



PILOT TRAINING GUIDE

# TABLE OF CONTENTS

# Page

Introduction	. 5-1
Description	. 5-1
Interphone Communication	. 5-1
Flight Compartment Speakers	. 5-1
Flight Crew Intercom	. 5-2
Service Intercom Panels	. 5-3
Control Wheel Radio Key	. 5-5
Audio Control Panel	. 5-5
Radio Communication System	. 5-7
VHF 1 and 2 Communications Systems	. 5-7
VHF 3 Communications System (if installed)	. 5-7
Integrated Radio System	. 5-8
Radio Management Unit (RMU) Display	. 5-9
Radio Management System	5-10
General Color Philosophy	5-11
Transfer Keys	5-12
Line Select Kevs	5-12
Function Kevs and Tuning Knob	5-13
Function Kevs	5-13
Direct COM/NAV Tuning	5-19
COM Memory	5-20
High Frequency (HF) Communication System	5-21
Menu Page	5-23
HF Memory and Control Pages	5-24
SELCAL	5-24
Static Wicks	5-26
Cockpit Voice Recorder	5-27
CVR Location	5-27
Microphone Monitor Control Panel	5-28
CVR System Schematic	5-30
Microphone Monitor Control Panel Test	5-31
Flight Data Recorder	5-32
Underwater Locator Beacon	5-33
Emergency Locator Transmitter	5-33
Light Sensor – ELT Panel	5-33
ELT Schematic	5-34
Airborne Data Link System (if installed)	5-34
Communication Links	5-34
SATCOM (if installed)	5-36
Cabin Communication System (if installed)	5-38
Flight Compartment Printer (if installed)	5-39
EIČAS Messages	5-41







#### PILOT TRAINING GUIDE





#### INTRODUCTION

The intercom system, VHF and HF communications transceivers, and selective calling (SELCAL), comprise the basic communications system. All communication and navigation radios are tuned through the Radio Management Unit (RMU) installed in the center pedestal. The RMU controls the TCAS modes and provides direct tuning of the NAV, COM, ADF, TCAS, ATC and HF radios. RMU color LCD can display several pages of radio system data including channels, frequencies, codes, backup engine data, strap options, maintenance data log, and software versions.

A cockpit voice recorder (CVR) is installed in the flight compartment, on the copilot's side console. All incoming, outgoing and internal communications are recorded on the cockpit voice recorder. Radio frequency interference is reduced through a series of electrostatic dischargers and through an equipment bonding/grounding system.

Audio control panels (center pedestal) function as the interface to the remote NAV and COM units.

### DESCRIPTION

#### INTERPHONE COMMUNICATION

The interphone communication consists of the following internal and external components:

# FLIGHT COMPARTMENT SPEAKERS

Two five-inch speakers, located in the overhead panel, supply audio output for headset free operation. A speaker volume control is located on each audio panel and can be selected off by the ST switch on each control panel, unless the oxygen mask mic is in use.







#### FLIGHT CREW INTERCOM

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

Crew members can key communications transmission as follows:

- Audio control panel hot mic (H'MIC) and intercom (INT) switch
- RT/IC switch on the back side of each control wheel

Flight compartment microphone and headset jacks are installed at the following locations:

- Below pilot's side console
- Below copilot's side console



HEADSET PANEL





#### SERVICE INTERCOM PANELS

Service intercom panels are provided throughout the airplane and permit hot microphone communication between locations, and interface with the flight compartment when selected on the audio control panel. A headphone and microphone jack are installed at each location. Hand microphones with a Press-To-Talk (PTT) switch are attached to the front of each control wheel.

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

- Forward and rear external services panel
- Aft equipment bay
- Avionics bay

### Forward External Services Panel Interphone Station



# Aft External Services Panel Interphone Station









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# Aft Equipment Bay Interphone Station



**Avionics Bay Interphone Station** 







### CONTROL WHEEL RADIO KEY

Each control wheel has a radio key which activates the selected radio transmitter.



# AUDIO CONTROL PANEL

The Audio Control Panel (ACP) operates independently to the remote COMM and NAV units, and provides on-side/cross-side selection. They also control the audio to and from the radios, intercom, PA, and aural warning system.

# **Audio Control Panel Input Schematic**







#### Audio Control Panel Switch Operation



TRANSMIT - Channel active - bar illuminates. Only one pushbutton can be selected at a time. EMER - When pressed, the microphone is connected directly to the on-side VHF (COMM) transceiver and the audio is connected directly to the airplane's headphone. This mode disables all other audio control unit modes.



#### **Microphone Selection**

Connect the MIC audio and PTT to the selected COMM or NAV radios, or PA when pushed in.

MIC/MASK - When pushed in, the headset microphone is available. When pulled out, the mask microphone is available.

INT - Adjusts the headset audio level. Connects audio control panel(s) and external audio jacks. **ID/BOTH/VOICE** 

• ID - Allows only NAV tone ident to be heard. · VOICE - Allows only VOICE audio on NAV frequency to be heard.

• BOTH - allows voice and ID to be heard simultaneously.

As many radios frequencies can be monitored by pulling out appropriate button. (Listen only)



Single Channel Controls **NAV 1** – Idents from RMU 1. NAV 2 - Idents from RMU 2.

**Dual Channel Controls** Mid Position - Silent 1 Position - Ident RMU 1. 2 Position - Ident RMU 2.

#### Speaker/Headphone

Speaker - Adjusts the audio level of the flight compartment speakers.

ST switch - Sidetone switch adjusts the level on the speaker audio. Turns the speaker ON/OFF unless oxygen mask is in use.

MKR/MUTE - Marker beacon controls on-side receiver sensitivity. Mute silences the marker beacon audio.

H'MIC - Button out, interphone functions operate in hot mic mode. Button in, connects microphone to the radio key/interphone toggle switch on the control wheel.

Headphone - Adjusts the audio level of headphone (master volume control).





## **RADIO COMMUNICATION SYSTEM**

The capability for controlling the operating modes, frequencies, and codes can be accomplished by using the Radio Management Unit (RMU) which is the central control unit for the entire radio system.

The RMU controls all of the VHF COM tuning functions and allows emergency tuning by the FMS. When an FMS tunes the radios, the digital signals from the FMS enter the system where they act in much the same manner as if the RMU tuning knob was being operated. This will allow the FMS to enter into the system in an organized manner. For FMS operation, refer to the Honeywell Pilot's Operating Manual.

The audio section of the VHF COM provides SELCAL outputs used for airplane addressing by transmitting tones across a VHF COM channel.

# **VHF 1 AND 2 COMMUNICATIONS SYSTEMS**

Two separate, but identical narrow bandwidth VHF communications systems (VHF 1, VHF 2) which can be operated separately or simultaneously, are provided. These systems are used to provide AM voice communication between the airplane and a ground station and/or another airplane. Frequency tuning and mode selection is by CRT pages and controls on the RMU.

The integrated communications units with transceivers (located in the forward fuselage avionics bay) provide VHF communication (VHF COM) and Mode S Transponder data link capabilities. The communication transceiver tuning range is as follows:

SYSTEM	FREQUENCY RANGE	CHANNEL SPACING
VHF 1 and 2	118.00 to 151.975 MHz	25 kHz (760 channels)

# **VHF 3 COMMUNICATIONS SYSTEM (IF INSTALLED)**

An optional VHF 3 is located in the forward fuselage avionics bay and is used primarily as a data radio. It does not have an attached transponder but has the capability of operating in the data mode as well as the voice mode.

The RMU automatically senses when the optional third VHF COM radio is installed, and adds a menu selection to the MENU page. Control of frequency and operating mode is performed by the RMU and FMS CDU. VHF COM 3 works in conjunction with the Data Link System as the data radio. The communication transceiver tuning range is as follows:

SYSTEM	FREQUENCY RANGE	CHANNEL SPACING
VHF 3	118.00 to 151.975 MHz	25 kHz





#### INTEGRATED RADIO SYSTEM

The radio communications unit provides VHF communication (VHF COM) and Mode S Transponder data link capabilities. It interfaces with the FMS, SELCAL, TCAS, HF, audio control panels, and is controllable from either RMU.

#### **Integrated Radio System Schematic**



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# RADIO MANAGEMENT UNIT (RMU) DISPLAY

The following is a description of the panel controls and information available on the RMU.





#### RADIO MANAGEMENT SYSTEM

The RMU is mounted in the center pedestal. It is a color Liquid Crystal Display (LCD)-based radio tuning controller that provides centralized control and display of frequencies, channels, codes and modes set on the communications and navigation receivers. Each RMU provides single point control of both the on-side and cross-side radios. The RMUs provide on-side and cross-side access to the following radios:

RMU-1	RMU - 2
VHF COM - 1	VHF COM - 2
VHF NAV - 1	VHF NAV - 2
DME - 1	DME - 2
ADF - 1	ADF - 2
ATC - 1	ATC - 2
TCAS DSPY 1	TCAS DSPY 2
HF - 1	HF - 2

The RMU uses the concept of selecting a function by pushing a line select key next to the parameter that you wish to control. Any selectable parameter may be changed by pressing the corresponding line key next to the displayed parameter and then rotating the concentric tuning knobs to set the desired value.

The RMU display is divided into dedicated windows. Each window groups the data associated with a particular function of the radio system. The windows COM, NAV, ATC, HF, ADF, and TCAS each provide for complete control of frequency and operating mode of the associated function.

The RMU also has other display modes, called pages, which perform additional features and functions for the control of the radio system. A menu of the pages is provided to access these additional functions.

Located on the front of the RMU is a button labeled, PGE which, when pressed, causes the system page menu to be displayed. Pressing PGE will allow the selection of other functions such as:

•	Radio page	Normal tuning
•	COMM memory	Preset COMM frequencies
•	NAV memory	Preset VOR NAV frequencies
•	ATC/TCAS	ATC/TCAS display frequencies
•	HF control	Preset and Direct tune modes
•	Maintenance	Access to maintenance data (only on ground)







### **GENERAL COLOR PHILOSOPHY**



For radio parameters the RMU provides a local tune color and a remote tune color. Local tune is performed on the same RMU it is observed on. Remote tune is performed on another tuning source, the other RMU or the FMS. Following local tune, the tuned item changes to the local tuned color.

ITEM	LOCAL TUNE COLOR	EXAMPLE
VHF 1 and 2	White	NAV Display Channel
Preset Data	Cyan	COM Preset Channel
Mode Data	Green	ADF Mode
FMS Data	Magenta	Nav Auto Annunciator

Following remote tune, the tuned item changes to yellow, with one exception - an FMS database tune (auto tune) of the NAV display channel, which is magenta.

ITEM	LOCAL TUNE COLOR	EXAMPLE
Channel Data	Yellow	NAV Display Channel
Preset Data	Yellow	COM Preset Channel
Mode Data	Yellow	ADF Mode
FMS Data Base	Magenta	Nav Auto Annunciator







Other items which are not radio parameters, such as page banners and window labels, also follow a general color philosophy. The page banners and window labels are white when the on-side is selected, and are magenta when the off-side system is selected. Example: on RMU 1, the HF window label is white when HF 1 is selected, and is magenta when HF 2 is selected from RMU 1.

ITEM	FIXED TUNE COLOR	EXAMPLE
Field Labels	Cyan	TCAS INTRUDER ALTITUDE
Key Labels	Cyan	Page Menu HF CONTROL key
Caution/Notice	Yellow	Transponder ATT ERR

# TRANSFER KEYS

The transfer key, when pushed, flip-flops the active (top line) frequency and the preset (bottom line) frequency of the respective VHF COM, VHF NAV, or HF COM window. Example below:



# LINE SELECT KEYS

The first push of the line select key moves the yellow curser to surround the data field associated with that particular line select key. It also electronically connects that data field to the tuning knobs so that the frequency or mode may be changed. For some functions, additional pushes of the line select key will toggle modes or recall stored frequencies. The line select key, when pressed and held for certain functions, allows the ADF and ATC memories to be recalled, and to enter and exit direct tune mode for the VHF COM and the VHF NAV.

	_ COM 1	NAV 1	
	118.00	112.00	
	130.27	113.10	
m2	TEMP-1	TEMP-1	14
	_атс-тсаз - 1200	ADF 1 <b>1799.5</b>	20 25



### FUNCTION KEYS AND TUNING KNOB

Function keys provide control of system data/configuration. The tuning knobs are used to modify the data field enclosed by the curser. This may be frequency or mode depending on the data field.



# **FUNCTION KEYS**

Pressing the squelch (SQ) key opens the COM radio squelch and allows any noise or signal present in the radio to be heard in the audio system. The letters "SQ" are annunciated along the top line of the VHF COM window (if the curser is in the window), or the HF COM window (curser in the HF COM window).

The "SQ" for the HF-9000 toggles between "SQ OFF" and the previously selected "SQ" level (MIN, MED, MAX). The "SQ" level is selected on the HF control page.







#### PILOT TRAINING GUIDE

Pressing the DIM key connects the RMU brightness control to the tuning knob and the RMU brightness display will appear. The display brilliance is then adjustable using the TUNE control knob on the RMU.



Pressing the cross-side (1/2) key, with the cursor in a window (except ATC TCAS) display transfers the entire RMU operation and display to the cross-side radio system. The legend color changes from white to magenta when the RMU is displaying, and is in control of data associated with the cross-side system. Pressing the 1/2 key with the cursor on the mode line of the ATC-TCAS window and the transponder in other than STANDBY mode allows to switch between transponder 1 and 2







Pressing the page (PGE) key once will change the RMU display to the Menu page. When not on the radio tuning page (main or system page), the RMU assigns a RETURN function to the lower left line select key. Pressing this key returns the display to the radio tuning page.



Pressing the store (STO) key results in a temporary (TEMP) COM/NAV preselect frequency to be stored in memory.



The temporary preselect frequency is assigned a numbered location, provided the curser has been first placed around that frequency or code.







While on the main tuning page, press the "PGE" function key once to display SYSTEM 1 PAGE MENU. Next press the line select key for the COM MEMORY to view the frequency held in memory.



Pressing the identification (ID) key places the transponder in the identification response mode. The transponder will go into ident mode for approximately 18 seconds when the ID function key is pushed and an ID annunciator will appear.







A self-test sequence of any radio is available. Press/hold the TST key with the curser placed around the frequency or code to activate an internal test sequence of the selected system.



The "TST" key must be held down for the duration of the test for approximately:

- 2 seconds for VHF COM and HF COM
- 5 to 7 seconds for DME, ADF
- 20 seconds for NAV (VOR/ILS)
- The TCAS test function is slightly different

After the test is complete, a green "PASS" or red "ERR (error)" legend will appear in the window.

# NOTE

If the "TST" key is held for 30 seconds or more, the radios are automatically commanded back into normal operation.

Releasing the "TST" key for any time, immediately returns the function to normal operation.





#### PILOT TRAINING GUIDE

Pressing the DME key deslaves the DME from the active VOR frequency, so a different DME channel may be tuned, without changing the active VOR. Successive presses of the DME key enables display and selection of the DME channels in VHF and TACAN formats.



#### Note:

Cycling the DME function button will display the following in sequence: VOR/ILS – VOR/ILS and DME – VOR/ILS and TACAN – VOR/ILS



#### DIRECT COM/NAV TUNING

To direct tune the COM, press the line select key beside the preset COM frequency and hold for approximately 3 seconds. The following events will occur:

- The cursor will first move through the TEMP-1 selection
- The preset window will go blank
- The cursor will appear at the active frequency allowing direct tuning



To exit from direct tuning, press the line select key beside the preset COM frequency window and hold until the preset frequency appears. Direct NAV tuning is identical.







#### **COM MEMORY**

To recall stored frequencies, select the cursor to the preselect position on the main radio page. Rotate the tune control knob to view the frequencies stored (1-12) in memory.



While on the main tuning page, press the PGE function key and then press COM MEMORY option. COM MEMORY page will provide the following information:





## HIGH FREQUENCY (HF) COMMUNICATION SYSTEM

The HF communication system is a dual configuration integrated with the radio system on the airplane. The system provides long range air-to-air and air-to-ground communications, operates in the 2.0000 to 29.9999-MHz range and consists of:

- Two transceiver/antenna couplers
- One antenna

The basic radio control functions are:

- HF COM mode and frequency
- Audio selection and volume control

# NOTE

HF tuning via the RMUs displays the frequency as xxxx kHz (the decimal point is not displayed). However, HF tuning via the FMS displays the frequency on the FMS CDU as yyyyy.y kHz (the decimal point is displayed). As an example, an entry of "10000" on the RMU would be entered as "10000.0" on FMS.

Frequency and mode control of the remotely located HF radios can be input from either the RMUs or the Flight Management System (FMS) CDUs. Both normal Simplex Tuning mode and Emergency Tuning mode are supported by the FMS. The audio control panels provide microphone selection, radio headset/speaker audio selection, volume control, and audio control switching.

The HF transceiver units (HF COM 1 and HF COM 2) are located in the Avionics Bay. The HF antenna coupler units are located in the upper Aft Fuselage. The antenna is located in the Vertical Stabilizer (forms the leading edge).

The RMUs are the central control for the HF Communication System, providing complete capability for controlling the operational mode and frequencies. Each RMU has the capability to control operation of its primary (on-side) radio or its secondary (cross-side) radio.

The HF information on each RMU is displayed at the lower right of the radio tuning page. HF emission mode and status are displayed in the HF window. In order to tune an HF frequency, one of the two line select keys on the lower right side of the RMU is pressed. This selection will place the "curser tune box" around the frequency to be tuned, and using the RMU tuning knobs will accomplish the desired frequency. The HF System can operate in the following modes: Upper Sideband Voice (UV), Lower Sideband Voice (LV), Amplitude Modulation Equivalent (AM), and Continuous Wave (CW).





#### **RMU HF Display**



The RMU HF window is optimized for use with Upper Side Band voice mode. The HF window has two modes of operation: Preset Tune mode and Direct Tune mode. Both the active and preset are displayed when the RMU is in preset tune mode, while only the active frequency is displayed in direct tune mode.

The HF will keep the most recently keyed HF tuned to the antenna for 20 seconds after the push-to-talk key opens. Following 20 seconds the HF reverts to "Dual Receive mode" (neither HF antenna remains tuned to the antenna) providing the squelch is not open.

# **HF Preset and Direct Tuning Modes**



When the coupler is tuning to match the antenna, a steady tone will be heard from the transceiver. If tuning takes longer than six seconds, the tone will begin to beep, signaling that the coupler was not able to tune properly. If this occurs, an ERR annunciator is displayed and the frequency data will dash (----) on the RMU HF window. To clear this fault, tune any HF parameter on the RMU. For information on additional message annunciations, refer to the manufacturer pilot handbook on HF communication.





# **HF Fault Annunciation**



HF 1 Preset Mode

HF communication control and status are accessed and/or displayed on the "back" pages of the RMU. These pages are accessed via RMU "PAGE MENU" page:

- HF Control Page
- HF Memory Page
- Maintenance Log

#### MENU PAGE

The menu page is accessed from the radio tuning page by pressing the PAGE function key on the front face of the RMU. All stored frequencies are displayed and there are six memory locations on the first page, and an additional six available on the second page.

The HF Maintenance Log provides the maintenance log for on-side HF radio operation. The Maintenance page is a ground maintenance function and will not be covered in this manual.







#### HF MEMORY AND CONTROL PAGES

The HF Control page provides active and preset channel tuning and emission mode control, memory channel recall/store, HF status, squelch level tuning, and transmitter power level tuning.

The HF Memory page provides active channel tuning, memory channel tuning, and HF status.





# SELCAL

The Selective Calling System (SELCAL) monitors the ground stations for a four-letter tone code that is transmitted to the airplane on the VHF or HF communication systems. When the SELCAL receives the code, it sends a visual and aural message to alert the flight crew.

The SELCAL decoder unit located in the avionics equipment bay, has five audio input channels used to monitor the audio output from:

- VHF COM 1
- VHF COM 2
- VHF COM 3 (Optional)
- HF COM 1
- HF COM 2







The SELCAL interfaces with the audio integrating system (audio control panels), flight compartment speakers, and EICAS. Each airplane is assigned its own SELCAL code at the time of installation. Upon receiving the code for which it was programmed, the SELCAL will signal the audio integrating and EICAS systems that a call has been received.

#### Operation

The VHF and/or HF communication systems are tuned to a SELCAL frequency that has been assigned to a ground station.

When a ground station wants to talk to the flight crew, the ground station sends a SELCAL code on the assigned frequency. The SELCAL unit monitors the VHF and HF communication systems audio output channels.

When a SELCAL signal is received, the decoder checks the signal tones for the correct frequency, sequence, amplitude and duration.



If all the parameters are met, a SELCAL HF or VHF advisory message will be displayed on EICAS, and the audio integrating system will command an aural message "SELCAL, SELCAL" in the flight compartment speakers and headsets.

The pilot selects the respective VHF or HF system on the audio panel and when the Push-To-Talk (PTT) switch is pushed, the EICAS message is canceled.



#### **STATIC WICKS**

The airplane wings and tail sections contain 24 static wicks installed to discharge static electricity to reduce radio interference. They are installed at the following locations:

- Winglets (1 per side), wingtips (1 per side), and ailerons (4 per wing)
- Elevators (3 per elevator), rudder (2), vertical stabilizer (1), horizontal stabilizer (2), and tail cone (1)



There are two parts to each static discharge assembly: the static discharger and the mounting base. If any are found missing during the walkaround, refer to the configuration deviation list of the AFM to verify if you can dispatch.







#### COCKPIT VOICE RECORDER

The Cockpit Voice Recorder (CVR) is a crash-survivable recording device that simultaneously records four channels of audio data representing the cockpit acoustic environment. The system consists of a:

- CVR
- Microphone monitor/control panel
- Remote area microphone
- Impact switch

The CVR retains the most recent two hours of recorded information in memory. Input is received from each audio control panel and CVR area microphone. The CVR also receives digital data (GMT time) from DAU 4 to synchronize the CVR with the flight data recorder.

# **CVR LOCATION**



The CVR is mounted in the aft equipment bay. The microphone monitor/control panel is located in the flight compartment right side panel.





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### **MICROPHONE MONITOR CONTROL PANEL**



### **Remote Area Microphone**

The area microphone is mounted on the overhead panel in the flight compartment.







#### Impact Switch

The impact switch mounted in the aft avionics bay removes electrical power to the CVR when the airplane experiences an impact.



# **Audio Control Panel Input**

The audio panels provide audio inputs to the CVR for recording flight crew voice communications and other flight compartment audio signals.



AUDIO CONTROL PANEL

The various audio signals are summed together in the audio panels to form a single audio input to the CVR from each audio panel.



# **CVR SYSTEM SCHEMATIC**





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### **MICROPHONE MONITOR CONTROL PANEL TEST**

The cockpit voice recorder microphone monitor panel TEST, STATUS and ERASE functions are as follows:

• TEST – Push and hold the TEST pushbutton for approximately 1/2 second to activate the CVR internal self-test



A successful test will result in the green STATUS LED illuminating for one second, and a two second aural tone will be heard using the headphone, as long as the headphone is plugged into the CVR port shown on the diagram above.

# NOTE

If a failure occurs during the self-test, the green STATUS LED will illuminate continuously, and no aural tone will be heard.







• ERASE – The ERASE pushbutton is used to initiate a memory erase sequence within the CVR. The CVR logic ensures that the ERASE function is only enabled when the airplane is on the ground (WOW), and the parking brake set

# FLIGHT DATA RECORDER

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The Flight Data Recorder (FDR) is a crash survivable data recorder capable of retaining up to 25 hours of airplane parameters/flight data. The FDR system consists of:

- Solid state flight data recorder
- High-G accelerometer

The High-G accelerometer is mounted in the airplane landing gear bay and provides the normal acceleration data for the FDR system.

The DAU 4 receives airplane parameters/flight data from various systems, and normal acceleration input from a dedicated accelerometer. The FDR receives its systems information from DAU 4 and sends status information back to the DAU 4.

An FDR self-test is performed on airplane power-up and if a failure is detected (at any time including self-test), an advisory message will be displayed on EICAS.





#### UNDERWATER LOCATOR BEACON

An Underwater Locator Beacon (ULB) is attached to the CVR as part of the handle to help locate it in the event of a crash.



The ULB's operating frequency is 37.5 kHz, and it will operate for 30 days.

### EMERGENCY LOCATOR TRANSMITTER

The Emergency Locator Transmitter (ELT) is an operational system and consists of:

- ELT switch
- Emergency locator transmitter
- ELT antenna

A flight compartment switch, located on the overhead panel, provides ON and ARM modes of operation. The switch can be used to manually activate the ELT for test purposes or emergency situations.

# LIGHT SENSOR - ELT PANEL



LIGHT SENSOR - ELT

ELT Switch ON – When selected the ELT will begin to transmit. ARM/RESET – Normal position selected to arm the system for automatic activation.

Note:

If the system is accidentally activated, the unit can be reset by placing the switch to ON, then back to ARM/RESET.

The ELT transmits signals on 121.5, 243.0, and 406.025 MHz. The 406.025 MHz signal is transmitted for satellite relay. Upon activation, the 121.5, 243.0 signals operate continuously until the self-contained battery pack power is exhausted (typically last at least 72 hours) or the unit is reset. The output signal of the 406 MHz transmitter is transmitted for 24 hours (once every 47 seconds) then automatically shuts off. It transmits tail number, owner and emergency phone number. An optional nav interface box can be installed, which will then also transmit the last GPS latitude and longitude to the satellite.





# **ELT SCHEMATIC**



An internally mounted G-switch is triggered on impact and activates the ELT. The ELT antenna is mounted on the top aft exterior of the airplane and interfaces with all signal outputs. When the ELT is transmitting, a signal is sent to the transmitter to DAU 2. This signal used by the DAU provides an ELT transmitting advisory message to EICAS.

# CAUTION

The emergency locator system test should only be performed during the first 5 minutes of every hour of UTC time to avoid nuisance warnings and alerting Search and Rescue services. The test duration is not to exceed 30 seconds to avoid triggering the satellite system.

# AIRBORNE DATA LINK SYSTEM (IF INSTALLED)

Data link operation is via the third VHF comm, UHF (telephony), or SATCOM and controllable from all FMS CDUs. The system utilizes the same data loading unit as the FMS with printer interface, air-ground-air, and air-air capabilities. Crew advisory messages are displayed on the CDU scratchpad.

# **COMMUNICATION LINKS**

Third VHF comm – Using the SYSTEM SELECT page on the RMU, the pilot can select COM 3 MODE to be VOICE or DATA. When DATA is selected, the data link is in control of the radio; data frequency is selectable only through the data link.

SATCOM – Automated to this link as required (VHF or UHF not available). Pilot selectable if desired.



UHF (Telephony) – Available through the Cabin Communication System. Weather maps (graphical weather) could be routed to the airplane via this medium (optional growth path).

# **Data Link Features**

Flight Planning

- Requests flight plans from service provider
- Reports current flight plan to service provider

Enroute Winds Aloft

- Requests winds aloft for flight plan
- Report current wind at present position

Position Reporting (ICAO format)

- Send crew initiated position report
- Automatically send position report

Preflight Data Request

• ATIS, terminal weather, departure clearance, and oceanic clearance

In flight Communication

• 0001 reports, ETA update, diversion, fuel update, flight delay, and airplane problem report

Messages

• Send message, messages received

Text Weather

• Terminal, Sigmets, and Pireps

Graphical Weather Maps

• Composite, significant, tops/movement, depiction, satellite, and winds/temp aloft

Configure Data Link System

• VHF, SATCOM, telephone, display telelink configuration, discretes configuration, ARINC ports/devices configuration, and display telelink faults

The crew can access the DATALINK INDEX PAGE from the NAV INDEX page of the flight management system.









For additional system description and operation refer to the applicable manufacture handbook.

# SATCOM (IF INSTALLED)

The optional multichannel Satellite Communications (SATCOM) System is provided for worldwide voice and data communications over L-band frequencies.

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 to the Office In The Sky (OITS) telephone. The data channel is dedicated for either the Airborne Flight Information System (AFIS), or the OITS facsimile or modem.

The factory option of the MCS-6000 consists of a six-channel SATCOM system and antenna. Components include:

- Satellite data unit (forward avionics bay)
- High power amplifier (vertical stabilizer)
- Radio frequency unit (forward avionics bay)
- High gain antenna (top of vertical stabilizer)
- Cabin communication system interface via handset
- IRS
- Airborne data link system
- Maintenance system through CAIMS
- PC data and FAX capability

#### 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 Frequency Unit (RFU)

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



# High Power Amplifier (HPA)

The HPA 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.

# High Gain Antenna/Antenna Control Unit

The antenna is steered by the antenna control unit to point a high gain beam in the direction of the desired satellite.

# **Communication Link Schematic**

The following schematic depicts the interface between the various components as related to the MCS-6000, minus buyer furnished equipment. Example: PC data provision, FAX, and analog phones.





# CABIN COMMUNICATION SYSTEM (IF INSTALLED)

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

The digital radio components consist of: one UHF antenna, filtering device, and one airborne radio telecommunication unit. The CCS plus all customer supplied handsets/ FAXs/modems is known as the Office In The Sky (OITS).



The digital handset is located in the flight compartment and has a backlit LCD display and telephone style keypad used 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 manufacture handbook for description/function and operation of the system.



# FLIGHT COMPARTMENT PRINTER (IF INSTALLED)

The optional flight compartment printer is installed in the copilot's side console. The printer has ARINC 429 and standard PC interfaces and is capable of full format and graphic printing of information from CAIMS and DATALINK.



The printer can be used to print selected messages and weather data sent to it via the Airborne Data Link System (ADLS). The printer is also used by the Central Aircraft Information Maintenance System (CAIMS) to print out certain maintenance fault and status information. This is accomplished via the Portable Maintenance Access Terminal (PMAT).







#### PILOT TRAINING GUIDE

The PMAT can be used to generate an active fault report to the printer by operating the PRINT MAINT REPORT button located on the left forward bulkhead in the flight compartment.

The printer interfaces via a communication link to the Airborne Data Link System (ADLS) and a parallel interface from the PMAT.



PMAT

The printer pushbuttons provide the following functions:









#### COMMUNICATIONS

#### **EICAS MESSAGES**







#### COMMUNICATIONS

# **EMS CIRCUIT PROTECTION**



Μ



