



B737 NG CBT - COMMUNICATION

COURSE OUTLINES

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COURSE START

1-The material contained in this training program is based on the information obtained from current state, local and company regulations and it is to be used for training purposes only. At the time of designing this program contained then current information. In the event of conflict between data provided herein and that in publications issued by the authority, the authority shall take precedence.

COMMUNICATIONS

2-This chapter introduces you to the various airplane communication systems and provides an overview of their organization, operation, controls and indications. Here is the chapter outline: Introduction Audio control panel VHF communication HF communication Flight interphone Service interphone Passenger address system Call system Selective calling Cockpit voice recorder Aircraft communications addressing and reporting system

INTRODUCTION

3-Communication is the process of exchanging information. In general, there are two types of communication: Voice communication and data link communication.

4-In voice communication information is exchanged verbally. In datalink communication you communicate through messages.

5-The B737 has these voice communication systems: VHF communication system, the HF communication system, the Flight interphone system, service interphone system and the passenger address system.

6-For datalink communications, the Aircraft Communications Addressing and Reporting System or ACARS is available in most airplanes.

7-The airplane also incorporates communication crew alerting systems and cockpit voice recorder.

8-The Captain and First Officer are provided with speakers on the ceiling above their seats to listen to communication or navigation system audio. The headsets or headphones are also available for the same purpose.

9-Hand microphone or boom microphone is used for voice transmission. Each oxygen mask also has an integral microphone

10-Push-to-talk (PTT) switch on the control wheel lets you speak on the oxygen mask or boom microphone. In some B737s, microphone switches are also installed in the glareshield, which allows boom or mask microphone transmission on the selected transmitter.

11-Push-to-talk (PTT) switch on the hand microphone is used to transmit through the hand microphone.

AUDIO CONTROL PANEL

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12-All external and internal voice communications and navigation system audio go through the audio control panels which allow you to select the desired radio communication and radio navigation systems, interphones, and passenger address systems for transmission and reception of audio signals

13-There are three audio control panels in the cockpit.

14-Captain's and first officer's audio control panels are located on aft electronic panel. The observer's audio control panel is on the aft overhead panel. Each panel operates independently from the others.

15-The Captain, First Officer, and Observer audio control panels are connected to a common remote electronics unit in the electronic equipment compartment below the cockpit.

16-The audio control panel consists of transmitter or microphone selectors and receiver switches. If a transmitting or receiving system is not installed, it is indicated with INOP on the panel.

17-The push-to-talk switch lets you select the way that you transmit.

18-When you set the switch to the radio/transmit or R/T position, it acts as a push-to-talk switch for transmission on the communication system selected by microphone selector through boom or oxygen mask microphone

19-You set the switch to intercom, I/C, position to talk on the flight interphone system through boom or oxygen mask microphone. With the switch in intercom position, microphone selector is bypassed.

20-The BOOM-MASK switch allows selection of the boom microphone or the oxygen mask microphone as audio source for transmission.

21-The filter switch controls audio from the VOR and ADF navigation systems.

22-The V (voice) position lets you hear only VOR and ADF voice audio.

23-The R (range) position passes only range or station's Morse code identification audio.

24-The B (both) position passes both VOR and ADF voice and range audio.

25-You push the speaker switch on to hear the audio from the selected receiver on the overhead speaker at that crew station.

26-You turn the switch to adjust the volume. When you push the switch again, the overhead speaker deactivates.

27-You use the transmitter or microphone selectors to select the communication system that you want to speak on. You can select VHF radio, HF radio, flight interphone, and service interphone or passenger address system for transmission. Note that you can select only one system at a time.

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28-To transmit on a communication system, you push related microphone selector. The selector light illuminates. The system is now ready for transmission.

29-To start transmitting on the selected communication system, you do one of these: Push the talk switch on the audio panel to radio-transmit (R/T) position or move the control wheel push-to-talk switch to MICROPHONE position. This activates the boom microphone and oxygen mask microphone.

30-You can also push the talk switch on the hand microphone for transmission.

31-When you select transmitter selector for a communication system, any received audio on the same system can be heard regardless of related receiver switch position.

32-The receiver switches let you monitor communication system audio or navigation system audio

33-The receiver switches are push ON, push OFF type. When you push a switch to ON, the switch light illuminates and reception of related communication system or navigation receiver is activated. You can select any combination of switches at any time.

34-When you push the switch again, the related communication system or navigation receiver is deactivated.

35-Receiver switches also let you adjust the volume for the headset and speaker.

36-Audio warnings for altitude alert, ground proximity, collision avoidance, and windshear are also heard through the headsets and speakers at preset volumes. You cannot turn off or adjust the volume of these audio alerts.

37-The audio control panel can operate in two modes. Normal mode and degraded mode. You can control the mode of operation through the alternate/normal switch on the panel.

38-In normal operation the Captain, First Officer, and Observer audio systems operate independently.

39-For instance, when the captain transmits, audio signals go to the related communication system through the remote control unit.

40-When the captain receives, audio signals from the related communication or navigation system go to the captain's headset or speaker through the remote control unit.

41-If the audio control panel or remote electronics unit fails, you can switch the audio system to a degraded mode of operation.

42-You can activate the degraded mode by placing the alternate-normal switch to alternate position.

43-If the degraded mode is selected on the Captain's or observer audio control panel, the Captain or the observer only

transmits and receives on the VHF-1 radio. The microphone selector for VHF-1 radio illuminates on the related panel.

44-If the degraded mode is selected on the first officer's audio control panel, the first officer only transmits and receives on the VHF-2 radio. The microphone selector for VHF-2 radio illuminates on the panel.

45-In degraded mode of operation, microphone selectors are not functional. You can only transmit on the usable VHF radio.

46-The receiver switches are not functional. You can only hear the usable VHF radio in the headset at a preset volume. There is no volume control in degraded mode.

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

48-The speaker and speaker switch are not operative at that crew station.

49-The only audio control panel controls that operate are the BOOM-MASK switch and the R/T position of the push-to-talk switch. Thus, you can use boom or mask microphone for transmission on the usable VHF radio.

50-You can also use the MIC position of the control wheel push to talk switch to transmit on the usable VHF radio at that crew station

51-The hand microphone does not operate in degraded mode.

VHF COMMUNICATION

52-The very high frequency (VHF) radio communication system is used for short range communication.

53-The VHF communication system provides voice communications between different airplanes in flight or on ground, or between the airplane and a ground station. Note that VHF communication system also supplies datalink communication which will be discussed later.

54-The VHF communication system operates within the frequency range of 118.00 to 136.975 MHz.

55-Most 737s have three independent VHF communication systems. However, there are airplanes which are fitted with two VHF radios. Each system consists of a VHF transceiver, VHF antenna and a radio tuning panel (RTP).

56-Three VHF transceivers are in the electronic equipment compartment. The VHF transceiver transforms the audio signals into VHF signals in transmission mode and VHF signals into audio signals in reception mode.

57-The VHF antenna provides a means of transmitting and receiving radio signals in the VHF frequency range. VHF 1 antenna is on the top of the aircraft, and VHF 2 and VHF 3 antennas are on the bottom of the airplane fuselage on the centerline.

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58-Note that VHF antennas on the lower fuselage are susceptible to multipath interference which is caused by the radio signals reflected from terrain, structures or other vehicles. This may disturb the VHF communications. The VHF antenna on the upper fuselage is less exposed to multipath interference.

Radio Tuning Panel

59-The radio tuning panel (RTP) lets you select active and standby VHF frequency and test the VHF transceivers

60-The radio tuning panels are on the aft electronic panel.

61-The radio tuning panels are identical. Normally, radio tuning panel 1 controls VHF 1, radio tuning panel 2 controls VHF 2 and radio tuning panel 3 controls VHF 3. However, any panel can control any transceiver.

62-On the panel, there are six Radio Tuning Switches which are used to select the VHF or HF radio to be tuned. Each radio tuning panel can tune only one radio at a time. Uninstalled radios are shown with INOP.

63-When a radio is selected, Radio Tuning Light above respective switch illuminates in white to indicate the selected radio

64-The ACTIVE frequency indicator displays the tuned frequency of the selected radio. The STANDBY frequency indicator displays the preselected or previously tuned frequency.

65-For airplanes with ACARS, the indicator shows DATA if the selected radio is in the data mode.

66-If a radio tuning panel fails, panel fail light illuminates on the respective indicator

67-The Frequency Selector lets you select frequency in standby frequency indicator.

68-When the frequency transfer switch is pushed the standby frequency becomes the active frequency, and the active frequency becomes the standby frequency.

69-When you select a radio which is normally associated with another panel, the offside tuning light illuminates in white. The light also illuminates on the other radio tuning panel that is normally associated with the radio that you have selected.

70-The test switch can be used for two purposes. To check a transceiver operation, push the switch to stop squelch function in the respective transceiver. This lets you hear static, which provides a confidence check of the transceiver operation.

71-You can also use the test switch to improve reception of weak signals.

72-You push the OFF switch to stop the operation of the radio tuning panel. The switch shows white when it is off.

73-Now let's see how you can operate VHF communication system for transmission.

74-Push the radio tuning switch to select the VHF radio for that radio tuning panel. The light above the switch comes on.

75-Turn the frequency selectors to set the frequency in the standby frequency window.

76-Push the frequency transfer switch to change the active and standby frequencies. Make sure the active frequency indicator shows the frequency you want to transmit

77-Push the microphone selector switch on the audio control panel for the selected VHF radio

78-Listen for transmissions on the frequency you selected. When the frequency is clear and you want to transmit, key the microphone and speak into

79-To receive transmissions on VHF radio that you have selected on the radio tuning panel, push the receiver switch for the selected VHF radio on the audio control panel. Turn the switch to adjust the volume from the VHF radio.

HF COMMUNICATION

80-The high frequency (HF) communication system is used for long range voice communication.

81-The HF communication system provides voice communications between the airplanes and ground stations or between different airplanes.

82-The HF communication system operates within the aeronautical frequency range of 2 MHz to 29.999 MHz.

83-Most 737s have one HF radio. However, there are airplanes which are fitted with two HF radios.

84-The HF transceiver is in the electronic equipment compartment. A single HF antenna is on the leading edge of the vertical stabilizer.

85-You can select and tune the HF radio with the radio tuning panels.

86-The AM light is extinguished when the upper side-band operation is active. When you select HF AM, the AM light illuminates to indicate AM operation.

87-The HF Sensitivity Control lets you improve HF reception. Note that HF radio sensitivity can only be set on the on-side radio tuning panel.

88-Now let's see how you can operate HF communication system for transmission

89-Push the radio tuning switch to select the HF radio for that radio tuning panel. The light above the switch comes on.

90-Turn the frequency selectors to set the frequency in the standby frequency window.

91-Push the frequency transfer switch to change the active and standby frequencies. Make sure the active frequency

indicator shows the frequency you want to transmit

92-Push the microphone selector switch on the audio control panel for the selected HF radio.

93-This causes the HF antenna to tune to the transmission frequency. While tuning, you may hear steady or intermittent tone on the speaker and in the headset for several seconds. When the tone stops, the HF system is ready to transmit.

94-When the frequency is clear and you want to transmit, key the microphone and speak into it.

95-If you hear the tone for more than 15 seconds, it indicates the system has failed to tune

96-To receive transmissions on HF radio that you have selected on the radio tuning panel, push the receiver switch for the selected HF radio on the audio control panel. Turn the switch to adjust the volume from the HF radio.

FLIGHT INTERPHONE

97-The flight interphone system lets the flight crew to talk to each other. The system is independent of the service interphone system to provide private communication between the flight crew members.

98-You can also use the flight interphone system to monitor the navigation receivers.

99-The ground crew can also use the flight interphone system through a jack at the external power panel to talk to the flight crew.

100-To monitor the flight interphone you push the flight interphone receiver switch and adjust the volume.

101-There are several ways to transmit over the flight interphone. You can transmit directly over the flight interphone by moving the control wheel push-to talk switch or the audio control panel push-to-talk switch to intercom position.

102-Alternately, you can push the flight interphone microphone selector. Then you use R/T position of the audio control panel push-to talk switch or the microphone position of the control wheel push to talk switch, or the hand microphone to transmit over the flight interphone.

SERVICE INTERPHONE

103-The service interphone system provides intercommunication between the flight crew, flight Attendants, and ground crew.

104-The flight crew can select the service interphone function from the audio control panel or they can use a handset, if installed, to talk on the service interphone system.

105-The flight attendants operate a handset to communicate with each other, the flight crew, and the ground personnel.

106-The ground crew microphones connect into the system through the external service interphone jacks located at

various stations on the airplane.

107-The service interphone switch on the aft overhead panel lets the flight crew activate or deactivate the external jacks

108-With the service interphone switch in OFF position, the external jacks are deactivated. However, communication between flight deck and flight attendants is still possible.

109-When the service interphone switch is placed to ON position, the external jacks activate. The ground crew now can connect to service interphone system.

PASSENGER ADDRESS SYSTEM

110-The passenger address (PA) system lets flight crew and flight attendants make announcements to the passengers.

111-To make an announcement, you push the passenger address microphone switch on the audio control panel and then key a standard microphone.

112-If an optional handset is installed on the aft electronic panel, you use it to make an announcement directly.

113-The flight attendants use the attendant handset to make passenger announcements from the forward and aft attendant stations.

114-If a pilot and flight attendant talk to the passengers at the same time, the pilot announcement has first priority and override all others.

CALL SYSTEM

115-The call system provides a means for flight crew, cabin crew and ground crew to draw the attention of other crew members and to indicate that interphone communication is desired.

116-The call system may be divided into two parts: Flight crew call system and ground crew call system.

117-The flight crew call system lets the flight crew and attendants call each other. The call can be made from flight deck to attendant stations or attendant stations to flight deck. Aural and visual indications from the system tell the flight and cabin crew to use the cabin interphone.

118-To call the flight attendant station from the flight deck, you use attendant call switch on the forward overhead panel.

119-When you push the switch, the pink light on the forward and the aft exit locator signs illuminates and a two-tone chime sounds in the passenger cabin speakers.

120-The flight attendants use the handsets located at each attendant station to make a call to the flight deck.

121-When a flight attendant makes a call to the flight deck, a single-tone chime sounds in the flight deck and the call light

illuminates.

122-The ground crew call system lets the flight crew and ground crew call each other.

123-To call the ground crew from the flight deck, you use ground crew call switch.

124-When you push the switch, a horn sounds in the nose wheel well until you release the switch.

125-The ground crew uses PILOT CALL switch on the external power panel to call the flight crew.

126-When ground crew makes a call to the flight deck, a single-tone chime sounds in the flight deck and the call light illuminates.

SELECTIVE CALLING (SELCAL)

127-The selective calling or SELCAL system relieves the flight crew from continuously monitoring company communications channels.

128-The SELCAL system monitors selected frequencies on VHF and HF radios and provides the flight crew with indications of incoming calls from the airline ground stations.

129-For SELCAL operation each airplane is assigned a different four-letter code.

130-The SELCAL control panel is located on the aft electronic panel.

131-The panel provides visual indications and reset operations for the SELCAL system. Uninstalled radio systems are indicated with INOP.

132-When the system receives an incoming call from a ground station, the respective SELCAL light illuminates and a two-tone chime sounds in the flight deck.

133-You push the respective switch to extinguish the light and reset the SELCAL.

COCKPIT VOICE RECORDER

134-The cockpit voice recorder continuously records flight crew communications and flight deck sounds. It keeps the last 120 minutes of communication data in memory.

135-The cockpit voice recorder system consists of a voice recorder unit, a cockpit voice recorder switch and a control panel.

136-The voice recorder unit is watertight, shock resistant and heat resistant. It has an underwater locator beacon which helps find the voice recorder unit in water.

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137-The voice recorder unit collects and records audio from Captain Microphone and headphone, First officer microphone and headphone, and First observer microphone and headphone.

138-The area microphone on the cockpit voice recorder panel sends flight deck sounds, such as voices and aural warnings to the voice recorder

139-The voice recorder unit also receives time data from the clock system.

140-The cockpit voice recorder switch is on the forward overhead panel.

141-When the switch is in AUTO position, the voice recorder unit records from first engine start until 5 minutes after last engine shutdown.

142-When the switch is set to ON, voice recorder immediately starts to record before the first engine start.

143-With first engine start, the switch trips to AUTO.

144-The cockpit voice recorder panel is on the forward overhead panel.

145-The cockpit voice recorder panel lets you monitor the recorded audio, erase the recorded audio and test the voice recorder system.

146-You can erase the audio if the airplane is on the ground and the parking brake is set.

147-To erase the voice recorder push and hold the erase switch for at least 2 seconds.

148-You can monitor the audio by plugging a headset into the HEADPHONE jack.

149-To test the voice recorder, you push and hold the TEST switch. After a short delay if the green STATUS light illuminates momentarily, the voice recorder is operating correctly. Note that you can hear a tone through a headset connected to the HEADPHONE jack.

AIRCRAFT COMMUNICATIONS ADDRESSING AND REPORTING SYSTEM (ACARS)

150-The aircraft communications addressing and reporting system (ACARS) is a datalink communication system.

151-The ACARS lets you transmit messages and reports between an airplane and an airline ground base through VHF transceiver.

152-A message or report from the airplane to the airline ground base is called a downlink. A message or report from the airline ground base to the airplane is called an uplink.

153-The ACARS consists of a management unit (MU), a control display unit (CDU) and usually a printer.

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154-The ACARS management unit receives ground-to-air messages and controls transmission of the air-to-ground messages through VHF transceiver.

155-You use control display unit (CDU) to control the operation of the ACARS and to show ACARS messages.

156-A printer on the aft electronic panel is used to print ACARS reports and messages.

157-When an ACARS message is received, white ACARS indication appears on the Upper Display Unit to draw flight crew attention.

158-If it is a medium level message, ACARS indication is accompanied by a two-tone chime in the flight deck.

159-If the ACARS message is low level, the position of ACARS indication on the Upper Display Unit is indented one space to the right of higher level messages. Low level ACARS indication is not accompanied by an aural alert.

COURSE END

160-End Of Course.