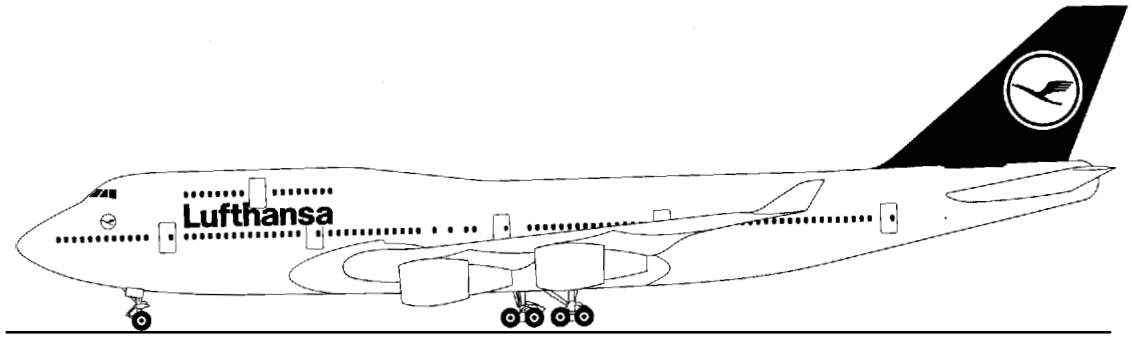
Lufthansa Technical Training

Training Manual B 747-400



ATA 23-33
PSS

ATA Spec. 104 Level 3

Book No:

Lufthansa
Technical Training GmbH
Lufthansa Base

Issue: DEC 2001

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ATA 23-33 PASSENGER SERVICE SYSTEM

PASSENGER SERVICE SYSTEM - INTRODUCTION

The passenger service system (PSS) gives the passengers control of:

- Passenger reading lights
- Passenger to attendant calls
- Lavatory to attendant calls

The system also controls passenger information signs.

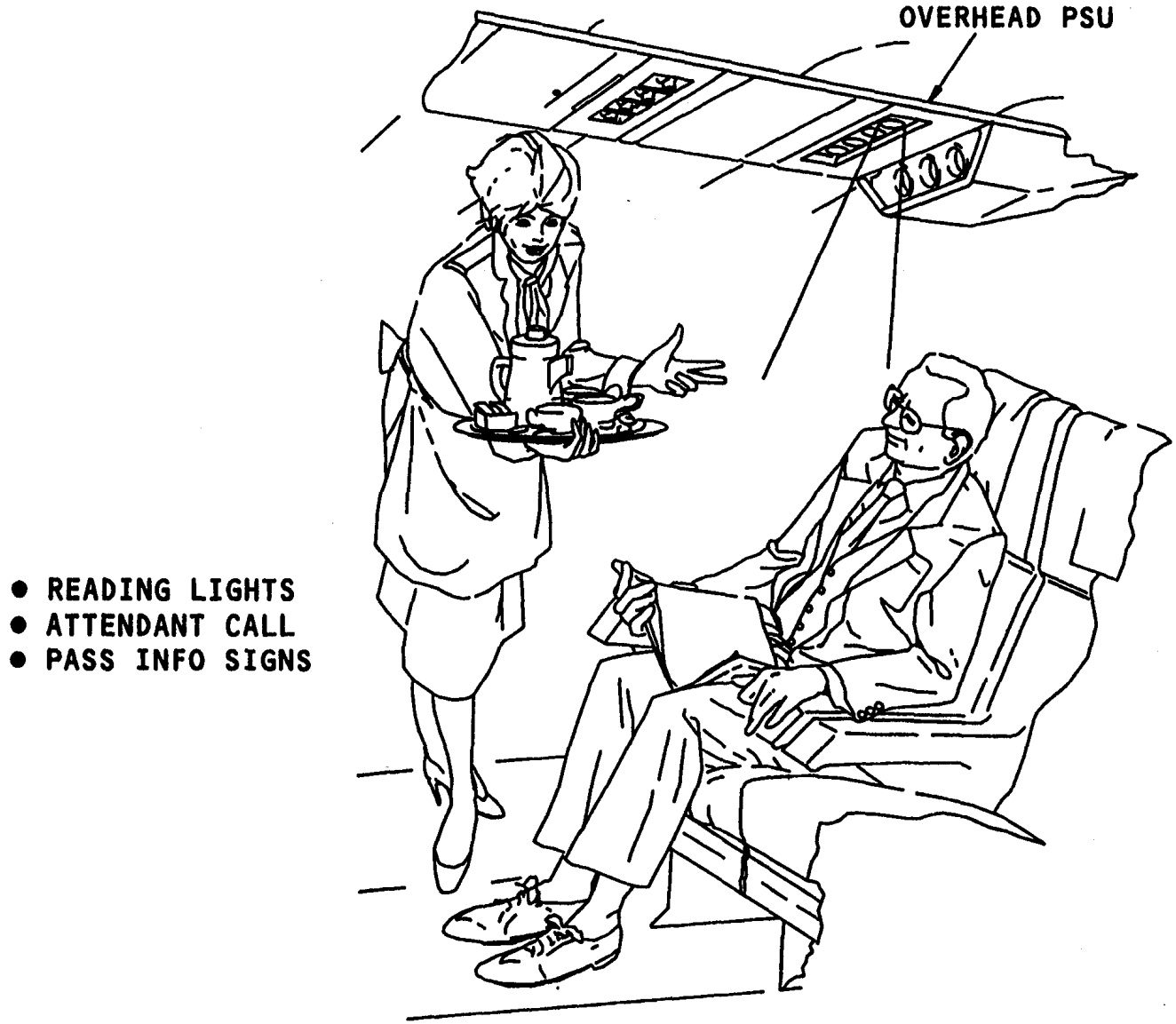

Figure 1 PASSENGER SERVICE SYSTEM - INTRODUCTION

PASSENGER SERVICE SYSTEM

General

The main components of the PSS are:

- Entertainment/service controller (ESC)
- Four local area controllers (LACs)
- One seat electronics unit (SEU)/interseat cable for each seat group
- One SEU termination plug for each column
- One inboard or outboard overhead electronics unit (OEU) for each passenger service unit (approximate)
- one digital passenger control unit (DPCU) for each seat
- Cabin configuration test module (CCTM)
- Two cabin system modules (CSMs)
- Central management unit (CMU)

The components that interface with the PSS are:

- Software data loader
- Three EFIS/EICAS interface units (EIUs)
- Air/ground relay
- Passenger address controller (PAC)
- Passenger information signs
- Lavatories (Lavs)
- Passenger service units (PSUs)
- Master call lights

DPCU Control

Passengers use a digital passenger control unit (DPCU) to control:

- Passenger reading lights
- Passenger to attendant calls

Reading Light Control

Reading light Control selections go through the seat electronics units (SEUs) to a local area controller (LAC). The LAC sends the selection to an overhead electronics unit which makes the reading light come on or go off.

Passenger To Attendant Call Control

Attendant call selections go through the SEUs to a LAC. The LAC:

- Sends the selection to an overhead electronics unit which makes a row call light above the passengers seat come on.
- Makes a master call light at the attendants station come on.
- Sends the selection through the entertainment/service controller (ESC) to the passenger address controller (PAC). The PAC makes a chime sound at the attendants station.

Lavatory Functions

Lavatories have an interface with inboard overhead electronics units (IOEUs). The I-OEUs give control of:

- Lavatory to attendant calls
- Lavatory occupied signs
- The return to seat sign in the lavatory

Passenger Information Sign Control

The ESC uses these discrete inputs to control the passenger information signs:

- No smoking
- Fasten seatbelts
- Decompression

Passenger Information Sign Control (cont)

When the ESC gets a discrete input, it sends a control signal to the LACs, which send it to the OEUs. The OEUs make the passenger information signs come on or go off.

Chime Off Control

Each attendants station has a chime off switch. The chime off switch stops passenger to attendant call chimes at the attendants station. It does not effect lavatory to attendant or attendant to attendant call chimes.

Smoking Section Adjustment

DPCUs have a no smoking indicator on their front panel. In passenger rows where smoking is not allowed, the indicator is always on. Attendants use the CCTM to adjust the number of rows in a smoking section. The adjustments control the no smoking indicator on the DPCUs.

Cabin System Module

Switches on the CSM's front panel control:

- Power to the SEUs and OEUS
- Passenger reading lights
- Passenger to attendant call reset

Cabin Configuration Test Module

Switches on the CCTM's front panel:

- Adjust smoking sections
- Select the ESCs normal or alternate controller circuit
- Select alternate CSM operation

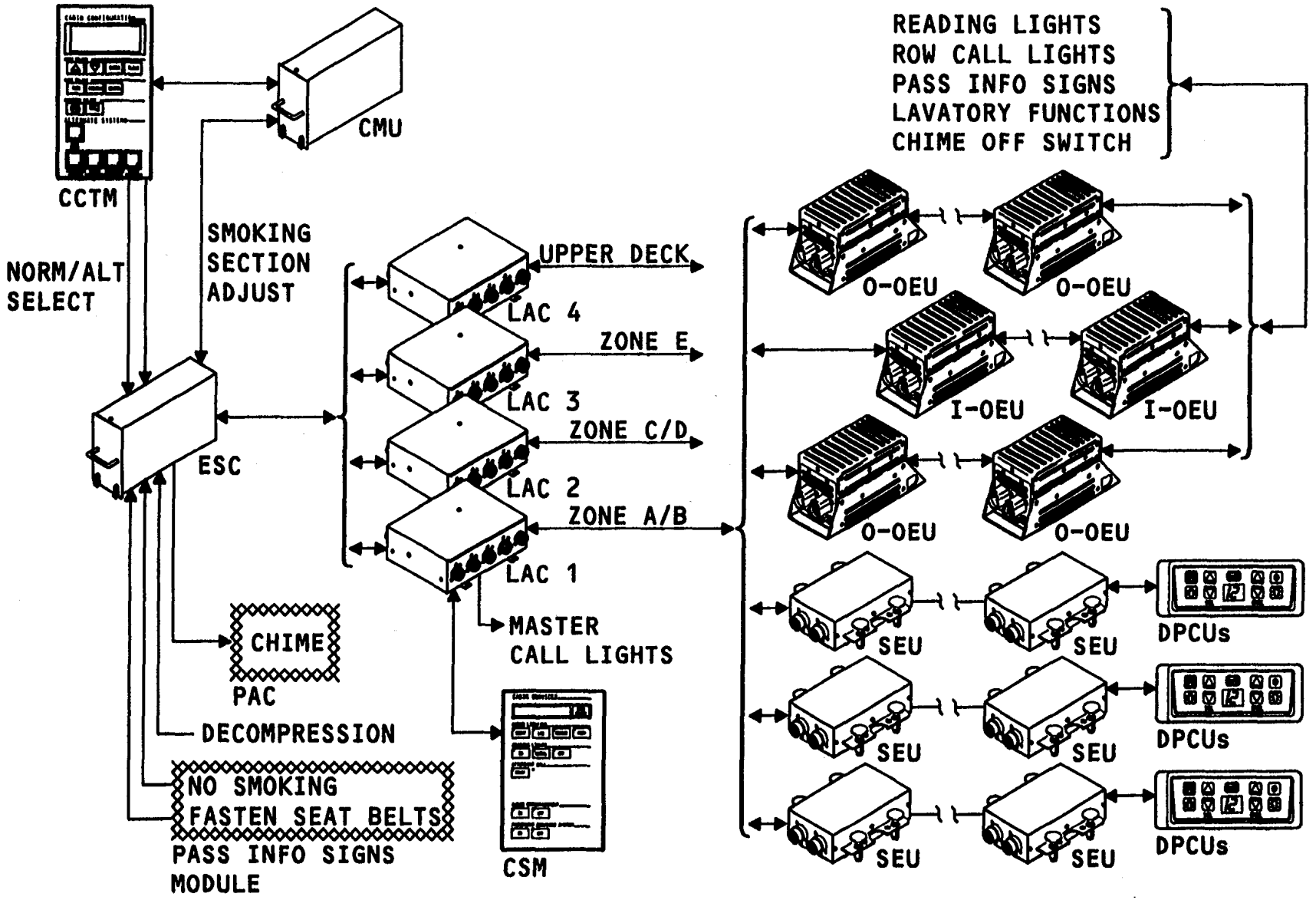

Figure 2 PASSENGER SERVICE SYSTEM

COMPONENT LOCATIONS - MEC

The PSS components and interface components in the main equipment center are:

- Entertainment/service controller (ESC)
- Central management unit (CMU)
- AUDIO ENT-TAPE/MUX circuit breaker
- ENT/SERV-DC circuit breaker
- ENT/SERV-AC circuit breaker
- BEAT ELEX ZONE A/B circuit breaker
- SEAT ELEX ZONE C/D circuit breaker
- SEAT ELEX ZONE E circuit breaker
- SEAT ELEX UPR DK circuit breaker
- RDNG LTS ZONE A/B RIGHT circuit breaker
- RDNG LTS ZONE A/B CTR circuit breaker
- RDNG LTS ZONE A/B LEFT circuit breaker
- RDNG LTS ZONE C/D RIGHT circuit
- RDNG LTS ZONE C/D CTR circuit breaker
- RDNG ITS ZONE C/D LEFT circuit breaker
- RDNG LTS ZONE E RIGHT circuit breaker
- RDNG LTS ZONE E CTR circuit breaker
- RDNG LTS ZONE E LEFT circuit breaker
- RDNG LTS UPR DK circuit breaker
- Seat electronics unit relay, R7574
- Reading light relay-1, R7575
- Reading light relay-2, R7576
- Reading light relay-3, R7577
- Audio entertainment relay, R7578

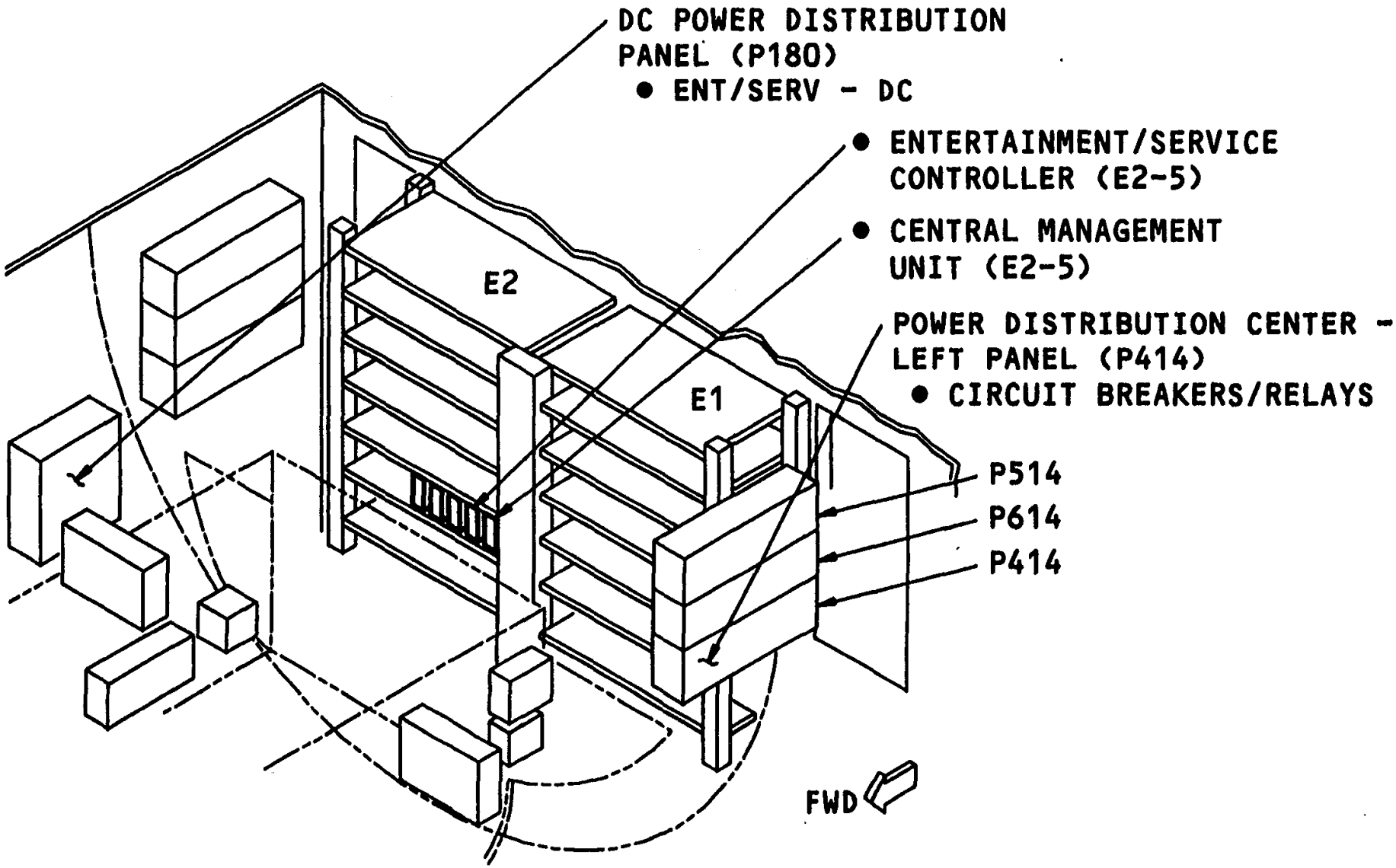

Figure 3 COMPONENT LOCATIONS - MEC

COMPONENT LOCATIONS - CABIN

The PSS components and interface components in the passenger cabin are:

- Local area controller-1
- Local area controller-2
- Local area controller-3
- Local area controller-4
- Seat electronics unit/interseat cable (one for each seat group)
- Inboard overhead electronics units
- Outboard overhead electronics units
- Digital passenger control unit (one for each seat)
- Cabin configuration test module
- Cabin system module (2)

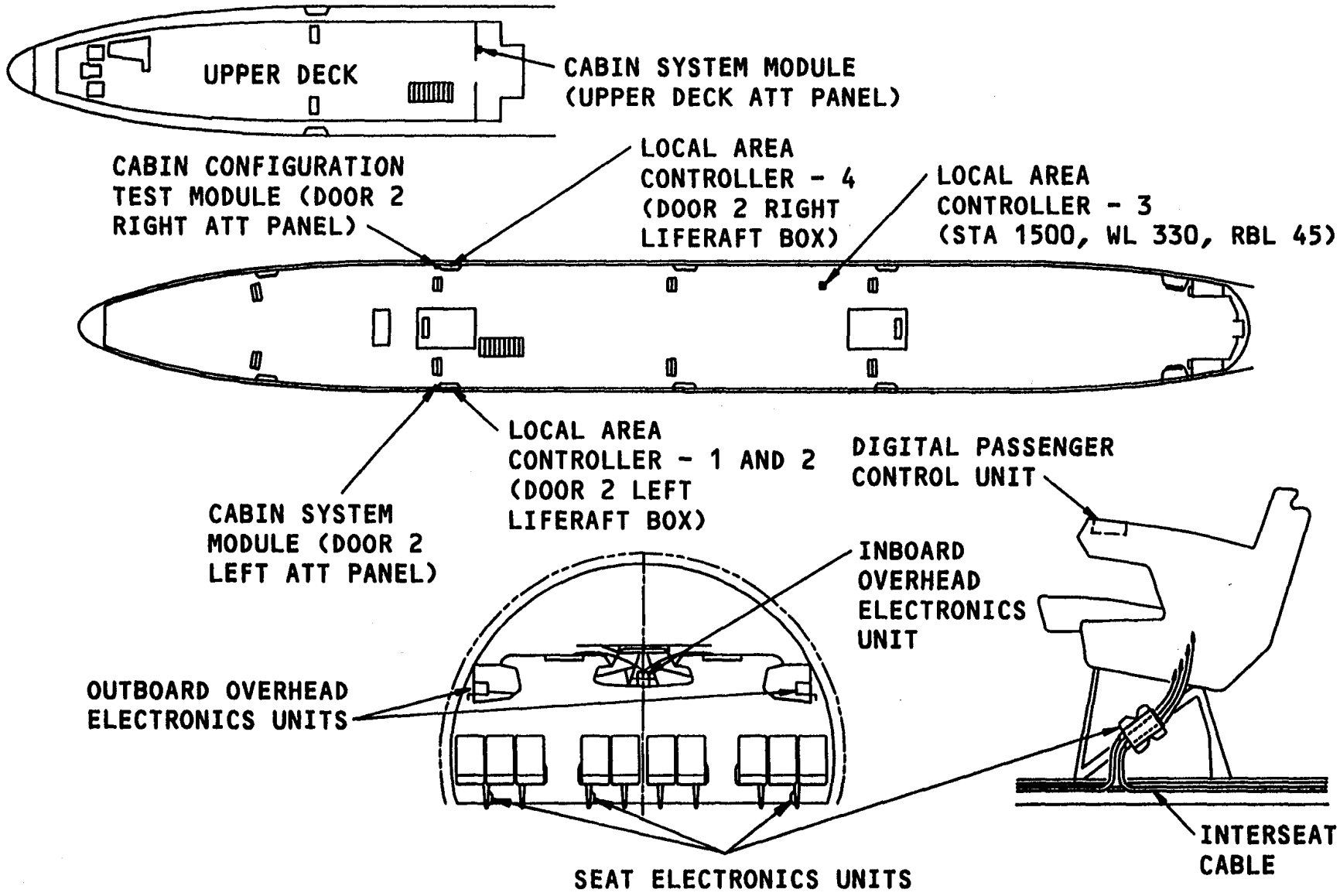

Figure 4 COMPONENT LOCATIONS - CABIN

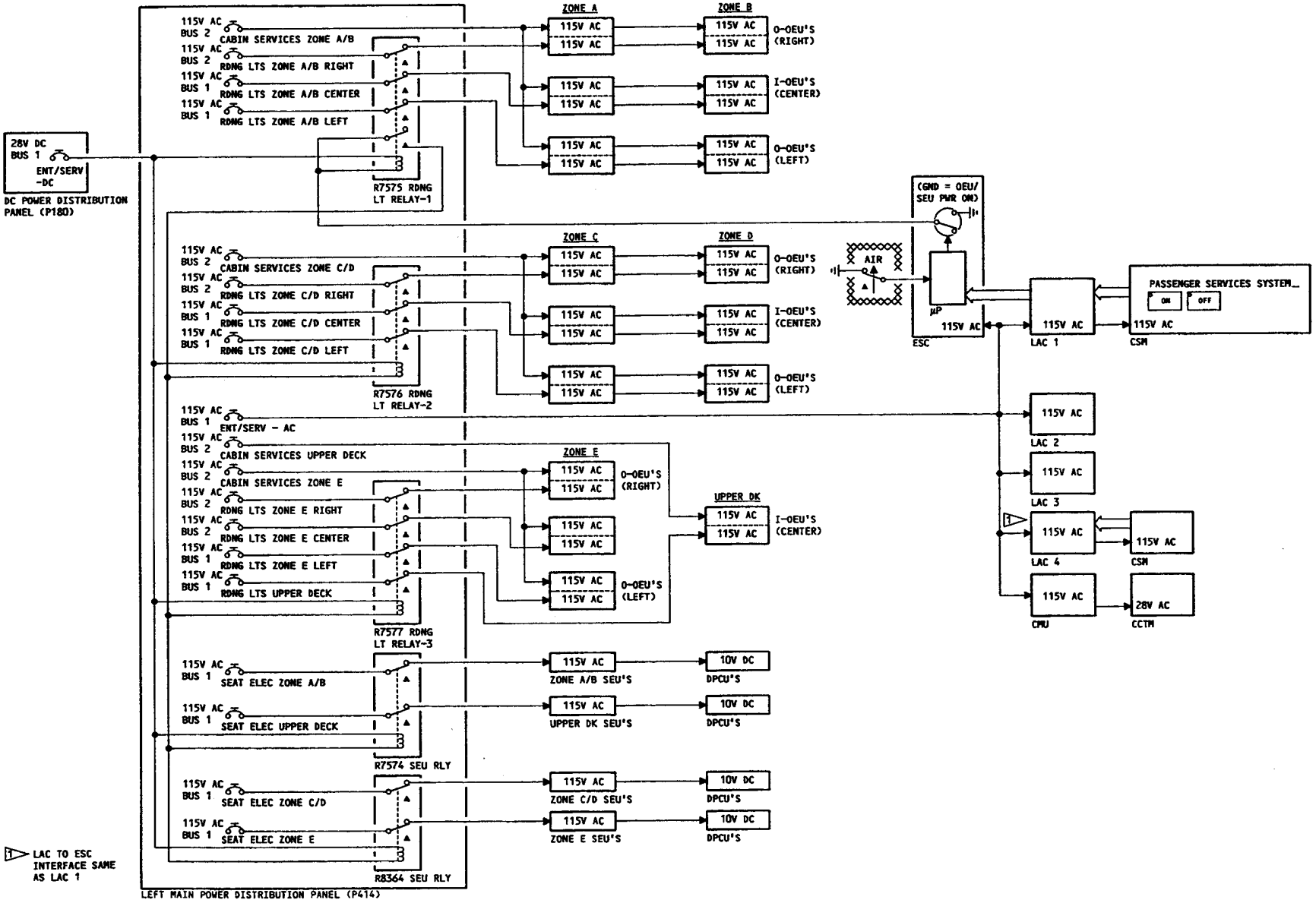

Figure 5 PSS - INTERFACE DIAGRAM - 1

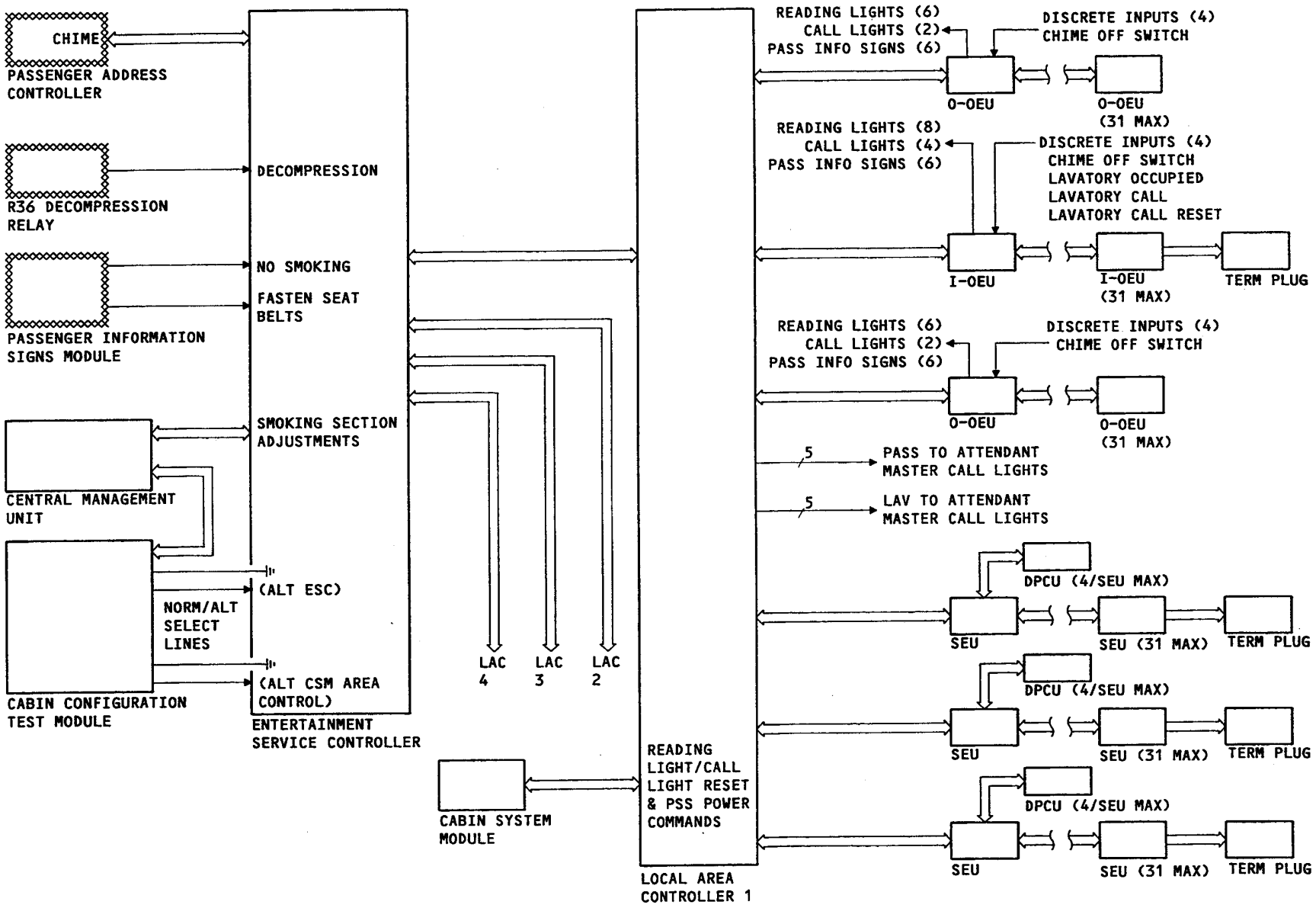

Figure 6 PSS - INTERFACE DIAGRAM - 2

POWER INTERFACE - 1

Power

The ENT SERV-AC circuit breaker sends 115v ac power to the entertainment/ service controller (ESC), central management unit (CMU) and each local area controller (LAC).

The cabin configuration test module (CCTM) gets 28v ac from the CMU.

The cabin system modules (CSMs) get 115v ac from the LAC.

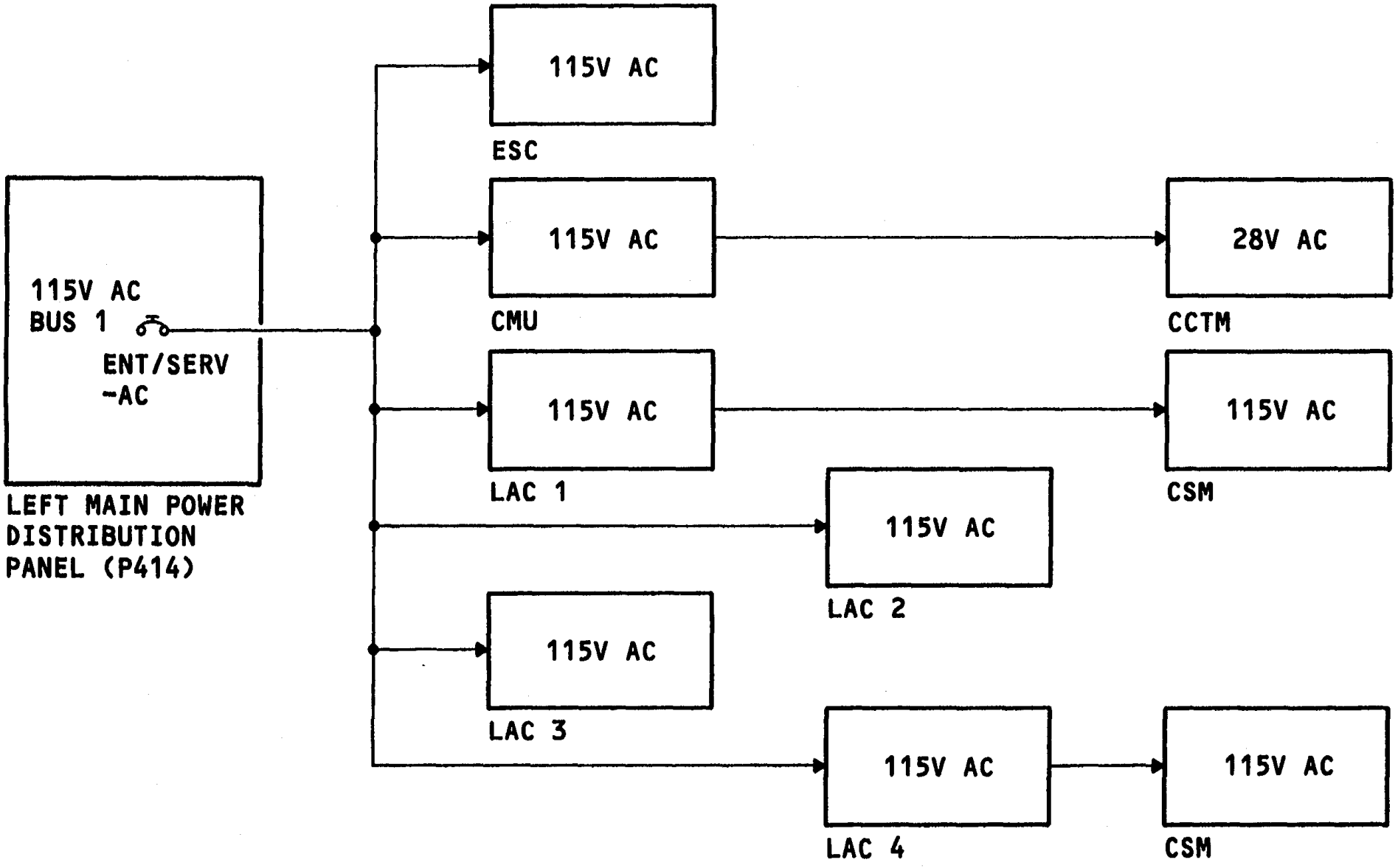

Figure 7 POWER INTERFACE - 1

POWER INTERFACE - 2

Purpose

The PASSENGER SERVICES SYSTEM ON and OFF switches on any cabin system module (CSM) controls the 115v ac to the seat electronics units (SEUs) and the overhead electronics units (OEUs).

General Description

When the system gets power for the first time, a light in the PASSENGER SERVICES SYSTEM ON switch comes on and 115v ac goes to the SEUs and OEUs.

When the PASSENGER SERVICES SYSTEM OFF switch is pushed, a signal goes through the local area controller (LAC) to the entertainment/service controller (ESC). The ESC sends a ground to reading light relay-1. When energized, reading light relay-1 sends a ground to energize reading light relay-2, reading light relay-3, and both SEU relays. When energized, the relays remove power from the SEUs and OEUs.

Air/ground relay R121 sends a round discrete to the ESC when the airplane is in flight. In flight, the ESC cannot remove power from the SEUs and OEUs.

Zone A/B OEU Power

When deenergized, reading light relay-1 sends 115v ac to the OEUs in zones A and B.

Each OEU also gets 115v ac power from a circuit breaker in the P414 panel.

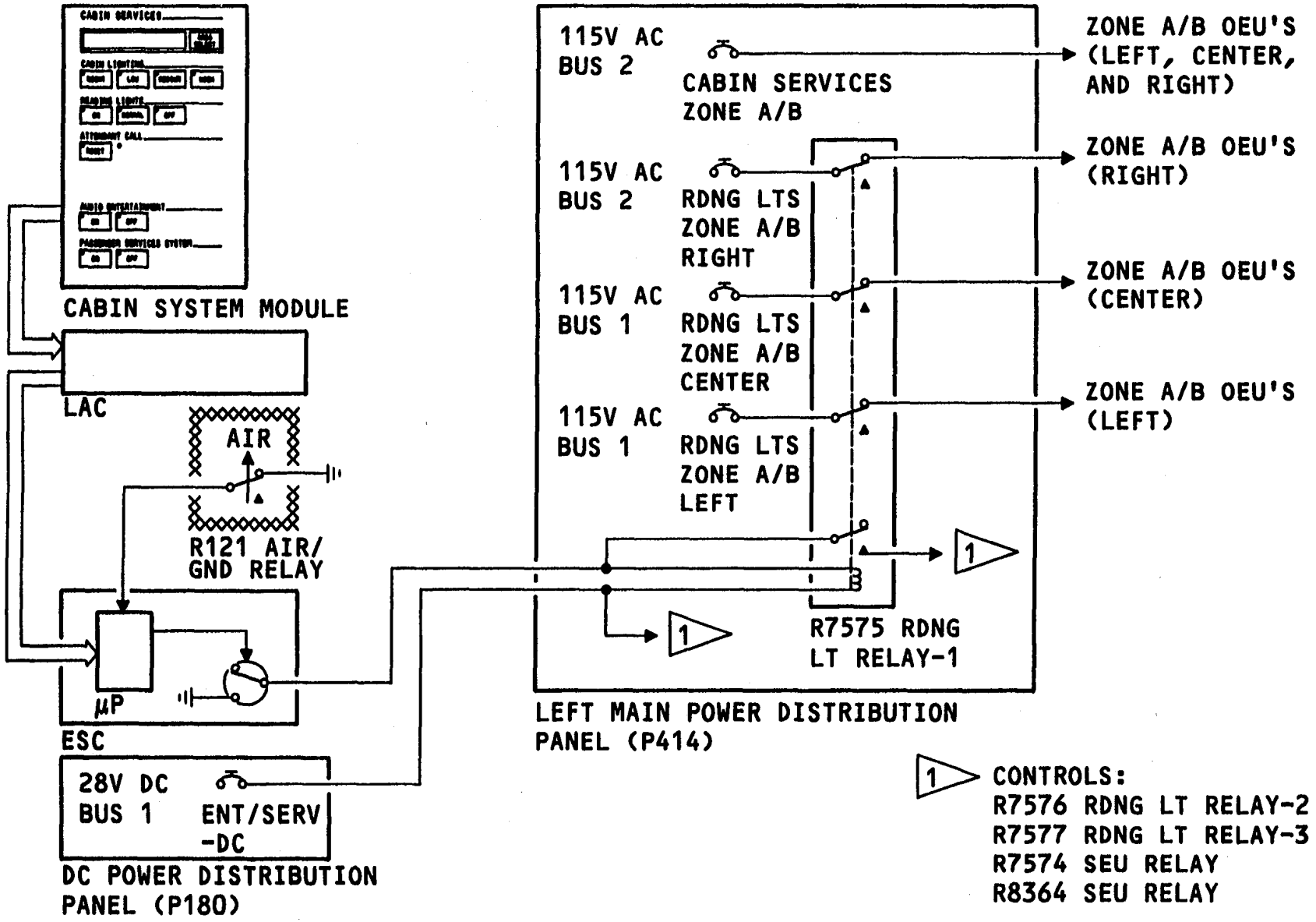

Figure 8 POWER INTERFACE - 2

POWER INTERFACE - 3

When deenergized, reading light relays 2 and 3 send 115v ac power to the overhead electronics units (OEUs) in:

- Zones C and D
- Zone E
- The upper deck

Each OEU also gets 115v ac power from circuit breakers in the P414 panel.

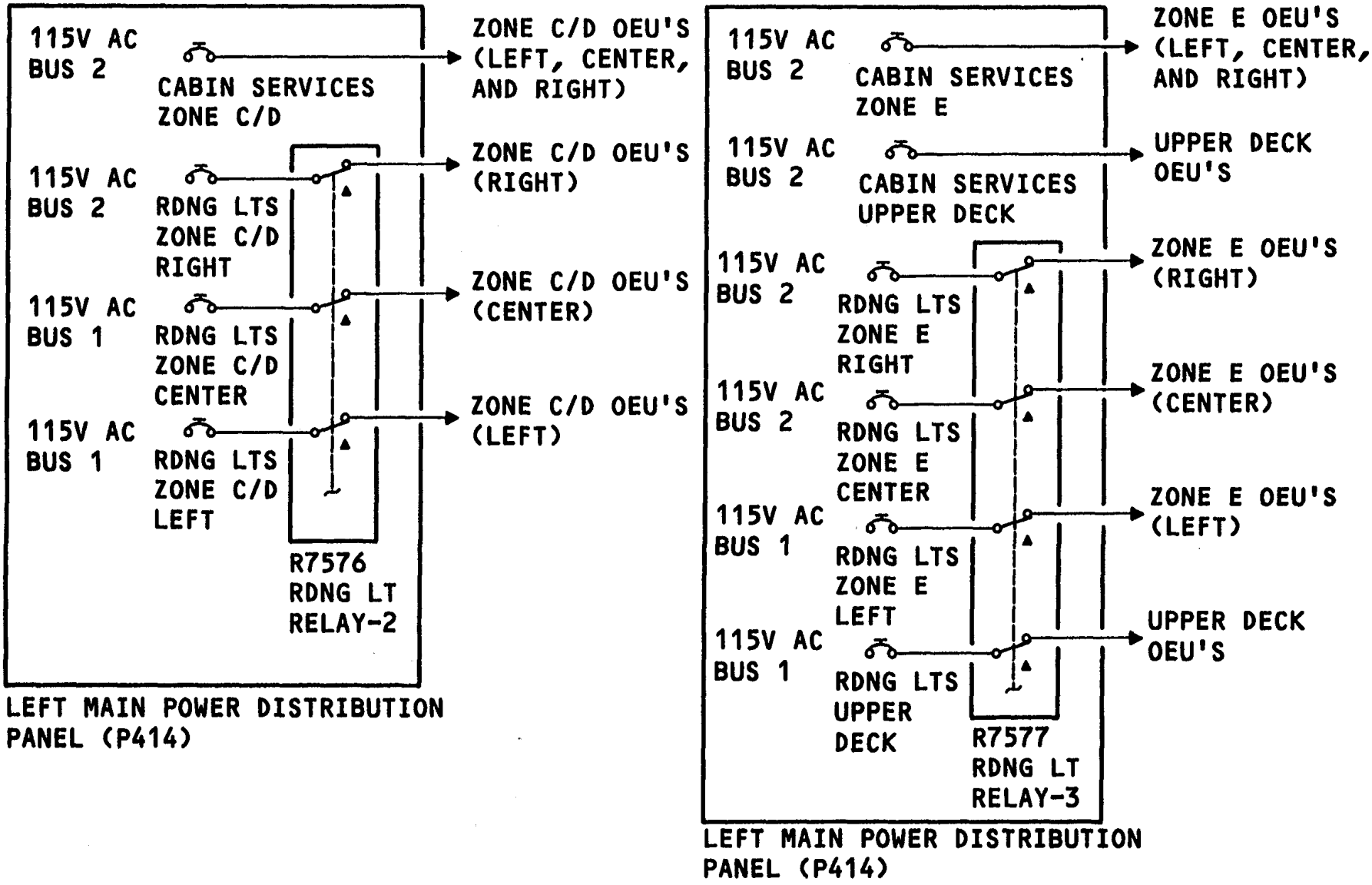

Figure 9 POWER INTERFACE - 3

POWER INTERFACE - 4

When deenergized, the SEU relays send 115v ac power to all the seat electronics units (SEUs) in the airplane.

The SEUs send 10v dc to the digital passenger control units (DPCUs).

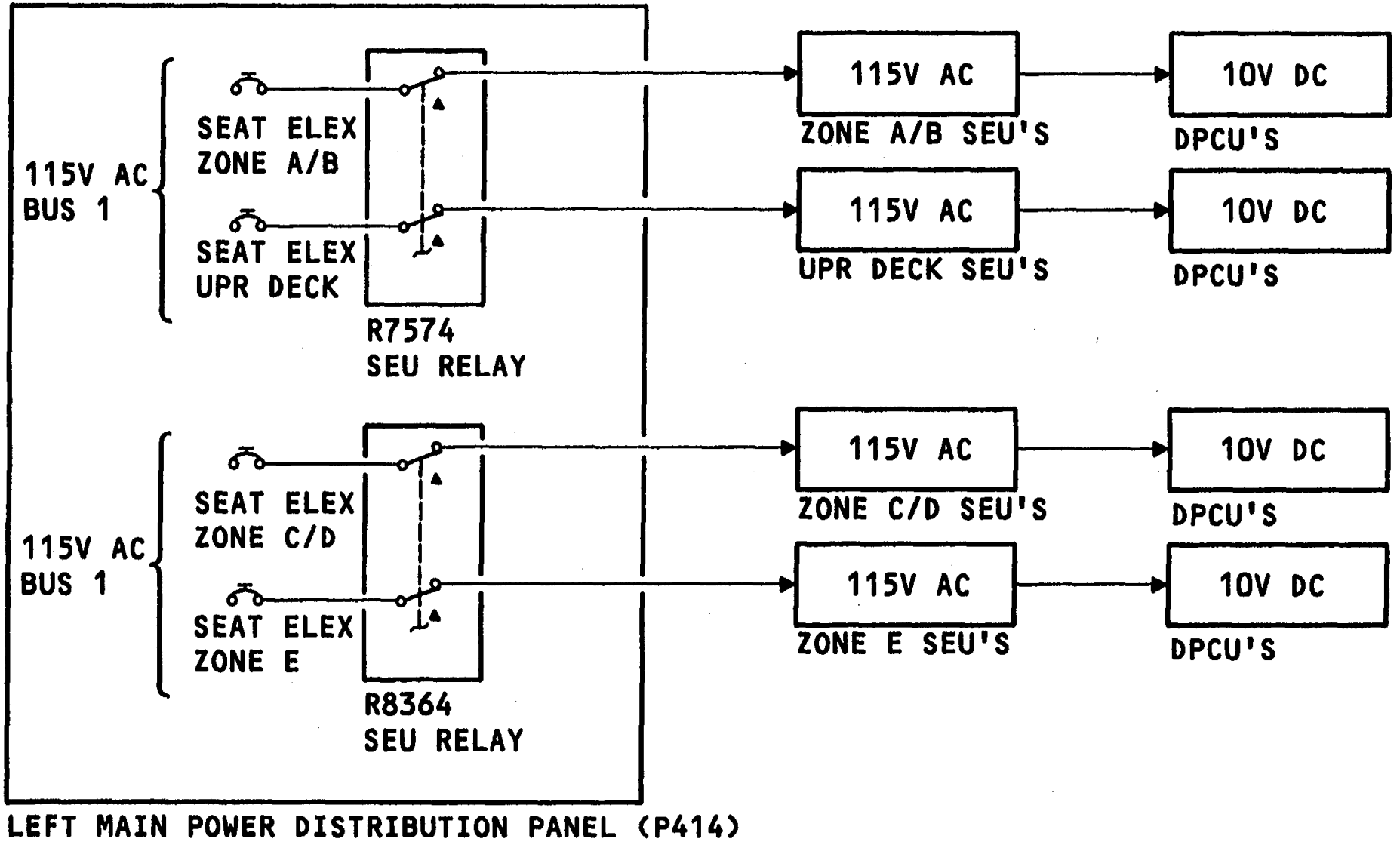

Figure 10 POWER INTERFACE - 4

ATTENDANT CALL/READING LIGHTS

Attendant Call/Reset

To call an attendant, push the attendant call switch on a digital passenger control unit (DPCU). The command goes through the seat electronics unit (SEU) to the local area controller (LAC). The LAC then:

- Makes a master call light at the appropriate attendants station come on .
- Sends data to the inboard or outboard overhead electronics units (OEUs) which make the row call light over the seat group come on.
- Sends data through the entertainment/service controller (ESC) to the passenger address controller (PAC) which sounds the attendant call chime.

Push the attendant reset switch on any DPCU in the seat group to make the row call light and master call light go off.

The chime off switch sends a discrete to an overhead electronics unit. The discrete stops passenger to attendant call chimes.

Passenger Reading Lights

When the passenger reading light switch is pushed on a DPCU, the reading light command goes through the SEU to the LAC. The LAC sends the command to an OEU which makes the reading light above the seat where the selection was made come on or go off.

Cabin System Module

The cabin system module (CSM) gives attendants control of:

- Passenger reading lights
- Row call lights
- Passenger-to-attendant master call lights

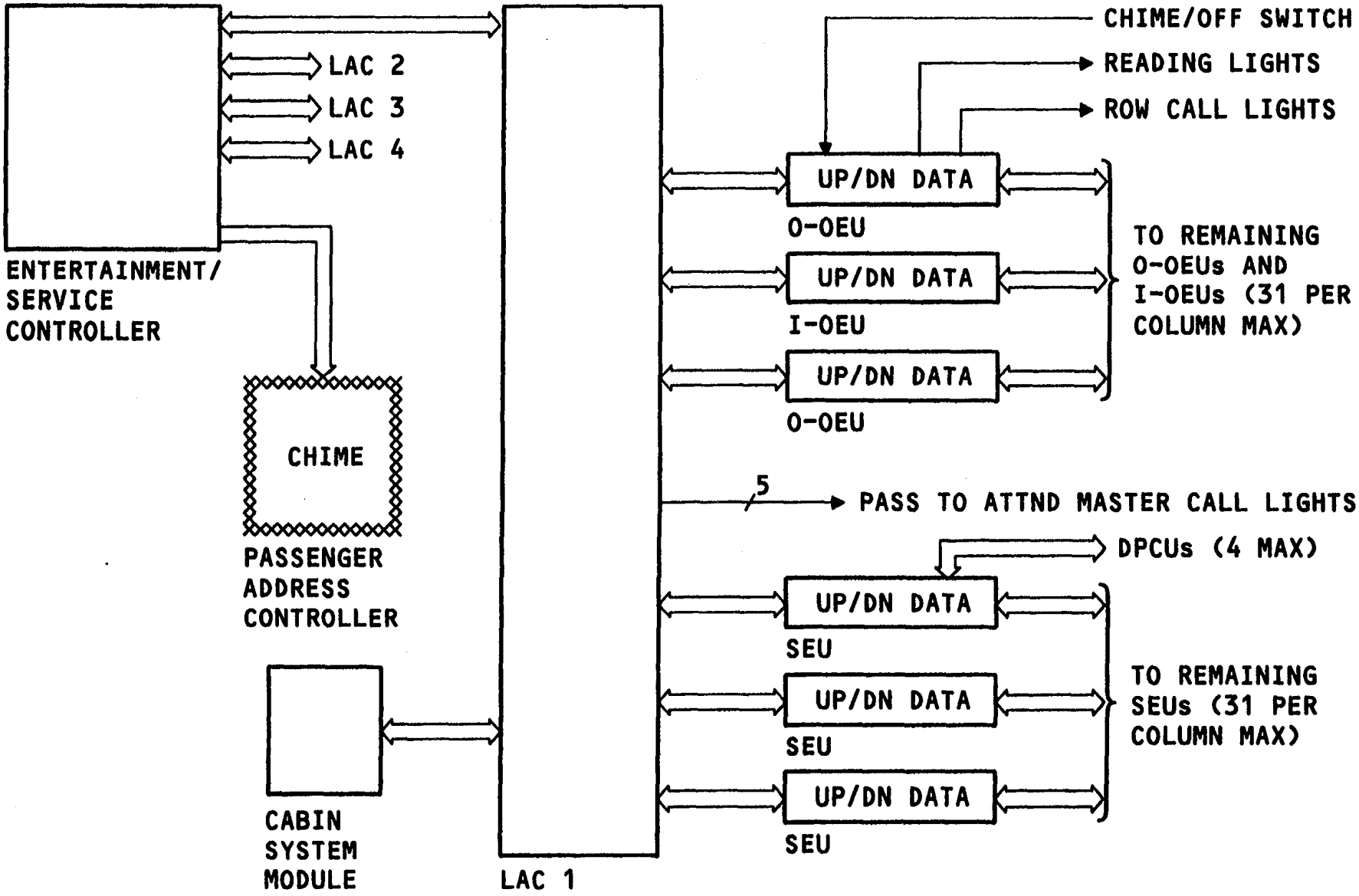

Figure 11 ATTENDANT CALL/READING LIGHTS

LAVATORY/PASSENGER INFORMATION SIGNS

Lavatory Call

Push the lavatory (LAV) call switch to send a discrete to the inboard overhead electronics unit (I-OEU) which then sends the data to the local area controller (LAC).

The LAC:

- Makes the lavatory master call light at the attendants' station come on
- Sends data to the I-OEU which makes the lavatory call light come on
- Sends data through the entertainment/service controller (ESC) to the passenger address controller (PAC) to make a single lavatory call chime

ESC Discrete Inputs

Discrete inputs control passenger information signs and lavatory signs.

When the ESC gets a no smoking discrete:

- The PAC makes a low chime
- The NO SMOKING sign in each passenger information sign comes on

When the ESC gets a fasten seat belts discrete:

- The PAC makes a low chime
- The FASTEN SEAT BELT sign in each passenger information sign comes on
- The RETURN TO SEAT sign in each lavatory comes on

When the ESC gets a decompression discrete:

- The PAC makes a low chime
- The NO SMOKING and FASTEN SEAT BELT signs in each passenger information sign comes on
- The RETURN TO SEAT sign in each lavatory goes off.

The I-OEU gets a lavatory-occupied discrete which makes the LAV OCCUPIED sign on the passenger information signs come on,

The cabin system module (CSM) gives attendants control of:

- Lavatory call lights Lavatory master call lights

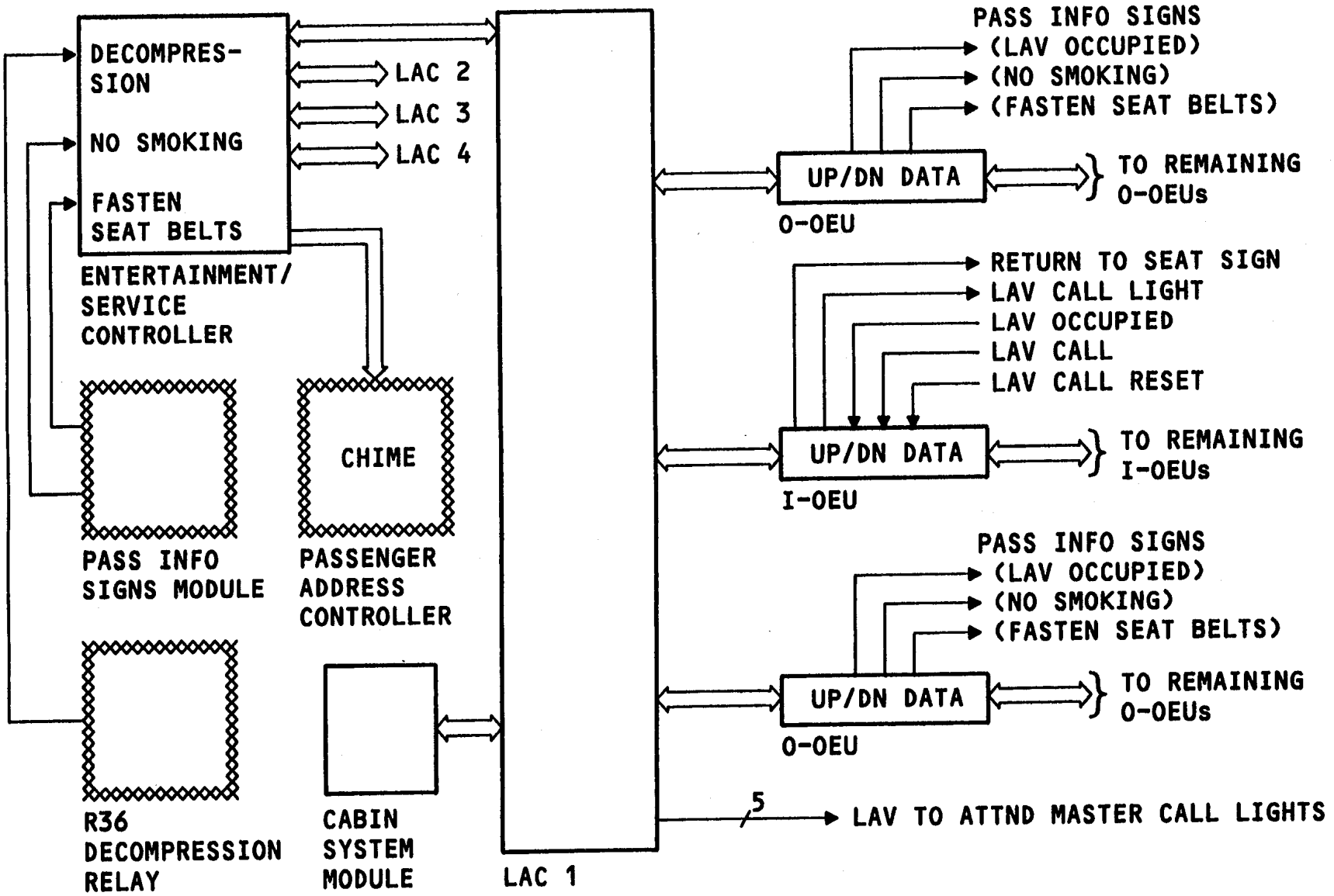

Figure 12 LAVATORY / PASSENGER INFORMATION SIGNS

CCTM CONTROLS

General Description

For the passenger service system (PSS), the cabin configuration test module (CCTM) has switches to:

- Make the alternate circuit in the entertainment/service controller (ESC) come on
- Make the cabin system modules (CSMs) control all passenger seating areas. The CSMs More the areas set in the ACESS configuration database
- Adjust the number of rows in a smoking section

Normal/Alternate Circuit Selection

The CCTM has a passenger services alternate system switch. The switch sends a discrete to the ESC to make either the normal or the alternate controller circuit come on. Usually the normal circuit in the ESC is on.

Normal/Alternate CSM Area Selection

Usually, a CSM only controls the passenger seating areas that the ACESS configuration database assigns to it If the CSM has a failure, then that CSM cannot control its assigned seating areas.

The CCTM has a cabin services alternate select switch. The switch sends a discrete to the ESC to make all CSMs ignore their ACESS configuration database assignments. Each CSM can control all passenger seating areas in the airplane.

Smoking Section Adjustment

Each digital passenger control unit (DPCU) has a no smoking indicator. If the indicator is on, it shows that smoking is not allowed at that seat. Attendants use the CCTM to change the number of rows in a smoking section. Changes made on the CCTM go through the PSS LRUs to the DPCUs. The DPCUs make the no smoking indicator come on or go off.

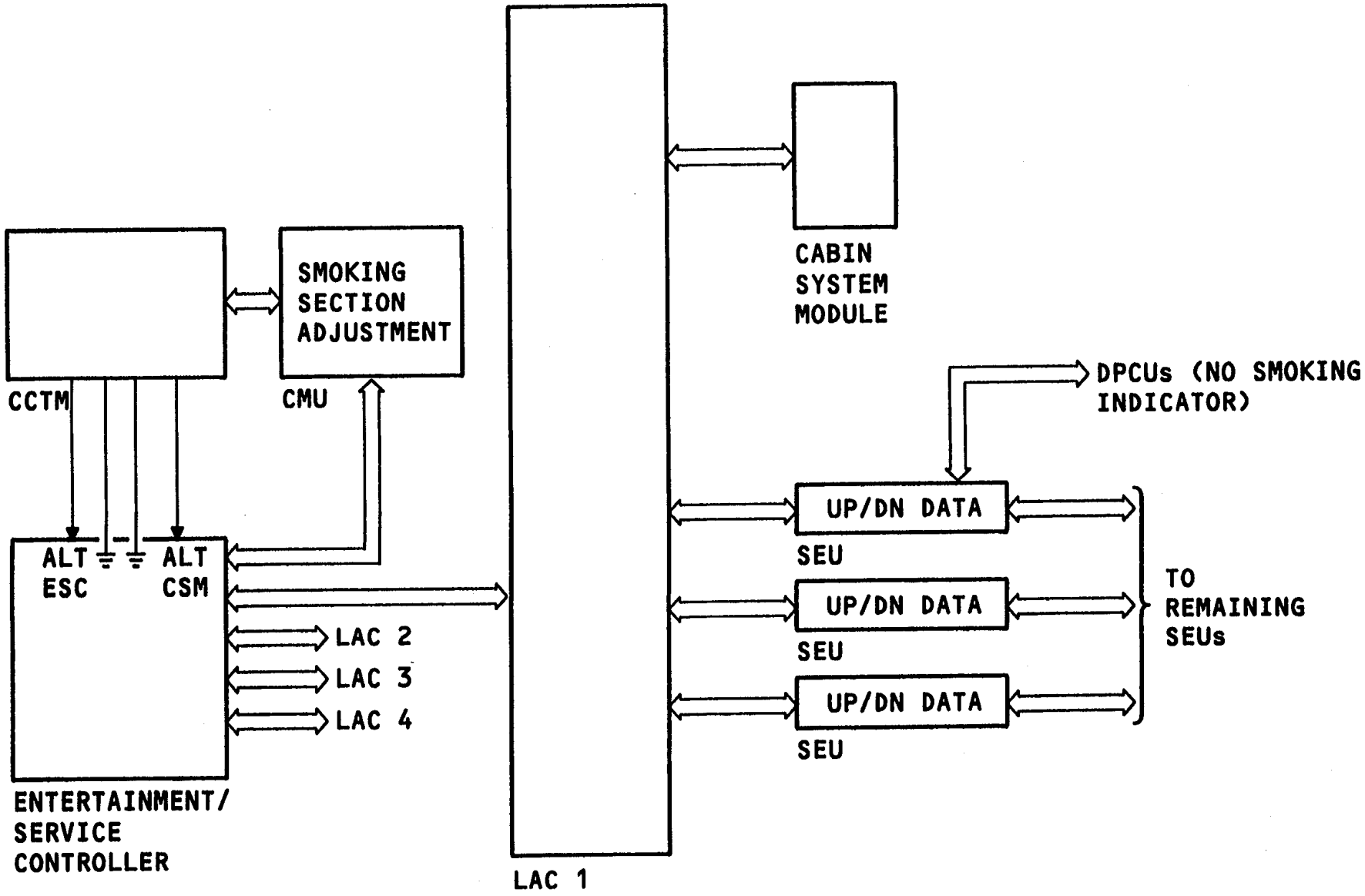

Figure 13 CCTM CONTROLS

LAC PASSENGER ZONE INTERFACES

Each local area controller (LAC) has an interface with seat electronics units (SEUs), outboard overhead electronics units (O-OEUs) and inboard overhead electronics units (I-OEUs) in one or two passenger zones through interface cables. Each LAC has interfaces with passenger zones:

- LAC 1: Zones A and B
- LAC 2: Zones C and D
- LAC 3: Zone E
- LAC 4: Upper deck

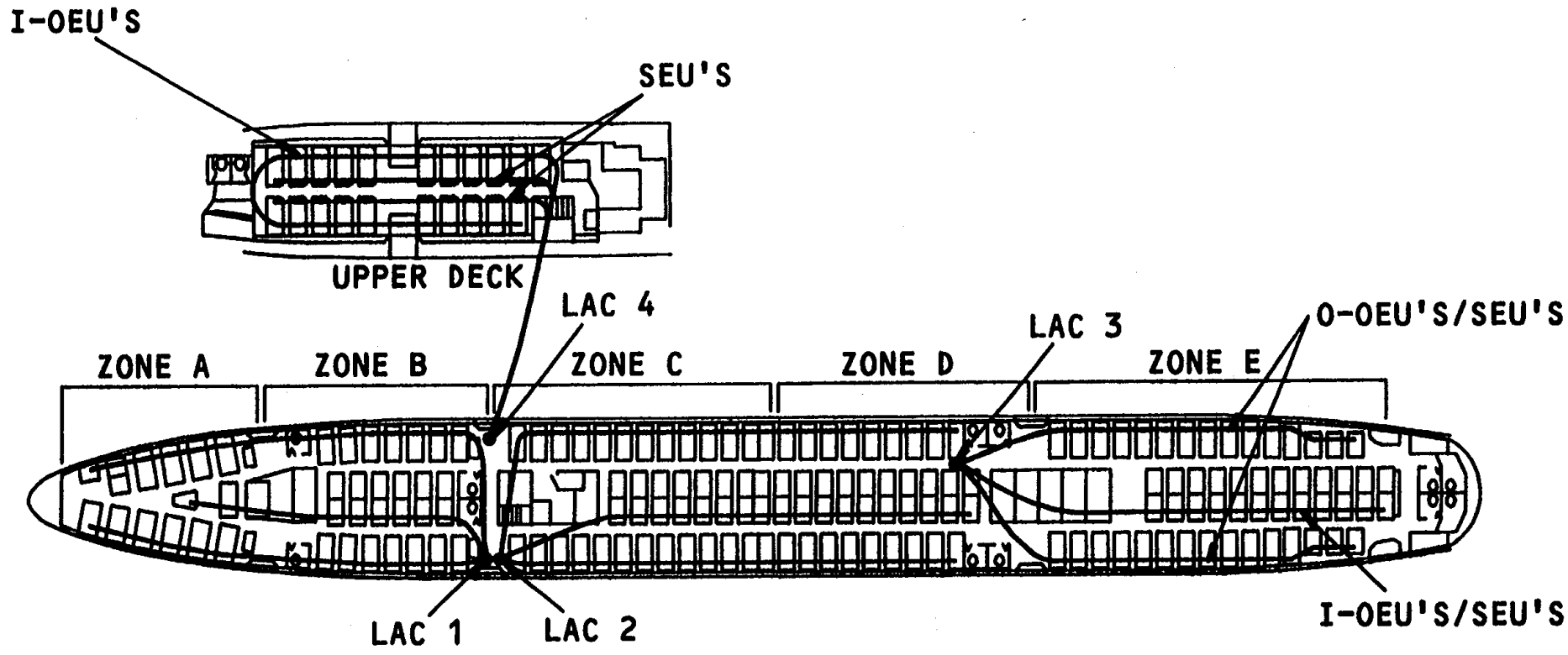

Figure 14 LAC PASSENGER ZONE INTERFACES

DIGITAL PASSENGER CONTROL UNIT

Purpose

The digital passenger control unit (DPCU) gives passengers:

- Control of reading lights
- A no smoking LED to show if the seat is in a smoking or no smoking section
- A switch used to call cabin attendants

Operation

Four push button switches give control of passenger service functions.

The attendant call switch:

- Makes the row call light in the passenger service unit over the seat come on
- Makes the passenger-to-attendant master, call light (BLUE) at the attendants station come on
- Makes a chime sound at the attendants station

The attendant call reset switch makes the master attendant call and row call lights go off. The attendant call reset switch on any DPCU in a seat group can reset the attendant call started from any DPCU within the seat group.

The passenger reading light switch makes the passenger reading light above the seat come on or go off.

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.

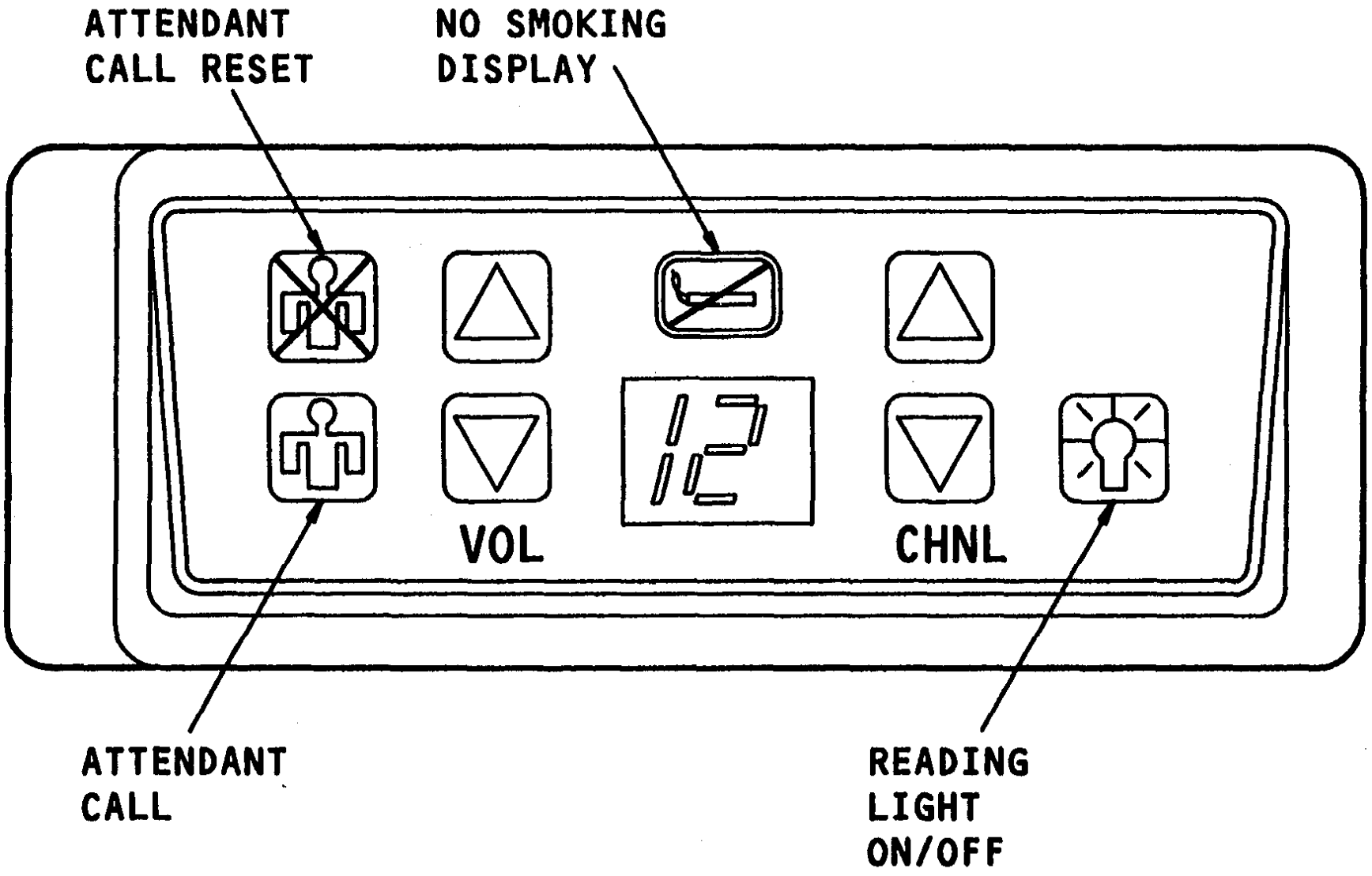

Figure 15 DIGITAL PASSENGER CONTROL UNIT

SEAT ELECTRONICS UNIT

General

The seat electronics unit (SEU) gets reading and call light data from the digital passenger control unit (DPCU) and sends the data to the local area controller (LAC). An SEU can interface with one, two, three or four DPCUs.

Power

The PASSENGER SERVICES SYSTEM switches on any cabin system module (CSM) controls power to the SEUs.

SEU Termination Plug

A termination plug connects to the J2 connector of the last seat electronics unit (SEU) in a column. The SEU termination plug has a 75 ohm resistor which agrees with the characteristic impedance of the transmission cable. The SEU termination plug also has a wire attached to a lug that fits in the seat track and is the power ground for the SEU column.

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.

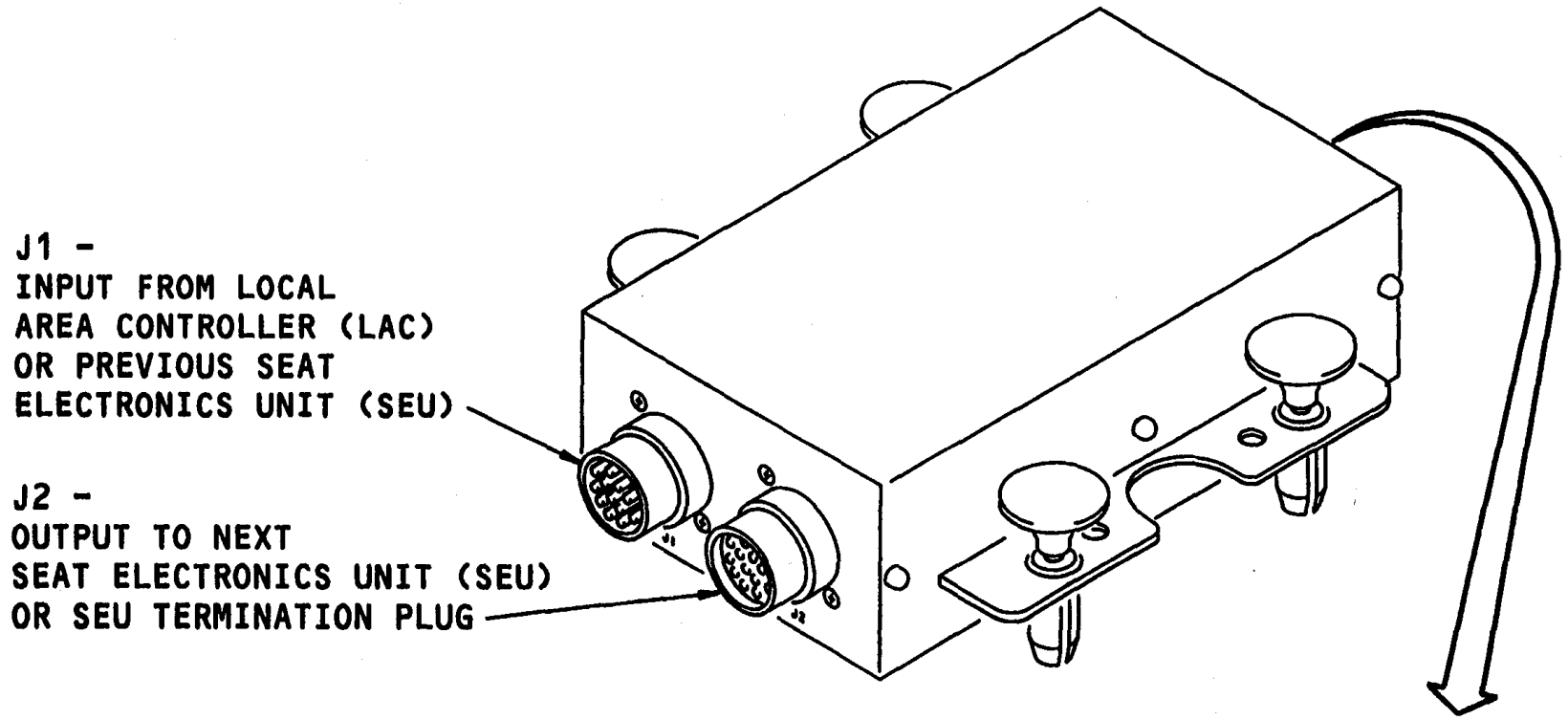

Figure 16 SEAT ELECTRONICS UNIT

LOCAL AREA CONTROLLER

Purpose

The local area controllers (LACs) get and send multiplexed data from the entertainment/service controller (ESC), cabin system module (CSM), overhead electronics units (OEUs) and seat electronics units (SEUs).

Characteristics

The local area controller has three independent assemblies. One assembly does functions of the passenger address system, one does functions of the cabin inter one system, and one does functions of passenger entertainment, passenger service and cabin lighting systems.

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.

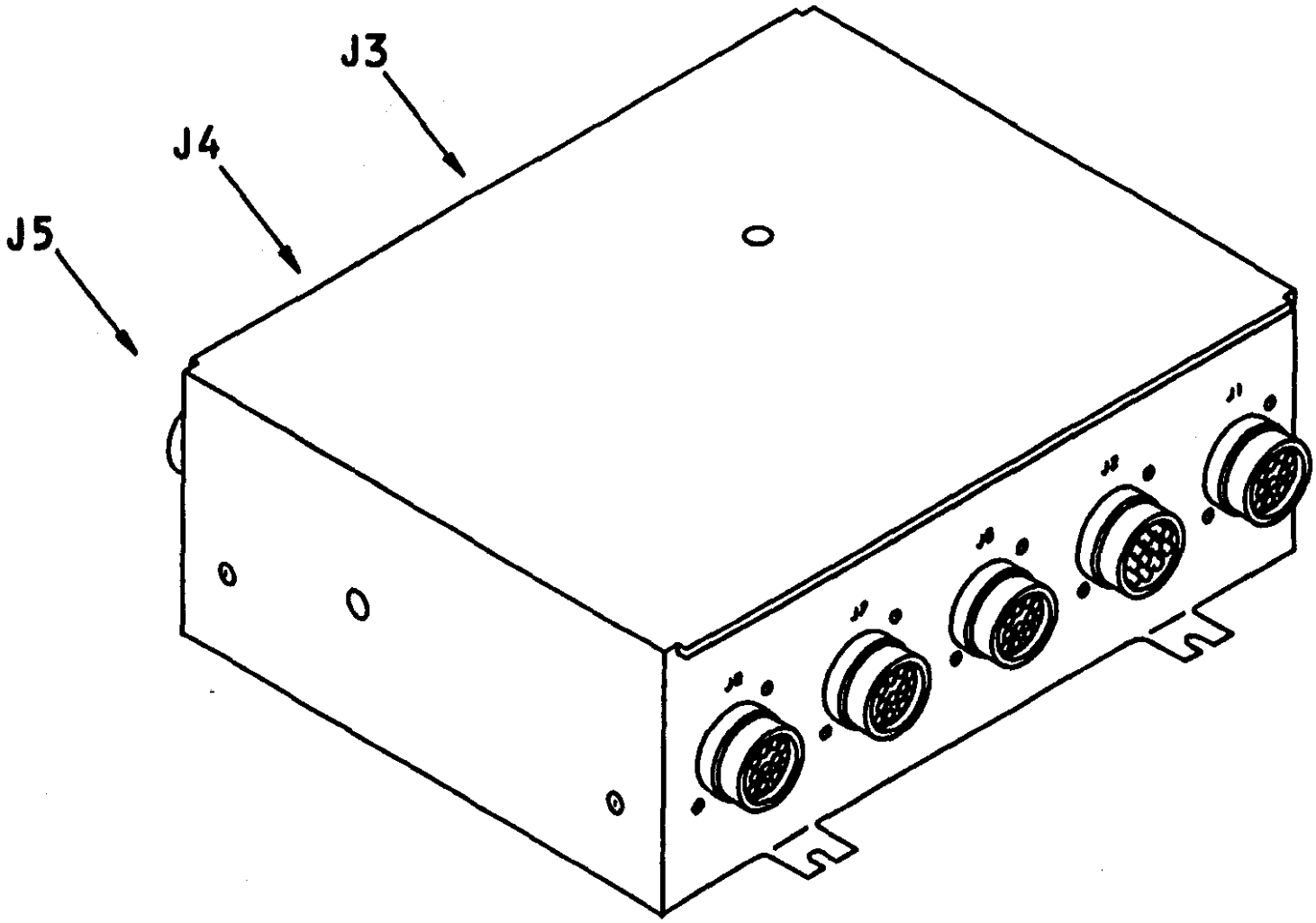

Figure 17 LOCAL AREA CONTROLLER

MASTER CALL LIGHTS

The passenger-to-attendant and lavatory-to-attendant master call lights are controlled by a local area controller (LAC). The master call lights are near each attendant station.

If either master call light is on, it means that there was a call from a passenger seat or lavatory. The attendant looks at the lavatory or row call lights to see where the call came from. When the call lights in the area of the attendants' station are reset, the master call lights go off.

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.

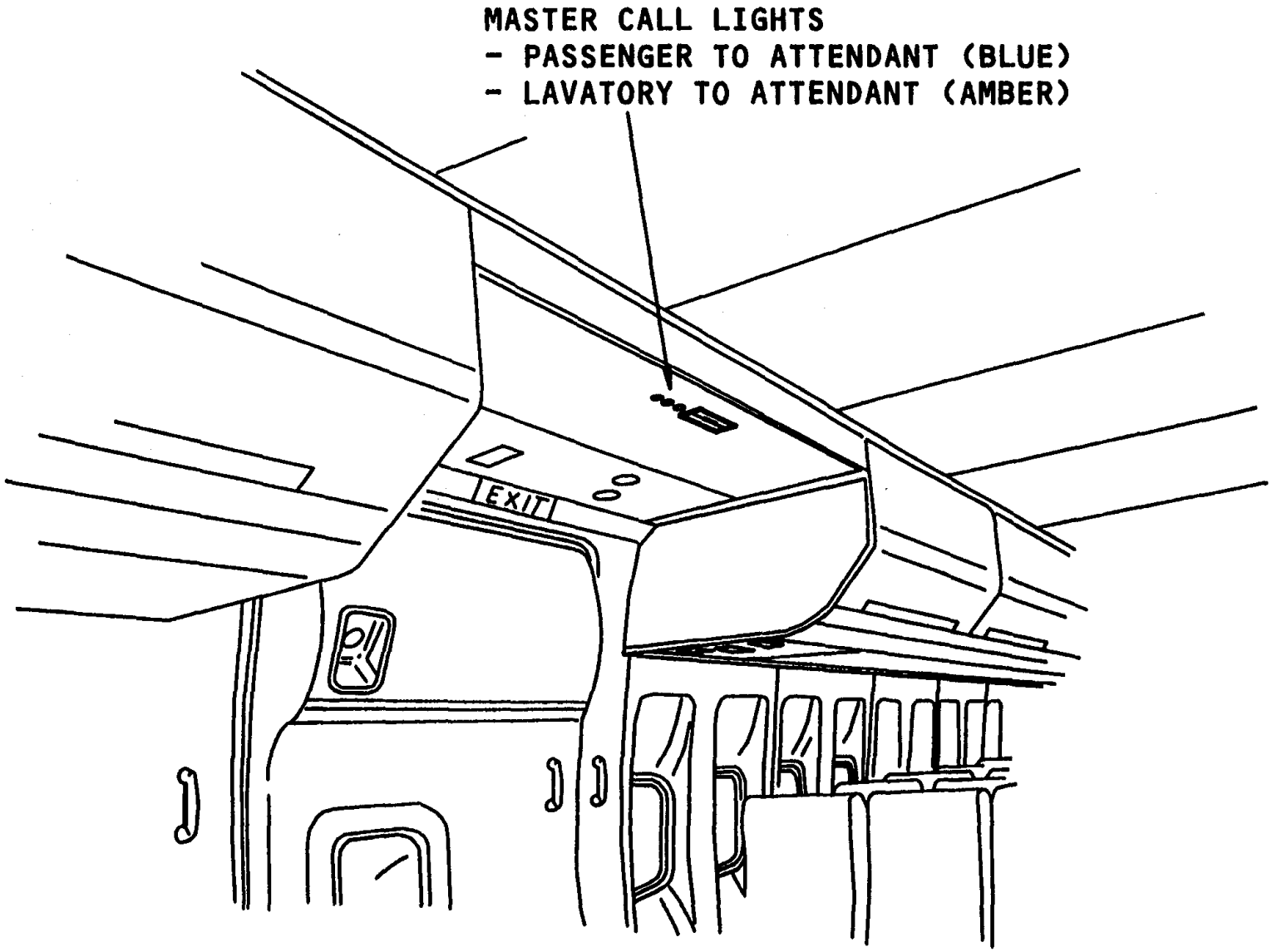

Figure 18 MASTER CALL LIGHTS

ENTERTAINMENT / SERVICE CONTROLLER

Purpose

The entertainment/service controller (ESC) gets discretes and digital data inputs, and makes digital data outputs which control the passenger service system.

General Description

The ESC has a normal circuit and an alternate controller circuit. One controller circuit does all the functions of the ESC. Only one controller circuit operates at a time. If there is a failure of the normal controller, the alternate controller does the functions of the ESC. The alternate controller is manually selected with controls on the cabin configuration test module (CCTM).

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.

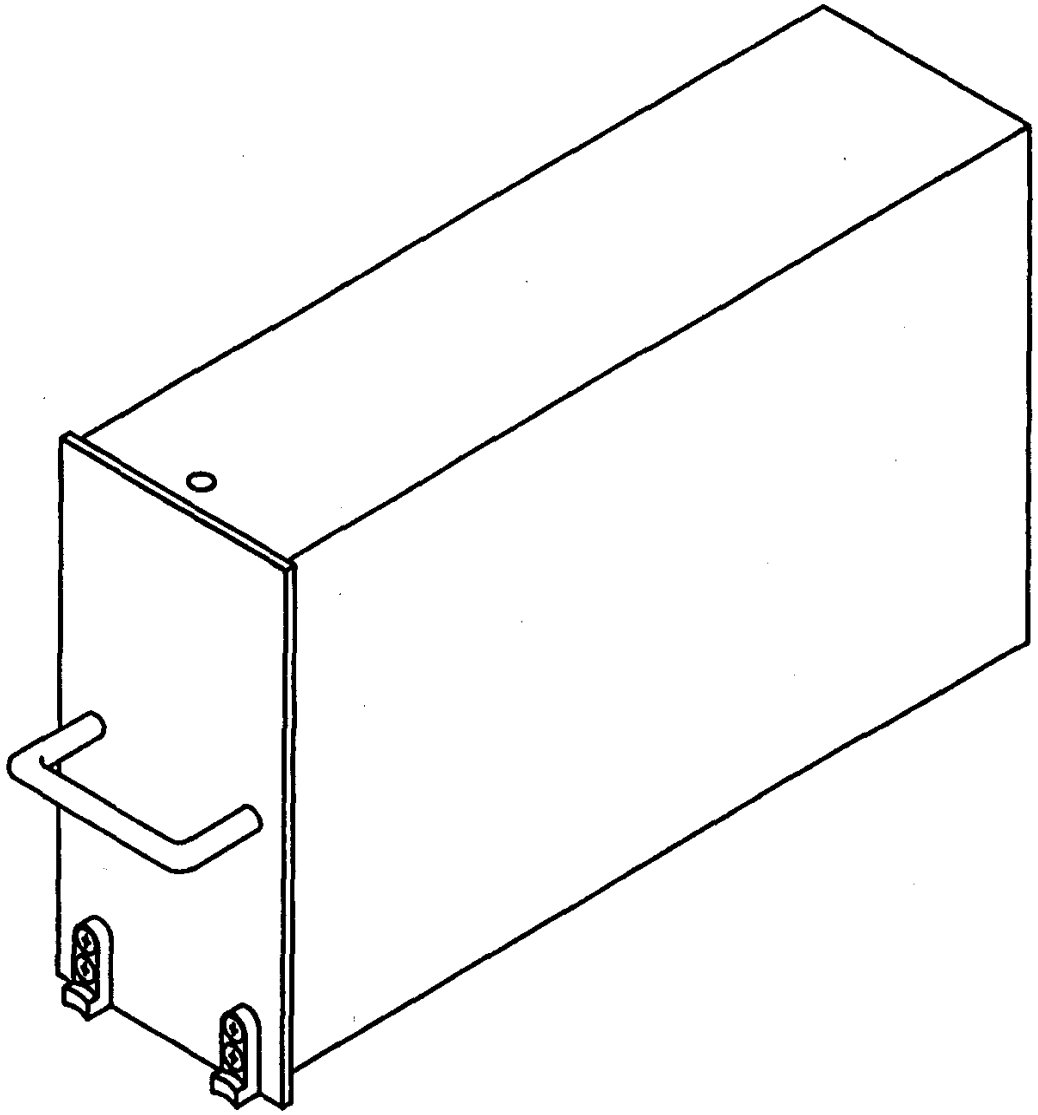

Figure 19 ENTERTAINMENT / SERVICE CONTROLLER

INBOARD OVERHEAD ELECTRONICS UNIT

Purpose

The inboard overhead electronics units (IOEUs) make these lights come on or go off:

- Passenger reading lights
- Row call lights
- Passenger information signs
- The return to seat sign in the lavatories

Characteristics

Each I-OEU has two independent subsystems which control functions of the passenger address and passenger service/cabin lighting systems. only passenger service functions are discussed here.

One I-OEU controls up to:

- Eight reading lights
- Four call lights
- Six passenger information sign modules

An I-OEU can get up to four discrete inputs, such as a lavatory call or lavatory call reset discretes.

Power

The I-OEU gets two power inputs for passenger service functions. They are:

- 115v ac unswitched power (direct from a circuit breaker) for passenger information signs and lavatory signs
- 115v ac switched power for the reading and call lights.

The PASSENGER SERVICES SYSTEM switches on any cabin system module (CSM) control switched power.

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.

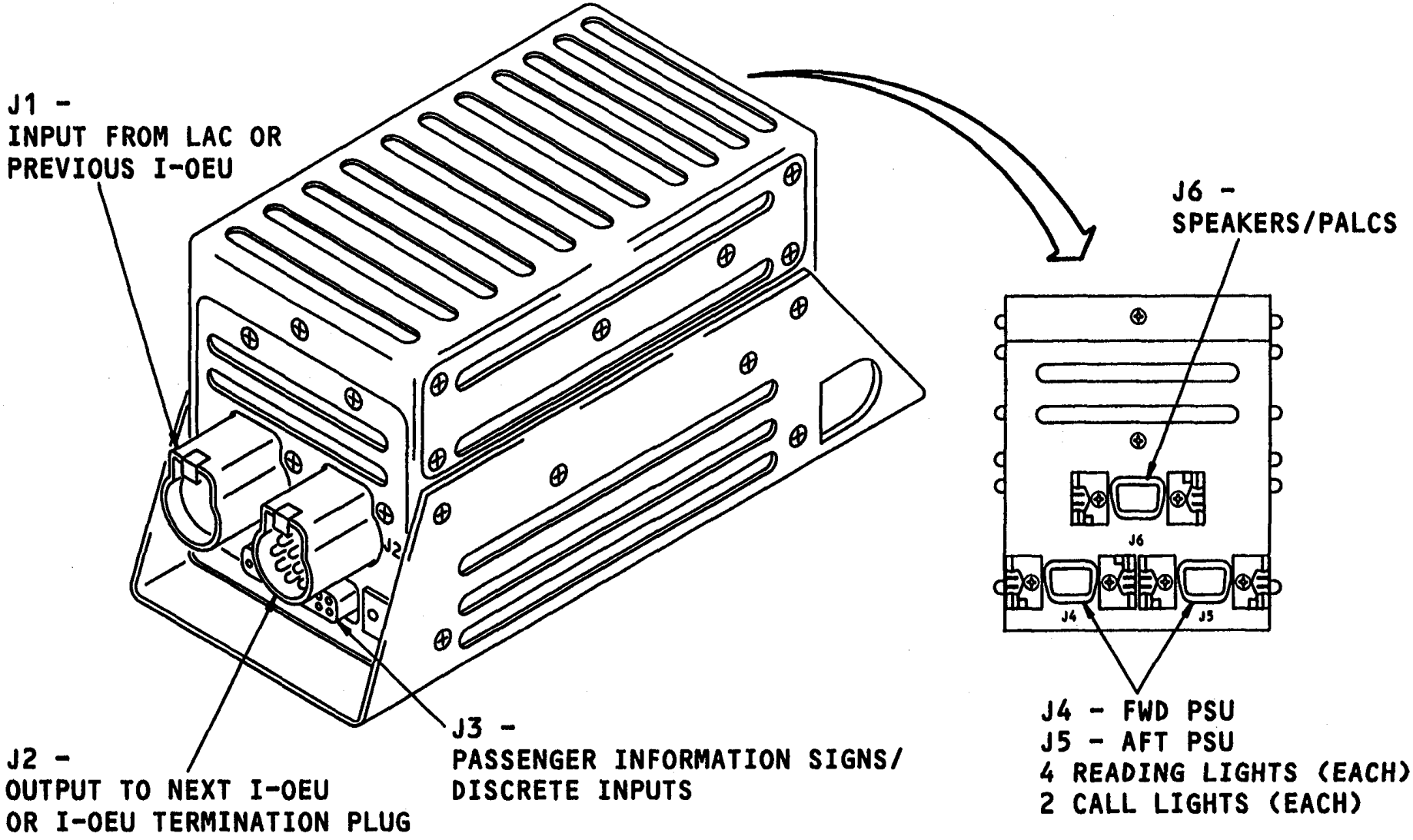

Figure 20 INBOARD OVERHEAD ELECTRONICS UNIT

OUTBOARD OVERHEAD ELECTRONICS UNIT

Purpose

The outboard overhead electronics units (O-OEUs) make these lights come on or go off:

- Passenger reading lights
- Row call lights
- Passenger information signs

Characteristics

Each O-OEU does functions of the passenger service/cabin lighting systems. Only passenger service functions are discussed here.

One O-OEU controls up to:

- Six reading lights
- Two call lights
- Six passenger information sign modules

An O-OEU can get up to four discrete inputs.

Power

The O-OEU gets two power inputs for passenger service functions. They are:

- 115v ac unswitched power (direct from a circuit breaker), for passenger information signs
- 115v ac switched power for the reading and call lights

The PASSENGER SERVICES SYSTEM switches on any cabin system module (CSM) control switched power.

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.

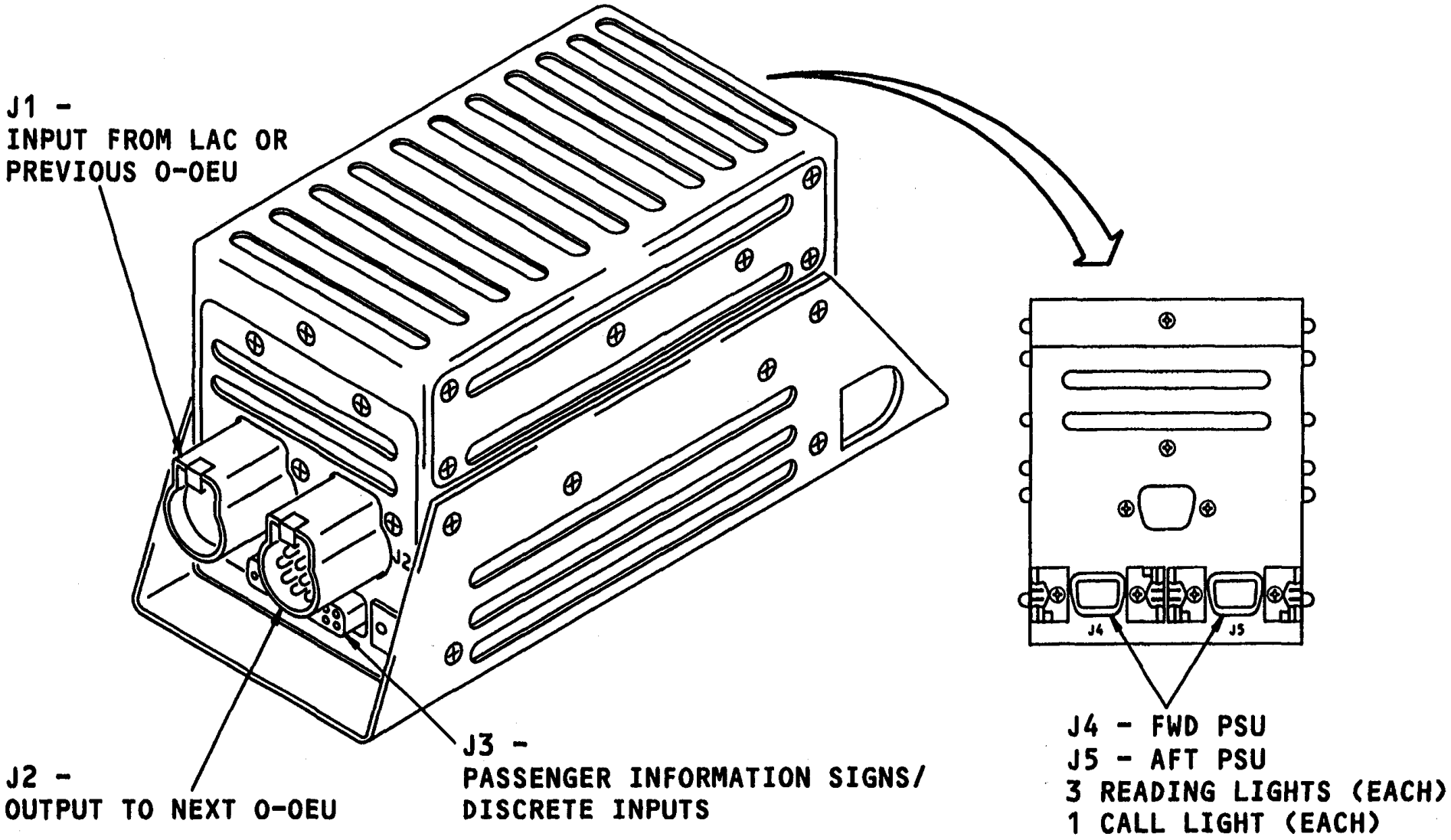

Figure 21 OUTBOARD OVERHEAD ELECTRONICS UNIT

O-OEU - INSTALLATION

The outboard overhead electronics units (O-OEUs) are on approximately every other passenger service unit (PSU) panel.

The PSU panel assembly is held in place by three latches. Push a rod into the holes in the face of the PSU panel to release the assembly. Lanyards makes sure that the PSU panel assembly does not owing freely. Three screws hold the O-OEU in place.

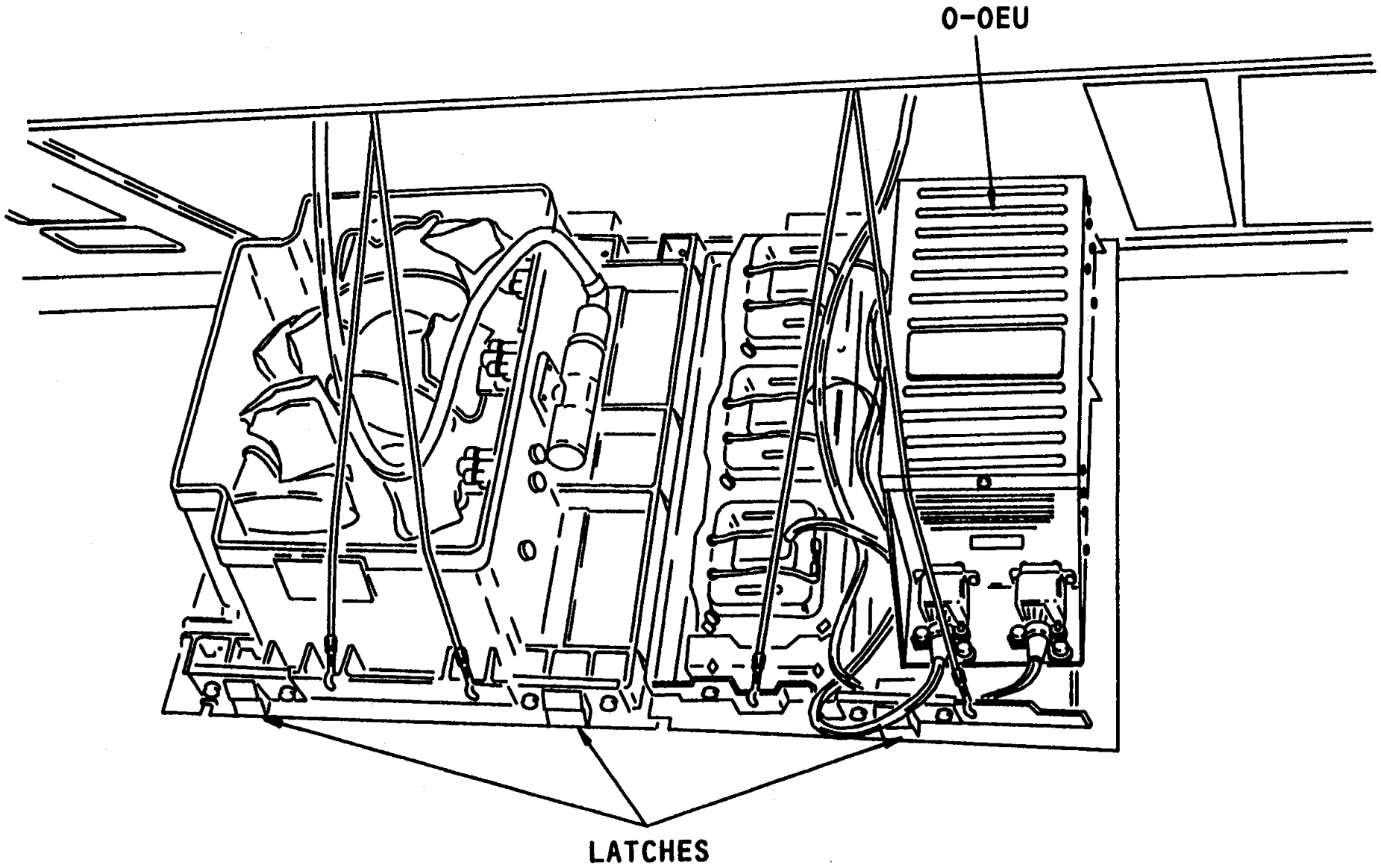

Figure 22 O-OEU - INSTALLATION

PASSENGER SERVICE UNIT

The passenger service system interfaces with passenger service units (PSUs) to control:

- Passenger reading lights
- Row call lights
- passenger information signs

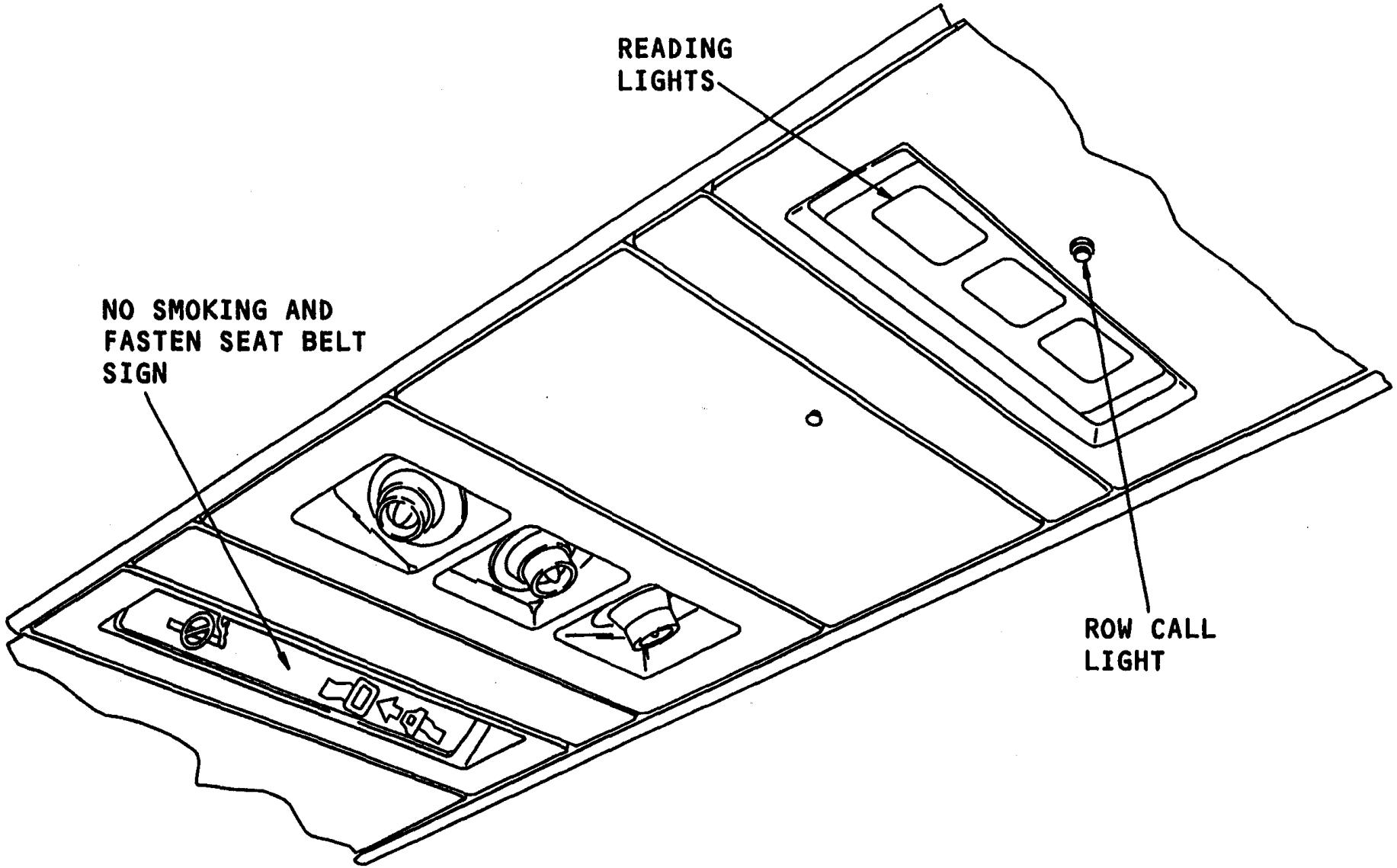

Figure 23 PASSENGER SERVICE UNIT

LIGHT / CHIME CONTROL MODULE

Chime off switches on the light/chime control module, inhibit passenger-to-attendant call chimes. A chime sounds at an attendant's station each time the passenger-to attendant call button is pushed on a digital passenger control unit (DPCU). Sometimes, the chime is generated but does not really indicate a call. For example:

- A child repeatedly pushes the call switch
- A sleeping passenger accidentally pushes the call switch
- The DPCU has a failure

The attendant can push the chime off switch to stop the chime. The row call light and master call light still come on.

The chime off switch does not affect lavatory-to-attendant calls or cabin interphone calls.

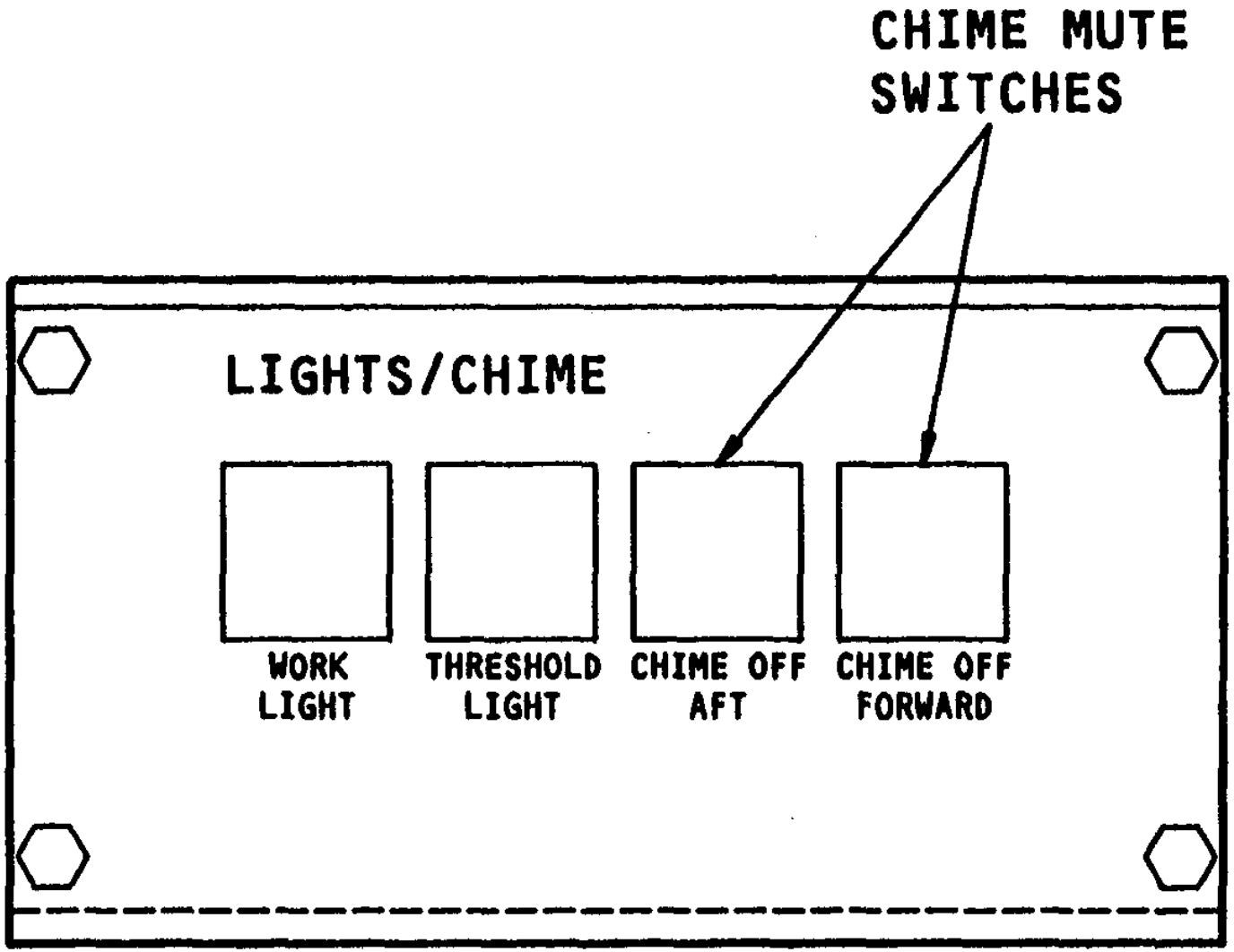

Figure 24 LIGHT / CHIME CONTROL MODULE

PASSENGER INFORMATION SIGNS

Light modules inside a passenger information sign are controlled by an inboard or outboard overhead electronics unit (OEU). A bill board type passenger information sign contains six light modules. The configuration database determines which light module comes on for a discrete input to the passenger service system. Discrete inputs include:

- No smoking
- Fasten seat belts
- Decompression
- Lavatory occupied

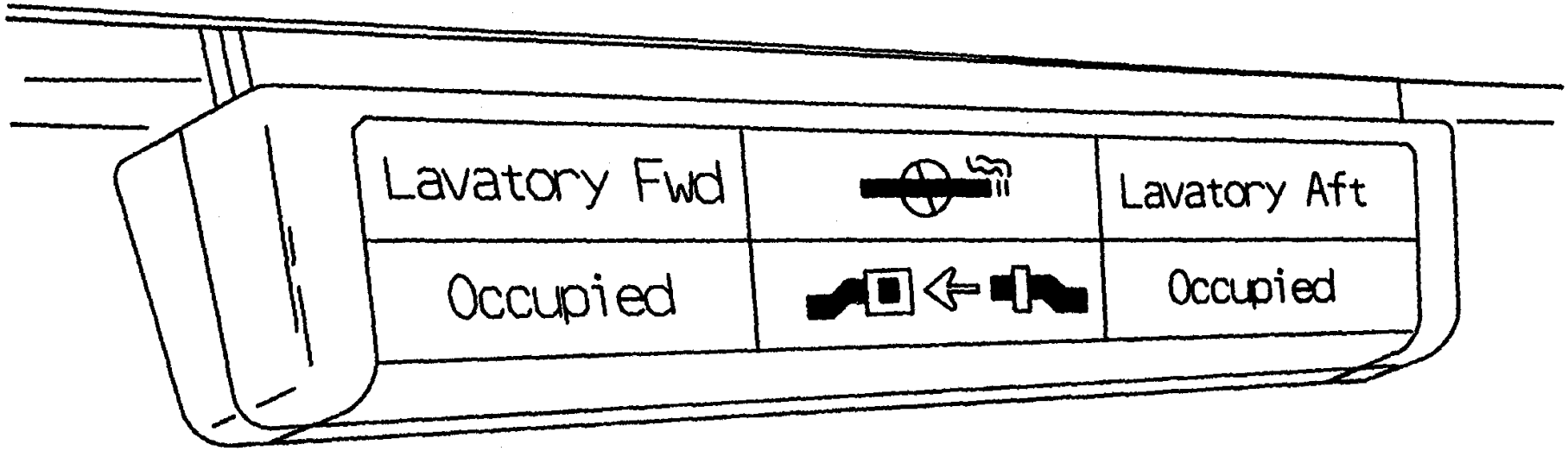

Figure 25 PASSENGER INFORMATION SIGNS

LAVATORY

General

Components in the lavatories interface with ACESS through the inboard overhead electronics units I-OEUs. The I-OEU accepts discrete inputs and sends the data to the local area controller (LAC). Control data then goes back to the I-OEU to make the lavatory call light and RETURN TO SEAT sign go on or off.

Function

The function of the lavatory components that interface with the I-OEU are:

- Lavatory door latch: produces lavatory occupied discrete when door latch is locked. This discrete controls the lavatory OCCUPIED sign in the passenger information sign.
- Lavatory call switch: this switch turns on the lavatory call light outside the lavatory door, the lavatory master call light, and sounds a chime.

Lavatory call light/reset switch: this unit is a lavatory call light and a switch to reset the lavatory call.

RETURN TO SEAT sign: the sign comes on when the FASTEN SEAT BELT signs come on. The decompression discrete inhibits the RETURN TO SEAT sign.

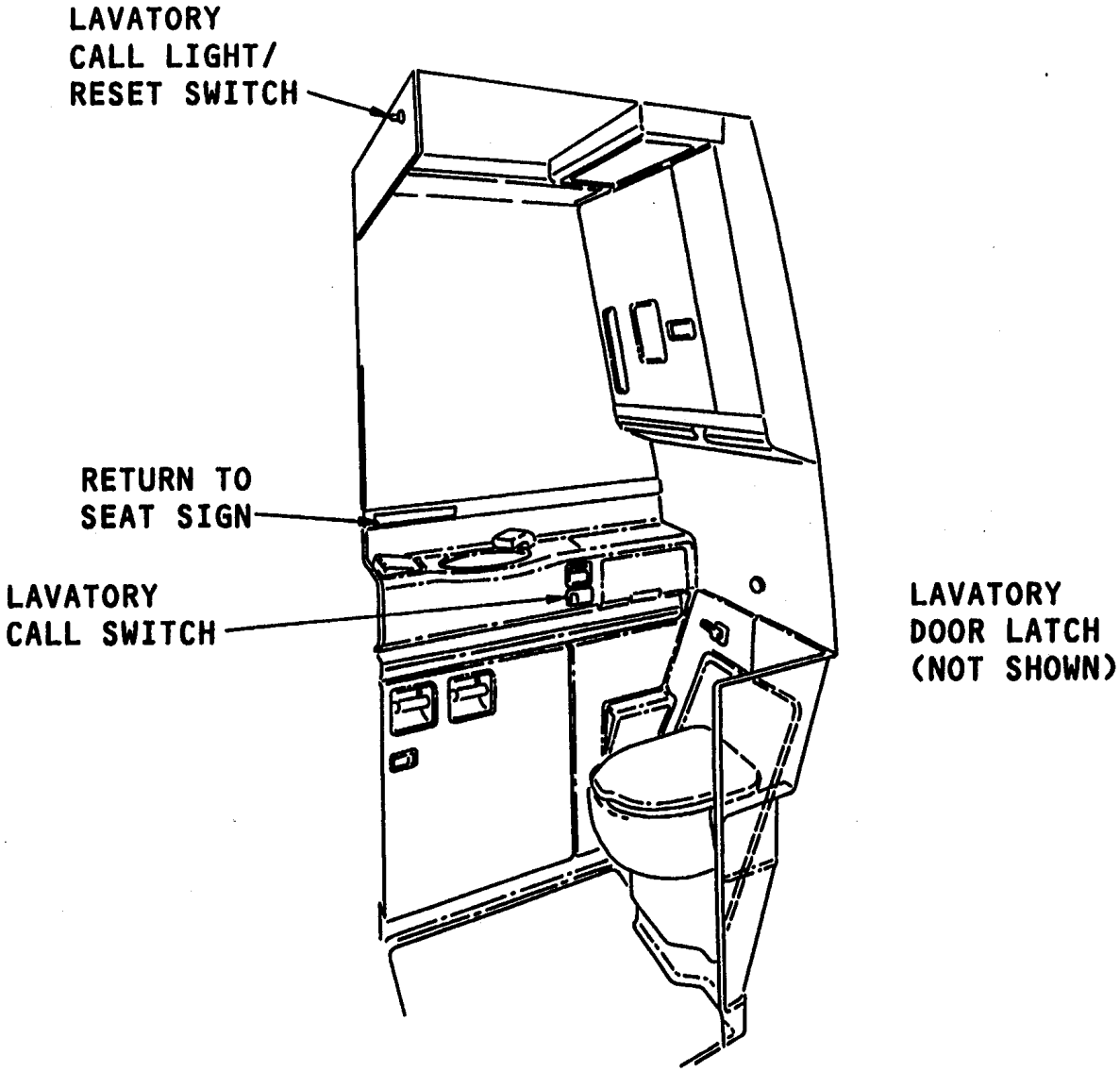

Figure 26 LAVATORY

CABIN SYSTEM MODULE

Purpose

The cabin system module (CSM) gives attendants control of passenger reading lights, passenger to attendant calls and cabin lighting in the passenger seating area shown in the CSM display. The CSM also controls:

- Power to the seat electronics units (SEUs)
- Power to the overhead electronics units (OEUs)

Passenger Seating Areas

The configuration database sets:

- The number of passenger seating areas (from one to eight)
- The passenger seating areas that a CSM controls

For example, if there are two CSMs installed, and four areas are specified in the configuration database, then one CSM can control areas 1 through 3 while the other CSM controls area 4.

If a CSM has a failure, push the CABIN SERVICES alternate system switch on the cabin configuration test module (CCTM). This lets the CSMs ignore the configuration database, and control all passenger seating areas.

CSM Display

A one line, sixteen character LED display shows the selected/passenger seating area. The description comes from the configuration database. For example, AREA 11 FIRST CLASS, FWD AREA, or any other description can describe the first passenger seating area.

The CSM display and a light in each button goes off if none of the buttons are pushed for five minutes.

AreA Select Button

Push the AREA SELECT button to see the passenger seating areas that a CSM controls.

Reading Light Buttons

The reading light buttons operate in an absolute or momentary mode. The configuration database sets the mode. In either mode, the reading light buttons make all passenger reading lights in the area shown in the CSM display come on or go off.

In the momentary mode, push the ON or OFF button to:

- Make the reading lights come on or go off.
- Make a light in the button come on and then go off. When the light goes off, a light in the NORMAL button comes on.

In the absolute mode, push the ON or OFF button to:

- Make the reading lights come on or go off.
- Make a light in the button come on.
- Remove control of reading lights from the DPCUs.

To return control of the reading lights to the DPCUs, push the NORMAL button. When pushed, a light in the NORMAL button comes on.

Attendant Call RESET Button

Push the attendant call RESET button to make a light in the button come on and the call lights in the area shown in the CSM display go off. The call lights that go off are:

- Attendant row call lights
- Passenger to attendant master call lights
- Lavatory master call lights

When all the call lights are off, the light in the RESET switch goes off.

Cabin Lighting Buttons

The operation of the CABIN LIGHTING switches are discussed in ATA Chapter 33 (Lighting).

Passenger Services System Buttons

The PASSENGER SERVICES SYSTEM ON and OFF buttons control power to the inboard and outboard overhead electronics units (OEUs), and the seat electronics units (SEUs). The selected switch (light) comes on to show the present selection.

The passenger services system ON and OFF switches control all passenger seating areas. Any CSM can control power to the OEUs and SEUs.

Audio Entertainment Buttons

The operation of the AUDIO ENTERTAINMENT buttons are discussed in the passenger entertainment system.

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.

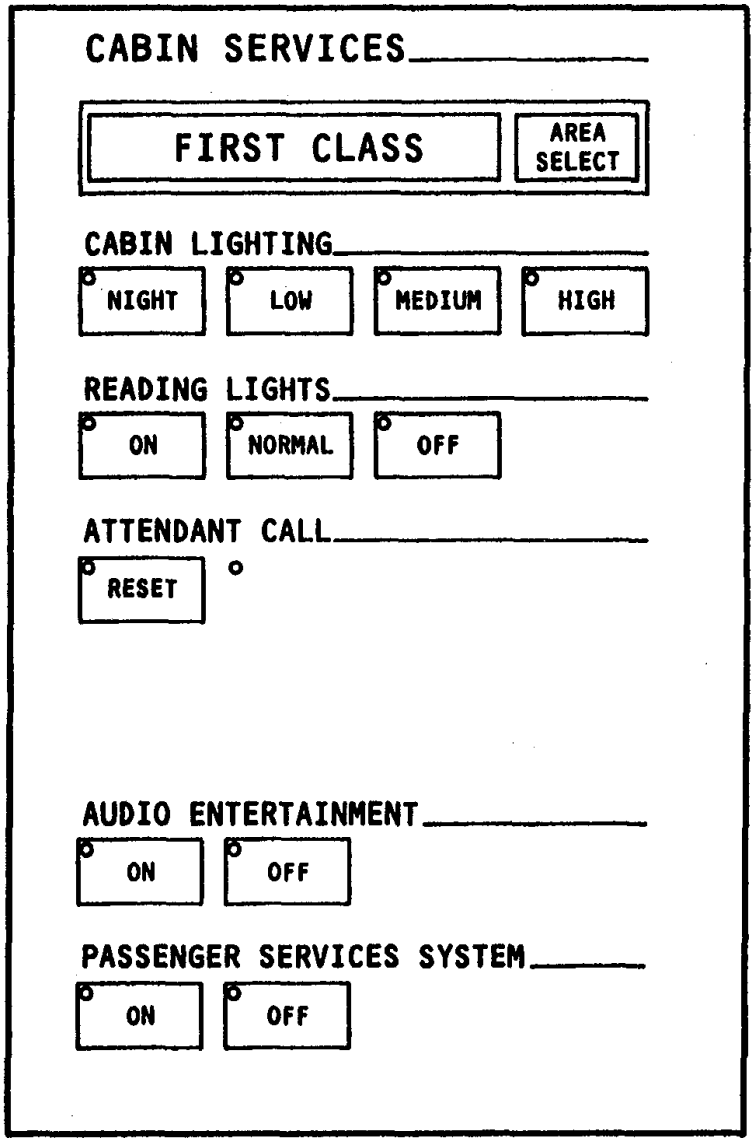

Figure 27 CABIN SYSTEM MODULE

CABIN CONFIGURATION TEST MODULE

General Description

For the passenger service system (PSS), the cabin configuration test module (CCTM) has switches to:

- Do a PSS test
- Install the ACESS configuration database
- Install operational software
- Make the alternate circuit in the entertainment/service controller (ESC) come on

Normal/Alternate Circuit Selection

The CCTM has a passenger services alternate system switch. The switch sends a discrete to the ESC to make either the normal or the alternate controller circuit come on. Usually the normal circuit in the ESC is on. Push the PASSENGER SERVICES 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 ESC functions.

If the light in TEST MODE switch is on, then the passenger services alternate system switch does not operate.

Normal/Alternate CSM Area Selection

Usually, a CSM only controls the passenger seating areas that the ACESS configuration database assigns to it. If the CSM has a failure, then that CSM cannot control its assigned seating areas,

The CCTM has a cabin services alternate select switch. The switch sends a discrete to the ESC to make all CSMs ignore their ACESS configuration database assignments. Each CSM can control all passenger seating areas in the airplane.

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.

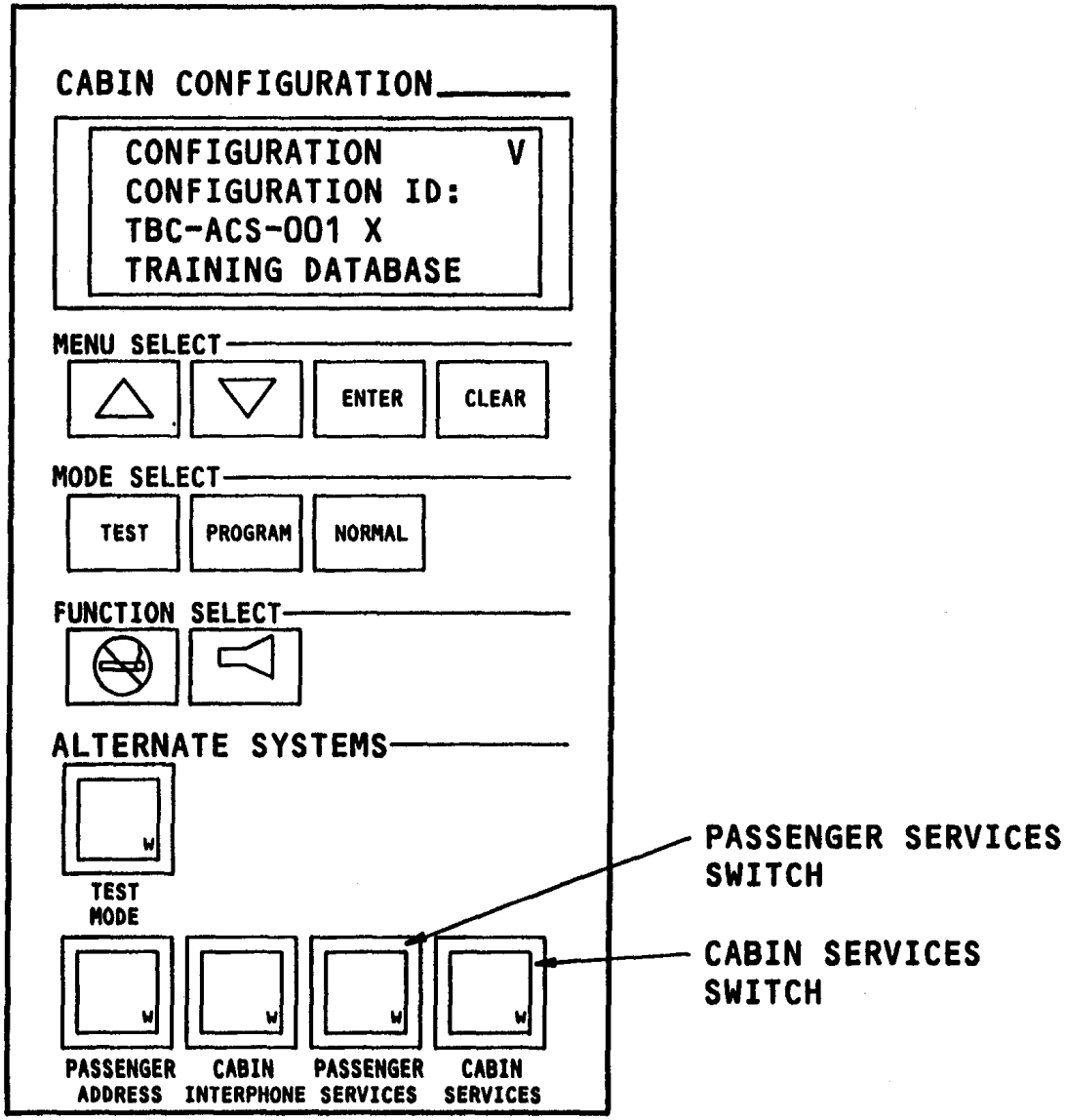

Figure 28 CABIN CONFIGURATION TEST MODULE

CENTRAL MANAGEMENT UNIT

For the passenger service system (PSS), the central management unit (CMU) gets smoking section adjustment data from the cabin configuration test module (CCTM) and sends it to the entertainment/service controller.

The CMU also has some PSS maintenance functions. The CMU is used to:

- Do a PSS test
- Install the ACESS configuration database
- Install operational software

The maintenance functions are discussed in the ACESS maintenance practices lesson.

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.

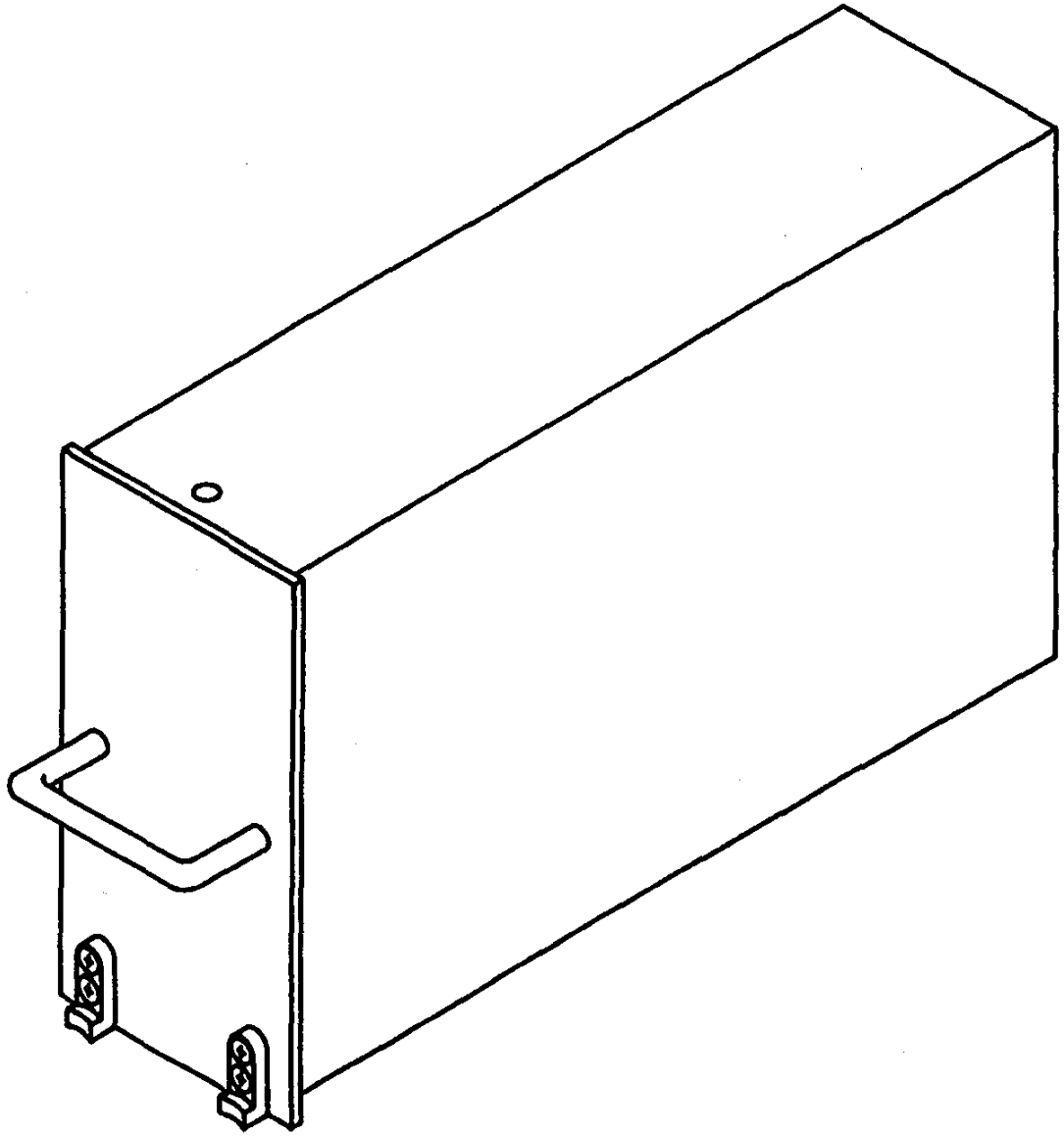

Figure 29 CENTRAL MANAGEMENT UNIT

SET SMOKING AREAS - 1

General

The passenger cabin can have eight, or less, passenger seating areas. Each area can have one or two smoking sections. The passenger seating areas and smoking sections are set in the ACESS configuration database.

The CCTM has controls to change the size of the smoking sections. When a change is entered, the data goes into random access memory (RAM) in the active entertainment/service controller circuit (normal or alternate). The data stays in RAM until power is removed from the airplane.

When power is reapplied, the smoking sections are again the size that is set in the configuration database.

Operation

To change passenger seating area 1 to allow smoking in all rows, do these steps. The airplane must be on the ground to do this:

Push the NO SMOKING button. The SET SMOKING AREAS menu shows.

With the description for passenger seating area 1 (FIRST CLASS in this case) next to the prompt, push ENTER, The FIRST CLASS submenu shows. The display shows the seat row numbers in first class, and the present smoking section (rows 10 through 12).

Push the CLEAR button to set the smoking start row to 00 (notice the prompt is next to the smoking start line).

Push the SCROLL UP button once to increase the smoking start row to 1.

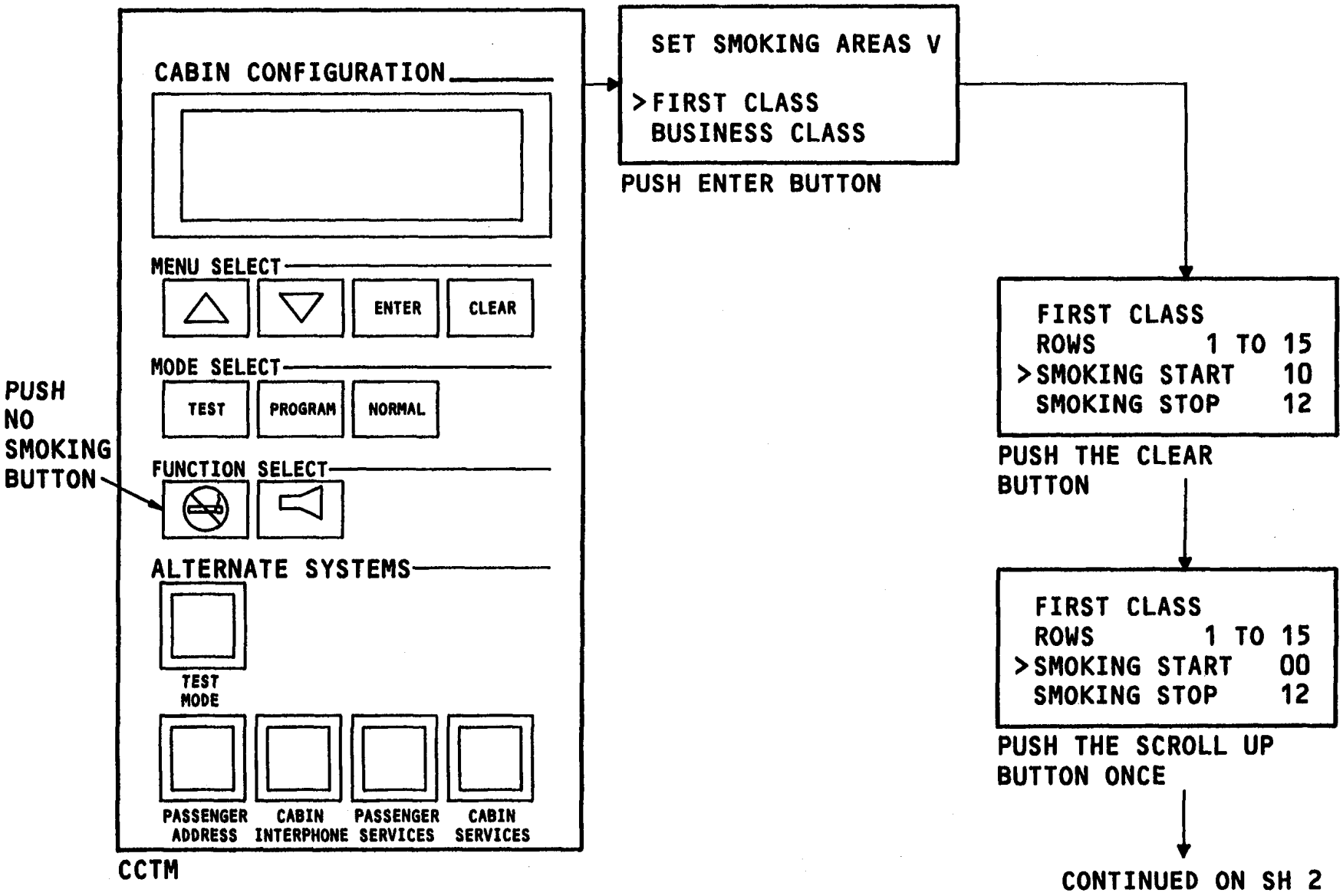

Figure 30 SET SMOKING AREAS - 1

SET SMOKING AREAS - 2

- Push ENTER. The prompt moves to the smoking stop line.
- Push the SCROLL UP button three times to set the smoking stop row to 15. Push ENTER.

When ENTER is pushed, the configuration data goes to the central management unit (CMU). It puts this data into the ESC.

The smoking section in first class stays as rows 1 through 15 until power is removed from the airplane. When power is re-applied, the smoking section is again rows 10 through 12 as set in the configuration database.

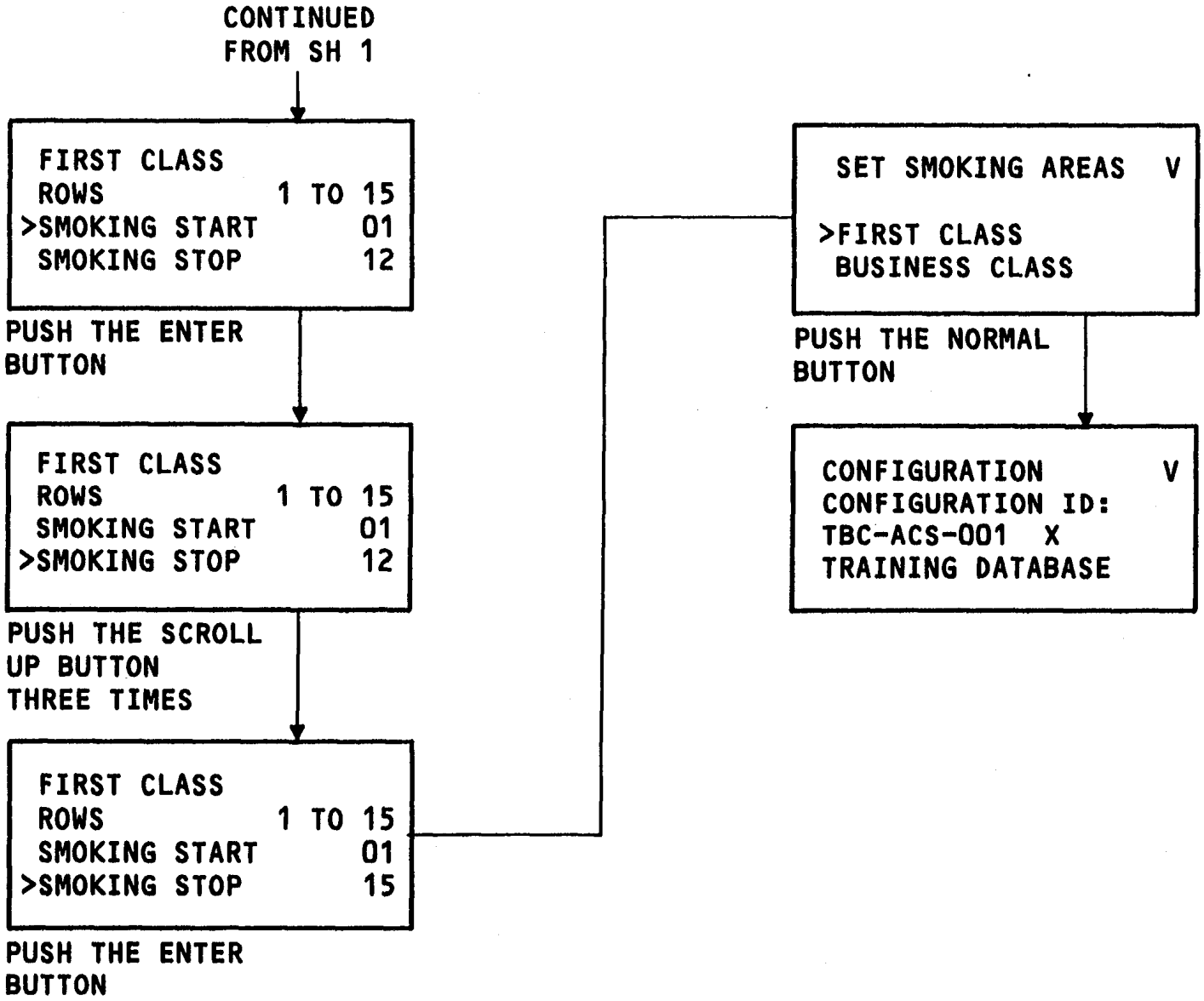

Figure 31 SET SMOKING AREAS - 2

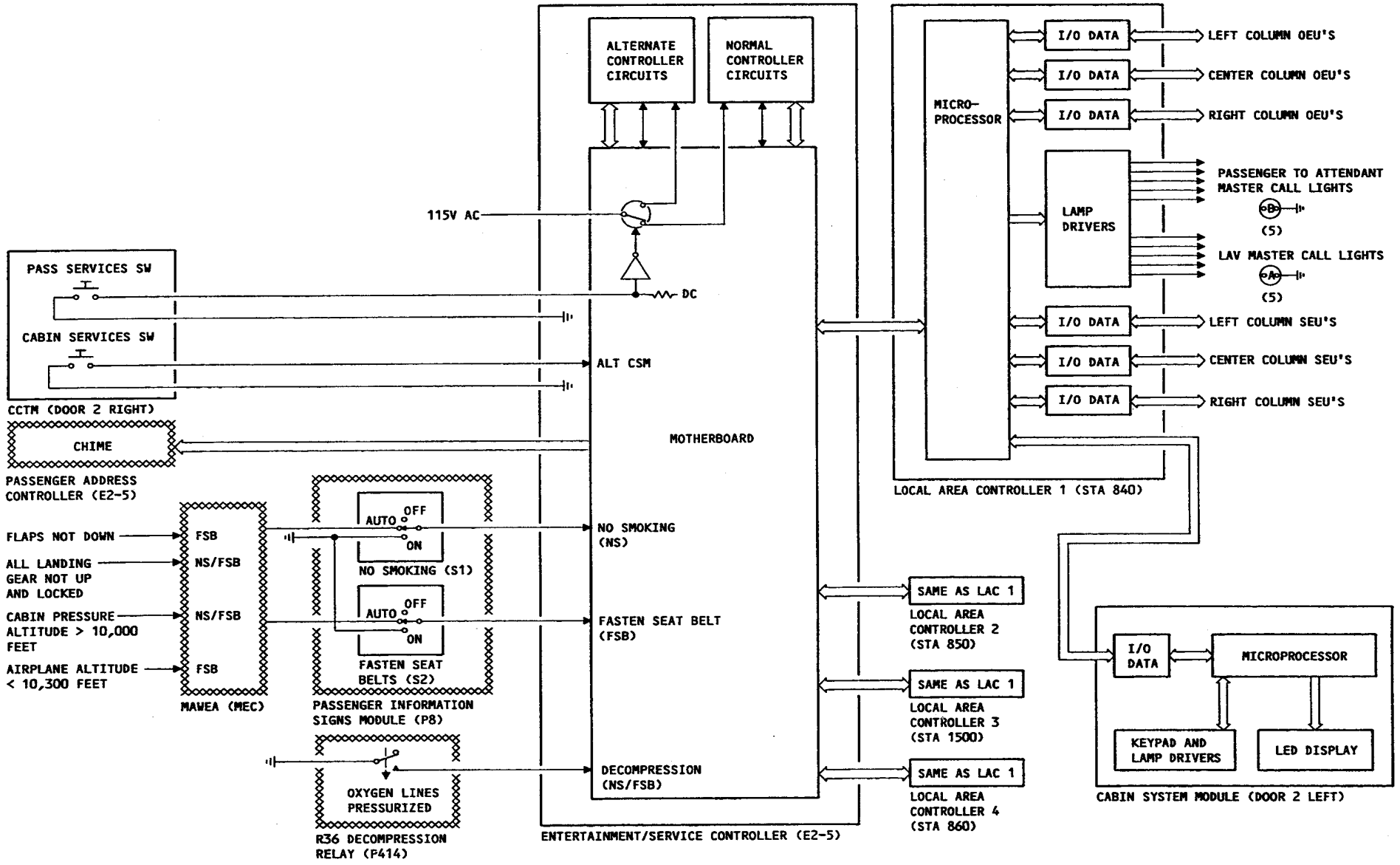

Figure 32 PSS - SCHEMATIC DIAGRAM - 1

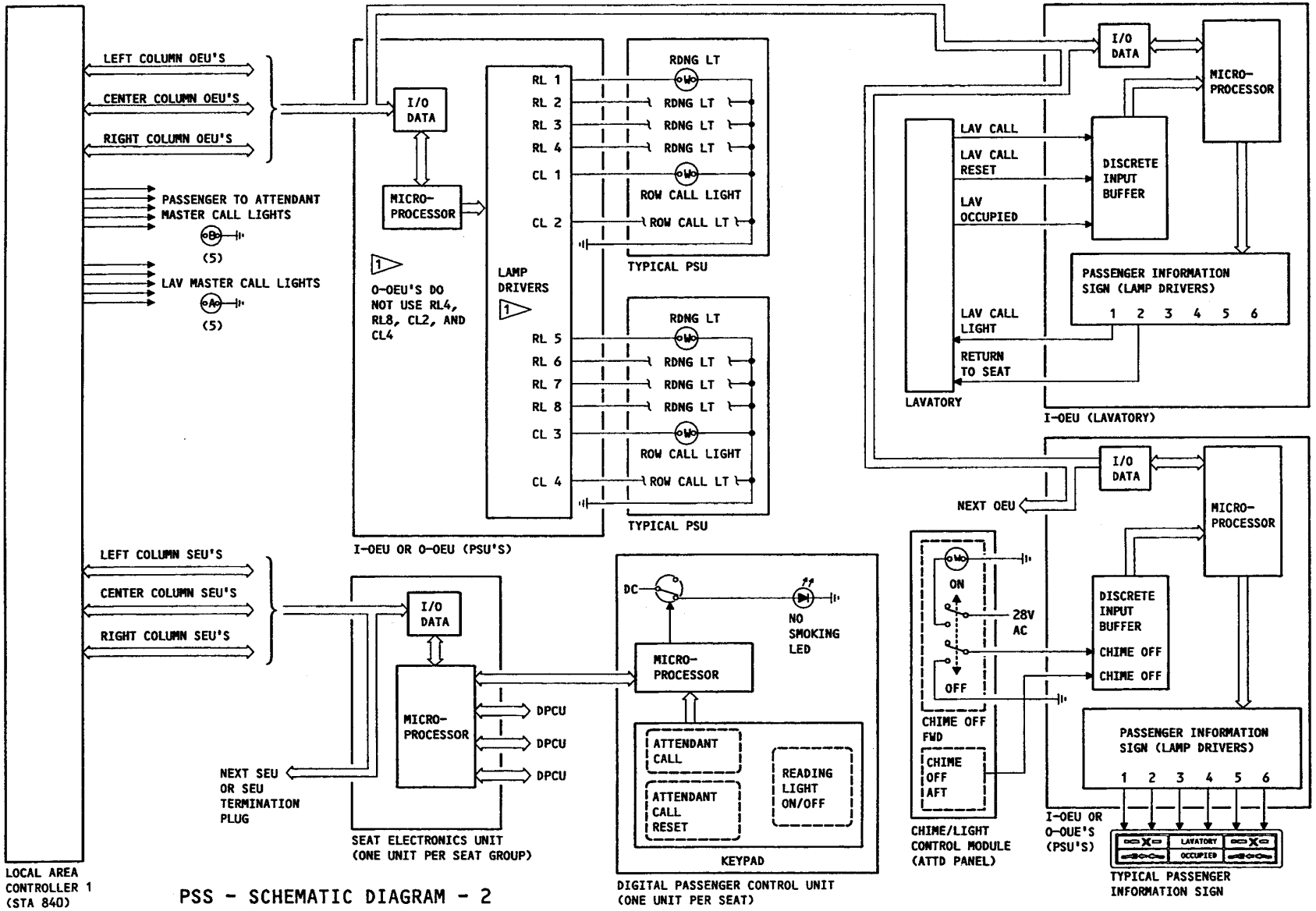

Figure 33 PSS - SCHEMATIC DIAGRAM - 2

ESC DISCRETES

General

The entertainment/service controller (ESC) gets discrete inputs from:

- The crew alerting card, located in the MAWEA (modularized avionics warning electronics assembly) through the passenger information signs module (P8)
- The R36 decompression relay

The discretes control the passenger information signs (no smoking and fasten seat belt) and the RETURN TO SEAT sign in the lavatories.

The no smoking and fasten seat belt discretes cause passenger information signs to come on. The decompression discrete causes the passenger information signs to come on, and the RETURN TO SEAT sign in the lavatories to go off.

The no smoking and decompression discretes make the no smoking LED on the digital passenger control units come on.

No Smoking Discrete

The ESC gets a no smoking discrete when the no smoking switch (S1) on the passenger information signs module is ON, or when the switch is in AUTO and:

- The landing gear is not up and locked, or
- The cabin pressure altitude is more than 10,000 feet.

Fasten Seat Bolt Discrete

The ESC gets a fasten seat belt discrete when the fasten seat belts switch (S2) on the passenger information signs module is ON, or when the switch is in AUTO and:

- The flaps are not up, or
- The landing gear is not up, and locked, or
- The cabin pressure altitude is more than 10,000 feet, or
- The airplane altitude is less than10,300 feet

Decompression

The ESC gets a decompression discrete when the passenger oxygen lines are pressurized.

Chime Generation

When the ESC gets a no smoking or fasten seat belt discrete, the passenger address controller (PAC) also gets those discretes. The PAC makes a low chime sound in the passenger cabin when the passenger information signs come on or go off.

When the ESC gets a decompression discrete, a digital output goes to the PAC. The PAC makes a low chime sound in the passenger cabin.

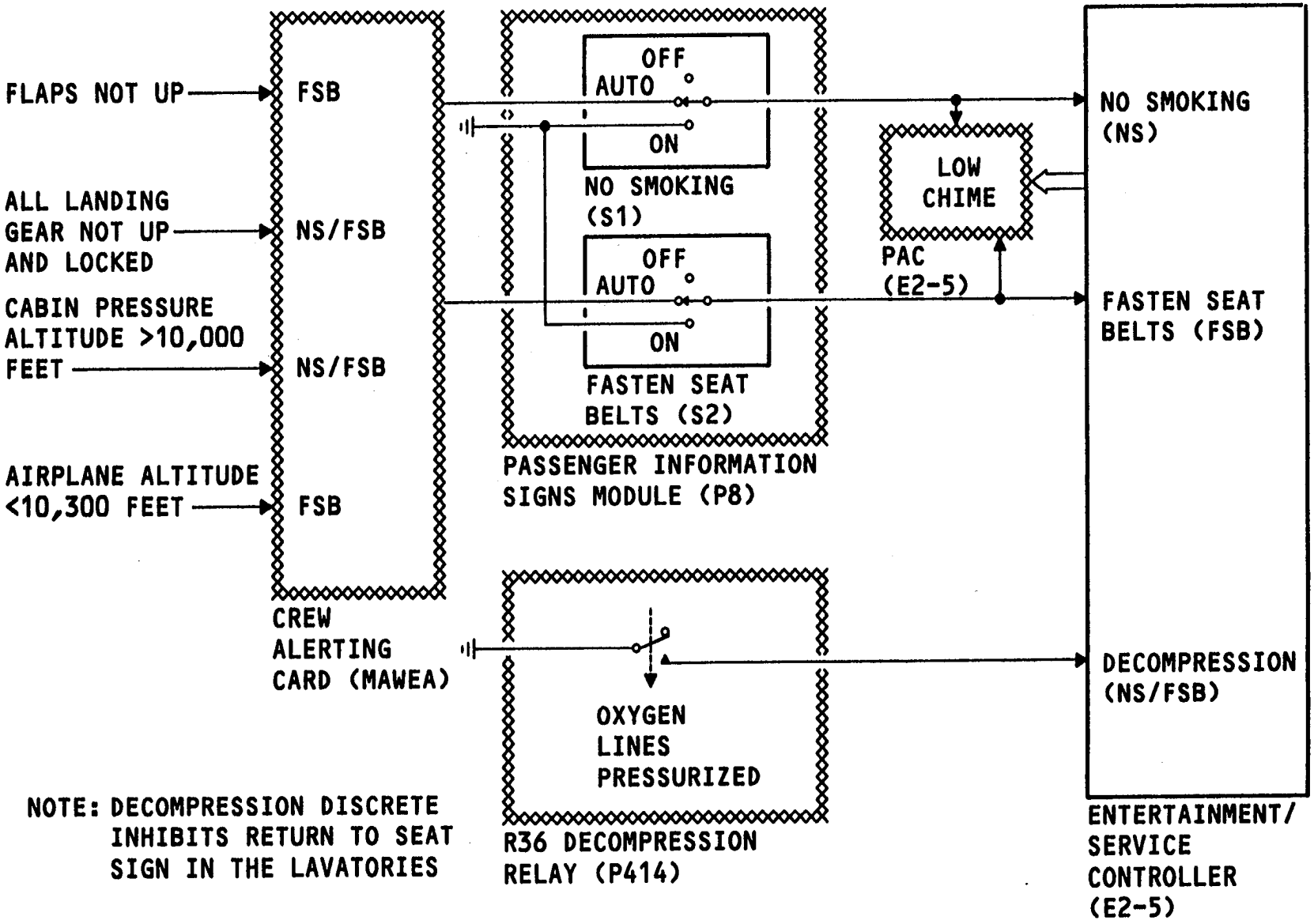

Figure 34 ESC DISCRETES

ESC OPERATION

Normal and Alternate Circuits

The entertainment/service controller (ESC) has these two fully redundant controller circuits:

- Normal
- Alternate

Each circuit can do all ESC functions. All interfaces with the ESC connect in parallel to both circuits through a motherboard.

Normally, the passenger services 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 ESC (an open is a logic one). This sends a logic zero to switch (S1) The switch sends 115v ac to the normal controller circuit.

When the passenger services switch closes, it sends a ground discrete from the ESC back to the ESC to an inverter on the motherboard (a ground is a logic zero). This sends a logic one to switch (S1) The switch sends 115v ac to the alternate controller and removes power from the normal circuit. Thus,

the alternate circuit now does all the ESC functions.

Operation

The ESC gets discrete inputs for control of:

- Passenger information signs (no smoking and fasten seat belts)
- The return to seat sign in each lavatory
- The no smoking LED on each digital passenger control unit (DPCU)

The ESC sends commands to the local area controllers (LACs). The LACs send commands to the seat electronics units and overhead electronics units to make the applicable lights come on or go off.

The LACs send attendant call data to the ESC. The ESC sends a command to the passenger address controller (PAC) which makes a chime sound at the attendants station.

Cabin System Module Area Control

The cabin services switch on the CCTM lets any cabin system module control all the passenger seating areas in the airplane. When the switch is on, a ground discrete goes to the ESC. This tells the ESC to let any CSM control all passenger seating areas. Normally, the switch is off, and each CSM controls only the areas set in the ACESS configuration database.

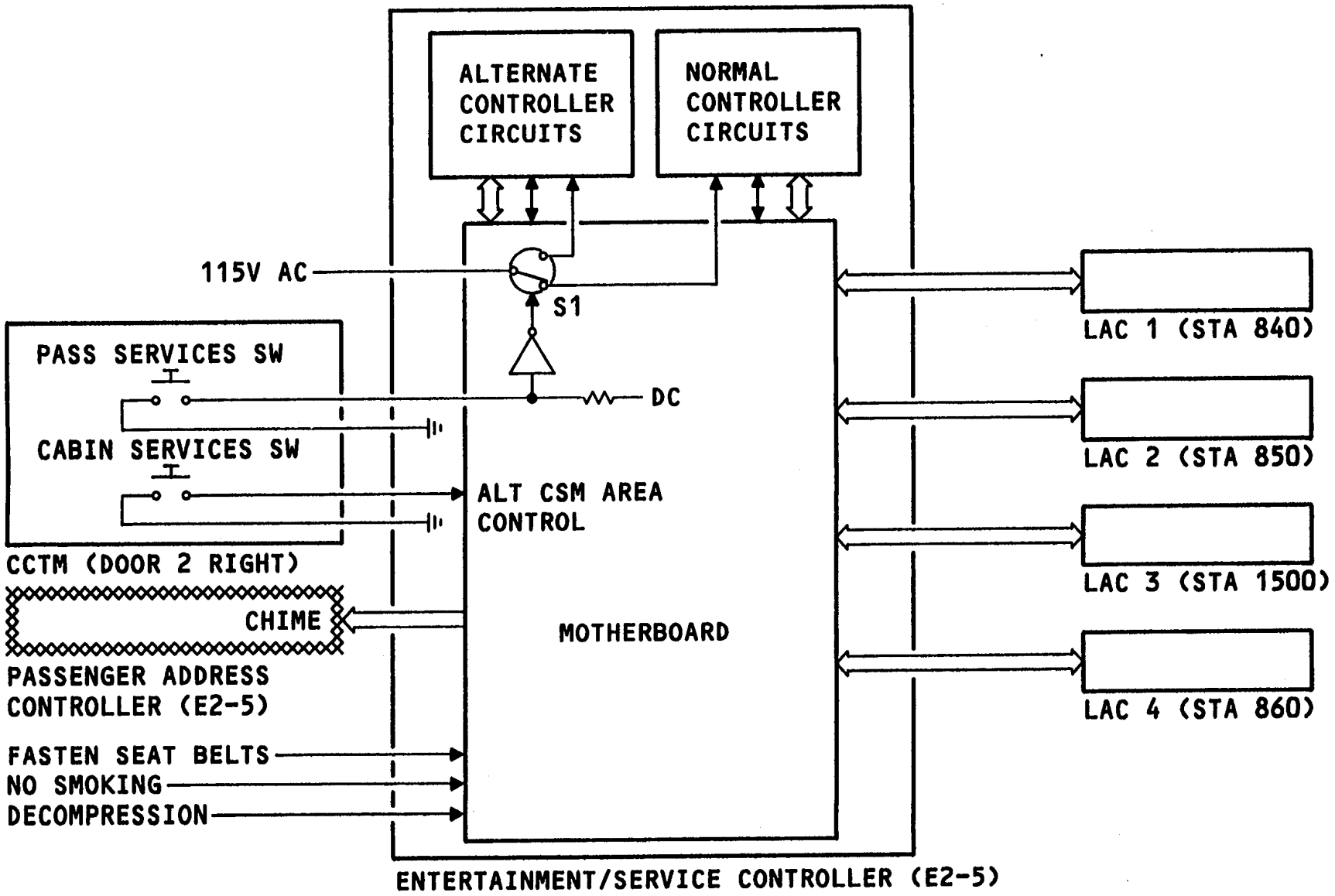

Figure 35 ESC OPERATION

LOCAL AREA CONTROLLER OPERATION

General

The local area controller (LAC) has an interface with the:

- Entertainment/service controller (ESC)
- Cabin system module (CSM)
- Overhead electronics units (OEUs)
- Passenger to attendant master call lights
- Lavatory to attendant master call lights
- Seat electronics units (SEUs)

SEU Interface

The LAC gets DPCU data from the SEUs.

When the attendant call button is pushed on a DPCU, the SEU sends the selection to the LAC. The LAC:

- Makes the applicable passenger-to attendant master call light come on
- Sends a command to the OEUs which make the row call light come on
- Sends chime data to the ESC which sends it to the PAC

Other DPCU selections, such as attendant call reset and reading light on/off, operate the same.

I-OEU Interface

The LAC gets lavatory data from the IOEUs.

When the attendant call button is pushed in a lavatory, the I-OEU sends the selection to the LAC.

The LAC:

- Makes the lavatory to attendant master call light come on
- Sends a command back to the I-OEU which makes the lavatory call light come on
- Sends chime data to the ESC which sends it to the PAC

I-OEU/O-OEU Interface

The LAC sends commands to the I-OEUs and O-OEUs which make these lights come on or go off;

- Passenger reading lights
- Row call lights
- Lavatory call lights (I-OEUs only)
- Return to seat signs (I-OEUs only)

CSM Interface

The LAC gets data from the CSM to control:

- Reading lights
- Attendant call lights
- OEU and SEU power

The LAC sends the data through ESC to the other LACs. The LACs use the data to control lights in the passenger seating areas that they connect to.

ESC Interface

The ESC sends the LAC:

- Passenger reading light and row call light commands from the other LACs
- Passenger information sign commands

The LAC sends commands to the OEUs which make the lights come on or go off.

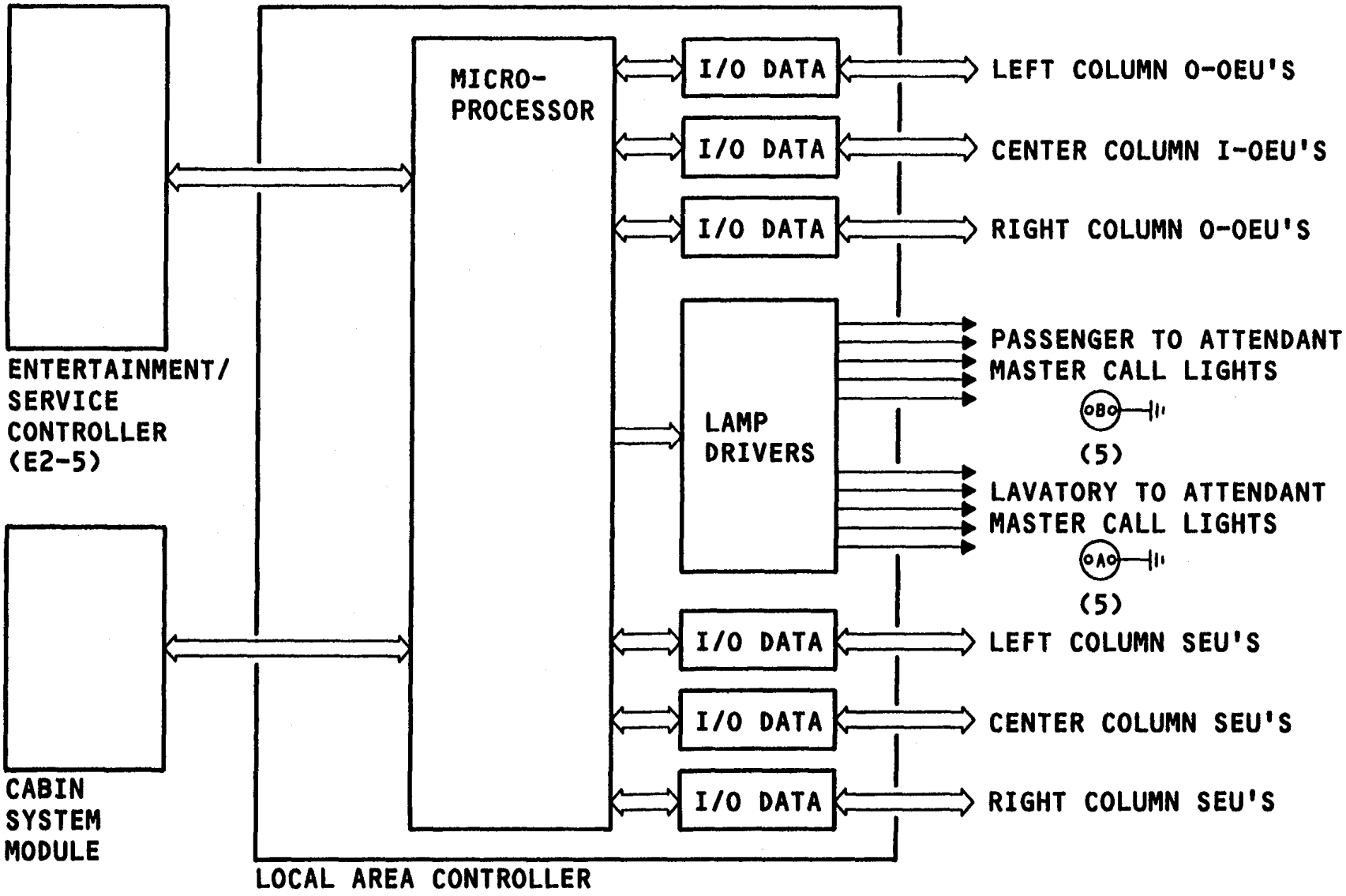

Figure 36 LAC OPERATION

CABIN SYSTEM MODULE OPERATION

General

The attendants use the cabin system modules (CSMs) to control:

- Passenger reading lights
- Attendant calls
- Power to the overhead electronics units (OEUs)
- Power to the seat electronics units (SEUs)

The passenger seating areas that a CSM controls is set by the ACESS configuration database.

Operation

Lamp drivers make lights come on in the keypad buttons to show the status of the passenger seating area shown in the CSMs display.

Push the keypad buttons to send a command through the local area controller (LAC) to the entertainment/service controller (ESC). The ESC sends the command to the LAC that controls the passenger seating area shown in the CSMs display.

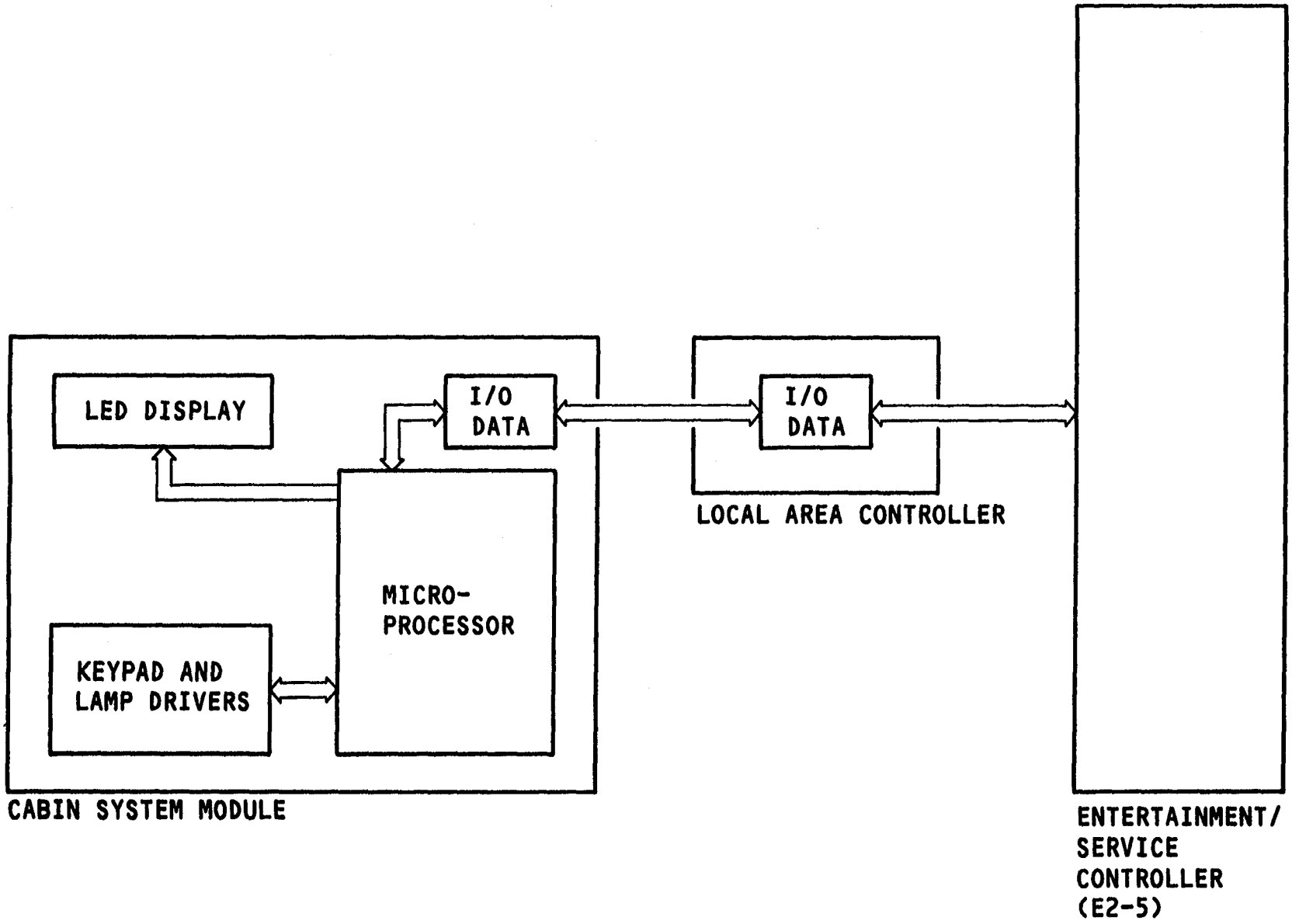

Figure 37 CABIN SYSTEM MODULE OPERATION

PSS - SEU /DPCU OPERATION

Smoking / No Smoking Control

The local area controller (LAC) sends smoking/no smoking control data to the seat electronics units (SEUs). The SEU sends the data to each digital passenger control unit (DPCU). A microprocessor in the DPCU, makes the no smoking LED come on or go off.

DPCU Selections

The DPCU keypad sends attendant call, attendant call reset, and reading light on/off data to the DPCU's microprocessor. The DPCU sends the data through an SEU to the LAC.

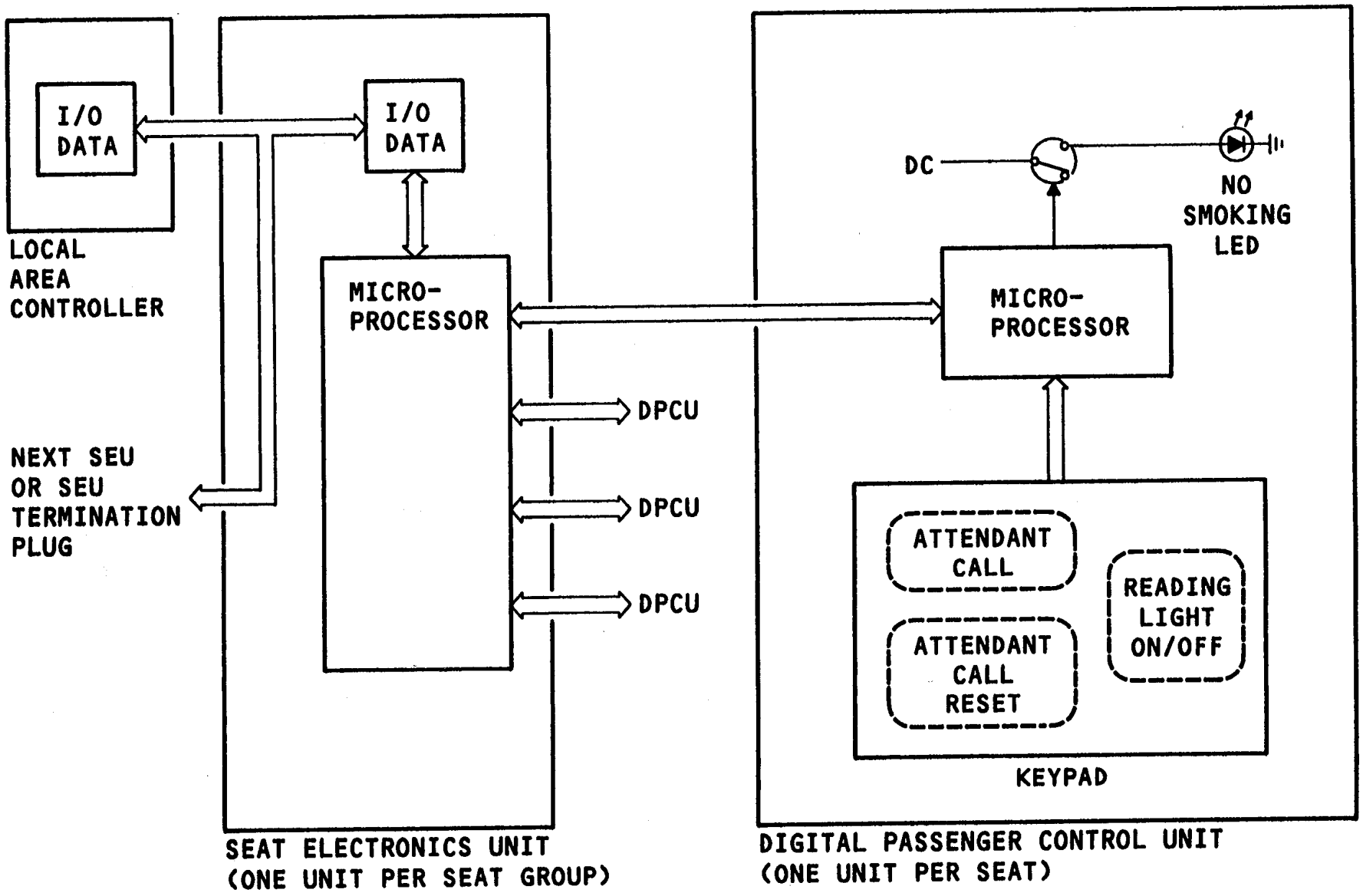

Figure 38 PSS - SEU / DPCU OPERATION

READING LIGHT / ROW CALL LIGHT OPERATION

The local area controller (LAC) sends passenger-to-attendant call and reading light data to the inboard and outboard overhead electronics units (OEUs). The OEUs microprocessor sends commands to the lamp drivers which make the passenger reading lights and row call lights come on or go off.

An inboard overhead electronics unit can control eight reading lights and four row call lights. An outboard overhead electronics unit can control six reading lights and two row call lights.

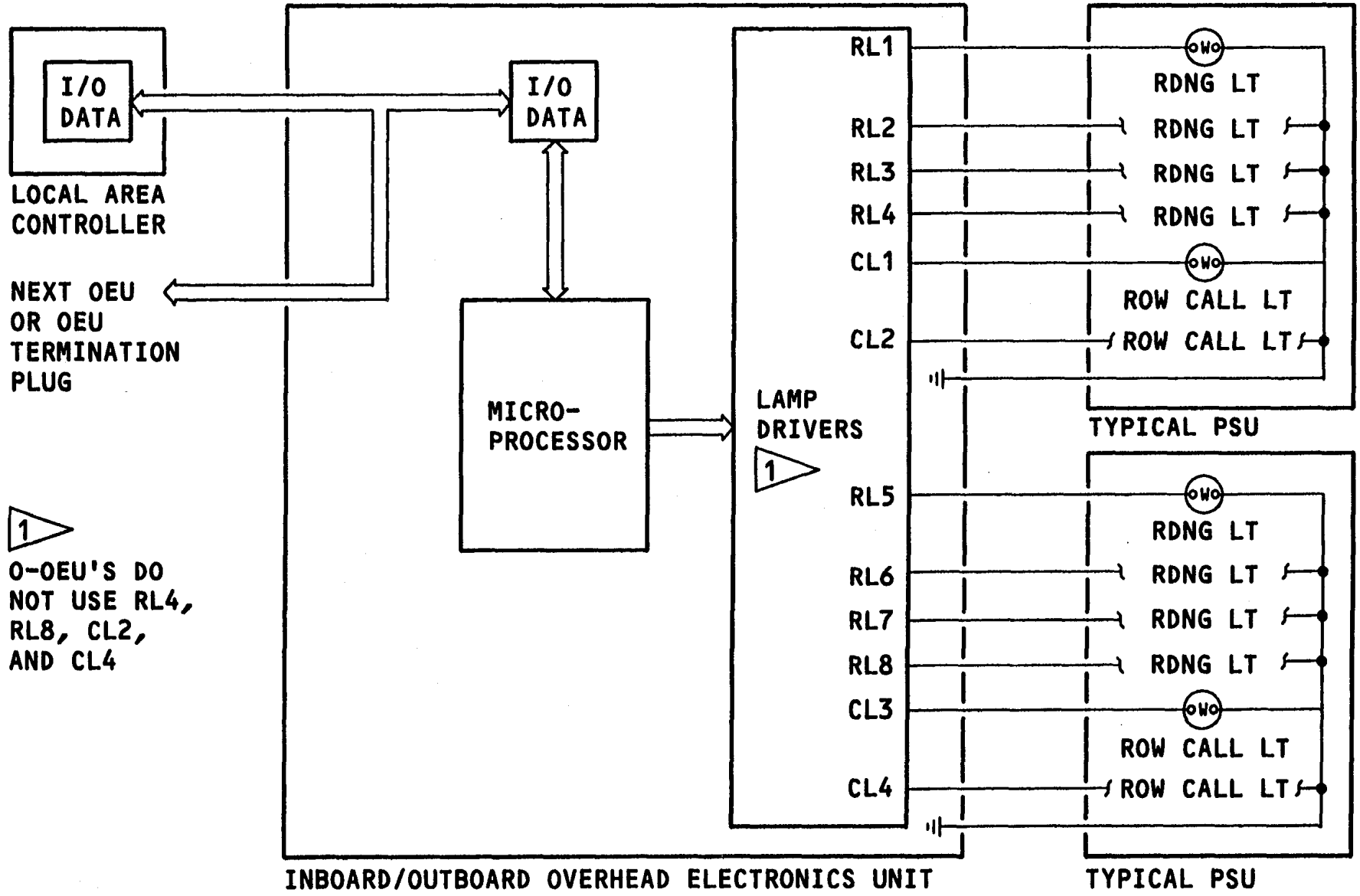

Figure 39 READING LIGHT / ROW CALL LIGHT OPERATION

LAVATORY OPERATION

Lavatories have an interface with an inboard overhead electronics unit (IOEU).

An I-OEU can get four discrete inputs. The lavatory sends these discretes to the I-OEUs discrete input buffer:

- Lavatory to attendant call
- Lavatory call reset
- Lavatory occupied

The I-OEU sends this data to the local area controller (LAC).

The LAC sends data to the I-OEU to make lights in the Lavatory come on or go off. The I-OEU uses its passenger information sign lamp drivers to make these lights come on:

- Lavatory call
- Return to seat

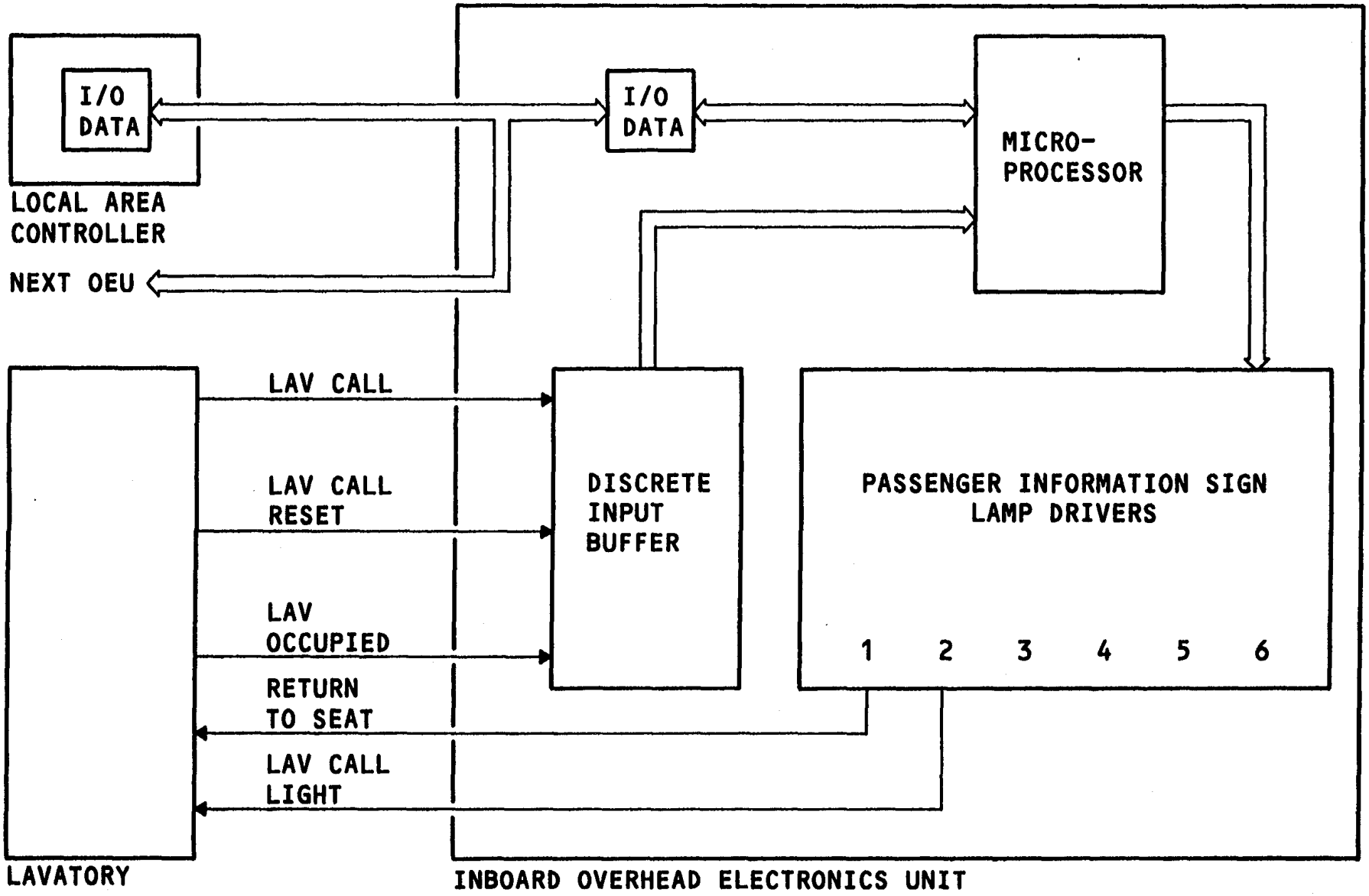

Figure 40 LAVATORY OPERATION

PASSENGER INFORMATION SIGN OPERATION

An overhead electronics unit (OEU) can control six lamp circuits with its passenger information sign lamp drivers. A billboard-type passenger information sign, like the one shown in this graphic, uses all six lamp drivers.

The OEU gets commands from the LAC which make lights in the sign come on or go off.

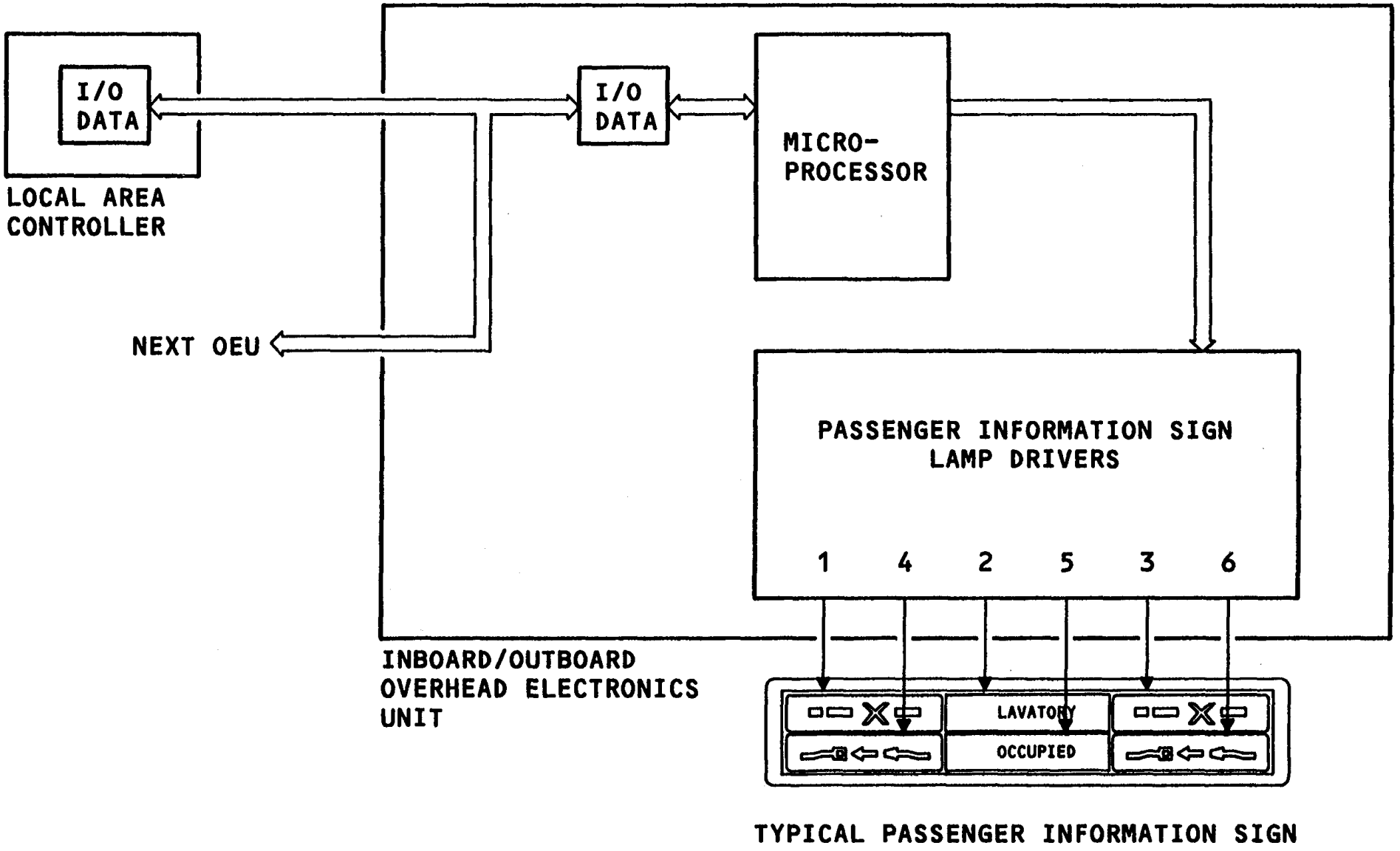

Figure 41 PASSENGER INFORMATION SIGN OPERATION

CHIME MUTE OPERATION

The chime/light control module (on an attendants panel), sends chime off discretes (forward and aft) to an overhead electronics unit (OEU). The OEU sends chime off data to the local area controller (LAC). The LAC sends the data to an inboard overhead electronics unit (I-OEU).

The I-OEU stops chimes for passenger to attendant calls from any seat rows (forward and/or aft) assigned to that attendants station by the configuration database.

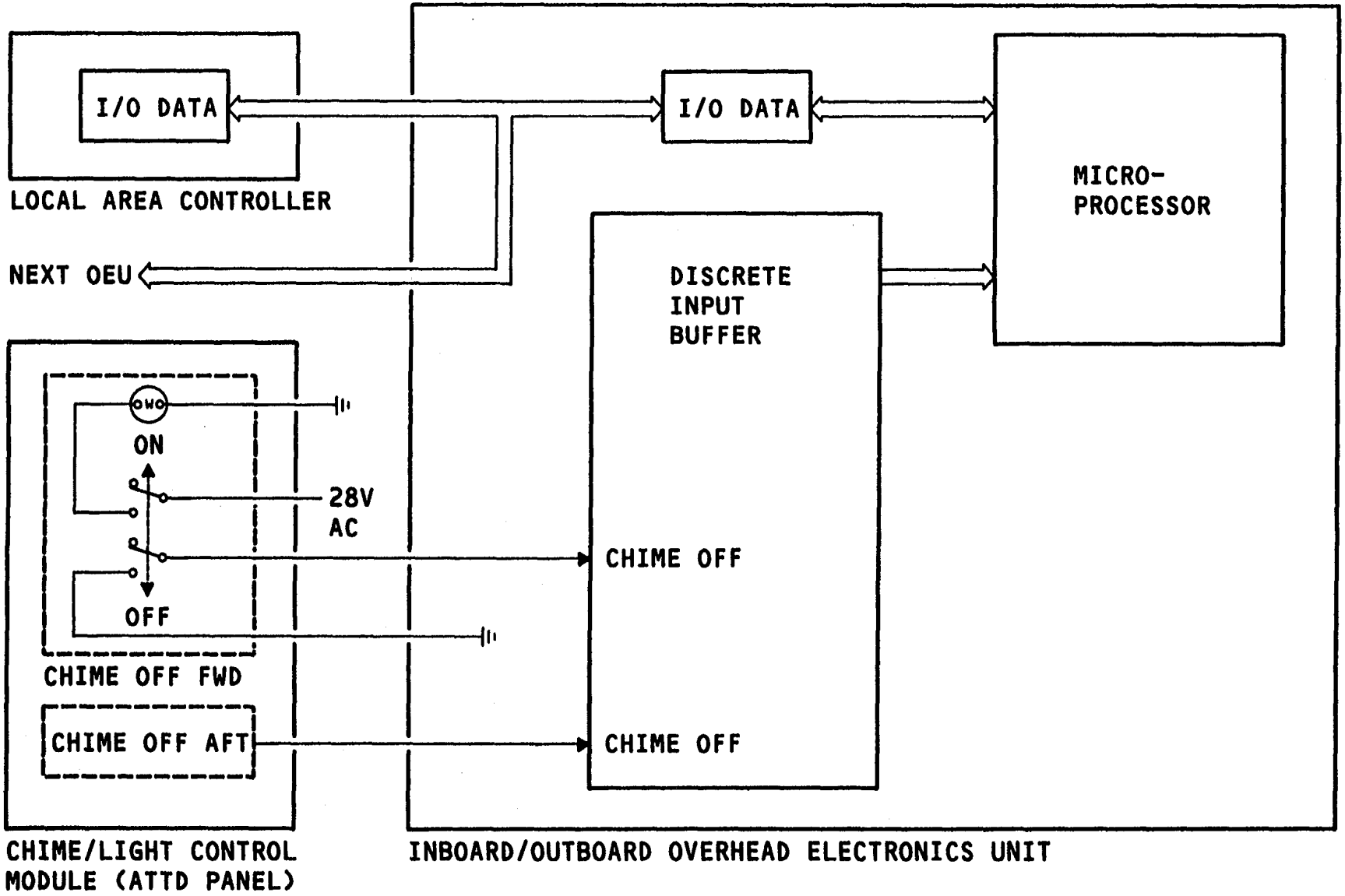

Figure 42 CHIME MUTE OPERATION

PROGRAMMABLE FEATURES

The passenger service system (PSS) uses the ACESS configuration database to control some PSS functions. All ACESS systems use part of the configuration database. For PSS, this database has data that:

- Sets the rows that each passenger seating area has
- Gives the passenger seating areas a name (shows on the cabin system module (CSM) display)
- Sets the passenger seating areas that a CSM can control
- Sets the passenger reading light control modes on the CSMs to momentary or absolute
- Sets the no smoking sections

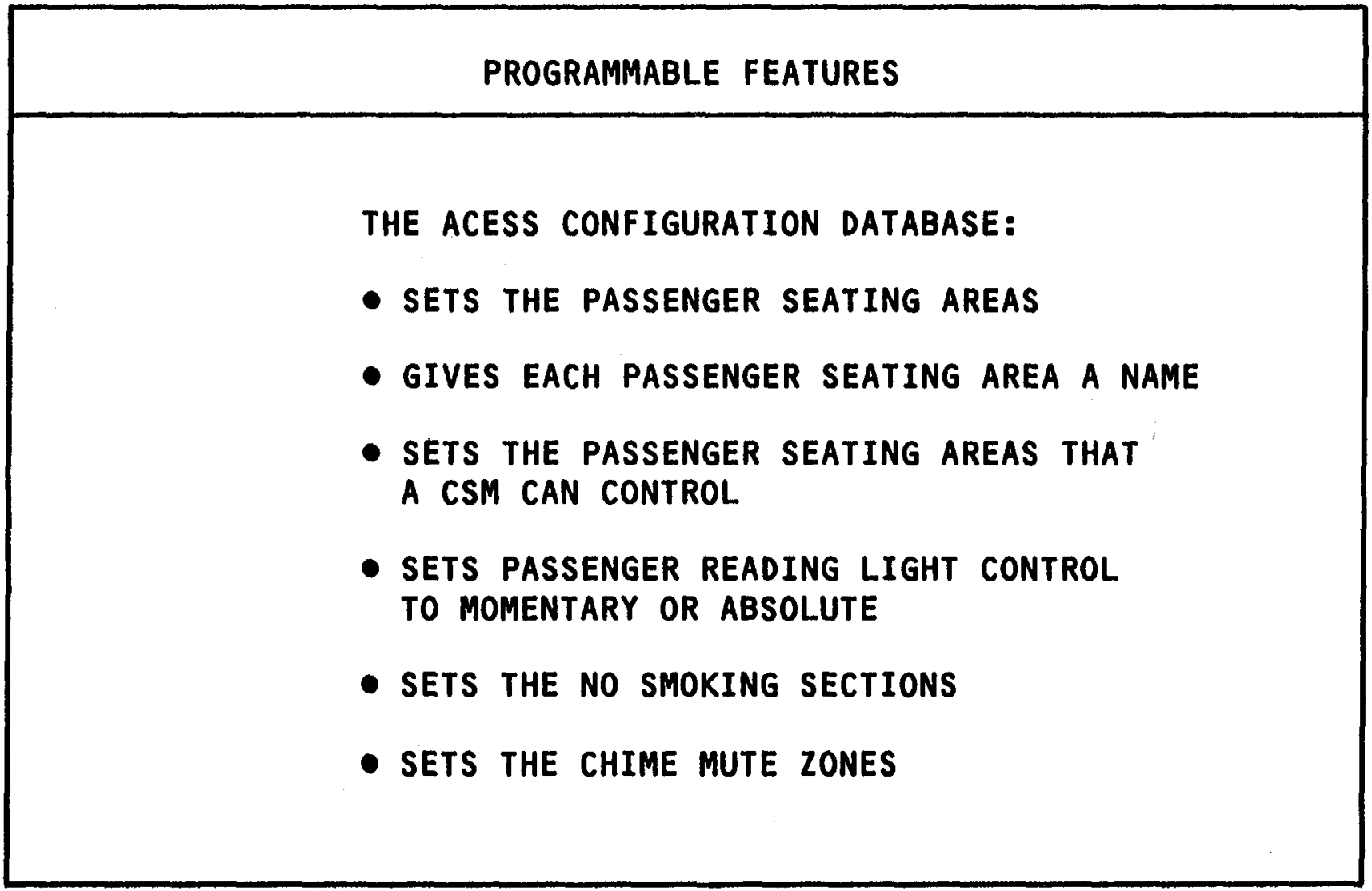

Figure 43 PROGRAMMABLE FEATURES

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