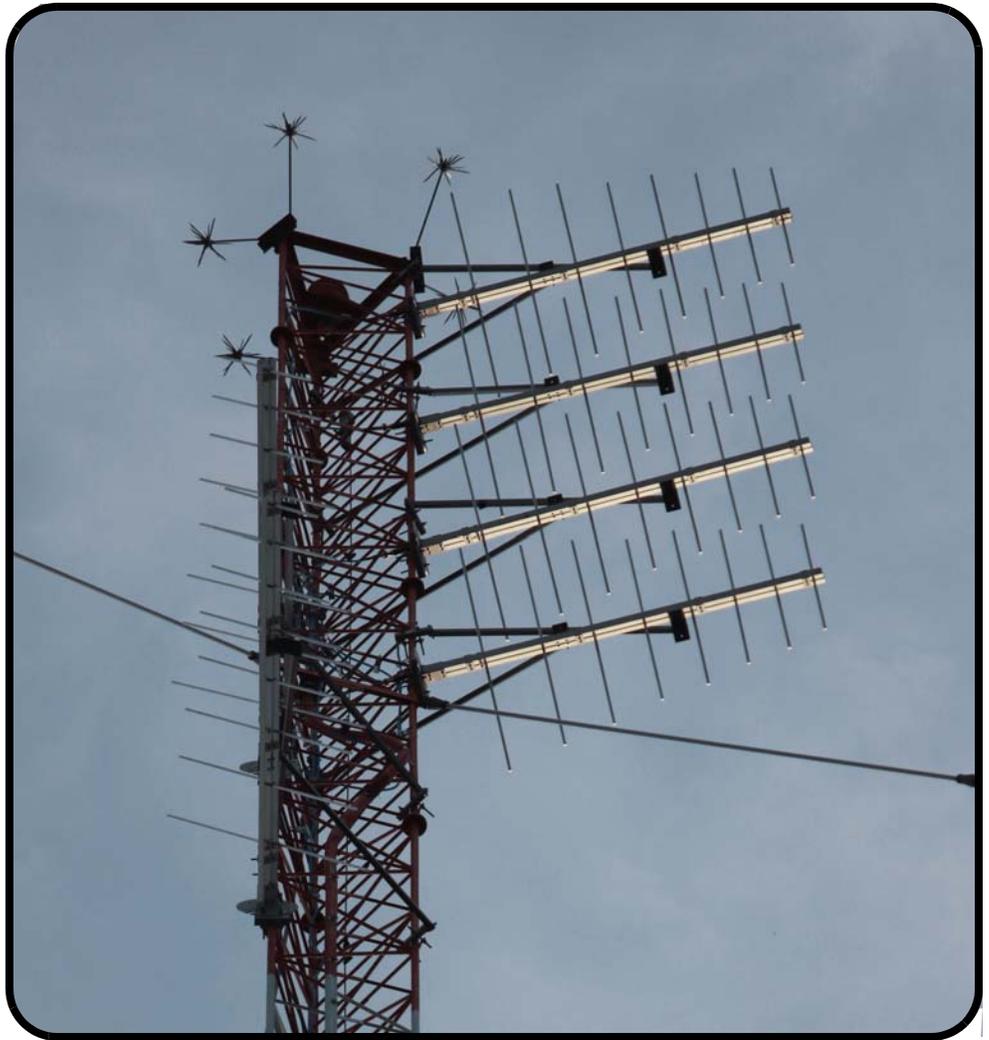


Shively Labs®

Circularly Polarized FM Broadcast Antenna

Model 6025



Instruction Manual

Installation, Operation, &
Maintenance

Congratulations!

Thank you for purchasing one of the finest FM broadcast antennas on the market today. The Shively Labs Model 6025 is the top-of-the-line in its class for its simplicity, superior performance and durability.

Your purchase is backed by the best technical support in the industry. Shively is a leading manufacturer in the broadcast industry, providing an extensive range of antennas, transmission line and components. Our technical staff has a wealth of experience in the broadcast industry and is standing by to serve you in any way.

This manual is intended to give you a good basic understanding of your antenna: its proper and safe installation, startup, and operation, and troubleshooting and maintenance information to keep it working satisfactorily for years to come. *Please have everyone involved with the antenna read this manual carefully, and keep it handy for future reference.*

Meanwhile, please feel free to contact your sales representative at Shively Labs at any time if you need information or help. Call or write:

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IMPORTANT

Please read this manual in its entirety before beginning installation of your antenna!

Failure to follow the installation and operation instructions in this manual could lead to failure of your equipment and might even void your warranty!

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1

Preparing for Installation

Check the shipment.

As soon as you receive your antenna, BEFORE signing for the shipment:

- a. Check to be sure all the material has arrived.
- b. Check for evident damage to any of the boxes.
- c. If any boxes are missing, or if any are obviously damaged, describe the problem in a WRITTEN note on the shipping papers BEFORE signing them. Then call Shively right away, and we'll do everything we can to correct the situation.

Important!

Never store the antenna system outdoors, boxed or otherwise. Take pains to keep the antenna components dry. Moisture inside antenna components can lead to arcing and equipment damage.

Check the parts.

Check to be sure all the parts shown in [Chapter 11](#) have arrived in good condition.

NOTE

Item callouts are consistent across all the illustrations throughout this manual.

In addition to the parts, before beginning you need to have:

- Your "Figure 2," a sketch that was provided with the antenna proof-of-performance, showing the mounting parameters.
 - Outrigged mounting pole(s) (customer-provided) or tower leg(s) in accordance with your "Figure 2."
-

Review the antenna layout.

Review your "Figure 2." It shows the overall layout and dimensions of your finished antenna. This may be:

- A 6025 single-boom: one antenna boom or a vertical array of single booms ([Figure 1](#) on page 2).
- A 6025 dual-boom: two antenna booms mounted side-by-side on a pipe structure ([Figure 2](#)).
- A combination, for example, a dual-boom portion and a nearby single-boom. These will be mounted separately.

Preparing for Installation

Figure 1. Model 6025 single-boom, two-bay antenna

(Vertically polarized, with radomes)

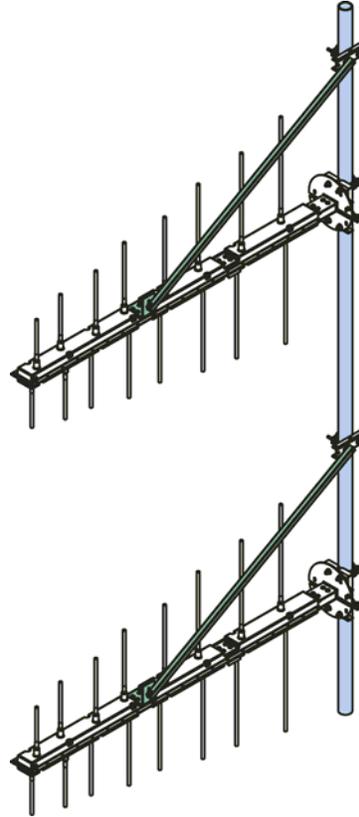
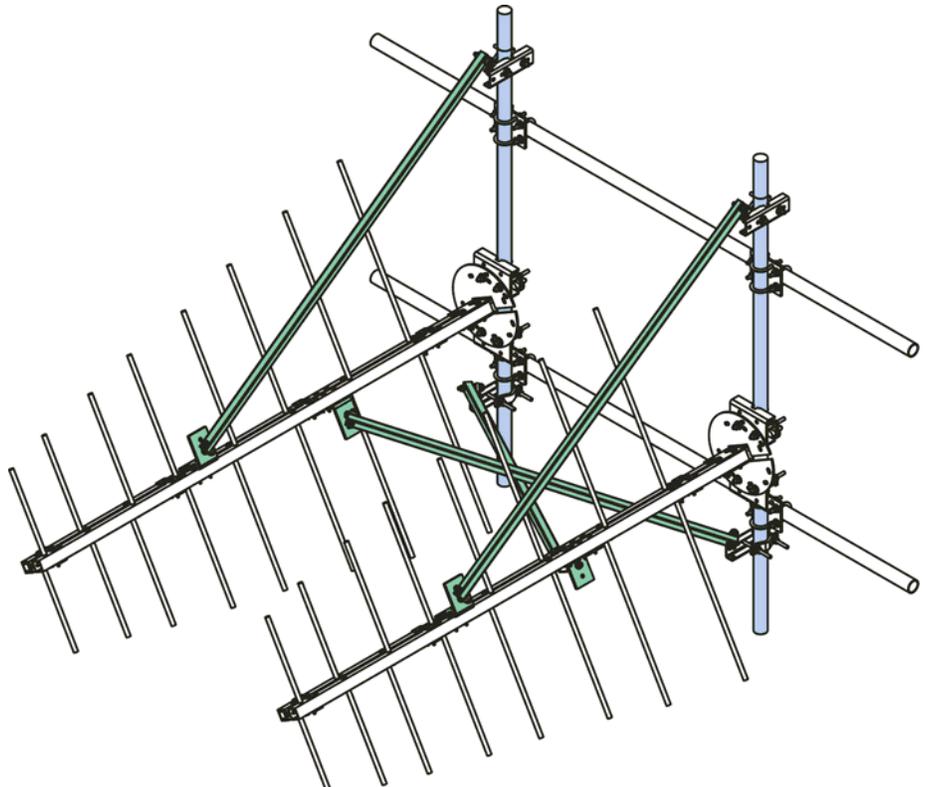


Figure 2. Model 6025 dual-boom, single-bay antenna

(*** polarized, without radomes)



Torque specifications.

Use torques in [Table 1](#) unless otherwise specified.

NOTE

Use an anti-seize compound to minimize galling on stainless steel threads.

Table 1. Torque specifications

Hardware size	Torque (dry)	Torque (lubricated)
10-32 stainless (radome flanges)	tbd	tbd
1/4-20 (radome flanges, 7/8" EIA flanges)	75.2 lb-in (8.5 N-m)	63.9 lb-in (7.2 kg-m)
5/16-18 (1-5/8" EIA flanges)	200 lb-in (22 N-m)	n/a
3/8-16 (3-1/8" EIA flanges)	236 in-lbf (26.7 N-m)	201 in-lbf (22.7 N-m)
1/2-13 stainless	43 lb-ft (58 N-m)	37 lb-ft (37 N-m)
1/2-20 stainless	45 lb-ft (61 N-m)	38 lb-ft (51 N-m)
1/2-13 Grade 2 galvanized	61 lb-ft (82 N-m)	n/a
1/2-13 Grade 5 galvanized	94 lb-ft (123 N-m)	n/a
5/8-11 Grade 2 galvanized	121 lb-ft (164 N-m)	n/a

2

Assembling the Bays

Install the arms onto the boom.

NOTE

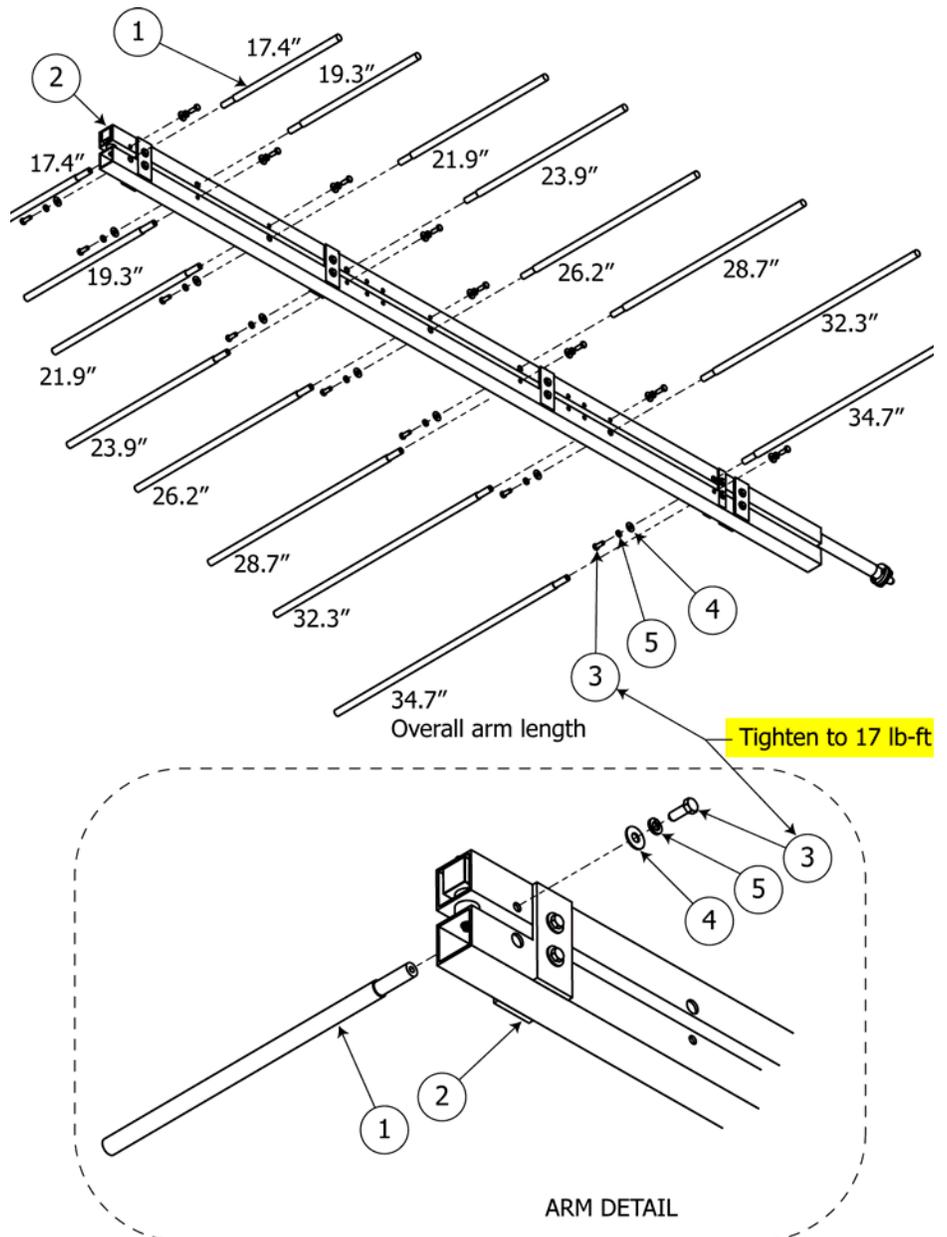
The arms are different lengths - be sure to locate them with the longest nearest the base of the boom assembly as shown.

- Attach arms (Figure 3, 1) to the boom assembly (2), using 5/16" stainless hardware (3, 4, and 5). Tighten in accordance with Table 1 on page 3.

CAUTION

When inserting the arms, be careful not to damage the coax inside one of the booms. If necessary, use a small Phillips screwdriver to push the coax gently out of the way.

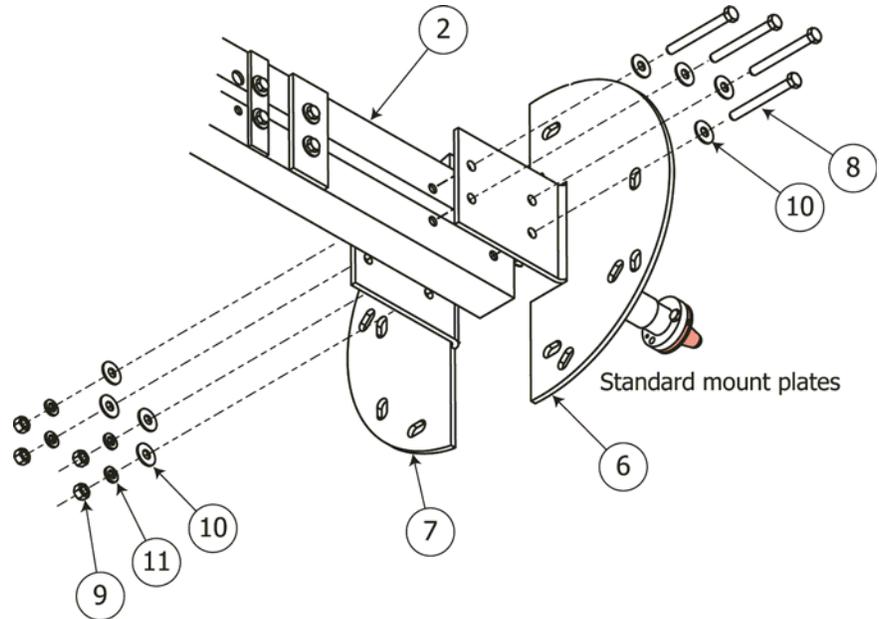
Figure 3. Arms attached to boom



Attach the mounting plates.

Figure 4. Mounting plates attached to boom assembly

Attach the mounting plate halves ([Figure 4, 6 & 7](#)) to the booms, using four sets of 3/8" stainless hardware ([8, 9, 10, and 11](#)). Tighten in accordance with [Table 1](#) on page 3.



Install the square plugs (antenna with radomes only).

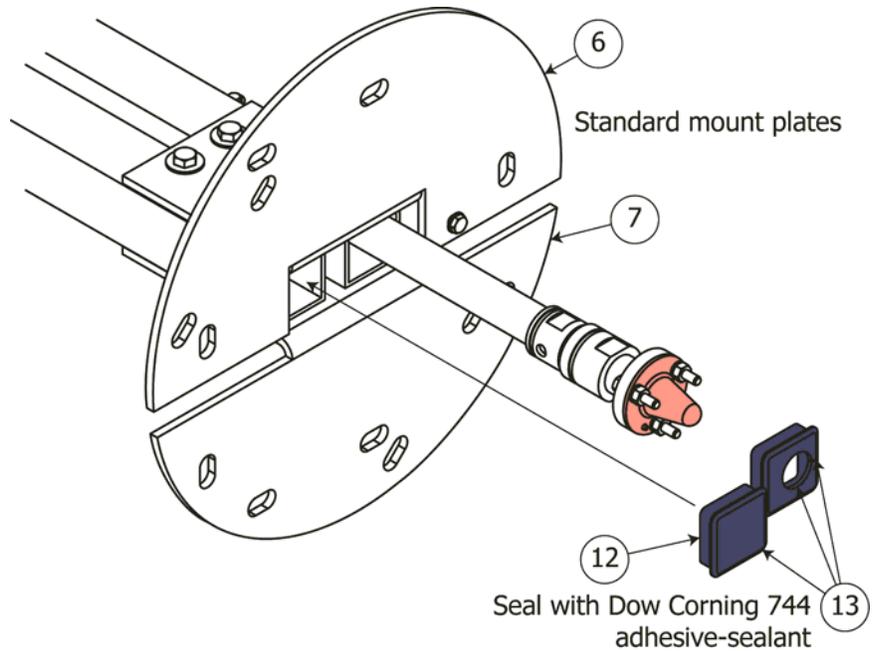
NOTE

If your antenna does not include radomes, skip this section and go to [Install the mount channels and clamp halves](#), on page 8.

Install the square plugs ([Figure 5, 12](#)) in the ends of the booms:

- a. Wrap the hole in one plug around the coax and install it with the slit to the outside, as shown.
- b. Seal the plugs with Dow Corning 744 adhesive-sealant ([Figure 5, 13](#), provided with the antenna):
 - All around the plugs,
 - Around the coax cable, and
 - The slit in the plug.

Figure 5. Square plug installation



Attach the cable clamp and secure the cable end.

- Attach the cable clamp (Figure 6, 14) to the cable clamp clip (15), using 1/4" stainless hardware (16, 17, 18, and 19).
- Attach the cable clamp clip to the top mount plate half (6) using 1/4" stainless hardware (20, 17, 18, and 19).
- Secure the cable section extending from the boom, using the cable clamp.

Figure 6. Cable clamp clip & cable clamp, installed (without radomes)

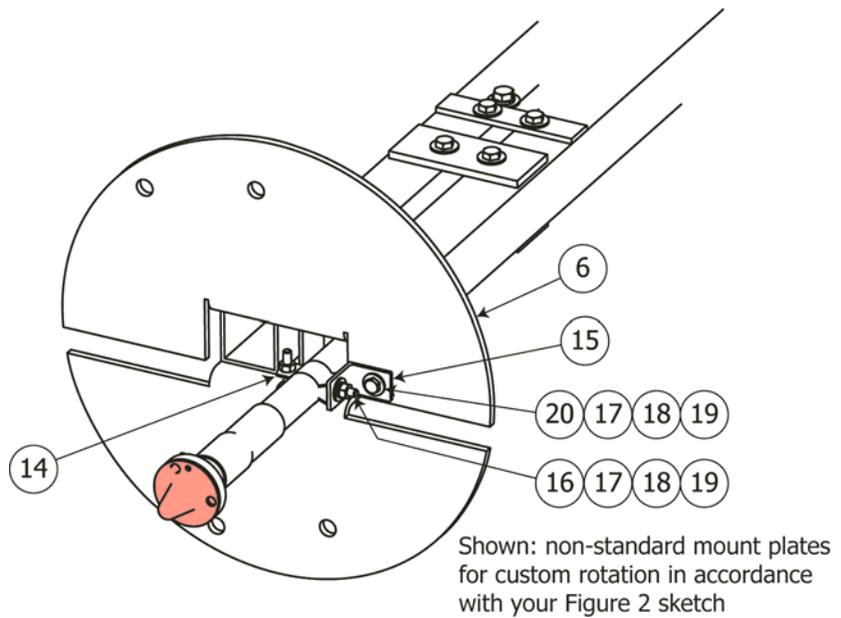
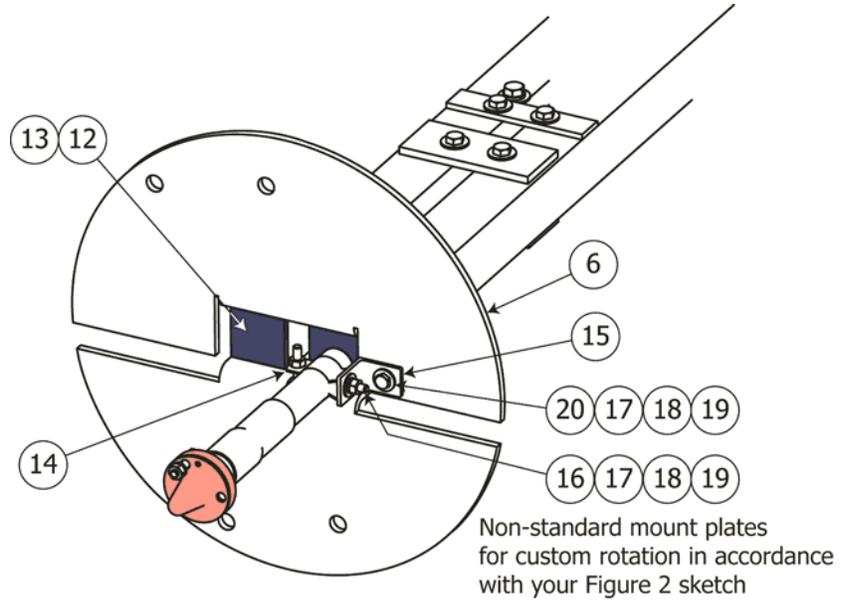


Figure 7. Cable clamp clip & cable clamp, installed (with radomes)



Install the mount channels and clamp halves.

NOTE

The channels must be installed in the outermost positions to clear the coax cable section.

NOTE

Standard mount plates include bolt holes for vertical, horizontal, and 45° angled mounting. For angles other than 45° (see [Figure 10](#)), only the required bolt holes will be present.

NOTE

Orient the antenna arms in either the vertical ([Figure 8](#)), horizontal ([Figure 9](#)), or an angled ([Figure 10](#)) mounting position, as specified in your "Figure 2."

- a. (Tower leg or mounting pole up to 3-1/2" diameter only) Using four 1/2" galvanized threaded rods ([21](#)), attach two mount channels ([22](#)) to the mount plates as shown, with 1/2" galvanized hardware ([23](#), [24](#), and [25](#)). Tighten in accordance with [Table 1](#) on page 3.
- b. (Tower leg or mounting pole 3-1/2" to 5-1/4" diameter only) Using four 1/2-13 x 1-1/2" bolts ([26](#)), attach two mount channels ([22](#)) to the mount plates as shown, with hardware ([23](#), [24](#), and [25](#)). Tighten in accordance with [Table 1](#) on page 3.

Assembling the Bays

Figure 8. Vertical mounting position

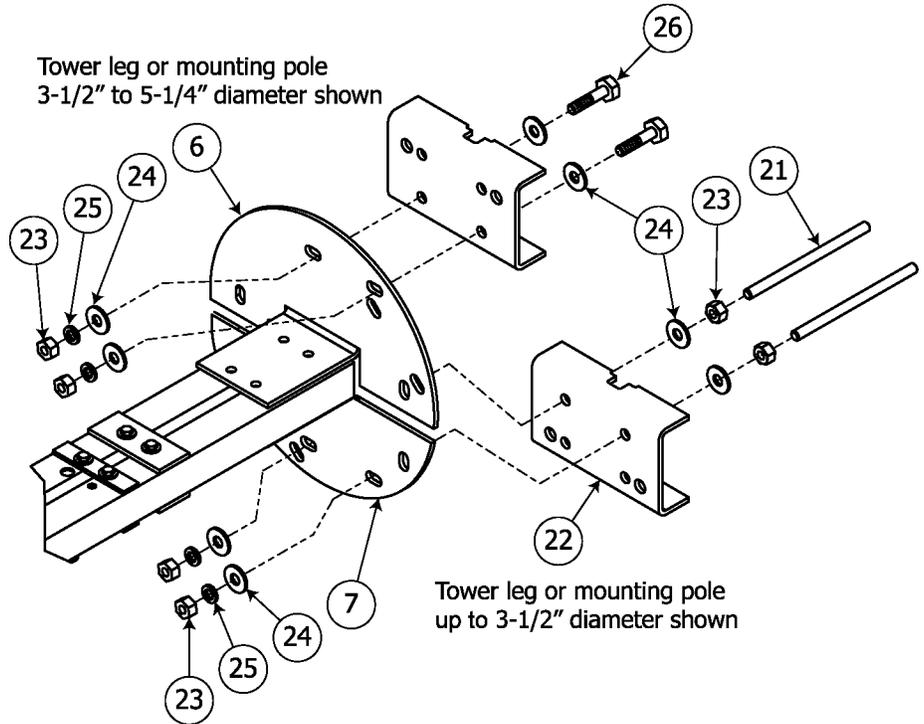
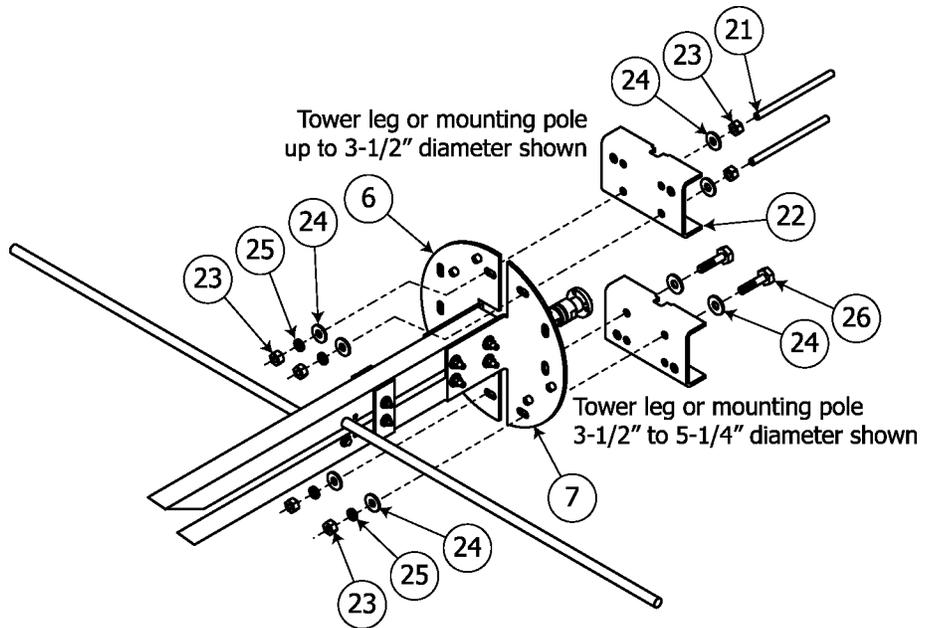
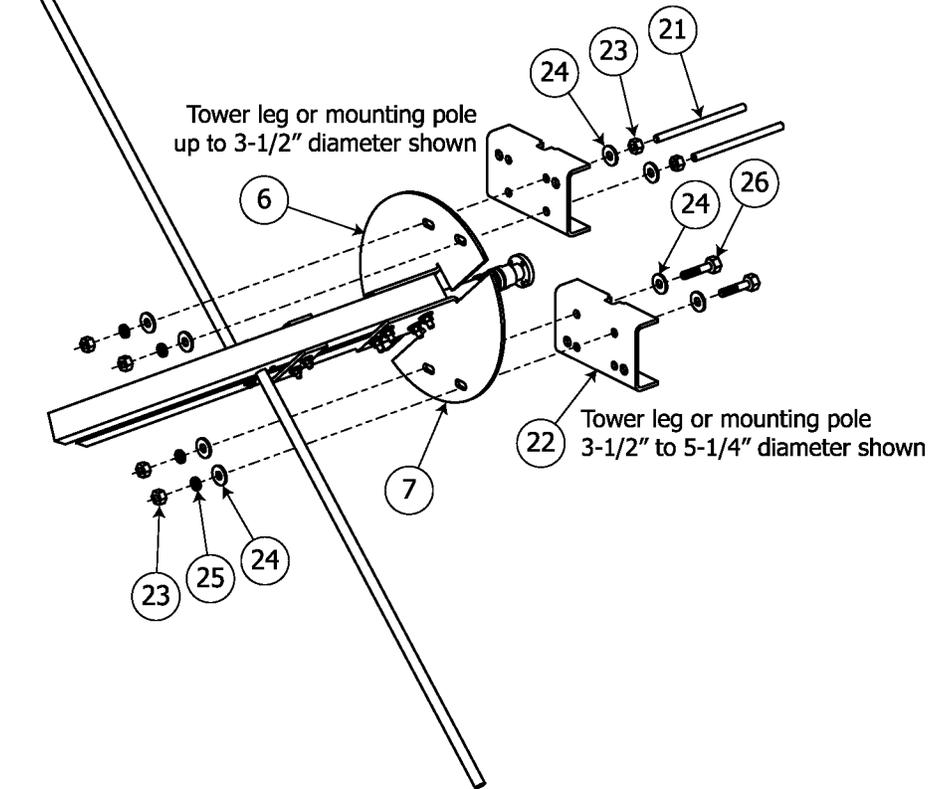


Figure 9. Horizontal mounting position



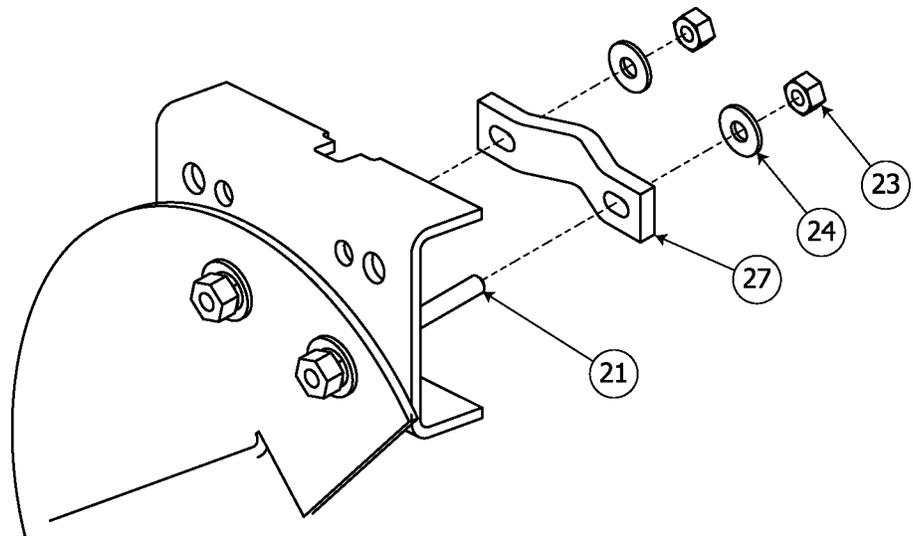
Assembling the Bays

Figure 10. Angled mounting position



- c. (Tower leg or mounting pole up to 3-1/2" diameter only) Assemble the clamp halves (Figure 11, 27) loosely onto the threaded rods (21), with hardware (23 and 24).

Figure 11. Clamp halves, installed (tower leg or mounting pole up to 3-1/2" diameter)

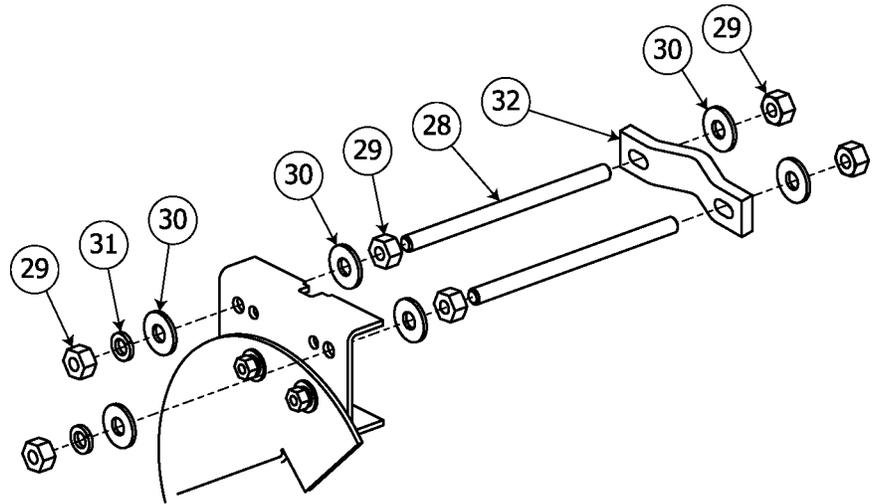


- d. (Tower leg or mounting pole 3-1/2" to 5-1/4" diameter only) Assemble the 5/8" threaded rods (Figure 12, 28) into the larger holes in the mount channel, with hardware (29, 30, and 31).

Assembling the Bays

- e. Assemble the clamp halves ([Figure 12](#), [32](#)) loosely onto the threaded rods ([28](#)), with hardware ([29](#) and [30](#)).

Figure 12. Clamp halves, installed (tower leg or mounting pole 3-1/2" to 5-1/4" diameter)



If your antenna has radomes, proceed to [Chapter 3](#). If your antenna does not include radomes, skip to [Chapter 4](#).

3

Installing the Radomes

This chapter applies only if your antenna includes radomes. If it does not, go straight to [Chapter 4](#).

Install the radomes.

- a. Slip the radome halves ([Figure 13](#), [33](#)) over the antenna arms ([1](#)) onto the boom assembly ([2](#)).
- b. Apply a line of Dow Corning 744 adhesive-sealant ([13](#)) between the flanges of the radome halves.
- c. Using hardware ([34](#), [35](#), [36](#)), and starting at the center and working toward the ends, attach the radome flanges.

NOTE

The intent of the filler gasket is to prevent water getting into the antenna by entering between the booms. Install and seal accordingly.

- d. Insert the silicone sponge filler gasket ([37](#)) between the antenna booms.
- e. Insert the bolt ([38](#)) with washer ([18](#)) through the holes in the mount-end radome flanges and through the filler gasket, as shown. Secure the filler gasket with a second washer and nut ([39](#)).
- f. Seal with adhesive-sealant:
 - The mount-end radome flange, and
 - Around the filler gasket.

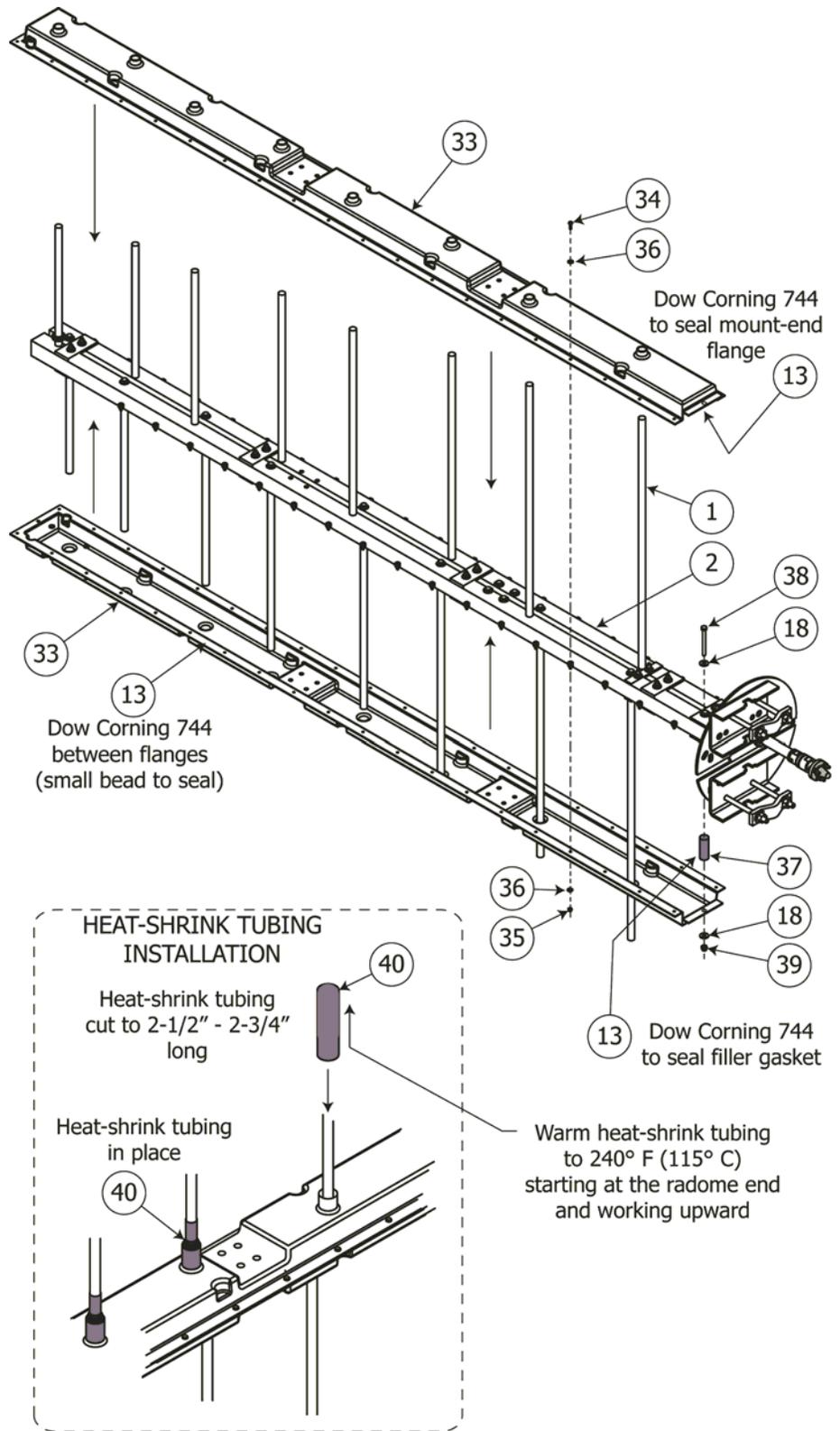
CAUTION

To ensure the heat-shrink tubing grips the radome boss, start warming the tubing at the base. When the base shrinks and grips the radome boss, move up away from the radome to the far end of the tubing.

- g. Cut the heat-shrink tubing ([40](#)) into sections, each 2-1/2 to 2-3/4 inches (6.35 - 7 cm) long. Slip the heat-shrink tubing sections over the antenna arms and over the bosses on the radome. Using a heat gun, warm the heat-shrink tubing to seal the antenna arm ports in the radome.
- h. Double-check to ensure all potential leak points are sealed with Dow Corning 744 adhesive-sealant (see [Figure 14](#)).

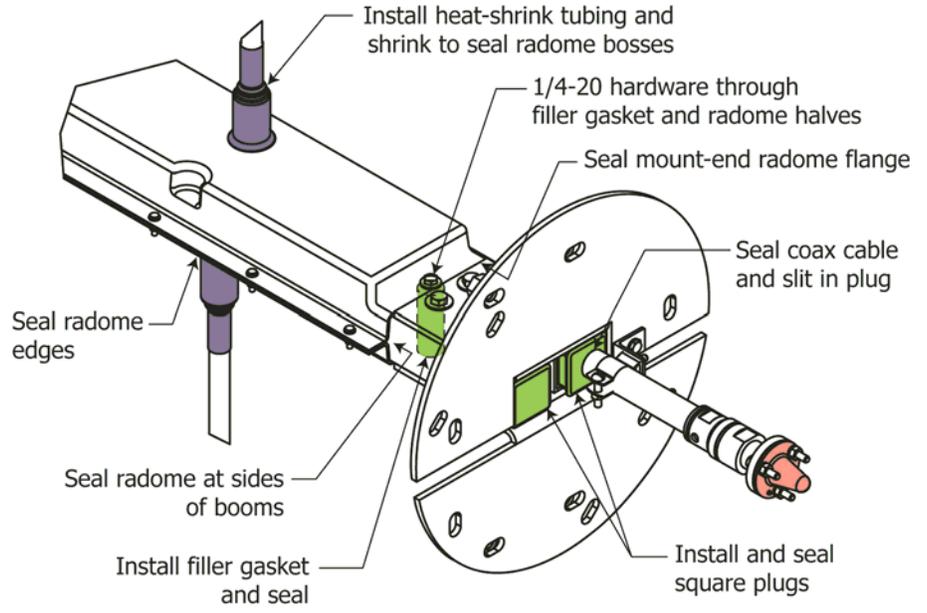
Installing the Radomes

Figure 13. Radome installation



Installing the Radomes

Figure 14. Sealing summary



4

Installing the Boom Supports on the Bays

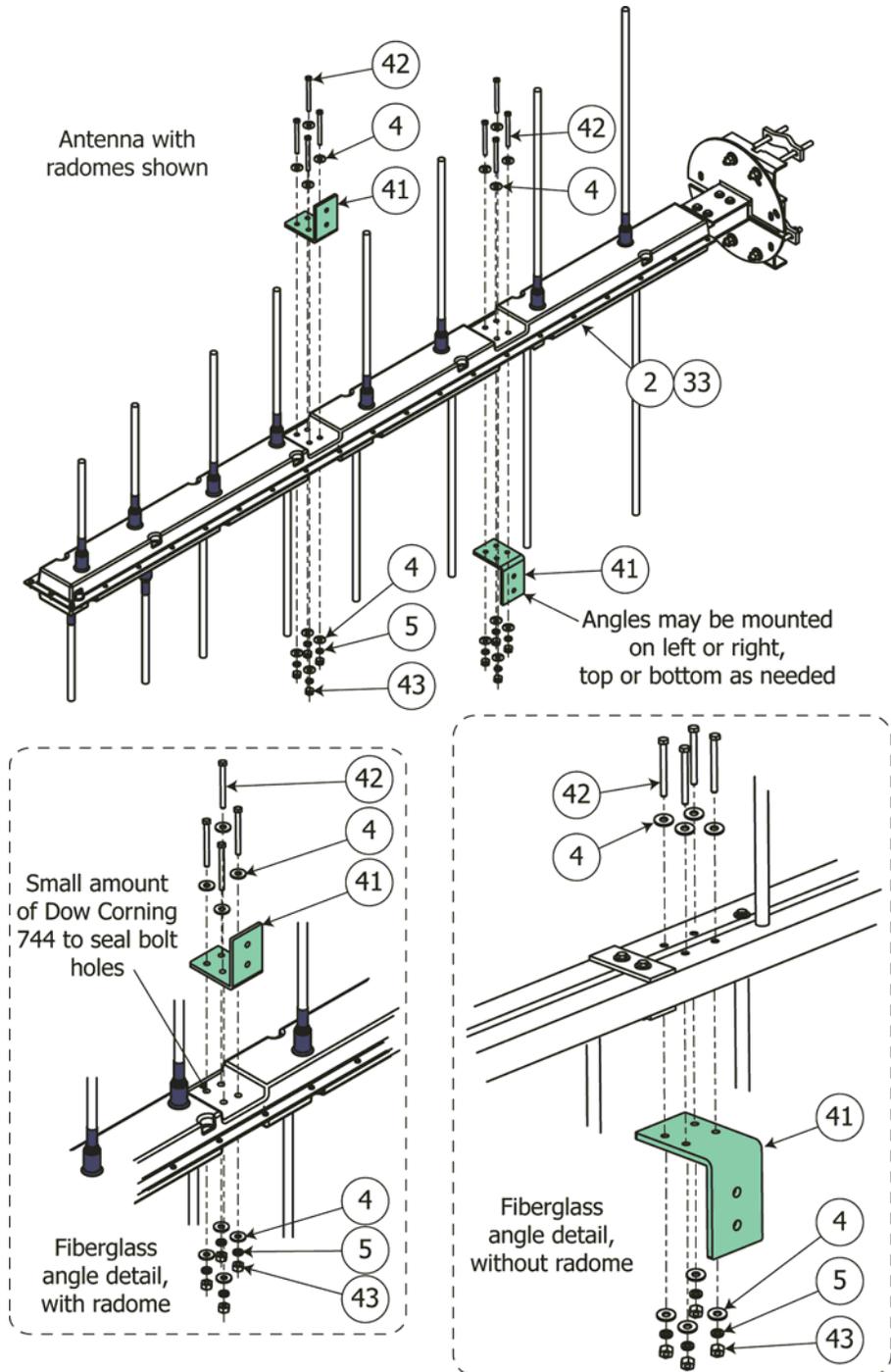
Install fiberglass angles.

NOTE

Fiberglass 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.

- a. Attach the two fiberglass angles (Figure 15, 41) to the booms using 5/16" hardware (42, 43, 4, and 5).

Figure 15. Fiberglass angle installation



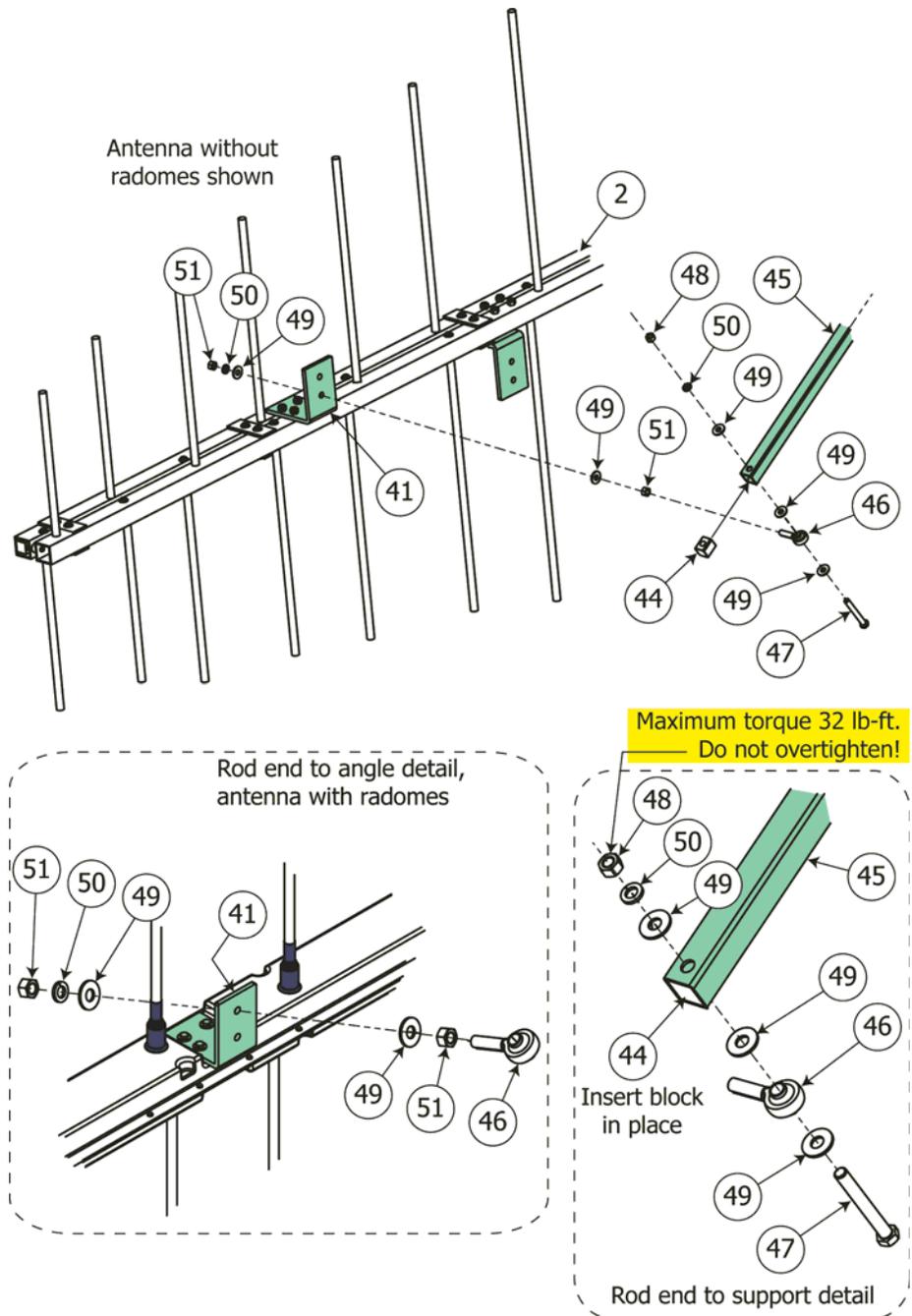
Attach the vertical boom support.

CAUTION

Ensure an insert block is in place in the end of the fiberglass support before attaching the rod end. Without the block, the fiberglass support will crack when torque is applied to the nut.

- a. Install an insert block (Figure 16, 44) into one end of the vertical boom support (45) and attach a rod end (46) as shown, with 1/2" stainless hardware (47, 48, 49, and 50).

Figure 16. Vertical boom support installation



Installing the Boom Supports on the Bays

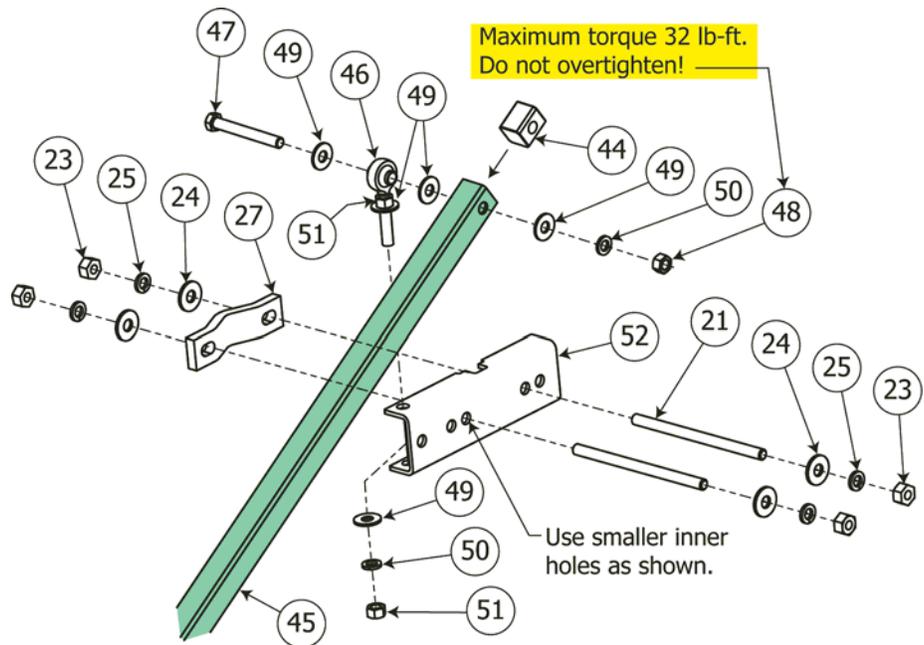
- b. Repeat for the other rod end at the other end of the vertical support.

NOTE

The vertical boom support may be located on the opposite side of the boom from that shown – or on the bottom, angled down – as dictated by best fit to the tower.

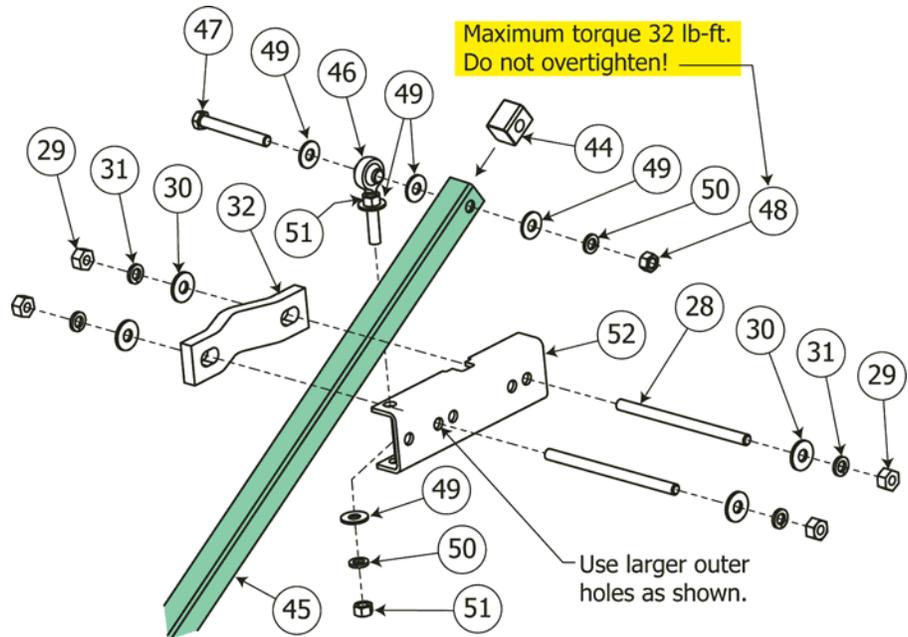
- c. Attach the vertical boom support (Figure 16, 45) to the fiberglass angle (41) using 1/2-20 stainless hardware (51, 49, and 50) on the rod end.
- d. (Tower leg or mounting pole up to 3-1/2" diameter only) Attach an antenna clamp half (Figure 17, 27) loosely to the vertical support channel (52) using 1/2" threaded rods (21) and galvanized hardware (23, 24, and 25).

Figure 17. Vertical boom support channel installation (tower leg or mounting pole up to 3-1/2" diameter)



- e. (Tower leg or mounting pole 3-1/2" to 5-1/4" diameter only) Attach a clamp half (Figure 18, 32) loosely to the vertical support channel (52) using 5/8" threaded rods (28) and galvanized hardware (29, 30, 31).

Figure 18. Vertical boom support channel installation (tower leg or mounting pole 3-1/2" to 5-1/4" diameter)



- f. Attach a rod end (46) to the vertical boom support (45), with an insert block (44) and 1/2" stainless hardware (47, 48, 49, and 50).
- g. Attach the rod end to the vertical support channel at the outer end of the vertical boom support using 1/2-20 stainless hardware (51, 49, and 50).

Attach the horizontal boom support.

- a. Repeat the above to attach one end of the horizontal boom support (Figure 19, 54) to the other fiberglass angle (41) using an insert block (44), a rod end (46), 1/2" stainless hardware (47, 48, 49, and 50), and 1/2-20 stainless hardware (51, 49, and 50).

NOTE

The horizontal boom support may be located on the opposite side of the boom from that shown, as dictated by best fit to the tower.

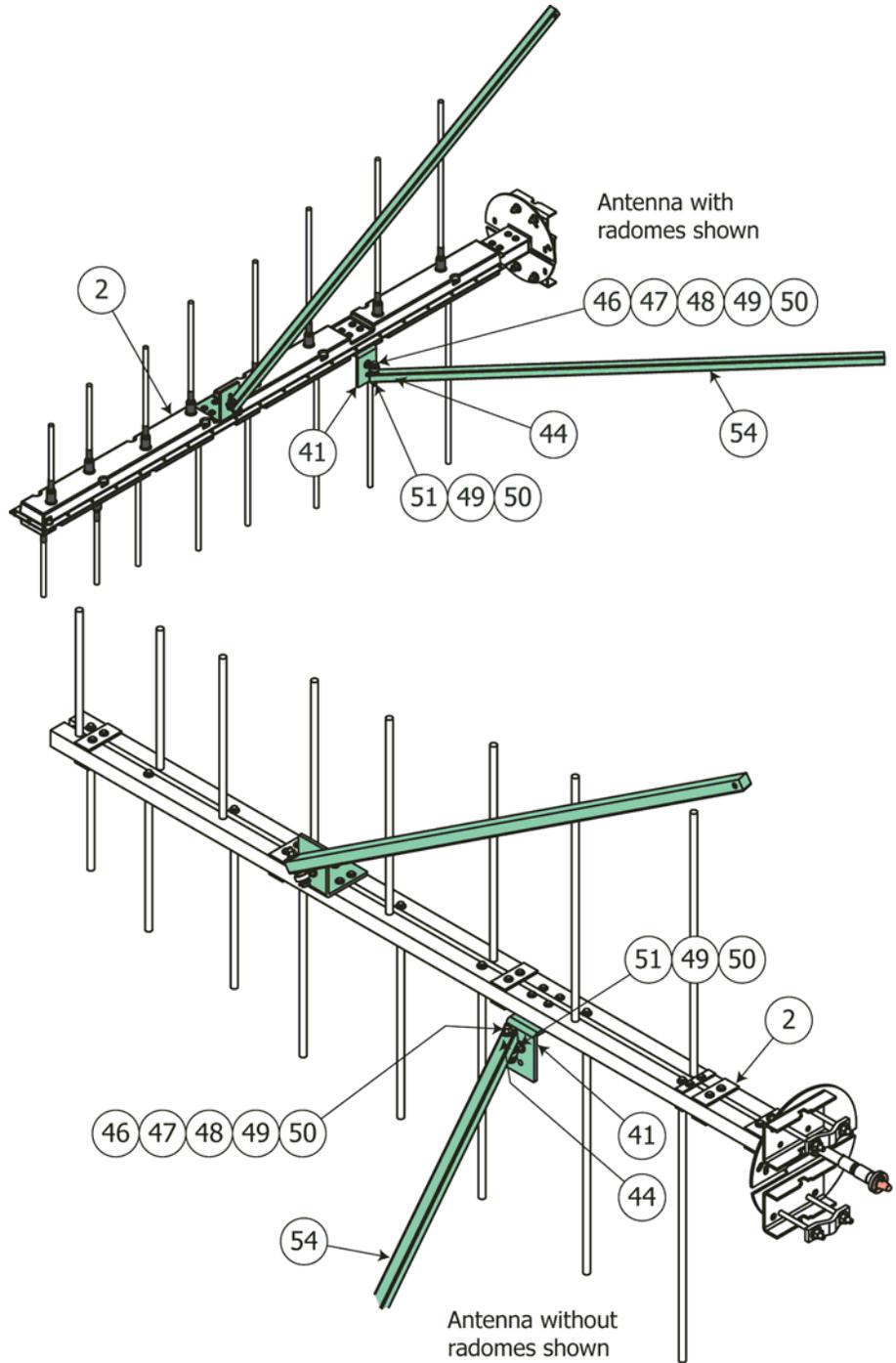
NOTE

Do not attach the support channel to the horizontal boom support (54) at this time.

CAUTION

Consult Shively Labs to check buckling criteria for the strut. This must be checked for all Class III structures.

Figure 19. Horizontal boom support, installed



Repeat for additional bays.

Repeat boom support attachment for additional boom assemblies if your system has more than one (dual-boom antenna and/or multiple bays).

If your system is a dual-boom bay (see [Figure 2](#) on page 2), continue with [Assembling the Mounting Structure](#) on page 23.

If your system has multiple single-boom bays (see [Figure 1](#) on page 2), arrayed vertically, go to [Installing the Antenna on the Tower](#) on page 27.

5

Assembling the Mounting Structure

Single-boom

Your "Figure 2" may show a mounting pole, to be provided by you. If no mounting pole is shown, your antenna is designed to mount directly on the tower leg.

- a. If your "Figure 2" shows a mounting pole, install the pole on the tower at the height and azimuth specified.
- b. Mark the outriggered pole or tower leg at the location where the antenna will be mounted. Watch for tower components that might interfere with your installation.

CAUTION

If you do not get good electrical contact between the antenna and the mounting structure, the antenna may generate unwanted electrical signals, and performance may be degraded.

- c. Before attaching the pole to the tower, scrape away tower paint to ensure good electrical contact.
- d. Retouch the paint after installation.
- e. Proceed to [Installing the Antenna on the Tower](#) on page 27.

Dual-boom

[Figure 20](#) on page 24 and [Figure 21](#) on page 25 show several typical mounting configurations and typical methods of clamping the pipes together.

Your installation, shown on your "Figure 2," will be similar to one of these. The pipes and clamps are included in your antenna package.

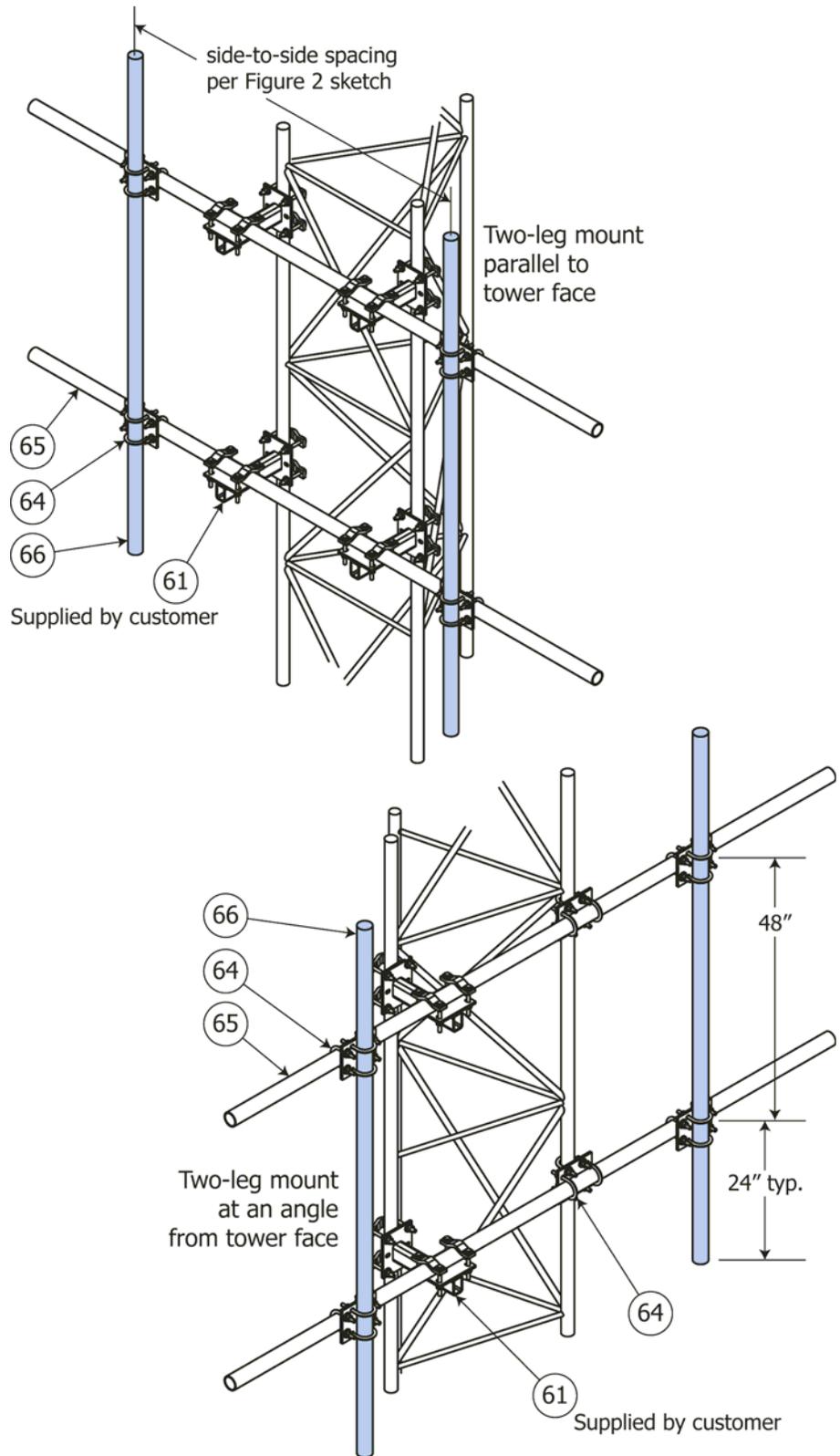
CAUTION

If you do not get good electrical contact between the antenna and the tower, the antenna may generate unwanted electrical signals, and performance may be degraded.

- a. Before attaching each component to the tower, scrape away tower paint to ensure good electrical contact.
- b. Using tower mounts ([Figure 20](#), [61](#): supplied by the customer) and a combination of clamps ([62](#), [63](#), and [64](#)), assemble the horizontal mount pipes ([65](#)) onto the tower in accordance with your installation drawing.
- c. Similarly, install the vertical mount pipes ([66](#)) onto the horizontal pipes. Adjust the side-to-side spacing before tightening the clamps. Each vertical pipe will serve the same purpose as the outriggered pole of a single-boom antenna.
- d. Level the mount pipes, adjust their azimuths, and tighten all mount pipe hardware securely.
- e. Retouch the paint after installation.
- f. Proceed to [Installing the Antenna on the Tower](#) on page 27.

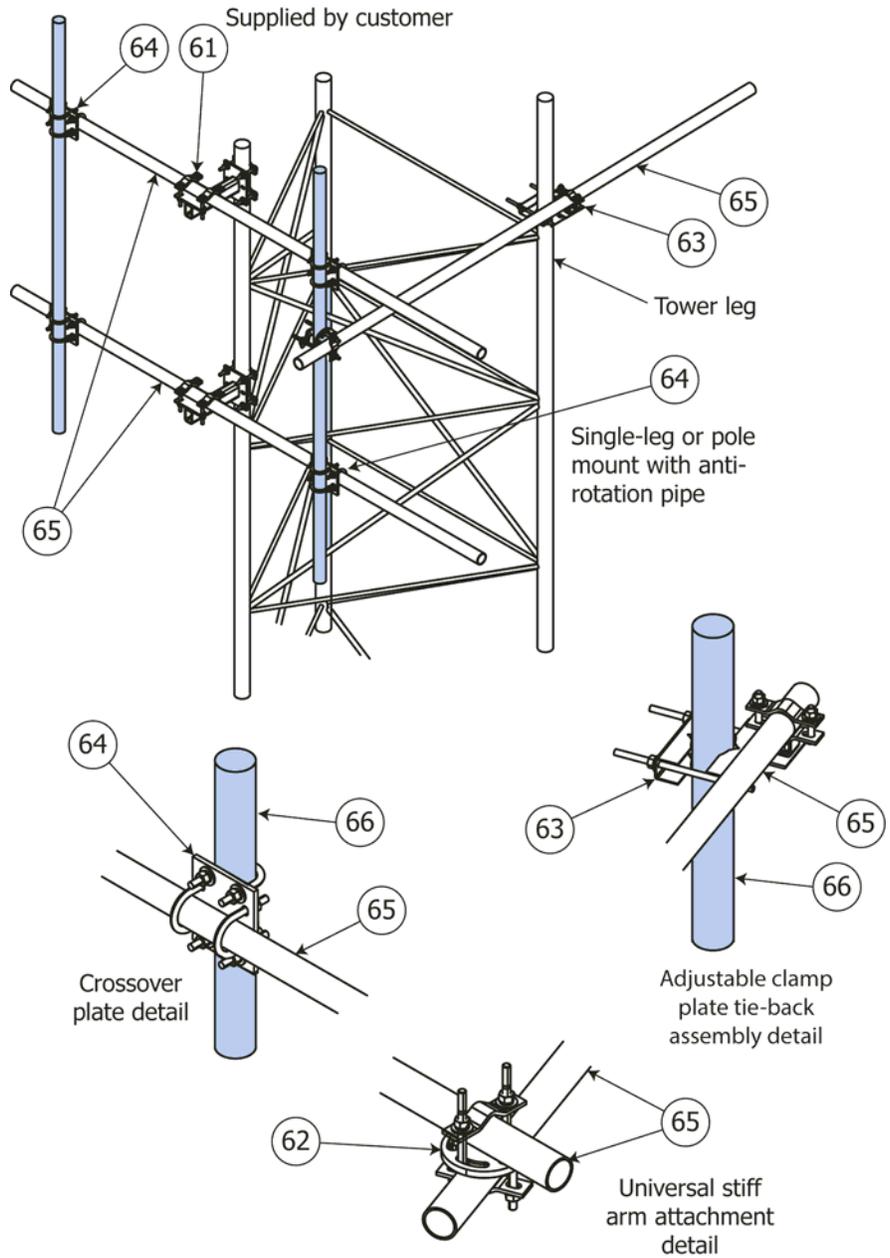
Assembling the Mounting Structure

Figure 20. Typical mounting configurations, dual-boom antenna



Assembling the Mounting Structure

Figure 21. More typical mounting configurations, dual-boom antenna



6

Installing the Antenna on the Tower

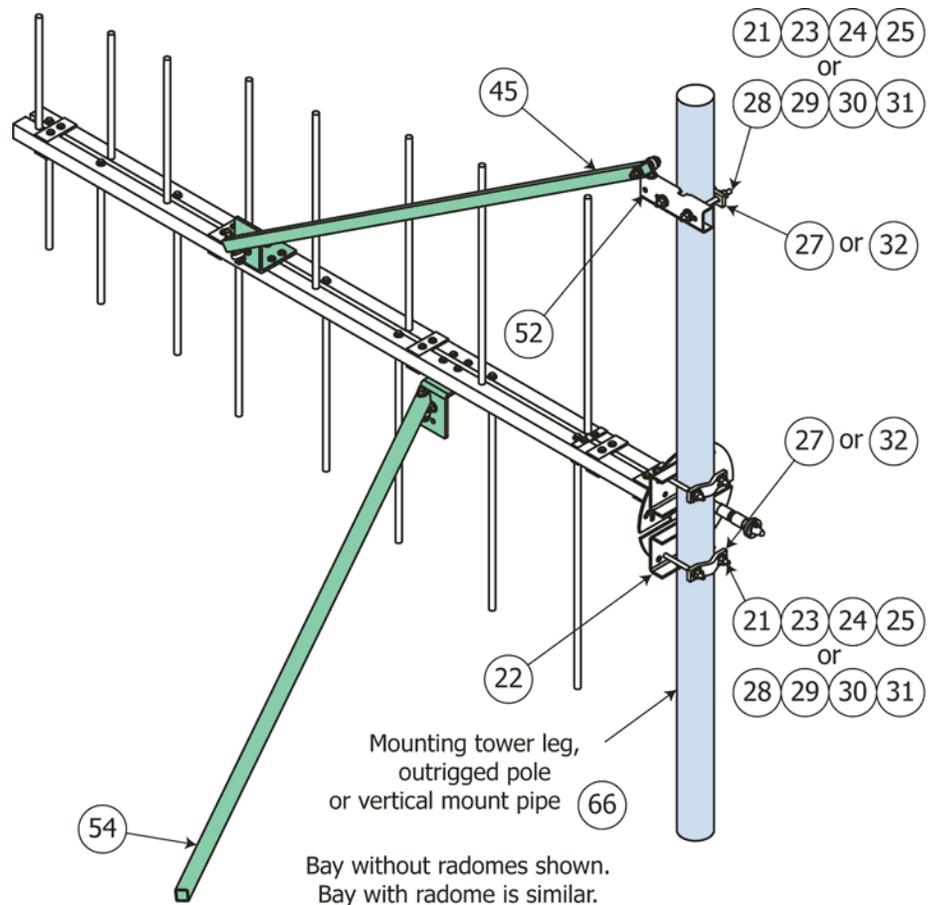
Vertical support.

CAUTION

If you don't get good electrical contact between the antenna and the mounting structure, the antenna may generate unwanted electrical signals, and performance may be degraded.

- Before mounting the antenna, scrape away any paint on the tower leg, outriggered pole, or vertical mount pipe (66) to ensure good electrical contact.
- (Tower leg or mounting pole up to 3-1/2" diameter only) Mount the bay at the location you marked, attaching the mount channels (Figure 22, 22) to the mounting pole using the 1/2" galvanized hardware (21, 23, 24, and 25) on the mount channel clamp halves (27). Likewise, attach the vertical support channel (52) to the mounting pole above the antenna bay.
- (Tower leg or mounting pole 3-1/2" to 5-1/4" diameter only) Mount the bay at the location you marked, attaching the mount channels (Figure 22, 22) to the mounting pole using the 5/8" galvanized hardware (28, 29, 30, and 31) on the mount channel clamp halves (32). Likewise, attach the vertical support channel (52) to the mounting pole above the antenna bay.

Figure 22. Bay and vertical support, installed



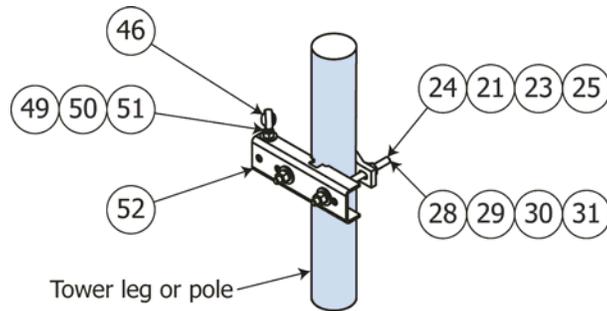
- Adjust the vertical support channel up or down on the tower leg or pole to level the bay.

- e. Tighten the vertical support channel clamp half, tightly enough to support the antenna bay but loosely enough to allow azimuth adjustment.

Horizontal support.

- a. Attach a rod end (46) to the horizontal support channel (Figure 23, 52), with 1/2-20 stainless hardware (51, 49, and 50).
- b. (Tower leg or mounting pole up to 3-1/2" diameter only) Using threaded rods (21) and hardware (23, 24, and 25), attach the horizontal support channel to a tower leg or pole, or the opposite vertical mount pipe (66), that will be used for lateral bracing.
- c. (Tower leg or mounting pole 3-1/2" to 5-1/4" diameter only) Using threaded rods (28) and hardware (29, 30, and 31), attach the horizontal support channel to a tower leg or pole, or the opposite vertical mount pipe (66), that will be used for lateral bracing.

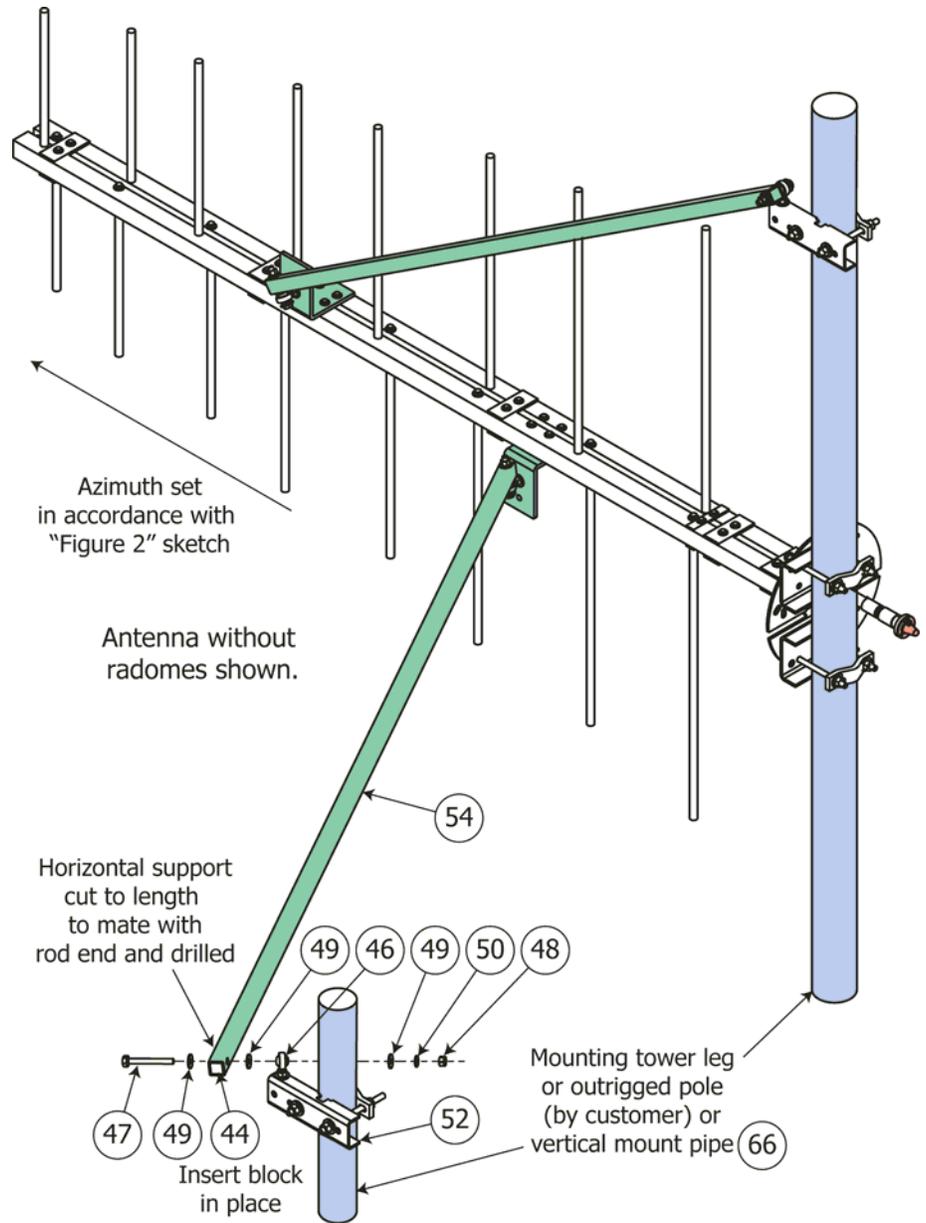
Figure 23. Horizontal support channel, installed



- d. Adjust the bay to the proper azimuth.
- e. Align the horizontal boom support (Figure 24, 54) with the rod end on the support channel, and measure the required length for the horizontal support.
- f. (If necessary) Cut the horizontal support to length.
- g. Drill the end of the horizontal support, using the insert block (44) as a drill template.
- h. With the insert block in place, connect the horizontal boom support to the rod end (46) using hardware (47, 48, 49, and 50).
- i. Tighten all hardware before proceeding.
- j. Retouch the paint you removed in step a above.

Installing the Antenna on the Tower

Figure 24. Cut and attach the horizontal support.

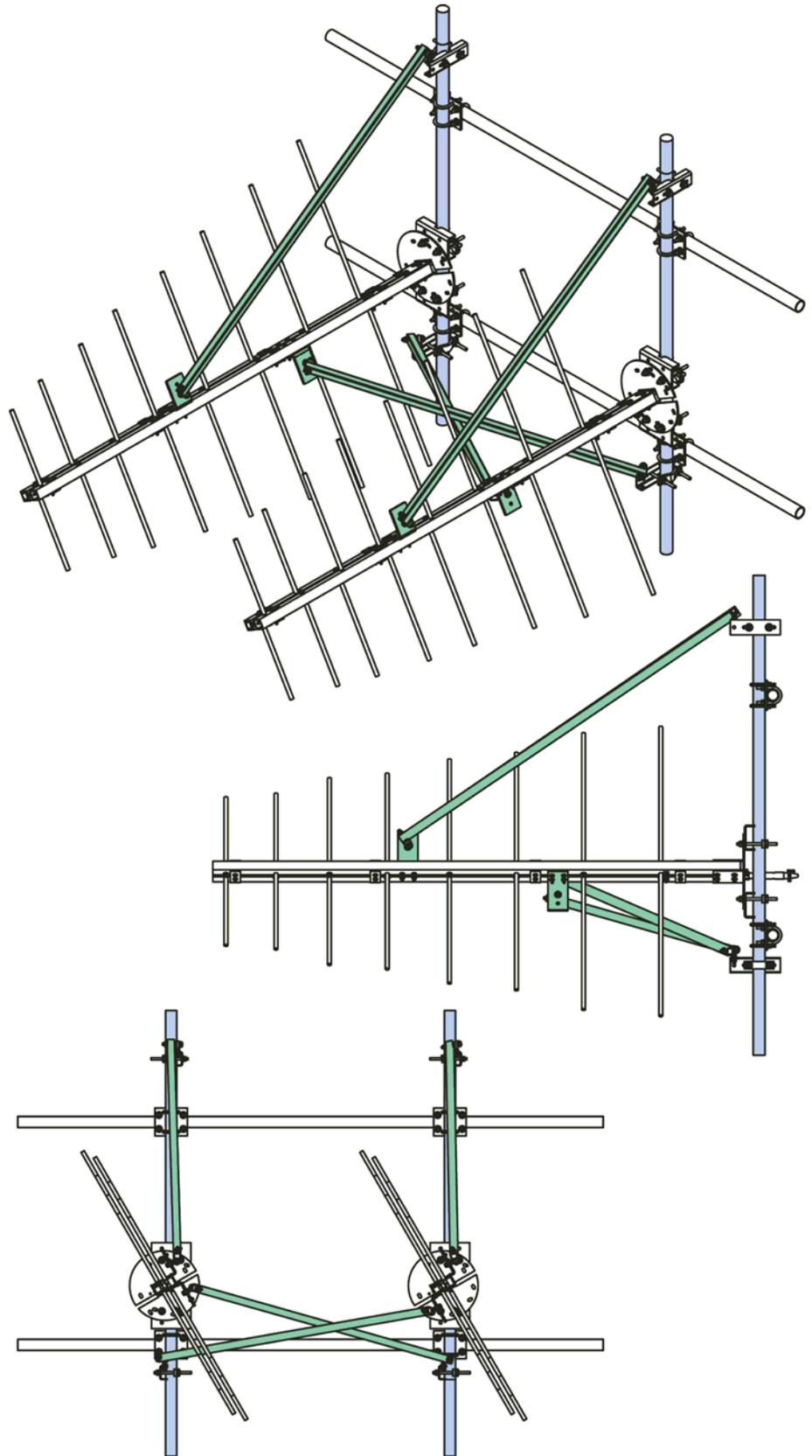


Repeat for additional bays.

- Repeat installation for the other antenna assembly of a dual-boom pair.
- Repeat installation for additional antenna bays if your system has more than one, arrayed vertically.

Installing the Antenna on the Tower

Figure 25. Dual-boom antenna, installed



7

Connecting the Antenna

Mount the power divider (dual-boom or multi-bay antennas only).

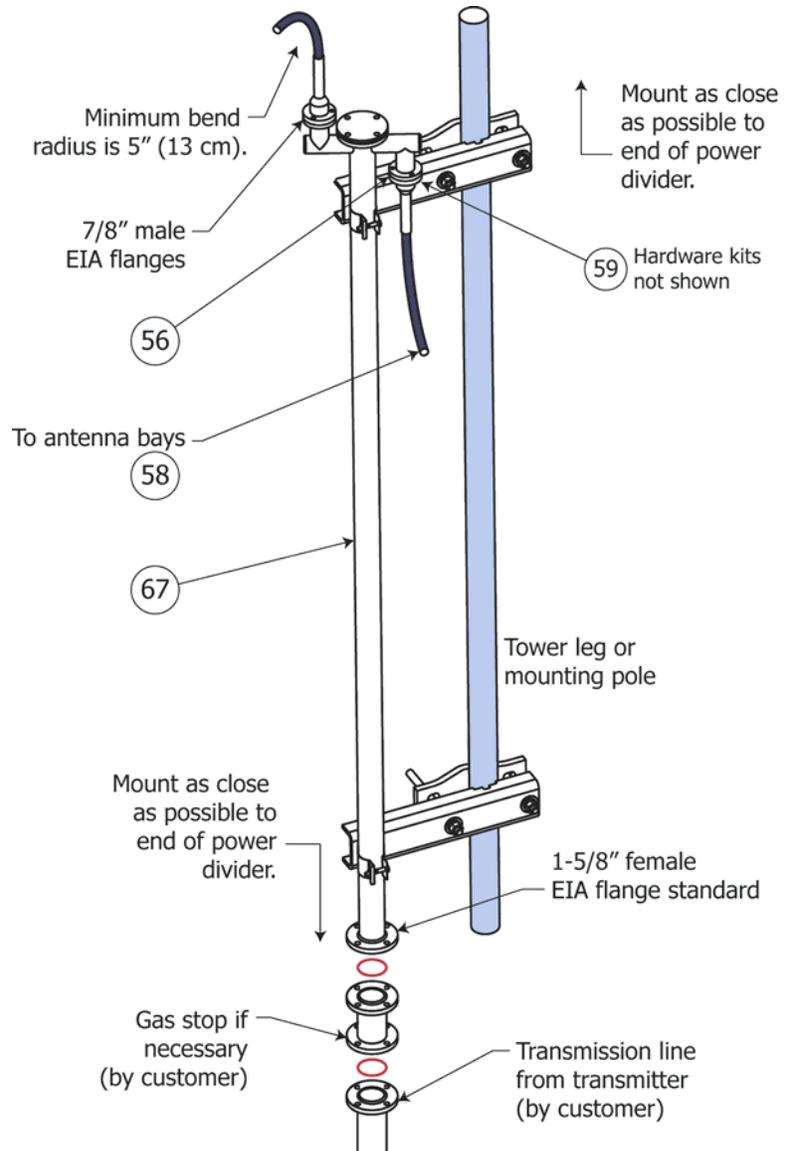
Figure 26. Power divider, mounted

NOTE

If your antenna is a single bay, skip this part and proceed to [Connect the transmission line cable](#), on page 33.

CAUTION

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

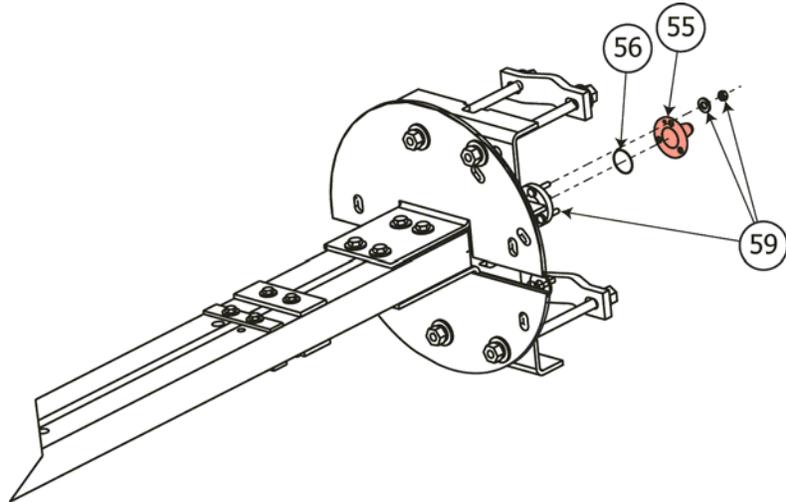


- Before mounting the power divider, scrape away paint to ensure good electrical contact.
- Mount the power divider (67) to the mounting structure with its outlet ports roughly halfway between the antenna elements.
- Retouch the paint removed in step a.

Connect the feedline coax (dual-boom or multi-bay antennas only).

Figure 27. Flange cover, removed.

- a. Remove the flange covers ([Figure 27, 55](#)) from the antenna bay input flanges.



CAUTION

The O-rings are made of silicone. Do not lubricate them with silicone grease, as this will soften the O-ring. Use only petroleum jelly or Parker O-Lube lubricant provided with the antenna (It is safe despite being silicone-based).

CAUTION

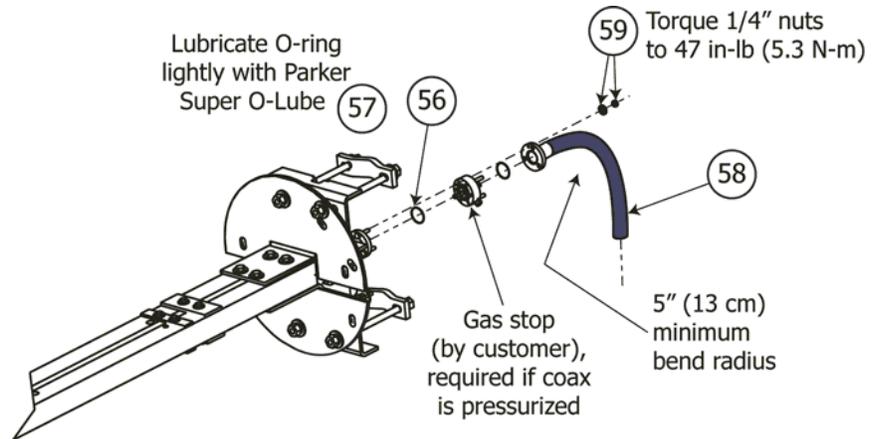
Use only a light lubricating coat of O-Lube or petroleum jelly; too much may hamper electrical contact and contaminate the interior of the system.

CAUTION

Be sure the O-rings are properly seated in their grooves and not pinched between the flange contact surfaces.

- b. Coat the flange O-rings ([Figure 28, 56](#)) lightly with O-Lube ([57](#); supplied with the antenna), then install them in the O-ring grooves in the antenna input flanges.

Figure 28. Coax connection to the flange.



CAUTION

The minimum bend radius of 7/8" coax is 5" (13 cm). Do not bend cable tighter than this; you will damage the cable and cause elevated VSWR.

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.

- c. Form the coax feedline cables (58) to the desired shape and align them with the antenna input flanges properly, then make the connections.

CAUTION

Don't overtighten the flange bolts. Overtightening may break the bolts or damage the flange.

- d. Tighten the 1/4" flange hardware (59) to 47 lb-in (5.3 N-m) torque.
- e. Connect the other end of the cable to one of the power divider outputs. Torque to 20 lb-in (2.25 cm-kg).
- f. Secure any excess cable to the tower or pole to prevent wind damage, using the tie-wraps (60) or customer-supplied cable clamps.
- g. (6025 dual-boom only) Repeat for the other bay.

Connect the transmission line cable.

CAUTION

The minimum bending radius for 1-5/8" coax is 10" (26 cm). Do not bend it too tightly; you may damage it.

- a. Connect the transmission line cable from the transmitter to the power divider input, with a lightly lubricated O-ring.
- b. Secure the transmission line cable to the mounting pole or tower leg, using customer-supplied cable clamps.

This completes the installation of your 6025 antenna. Please proceed to [Startup and Operation](#) on page 35.

8

Startup and Operation

**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.

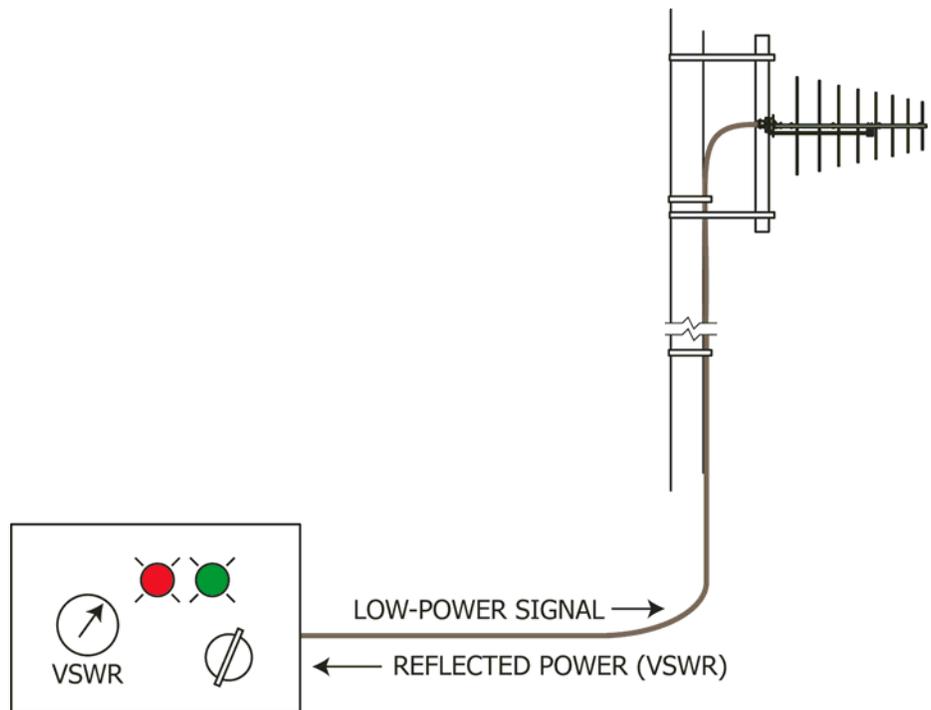
NOTE

The Model 6025 does not require pressurization or purging.

Optimize VSWR.

Figure 29. Power up your antenna

- a. Apply a low-power signal to the antenna and read reflected power (VSWR). VSWR should be below 1.28 : 1.



- b. If VSWR is not below 1.28 : 1, check the system VSWR as follows:
 - (1) Briefly disconnect the transmission line from the antenna system input. Seal the antenna system input to prevent the entry of moisture.
 - (2) Terminate the coax transmission line in an instrument-quality 50-ohm load.
 - (3) Measure and record the voltage standing wave ratio (VSWR). File this information with this manual for future reference.
 - (4) The VSWR of the transmission line should be within the manufacturer's specifications. If it is, proceed. If not, call the line manufacturer and correct the problem before connecting the antenna.

- c. Check system TDR:
 - (1) With the transmission line still terminated in 50 ohms, make a time domain reflectometer (TDR) plot. Label and file the plot with this manual.
 - (2) Remove the load and connect the transmission line to the antenna system input, with an O-ring to seal the connection.
- d. Recheck VSWR:
 - (1) Measure VSWR. VSWR at this point should be below 1.28 : 1.
 - (2) Record the reading and file it with this manual.
 - (3) If VSWR is not satisfactory, check to be sure all the radiators are functioning (see below). If they are, call Shively Labs to help identify the problem.
- e. Check radiator function:
 - (1) Again using the low-power test equipment to provide a signal to the antenna and read VSWR, have the rigger detune each radiator in turn.
 - (2) Each time, a deflection in VSWR should be apparent. The deflection for various bays should be similar, but not necessarily identical.
 - (3) If the VSWR of the array does not change when a radiator is detuned, that bay is not functioning. Check to be sure the radiator was installed properly, including the inner conductor connector.
- f. If you cannot find the problem, please call Shively Labs before proceeding.

Operate.

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.

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, free of moisture, and that center pins are not bent over.
 - Damage to any antenna components.
 - Paint on radiators.
 - Ice buildup 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.

**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 record 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 an returned materials authorization (RMA) number first. Material may be refused and sent back to you at your expense if you don't do this.

Parts list

NOTE

Item callouts are consistent across all the illustrations throughout this manual.

Table 2. Components, antenna bay assembly (per bay)

Item & Description (Figure 30)	without radomes	with radomes	Shively P/N
1. Antenna arms, approximately 34.7", 32.3", 28.7", 26.2", 23.9", 21.9", 19.3, and 17.4" long	2 each size	2 each size	99186-various
2. Boom assembly	1	1	99181-G502
3. 5/16-18 x 3/4" hex head bolt, stainless steel	16	16	
4. 5/16" flat washer, stainless steel	32	32	
5. 5/16" lock washer, stainless steel	24	24	
6. Top formed mounting plate	1	1	99195-01 or equivalent
7. Bottom formed mounting plate	1	1	99195-02 or equivalent
8. 3/8-16 x 3-1/4" hex head bolt, stainless steel	4	4	
9. 3/8" hex nut, stainless steel	4	4	
10. 3/8" flat washer, stainless steel	8	8	
11. 3/8" lock washer, stainless steel	4	4	
12. Square plugs, set of 2	n/a	1	99346-01, 99346-02
13. Dow Corning 744 adhesive-sealant, tube	n/a	1	DO 88060
14. Cable clamp, 7/8" with its own 1/4-20 x 3/4" hex bolt, washers and nuts, stainless steel	1	1	98611-01
15. Cable clamp clip	1	1	98611-02
16. 1/4-20 x 3/4" bolt, stainless steel	1	1	
17. 1/4" hex nut, stainless steel	2	2	
18. 1/4" flat washer, stainless steel	4	4	
19. 1/4" lock washer, stainless steel	2	2	
20. 1/4-20 x 1" bolt, stainless steel	1	1	
21. Threaded rod 1/2-13 x 8", galvanized (small diameter pole or dual assembly)	8	8	
22. Mount channel	2	2	86178-08

Parts

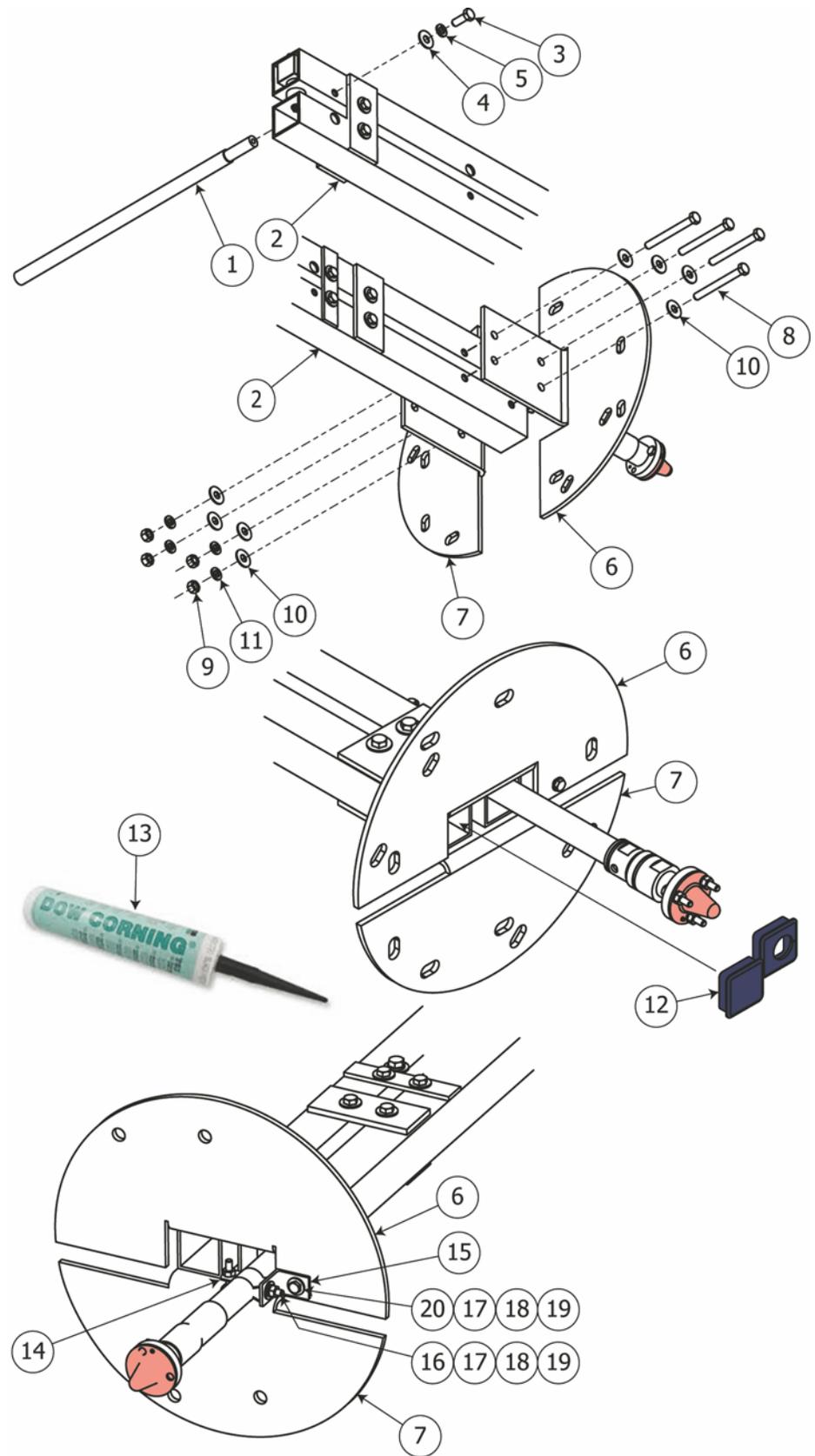
Table 2. Components, antenna bay assembly (per bay) (continued)

Item & Description (Figure 30)	without radomes	with radomes	Shively P/N
23. 1/2-13 hex nut, galvanized (small diameter pole or dual assembly) (large diameter pole, single assembly only)	16 4	16 4	
24. 1/2" flat washer, galvanized (small diameter pole or dual assembly) (large diameter pole, single assembly only)	14 8	14 8	
25. 1/2" lock washer, galvanized	6	6	
26. 1/2-13 x 1-1/2" bolt, galvanized (large diameter pole, single assembly only)	4	4	
27. Clamp half (small diameter pole or dual assembly)	4	4	SCP
28. Threaded rod 5/8-11 x 10", gal- vanized (large diameter pole, single assembly only)	8	8	
29. 5/8-11 hex nut, galvanized (large diameter pole, single assembly only)	20	20	
30. 5/8" flat washer, galvanized (large diameter pole, single assembly only)	20	20	
31. 5/8" lock washer, galvanized (large diameter pole, single assembly only)	8	8	
32. Clamp half (large diameter pole, single assembly only)	4	4	DCP

Parts

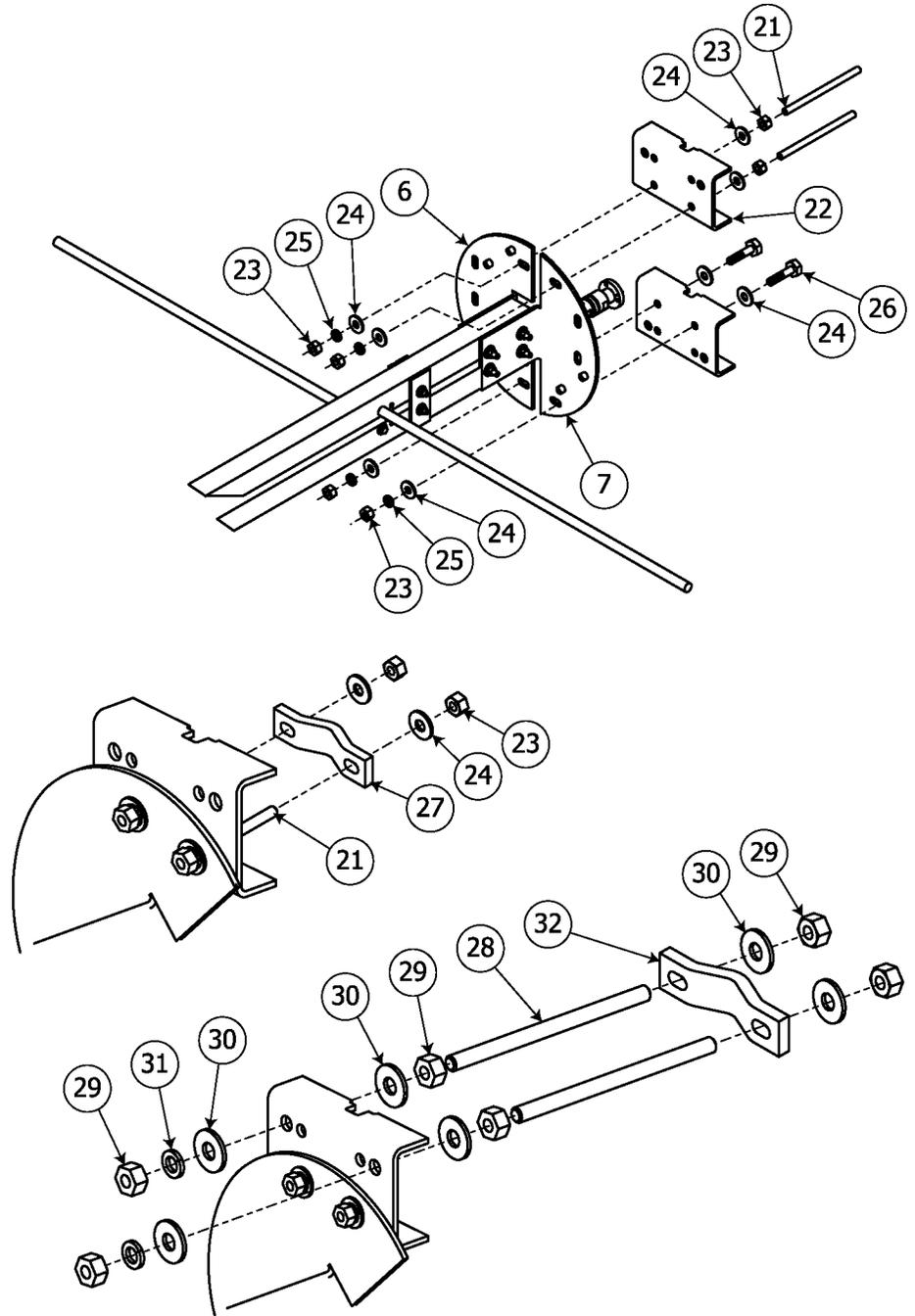
Figure 30. Components, antenna bay assembly

(Sheet 1 of 2)



Parts

(Sheet 2 of 2)



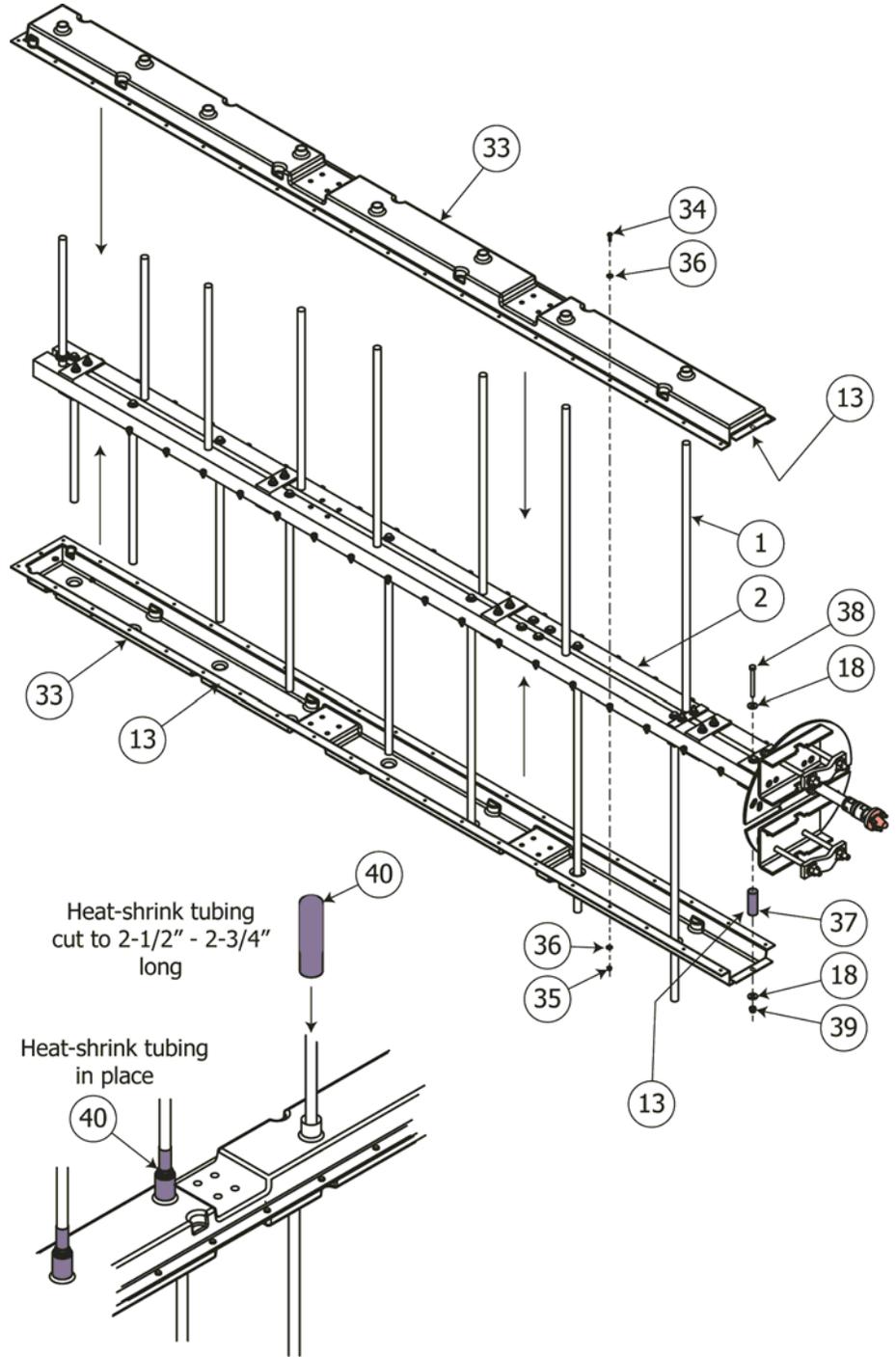
Parts

Table 3. Components, radome (per bay)

Item & Description (Figure 31)	without radomes	with radomes	Shively P/N
33. Radome half	n/a	2	99475-01
34. 10-32 hex washer head screw, stainless steel	n/a	43	
35. 10-32 Nylok hex nut, stainless steel	n/a	43	
36. #10 flat washer, stainless steel	n/a	86	
37. Silicone sponge filler gasket	n/a	1	99348-03
38. 1/4-20 x 2-3/4" hex bolt, stainless	n/a	1	
39. 1/4-20 Nylok hex nut	n/a	1	
40. Heat-shrink tubing, 1" ID x 4" long	n/a	96 in	57941-01

Parts

Figure 31. Components, radome



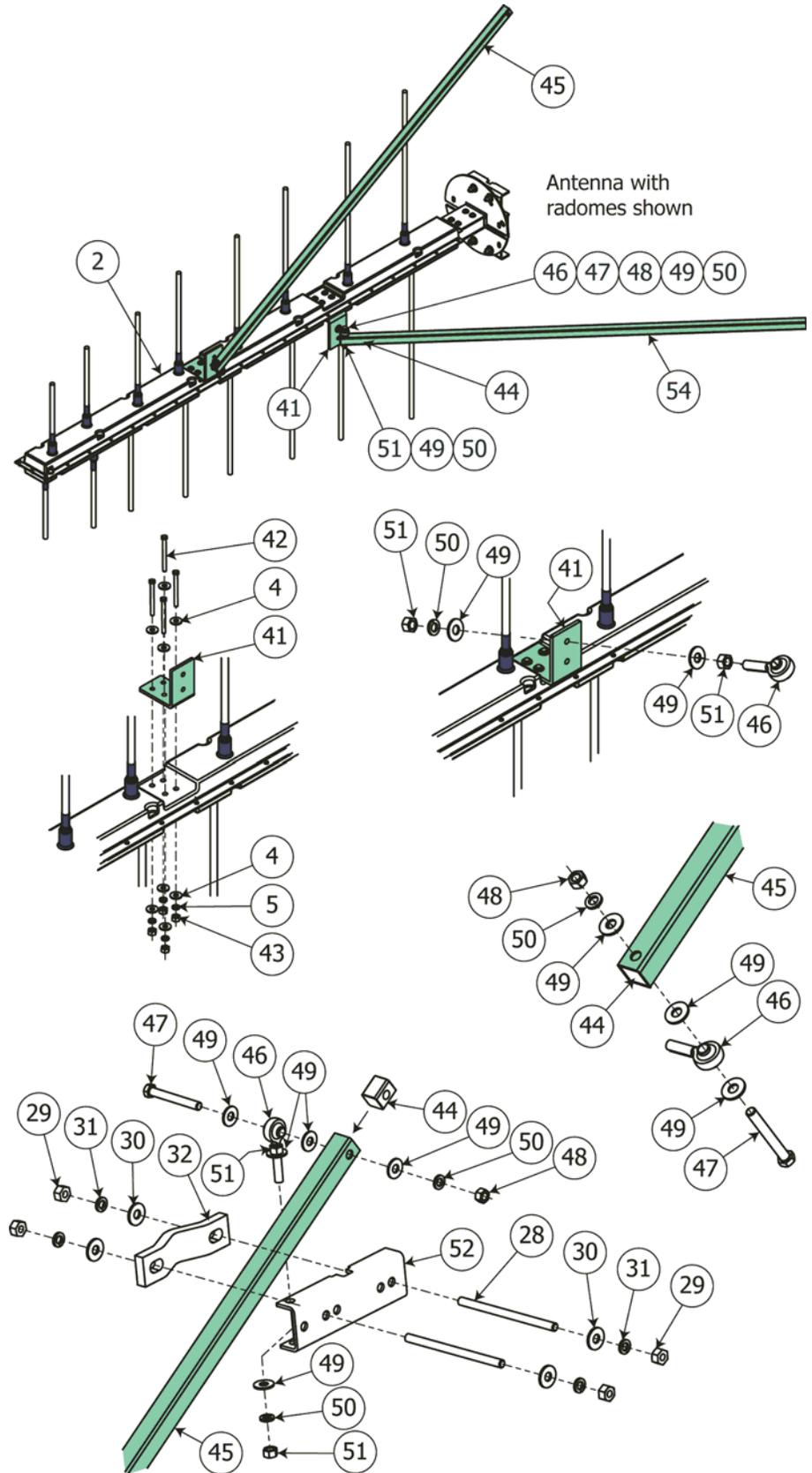
Parts

Table 4. Components, mount system (per bay)

Item & Description (Figure 32)	without radomes	with radomes	Shively P/N
41. Fiberglass angle for diagonal support	2	2	99193-02
42. 5/16-18 x 3-1/4" long bolt, stainless steel	8	8	
43. 5/16-18 hex nut, stainless steel	8	8	
44. Insert block	4	4	99193-04
45. Vertical boom support (holes across both ends)	1	1	99193-03
46. Super-swivel rod end (note 1/2-20 thread)	4	4	99196-02
47. 1/2-13 x 3-1/2" hex head bolt, stainless steel	4	4	
48. 1/2-13 Nylok hex nut, stainless steel	4	4	
49. 1/2" flat washer, stainless steel	31	31	
50. 1/2" lock washer, stainless steel	8	8	
51. 1/2-20 hex nut, stainless steel	12	12	
52. Support channel	2	2	98141-02
53. 1/2-13 x 4" hex bolt, stainless steel	8	8	
54. Horizontal boom support (hole across one end only)	1	1	99193-05

Parts

Figure 32. Components, mount system



Parts

Table 5. Components, feed system (per bay)

Item & Description	without radomes	with radomes	Shively P/N
55. Male 7/8" flange cover (shipped in place on boom assembly)	1	1	86679-01
56. 7/8" flange O-ring (shipped in place)	1	1	9068-215
57. Parker Super O-Lube, tube	1	1	94906
58. Feedline cable	1	1	A/R
59. 7/8" flange hardware kit (includes 3 bolts, 3 lock washers, 3 nuts), stainless steel	1	1	82912-G506
60. Tie-wrap	20	20	TY529MX

Table 6. Components, mounting system (quantities vary)

Item & Description (Figure 33)	without radomes	with radomes	Shively P/N
61. Tower mount	Various	Various	Various
62. Universal stiff arm attachment	1	1	PUCK
63. Adjustable clamp plate tie-back assembly	1	1	SAM-U
64. Crossover plate kit (includes 2 plates, 4 U-bolts, and hardware)	4	4	SCX1-K
65. Horizontal mount pipe, 2" NPT x 126" long	3	3	P2126
66. Vertical mount pipe, 2" NPT x 96" long	2	2	P296
67. Power divider assembly, 2-way (includes mounts and hardware)	1	1	Various

NOTE

Items 62 - 66 are included with the dual boom kit.

Parts

Figure 33. Components, mounting system

