Model: PRO-500 Installation Instructions

This antenna can be used for reception of XM or Sirius Satellite Radio. Its internal voltage regulator makes it compatible with all generations and models of XM and Sirius radios.

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.

This package includes the following components:

QTY	Description
1	Antenna Panel
1	Wall mount bracket
1	Pole mount bracket
1	F-female to SMB-plug adapter cable, 3’
1	Rubber weather boot
1 lot	Mounting and assembly hardware

Figure 1: Included Items

Wall Mounting

- This kit comes with the wall mount pre-installed to the antenna panel.
- Attach the wall mount assembly to a flat surface (see Figures 3 and 4). Use the supplied screws to secure the mount in the position desired (use of the included anchors requires 5/16” holes).

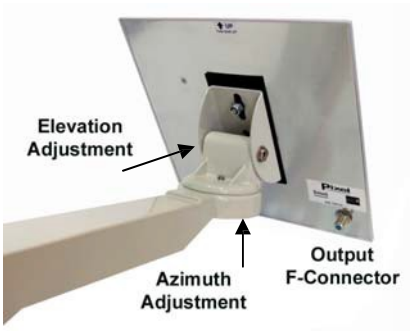

Figure 2: Elevation and Azimuth Adjustments

Figure 3: Horizontal Mount

Figure 4: Vertical Mount

- Connect an RG-6 coaxial cable (not supplied) not longer than 200 ft with male F-connectors to the antenna. Using the supplied 3 ft F-Female to SMB adapter cable, connect the antenna to the radio's antenna input (see Figure 5). For cable runs exceeding 200 feet, use a line amplifier(s) (Pixel SBA-1, not supplied) to increase the signal strength.

- Adjust the azimuth and elevation pointing of the antenna (see Figure 2) for best reception using the antenna signal strength menu in the radio. The antenna has a beam width of ± 25º, which is narrower than standard consumer- quality home-kit antennas, but provides higher gain and rejection to multi-path interference.

  Appendix 1 lists exact magnetic azimuth bearings and elevation pointing angles for many major cities throughout the US and Canada.

- Tighten all hardware and seal the outdoor connectors using the included weather boot or other means to prevent moisture ingress. Provide a strain relief for the cable.

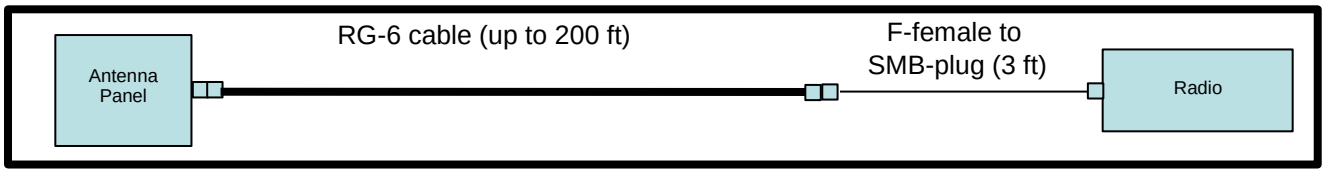

Figure 5: Electrical Connections

Pole Mounting

- Remove the wall mount bracket from the back of the antenna panel and install the pole mount bracket using the same nuts and insulating shoulder washers. I**t is important to keep the antenna panel's back plate electrically isolated from the mount as shown in the diagram using the supplied insulating shoulder washers** (see Figure 8).

- Attach the pole mount bracket to any pole (not larger than 1.75 inches in diameter) using the U-bolt and saddle as shown in Figures 6 and 7.

Figure 6: Pole Mount U-bolt

Figure 7: Pole Mount Bracket

- Connect an RG-6 coaxial cable (not supplied) not longer than 200 ft with male F-connectors to the antenna. Using the supplied 3 ft F-Female to SMB adapter cable, connect the antenna to the radio's antenna input (see Figure 5). For cable runs exceeding 200 feet, use a line amplifier(s) (Pixel SBA-1, not supplied) to increase the signal strength.

- Adjust the azimuth and elevation pointing of the antenna (see Figure 6) for best reception using the antenna signal strength menu in the radio. The antenna has a beam width of ± 25º, which is narrower than standard consumer- quality home-kit antennas, but provides higher gain and rejection to multi-path interference.

Appendix 1 lists exact magnetic azimuth bearings and elevation pointing angles for many major cities throughout the US and Canada.

- Tighten all hardware and seal the outdoor connectors using the included weather boot or other means to prevent moisture ingress. Provide a strain relief for the cable.

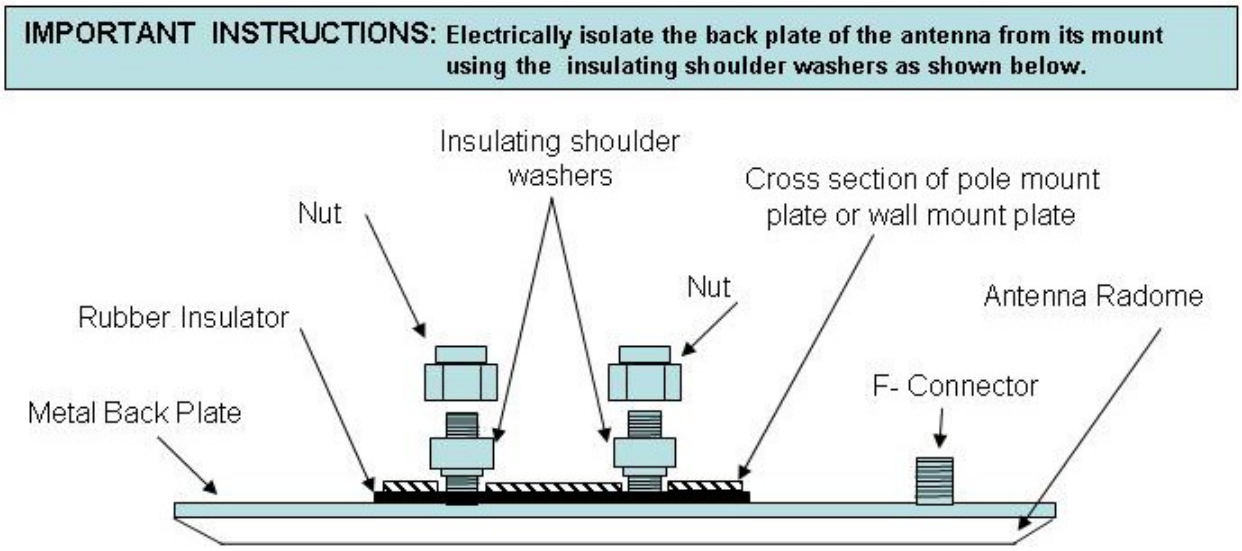

Figure 8: Electrical Isolation of Antenna from Mount

XM Reception

XM has two satellites located at fixed orbital positions in the southern sky (at 115° W longitude and 85º 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. To initially set up the antenna, orient it approximately due south at an up elevation angle of approximately 45º. Use this as starting spot and peak the signal reception for maximum signal reception on one of the XM satellites using the antenna alignment menu in the radio.

Sirius Reception

Sirius has three satellites in elliptical orbit that are constantly moving over the earth. 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. Figure 9 shows relative azimuth pointing guidelines for reception in different regions of the US, and Figure 10 shows them for Canada.

Because the satellites' positions are constantly changing, signal strength will vary somewhat at different times of the day. The "sweet spot" for optimum Sirius antenna pointing is just over the eastern border of North Dakota. Figures 9 and 10 show approximate pointing guidelines for five regions of the US and three regions of Canada. These guidelines should get you close to optimum. The radio's antenna / signal menu should be used to make fine adjustments. Appendix 1 shows the exact magnetic azimuth and elevation pointing for major cities in the US and Canada. However, exact precision pointing is rarely necessary.

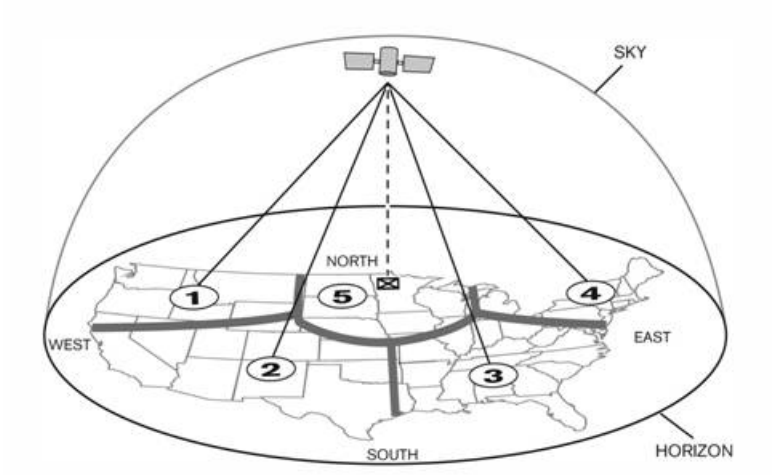

Figure 9: SIRIUS Antenna Pointing Guidelines, United States

AREA	ANTENNA AIMING DIRECTION UNITED STATES
AREA 1	Aim the antenna **EAST** or **NORTHEAST**
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

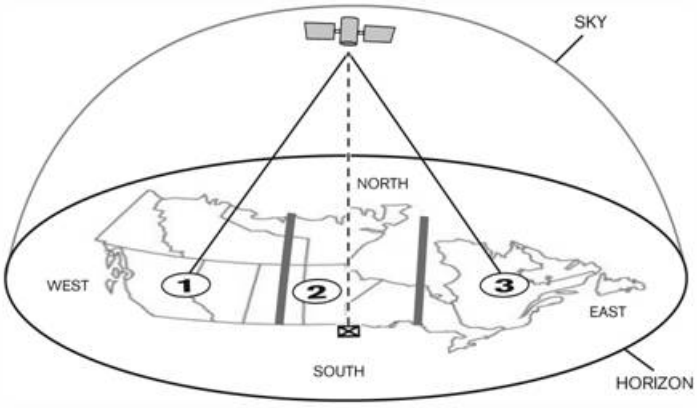

Figure 10: SIRIUS Antenna Pointing Guidelines, Canada

AREA	ANTENNA AIMING DIRECTION CANADA
AREA 1	Aim the antenna **EAST** or **SOUTHEAST**
AREA 2	Aim the antenna **SOUTH** or **STRAIGHT UP** at the sky
AREA 3	Aim the antenna **WEST** or **SOUTHWEST**

Installation Notes

Unlike other satellite radio antennas the PRO-500 has a much narrower beam width (± 25º) and exhibits superior gain, multi-path and out-of- band signal rejection capability. As such it may take a little more effort to point it at the satellite to achieve optimum performance. Here are important tips for its installation:

- Mount the antenna outdoors with the supplied wall mount or pole mount bracket. Operation indoors or behind windows is not recommended. Window panes can have tinted coatings which can attenuate the signal. The attenuation of these coatings can vary greatly as the temperature changes.
- (XM Installation) Use the menus in the radio to peak the satellite signal reception on one of the satellites. It is not necessary to position the antenna for simultaneous reception of multiple satellites.
- The antenna's internal low noise amplifier is designed to compensate for the loss of up to 200 feet of RG-6 cable. For longer cable runs use an in-line amplifier (Pixel Model SBA-1) 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 greatly impact signal quality from repeaters over time.
- Seal all outdoor coax connector fittings with the weather boot (supplied), sealant or weatherized tape to eliminate moisture ingress.

Troubleshooting

Problem: No signal reception and the following messages may be displayed on the radio:

Antenna:

This error signal indicates that the antenna is not properly connected.

- Ensure there are no "shorts" or discontinuities in the cables and that all connections are tight. The easiest way to do this is as follows:
- With the radio turned on and all antenna cables connected at the radio, check the DC voltage at the antenna end of the cable. It should be between 4 VDC and 7 VDC.

No Signal:

This error signal indicates that the antenna is connected properly but that the signal too weak for reception.

- Ensure the cable between the antenna and radio is no longer than 200 Feet and it is RG-6 cable.
- Ensure the antenna is properly aimed.

Warranty

Pixel Technologies warrants its products against defects in material or workmanship for a period of 12 months from the date of retail sale unless otherwise contracted.

Defective products will be repaired or replaced at the sole discretion of Pixel Technologies, Inc.

Shipping Your Product for Warranty Repair

• When shipping your product you must include the following:
• A copy of the receipt, invoice, or other proof of purchase.
• A description of the problem
• Include all original components that came with the unit. Missing components will not be replaced.
• Include return name, physical address, & telephone number/email address and RMA number.
(An RMA number can be obtained by calling Pixel Technologies at (303) 526-1965)
• Please ship product by traceable means (such as UPS, FedEx, etc)

Return Material Authorization (RMA)

You must email or call us and obtain an RMA number before returning any product and be sure to write it clearly on the outside of the package. We reserve the right to refuse any products returned to us without a return authorization number clearly written on the outside of the return package. All returns or exchanges MUST be postmarked within 3 business days after an RMA number is issued. Please keep products and packaging in like-new condition when returning for a refund to avoid fees for damaged/missing items. Packaging may be opened, but ALL items must be present including the packaging itself and literature. Items that have been physically damaged and show clear signs of wear also cannot be returned.

Damaged, Missing, Delayed or Wrong Items Shipped

Pixel Technologies is not responsible for items that may be damaged, lost, or missing by the shipping company, or "carrier" (UPS, DHL, USPS, etc.). All products and packaging should be carefully inspected upon receipt. Any and all claims regarding wrong item shipped, missing items, or items damaged in shipping must be made to us by email or phone **within 7 (seven) calendar days** of your order being marked delivered to you by the carrier; after that we can no longer file any claims. The purchaser should alert the carrier and Pixel Technologies that a claim needs to be filed for that shipment. Once the claim is approved, we will re-ship your item at no additional charge.

If we shipped you the wrong item, we will ship out the correct item to you at no additional charge. We will ask that you return the incorrect item to us. An RMA number will be issued and you will be fairly compensated for your return shipping expenses. We reserve the right to choose a shipping method for your replacement, normally matching the same in-transit time as your original shipment.

If an item is missing, we will review the order, checking correct package weight, etc.. If we determine that the item was in fact omitted through our error, we will ship the item out at no additional charge to you. Shipping method will be equal in speed to the original shipping method at time of order (Air or Express service may not apply to shipments going to Hawaii, Alaska, or Canada).

If a piece is missing from a kit (for example, a cable) we will ship the missing piece via the carrier and shipping method of our choice.

We will be happy to help you with the details of packaging and shipping your merchandise for credit or exchange if defective. Some limitations and restrictions apply. Replacements for defective items are usually shipped within 1-3 business days (via ground) after receipt of the defective item.

We strive to ship products out as soon as possible. Once items are shipped, Pixel Technologies has no control over the timeliness of the shipments and cannot be held responsible for any delays caused by the carrier.

If necessary, Pixel Technologies will aid in the filing of an appropriate claim with the carrier in the event of package loss or damage. We cannot refund shipping charges regardless of reason for delayed shipments.

Model: PRO-500 Installation Instructions

Appendix 1

The following chart shows the optimum azimuth bearing and elevation pointing angles for locations throughout the US and Canada. **The azimuth has been magnetically corrected**.

Warning: 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 function of many uncontrolled variables.

		Sirius		XM Sat 1 (West 85°)		XM Sat 2 (West 115 °)	
City	St	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
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

Model: PRO-500 Installation Instructions

City	St	Sirius Azimuth°	Sirius Elevation°	XM Sat 1 (West 85°) Azimuth°	XM Sat 1 (West 85°) Elevation°	XM Sat 2 (West 115 °) Azimuth°	XM Sat 2 (West 115 °) Elevation°
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

Canada City	Pr	Sirius Azimuth	Sirius Elevation	XM Rock (East 85°) Azimuth	XM Rock (East 85°) Elevation	XM Roll (West 115 ° Azimuth	XM Roll (West 115 ° 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