

# Canadair Regional Jet 100/200 - Communications

## 1. INTRODUCTION

The communications system consists of the following

- Intercom System
- VHF Communication System
- Service Interphone
- Announcement and Boarding Music System <0009>
- Announcement and Boarding Music System <0009><0036>
- Digital Announcement and Boarding Music System <0035>
- Passenger Briefing System <0085>
- Passenger Briefing System <0085><0036>
- HF Communication System <0011><0060>
- Airborne Communication Addressing and Reporting System (ACARS) <0082>
- Selective Calling (SELCAL) <0010>

Two radio tuning units are used to frequency tune the radios. A back-up standby tuning unit is provided in the event of a failure of one of the radio tuning units. The audio integrating system receives inputs from the radios and the intercom/interphone systems. The system then provides audio output to the flight crew speakers, headsets, passenger address system, communication radios and recorders. All incoming, outgoing and internal communications are recorded on the cockpit voice recorder.

The flight crew intercom system permits communications between stations within the aircraft, selection and monitoring of audio on the communications and navigation receivers, and selection for transmission on the communications transceivers. The flight crew can select and monitor the audio output of one or more communications transceivers and navigation receivers.

Individual speakers, installed above the pilot and copilot, are used to monitor audio selected at the audio control panels. Hand microphone jacks are installed at the rear of each control column. Headset jacks are installed below the pilot's and copilot's side consoles and the right side of the observer's station.

The service interphone system provides intercommunication between service and maintenance areas and the flight compartment. The service interphone and passenger address systems are interconnected. The flight attendants use their telephone-type handsets for both systems. One handset is located on each attendant's panel. Switches located on the interphone control panel in the flight compartment centre pedestal, access the external maintenance interphone stations and flight attendant's handsets.

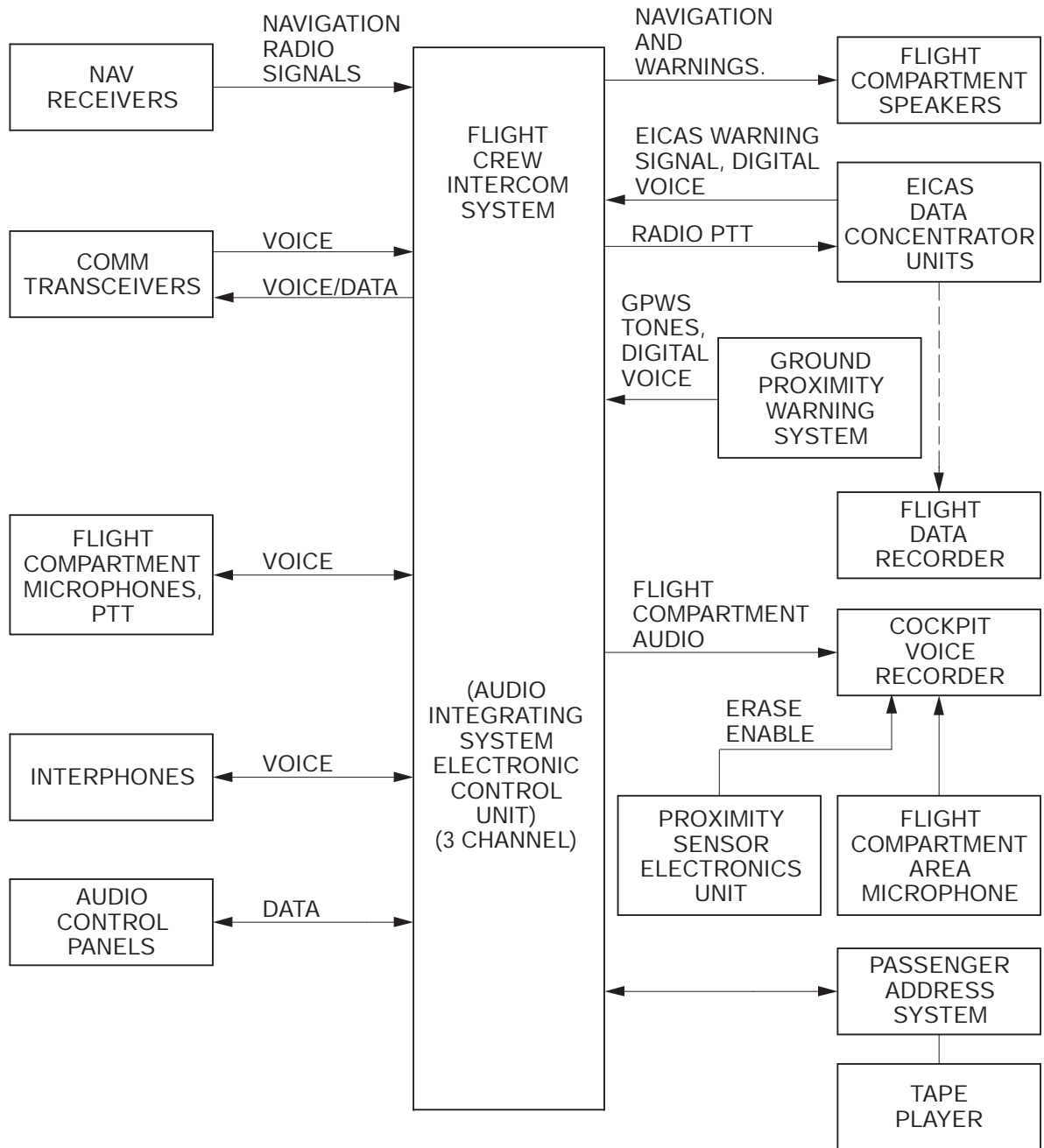
## **Canadair Regional Jet 100/200 - Communications**

The passenger address system enables the pilots and flight attendants to address passengers through speakers located throughout the cabin and in the lavatory.

The announcement and boarding music system provides voice messages and music through the passenger address system. <0009><0035><0036><0085>

Data communications provides a message link between the airplane computers and ground service providers.<0082>

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Communications – Block Diagram  
Figure 5–10–1

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### 1. AUDIO INTEGRATING SYSTEM

The audio integrating system provides display, switching and control of all incoming and outgoing audio signals from the aircraft navigation and communication systems. The audio integrating system receives inputs from various radio sources and from internally generated audio systems. The system provides audio output to the flight crew speakers, headsets, passenger address system, communication radios and to the cockpit voice recorder.

#### A. Audio Control Panels

Three audio control panels, located in the centre pedestal, provide the primary interface between flight crew and audio system. Each audio control panel provides a rotary transmit switch for selection of communication transceivers, interphone/service and passenger address systems.

Audio from the selected system is enabled by pressing the corresponding pushbutton and adjusting the desired volume. A switch and a potentiometer are combined in each pushbutton. Audio sources selected on the audio control panel can be routed to the flight compartment speakers by pressing in the speaker switch. Speaker volume is controlled by rotating the speaker control.

A radio transmit (R/T) and intercom (I/C) switch is used to transmit on the radios or passenger address system. The R/T position, when pressed, allows the pilot to transmit. When released, it returns to the OFF position, to receive. Continuous ("hot mike") conversation is provided in the I/C position for the intercom systems. A radio transmit (R/T) and intercom (I/C) switch is also provided on each pilot control wheel.

#### NOTE

Hot-mic communications can be selected by any one of the following switches:

- RT/IC switch on any audio control panel
- INT/SVC transmit select switch on any audio control panel with PTT pushed
- IC/OFF/RT switch on any audio control panel.

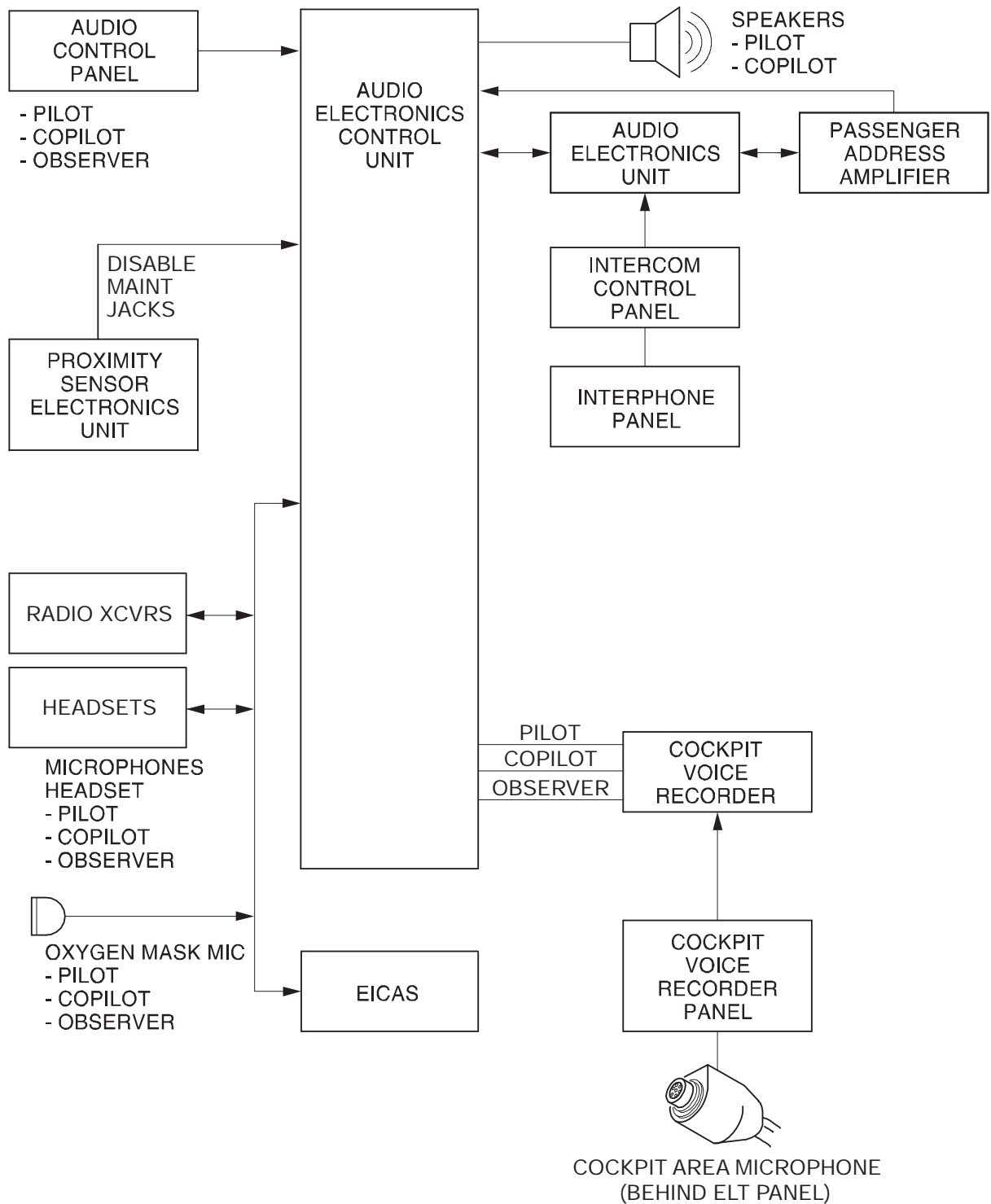
Selecting VOICE on the VOICE/BOTH switch eliminates the station Morse code identifier from VOR, ILS and ADF received signals. The MASK/BOOM switch gives the flight crew a choice between headset with boom mike (or hand mike) with BOOM selected, or the oxygen mask microphone, when MASK is selected.

During normal operation, the latching EMER/NORM switch is in the NORM position. The EMER position is used only when the audio integrating system fails. The EMER/NORM switch is disabled at the observer's station.

## **Canadair Regional Jet 100/200 - Communications**

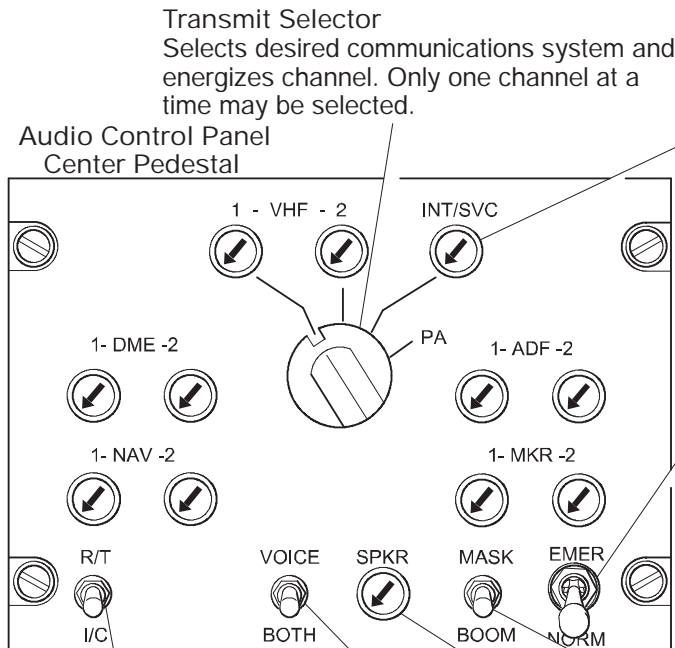
When the pilot's audio control panel EMER/NORM switch is set to EMER, the pilot's headset is connected directly to NAV 1 navigation radio and VHF 1 communication radio. Most of the system is bypassed making most audio control panel functions inoperative. Cockpit speakers are disabled and all warnings and tones are heard through the headsets. The observers station, passenger address and interphones are disabled in emergency mode.

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Communications – Block Diagram  
Figure 05-20-1

# Canadair Regional Jet 100/200 - Communications



**Transmit Selector**  
 Selects desired communications system and energizes channel. Only one channel at a time may be selected.

**Receive Pushbuttons**  
 Press to monitor respective navigation or communication system. Press again to deselect. Switches are lit when pressed. Any number of audio sources can be monitored at the same time. Rotate clockwise to increase volume.

**EMER / NORM (Lever-locked)**

- NORM - Normal functions.
- EMER - Bypasses audio electronics control unit.

Pilot has two-way communication on VHF 1, audio on NAV 1 and aural warnings. Copilot has two-way communication on VHF 2, audio on NAV 2 and aural warnings. Observer has aural warnings only.

**NOTE**  
 Inoperative at observer's audio control panel.

**Radio Transmit (RT) Intercom (IC)**  
 Used to transmit on radios or passenger address system.

- RT - When held, permits communication using headset or oxygen mask microphones.
- IC - Provides hot mic talk through interphone system.

**VOICE/BOTH**

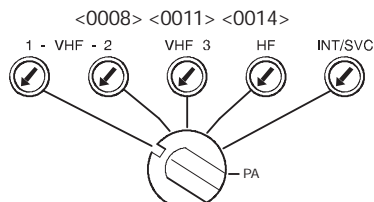
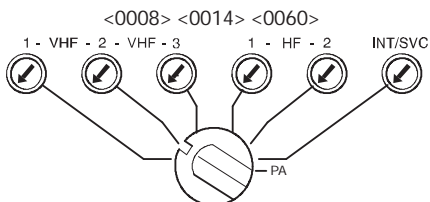
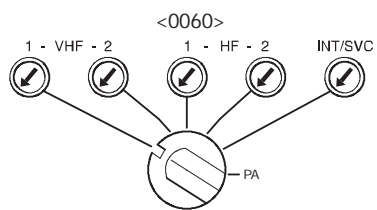
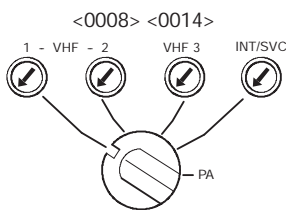
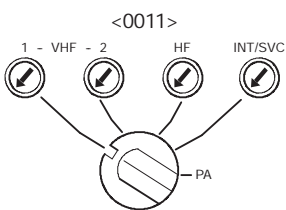
- VOICE - Station identification is filtered out allowing only voice signals to be audible.
- BOTH - Station identification and voice signals are audible.

**MASK/BOOM**

- MASK - Oxygen mask microphone of respective station is active.
- BOOM - Boom microphone of respective station is active.

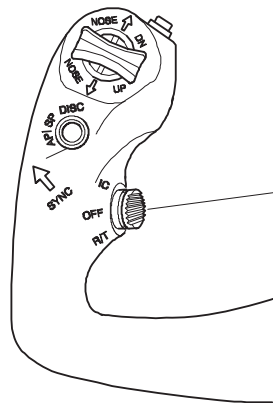
**SPKR**  
 Press to select and deselect audio on the flight compartment speakers. Rotate to adjust volume.

**NOTE**  
 Inoperative at observer's audio control panel.



Audio Control Panel <MST>  
 Figure 05-20-2

## Canadair Regional Jet 100/200 - Communications



Radio Transmit (RT)  
Intercom (IC)  
Used to transmit on radios  
or passenger address  
system.

- RT - When held, permits communication using headset or oxygen mask microphones.
- IC - Provides hot mic talk through interphone system.

Pilot's Control Wheel  
(Copilot's Opposite)

COMM – Pilot's Control Wheel (Copilot's opposite)  
Figure 05–20–3

### B. Ground Crew Interphone

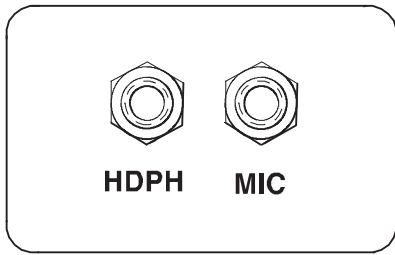
There are four external interphone stations in the following locations:

- External AC service panel
- Refuel/defuel panel
- Avionics compartment
- Aft equipment compartment.

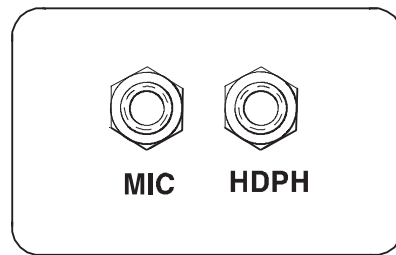
The CALL switches on the interphone panel external service panel are used to call either the pilot or maintenance. When either CALL switch is pressed and released, both lights are illuminated for 30 seconds and a two tone chime sounds in the aircraft.



Canadair Regional Jet 100/200 - Communications



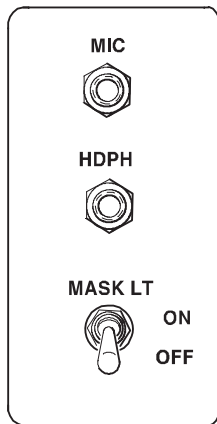
PILOT'S SIDE CONSOLE



COPILOT'S SIDE CONSOLE

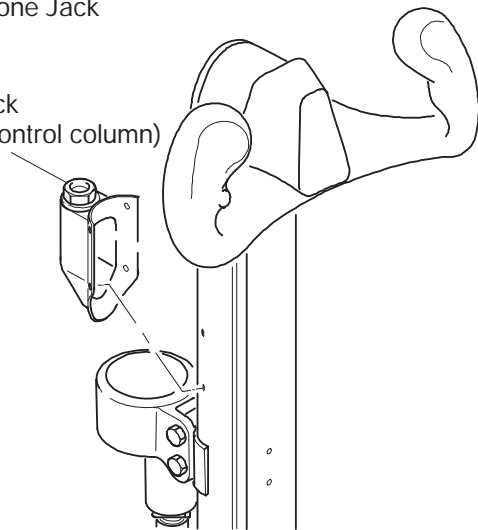
HDPH - Headphone Jack

MIC - Boom Microphone Jack

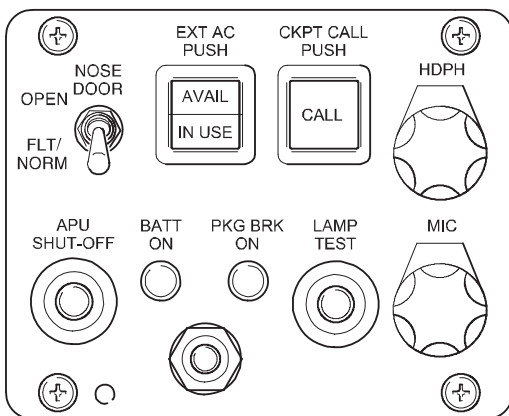


OBSERVERS STATION  
FORWARD WARDROBE UNIT

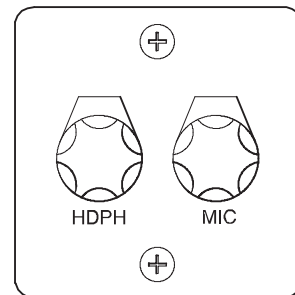
Hand Microphone Jack  
(Attached to rear of control column)



CONTROL COLUMN



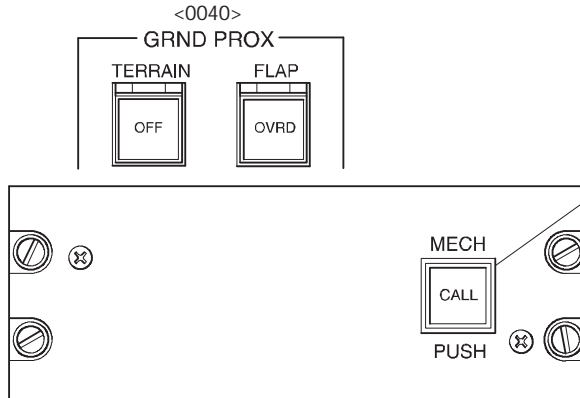
EXTERNAL SERVICE PANEL



TYPICAL PANEL -  
AVIONICS BAY  
REAR EQUIPMENT BAY

Jack Panel  
Figure 05-20-4

# Canadair Regional Jet 100/200 - Communications

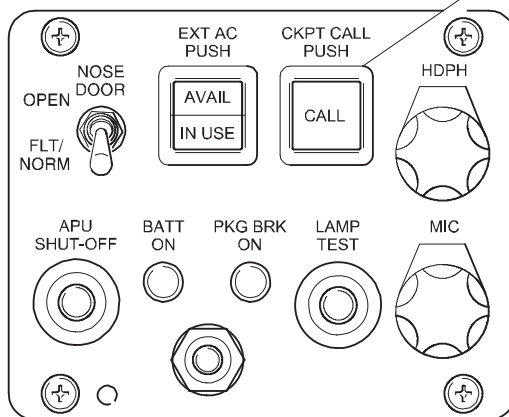


Interphone Panel  
Center Pedestal

## MECH CALL Switch/light

Used by flight crew to call ground crew or answer ground crew call.

- Pushed in - Flight compartment call to ground crew. CKPT CALL switch/light on external service panel comes on to indicate call to ground crew.
- Lit (white) - Ground crew to flight compartment call.
- CALL (white) - Ground crew to flight <0040> compartment call.



External Service Panel

## COCKPIT CALL Switch/Light

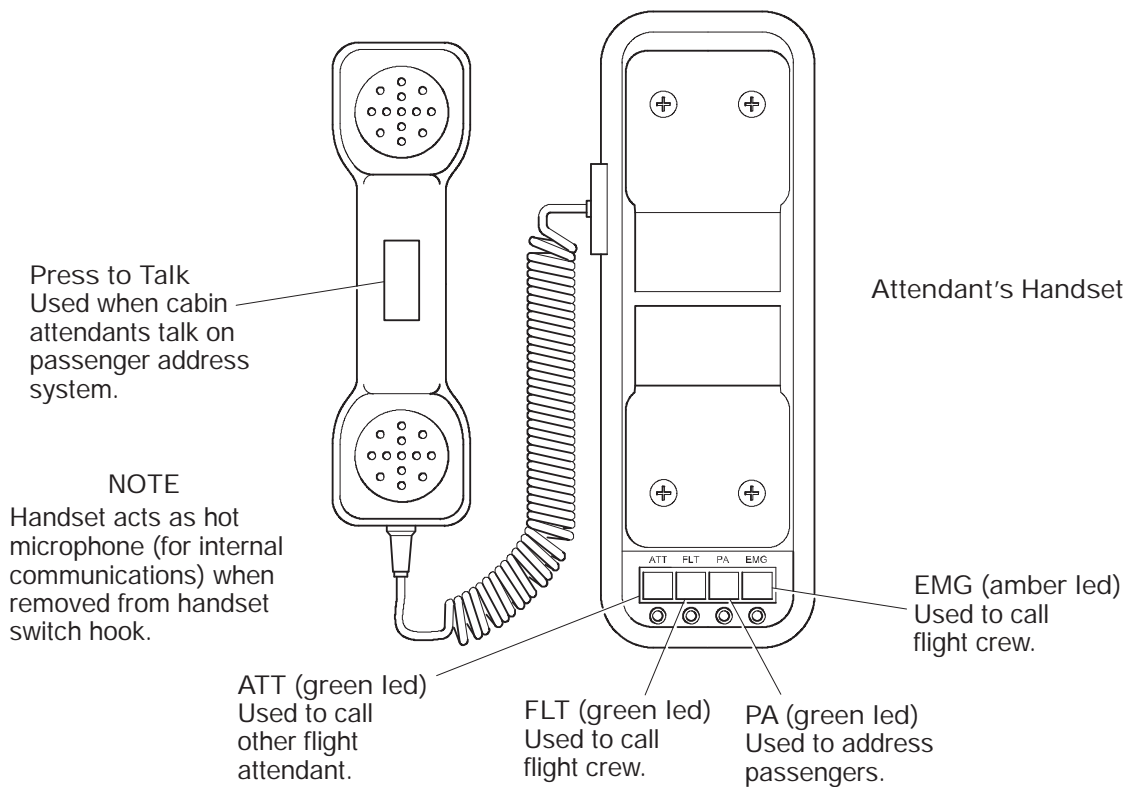
Used by ground crew to call flight crew.

- Pushed in - Ground crew call to flight compartment. MECH CALL switch/light on flight compartment centre pedestal comes on to indicate call from ground crew. Two-tone chime sounds in flight compartment.
- Lit (amber) - Flight compartment to ground crew call.

Interphone Control Units <MST>  
Figure 05-20-5

C. Attendant's Handset

Switches on the attendant's handset cradle and on the intercom control panel, in the flight compartment, are used for routing communications to the crew and passengers. On the handset cradle, the ATT button signals both attendant stations by illuminating the ATT indicators green. To call the flight crew, the attendant removes the handset from the hook and presses the FLT or the EMG button. This will illuminate the CALL or EMER light on the intercom control panel and sound a high-low chime on the flight compartment speakers. When PA is selected on the intercom control panel, and the RT/IC switch, on the control wheel, is set to IC, two-way conversation is established. The galley speaker is muted when a flight attendant's handset is activated.



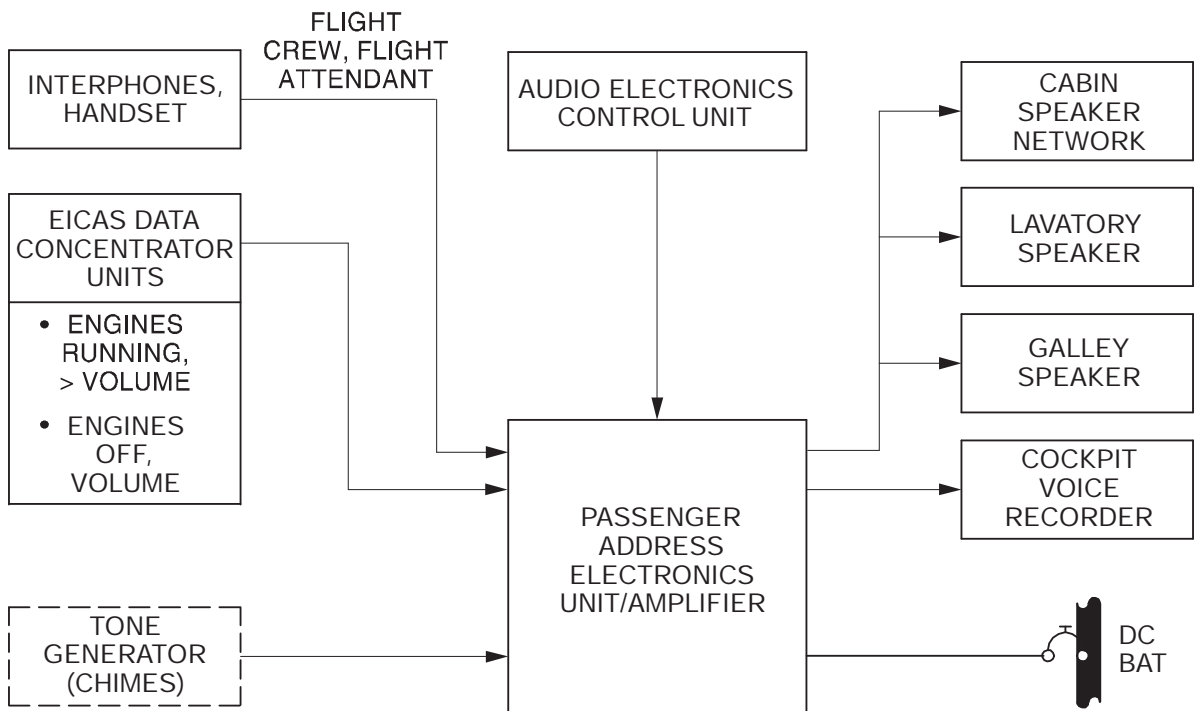
Attendant's Handset  
Figure 05-20-6

D. Passenger Address System

The passenger address system allows both pilots and flight attendants to make announcements to the passengers.

Cabin speakers are installed in the passenger service unit above each passenger seat. Additional speakers are installed in the lavatory and the galley. Volume of the cabin speakers is automatically adjusted for engine background noise.

Pressing in the PA button on the handset cradle and pressing the PTT switch in the handset allows either flight attendant to make an announcement on the PA system. The announcement will interrupt any entertainment system that may be operating. To ensure priority access to the system, all other PA transmissions are overridden when the pilot pushes the PA switch on the intercom control panel.



Passenger Address System – Block Diagram  
Figure 05-20-7

### E. Intercom Control Panel

The intercom control panel is located on the centre pedestal and is used to select one of four communication modes. When a button is pressed the labeled mode is activated and any previous mode is deactivated.

To make an announcement from the flight compartment:

- Set the audio control panel rotary transmit selector to PA
- Press the PA pushbutton on the intercom control panel
- Use any press to talk switch to transmit.

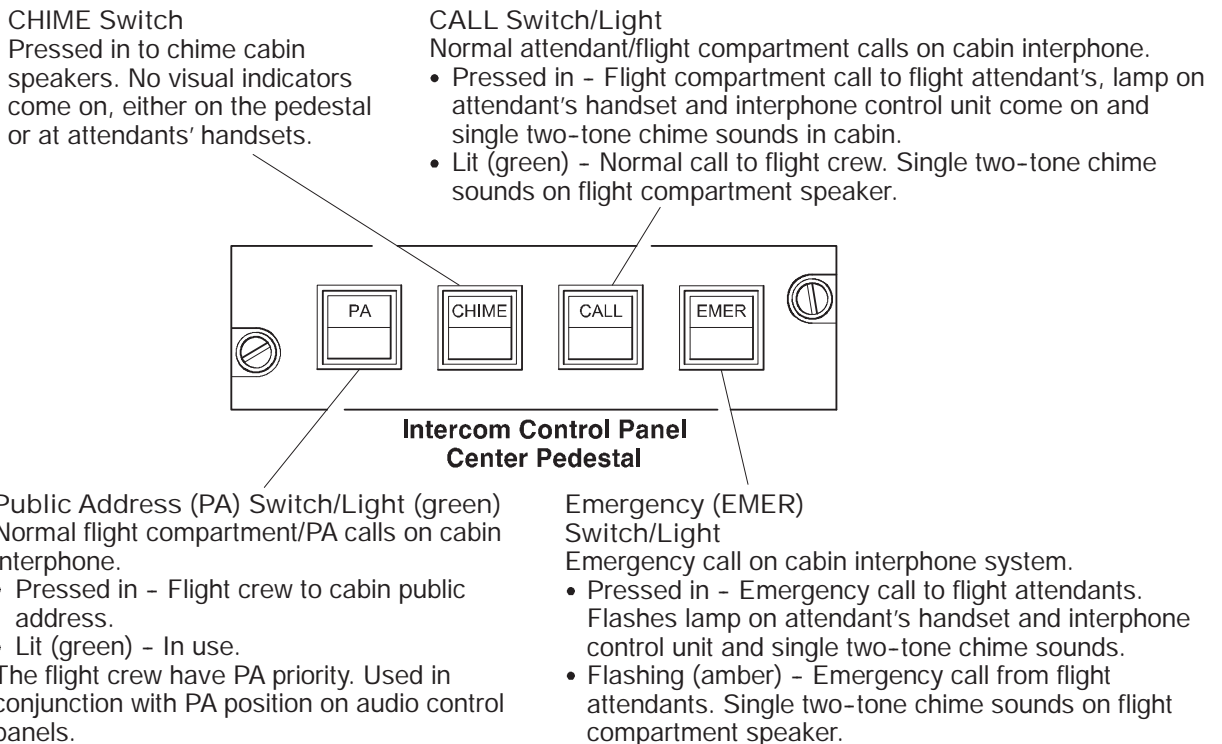
The PA indicator light on both flight attendant handset cradles will illuminate (green) and the PA pushbutton on the intercom control panel will illuminate (green).

Pressing the CHIME pushbutton, only sounds a high-low chime in the passenger compartment (there are no indicator lights for this action).

When the CALL is pressed, it illuminates green and sounds a high-low chime in the passenger compartment. The green FLT indicator light on both flight attendant's handset cradles illuminate and a red light comes on in the mid-cabin overhead exit sign.

The EMER button is used to notify the flight attendants of an in-flight emergency. When activated, the EMER indicator light on the intercom panel, flashes (amber) and a high-low chime sounds. In the passenger compartment, the amber EMG light on both flight attendant stations, flashes on the handset cradles and a red light flashes on the mid-cabin overhead exit sign.

## Canadair Regional Jet 100/200 - Communications



Intercom Control Panel  
Figure 05-20-8

### F. Passenger Service Units

An attendant call button is installed in each overhead passenger service unit. When a passenger activates the attendant call button, the cabin speakers sound a high tone chime and an amber light on the passenger service unit illuminates, a ceiling mounted call light comes on.

When the flight compartment NO SMKG or SEAT BLTS switch is turned on, the passenger compartment speakers sound a low tone chime and the NO SMKG and SEAT BLTS lights are illuminated.

## Canadair Regional Jet 100/200 - Communications

### G. System Circuit Breakers

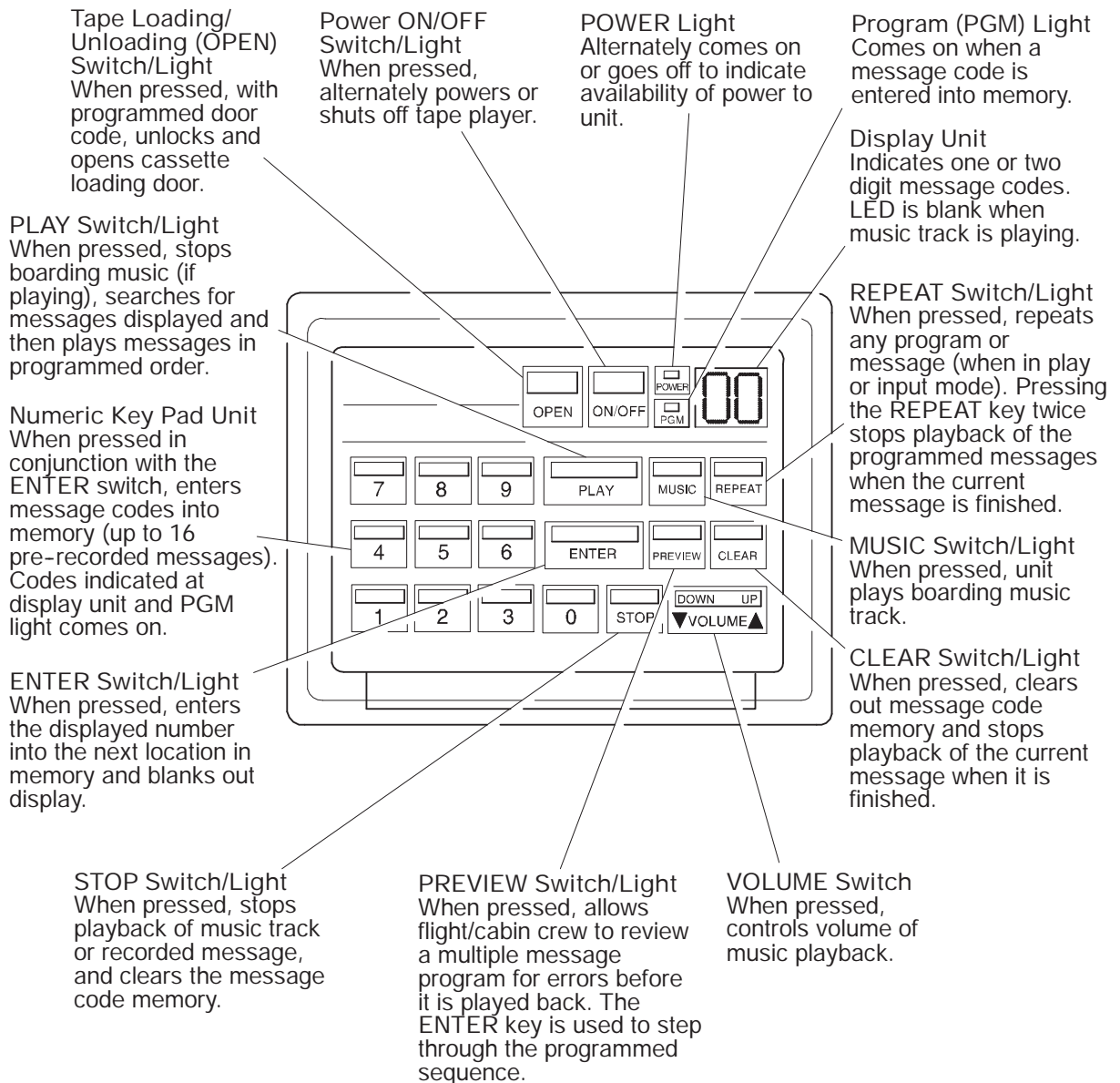
SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Comm Systems	Audio System	AUDIO PILOT	DC BAT	1	Q6	
		AUDIO OBS	DC BUS 1		Q8	
		AUDIO C/PLT	DC BAT		Q7	
		AUDIO OBS	DC BUS 2	2	H4	
		AUDIO PILOT	DC ESS	4	D1	
	Tape Player	PASS ADDR	DC BAT	1	Q5	

## Canadair Regional Jet 100/200 - Communications

### 1. ANNOUNCEMENT AND BOARDING MUSIC SYSTEM <0009>

The announcement and boarding music system includes a tape player unit to provide voice messages and music for the passenger address system. The unit is located in the top of the forward wardrobe and is activated by pressing the ON button.

The numeric key pad is used to enter message codes into the memory (up to 16 messages).



Boarding Music and Announcement System <0009>  
Figure 05-25-1



### NOTE

If the cabin depressurizes, a digital signal from the cabin pressure control module (CPAM), activates the automatic announcement of CABIN DEPRESSURIZATION. <0036>

## 2. PASSENGER ADDRESS AND MUSIC SYSTEM <0085>

The passenger address and music system is a source of voice messages and music. The unit is located in the top of the forward wardrobe. The system is activated by pressing the POWER button. System messages and music are contained in a memory card which is installed in the unit. The flight crew can not access the card.

To display a list of available languages on the liquid crystal display (LCD), the LANGUAGE button is pushed and released. The ( $\Delta$  and  $\nabla$ ) buttons are used to scroll through the list and the SELECT key is used to add a language to the active list. The order in which the languages are selected is the order in which they are played for any particular briefing. In PLAY mode, the language selection is highlighted on the LCD.

After selecting the languages, the MESSAGE button is pushed then the scroll arrows and the SELECT button are used to select a group of messages and music. The name of the message/music group and the name of the first message (which is cued ready to play) are displayed on the LCD. The WAIT indicator will be displayed.

Pressing the PLAY button starts the currently displayed message/music playing. The WAIT indicator is replaced by PLAY. Pressing PLAY again or pressing the PA switch on the intercom control panel will mute/pause the selection. During play, the PA indicator on the intercom control panel comes ON. Once the message is complete and only music is playing, the PA light goes out. The next message will cue up and the WAIT indicator will display.

Pressing the NEXT button causes the next message to cue and pressing the BACK button causes the previous message to cue. Pressing PLAY causes the cued message to play. During PLAY mode, normal use of the passenger address system will mute the boarding music system, while a crew member is making an announcement.

### NOTE

If the cabin depressurizes, a digital signal from the cabin pressure control module (CPAM), activates the automatic announcement of CABIN DEPRESSURIZATION. <0036>

# Canadair Regional Jet 100/200 - Communications

(Located in the forward wardrobe)

Darkened Arrow indicates selected message.

LCD DISPLAY, displays titles of message groups, selected language, current and cue message.

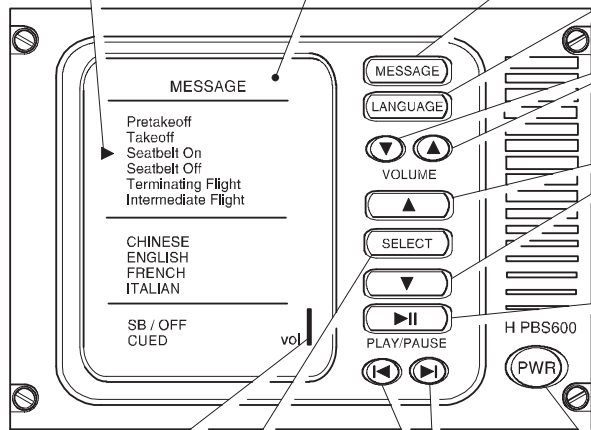
Press the MESSAGE button, then the UP or DOWN SELECTION arrow to select the desired message group.

Press the LANGUAGE button, then the UP or DOWN SELECTION arrow to select the desired message language.

UP or DOWN VOLUME arrows.

UP or DOWN SELECTION arrows, used to scroll to the desired message group.

The PLAY / PAUSE button is used to activate the selected briefing message. Pressing the PLAY / PAUSE button while a message is playing, will cause the message to pause. Pressing it again will cause the message to resume (at the beginning of the interrupted message).



Volume setting indication.

The SELECTION arrow, activates the selected briefing message group.

LEFT arrow, is used to skip backward through the available message group, RIGHT arrow is used to skip forward.

PWR button, (PUSH ON / PUSH OFF) Upon unit power up, the selection menu appears on display. A darkened arrow appears adjacent to the first message group or the last message group played prior to powering down.

## NOTE

A pre-recorded message will be played on the intercom when the Oxygen Deployment system is activated.

Passenger Briefing System <0085>  
Figure 05-25-2

### 3. DIGITAL ANNOUNCEMENT AND BOARDING MUSIC SYSTEM <0035>

The announcement and boarding music system is a source of voice messages and music for the passenger address system. The digital boarding music unit is located in the top of the forward wardrobe. The unit is energized by pressing and releasing the momentary action ON key. During power up, the system performs a self test that checks the system components and data file integrity.

System configuration, messages and music are contained in a memory card installed in the unit. The flight crew can not access the card.

Pressing the language/volume key, labeled L/V, activates the language selection mode. The up and down arrows and the SEL (select) key may then be used to select up to four languages. The order of selection is the order that the languages will play.

The liquid crystal display (LCD) lists the languages as they are selected. When in play mode, the active (cued) language will be highlighted. If the flight attendant activates a message, the SEL key is inhibited for the duration of the message.

After pressing the A (announcement) key, the up and down arrows and the PLAY key may be used to scroll up and down the list of available message and music files and select a particular group of messages to be played.

The selected message or music group name will appear on the LCD and the first cued up message will be highlighted. Music can be selected by scrolling through the displayed titles and pressing the SEL key. The PLAY key will cause the highlighted file, message or music, to be broadcasted. When no music is selected for three minutes, the system defaults to announcement mode.

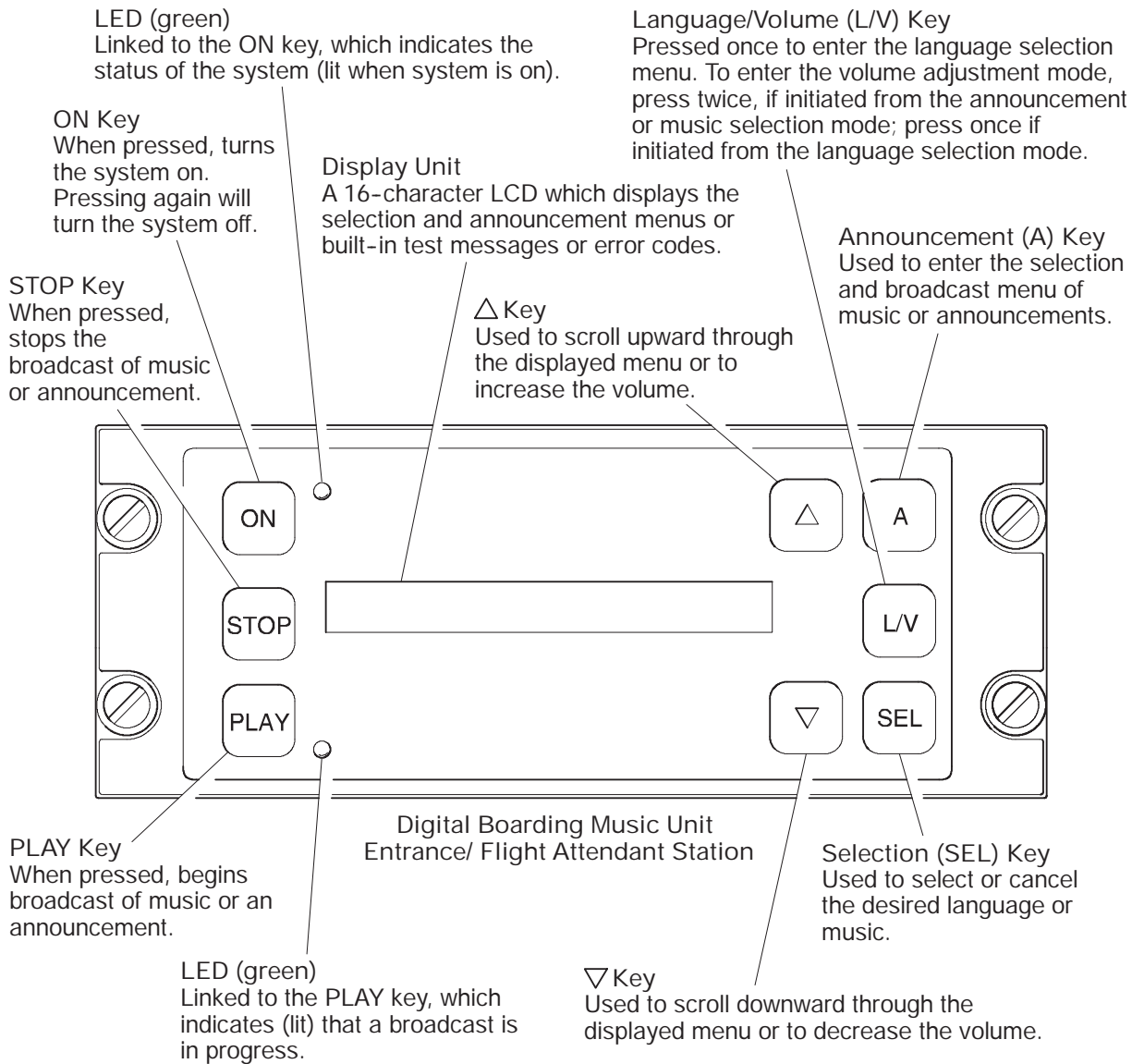
In play mode, selecting the L/V key will allow the user to adjust the volume of the broadcast by pressing the up and down arrows. The broadcast can be interrupted by pressing STOP.

A signal from the PSEU (oxygen deployment at cabin altitude greater than 10,000 feet) keys up to three prepared messages. These messages supercede all other system outputs. The music system is, also, muted when a crew member makes an announcement using the passenger address system.

Control Panel Function Keys:

- ON - Turns the system ON and OFF
- STOP - Stops the broadcast
- PLAY - Plays the announcement or music
- A - Announcement, used to enter the Announcement Menu
- L/V - Language/volume used to select the Language Menu or adjust volume
- SEL - Selects the language or music

## Canadair Regional Jet 100/200 - Communications



Boarding Music and Announcement System <0035>  
Figure 05-25-3

## Canadair Regional Jet 100/200 - Communications

### A. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Boarding Music System	Tape Player	PASS ADDR.	DC BAT	1	Q5	

### 1. RADIO COMMUNICATION SYSTEM

Two VHF radio communication systems provide AM voice communication with ground stations and other aircraft. The radios work with the audio integrating system to provide full two way communication. The audio control panels provide selection and control of the audio outputs. The radio communication system is energized when electrical power is applied to the aircraft.

Two VHF radio communication systems provide AM voice communication with ground stations and other aircraft. A third VHF system provides a backup to VHF 1 and VHF 2. The radios work with the audio integrating system to provide full two way communication. The audio control panels provide selection and control of the audio outputs. The radio communication system is energized when electrical power is applied to the aircraft.  
<0008> <0014>

Two VHF radio communication systems provide AM voice communication with ground stations and other aircraft. A third VHF system is used as a data link only. The radios work with the audio integrating system to provide full two way communication. The audio control panels provide selection and control of the audio outputs. The radio communication system is energized when electrical power is applied to the aircraft. <0081><0084>

Transceiver tuning range is 118.000 to 136.975 MHz. Frequency tuning and mode selection is done by two primary radio tuning units (RTU). Frequency tuning can also be done by a backup standby tuning unit or the FMS control display unit.

#### A. Radio Tuning Unit

The radio tuning units and radio systems have an on-side relationship. RTU 1 monitors and controls COM 1 and RTU 2 monitors and controls COM 2. In the event of total AC power loss or failure of both radio tuning units, the backup tuning unit provides reversionary control of COM 1.

Radio information is presented on two levels of the radio tuning units. The top level page displays the overall status of all radios and allows the operator to make frequency changes. A COM main page provides the means to change frequencies, codes and operating modes.

The active VHF COM frequency is shown on the top left hand side of the radio tuning unit top level page, while the preset frequency is displayed on the top right hand side. Pressing the line select key adjacent to any frequency brings the tuning window to that frequency. It is then possible to modify that frequency with the frequency select knobs. Pressing the line select key adjacent to the preset frequency twice, swaps the active frequency with the preset frequency. Pressing the line select key adjacent to the active frequency twice, brings up the COM main page.

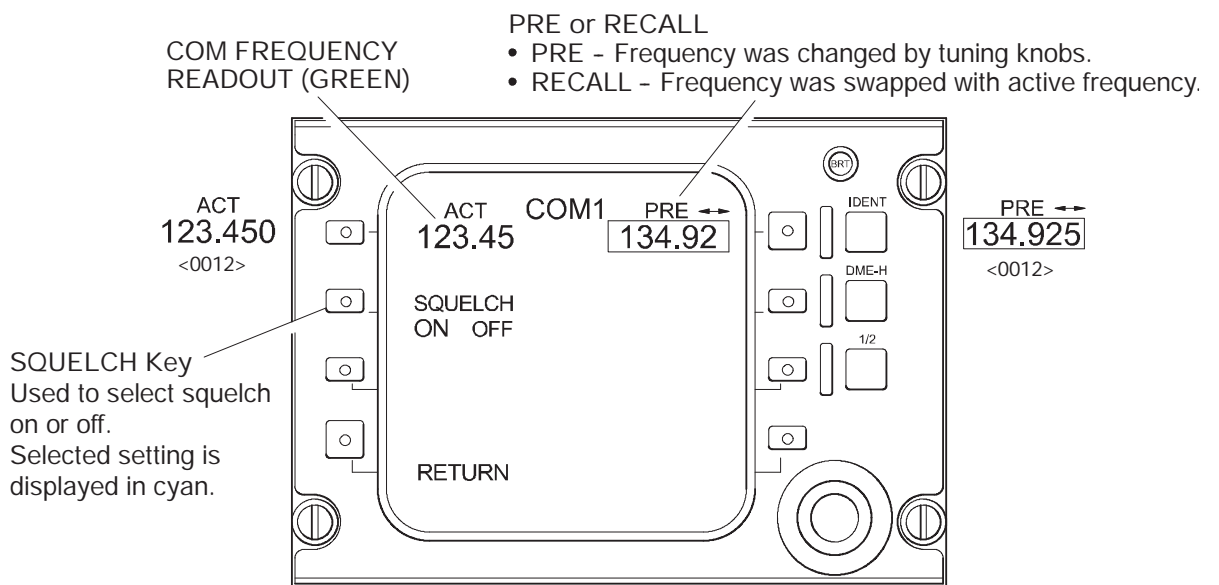
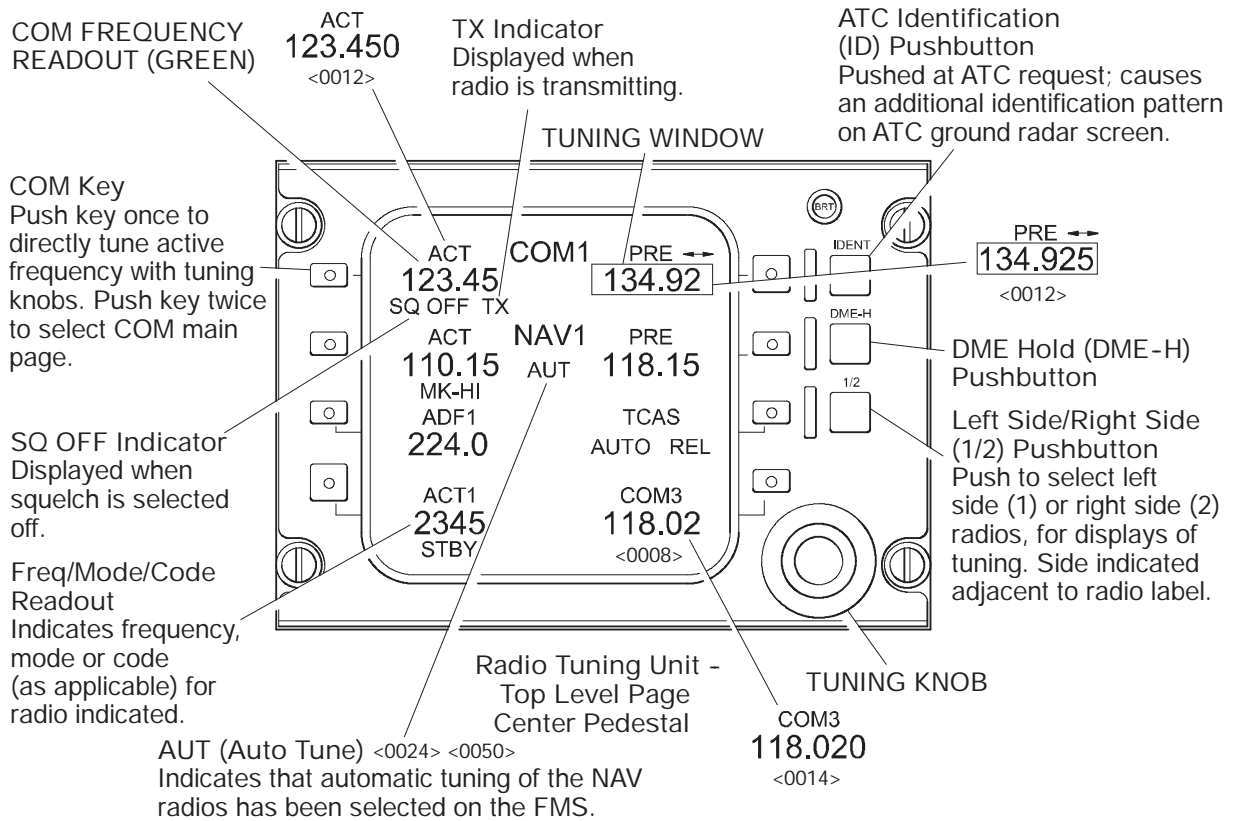
On the main page, pressing the line select key adjacent to the SQUELCH field toggles the squelch ON or OFF. The selected state is displayed in large cyan letters. The inactive state is displayed in smaller white letters.

If no entry is made on the main page within 20 seconds, the radio tuning unit display will return to the default top level page. The operator can press the line select key next to the RETURN line to return to the top level page at any time.

If the squelch is selected OFF, a SQ OFF message is displayed on the top level page. Since Squelch ON is considered the normal operating mode it is not displayed on the top level page. When a COM transceiver is transmitting, a TX annunciation is displayed in cyan letters below and to the right of the active frequency field on the top level page.

The radio tuning units continuously monitor the status of the VHF COM transceivers and if any discrepancy is detected between the commanded frequency and the actual tuned frequency, the frequency indication is replaced by white dashes to warn the pilot of the inconsistency.

# Canadair Regional Jet 100/200 - Communications





### B. Backup (Standby) Tuning Unit

Under normal conditions the backup tuning unit is in standby mode and acts as a system monitor displaying the echoed frequencies from the radios. The backup tuning unit provides radio control in the event of the loss of both radio tuning units and the flight management system. The active frequencies are stored in non-volatile memory and can be recalled after a power interruption.

When the backup tuning unit is switched on, it takes over control of the left side VHF COM 1 and NAV 1, and overrides all other controls.

Radio tuning unit inhibit switches, on the backup tuning unit, are used to disable a failed primary radio tuning unit. Cross-side tuning can then be accessed by using the 1/2 cross-side key on the serviceable radio tuning unit. Not all available radios can be displayed on the radio tuning unit at once. Switching back and forth with the 1/2 key is required to display all of the radios. When both radio tuning units fail, the displays go blank and cross-side tuning becomes inoperative.

**RTU INHIBIT PUSH**

Used to disable a failed radio tuning unit and enable cross-side tuning.

- RTU 1 or 2 INHIBIT (white) light comes on to indicate that radio tuning unit is disabled.

**Transponder Selector Switch**

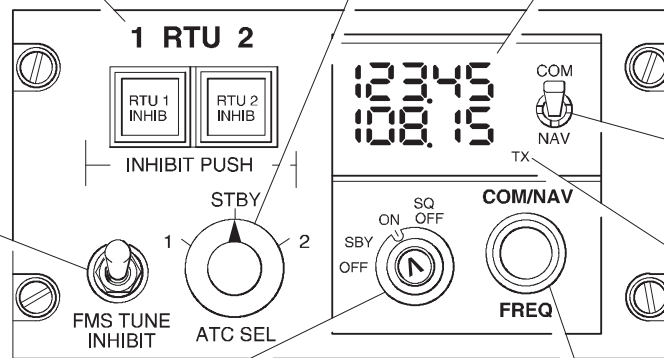
- 1 - Number 1 transponder is activated; number 2 transponder on standby.
- STBY - Both transponders on standby.
- 2 - Number 2 transponder is activated; number 1 transponder on standby.

**Frequency Readouts**

Displays frequencies set on COM 1 and NAV 1 radios.

**FMS TUNE INHIBIT**

Used to inhibit the auto tune functions of the FMS.



<0012>  
12345

**Tuning Selector**  
Selects COM 1 or NAV 1 for tuning.

**TX Indicator**  
Indicates that VHF 1 transceiver is transmitting.

**Backup Tuning Unit Center Pedestal**

**Mode Selector**

- OFF - Display is off.
- STBY - Displays frequency selected by RTU 1.
- ON - Frequency controlled by frequency knobs.
- SQ OFF - Squelch is selected off.

Audio volume controlled by centre knob.

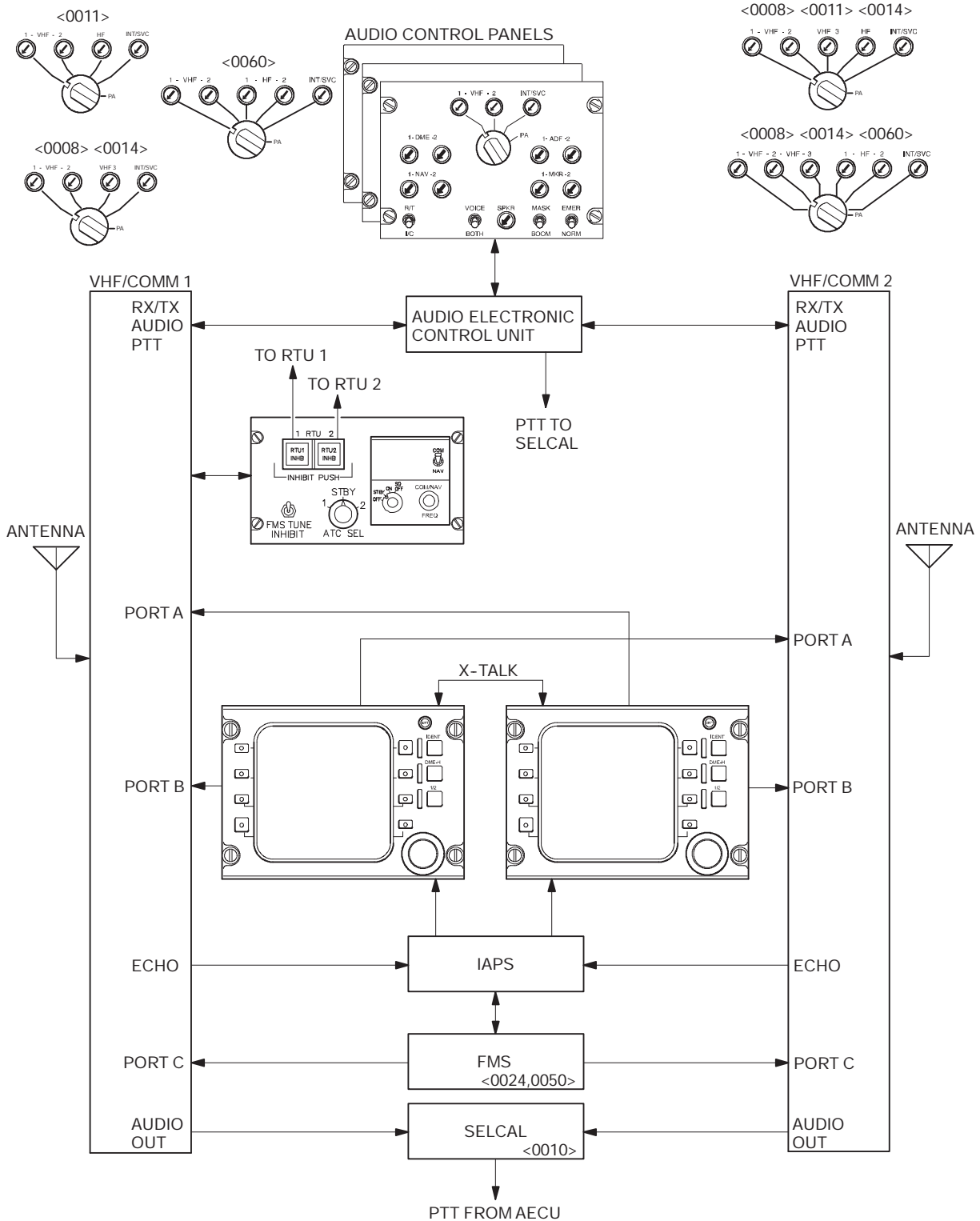
**Tuning Knobs**

Used to change displayed frequencies.

- Outer knob - Changes frequency in 1-MHz steps.
- Inner knob - Changes frequency in 50-kHz steps (NAV), or in 25 kHz <0008><0081> / 8.33 kHz <0012><0014><0084> steps (COM).

Backup Tuning Unit <MST>  
Figure 05-30-2

# Canadair Regional Jet 100/200 - Communications



VHF Communication Interface <MST>  
Figure 05-30-3

## Canadair Regional Jet 100/200 - Communications

### C. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Radio Communication System	Receivers/ Transmitters	VHF COM 1	DC BAT	1	Q3	
		VHF COM 2	DC BUS 2	2	H11	
		VHF COM 3	DC ESS	4	D12	<0008> <0014> <0081> <0084>
	Radio Tuning Unit	RTU 1				D13
		RTU 2	DC BUS 2	2	K4	
	Backup Tuning Unit	EMER TUNING	DC BAT	1	Q4	

## Canadair Regional Jet 100/200 - Communications

### 1. HF RADIO COMMUNICATIONS <0011> <0060>

#### A. HF Communications

The single Collins HF communications system (labeled HF on the RTU) is provided for long-range, air-to-ground and air-to-air communications. The HF system consists of a Receiver/transmitter, Coupler, and Antenna. The system is normally tuned and controlled by No. 2 radio tuning unit (RTU). <0011>

The dual Collins HF communications systems (labeled HF on the RTU's) are provided for long-range, air-to-ground and air-to-air communications. Each HF system consists of a Receiver/transmitter, Coupler, and Antenna. The systems are normally tuned and controlled by the respective radio tuning units, RTU 1 for HF 1 and RTU 2 for HF 2. <0060>

The HF system provides amplitude modulation (AM) and single sideband (SSB) voice communications at a frequency range of 2 to 30 MHz. The system has 280,000 communication channels (tuned at 100 Hz steps), and 16 programmable preset channels. <0011>

The HF systems provide amplitude modulation (AM) and single sideband (SSB) voice communications at a frequency range of 2 to 30 MHz. Each system has 280,000 communication channels (tuned at 100 Hz steps), and 16 programmable preset channels. <0060>

The HF receiver/transmitter is installed in the aft equipment compartment and contains the receiving, transmitting and processing circuits required for operation of the system. The unit interfaces with the antenna coupler to control the antenna tuning. It also sends signals to the audio control unit for microphone, headphone, speaker operation and ADF. <0011>

The HF receiver/transmitter is installed in the aft equipment compartment and contains the receiving, transmitting and processing circuits required for operation of the system. The unit interfaces with the antenna coupler to control the antenna tuning. It also sends signals to the audio control unit for microphone, headphone, speaker operation, ADF and SELCAL decoder. <0010><0011>

The HF receiver/transmitters are installed in the aft equipment compartment and contain the receiving, transmitting and processing circuits required for operation of the systems. Each unit interfaces with its antenna coupler to control the antenna tuning. They also send signals to the audio control unit for microphone, headphone, speaker operation and ADF. <0060>

The HF receiver/transmitters are installed in the aft equipment compartment and contain the receiving, transmitting and processing circuits required for operation of the systems. Each unit interfaces with its antenna coupler to control the antenna tuning. They also send signals to the audio control unit for microphone, headphone, speaker operation, ADF and SELCAL decoder. <0060><0010>

The antenna coupler is installed in the aft equipment compartment and tunes the antenna to the selected frequencies. To reduce tuning time, the tuning data for a frequency that was tuned previously is stored in the unit memory. <0011>

## Canadair Regional Jet 100/200 - Communications

The antenna couplers are installed in the aft equipment compartment and tune the antenna to the selected frequencies. To reduce tuning time, the tuning data for a frequency that was tuned previously is stored in the unit memory. <0060>

The antenna is an integral part of the leading edge of the vertical stabilizer and is connected to the antenna coupler. <0011>

The antenna is an integral part of the leading edge of the vertical stabilizer and is connected to each antenna coupler. <0060>

The system operates in simplex or half-duplex modes using the following three types of modulation: <0011>

The systems operate in simplex or half-duplex modes using the following three types of modulation: <0060>

- LV (Lower Voice Single Sideband)
- UV (Upper Voice Single Sideband)
- AM (Amplitude Modulation).

The HF frequency and modes of operation are controlled and monitored from the Top Level page of RTU No. 2, which displays the frequency, and mode of operation. The HF line key on the lower right side and the rotary frequency tuning knobs are used to select the frequency and control the mode of operation. <0011>

The frequency and modes of operation for each HF system is controlled and monitored from the Top Level page of the respective RTU, which displays the frequency, and mode of operation. The HF line key on the lower right side and the rotary frequency tuning knobs are used to select the frequency and control the mode of operation. <0060>

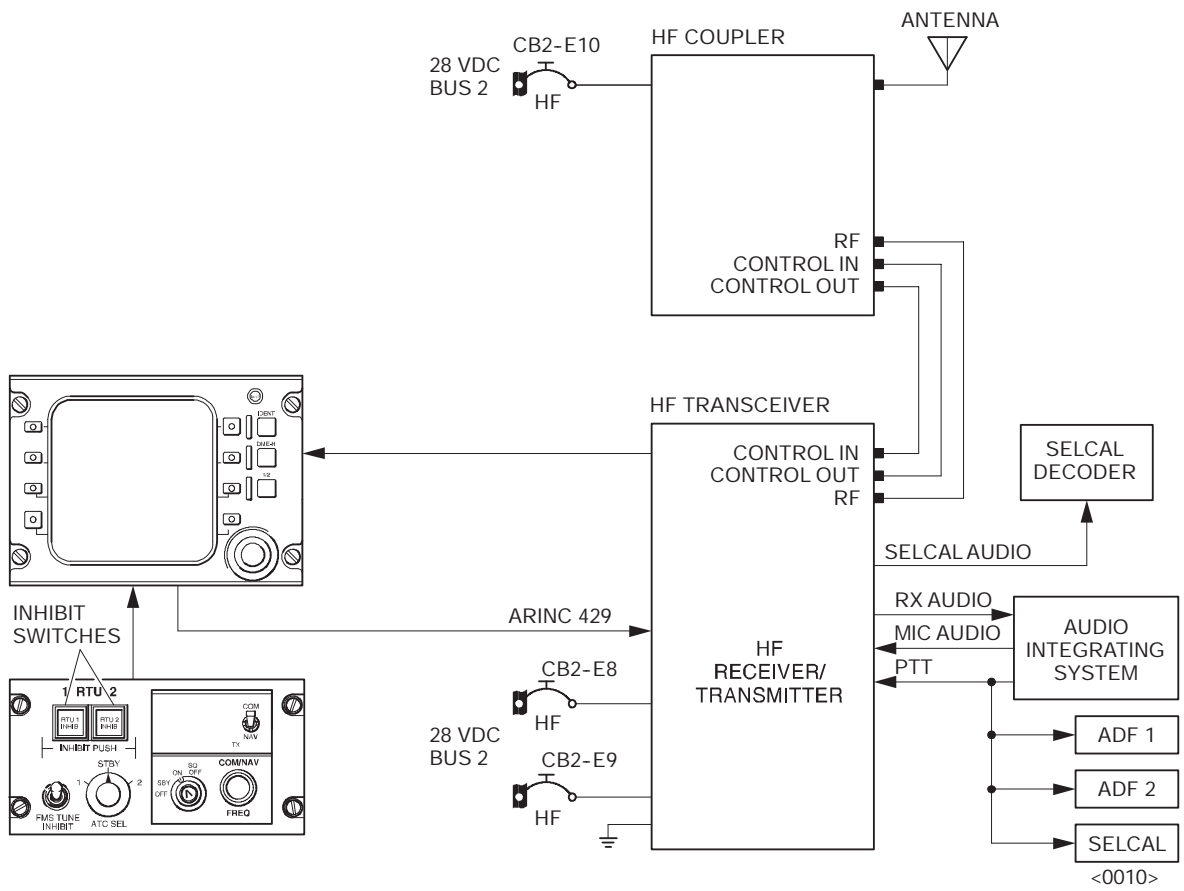
Before transmitting, the antenna must be tuned to the selected frequency through the antenna coupler. The coupler tunes to the new frequency when the HF push-to-talk (PTT) switch is pushed momentarily. When the coupler is tuning, a steady 1000-Hz tone is heard in the headphone. The tone stops when the coupler is tuned. If a fault occurs, a beeping tone is heard.

There are two main HF pages HF COM and HF PRESET for system operations. These pages are accessed in sequence from the top-level page when the HF line key is pushed. The main pages display the HF active frequencies, modes of operation, and the preset frequency channels.

The HF system is also coupled to the SELCAL decoder to monitor the selected HF frequencies for the aircraft unique SELCAL code.<0010><0011>

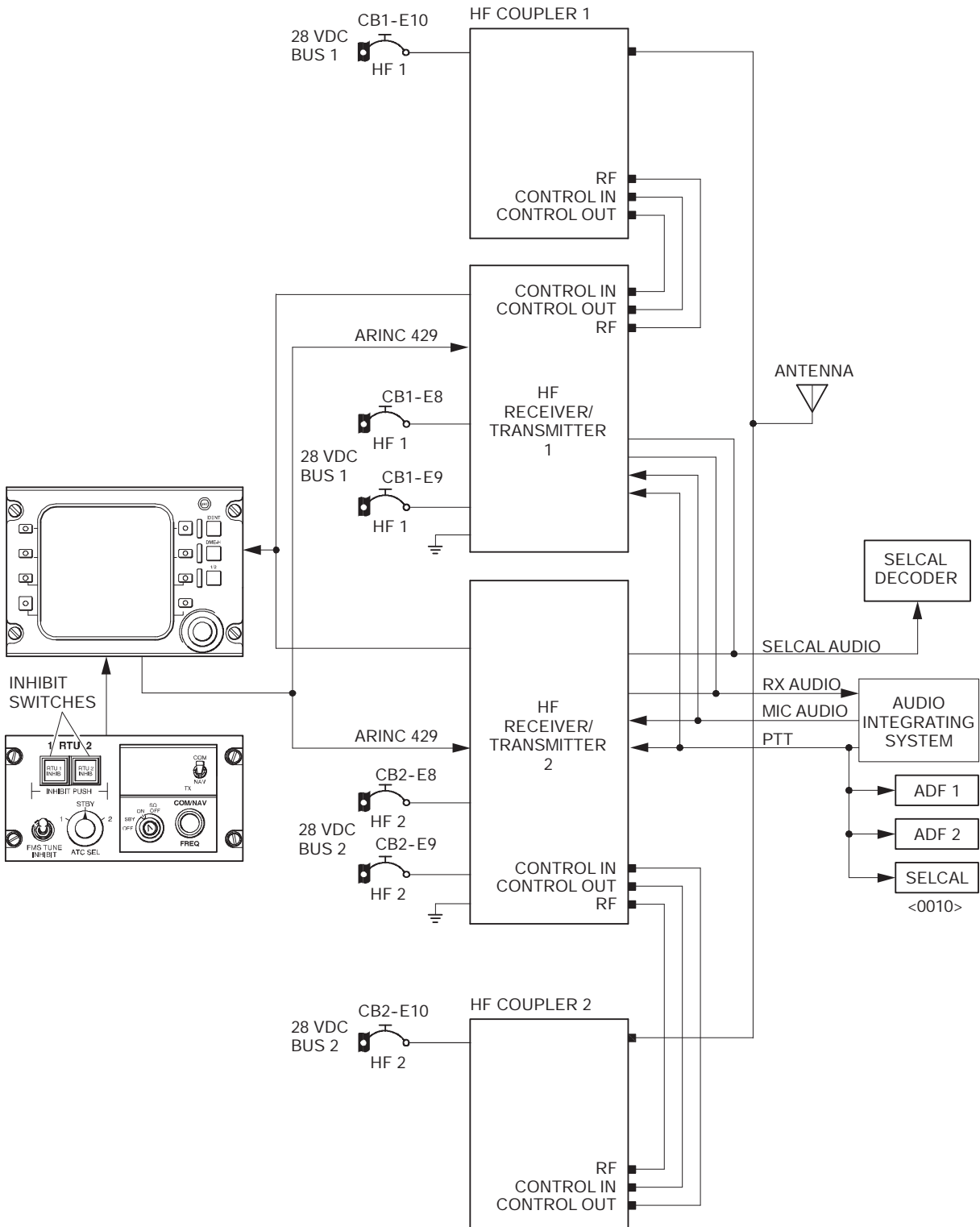
The HF systems are also coupled to the SELCAL decoder to monitor the selected HF frequencies for the aircraft unique SELCAL code. <0010><0060>

# Canadair Regional Jet 100/200 - Communications



Single HF Communication Interface Diagram <MST>  
Figure 05-35-1

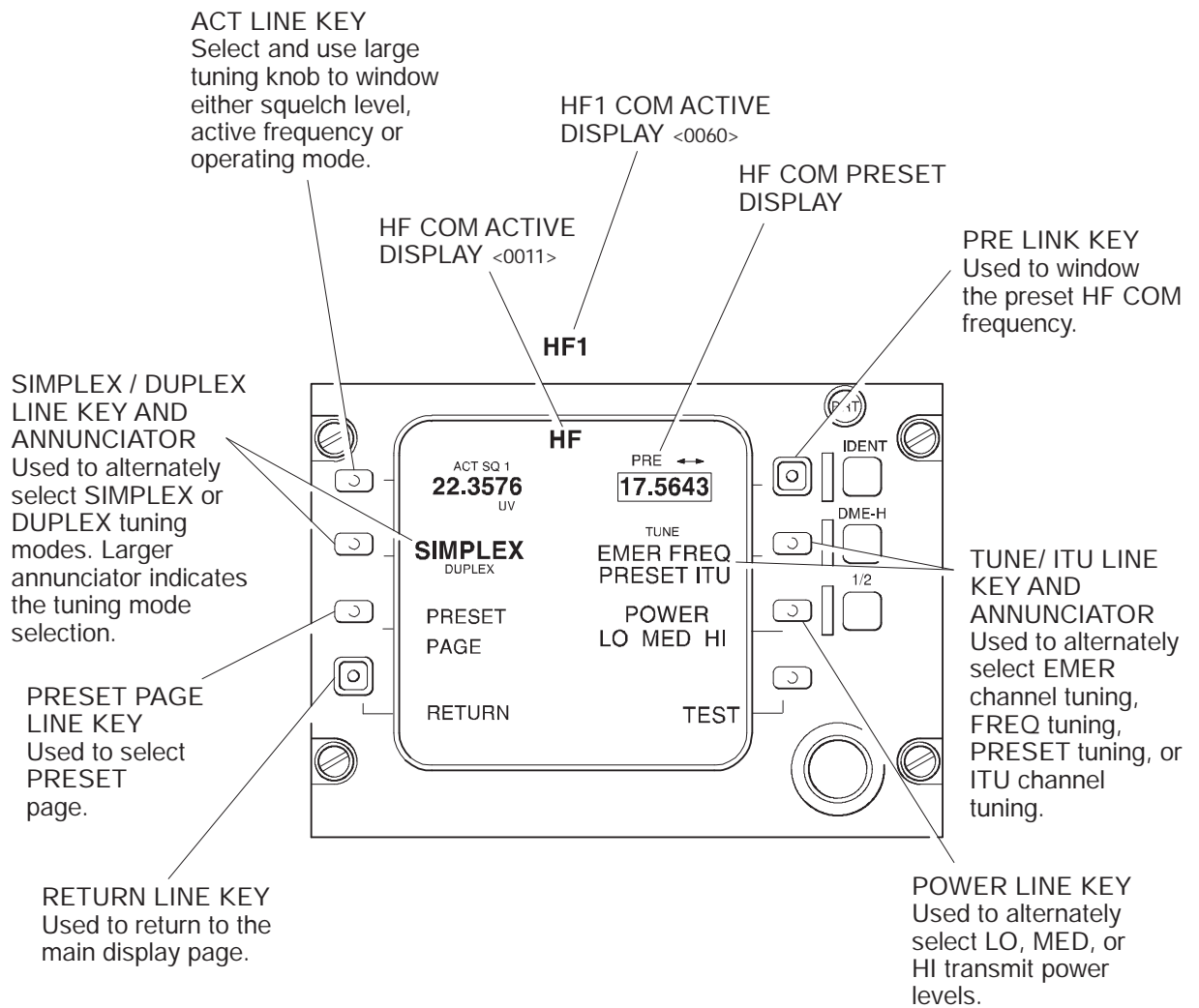
# Canadair Regional Jet 100/200 - Communications



Dual HF Communication Interface Diagram <MST>  
Figure 05-35-2

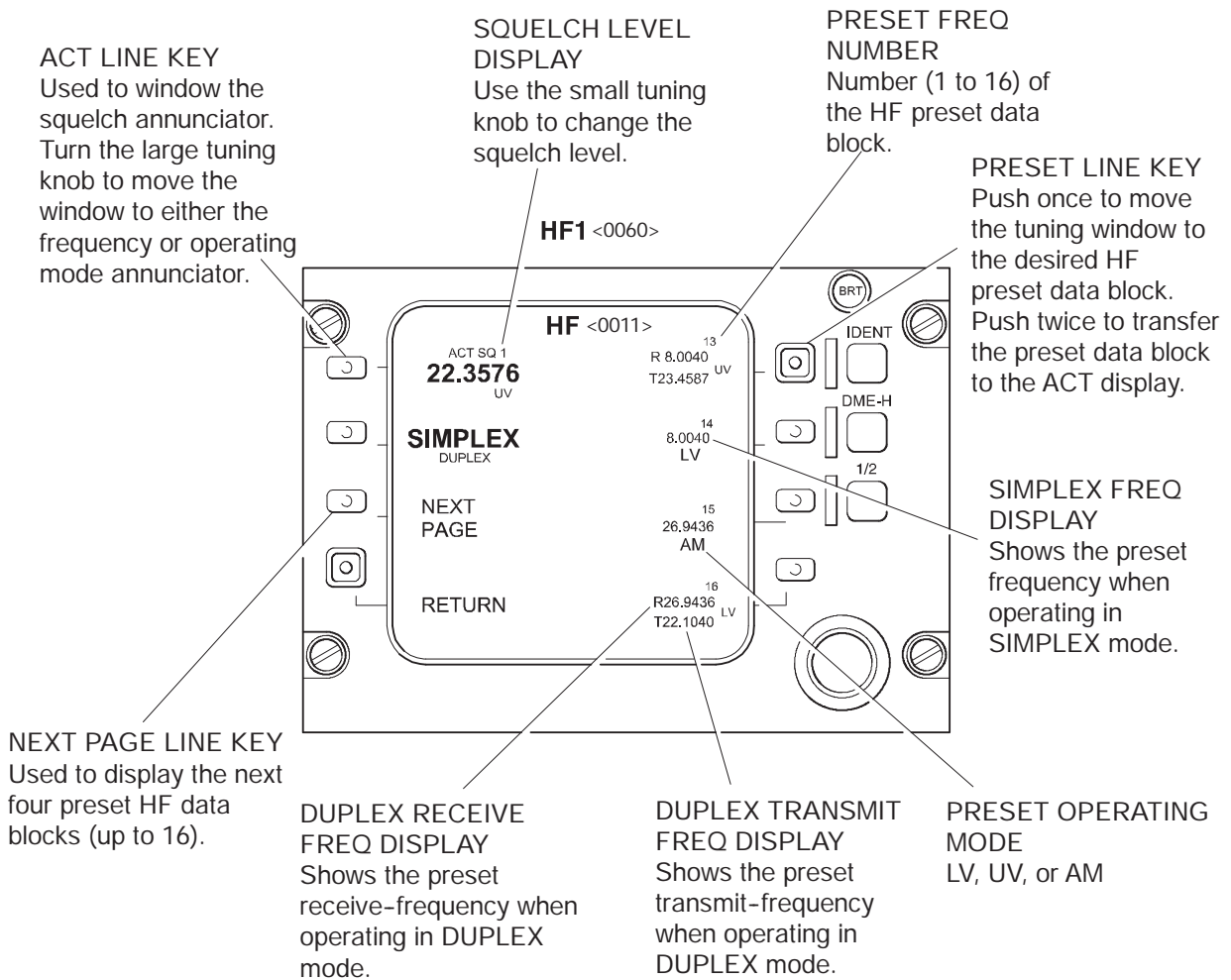


# Canadair Regional Jet 100/200 - Communications



Communication RTU – HF COM Page <MST>  
Figure 05–35–3

# Canadair Regional Jet 100/200 - Communications



Communication RTU – HF Preset Page <MST>  
Figure 05–35–4

## Canadair Regional Jet 100/200 - Communications

### B. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Single HF Radio Communication System <0011>	Receiver/Transmitter	HF	DC BUS 2	2	E8	
					E9	
	Coupler	HF CPLR			E10	
Dual HF Radio Communication System <0060>	Receiver/Transmitter	HF 1	DC BUS 1	1	E8	
					E9	
	Coupler	HF CPLR 1			E10	
	Receiver/Transmitter	HF 2	DC BUS 2	2	E8	
					E9	
	Coupler	HF CPLR 2			E10	

### 1. **DATA COMMUNICATIONS** <0082>

Data communications consists of the Airborne Communications Addressing and Reporting System (ACARS). The ACARS provides the capability to route messages between the aircraft and the ground-based data link service providers. The ACARS enables the aircraft to function as an airborne communications terminal and performs airline operational communications and limited air traffic service functions.

The ACARS operates with the flight management system to transmit downlink messages and receive uplink messages using VHF 3. VHF 3 is used for data only, and not for communications. Control of the ACARS functions is provided via the MENU pages on the FMS CDU.

The ACARS consists of a Communications Management Unit (CMU) and an Aircraft Personality Module (APM).

#### A. Communications Management Unit (CMU)

The CMU functions as the central processing and routing computer. The CMU gathers aircraft data from the various systems such as: aircraft tail number, flight number, departure station, etc. for use in the downlink messages and for event detection. The system allows the aircraft to locate and acquire a ground station for communications.

The CMU interfaces with other avionics systems to provide ACARS function and operation. These systems/components include:

- The FMS CDU, which provides the crew with a means for data entry into the ACARS, ability to receive and display uplink messages and a visual indication that the data communication link is operating properly.
- VHF 3 configured for data link. The CMU tunes VHF 3 to the ACARS data frequency (Canada: 131.475 Mhz) (United States: 131.55 Mhz) (Europe: 131.725 Mhz). When the aircraft moves from one network coverage to another, the ACARS will automatically search for the appropriate frequency. While searching for a usable frequency, a NO COMM advisory is displayed on the CDU. The advisory will be removed when the ACARS is communicating with a VHF ground station.
- The CMU, which uses ARINC buses for incoming data from the Data concentrator units (DCU's).
- The CMU also uses the Integrated Avionics Processor System ARINC buses for incoming data.
- The transponder, which provides the aircraft's unique ICAO address (Mode S).

Transmitted information can include:

- Requests for air traffic control (ATC) data
- Flight plans and weather data
- Operational and maintenance data

Received information can include:

- Text weather data
- ATC messages and clearances
- Operational messages

### B. Aircraft Personality Module (APM)

The aircraft personality module (APM) is a memory unit which stores information unique to the aircraft, such as tail number, ICAO address, aircraft type and configuration.

### C. ACARS Printer

The printer is installed in the copilot's side console. It is used for preflight and inflight activities to print pilot selection of messages and weather data sent to it from the CMU. The printer is also used by maintenance to download information.

### D. ACARS Messages

#### (1) Downlink Messages:

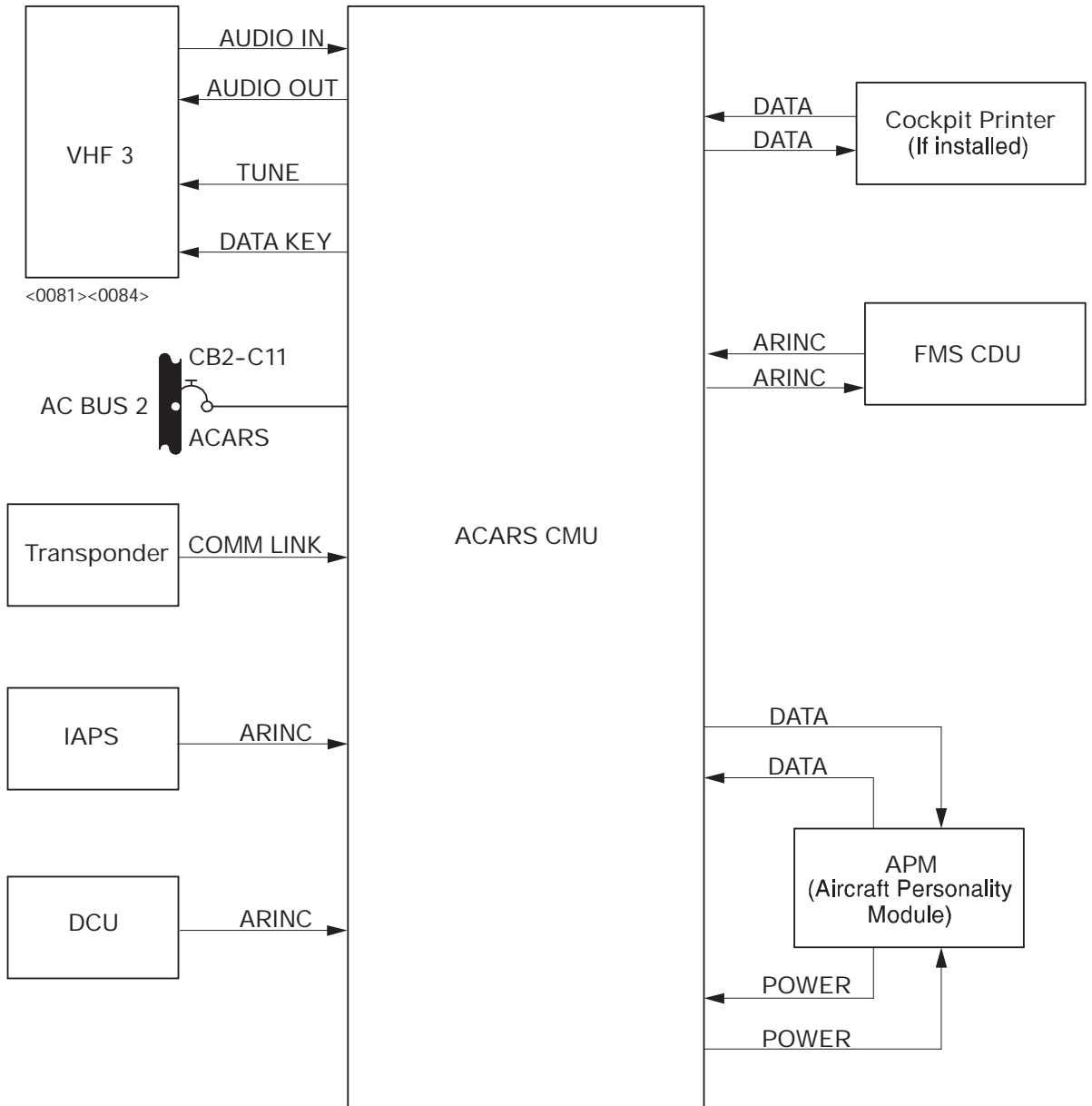
Downlink messages originate onboard the aircraft and are transmitted to the ground station automatically (appropriated system event detected) or by the crew. The CMU encodes the downlink message and stores it in a downlink queue until successfully transmitted.

#### (2) Queued Messages:

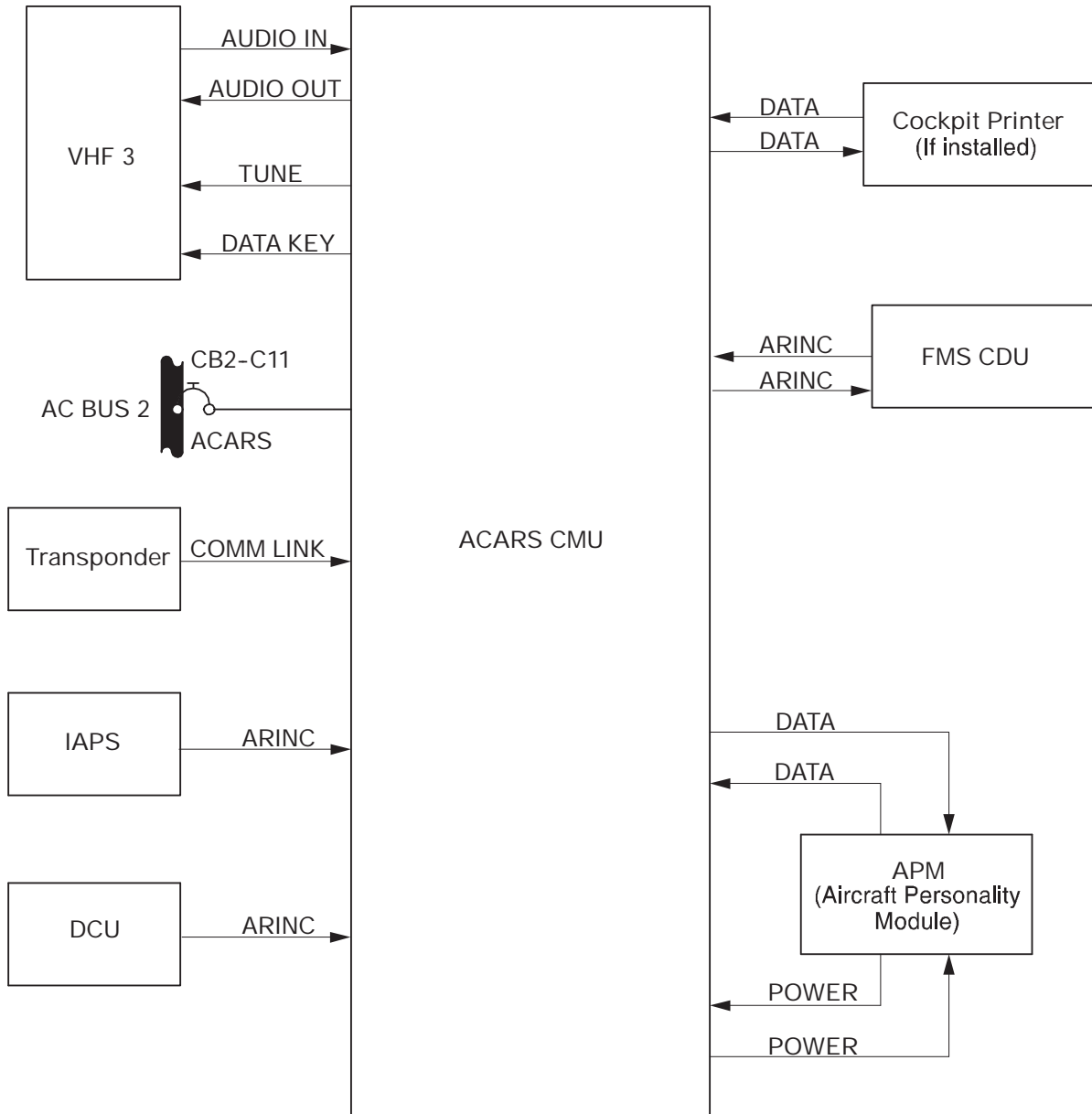
Queued messages are transmitted in sequence or by priority. Once a message is transmitted, the CMU waits for the ground station to acknowledge (ACK) positive receipt of the message. If ACK is not received within a specific time frame, the message is transmitted again. Any downlink messages that are generated during a NOCOMM state (link to ground station is not established) will be stored in the queue buffer until the link to the ground station is established.

#### (3) Uplink Messages:

Uplink messages originate on the ground and are transmitted to the CMU. When the message is received, the CMU validates the data content and compares the aircraft ICAO address within the messages to the ICAO address programmed in the APM. If the addresses match, the ACARS then transmits an ACK or negative acknowledgement (NACK) of receipt to the ground station. The ground station will re-transmit the message if an ACK is not received within a specific time frame. When an uplink message has been processed, a MESSAGE prompt is displayed on the CDU (if the ACARS application is running). The message can be viewed by selecting the message prompt. An EICAS advisory message SELCAL VHF 3 and a SELCAL SELCAL aural is triggered whenever there is reception of an uplink message.



ARINC Communications Addressing and Reporting System (ACARS) Block Schematic <MST>  
Figure 05-40-1

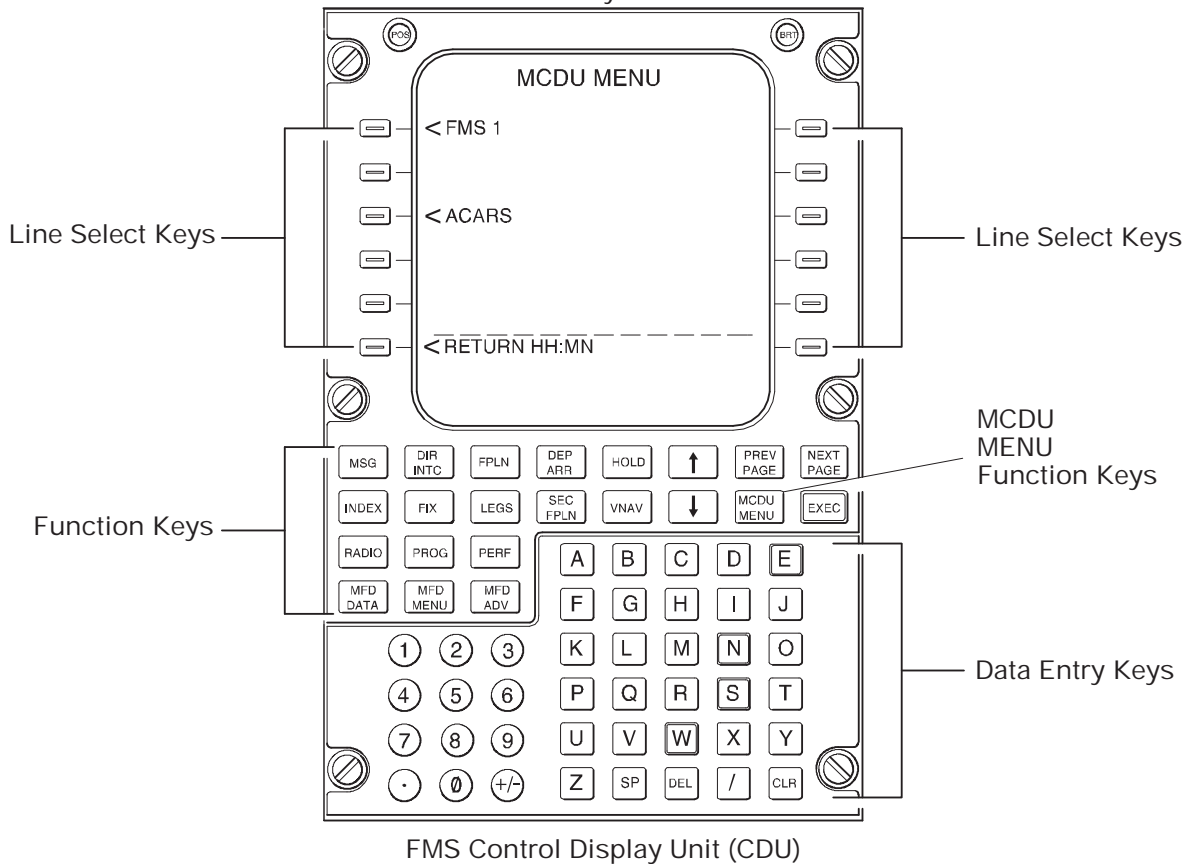


ARINC Communications Addressing and Reporting System (ACARS) Block Schematic <0082>  
Figure 05-40-2

# Canadair Regional Jet 100/200 - Communications

## ACARS

Access to ACARS is via the MCDU MENU function key on the FMS CDU.



The CDU displays the following prompts:

Prompt	Description
*	Selection executes a function
> and <	Selection changes the page
↓	Selection steps through a select list

The following conventions are used in this section to indicate actions, results and sequences:



**INDEX** Push a Function Key or Line Key  
The finger indicates to push a function or line key. Keys shown under finger, are keys to push.



**Sequence of Actions**

Circled numbers show sequences for graphic images and their relationship to written steps of text. Must be followed in sequence to achieve desired results.



**Result of Action**

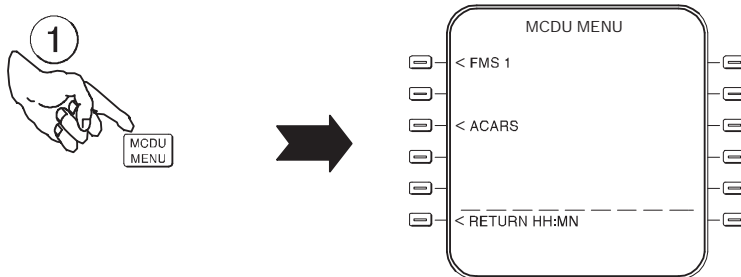
Points to expected result of an action. Unexpected results may indicate incorrect key inputs.

**ACARS Operation**  
Figure 05-40-3 Sheet 1

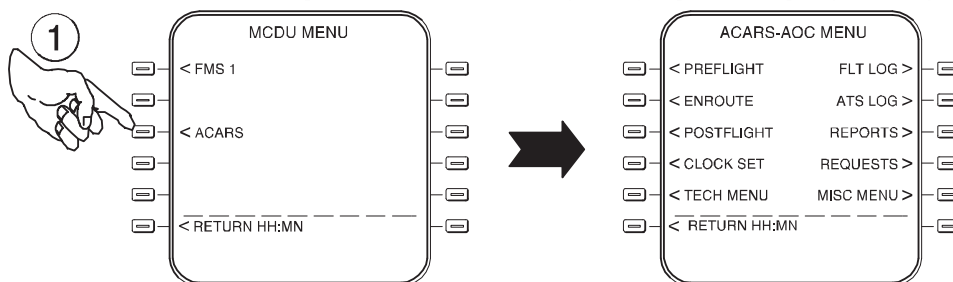


# Canadair Regional Jet 100/200 - Communications

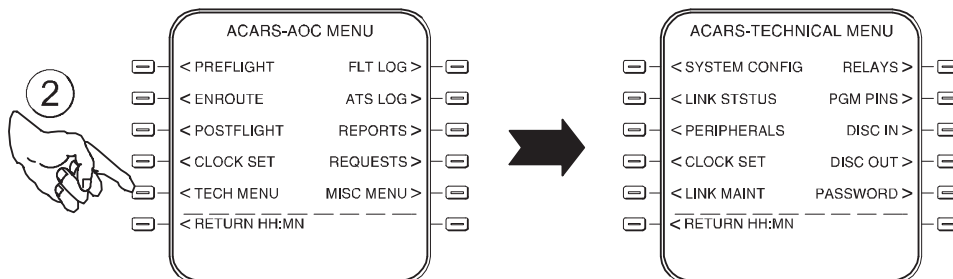
To access the ACARS menu page select the MCDU MENU function key on the FMS CDU.



To access the ACARS - AOC (Airline Operational Control) MENU page, select the <ACARS line select key. This will allow the crew to enter flight data and to send reports (Engine, Snag, Ops, Delay, etc).

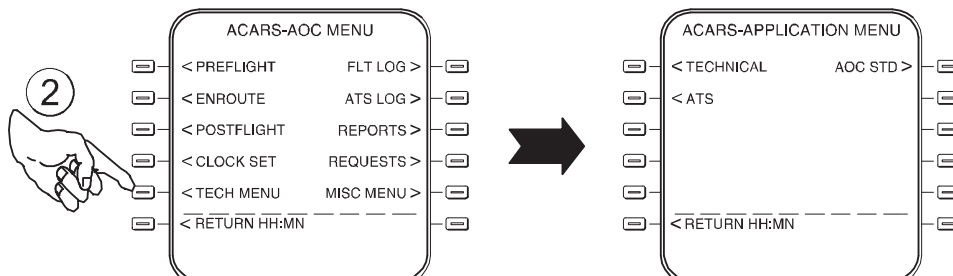


To access the TECHNICAL MENU page, select the <TECH MENU line select key. This will allow the maintenance personnel to perform maintenance applications (APM reconfiguration, VHF link testing and peripherals status).



## NOTE

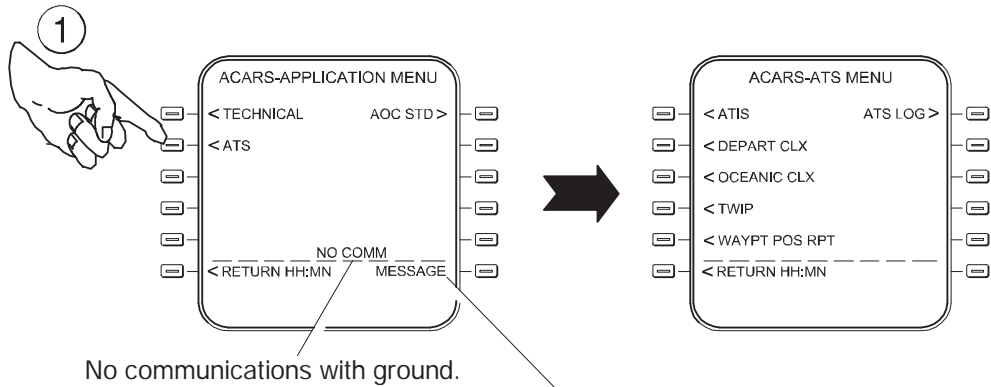
The TECHNICAL MENU page can also be accessed by selecting the <RETURN line select key until the APPLICATION MENU page is displayed, then select <TECHNICAL line select key.



ACARS Operation  
Figure 05-40-3 Sheet 2

# Canadair Regional Jet 100/200 - Communications

To access the ACARS - ATS (Air Traffic Services) MENU page, select the <RETURN line select key, until the APPLICATION MENU page is displayed, then select <ATS line select key. This will provide access to Departure Clearance, Oceanic Clearance and TWIP (Terminal Weather Information for Pilots).



No communications with ground.

Uplink message has been processed.

## NOTE

MESSAGE \* will only appear when ACARS application is running.

## Canadair Regional Jet 100/200 - Communications

### E. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Data Communication System	ACARS	ACARS CMU	AC BUS 2	2	C11	

### 1. SELECTIVE CALL SYSTEM (SELCAL) <0010>

The SELCAL system permits ground stations equipped with SELCAL tone transmitting equipment to call individual aircraft selectively by means of a coded RF signal on the VHF communication systems. When the SELCAL system receives the code, it sends a visual and oral message to alert the flight crew. This eliminates the necessity of continuous monitoring of routine radio signals.

The SELCAL system permits ground stations equipped with SELCAL tone transmitting equipment to call individual aircraft selectively by means of a coded RF signal on the VHF or HF communication systems. When the SELCAL system receives the code, it sends a visual and oral message to alert the flight crew. This eliminates the necessity of continuous monitoring of routine radio signals. <0011><0060>

The SELCAL system consists of a:

- SELCAL decoder
- Strapping connector.

The decoder is a 5-channel, 16-tone decoder located in the forward avionics compartment and receives VHF communication systems inputs. The decoder has independent inputs for up to five radio sources to drive five decoder channels. Any of the available VHF communication systems can be used for SELCAL monitoring. The SELCAL code is a four-letter code assigned to each aircraft and is represented by a combination of audio tone signals.

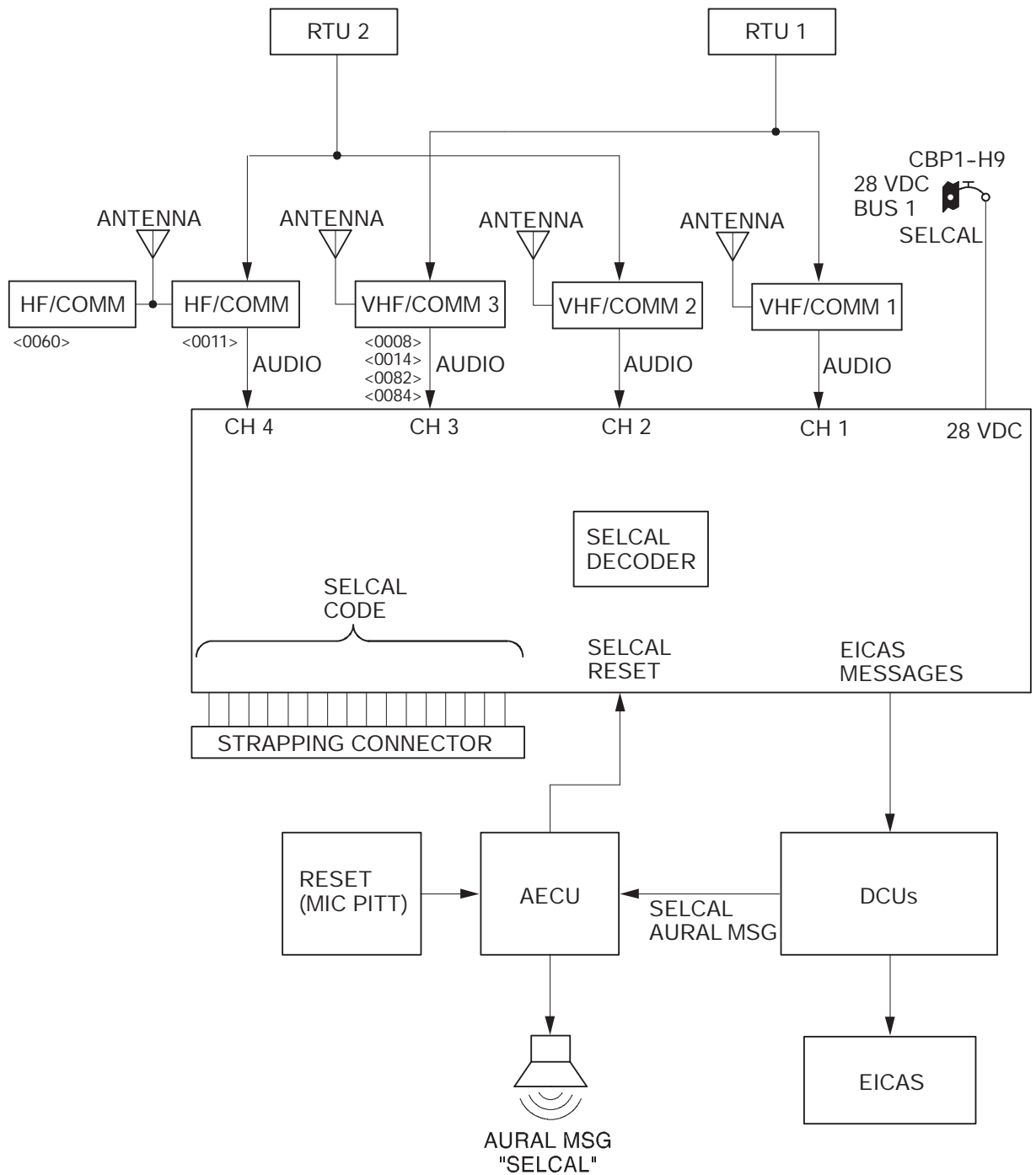
The decoder is a 5-channel, 16-tone decoder located in the forward avionics compartment and receives VHF or HF communication systems inputs. The decoder has independent inputs for up to five radio sources to drive five decoder channels. Any of the available VHF and HF communication systems can be used for SELCAL monitoring. The SELCAL code is a four-letter code assigned to each aircraft and is represented by a combination of audio tone signals. <0011><0060>

Each aircraft is assigned its own SELCAL code when the decoder is installed in the aircraft. The strapping connector is located next to the decoder in the avionics compartment and provides the means of programming the decoder with the aircraft SELCAL code.

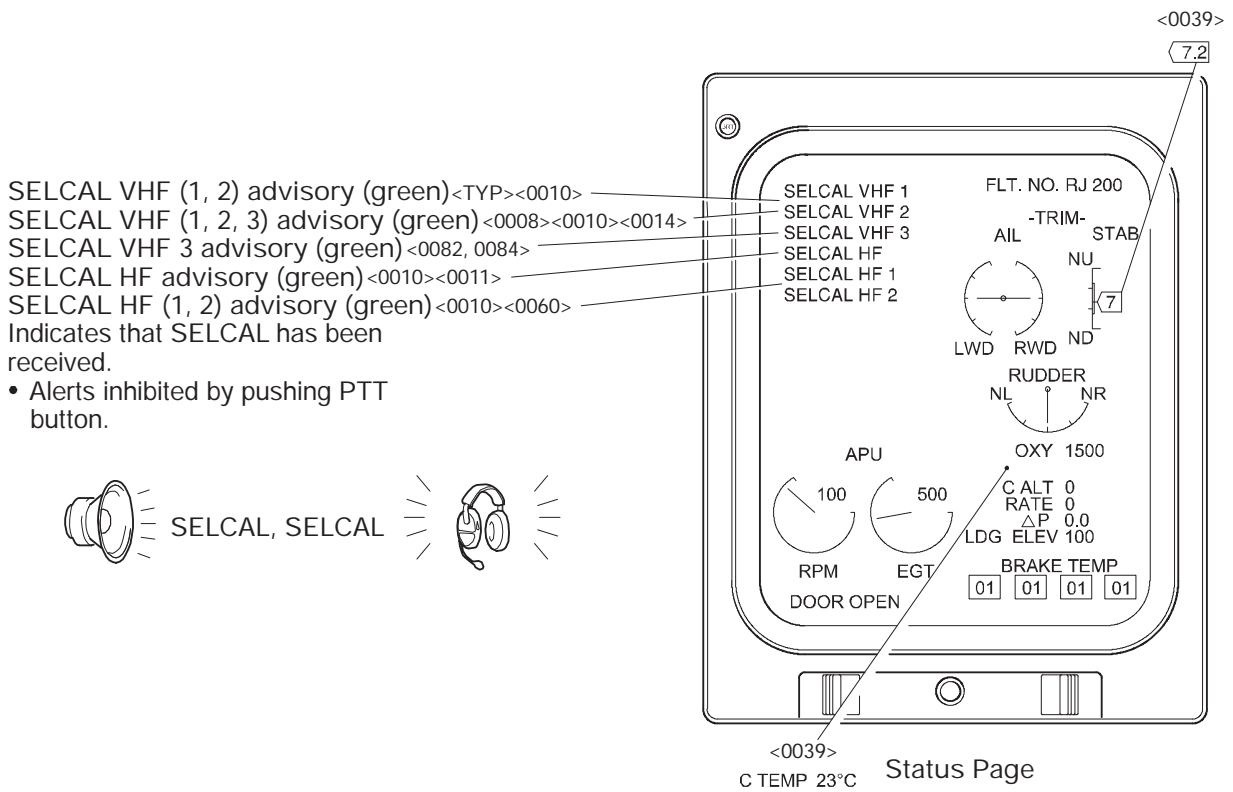
For SELCAL operation, the crew will normally tune one of the VHF radios to a pre-assigned SELCAL frequency. When ATC contacts the flight crew, the ground communication equipment sends a SELCAL code on this frequency. When the SELCAL signal is received by the VHF communications system, it is redirected to the decoder. The decoder then sends a signal to the EICAS and Audio Integrating System. A green SELCAL VHF advisory message will be displayed on the EICAS status page and a "SELCAL" oral message will be heard through the speakers and headsets. Pressing the PTT button for the VHF radio that received the call will reset the channel decoder and EICAS advisory.

## Canadair Regional Jet 100/200 - Communications

For SELCAL operation, the crew will normally tune one of the VHF or HF radios to a pre-assigned SELCAL frequency. When ATC contacts the flight crew, the ground communication equipment sends a SELCAL code on this frequency. When the SELCAL signal is received by the VHF or HF communications system, it is redirected to the decoder. The decoder then sends a signal to the EICAS and Audio Integrating System. A green SELCAL VHF/HF advisory message will be displayed on the EICAS status page and a "SELCAL" oral message will be heard through the speakers and headsets. Pressing the PTT button for the VHF or HF radio that received the call will reset the channel decoder and EICAS advisory. <0011><0060>



Selective Call System (SELCAL) – Simplified Diagram <MST>  
Figure 05-45-1



SELCAL EICAS Messages <MST>  
Figure 05-45-2

## Canadair Regional Jet 100/200 - Communications

### A. System Circuit Breakers

SYSTEM	SUB-SYSTEM	CB NAME	BUS BAR	CB PANEL	CB LOCATION	NOTES
Selective Call System	Decoder	SELCAL	DC BUS 1	1	H9	