COMMUNICATION SYSTEM

RADIO SYSTEM DESCRIPTION

The radio system consists of the following equipment:

- Radio tuning function located in MFD's
- Dual CDU's (for tuning - shared with FMS)
- Two VHF communication transceivers (optional third transceiver)
- One ILS/VOR/marker beacon navigation receiver
- One ILS/VOR/marker beacon/ADF navigation receiver
- One HF-9000 communication transceiver
- Two mode S diversity transponders
- Two DME receivers
- Two radio interface units (RIU)
- Optional second ILS/VOR/marker beacon/ADF navigation receiver
- Optional second HF communication transceiver

Radio Control

The MFD provides all primary radio control functions. Pilot entries are made using the cursor control panel (CCP). The shared FMS CDU is an alternative means of tuning all radios.

The radio interface unit (RIU) provides a single point for radio interface, including data concentration and radio control pass-thru functions.

The pilot and copilot MFD's perform as primary radio tuning sources in the cockpit. Each MFD is capable of displaying and controlling all radio modes, both on-side and cross-side.

(Continued)

The MFD has the following control capability:

- Master frequency (nonvolatile memory)
- Frequency control
- Mode control (nonvolatile memory)
- VHF communication
  Frequency
  Squelch (on/off)
  Transmit indication
- VOR/ILS/MB receiver
  Frequency
  Auto-tune (on/off /inhibit)
- DME
  Frequency
  Hold (on/off)
- ADF
  Frequency
  Mode (on/off)
  BFO (on/off)
  Test (on/off)
- Transponder
  Code
  Mode (A/C)
  Reporting altitude
  Ident
  Elementary Surveillance (Flight ID)
  Enhanced Surveillance

(Continued)

- HF
  Frequency
  Numbered preset channels
  Simplex/duplex
  Squelch
  Lower sideband voice
  Upper sideband voice
  Amplitude modulation
  Test
- TCAS II
  Mode (STBY, TA/RA, TA, ALT ON, ALT OFF)
  Altitude tag (relative/absolute)
  Test (on/off)
  Traffic (on/off)
  Altitude range (above/below/normal)

RADIO INTERFACE UNIT (RIU)

The radio interface unit performs radio data concentration, single communications management, dual audio management and dual radio control pass-through functions. Each RIU supports dual tuning paths to its on-side radios.

The RIU provides an interface for software downloading of radios.
As the audio management unit, the RIU receives audio inputs from the radio sensors, the audio control panels (ACP), and other aircraft audio sources and provides audio to the audio system. Each RIU supports dual audio management to the ACP's.

The RIU analyzes audio inputs from the HF communications transceivers for the presence of SELCAL tones. VHF provides SELCAL tone detection to the RIU. SELCAL alerts are then provided by the RIU to the crew via the display control unit (DCU) when SELCAL tones match the pattern assigned to the aircraft.

(Continued)

The RIU receives commands from the DCU to drive aural warning tones and voice alerts.

Aural voice alerts (🔊) include:

- STALL
- TAWS audio
- TCAS audio
- ENGINE FIRE
- ENGINE OVERHEAT
- APU FIRE
- CONFIGURATION
- CABIN ALTITUDE
- GEAR
- SELCAL

Aural tones include:

- Autopilot cavalry charge
- Trim clacker
- Overspeed
- Altitude alert - C chord
- Vertical track alert
- Warning attenson - Triple chime
- Caution attenson - single chime
- Ground call

AUDIO CONTROL AND AUDIO OPTIONS PANELS

The pilot and copilot audio control panels (ACP) (Figure 7-23-1, page VII-23-6) include the microphone select buttons, headphone volume knob, speaker volume knob, PA, and interphone volume knob.
Individual volume knobs allow the pilot to select which radios are being listened to, and to adjust their receive volumes individually. The select buttons for radios being listened to are out, otherwise the buttons are in.

Each ACP provides audio output to the cockpit voice recorder (CVR). Both marker beacon receivers are enabled and controlled by the single MKR volume knob. A marker MUTE button is provided.
The V/BOTH/ID selector selects the audio from the navigation radios (NAV, DME, ADF).

The audio options panel (AOP) provides additional controls including RADIO and INPH (interphone) PTT, SELCAL CANCEL, MASK / BOOM microphone select switch, and the EMER / NORM emergency mode switch.

Unique Modes

The VHF communication radios have an emergency tuning mode. When powered up with no tuning inputs active, the radios tune to the international emergency frequency of 121.5 MHz. If all tuning devices fail, a momentary interruption of power to the VHF radios activates this mode.

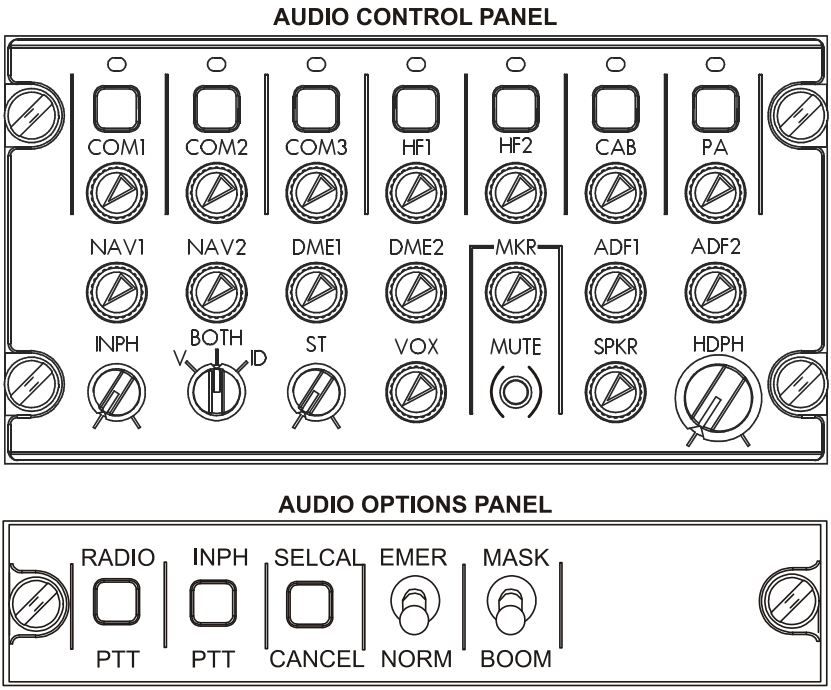


Figure 7-23-1. Audio Control and Audio Options Panels

CURSOR CONTROL PANEL

The cursor control panel (CCP) (Figure 7-23-2, page VII-23-8) provides for MFD display control. The CCP calls up main menus and associated submenus to control the current MFD display. The CCP provides control of all crew alert system (CAS) displays, including on the PFD when the PFD is in compressed format. Pressing a button for an optional function that is not enabled (e.g. CHART) displays a SELECTION INACTIVE message on the MFD.

Cursor Control Panel Radio Controls

RADIO button - Selects and deselects the sub menu for the selected radio system on the MFD, the tuning control sub-menu of the radio associated with the current position of the displayed tuning control. Pressing the RADIO button when another menu is displayed closes the menu and returns the tune box to it's default position (COM). All sub-menus automatically close.

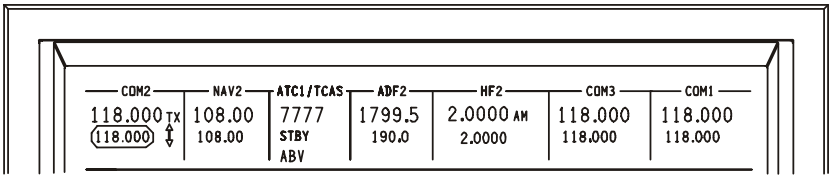
RADIO ADV/DATA/ knobs - Used for MFD radio tuning and radio menu control. The larger and smaller knobs change the frequency respectively.

IDENT button - Select transponder ident for the active transponder.

DME-H button - Selects/deselects the DME Hold function. When selected, DME Hold holds the current DME frequency while allowing independent tuning of the VOR receiver.

1/2 button - Selects/deselects the cross-side radio menu on the MFD. When a radio sub-menu is in view, the equivalent cross-side radio (e.g., #2) sub-menu is selected/deselected.

FREQ button - Swaps the active and preset frequency for the selected radio system.



MFD FREQUENCY DISPLAY

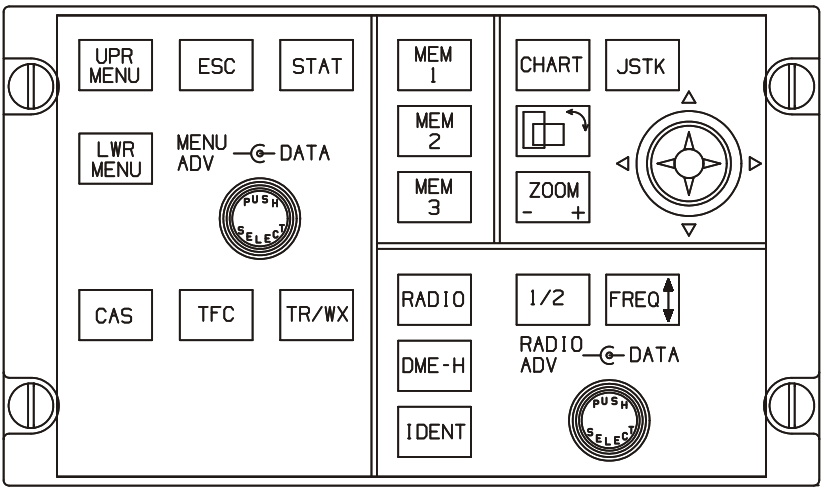


Figure 7-23-2. Cursor Control Panel

COCKPIT VOICE RECORDER

The cockpit voice recorder system (CVR) (Figure 7-23-3, page VII-23-10) provides solid-state recording of 4 separate voice channels, derived from pilot and copilot audio sources, passenger address and cockpit area microphone.
The universal avionics cockpit voice recorder system CVR-120 provides 120 minutes of recording time. It consists of a CVR, a control unit and remote microphone.

The system provides four separate channels of transmitted and received signals that originate at the pilot station, co-pilot station, passenger address (PA) system, and in the cockpit area. The cockpit area microphone is located in the pedestal, between the FMS CDU's, to pick-up and record cockpit voice and sound.

The control unit is a panel-mounted unit that provides remote control of the CVR. The control unit contains erase and test switches that make it possible to bulk erase (for maintenance purposes only), and to test monitoring the recording memory remotely. In addition, a phone jack is included that provides the means to monitor the recorded audio.

Each audio system (pilot and copilot panels) summarizes the signals (hand microphone, boom microphone mask microphone and PTT) to one channel, which is provided, to the CVR. In addition, an acceleration switch is installed in the aircraft to automatically disconnect power to CVR when the aircraft deccelerates at more than 4G.

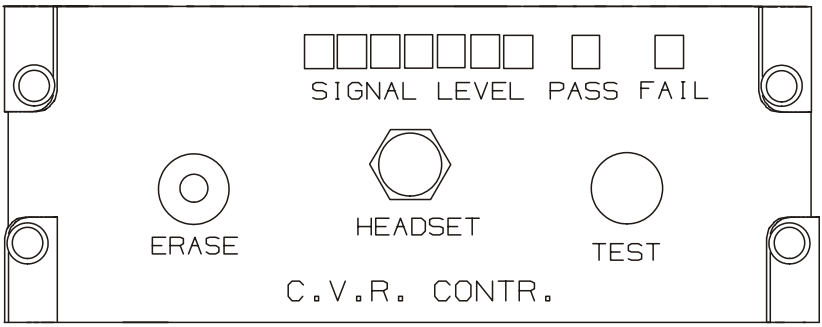


Figure 7-23-3. Cockpit Voice Recorder