ground crew, the flight crew enters the ground crew call dial code on the PCP. This causes the horn on the nose wheel well to sound.

Video In Use

The PCP shows VIDEO IN USE when the video system is on.

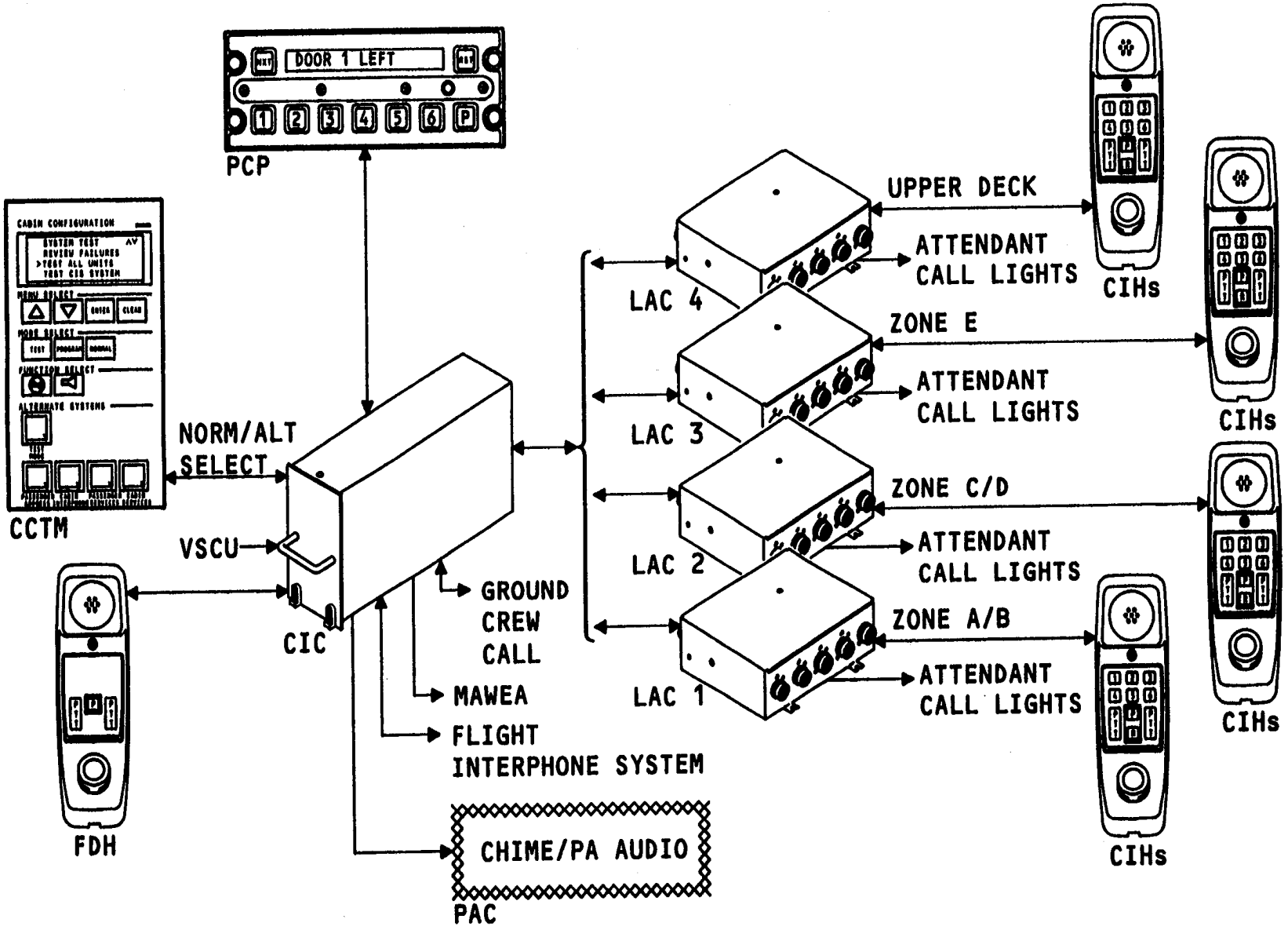

Figure 2 CABIN INTERPHONE SYSTEM

COMPONENT LOCATIONS - FLIGHT DECK

These components are located in the flight deck:

- Pilots' call panel
- Flight deck handset
- Interphone cabin circuit breaker

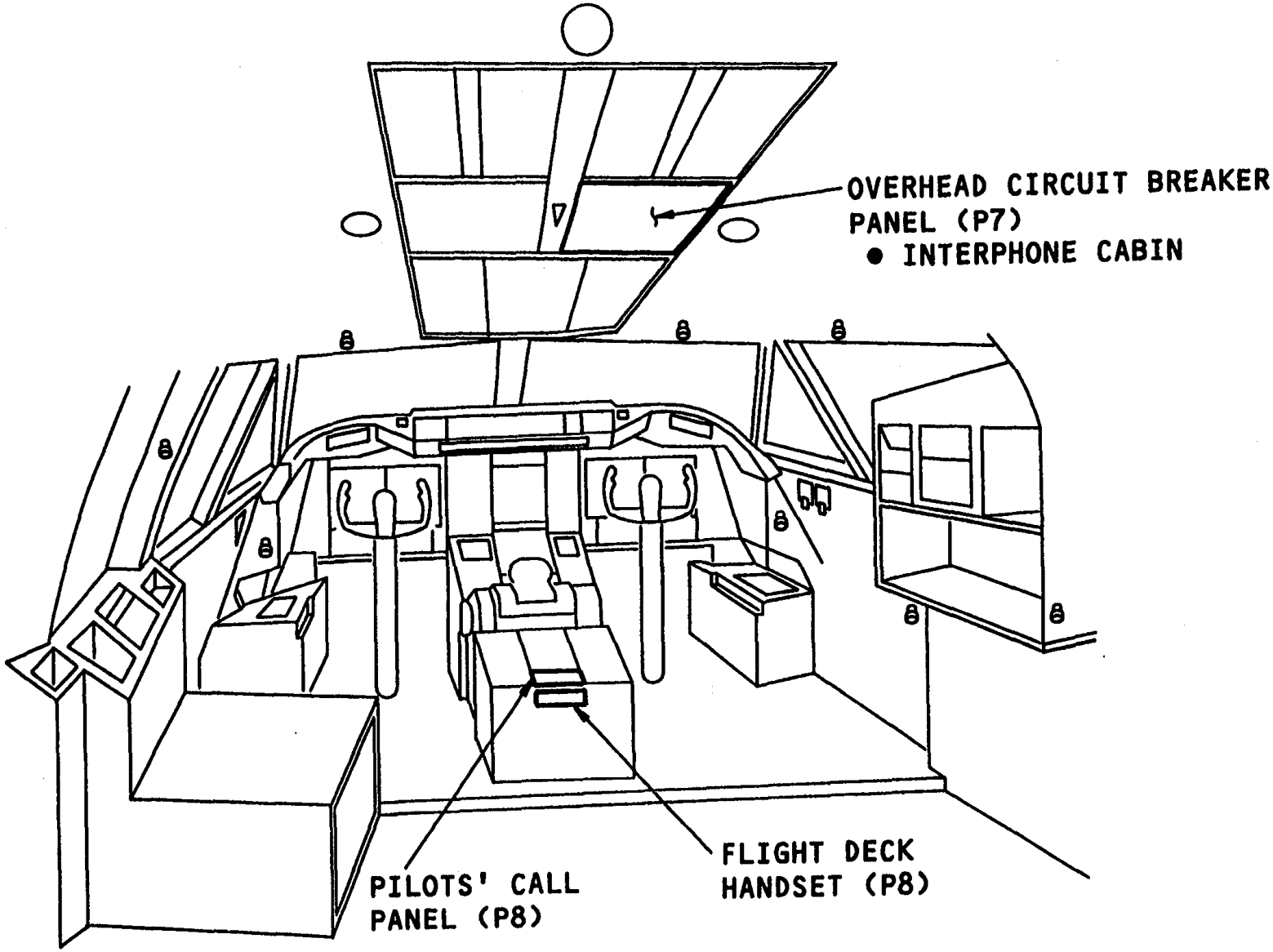

Figure 3 COMPONENT LOCATIONS - FLIGHT DECK

COMPONENT LOCATIONS - MEC

The cabin interphone controller is in the main equipment center.

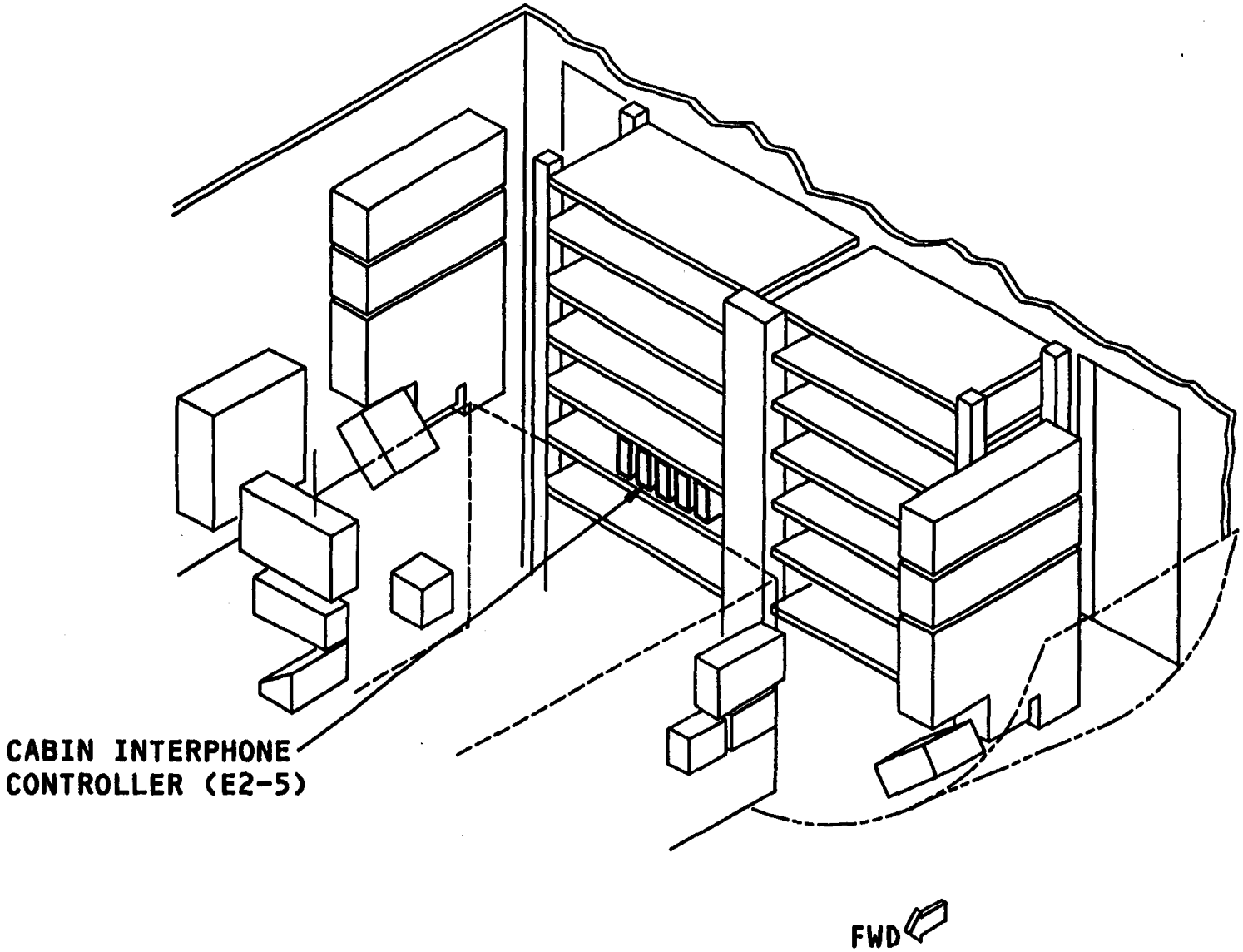

Figure 4 COMPONENT LOCATIONS - MEC

COMPONENT LOCATIONS - CABIN - 1

These components are in the passenger cabin:

- Local Area Controller 1
- Local Area Controller 2
- Local Area Controller 3
- Local Area Controller 4

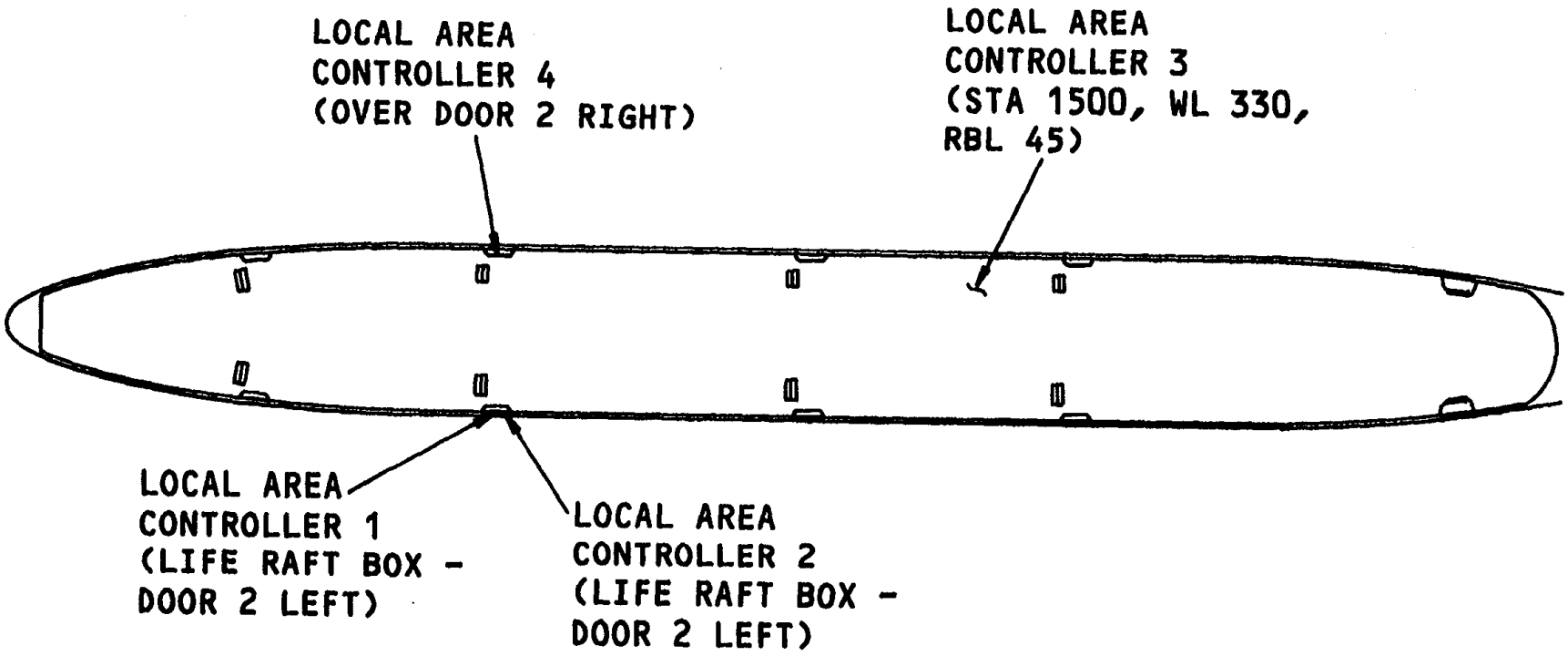

Figure 5 COMPONENT LOCATIONS - CABIN - 1

COMPONENT LOCATIONS - CABIN - 2

These components are in the passenger cabin:

- Cabin interphone handsets (on cabin interphone panels)
- Cabin configuration test module (CCTM)

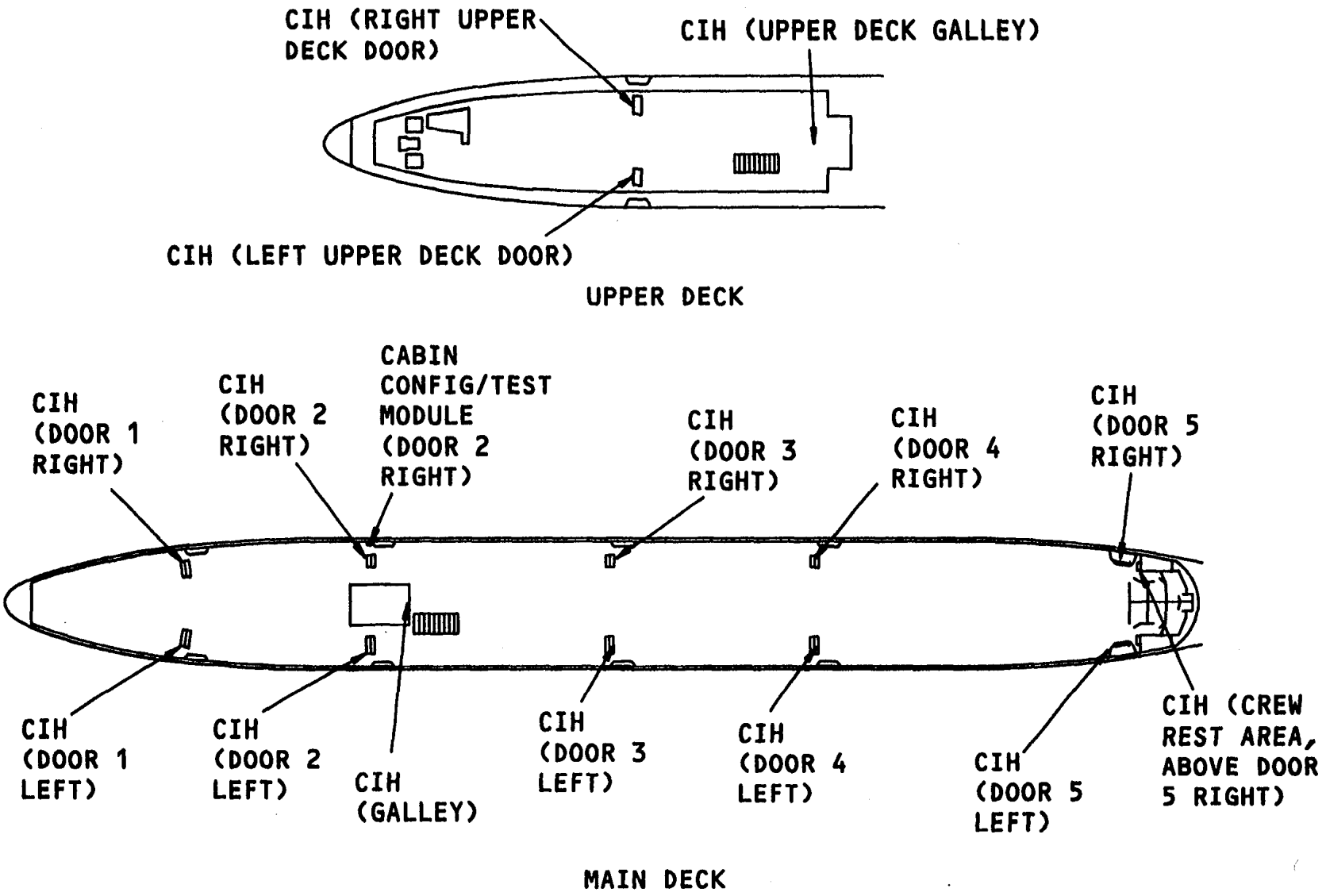

Figure 6 COMPONENT LOCATIONS - CABIN - 2

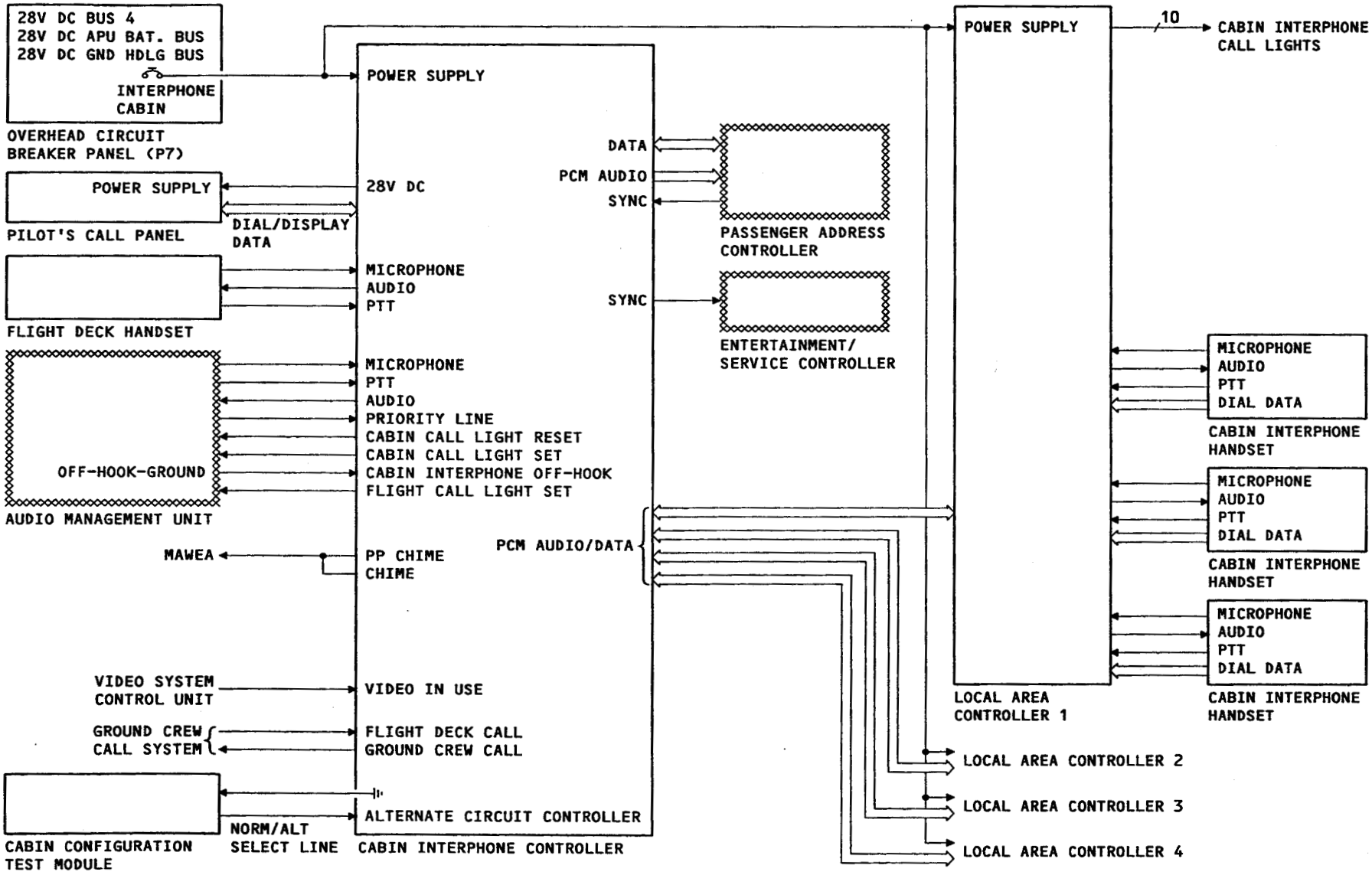

Figure 7 CIS - INTERFACE DIAGRAM

POWER INTERFACE

The cabin interphone circuit breaker sends 28v dc to the cabin interphone controller (CIC) and the local area controllers. The CIC sends 28v dc to the pilots' call panel.

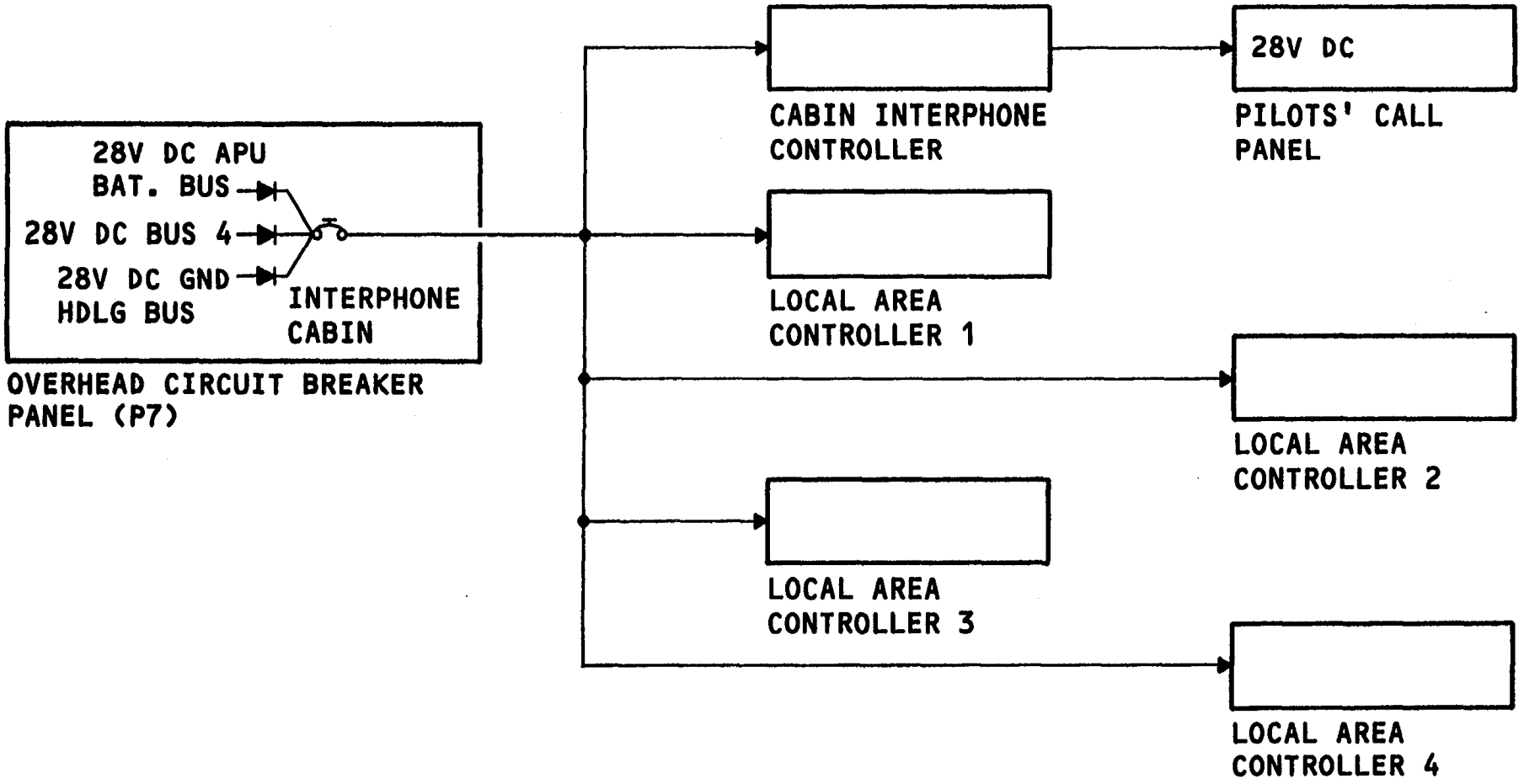

Figure 8 POWER INTERFACE

LAC INTERFACES

General Description

The local area controllers (LACS) have interfaces with up to five attendant stations. Each attendant station has:

- Cabin interphone handset (CIH)
- Attendant call light

Interfaces

LAC 1 has interfaces with stations at:

- Door 1 left
- Door 1 right
- Door 2 galley

LAC 2 has interfaces with stations at:

- Door 2 left
- Door 2 right
- Door 3 left
- Door 3 right

LAC 3 has interfaces with stations at:

- Door 4 left
- Door 4 right
- Door 5 left
- Door 5 right
- Door 5 overhead crew rest area

LAC 4 has interfaces with stations at:

- Left upper deck door
- Right upper deck door
- Upper deck galley

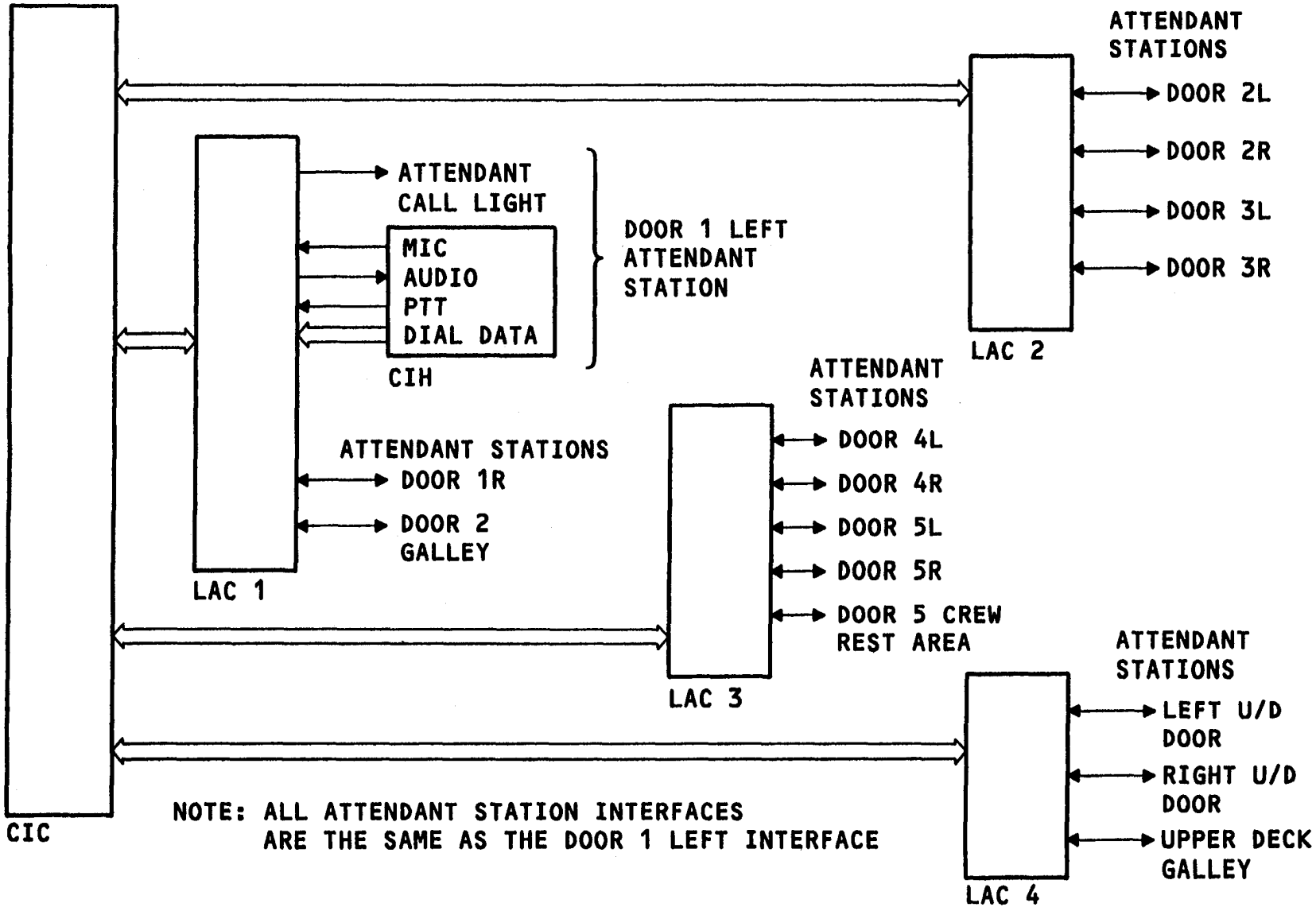

Figure 9 LAC INTERFACES

CABIN INTERPHONE CONTROLLER INTERFACE

The cabin interphone controller (CIC) has interfaces with these cabin interphone system (CIS) components:

- Pilots' call panel (PCP)
- Flight deck handset (FDH)
- Cabin configuration and test module (CCTM)
- Local area controllers (LACs)

The CIC has interfaces for CIS with the:

- Audio Management Unit (AMU)
- Modularized avionics and warning electronics assembly (MAWEA)
- Passenger address controller (PAC)
- Video system control unit (VSCU)

The CIC has interfaces for functions that are not part of CIS-with:

- Entertainment/service controller (ESC)
- Ground crew call system

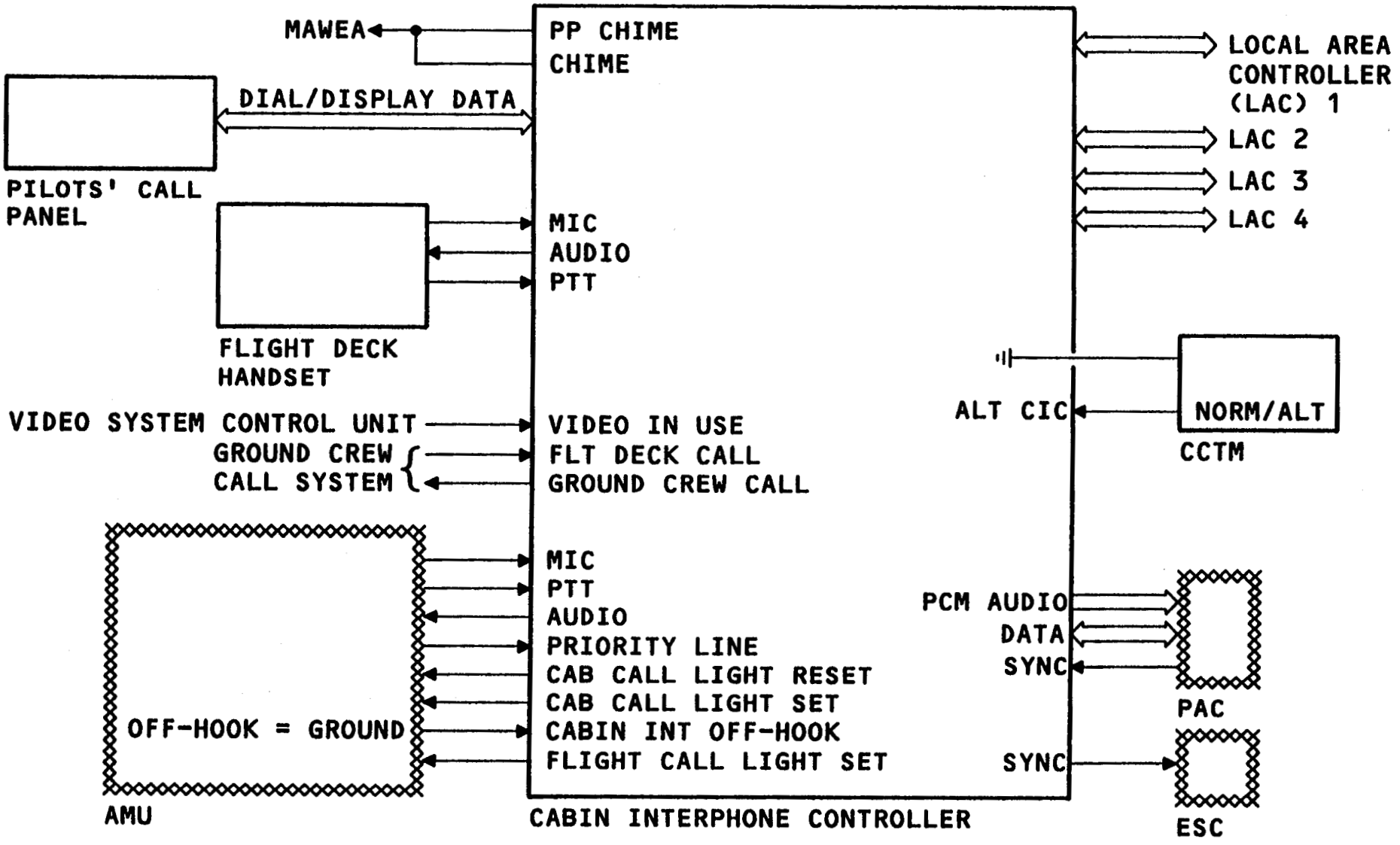

Figure 10 CABIN INTERPHONE CONTROLLER INTERFACE

CABIN INTERPHONE HANDSET

Purpose

The cabin interphone handsets (CIHs) let the attendants use the cabin interphone system and make announcements through the passenger address system.

General Description

There are seven dial code buttons on each cabin interphone handset. Use these buttons to dial two-digit station code$. Use the button labeled R to end a call. Use the PTT buttons only for passenger address announcements.

An electrical cord connects the cabin interphone handset to the cabin interphone panel.

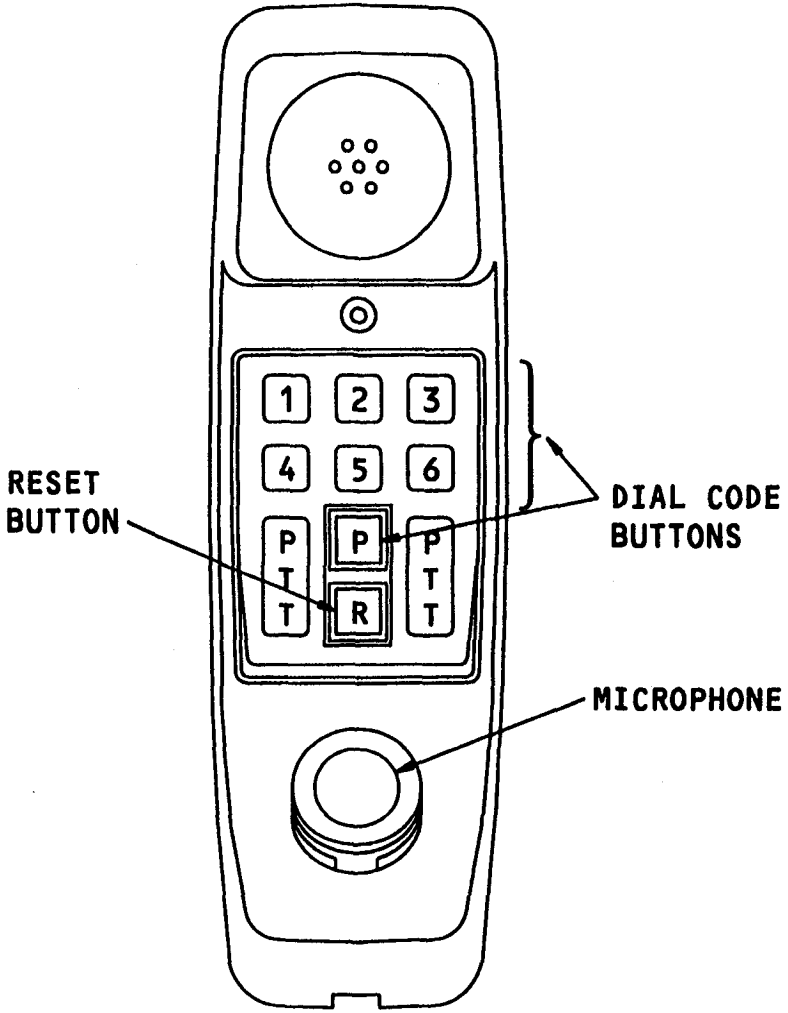

Figure 11 CABIN INTERPHONE HANDSET

CABIN INTERPHONE PANEL

Purpose

The cabin interphone panels hold the cabin interphone handsets (CIHs). When a CIH is in its holder, it is in the onhook condition.

General Description

Each cabin interphone panel has an electrical connector which connects the cabin interphone handset to the airplane wiring. Four screws hold the cabin interphone panel in place.

There is a magnet in the cabin interphone panel. This magnet removes power from the CIH microphone line when the handset is in the holder (on-hook).

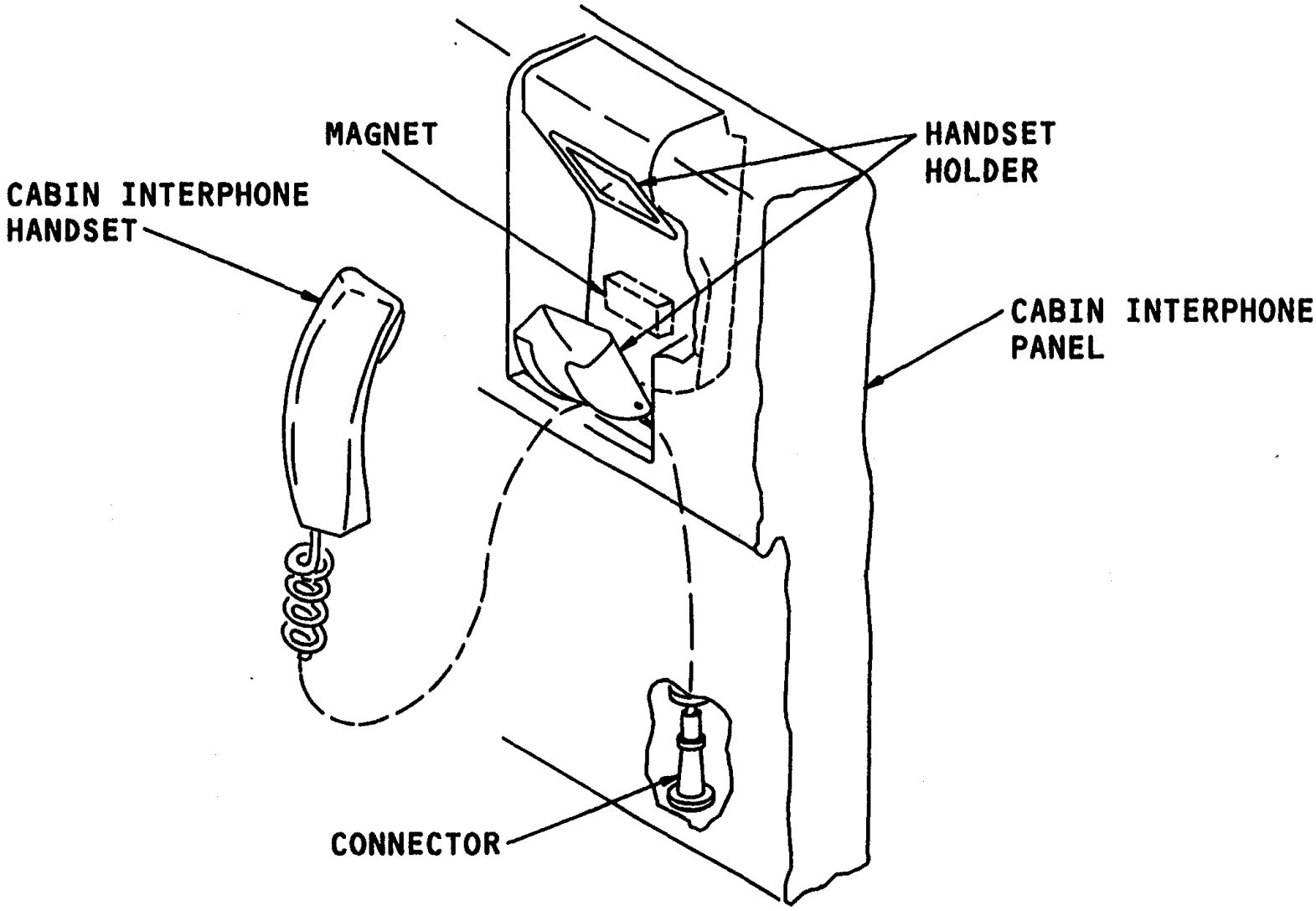

Figure 12 CABIN INTERPHONE PANEL

LOCAL AREA CONTROLLER

Purpose

The local area controller (LAC) is a multiplexer/demultiplexer which connects the cabin interphone controller (CIC) with up to five cabin interphone handsets (CIHs) and 10 attendant call lights.

General Description

A LAC gets analog audio and digital dial codes from the cabin interphone handsets. It multiplexes these signals and sends them to the cabin interphone controller (CIC).

The LAC gets digital data from the cabin interphone controller. This data has digital audio and call connection data. The LAC converts the digital audio from the cabin interphone controller into analog audio. It sends the analog audio to the correct cabin interphone handset. It also makes the correct attendant call lights come on.

Characteristics

The dimensions of the local area controller are:

- Length: 10 inches
- Width: 8.75 inches
- Height: 4.5 inches

There are eight connectors labeled J1 through J8. There are no external controls or indicators.

The LAC needs the configuration database to operate correctly.

CAUTION: STATIC SENSITIVE. DO NOT HANDLE BEFORE READING PROCEDURE FOR HANDLING ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (REP 20-41-02/201). CONTAINS DEVICES THAT CAN BE DAMAGED BY STATIC DISCHARGE.

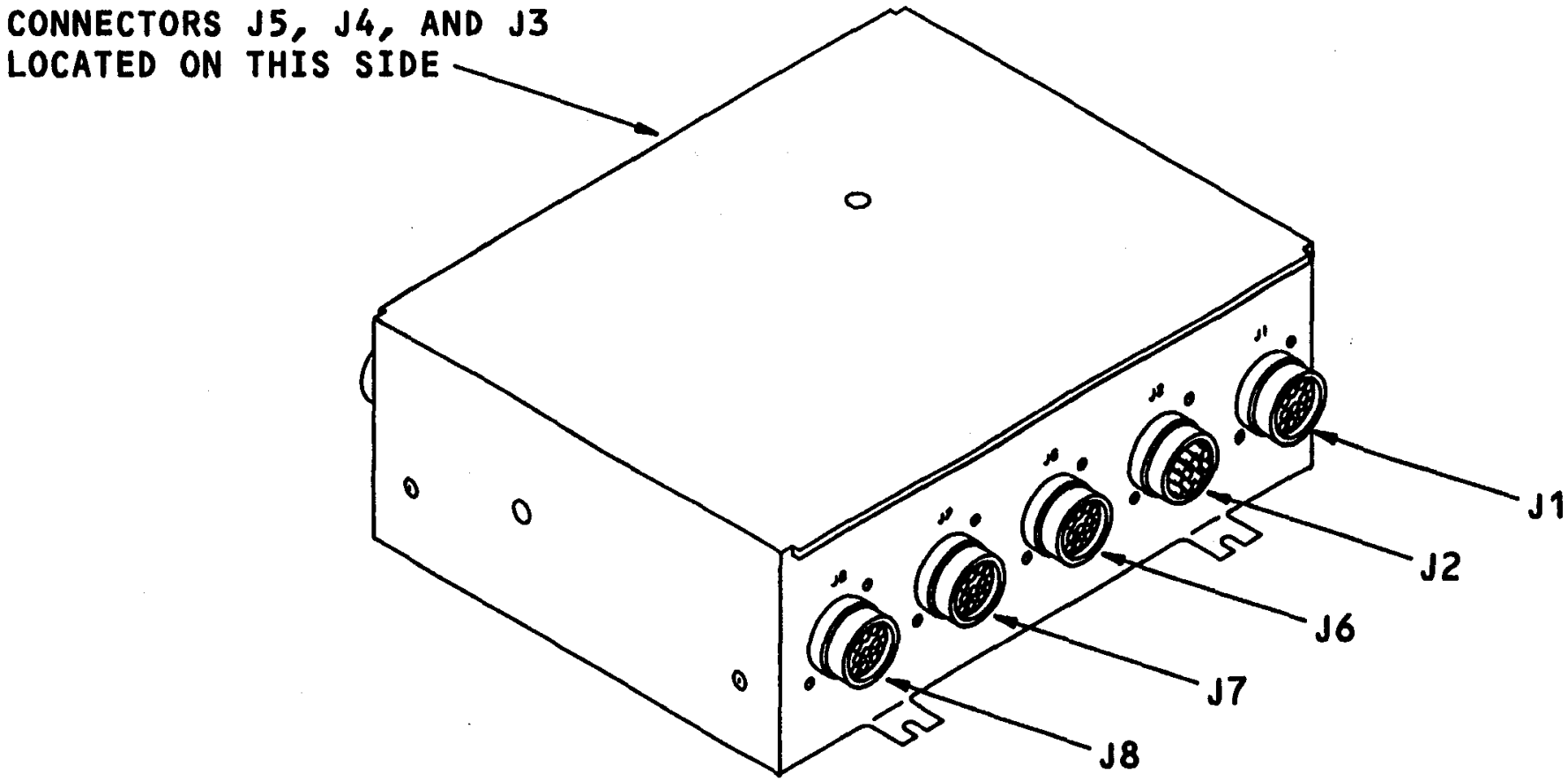

Figure 13 LOCAL AREA CONTROLLER

CABIN INTERPHONE CONTROLLER

Purpose

The cabin interphone controller (CIC) is the central digital multiplexer/ demultiplexer for the cabin interphone system (CIS). All CIS calls go through the CIC.

General Description

The cabin interphone controller (CIC):

- Sends a dial tone to a handset when it is removed from its holder.
- Senses and decodes dial codes from the cabin interphone handsets and the pilots' call panel.
- Alerts a station of a call. To do this, it tells the local area controllers to make the appropriate attendant call light come on, and tells the passenger address controller to sound a chime in the called station area.
- Makes all digital connections between stations.
- Stores up to four flight deck call messages and sends them to the pilots' call panel.

Characteristics

The cabin interphone controller is three MCU (modular concept unit) in size.

The CIC needs the configuration database to operate correctly.

There are two fully redundant circuits inside the cabin interphone controller:

- Normal
- Alternate

Only one of the circuits is on at a time.

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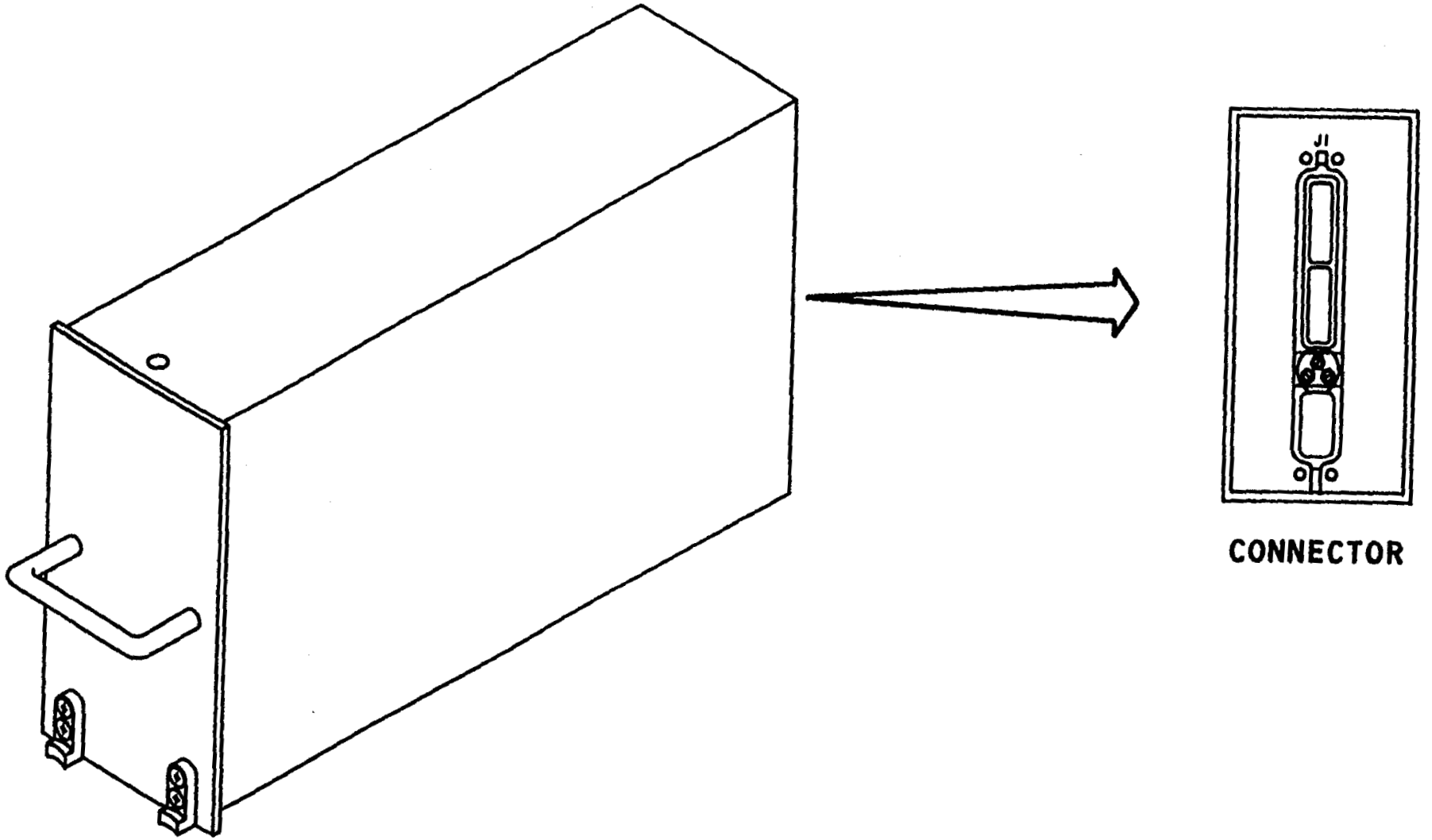


Figure 14 CABIN INTERPHONE CONTROLLER

ATTENDANT CALL LIGHTS

There is a pink attendant call light at each attendant station that has a cabin interphone handset. It comes on when the station gets a cabin interphone call.

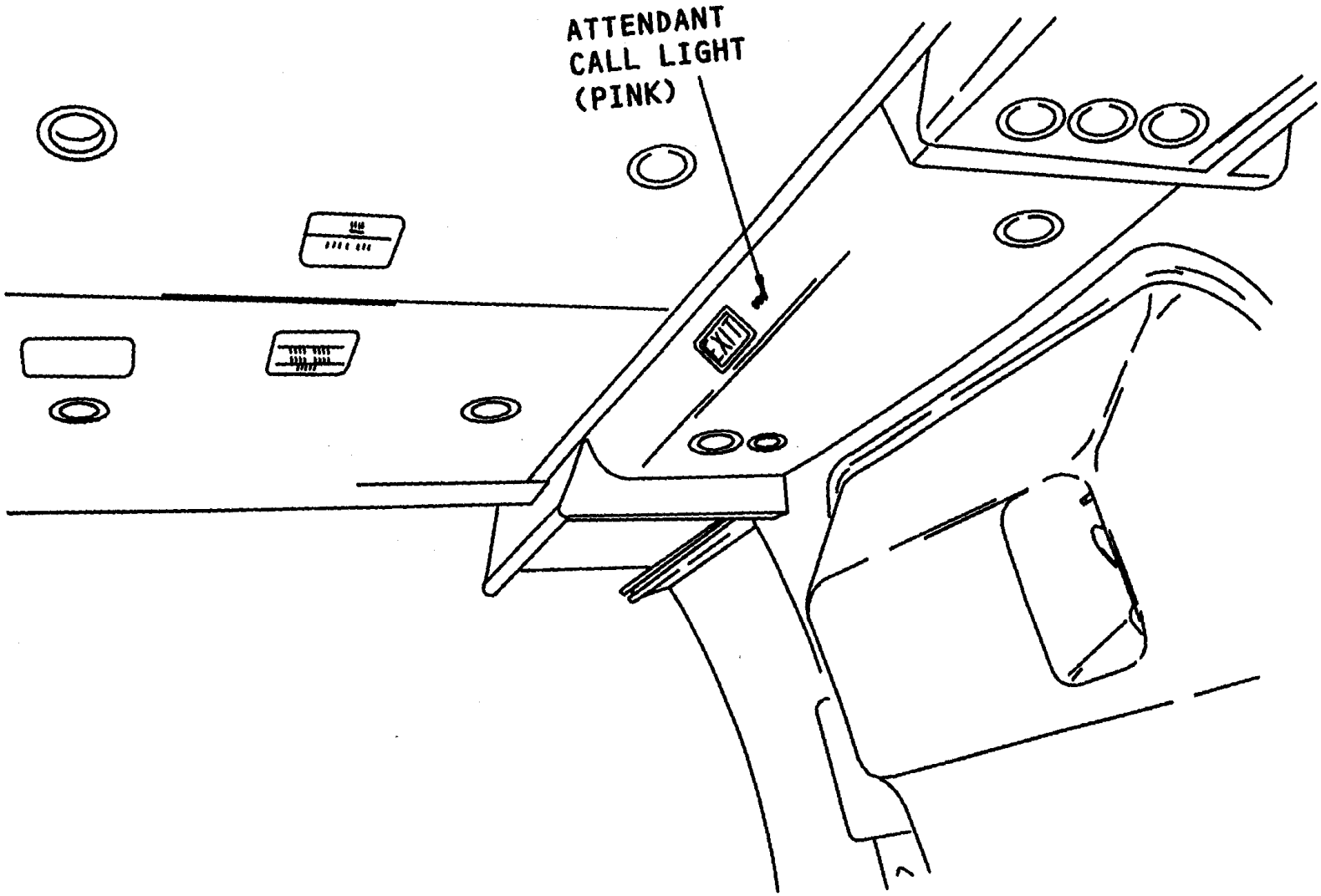


Figure 15 ATTENDANT CALL LIGHTS

FLIGHT DECK HANDSET

Purpose

The flight deck handset (FDH) lets the flight crew talk on the cabin interphone system and make announcements through the passenger address system.

General Description

Use the button labeled R to stop a call. Use the PTT buttons only for passenger address announcements.

An electrical cord connects the cabin interphone handset to the cabin interphone panel.

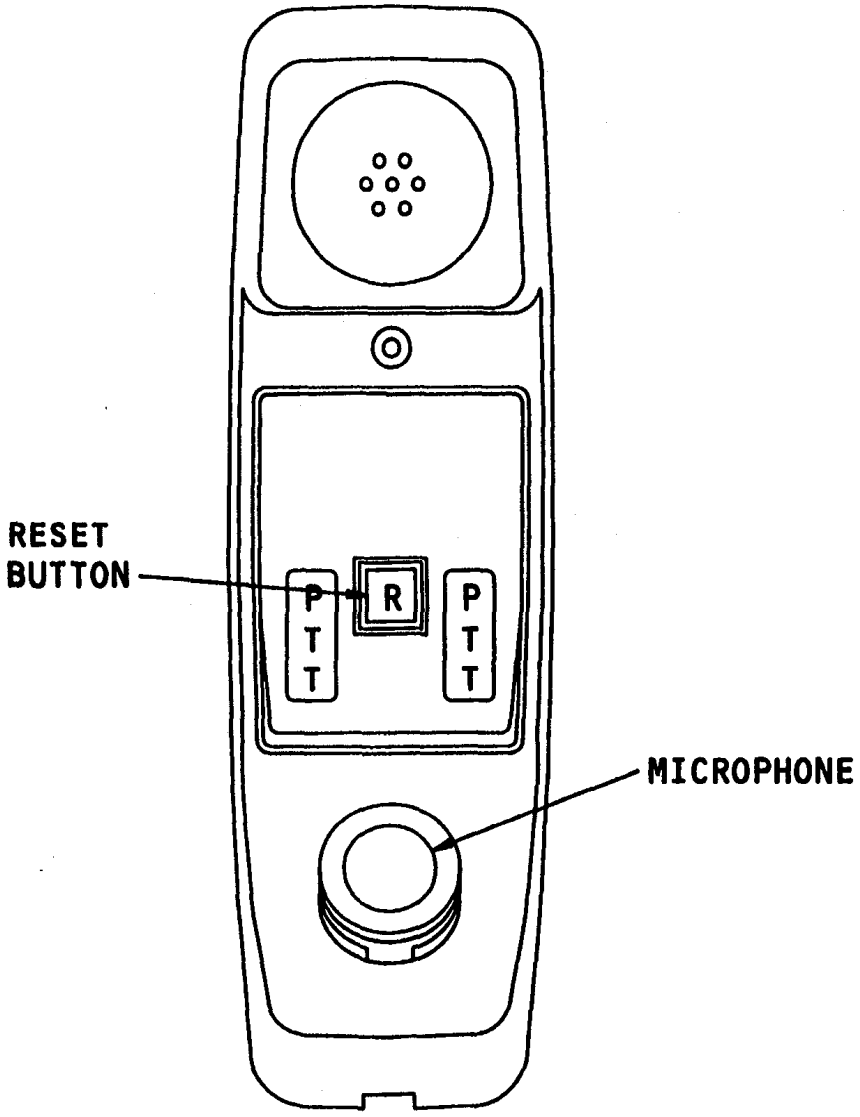


Figure 16 FLIGHT DECK HANDSET

PILOTS' CALL PANEL

Purpose

The pilots' call panel (PCP);

- Lets the flight crew dial cabin interphone calls
- Shows calls to the flight deck on the display
- Shows a complete directory with all possible two-digit dial codes

Characteristics

The PCP has a 16-character LED display and 9 momentary buttons.

An external light sensor monitors ambient light in the flight deck. The input from the ambient 1 light sensor controls the display brightness.

General Operation

Use buttons one through six and P to dial two-digit Station codes on the cabin interphone system.

When there is more than one flight deck call, push NXT to cause the display to show the next call message in memory (up to a maximum of four?.

When there are no flight deck calls, push NXT to show the directory of the station dial codes.

Push the RST button to stop any call from the flight deck. Put the flight deck handset on-hook to do the same thing.

CAUTION: STATIC SENSITIVE. DO NOT HANDLE BEFORE READING PROCEDURE FOR HANDLING ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (REF 20-41-02/201). CONTAINS DEVICES THAT CAN BE DAMAGED BY STATIC DISCHARGE.

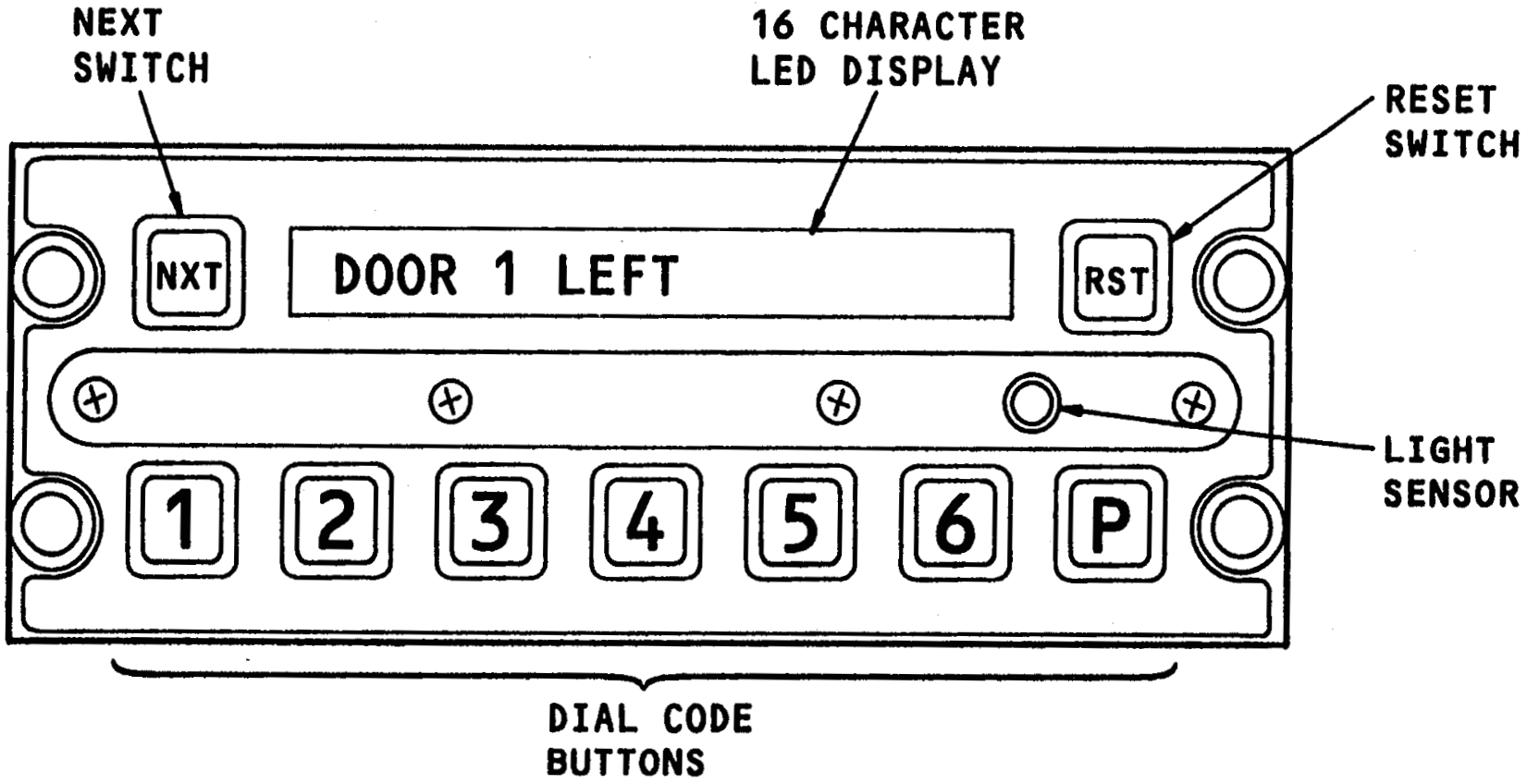


Figure 17 PILOTS' CALL PANEL

AUDIO CONTROL PANEL

Purpose

The audio control panel lets the flight crew make the cabin interphone calls with the flight interphone system.

General Description

When there is a call to the flight deck, the cabin interphone call light on the cabin interphone switch comes on. Answer the call to make the call light go off.

Push the cabin interphone receiver control to send audio from the cabin interphone system to the flight deck speakers and headsets. Rotate the same knob to adjust the volume of the audio.

Push the cabin interphone microphone selector switch to connect the flight deck microphone associated with that audio control panel to the cabin interphone system.

Push the cabin interphone microphone selector switch twice within three seconds to connect the flight deck microphone to the cabin interphone system and automatically dial the primary attendant station.

CAUTION: STATIC SENSITIVE. DO NOT HANDLE BEFORE READING PROCEDURE FOR HANDLING ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (REF 20-41-02/201). CONTAINS DEVICES THAT CAN BE DAMAGED BY STATIC DISCHARGE.

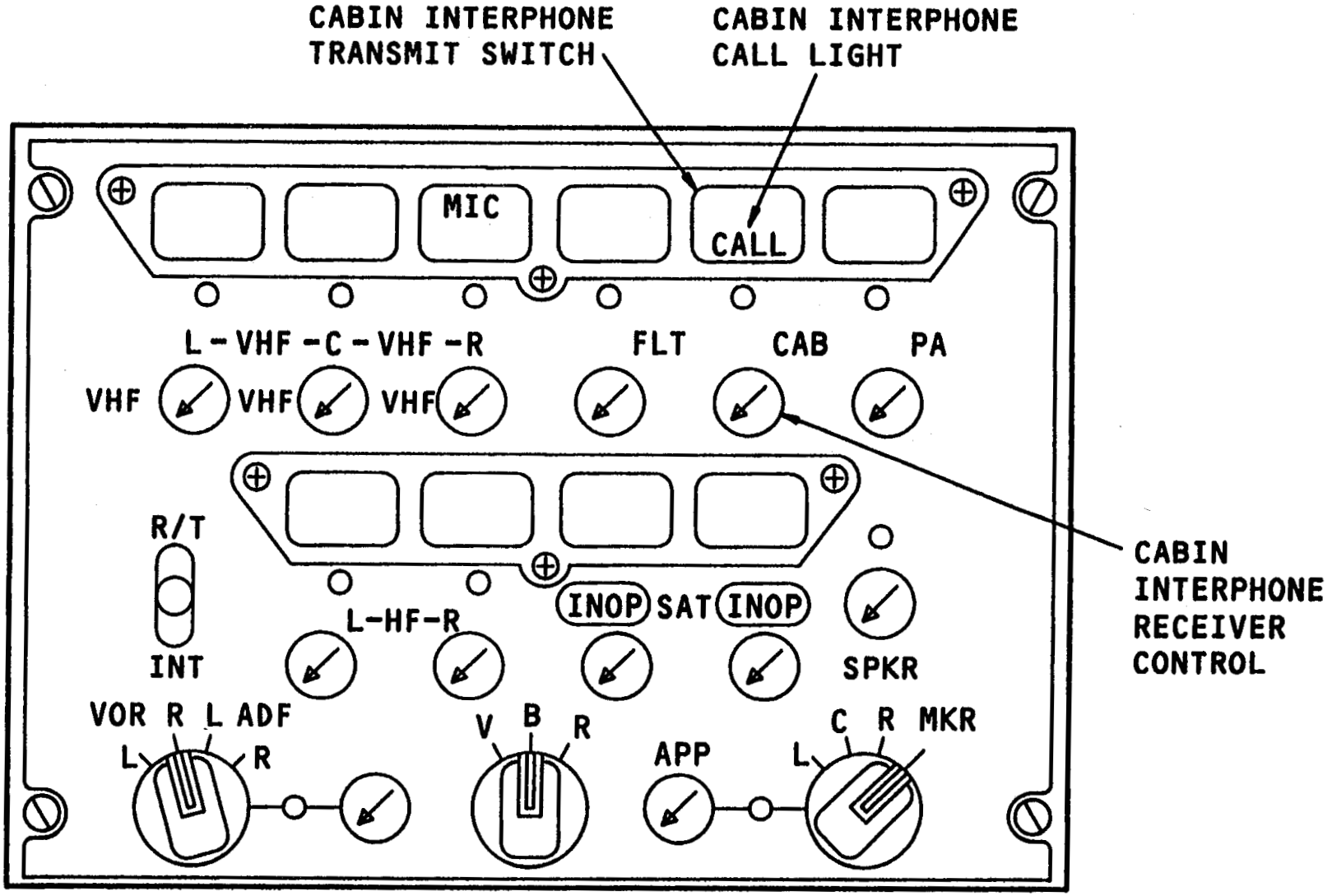


Figure 18 AUDIO CONTROL PANEL

CABIN CONFIGURATION TEST MODULE

General Description

For the cabin interphone system (CIS), the cabin configuration test module (CCTM) has switches to:

- Do a CIS test
- Install the configuration database
- Install operational software
- Make the alternate circuit in the cabin interphone controller (CIC) come on

Normal/Alternate Circuit Selection

The CCTM has a cabin interphone alternate system switch. The switch sends a discrete to the CIC to make either the normal or the alternate controller circuit come on.

Usually, the normal circuit in the CIC is on. Push the CABIN INTERPHONE switch to:

- Make the alternate circuit come on
- Make the normal circuit go off
- Make a light in the switch come on

When this occurs, the alternate circuit does all CIC functions.

CAUTION: STATIC SENSITIVE. DO NOT HANDLE BEFORE READING PROCEDURE FOR HANDLING ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (REF 20-41-02/201). CONTAINS DEVICES THAT CAN BE DAMAGED BY STATIC DISCHARGE.

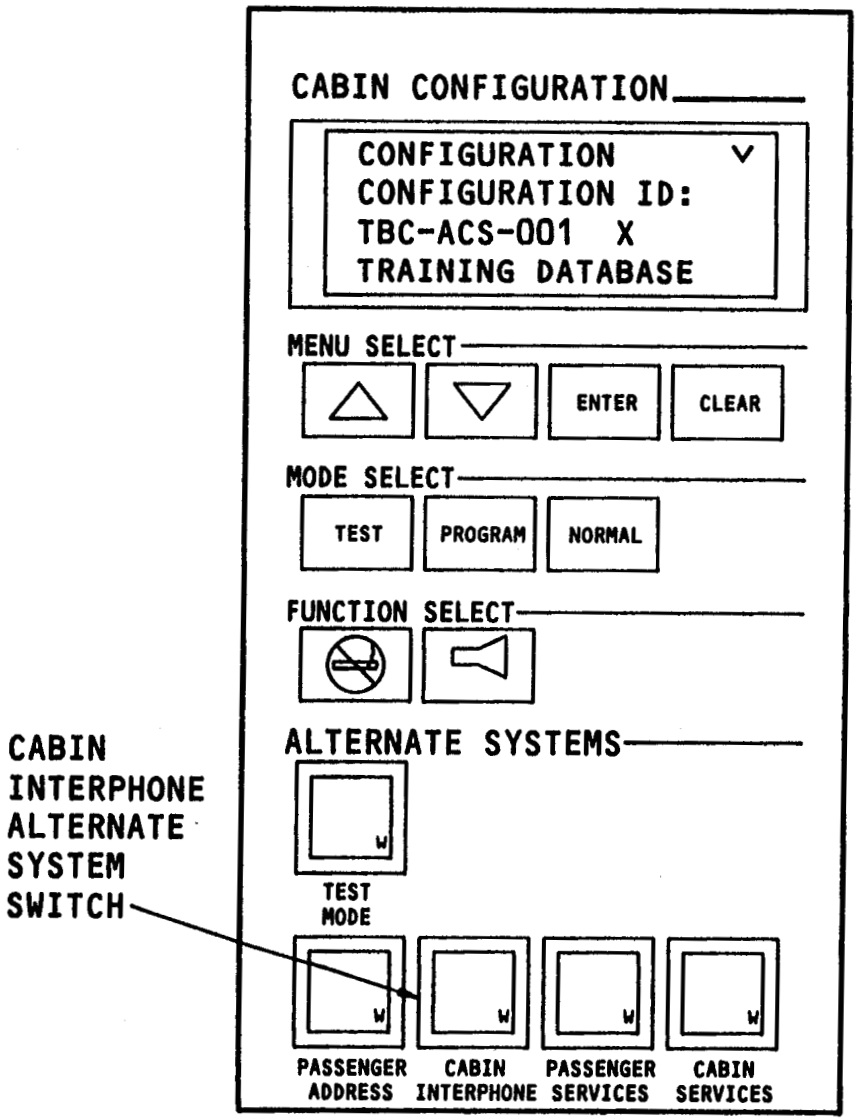


Figure 19 CABIN CONFIGURATION TEST MODULE

TYPES OF CALLS

These are the types of cabin interphone calls in order of priority:

- Pilot alert call
- All call
- Priority line call
- Attendant's all call
- Normal station-to-station call

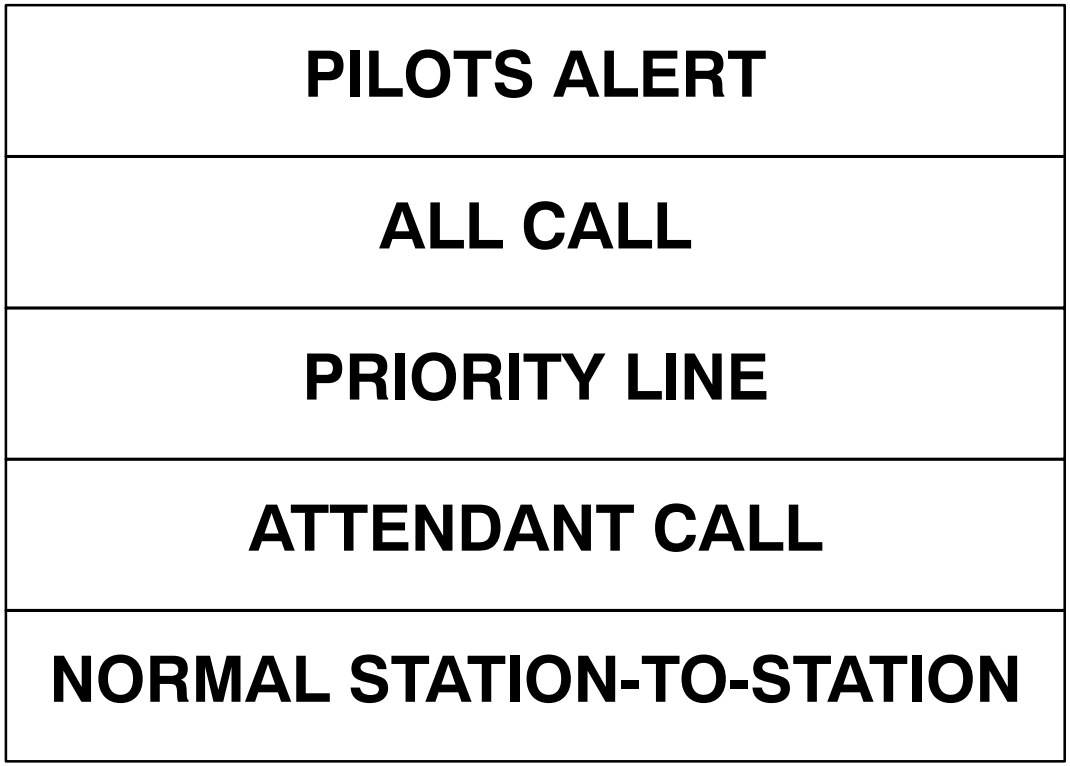


Figure 20 TYPES OF CALLS

PILOT ALERT CALL

The pilot alert call comes from any attendant station to the flight deck. It uses code PP. This call overrides all other calls to the flight deck except when one of these conditions exists:

- There is another pilot alert call.
- The flight deck is on a passenger address announcement.

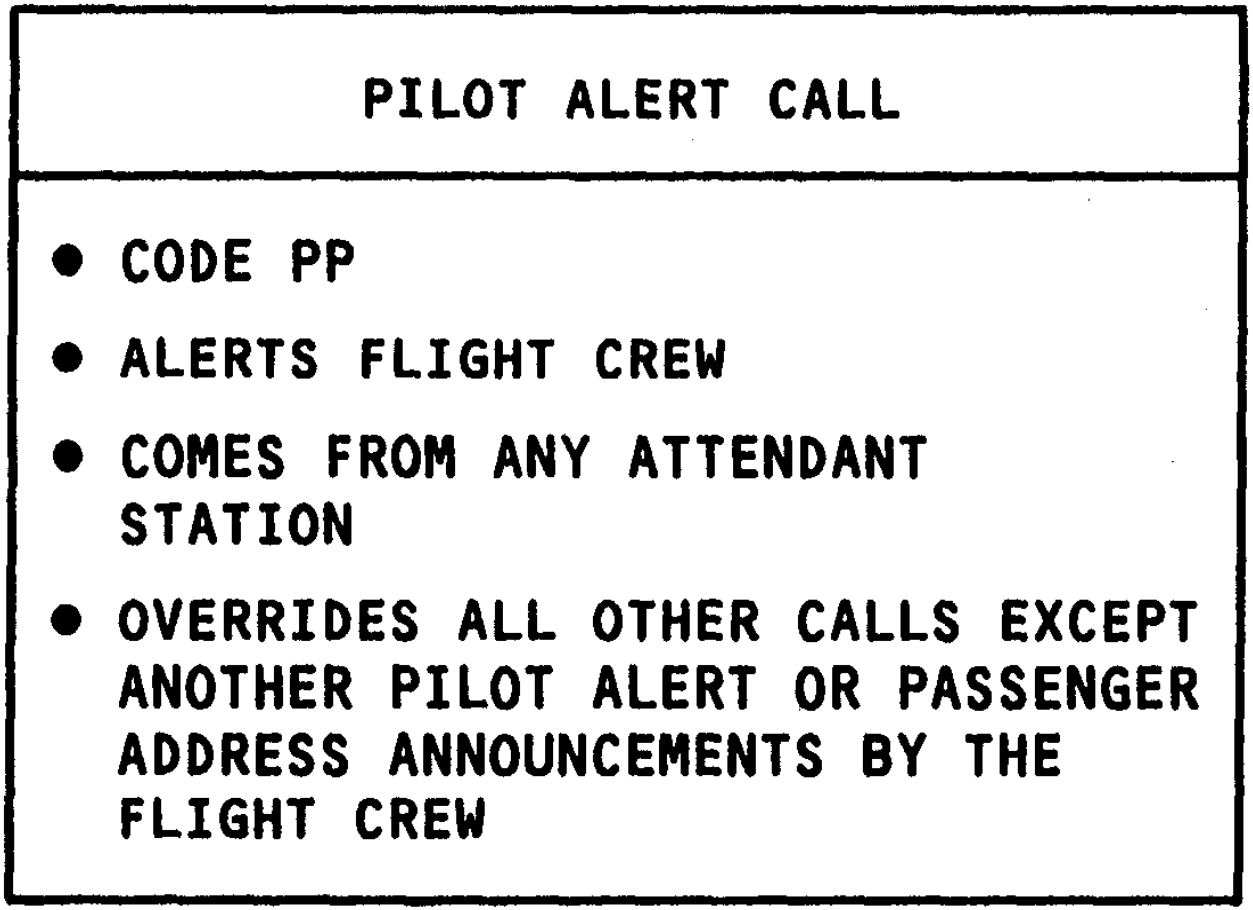


Figure 21 PILOT ALERT CALL

ALL CALL

General

An all call can come from any attendant station and the flight deck. It uses code 55. This type of call calls all stations. It connects all handsets on a common line when they go off-hook.

When there is an all call:

- The message ALL CALL shows on the pilots' call panel.
- A low chime sounds in the flight deck.
- A high/low chime and flashing attendant call lights occur at all attendant stations.

As each handset is picked up, including the flight deck handset, they connect into a common line.

Attendant On Passenger Address

If an attendant is on a passenger address (PA) announcement when there is an all call, that station shows a flashing attendant call light. It does not connect to the all call. If the all call is still in progress when the attendant station stops Its passenger address announcement, the attendant station automatically connects into the all call. If the all call stops before the passenger address announcement stops the flashing attendant call lights go off.

Flight Crew Using Passenger Address

If the flight crew is on a passenger address announcement when there is an all call:

- The message ALL CALL shows on the pilots' call panel.
- A low chime sounds.
- The flight deck does not connect to the all call.

If the all call is still in progress when the flight crew stops its passenger address announcement, it automatically connects to the all call.

Pilot Alert Call

If an attendant station is on a pilot alert call, the all call does not put the flight deck or the station on all call. The attendant station in the pilot alert call gets:

- A high/low chime
- A flashing attendant call light

For the flight deck, the all call is prioritized in the cabin interphone controller's memory. If there is an all call when the pilot alert call stops, the flight deck and the station included in the pilot alert connect to the all call.

ALL CALL

- CODE 55
- COMES FROM ANY ATTENDANT STATION OR THE FLIGHT DECK
- ALERTS ALL ATTENDANT STATIONS AND THE FLIGHT DECK
- CAUSES ALL ATTENDANT CALL LIGHTS TO FLASH
- CAUSES ALL CALL MESSAGE TO SHOW ON PILOTS' CALL PANEL
- DOES NOT OVERRIDE A PILOT ALERT
- AS EACH HANDSET GOES OFF-HOOK IT CONNECTS INTO A COMMON LINE
- ATTENDANT STATION ON PA GETS A FLASHING ATTENDANT CALL LIGHT ONLY, BUT DOES NOT CONNECT TO ALL CALL
- FLIGHT CREW ON PA GETS LOW CHIME AND ALL CALL MESSAGE ON PILOTS' CALL PANEL. WHEN FLIGHT CREW STOPS PA ANNOUNCEMENT, FLIGHT DECK CONNECTS INTO ALL CALL
- STATIONS INVOLVED IN A PILOT ALERT DO NOT CONNECT TO THE ALL CALL UNTIL THE PILOT ALERT STOPS

Figure 22 ALL CALL

PRIORITY LINE CALLS

General

The advanced cabin entertainment service system (ACESS) configuration database sets one of the attendant stations as the primary station and another as the secondary station.

Priority Lines

The priority line calls are special priority connections between the:

- Flight deck and the primary station
- Primary station and the secondary station
- Flight deck, primary station, and secondary station

The dial code for use by the flight deck and the primary station is 33. They use this code to access the priority line.

The flight crew can push the CAB microphone selector switch twice within 3 seconds to access the priority line. This automatically rings the primary station. The flight crew can use the flight deck microphones to communicate.

The dialing code for use by the primary station and the secondary station is 32. The primary station and the secondary station can use it to access the priority line.

When any two stations are on the priority line and the third one pushes

its priority line code, it connects into a party line with the two stations that were on the priority line.

A station that calls one of the stations on a priority line call gets a busy signal. The exception is a higher priority call such as a pilot alert or an all call.

PRIORITY LINES

- PRIORITY LINES ARE SPECIAL PRIORITY CONNECTIONS BETWEEN FLIGHT DECK, PRIMARY STATION AND SECONDARY STATION
- PRIORITY LINES CONNECT
  - FLIGHT DECK AND PRIMARY STATION (CODE 33)
  - PRIMARY STATION AND SECONDARY STATION (CODE 32)
  - FLIGHT DECK, PRIMARY STATION, AND SECONDARY STATION (FLIGHT DECK AND PRIMARY STATION DIAL 33, PRIMARY STATION AND SECONDARY STATION DIAL 32)
- ALL CALLS TO A STATION IN A PRIORITY LINE, EXCEPT A PILOT ALERT TO THE FLIGHT DECK OR AN ALL CALL, GET A BUSY SIGNAL
- PUSH THE CAB MICROPHONE SELECTOR SWITCH TWICE ON THE AUDIO CONTROL PANEL TO CALL THE PRIMARY STATION

Figure 23 PRIORITY LINE CALLS

ATTENDANT'S ALL CALL

An attendant's all call uses dial code 54. It is lower in priority than priority line calls. An attendant's all call is the same as an all call except that it does not include the flight deck.

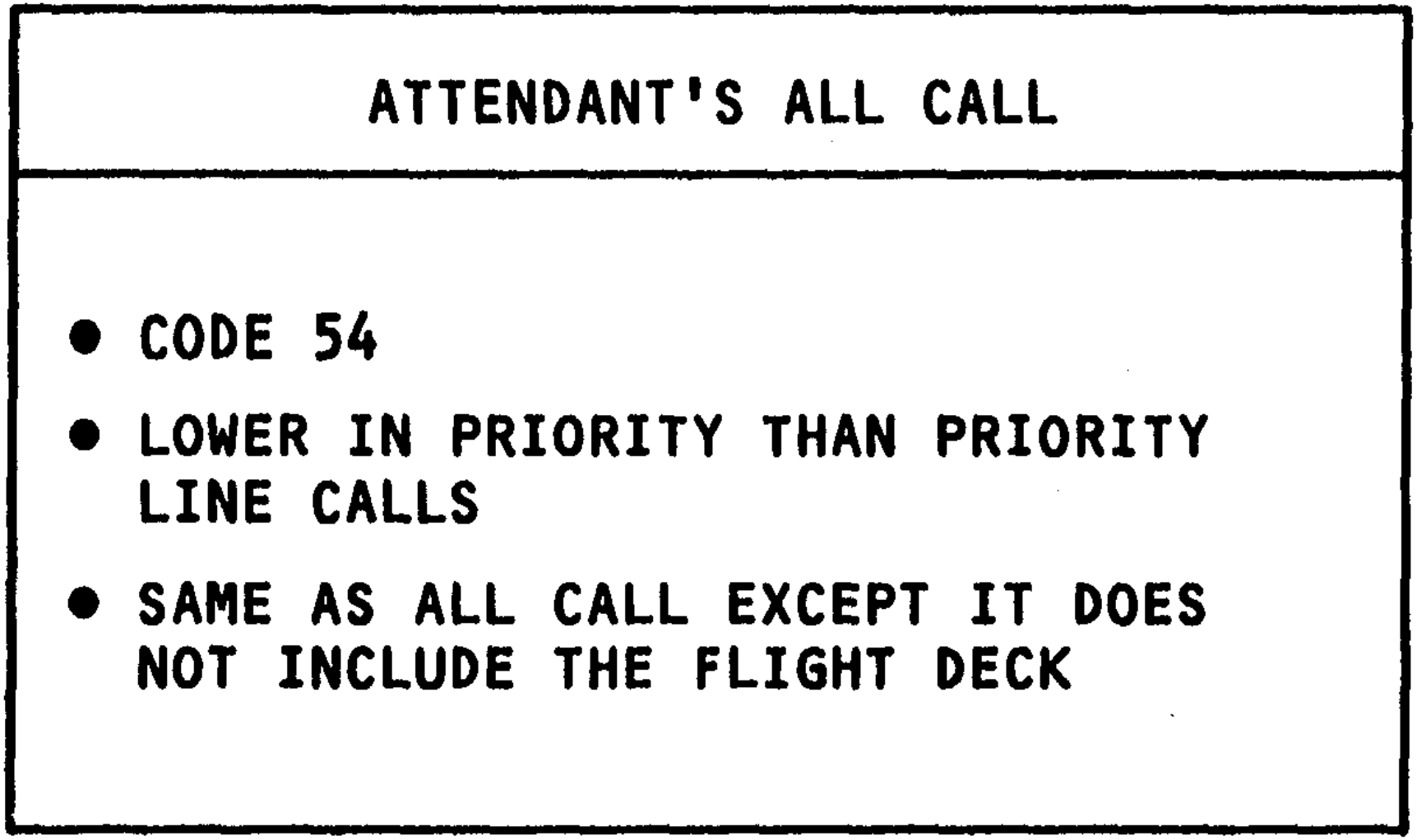


Figure 24 ATTENDANT'S ALL CALL

NORMAL STATION-T O-ST ATION CALLS

The cabin interphone controller (CIC) connects all normal station-to-station calls in the order in which it gets them. No normal station-to-station call can override any other call.

When there is a normal station-to-station call to the flight deck:

- The call location shows on the pilots' call panel
- A low chime occurs in the flight deck.

When there is a normal station-to-station call to an attendant station:

- A high/low chime occurs at the

called station

- A non-flashing attendant call light

comes on at the called station

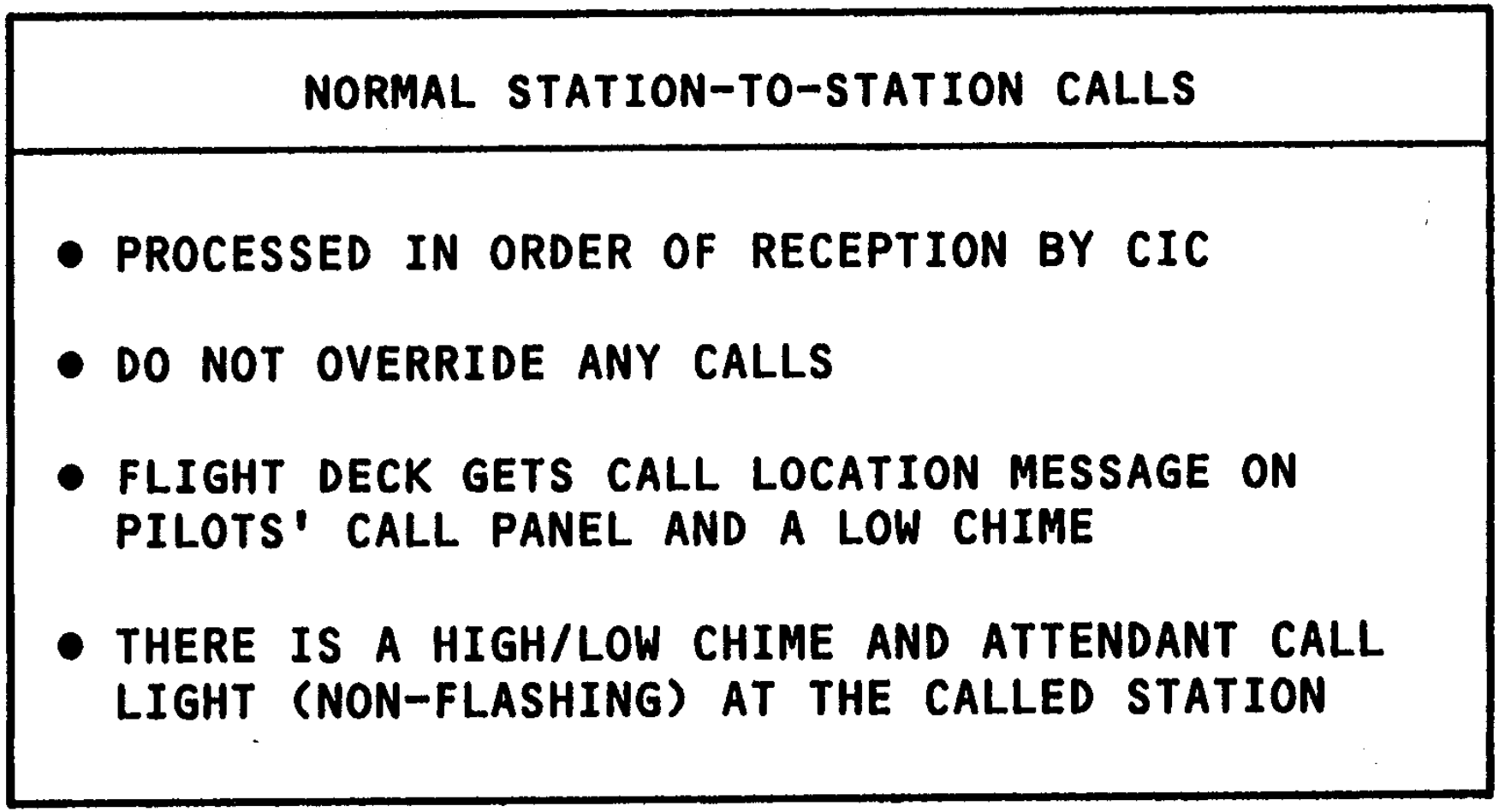


Figure 25 NORMAL STATION-T O-ST ATION CALLS

DIAL CODES

Each attendant station and the flight deck has a dial code. Special function codes that are not assigned to a particular station are also available.

The cabin interphone controller stores all the codes and their locations. All dial codes have two digits. Use the codes at the pilots' call panel (PCP) or at the cabin interphone handsets (CIHs).

Codes 32 and 33 are for the priority line.

Codes 41 through 4P are for passenger address announcements.

Code 54 is for attendant all calls. Use it to call all attendant stations at the same time from any attendant station.

Code 55 is for all calls. Use it to call all stations at the same time from any station.

Code 6P (cabin ready) is for use by any attendant station. It gives a signal to the flight deck.

Code PP is for pilot alert. Attendants can use it to alert the flight crew.

Code P1 is for use by the flight deck only. It activates the ground crew call horn in the nose wheel well.

CODE	LOCATION/FUNCTION
11	DOOR 1 LEFT
12	DOOR 2 LEFT
13	DOOR 3 LEFT
14	DOOR 4 LEFT
15	DOOR 5 LEFT
16	UPPER DECK LEFT DOOR
21	DOOR 1 RIGHT
22	DOOR 2 RIGHT
23	DOOR 3 RIGHT
24	DOOR 4 RIGHT
25	DOOR 5 RIGHT
26	UPPER DECK RIGHT DOOR
31	FLIGHT DECK
32	PRIORITY LINE (PRIMARY STATION - SECONDARY STATION) (1)
33	PRIORITY LINE (PRIMARY STATION - FLIGHT DECK) (1)

CODE	LOCATION/FUNCTION
41, 42, 43, 44, 46, 4P	PASSENGER ADDRESS CODES
52	MAIN DECK GALLEY
54	ATTENDANT ALL CALL
55	ALL CALL
56	UPPER DECK GALLEY
61	DOOR 5 CREW REST
6P	CABIN READY
PP	PILOT ALERT
P1	GROUND CREW CALL (2)

(1) DIALED NUMBER GOES BOTH WAYS

(2) DIALED AT PILOTS' CALL PANEL ONLY

Figure 26 DIAL CODES

SPECIAL FUNCTIONS

Party Lines

A party line occurs when three or more stations connect into a single communication line.

Up to four party lines are available on the cabin interphone system. Each party line can connect up to four stations. When two stations are on a call and another station calls one of them, no visual indications occur, but a high/low chime occurs at the called station. The station that called then connects with the other two stations.

A party line can also occur when one station dials more than one dial code. In this case, a high/low chime occurs and the attendant call lights at the called stations come on..

To get into a party line, the flight crew can call a station that is on a call with three or fewer stations.

No station can dial the flight deck (code 31) to access a party line.

only the flight deck, the primary station, and the secondary station can access the priority line.

Call Transfer

To transfer a call to another station, dial that station code and reset the cabin interphone handset. This function is only available at the attendant stations.

Remote Answering

Push the code of another station to answer a call to that station. When the call connects, the attendant call light at the called station goes off and that station can then get another call. This function is only available at the attendant stations.

Cabin Ready

When the code 6P is dialed from any attendant station, the message CABIN READY shows on the pilots' call panel and a low chime occurs.

PARTY LINES

- MAXIMUM OF 4 PARTY LINES
- EACH PARTY LINE HAS A MAXIMUM OF FOUR STATIONS AT ONE TIME
- NO STATION CAN DIAL THE FLIGHT DECK TO JOIN A PARTY LINE
- PRIORITY LINE BETWEEN FLIGHT DECK, PRIMARY AND SECONDARY STATIONS IS AVAILABLE ONLY TO THOSE THREE STATIONS

CALL TRANSFER

- TO TRANSFER A CALL TO ANOTHER STATION, DIAL ITS LOCATION CODE
- FUNCTION AVAILABLE ONLY AT ATTENDANT STATIONS

REMOTE ANSWERING

- PUSH THE CODE OF ANOTHER STATION TO ANSWER A CALL TO THAT STATION
- FUNCTION AVAILABLE ONLY AT ATTENDANT STATIONS

CABIN READY

- SHOWS CABIN READY ON PILOTS' CALL PANEL AND SOUNDS A CHIME IN THE FLIGHT DECK
- COMES FROM ANY ATTENDANT STATION
- 6P

Figure 27 SPECIAL FUNCTIONS

FLIGHT DECK CALLS STORAGE

General

For calls to the flight deck the cabin interphone controller:

- Stores messages to the flight deck
- Prioritizes messages to the flight deck
- Controls messages to the flight deck.

Message Storage

The cabin interphone controller stores up to four flight deck calls.

This function tells the flight crew the location of calls to the flight deck while the flight crew is on an equal or higher priority call. This is so that the calls can be returned. The calls get a busy signal. The flight crew gets a message on the pilots' call panel. This tells them the location of the calls attempted when they were on another call. When the caller gets a busy 1 signal the caller hangs up and waits for the pilot to call.

Message Priority

The messages and accompanying high chime stored by the cabin interphone controller are put into this priority:

- Pilot alert calls
- All calls
- Primary station priority
- Flight deck calls (dealing code 31)

Message Control

The cabin interphone controller sends display information to the pilots' call panel to show that there are messages stored.

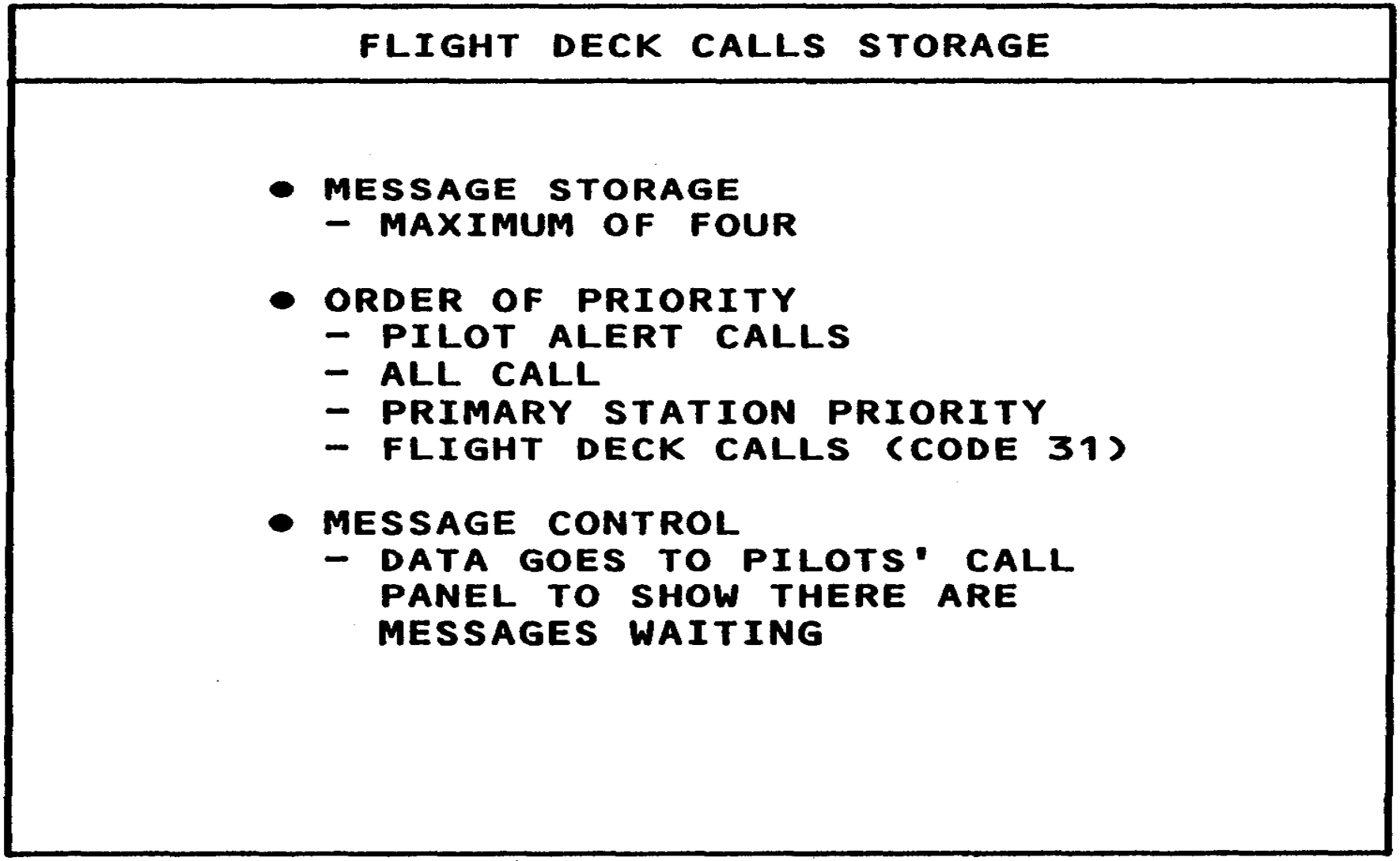


Figure 28 FLIGHT DECK CALLS STORAGE

AURAL SIGNALS

The cabin interphone system sends aural signals to the handset user. They tell the user the state of a call. These signals go to all handsets:

- Dial tone
- Ring back
- Type 1 busy signal
- Type 2 busy signal
- Sidetone

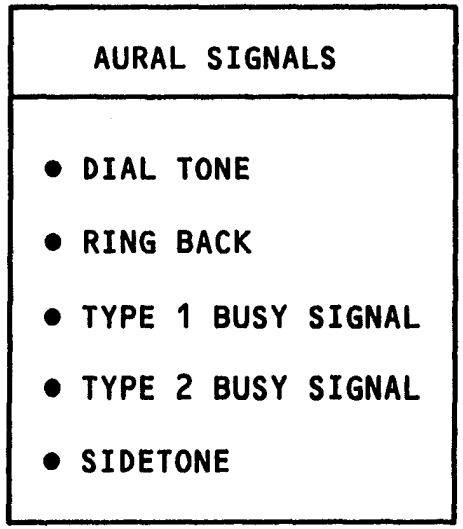


Figure 29 AURAL SIGNALS

DIAL TONE

A dial tone goes to a handset when it goes off-hook and there are no calls to that station. The dial tone signal is a continuous sound which is a sum of two tones with frequencies of 350 and 440 Hertz.

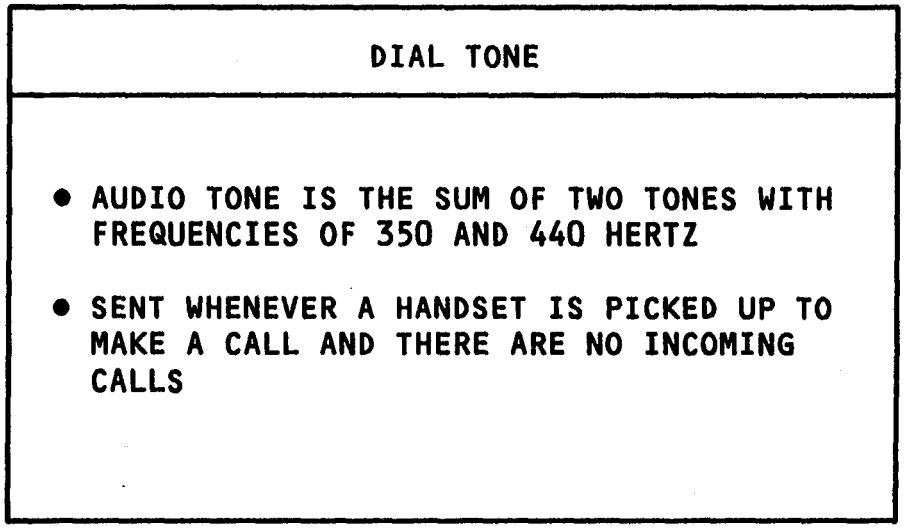


Figure 30 DIAL TONE

RING BACK

A ring back signal goes to a station when a person at that station calls another station and the handset at the called station is on-hook.

The ring back signal is a sound which is the sum of two tones of frequencies 440 and 480 Hertz. The sound is on for 2 seconds and off for 4 seconds, then repeats.

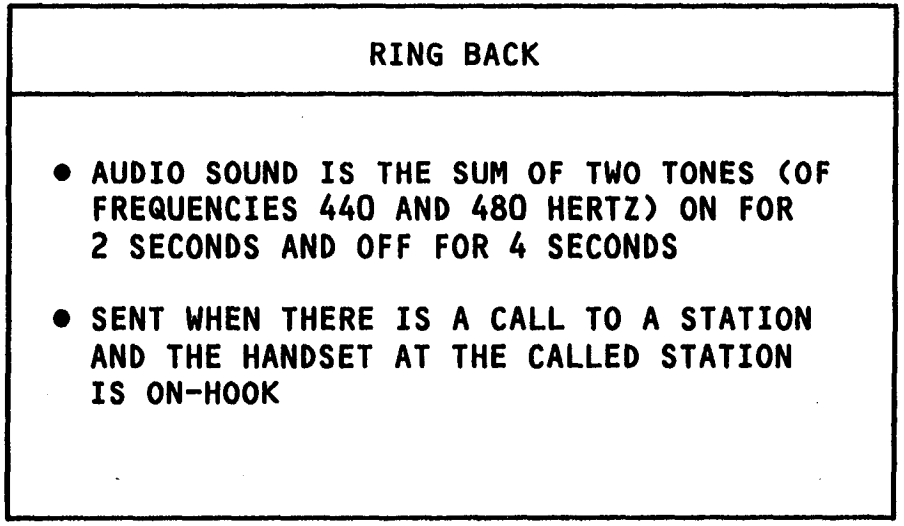


Figure 31 RING BACK

TYPE 1 BUSY SIGNAL

The type 1 busy signal is the sum of two tones with frequencies of 480 and 620 Hertz. The sound is on for 0.5 seconds and off for 0.5 seconds, then repeats.

A type 1 busy signal goes to a station when

- An attendant or flight crew member tries to call a station which has its handset off-hook but is not on a call.
- An attendant tries to call a station, and the called station is on a call with higher priority. Higher priority calls are pilot alert call, all call, attendant all call, and passenger address announcements.
- An attendant or flight crew member tries to call a station that is on a full party line (four stations).
- An attendant tries to call the flight deck while the flight deck is on call of the same or higher priority.

TYPE 1 BUSY SIGNAL

AUDIO SOUND IS A COMBINATION OF TWO TONES (OF FREQUENCIES 480 AND 620 HERTZ) ON FOR 0.5 SECONDS AND OFF FOR 0.5 SECONDS

TYPE 1 BUSY SIGNAL GOES TO A STATION WHEN:

- ATTENDANT OR FLIGHT CREW CALLS A STATION THAT IS OFF-HOOK AND NOT ON A CALL
- ATTENDANT TRIES TO CALL A STATION THAT IS ON A HIGHER PRIORITY CALL
- ATTENDANT OR FLIGHT CREW TRIES A CALL TO A STATION THAT IS ON A FULL PARTY LINE (4 STATIONS)
- ATTENDANT TRIES A CALL TO THE FLIGHT DECK WHILE THE FLIGHT DECK IS ON A CALL OF EQUAL OR HIGHER PRIORITY

Figure 32 TYPE 1 BUSY SIGNAL

TYPE 2 BUSY SIGNAL

The type 2 busy signal is a sound which is the sum of two tones of frequencies 480 and 620 Hertz. The sound comes on for 0.25 seconds and goes off for 0.25 seconds, then repeats.

A type 2 busy signal goes to a station when:

- A caller dials own station code.
- A higher priority call stops another call.
- An attendant tries to call a station number that starts with P (except pilot alert calls).
- Flight crew dials 6P (cabin ready).
- Flight crew tries to access the secondary station priority line (code 32).
- An attendant or flight crew member tries to dial a passenger address code when they are in a station-to-station or party line connection.
- An attendant or flight crew member tries to make a call while on a full party line.
- An attendant or flight crew member tries to dial a code for which own station is not configured.
- Flight crew or attendant tries to dial a code that is not in the directory.
- Flight crew or attendant tries to dial an unusable code.

TYPE 2 BUSY SIGNAL
AUDIO SOUND IS THE SUM OF TWO TONES (OF FREQUENCIES 480 AND 620 HERTZ) ON FOR 0.25 SECONDS AND OFF FOR 0.25 SECONDS TYPE 2 BUSY SIGNAL GOES TO A STATION WHEN: • CALLER DIALS OWN STATION CODE • CALL STOPPED BY A HIGHER PRIORITY CALL • ATTENDANT TRIES TO CALL A STATION NUMBER THAT STARTS WITH P (EXCEPT PILOT ALERT) • FLIGHT CREW PUSHES 6P (CABIN READY) • FLIGHT CREW TRIES TO ACCESS SECONDARY STATION PRIORITY LINE (CODE 32) • SECONDARY STATION TRIES TO USE THE FLIGHT DECK PRIORITY LINE (CODE 33) • ATTENDANT OR FLIGHT CREW TRIES TO USE A PASSENGER ADDRESS CODE WHEN IN A STATION-TO-STATION OR PARTY LINE CONNECTION • ATTENDANT OR FLIGHT CREW MEMBER TRIES TO MAKE A CALL WHILE ON A FULL PARTY LINE • ATTENDANT OR FLIGHT CREW MEMBER TRIES TO DIAL A CODE FOR WHICH OWN STATION IS NOT CONFIGURED • ANY CALLER USES A CODE THAT IS NOT IN THE DIRECTORY • ANY CALLER USES AN UNUSABLE CODE

Figure 33 TYPE 2 BUSY SIGNAL

SIDETONE

Sidetone goes to the flight deck when the cabin interphone system or the passenger address system is on in the flight deck. Sidetone goes to a cabin interphone handset only when it is on a cabin interphone call.

SIDE TONE

- FLIGHT DECK: AVAILABLE FOR CABIN INTERPHONE AND PASSENGER ADDRESS SYSTEM
- CABIN INTERPHONE HANDSETS: ONLY AVAILABLE FOR CABIN INTERPHONE SYSTEM

Figure 34 SIDE TONE

PCP - CALL TO FLIGHT DECK

When there is a call to the flight deck, a low chime occurs in the flight deck and the station location shows on the pilots' call panel (PCP).

An example is a call to the flight deck from the door 2 right attendant station.

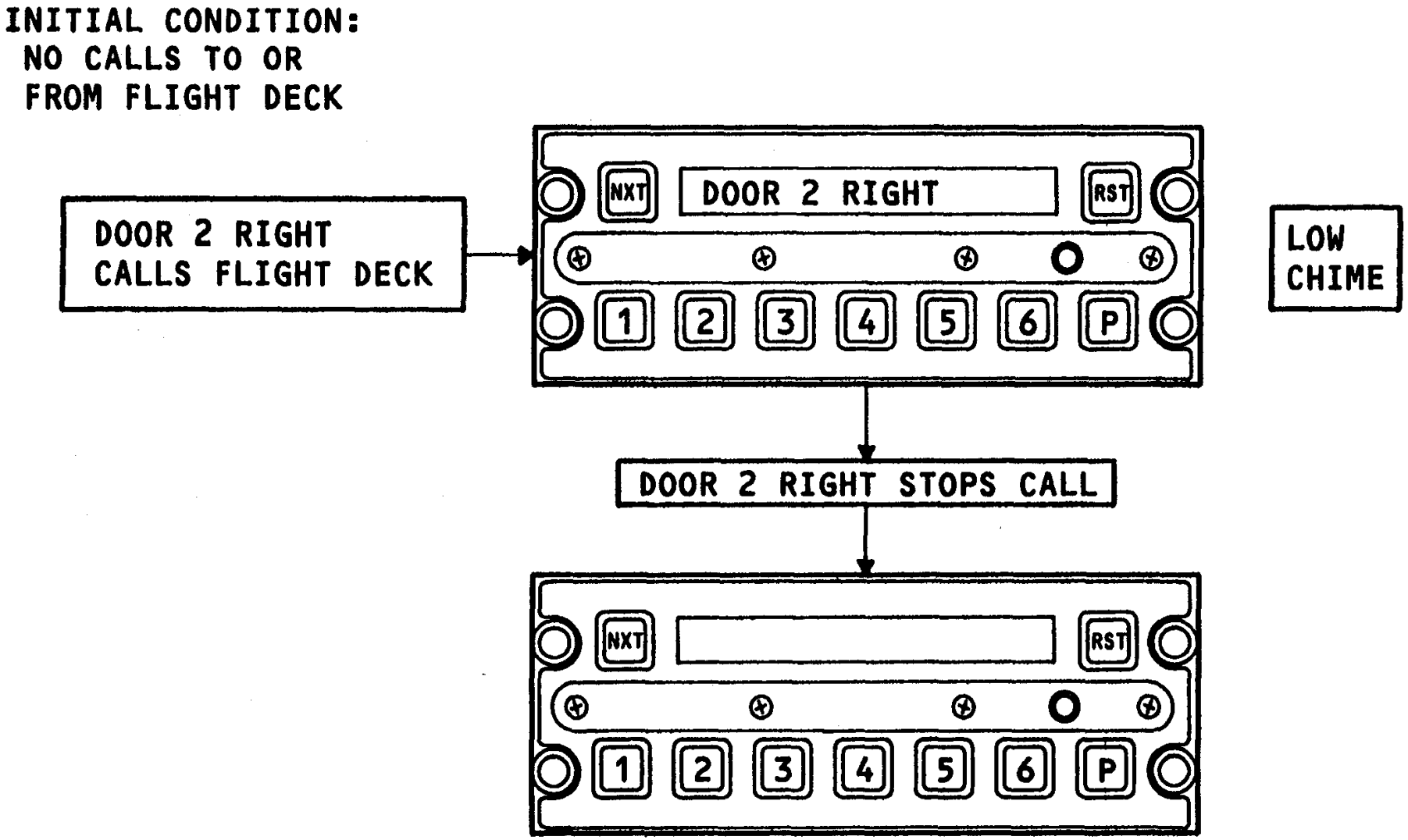


Figure 35 PCP - CALL TO FLIGHT DECK

PCP - CALL FROM FLIGHT DECK

To make a call, push the station dial code on the pilots' call panel (PCP). A call to door 2 left is an example.

When the flight deck calls door 2 left (dial code 12):

- A high/low chime occurs at the door 2 left attendant station.
- The call light at door 2 comes on continuously.

When the station goes off-hook, the message DOOR 2 LEFT shows on the PCP display.

To stop the call, the flight crew member pushes the RST pushbutton. It causes the message DIRECTORY to show on the PCP.

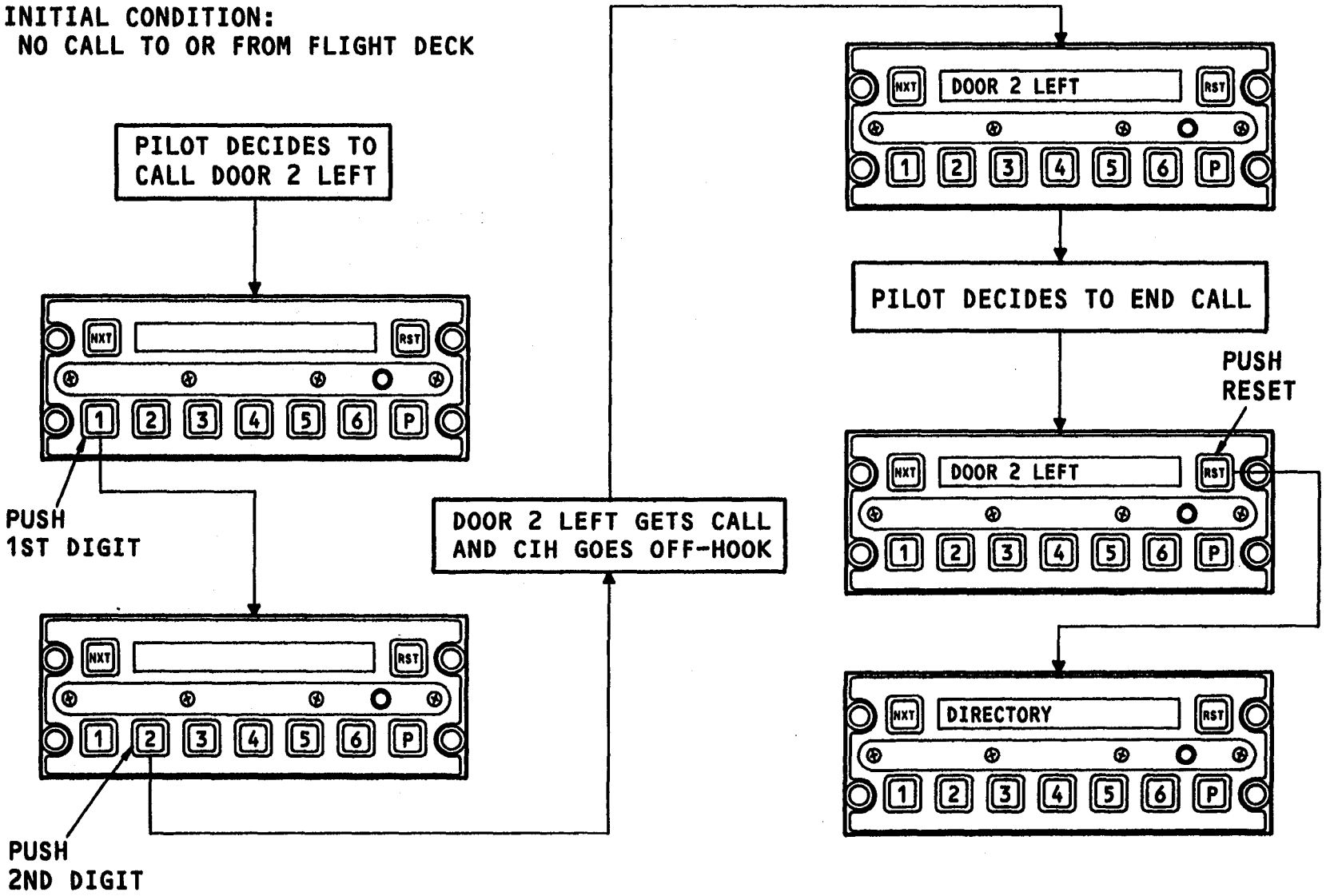


Figure 36 PCP - CALL FROM FLIGHT DECK

PCP - DIRECTORY

The pilots' call panel (PCP) can show a complete directory of all dial codes available to the flight crew. The cabin interphone controller (CIC) stores the directory. To scroll through the directory:

- Push the RST button on the PCP. This resets the PCP display and causes the message DIRECTORY to show.
- Push the NXT button. This causes the GND CREW CALL P1 message to show. This is the first dial code in the directory.

Each push of the NXT button causes the display to show the next dial code in the directory in this order:

- Dial codes that start with P
- Dial codes that start with 4
- Dial codes that start with 5
- Dial codes that start with 3
- Dial codes that start with 6
- Dial codes that start with 1
- Dial codes that start with 2

Push the NXT button at the end of the directory to go back to the start of the directory.

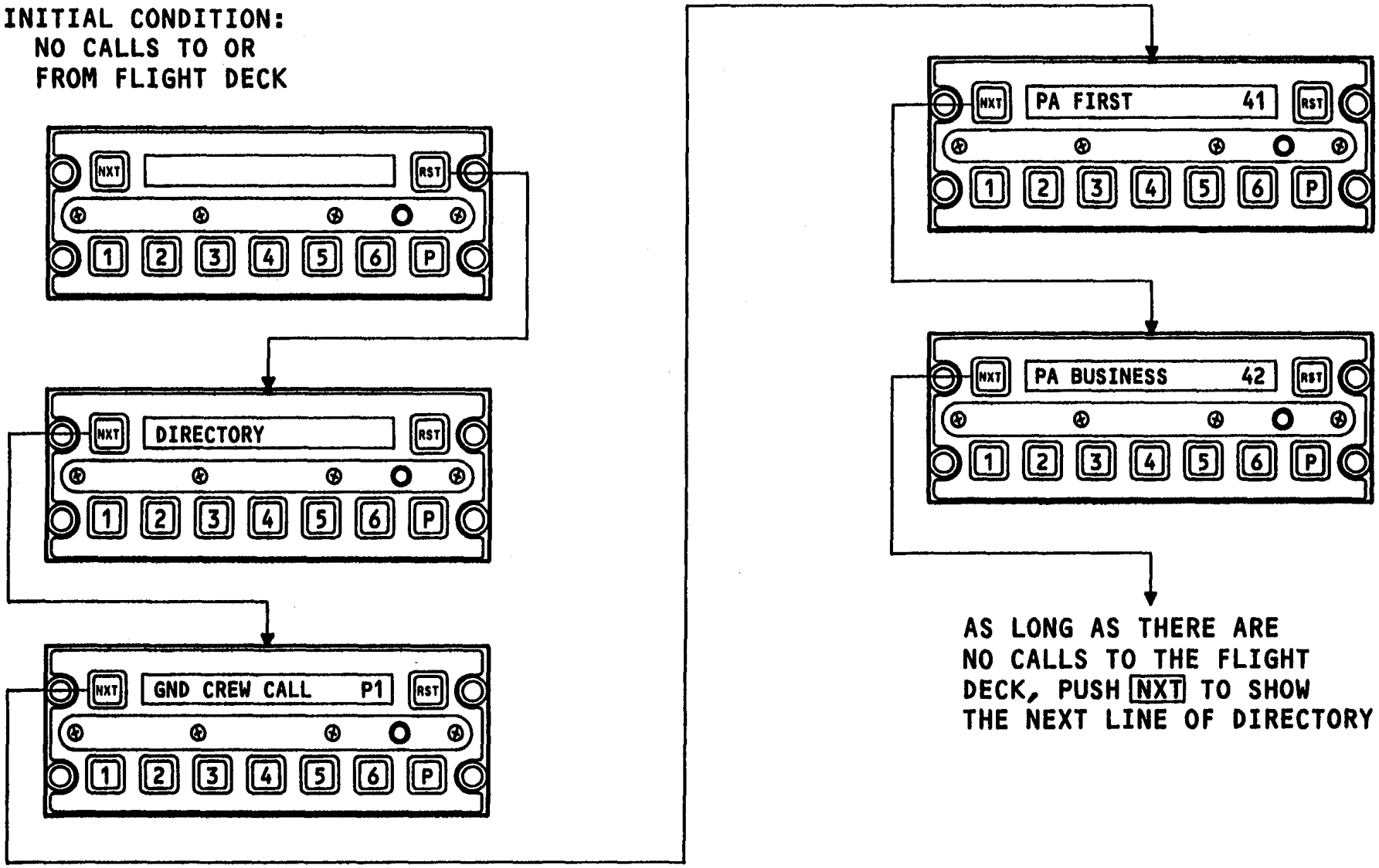


Figure 37 PCP - DIRECTORY

PCP - PASSENGER ADDRESS IN USE-1

When the passenger address system is in use, the message PA IN USE shows on the pilots' call panel (PCP) display. Push the RST button on the PCP to cause the DIRECTORY message to show. Then push the NXT button to scroll through the directory.

INITIAL CONDITION:
NO CALLS TO OR FROM
FLIGHT DECK AND PA
IN USE BY ATTENDANT

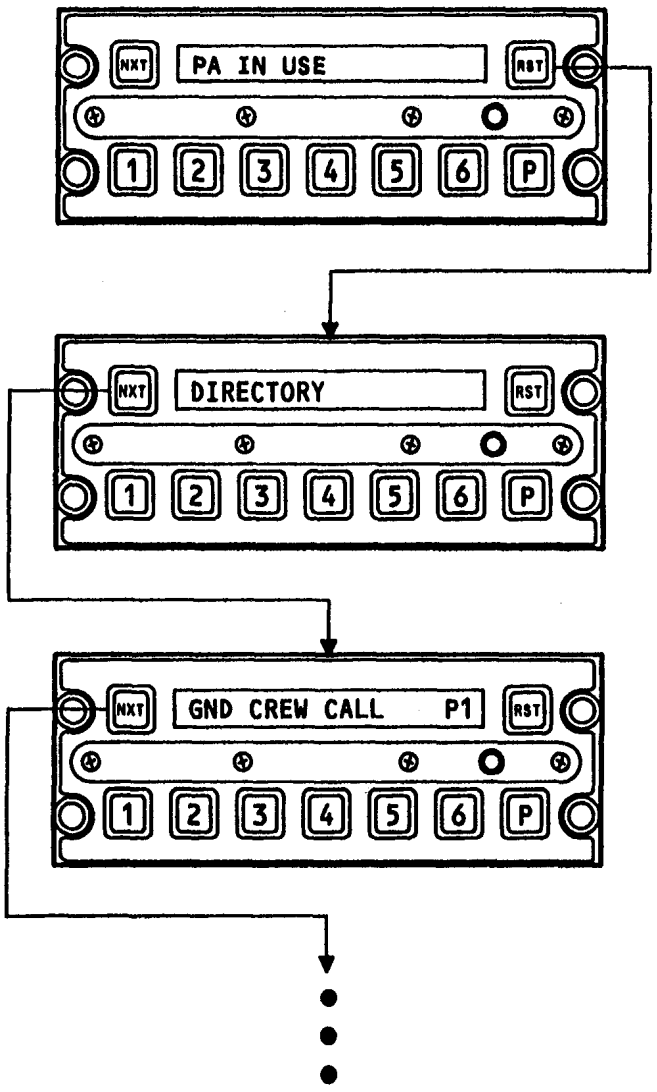


Figure 38 PCP - PASSENGER ADDRESS IN USE-1

PCP - PASSENGER ADDRESS IN USE-2

When there is a passenger address announcement, the message PA IN USE shows on the pilots' call panel (PCP) display. This message shows as long as the passenger address system is in use.

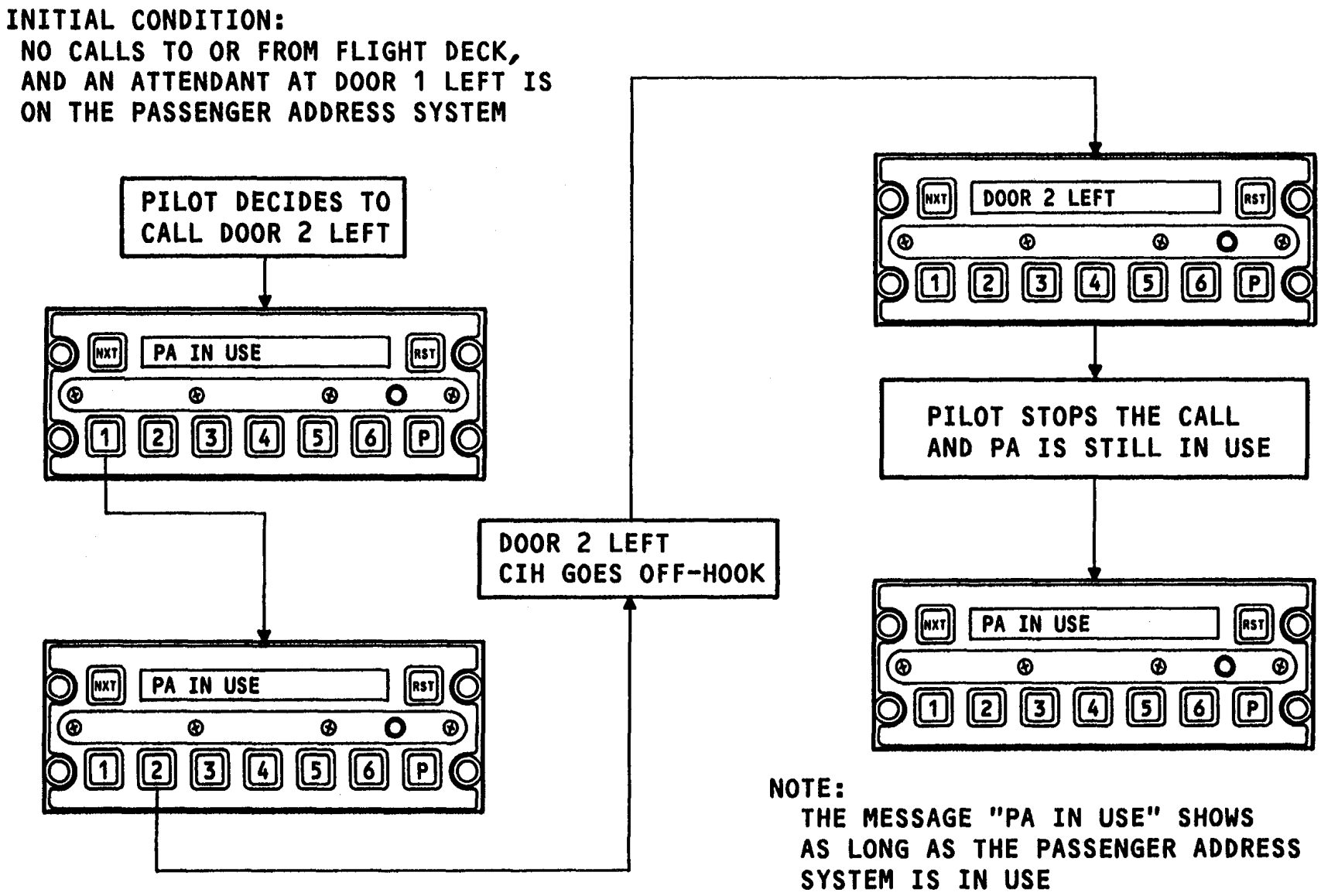


Figure 39 PCP - PASSENGER ADDRESS IN USE-2

PCP - VIDEO IN USE

The pilots' call panel (PCP) shows the message VIDEO IN USE when the video system is in use in any passenger cabin area.

When there is no call to or from the flight deck for more than five minutes, the PCP display is blank. If a flight crew member decides to make a call, the message VIDEO IN USE shows on the display after the flight crew member pushes the first digit of the dial code.

For example, when the flight crew member pushes the second digit of the dial code for door 1 left (code 11), the message DOOR 1 LEFT shows on the PCP display. The call to door 1 left occurs as usual.

The flight crew member pushes the RST button on the PCP to stop the call. If the video system stays in use, the message VIDEO IN USE shows on the PCP. The PCP display goes blank after five minutes, or when the video system goes off.

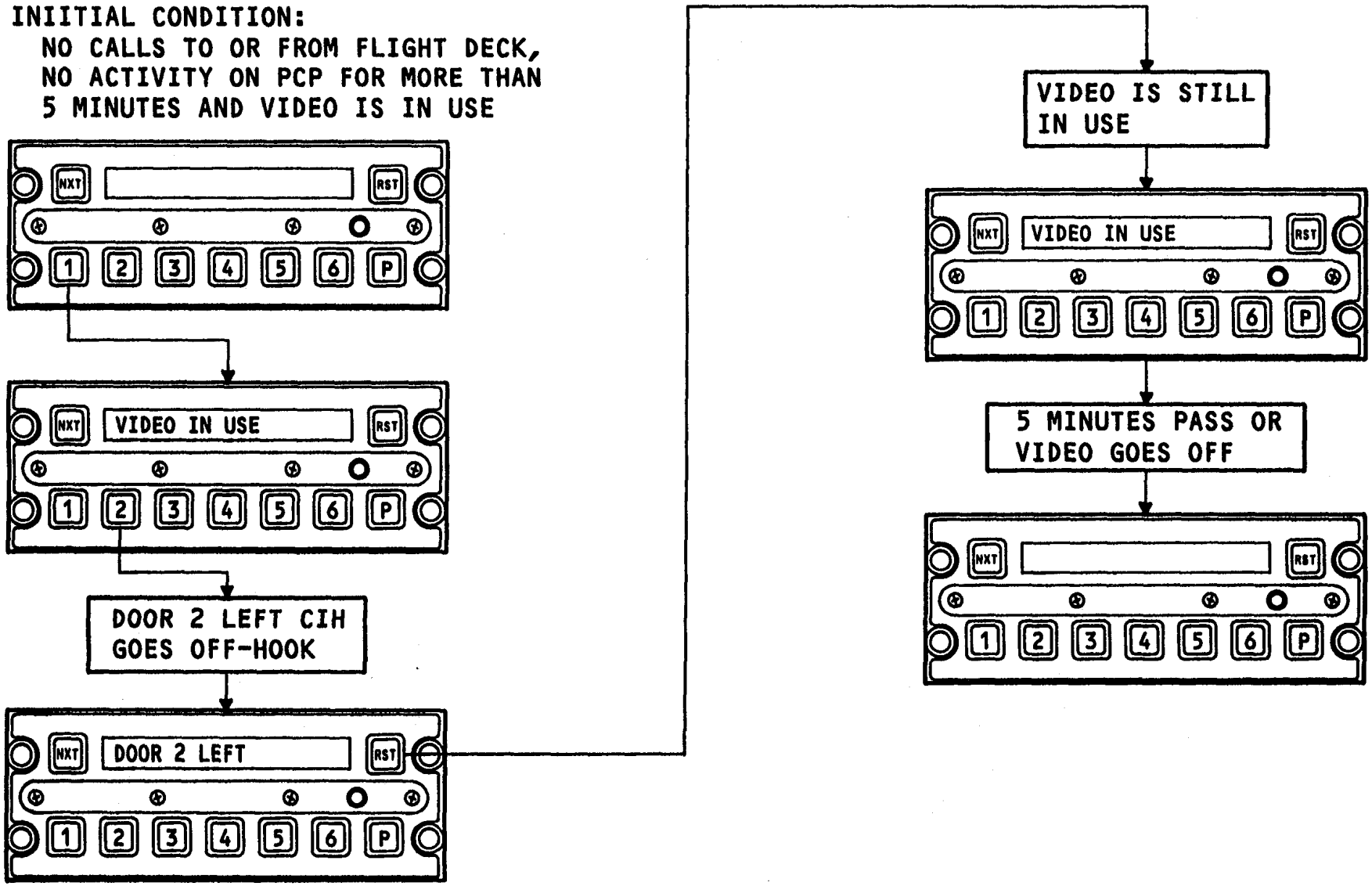


Figure 40 PCP - VIDEO IN USE

PCP - MESSAGE CONTROL

The cabin interphone controller (CIC) can store up to four flight deck call messages. The pilots' call panel (PCP) shows them. If there are four messages stored in the CIC, and there is a higher priority call to the flight deck (but is lower in priority than the call that the flight deck is on), the CIC stores the higher priority call. The last call in storage goes out of memory.

For example: the flight deck is on a pilot alert call and there are four calls stored in memory by the CIC, the messages stored are in this order:

- Door 2 left
- Door 4 left
- Door 5 right
- Door 3 right

Assume that door 1 left is the primary station. The attendant at that station dials a priority line code to the flight deck. This call has a higher priority than all the calls stored by the CIC. Therefore, the last stored call goes out of the memory, and the priority line call is put first among the stored calls.

When the pilot alert call is over, a low chime occurs in the flight deck and the message PRIORITY >33 shows on the PCP. This tells the flight crew that there was a priority line call, and to use code 33 to return the call. When the flight deck calls back, the message PRIORITY W3 shows on the PCP. Thus, the crew knows that there are three calls in storage.

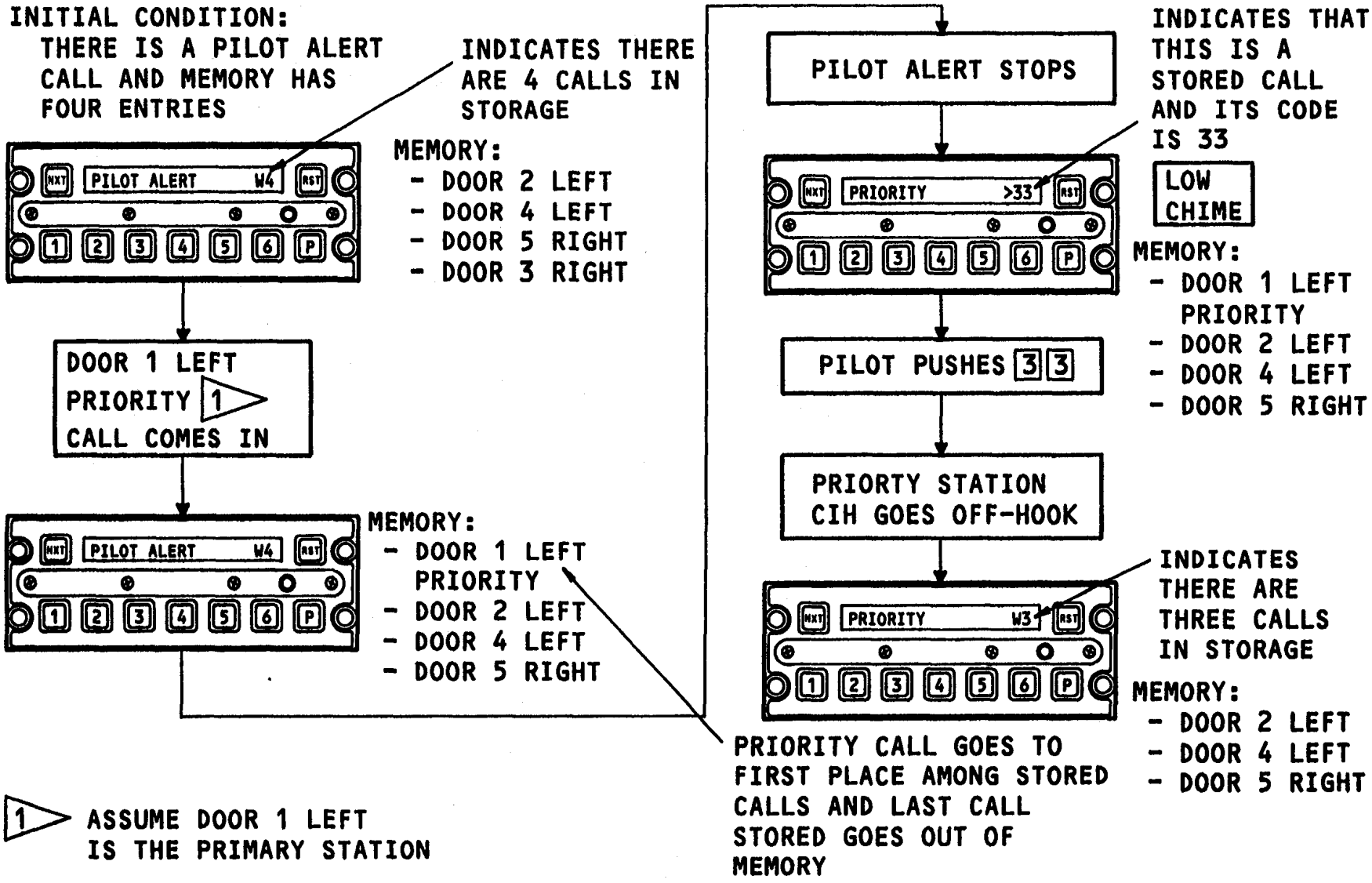


Figure 41 PCP - MESSAGE CONTROL

PCP - STORED CALL SCROLL

The cabin interphone controller (CIC) stores and prioritizes up to four calls to the flight deck. It is possible to scroll through the stored flight deck calls.

For example: if door 4 left calls the flight deck, a low chime occurs, and the message DOOR 4 LEFT shows on the pilots' call panel (PCP).

While the flight crew member talks with door 4 left, there are four calls to the flight deck. They all get type 1 busy signals, but the CIC stores the locations of the calls in the order received. In this example, the calls tried are in this order:

- Upper deck galley (code 56)
- Door 5 right (code 25)
- Door 3 right (code 22)
- Door 3 left (code 13)
- Door 1 left (code 11)

The CIC cannot store more than four calls, so door 1 left does not go into its memory. As the CIC stores and prioritizes the calls, the character W shows on the right side of the PCP display along with the number of stored

calls. Thus, when the CIC stores the four calls, the right side of the PCP display shows the characters W4.

When the flight crew member stops the call to door 4 left, a low chime occurs in the flight deck, and the message U/D GALLEY >56 shows on the PCP. This is the first call stored by the cabin interphone controller. The > character indicates that this is a stored call.

To scroll through the stored calls, push the NXT button. Push the NXT button after all the stored calls are shown to cause the PCP display to go back to the top of the list.

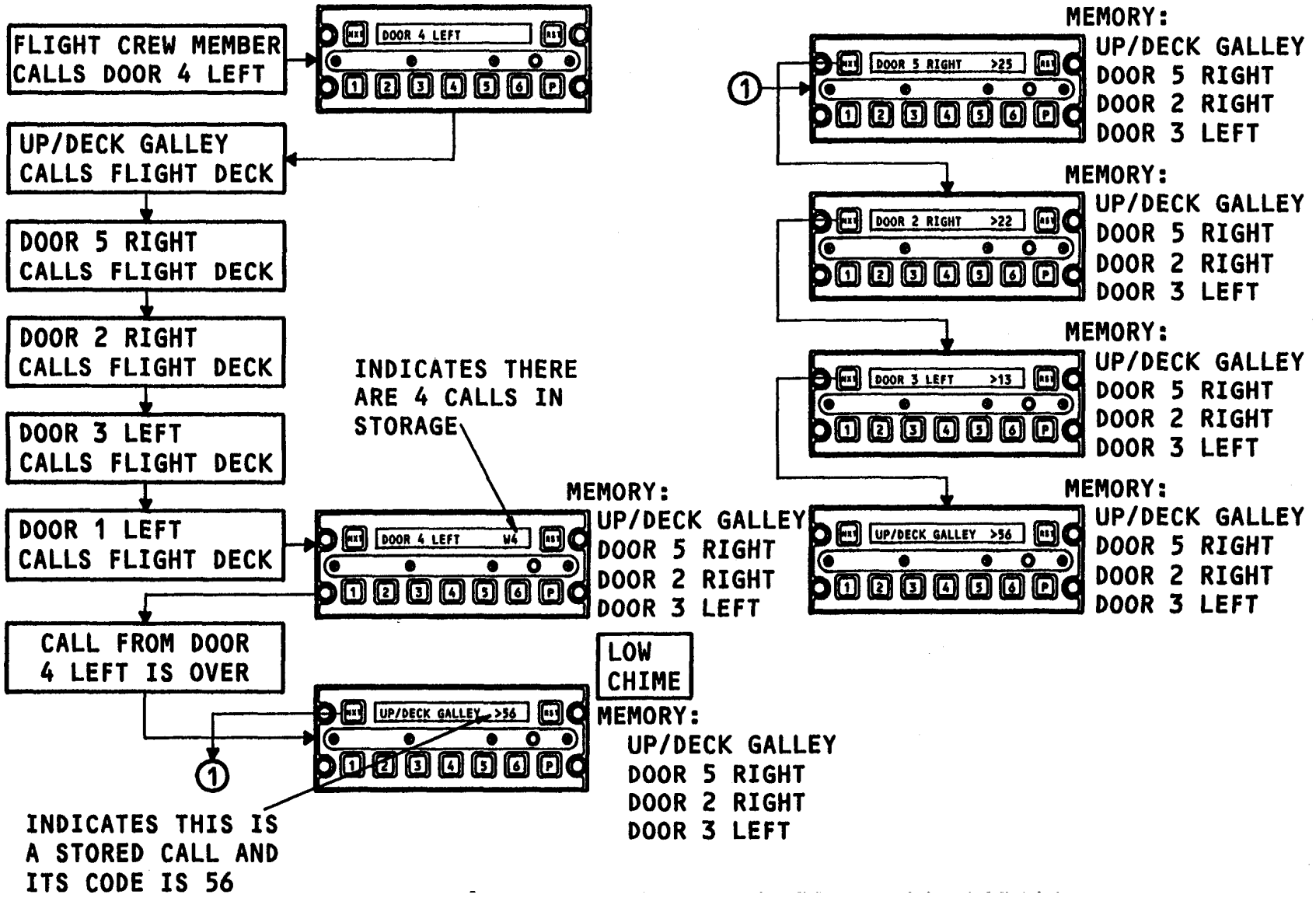


Figure 42 PCP - STORED CALL SCROLL

PCP - MESSAGE STORAGE AND PRIORITY

The cabin interphone controller (CIC) can store four call messages. The stored calls show on the pilots' call panel (PCP).

For example: a call from door 5 left goes to the flight deck; this causes a low chime in the flight deck, and the message DOOR 5 LEFT shows on the PCP.

A flight crew member picks up the flight deck handset or connects the flight deck microphone and headset to the cabin interphone system with the audio control panel.

Two calls come to the flight deck while the flight crew member communicates with door 5 left. One call is from door 1 right and the other from door 2 left. The CIC stores both calls in the order received. Therefore, W2 shows on the right side of the PCP display. This tells the flight crew that there were two attempted calls while they used the cabin interphone system.

It also means that they are in the memory of the CIC. When the call from door 5 left stops, a low chime sounds in the flight deck and the message DOOR 1 RIGHT >21 shows on the PCP display. The > character tells the flight crew that the message is a stored call. Therefore, they are aware that there was a call from door 1 right (dial code 21) while they were on the cabin interphone system. The call from door 2 left stays in memory.

While the message DOOR 1 RIGHT >21 shows, there is a call from the upper deck galley. The PCP display does not show this condition at this time.

Because there is a message from door 1 right, the flight crew member decides to call door 1 right (code 21). An attendant picks up the cabin interphone handset (CIH) at that location. The PCP now shows the message DOOR 1 RIGHT W2. This means that there are two calls in memory.

When the call to DOOR 1 RIGHT stops, there is a low chime in the flight deck and the message DOOR 2 LEFT >12 shows on the PCP. So the flight crew is aware that there was a call from door 2 left. The flight crew member decides to call door 2 left. Once that call stops, there is a low chime in the flight deck and the message UP/DECK GALLEY >56 shows on the PCP.

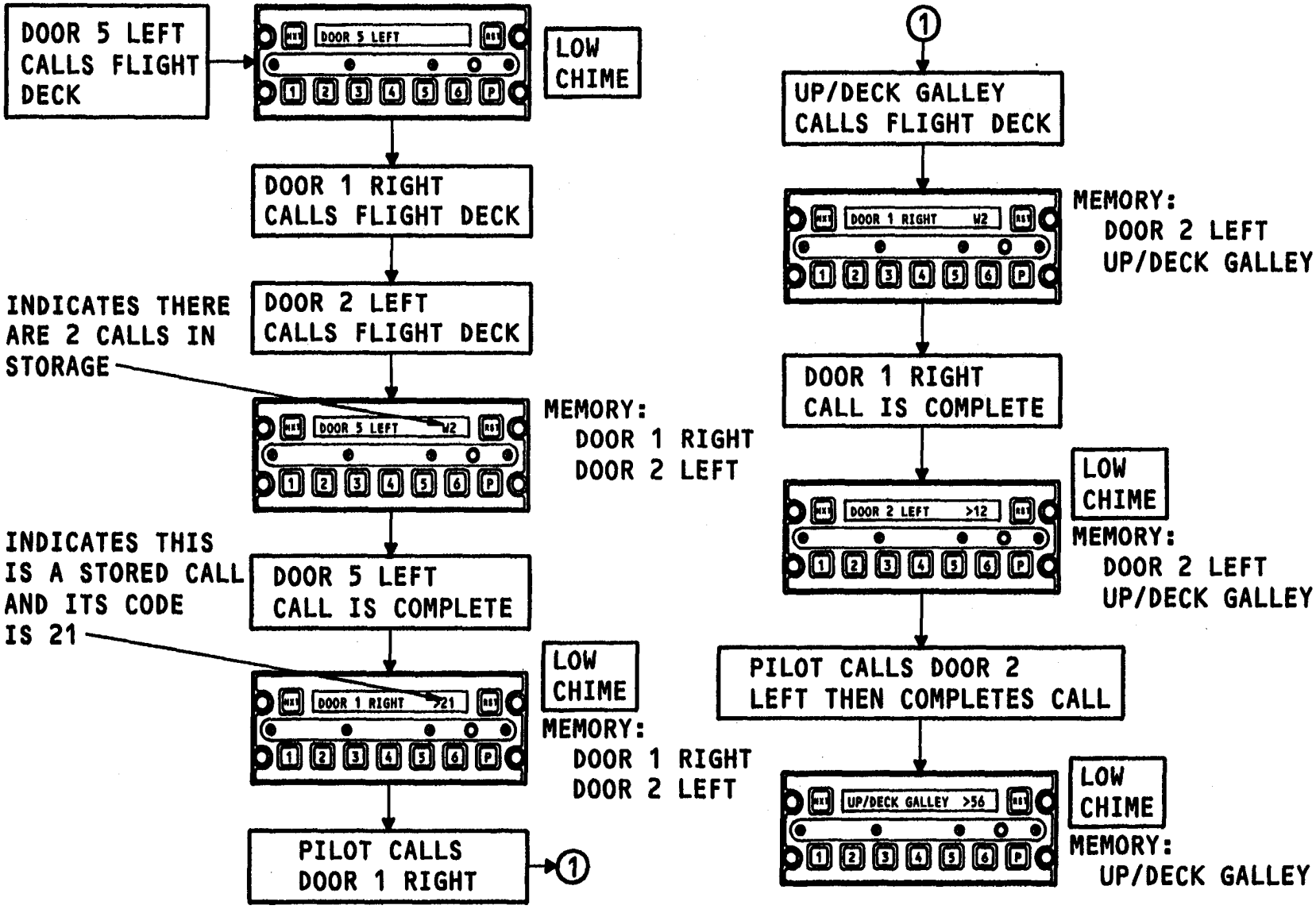


Figure 43 PCP - MESSAGE STORAGE AND PRIORITY

PCP - PILOT ALERT

Pilot alert calls have the highest priority. A pilot alert call overrides any call in the flight deck except:

- Another pilot alert call already in progress
- A flight deck passenger address announcement

The pilots' call panel (PCP) tells the flight crew that there is a pilot ALERT CALL.

For example, door 1 left calls the flight deck. A low chime sounds, and the message DOOR 1 LEFT shows on the PCP.

While the flight crew member is on a call with door 1 left, a call to the flight deck comes from door 3 right. The attendant at door 3 right gets a type 1 busy signal. The cabin interphone controller (CIC) stores the call and the characters W1 show on the right side of the PCP display.

When a pilot alert comes from an attendant station:

- A low chime sounds
- The call from door 1 left stops

At this point, the cabin interphone handset at door 1 left gets a type 2 busy signal. The call stops and does not go into memory.

The message PILOT ALERT W1 shows on the PCP. The characters W1 mean that there is a stored call message. A low chime sounds.

When the pilot alert stops, a low chime sounds and the message DOOR 3 RIGHT >23 shows on the PCP. This means that there was a call from that location while the cabin interphone system was in use.

The flight crew member can then dial 23 to return the call. The flight crew member can also push the RST pushbutton to delete the stored call message and to cause the message DIRECTORY to show on the PCP.

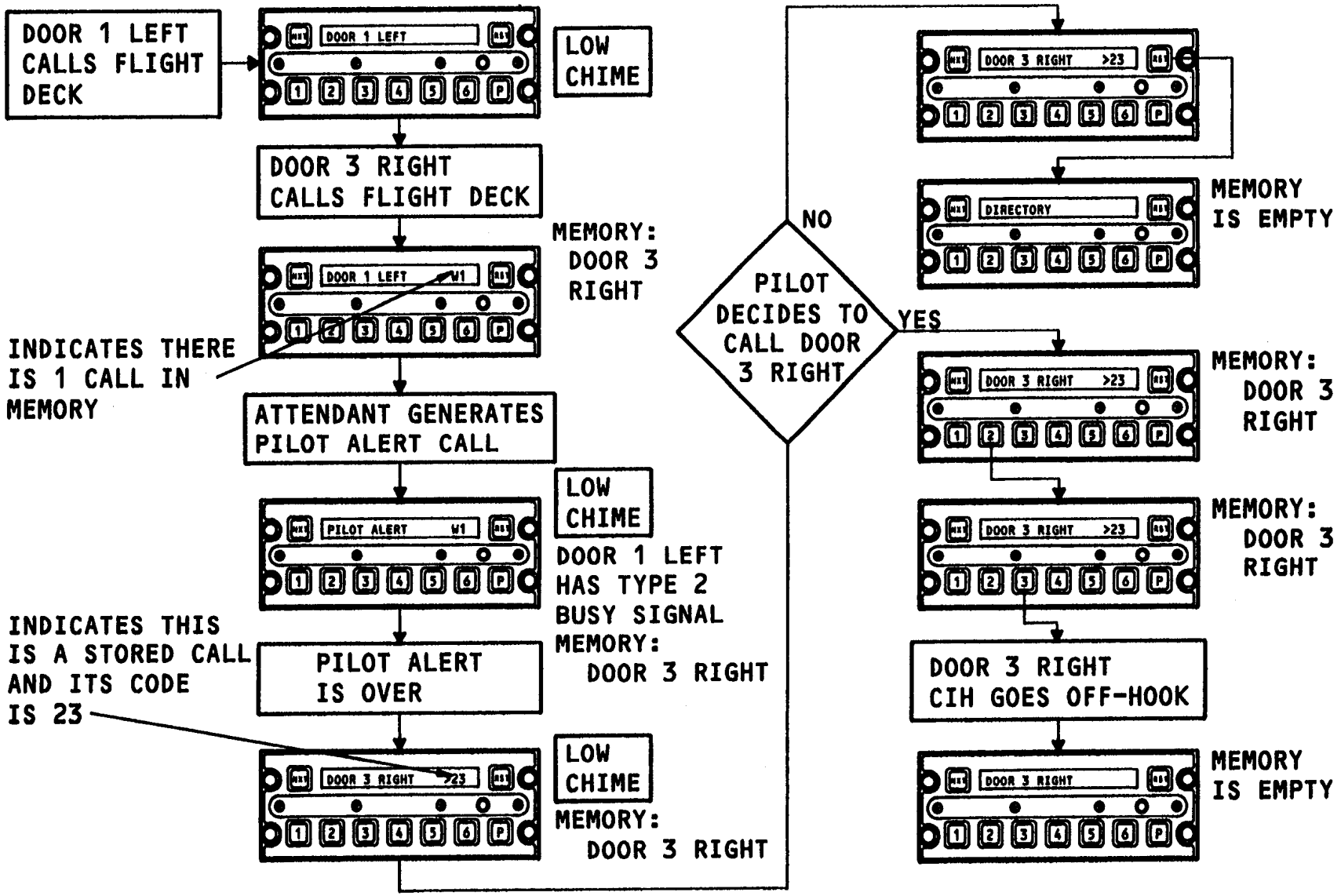


Figure 44 PCP - PILOT ALERT

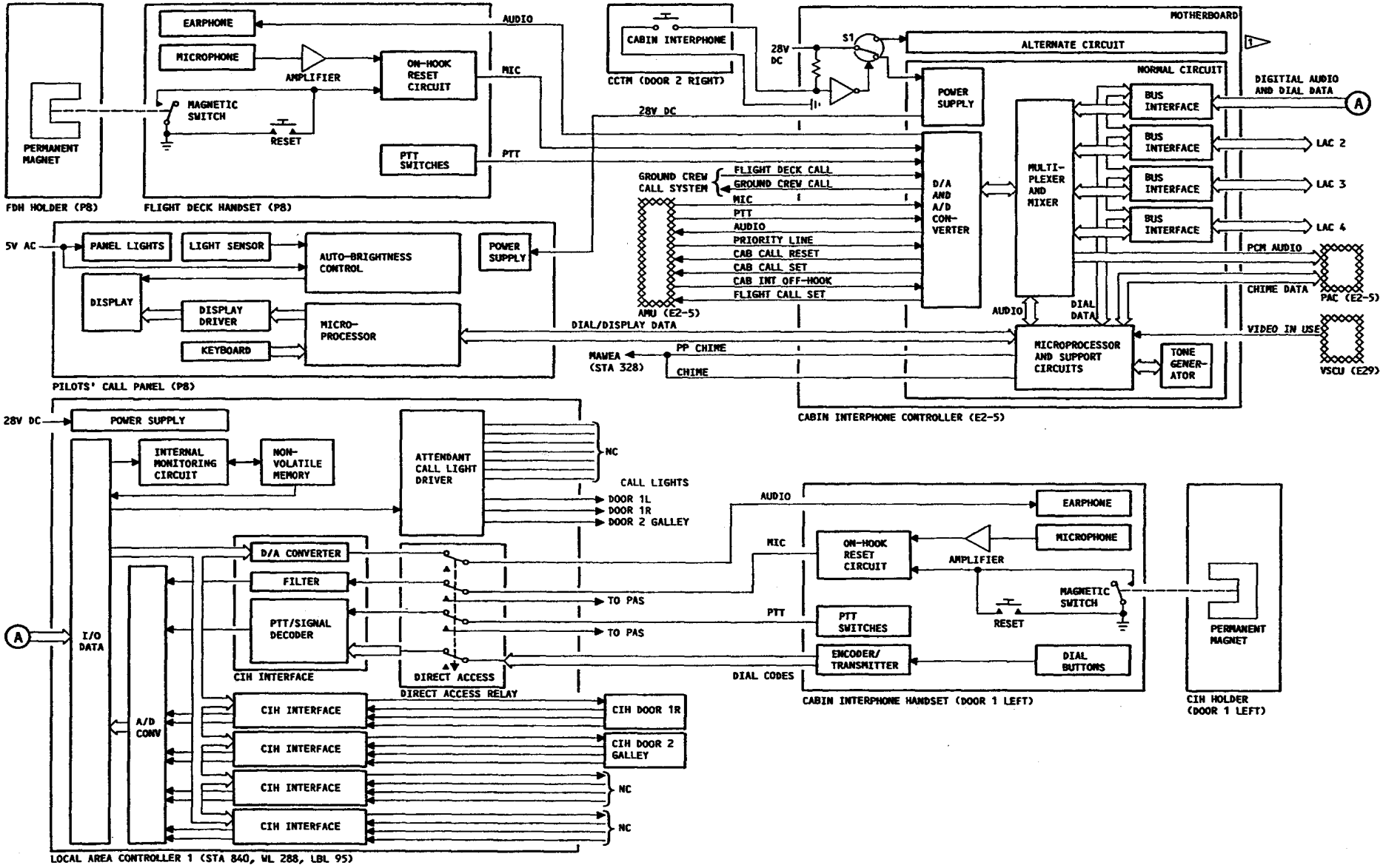


Figure 45 CIS SCHEMATIC DIAGRAM

PILOTS' CALL PANEL OPERATION

General Description

The pilots' call panel (PCP) has a microprocessor which controls its functions.

The cabin interphone controller sends 28v dc to a power supply which supplies power for operation of the PCP.

The panel lights and the auto brightness control circuit get 5v ac.

The auto brightness control circuit senses the amount of light in the flight dock and adjusts the brightness of the LED display.

Dial Code Data

Discrete pulses go from the keyboard to the microprocessor when a code is dialed. The microprocessor decodes the inputs from the keyboard and sends the dial code data to the cabin interphone controller (CIC).

Call Locations and Messages

The CIC sends the pilots' call panel:

- Messages (PA IN USE, VIDEO IN USE, etc.)
- Call location messages

This data goes to the microprocessor. The microprocessor causes the messages to show on the LED display.

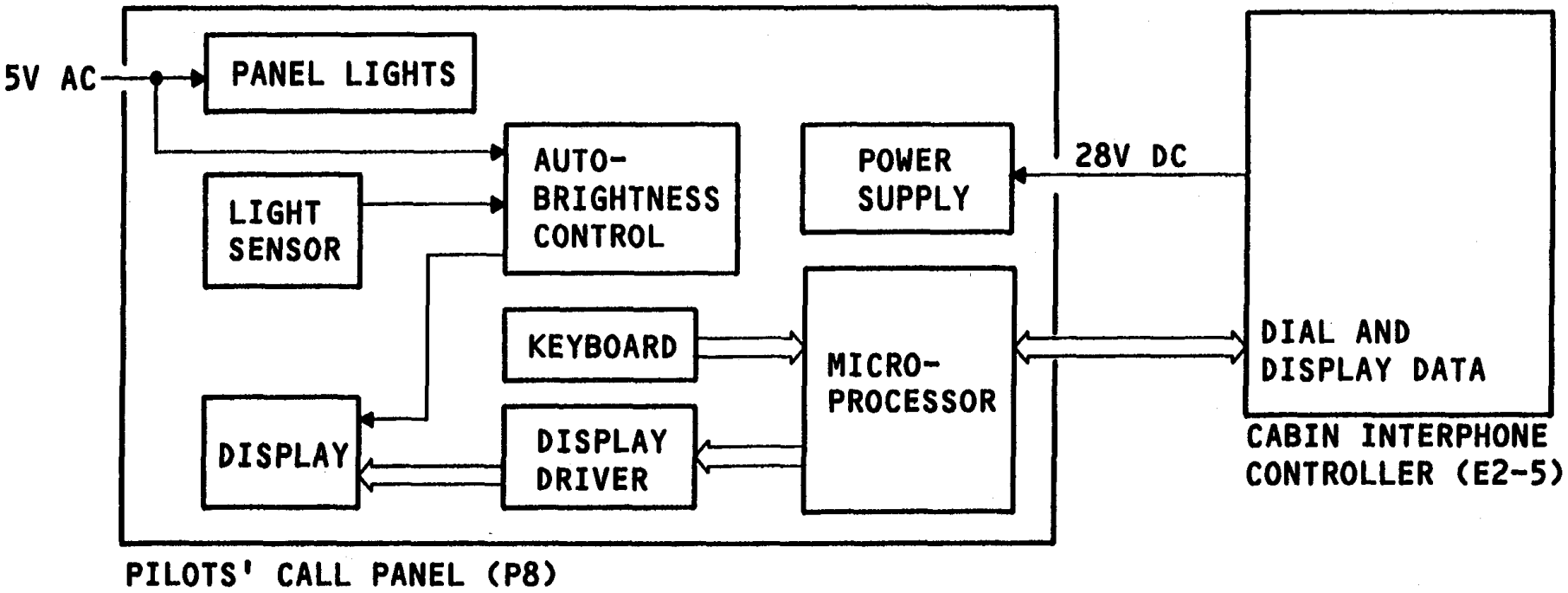


Figure 46 PILOTS' CALL PANEL OPERATION

CABIN INTERPHONE HANDSET OPERATION

General Description

The cabin interphone handsets (CIHs):

- Get cabin interphone audio from the LACs
- Send dial code data to the local area controllers (LACs)
- Send microphone audio to LACs
- Send a PTT (push-to-talk) signal to the LACs

Cabin Interphone Audio

The cabin interphone handset gets analog audio from the LAC to which it connects. The audio goes to the earphone.

Dial Code Data

Discrete pulses from the dial code buttons go to an encoder and transmitter circuit. This circuit sends the dial codes to the LAC to which the handset connects.

Microphone Audio

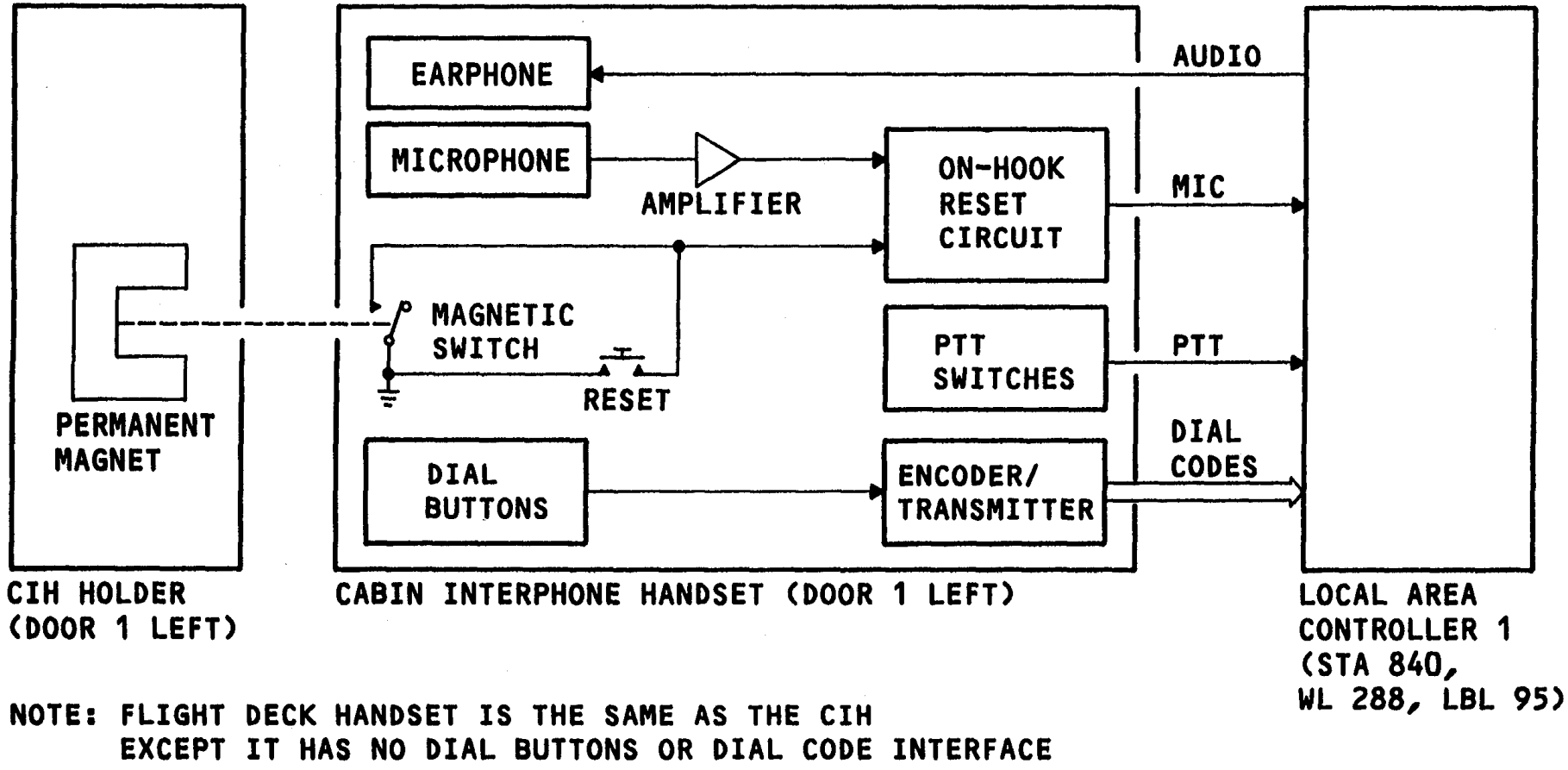
Analog audio from the microphone goes through an amplifier to the on-hook reset circuit. The on-hook reset circuit sends power to the microphone only when the handset off-hook and the reset button is not pushed. A magnet in the handset holder closes a magnetic switch to do the on-hook function.

PTT Signal

Two PTT (push-to-talk) switches send ground discrete signals when pushed. They are only used to make passenger address announcements. The PTT switches have no effect on the cabin operation.

Flight Deck Handset

The flight deck handset (FDH) is the same as the CIH except it has no dial buttons or dial code interface. Its holder does the same functions as the CIH holder.



NOTE: FLIGHT DECK HANDSET IS THE SAME AS THE CIH
EXCEPT IT HAS NO DIAL BUTTONS OR DIAL CODE INTERFACE

Figure 47 CABIN INTERPHONE HANDSET OPERATION

CIC NORMAL AND ALTERNATE CIRCUITS

The cabin interphone controller (CIC) has these two fully redundant controller circuits:

- Normal
- Alternate

Each circuit can do all CIC functions. All interfaces with the CIC connect in parallel to both circuits.

Normally, the cabin interphone switch on the cabin configuration test module (CCTM) is open. When it is open, it sends an open discrete to an inverter on the motherboard of the CIC (an open is a logic one). This sends a logic zero to switch S1. The switch sends 28v dc to the normal controller circuit.

When the cabin interphone switch closes, it sends a ground discrete from the CIC back to the CIC to an inverter on the motherboard (a ground is a logic zero). This sends a logic one to switch S1. The switch sends 28v dc to the alternate controller and removes power from the normal circuit. Thus, the alternate circuit now does all the CIC functions.

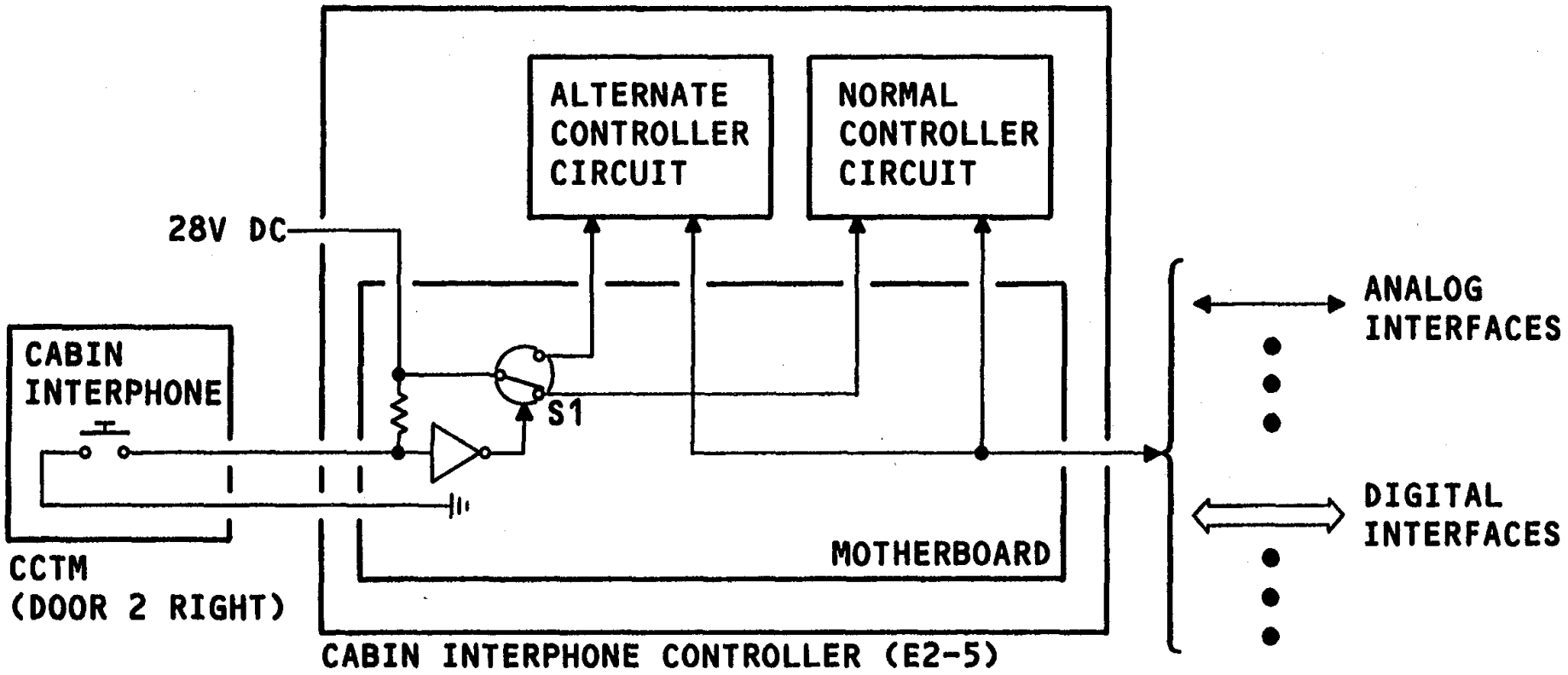


Figure 48 CIC NORMAL AND ALTERNATE CIRCUITS

CABIN INTERPHONE CONTROLLER OPERATION

General Description

The cabin interphone controller (CIC) is microprocessor-controlled..

The 28v dc battery bus sends 28v dc power to a power supply. The power supply circuit supplies dc power for operation of the CIC and 28v dc to the pilots' call panel (PCP).

Call Connection

Digitized audio and dial data come from each local area controller (LAC). This data goes to bus interface circuits.

Each bus interface circuit sends:

- The dial data to the microprocessor and support circuits.' These circuits send the multiplexer and mixer the call connection data.
- The digitized audio to the multiplexer and mixer.

The multiplexer and mixer connects the digital audio to the appropriate bus interface circuit, which sends the digital audio to the LAC.

Flight Interphone System Interface

There is an audio interface between the cabin interphone system and the audio management unit (AMU) to let the flight crew use the flight deck microphones and headsets for cabin interphone functions.

A cabin interphone call set output to the AMU makes the cabin call light in the audio control panel (ACP) come on.

A cabin call reset discrete output from the CIC tells the AMU to make the cabin call light in the ACP go off. This happens when the flight deck handset (FDH) goes off hook.

A cabin interphone off-hook discrete goes to the CIC when the cabin interphone transmit switch on the ACP is pushed. This tells the CIC to send cabin interphone audio (e.g. a dial tons) to the AMU.

A priority line discrete is generated by the AMU when the CAB transmit switch on the ACP is pushed twice within three seconds.

All of these inputs and outputs go to and from a digital-to-analog and analog-to-digital (D/A and A/D) converter. The D/A and A/D converter sends and receives digital audio and data to and from the multiplexer and mixer.

Passenger Address Interface

Digitized audio and passenger area data go to the passenger address controller (PAC) This is for passenger announcements.

When there is a call to an attendant station, the microprocessor and support logic tells the PAC to sound a chime at the attendant station.

Pilots' Call Panel Interface

The pilots' call panel (PCP) sends the CIC dial data. It gets call locations and messages from the CIC.

When there is a call to the flight deck, the microprocessor and support logic gets the dial data. The microprocessor and support logic circuit then tells the PCP the location of the station that made the call.

A video-in-use discrete goes to the microprocessor and support logic from the video system control unit (VSCU). This discrete tells the CIC that the video system is in use in the passenger cabin. The microprocessor and support logic sends a VIDEO IN USE message to PCP.

Flight Peck Chime

When there is a call to the flight deck, a chime discrete signal goes to the modularized avionics and warning electronics assembly (MAWEA). This discrete tells MAWEA to sound a chime in the flight deck.

There are two discretes which go in parallel to the MAWEA: .

- PP CHIME, for pilot alert calls
- CHIME, for all other calls

Normal/Alternate Circuit Selection

The CIC contains two identical circuits. Only one of these circuits

is on at a time. The cabin configuration/test module (CCTM) has a switch which makes the selection between normal and alternate circuits.

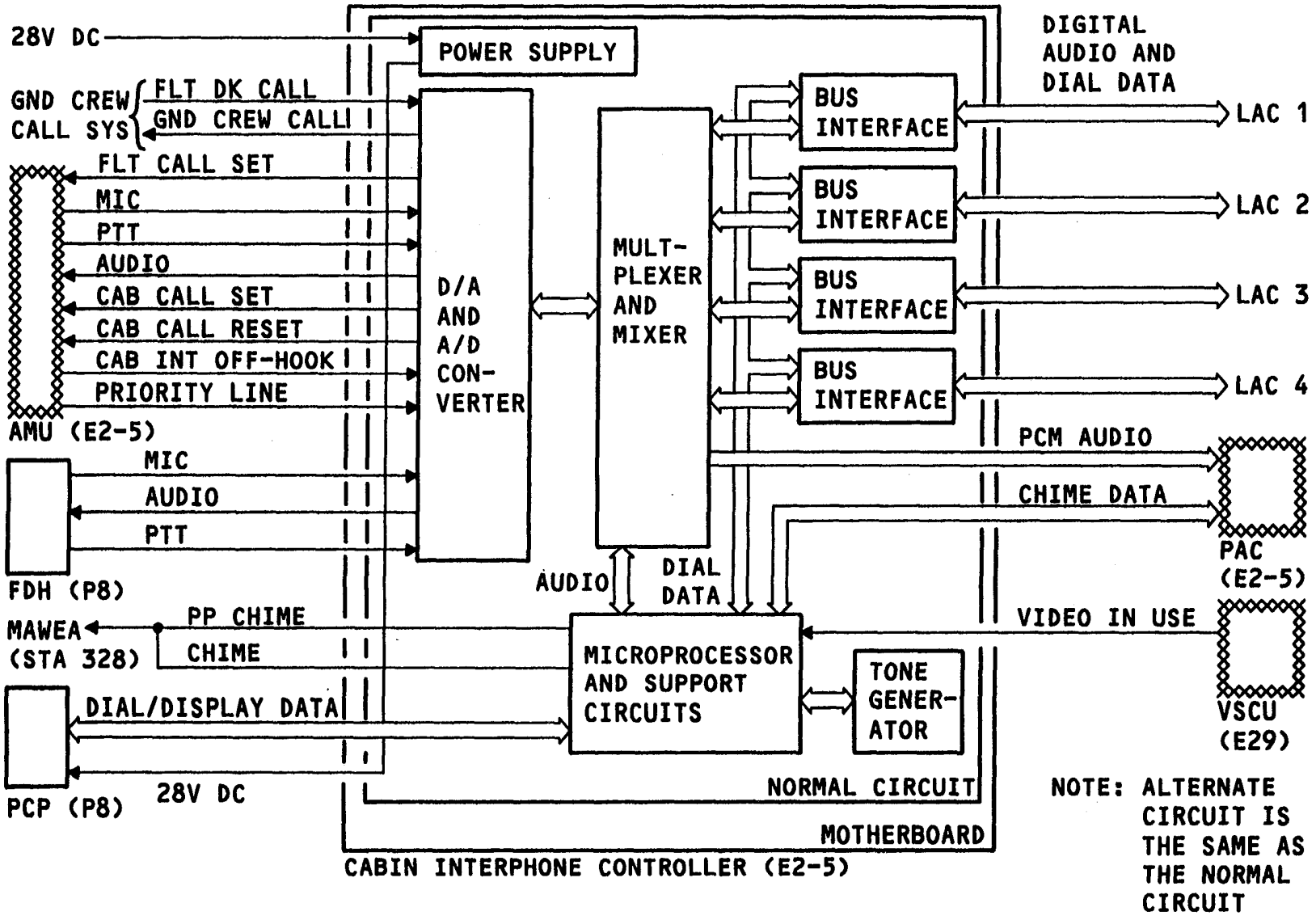


Figure 49 CABIN INTERPHONE CONTROLLER OPERATION

LOCAL AREA CONTROLLER OPERATION

General Description

The local area controllers have three internal circuits which serve systems within the advanced cabin entertainment and service system (ACESS). Each internal circuit is dedicated to only one system. The systems which use these three internal circuits are:

- The cabin interphone system (CIS)
- The passenger address system (PAS)
- The passenger service, passenger entertainment audio, and cabin lighting systems (PSS, PES audio, and CLS

The three internal circuits within the local area controllers are independent of each other, and each has its own power source.

General Operation

The local area controllers (LACs) yet data from and send data to the cabin interphone controller (CIC).

The CIC sends the LACs:

Attendant call lights data

Digitized audio, which includes voice, dial tone, ring back, and busy signals

The LACs send the CIC:

- Dial code data
- Digitized audio
- PTT (for passenger address announcements)

Each LAC can make up to 10 attendant call lights come on, and can interface with up to 5 cabin interphone handsets.

The graphic below shows only the operation of LAC 1. LACs 2, 3 and 4 operate in a similar way.

Power,

The LACs get 28v dc for internal operation.

Attendant Call Lights

LAC 1 connects with the attendant call lights at door 1 left, door 1 right, and door 2 galley.

The data that tells the LAC to make an attendant call light come on comes from the CIC. The 1/0 (input/output) data port decodes the data. It sends an enabling pulse to the attendant call light driver, which turns on the appropriate attendant call light.

Dial Codes

The cabin interphone handsets (CIHs) send the dial codes to the LAC. The PTT/signal decoder decodes the dial codes and re-encodes them with the PTT signal. This digital signal goes to the A/D converter. This circuit signal with the microphone audio and sends it to the 1/0 data circuit, which sends it to the CIC.

Attendant Microphone audio

Attendant microphone audio from the cabin interphone handsets goes to the

filters in the handset interface circuits. The filters send the audio to the analog to digital (A/D) converter, which digitizes the audio.

The A/D converter sends the digitized microphone audio to the 1/0 data port. The 1/0 data port multiplexes it with other audio and sends it to the CIC.

Attendant Earphone audio

Digitized audio from the CIC goes to the 1/0 data port. The 1/0 data demultiplexes the audio and sends it to the appropriate digital to analog (D/A) converters in the handset interface circuits. The analog audio then goes to the cabin interphone handsets.

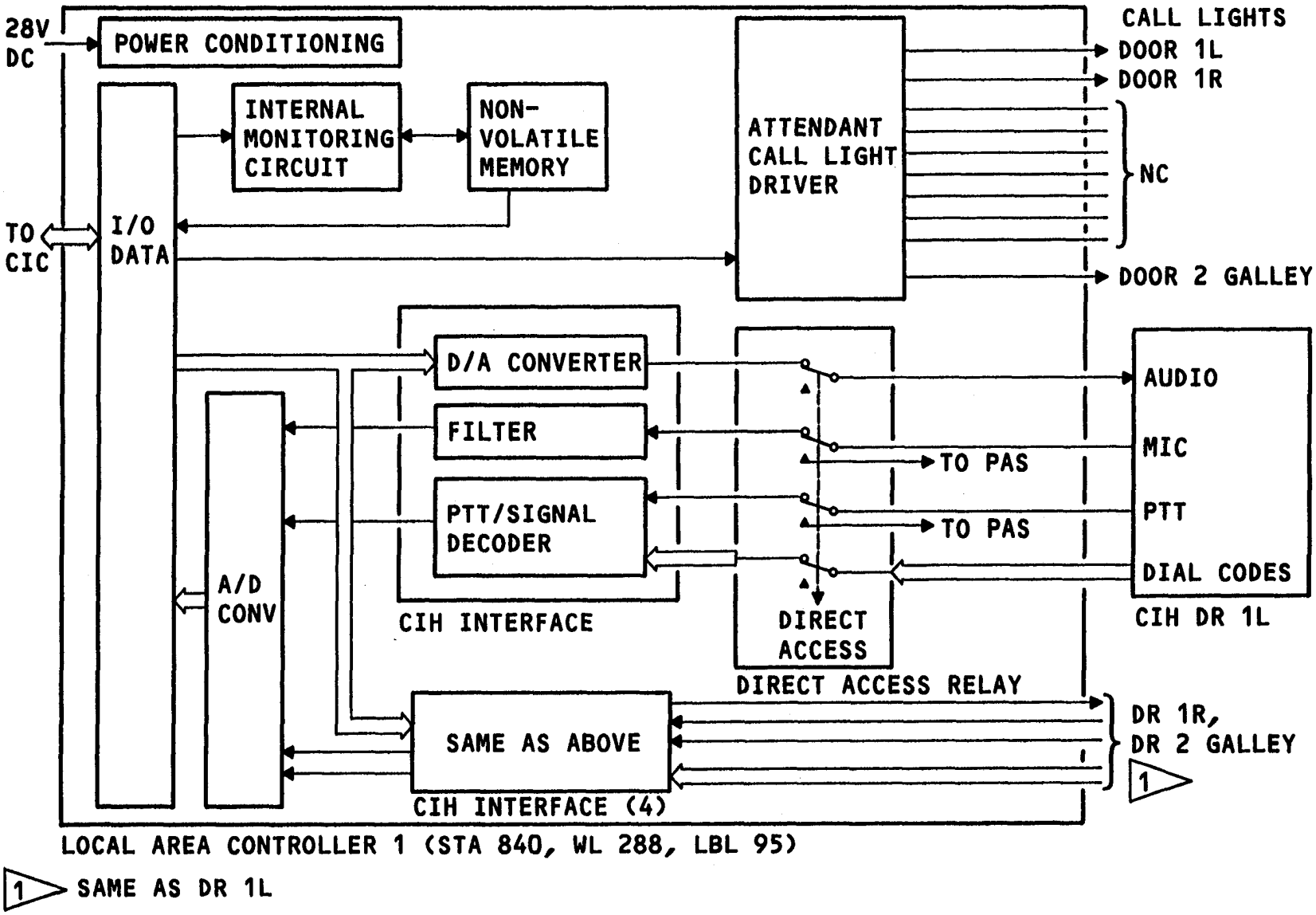


Figure 50 LOCAL AREA CONTROLLER OPERATION

PROGRAMMABLE FEATURES

General Description

ACESS uses a configuration data base to accommodate different airplane configurations. only the data base for the cabin interphone system is discussed here.

Programmable Features

The features that are programmable in the cabin interphone system are:

- Handset installation for attendant stations and flight deck
- Dial code directory
- Visual and aural call annunciations
- Accessibility of dial codes from attendant stations and flight deck
- Pilot alert (PP) chime output pulses in the flight deck

Handset Installation for Attendant Stations and Flight Deck

The cabin interphone controller (CIC) must have in its memory the number of cabin interphone handsets installed and their locations, which includes the flight deck handset.

Dial Code Directory

The dial code directory must be in the memory of the CIC. This includes data such as which stations are the primary and secondary stations.

Visual and aural Call Annunciations

The types of visual and aural call annunciations at the attendant stations are in the configuration program. The messages which show on the pilots' call panel are also in the configuration program.

Accessibility of Dial Codes from Attendant And Flight Peck Locations

Dial codes can be configured to be non-accessible from attendant locations and/or the flight deck. The configuration database can make a code accessible or non-accessible for all attendant stations, not for particular attendant stations.

Pilot Alert (PP) Chime Output Pulses the Flight Deck

The number of chimes that sound in the flight deck when there is a pilot alert call can be configured from zero to eight.

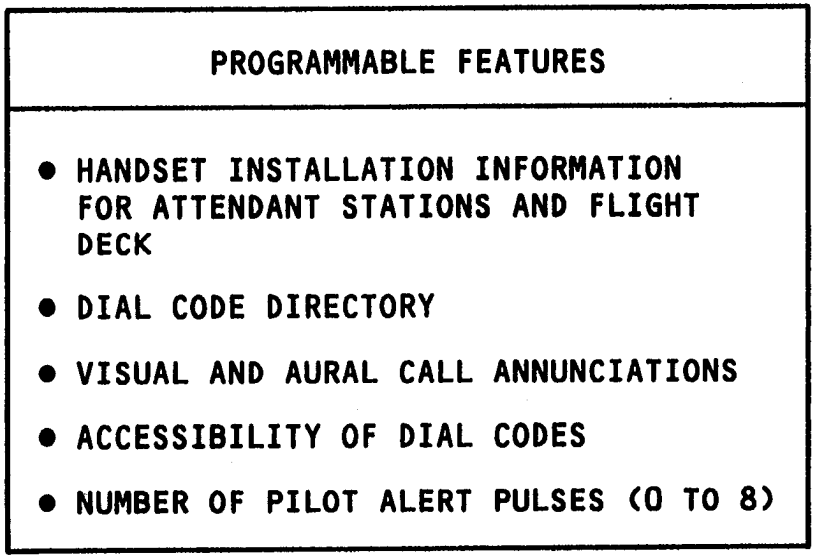


Figure 51 PROGRAMMABLE FEATURES

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