

Challenger Global 300 - Communications

INTRODUCTION

The radio communication system (RCS) contains the radios and controls used for communication purposes. It shares controls with other systems (intercom, audio, passenger address, navigation and FMS).

Two separate systems are provided for the VHF radio communication and they are designed and installed so that the failure of one system does not preclude the operation of the other system. Both systems are connected to the on-side and cross-side cockpit controls, displays and audio features.

DESCRIPTION

The MFD is the primary radio tuning source for the radio communication system. Frequency, as well as the state of other control functions, is maintained in memory such that the radio does not change state or frequency due to an interrupt in power.

The CDU may also be used for tuning and control of VHF radios, either as a convenience in normal operation, or as a primary control in reversionary operation if the RSP tune switch is selected to CDU ONLY. The CDU provides integrated control of the combinations of aircraft communications radio subsystems. The CDU provides single point control of both on-side and cross-side radios from the pilot or copilot position, in both normal and CDU ONLY configurations.

COMPONENTS

The radio communication system in the Challenger 300 consists of the following:

- Two VHF communication transceivers
- Two VHF communication antennas
- HF antenna (optional)
- Two radio integration units
- Two audio control panels
- Two maintenance interphone panels

AUDIO CONTROL PANELS (ACPs)

An audio control panel (ACP) is located on both sides of the instrument panel. The ACPs allow the pilots to monitor the navigation radios, monitor and transmit on VHF and HF communication radios, the PA system and intercom system.

Receiver controls and volume adjustment for the intercom and radio are provided at each ACP. The output from each audio control panel is directed to the associated headset jacks and speaker.

The aural warning system volume is not adjustable by the crew. Audio signals from the aural warning system, TAWS, and TCAS do not go through the volume control switches.

Headphone audio is always available, with the volume control capability from any control switch.

SPKR

The SPKR audio selector enables the selected audio to be routed to the on-side crew speaker.

Warning audio can be heard with the switch in any position.

INPH

The INPH audio selector enables intercommunication between the crew positions in the cockpit and service interphone positions external to the aircraft.

VOICE/ID/BOTH

The VOICE/ID/BOTH toggle switch is a three position toggle switch that allows the pilot to separate the audio when monitoring the simulcast audio of a radio transmission. When the switch is selected to VOICE, the VOR, ILS, or ADF station morse code identifier is filtered out, allowing only the voice signal to be audible. In the ID position, only NAV and ADF identifier code will be heard. When BOTH is selected, the station morse code identifier and voice message are audible.

EMER/NORM

The EMER/NORM is a two position locking toggle switch. In the NORM position, the audio system operation is normal. In the EMER position, the audio is routed directly to the headphones.

AUDIO CONTROL PANELS (ACPs) (Cont)

O2/MASK

The O2/MASK toggle switch is a two position switch. In the NORM position, the headphone boom microphone input is active. In the O2 position, the oxygen mask microphone is active.

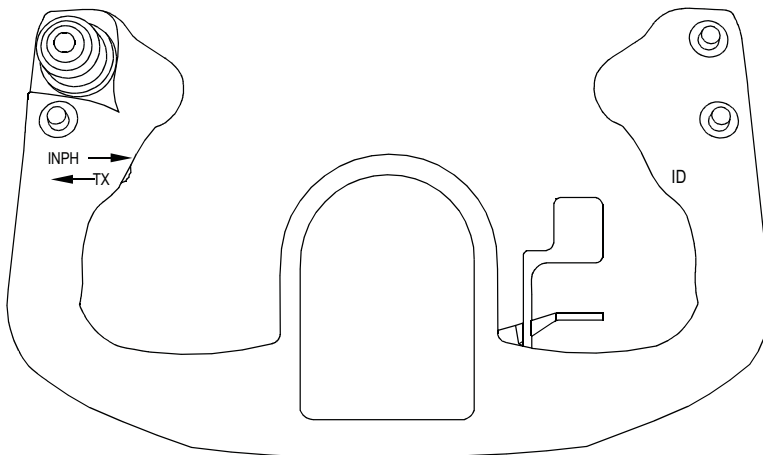


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CONTROL WHEEL TX AND INPH SWITCHES

The pilot and copilot's control wheels are equipped with TX/INPH momentary switches.

The TX position allows transmitting on the selected radio. The INPH position allows intercom transmissions when the interphone is selected off on the ACP.

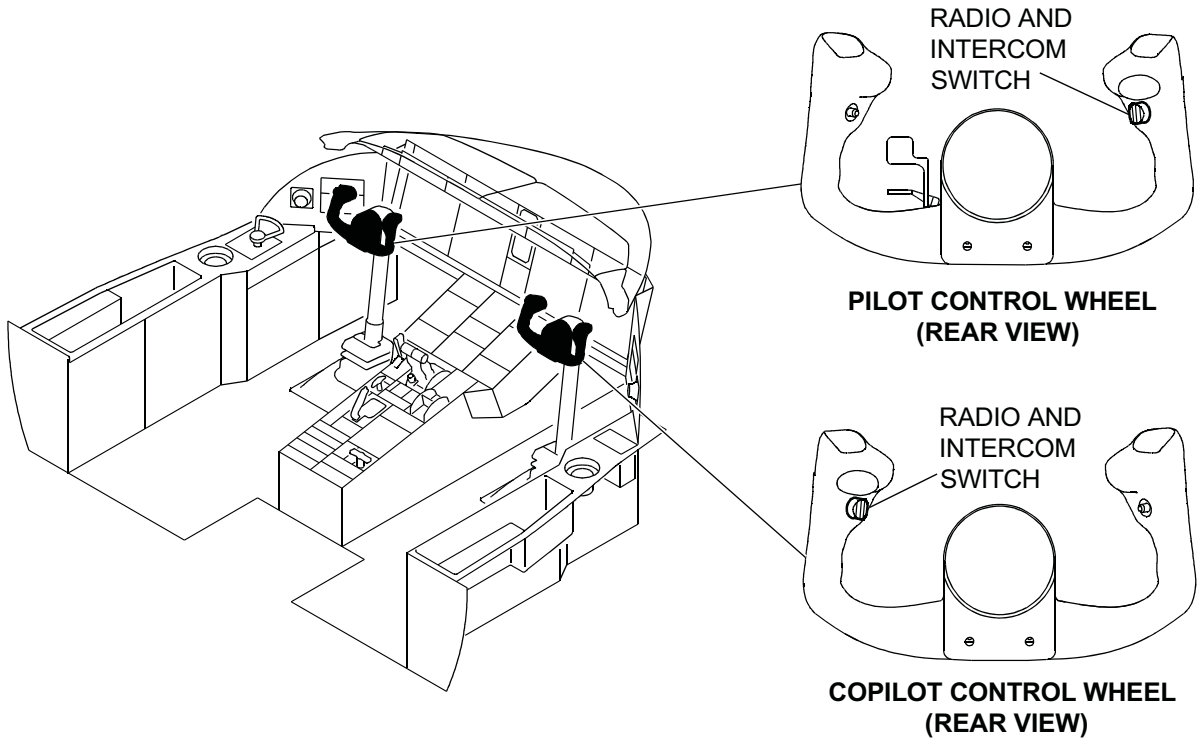


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RADIO AND INTERCOM SWITCHES AND HAND MICROPHONES

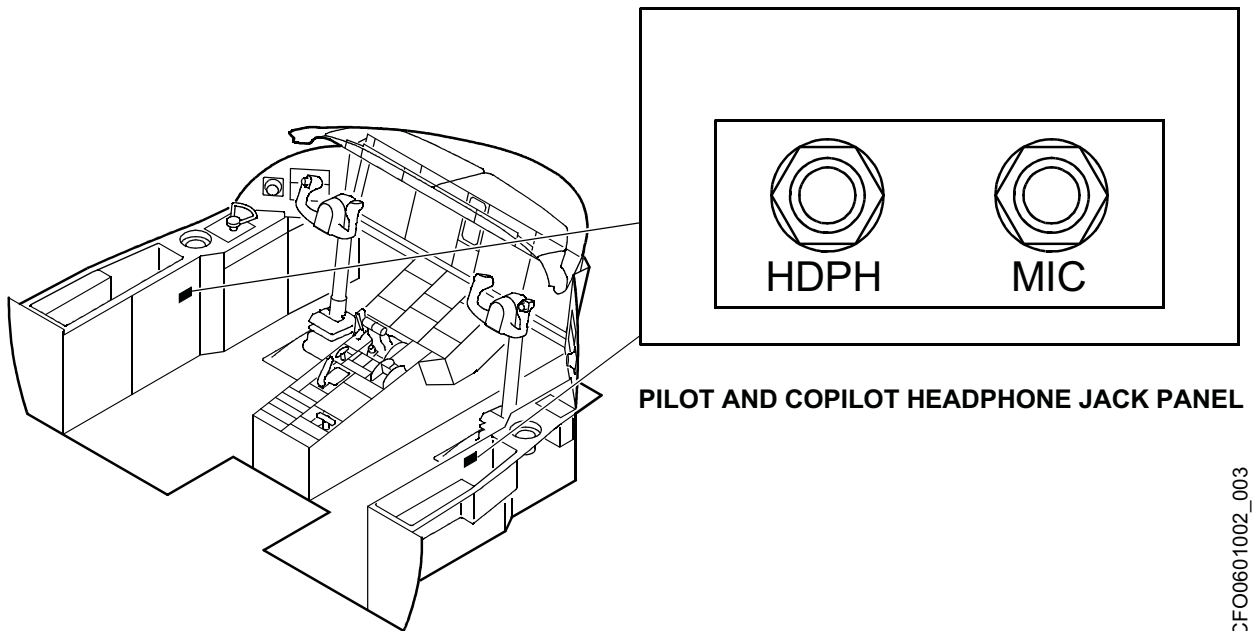
The control wheel radio/intercom switches at each pilot's station and the hand microphones allow the pilots to transmit on the communication radios or interphone.



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HEADSET JACK PLUGS

Headset panels are available at the two flight deck positions to connect the headsets to the audio system.



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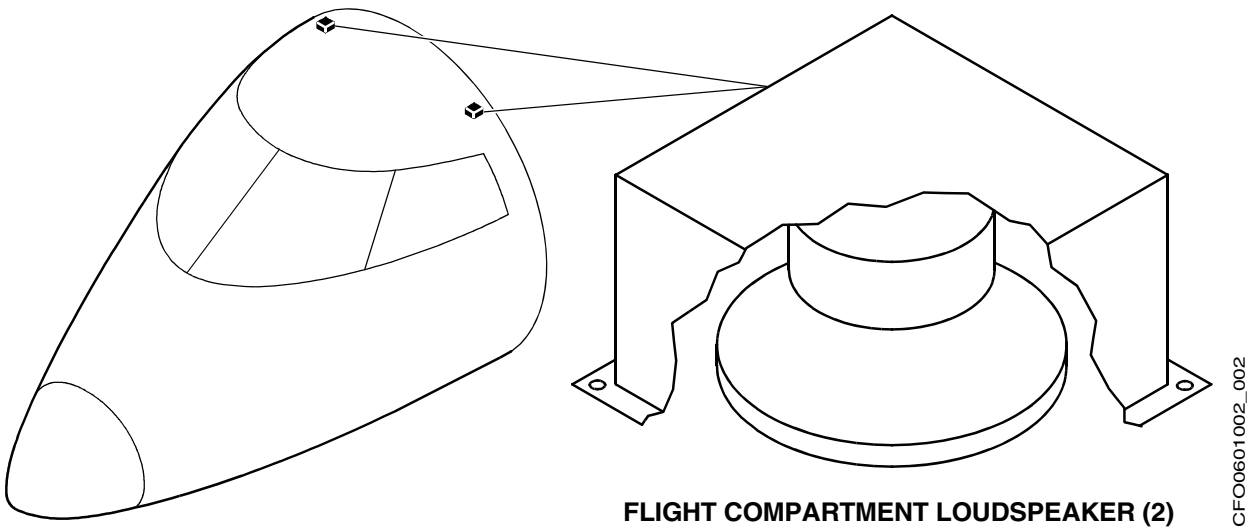
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HAND MICROPHONES

Hand microphones are mounted on the control columns at each of the pilot's stations.

FLIGHT COMPARTMENT SPEAKERS

Two speakers are located overhead in the flight compartment. The speaker volume can be adjusted by rotating the SPKR knob. The speaker can be selected off by pressing the SPKR knob in.



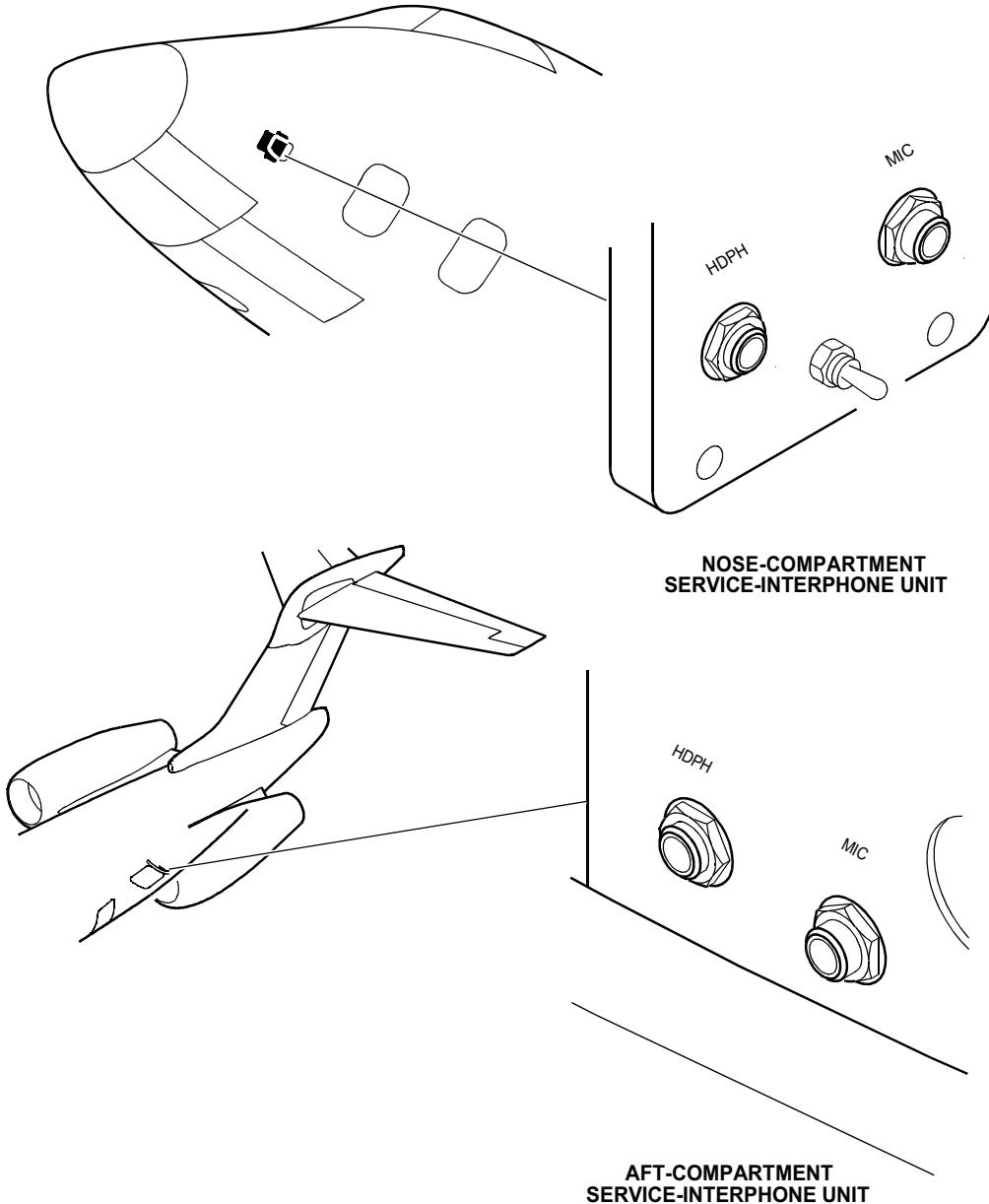
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MAINTENANCE INTERPHONE PANELS

Two maintenance interphone panels are located in airplane to permit hot microphone communications to interface with the flight compartment when selected on the flight deck audio control panel. A headphone and microphone jack are installed at each location.

Microphone and headset jacks are installed at the following airplane locations:

- Left side of the aircraft in the nose compartment area (accessible behind the communication access door)
- Left side of the aft equipment compartment



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VHF COMMUNICATION

DESCRIPTION

The VHF-4000 is a remote-mounted very high frequency (VHF) communications transceiver. Two VHF radios are standard, with an option for a third VHF radio. VHF radio displays are integrated into the lower part of the left and right MFDs. The radios can be controlled through the display control panels on the glareshield or the FMS central display unit. The radios operate in the domestic VHF communications band from 118.000 through 136.991 MHz. When tuning in 25kHz increments tuning is from 118.000 to 136.975MHz. In 8.33 kHz increments, tuning is from 118.000 to 136.991 MHz.

GENERAL MFD TUNING

The MFD and the Display Control Panel (DCP) provide single point control of both the on-side and cross-side radios from the pilot's and copilot's position. The radio menu provides an "at a glance" summary of the radios as well as control for each.

1. Push the RADIO button on the DCP to show the MFD radio menu if another menu/list is active.
2. Push the 1/2 button if necessary to alternately select the side 1 radios and the side 2 radios.
3. Turn the MENU knob on the DCP to move the selection box on the radio menu to the radio (COM, NAV, ATC/TCAS, etc.) frequency or channel that is to be tuned.
4. Turn the TUNE knob on the DCP to tune the desired frequency or channel.
 - The larger (outer knob) tunes the digits to the left of the decimal point.
 - The smaller (inner knob) tunes the digits to the right of the decimal point.
5. To activate the new frequency/channel:
 - Push the transfer button in the center of the tune knob.
6. To change modes, adjust squelch, and other non-tuning functions of a radio:
 - Turn the MENU knob to move the selection box to the appropriate radio (COM1, NAV2, ATC/TCAS, etc.)
 - Push the RADIO button on the DCP to select the submenu.
 - Turn the MENU knob to move the selection box on the submenu.
 - Turn the DATA knob to change the mode or select an option) i.e, tune mode, squelch level, traffic mode, etc.)
 - Push the PUSH SELECT button to step through available options. (the PUSH SELECT button acts the same as the DATA knob in selecting options)
 - To exit the sub menu, push the RADIO button. The display returns to the radio menu.

NOTE: The menu is automatically removed 20 seconds after the last activity of the MENU, DATA, or PUSH SELECT knob, or when another menu or list button is pushed.

VHF COMMUNICATION (Cont)

DISPLAY CONTROL PANEL COM RADIO OPERATION

The radio menu provides basic COM radio tuning control. The COM submenu provides control display for other COM radio operation. Each COM radio installed on the aircraft has its own submenu. The active frequency, recall frequency, and squelch status displays are identical to the display on the radio menu.

The current control location is indicated by a cyan control box. The default location is the last tuned communication radio (VHF or HF). After 20 seconds of inactivity, the cyan control box returns to the default location.

Selecting the 1/2 button results in the cross side radios being displayed and the radio legends being displayed in yellow.



| COM1 | NAV1 | ATC1/TCAS | ADF1 | HF1 | COM3 | COM2 |
|-----------------------|------------------|---------------------|-----------------|---------------------|--------------------|--------------------|
| 118.000 TX 118.000 | 108.00 108.00 | 7777 STBY ABV | 1799.5 190.0 | 2.0000 AM 2.0000 | 118.000 118.000 | 118.000 118.000 |

- Push the RADIO button on the DCP to show the radio menu on the MFD if another menu/list is active
- Turn the MENU knob on the DCP to move the selection box to the desired radio (COM 1, COM 2, COM 3 if installed) display on the radio menu.
- Push the RADIO button on the DCP to show the appropriate submenu on the MFD
- The following operations are performed on the submenu
 - Change the SQUELCH mode
 - Turn the MENU knob to move the selection box to the SQUELCH control.
 - Turn the DATA knob or push the PUSH SELECT button to select the squelch ON or OFF
 - Change the frequency spacing for radio tuning
 - Turn to MENU knob to move the selection box to the FREQ SEL control.
 - Turn the DATA knob or push the PUSH SELECT button to select 8.33 or 25 kHz spacing for tuning
 - Select the COM TEST mode
 - Turn the MENU knob to move the selection box to the TEST control.
 - Turn the DATA knob or push the PUSH SELECT button to select the TEST mode
 - Change the COM 3 mode (only if Voice/Data option is enabled)
 - Turn the MENU knob to move the selection box to the COM 3 MODE control.
 - Turn the DATA knob or push the PUSH SELECT button to select the VOICE or DATA mode. When DATA mode is selected, the squelch annunciation, squelch status, transfer arrow, frequency selections 8.33 and 25, and TEST selection do not show on the COM 3 CONTROL menu

VHF COMMUNICATION (Cont)

DISPLAY CONTROL PANEL COM RADIO OPERATION (Cont)

When the **FREQ SEL** setting is changed to 8.33, the recall COM radio frequency display resolution on the MFDs is three decimal places for that radio. If the prior recall frequency had two decimal places, the MFD adds the appropriate 0 or 5 to the frequency value. When the **FREQ SEL** setting is changed to 25, the recall COM radio frequency display resolution on the MFDs is 2 decimal places for that radio. If the prior recall frequency had an 8.ss kHz frequency, the MFD changes the frequency to the next lower valid 25 kHz frequency value. If the prior recall frequency was a 2 digit 25 kHz frequency, the third decimal digit is removed.

CONTROL DISPLAY UNIT (CDU)

The control display unit (CDU) is also capable of tuning the communication radios, ADF receivers, and ATC transponders.



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CDU COM RADIO TUNING

The CDU provides tuning control of both the on-side and cross-side radios. Data entry to the CDU is made through the scratch pad and the line select keys. Information is entered on the scratchpad, then transferred to the appropriate location with the adjacent line select key. Messages show if the information entered is not appropriate for the data field. Access to CDU tuning is accomplished through the **TUNE** page.

To tune the radio using the CDU execute the following steps:

1. Push the **TUN** key on the CDU to show the **TUNE** page.
2. To tune a radio directly, do one of the following steps:
 - Enter the frequency into the scratch pad, then push the line select key for the appropriate radio.
 - Enter a preset channel number (1 through 20) into the scratch pad, then push the line select key for the appropriate radio.
 - NAV radios only: Enter the three-letter identifier for the NAVAID, then push the line select key for the appropriate radio (NAV 1 or NAV 2).
3. To show the submenu for a particular radio (to set presets, select modes, etc.), push the line select key for the radio when the scratch pad is empty.
4. To return to the **TUNE** page from a **CONTROL** submenu, push the line select key for the radio or push the **TUN** key.

VHF COMMUNICATION (Cont)

TUNING REVERSION

DESCRIPTION

The tune reversion switch is located on the reversion panel located on the center pedestal. The COM 1 121.5 MHz switch allows the pilot to directly transmit on the emergency frequency 121.5 MHz via COM 1. The MFD ONLY position on the TUNE switch allows the radio to be tuned by using the display control panel only. The NORM position on the TUNE switch allows the radio to be tuned using either the display control panel or the central display unit. The CDU ONLY position on the TUNE switch allows the radio to be tuned by using the central display unit only.

COMPONENTS AND OPERATION

Tuning reversion allows the pilot to select the MFDs or CDUs as the master tuning control. Normally, the MFD provides the master tuning control. However, if the MFD fails or is reverted to a compressed PFD format, radio tuning through that MFD is no longer available. Tuning reversion allows the pilot to select either the MFD or the CDU as the master tuning control for the on-side radios. When the TUNE knob on the Reversion Selection Panel is set to MFD ONLY, the MFDs ignore tuning commands from the CDUs. Additionally, the CDU TUNE page is blank when the TUNE knob is set to MFD ONLY. When the TUNE knob is set to CDU ONLY, the CDUs ignore tuning commands from the MFDs and the MFD radio Menus is blanked. When the TUNE knob is in the COM 1 121.50 position, tuning is as normal (MFD is the master tuning control), but the COM 1 radio is forced to the emergency frequency 121.50.

HF RADIO COMMUNICATION (OPTIONAL)

DESCRIPTION

The optional high-frequency radio provides long-range communication within the frequency range of 2.0 to 29.9999 MHz. The HF radio has 280 000 communication channels together with six emergency and 16 programmable preset channels.

The HF system operates in simplex or duplex mode as:

- Upper side band voice (UV)
- Upper side band data (UD)
- Lower side band voice (LV)
- Lower side band data (LD)
- Amplitude modulation equivalent (AME)
- Continuous wave (CW)

In simplex mode the radio transmits and receives on the same frequency. Simplex is the most common transmission/reception mode.

The duplex mode is similar to using a cellular phone in that you actually transmit on one frequency and receive on another. It is used to relay radio signals between stations or communicate with marine facilities.

COMPONENTS AND OPERATION

RECEIVER/TRANSMITTER

The receiver/transmitter is installed in the aft equipment bay. The receiver/transmitter controls all the functions associated with signal transmission and reception, power generation and fault detection.

HF COUPLER

The HF coupler is located near the receiver/transmitter. The coupler tunes the system by matching the impedance of the antenna to the transmitter. Matching the impedance allows maximum power transfer to the antenna during transmissions.

The coupler tunes to the new frequency when the transmit switch is momentarily pushed. The tuning time for a new frequency is nominally less than one second but can take up to a maximum of six seconds. A 1000 Hz tone is heard in the headset and stops when tuning is complete. Impedance data for the previous last 50 frequencies tuned are stored in memory and reused whenever a frequency is reselected. This minimizes the tuning times for frequently used frequencies.

HF ANTENNA

The HF antenna is classified as a conformal-type antenna in that it is an integral part of the leading edge of the vertical stabilizer.

HF RADIO COMMUNICATION (Cont)

DISPLAY CONTROL PANEL HF TUNING CONTROL

1. Push the RADIO button on the DCP to show the radio menu on the MFD if another menu/list is active.
2. Turn the MENU knob on the DCP to move the selection box to the HF radio (HF1 or HF2) display on the radio menu.
3. Push the RADIO button on the DCP to show the HF CONTROL submenu on the MFD.
4. The following operations are performed on the HF CONTROL submenu.
 - Select the HF tune mode.
 - Turn the MENU knob to move the selection box to the MODE control
 - Turn the DATA knob or push the PUSH SELECT button to select FREQ, EMER, or MAR mode. Each click of the DATA knob or push of the button selects the next mode option
 - Select the HF transmission mode.
 - Turn the MENU knob to move the selection box to the MODE control
 - Turn the DATA knob or push, the PUSH SELECT button to select SIMP (simplex) or DUP (duplex) transmission mode
 - Select HF emission mode.
 - Turn the MENU knob to move the selection box to the emission mode control (beneath the MODE control)
 - Turn the DATA knob or push the PUSH SELECT button to select LV (lower voice single sideband), UV (upper voice single sideband), or AM (amplitude modulation) mode. Each click of the DATA knob or push or the button selects the next mode option
 - Select the HF squelch level.
 - Turn the MENU knob to move the selection box to the SQUELCH control
 - Turn the DATA knob or push the PUSH SELECT button to select the squelch level. Each click of the DATA knob or push of the button selects the next squelch level option
 - Select the HF power level.
 - Turn the MENU knob to move the selection box to the POWER control
 - Turn the DATA knob or push the PUSH SELECT button to select the squelch level. Each click of the DATA knob or push of the button selects the next squelch level option
 - Select the HF TEST mode.
 - Turn the MENU knob to move the selection box to the TEST control
 - Turn the DATA knob or push the PUSH SELECT button to select the TEST mode

MFD — HF CONTROL MENU

The HF CONTROL menu provides control for HF radio modes other than those available through the Radio Menu. Each HF radio installed on the aircraft has its own HF CONTROL menu. The active frequency, recall frequency, and squelch status that show on the left side of the HF CONTROL menu are identical to the HF display on the radio menu.

The TUNE MODE control selects the HF tuning mode as follows:

1. Tune directly by tuning a frequency (FREQ).
2. Select an emergency channel (EMER).
3. Select a maritime (optional) channel (MAR).

CDU HF RADIO TUNING

To tune the HF radio using the CDU, do the following steps:

1. Push the TUN key on the CDU to show the TUNE page.
2. Select page 2 by selecting NEXT button (depending on radio options, there will be 1 or 2 pages).
3. Enter the frequency into the scratchpad, then push the line select key for the appropriate radio.
or
4. Enter a preset channel number (1 thru 20) into the scratchpad, then push the line select key for the appropriate radio.
5. To show the submenu for a particular radio (to set presets, select modes, etc.), push the line select key for the radio when the scratchpad is empty.
6. To return to the TUNE page from a submenu, push the line select key for the radio or push the TUN key.

HF RADIO COMMUNICATION (Cont)

PRESET PAGE

In the tune mode, PRESET allows the pilot to select and configure 16 predetermined combinations of transmit and receive frequencies and transmission modes on the CDU PRESET pages or on the MFD radio control pages. Five CDU preset pages are available for each HF1 (HF1 and HF2), depending on the type of preset data and selected HF mode of operation. Selection of the preset mode changes the HF preset frequency to the last selected numbered preset selection.

SIMPLEX/DUPLEX OPERATION

The simplex/duplex mode selection is applicable to all modes of transmission. Simplex mode allows transmission and reception to occur on only one frequency and in only one direction at a time. Both parties cannot receive at the same time as they are transmitting. The duplex mode is actually half-duplex mode allowing transmission and reception on separate frequencies, but still only one direction at a time.

SELCAL SYSTEM (OPTIONAL)

DESCRIPTION

The optional SELCAL system allows the crew to maintain continuous VHF or HF radio watch with a ground facility without the burden of listening to the assigned radio.

COMPONENTS AND OPERATION

The selective calling (SELCAL) system monitors the pre-assigned SELCAL VHF or HF frequency. Each SELCAL equipped aircraft is assigned its own four-letter SELCAL code. When the ground station wants to talk to the aircrew, they transmit the aircraft's assigned SELCAL code.

When the VHF or HF radio receives the code, the SELCAL decoder sends a signal to the EICAS data concentrator unit to display the cyan advisory message. The advisory message identifies which of the VHF or HF systems received the message. An aural "SELCAL" alert is sounded to advise the crew of the incoming call.

The SELCAL message on EICAS is removed when the radio/transmit switch is activated for the VHF or HF radio that received the message.

SATCOM (OPTIONAL)

DESCRIPTION

The satellite communication (SATCOM) system (optional), makes possible voice and data communications in most locations in the world (except in the farthest polar regions). SATCOM is also better than other long-range communication systems in connectivity, voice quality, reliability, and traffic volume capacity.

The SATCOM option consists of three primary systems:

- Space system
- Ground system (ground earth stations (GESs), service providers, public telephone systems, etc.)
- Aircraft earth station (AES)

The space system is a series of satellites that act as a two-way relay between the AES and GES. The satellites are in geosynchronous orbits 22 300 mi (36 000 km) above the equator. The satellites operate between 75 degrees north and south latitude and there is an overlap in the areas of coverage.

The ground system has GESs and local/long distance telephone networks. The GESs interchange data between the space system and the public or private telephone and data networks for worldwide communications.

The AES operates within the satellite communications system of the international maritime satellite organization. The AES uses the satellite to give digital communication between the aircraft and the GES. The AES access the international maritime satellite organization satellites with L-band communications. The satellites then transmit and receive the data with C-band to the GES. The GES can transmit packet data (such as ARINC communications addressing and reporting system (AFIS), that provides data on aircraft conditions, departure time, arrival time, or flight delay time). The GES can also transmit telephone communications (such as voice, fax, and PC modem data).

SATCOM (OPTIONAL) (Cont)

The SATCOM system interfaces with a dedicated antenna subsystem to provide satellite communications. A minimum of three satellite communications channels are required: two voice channels and one data channel. One voice channel is dedicated to the flight compartment, and another voice channel is dedicated to the office in the sky (OITS) telephone. The data channel is assigned for either the airborne flight information system (AFIS) or the OTIS facsimile or modem.

The factory option of the SATCOM consists of a six channel SATCOM system and antenna. Components include:

- Satellite data unit
- High power amplifier
- Radio frequency unit
- High gain antenna.
- Cabin communication system interface via handset
- Airborne data link system
- PC data and fax capability

COMPONENTS AND OPERATION

SATELLITE DATA UNIT (SDU)

Provides interface to all airplane avionics and contains the location of the applicable satellites and rate/frequency translation for two-voice communication.

RADIO INTERFACE UNIT

The radio interface unit provides three additional simultaneous voice communication channels when operated in conjunction with the SDU.

HIGH-POWER AMPLIFIER

The high-power amplifier provides rate/frequency power amplification on the L band signals generated by the satellite data unit or radio frequency unit to a power level required for transmission to the satellite.

SATCOM ANTENNA

The SATCOM system is equipped with one antenna and is located on top of the vertical stabilizer. The SATCOM antenna is directional and mechanically controlled.

The SATCOM antenna transmits and receives data to the SATCOM LNA/duplexes and the SATCOM antenna control unit (ACU).

SATCOM ANTENNA CONTROL UNIT

The antenna control unit processes signals from the SATCOM antenna to calculate location. The ACU transmits data to the SATCOM antenna to control the antenna direction. The ACU gives built-in-test equipment and location data to the SATCOM transceiver.

DATA LINK (OPTIONAL)

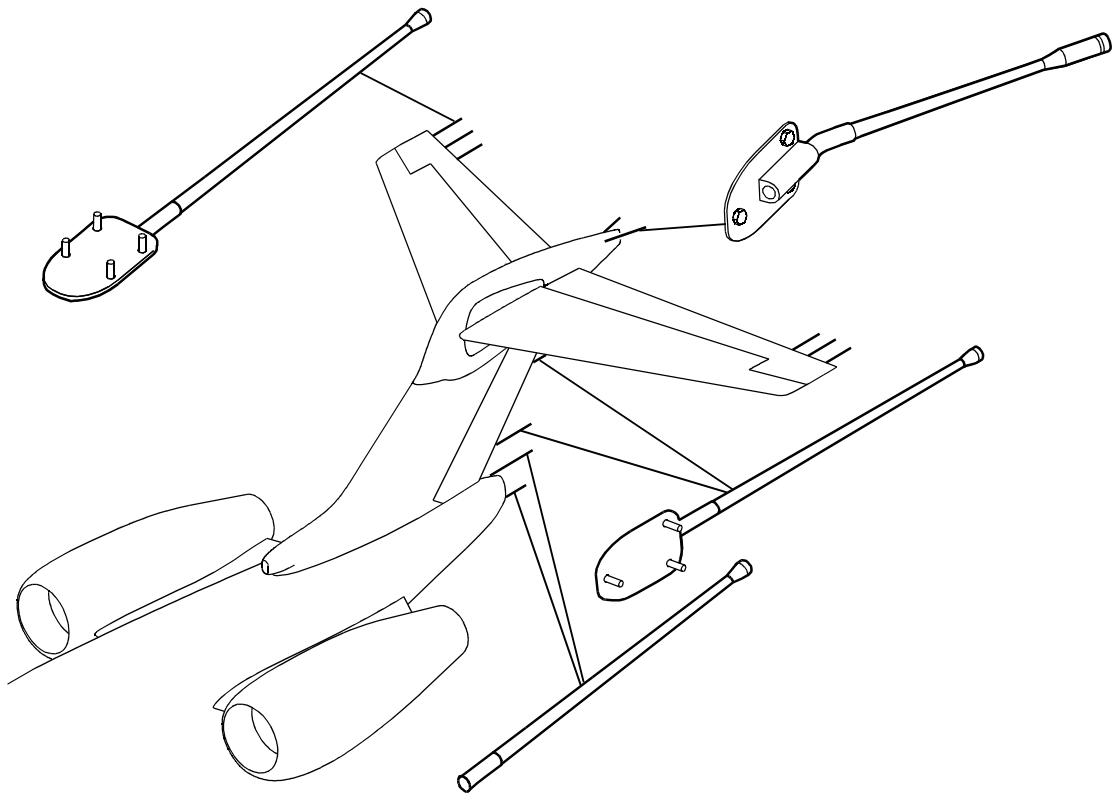
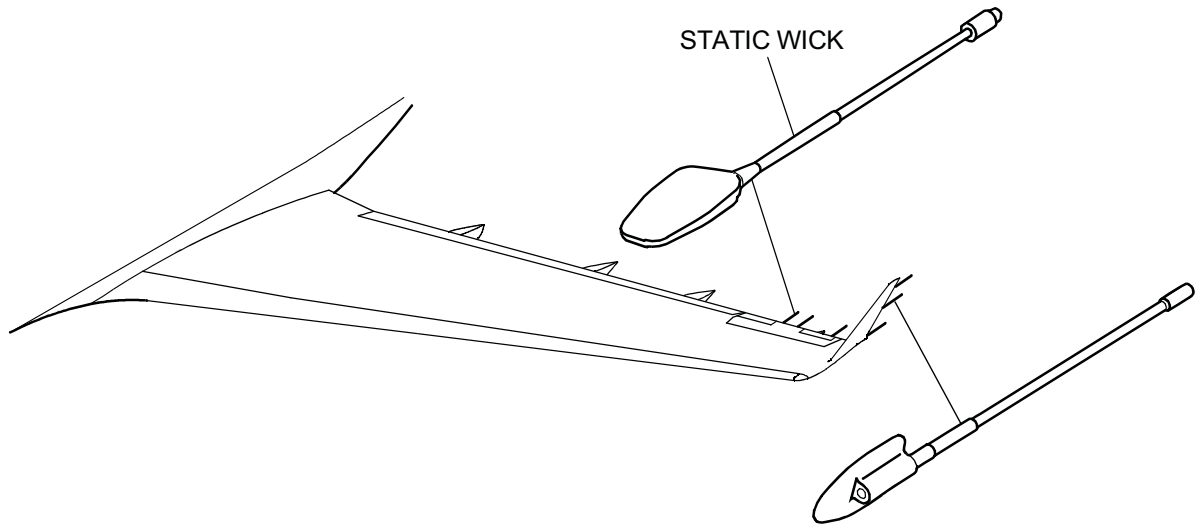
DESCRIPTION

Data link operation is via the VHF, HF, or SATCOM and is controllable from the FMS CDU. The system utilizes the same data loading unit as the FMS with air-ground-air and air-to-air capabilities. Crew advisory messages are displayed on the CDU scratch pad.

STATIC WICKS

Static wicks are installed to discharge static electricity, thereby reducing radio interference. They are installed at the following locations:

- Winglets/wingtips and ailerons
- Elevators, rudder, vertical stabilizer, horizontal stabilizer and tail cone



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COCKPIT VOICE RECORDER (CVR)

DESCRIPTION

The solid state cockpit voice recorder (CVR) consists of a flight deck control panel and a recorder unit that is painted bright orange with reflective stripes. The CVR is mounted in the aft equipment bay.

COMPONENTS AND OPERATION

The CVR receives four channels of audio data from the audio electronics control unit. The recorded information includes all audio received and transmitted from the following locations:

- Pilot station
- Copilot station
- Area microphone (center of glareshield)
- Observer station

CVR CONTROL PANEL

The CVR control panel is located on the center pedestal and is used to test the CVR system.

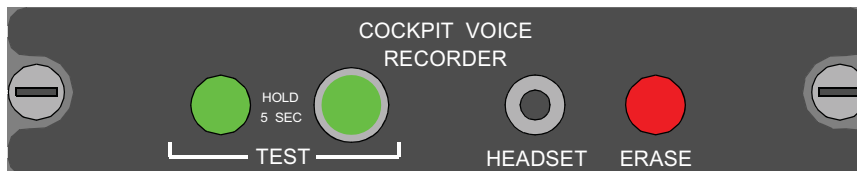
The CVR control panel contains:

- A green TEST button and green indicator lamp
- Headset jack
- ERASE button

The CVR starts recording as soon as electrical power is applied to the aircraft. When the aircraft experiences impact deceleration, electrical power is removed from the recorder to prevent erasure of the stored audio data.

The CVR TEST button, when selected, performs an internal test of the CVR system. A successful test is indicated by illumination of the green indicator lamp.

When the erase button is pushed, all recorded information will be erased as long as the aircraft is on the ground, the hydraulic systems are pressurized and the parking brake is set.

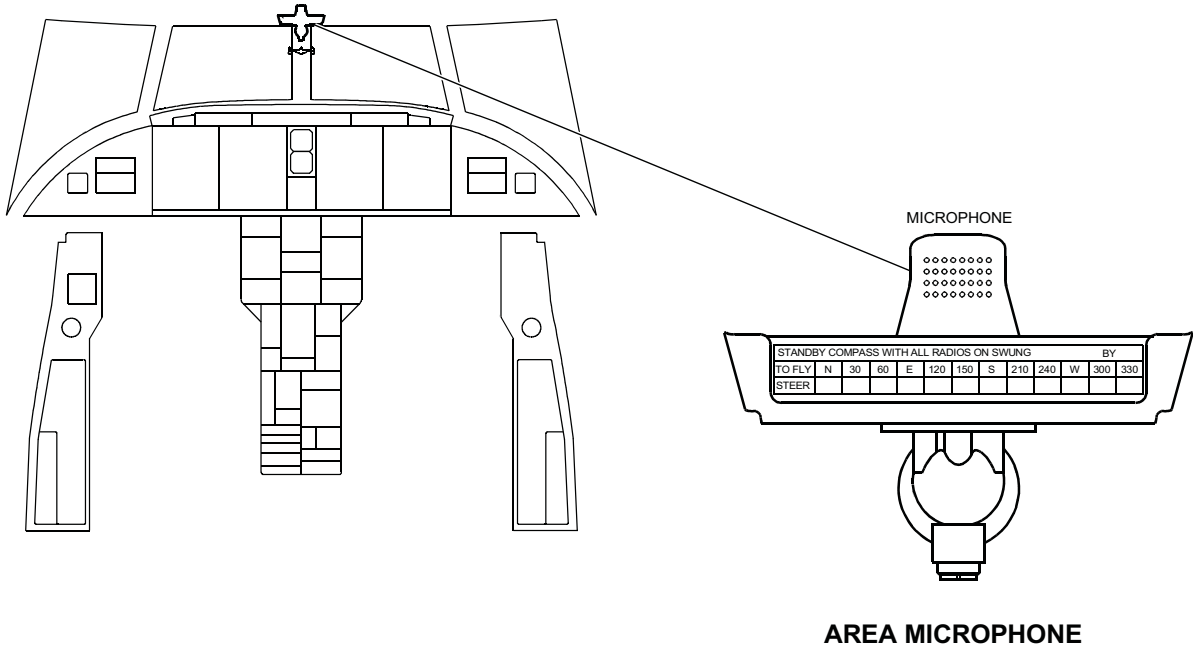


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COCKPIT VOICE RECORDER (CVR) (Cont)

AREA MICROPHONE

The area microphone picks up sounds and voices in the flight compartment and is located just above the liquid compass on the windshield center post.



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RECORDER UNIT

The recorder unit is housed inside a crash survivable container. Access to the container is through the aft equipment bay.

The unit records data in a solid state non-volatile memory and stores 120 minutes of recorded information. An underwater locator device (ULD) is installed on the front of the recorder. The ULD emits a pulsed acoustic signal into the water after ditching of the aircraft. The ULD sonar beacon is capable of transmitting for up to 30 days after activation.

UNDERWATER ACOUSTIC BEACON

As a further detection aid, the recorder has an underwater locator beacon. the beacon is mounted on the crash survivable memory unit front bracket to facilitate reading of the batter replacement date as well as for quick removal and replacement of the beacon. The unit is equipped with a battery having a life expectancy of 6 years.

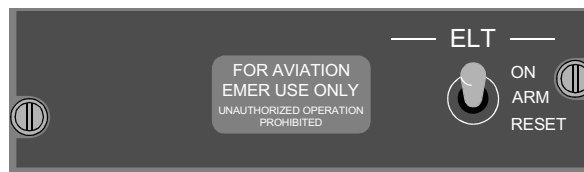
EMERGENCY LOCATOR TRANSMITTER

DESCRIPTION

The emergency locator transmitter (ELT) is a self contained battery operated unit, located in the top left side of the aft fuselage. When the aircraft is subjected to excessive longitudinal forces, the ELT is automatically activated and transmits on 121.5 (VHF), 243.0 MHz (UHF) and 406.025 MHz. When the ELT is transmitting, an ELT ON (C) CAS message is illuminated.

The flight deck ELT switch is normally set to ARM. The ON position is for system test, or to manually activate the ELT. The RESET position resets the ELT.

An ELT buzzer is installed in the rear fuselage section near a venting cutout. It is installed so that the buzzer alarm will not distract the flight crew, but will be audible during ground operations and servicing when the engines are not operating.



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CABIN COMMUNICATION SYSTEM (OPTIONAL)

DESCRIPTION

The cabin communication system option provides a private automatic branch exchange switching network. This network routes voice and data communications for up to nine optional active devices (handsets/FAXs/modems/data link, etc.) in the airplane and provides two air-to-ground channels. The systems includes connections of basic telephone/telecomputing equipment to UHF antenna and SATCOM links. If a data link device is installed on the airplane, the cabin communication system has the capability to communicate with the data link device using an internal modem.

COMPONENTS AND OPERATION

The digital radio components consist of: one UHF antenna, a duplexer and one airborne radio telecommunication unit. The digital handset is located in the flight compartment and has a backlit LCD display and telephone style keypad to dial calls and select various options. A credit card reader (for optional billing) is built into the handset and a two-button increase/decrease volume control (side of handset) is also installed.

Refer to the Magnastar C-2000 user guide CA1030 for description/function and operation of the system.

FLIGHT COMPARTMENT PRINTER (OPTIONAL)

DESCRIPTION

The optional flight compartment printer is installed in the copilot side console. The printer has ARINC 429 and standard PC interfaces and is capable of full format and graphic printing of information from Central Aircraft Information Maintenance System (CAIMS) and DATALINK.

COMPONENTS AND OPERATION

The printer can be used to print selected messages and weather data sent to it via the airborne data link system. The printer is also used by the central aircraft information maintenance system to print out certain maintenance faults and status information.

FLIGHT DATA RECORDER (FDR) (OPTIONAL)

DESCRIPTION

The solid state flight data recorder (FDR) unit is located in the tail section of the aircraft. The (FDR) records aircraft flight parameters. The FDR includes a digital FDR, an underwater locator device (ULD), and a tri-axial accelerometer.

COMPONENTS AND OPERATION

RECORDER UNIT

The recorder unit is housed inside a crash survivable container. Access to the container is through the aft equipment bay.

The unit records data using a solid state non-volatile memory. The unit records the last 25 hours of critical aircraft and flight parameter data. An underwater locator device (ULD) is installed on the front of the recorder and emits a pulsed acoustic signal into the water after ditching of the aircraft.

The ULD beacon is capable of transmitting up to 30 days after activation. The FDR starts to record when one of the following occurs:

- STROBE/BEACON switch is in the BEACON or STROBE position
- Weight-off-wheels as sensed by the proximity sensing electronic unit (PSEU)

If the aircraft experiences impact deceleration, electrical power is removed from the recorder. Removal of power prevents the erasure of the stored digital information.

EVENT (button)

Pressing the EVENT button on the ENGINE panel places an event marker in the FDR data. This can be used when required during system functional testing as required by some regulatory agencies.

UNDERWATER LOCATOR DEVICE (ULD)

The ULD, mounted on the FDR front panel, is a battery-operated underwater acoustic pulse generator. The ULD transmits when submerged under water.

TRI-AXIAL ACCELEROMETER

The tri-axial accelerometer is used for acceleration measurements. It contains three separate seismic sensors that measure vertical, lateral, and longitudinal acceleration near the center of gravity of the aircraft. This data is sent to the DCUs where it is formatted for the FDR.

Challenger Global 300 - Communications

EICAS MESSAGES

Communication messages are shown on the EICAS. In the table below is a list of communication system messages. A brief explanation of each message is provided.

| MESSAGE | INHIBITS | MEANING | AURAL WARNING |
|--|----------|--|---------------|
| CVR FAIL | TO/LAND | The cockpit voice recorder has failed | |
| FDR FAIL | TO/LAND | The flight data recorder has failed | |
| FDR FAULT | TO/LAND | The longitudinal, lateral or normal accelerations parameters in the flight data recorder are inoperative. It may be possible to clear this message | |
| SELCAL HF 1 SELCAL HF 2 | TO/LAND | The SELCAL code has been received on HF 1 or HF 2 | "SELCAL" |
| SELCAL VHF 1 SELCAL VHF 2 SELCAL VHF 3 | TO/LAND | The SELCAL code has been received on VHF 1, 2, or 3 | "SELCAL" |
| SELCAL DATALINK | TO/LAND | The SELCAL code has been received on DATALINK | "SELCAL" |
| ELT ON | | Pilot status that ELT is transmitting | |