

**Turners Falls, MA - WRSI(FM) (Auxiliary FM)  
Service Contour Study:  
Proposed Auxiliary vs Primary  
47 C.F.R. Section 73.1675(a) (1) (ii) Study**

**Primary 1.0 mV/m (60 dBμ) Contour**

**Proposed Auxiliary 1.0 mV/m (60 dBμ) Contour**

FCC 30 SEC Terrain Database  
US Census 2020 PL Database  
NAD 1983 Coordinate Datum

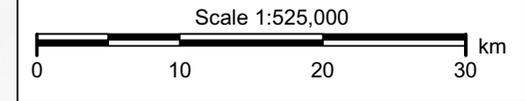
**WRSI.L**  
Turners Falls, MA  
LMS-0000168026  
Facility ID: 8775  
Latitude: 42-34-15.10 N  
Longitude: 072-38-41.10 W  
ERP: 4.90 kW  
Channel: 230A (93.9 MHz)  
AMSL Height: 323.5 m  
Pattern: Omni

60 dBμ F(50:50) Contour  
Total Population: 226,297  
Total Area: 2,907.3 sq. km

**WRSI.P(aux)**  
Turners Falls, MA  
Proposed Auxiliary  
Facility ID: 8775  
Latitude: 42-22-25 N  
Longitude: 072-40-24 W  
ERP: 3.00 kW  
Channel: 230A (93.9 MHz)  
AMSL Height: 223.9 m  
Horiz. Pattern: Directional  
(Ant Orientation: 060°T)

60 dBμ F(50:50) Contour  
Total Population: 112,087  
Total Area: 914.6 sq. km

Asher Broadcast Consulting LLC  
justinasher@consultant.com  
1 (202) 875-2986

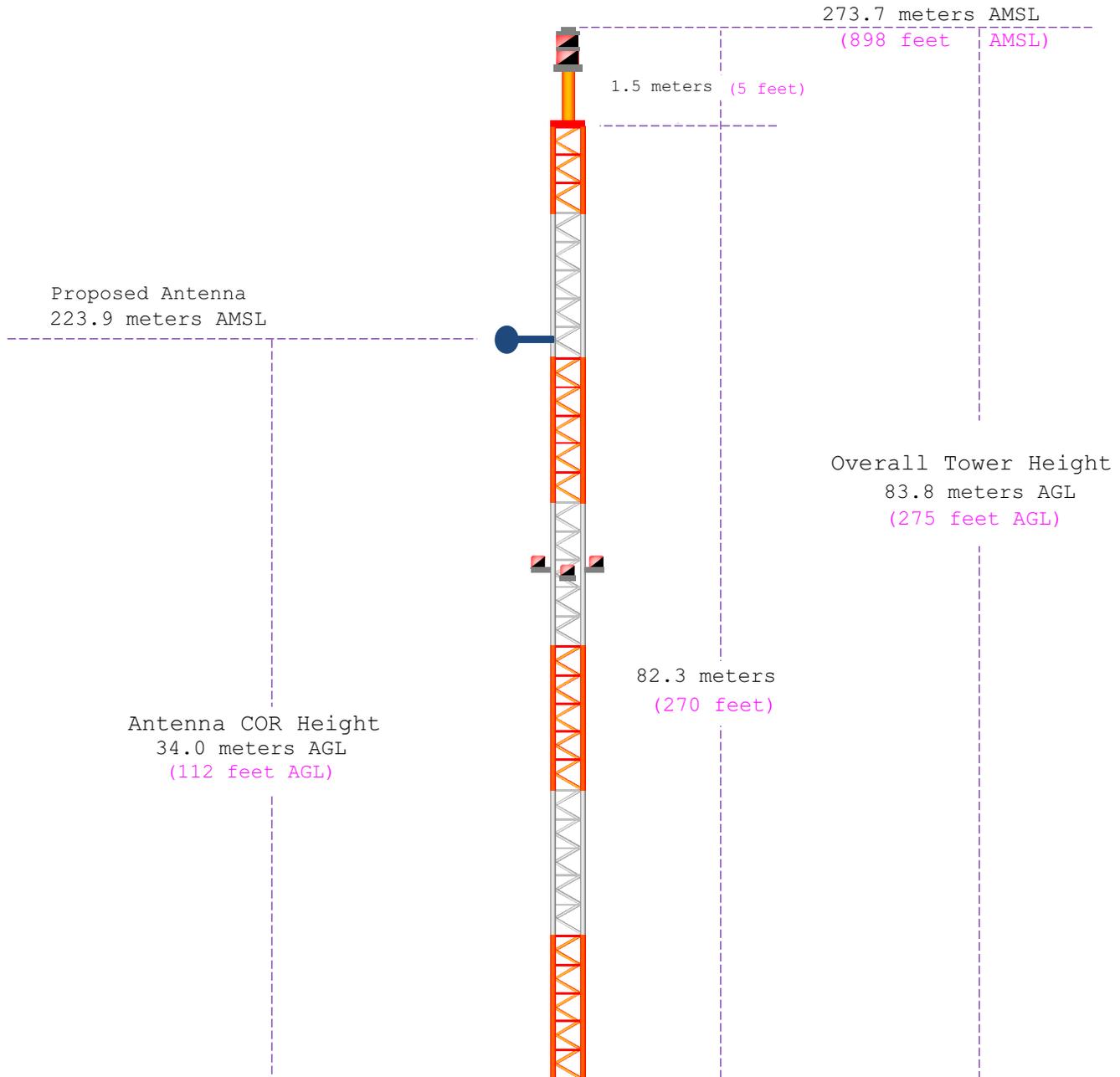


**§73.1675(a)(1)(ii) Auxiliary antennas.**

An auxiliary antenna is one that is permanently installed and available for use when the main antenna is out of service for repairs or replacement. An auxiliary antenna may be located at the same transmitter site as the station's main antenna or at a separate site. The service contour of the auxiliary antenna may not extend beyond the following corresponding contour for the main facility: (ii) FM stations: The 1.0 mV/m field strength contours.

# Turners Falls, MA - WRSI(FM) (Auxiliary FM)

## Vertical Plan of Antenna System and Support Tower



<b>Ground Elevation:</b> 189.9 meters AMSL (623 feet AMSL)		
<b>Address:</b> ON HORSE MOUNTAIN 6 KM NW OF NORTHAMPTON MA		
<b>City:</b> WILLIAMSBURG	<b>Latitude (D M S)</b>	<b>Longitude (D M S)</b>
<b>County:</b> HAMPSHIRE	---	---
<b>State:</b> MASSACHUSETTS	(NAD 1927)	
	<b>Lat/Long</b> 42-22-25.0 N 072-40-24.0 W (NAD 1983)	
<b>Antenna Structure Registration</b> 1008868	Drawing Is Not To Scale	<b>Asher Broadcast Consulting, LLC</b> justinasher@consultant.com 1(202)875-2986

**Turners Falls, MA - WRSI(FM) (Auxiliary FM)**  
**Copy of Existing Antenna Structure Registration**  
*(public record copy)*

**Registration Detail**

Reg Number	1008868	Status	Constructed
File Number	A0444885	Constructed	01/01/1993
EMI	No	Dismantled	
NEPA	No		

**Antenna Structure**

Structure Type TOWER - Free standing or Guyed Structure used for Commu

**Location** (in NAD83 Coordinates)

Lat/Long	42-22-25.0 N 072-40-24.0 W	Address	ON HORSE MOUNTAIN 6 KM NW OF NORTHAMPTON MA
City, State	WILLIAMSBURG , MA		
Zip	01062	County	HAMPSHIRE
Center of AM Array		Position of Tower in Array	

**Heights (meters)**

Elevation of Site Above Mean Sea Level	189.9	Overall Height Above Ground (AGL)	83.8
Overall Height Above Mean Sea Level	273.7	Overall Height Above Ground w/o Appurtenances	82.3

**Painting and Lighting Specifications**

FAA Chapters 3, 4, 5, 13  
 Paint and Light in Accordance with FAA Circular Number 70/7460-1H

**FAA Notification**

FAA Study	97-ANE-0202-OE	FAA Issue Date	06/04/1997
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**Owner & Contact Information**

FRN 0009269424

**Owner**

Saga Communications of New England, LLC  
 Attention To: Greg Urbiel  
 73 Kercheval Avenue, Suite 201  
 Grosse Pointe Farms , MI 48236

Owner Entity Type

P: (313)886-7070  
 F:  
 E: gurbiel@sagacom.com

**Contact**

Smithwick , Gary S Esq  
 5028 Wisconsin Avenue, NW Suite 301  
 Washington , DC 20016

P: (202)363-4050  
 F:  
 E: gsmithwick@fccworld.com

**Last Action Status**

Status	Constructed	Received	04/27/2005
Purpose	Admin Update	Entered	04/27/2005
Mode	Interactive		

**Related Applications**

04/27/2005	A0444885 - Admin Update (AU)
10/14/1997	A0010552 - Modification (MD)
11/22/1996	A0010551 - New (NE)

**Comments**

**Comments**

None

**History**

**Date**

**Event**

04/28/2005	Registration Printed
04/27/2005	FRN association email send: Tower email
04/27/2005	ASR Application receipt email sent: Tower email

All History (4)

**Pleadings**

**Pleading Type**

**Filer Name**

**Description**

**Date Entered**

None

**Automated Letters**

04/28/2005	Authorization, Reference 421671
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# Turners Falls, MA - WRSI(FM) (Auxiliary FM) HAAT and Miscellaneous Coordinate Information

## HAAT Calculation (NAD 1983):

N. Lat. = 422225.0    W. Lng. = 724024.0  
HAAT and Distance to Contour,  
FCC, FM 2-10 Mi, 51 pts Method - FCC 30 SEC

Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	192.8	31.1	0.3025	-5.19	0.550	7.55
045	84.9	139.0	0.9506	-0.22	0.975	21.56
090	59.9	164.0	0.7225	-1.41	0.850	21.86
135	71.5	152.4	0.1600	-7.96	0.400	14.25
180	67.2	156.7	0.0100	-20.00	0.100	7.26
225	199.4	24.5	0.0100	-20.00	0.100	3.15
270	324.5	-100.6	0.0100	-20.00	0.100	3.15
315	330.7	-106.8	0.0156	-18.06	0.125	3.51

Ave El= 166.36 M    HAAT= 57.54 M    AMSL= 223.9 M

## NAD 1983 to NAD 1927 Conversion:

## Various Coordinate Conversion Calculations (NAD 1983):

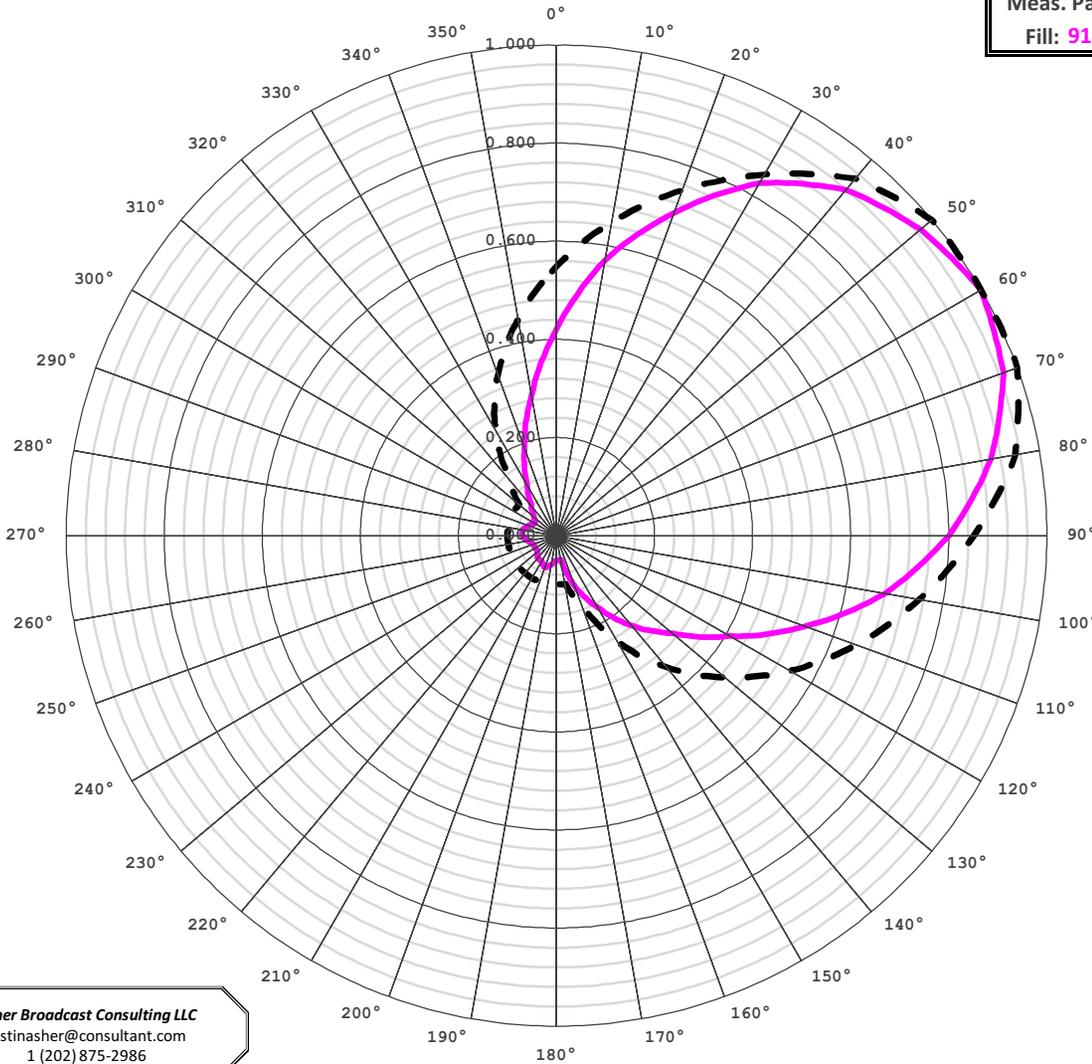
<b>Position Type</b>	Lat Lon
<b>Degrees Lat Long</b>	42.3736111°, -072.6733333°
<b>Degrees Minutes</b>	42°22.41667', -072°40.40000'
<b>Degrees Minutes Seconds</b>	42°22'25.0000", -072°40'24.0000"
<b>UTM</b>	18T 691562mE 4693881mN
<b>UTM centimeter</b>	18T 691562.66mE 4693881.32mN
<b>MGRS</b>	18TXM9156293881
<b>Grid North</b>	1.6°
<b>GARS</b>	215MA24
<b>Maidenhead</b>	FN32PI99EP89
<b>GEOREF</b>	HJCN19602241

Manufacturer's	Make/Model	Orientation	Power
Element 1:	6025(V)-1DA	060° True	100.0%
Element 2:			
Element 3:			
Element 4:			

**Composite Power: 100%**

**Turners Falls, MA - WRSI(FM)  
(Auxiliary FM)  
Preliminary Directional Antenna Pattern  
Proof of Performance Data**

**Meas. Pattern**  
Fill: 91.3%



Azimuth ° True	FCC Pattern	Manufacturer's Pattern
0°	0.550	0.420
10°	0.650	0.570
20°	0.750	0.700
30°	0.850	0.830
40°	0.950	0.920
50°	1.000	0.970
60°	1.000	1.000
70°	1.000	0.970
80°	0.950	0.900
90°	0.850	0.800
100°	0.750	0.680
110°	0.650	0.540
120°	0.550	0.410
130°	0.450	0.310
140°	0.350	0.240
150°	0.250	0.170
160°	0.150	0.110
170°	0.100	0.050
180°	0.100	0.050
190°	0.100	0.060
200°	0.100	0.070
210°	0.100	0.060
220°	0.100	0.060
230°	0.100	0.050
240°	0.100	0.050
250°	0.100	0.050
260°	0.100	0.060
270°	0.100	0.070
280°	0.100	0.070
290°	0.100	0.060
300°	0.100	0.050
310°	0.100	0.060
320°	0.150	0.080
330°	0.250	0.120
340°	0.350	0.190
350°	0.450	0.290

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Allocation (FCC) Pattern:    - - -  
Manufacturer's Pattern:        ———

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Copy of Preliminary Directional Antenna Pattern  
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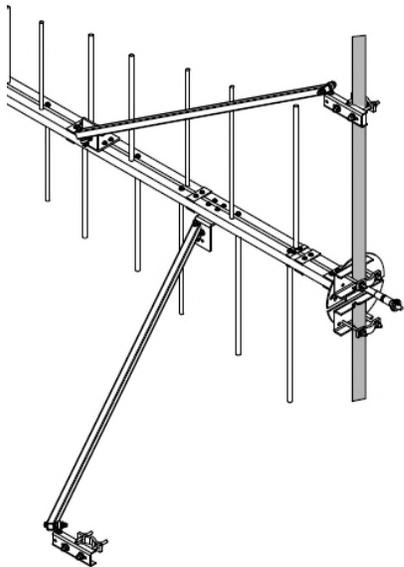
*(Actual Antenna Pattern rotated to 060.0°T)*

*(public record copy)*

**Shively Labs<sup>®</sup>**  
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[s://www.shively.com/wp-content/uploads/2018/04/6025.jpg](https://www.shively.com/wp-content/uploads/2018/04/6025.jpg)

## 6025

MEDIUM POWER ([HTTPS://WWW.SHIVELY.COM/PRODUCT-CATEGORY/FM-ANTENNA/MEDIUM-POWER-ANTENNA/](https://www.shively.com/product-category/fm-antenna/medium-power-antenna/))

Model: 6025

This is a Log Periodic Antenna. Designed for up to 5 kW per bay. Pattern Studies and Directional Patterns are available.

- Vertical, Horizontal and Slant Polarization
- Broadband from 88 to 108 MHz
- Directional options available

Performance Specifications:

Polarization: Right Circular

VSWR: Under 1.28 :1 over FM band

Input Connection: Sized for your needs, contact factory

QUOTE REQUEST

ELECTRICAL SPECIFICATIONS

OPTIONS

INSTALLATION & MOUNTING

TYPICAL PATTERNS

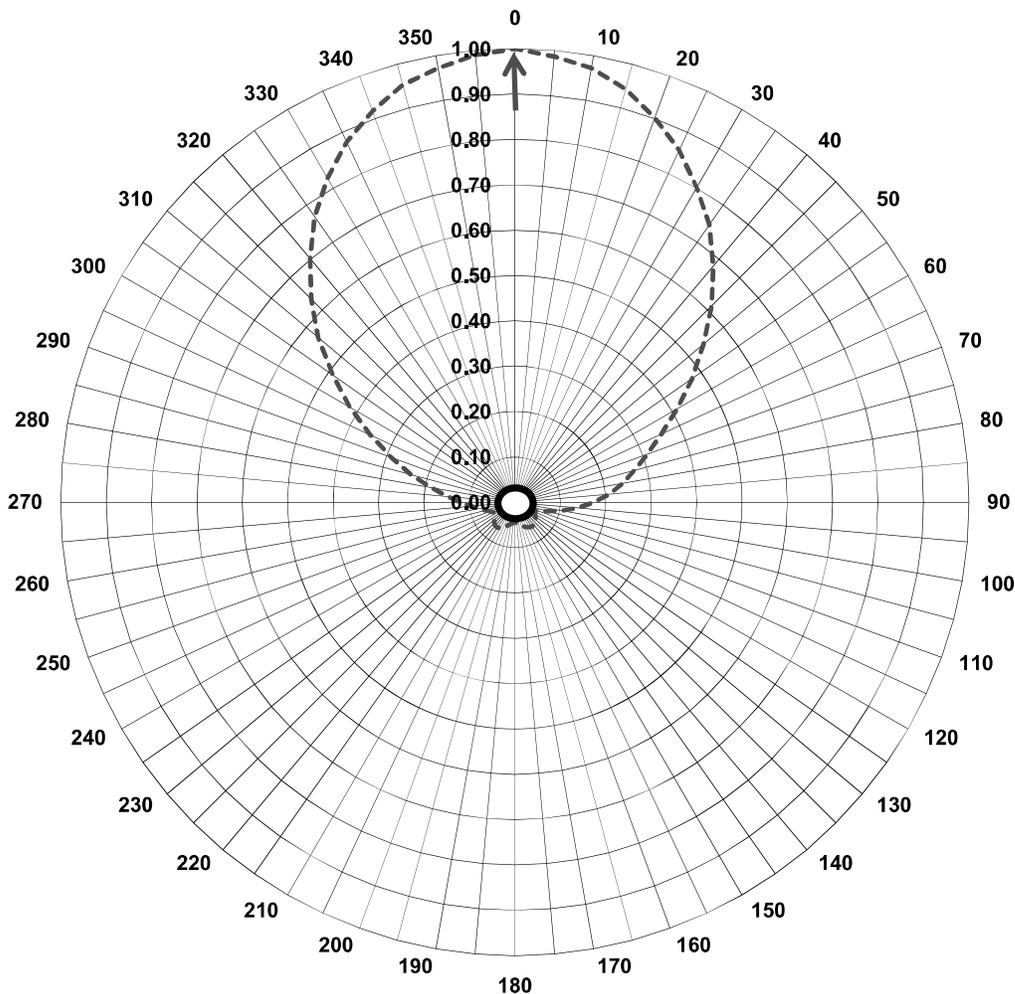
**Turners Falls, MA - WRSI(FM) (Auxiliary FM)  
Copy of Preliminary Directional Antenna Pattern**

**Proof of Performance Data**

(Actual Antenna Pattern rotated to 060.0°T)

(public record copy)

**SHIVELY LABS SAMPLE PATTERN**



**6025 ANTENNA VERTICAL**

VERTICAL RMS: 47.65%

HORIZONTAL RMS: 0.00%

PATTERN NUMBER	6025-002-V
FREQUENCY:	BROAD BAND
ANTENNA AZIMUTH	0-Degrees
TOWER	POLE
MOUNT STYLE	STD 6025 MT.
MOUNT REMARKS	N/A
DISTANCE FROM TOWER	N/A

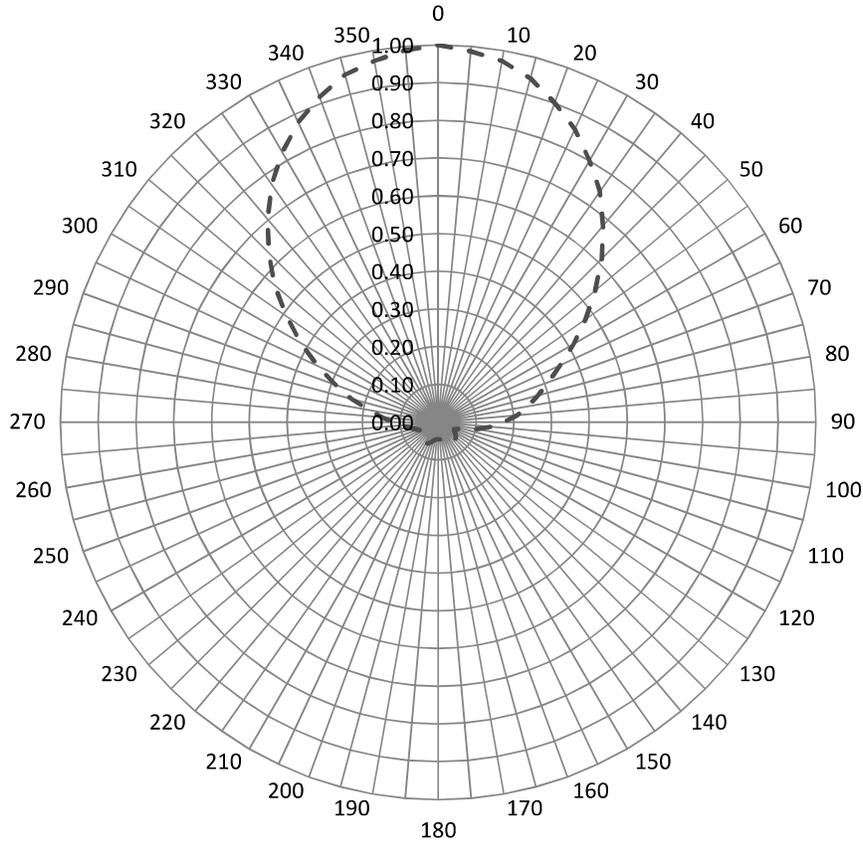
This is a standard 6025 mount  
Radomes are optional  
Pattern studies are optional  
See Shively Labs 6025 Data Sheet  
for complete details.

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**Copy of Preliminary Directional Antenna Pattern**  
**Proof of Performance Data**

(Actual Antenna Pattern rotated to 060.0°T)

(public record copy)

**SHIVELY LABS SAMPLE PATTERN**



**PATTERN NUMBER 6025-002-V**

**V-RMS 47.65%**  
**H-RMS 0.00%**

DEGREE	VERT	HORZ									
0	1.00	0.00	90	0.17	0.00	180	0.05	0.00	270	0.12	0.00
5	0.99	0.00	95	0.14	0.00	185	0.05	0.00	275	0.15	0.00
10	0.97	0.00	100	0.11	0.00	190	0.05	0.00	280	0.19	0.00
15	0.94	0.00	105	0.07	0.00	195	0.05	0.00	285	0.24	0.00
20	0.90	0.00	110	0.05	0.00	200	0.06	0.00	290	0.29	0.00
25	0.86	0.00	115	0.05	0.00	205	0.06	0.00	295	0.35	0.00
30	0.80	0.00	120	0.05	0.00	210	0.07	0.00	300	0.42	0.00
35	0.75	0.00	125	0.06	0.00	215	0.07	0.00	305	0.49	0.00
40	0.68	0.00	130	0.06	0.00	220	0.07	0.00	310	0.57	0.00
45	0.61	0.00	135	0.06	0.00	225	0.06	0.00	315	0.63	0.00
50	0.54	0.00	140	0.07	0.00	230	0.06	0.00	320	0.70	0.00
55	0.48	0.00	145	0.07	0.00	235	0.05	0.00	325	0.77	0.00
60	0.41	0.00	150	0.06	0.00	240	0.05	0.00	330	0.83	0.00
65	0.36	0.00	155	0.06	0.00	245	0.05	0.00	335	0.88	0.00
70	0.31	0.00	160	0.06	0.00	250	0.06	0.00	340	0.92	0.00
75	0.27	0.00	165	0.05	0.00	255	0.07	0.00	345	0.95	0.00
80	0.24	0.00	170	0.05	0.00	260	0.08	0.00	350	0.97	0.00
85	0.21	0.00	175	0.05	0.00	265	0.10	0.00	355	0.99	0.00

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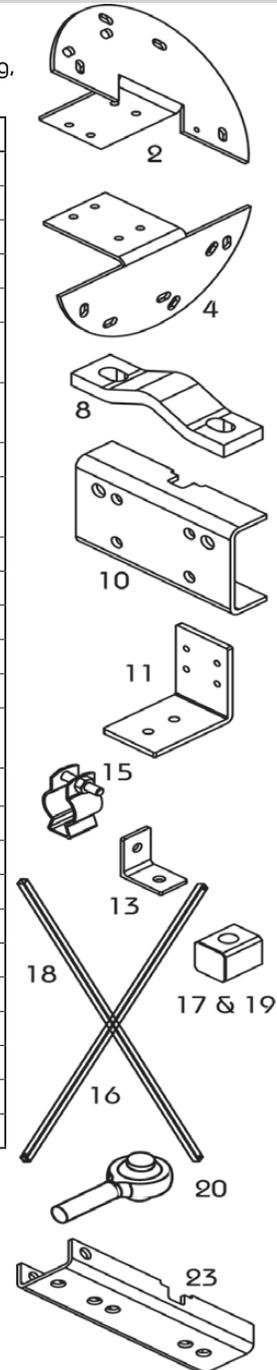
**Shively Labs®**

## Installing a Single-Bay Model 6025 FM Antenna

### Check Shipment.

Your single-bay antenna consists of the following parts and subassemblies. Before beginning, check to be sure they all have arrived in good condition.

Item	Qty	Description	P/N
1	1	Boom assembly	99181-G502
2	1	Top formed mounting plate	99195-01
3	4 sets	3/8-16 x 3-1/4" hex head bolts, lock washers, flat washers, and nuts	
4	1	Bottom formed mounting plate	99195-02
5	4 sets	3/8-16 x 3-1/4" hex head bolts, lock washers, flat washers, and nuts	
6	2 each	Antenna arms, approximately 34.7", 32.3", 30", 28", 26.1", 24.3", 22.7, and 22.3" long	99186-various
7	16 sets	5/16-18 x 3/4" long bolts, 5/16-18 nuts, 5/16" lock washers, and 5/16" flat washers, stainless steel	
8	4	Clamp halves	SCP
9	8	Threaded rods 1/2-13 x 8" galvanized, with nuts, lock washers, and flat washers	
10	2	Mount channels	86178-08
11	2	Fiberglass angles for diagonal braces	99193-02
12	8 sets	5/16-18 x 3-1/4" hex head bolts, lock washers, flat washers, and nuts	
13	1	Angle cable clamp clip	98611-02
14	1 set	14-20 x 1" bolt, nut, lock washer, and flat washers	
15	1	Coax clamp, 7/8" with 1/4-20 x 3/4" hex bolt, washers and nuts	98611-01
16	1	Vertical support, with holes across both ends	99193-03
17	2	Insert blocks	99193-04
18	1	Horizontal support, with a hole across one end	99193-05
19	2	Insert blocks	99193-04
20	4	Super-swivel rod ends	99196-02
21	4 sets	1/2-20 nuts, lock washers, and flat washers	
22	4 sets	1/2-13 x 4" hex bolts, lock washers, flat washers, and nuts	
23	2	Brace channels	98141-02
24	1	Male 7/8" flange cover	86679-01
25	1	7/8" flange O-ring	9068-215
26	1	7/8" flange hardware kit	82912-G506



### Tower preparation

- In addition to the above parts, before beginning you need to have (see Figure 5):
- Your "Figure 2," a sketch that was provided with the antenna proof-of-performance, showing the mounting parameters.
  - An outriggered mounting pole (customer-provided) or a tower leg with enough room above and/or below the antenna to attach the vertical support.

Document No. ts-6025\_installation (150320)

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1-888-SHIVELY

Fax: (207)647-8273

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**Turners Falls, MA - WRSI(FM) (Auxiliary FM)**  
**Copy of Preliminary Directional Antenna Pattern**  
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*(Actual Antenna Pattern rotated to 060.0°T)* *(public record copy)*

- A tower member or other structure (customer-provided) to which you will attach the horizontal support.

**NOTE**

Item callouts are consistent across all the illustrations in this technical sheet.

**NOTE**

Figure 2 of this technical sheet has been skipped, to avoid confusion with your "Figure 2" installation sketch.

**Installation.**

**WARNING**

Whenever a rigger is on the tower in the area of the antenna, shut off the signal and lock it off so that it cannot be turned on accidentally. RF emissions at close range are hazardous.

- Review your "Figure 2." If it calls for a mounting pole (provided by customer), mount the pole on the tower at the height and azimuth specified.

**CAUTION**

Before attaching the pole to the tower, scrape away tower paint to ensure good electrical contact. If you don't, the antenna may generate unwanted electrical signals, and performance may be degraded. Retouch the paint after installation.

- Mark the outriggered pole (or tower leg if there is no pole) at the location where the antenna bay will be mounted. Watch for tower components that might interfere with your installation.
- Assemble the antenna bay:
  - Using the 5/16" hardware (7), attach the antenna arms (6) to the sides of the booms (1) as shown in Figure 1. Note that the arm lengths are different lengths - be sure to locate them with the longest nearest the base of the boom assembly as shown.
  - Using the 3/8 x 3-1/2" hardware (3 & 5), attach the mounting plate halves (2 & 4) to the base of the booms as shown.
  - Using the 1/4-20 hardware (14), attach the cable damp clip (13) to the top mount plate half. Using the coax clamp (15), secure the cable section extending from the boom to the cable clamp clip, as shown in Figure 3.
  - Using the 1/2" threaded rods (9), attach the mount channels (10) to the mounting plates, with the an-

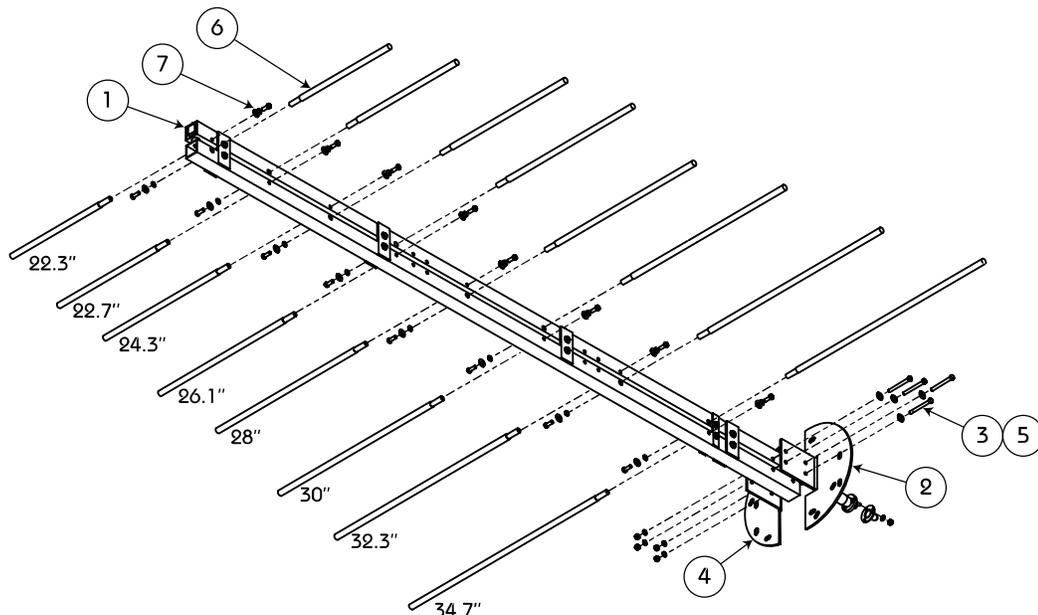


Figure 1. Attach the antenna arms and mounting plates [steps c(1) - (2)]

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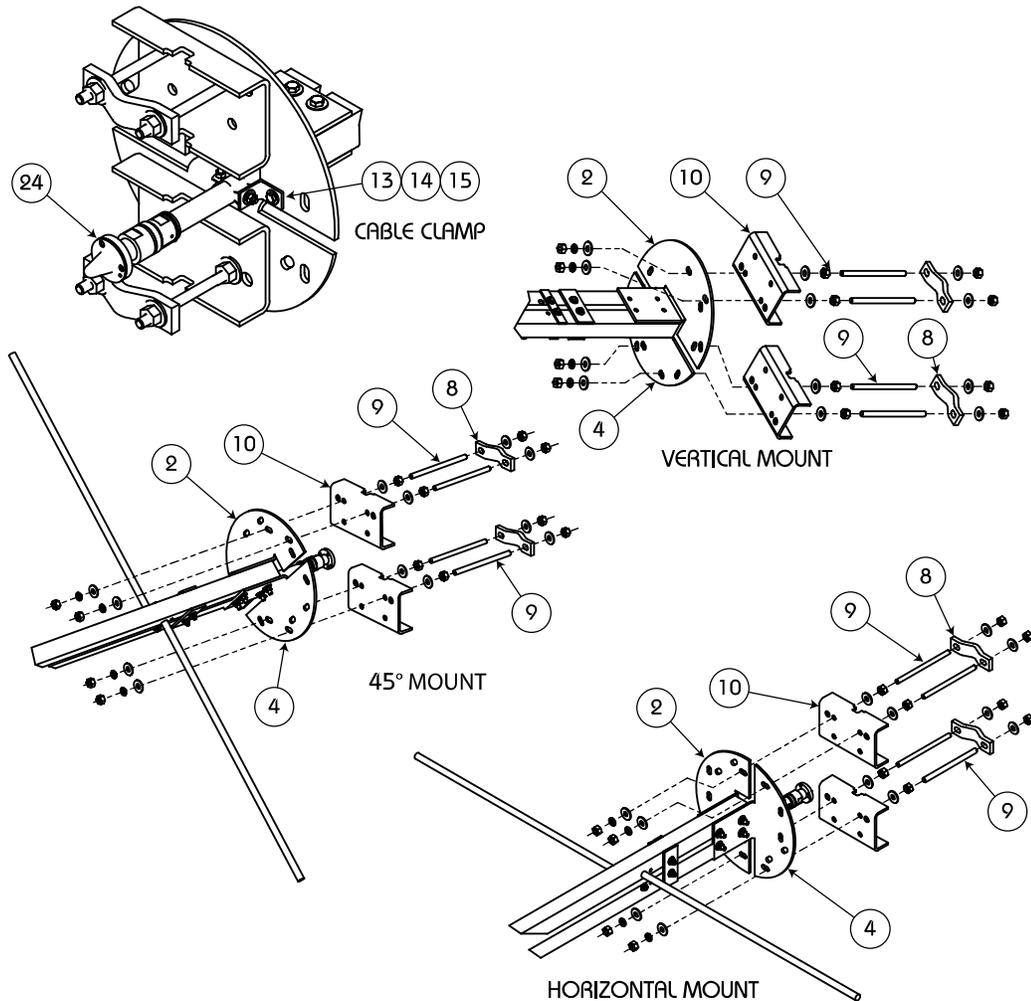


Figure 3. Attach the cable clamp and antenna mounts [step c(3) - (5)]

antenna arms in either the vertical, horizontal, or an angled mounting position, as specified in your "Figure 2." Attach the clamp halves (8) loosely onto the threaded rods. Mount attachment is shown in Figure 3.

- 5) Using the 5/16 x 3-1/4" hardware (12), attach the fiberglass angles (11) to the booms, as shown in Figure 4.

**NOTE**

Mounting angles may be located on the opposite side of the boom from that shown – or on the bottom – as dictated by best fit to the tower.

- d. Assemble the vertical and horizontal supports (Figure 4):

**CAUTION**

Ensure an insert block is in place in each end of the fiberglass support before attaching the rod end. If you do not, the fiberglass stabilizer may crack when torque is applied to the nut.

- 1) Using the 1/2 x 4" hardware (22) and an insert block (17 & 19) on each end of each support, attach the rod ends (20) to both ends of the vertical support (16) and one end of the horizontal support (18) as shown in Figure 4.
- 2) Using the 1/2" threaded rods (9), attach the antenna clamp halves (8) loosely to the brace channels (23),
- 3) Using the 1/2-20 hardware (21), attach the brace channel (23) to the rod end at the outer end of the

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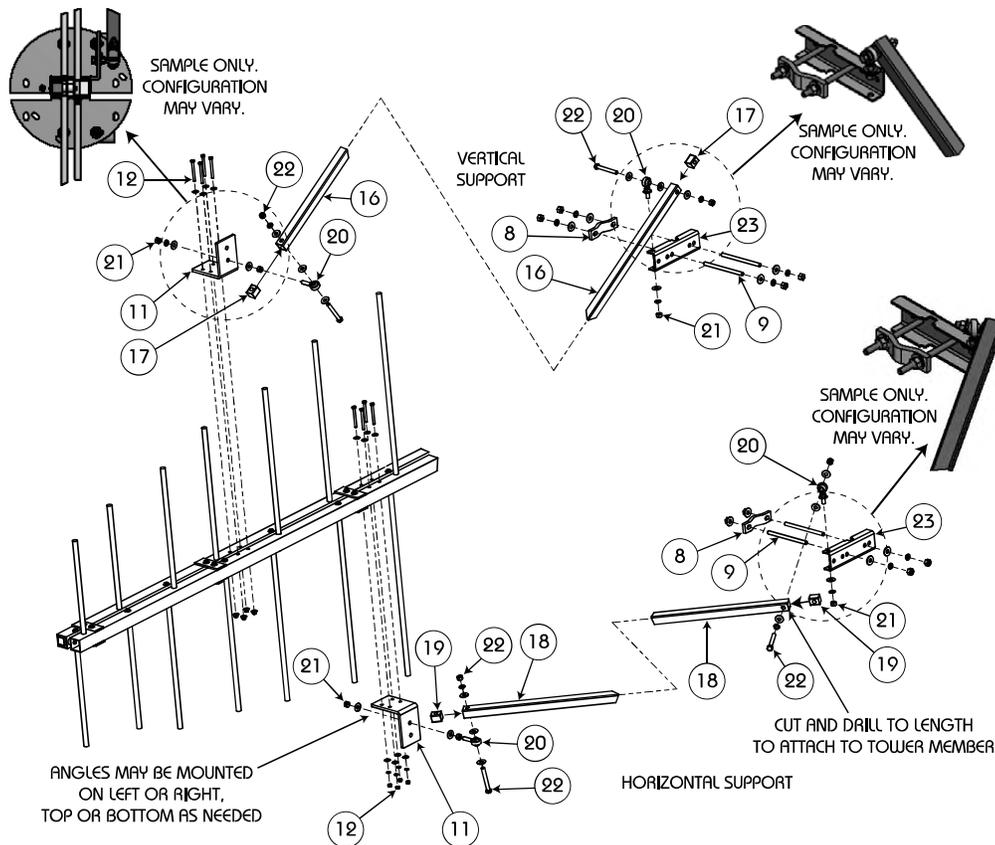


Figure 4. Completing antenna bay and support assembly [step d]

vertical support (16) as shown.

4) Do not attach the brace channel to the horizontal support (18) at this time.

e. Mount the antenna bay on the pole or tower (Figure 5):

**CAUTION**

NEVER try to support the bay from the cable.

**CAUTION**

Don't overtighten the connector. Overtightening may damage it.

- 1) Mount the bay on the tower leg or outrigged pole at the location you marked (step b). Tighten the nuts on the threaded rods snugly, but loosely enough for azimuth adjustment.
- 2) Attach the vertical support's brace channel securely to the tower leg or pole and use it to level the bay.
- 3) Attach the horizontal support (18) loosely to the boom as shown in Figure 4 of this tech sheet. Locate a tower leg or cross-member to which to attach the support.
- 4) If necessary, cut the horizontal support to length and drill it, using the insert block (19) as a drill template.
- 5) Install the rod end (20) on the horizontal support. Connect the rod end to the brace channel (23).
- 6) Attach the brace channel to the tower leg or cross-member and use it to secure the bay at the proper

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**(Actual Antenna Pattern rotated to 060.0°T)**

**(public record copy)**

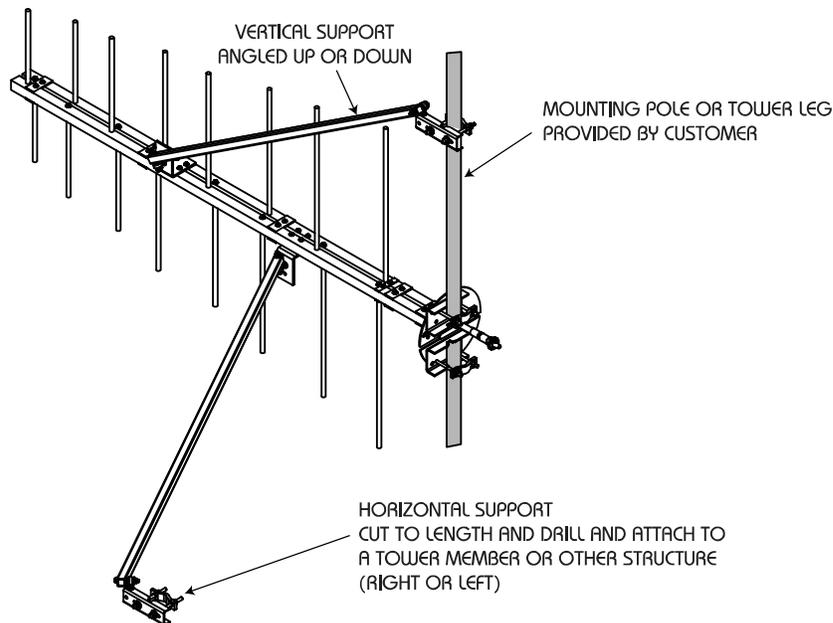


Figure 5. Mounting antenna on tower (vertical polarization shown)

azimuth.

7) Tighten all hardware before proceeding.

f. Attach the transmission cable to the antenna bay:

**CAUTION**

Stressing a coax connection after assembly can detune the system. Therefore, never make a connection and then bend or twist the cable. Likewise, do not use the connector and flange to force the coax into shape.

**CAUTION**

The antenna is non-pressurized. If you are using pressurized cable, you must install a gas stop at the antenna input flange.

1) Remove the flange cover (24) from the antenna input flange.

**CAUTION**

All O-rings are made of silicone. Do not lubricate them with silicone grease, as this will soften the O-ring. Use only a light lubricating coat of O-Lube or petroleum jelly; too much may hamper electrical contact and contaminate the interior of the system.

Be sure the O-ring is properly seated in its groove and not pinched between the flange contact surfaces.

2) Coat the O-ring (25) lightly with O-Lube (supplied with the antenna), then install it in the O-ring groove in the flange..

**CAUTION**

The minimum bending radius for 7/8" coax is 10". Do not bend it too tightly; you may damage it.

3) Form the coax to the desired shape before attaching it and align the flange properly, then make the connection.

4) Tighten the 1/4" flange hardware (26) to 7 ft-lb (9 N-m) torque.

Your Model 6025 installation is now complete. We hope you find the unit satisfactory in every way.

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***Copy of Preliminary Directional Antenna Pattern***  
***Proof of Performance Data***  
***(Actual Antenna Pattern rotated to 060.0°T) (public record copy)***

**NOTE**

If you have any problems with installation, call Shively and talk with a designer or Sales.

**Startup**

**NOTE**

The Model 6025 does not require pressurization or purging.

When all personnel are clear of the tower, apply a low-power signal to the antenna and read the VSWR. The VSWR should be below 1.28: 1. If it is not, call Shively and speak with a designer or Sales.

**Operation**

Once the antenna has been installed and VSWR has been confirmed, simply apply the transmitter signal. Don't exceed the rated power of the antenna.

**Troubleshooting**

**Broad spectrum RF noise:**

This indicates that some component is not in good electrical contact with the tower. Make sure mounts are tight, that tower paint has been removed from under the mounts, and that components of other systems are likewise in good contact with the tower.

**High VSWR:**

This is caused by any factor that changes the impedance match between the antenna and the transmitter. Look for:

- Defective RF connector. Make sure connectors are in good shape, and that center pins are not bent over.
- Damage to any antenna components.
- Paint on radiators.
- Interference from other tower components, especially components broken by wind or ice.

**Change in coverage:**

This may be caused by the same factors that can cause high VSWR. Look for VSWR changes as well.

Do recognize, however, that apparent changes in coverage may be due to subjective factors or faults of the receiving equipment. Before doing more than checking the VSWR, be sure that an actual coverage change has occurred.

**Maintenance**

**WARNING**

Whenever a rigger is on the tower in the area of the antenna, shut off the signal and lock it off so that it cannot be turned on accidentally. RF emissions at close range are hazardous.

**Log:**

We recommend that you keep a log of VSWR readings and any other performance notes and maintenance history for your antenna. Such a log can be invaluable for troubleshooting.

**Inspection:**

Whenever a rigger is on the tower for any reason, it is a good idea to have him check your antenna for general condition, looseness of connectors and mounts, and electrical damage.

**Paint:**

The radiator should never be painted; this will affect the VSWR.

**Return policy:**

When returning any material to the factory, be sure to call your salesperson and obtain a returned materials authorization (RMA) number first. Material may be refused and sent back to you at your expense if you don't do this.