



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

ITEM	SPECIFICATION
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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