

MODEL AFXSM-6 Universal Antenna Installation Kit

This kit is designed to permit the reception and multiplexing on a single RG-6 cable of:

- Satellite radio signals at 2.33 GHz (either Sirius or XM or both simultaneously)
- Over-the-air digital TV signals (Channels 7 to 51) with appropriate antenna (not supplied)
- FM Radio (88 -108 MHz)
- AM radio (500 KHz to 1.7 MHz)
- HD Radio signals in the AM and FM bands

This kit includes the following items:

Parts List: Model AFXSM-6	
1	PRO-600 Satellite Radio Antenna with wall mount
1 Lot	Mounting hardware for PRO-500 wall mount
1Lot	Pole mounting hardware for PRO-500 antenna
1	AFHD-4 AM / FM Antenna with wall mount
1 Lot	Mounting hardware for AM /FM wall mount
1Lot	Pole mounting hardware for AM/FM antenna
1	Triplexer Model TPLXR
6	Weather boot
1	Quadplexer Model QPLEX
1	F-71 F-male to F-male coupler
1	3 ft F-female to SMB-plug cable
2	3 ft F-male to F-male RG-59 cable
2	20 dB attenuator
2	10 dB attenuator
1	F-female to DIN adapter
1	Twin lead AM radio antenna adapter
2	Grounding lug and star washer

Figure 1 shows the system wiring diagram

Important installation instructions:

- Do not exceed 300 feet of cable between the Triplexer and Quadplexer
- If the VHF UHF antenna uses a powered preamp. Use the wiring diagram shown in Figure 2. The Triplexer will not pass DC to the VHF / UHF antenna.
- The Triplexer will pass all UHF TV frequencies and all VHF high band frequencies (Ch 7 -13). It will not pass VHF low band frequencies (Ch -2 -6). If this is required a separate cable must be run to the TV from the TV antenna
- Make sure the red lead of the coax-to-twin lead AM radio adapter is connected to the terminal on the receiver marked antenna and the black lead is connected to the terminal marked Ground on the AM antenna connection block

Antenna Installation

See the individual antenna installation instructions attached:

- Model: AFHD-4 AM / FM, HD Radio Antenna Installation Instructions
- Model PRO-600 Satellite Radio Antenna Installation Instructions

Figure 3 shows some alternative mounting configurations with a similar satellite radio antenna

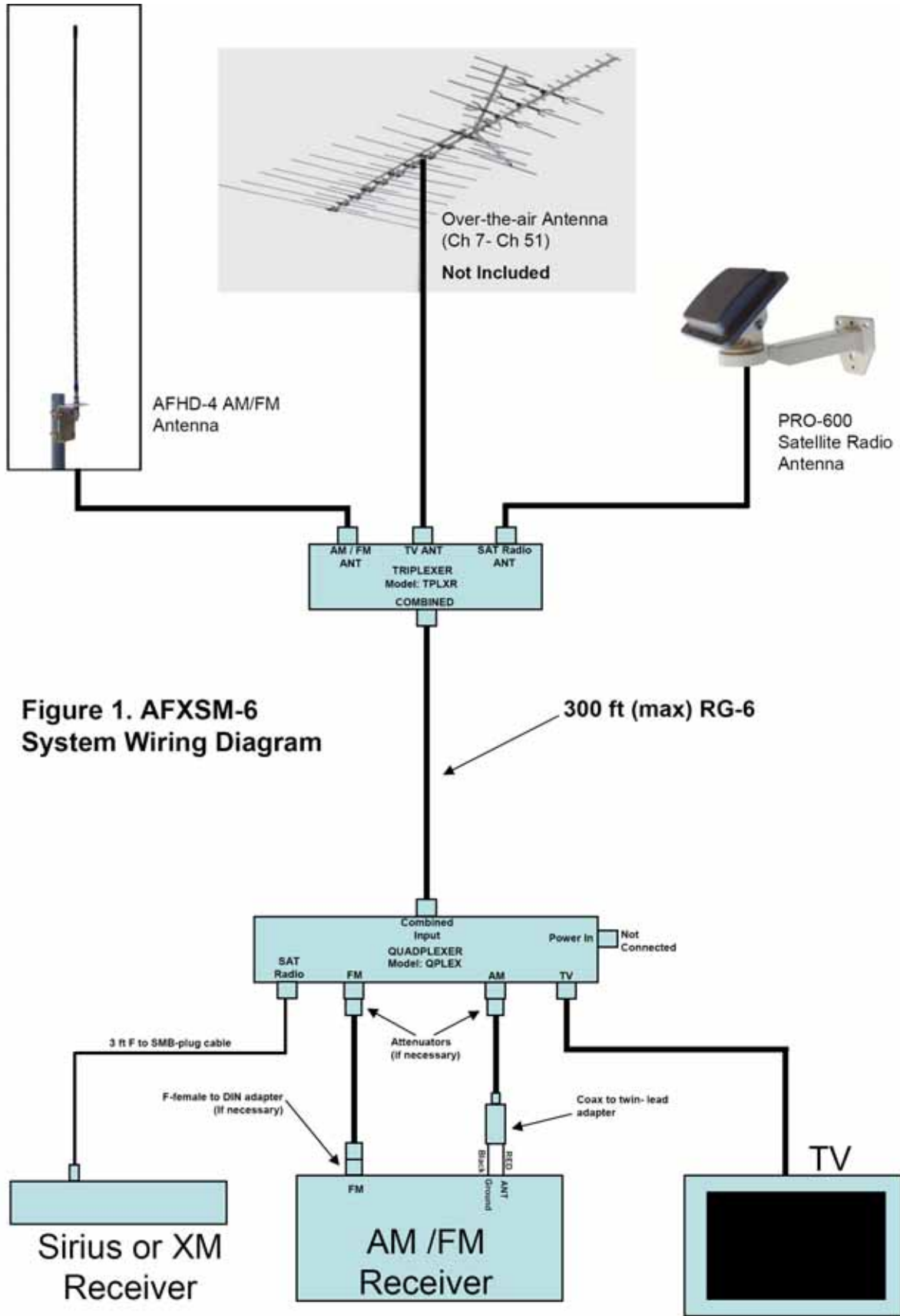


Figure 1. AFXSM-6 System Wiring Diagram

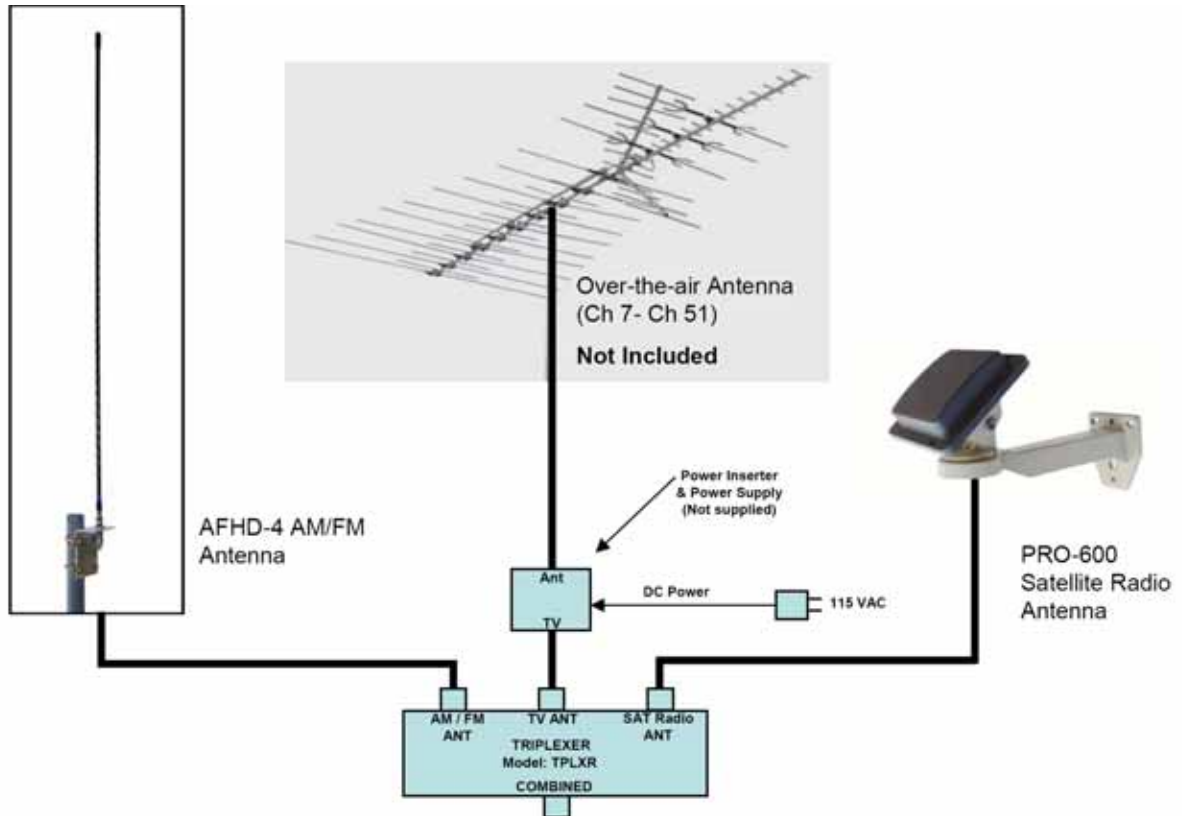


Figure 2. AFXSM-6 System Wiring Diagram for VHF / UHF Antennas that use powered Preamps

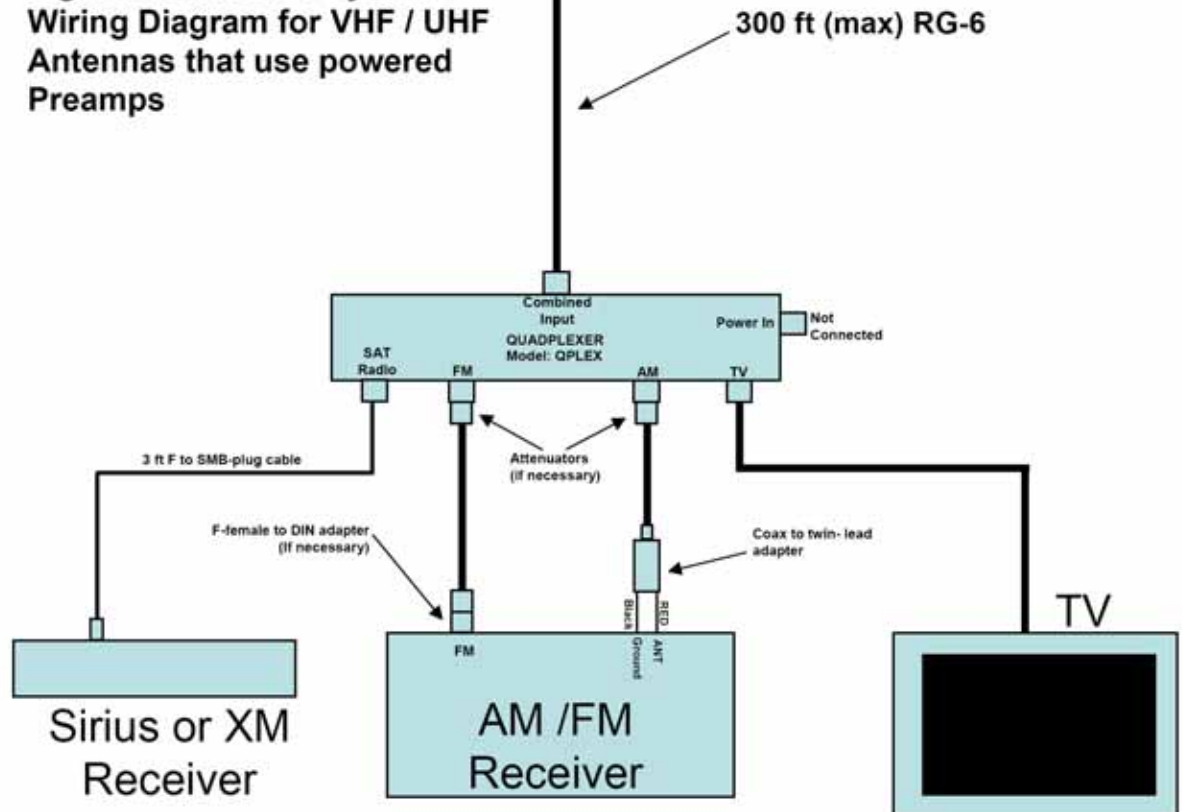
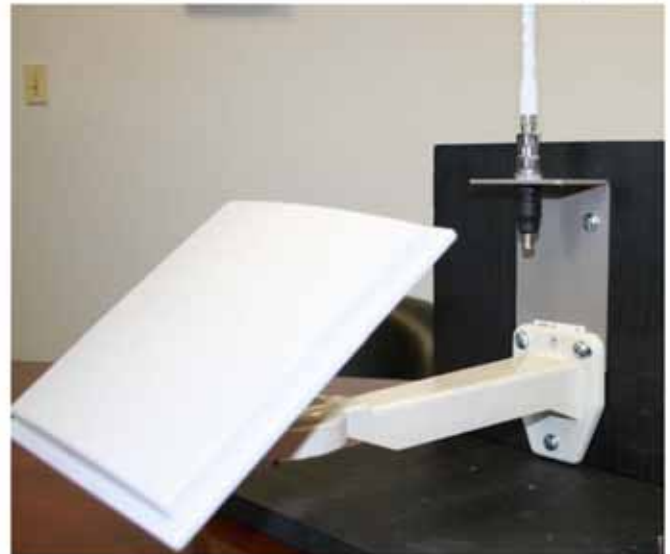


Figure 3. Alternative Mounting Configurations



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.

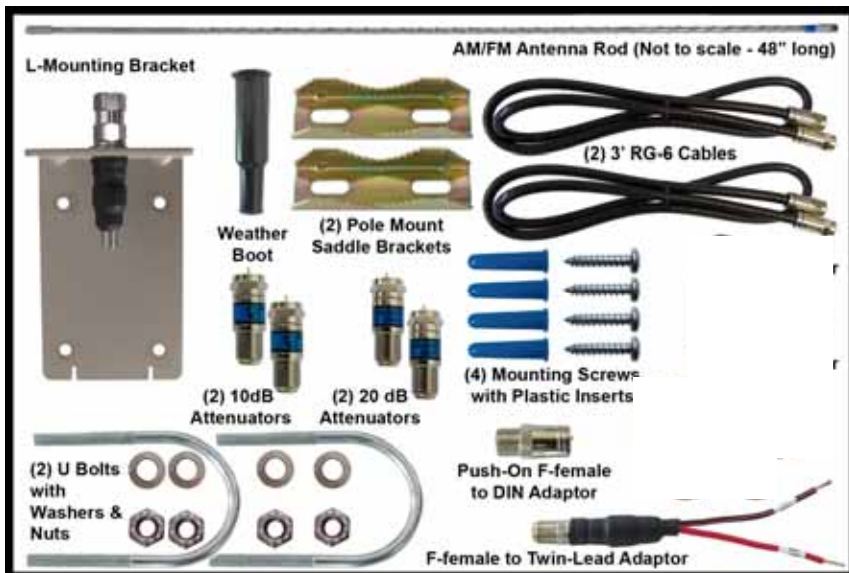
Model: AFHD-4 AM / FM HD Radio Antenna Installation Instructions



This kit includes the following items required to install the AFHD-4 AM / FM antenna

Included items in the kit

QTY	Description
1	AM / FM antenna
1	L-mounting bracket
1	Weather boot
2	20 dB attenuator
2	10 dB attenuator
2	3 ft RG-6 cables
2	U bolts with washers and nuts
2	Pole mount saddle brackets
4	Mounting screws with plastic inserts
1	F-female to twin-lead adaptor
1	Push-on F-female to DIN adaptor



Antenna Location

For optimum results the antenna should be mounted outdoors as high above ground level and as far away as possible from any AM interference sources (see Table 1). It can also be mounted in an attic, but reception will depend on the roofing material and the insulation and siding materials. Thermal insulation that uses aluminum foil backing or metal roofing/siding material will shield the antenna from achieving good reception. Most stone and stucco siding has wire mesh reinforcement that will also block signal reception indoors. **Before finalizing the mounting location it is recommended to experiment with a few different temporary locations. AM and FM reception can vary greatly as function of the antenna's location.**

Cable length, Type and Routing

Always use good quality RG-6 cable and do not run the cable more than 300 ft. (The shorter the better for best FM reception). (RG-6 cable has a loss of about 2.8 dB / 100 ft at the high end of the FM band (108 MHz)). For runs longer than 300 ft, a special wide-band line-amplifier is available to amplify the signal.

For AM reception, RG-6 cable loss is not an issue (only 0.33 dB per 100 ft at 1.7 MHz) but for best rejection of local AM interference, Quad-shielded RG-6 should be considered. **In addition, do not run the cable in parallel with cat 5 cables carrying digital signals or in parallel with AC power lines.**

Antenna Mounting

The antenna L-bracket (Figure 1) should be first mounted in place to either a wall, chimney or a pole (not larger than 2 inches in diameter) with the supplied hardware as shown in Figures 2 and 3. The antenna should be as high above ground level as practical and as far away as possible from local AM interference sources and any structure (including aluminum siding) that could block reception.

After mounting the L-bracket, screw the antenna rod into its base and tighten with a wrench.

Use the included weather boot with the lead-in RG-6 cable or other weather proofing means to seal the outdoor F-connector from moisture ingress.



Figure 1: L-Bracket



Figure 2: Pole Mount



Figure 3: Wall Mount

Model: AFHD-4 AM / FM HD Radio Antenna Installation Instructions



Wiring Diagram

Wire the components to the Triplexer and Quadplexer as shown in Figure 1 of the Model AFXSM-6 Universal Antenna Kit instruction sheet. **Make sure the black wire from the coax- to- twin lead adapter is connected to the ground input of receiver's AM antenna terminals.**

Attenuator Selection

Occasionally nearby high-power transmitters (TV, AM or FM) can overload your receiver's front-end causing cross-modulation distortion, audio distortion or noise. Use the supplied coaxial 10 dB (FAM-10) and 20 dB attenuators (FAM-20) on the outputs of the AM /FM band splitter to determine the best amount of attenuation that provides optimum reception.

To do this, first tune the radio manually across the entire AM band one step at a time (do not use the channel scan or search function of the receiver) and note the station frequencies that you are receiving well. Repeat this with first a 10 dB and then a 20 dB attenuator to determine if the attenuators help or hurt overall reception. The attenuators can be combined to achieve different amounts of attenuation. In most cases no attenuation is required and the best reception is achieved. Once the reception for the AM band is optimized, repeat these steps for the FM band to determine the best attenuator setting. These are standard cable-TV type attenuators that can be obtained from Pixel and many other sources if additional attenuation is required.

AM Interference:

Unfortunately in this age of digital entertainment, AM radio has become the "weak sister" of features included in most entertainment systems. Most receiver manufacturers are spending the minimum possible amount on their AM tuning sections and the number of household source of AM radio interference has increased exponentially (see Table 1 below). Fortunately the emergence of Hybrid Digital (HD) AM radio technology is helping to cure some of these problems but the best strategy for good AM reception is to first eliminate as many of the interference sources as is practical and then locate the receiving antenna as far away as possible from the remaining interference sources. Using high quality well-shielded, Quad RG-6 lead-in wire from the antenna to the receiver will help reduce interference and optimize reception.

Table 1. Typical sources of AM Radio Interference

Dimmer switch
Neighbor's dimmer switch
Fluorescent light
Computer
Touch lamp (even when turned off)
Automatic on/off night lights.
Automatic outdoor yard lights
Electronic bug and pest controllers
Light bulb that is about to burn out
Faulty electrical switch
Nearby television, plasma or LCD display
Neighbor using fluorescent lights
Christmas tree lights & other blinking bulbs
Neighbor's dimmer switch (apt. complex)
Cell phone chargers
Dirty insulators on nearby power pole
Electric blanket
120V AC smoke detectors (battery operated OK)
Ionic Breeze or other electrostatic air purifier
Ultrasonic motion detectors
Appliances with motors
Lap top computer power supply
Almost any wall mounted power supply that uses a "switching design"
Computer network "Cat 5" wiring

Model: AFHD-4 AM / FM HD Radio Antenna Installation Instructions



Specifications:

Antenna length: 48 inches

Frequency of operation:

AM Band 500 KHz to 1750 KHz

FM Band 88MHz -108 MHz

Ground plane required: None

AM capture length: 300 inches

AM / FM Band Separator Performance:

FM rejection in AM band: > 50 dB

AM rejection in FM band: > 60 dB

AM/FM Pass-band loss: < 1dB

AM load impedance: 300 ohms

FM load impedance: 75 ohms

Antenna Beam width: Omni-directional

Reception Performance:

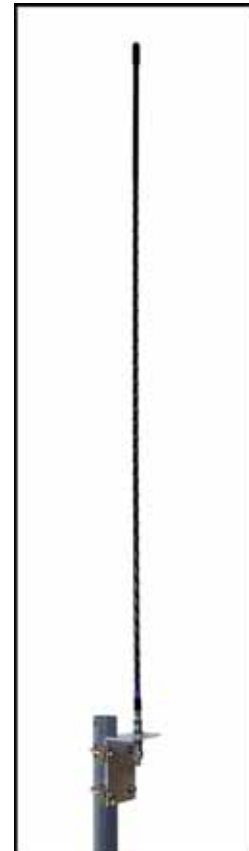
These results will vary as function of the antenna's height above ground, the power of the transmitting station, the transmitter's antenna beam pattern, the local terrain and the quality of the receiver utilized. Table 2 shows actual reception test results for the antenna mounted 20 feet above ground over flat terrain, using a Sangean Model HDT-1X as the receiver with 200 ft of cable between the antenna and receiver.

Table 2. Reception Capability

Receiver Mode	Reliable Good Quality Daytime Reception
FM Stereo	80 Miles
FM HD	50 Miles
AM (Mono)	90 Miles
AM HD	50 Miles

Test Conditions:

Receiver: Sangean HDT-1X
Cable Length (antenna to receiver): 200 feet RG-6 cable
Antenna height above ground: 20 feet
Terrain: Flat



Model: PRO-600 Installation Instructions



This antenna can be used for reception of XM or Sirius Satellite Radio or both simultaneously. 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 & Wall mount
1	U-bolt
1	Saddle bracket
1	F-female to SMB-plug adapter cable, 3'
1	Rubber weather boot
1 lot	Mounting and assembly hardware
1	Grounding lug and star washer



Figure 1: Included Items

Wall Mounting

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

- Connect an RG-6 coaxial cable (not supplied) with male F-connectors to the antenna and to the Sat Radio input of the Triplexer (the sum of all the cable lengths from the antenna to the Triplexer and from the Triplexer to the Quadplexer and from the Quadplexer to the radio should not exceed 300 feet. Using the supplied 3 ft F-Female to SMB adapter cable, connect the Quadplexer's Sat Radio output to the satellite radio's antenna input. For cable runs exceeding 300 feet, special line amplifiers are available to increase the signal strength.
- Adjust the azimuth and elevation pointing of the antenna (see Figure 4 & 5) for best Sirius reception using the antenna signal strength menu in the radio. The antenna has a beam width of $\pm 35^\circ$. For XM reception point the antenna due South at an up elevation angle of approximately 45° and then use the antenna aiming menu on the radio to optimize pointing and signal reception. For simultaneous reception of both Sirius and XM, first align the antenna for good Sirius reception and then tilt the antenna slightly to the South incrementally until good XM reception is also achieved.

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.

Pole Mounting

- Attach the pole mount bracket to any pole (not larger than 2 inches in diameter) using the U-bolt and saddle as shown in Figure 3.

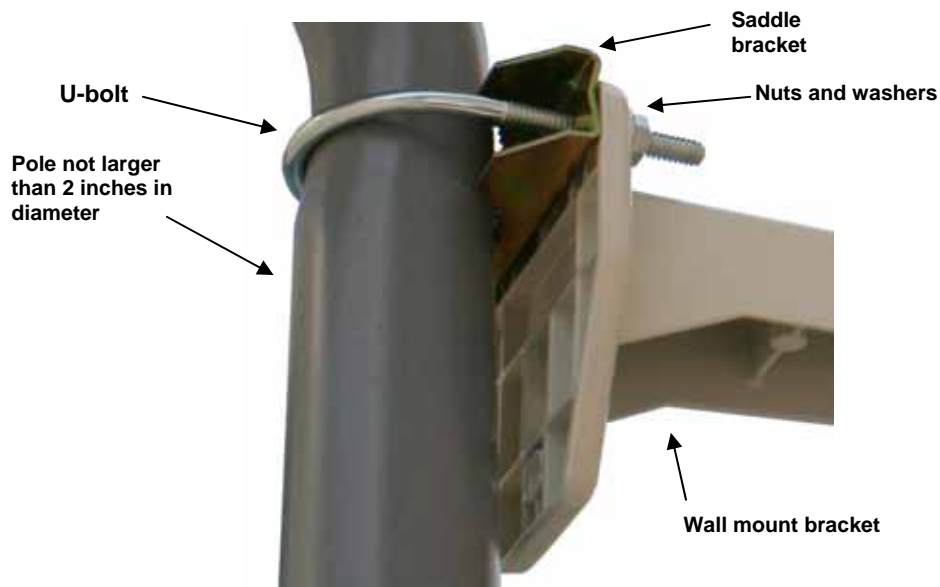


Figure 3: Pole Mount U-bolt & saddle

XM Reception

XM has two satellites located at 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. To initially set up the antenna, orient it approximately due south at an up elevation angle of approximately 45°. 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 4 shows relative azimuth pointing guidelines for reception in different regions of the US, and Figure 5 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 4 and 5 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.

Simultaneous XM and Sirius Reception

For simultaneous reception of both Sirius and XM, first align the antenna for good Sirius reception and then tilt the antenna slightly to the South incrementally until good XM reception is also achieved.

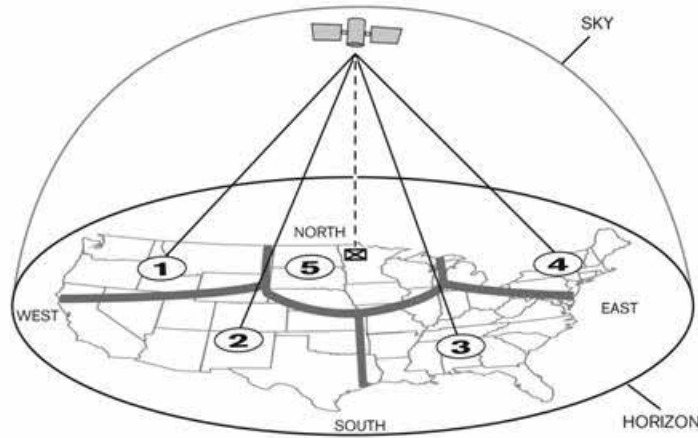


Figure 4: SIRIUS Antenna Pointing Guidelines, United States

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

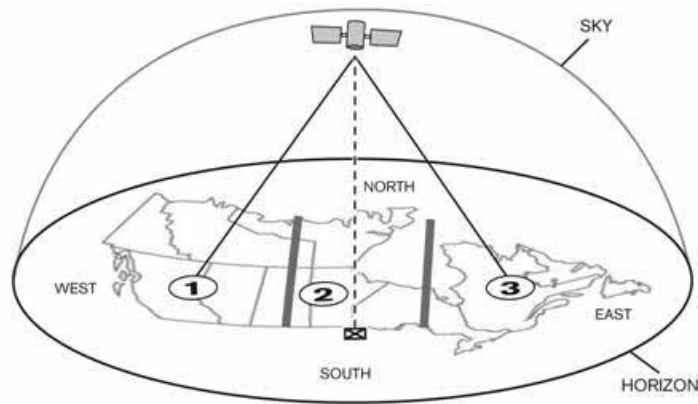


Figure 5 : SIRIUS Antenna Pointing Guidelines, Canada

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

- 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 is 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.

Model: PRO-600 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.

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
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-600 Installation Instructions



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