

# Telcosat Inc

OPERATION & MAINTENANCE MANUAL  
LTE CELLULAR REPEATER MODEL RPT 700



**DESIGNED AND MANUFACTURED IN CANADA**

**Any modifications to this device will void FCC and IC approvals.**

# Telcosat Inc

## **OPERATIONS & MAINTENANCE MANUAL CELLULAR REPEATER MODEL RPT700 (698-716MHz, 777-787Mhz)**

TELCOSAT RPT700

The information set forth in this document and all rights in and to inventions disclosed herein, and patents which might be granted thereon disclosing, employing or covering the materials, methods, techniques or apparatus described herein are the exclusive property of Telcosat Inc.

This document is an operation and maintenance manual. No disclosure or reproduction of the information or drawings shall be made of any other purpose without the prior written consent of Telcosat Inc. Use of the information contained herein to fabricate or assemble any item in whole or in part is expressly prohibited.

**Any modifications to this device will void FCC and IC approvals.**



### **FCC RULING**

**WARNING.** This is **NOT** a **CONSUMER** device. It is designed for installation by **FCC LICENSEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENCE** or express consent of an FCC Licensee to operate this device.

Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.



### **INDUSTRY CANADA RULING**

**WARNING:** This is **NOT** a **CONSUMER** device. It is designed for installation by an installer approved by an ISED licensee. You **MUST** have an **ISED LICENCE** (Industry Canada license to operate a cellular zone enhancer) or the express consent of an ISED licensee to operate this device.

A Canadian Company  
Telcosat Inc.  
116, 1919 – 27<sup>th</sup> Ave NE,  
Calgary, Alberta, Canada. T2E 7E4  
TEL (403) 291-4031  
FAX (403) 291-3059



## **SAFETY SUMMARY**



**High voltage is used in the operation of this equipment.  
Death on contact may result if personnel fail to observe the following safety precautions:**

- Only qualified trained personnel can install this equipment. Electrical connection and installation must meet your local Electrical Safety Installation codes.
- Prior to any maintenance or inspection of this device disconnect the power supply.
- Do not remove covers or access plates on the equipment unless you are a trained technician and authorized to carry adjustment and maintenance for this apparatus.
- When installing antennas always be aware of high voltage overhead power lines. Contact with power lines will result in severe injury and or death.
- To prevent electrical shock or damage to the equipment, do not operate the repeater until you thoroughly understand the operation and function of all controls, indicators, and connectors.
- The RPT700 Repeater weighs approximately 65 lbs / 28.5 Kilograms. The repeater must be attached to the appropriate supporting device using the welded supporting lugs on the enclosure. The nuts and bolts must be a minimum Grade 5, 1/4" (6mm) diameter and corrosion resistant.



## **FIRST AID**



### **In case of electrical shock:**

**THIS PERSON COULD STILL BE IN CONTACT WITH ELECTRICAL POWER. DO NOT TOUCH THIS PERSON BEFORE YOU INSULATE YOUR SELF FROM THE ELECTRICAL SOURCE.**

- Turn off the electrical power.
- If you cannot turn off the electrical power, pull, push, or lift the person to safety using a dry wooden pole, a dry rope, or some other insulating material. Do not use any metallic objects to move this person.
- After the injured person is no longer in contact with the electrical source, obtain/perform immediate medical attention.

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# 1. CHAPTER 1

## 1.1 TERMINOLOGY

Throughout this manual, the terms DOWNLINK and UPLINK are used.

Downlink is the direction of RF energy from the Cell Tower (Donor) to the Cell Phone.

Uplink is the path direction from the Cell Phone to the Donor Cell Tower.

Cell phone signal booster is used synonymously with cell phone repeater and cell phone extender.

## 1.2 GENERAL

The TELCOSAT RPT700 Cellular Repeater, comprises UPLINK and DOWNLINK bidirectional modules that will enable the extension of cell phone signal coverage. This manual, containing operational and maintenance information, comprises four chapters and two appendices as follows:

- Chapter 1 outlines the manual contents, with description and general application notes
- Chapter 2 contains an operational overview and tune-up procedures (single and multi carrier).
- Chapter 3 contains installation procedures, packing and shipping instructions.
- Chapter 4 contains the repeater warranty information
- Appendix A contains equipment specifications and environmental data.
- Appendix B contains the return goods procedure.

## 1.3 INTRODUCTION

The TELCOSAT RPT700 is a bidirectional system comprising UPLINK and DOWNLINK modules. It is used in locations that require cell phone signal coverage, and where conventional communication systems cannot reach. Typically such locations include buildings, parking structures, tunnels and remote areas.

The TELCOSAT RPT700 has been designed using highly reliable high quality components.

Adjustable RF Gain is provided in each direction of communication (donor to cell phone and cell phone to donor) to compensate for losses through over-the-air links.

The RPT 700 has Digital control to prevent the repeater exceeding the certified Maximum RF transmit power.

### **1.3.1 Materials**

The only other materials supplied as standard by the manufacturer of the Repeater are this user manual.

### **1.3.2 Applications**

The RPT700 cellular repeater can be used as part of a complete in building package or as a stand-alone cell phone signal booster or extender in remote areas.

## ***1.4 RPT700 SPECIFICATIONS***

Appendix A contains the TELCOSAT RPT700 Repeater Specifications.

## ***1.5 TECHNICAL ASSISTANCE***

Technical assistance on the TELCOSAT RPT700 Repeater is available through:

TELCOSAT Customer Service Center  
Phone: 1-403-291-4031  
Fax: 1-403-291-3059

## 2. CHAPTER 2

### 2.1 OPERATIONAL OVERVIEW

#### 2.1.1 GENERAL

The TELCOSAT RPT700 is available as a dual band or single band unit. The single band version is available in two Uplink bands;

- UL Band 12 covering 698MHz – 716MHz,
- UL Band 13 covering 776MHz – 787MHz.

The Dual band version covers DownLink bands 12 and 13 from 728Mhz –746Mhz and 746Mhz – 756Mhz..

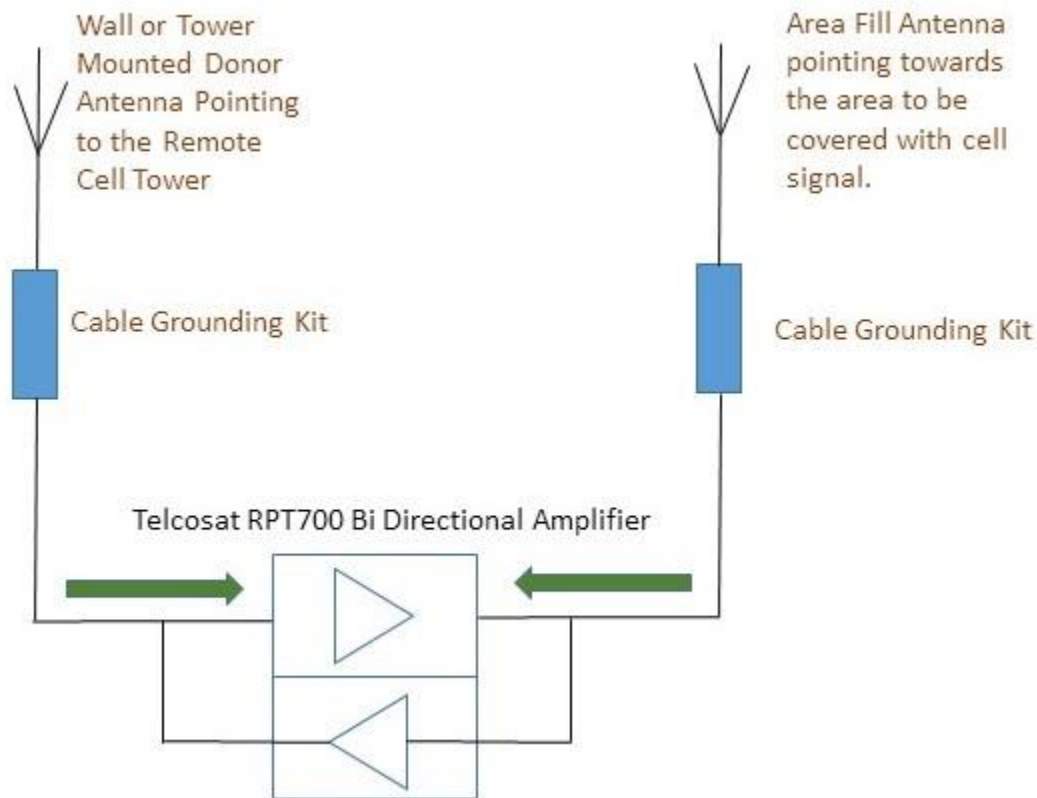


Figure 1 Simplified functional block diagram installation for a remote site

Figure 1 shows a typical minimum functional block diagram installation for a remote site.



### **Downlink Signal From the Remote Cell Tower to the Cell Phones**

Downlink RF signals from a donor cell site are received by the pick-up antenna connected to the repeater. This signal is then passed through a Diplexer. The RF output from the diplexer is then passed through a signal filter chain to reject out-of-band Inter Modulation products and unwanted radio signals. The cleaned signal is finally amplified in the down link amplifier module and injected into the area fill antenna for full-area coverage.

### **Uplink Signal from the Cell Phones to the Cell Tower**

The Up-link signals from cell phones are received at the area fill antenna of the repeater. The incoming signal then passes through a Diplexer. The RF output of the diplexer is then passed through a filter chain to remove unwanted signals. The RF output of the filter chain and is then amplified in the Up-link power amplifier.

## **2.1.2 RPT 700 Functional Description**

The Up-link RF path is isolated from the Down-link RF path by utilizing Cavity Band Pass Diplexers and Saw Band-pass filters (BPF) which provide out-of-band rejection.

### **Downlink Signal Path**

An RF signal from the remote cell tower is picked up by a donor antenna connected to the RPT700 “N” Type donor antenna port. The signal passes through a multiplexer and then into a Phase Lock Loop (PLL) controller where unwanted signals are removed. The cleaned RF signal leaves the PLL and is amplified by an onboard Power Amplifier. The amplified RF signal then passes through another multiplexer and out to the area fill antenna via an “N” Type connector port on the RPT700. A suitable antenna connected to Area Fill port then broadcasts the amplified signal around the local area site and the cell phones.

### **Uplink Signal Path**

An RF signal from the local cell phone(s) is picked up by the area fill antenna connected to the RPT700 “N” Type area fill antenna port. The signal passes through a multiplexer. For a dual band system the multiplexer isolates the two frequency bands, band 12 and band 13 and each band is passed to separate PLL’s according to the specific frequency band. After the PLL has removed any unwanted signals the cleaned RF signal is amplified by an onboard frequency dependent Power Amplifier. The amplified RF signal then passes through another multiplexer and out to the Donor antenna via an “N” Type connector port on the RPT700. A suitable antenna connected to Donor port then broadcasts the amplified signal back to the remote cell tower.

### **2.1.3 USER CONFIGURATION**

The RPT700 does not provide the ability for a user to make changes to the radio frequency, the radio bandpass, change the mode of operation, changes to the maximum R.F. power, or being able to modify the repeater in any way that will affect the designed and certified operation. Prevention control is managed by the use of factory preset cavity filters, maximum RF transmit power is digitally controlled and factory calibrated only. Any such changes are only able to be made by the factory.

The only user controlled variable is the ability to manually change the RF gain via the external toggle switches. Maximum RF Power is digitally controlled to a maximum of one Watt. The digital control will not allow an increase of RF Power over one Watt irrespective of the user adjustments.

The RPT700 contains no user replaceable parts and requires no additional calibration once installed.

### **2.1.4 AC POWER DISTRIBUTION**

AC input power is through a power cord then a 2-pole on/off circuit breaker switch which feeds two DIN rail mounted fuse holders with cartridge fuses rated at 5 AMP and 5 AMPS. The fuses are replaceable and each DIN rail fuse holder holds a spare fuse. AC power from the DIN rail fuse holders feed two DIN rail switching power supply units. The power supply units are adjustable to operate on either 220 VAC or 240VAC. (Customer to notify Telcosat Inc with AC power requirement prior to shipping)

The internal power supply units convert AC line voltage to DC power, one power supply unit supplies 10volts DC and the other power supply unit provides 28volts DC. The DC power provides all the necessary requirements for the active components.

## 3. CHAPTER 3

### 3.1 INSTALLATION

**Any modifications to this device will void FCC and IC approvals.**

#### **DETAILED SET UP INSTRUCTIONS FOR YOUR RPT700 CELLULAR REPEATER.**

### **READ THESE INSTRUCTIONS PRIOR TO INSTALLATION**

### 3.2 WARNINGS



**DO NOT POWER UP THE REPEATER WITH OUT THE ANTENNAS CONNECTED**



THIS IS NOT A CONSUMER PRODUCT. THIS IS A COMMERCIAL PRODUCT THAT MUST BE INSTALLED AND OPERATED BY TRAINED AND QUALIFIED PERSONNEL.

OPERATION OF THIS PRODUCT REQUIRES NOTIFICATION AND APPROVAL FROM YOUR CELLULAR SERVICE PROVIDER.

BEFORE USE, you MUST REGISTER THIS DEVICE with your wireless provider and have your provider's consent. If you are unsure, contact your provider. You MUST operate this device with approved antennas and cables as specified by the manufacturer. Antennas MUST be installed at least 22 cm (8.7 inches) from (i.e., MUST NOT be installed within 22 cm of) any person. You MUST cease operating this device immediately if requested by the FCC (or ISED in Canada) or any licensed wireless service provider

Cellular Repeaters should be installed by fully trained technicians. Improper installation and excessive RF power levels can cause interference with the operation of cellular towers. Antennas must be mounted in a secure safe manner and according to safe working practices. Lightning protection is recommend and should be installed on every cellular repeater unit. Antennas must not be installed near overhead electrical power lines as this can cause serious injury and or death.

If you require any additional installation guidelines then please consult your supplier or consult with an RF Systems Engineer.

### **3.3 TOOLS REQUIRED**

Spectrum analyzer with a tracking generator, frequency ranges 1 Gigahertz.  
Optional Signal Generator for onsite testing of the repeater, frequency range of 4 Gigahertz.  
Hand held cable fault locator (TDR)  
Multi-meter  
Hand tools.  
Water proofing tape.  
Coax cable straps for support.  
Cellular Phone.

### **3.4 ANTENNA REQUIREMENTS**



#### **WARNING**

**Maximum antenna gain connected to this device is 14dB or lower. DO NOT EXCEED THIS REQUIREMENT.**

**ANTENNAS: please read your manufacturers antenna specifications before installation. Your antenna will require a type “N” connection. The antenna, coax, and fittings must be 50 ohms impedance.**

The cellular repeater requires antennas that operate in the desired frequency range of the cellular repeater. The RPT700 Dual Band Repeater has a frequency operating range covering 698 to 787 Megahertz for the up- link, and 728 to 756 Megahertz for the downlink. Your antennas must operate within these frequencies.

Failure to select the proper antennas will greatly degrade the performance of your repeater.

The repeater requires two antennas to be connected to the system. See figure 3 below showing coax connectors on the bottom of the repeater enclosure.

The Donor antenna is the antenna pointing to the Cellular Tower and the Area Fill antenna is the antenna that provides the fill signal to your desired area.



*Figure 2 Location of the N Type Connectors for the Antennas*

### **3.5 ANTENNA ISOLATION & COAX CABLES**

All repeaters require antenna isolation (separation) to prevent the signal from one antenna directly feeding into the other antenna. If this occurs it is called “oscillation” and your repeater will not work. The usable gain of your repeater is directly linked to the antenna isolation.

Due to the variations of system layouts and requirements it is not possible to have one procedure that will suffice every installation. Therefore, we strongly advise that you acquire the services of an RF system designer to calculate your antenna isolation requirements, or contact Telcosat and we will determine the antenna isolation requirements that are unique to your installation.

In summary, ensure that your antennas are at the maximum possible distance apart, and where possible facing away from each other. Under no circumstances should you place antennas in close proximity to each other.

Coax cables should be low loss 50 ohm, and suitable for the 700 megahertz band frequency.

Antenna connections should be clean and moisture free.

Do not spray lubricant into the connectors as this prevents the signal traveling through the coax.

Use a cleaning solvent that has no oil and does not leave any residue. High quality oil-less contact cleaner is suitable.

All coax connectors must be water tight and wrapped with water proof tape. Any moisture in the connectors will degrade or eliminate the signals.

### **3.6 PREPARING YOUR CELLULAR REPEATER**

#### **3.6.1 Installing your Repeater**

The Telcosat Repeater weighs in excess of 65 pounds (28.5 Kilograms)

Make sure that your repeater is securely bolted to a suitable support. There are four welded steel tabs on each corner that must be used to bolt your unit onto a suitable support system. You must use ¼” diameter grade five steel corrosion resistant bolts with lock washers and securing nuts, a total of 4 bolts and nuts/lock washers are required.



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*Figure 3 Antenna Connection Points*

Only when you have safely connected and installed your antennas and coax then proceed to the next step.  
**DO NOT CONNECT TO THE POWER SUPPLY.**



### 3.7 POWER AND ANTENUATION SWITCH SETTINGS



*Figure 4 RPT700 Dual Band Front Panel*

For the RPT700 Dual Band Repeater open the door on the Repeater and you will see three modules with a row of switches on each module

The left side Module is marked “Uplink to Cell Tower” and below that is a frequency range. This module controls the power level that will be transmitted back to the cellular tower for the stated frequency range.

The middle module is marked “Downlink to Area Fill” and below that is a frequency range. This module controls the power level to the area you want covered by cell phone signal.

The right side Module is also marked “Uplink to Cell Tower” and below that is a different frequency range. This module controls the power level that will be transmitted back to the cellular tower for the stated frequency range.



Each module has five switches. Each switch has numbers engraved below them. Above the switches the word “Attenuate” is engraved into the module.

When the switches are in the up position, towards the word Attenuate, the signal levels are reduced. (Attenuate means to reduce the signal level). To increase power you toggle the switch down.

The numbers below the switches are calibrated in dBm. For instance, the switch numbered 20 means that if the switch is toggled up, Attenuate, then the signal is reduced by 20 dBm. If the same switch is toggled down then the transmit power is increased by 20dBm. This same process applies all three modules.

### **3.8 RSSI METER AND SIGNAL LEVELS**

Your Repeater is fitted with a Receive Signal Strength Indicator (RSSI). The RSSI indicator is located just above the row of attenuator switches and is displayed as green LED's.

(NOTE: THE RSSI INDICATOR DISPLAYS RECEIVE SIGNAL STRENGTH ONLY. THEY DO NOT DISPLAY TRANSMIT POWER.)

The RSSI indicator has a dynamic range of -80 dBm to – 65dBm.

The green LED's display will start to illuminate when a signal strength of -80dBm or greater is received. When aligning your antenna to the cellular tower the RSSI meter must be monitored during setup. When you rotate your antenna you will see the RSSI indicator increase and decrease as you pass the signal with your antenna.

### **3.9 ALIGNING YOUR DONOR ANTENNA TO A CELLULAR TOWER**

**It is very important not to have too much signal from the cellular tower on the “Area Fill” input signal. Full bars on the middle module green LED RSSI display indicates possible signal excess.**

Rotate your antenna until you pick up a cellular signal from a Cell tower. If the signal strength is greater than -80dBm then the LED window on one or both of the Uplink modules side will start to illuminate. Adjust the antenna until the received signal is peaked. Check to see that the green LED display is not more than about 80% illuminated. If you have 100% solid green lights on the centre RSSI display window then you must reduce the receive signal level.

You can reduce the received signal level two ways.

- 1) Replace your Donor antenna with a lesser gain antenna.
- 2) If your system design will permit, slightly rotate the antenna away from the maximum signal until the RSSI window reads about 98% of maximum display level.

After adjusting the receive signal levels from the Cellular Tower we now adjust the power levels for the area fill. (Down-Link Signal)

For the next step you can use your cellular phone signal level indicator or preferably a spectrum analyzer. Toggle down the area fill switches in 2dBm steps until the desired power levels have been obtained.

### **3.10 ADJUSTING UP-LINK TRANSMIT POWER TO CELLULAR TOWER**

**It is important to only use the minimum required power level for the Up-Link transmit power. The required power level can be provided from a RF Systems Engineer or appropriate RF Path Loss computer software. Contact Telcosat Inc for more details about our RF Path Loss profiling tool.**

CONNECT A SPECTRUM ANALYZER OR AN RF POWER METER TO MEASURE MAXIMUM TRANSMIT POWER FOR THE UPLINK AND DOWN LINK CARRIER.

Make a test call while the repeater is adjusted to the minimum gain on the appropriate Uplink Frequency.

When making the test call on your cellular phone you must be a minimum of 30 metres (100ft) from the area fill antenna.

If you cannot complete the call increase power in 2 dBm increments. Make a test call after every adjustment.

**NOTE: YOUR REPEATER HAS THE CAPABILITY TO BOOST SIGNALS FROM AS LOW AS -104dBm. THIS IS BELOW THE RANGE OF YOUR RSSI INDICATOR. USE A SPECTRUM ANALYZER TO LOCATE YOUR SIGNAL**

**If you find that you cannot detect any cellular signals using the RSSI indicator then you must use an alternative method to locate the signal.**

If you fail to locate a signal then you have the following possibilities.

- 1) There is no cellular service.
- 2) Faulty coax, connectors or antenna.
- 3) Insufficient antenna separation, (vertical separation/ horizontal separation)
- 4) Aimed to a competitor's cell tower which does not service your cellular phone. This may show full power on your cellular phone but will not connect to the service.

### **3.11 CALIBRATION and TUNING**

Your BDA, during the manufacturing process, is tested and measured to meet the required performance standards. There are no tune up procedures required for this BDA.

Your repeater requires no further field testing or measurement.

Your repeater contains no user replaceable parts and must be returned to the factory for repair.

FOR TECHNICAL ASSISTANCE INSTALLING YOUR REPEATER PLEASE CONTACT:

Telcosat Inc,  
Calgary, Alberta,  
Canada.

T2E 7E4

403 291 4031

Fax 403 291 3059

Website: [www.telcosat.com](http://www.telcosat.com)

NOTE: Local time, Mountain Time. (-7 GMT)

## 4. CHAPTER 4

### 4.1 WARRANTY AND REPAIR

#### 4.1.1 WARRANTY

Your Telcosat Repeater is guaranteed against manufacturers defects for 2 years. Telcosat Inc retains the right to decide if the fault/defect is a manufacturer's defect. Telcosat Inc will not accept liability for any damage caused through improper use or poor installation practices.

#### 4.1.2 Limited Warranty

**Hardware.** Telcosat Inc, or any subsidiary selling the Product (RPT700 Cellular Repeater) warrants that commencing from the date of shipment for a period of 2 years factory warranty against manufactures defect. Warranty includes parts and labour.

Note, freight is not included in the warranty. Shipper is liable for all freight costs.

Telcosat Inc reserve the right to determine if repair claims are Warranty, or damage is caused by some other reason, for example and not limiting to, lightning strikes etc.,.

**EXCEPT AS SPECIFIED IN THIS WARRANTY, ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS, AND WARRANTIES INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, SATISFACTORY QUALITY, NON-INTERFERENCE, ACCURACY OF INFORMATIONAL CONTENT, OR ARISING FROM A COURSE OF DEALING, LAW, USAGE, OR TRADE PRACTICE, ARE HEREBY EXCLUDED TO THE EXTENT ALLOWED BY APPLICABLE LAW AND ARE EXPRESSLY DISCLAIMED BY TELCOSAT INC, ITS SUPPLIERS AND LICENSORS. TO THE EXTENT AN IMPLIED WARRANTY CANNOT BE EXCLUDED, SUCH WARRANTY IS LIMITED IN DURATION TO THE EXPRESS WARRANTY PERIOD. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, THE ABOVE LIMITATION MAY NOT APPLY. THIS WARRANTY GIVES CUSTOMER SPECIFIC LEGAL RIGHTS, AND CUSTOMER MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.**

This disclaimer and exclusion shall apply even if the express warranty set forth above fails of its essential purpose.

**Restrictions.** This warranty does not apply if the Product or any other equipment upon which the Product is authorized to be used (a) has been altered, except by Telcosat Inc, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Telcosat Inc, (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, accidents forces of nature, earthquakes, lightning strikes, vandalism, and civil unrest.

## 5. CHAPTER 5.

### 5.1 *Storage of Equipment*

When storing your equipment you must place the unit in a dry location, away from direct sun exposure and take measures to prevent moisture/condensation build up in your repeater enclosure.

Silica Gel bags should be placed inside the enclosure to absorb moisture. The door on the enclosure should be closed and sealed with weather proof tape to ensure an air tight enclosure.

The silica gel bags should be changed /inspected at regular intervals to ensure proper functionality of the material.

You are strongly advised to seek the advice of a professional company that has expertise in long term preservation techniques of electronic equipment.

Maximum storage temperatures of your Telcosat Repeater is +60c (122F)

Minimum storage temperature of your Telcosat Repeater is -40c (-40F)

## 6. APPENDIX A

### 6.1 TECHNICAL SPECIFICATIONS

**Specifications for the Telcosat Repeater system LTE Model RPT700**

Frequency Uplink	698-716MHz , 777-787Mhz
Gain Uplink	95dB
Gain step Uplink	2dB
Nominal Power Uplink	30dB
Frequency Down Link	728-746Mhz, 746-756Mhz
Gain Down Link	95dB
Gain Step Downlink	2dB
Nominal Power Downlink	30dB
Input /Output Impedance	Z= 50 ohms
Manual Gain adjustment Range	50dB
Noise Figure	≤ 3.7dB
Power Supply:	100Watts. 110/240 AC
Operating Temperature	-20 to+50 C
RF Connectors:	N- Female
Mechanical Specifications:	Size: H 18"W 16.5" D 12" , 45 x 40.64 x 30.48 cm
Weight:	68 pounds/ 28.5Kg typical
Enclosure type:	NEMA 4A, 12

*Table 1 RPT 700 Technical Specifications*

#### FCC/IC RF Exposure Requirements

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 72.5 cm (28.75 inches) from all persons, and must not be co-located or operating in conjunction with any other antenna or transmitter.

**Any modifications to this device will void FCC and IC approvals**

## 7. APPENDIX B

### 7.1 RETURNED GOODS PROCEDURE

#### 7.1.1 Technical Information

Contact Telcosat Inc or your supplier to determine whether or not an item should be returned for repair. Contact Telcosat Inc 403 291 4031 or email, (Go to [www.telcosat.com](http://www.telcosat.com) for email link.)

#### 7.1.2 Return Identification

Please provide the following information with each repair.

1. Date of requested repairs.
2. Customer name with full address for returning goods
3. Contact person responsible for returning the product for repairs
4. Client telephone number
5. Serial number (serial number is located on the exterior heat sink)
6. Original purchase date
7. Reason for return.

#### 7.1.3 Shipping Procedure

Ship all returned goods PREPAID to the following address:  
Product Repairs,  
Telcosat Inc,  
Bay 116 1919 – 27<sup>th</sup> Avenue NE,  
Calgary, Alberta,  
Canada. T2E 7E4  
Telephone 403 291 4031  
Fax 403 291 3059

Your commercial invoice must state REPAIR/RETURN. Failure to provide proper Commercial Invoices may result in taxes and duties which will be charged back to the client.

#### 7.1.4 Return Shipments

All returned shipments will be sent PREPAID, to the customer's indicated address. Any extra packaging material will be charged back to the client.

### **7.1.5 Repair / Return Status**

Under normal circumstances defective items will be replaced repaired within 5 working business days of receipt.

Telcosat Inc will inspect and test your repeater in a lab environment. Upon completion of the inspection a written estimate will be provided to the client. A minimum charge of \$500.00 will be charged to the client to cover the cost of inspection and testing plus minor repairs.