

Technical Support Newsletter 1/96

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Paraclipse®

Technical Support Newsletter - Volume 3, Number 5 - 1/96

OUR PURPOSE

To all those working with our products out in the field, whether it be a dealer, distributor, or a do-it-yourself home owner, it is hoped that this will save a valuable commodity, TIME. As my father likes to say, "When all else fails, read the instructions."

This newsletter, coupled with the installation manual that came with your antenna, should save you valuable time in dealing with situations that come up in the field. Please take the time to look over this sheet.

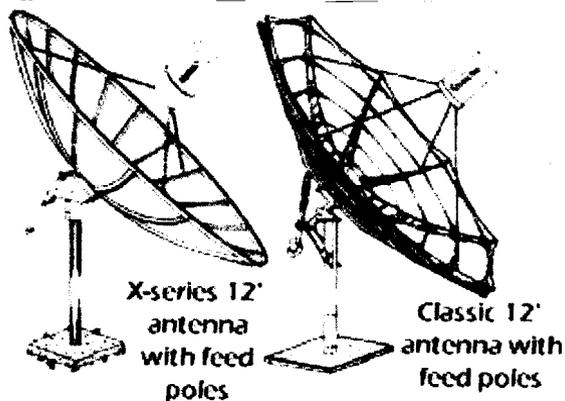
AN INEXPENSIVE WAY TO GET MORE KU-BAND SIGNAL

As the availability of Ku-band signal continues to increase, many have wondered whether the cost and time of upgrading was worth receiving it. The thought of buying and replacing mesh on their old antenna just did not sound appealing, and they ended up filing the idea under "things nice to have but not worth it". (For most of us, that file is probably quite big.)

There is a way to increase your Ku reception at minimal cost and installation time. If you have an old buttonhook-style antenna (whether CLASSIC or X-series), all you have to do is replace your feed supports. While this won't do as much as replacing your old C-band mesh would, you can get improvement that you can justify financially to whoever handles the budget. What if they ask why? While the buttonhook's stability was sufficient for receiving C-band signal, we need to remember that Ku-band signal is only a third as wide. Any wobble of this feed support (even if you have guy wires) will reduce your reception. The stability feed poles give eliminate this problem.

Another feature of this upgrade that will improve your Ku-band reception is Paracclipse's specially designed feed plate. With the three thumb screws built into it, you can precisely align your feedhorn so that it will point accurately at the reflector's center.

How much assembly is required? Just drill the holes in the appropriate ribs and assemble using the dozen bolts provided. After aligning your feed, you are ready to explore. That's the fun part, isn't it?



[Classic 10' Quad Pole Pricing & Ordering...](#)

[Classic 12/14.5' Quad Pole Pricing & Ordering...](#)

[16' Quad Pole Pricing & Ordering...](#)

DON'T DO IT YOURSELF, UPGRADES ARE AVAILABLE!

While not downgrading the abilities of custom fabricators, it is admittedly a risky and time-consuming method of upgrading your antenna (like one individual who was trying to make his own Ku-band mesh out of sheet metal).

Many times the reason for taking that route is simple a lack of knowledge of what we make. If you have a Paracclipse antenna, please check below to see what is available for your antenna before trying the custom fabrication route.

<u>PART NO.</u>	<u>UPGRADE KIT NAME</u>	<u>DESCRIPTION</u>
350000 <u>Pricing & Ordering...</u>	Polar T to Chain Drive Kit	Upgrades CLASSIC 12' & 14.5' Polar T mount to a chain drive mount
350507 <u>Pricing & Ordering...</u>	CD Counterbalance Kit	Adds counterbalance to CLASSIC 12' CD & older 14.5' CD
35060 <u>Pricing & Ordering...</u>	Boston to Sipco Gearbox Kit	Upgrades older CLASSIC 16' CD gearbox to current Sipco gearbox
62177 (12' PT) <u>Pricing & Ordering...</u> 65565 (12' CD) <u>Pricing & Ordering...</u> 65578 (14.5' PT) <u>Pricing & Ordering...</u> 65579 (14.5' CD) <u>Pricing & Ordering...</u>	Stainless Steel Hardware Kit	Upgrades all CLASSIC antennas but 16' CD to stainless steel hardware

65357	CD Motor & Chain Drive Kit	Upgrades older CLASSIC 12' & 14.5' CD antennas to current motor and chain drive
65358 <u>Pricing & Ordering...</u>	CD Motor/Gearbox Retrofit Kit	Upgrades older CLASSIC 12' & 14.5' CD antennas to current Sipco gearbox and Venture motor
65380 (9' & 10') <u>Pricing & Ordering...</u> 65381 (12' & 14.5') <u>Pricing & Ordering...</u> 653826 (16') <u>Pricing & Ordering...</u>	Feed Pole Retrofit Kit	Upgrades older CLASSIC buttonhook antennas to feed poles, plate & cover, also available for X-series buttonhook antennas (inquire if interested)
65383 (9' & 10') <u>Pricing & Ordering...</u> 65384 (12') <u>Pricing & Ordering...</u> 65386 (14.5') <u>Pricing & Ordering...</u>	C to Ku Retrofit Kit	Upgrades older CLASSIC C-band mesh & buttonhook to current Ku-band mesh, feed poles, plate & cover, also available for CLASSIC 16' CD & X-series antennas (inquire if interested)
65392 <u>Pricing & Ordering...</u>	Dual Turnbuckle Retrofit Kit	Upgrades older CLASSIC PT from one to two turnbuckles for stability required for Ku-band reception
653947 <u>Pricing & Ordering...</u>	Polar L to Polar T Retrofit Kit	Upgrades older CLASSIC Polar L mount to current Polar T mount
65405 <u>Pricing & Ordering...</u>	Extreme Weather Bolt Kit	Adds hardware to strengthen reflector hub on CLASSIC 12' & older 14.5' antennas
65475	CD Limit Switch Kit	Adds backup limits to older CLASSIC 12' CD antennas
65600 <u>Pricing & Ordering...</u>	Chain Drive Retrofit Kit	Upgrades CLASSIC 12' & 14.5' cog belt antennas to current chain drive
651007 <u>Pricing & Ordering...</u>	Stabilizer Struts Kit	Adds stabilizer struts to CLASSIC 12' antenna to strengthen mount

66400	16' Adjustable Declination Kit	Converts CLASSIC 16' CD to adjustable declination for tracking inclined orbit satellites
92081	Ajak Inclined Orbit Kit	Converts ECLIPSE 12' H-H and HYDRO 7.5' Ajak 180 to adjustable elevation for tracking inclined orbit satellites
923787	Mesh Support Ring Kit	Adds mesh support rings to ECLIPSE & X-series 10' and older 12' antennas

0° IS STRAIGHT UP!

Occasionally, I get calls from those with serious tracking problems. They can get one satellite good, but not the rest. If they live around 45° latitude, I ask if they are measuring their elevation 0° as straight up. Sometimes I will get silence on

the other end of the line and then an embarrassed "Thank you" before they hang up. Why? Around 45° latitude, it's easy to get our elevation angles flipped which then causes maddening tracking problems (not to mention embarrassment).

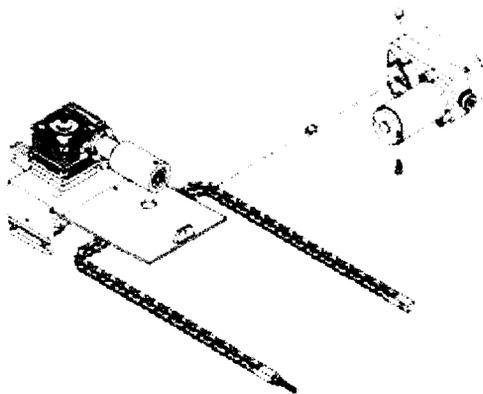
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THE COG BELT DRIVE VERSUS THE CHAIN DRIVE

One reputation that Paracclipse has worked hard to maintain over the years is that of durability. As time goes on, we have made improvements to our antennas to continue that reputation. A case in point is our Classic CD antennas.

At first, we used a cog belt to drive the antenna. Its durability was based on the premise that the customer would maintain the belt with a special lubricant and would replace the belt every three years. Unfortunately, people's view of what was necessary maintenance differed. As the years go by, belts stretch and develop cracks. On very rare occasions, belts that were not maintained have snapped and allowed the antenna to crash into the ground. (This would definitely contribute to poor picture quality.)



Therefore, Paracclipse developed a system that was more durable and required less maintenance. A simple kit of chain, sprockets, and the hardware at each end of the chain was put out. The only maintenance necessary was a regular (annually for most people) greasing of the chain to prevent rust. The advantages? The chain won't stretch and make your tracking less accurate. There is also no reason to worry about it snapping and damaging your antenna. Probably the clincher is that it doesn't need to be replaced every three years.

One more suggestion. If you are going to the trouble of upgrading to a chain drive, you might as well upgrade your motor/gearbox system, too. We have recently gone to a stronger, more accurate, and more durable motor and gearbox. (See my 3/96 Technical Support Newsletter for more details.) You can get just the chain drive upgrade (#65600) or you can get the combined chain drive and motor/gearbox upgrade (#65359). Either way, you will have a system that you can boast about to your neighbors for years to come.

[CD Chain Drive Upgrade Pricing & Ordering...](#)

[CD Sipco/Venture Motor & Chain Drive Retrofit Kit with motor mount plate Pricing & Ordering...](#)

HAVE YOU CHECKED YOUR NORTH/SOUTH ALIGNMENT?

For those of us who live in areas where roads are laid out in gridwork, we may not appreciate how difficult north/south alignment may be for some. Recently, I received a call from a remote part of Alaska regarding proper alignment of his Paraclipse antenna. Where exactly is due south? Nothing is laid out north, west, east, or south, and all a compass does is point you to the magnetic north pole, which for him was due east.

Thankfully, there are useful methods of aligning your north/south no matter where you are in the world. The following procedure should be of help. This procedure assumes that your elevation, declination, and plumb of mount have all been fine-tuned.

- 1) Aim towards the equator as close as you can using a compass and magnetic deviation charts. Remember, the magnetic poles move slowly over the years. A nearby airport can give you an up-to-date figure because this information is critical to airline tracking equipment. This should get you fairly close to true north/south.
- 2) While facing the equator, determine whether the lowest (closest to the horizon) viewable satellite is to the right or left of you. If it is to your left, continue with the following instructions. If it

is to your right, reverse all "right/left" and "raise/lower" references.

- 3) Swing your antenna to the satellite farthest to your right and adjust your azimuth and elevation for the absolute maximum signal. Swing your antenna to the satellite farthest to your left and do the same. If any azimuth and elevation adjustments are required to peak the signal on this satellite, your north/south alignment will still need minor correction.

- 4) If you raise the antenna to improve the picture (for most this is with the elevation adjustment bolt), rotate the mount slightly (a fraction of an inch or a few millimeters) counterclockwise. If you lower the antenna to improve the picture, rotate the mount slight clockwise. NOTE: It would be helpful to make a mark on your mount and base pipe as a reference point. That way you will know exactly how much you have moved the mount.

- 5) Repeat steps 3 and 4 until there is no adjustment needed from the satellite farthest to your right to the satellite farthest to your left. The result? You will have aligned your antenna to true north/south even if you are out in the middle of nowhere.

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HAVE YOU PROPERLY PEAKED YOUR FEED?

I think that most people, even experienced installers, would agree that they can find a wrong way to do something. I can do it, too. Even if our method isn't wrong, it could still be improved upon. Especially have I found this to be the case regarding the fine-tuning of feed electronics.

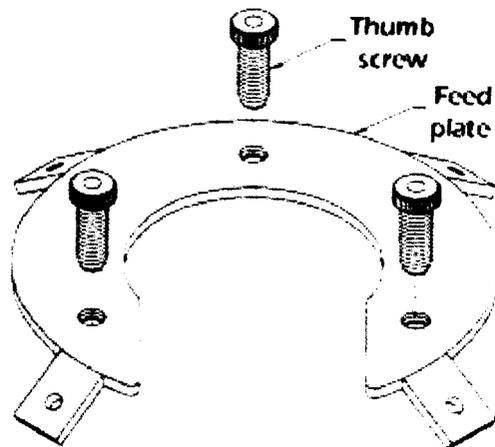
Probably the biggest thing I run across is that people don't use the features available to them. In our Classic series and our Eclipse series 10' (3.0m) and larger, this is Paracclipse's feed plate and thumb screws.

Our feed plate does more than just hold the feed. The position of the feed can be adjusted. More than that, it can be done with fine precision. One partial turn of one thumb screw may be all it takes to go from a marginal Ku-band signal to a good one.

Don't stint on your equipment. You would be surprised to find out how many out there do not use a decent signal strength meter or a centering tool. Doing it by eye and/or by trial and error is only cost effective if your time isn't worth much. In today's world, time is very precious. Another major misconception is that published focal distances and F/D ratios are absolute truths. Why? Small variations in the assembly of the reflector can cause differences. Therefore, use our figures as a starting point and go from there. Also, make sure you peak your signal on a satellite. (See my [8/95 Technical Support Newsletter](#).)

Please don't forget basic techniques. 1) Make sure that the feed plate is exactly centered in the reflector by measuring to the edge of the reflector all the way around. 2) Make sure that the feed is exactly straight (not cocked). A good centering tool is helpful here. 3) Measure the focal distance from the top of the hub plate to the point of the feed recommended by the manufacturer. Top of the hub plate means the center! I had one caller (who claimed he was an experienced installer) measure from the top edge of the hub plate, and he was wondering why his focal distances were way off.

What is the moral of the story? An installer that is still learning is better than one who already knows it all.



WORKING WITH OUR OLD VON WEISE MOTOR/GEARBOX

When an antenna is used in thousands of places literally from the Antarctic to the equator, it is truly a tested piece of equipment. Our Classic CD line of antennas has been used in all these places and many continuously so since 1985. Some are even using the original motor/gearbox that came with the antenna. When you consider that motors and gearboxes are wearable items that are recommended to be replaced after about five years, this is worthy of note.

Still, some people think that anything "Paraclipse" should last forever. As a result, a large number of my calls deal with trying to bring their motor/gearbox back up to par. While I don't mind helping them with this, I generally encourage people to go to our CD motor/gearbox upgrade because of its accuracy, strength and durability. (For more information on the upgrade, see my [3/96 Technical Support Newsletter](#).)

What can be done with the old Von Weise motor/gearbox? While we don't have any more for replacement purposes, we do have a few parts: worm gears (the gear off the tensioning screw), output gears (the round gear off of the worm gear), reed switches, and Hall effect boards. If you do take the gearbox apart, be careful not to lose the tiny ball bearings on each end of the worm gear.

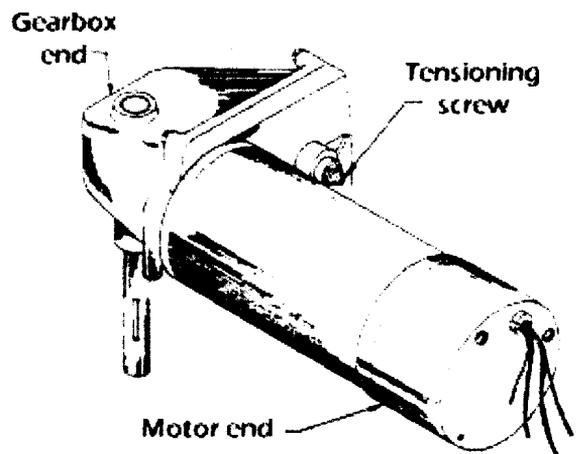
Another helpful reminder is that the tensioning screw is not for adjustment. Its purpose is to keep the worm gear in place. If it is too tight or loose, it will interfere with gearbox operation. If you want to make sure it is set right, loosen the nut holding it in place. Turn the screw until you first encounter resistance and then stop. When you tighten the nut, the tension is properly set.

Another common situation involves the five wires connecting the motor to the receiver. The two large motor wires are obvious. It is the

three smaller sensor wires that sometimes confuse people. Two of the sensor wires (the pulse and the ground or common) are used for standard configurations. The third wire (red or +5 volts) is only used for Hall effect boards or, very rarely, for the old, normally open circuit systems. The problem comes when the third sensor wire of a reed switch is left over. The natural thought is "it must hook up somewhere" and so people hook it up to the +5 volts wire. The result is that the reed switch gets fried, or in other words, becomes useless. So remember, 99.9% of people will use only two wires of the reed switch.

What about the Hall effect board that I mentioned earlier? These are used for older Houston Tracker and Toshiba receivers. Why? It seems that the receiver industry didn't agree on what constituted an electronic spike that the sensors read. As a result, reed switches didn't properly count their signals and Hall effect boards had to be used in their place.

Hopefully, this brief overview helps, and you can squeeze a little bit more out of your motor/gearbox. Despite all this, people still seem to want more. That's why we listened and developed the upgrade I mentioned.



[CD Von Weise Motor to Sipco/Venture Upgrade Pricing & Ordering...](#)

[CD Sipco/Venture Motor & Chain Drive Retrofit Kit with motor mount plate Pricing & Ordering...](#)

DECLINATION AND POLAR TRACKING

If there is one common problem that seems to stumble people in tracking satellites across the arc, it would be setting the declination angle (and this includes satellites professionals). Why?

I suppose part of it is that it might seem unnecessary to set two separate angles. Why not just point your antenna at the satellite arc and be done with it? This would work fine at the equator. The problem is that as you get away from the equator you are tracking an ellipse instead of a circle. You could probably illustrate it by taking something circular and turning it at a slight angle. To the eye, it now looks like an ellipse. In real life, what does this mean? Since a circle will only come close to part of an ellipse, ignoring declination would cause you to lose some satellites. (See my [4/95 Technical Support Newsletter](#).)

Another part of the problem seems to be that many treat declination as something that doesn't have to be too accurate. That is not true. If your declination is off even $\frac{1}{4}^\circ$, this will make a difference in tracking the entire satellite arc, especially on Ku-band. This might explain why our antennas allow you to adjust your declination as precisely as $\frac{1}{8}^\circ$. We designed it that way for a reason. So, take advantage of this design and set your declination as precisely as possible. Knowing the latitude of your antenna, you can find your declination on the chart at right. Please take the time to use it. This likely will save some time, both yours and mine.

DECLINATION & ELEVATION CHART

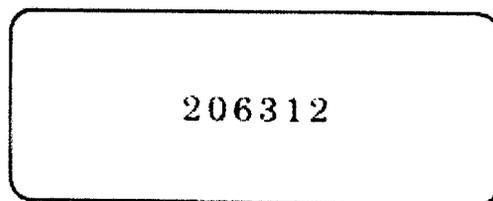
Site Latitude (Elevation)	Declination	Site Latitude (Elevation)	Declination
0	0.00	36	5.09
2	0.30	38	5.33
4	0.61	40	5.56
6	0.91	42	5.79
8	1.21	44	6.00
10	1.51	46	6.21
12	1.81	48	6.41
14	2.11	50	6.61
16	2.40	52	6.79
18	2.69	54	6.97
20	2.98	56	7.14
20.91	3.16	58	7.30
22	3.26	60	7.45
24	3.54	62	7.59
26	3.81	64	7.72
28	4.08	66	7.84
30	4.34	68	7.95
32	4.60	70	8.06
34	4.85		

Something we probably have all seen and likely have taken for granted are those little tags with numbers on products we buy. While it is possible that some think they are used for decoration, I'm sure most people realize that they serve a very useful purpose.

All antennas going out of our plant at Paraclipse have serial numbers. (On the other hand, retrofits and other kits do not.) On my end, serial numbers are quite useful because sometimes the customer is not sure exactly which antenna he has or how old it is. Identifying antennas by their serial number makes a definite difference in solving problems. What is more important is that serial numbers are valuable to the end user. If you were to contact us in a warranty situation, a serial number is required to proceed. Why? This gives us one means of verifying that a claim is valid.

Where can you find this tag? First of all, you can find it on the original packing list and the original invoice that came from Paraclipse. If you don't have them, contact your dealer for them. Also, you can find it on the antenna mount, and in the case of the Hydros, you can find it on the reflector. Once you find it, write it down because these little tags sometimes come off. A place is provided for this on the inside front cover of your installation manual.

Serial numbers are just another one of those things that require very little time now and could save a great deal of grief down the road. Isn't that a good reason not to take it for granted?



CONVERTING POLAR TO AZ-EL - PART 2

In my 2/96 Technical Support Newsletter, I covered this subject because of a few requests for a kit that converts our polar mounts to an AZ-EL configuration. At that time, I suggested either tooling your own AZ-EL bar or just leaving an actuator in a fixed position.

I suppose there are a number of people out there that don't like taking "No" for an answer. Okay, you win. Because of the amount of interest expressed, we ended up engineering an AZ-EL Lockdown Kit for each one of our polar mount antennas. Basically, we have two different types.

The first is our VP AZ-EL Lockdown Kit. This works on our VP polar mounts on the Hydro (6' [1.8m] and 7.5' [2.4m]) and the Eclipse (8.5' [2.6m], 10' [3.0m], and 12' [3.8m]). How does this one kit

work for these? The answer is our versatile VP actuator extension. (See my 8/95 Technical Support Newsletter.) Using the various configurations possible on the VP actuator extension and the included instructions, you will be able to secure your VP antennas to a fixed position. The second is our PT AZ-EL Lockdown Kit which works on our heavy-duty polar mounts on our Classic 12' (3.8m) and 14.5' (4.5m). Because of the strength of these antennas, the AZ-EL position is locked down with two bars.

In essence, we now have AZ-EL configurations for all of our polar mounts from 6' (1.8m) to 14.5' (4.5m). I guess that means this question is settled. (Nobody would ask for an AZ-EL lockdown kit for our motorized, horizon-to-horizon mounts, would they?)

DEALING WITH SNOW AND ICE ON YOUR ANTENNA

To all our customers in colder climates or high elevations, little needs to be told to you about the problems resulting from snow or ice buildup on your antenna. These problems range anywhere from loss of signal to actual damage of the antenna, but this is an area where some forethought can save a lot of grief. After all, who wants to go outside and clear off the antenna in the middle of a blizzard?

Many try to get by with manually dumping the snow by driving the antenna to the horizon. Not only does this not help with ice, those in areas with frequent heavy snowfalls will build up quite a pile after a while. I have had a couple of reports of antenna damage because the antenna was driven into an icy pile of snow that had been previously dumped.

A number of companies have seen profit potential in this situation and have put out a variety of products. These can be grouped into two categories: (1) keeping the snow and ice off of the reflector; and (2) preventing snow and ice from building up.

The first basically involves some sort of cover for the reflector. Before you go out and grab a piece of canvas to throw on your antenna, don't forget that the signal has to get through, too. Therefore, the cover material has to not only not absorb water, but it also must shed water well, too. Also,

the cover cannot have any metallic substances in it. Companies have gone to great lengths trying to find the best material that meets these specifications. Still, this doesn't do much for freezing rain or freezing mist.

This leads to the second type of solution which is some sort of heating device. Some enclose the back side of the reflector and heat the space between the back cover and the reflector. This prevents snow and ice buildup. Others heat the space between the reflector cover that we discussed previously and the reflector. Obviously, this would become more difficult and expensive with larger antennas.

Another problem with these heating systems is that it doesn't work very well for mesh antennas. I have heard of companies putting out a kit that lays heated strips on the back of the mesh. I haven't heard how well this system works, but it sounds like they are on the right track.

True, some expense is involved in this, especially when you get into heating systems, but unless you want to pack up your antenna and move to a warmer climate, you need to decide whether the advantages are worth it to you. In some areas, you may not have much choice, and it is just chalked up to the cost of living in colder climates. For many, myself included, living there is worth it.

included, living there is worth it.

WHAT KIND OF PARACLIPSE ANTENNA DO I HAVE?

It seems that if the antenna is more than five years old, half of my time is spent trying to figure out which antenna the caller has. The large majority of the calls deal with our *Classic* line of antennas (identified by truss-rib construction) since there are tens of thousands out there still being used. Detailed below and right, you will see a picture of each mount of the *Classic* antennas that Paracclipse has made for the past 17 years. Trust me. It makes a difference when you are trying to replace parts or get help.

HORIZON TO HORIZON MOUNTS

9' (2.8m), 12' (3.8m), 14.5' (4.5m) COG
BELT DRIVE MOUNT

(1985 to 1989)

Identified by cog belt

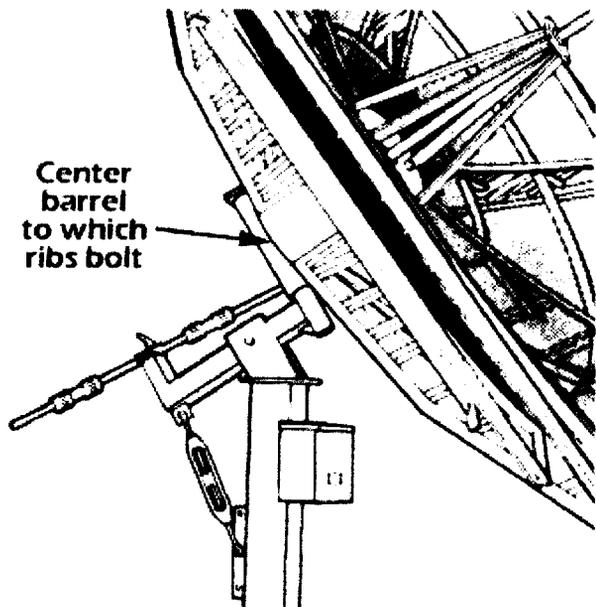


POLAR MOUNTS

12' (3.8m) BARREL HUB MOUNT

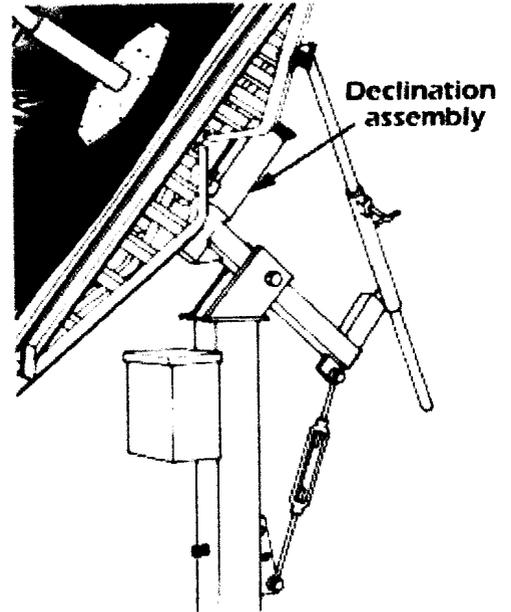
(1979 to 1982)

Identified by the center barrel of the reflector



(1982 to 1984)

Identified by the declination assembly which slides over the Polar L mount and has a slotted declination adjustment on top



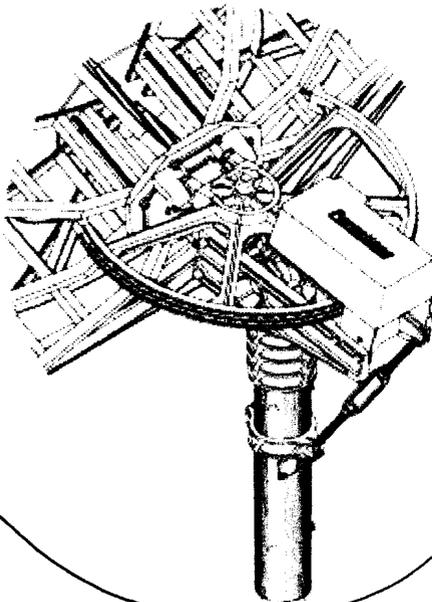
10' (3.0m), 12' (3.8m), 14.5' (4.5m) CHAIN DRIVE MOUNT

12' (3.8m) Pricing & Ordering...

14.5' (4.5m) Pricing & Ordering...

(1990 to present) (10' 1990 to 1991)

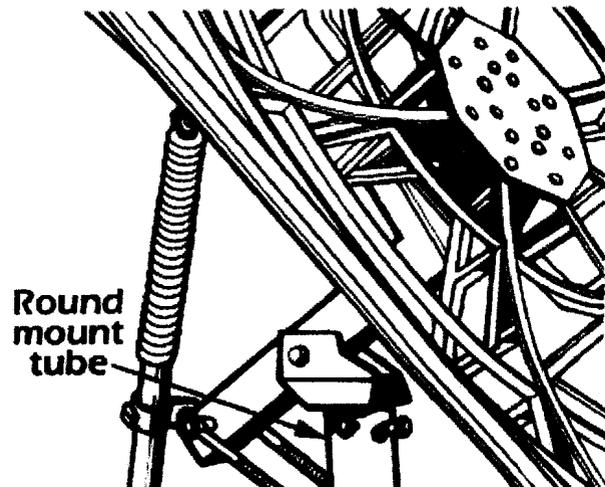
Identified by chain



10' (3.0m) PLUS MOUNT

(1989 to 1994)

Only round mount tube among polar mounts

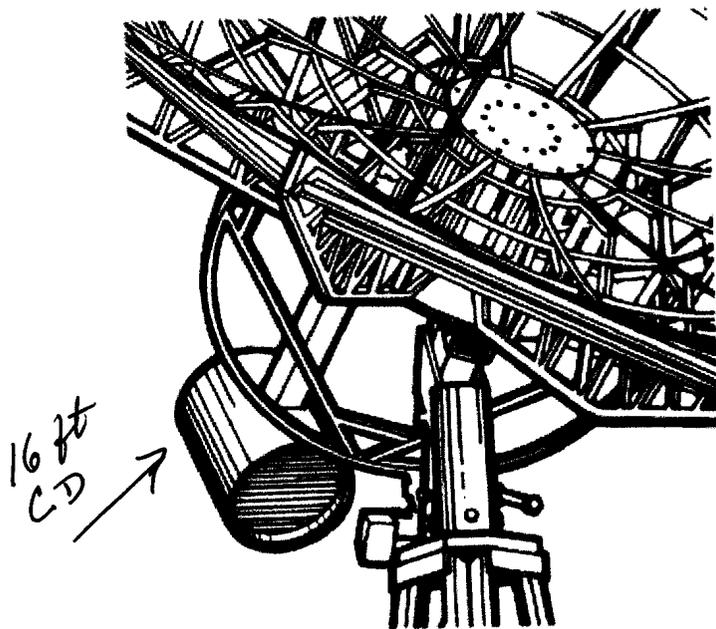


16' (4.8m) CHAIN DRIVE MOUNT

Pricing & Ordering...

(1984 to present)

Identified by tower, chain drive, and
fabricated steel mount



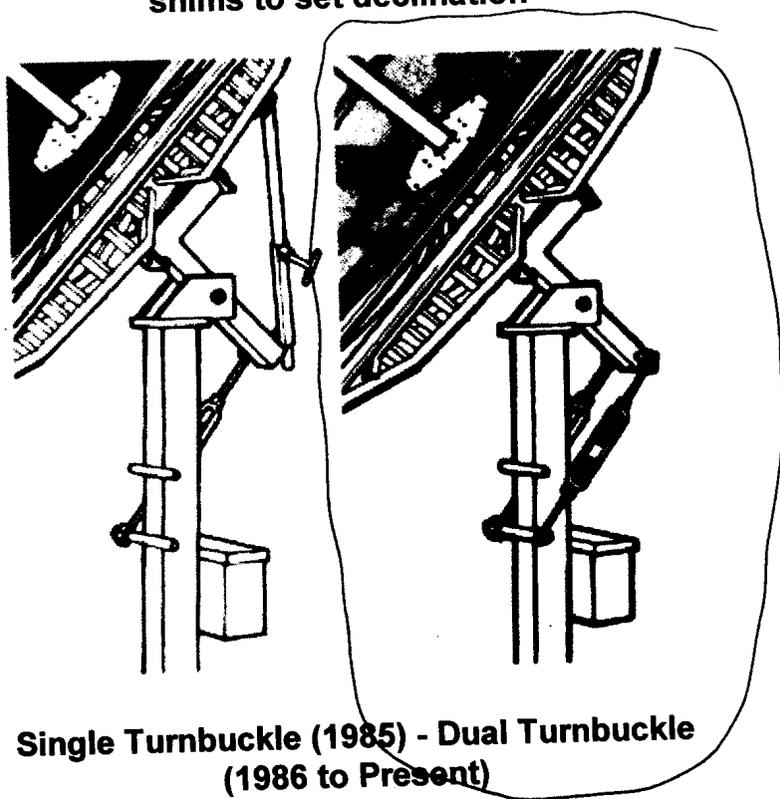
9' (2.8m), 12' (3.8m), & 14.5' (4.5m) POLAR
T MOUNT

12' (3.8m) Pricing & Ordering...

14.5' (4.5m) Pricing & Ordering...

(1985 to present) (9' 1985 to 1989)

Identified by Declination Bracket using
shims to set declination



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