

DO NOT USE FOR FLIGHT

737 Flight Crew Operations Manual

Communications

Chapter 5

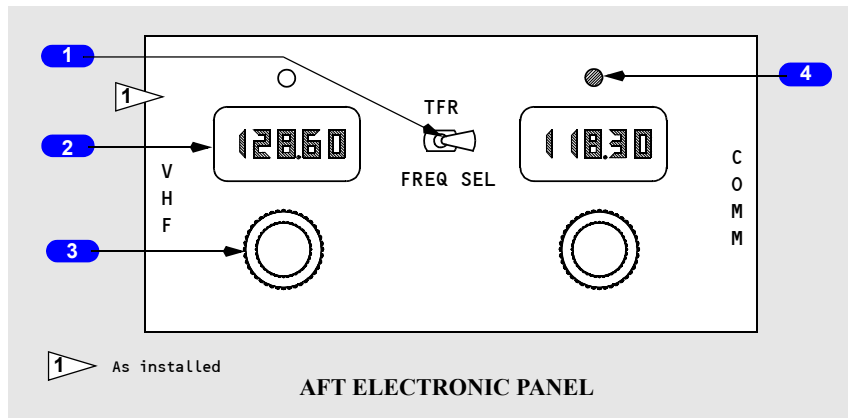
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VHF Communication Panel



1 VHF Communications Transfer (TFR) Switch

Selects which frequency as active for the transceiver.

2 Frequency Indicator

Indicates selected frequency.

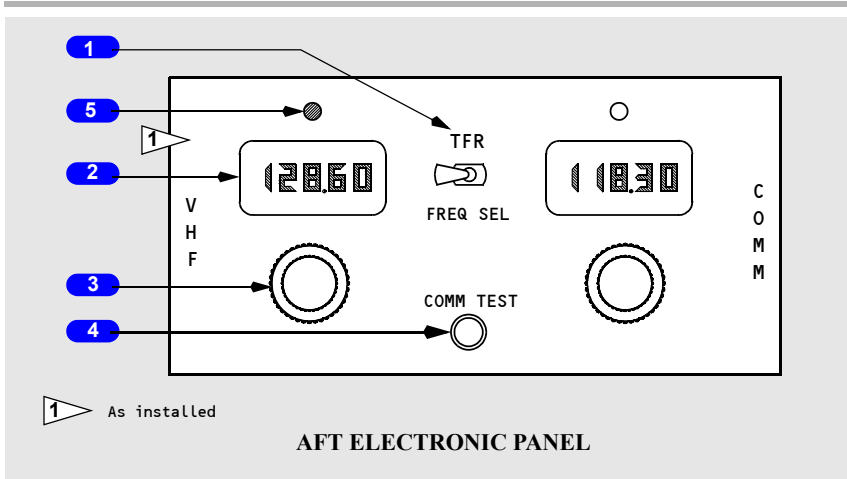
3 Frequency Selector

Rotate – selects frequency in related indicator:

- outer selector changes three left digits
- inner selector changes two right digits.

4 Active Frequency Light

Illuminated (white)–indicates related frequency is selected.



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4 Communication (COMM) TEST Switch

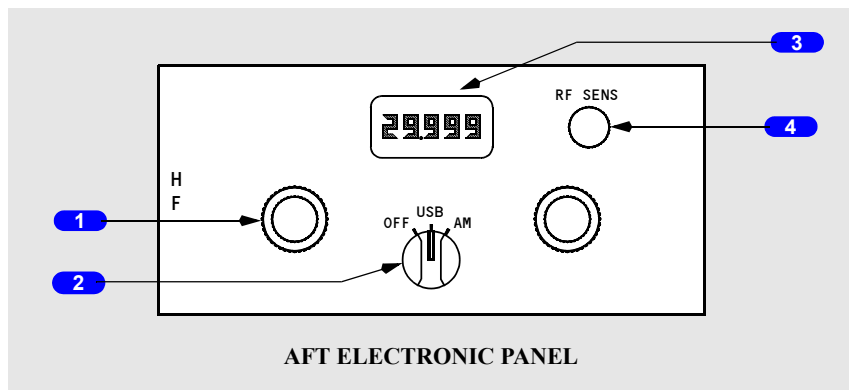
Push –

- removes automatic squelch feature, permitting reception of background noise and thereby testing receiver operation
- improves reception of weak signals.

5 Active Frequency Light

Illuminated (white)–indicates related frequency is selected.

HF Communication Panel



1 Frequency Selector

Rotate – selects frequency.

2 Mode Selector

OFF – transceiver not powered.

USB (Upper Sideband) – transmits and receives on higher side of frequency.

AM (Amplitude Modulation) – transmits and receives on selected frequency with a carrier wave.

3 Frequency Indicator

- indicates selected frequency
- frequency range from 2,000 to 29,000 megahertz.

4 RF/HF Sensitivity Control

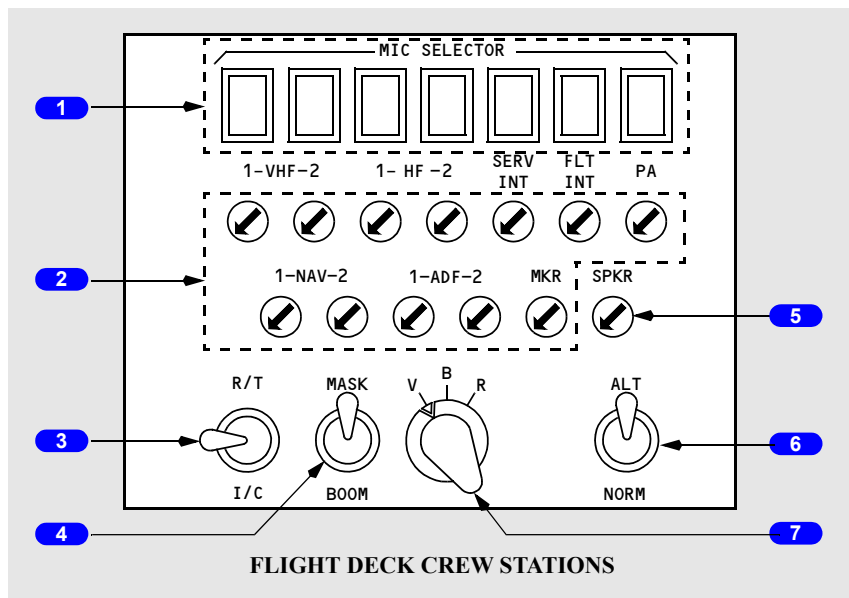
Rotate – controls sensitivity of receiver.

- (clockwise) increases sensitivity for reception of weak or distant stations
- (counterclockwise) decreases sensitivity to reduce noise and static.

Note: decreasing sensitivity too far prevents reception, including SELCAL monitoring of HF radio.

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Audio Selector Panel (ASP)



1 Transmitter Selector (MIC SELECTOR) Switches

Illuminated (white) – related switch is active.

Push –

- selects related communication system for transmission
- only one switch may be selected at a time; pushing a different switch deselects active switch
- receiver also selected on regardless of whether related receiver switch is on.

2 Receiver Switches

Illuminated (white) – related switch is active.

Rotate – adjusts volume.

Push –

- receiver selected for related communication system or navigation receiver
- multiple switches may be selected

Push again – deselects related system or receiver.

3 Push-to-talk Switch

(spring-loaded to neutral position)

R/T (radio-transmit) – keys oxygen mask or boom microphone for transmission as selected by transmitter selector.

I/C (Intercom) – keys oxygen mask or boom microphone for direct transmission over flight interphone and bypasses transmitter selector.

4 MASK-BOOM Switch

MASK – selects oxygen mask for transmissions.

BOOM – selects boom microphone for transmissions.

5 Speaker (SPKR) Switch

Illuminated (white) – SPKR switch is active.

Push – audio from selected receiver switches is heard on overhead speaker.

Rotate – adjusts overhead speaker volume.

Push again – deselects audio from selected receiver switches to be heard on overhead speaker.

6 Alternate-Normal (ALT-NORM) Switch

NORM (Normal) – ASP operates normally.

ALT (Alternate) – ASP operates in degraded mode.

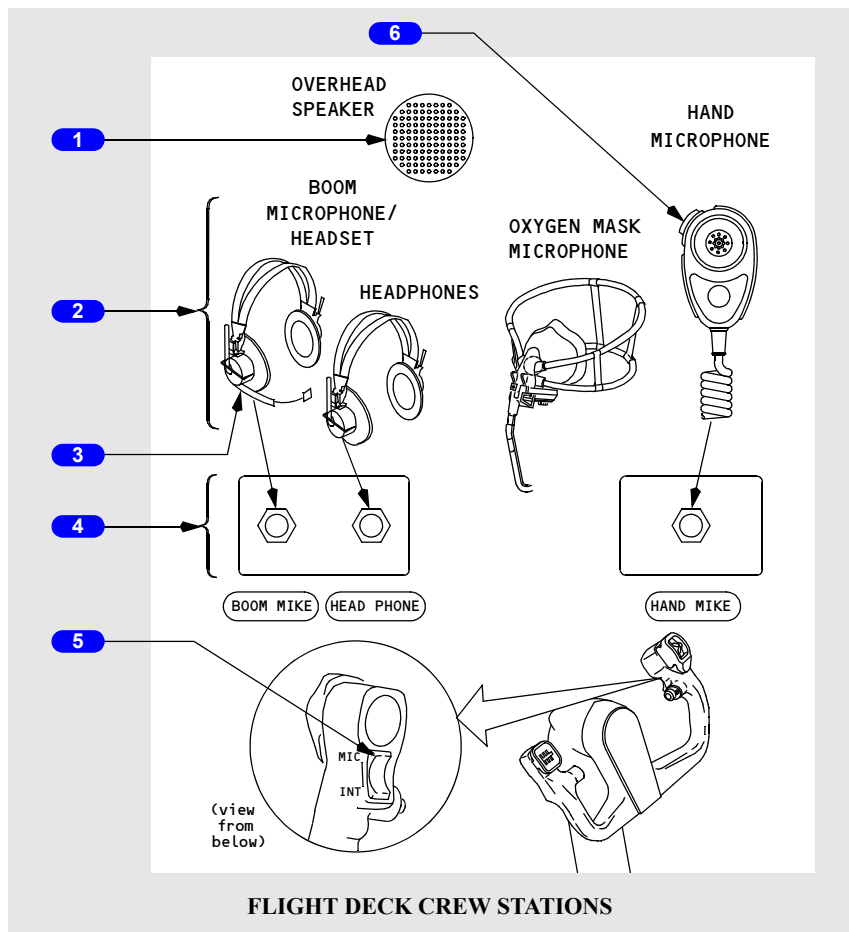
7 Filter Switch

V (Voice) – receive NAV and ADF voice audio.

B (Both) – receive NAV and ADF voice and range audio.

R (Range) – receive NAV and ADF station identifier range (code) audio.

Miscellaneous Communication Controls (Typical)



1 Overhead Speaker

Monitors audio from related pilot's ASP.

2 Standard Microphones

Choose desired microphone for voice transmission through selected radio, interphone system, or passenger address (PA).

3 Headset or Headphones

Monitors audio from related ASP.

4 Communication Jacks

Used for appropriate microphone or headphone plugs.

5 Push-To-Talk Switch

MIC (microphone) –

- keys oxygen mask or boom microphone for transmission, as selected by ASP transmitter selector.
- Same as using ASP PTT switch (R/T position).

OFF – center position.

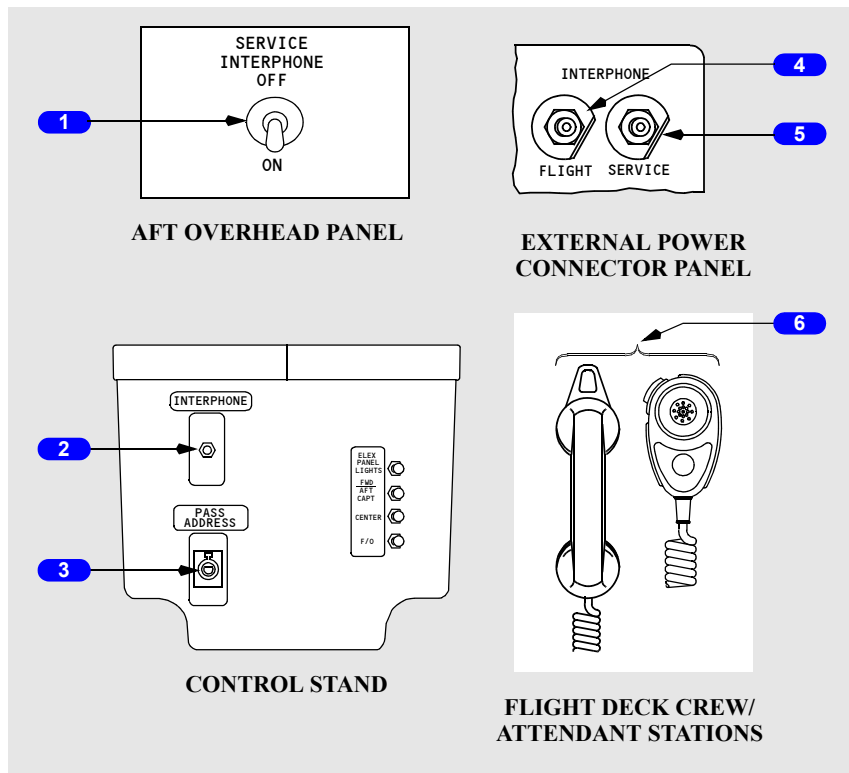
INT (interphone) –

- keys oxygen mask or boom microphone for direct transmission over flight interphone
- bypasses ASP transmitter selector
- same as using ASP PTT switch (I/C position).

6 Push-To-Talk Switch

Push – keys hand microphone for transmission, as selected by ASP transmission selector.

Interphone and Passenger Address Controls



1 SERVICE INTERPHONE Switch

OFF –

- external jacks are deactivated
- communication between flight deck and flight attendants is still possible.

ON – adds external jacks to service interphone system.

2 Service INTERPHONE Handset Jack

With microphone installed, used to communicate with flight attendant stations:

- with SERVICE INTERPHONE switch ON, also used to communicate with any external jack location
- bypasses ASP.

3 Passenger Address (PASS ADDRESS) Hand Microphone Jack

With microphone installed:

- used to make PA announcements
- bypasses ASPs.

4 FLIGHT INTERPHONE Jack

Connects ground crew to Flight Interphone system.

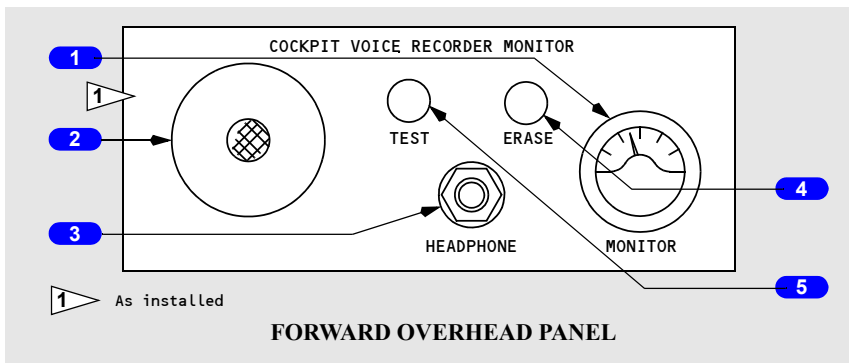
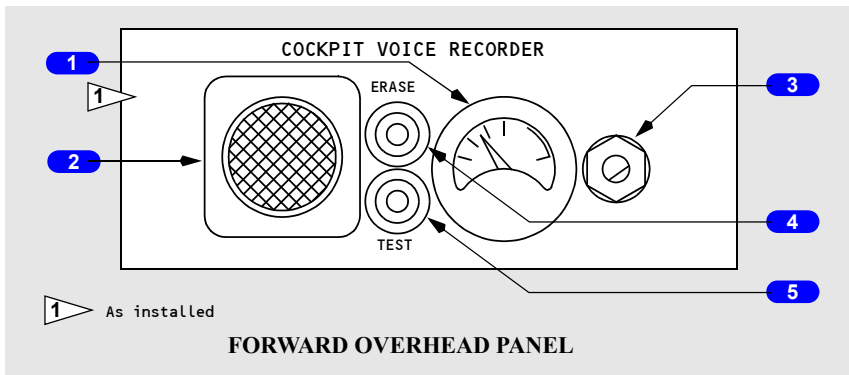
5 SERVICE INTERPHONE Jack

Connects ground crew to Service Interphone system if Service Interphone switch is ON.

6 Flight Deck / Attendant PA Hand Microphone

Used to make PA announcements.

Cockpit Voice Recorder



1 Monitor Indicator

Pointer deflection indicates recording or erasure on all four channels (approximately a one second delay); during test, pointer rises into green band.

2 Area Microphone

Active anytime 115V AC is applied to airplane.

3 HEADSET Jack

Headset may be plugged into jack to monitor tone transmission during test, or to monitor playback of voice audio.

4 ERASE Switch

Push (14 seconds) –

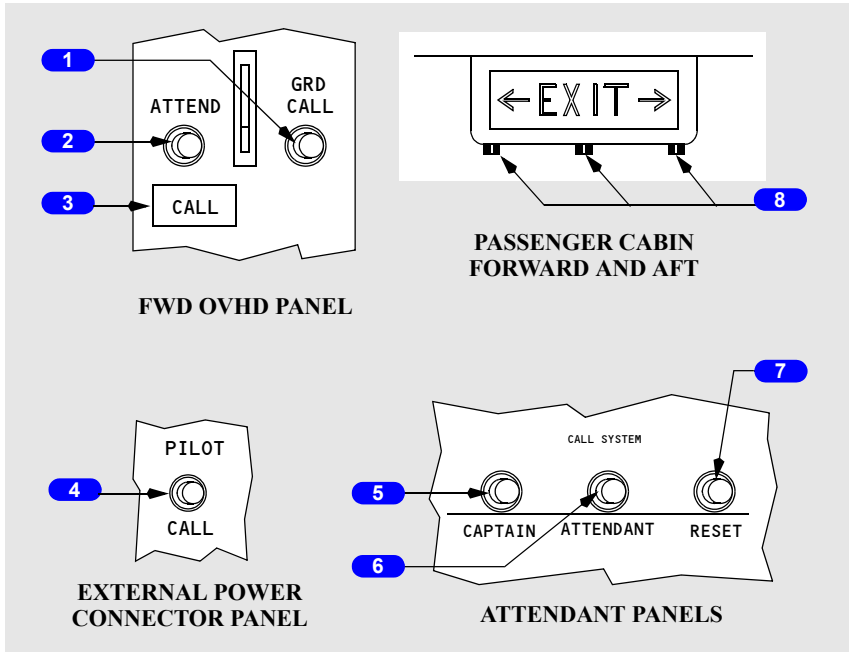
- all four channels are erased
- monitor indicator momentarily deflects
- operates only when airplane is on ground and parking brake is set.

5 TEST Switch

Push –

- after a slight delay, monitor indicator rises into green band
- a tone may be heard through a headset plugged into HEADSET jack.

Call System



1 Ground Call (GRD CALL) Switch

Push – sounds a horn in nose wheel well until released.

2 Attendant Call (ATTEND CALL) Switch

Push –

- sounds a two-tone chime in the passenger cabin.
- illuminates both pink master call lights.

3 Flight Deck CALL Light

Illuminated (blue) – flight deck is being called by flight attendants or ground crew.
Extinguished when Captain Call or Pilot Call switch released.

4 PILOT CALL Switch

Push – sounds a single-tone chime in flight deck.

Flight deck CALL light extinguished when switch is released.

5 CAPTAIN Call Switch

Push – sounds a single–tone chime in flight deck

Flight deck CALL light extinguished when switch is released.

6 ATTENDANT Call Switch

Push –

- sounds a two–tone chime in passenger cabin
- illuminates both pink master call lights.

7 Call RESET Switch

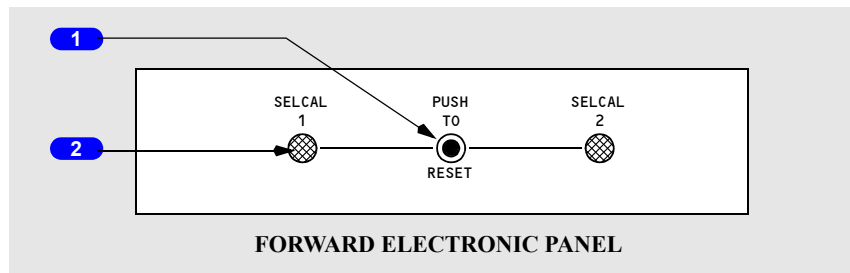
Push – extinguishes both pink master call lights.

8 Master Call Light

Illuminated –

- amber – a lavatory call switch is activated or smoke has been detected in a lavatory
- pink – flight deck or other flight attendant station is calling
- blue – a passenger seat call switch is activated.

Selective Calling Panel (SELCAL)



1 SELCAL Reset Switch

Push – extinguishes SELCAL light and resets decoder.

2 SELCAL Light

Illuminated–

- alerts crew that communication is desired on a communication radio
- SELCAL 1 light illuminates for a call on VHF –1 or HF
- SELCAL 2 light illuminates for a call on VHF– 2.

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Introduction

The communication system includes:

- radio communication system
- interphone communication system
- cockpit voice recorder system
- communication crew alerting system

The communication systems are controlled using the:

- audio selector panels
- radio tuning panels

Audio Systems and Audio Selector Panels

An ASP is installed at the Captain, First Officer, and Observer stations. Each panel controls an independent crew station audio system and allows the crewmember to select the desired radios, navigation aids, interphones, and PA systems for monitoring and transmission.

Transmitter selectors on each ASP select one radio or system for transmission by that crewmember. Any microphone at that crew station may then be keyed to transmit on the selected system.

Receiver switches select the systems to be monitored. Any combination of systems may be selected. Receiver switches also control the volumes at the respective crew stations. Audio from each ASP is monitored using a headset/headphones or the related pilot's speaker.

Speakers and Headsets

Each crew station has a headset or headphone jack. The Captain and First Officer have speakers on the ceiling above their seats. There is no speaker at the observer station. Headset volume is controlled by the receiver switches. Speaker volume is controlled by the receiver switches and also the speaker switch.

Audio warnings for altitude alert, GPWS, and windshear are heard at preset volumes. They cannot be controlled or turned off by the crew.

Microphones

Hand microphones and boom microphones may be plugged into the related jacks at the flight deck crew stations. Each oxygen mask also has an integral microphone.

Each hand microphone has a PTT switch to key the selected audio system. The PTT switches on the control wheel or ASP are used to key the oxygen mask or boom microphone, as selected by the MASK–BOOM switch. The MASK–BOOM switch does not affect the operation of the hand microphone.

Normal Audio System Operation

The Captain, First Officer, and Observer audio systems are located in a common remote electronics unit in the E & E compartment. They function independently and have separate circuit breakers. The audio systems are normally controlled by the related ASPs through digital or computerized control circuits.

Degraded Audio System Operation (airplanes with ALT-NORM switch)

If the remote electronics unit or ASP malfunctions, the ASP cannot control the remote electronics unit. Audio system operation can be switched to a degraded mode by placing the ALT–NORM switch to ALT. In this mode, the ASP at that station is inoperative and the crewmember can only communicate on one radio.

The ASP transmitter selectors are not functional, and any transmission from that station is on the radio shown on the chart below. The transmitter selector for the usable radio illuminates when a station is operating in the degraded mode. The receiver switches are not functional, and only the usable radio is heard at a preset volume, through the headset. The speaker and speaker switch are not functional at that station. In addition, the flight interphone and service interphone cannot be used. The control wheel PTT switch INT position and the ASP PTT switch I/C, or on some airplanes, INT position are not functional, since the flight interphone is not functional.

The mask and boom microphones can be used for transmission on the usable radio. The MASK–BOOM, or on some airplanes, BOOM-OXY switch works normally in the degraded mode. The mask and boom microphones can be keyed with the control wheel PTT switch MIC position or the ASP PTT switch R/T position. The hand microphone is not usable in the degraded mode of operation.

Audio warnings for altitude alert, GPWS, and windshear are not heard on an audio system operating in the degraded mode.

An audio system operating in the degraded mode cannot access the passenger address system through the audio control panel. The crewmember can still use the service interphone handset and PA microphone if they are installed on the control stand.

CREW STATION AUDIO SYSTEM IN DEGRADED MODE	RADIO AVAILABLE FOR TRANSMISSION AND RECEPTION AT DEGRADED STATION
CAPTAIN	VHF-1
FIRST OFFICER	VHF-2
OBSERVER	VHF-1

Flight Interphone System

The flight interphone system is an independent communication network. Its primary purpose is to provide private communication between flight deck crewmembers without intrusion from the service interphone system. The ground crew may also use the flight interphone through a jack at the external power receptacle.

The pilots can transmit directly over the flight interphone by using the control wheel PTT switch. Alternatively, any crewmember with an ASP can transmit/receive over the flight interphone by using their related ASP and normal PTT switches. Any standard microphone may be used with the flight interphone system.

Service (Attendant) Interphone System

The service interphone system provides intercommunication between the flight deck, Flight Attendants, and ground personnel. Flight deck crewmembers communicate using either a separate handset (if installed) or their related ASP and any standard microphone.

The Flight Attendants communicate between flight attendant stations or with the flight deck using any of the attendant handsets. Anyone who picks up a handset/microphone is automatically connected to the system.

External jacks for use by maintenance or service personnel can be added to the system by use of the service interphone switch.

Passenger Address System

The passenger address (PA) system allows flight deck crewmembers and flight attendants to make announcements to the passengers. Announcements are heard through speakers located in the cabin and in the lavatories.

The flight deck crewmembers can make announcements using a PA hand microphone or by using any standard microphone and the related ASP. Flight Attendants make announcements using PA hand microphones located at their stations. The attendants use the PA to play recorded music for passenger entertainment.

PA system use is prioritized. Flight deck announcements have first priority and override all others. Flight Attendant announcements override the music system. The forward attendant has priority over the aft attendant.

Call System

The call system is used as a means for various crewmembers to gain the attention of other crewmembers and to indicate that interphone communication is desired. Attention is gained through the use of lights and aural signals (chimes or horn). The system can be activated from the flight deck, either flight attendant station, or from the external power receptacle. Passengers may also use the system to call an attendant, through the use of individual call switches at each seat.

The flight deck may be called from either flight attendant station or by the ground crew. The ground crew may only be called from the flight deck. Flight Attendants may be called from the flight deck, the other attendant station, or from any passenger seat or lavatory. Master call lights in the passenger cabin identify the source of incoming calls to the attendants.

Call system chime signals are audible in the passenger cabin through the PA system speakers. The PA speakers also provide an alerting chime signal whenever the NO SMOKING or FASTEN SEAT BELT signs illuminate or extinguish.

Location of Call Originator	Called Position	Visual Signal at Called Position	Aural Signal at Called Position
Flight deck	Attendant station	Pink master call light	Two-tone chime
Flight deck	Nose wheel well		Horn in nose wheel well
Attendant station	Flight deck	Blue flight deck call light	Single high-tone chime
Nose wheel well	Flight deck	Blue flight deck call light	Single high-tone chime
Flight deck	Passenger cabin	NO SMOKING or FASTEN BELT signs illuminate/ extinguish	Single low-tone chime

Selective Calling (SELCAL)

A ground station desiring communication with the flight deck can use the SELCAL system. SELCAL monitors selected frequencies on VHF and HF radios. Each airplane is assigned a unique four-letter SELCAL identification code. When the system receives an incoming call from a ground station, a two-tone chime sounds, and the related SELCAL light illuminates.

VHF Communications

Primary short-range voice communication is provided in the VHF range by two or three independent radios. Each radio provides for selection of an active frequency and an inactive (preselected) frequency. Voice transmission and reception are controlled at the related ASP.

VHF-3 communication on airplanes equipped with three VHF transceivers is used in conjunction with ACARS. Frequency tuning for this radio is provided by the ACARS system.

VHF-1 is located on the left aft electronic panel, VHF-2 on the right. The VHF-1 antenna is located on the upper fuselage, VHF-2 and VHF-3 on the lower fuselage.

HF Communications

HF transmission and reception are controlled at the related ASP. When the HF transmitter is keyed after a frequency change, the antenna tunes. A steady or intermittent tone may be heard through the audio system. While tuning, the tone can last as long as 7 seconds. If the system fails to tune, the tone will last more than 7 seconds, to a maximum of 15 seconds. The antenna is located in the vertical stabilizer.

Note: Keying HF transmitter on the ground may cause oil and fuel quantity indicators to fluctuate if one or more of the following conditions exist:

- cargo or passenger entry door open
- service interphone microphone plugged into service interphone jack
- airplane grounding wire attached to airplane
- ground power cart connected.

Cockpit Voice Recorder

The cockpit voice recorder uses four independent channels to save the last 30 minutes of flight deck audio. Recordings older than 30 minutes are automatically erased. One channel records flight deck area conversations using the area microphone. The other channels record individual ASP output (headset) audio and transmissions for the pilots and observer.

ACARS System

The ARINC Communication Addressing and Reporting System (ACARS) is an addressable digital data link system which permits exchange of data and messages between an airplane and a ground-based operations center utilizing the onboard VHF-3 communication system.

The ACARS airborne subsystem provides for the manual entry of routine data such as departure/arrival information. Also possible is manual entry of addresses (telephone codes) of parties on the ground for voice communications.

The airborne system consists of a management unit (MU) in the E & E compartment, and interactive display unit (IDU), and a multiport printer. Data is entered and automatically transmitted to the ground operations center.

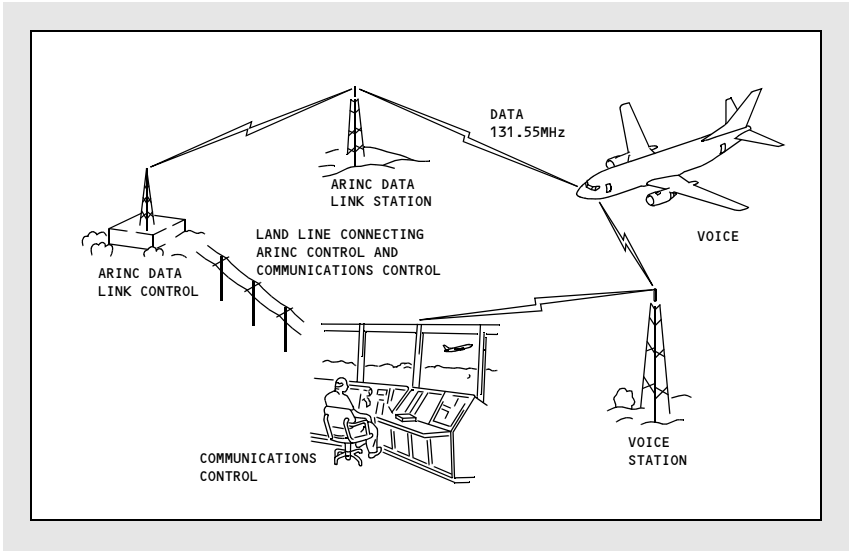
Page Routines

When the IDU is initially powered up (AC busses powered), it establishes contact with the ACARS and the digital flight data acquisition unit (DFDAU). The IDU screen then displays the MAIN MENU. This is the root page for accessing all other ACARS pages. Return to this MAIN MENU is possible by touching the MENU cue on any displayed page.

When a cue is touched on the IDU screen, the cue name is highlighted in reverse video. Moving the finger to another cue without breaking screen contact returns the cue first touched to normal video and highlights the new cue being touched. Releasing the highlighted cue activates the cue's function.

The following cues are special in that they always perform the same functions: MENU, RTN, ENT, CLR, SEND, RE-DO, and VOX. Other cues are advisory cues. Advisory cues appear in place of **** on the standard ACARS menu. Some advisory cues flash from normal to reverse video: FAIL, DATA, SELC, MSG, and INIT. Other advisories are displayed in normal video: NOCOM, VOICE; and in reverse video: FAIL.

ACARS System Diagram



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