

# Crestron **SRD-ANT-4-PAK** Antenna System

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## Installation Guide



This document was prepared and written by the Technical Documentation department at:



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### **Important Safety Instructions**

- **Read and Retain Instructions** – Read all Instructions before operating equipment and save for future reference.
- **Outdoor Antenna Grounding** – The antenna and coaxial cable connecting to the unit should be properly grounded to provide protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code (NEC), ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
- **Power Lines** – An outside antenna system should not be located in the vicinity of overhead power lines or electric light or power circuits, or where they can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits, as contact with them might be fatal.

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# Antenna System: SRD-ANT-4-PAK

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## Introduction

The SRD-ANT-4-PAK is a high quality outdoor antenna system designed for use with up to four Crestron® XM or SIRIUS® satellite radio tuners. The inclusion of an SRD-SPL-4 Four-Way Amplified Splitter enables distribution of the antenna signal to four separate tuners while allowing the antenna to be positioned up to 200 feet (cable length) from the tuners using standard RG-6 cable (not included).

The antenna features a considerably narrower beam width compared to standard consumer antennas, achieving superior gain and multi-path rejection. Additional front end filtering provides excellent rejection to nearby out-of-band RF signals from sources such as Wi-Fi, cellular telephones, and cordless telephones.

A wall mount bracket with elevation and azimuth adjustments is provided for installation of the antenna to any horizontal or vertical flat surface. The additional U-bolt and saddle enable mounting to a pole (not included) up to two inches in diameter. Connections between the antenna and splitter are achieved using industry standard RG-6 cable and F-type connectors (not supplied).

Four 3-foot F-to-SMB adapter cables are included for connecting each tuner to the splitter outputs. If needed, standard RG-6 cable with male F-connectors (not supplied) may be used to extend the output cable lengths up to 70 feet from each individual splitter output to the tuners. Adding an SRD-AMP-1 line amplifier (sold separately) at the input of the splitter will enable longer output cable lengths of up to 200 feet each.

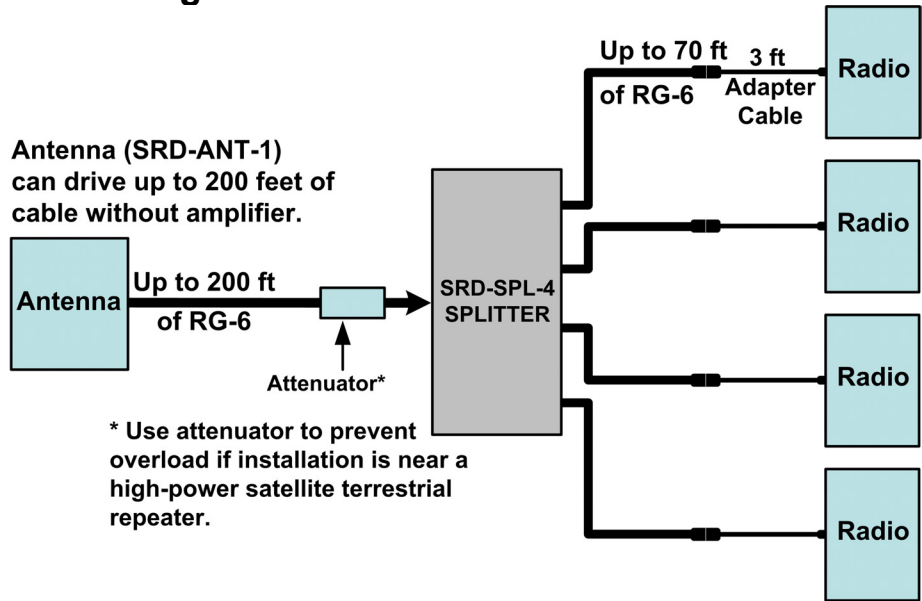
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**NOTE:** Unused splitter outputs do not have to be terminated for proper operation.

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A 20 dB power passing attenuator is also included for use in preventing overload of the splitter input in any installation that is located near a high power satellite radio terrestrial repeater.

### Block Diagram



**NOTE:** In this typical layout example, the sum total of all the cable segments between the antenna output and the most distant radio should not exceed 275 feet.

### Specifications

Following are specifications for the SRD-ANT-4-PAK.

#### SRD-ANT-4-PAK Specifications

SPECIFICATION	DETAILS
Antenna	
Gain	12dBi (Typical)
Polarization	Left hand circular
Output connector	F-female
Wind resistance	Up to 100 MPH
Splitter	
Gain at 2.335 GHz	8 dB min
Max noise figure	3 dB
Max input signal	-10 dBm <sup>1</sup>
Current consumption	40 – 100 milliamps
DC power passing	all ports (diode protected)
DC voltage drop (output to input)	0.5 VDC typical
Environmental Temperature	-40° to 150°F (-40° to 66°C)
Humidity	0% to 98% RH (non-condensing)

(Continued on following page)

*SRD-ANT-4-PAK Specifications (Continued)*

SPECIFICATION	DETAILS
Overall Dimensions	
Antenna	
Height	7.75 in (19.69 cm)
Width	7.75 in (19.69 cm)
Depth	1.19 in (3.03 cm) <sup>2</sup>
Wall Mount <sup>3</sup>	
Height	5.38 in (13.67 cm)
Width	3.38 in (8.59 cm)
Length	11.63 in (29.54 cm)
Splitter	
Height	0.88 in (2.24 cm)
Width	3.75 in (9.53 cm)
Length	2.83 in (7.19 cm)
Weight	2.6 lbs (1.2 Kg)

1. Specification is achieved with supplied 20 dB attenuator.
2. Depth is measured from the interface connector to the high point of the convex antenna cover.
3. Wall mount dimensions include the antenna mounting bracket.

**Included Items**

The items included in the SRD-ANT-4-PAK are listed in the following table and illustrated on the following page.

*SRD-ANT-4-PAK Included Items*

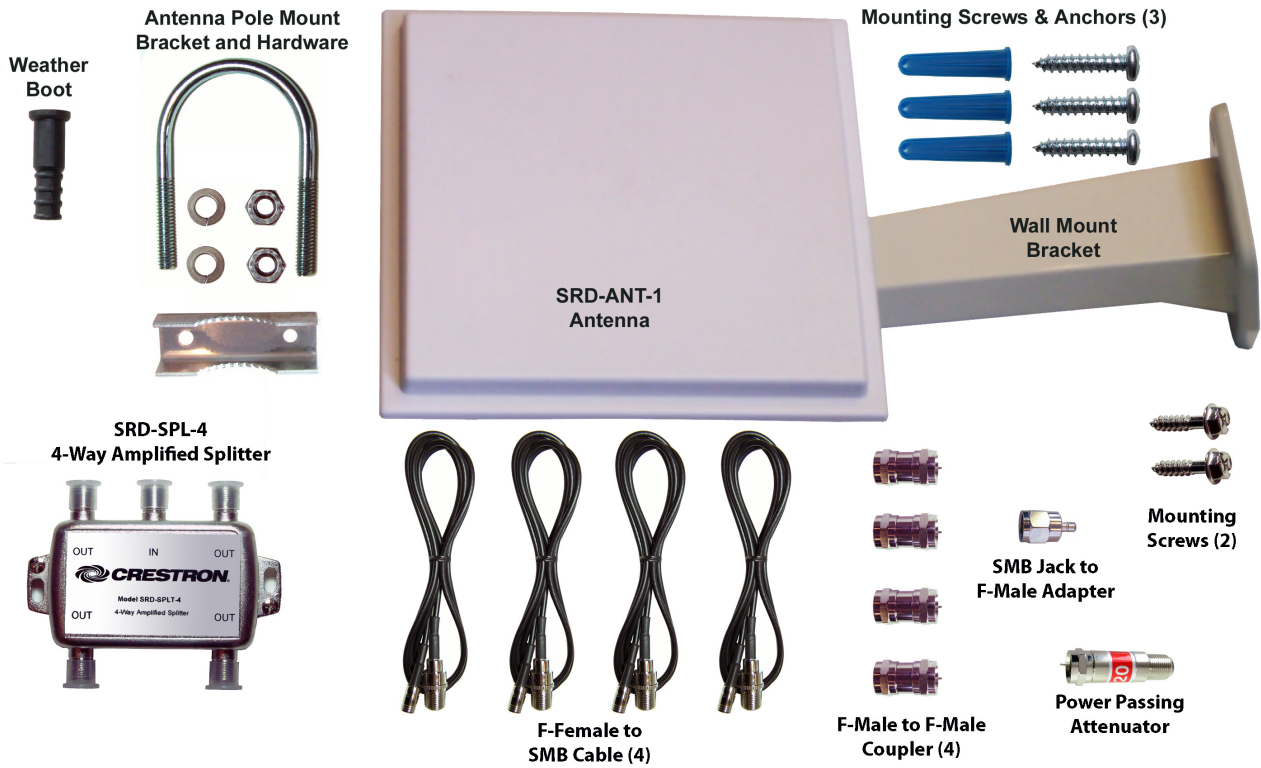
DESCRIPTION	PART NUMBER	QTY
Satellite Radio Antenna	SRD-ANT-1	1
Wall Mount Bracket	2021597	1
Pole Mount Saddle	2021596	1
Mounting Screws and Hardware Package	4506257	1
Weather Boot	2021595	1
Four-way Amplified Splitter	SRD-SPL-4	1

The items included with the SRD-SPL-4 are listed in the following table and are also illustrated on the following page.

*SRD-SPL-4 Kit Included Items*

DESCRIPTION	PART NUMBER	QTY
4-Way Splitter w/Mounting Screws	2021578	1
F-female to SMB-plug, 3 ft cables	2021515	4
F-male to F-male Coupler	2021526	4
20 dB Power Passing Attenuator	2021580	1
SMB-jack to F-male Adapter	2021579	1

*SRD-ANT-4-PAK and SRD-SPL-4 Included Items*



**Industry Compliance**

As of the date of manufacture, the SRD-ANT-4-PAK has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.





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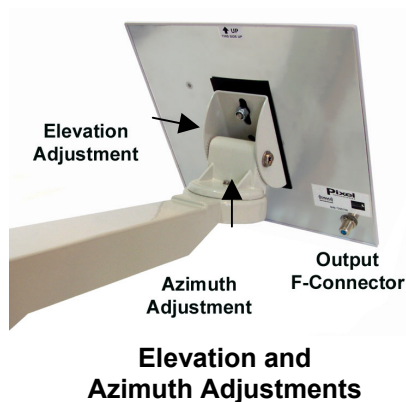
## Installation

### Installation Notes

- Mount the antenna outdoors with the supplied wall mount or pole mount accessories. Installation indoors or behind windows is not recommended. Windowpanes can have tinted coatings that can attenuate the signal. The attenuation of these coatings can vary greatly as a function of temperature.
- Use the radio's signal strength display as a guide to adjust the antenna for peak satellite signal reception.
- This antenna kit is designed to drive up to 200 feet of RG-6 cable with no signal loss. For longer cable runs, use in-line amplifier(s) SRD-AMP-1 (purchased separately) to boost the signal.
- Although this antenna can receive signals from terrestrial repeaters, it is recommended to always use the satellite signals for primary reception at fixed sites. The satellite signals are much more stable and are not affected by many uncontrolled variables that can impact reception signal quality greatly over time.

### Wall Mounting

Attach the wall mount assembly to a flat surface. Use the supplied screws to secure the mount in the position desired (use of the included anchors requires 5/16" holes).

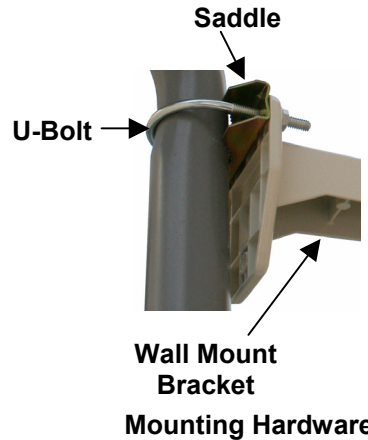


## Pole Mounting

Attach the antenna to any pole (not larger than two inches in diameter) using the U-bolt and saddle with supplied attaching hardware as shown in the following figures.



**2" DirecTV Pole**



**Mounting Hardware**



**1 3/4" Dish Network Pole**

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**NOTE:** For operation in close proximity to high power satellite radio terrestrial repeaters, please use the supplied 20 dB attenuator on the input of the splitter to avoid amplifier overload. Otherwise this attenuator is not required.

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## Hookup

After the antenna is mounted, refer to the diagram on page 2, connect cables, attach the splitter, adjust the antenna position, and finalize the installation as follows:

1. Attach the RG-6 cable from the antenna to the splitter port labeled **IN**.
2. Attach an RG-6 cable from one of the **OUT** ports and route the cable to the radio. (If the radio is located by the splitter, you can use the included F-male splice).

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**NOTE:** For best results in all configurations, use quad-shielded RG-6 cable whenever possible.

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3. Using the supplied 3-foot F-Female to SMB adapter cable, connect the RG-6 coaxial cable from the antenna to the radio's antenna input.
4. Adjust the azimuth and elevation pointing of the antenna for best reception using the antenna signal strength menu in the radio. The antenna has a beam width of  $\pm 25^\circ$ , which is narrower than standard consumer-quality home-kit antennas, but provides higher gain and rejection to multi-path interference.

The "Appendix", which starts on page 10, lists exact magnetic azimuth bearings and elevation pointing angles for many major cities throughout the US and Canada.

5. Tighten all hardware and seal the outdoor connectors using the included weather boot or other means to prevent moisture ingress.

### Aiming the Antenna

Refer to the documentation supplied with the tuner/radio for information on observing signal strength. Adjust the antenna as required to maximize the signal.

#### ***XM Reception***

XM has two satellites located in fixed orbital positions in the southern sky (at 115° W longitude and 85° W longitude). These satellites each carry all of the XM channels, so it is only required to have an un-obscured line-of-sight to one of these orbital locations.

Initially set up the antenna with its orientation approximately due south, at an up elevation angle of approximately 45°. Use this as the starting spot and peak the signal reception for maximum on one of the XM satellites using the antenna alignment menu in the radio. The “Appendix” lists exact magnetic azimuth bearings and elevation pointing angles for many major cities throughout the US and Canada.

#### ***SIRIUS Reception***

SIRIUS has three satellites in elliptical orbits that are constantly moving over the earth in a “figure 8”. These orbits are arranged so that two satellites are always in view at any point in time at relatively high elevation angles (from + 45° to almost 90°) in the sky. Your antenna should be aimed at the “cross-over point” of the “figure 8”, or about 96.5° West Longitude and 46° North Latitude.

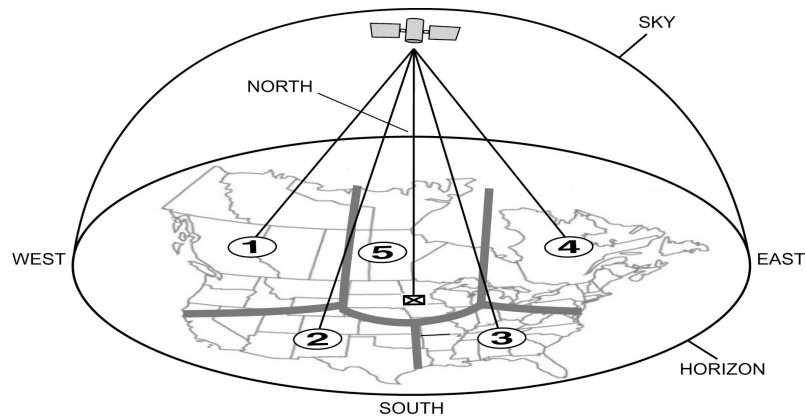
The table and figure below provide relative azimuth pointing guidelines for the United States and Canada. Your antenna should be aimed for the “X” in the figure. The “Appendix” lists exact magnetic azimuth bearings and elevation pointing angles for many major cities throughout the US and Canada. Since the satellites’ positions are constantly changing, signal strength will vary somewhat at different times of the day.

#### ***SIRIUS Antenna Aiming Guidelines***

AREA*	ANTENNA AIMING DIRECTION NORTH AMERICA
AREA 1	Aim the antenna EAST, NORTHEAST, or SOUTHEAST
AREA 2	Aim the antenna NORTH or NORTHEAST
AREA 3	Aim the antenna NORTH or NORTHWEST
AREA 4	Aim the antenna WEST or NORTHWEST
AREA 5	Aim the antenna STRAIGHT UP at the sky

\* Refer to the following illustration for approximate area definitions.

***SIRIUS Antenna Aiming Areas, North America***



## Problem Solving

### Troubleshooting

The table after this paragraph provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

#### *SRD-ANT-4-PAK Installation Troubleshooting*

TROUBLE	POSSIBLE CAUSES	CORRECTIVE ACTION
No signal reception. Radio display shows: "Antenna Disconnected", or "Acquiring Signal"  "Check Antenna" or "No Signal"	Short circuits or discontinuities	With radio on and all antenna cables connected at the radio, check for 4 - 7 VDC at antenna end of cable.
		With radio on and all antenna cables connected at the radio, check for AC voltage at antenna end of cable; should be < 1 VAC. If AC voltage is found, check for ground loops.
	Antenna is connected properly but signal is too weak for reception.	Ensure proper cable type and length(s) per the illustration on page 2.
		Ensure amplifiers are oriented properly with the output (marked with an arrow labeled <b>Radio</b> ) oriented towards the radio.
		Refer to the instructions supplied with the antenna to ensure the antenna is pointed accurately.
Limited reception or channels available for XM and/or SIRIUS tuners.	Problem with tuner card.	Ensure that the tuner card is registered/activated.

### Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876].

You can also log onto the online help section of the Crestron website ([www.crestron.com/onlinehelp](http://www.crestron.com/onlinehelp)) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

### **Future Updates**

As Crestron improves functions, adds new features and extends the capabilities of the SRD-ANT-4-PAK, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an “Addendum” in the Download column.

## Appendix: Azimuth and Elevation Pointing Guide

The following chart shows the optimum azimuth bearing and elevation pointing angles for locations throughout the US (below) and Canada (starting on page 12).

**The azimuth has been magnetically corrected.**

**NOTE:** Although in many locations it may be possible to receive signals from terrestrial repeaters, it is not recommended to use these signals at fixed locations. Repeater signal strength can vary greatly from day to day as a function of many uncontrolled variables.

### *SIRIUS and XM Satellite Azimuth and Elevation Angle Settings - US*

CITY	ST	SIRIUS		XM SAT 1 (WEST 85°)		XM SAT 2 (WEST 115 °)	
		AZIMUTH°	ELEVATION°	AZIMUTH°	ELEVATION°	AZIMUTH°	ELEVATION°
Birmingham	AL	324.1	71.5	179.1	49.1	223.5	39.8
Dothan	AL	325.5	68.4	182.1	51.8	227.5	40.9
Little Rock	AR	337.9	75.9	166.6	47.0	212.1	41.6
Phoenix	AZ	40.7	66.7	128.0	40.5	173.0	49.1
Fillmore	CA	50.8	60.7	119.2	35.5	160.0	47.9
Los Angeles	CA	49.0	61.1	119.8	36.3	161.2	48.4
San Diego	CA	45.7	61.4	120.6	38.0	163.4	50.0
San Francisco	CA	58.5	58.3	116.4	30.6	153.8	43.5
Denver	CO	43.8	77.6	142.4	37.9	184.4	40.8
Washington	DC	300.0	65.7	202.5	42.1	239.2	29.4
Ft Myers	FL	326.3	61.8	190.9	57.2	237.1	42.0
Jacksonville	FL	320.9	64.9	191.3	52.7	234.8	39.2
Key West	FL	328.5	59.9	191.3	59.6	238.9	43.4
Miami	FL	325.2	59.9	195.4	57.9	240.5	41.4
Tampa	FL	325.7	63.5	189.3	55.6	235.1	41.5
Atlanta	GA	318.6	69.9	185.0	48.8	228.0	38.1
Savannah	GA	317.3	65.8	192.8	50.6	234.9	37.4
Pocatello	ID	355.3	70.9	131.0	31.6	169.6	38.1
Chicago	IL	298.0	78.6	179.4	39.2	218.5	32.6
Dodge City	KS	16.3	79.2	151.1	41.6	194.9	41.7
Kansas City	KS	341.5	81.6	162.9	41.5	205.2	38.3
Louisville	KY	309.3	74.5	182.7	43.5	223.4	35.0
New Orleans	LA	337.0	69.8	170.1	52.9	219.5	45.0
Boston	MA	293.3	60.0	214.5	36.9	247.9	23.2
Germantown	MD	299.7	66.1	202.0	41.8	238.7	29.4
Caribou	ME	287.4	56.8	220.2	31.3	252.0	19.0
Portland	ME	291.3	59.3	216.1	35.3	248.9	21.8
Meridian	MN	300.8	85.8	166.9	36.1	205.8	32.8
Minneapolis	MN	285.8	86.0	167.7	35.1	206.0	31.8

*(Continued on following page)*

*SIRIUS and XM Satellite Azimuth and Elevation Angle Settings - US (Continued)*

US CITY	ST	SIRIUS		XM SAT 1 (WEST 85°)		XM SAT 2 (WEST 115 °)	
		AZIMUTH	ELEVATION	AZIMUTH°	ELEVATION°	AZIMUTH	ELEVATION°
St Louis	MO	319.7	78.7	172.6	42.8	214.4	36.9
Billings	MT	76.2	75.9	137.9	30.4	175.6	34.5
Kalispell	MT	80.8	68.9	129.1	25.8	164.8	32.0
Winston-Salem	NC	308.2	67.7	195.2	45.8	234.6	33.6
Minot	ND	106.5	83.7	151.7	30.0	188.7	30.6
North Platte	NE	33.8	82.4	150.8	37.8	192.0	38.2
Omaha	NE	349.9	84.4	160.7	38.9	201.7	36.6
Cherry Hill	NJ	297.6	63.9	206.7	40.5	242.3	27.4
Albuquerque	NM	33.1	72.6	137.5	41.8	183.0	46.4
Shiprock	NM	41.9	72.0	134.8	39.3	178.3	44.9
Elco	NV	61.0	66.7	125.7	31.9	164.4	40.5
Las Vegas	NV	49.9	65.4	124.9	36.3	166.5	46.0
Reno	NV	60.2	61.7	120.0	30.8	157.8	41.8
Brooklyn	NY	295.9	62.8	208.9	39.5	243.7	26.2
Albany	NY	292.2	63.1	209.5	37.3	243.8	24.6
Buffalo	NY	290.5	69.1	199.1	37.8	235.1	27.3
New York	NY	295.9	63.0	208.8	39.4	243.7	26.2
Cleveland	OH	294.6	71.8	192.6	39.7	230.1	30.0
Tulsa	OK	352.6	78.4	158.8	44.6	203.8	41.9
Burns	OR	67.9	63.4	121.9	27.9	158.4	37.3
Eugene	OR	69.0	58.9	117.1	25.3	152.1	36.2
Pendleton	OR	72.4	63.9	122.6	26.2	158.3	34.8
Philadelphia	PA	297.5	64.1	206.4	40.6	242.0	27.5
Newport	RI	294.7	60.1	214.0	37.9	247.7	24.0
Columbia	SC	313.4	67.1	193.1	48.3	234.0	35.8
Pierre	SD	59.5	85.1	152.7	34.4	191.8	34.6
Nashville	TN	317.6	73.8	179.8	45.9	222.2	37.4
Dallas	TX	356.4	74.5	155.6	48.1	204.1	45.7
Houston	TX	352.0	70.9	157.3	52.0	209.1	48.1
Lubbock	TX	15.8	74.1	145.6	45.5	193.3	46.8
San Antonio	TX	1.1	70.5	150.0	51.2	202.8	50.0
Salt Lake City	UT	58.4	70.9	131.3	33.9	171.1	40.5
Milford	UT	52.6	68.7	128.8	35.6	169.9	43.4
Norfolk	VA	304.1	64.1	204.1	44.3	241.2	30.5
Burlington	VT	288.9	62.7	210.8	35.1	244.5	22.9
Seattle	WA	75.0	59.8	118.3	22.8	152.5	32.3
Green Bay	WI	283.3	79.9	179.3	36.2	217.1	30.3
Milwaukee	WI	291.9	79.3	179.1	37.9	217.6	31.6
Charleston	WV	303.8	70.4	192.2	43.3	231.2	32.6
Casper	WY	61.3	77.9	141.0	34.1	180.7	37.5

*SIRIUS and XM Satellite Azimuth and Elevation Angle Settings - Canada*

CANADA		SIRIUS		XM SAT 1 (WEST 85°)		XM SAT 2 (WEST 115 °)	
CITY	PR	AZIMUTH°	ELEVATION°	AZIMUTH°	ELEVATION°	AZIMUTH°	ELEVATION°
Vancouver	BC	78.4	58.7	115.9	22.9	151.3	33.0
Prince Rupert	BC	81.4	49.7	108.0	15.9	140.6	26.5
Calgary	AB	89.7	68.6	128.6	25.5	165.3	31.5
Edmonton	AB	129.7	68.3	162.3	23.5	198.2	28.8
Saskatoon	SK	109.0	76.0	141.4	27.0	178.6	29.9
Toronto	ON	287.9	69.8	198.6	39.3	236.5	28.4
Ottawa	ON	282.6	65.6	204.0	36.9	240.1	25.1
Montreal	QB	286.3	63.2	210.9	36.4	246.1	23.8
St Johns	QB	286.8	62.8	211.5	36.6	246.6	23.7
Halifax	NS	290.7	51.7	227.8	34.3	259.4	18.1
Saint John's	NF	288.2	39.4	240.4	27.1	268.6	9.7
Brandon	MT	131.5	83.9	154.3	31.1	193.0	31.1
Sault Sainte Marie	ON	274.9	75.7	188.3	36.5	226.7	28.7
Thunder Bay	ON	255.0	80.9	177.8	34.3	216.3	29.1
Whitehorse	YT	84.2	42.8	102.7	9.8	133.9	19.2
Winnipeg	MA	165.3	85.4	159.3	31.7	197.9	30.4
Yellowknife	NT	110.9	61.7	127.2	15.3	160.3	19.3
Vancouver	BC	78.4	58.7	115.9	22.9	151.3	33.0



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## Return and Warranty Policies

### Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

### CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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**Installation Guide – DOC. 6723A**  
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