



## **Installation Guide** **Exchange System**

### **1. GENERAL INFORMATION**

#### **1.1. INTRODUCTION**

1.1.1. This section contains information related to the physical, mechanical, and electrical characteristics and installation procedures of the EXCHANGE satellite communications system.

#### **1.2. EQUIPMENT DESCRIPTION**

1.2.1. The basic EXCHANGE system consists of a multi-channel repeater enclosure, two external antennas, two internal antennas, one master power switch, DC/RF cabling, and Iridium capable handsets.

1.2.2. The multi-channel system uses the Iridium satellite constellation for worldwide voice communications service.

1.2.3. Access to the constellation is controlled by means of an Iridium Commissioned Subscriber (SIM) Card.

1.2.4. This unit is compliant with DO160 – D requirements.

#### **1.3. EXCHANGE SPECIFICATIONS**

<b>ITEM</b>	<b>SPECIFICATION</b>
Rack System	ARINC 404
Height	7.6 in
Width	3.56 in
Depth	12.675 in
Weight	10.2 pounds (4.6 kg)
DC Power Requirements	+28 VDC
DC Power Consumption	63 watts
Temperature	-15 - +55 C
RF Connectors	N – Type (4)
Tx / Rx Frequency	1616 – 1626.5 MHz
Tx Power	5 watts ( +37 dBm)
DC Connector	Canon Plug, 4 pin, MS

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1.4. ANTENNA SPECIFICATIONS

ITEM	SPECIFICATION
Dimensions	
Height	0.60 in
Height with TNC Connector	1.31 in
Diameter	2.75 in
Weight	14 oz
Temperature	-55 - +85 C
Tx / Rx Frequency	1616 – 1626.5 MHz
VSWR	<2.0 : 1
Impedance	50 Ohms
Polarization	LHCP
Lightning	DC Grounded
Vibration	10 G
Connector	TNC female
Standards	DO-160C; MIL-STD-810, TSO C 129 a

1.4.1. The antenna must be placed at least 50 cm (20 in) away from GPS, TCAS, and INMARSAT antenna to prevent interference.

1.5. PHONE SPECIFICATIONS: MOTOROLA 9500

ITEM	SPECIFICATION
Dimensions	
Height	2.45 in
Width	2.69 in
Length	7.63 in
Weight	1 lb. (16 oz)
Standby Time	20 hours
Talk Time	2 Hours
Indicators	
Battery	
Low Battery	
Signal Strength	
Tx / Rx Frequency	1616 – 1626.5 MHz
Output Power	10 – 18 dBm (11 – 63 mW)
Range	0 – 150 ft

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- 1.5.1. The mobile phone can be used at any location throughout the aircraft.  
Interference with navigational and communication systems is not an issue.

## 2.0 EQUIPMENT INSTALLATION AND START-UP

### 2.1 HARDWARE INSTALLATION

- 2.1.1 Install the supplied antennas on an existing (exterior) penetration by the aircraft manufacturer. To avoid potential interference, a minimum distance of 50 cm (20 in) must be placed between Iridium and GPS, TCAS, and INMARSAT antennas.
- 2.1.2 **WARNING:** Installation of all hardware must be installed by a certified maintenance technician and follow all aircraft manufacturer's specifications for exterior/ interior modifications.
- 2.1.3 Select an appropriate slot in the electronic bay that will permanently house the EXCHANGE repeater. Access may be required to the rear panel. Bolt the EXCHANGE repeater in place.
- 2.1.4 Install the supplied coaxial antenna cables. Ensure all cables are secured as required. Ensure all RF/ DC connections are securely tightened.
- 2.1.5 Using a voltmeter, ensure the voltage supply is +28 VDC. Prepare a +28 VDC / 5.0 A power supply line to be connected with a 4 pin Canon Plug, MS connector. Connect the EXCHANGE repeater to the aircraft voltage source.
- 2.1.6 **CAUTION:** The power supply must include a circuit breaker (switch) that is installed in the cockpit. Civil aviation authorities require this action.

### 2.2 SIM CARD INSTALLATION

- 2.2.1 The EXCHANGE repeater does NOT require a SIM card. Authorized users employ dedicated SIM cards in their respective handsets
- 2.2.2 Authorized users are responsible for SIM card activation.

### 2.3 ELECTRICAL CONNECTIONS

- 2.3.1 **CAUTION:** Verify the power supply input voltage is +28 VDC prior to connecting the EXCHANGE repeater.
- 2.3.2 Connect the power supply 4 pin MS connector to the EXCHANGE.
- 2.3.3 Verify the cockpit power indicator is illuminated.

## 3.0 FUNCTIONAL TEST

- 3.1 Ensure aircraft is outside in an area where line-of-sight to satellites is attainable.

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3.2 Telephone Call Test

- 3.2.1 Ensure a valid SIM card is installed and has been activated.
- 3.2.2 Apply power to the EXCHANGE repeater by turning power switch to on in cockpit.
- 3.2.3 Turn on Iridium handset.
- 3.2.4 Verify the turn on procedure by referring to handset manual.
- 3.2.5 Place a phone call as instructed by handset manual.
  - 3.2.5.1 In Europe: "00<country code><area code><number>"
  - 3.2.5.2 In USA and Canada: "011<country code><area code><number>"
- 3.2.6 Once the number is dialed, verify communication with number dialed.
- 3.2.7 Inter-phone and conference call functions are also available. Refer to the handset manual.

4.0 **TROUBLESHOOTING**

- 4.1 Symptom: No signal at the handset, searching for signal, or unable to register.
  - 4.1.1 Ensure power is applied to the EXCHANGE repeater.
  - 4.1.2 Ensure handset meets range requirements.
  - 4.1.3 Ensure valid SIM card is being utilized.
  - 4.1.4 Ensure all antennas are free from line-of-sight obstructions.
  - 4.1.5 Last resort: Reset power to the EXCHANGE repeater.

5.0 **MAINTENANCE**

- 5.1 The EXCHANGE repeater operates maintenance free and does not require any routine maintenance
  - 5.1.1 Users are responsible for charging handsets and activating SIM cards.
- 5.2 Annual Inspection
  - 5.2.1 The EXCHANGE repeater should be inspected annually. The inspection should include, but not limited to:
    - Screws securely fastened
    - RF/ DC connectors tightened
    - EXCHANGE repeater is free from foreign debris
    - Antenna conditions

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6.0 **INTERFERENCE**

- 6.1 Laboratory and field testing has shown that the EXCHANGE repeater does not emit signals that may interfere with other on-board electronic equipment. All frequencies are significantly higher than standard ground to air (HF/ VHF/ UHF) communications.
- 6.2 Removing power to electronic devices can isolate suspected interference. A switch in the cockpit can turn off the EXCHANGE repeater remotely.

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