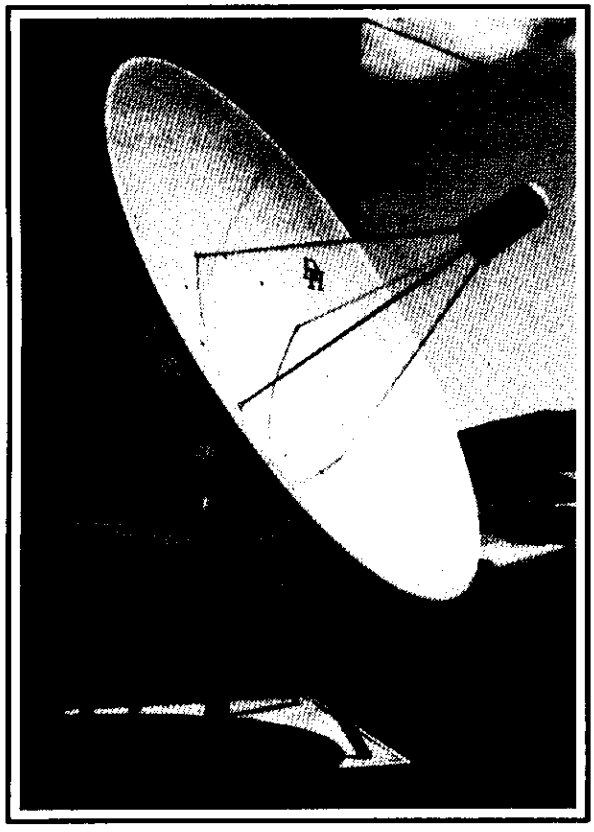
Installation Instructions for the

Horizon-to-Horizon Mount

Congratulations, you have now purchased the finest Horizon-to-Horizon Mount available. This unit will not only track the Geosynchronous Arc, but when equipped with the Power Declination option, it will work very well for satellites that are in inclined orbit or elliptical orbit. Please follow these instructions and if you have any questions please call (608) 326-8406 for help.

The Horizon-to-Horizon Mount is designed to go with the 3.0m, 3.3m, 3.7m, 3.9m, 4.2m, 4.5m and the 5m antenna. As all are identical in theory, we will cover the basic installation first and address each individually as the installation requires. **PLEASE READ COMPLETE INSTRUCTIONS BEFORE BEGINNING INSTALLATION!**



PARTS LIST

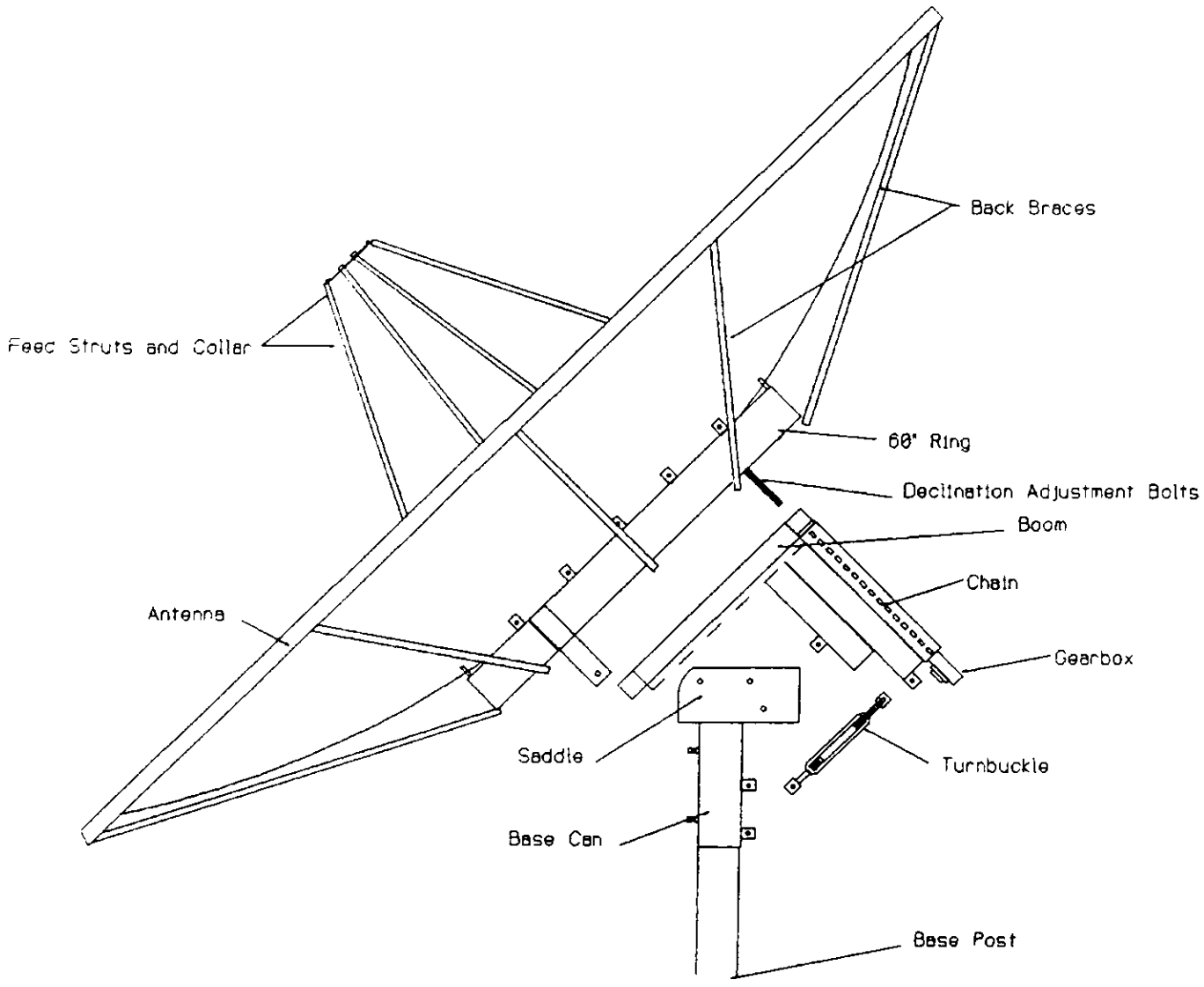
1 - DH Antenna
1 - Horizon-to-Horizon Mount
  60" Back Ring
  5 1/2" Base Can
4 - Back Braces for 3.3m
  (8 Back Braces for 3.7m - 5m)
  (No Back Braces for 3.0m)
4 - Feed Struts
1 - 36V Motor
1 - Feed Collar
1 - Bolt Bag to include all Hardware listed on page 12.

*** Optional: Power Declination Instructions are on page 12.

DH Satellite
P.O. Box 239
Prairie du Chien, WI 53821
Phone: (608) 326-8406
Fax: (608) 326-4233

CAUTION! - All 3.0m-5.0m 2 pc. antennas must be handled with extreme care.

Horizon-to-Horizon Mount



MGD

11/28/95
Revised 2/29/96

Installation of Base

Look at the drawings below, the first drawing shows the recommended concrete base. (Please contact your DH Representative for the recommended cement pad). The actual base size will vary with the size of the antenna used. In areas of frost, we recommend that this base go below frost levels. Please use ½" rebar to reinforce this structure. WE RECOMMEND THAT YOU CHECK WITH A LOCAL ENGINEER TO DETERMINE SOIL TYPE AND BEARING TO VERIFY THAT THIS BASE WILL WORK FOR YOUR LOCALE.

With the Horizon-to-Horizon mount you have a choice of two different base assemblies. The first is a base post (see drawing #1). The base post is simply a 5" I.D. / 5 ½" O.D. pipe that has weldments on the lower section. The post is set in concrete and must be plumb. The following chart shows how much of the post should be out of the ground for the different size antenna's.

3.0M antenna	5' 0" out of the ground
3.3M - 3.7M antenna	5' 6" out of the ground
3.9M - 4.2M antenna	6' 0" out of the ground
4.5M - 5.0M antenna	7' 0" out of the ground

The second base assembly would be our Four Leg Base stand (figure 2). This Base Stand is designed to go above the ground and is installed on the concrete pad instead of in it. You can install this in either of two ways, the first is you can request a template of the base stand and then install J-bolts in the concrete as you are pouring it, or you can wait until you receive the base stand (having previously poured the pad) and drill the holes into the concrete using the stand as the template. You must use a type of lead head or Garonite, a Parafast resin mortar to secure the bolts.

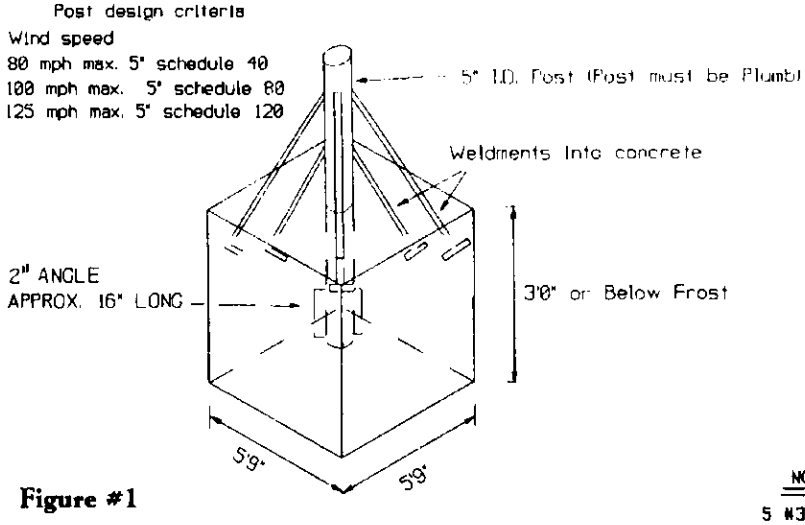


Figure #1

CONCRETE PAD FOR 3.7M ANTENNA

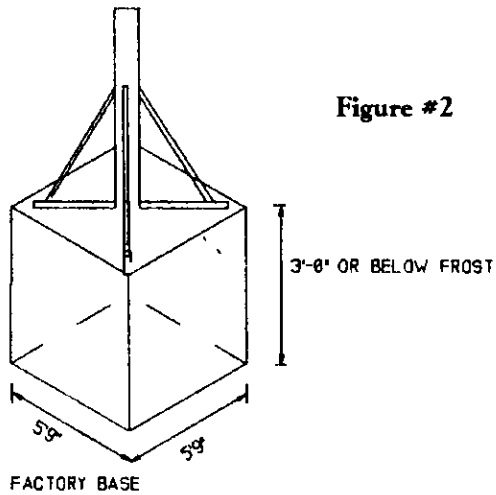


Figure #2

FACTORY BASE

NOTES:

5 #3 Rebar used in Footings
Rebar distributed evenly in two directions
Center of Rebar should be min. of 2" above bottom of pad
Outside of bars should be 3" from edge of footings.

Assembly of the Ring to the Mount

Most of the time the mount will be assembled at the factory, unless the truck load won't allow for the extra room required when assembled. If your mount is not assembled, look at the sketch on page 1 and familiarize yourself with the orientation of the mount. Notice that the upper crossmember has two holes to slide over the declination adjustment bolts where the lower crossmember has the two holes in the end to attach to the swivel.

First put one ¾" nut on each of the two declination bolts, then slide the 3" top frame over the bolt and thread on the second nut. Now go to the 3" bottom frame and line it up with the hole in the bracket on the lower section of the mount. Install the ¾" x 2" bolts through the bracket and tighten into the end of the 3" lower frame member. (There should be a factory installed bushing in the bracket, make sure this is in place before installing bolt.)

Once the unit is assembled and all bolts are tightened down, you can set the declination. To do this, set the angle of the boom the same as your latitude. Refer to the declination adjustment chart in the back of this manual on page 11. Now, adjust the top of the ring away from the boom by the amount of degrees you find on the chart. You do this by using the nuts on the upper 3" tube, first loosen both nuts and then tighten or loosen the inside nut or the outside nut to give you the offset angle (declination) you need.

For example, our factory is located at 43 degrees north latitude. The chart on page 11 tells you that we must have 6.6 degrees declination. We first use the turnbuckle and elevate the boom to 43 degrees, now you tilt the ring ahead another 6.6 degrees. Your reading on the boom is 43 degrees and 49.6 degrees on the ring.

Assembly of the Antenna

The antenna will come in either one or two pieces. If you have requested your antenna to be shipped in one piece, please ignore this paragraph and go on to the next one. Those of you who received your antenna shipped in two pieces, you must take the two halves and place them on a flat surface. The antenna must always set on the lip when assembling and/or storing, (see figure #3). Before sliding the halves together one person should get under the antenna with the 1/4" x 3/4" bolts supplied. Using the proper joiner strips, push the bolts from the inside out and secure with the 1/4" nuts. The joiner strips and the dish will have serial numbers that match, so when installing be sure the numbers match. These numbers are on the inside lip of the dish and the end of the joiner strip (see figure #4). Tighten these very tight so the dish holds the shape it had when it was manufactured.

Below is a listing of the additional number of 1/4" bolts that should be in your bolt bag when your antenna is in two pieces.

10' (3.0m)	28 1/4" x 3/4" bolts
11' (3.3m)	28 1/4" x 3/4" bolts
12' (3.7m)	28 1/4" x 3/4" bolts
12'9" (3.9m)	36 1/4" x 3/4" bolts
14' (4.2m)	36 1/4" x 3/4" bolts
14'9" (4.5m)	36 1/4" x 3/4" bolts
16' (5m)	36 1/4" x 3/4" bolts

Figure #4

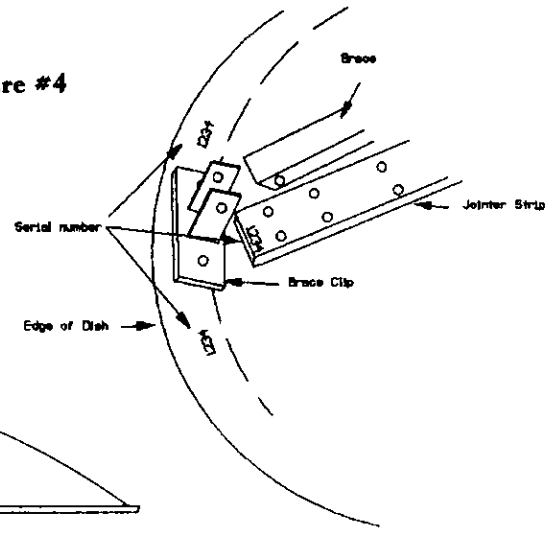
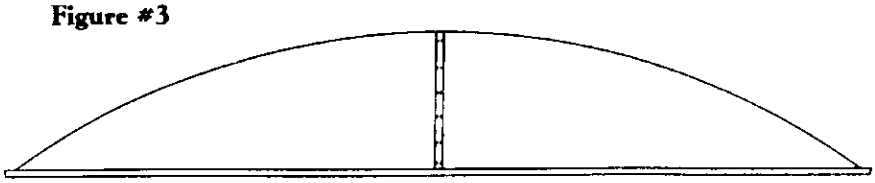


Figure #3

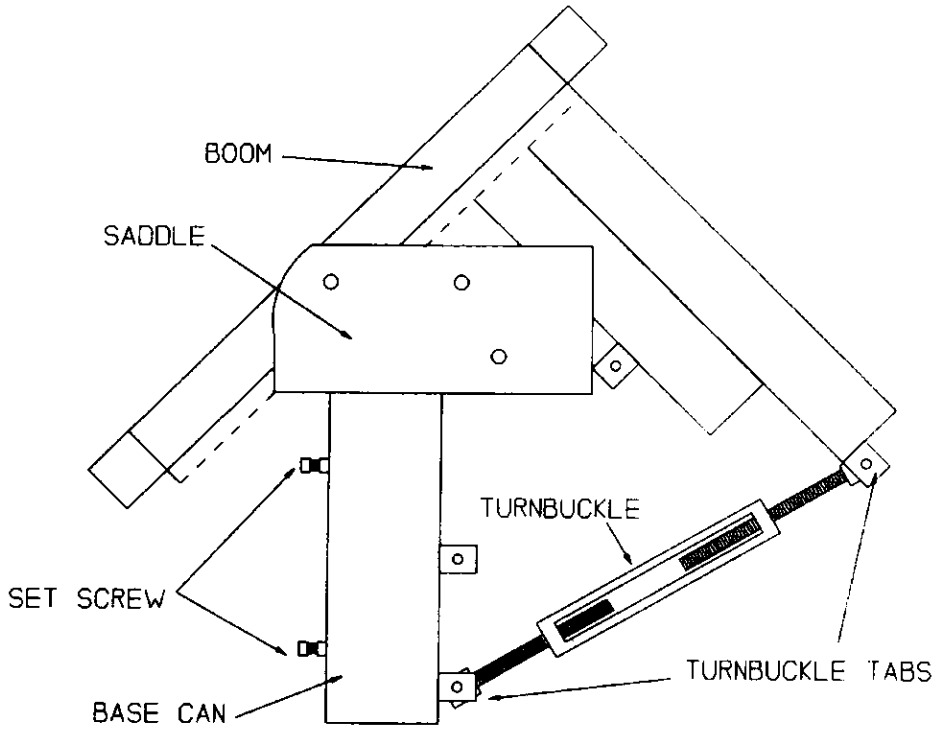


Preparing the Base Post

Before setting the base can over the base post, please loosen the four set screws on the base can. Now get some help and lift this base can over the base post. Set it so the front ears of the saddle are pointing in a southerly direction. Now tighten down one or two of the set screws. If you are relying on man power to lift the antenna in place, you must now gather your manpower and take the 60" ring and lift it up and set it onto the top of the base can. This is referred to as the saddle, (See drawing below). While you align the hole in the boom to the holes in the ears of the base can, have one of your helpers slip the 3/4" x 5 1/2" bolt through these holes. Yes, the bolt will fit, we actually overdrilled this hole. After you have cooled down, come back and finish reading these instructions!! You may want to use a hammer to get this bolt in place.

Now take the turnbuckle and the two 1/2" x 1 1/2" bolts and place them as in the drawing below. The turnbuckle is used to set your elevation and then never adjusted again. The boom will be set to your latitude. This will be covered again in the section under declination.

In most locations you will use the top hole in the boom. The lower hole is for areas below 20 degrees latitude. Use the second ¾" x 5½" bolt in the back top of the saddle and tighten it until the sides of the saddle compress against the boom. (See below).



Preparing the Mount to receive the Antenna —

The Horizon-to-Horizon mount is made up of three basic parts. The Base Can, the Boom Assembly and the 60" Ring. Normally, the 60" ring and the boom assembly are shipped assembled. Now it is time to install the antenna.

First you must elevate the ring to about 60 degrees. Lock it in place. Now locate the 1/8" pilot holes, (see figure 5), one is located next to one of the 12 - 1/2" holes in the dish and the other is found on one of the 12 tabs on the mount next to the 1/2" holes. These pilot holes are only to locate the two 1/2" holes. The weld on the antenna is lined up with the boom on the mount. This should help in locating the pilot holes. They will not line up from the mount to the dish. When you have located these two holes, use 4-5 people and pick up the dish and set it onto the ring making sure the pilot holes line up. BE EXTREMELY CAREFUL IN HANDLING THE ANTENNA WHEN SETTING IT ONTO THE MOUNT. Now slip in the 1/2" x 1 1/2" bolts, (Leave out every third bolt when using a C, Ku, C/Ku or a S-band feed. Do not tighten these bolts more than just finger tight. Now, put the dish in a very flat position (birdbath). Have the smallest worker (installer) get into the dish and install the feed and hold the bolts while they are tightened. Install the bolts as in figure 6. DO NOT OVER TIGHTEN. Install the back braces finger tight. (Refer to figure 4, 7 & 8). Set the dish in its normal position for tracking the arc and walk 30 feet away and sight the front surface of the dish. It should be flat. If it is not, adjust any brace that may be holding pressure and try to make the front surface flat. Try to do very little adjusting and try to release pressure to make flat, if possible.

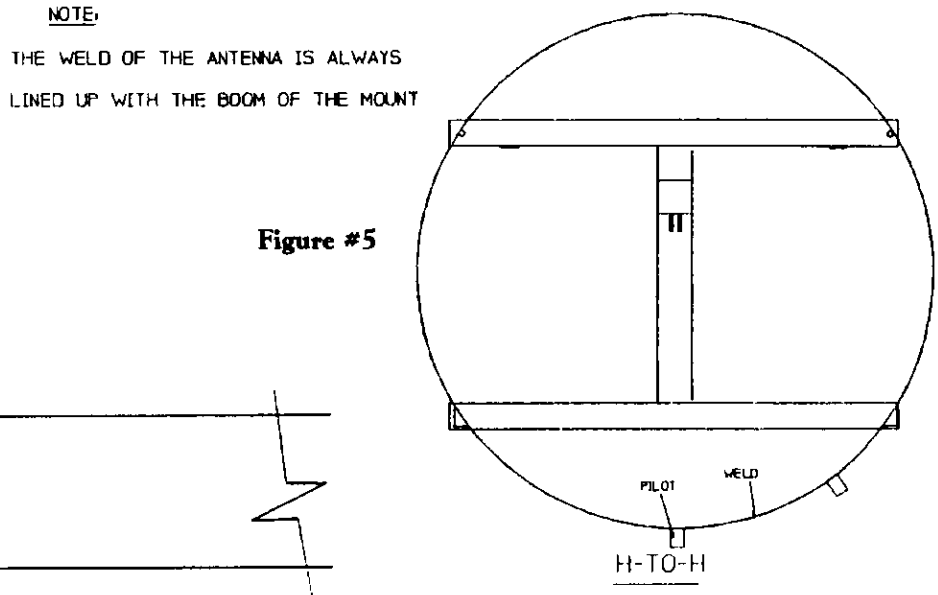


Figure #5

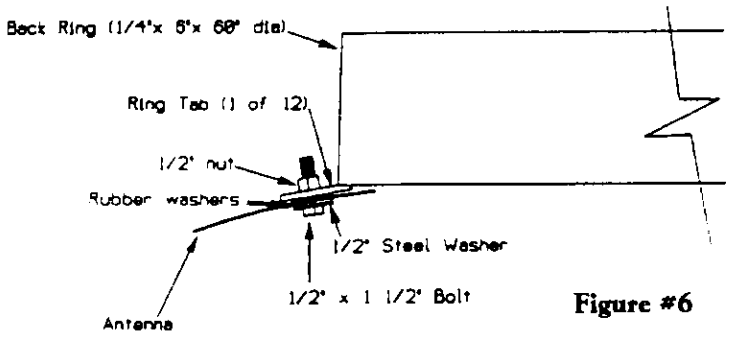


Figure #6

Assembling & Installing the Back Braces

There are eight holes around the rear of the 60" ring to accept the braces. See figure 7 & 8. The angle clip is a piece of steel, bent in the middle approximately 1 ½" x 3" long with two ½" holes. You will find these in the bolt bag. First fasten the clip with the ½" bolts to the 60" ring; now thread one ½" nut about ⅔ of the way down on the ½" rod end of the brace. Slip the rod end through the clip and install another ½" nut. Only tighten these finger tight. Now go to the edge of the dish and place the two ¼" x ¾" bolts thru the dish and into the end of the brace and tighten with the ¼" nuts. Repeat this for all back braces (four braces on the 3.7m - 3.9m) (eight braces on the 4.2m, 4.5m, 5.0m antenna). There are no back braces on the 3.0 antenna. (See figure 4 & 7).

The following is a list of the different back braces for the different size antennas. Check this chart to be sure you have the right length braces. This is listed as tube length only and does not include the bracket or the bolt in this measurement. (Refer to figure 9).

Dish Size	Focal Length	Tube Length
(3.0m)	36" f/1	None
(3.3m)	36" f/1	40"
12' (3.7m)	57.6" f/1	45"
12' 9" (3.9m)	57.6" f/1	50"
14' (4.2m)	57.6" f/1	55 ¼"
14' 9" (4.5m)	57.6" f/1	62 ½"
16' (5.0m)	57.6" f/1	68 ½"

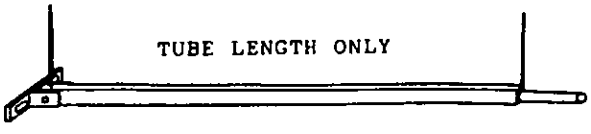


Figure #9

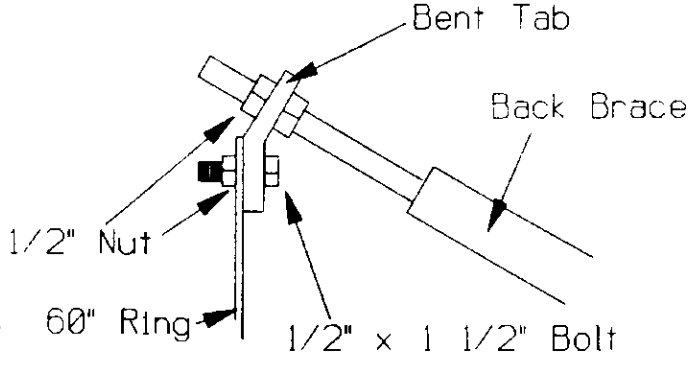


Figure #7

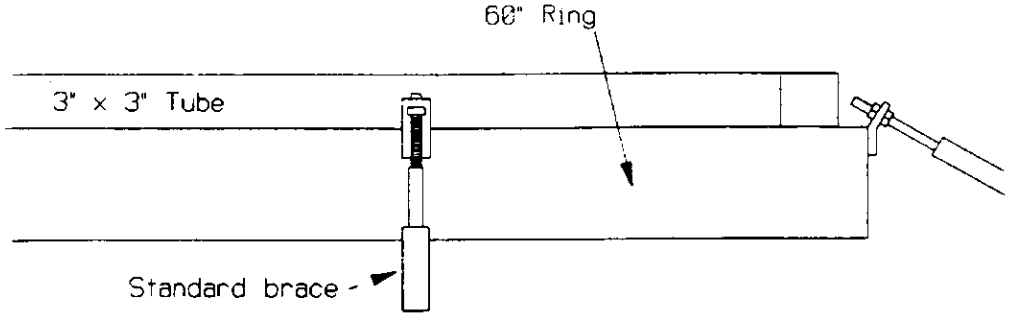
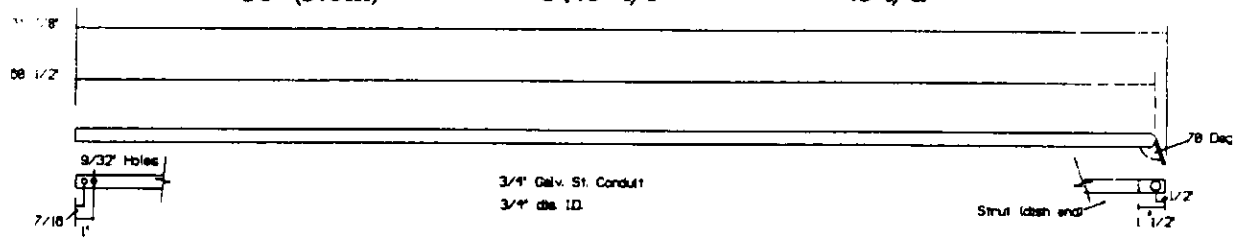


Figure #8

Preparing the C Band Feed Assembly

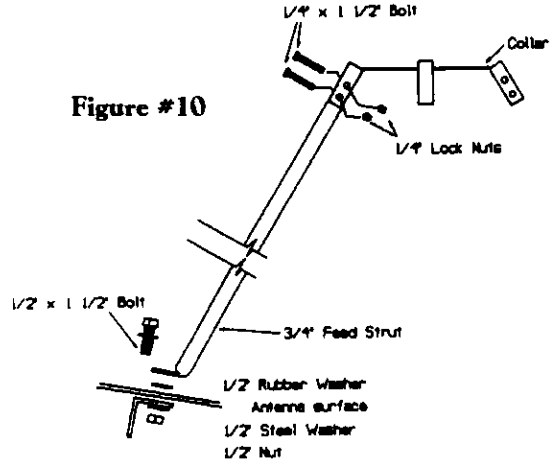
If the feedhorn you have selected has an adjustable scaler ring, move it to the proper wave guide setting as per the manufacturers instructions. Below, we have listed the focal lengths and focal length/diameter ratios for our commercial antennas, so just find your antenna and you will have the information to set the wave guide properly.

Antenna Size	Focal Length	Focal Distance
10' (3m)	36" f/l	.3 f/d
11' (3.3m)	36" f/l	.28 f/d
12' (3.7m)	57.6" f/l	.4 f/d
12' 9" (3.9m)	57.6" f/l	.375 f/d
14' (4.2m)	57.6" f/l	.34 f/d
14' 9" (4.5m)	57.6" f/l	.33 f/d
16' (5.0m)	57.6" f/l	.3 f/d



Your DH representative should have asked you what type feed you will be using. We need this information to be assured we are sending the proper collar to attach your feed to our struts. Take the collar and set it on the back of the scaler ring of the feedhorn. Turn it until all three holes line up between the two and insert the ¼" x ¾" bolts thru the scaler ring and then thru the collar; fasten with the ¼" nuts. Most C-band and dual feeds have a 3-bolt pattern on the scaler just for this. For the Chaparral style feed assembly, attach the collar to the scaler ring as described above. Now, insert 2 - ¼" x 1 ½" bolts through the collar and through the end of the strut. Do this on all four struts (refer to figure 10). Make sure the feed is set to the focal length and pointing at the center of the antenna.

Figure #10



(For use of Chaparral (Universal) Feed)

Seavey Feed Strut

We have developed a new feed strut and collar for the heavier 4 Port Seavey feed assembly. This utilizes the rectagular aluminum tube fot the feed strut. Below is the sketch of this feed assembly, it is very simple to install. Each strut has 2 - 5/16 x 2 1/4" bolts to attach to the feed collar. Now attach one of the angle brackets (2" x 2") to the antenna with the 1/2" x 1 1/2" bolts. Notice that angle bracket has two holes. You will use the bottom hole. The top hole is for an optional heavy duty Chaparral type feed. Next attach the base of the strut to the angle brackets with the 5/16 x 1 1/2 bolts supplied. Align the feed to point directly at the center of the antenna. Now measure the focal length to the front of the scaler rings. (Seavey recommends f/l is measured to front of scaler ring.)

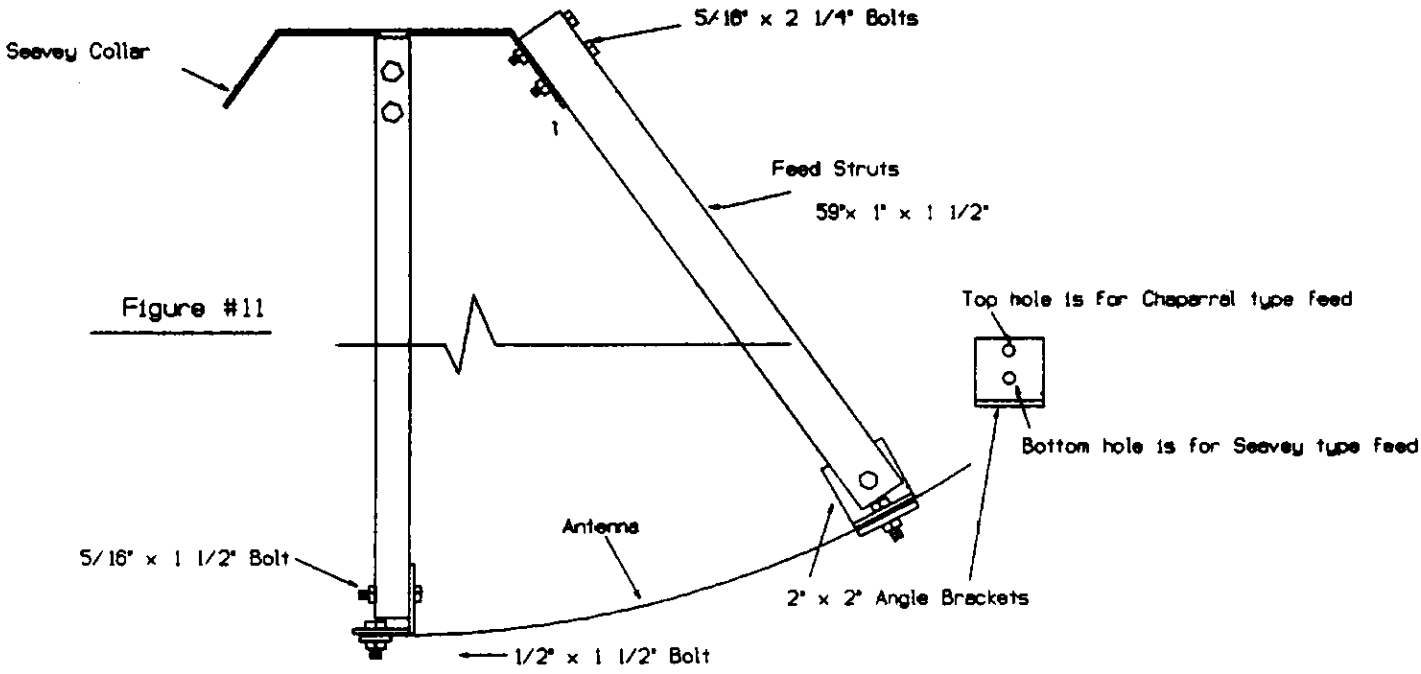


Figure #11

KU Band Feed Assembly

Several things will be different when using the Ku only feedhorns. The collar will be our three piece Ku collar and our commercial horseshoe collar. When attaching the collar to the throat of the feedhorn, first assemble two pieces of the Ku tri-collar, slide it onto the feed and then add the last piece. The collar is assembled by using the included 3/32" x 1" screws, one in each piece (see figure #12). Now put the 5/16" end of the strut thru the feed collar as shown in figure #13. Remember one 5/16" nut goes on either side of the collar. This is to allow you to adjust the focal length. If you find this doesn't give you enough adjustment, you can move the collar on the throat of the feedhorn to allow more adjustment.

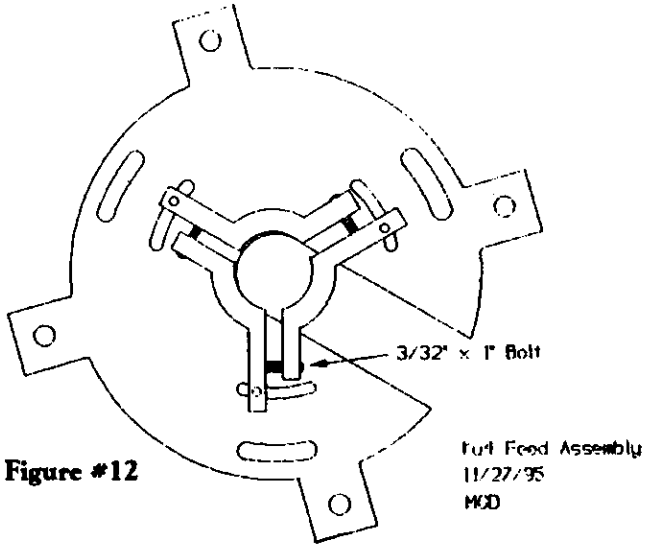
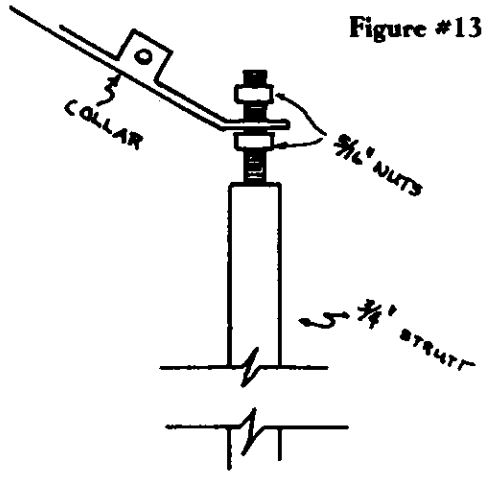


Figure #12

Figure #13



Fine Tuning the Feed

Set the feed at the exact focal length we recommend. It will either be 36" or 57.6" (This does not take into effect the allowance for the feed manufacturer's recommendation that the focal length be 1/4" inside the wavgeuide for C-band and 1/8" for Ku band).

Now you must set the feed so that you are looking directly at the center of the dish. Use a focal finder or anything handy, but the feed must not be tilted in any way. If you have any questions please call (608) 326-8406.